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MD880 Series
High-performance Engineering AC Drive
Selection Guide

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

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Preface

Introduction

This document is a comprehensive guide for selecting MD880 products. It provides information on selection procedures and examples, as well as product introduction, specifications, dimensions, and ordering guidelines. If you have any question on product function and performance, contact Inovance for technical support.

Documents provided by Inovance are subject to change without notice due to continuous product improvement.

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.

Revision History

Date	Version	Description
December 2024	A02	**Addition:** • Added description for the water-cooled DC chopper module in *"17.1 Product Features" on page 162*. • Added description for the HEIP-10 EtherNet/IP adapter module in *"20.2.23.1 Introduction" on page 251*. **Update:** • Updated content in selected sections.
November 2023	A01	• Updated *" Front Cover" on page 1*, *" Preface" on page 1*, and *" Back Cover" on page 343*. • Added *" Safety Precautions" on page 13*. • Updated the structure data in Table 7-1 in *" Product Specifications" on page 71*. • Updated the output current of 0024-4-B-SG in Table 11-2 in *" Product Specifications" on page 106*. • Added description that the specific model comes with an output reactor in *"12.1.1 Model Number and Nameplate" on page 112*. • Updated the rated power data in Table 20-67 "AC input reactor models" in *"20.6.2.3 Air-Cooled Single-Drive Product (400 V)" on page 274*. • Updated the order No. of 1370-7-SG in Table 22-4 in *"22.4 Inverter Module" on page 300*.
November 2022	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:

- **Inovance website:** Visit *www.inovance.com*, go to Support > Download, search by keyword, and then download the PDF file.
- **QR code**: Scan the QR code on the product with your smart phone.
- **My Inovance app:** 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 Levels 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 shows 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 equipment if you find water seepage or missing or damaged components upon unpacking. • Do not install the equipment if you find the packing list does not conform to the equipment you received.
 • Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking. • Unpack the package 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 injury or equipment damage. • Never stand or stay below the equipment when the equipment is being hoisted by the hoisting equipment. • When hoisting the equipment with a steel rope, ensure the equipment is hoisted at a constant speed without suffering from vibration or shock. Do not turn the equipment over or let the equipment stay hanging in the air. Failure to comply may result in personal injuries or equipment damage.
 • Handle the equipment with care during transportation and mind your steps to prevent personal injuries or equipment damage. • When carrying the equipment with bare hands, hold the equipment casing firmly with care to prevent parts from falling. Failure to comply may result in personal injuries. • Store and transport the equipment based on the storage and transportation requirements. Failure to comply will result in equipment damage. • Avoid storing or transporting the equipment in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration. • Avoid storing the product for more than 3 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 equipment with other equipment or materials that may harm or have negative impacts on this equipment.

Installation
 • The equipment must be operated only by professionals with electrical knowledge. 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 an electric shock. • When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire. • Do not retrofit the equipment. • Do not fiddle with the bolts used to fix equipment components or the bolts marked in red. • When the equipment is installed in a cabinet or final assembly, a fireproof enclosure providing both electrical and mechanical protections must be provided. The IP rating must meet IEC standards and local laws and regulations. • Before installing devices with strong electromagnetic interference, such as a transformer, install a shielding device for the equipment to prevent malfunction. • Install the product on an incombustible object, such as metal, and do not touch or attach the product to combustibles. Failure to comply can result in fire accident.
 • 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, or parts 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. After waiting for the designated time, measure the DC voltage in the main circuit to ensure the DC voltage is within the safe voltage range. Failure to comply will result in an electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power ON. Failure to comply will result in an electric shock.
- Check that the equipment is grounded properly. Failure to comply can result in an 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 a 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 user guide. Improper tightening torque may overheat or damage the connecting part, resulting in a fire.
- After wiring is done, check that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply may result in 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 can 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.
- Check that the power supply meets equipment requirements before power-on to prevent equipment damage or fire accident.
- After power-on, do not open the cabinet door or protective cover of the equipment, touch any terminal, or disassemble any unit or component of the equipment. Failure to comply will result in an electric shock.



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

Operation
 • The equipment must be operated only by professionals. Failure to comply can result in death or personal injury. • Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply will result in an electric shock.
 • Do not touch the equipment enclosure, fan, or resistor with bare hands. Failure to comply may result in personal injury. • Prevent metal or other objects from falling into the equipment during operation. Failure to comply may result in a fire or equipment damage.

Maintenance
 • Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals. • Do not maintain the equipment with power on. Failure to comply 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. • When a permanent magnet motor is used, do not touch the motor terminals immediately after power-off because the motor terminals can generate induced voltage during rotation even after the equipment power supply is off. Failure to comply will result in an electric shock.
 • Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.

Repair
 • Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals. • Do not maintain the equipment with power 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 death, personal injury or equipment damage. • 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 death, personal injury, or severe equipment damage. • After the equipment is replaced, check the wiring and set parameters again.

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

Safety Labels

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

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

1 Product Overview

The MD880 belongs to Inovance's high-end frequency control product platform, available in single-drive and multi-drive configurations. It is positioned as a premium drive solution featuring high-performance speed and torque control, high reliability, flexible system integration, easy commissioning and maintenance, and high power density.

Powerful control system

The HCU control module is the main controller of Inovance's next-generation frequency control systems, supporting both the MD880 single-drive series and MD880 multi-drive series products. It is used to control the basic rectifier, regenerative rectifier, active rectifier, inverter, three-phase brake, and DC/DC power modules. It boasts powerful functionality, compact design, high scalability, high reliability, fast and flexible networking, and excellent control algorithms. For inverters, the HCU supports control of synchronous and asynchronous motors in multiple modes, including V/f control, sensorless vector control (SVC), and feedback vector control (FVC). For DC/DC converters, the HCU supports voltage control, current control, and power control modes, which can be switched over as needed.

Robust and reliable product design

Industrial-grade, long-life components ensure stable and reliable hardware, with multiple fault-handling mechanisms guaranteeing rapid production line recovery in under 30 minutes on average.

- Rapid field maintenance
  Production line can be recovered without the need to replace the HCU module, disconnect the communication, control, or encoder cables, or download backup parameters or system software, minimizing operational loss. The HCU features a plug-and-play SD card for storing parameters and system software, enabling rapid HCU replacement. The battery-powered system clock ensures timestamp reliability for the HCU event logger, unaffected by power outages.
- Remote real-time diagnostics
  With customer authorization, technicians can connect to on-site remote servers through VPN to check fault records, verify system parameters, and monitor operational data, helping customers quickly identify faults, optimize processes, and improve production efficiency.
- Black box recording
  The black box stores pre- and post-fault waveform data of 50 monitored objects, retaining 1000 groups of data in a cyclic manner.
- Flexible fault level settings ensure hassle-free operation.

Flexible and streamlined multi-drive system

- The common DC bus design effectively reduces the rectifier and brake current while simplifying installation requirements. In applications such as potential energy torque decentralization and winding/unwinding, the regenerative and motoring energy of each inverter module can be directly exchanged through the common DC bus. The rectifier module, inverter module, braking module, and active rectifier filter module all adopt a booksize modular structure, enabling flexible selection, easy cabinet setup, and quick maintenance. The booksize modules efficiently utilize cabinet depth,

improving cabinet space utilization, reducing the number of cabinets, and saving 30% to 60% of floor space. Power modules and optional parts can be installed in a standard cabinet to ensure the overall high quality of the drive system. The product can be delivered on a chassis or in a cabinet to meet different needs of integrators and end users.

- The unified rectifier modules and unified input circuits significantly save input cables and power distribution protection devices compared to single-point drives, enhancing overall system safety, control functionality, and reliability.

Highly flexible modular structure

Flexible combination of hardware and software modules caters to different application scenarios without the need of code editing. Free software programming enables rapid secondary development for software autonomy. The development data flow diagram makes commissioning and process control clear and visible. A wide range of hardware expansion modules allows flexible functional configuration.

Comprehensive commissioning by host controller

- Convenient commissioning with InoDriveStudio: InoDriveStudio is the standard PC software tool for Inovance MD880 drive product family. The user-friendly interface ensures ease of use, requiring no specialized system knowledge. The graphical menu-based interface enables commissioning engineers to quickly complete basic configuration, parameter setting, fault detection, and maintenance and service for complex systems. InoDriveStudio supports trend recording for up to eight signals, simplifying diagnostics and optimization of AC drives. It can also access the HCU's internal high-speed data logger, fully restoring information for 50 monitored objects before and after a fault, helping electrical engineers efficiently locate faults and optimize production line process control.
- Professional-grade configuration design for background application setup.

Full compatibility

Seamless compatibility with various host controllers can be achieved without the need to modify the original PLC program.

- Compatibility with various host controllers
  Powerful communication conversion tool, parameter interconnection, and bus adaptation ensure full compatibility with any bus type without the need to modify host programs or configuration files.
- Excellent motor control performance
  Supports synchronous and asynchronous motor control, enabling zero-speed hovering without an encoder.
- Optional structural mounting brackets
  Provides optional mounting bracket to adapt to client's existing models, enabling rapid on-site replacement.

2 Selection Flow

The multi-drive configuration selection flow is shown in *“Figure 2–1” on page 21* . The single-drive configuration selection flow is shown in *“Figure 2–2” on page 21* .

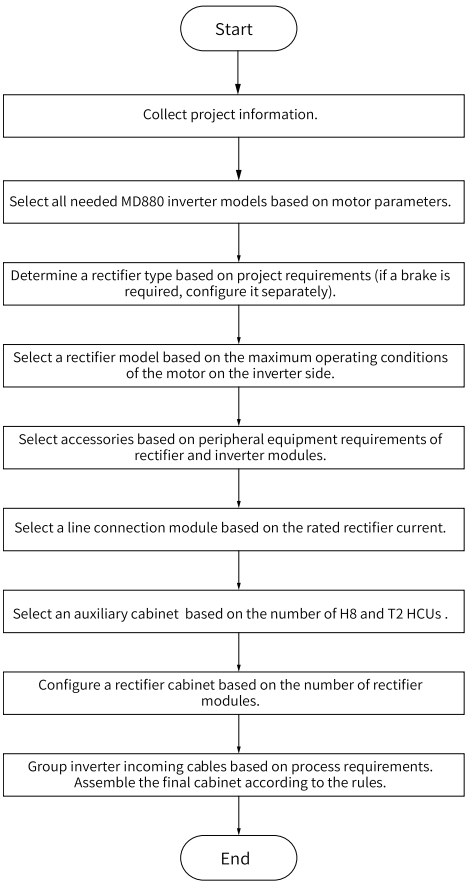


Figure 2-1 Multi-drive configuration selection flow

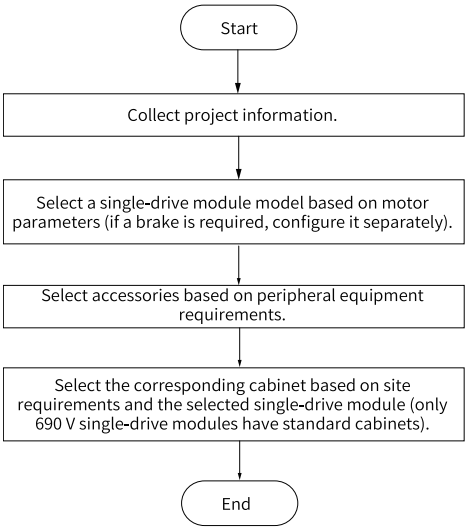


Figure 2-2 Single-drive configuration selection flow

2.1 Multi-Drive Module Selection Example

2.1.1 Inverter Module Selection Example

Based on the on-site motor parameters, select all MD880 inverter models that are needed to match each motor.

1. Collect on-site load information.

   a. Overload requirements: These depend on the motor's application conditions and the process requirements on site.

   b. Derating requirements: These include derating due to ambient temperature, altitude, carrier frequency, low-frequency output, parallel operation, periodic load fluctuation, and high IP rating.

   c. Overload capacity: The criterion for determining overload is that the drive system operates at the reference load current (I_{LD}/I_{HD}) before and after an overload event, within a cycle duration of 300 seconds.

   - Light overload: 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.

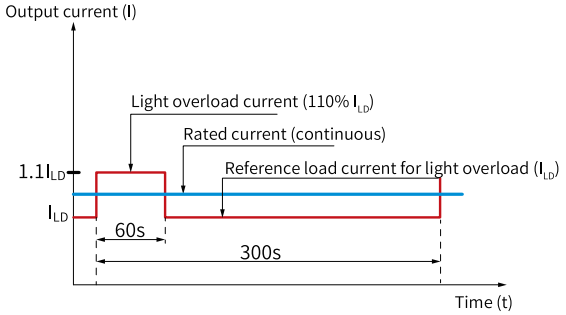


Figure 2-3 Curve of light overload mode

   - Heavy overload: 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.

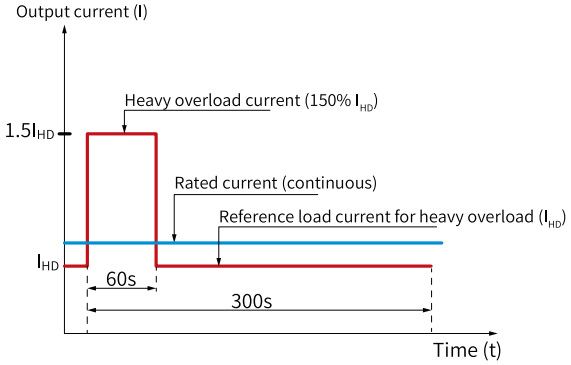


Figure 2-4 Curve of heavy overload mode

2. After obtaining the above information, use **current** as the main basis for model selection. The selection method is as follows:

   a. Calculate using the rated current from the motor nameplate:

   - No-overload application:

$I_N = I_E$

Note

- I_N: Rated current
- I_E: Rated motor current

- Overload application:
  $I_N \times K = I_E \times N$

Note

- I_N: Reference current for overload
- K: Overload coefficient (110% for light overload and 150% for heavy overload)
- I_E: Rated motor current
- N: Overload multiple

b. After calculating I_N, compare the I_N value with the rated current of the AC drive to complete the inverter module selection.

c. After selecting the inverter module model, compare the power corresponding to the overload level with the rated motor power to ensure that the power requirements are met.

Note

Select the module model based on current (preferred) or power.

3. In addition to the current-based selection method described above, if the selected motor load is a standard motor load with no special or customized operating conditions, you can use **power** as the main basis for model selection. The selection method is as follows:

   a. Compare the rated power from the motor nameplate with the power of the inverter module. Based on the load type, select the inverter module's no-overload power, light-load power, or heavy-load power. The following steps use the heavy-load power of the inverter module as an example.

   b. Select an inverter module with heavy-load power equal to the rated motor power, or select an inverter module with heavy-load power greater than and closest to the rated motor power.

   c. After completing the selection, verify whether the rated motor current matches the heavy-load current of the inverter module, ensuring that the heavy-load current is greater than the rated motor current.

4. Notes for selecting H8 and H8A inverter modules:

   - H8 module: Comes with a reactor as standard. The quick installation kit for H8 is optional.
   - H8A module: The reactor and mounting base are optional.
   - Wiring: The H8 module has rear-outlet wiring, while the H8A module has front-outlet wiring.

2.1.2 Rectifier Module Selection Example

Determine the rectifier type before selecting a rectifier model.

Determining the rectifier type

Determine the rectifier type based on the configuration of the client, such as the grid capacity, phase-shifting transformer, power transformer, quick braking, and drag load.

Client Configuration or Requirements	Rectifier Type
High requirements for harmonics suppression	• Select a multi-pulse rectifier or AFE rectifier. • Harmonic content of the active rectifier: 5%
Low requirements for harmonics suppression, but energy feedback to the grid is needed	Regenerative rectifier, with rectifier-side current harmonics of 30% to 45% under rated operating conditions
Low requirements for grid-side current harmonics suppression, and energy feedback to the grid is not needed	Basic rectifier, with rectifier-side current harmonics of 30% to 45% under rated operating conditions

Selecting a rectifier model

Calculate the power or current required on the inverter side when load motors are operating simultaneously at the maximum load. The calculated value is the minimum specification of the rectifier module.

When selecting the rectifier module, note that the T2 structure and H8 structure require the matching quick installation kits.

2.2 Single-Drive Module Selection Example

1. Collect on-site load information.

   a. Overload requirements: These depend on the motor's application conditions and the process requirements on site.

   b. Derating requirements: These include derating due to ambient temperature, altitude, carrier frequency, low-frequency output, parallel operation, periodic load fluctuation, and high IP rating.

   c. Overload capacity: The criterion for determining overload is that the drive system operates at the reference load current (I_{LD}/I_{HD}) before and after an overload event, within a cycle duration of 300 seconds.

   - Light overload: 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.

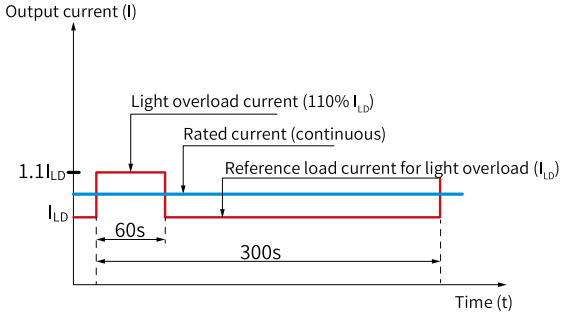


Figure 2-5 Curve of light overload mode

   - Heavy overload: 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.

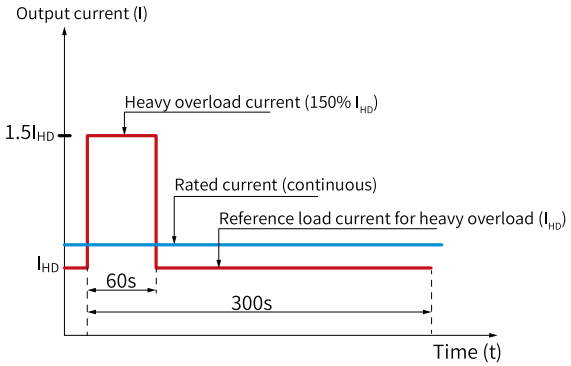


Figure 2-6 Curve of heavy overload mode

2. After obtaining the above information, use **current** as the main basis for model selection. The selection method is as follows:

   a. Calculate using the rated current from the motor nameplate:
   $I_N \times K = I_E \times N$

Note

- I_N: Rated current (in no-overload applications) or reference current for overload (in overload applications).
- K: Overload coefficient (110% for light overload and 150% for heavy overload)
- I_E: Rated motor current
- N: Overload multiple

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   b. After calculating I_N, compare the I_N value with the rated current of the AC drive to complete the inverter module selection.
   c. After selecting the inverter module model, compare the power corresponding to the overload level with the rated motor power to ensure that the power requirements are met.

Note

Select the module model based on current (preferred) or power.

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3. In addition to the current-based selection method described above, if the selected motor load is a standard motor load with no special or customized operating conditions, you can use **power** as the main basis for model selection. The selection method is as follows:

   a. Compare the rated power from the motor nameplate with the heavy-load power of the inverter module. Based on the load type, select the inverter module's no-overload power, light-load power, or heavy-load power. The following steps use the heavy-load power of the inverter module as an example.
   b. Select an inverter module with heavy-load power equal to the rated motor power, or select an inverter module with heavy-load power greater than and closest to the rated motor power.
   c. After completing the selection, verify whether the rated motor current matches the heavy-load current of the inverter module, ensuring that the heavy-load current is greater than the rated motor current.

2.3 Braking Resistor Selection Example

For single-drive modules in the 400 V voltage class (power range of 75 kW and below), a braking unit is included as standard.

Selecting a braking unit

Basis for selecting a braking unit:

- Select a braking unit that matches the input voltage class of the drive.
- Select a braking unit based on the braking power required by the drive.
  Ensure that the power of the braking unit is greater than the braking power. If the braking power is unknown, estimate it according to the following formula:

  Pb = P x Td x K

Note

- Pb: Braking power
- P: Motor power
- K: Mechanical energy conversion efficiency (typically K = 0.7)
- Td: Ratio of braking torque to rated motor torque
- The value of Td varies across different systems, as shown in the following table.

Common Application Scenario	Td Value
Elevators, hoists, and cranes	100%
Unwinding and winding	120%
Large-inertia equipment requiring fast stopping	120%
Regular-inertia loads	80%

Selecting a braking resistor

The selection of the braking resistor involves two aspects: resistance and power of the braking resistor.

- Resistance
  Resistance represents the regenerative energy from the motor the braking resistor dissipates during braking. The resistance can be calculated using the following formula. If the calculated R is less than the minimum resistance for the respective voltage class, multiple braking units are required.

  $U \times \frac{U}{R} = Pb$

Note

- U: Braking voltage during stable braking
- Pb: Braking power
- R: Resistance

- Braking power
  In theory, the power of the braking resistor is the same as the braking power. However, considering a derating factor of 70%, you may calculate the braking power using the following formula:

0.7 x Pr = Pb x Ed

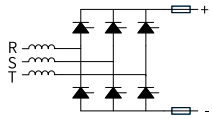
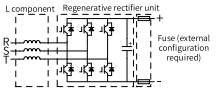
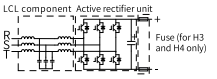
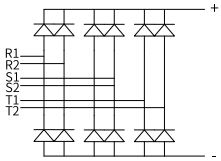
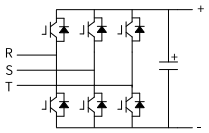
Note

- Pr: Power of the braking resistor
- Pb: Braking power
- Ed: Braking frequency, that is, the proportion of the braking process in the entire operating cycle
- The value of Ed varies across different systems, as shown in the following table.

Common Application Scenario	Ed Value
Elevators	20% to 30%
Unwinding and winding	20% to 30%
Cranes and centrifuges	50% to 60%
Occasional braking loads	5%
Injection molding machines	5% to 10%
Regular applications	10%

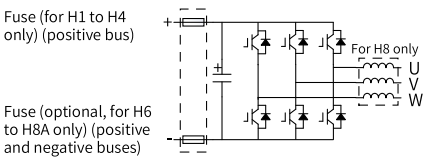
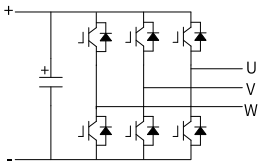
3 Selection

Table 3–1 Comparison of rectifier modules

Module	MD880-20M (Basic Rectifier)	MD880-30K (Regenerative Rectifier)	MD880-40K/MD880-40D (Active Rectifier)	MD880LC-20M (Water-Cooled Basic Rectifier)	MD880LC-40M (Water-Cooled Active Rectifier)
Unit topology					
Structure	T2	L+H8	LCL+(H3/H4/H6/H7/H8)	D3D	H7w (LC)
Input voltage class	400 V system: 380 VAC to 415 VAC 690 V system: 525 VAC to 690 VAC		400 V system: 380 VAC to 415 VAC 500 V system: 380 VAC to 500 VAC 690 V system: 525 VAC to 690 VAC	690 V system: 525 VAC to 690 VAC	
Input/Output frequency	Input: 47 Hz to 63 Hz				
Unbalance degree	Maximum: ⩽ ±3% of rated line voltage				
Output voltage	400 V system: 540 VDC to 590 VDC 690 V system: 740 VDC to 975 VDC		400 V system: 540 VDC to 720 VDC 500 V system: 570 VDC to 750 VDC 690 V system: 740 VDC to 975 VDC	690 V system: 740 VDC to 975 VDC	690 V system: 740 VDC to 1050 VDC
Maximum single unit power (no overload)	400 V single unit: 649 kW 690 V single unit: 929 kW	400 V single unit: 595 kW 690 V single unit: 1026 kW	400 V single unit: 556 kW 500 V single unit: 694 kW 690 V single unit: 639 kW	690 V single unit: 2273 kW	690 V single unit: 769 kW
Efficiency	> 98%		> 97%	> 99.5% (rated working condition)	> 98% (rated working condition)
Fundamental wave power factor	> 0.95 (rated full load)	> 0.95 (rated full load, with L filter module)	> 0.99 (with LCL filter)	> 0.95 (rated working condition, with L filter module)	≈ 1 (with LC filter)
Fuse configuration	Yes; built-in DC-side fuse	No; requires external DC-side fuse	H3/H4: built-in DC fuse H6/H7/H8: requires external DC-side fuse	No; requires external DC-side fuse	
Overload coefficient	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes				

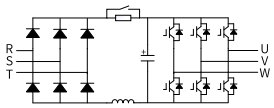
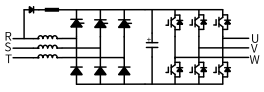
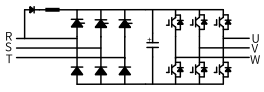
Module	MD880-20M (Basic Rectifier)	MD880-30K (Regenerative Rectifier)	MD880-40K/MD880-40D (Active Rectifier)	MD880LC-20M (Water-Cooled Basic Rectifier)	MD880LC-40M (Water-Cooled Active Rectifier)
Ambient temperature	Ambient temperature: –10°C to +40°C; derate output current by 1% per 1°C above 40°C; maximum ambient temperature 50°C			Ambient temperature: 0°C to +55°C; derate output current by 0.5% per 1°C above 45°C; maximum ambient temperature 55°C Coolant temperature: 0°C to +50°C; derate output current by 2% per 1°C above 40°C; maximum ambient temperature 50°C	
Operating altitude	⩽ 1000 m no derating; derate above 1000 m; isolation transformer required above 2000 m; maximum altitude 4000 m				
Vibration resistance	Class 3M4 in GB/T 4798.3-2007				
Pollution degree	PD2				
Overvoltage class	OVC III				
Power grid system	IT, TT/TN (VDR and EMC screws required)				
Cooling method	Forced air cooling (AF) compliant with EN 60146			Water cooling	
Noise	⩽ 80 dB		⩽ 85 dB	⩽ 70 dB	
Safety category	EN 61800-5-1				
IP rating	IP00 (module)	Frame: IP00	H3/H4: IP20 H6/H7/H8: IP00	IP00	

Table 3–2 Comparison of inverter products

Module	MD880-50M (Inverter)	MD880LC-50M (Water-Cooled Inverter)
Unit topology		
Structure	H1/H2/H3/H4/H6/H7/H8/H8A	H7w (LC)
Input voltage class	Matching 400 V system: 540 VDC to 720 VDC Matching 500 V system: 540 VDC to 750 VDC Matching 690 V system: 740 VDC to 975 VDC	Matching 690 V system: 740 VDC to 975 VDC
Input/Output frequency	Output: 0 Hz to 300 Hz; custom design required for frequency over 300 Hz	

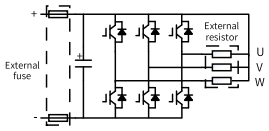
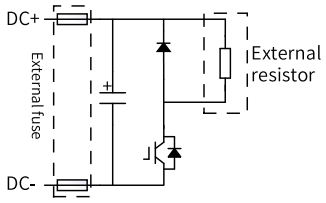
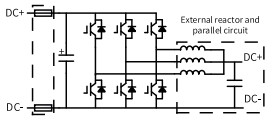
Module	MD880-50M (Inverter)	MD880LC-50M (Water-Cooled Inverter)
Output voltage	400 V system: 0 VAC to 415 VAC 500 V system: 0 VAC to 500 VAC 690 V system: 0 VAC to 690 VAC	690 V system: 0 VAC to 690 VAC
Maximum single unit power (no overload)	400 V single unit: 500 kW (AC) 500 V single unit: 560 kW (AC) 690 V single unit: 710 kW (AC)	690 V single unit: 630 kW (AC)
Efficiency	> 98%	> 98% (rated working condition)
Fuse configuration	H1/H2/H3/H4: built-in DC fuse H6/H7/H8/H8A: requires external DC-side fuse	No; requires external DC-side fuse
Overload coefficient	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes	
Ambient temperature	Ambient temperature: –10°C to +40°C; derate output current by 1% per 1°C above 40°C; maximum ambient temperature 50°C	Ambient temperature: 0°C to +55°C; derate output current by 0.5% per 1°C above 45°C; maximum ambient temperature 55°C Coolant temperature: 0°C to +50°C; derate output current by 2% per 1°C above 40°C; maximum coolant temperature 50°C
Operating altitude	⩽ 1000 m; derate output current by 1% per 100 m above 1000 m; isolation transformer required above 2000 m; maximum altitude 4000 m	
Vibration resistance	Class 3M4 in GB/T 4798.3-2007	
Pollution degree	PD2	
Overvoltage class	OVC III	
Cooling method	Forced air cooling (AF) compliant with EN 60146	Water cooling
Noise	⩽ 80 dB	⩽ 70 dB
Safety category	EN 61800-5-1	
IP rating	H1/H2/H3/H4: IP20 H6/H7/H8: IP00	IP00

Table 3–3 Comparison of single-drive products

Module	MD880-01S (400 V Single-drive)	MD880-01S/11S (690 V Single-drive)	MD880LC-01S (Water-Cooled Single-drive)
Unit topology			
Structure	T2/T3/T4/T5/T6/T7/T8/T9/T10/T11/T12	S12/2 x S12	H7w (LC)
Input voltage class	400 V system: 380 VAC to 480 VAC	690 V system: 525 VAC to 690 VAC	

Module	MD880-01S (400 V Single-drive)	MD880-01S/11S (690 V Single-drive)	MD880LC-01S (Water-Cooled Single-drive)
Input/Output frequency	Input: 47 Hz to 63 Hz Output: 0 Hz to 300 Hz; custom design required for frequency over 300 Hz		
Unbalance degree	Maximum: ⩽ ±3% of rated line voltage		-
Output voltage	400 V system: 0 VAC to 480 VAC	690 V system: 0 VAC to 690 VAC	
Maximum single unit power (no overload)	400 V single unit: 450 kW	690 V single unit: 710 kW (module)	690 V single unit: 500 kW (module)
Efficiency	> 98% (rated working condition)		> 98%
Fundamental wave power factor	> 0.95 (rated working condition, with L filter module)		
Fuse configuration	No		
Overload coefficient	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes		
Ambient temperature	Ambient temperature: –10°C to +40°C; derate output current by 1.5% per 1°C above 40°C; maximum ambient temperature 50°C		Ambient temperature: 0°C to +60°C; derate by 1% per 1°C above 50°C; maximum ambient temperature 60°C Coolant temperature: 0°C to +50°C; derate output current by 2% per 1°C above 40°C; maximum coolant temperature 50°C
Operating altitude	⩽ 1000 m; derate output current by 1% per 100 m above 1000 m; isolation transformer required above 2000 m; maximum altitude 4000 m		
Vibration resistance	Class 3M4 in GB/T 4798.3-2007		
Pollution degree	PD2		
Overvoltage class	OVC III		
Power grid system	IT TT/TN (VDR and EMC screws must be installed.)		
Cooling method	Forced air cooling (AF) compliant with EN 60146		Water cooling
Noise	⩽ 80 dB		⩽ 70 dB
Safety category	EN 61800-5-1		
IP rating	T2 to T9: IP20 T10 to T12: IP00	S12 module: IP00 S12 and 2 x S12 cabinet: IP20	IP00

Table 3–4 Comparison of brake and DC chopper products

Module	MD880-60M (Three-Phase Brake)	MD880-61M (Single-Phase Brake)	MD880-80M (DC Chopper)
Unit topology			
Structure	H8	-	H3/H4/H6/H7/H8A
Input voltage class	Matching 400 V system: 640 VDC to 750 VDC Matching 690 V system: 1075 VDC to 1150 VDC	800 VDC to 1200 VDC	(HVS) Matching 400 V system: 540 VDC to 720 VDC (HVS) Matching 500 V system: 540 VDC to 850 VDC (HVS) Matching 690 V system: 740 VDC to 1050 VDC
Output voltage	-		(LVS) 400 V system: 24 VDC to 670 VDC (LVS) 500 V system: 24 VDC to 800 VDC (LVS) 690 V system: 24 VDC to 1000 VDC
Maximum single unit power (no overload)	400 V single unit: 750 kW (DC) 690 V single unit: 1300 kW (DC)	147 kW (DC)	400 V single unit: 500 kW 500 V single unit: 300 kW 690 V single unit: 600 kW
Efficiency	> 99%	> 98% (rated working condition)	> 97%
Fuse configuration	No; requires external DC-side fuse		H3/H4: built-in DC fuse H6/H7/H8A: requires external DC-side fuse
Overload coefficient	-	• Light overload: 298 kW, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 404 kW, 10 seconds of continuous overload allowed every 60 seconds	• Fast overload: 200%, 10 seconds of continuous overload allowed every 60 seconds • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes
Ambient temperature	–10°C to +40°C; derate output current by 1% per 1°C above 40°C; maximum ambient temperature 50°C		
Operating altitude	⩽ 1000 m; derate output current by 1% per 100 m above 1000 m; maximum altitude 4000 m	⩽ 1000 m; derate output current by 1% per 100 m above 1000 m; maximum altitude 2000 m	⩽ 1000 m; derate output current by 1% per 100 m above 1000 m; maximum altitude 4000 m
Vibration resistance	Class 3M4 in GB/T 4798.3-2007		
Pollution degree	PD2		
Overvoltage class	OVC III		
Cooling method	Forced air cooling (AF) compliant with EN 60146		
Noise	⩽ 80 dB	⩽ 70 dB	⩽ 80 dB

Module	MD880-60M (Three-Phase Brake)	MD880-61M (Single-Phase Brake)	MD880-80M (DC Chopper)
Safety category	EN 61800-5-1		
IP rating	IP00		H3/H4: IP20 H6/H7/H8: IP00

4 Basic Rectifier Module

The MD880-20 series is a general-purpose low-voltage basic rectifier characterized by high power density, compact design, and high reliability. This series is available in the 400 V and 690 V voltage classes, with a single-unit rated power ranging from 475 kW to 929 kW. Higher rated output power up to 5183 kW can be achieved by parallel connection of multiple modules, capable of supplying the required power for one or more inverter modules. This product is widely applicable across various industries, including metallurgy, papermaking, lifting, shipping, and cable manufacturing.

4.1 Product Information

4.1.1 Model Number and Nameplate

MD880 ① - 20M ② - 0982 ③ - 4 ④

①	**Product series** MD880: MD880 AC drive series	③	**Rated current** 0982: 982 A
②	**Product type** 20M: Basic rectifier module	④	**Voltage class** 4: Three-phase 400 VAC 7: Three-phase 690 VAC

Note

③: The "rated current" code indicates only one current rating.

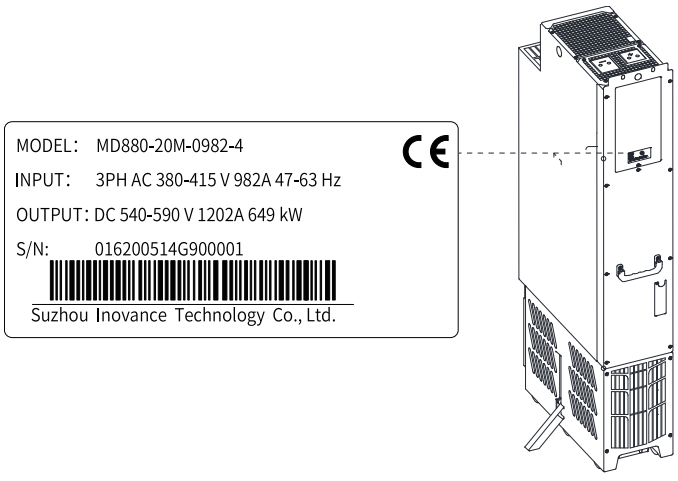


Figure 4-1 Nameplate of the basic rectifier module

4.1.2 Components

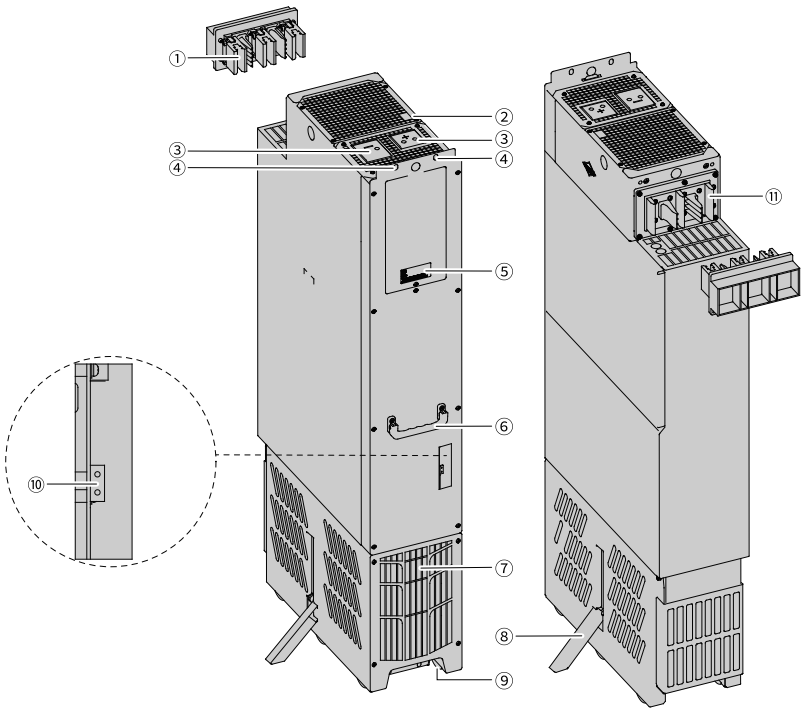


Figure 4-2 Components of the basic rectifier module

No.	Description
①	Quick connector (included in the T2 installation kit option or cabinet)
②	External 24 V power supply
③	DC output terminal
④	Module fixing hole with grounding protection
⑤	Nameplate label
⑥	Handle
⑦	Cooling fan
⑧	Anti-toppling bracket
⑨	Caster
⑩	Optical fiber port
⑪	Quick connector

4.1.3 Product Dimensions

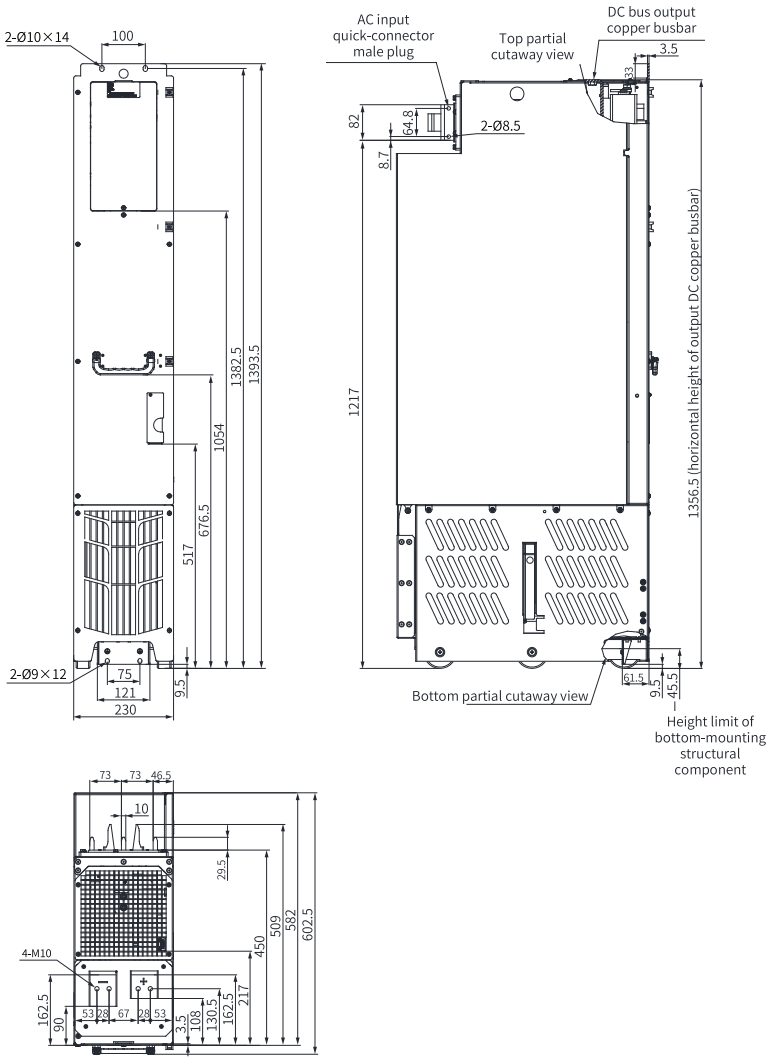


Figure 4-3 Outline dimensions of the basic rectifier module (unit: mm)

4.2 Specifications

The MD880-20 series basic rectifier module is available in two voltage classes. The product specifications are listed in the following table.

Table 4–1 Product specifications of the basic rectifier module

Model MD880-20M-...	No Overload					Light Overload		Heavy Overload		Basic Rectifier Module Loss	Cooling Air Volume (m^3/h)	Structural Specification
	I_N	I_N	I_{max}	S_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{loss}		
	Aac	Adc	Adc	kVA	kW	Adc	kW	Adc	kW	kW		
U_N = 400 V (380 V to 415 V), ±10% (–15%, < 1 min); rated power based on 400 V												
6-pulse												

Model MD880-20M-...	No Overload					Light Overload		Heavy Overload		Basic Rectifier Module Loss	Cooling Air Volume (m^3/h)	Structural Specification
	I_N	I_N	I_{max}	S_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{loss}		
	Aac	Adc	Adc	kVA	kW	Adc	kW	Adc	kW	kW		
0718-4	718	879	1142	497	475	844	456	659	356	3.52	1088	T2
0982-4	982	1202	1562	680	649	1154	623	901	487	5.12	2024	T2
1336-4	1336	1635	2126	926	883	1570	848	1226	662	7.04	2176	2 x T2
1826-4	1826	2235	2905	1265	1207	2146	1159	1676	905	10.24	4048	2 x T2
2739-4	2739	3352	4358	1898	1810	3218	1738	2514	1358	15.36	6072	3 x T2
3651-4	3651	4469	5809	2529	2413	4290	2317	3351	1810	20.48	8096	4 x T2
4564-4	4564	5586	7262	3162	3016	5363	2896	4190	2262	25.6	10120	5 x T2
5477-4	5477	6704	8715	3794	3620	6435	3475	5028	2715	30.72	12144	6 x T2
12-pulse												
1336-4	1336	1635	2126	926	883	1570	848	1226	662	7.04	2176	2 x T2
1826-4	1826	2235	2905	1265	1207	2146	1159	1676	905	10.24	4048	2 x T2
2674-4	2674	3273	4255	1853	1767	3142	1697	2455	1325	14.08	4352	4 x T2
3651-4	3651	4469	5809	2529	2413	4290	2317	3351	1810	20.48	8096	4 x T2
4008-4	4008	4906	6377	2777	2649	4709	2543	3679	1987	21.12	6528	6 x T2
5477-4	5477	6704	8715	3794	3620	6435	3475	5028	2715	30.72	12144	6 x T2
U_N = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V												
6-pulse												
0570-7	570	698	907	681	650	670	624	523	487	2.96	964	T2
0815-7	815	998	1297	974	929	958	892	748	697	4.32	1632	T2
1061-7	1061	1299	1688	1268	1210	1247	1161	974	907	5.92	1928	2 x T2
1515-7	1515	1854	2411	1811	1727	1780	1658	1391	1295	8.64	3264	2 x T2
2273-7	2273	2782	3617	2716	2591	2671	2488	2087	1944	12.96	4896	3 x T2
3031-7	3031	3710	4823	3622	3456	3561	3317	2782	2592	17.28	6528	4 x T2
3788-7	3788	4636	6027	4527	4319	4451	4146	3477	3239	21.6	8160	5 x T2
4546-7	4546	5564	7233	5433	5183	5341	4976	4173	3887	25.92	9792	6 x T2
12-pulse												
1061-7	1061	1299	1688	1268	1210	1247	1161	974	907	5.92	1928	2 x T2
1515-7	1515	1854	2411	1811	1727	1780	1658	1391	1295	8.64	3264	2 x T2
2122-7	2122	2597	3376	2536	2419	2493	2323	1948	1814	11.84	3856	4 x T2
3031-7	3031	3710	4823	3622	3456	3561	3317	2782	2592	17.28	6528	4 x T2
4546-7	4546	5564	7233	5433	5183	5341	4976	4173	3887	25.92	9792	6 x T2

Definitions:

I_N: Rated input (AC) or output (DC) current

I_{max}: Maximum output current

S_N: Rated apparent power

P_N: Rated output power

I_{Ld}: Continuous output current in light-overload applications

P_{Ld}: Output power in light-overload applications

I_{Hd}: Continuous output current in heavy-overload applications

P_{Hd}: Output power in heavy-overload applications

4.2.1 Electrical Specifications

Table 4–2 Electrical specifications of the basic rectifier module

Item	Specification
AC input voltage	400 V system: 380 VAC to 415 VAC, ±10% (−15%, < 1 min) 690 V system: 525 VAC to 690 VAC, ±10% (−15%, < 1 min)
Rated power	400 V system: 475 kW to 649 kW 690 V system: 650 kW to 929 kW
Input frequency	47 Hz to 63 Hz (±5 Hz)
Unbalance degree	Maximum: ⩽ ±3% of rated line voltage
Output voltage	400 V system: 540 VDC to 590 VDC 690 V system: 740 VDC to 975 VDC

4.2.2 Technical Specifications

Table 4–3 Technical specifications of the basic rectifier module

Item		Specification
Basic performance	Overload capacity	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes
	Operating efficiency	> 98%
Operating environment	Ambient temperature	−10°C to +50°C; derate at +40°C to +50°C
	Ambient humidity	5% to 95% RH, non-condensing
	Installation altitude	⩽ 1000 m; derate above 1000 m; maximum altitude 4000 m
Storage environment	Storage temperature	–40°C to +70°C
	Storage humidity	5% to 95% RH, non-condensing
Mechanical data	Vibration resistance	Usage/Transportation scenario: Tested according to IEC 60068-2-6; amplitude of 3.5 mm at 5 Hz to 8.4 Hz; acceleration rate of 1·g at 8.4 Hz to 200 Hz; 10 cycles/axis direction
	Shock resistance	Usage/Transportation scenario: Tested according to IEC 60068-2-27; acceleration rate of 10·g, pulse width of 11 ms, 18 times across three axes
	Protection rating	IP00 (module)
	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, overload, overvoltage, undervoltage, phase loss, and overtemperature

4.2.3 Derating Characteristics

Ambient temperature-based derating

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

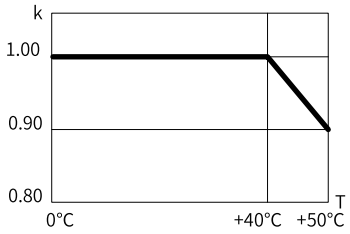


Figure 4-4 Ambient temperature-based derating

Altitude-based derating

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

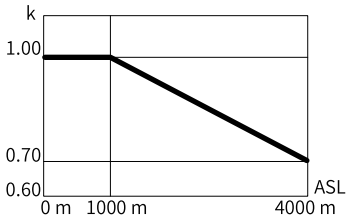


Figure 4-5 Altitude-based derating

4.2.4 Overload Characteristics

When the MD880-20 series basic rectifier 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.

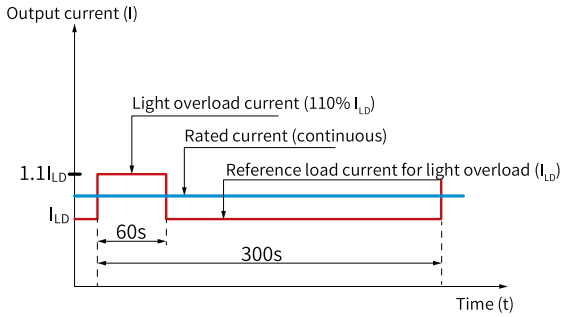


Figure 4-6 Curve of light overload mode

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.

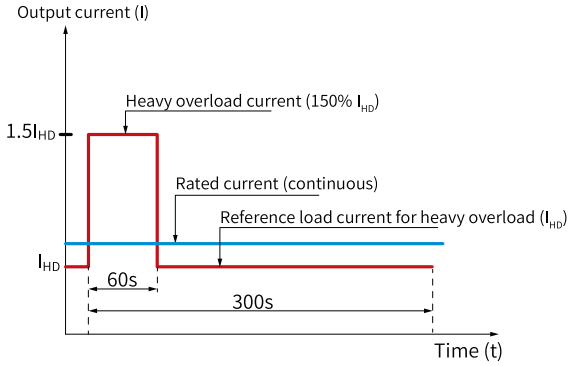


Figure 4-7 Curve of heavy overload mode

5 Regenerative Rectifier Product

The MD880-30 series is a regenerative rectifier product of the MD880 lineup, characterized by high power density, compact design, and high reliability. This series is available in the 400 V and 690 V voltage classes, with a single-unit power ranging from 423 kW to 1026 kW. Higher output power up to 5726 kW can be achieved by parallel connection, capable of supplying the required power for one or more inverter modules or other loads. The regenerative rectifier module features a simple structure, high integration, easy cabinet assembly, and convenient maintenance. It can improve cabinet utilization, reduce the number of cabinets needed, and minimize the footprint. This product is suitable for a wide range of applications, including metallurgy, papermaking, port machinery, large-scale lifting equipment, shipping, cable manufacturing, wind power conversion, unit test benches, low-voltage power control, oil and gas transportation, and mining conveyor systems.

5.1 Product Information

5.1.1 Model Number and Nameplate

MD880-30M-0900-4
① ② ③ ④

① **Product series** MD880: MD880 AC drive series	③ **Rated current** 0900: 900 A
② **Unit type** 30M: Regenerative rectifier module 30F: Regenerative rectifier filter module 30K: Regenerative rectifier frame kit	④ **Voltage class** 4: Three-phase 400 VAC 7: Three-phase 690 VAC

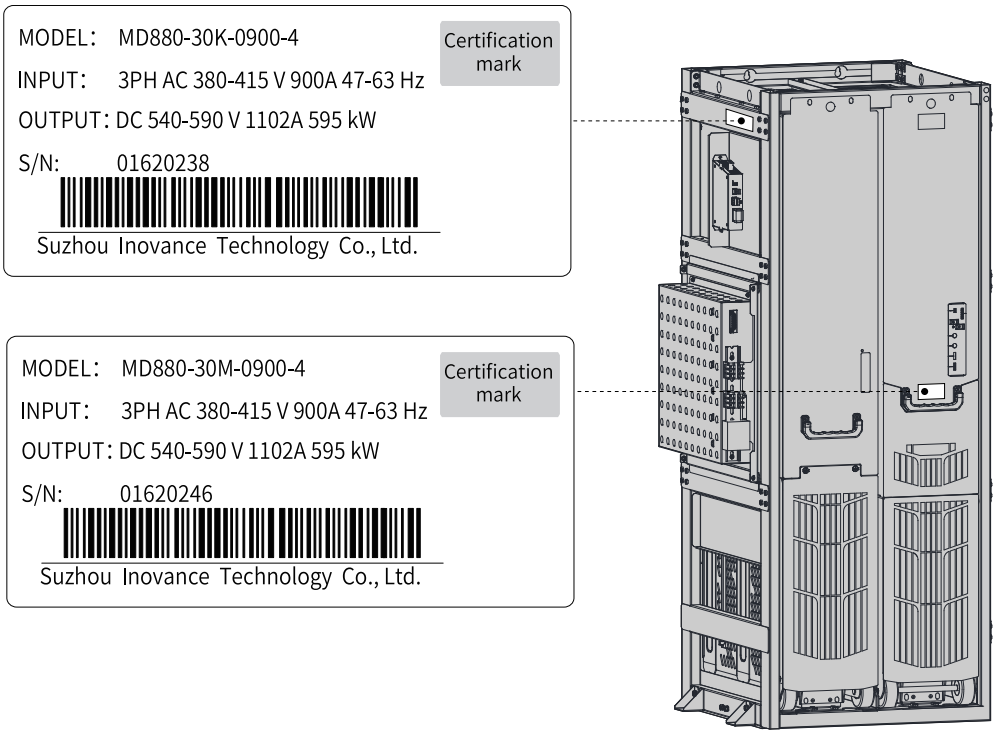


Figure 5-1 Nameplate of the regenerative rectifier product

5.1.2 Components

Structural configuration of the MD880-30M regenerative rectifier module

- The regenerative rectifier module can be used as a stand-alone unit or in parallel. In stand-alone applications, the maximum output current of the regenerative rectifier module is 900 A.
- The regenerative rectifier module must be used with a matching regenerative rectifier filter module.
- The regenerative rectifier module comes standard with a quick connector on its AC input side. The plug mates with the quick connector in the cabinet when the rectifier module is inserted into the cabinet. Each module in a parallel configuration can be individually wired to the busbar.

A power-on pre-charge circuit is required in the following cases:

- The regenerative rectifier module is connected to the DC bus through a disconnector.
- The regenerative rectifier module is directly connected to the DC bus, and the DC bus is incapable of charging.

The structural configuration of the regenerative rectifier module is as follows.

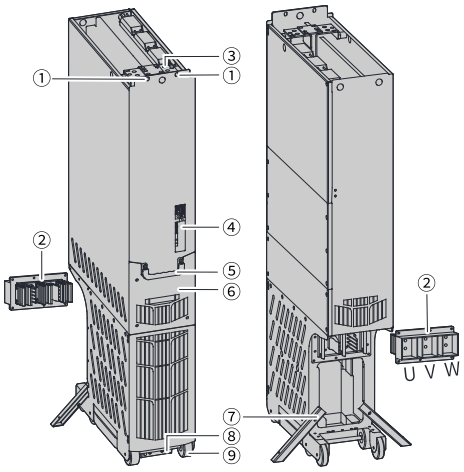


Figure 5-2 Components of the regenerative rectifier module

No.	Description
①	Top spray-coated fixing hole
②	Quick connector (matches the quick connector on the module)
③	DC output terminal
④	24 V power terminal/Optical fiber connection terminal
⑤	Handle
⑥	Cooling fan
⑦	Anti-toppling bracket
⑧	Bottom spray-coated fixing hole, the ground point (PE) between the regenerative rectifier frame and the cabinet frame
⑨	Caster

Structural configuration of the MD880-30F regenerative rectifier filter module

The regenerative rectifier filter module, which is an important part of the regenerative rectifier, is used to suppress current harmonics. The structural configuration of the regenerative rectifier filter module is shown in the following figure.

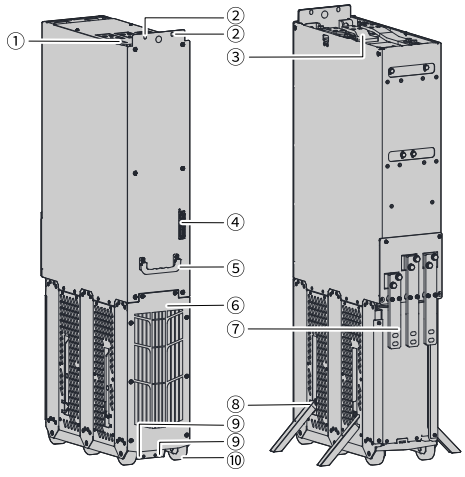


Figure 5-3 Components of the regenerative rectifier filter module

No.	Description
①	AC voltage sampling terminal
②	Fixing hole
③	Input copper busbar
④	Fan power input port, the L temperature switch connection terminal
⑤	Handle
⑥	Cooling fan
⑦	Output copper busbar
⑧	Anti-toppling bracket
⑨	Spray-coated fixing hole, the ground point (PE) between the module frame and the cabinet frame
⑩	Caster

5.1.3 Product Dimensions

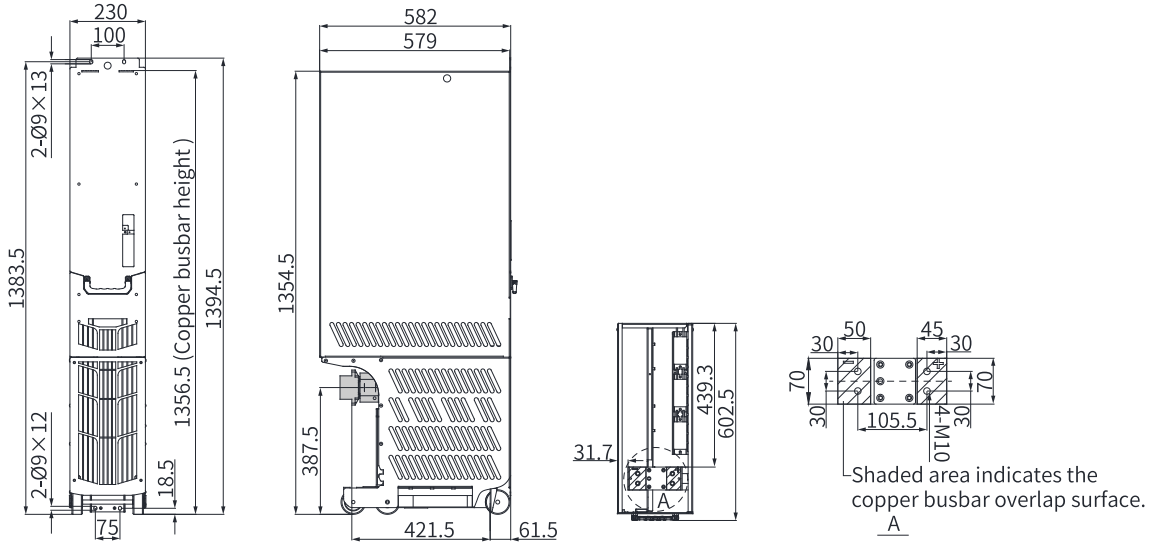


Figure 5-4 Outline dimensions of the MD880-30M regenerative rectifier module (unit: mm)

Note

The component marked in gray in the figure is the quick connector.

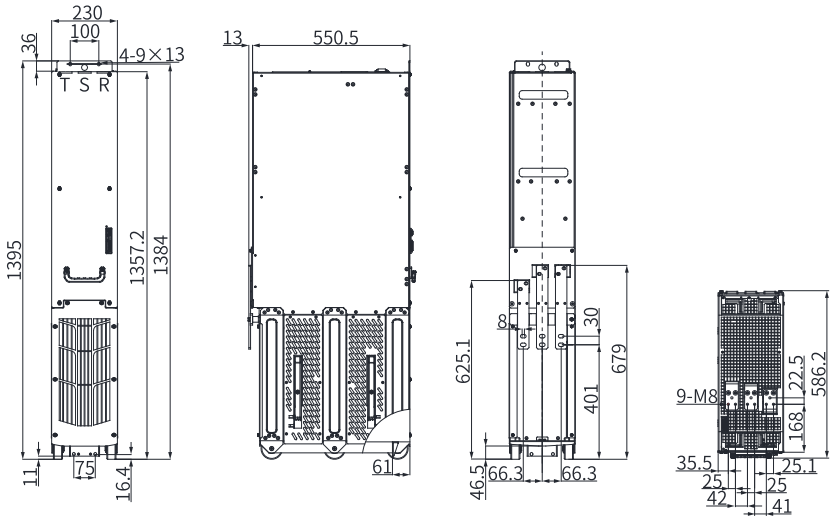


Figure 5-5 Outline dimensions of the MD880-30F regenerative rectifier filter module (unit: mm)

5.2 Specifications

The MD880 regenerative rectifier is available in multiple configurations, including standard cabinets, frame kits, and modules.

Table 5–1 Specifications and model selection of the MD880-30 series regenerative rectifier product

Model MD880-30-...	No Overload					Light Overload		Heavy Overload		Loss	Loss	Cooling Air Volume <1>	Cooling Air Volume (L)
	I_N	I_N	I_{max}	S_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{loss} <1>	P_{loss} (L)		
	Aac	Adc	Adc	kVA	kW	Adc	kW	Adc	kW	kW	kW	m^3/h	m^3/h
UN = 400 V (380 V to 415 V), ±10% (–15%, < 1 min); rated power based on 400 V													
0640-4	640	783	1018	443	423	752	406	587	317	4.9	3.0	663	1632
0900-4	900	1102	1432	624	595	1057	571	826	446	8.0	4.0	1632	1632
1190-4	1190	1457	1894	825	787	1399	755	1093	590	9.1	5.0	1326	1632
1674-4	1674	2049	2664	1160	1106	1967	1062	1537	830	14.9	7.5	3264	1632
2380-4	2380	2913	3787	1649	1573	2796	1510	2185	1180	18.2	10.0	2652	3264
3348-4	3348	4098	5327	2319	2213	3934	2124	3073	1660	29.8	15.0	6528	3264
5022-4	5022	6147	7991	3479	3319	5901	3186	4610	2489	44.7	22.5	9792	5022
UN = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V													
0600-7	600	734	955	717	684	705	657	551	513	6.2	3.0	964	1632
0900-7	900	1102	1432	1076	1026	1057	985	826	770	9.1	4.0	2024	1632
1116-7	1116	1366	1776	1334	1272	1311	1221	1024	954	11.5	5.0	1928	1632
1674-7	1674	2049	2664	2001	1909	1967	1832	1537	1431	16.9	7.5	4048	1632
2232-7	2232	2732	3551	2667	2545	2623	2443	2049	1909	23.0	10.0	3856	3264
3348-7	3348	4098	5327	4001	3817	3934	3664	3073	2863	33.8	15.0	8096	3264
5022-7	5022	6147	7991	6002	5726	5901	5497	4610	4294	50.7	22.5	12144	5022

Note

<1>: Layout of H8 regenerative rectifier module

Definitions

I_N : Rated input (AC) or output (DC) current

I_{max} : Maximum output current that can be sustained for at least 10 seconds (per 300-second cycle) during startup

$P_{loss\ (L)}$: Power loss of the regenerative rectifier input reactor

$P_{loss\ (H8)}$: Power loss of the regenerative rectifier module

S_N : Rated apparent power

P_N : Rated output power

I_{Ld} : Continuous output current in light-overload applications

P_{Ld} : Output power in light-overload applications

I_{Hd} : Continuous output current in heavy-overload applications

P_{Hd} : Output power in heavy-overload applications

L: Structure of the regenerative rectifier filter module

5.2.1 Electrical Specifications

Table 5–2 Electrical specifications of the regenerative rectifier module

Item	Specification
AC input voltage	400 V system: 380 VAC to 415 VAC, ±10% (−15%, < 1 min) 690 V system: 525 VAC to 690 VAC, ±10% (−15%, < 1 min)
Rated power	400 V system: 423 kW to 595 kW 690 V system: 684 kW to 1026 kW
Input frequency	47 Hz to 63 Hz
Unbalance degree	Maximum: ±3% of rated line voltage
Output voltage	400 V system: 540 VDC to 590 VDC 690 V system: 740 VDC to 975 VDC
Fundamental wave power factor	> 0.95 (rated full load)

5.2.2 Technical Specifications

Table 5–3 Technical specifications of the regenerative rectifier module

Item		Specification
Basic performance	Overload capacity	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes
	Operating efficiency	> 98%
Operating environment	Ambient temperature	－10°C to +40°C; derate at +40°C to +50°C
	Ambient humidity	5% to 95% RH, non-condensing
	Installation altitude	⩽ 1000 m; derate above 1000 m; isolation transformer required above 2000 m; maximum altitude 4000 m
Storage environment	Storage temperature	–40°C to +70°C
	Storage humidity	5% to 95% RH, non-condensing
Mechanical data	Shock and vibration resistance	Class 3M4 in GB/T 4798.3-2007
	Protection rating	Frame: IP00 Cabinet: IP21
	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, overload, overvoltage, undervoltage, phase loss, three-phase unbalance, and overtemperature

5.2.3 Derating Characteristics

Ambient temperature-based derating

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

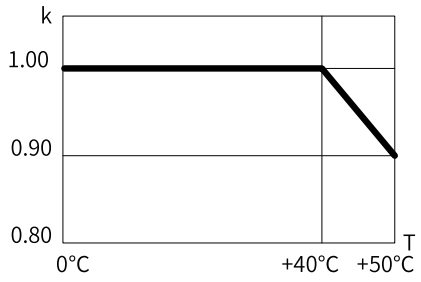


Figure 5-6 Ambient temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the regenerative rectifier module must be derated by 1% per 100 m increase.

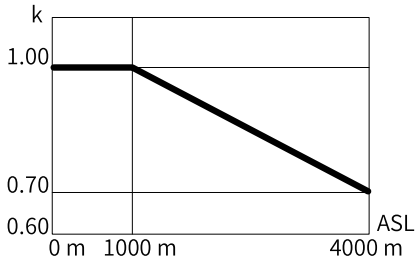


Figure 5-7 Altitude-based derating

5.2.4 Overload Characteristics

For some drive systems where overload may occur, proper base load current is necessary for the MD880-30 series regenerative rectifier. The criterion for overload is that the drive is operated with its base load current before and after the overload occurs in a cycle of 300s.

Curve in the light overload mode

In the light overload mode, the drive can run at 110% of the light overload base current (I_{LD}) for 60s every five minutes.

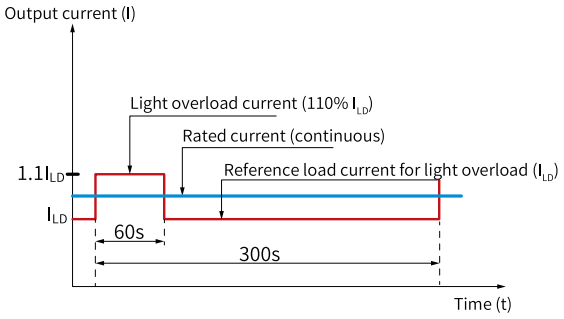


Figure 5-8 Curve in the light overload mode

Curve in the heavy overload mode

In the heavy overload mode, the drive can run at 150% of the heavy overload base current (I_{HD}) for 60s every five minutes.

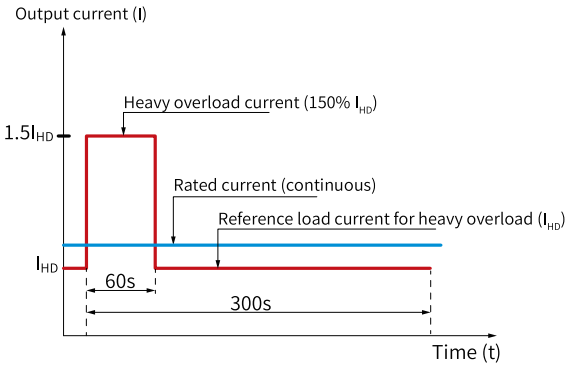


Figure 5-9 Curve in the heavy overload mode

6 Active Rectifier Product

The MD880-40 series is a general-purpose low-voltage active rectifier product of the MD880 lineup, characterized by high power density, compact design, and high reliability. This series is available in the 400 V and 690 V voltage classes, with a single-unit rated power ranging from 394 kW to 639 kW. Higher rated output power up to 6069 kW can be achieved by parallel connection of multiple modules, capable of supplying the required power for one or more inverter modules or other loads.

6.1 Product Information

6.1.1 Model Number and Nameplate

MD880-40K-0810-4 X
① ② ③ ④⑤

① **Product series** MD880: MD880 AC drive series	③ **Rated current** 0810: 810 A 0395: 95 A	⑤ **Option** X: Option included Null: Standard +JC: Filter integrated (for 40D only)
② **Unit type** 40K: Active rectifier frame kit 40M: Active rectifier module 40F: Active rectifier filter module 40D: Active rectifier integrated kit	④ **Voltage class** 4: Three-phase 400 VAC 7: Three-phase 690 VAC	

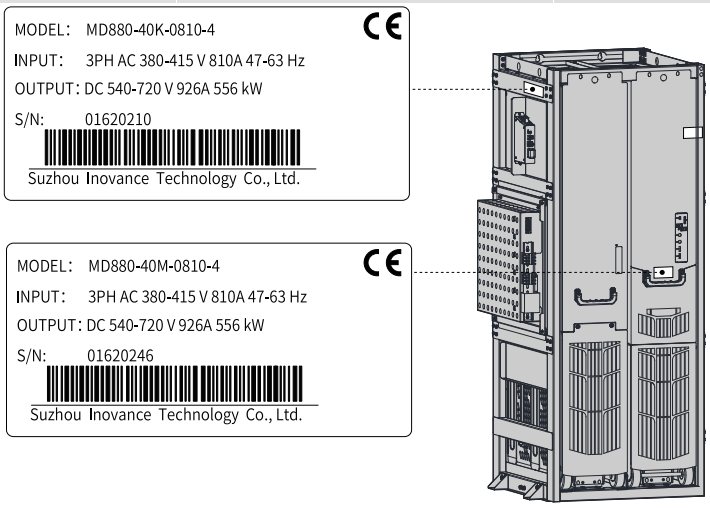


Figure 6-1 Nameplate of the active rectifier product

6.1.2 Components

Structural configuration of the active rectifier module

- The active rectifier module can be used as a stand-alone unit or in parallel. In stand-alone applications, the maximum output current of the active rectifier module is 810 A (for the 400 V system).
- The active rectifier module comes standard with a quick connector on its AC input side. The plug mates with the quick connector in the cabinet when the rectifier module is inserted into the cabinet. Each module in a parallel configuration can be individually wired to the busbar.

A power-on pre-charge circuit is required in the following cases:

- The active rectifier module is connected to the DC bus through a disconnector.
- The active rectifier module is directly connected to the DC bus, and the DC bus is incapable of charging.

The structural configuration of the active rectifier module is shown in the following figure.

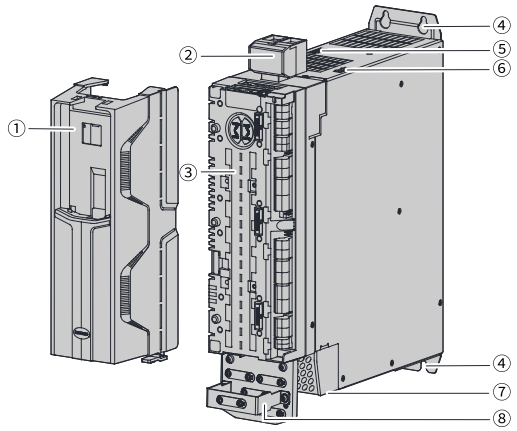


Figure 6-2 Components of the H3 active rectifier module

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

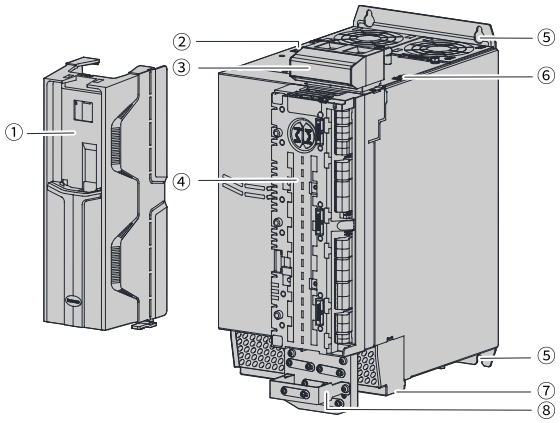


Figure 6-3 Components of the H4 active rectifier module

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

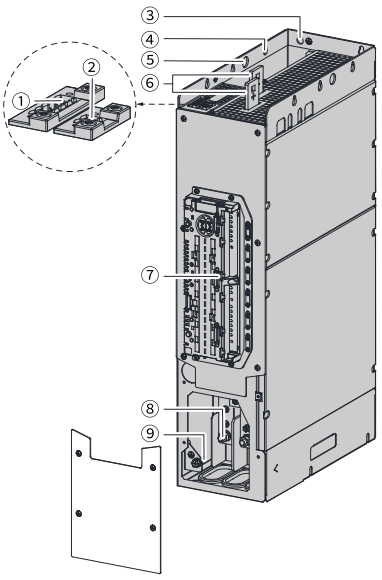


Figure 6-4 Components of the H6 active rectifier module

No.	Name
①	External I/O terminal
②	External 24 VDC auxiliary power terminal
③	Rear mounting hole
④	Side mounting hole

No.	Name
⑤	Eyebolt
⑥	DC bus output terminal
⑦	HCU control module
⑧	AC input terminal
⑨	Ground (PE) terminal

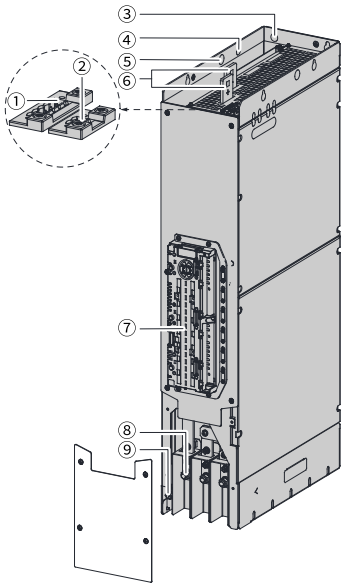


Figure 6-5 Components of the H7 active rectifier module

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 output terminal
⑦	HCU control module
⑧	AC input terminal
⑨	Ground (PE) terminal

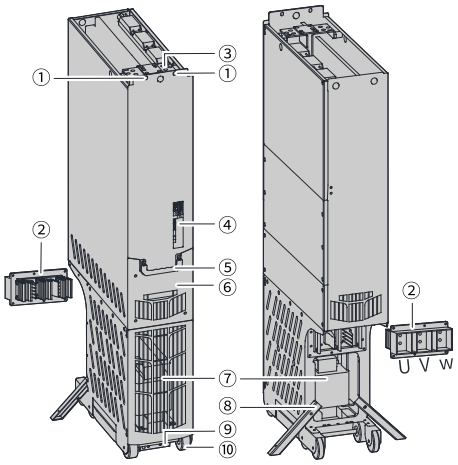


Figure 6-6 Components of the H8 active rectifier module

No.	Description
①	Top spray-coated fixing hole
②	Quick connector (matches the quick connector in the cabinet)
③	DC output terminal
④	24 V power terminal/Optical fiber connection terminal
⑤	Handle
⑥	Cooling fan
⑦	AC reactor
⑧	Anti-toppling bracket
⑨	Bottom spray-coated fixing hole, the ground point (PE) between the active rectifier module frame and the cabinet frame
⑩	Caster

Structural configuration of the active rectifier filter module

The active power supply filter module is used to suppress AC voltage distortion and current harmonics. It is an important component of active power supply devices. The structural configuration of the active rectifier filter module is shown in the following figure.

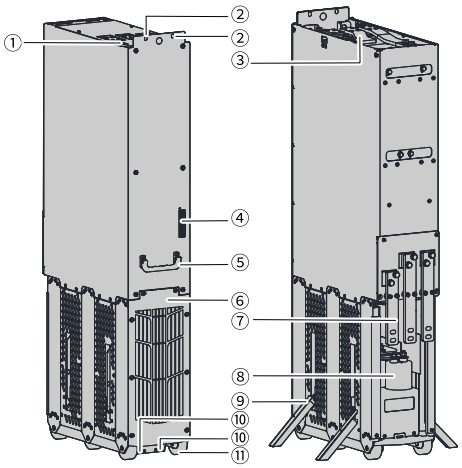


Figure 6-7 Components of the active rectifier filter module

No.	Description
①	AC voltage sampling terminal
②	Fixing hole
③	Input copper busbar
④	Fan power input port, BLCL temperature switch connection terminal
⑤	Handle
⑥	Cooling fan
⑦	Output copper busbar
⑧	Capacitor
⑨	Anti-toppling bracket
⑩	Spray-coated fixing hole, the ground point (PE) between the module frame and the cabinet frame
⑪	Caster

6.1.3 Product Dimensions

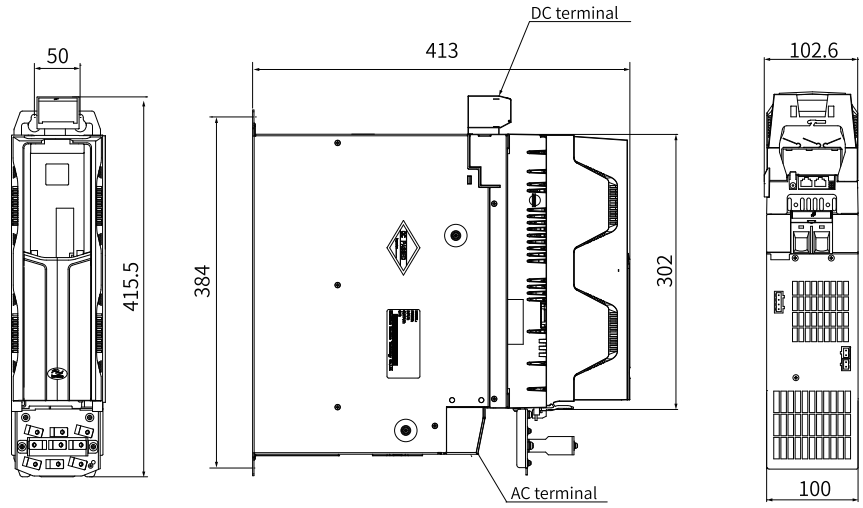


Figure 6-8 Outline dimensions of the H3 active rectifier module (unit: mm)

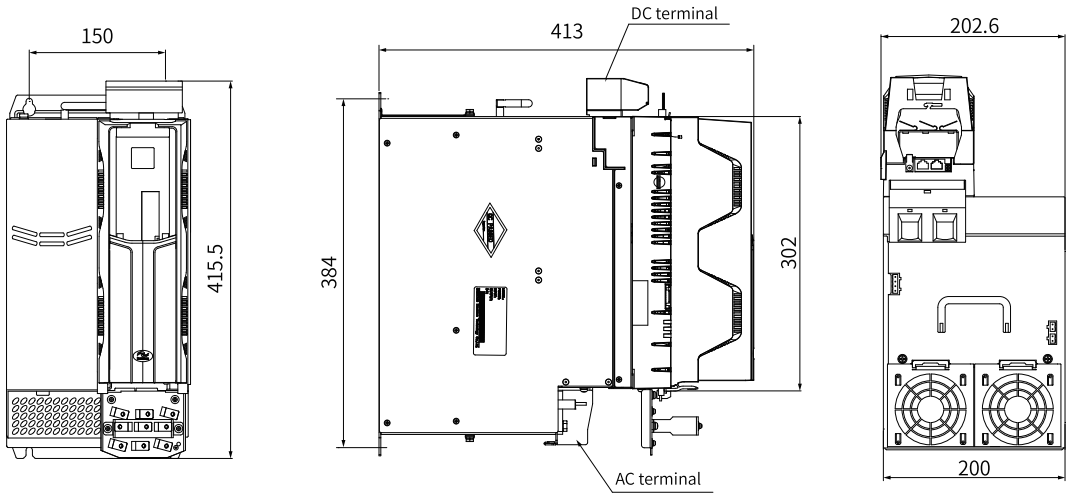


Figure 6-9 Outline dimensions of the H4 active rectifier module (unit: mm)

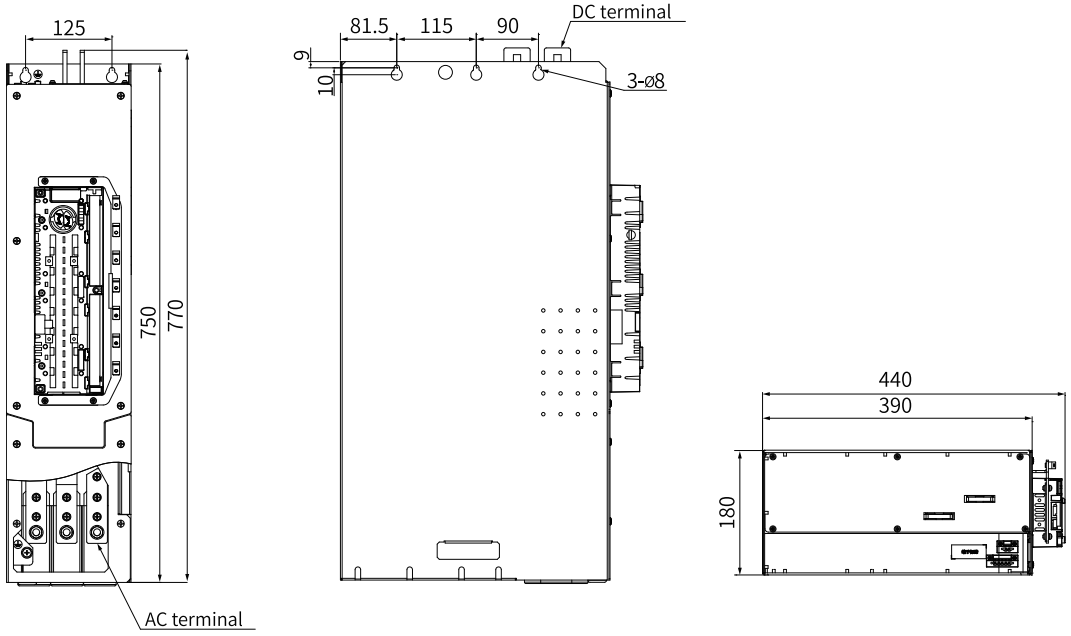


Figure 6-10 Outline dimensions of the H6 active rectifier module (unit: mm)

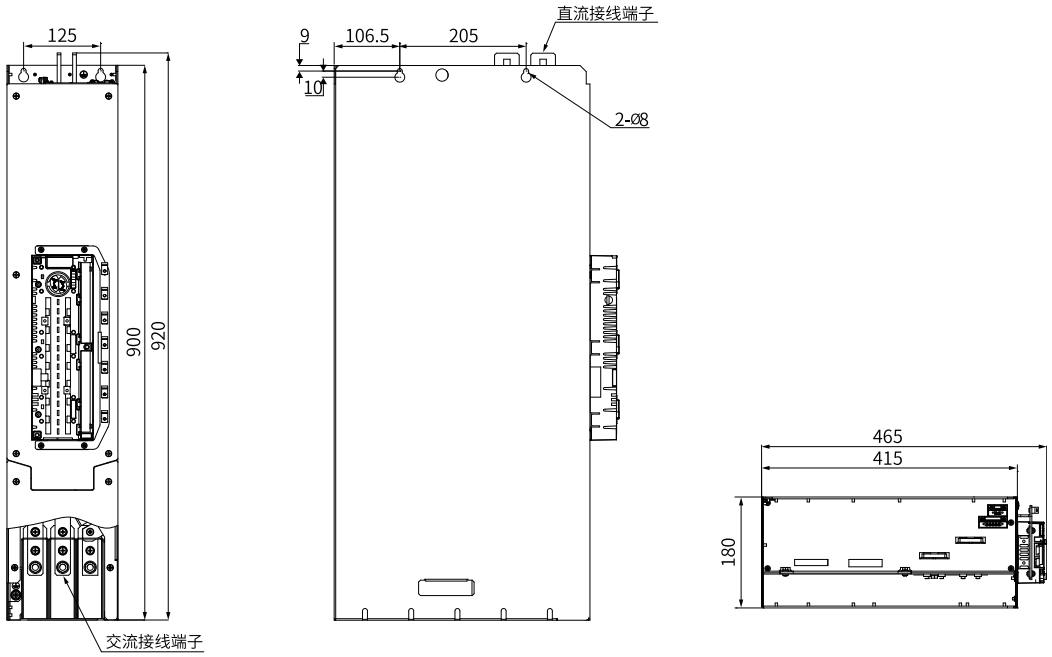


Figure 6-11 Outline dimensions of the H7 active rectifier module (unit: mm)

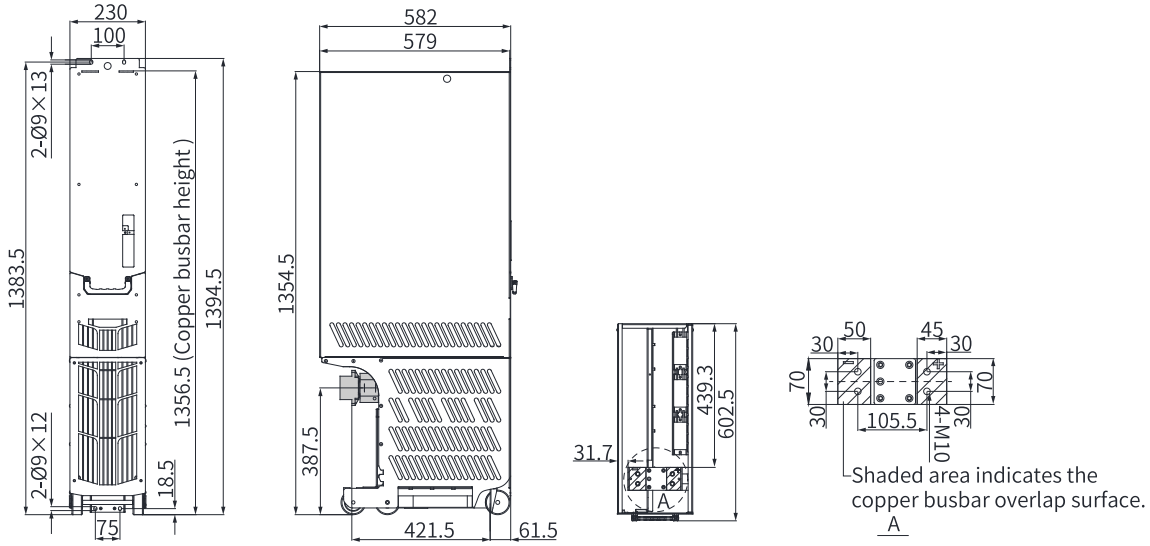


Figure 6-12 Outline dimensions of the H8 active rectifier module (unit: mm)

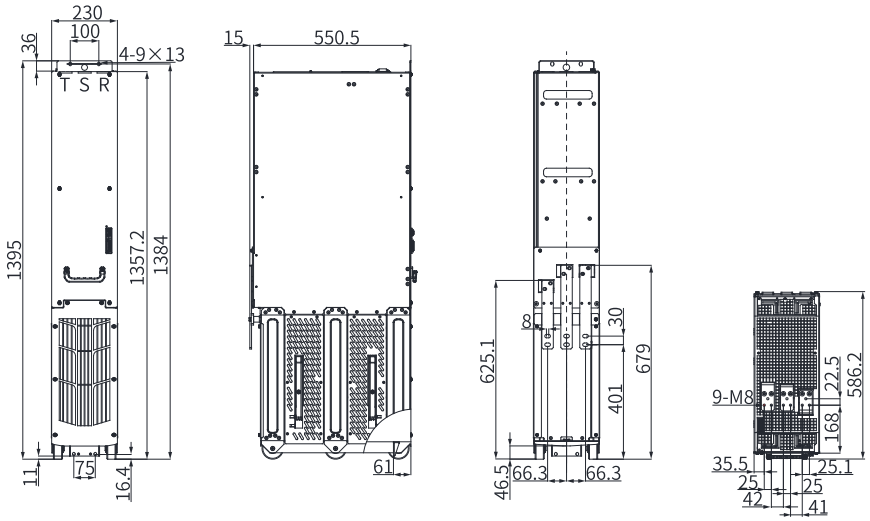


Figure 6-13 Outline dimensions of the MD880-40F active rectifier filter module (unit: mm)

6.2 Specifications

Table 6–1 Specifications of the active rectifier product

Model MD880-40...	No Overload					Light Overload		Heavy Overload		Total Loss of Active Rectifier and Filter Modules	Structure
	Rated Input Current	Rated Output Current	Max. Output Current	Rated Apparent Power	Rated Output Power	Output Current	Output Power	Output Current	Output Power		
	I_N	I_N	I_{max}	S_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{loss}	
	A (AC)	A (DC)	A (DC)	kVA	kW (DC)	A (DC)	kW (DC)	A (DC)	kW (DC)	kW	
Rated voltage U_n = 400 V (380 V to 415 V), ±10% (–15%, < 1 min), rated power based on 400 V											
0094-4	94	107	140	65	64	103	62	81	48	1.6	LCL+H3
0149-4	149	170	221	103	102	164	98	128	77	2.55	LCL+H4
0183-4	183	209	272	127	126	201	120	157	94	3.15	LCL+H4
0299-4	299	342	444	207	205	328	197	256	154	5.12	LCL+H6
0395-4	395	452	587	274	271	433	260	339	203	6.77	LCL+H7
0575-4	575	657	854	398	394	631	379	493	296	10.7	BLCL+H8
0810-4	810	926	1204	561	556	889	533	694	417	15.5	BLCL+H8
1092-4	1092	1248	1623	757	749	1198	719	936	562	20.3	BLCL+2 x H8
1539-4	1539	1759	2287	1066	1056	1689	1013	1319	792	29.5	BLCL+2 x H8
2185-4	2185	2498	3247	1514	1499	2398	1439	1873	1124	40.6	2 x (BLCL+2 x H8)
3078-4	3078	3519	4574	2132	2111	3378	2027	2639	1583	58.9	2 x (BLCL+2 x H8)
4617-4	4617	5278	6861	3199	3167	5067	3040	3958	2375	88.4	3 x (BLCL+2 x H8)
Rated voltage U_n = 500 V (380 V to 500 V), ±10% (–15%, < 1 min), rated power based on 500 V											
0540-5-CS	540	617	802	468	463	593	444	463	347	12	BLCL+H8
0810-5-CS	810	926	1204	701	694	889	667	694	521	18	BLCL+H8

Model MD880-40...	No Overload					Light Overload		Heavy Overload		Total Loss of Active Rectifier and Filter Modules	Structure
	Rated Input Current	Rated Output Current	Max. Output Current	Rated Apparent Power	Rated Output Power	Output Current	Output Power	Output Current	Output Power		
	I_N	I_N	I_{max}	S_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{loss}	
	A (AC)	A (DC)	A (DC)	kVA	kW (DC)	A (DC)	kW (DC)	A (DC)	kW (DC)	kW	
1026-5-CS	1026	1173	1525	889	880	1126	844	880	660	22	BLCL+2 x H8
1539-5-CS	1539	1759	2287	1333	1319	1689	1267	1319	990	36	2 x (BLCL+H8)
2052-5-CS	2052	2346	3049	1777	1759	2252	1689	1759	1319	44	2 x (BLCL+2 x H8)
2309-5-CS	2309	2639	3431	2000	1980	2534	1900	1980	1485	54	3 x (BLCL+H8)
3078-5-CS	3078	3519	4574	2666	2639	3378	2533	2639	1979	72	4 x (BLCL+H8)
3848-5-CS	3848	4399	5718	3332	3299	4223	3167	3299	2474	90	5 x (BLCL+H8)
Rated voltage U_n = 690 V (525 V to 690 V), ±10% (–15%, < 1 min), rated power based on 690 V											
0369-7	369	422	548	441	437	405	419	316	327	12.4	BLCL+H8
0540-7	540	617	802	645	639	593	613	463	479	16.5	BLCL+H8
0701-7	701	801	1042	838	829	769	796	601	622	23.6	BLCL+2 x H8
1026-7	1026	1173	1525	1226	1214	1126	1165	880	910	31.4	BLCL+2 x H8
1402-7	1402	1603	2083	1676	1659	1539	1592	1202	1244	47.2	2 x (BLCL+2 x H8)
2052-7	2052	2346	3049	2452	2428	2252	2331	1759	1821	62.8	2 x (BLCL+2H8)
3078-7	3078	3519	4574	3678	3642	3378	3496	2639	2731	94.2	3 x (BLCL+2 x H8)
4104-7	4104	4691	6099	4905	4856	4504	4661	3519	3642	126	4 x (BLCL+2 x H8)
5130-7	5130	5864	7623	6131	6069	5630	5827	4398	4552	157	5 x (BLCL+2 x H8)

Note

- H8: Active rectifier module
- BLCL: Active rectifier filter module

6.2.1 Electrical Specifications

Table 6–2 Electrical specifications of the active rectifier product

Item	Specification
AC input voltage	400 V system: 380 VAC to 415 VAC, ±10% (−15%, < 1 min) 500 V system: 380 VAC to 500 VAC, ±10% (−15%, < 1 min) 690 V system: 525 VAC to 690 VAC, ±10% (−15%, < 1 min)
Rated power	400 V system: 394 kW to 1056 kW 500 V system: 463 kW to 880 kW 690 V system: 437 kW to 1214 kW
Input frequency	47 Hz to 63 Hz

Item	Specification
Unbalance degree	Maximum: ⩽ ±3% of rated line voltage
Output 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
Power factor	> 0.99 (rated full load, with LCL filter module)

6.2.2 Technical Specifications

Table 6–3 Technical specifications of the active rectifier module

Item		Specification
Basic performance	Overload capacity	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes
	Operating efficiency	⩾ 97%
	Total harmonic distortion (THD)	THDI < 5% (rated power) THDU < 5% (RSC > 20)
Operating environment	Ambient temperature	－10°C to +40°C; derate at +40°C to +50°C
	Ambient humidity	5% to 95% RH, non-condensing
	Installation altitude	⩽ 1000 m; derate above 1000 m; isolation transformer required above 2000 m; maximum altitude 4000 m
Storage environment	Storage temperature	–40°C to +70°C
	Storage humidity	5% to 95%, non-condensing
Mechanical data	Vibration resistance	Usage/Transportation scenario: Tested according to IEC 60068-2-6; amplitude of 3.5 mm at 5 Hz to 8.4 Hz; acceleration rate of 1·g at 8.4 Hz to 200 Hz; 10 cycles/axis direction
	Shock resistance	Usage/Transportation scenario: Tested according to IEC 60068-2-27; acceleration rate of 10·g, pulse width of 11 ms, 18 times across three axes
	Protection rating	Frame: IP00 Cabinet: IP21
	Safety performance	EN 61800-5-1
	Cooling method	Forced air cooling (AF) compliant with EN 60146; natural cooling for the reactor
Protection functions	Protection functions	Protection against short circuit, overcurrent, overload, overvoltage, undervoltage, phase loss, three-phase unbalance, and overtemperature

6.2.3 Derating Characteristics

Ambient temperature-based derating

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

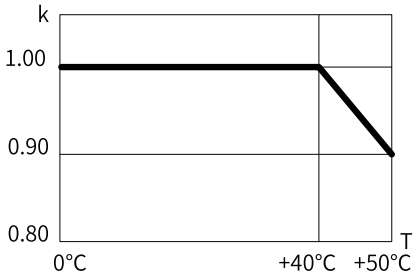


Figure 6-14 Ambient temperature-based derating

Altitude-based derating

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

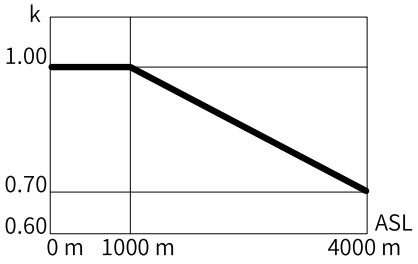


Figure 6-15 Altitude-based derating

6.2.4 Overload Characteristics

When the MD880-40 series active rectifier 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.

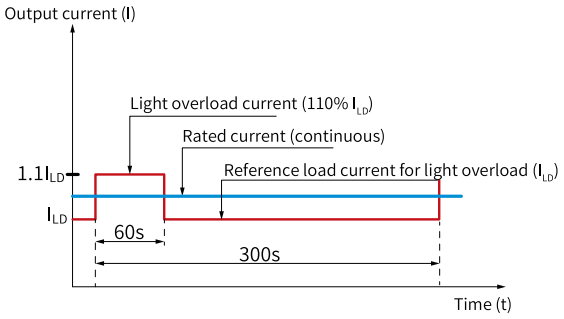


Figure 6-16 Curve of light overload mode

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.

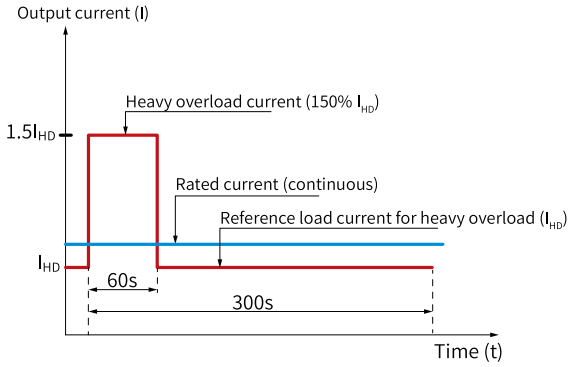


Figure 6-17 Curve of heavy overload mode

7 Inverter Module

The MD880-50 series is an inverter product of the MD880 lineup, providing power of 3.7 kW to 710 kW in stand-alone mode and drive capacity of up to 5600 kW in parallel connection. Every inverter module in this series adopts a booksize structure, enabling convenient combination and easy maintenance. The booksize structure also enhances the cabinet utilization and reduces the required number of cabinets and footprint.

7.1 Product Information

7.1.1 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 **Version number** SG: Second-generation controller CS: Supports STO SG-N: H8A module
② **Unit type** 50M: Inverter module	④ **Voltage class** 4: 400 VAC system 7: 690 VAC system 5: 500 VAC system	

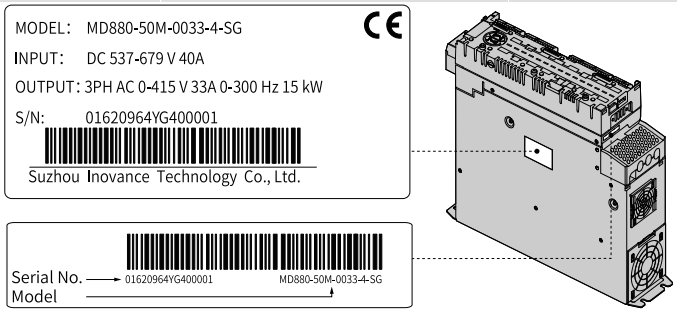


Figure 7-1 Nameplate of the H1 to H4 inverter modules

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.

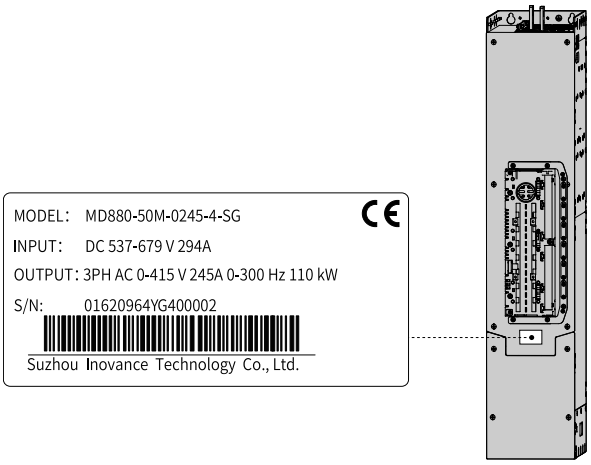


Figure 7-2 Nameplate of the H6 and H7 inverter modules

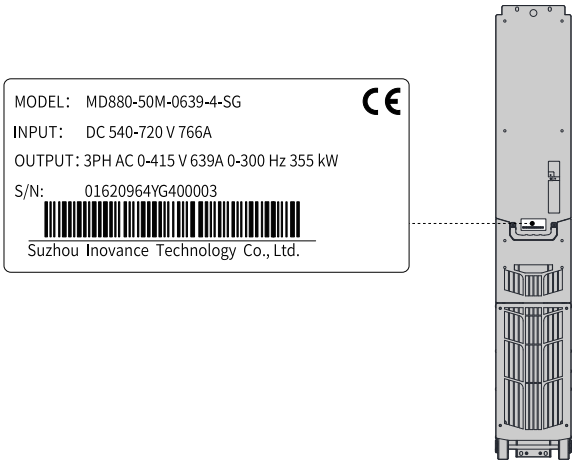


Figure 7-3 Nameplate of the H8 inverter module

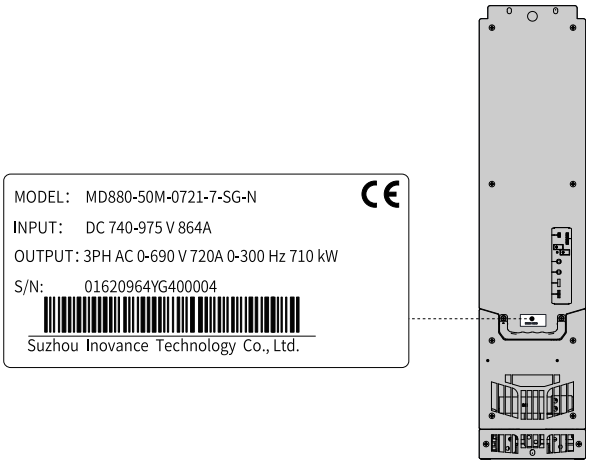


Figure 7-4 Nameplate of the H8A inverter module

Note

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

7.1.2 Components

Structural configuration of the H1 to H3 inverter modules

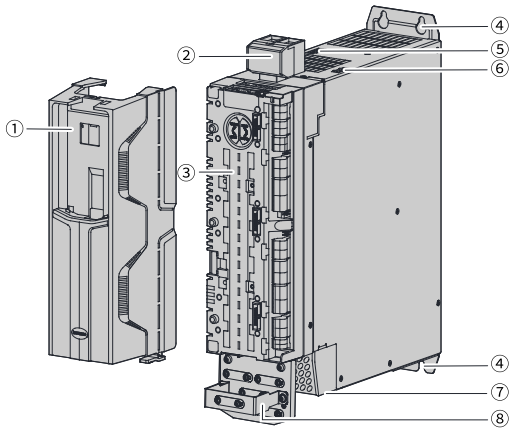


Figure 7-5 Components of the H1 to H3 inverter modules

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
⑦	U/V/W output terminal (covered)
⑧	Control cable ground plate

Structural configuration of the H4 inverter module

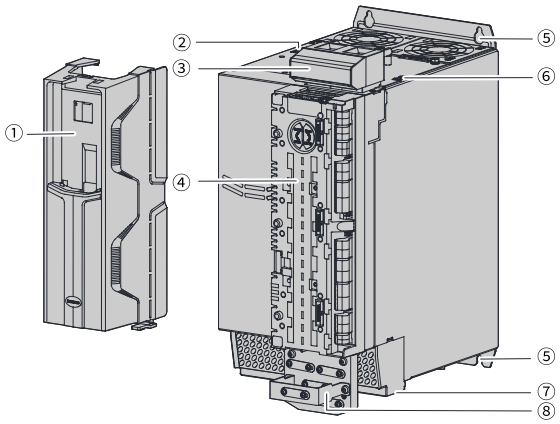


Figure 7-6 Components of the H4 inverter module

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

Structural configuration of the H6 inverter module

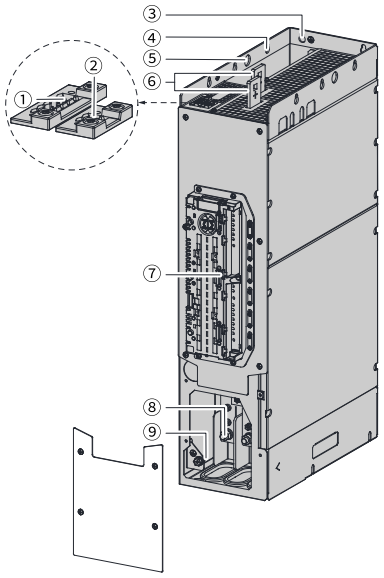


Figure 7-7 Components of the H6 inverter module

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	Ground (PE) terminal

Structural configuration of the H7 inverter module

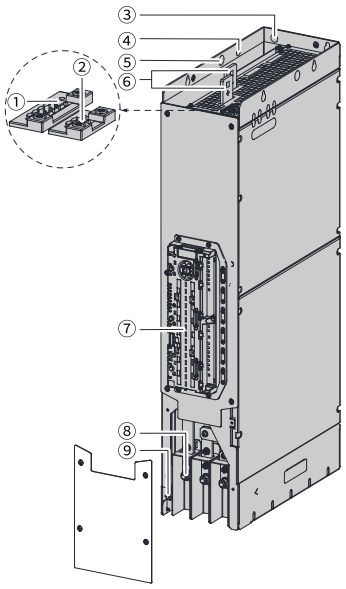


Figure 7-8 Components of the H7 inverter module

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	Ground (PE) terminal

Structural configuration of the H8 and H8A inverter modules and parallel connection

Structural configuration of the H8 inverter module

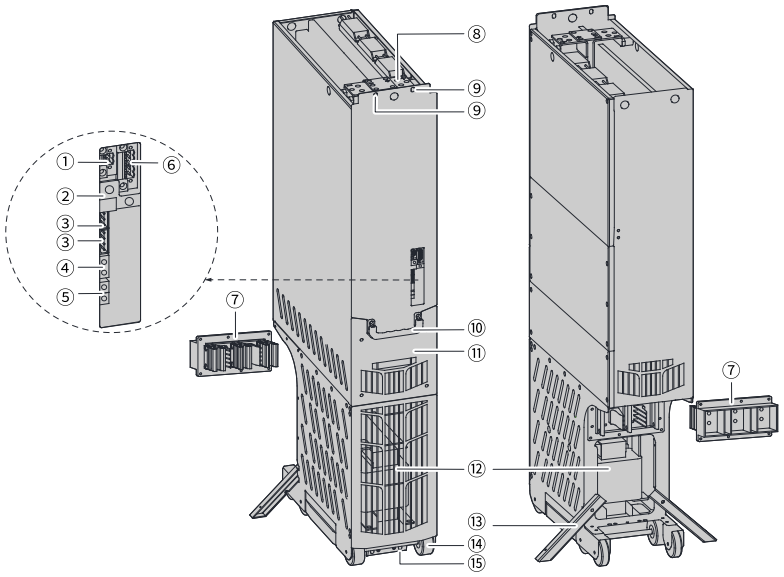


Figure 7-9 Components of the H8 inverter module

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
⑬	Anti-toppling bracket
⑭	Caster
⑮	Bottom spray-coated fixing hole, the ground point (PE) between the inverter module frame and the cabinet frame

Structural configuration of the H8A inverter module

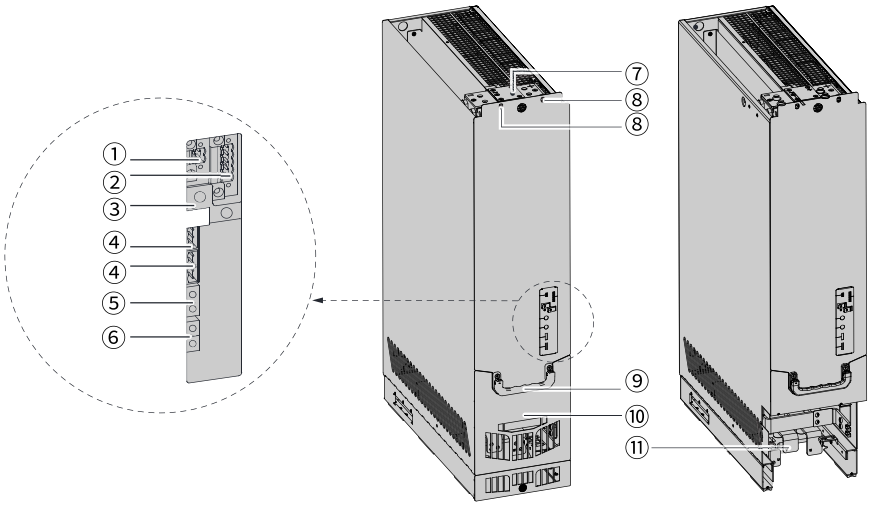


Figure 7-10 Structural configuration of the H8A inverter module

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

7.1.3 Product Dimensions

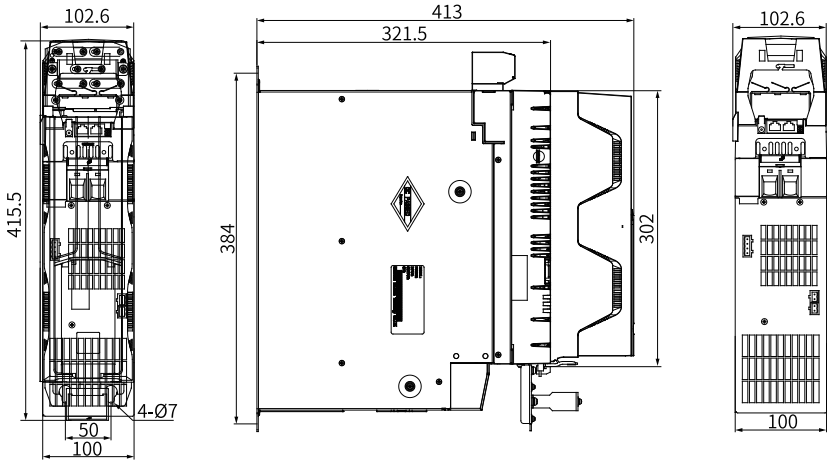


Figure 7-11 Outline dimensions of the H1 to H3 inverter modules (unit: mm)

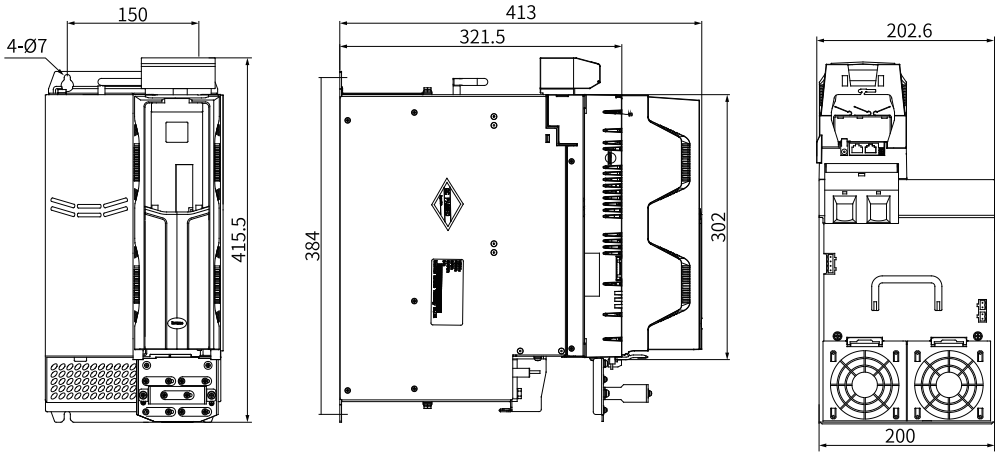


Figure 7-12 Outline dimensions of the H4 inverter module (unit: mm)

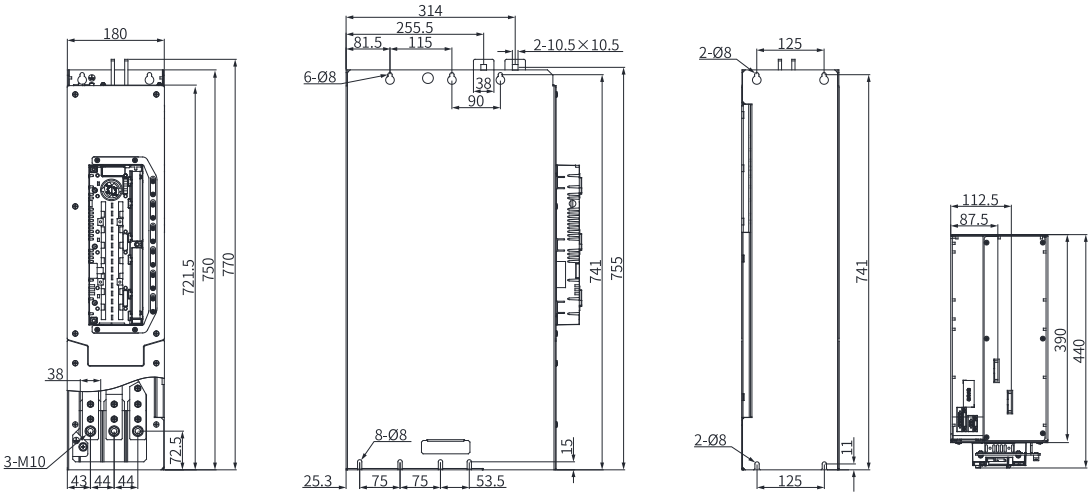


Figure 7-13 Outline dimensions of the H6 inverter module (unit: mm)

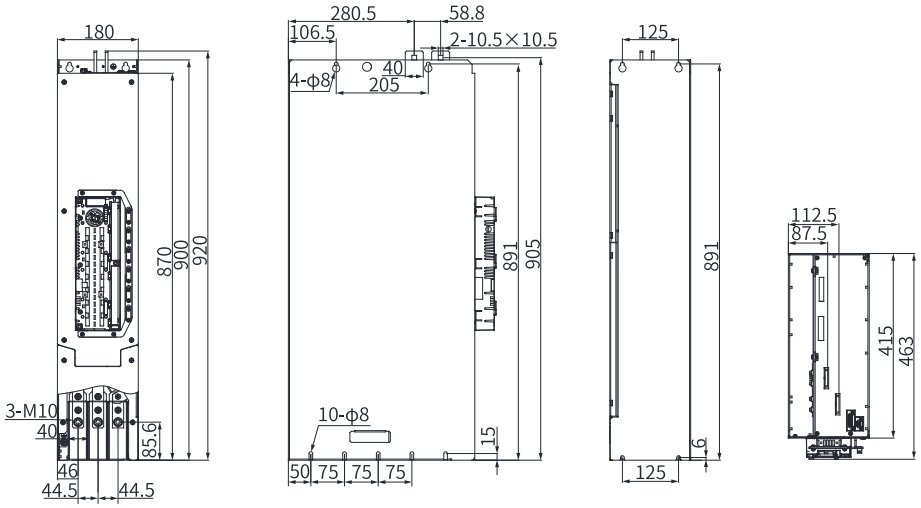


Figure 7-14 Outline dimensions of the H7 inverter module (unit: mm)

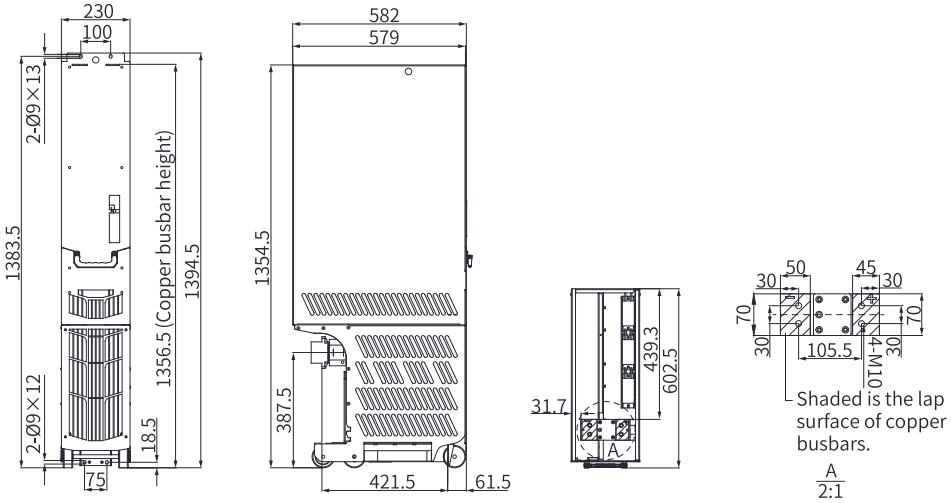


Figure 7-15 Outline dimensions of the H8 inverter module (unit: mm)

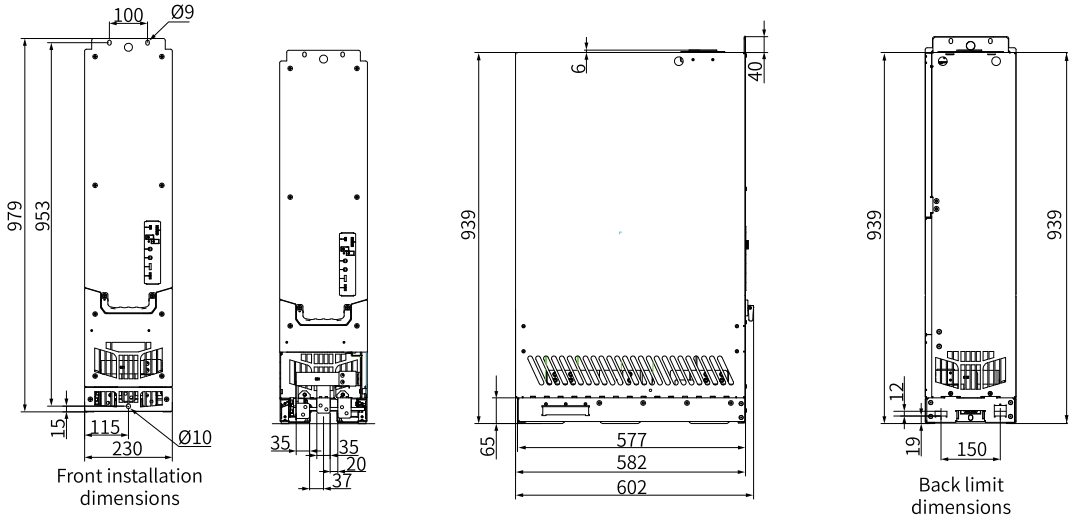


Figure 7-16 Outline dimensions of the H8A inverter module (unit: mm)

7.2 Specifications

Note

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

Table 7–1 Product specifications of the MD880-50M series inverter module

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 V (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	
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 V (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	

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 690 V (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	
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	

7.2.1 Electrical Specifications

Table 7–2 Electrical specifications of the inverter module

Item	Specification
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
Rated power	400 V system: 3.7 kW to 500 kW 500 V stand-alone: 250 kW to 560 kW 690 V system: 55 kW to 710 kW
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

Item	Specification
Output frequency	0 Hz to 300 Hz; custom design required for frequency over 300 Hz
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.

7.2.2 Technical Specifications

Table 7–3 Technical data of the inverter module

Item		Specification
Basic performance	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	Voltage/frequency (V/f) control Sensorless vector control (SVC) Feedback vector control (FVC)
	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
	Installation 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

7.2.3 Derating Characteristics

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).

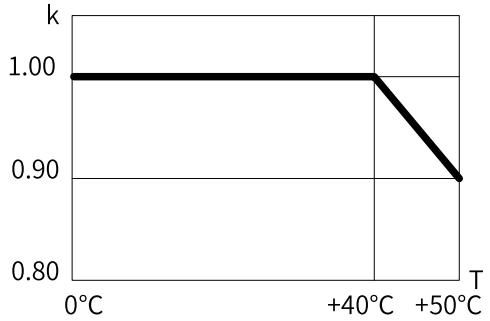


Figure 7-17 Ambient temperature-based derating

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.

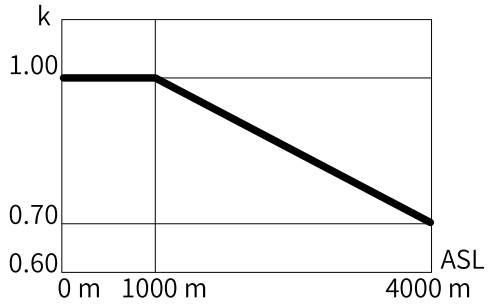


Figure 7-18 Altitude-based derating

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.

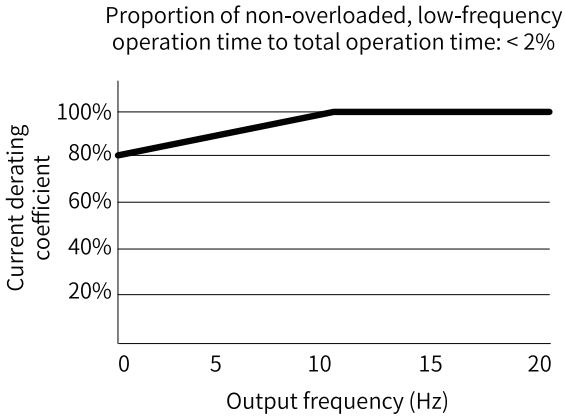


Figure 7-19 Current derating curve for non-overloaded conditions with low-frequency operation time accounting for < 2%

  - 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.

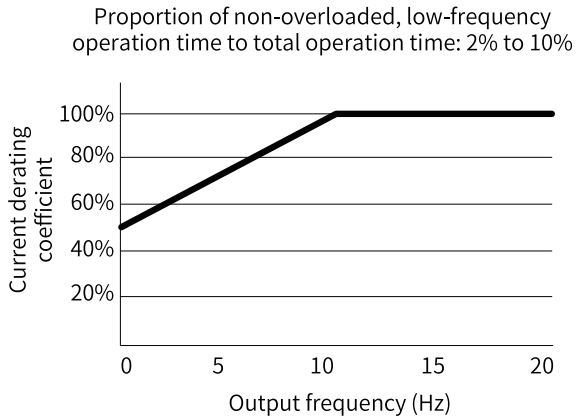


Figure 7-20 Current derating curve for non-overloaded conditions with low-frequency operation time accounting for 2% to 10%

- 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.

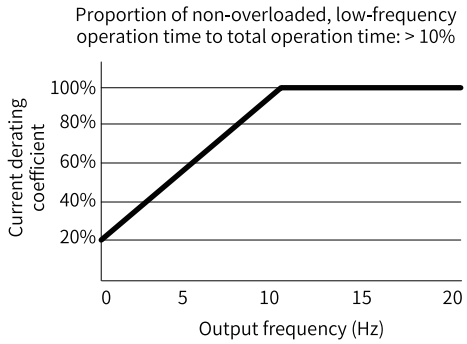


Figure 7-21 Current derating curve for non-overloaded conditions with low-frequency operation time accounting for > 10%

- 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.

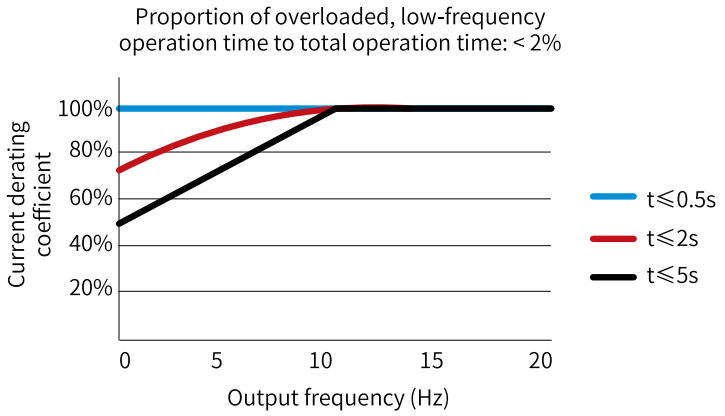


Figure 7-22 Current derating curve for overloaded conditions with low-frequency operation time accounting for < 2%

- 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.

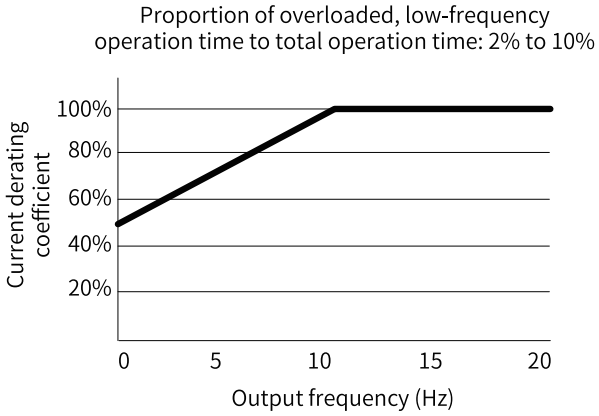


Figure 7-23 Current derating curve for overloaded conditions with low-frequency operation time accounting for 2% to 10%

- 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.

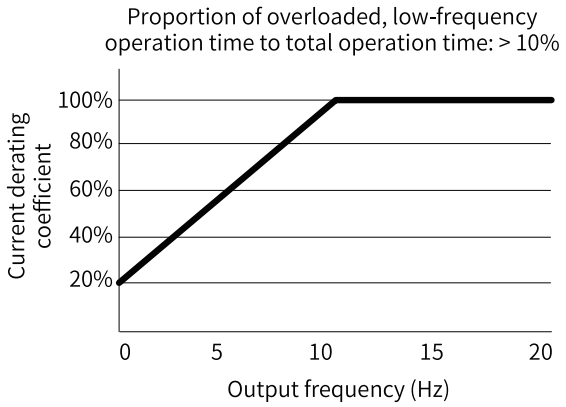


Figure 7-24 Current derating curve for overloaded conditions with low-frequency operation time accounting for > 10%

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%
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%

Model	Rated Power	Carrier Frequency (kHz)									
	P (kW)	1.2	1.5	2	2.5	3.2	4	5	6	7	8
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.

7.2.4 Overload Characteristics

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.

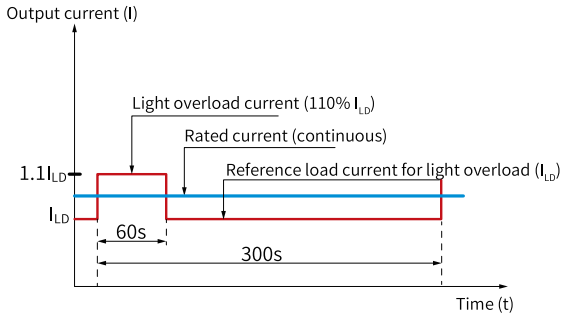


Figure 7-25 Curve of light overload mode

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.

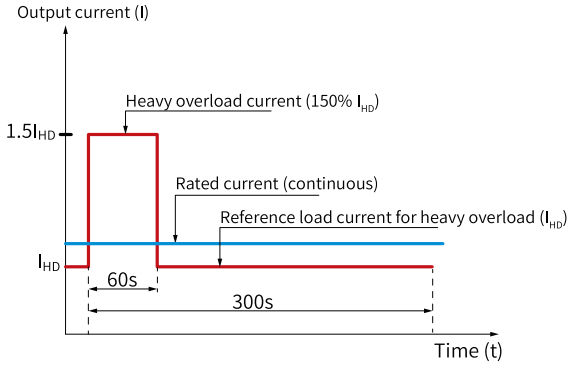


Figure 7-26 Curve of heavy overload mode

8 Three-Phase Braking Module

- The MD880 series three-phase braking modules offer comprehensive protective functions, including protection against overcurrent, overvoltage, overtemperature, as well as open circuit and short circuit of braking resistors. You can set the braking start/stop voltage and braking rate. You can also use the master/slave configuration to meet the braking requirements of high-power starters. During braking, due to the mechanical inertia of the load, kinetic energy is converted to electrical energy which is fed back to the drive, causing the drive DC bus voltage to rise. To ensure uninterrupted operation, a braking unit is essential. The regenerative energy can be dissipated through the braking resistor, preventing the drive from shutting down due to overvoltage protection. These three-phase braking modules mainly apply to applications where AC drives or servo drives (collectively referred to as drives) require rapid speed reduction, positioning, or braking.
- 400 V system:
  - No overload: 500 kW to 750 kW
  - Heavy overload: 640 kW to 800 kW
- 690 V system:
  - No overload: 870 kW to 1300 kW
  - Heavy overload: 1110 kW to 1390 kW

8.1 Product Information

8.1.1 Model Number and Nameplate

MD880-60M-1300-7
① ② ③ ④

① **Product series** MD880: MD880 AC drive series	③ **Rated power** 1300: 1300 kW
② **Product type** 60M: Three-phase braking module	④ **Voltage class** 4: 400 VAC system 7: 690 VAC system

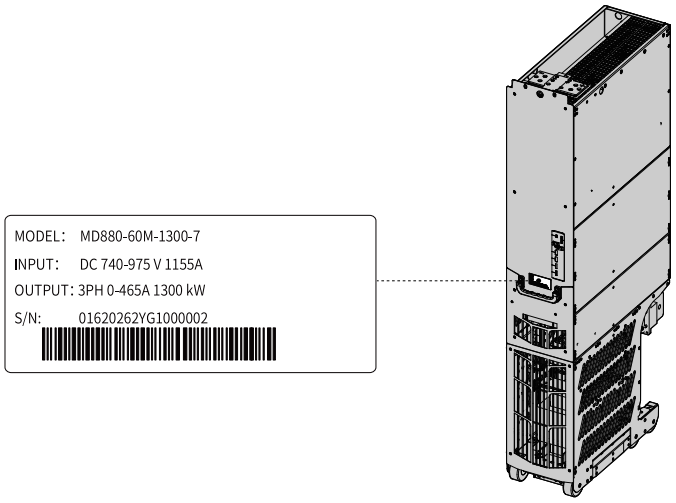


Figure 8-1 Nameplate of the three-phase braking module

Note

- INPUT indicates the allowable input voltage range under rated operating conditions, instead of the braking voltage.
- OUTPUT indicates the output current range and rated power.

8.1.2 Components

The three-phase braking module adopts the H8 structure. It provides a power range of 500 kW to 750 kW in the 400 V voltage class configuration, or 870 kW to 1300 kW in the 690 V voltage class configuration. The module has bottom casters for easy installation and maintenance.

The following figure shows the component layout of the braking module.

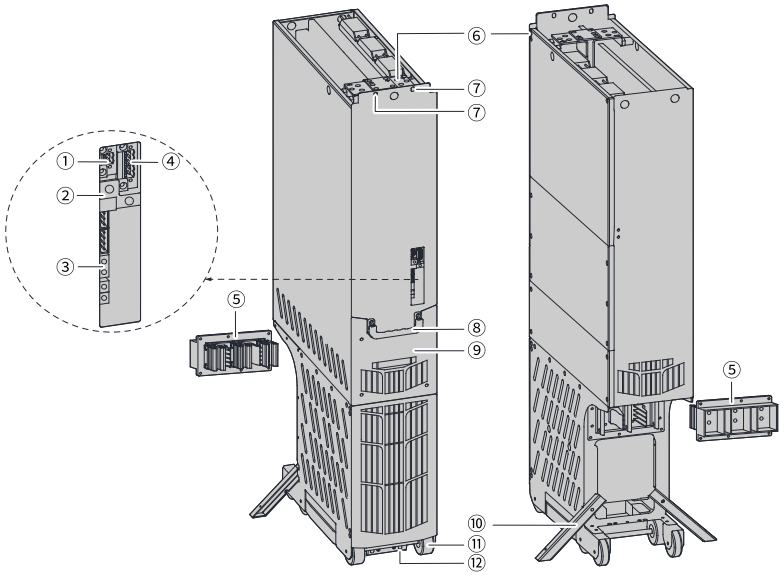


Figure 8-2 Components of the three-phase braking module

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

8.1.3 Product Dimensions

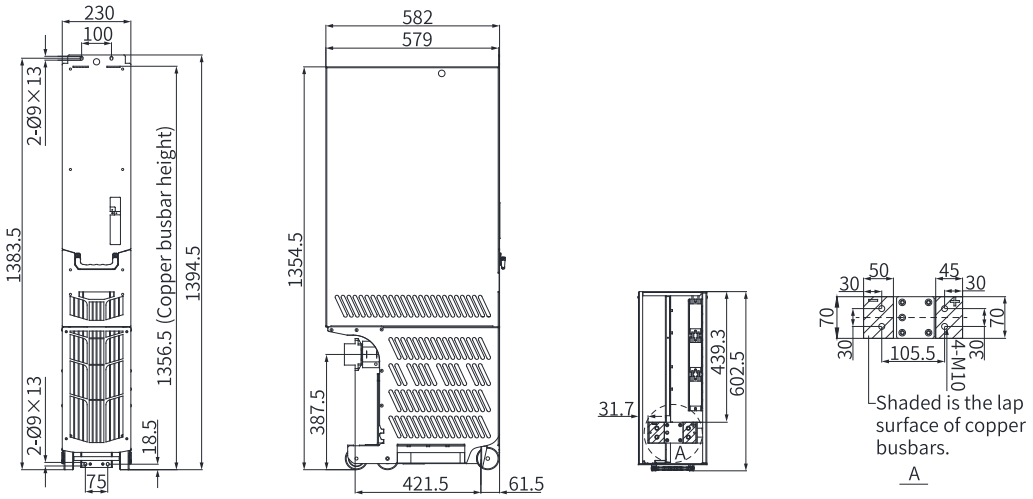


Figure 8-3 Outline dimensions of the three-phase braking module (unit: mm)

8.2 Specifications

8.2.1 Electrical Specifications

Table 8–1 Electrical specifications of the three-phase braking module

Model	Input voltage class	Max. Single Unit Power (No Overload)	Starting Braking Voltage	Max. Continuous Braking Phase Current	Min. Braking Resistance	Max. Continuous Braking Power	Loss
			(V)	(A)	(Ω)	(kW)	(kW)
MD880-60M-0500-4	• Matching 400 V system: 640 VDC to 750 VDC • Matching 690 V system: 1075 VDC to 1150 VDC	• 400 V single unit: 750 kW • 690 V single unit: 1300 kW	653	310	1.7	500	5
MD880-60M-0750-4			653	465	1.2	750	7.5
MD880-60M-0870-7			1126	310	3	870	8.7
MD880-60M-1300-7			1126	465	2	1300	13

Note

Note: Multiple braking units in the same voltage class can be connected in parallel.

8.2.2 Technical Specifications

Table 8–2 Technical specifications of the three-phase braking module

Item		Specification
Basic performance	Operating efficiency	> 99%
Environment requirements	Ambient temperature	–10°C to +40°C; derate output current by 1% per 1°C above 40°C; maximum ambient temperature 50°C
	Operating altitude	⩽ 1000 m; derate output current by 1% per 100 m increase above 1000 m; maximum operating altitude 4000 m
	Pollution degree	PD2
	Storage temperature	–40°C to +70°C
	Overvoltage class	OVC III
	Power grid system	-

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
	Cooling method	Forced air cooling (AF) compliant with EN 60146
	Safety category	EN 61800-5-1
	IP rating	IP00

8.2.3 Overload Characteristics

When the MD880-60M series three-phase braking 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.

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.

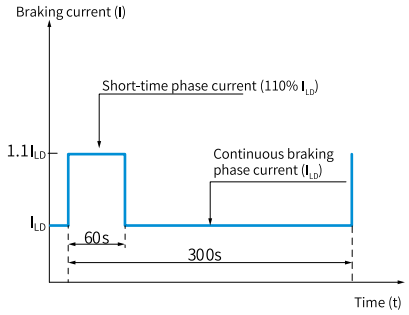


Figure 8-4 Load curve of the three-phase braking module

9 Single-Phase Braking Module

- The MD880-61M series single-phase braking modules offer comprehensive protective functions, including protection against overcurrent, overvoltage, overtemperature, as well as open circuit and short circuit of braking resistors. You can set the braking start/stop voltage and braking rate. You can also use the master/slave configuration to meet the braking requirements of high-power starters. During braking, due to the mechanical inertia of the load, kinetic energy is converted to electrical energy which is fed back to the drive, causing the drive DC bus voltage to rise. To ensure uninterrupted operation, a braking unit is essential. The regenerative energy can be dissipated through the braking resistor, preventing the drive from shutting down due to overvoltage protection. These single-phase braking units mainly apply to applications where AC drives or servo drives (collectively referred to as drives) require rapid speed reduction, positioning, or braking.
- 690 V system:
  - No overload: 147 kW
  - Heavy overload: 298 kW
  - Fast overload: 404 kW

9.1 Product Information

9.1.1 Model Number and Nameplate

MD880 - 61M – 0400 - 7
① ② ③ ④

① **Product series** MD880: MD880 series	③ **Rated power** 0400: 404 kW
② **Product type** 61M: Single-phase braking unit	④ **Voltage class** 7: 690 VAC system

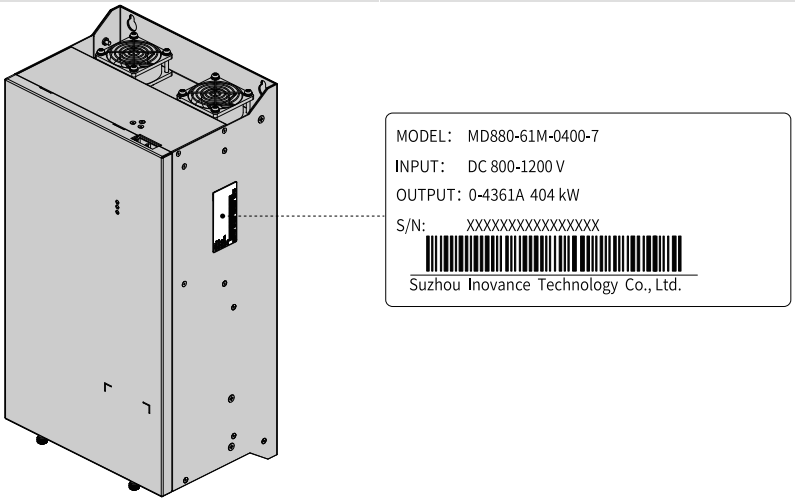


Figure 9-1 Nameplate of the single-phase braking module

9.1.2 Components

Main circuit terminals

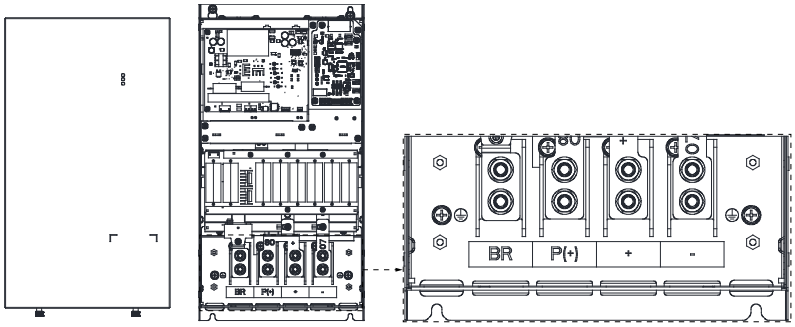


Figure 9-2 Layout of main circuit terminals

Table 9–1 Functions of power terminals

Terminal Mark	Name	Description
+, –	DC bus positive and negative terminals	Connected to the common DC busbar
P(+), BR	Braking resistor connection terminals	Connected to the braking resistor
⏚	Grounding terminal	Grounding terminal

Control circuit terminals

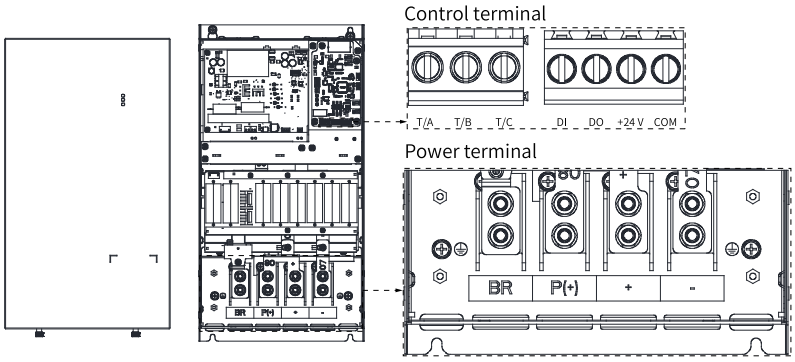


Figure 9-3 Layout of control circuit terminals

Terminal Mark	Name	Description
DI	Digital input	Input inhibited upon external faults
TA/TB/TC	Fault relay output	Normally open/Normally closed contact that acts upon braking unit faults
COM	Common terminal	Reference GND of internal auxiliary power supply
+24V	24 V input terminal	24 V input of external auxiliary power supply

The following figure shows the internal equivalent circuit of the control signal terminal.

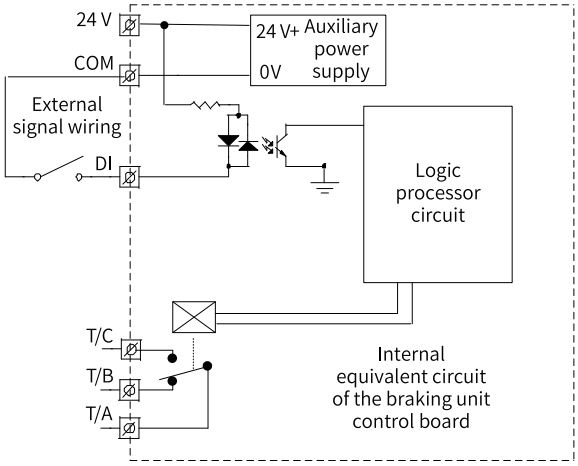


Figure 9-4 Internal equivalent circuit of the control signal terminal

9.1.3 Product Dimensions

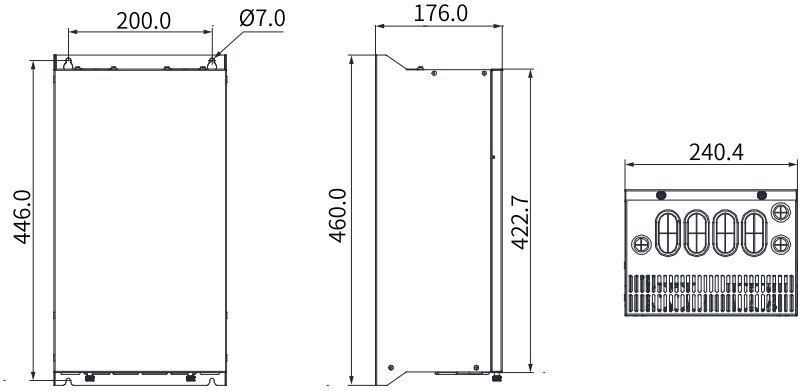


Figure 9-5 Outline dimensions of the single-phase braking module (unit: mm)

9.2 Specifications

9.2.1 Electrical Specifications

Table 9–2 Electrical specifications of the single-phase braking module

Model	Min. Braking Resistance R min (Ω)	No Overload		1 min/5 min[1] Overload		10s/60s[2] Overload	
		I_{rms} (A)	P_{cont} (kW)	I_{rms} (A)	P_{br} (kW)	I_{rms} (A)	P_{br} (kW)
MD880-61M-0400-7	2.72	131	147	267	298	361	404

9.2.2 Technical Specifications

Table 9–3 Technical specifications of the single-phase braking module

Item		Specification
Operating environment	Ambient temperature	−10°C to +40°C; derate by 1% per 1°C above 40°C; maximum ambient temperature 50°C
	Ambient humidity	< 95% RH, non-condensing
	Installation altitude	⩽ 1000 m; derate by 1% per 100 m above 1000 m; maximum altitude 3000 m
	Vibration	< 10 m/s^2 (1 · g)
Storage environment	Storage temperature	−20°C to +60°C
Mechanical data	Protection rating	IP20
	Pollution degree	2
	Cooling method	Air cooling

9.2.3 Overload Characteristics

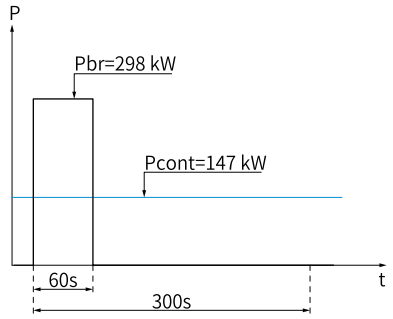


Figure 9-6 1 min/5 min load curve

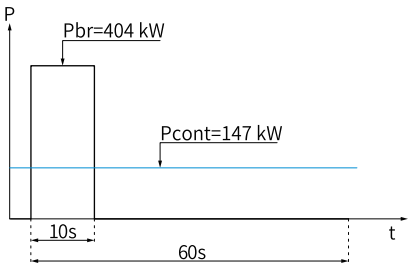


Figure 9-7 10s/60s load curve

10 DC Chopper Integrated Kit

The MD880-80 series DC chopper integrated kit features high power density, compact design, and high reliability, meeting the requirements for wide voltage range, high accuracy, rapid dynamic response, and programmable power output. The product is available in the 400 V or 690 V voltage class, provides a power range of 50 kW to 600 kW per unit, and supports parallel connection of up to 10 units for scalability. It is suitable for battery charge-discharge controllers, power conversion systems, DC test power supplies, and other similar applications.

10.1 Product Information

10.1.1 Model Number and Nameplate

MD880-80M-1000-4
① ② ③ ④

① **Product series** MD880: MD880 AC drive series	③ **Rated current** 0100: 100 A 0200: 200 A 0300: 300 A 0400: 400 A 0500: 500 A 0600: 600 A 0800: 800 A 1000: 1000 A
② **Product type** 80D: DC chopper integrated kit 80M: DC chopper module	④ **Voltage class** 4: 400 VAC system 7: 690 VAC system

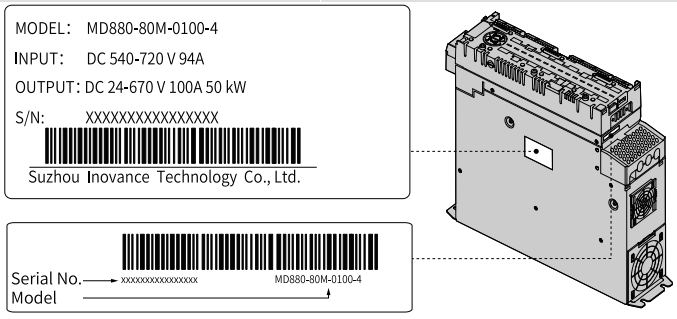


Figure 10-1 Nameplate of the H1 to H4 DC chopper modules

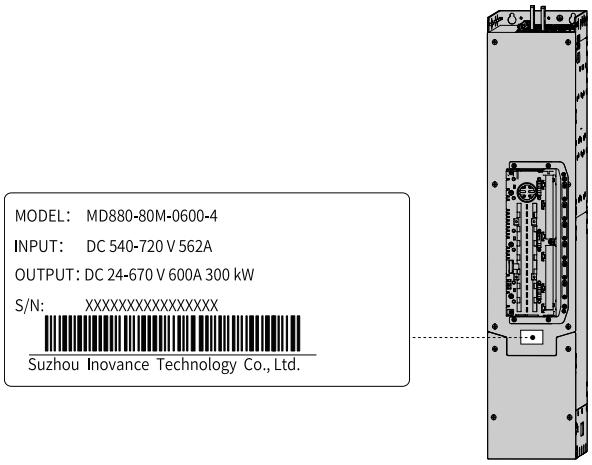


Figure 10-2 Nameplate of the H6 and H7 DC chopper modules

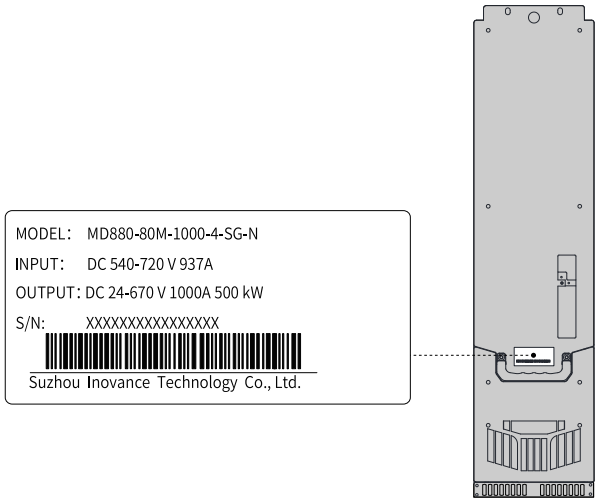


Figure 10-3 Nameplate of the H8A DC chopper module

Note

- For the H3 and H4 DC chopper modules, the nameplate is affixed to the left side of the module.
- For the H6 to H8A DC chopper modules, the nameplate is affixed to the front of the module.

10.1.2 Components

H3 module structural configuration

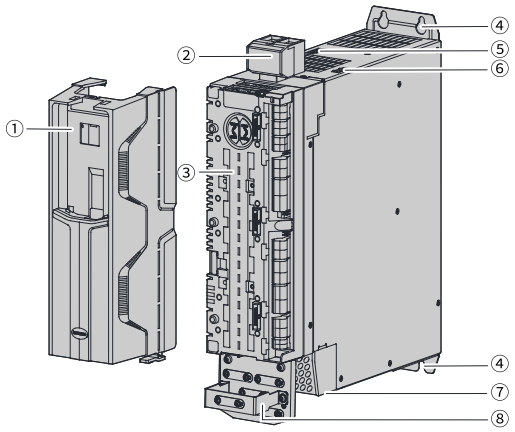


Figure 10-4 Components of the H3 DC chopper module

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

H4 module structural configuration

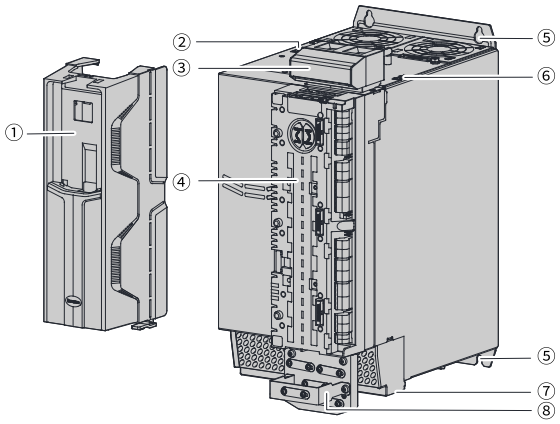


Figure 10-5 Components of the H4 DC chopper module

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

H6 module structural configuration

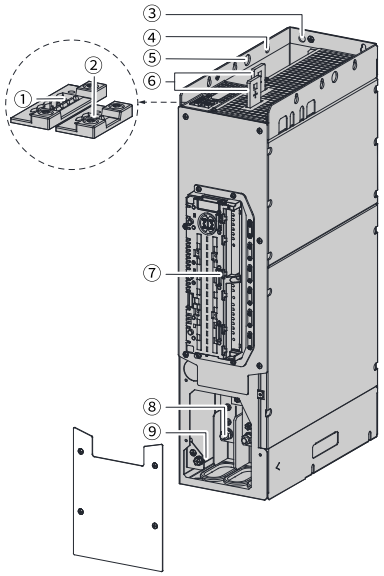


Figure 10-6 Components of the H6 DC chopper module

No.	Name
①	External I/O terminal
②	Internal 24 VDC auxiliary power terminal
③	Rear mounting hole
④	Side mounting hole
⑤	Eyebolt
⑥	HVS DC bus terminal
⑦	HCU control module
⑧	LVS U/V/W terminal
⑨	Ground (PE) terminal

H7 module structural configuration

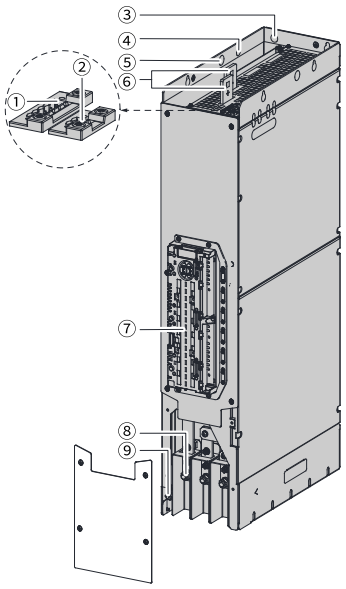


Figure 10-7 Components of the H7 DC chopper module

No.	Name
①	External I/O terminal
②	Internal 24 VDC auxiliary power terminal
③	Rear mounting hole
④	Side mounting hole
⑤	Eyebolt
⑥	HVS DC bus terminal
⑦	HCU control module
⑧	LVS U/V/W terminal
⑨	Ground (PE) terminal

H8A module structural configuration

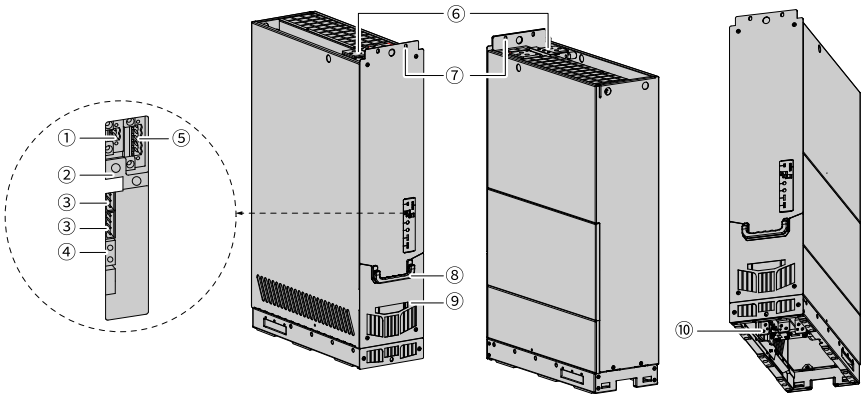


Figure 10-8 Components of the H8A DC chopper module

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

10.1.3 Product Dimensions

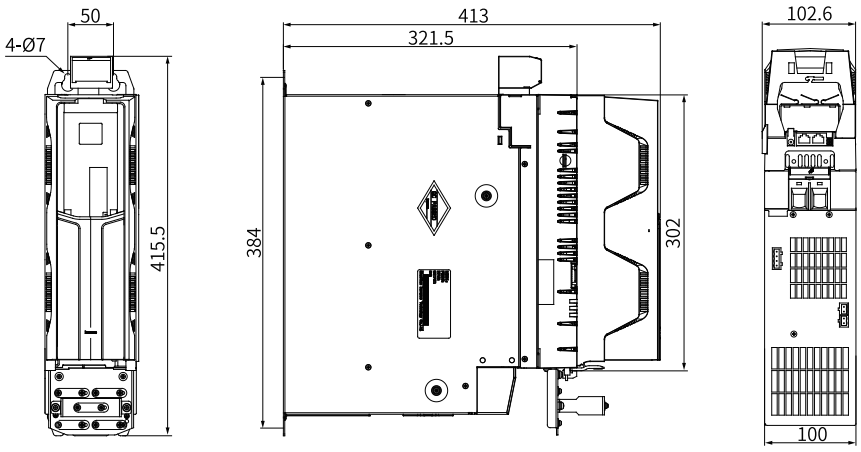


Figure 10-9 Outline dimensions of the H3 DC chopper module (unit: mm)

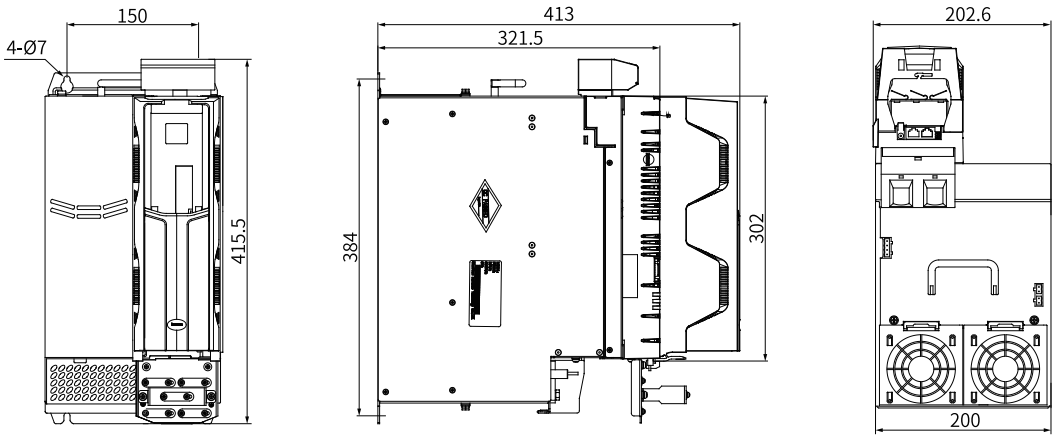


Figure 10-10 Outline dimensions of the H4 DC chopper module (unit: mm)

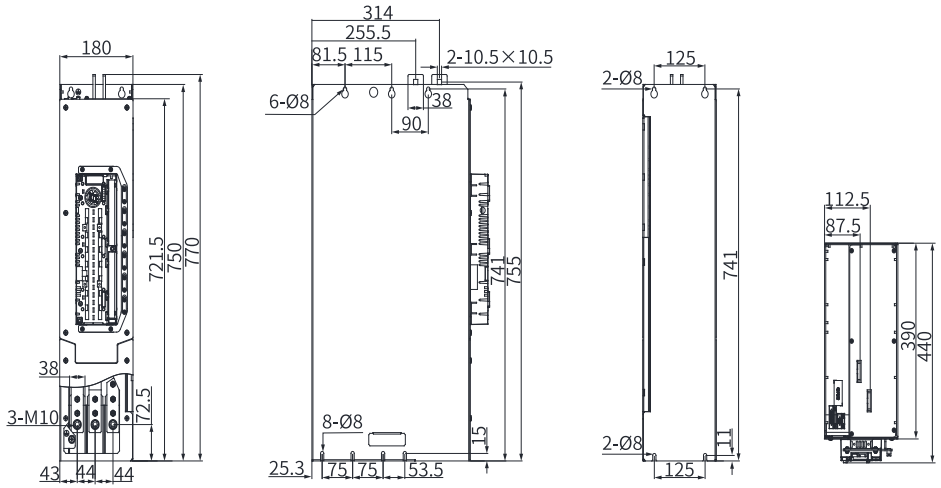


Figure 10-11 Outline dimensions of the H6 DC chopper module (unit: mm)

Note

It is recommended to use M6 bolts to secure the H6 DC chopper module, and use M10 bolts to connect the DC input copper busbar.

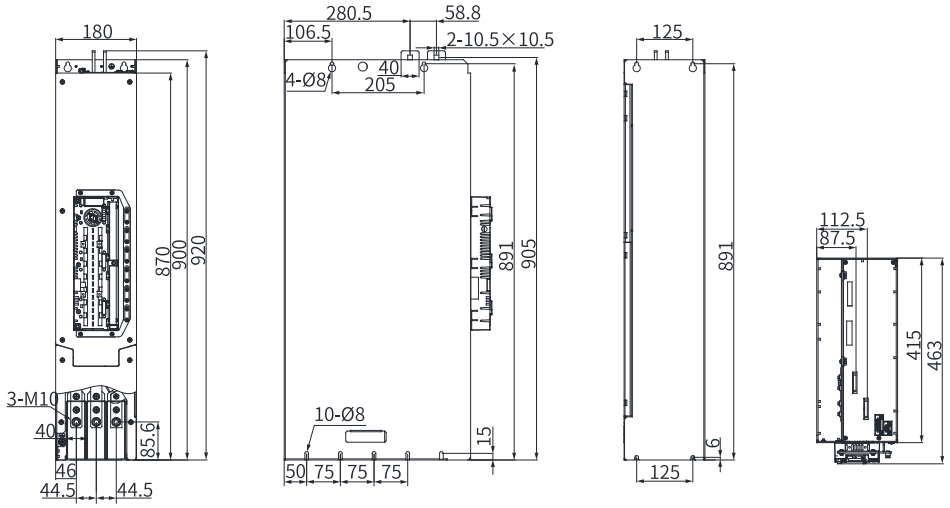


Figure 10-12 Outline dimensions of the H7 DC chopper module (unit: mm)

Note

It is recommended to use M6 bolts to secure the H7 DC chopper module, and use M10 bolts to connect the DC input copper busbar.

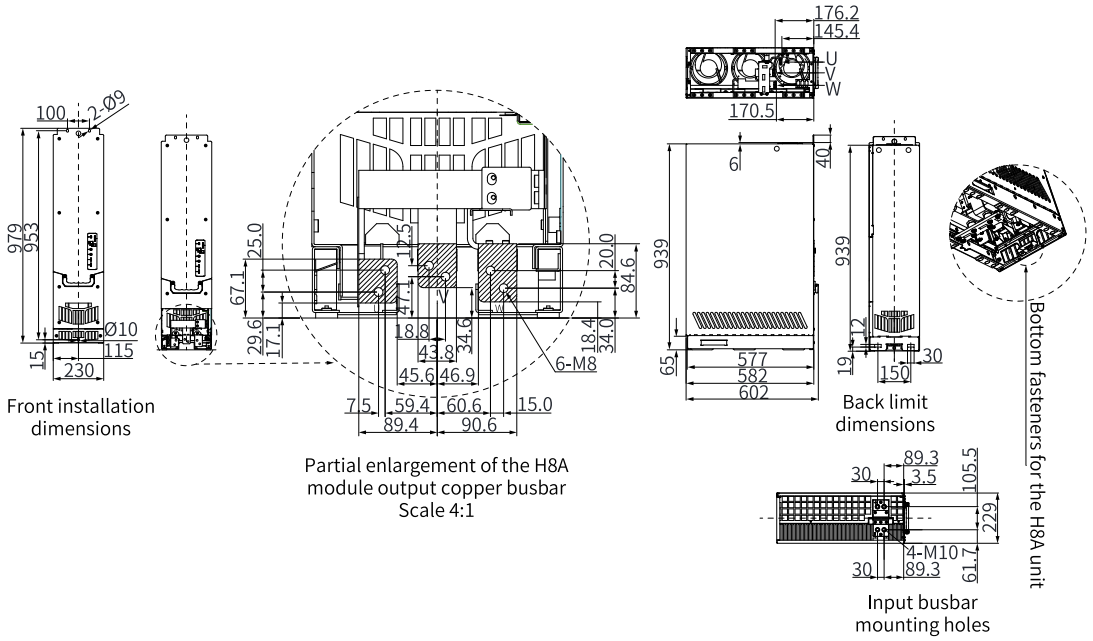


Figure 10-13 Outline dimensions of the H8A DC chopper module (unit: mm)

Note It is recommended to use M8 bolts to secure the H8A DC chopper module, and use M10 bolts to connect the DC input copper busbar.

10.2 Specifications

10.2.1 Product Specifications

Table 10–1 Product specifications of the DC chopper integrated kit

Model MD880-80...	Rating			No Overload		Fast Overload		Heavy Overload		DC Chopper Module Loss	Structure
	HVS Voltage	LVS Voltage	Rated Output Voltage	Rated Output Current	Rated Output Power	Output Current	Output Power	Output Current	Output Power		
	Ui	Uo	Uo_{nom}	I_N	P_N	I_{fast}	P_{fast}	I_{Hd}	P_{Hd}		
	V (DC)	V (DC)	V (DC)	A (DC)	kW	A (DC)	kW	A (DC)	kW	W	
Rated voltage U_n = 400 VAC (DC range: 540 VDC to 720 VDC)											
0100-4	540 to 720	24 to 670	500	100	50	75	38	85	43	592	H3+LC
0200-4	540 to 720	24 to 670	500	200	100	150	75	170	85	762	H4+LC
0300-4	540 to 720	24 to 670	500	300	150	225	113	255	128	1468	
0400-4	540 to 720	24 to 670	500	400	200	300	150	340	170	2104	H6+LC
0500-4	540 to 720	24 to 670	500	500	250	375	188	425	213	2587	H7+LC
0600-4	540 to 720	24 to 670	500	600	300	450	225	510	255	3203	
0800-4	540 to 720	24 to 670	500	800	400	600	300	680	340	4921	H8A+LC
1000-4	540 to 720	24 to 670	500	1000	500	750	375	850	425	6701	
Rated voltage U_n = 690 VAC (DC range: 740 VDC to 1050 VDC)											

Model MD880-80...	Rating			No Overload		Fast Overload		Heavy Overload		DC Chopper Module Loss	Structure
	HVS Voltage	LVS Voltage	Rated Output Voltage	Rated Output Current	Rated Output Power	Output Current	Output Power	Output Current	Output Power		
	Ui	Uo	Uo_{nom}	I_N	P_N	I_{fast}	P_{fast}	I_{Hd}	P_{Hd}		
	V (DC)	V (DC)	V (DC)	A (DC)	kW	A (DC)	kW	A (DC)	kW	W	
0100-7	740 to 1050	24 to 1000	1000	100	100	75	75	85	85	1321	H6+LC
0200-7	740 to 1050	24 to 1000	1000	200	200	150	150	170	170	2436	
0300-7	740 to 1050	24 to 1000	1000	300	300	225	225	255	255	5109	H8A+LC
0400-7	740 to 1050	24 to 1000	1000	400	400	300	300	340	340	6143	
0500-7	740 to 1050	24 to 1000	1000	500	500	375	375	425	425	7912	
0600-7	740 to 1050	24 to 1000	1000	600	600	450	450	510	510	9086	

Note The rated output voltage of the DC chopper power module in overload applications is the same as that in no-overload applications.

10.2.2 Electrical Specifications

Table 10–2 Electrical specifications of the DC chopper module

Item	Specification
HVS voltage	400 V system: 540 VDC to 720 VDC 690 V system: 740 VDC to 1050 VDC
LVS voltage	400 V system: 24 VDC to 670 VDC 690 V system: 24 VDC to 1000 VDC
Regenerative power	100%
Voltage accuracy	LVS: ⩽ 0.1% Fs HVS: ⩽ 1% Fs
Voltage ripple (Vrms)	LVS: ⩽ 0.2% Fs HVS: ⩽ 0.5% Fs
Current accuracy	⩽ 1% Fs

10.2.3 Technical Specifications

Table 10–3 Technical specifications of the DC chopper module

Item		Specification
Basic performance	Carrier frequency	4 kHz
	Overload capacity	• Fast overload: 200%, 10 seconds of continuous overload allowed every 300 seconds • Heavy overload: 150%, 60 seconds of continuous overload allowed every 300 seconds
	Operating efficiency	⩾ 97%
	Response time	⩽ 5 ms (at a rated voltage below 500 V, unidirectional increase by 10% to 90% of rated load) (Some models support 3 ms with enhanced parameters.)
	Switching time	⩽ 10 ms (at a rated voltage below 500 V, bi-directional switching between –90% and +90% of rated load) (Some models support 6 ms with enhanced parameters.)
Mechanical data	Shock and vibration resistance	Class 3M4 in GB/T 4798.3-2007 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, and overtemperature
Environment requirements	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate by 1% per 100 m increase above 1000 m; maximum altitude 4000 m
	Ambient temperature	–10°C to +50°C; derate by 2% per 1°C increase above 40°C; maximum ambient temperature 50°C
	Noise	⩽ 85 dB
	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	H3 and H4 DC chopper modules: IP20 H6 to H8 DC chopper modules: IP00

10.2.4 Derating Characteristics

Ambient temperature-based derating

When the temperature is 40°C to 50°C, the output current must be derated by 2% per 1°C increase. Output current = Rated current x Derating coefficient (k).

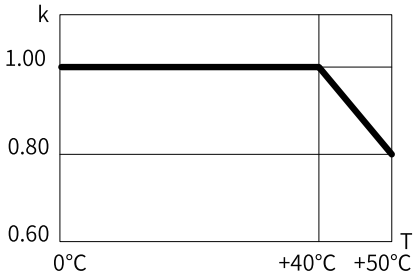


Figure 10-14 Ambient temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the DC chopper module must be derated by 1% per 100 m increase. Output current = Rated current x Derating coefficient (k).

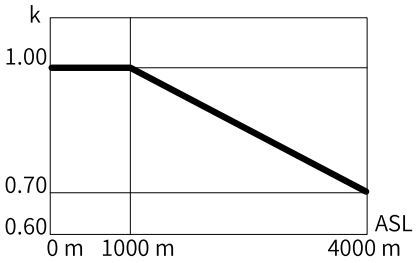


Figure 10-15 Altitude-based derating

10.2.5 Overload Characteristics

When the MD880-80 series DC chopper 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 system operates at the reference load current before and after an overload event.

Curve of fast overload mode

I_{fast} indicates the reference load current for fast overload mode. In this mode, the system operates at 200% of the reference load current for 10 seconds per 300 seconds.

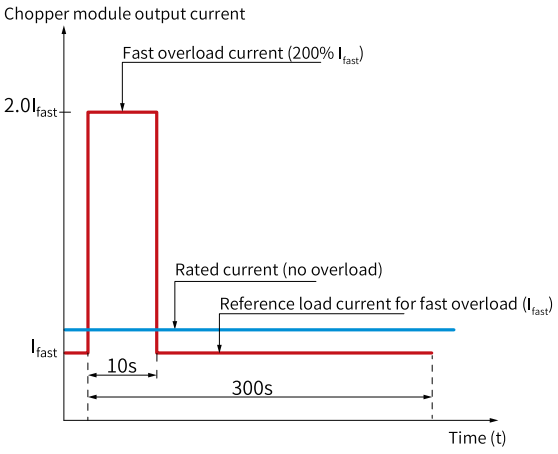


Figure 10-16 Curve of fast overload mode

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 seconds per 300 seconds.

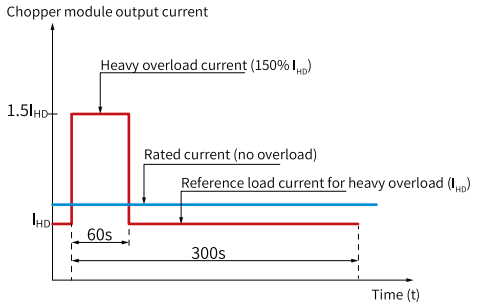


Figure 10-17 Curve of heavy overload mode

11 Air-Cooled Single-Drive Product (400 V)

- The MD880 series single-drive AC drive is a low-voltage, general-purpose, high-performance vector control AC drive with a power range of 5.5 kW to 450 kW. It features high power density, compact design, and high reliability, and supports V/f control, sensorless vector control (SVC), and feedback vector control (FVC) for motors. As an expansion of the MD880 lineup, this AC drive is designed to control and regulate the speed and torque of three-phase AC synchronous and asynchronous motors.
- This AC drive adopts high-performance vector control technology, delivering high torque output at low speeds, excellent dynamic performance, and superior overload capability. It provides user-programmable functions, background monitoring, and communication bus support. It also supports multiple encoder types and allows flexible function combinations with stable performance.
- This series is well-suited for drive applications in industries such as papermaking equipment, rolling mills, experimental stations, cranes, oil rigs, and mining engineering machinery.

11.1 Product Information

11.1.1 Model Number and Nameplate

MD880-01S-0048-4-B-SG
① ② ③ ④ ⑤ ⑥

① **Product series** MD880: MD880 AC drive series	③ **Rated current** 0048: 48 A	⑤ **Standard accessory**<1> B: Braking module included L: Output reactor included Null: None
② **Product type** 01S: single-drive AC drive module	④ **Voltage class** 4: 400 VAC system 7: 690 VAC system	⑥ **Standard accessory** SG: Controller

Note

<1>: Standard accessories can include both a braking module and an output reactor.

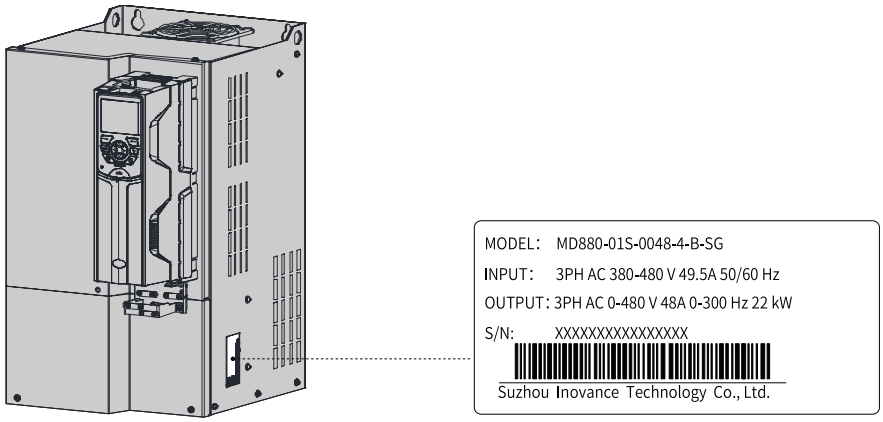


Figure 11-1 Nameplate of the MD880 series single-drive AC drive

11.1.2 Components

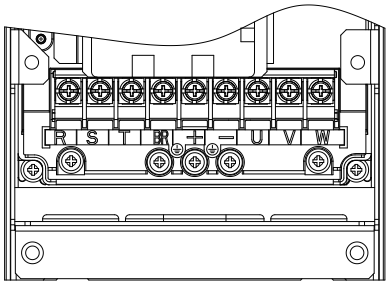


Figure 11-2 Layout of main circuit terminals for the T2 to T4 drives

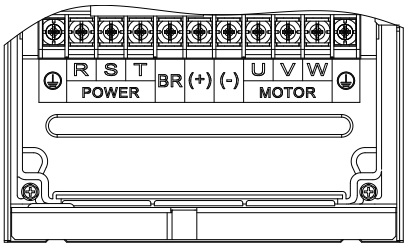


Figure 11-3 Layout of main circuit terminals for the T5 and T6 drives

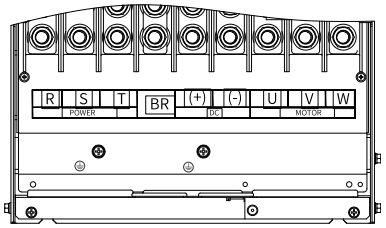


Figure 11-4 Layout of main circuit terminals for the T7 to T9 drives

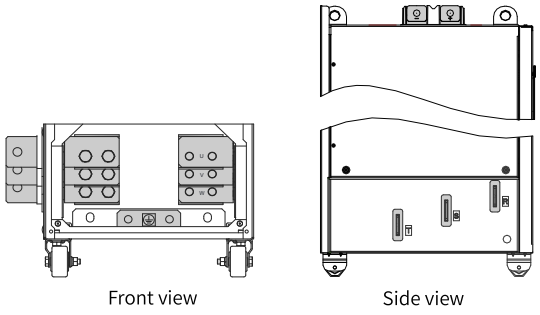


Figure 11-5 Layout of main circuit terminals of the T10 to T12 drives

Table 11–1 Main circuit terminals of the MD880 series single-drive AC drive

Terminal Mark	Name	Description
R, S, T	Three-phase power input terminal	Connected to a three-phase AC input power supply
(+), (–)	DC bus positive and negative terminals	Common DC bus input, connected to the external braking unit for AC drives with 90 kW or higher power
(+), BR	Braking resistor connection terminals	Connected to the braking resistor for AC drives with 75 kW or lower power
U, V, W	AC drive output terminals	Connected to a three-phase motor
⏚	Ground (PE) terminal	Connected to the ground

11.1.3 Product Dimensions

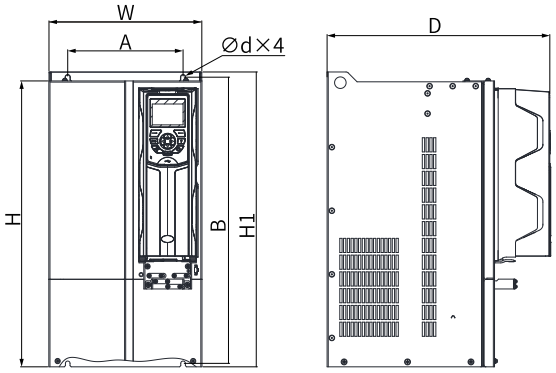


Figure 11-6 Outline and installation dimensions of the T2 to T9 drives

Structure	Mounting Hole Spacing (mm)		Outline Dimensions (mm)				Mounting Hole Diameter (mm)	Mass (kg)
	A	B	H	H1	W	D		
T2	90	435	433	450	140	338	Ø8	8.5
T3	90	455	453	470	150	348	Ø8	11
T4	140	455	453	470	190	348	Ø8	12.2
T5	170	485	484.5	500	230	357	Ø8	17.6
T6	200	495	493	510	265	387	Ø8	27.6
T7	245	523	525	542	300	425	Ø10	37.5
T8	270	560	554	580	338	465	Ø10	54
T9	320	890	874	915	400	470	Ø10	87.5

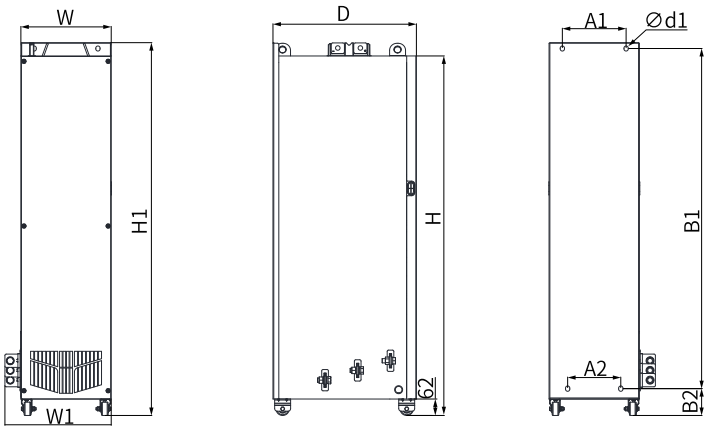


Figure 11-7 Outline and installation dimensions of the T10 to T12 drives (without reactors)

Structure	Mounting Hole Spacing (mm)				Outline Dimensions (mm)					Mounting Hole Diameter (mm)	Mass (kg)
	A1	A2	B1	B2	H	H1	W	W1	D	D1	
T10	240	150	1035	86	1086	1134	300	360	500	ϕ13	110
T11	225	185	1175	97	1249	1284	330	390	545	ϕ13	155
T12	240	200	1280	101	1353	1403	340	400	545	ϕ16	185

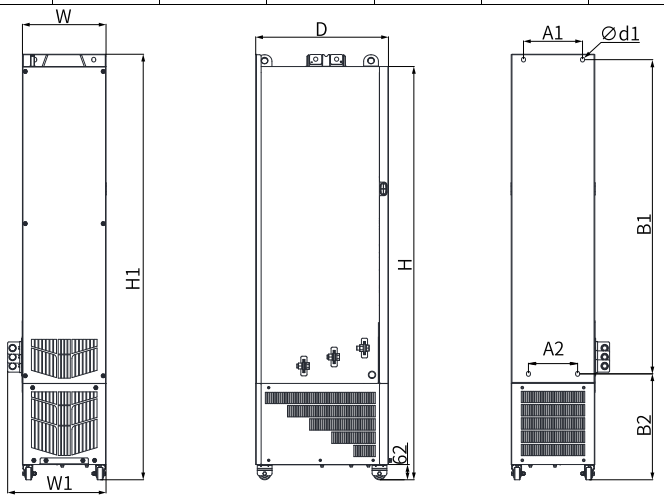


Figure 11-8 Outline and installation dimensions of the T10 to T12 drives (with reactors)

Structure	Mounting Hole Spacing (mm)				Outline Dimensions (mm)					Mounting Hole Diameter (mm)	Mass (kg)
	A1	A2	B1	B2	H	H1	W	W1	D	D1	
T10	240	150	1035	424	1424	1472	300	360	500	ϕ13	160
T11	225	185	1175	435	1586	1622	330	390	545	ϕ13	215
T12	240	200	1280	432	1683	1735	340	400	545	ϕ16	245

11.2 Specifications

Table 11–2 Product specifications of the MD880 series single-drive AC drive

Model MD880-01S-	No Overload		Light Overload		Heavy Overload		Loss	Structure
	Rated Output Current	Rated Output Power	Output Current	Output Power	Output Current	Output Power		
	A	kW	A	kW	A	kW	kW	
Rated voltage U_n = 400 V (380 V to 480 V), ±10% (–15%, < 1 min), rated power based on 400 V								
0012-4-B-SG	12.0	5.5	12.0	5.5	9.0	3.7	0.12	T2
0017-4-B-SG	17.0	7.5	17.0	7.5	13.0	5.5	0.195	
0024-4-B-SG	24.0	11.0	23.0	11.0	17.0	7.5	0.262	T3
0033-4-B-SG	33.0	15.0	32.0	15.0	25.0	11	0.445	
0038-4-B-SG	38.0	18.5	37.0	18.5	32.0	15.0	0.553	T4
0048-4-B-SG	48	22	45	22	37	18.5	0.478	T5
0060-4-B-SG	60	30	58	30	45	22	0.551	
0078-4-B-SG	78	37	75	37	60	30	0.694	T6
0094-4-B-SG	94	45	91	45	75	37	0.815	
0116-4-B-SG	116	55	112	55	91	45	1.01	T7
0149-4-B-SG	149	75	143	75	112	55	1.21	
0183-4-B-SG	183	90	176	90	150	75	1.57	T8
0217-4-SG	217	110	210	110	176	90	1.81	
0262-4-SG	262	132	253	132	210	110	2.14	
0314-4-SG	314	160	304	160	253	132	2.85	T9
0383-4-SG	383	200	370	200	304	160	3.56	
0441-4-SG	441	220	426	220	377	200	4.15	T10
0481-4-SG	481	250	465	250	426	220	4.55	
0441-4-L-SG	441	220	426	220	377	200	4.15	
0481-4-L-SG	481	250	465	250	426	220	4.55	
0538-4-SG	538	280	520	280	465	250	5.06	T11
0605-4-SG	605	315	584	315	520	280	5.33	
0538-4-L-SG	538	280	520	280	465	250	5.06	
0605-4-L-SG	605	315	584	315	520	280	5.33	
0673-4-SG	673	355	650	355	585	315	5.69	T12
0751-4-SG	751	400	725	400	650	355	6.31	
0849-4-SG	849	450	820	450	725	400	6.91	
0673-4-L-SG	673	355	650	355	585	315	5.69	
0751-4-L-SG	751	400	725	400	650	355	6.31	
0849-4-L-SG	849	450	820	450	725	400	6.91	

11.2.1 Electrical Specifications

Table 11–3 Electrical specifications of the MD880 series single-drive AC drive

Item	Specification
Rated input voltage	400 V system: 380 VAC to 480 VAC
Frequency	50 Hz/60 Hz
Voltage range	–15% to +10%; allowed voltage range: 323 VAC to 528 VAC
Output voltage	400 V system: 0 VAC to 480 VAC
Output frequency	0 Hz to 300 Hz

11.2.2 Technical Specifications

Table 11–4 Technical specifications of the MD880 series single-drive AC drive

Item		Specification
Basic performance	Overload capacity	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes
	Operating efficiency	> 98%
Control features	Motor types supported	Asynchronous motor Permanent magnet synchronous motor
	Motor control mode	Voltage/frequency (V/f) control Sensorless vector control (SVC) Feedback vector control (FVC)
	Carrier frequency	400 V system: 5.5 kW to 55 kW: 3.2 kHz default; 75 kW: 2.5 kHz default; 90 kW to 450 kW: 2 kHz default
	Speed range	V/f control: 1:50
		SVC: 1:200
		FVC: 1:1000
	Speed control accuracy	SVC: ±10% Fsl
		FVC: ±0.01%
	Torque response	SVC: ⩽ 5 ms
		FVC: ⩽ 5 ms
	Starting torque	SVC: 0.5 Hz/150%
		FVC: 0 Hz/200%
	Torque control accuracy	SVC: ±5% (above 5 Hz)
		FVC: ±3%

Item		Specification
Mechanical data	Shock and vibration resistance	GB/T 2423.10-2008 Displacement of 7 mm at 5 Hz to 9 Hz Acceleration rate of 5.9 m^2 at 9 Hz to 200 Hz Scanning speed: 1 oct/min
	Safety performance	EN 61800-5-1
	Cooling method	Forced air cooling (AF) compliant with EN 60146
	Maximum mass	245 kg
Protection functions	Phase loss protection	Input and output phase loss protection
	Overvoltage protection	Stops when the DC voltage of the main circuit rises above 800 V
	Undervoltage protection	Stops when the DC voltage of the main circuit falls below 350 V
	Overtemperature protection	Triggers protection when the inverter bridge overheats
	Overload protection	• Stops after 60 seconds of running at 150% of the reference load current for heavy overload • Stops after 60 seconds of running at 110% of the reference load current for light overload
	Overcurrent protection	Stops when the current exceeds 2.5 times the heavy-load reference current of the AC drive
	Braking protection	Protection against braking resistor short circuit (unavailable for models of 18.5 kW and below)
	Short circuit protection	Protection against output interphase short circuit and output short circuit to ground
Environment requirements	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate by 1% per 100 m above 1000 m; maximum altitude 3000 m
	Ambient temperature	−10°C to +40°C; derate by 1.5% per 1°C increase above 40°C; maximum ambient temperature 50°C
	Storage temperature	−20°C to +60°C
	Humidity	< 95% RH, non-condensing
	Vibration	< 5.9 m/s^2 (0.6 G)
	Pollution degree	PD2
	Power grid system	TT/TN IT (VDR and EMC screws removed)
	Overvoltage category	OVC III
	Protection rating	T2 to T9 AC drives: IP20 T10 to T12 AC drives: IP00

11.2.3 Derating Characteristics

Ambient temperature-based derating

When the temperature is 40°C to 50°C, the rated output current must be derated by 1.5% per 1°C increase. Output current = Rated current x Derating coefficient (k).

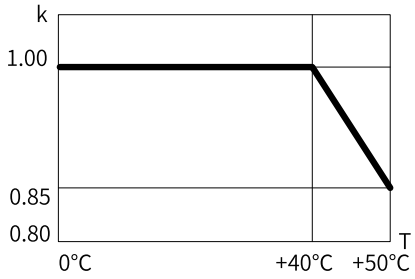


Figure 11-9 Ambient temperature-based derating of the MD880 series single-drive AC drive

Altitude-based derating

When the altitude is 1000 m to 3000 m, the output current of the AC drive must be derated by 1% per 100 m increase. Output current = Rated current x Derating coefficient (k).

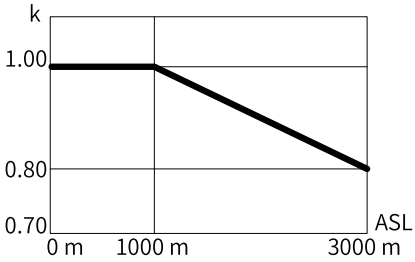


Figure 11-10 Altitude-based derating of the MD880 series single-drive AC drive

Carrier frequency-based derating

Model MD880-01S-	Rated Power	Carrier Frequency (kHz)									
	P (kW)	1.2	1.5	2	2.5	3.2	4	5	6	7	8
0012-4-B-SG	5.5	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	85.96%	80.86%	73.49%	67.24%
0017-4-B-SG	7.5	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	89.33%	80.42%	72.97%	66.50%
0024-4-B-SG	11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	91.04%	83.15%	76.32%	70.36%
0033-4-B-SG	15	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	91.54%	84.01%	77.27%	71.24%
0038-4-B-SG	18.5	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	91.29%	83.42%	76.55%	70.43%
0048-4-B-SG	22	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	93.65%	87.90%	82.65%	77.90%
0060-4-B-SG	30	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	93.45%	87.60%	82.20%	77.30%
0078-4-B-SG	37	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	90.60%	82.40%	74.85%	68.30%
0094-4-B-SG	45	100.00%	100.00%	100.00%	100.00%	100.00%	94.40%	86.50%	79.40%	72.85%	67.10%
0116-4-B-SG	55	100.00%	100.00%	100.00%	100.00%	100.00%	94.00%	86.15%	79.20%	73.35%	68.10%
0149-4-B-SG	75	100.00%	100.00%	100.00%	100.00%	95.28%	88.90%	81.75%	75.50%	70.00%	65.20%
0183-4-B-SG	90	100.00%	100.00%	100.00%	93.85%	85.72%	77.50%	-	-	-	-
0217-4-SG	110	100.00%	100.00%	100.00%	93.10%	84.00%	74.90%	-	-	-	-
0262-4-SG	132	100.00%	100.00%	100.00%	93.93%	85.90%	77.70%	-	-	-	-
0314-4-SG	160	100.00%	100.00%	100.00%	94.80%	87.98%	80.80%	-	-	-	-
0383-4-SG	200	100.00%	100.00%	100.00%	94.45%	87.08%	79.70%	-	-	-	-
0441-4-L-SG	220	100.00%	100.00%	100.00%	92.50%	82.80%	73.10%	-	-	-	-

Model MD880-01S-	Rated Power	Carrier Frequency (kHz)									
	P (kW)	1.2	1.5	2	2.5	3.2	4	5	6	7	8
0481-4-L-SG	250	100.00%	100.00%	100.00%	93.10%	84.16%	75.10%	-	-	-	-
0538-4-L-SG	280	100.00%	100.00%	100.00%	93.40%	84.80%	76.20%	-	-	-	-
0605-4-L-SG	315	100.00%	100.00%	100.00%	93.85%	85.80%	77.80%	-	-	-	-
0673-4-L-SG	355	100.00%	100.00%	100.00%	93.78%	85.46%	77.00%	-	-	-	-
0751-4-L-SG	400	100.00%	100.00%	100.00%	94.23%	86.62%	78.70%	-	-	-	-
0849-4-L-SG	450	100.00%	100.00%	100.00%	93.55%	85.16%	76.80%	-	-	-	-

Note

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

11.2.4 Overload Characteristics

When the MD880 series single-drive AC drive 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.

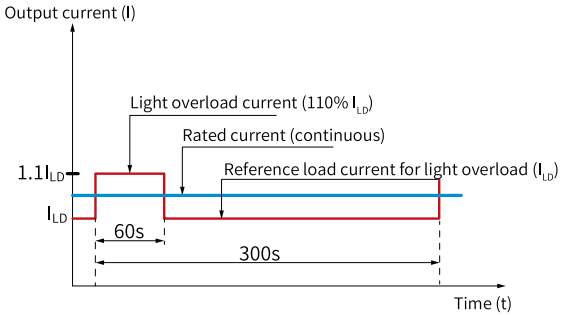


Figure 11-11 Curve of light overload mode

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.

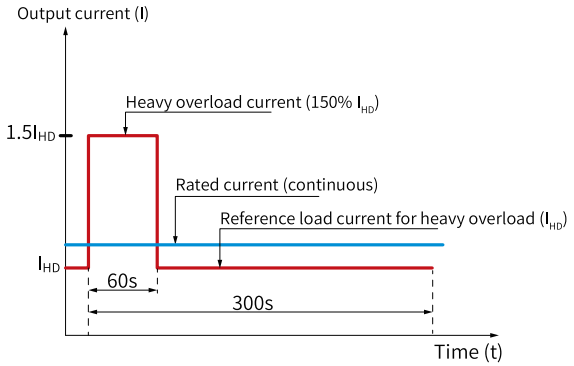


Figure 11-12 Curve of heavy overload mode

12 Air-Cooled Single-Drive Product (690 V)

The MD880 series 690 V single-drive AC drive offers the following features:

- Rated voltage class: 690 VAC
- Single-unit rated power range: 560 kW to 710 kW
- Maximum power for cabinet-mounted units: 1300 kW
- Suitable for controlling AC asynchronous induction motors and permanent magnet motors
- Fast dynamic response, high control accuracy, and high power density
- Flexible modular structure for easy cabinet assembly
- Easy to install, maintain, integrate into cabinets, and equipped with intelligent cooling fan speed regulation
- Widely applicable across industries, including metallurgy, petroleum, shipping, building materials, kneaders, slurry pumps, and belt conveyors

12.1 Product Information

12.1.1 Model Number and Nameplate

MD880-01S-0721-7-SG
① ② ③ ④ ⑤

① **Product series** MD880: MD880 AC drive series	③ **Rated current** 721: 721 A	⑤ **Standard accessory** SG: Controller
② **Product type** 01S: single-drive AC drive module	④ **Voltage class** 7: 690 VAC system	

MD880-11S-1370-7-L-B
① ② ③ ④ ⑤ ⑥

① **Product series** MD880: MD880 AC drive series	③ **Rated current** 1370: 1370 A	⑤ **Option** L: Output reactor<1>
② **Product type** 11S: Single drive cabinet	④ **Voltage class** 7: 690 VAC system	⑥ **Option** B: Braking module

Note

- <1>: The output reactor is optional for the S12 AC drive cabinet, while the 2 x S12 AC drive cabinet comes standard with an output reactor.

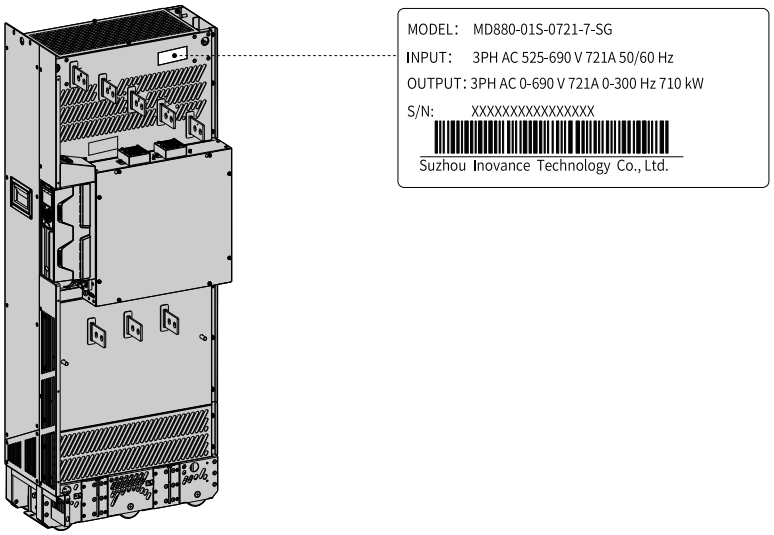


Figure 12-1 Nameplate of the S12 AC drive module

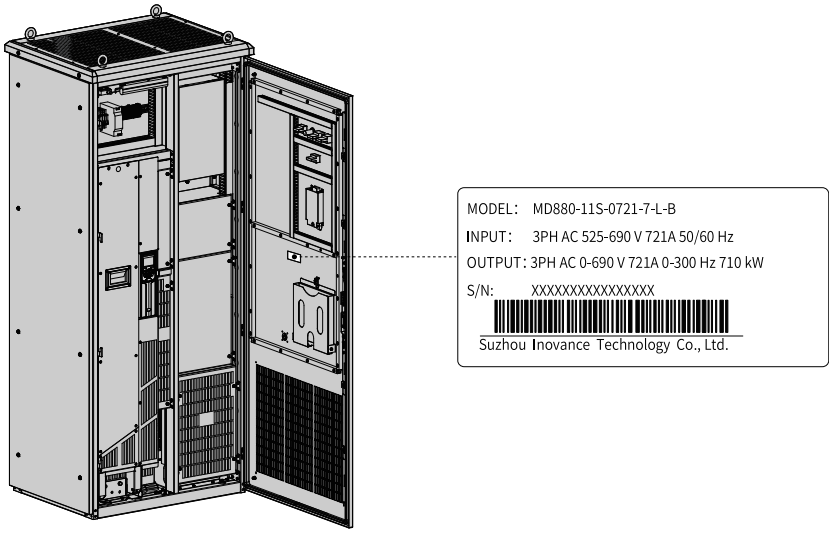


Figure 12-2 Nameplate of the S12 AC drive cabinet

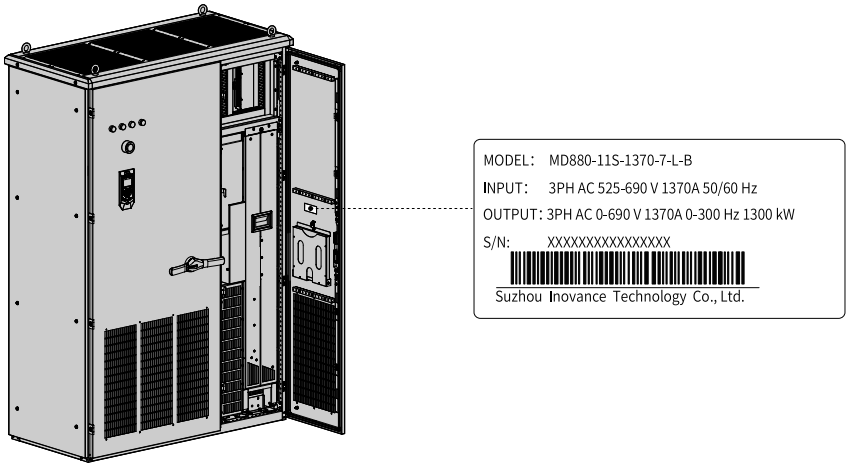


Figure 12-3 Nameplate of the 2 x S12 AC drive cabinet

12.1.2 Components

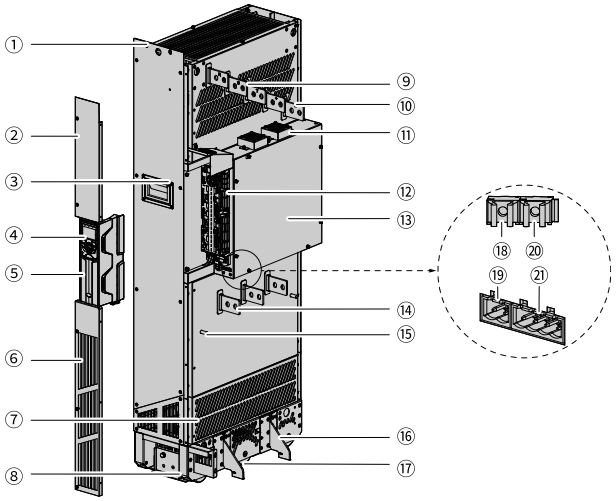


Figure 12-4 Configuration of the S12 AC drive module

No.	Name
①	Top mounting bracket
②	Upper baffle
③	Handle
④	SOP-20-880 smart operating panel kit
⑤	Mask
⑥	Lower baffle
⑦	Air inlet, total area: 1000 cm^2
⑧	Bottom mounting bracket
⑨	AC input copper busbar
⑩	DC bus copper busbar
⑪	Control chamber fan
⑫	HCU control module
⑬	Control chamber
⑭	AC output copper busbar
⑮	PE ground stud
⑯	Anti-toppling bracket
⑰	Caster
⑱	VR optical fiber receive terminal
⑲	24 VDC external power input terminal
⑳	VT optical fiber transmit terminal
㉑	STO terminal

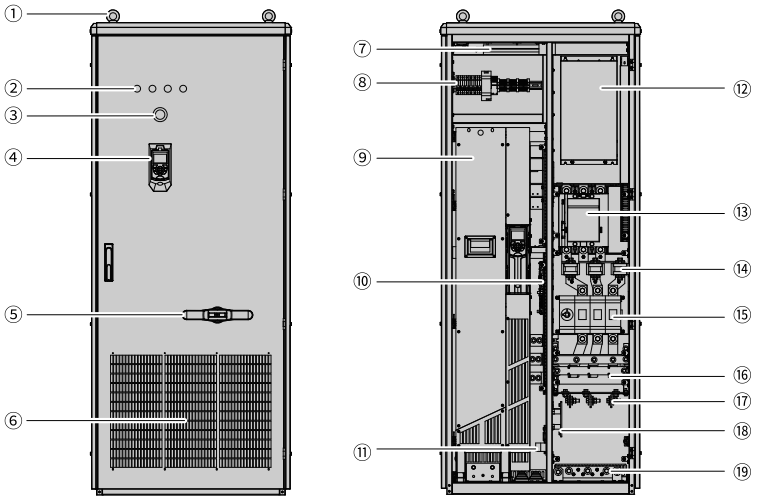


Figure 12-5 Configuration of the S12 AC drive cabinet

No.	Name
①	Eyebolt
②	Switch-on button/indicator, Switch-off button/indicator, fault indicator, and reset button
③	Emergency stop button
④	SOP-20-880 smart operating panel kit
⑤	External operating handle of the disconnector
⑥	Air inlet, total area: 2200 cm^2
⑦	Light
⑧	Control power circuit breaker
⑨	MD880-01S-XXXX-7-SG single-drive AC drive module
⑩	In-cabinet cooling fan power supply
⑪	User terminal
⑫	MD880-61M-0400-7 single-phase braking unit (optional)
⑬	Contactor (optional)
⑭	Three-phase input fuse
⑮	Disconnector
⑯	AC input copper bar
⑰	AC output copper bar
⑱	Braking resistor copper bar (optional)
⑲	Grounding copper busbar

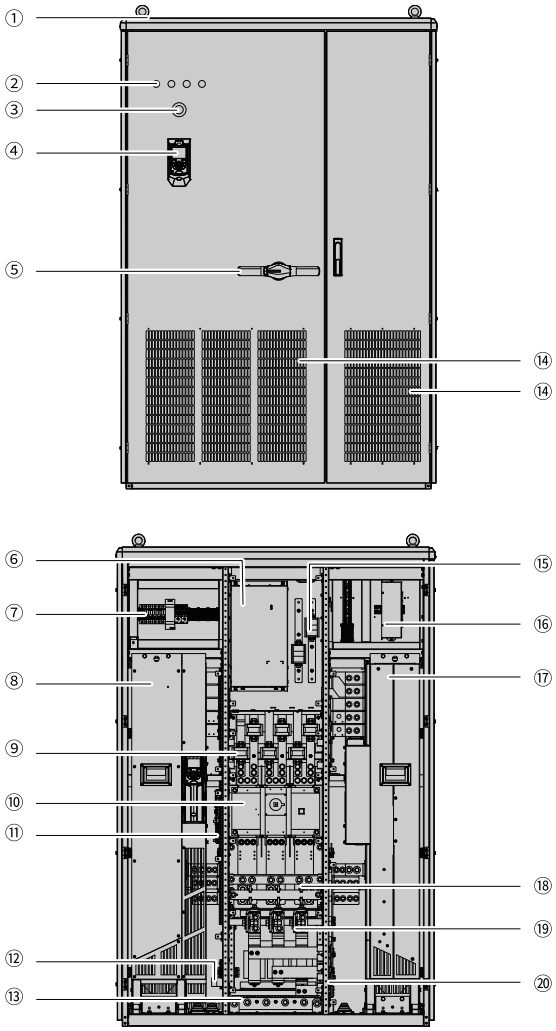


Figure 12-6 Configuration of the 2 x S12 AC drive cabinet

No.	Name
①	Eyebolt
②	Switch-on button/indicator, Switch-off button/indicator, fault indicator, and reset button
③	Emergency stop button
④	SOP-20-880 smart operating panel kit
⑤	External operating handle of the disconnector
⑥	MD880-61M-0400-7 single-phase braking unit (optional)
⑦	Internal terminal block
⑧	MD880-01S-xxxx-7-SG single-drive AC drive module
⑨	Three-phase input fuse
⑩	Disconnector
⑪	In-cabinet cooling fan power supply
⑫	User terminal
⑬	Grounding copper busbar
⑭	Air inlet, total area: 3680 cm^2

No.	Name
⑮	Braking unit DC fuse (optional)
⑯	MD880-HPCU-40 parallel control module
⑰	MD880-01S-XXXX-7-SG single-drive AC drive module (symmetrical installation)
⑱	AC input copper bar
⑲	AC output copper bar
⑳	Braking resistor copper bar (optional)

12.1.3 Product Dimensions

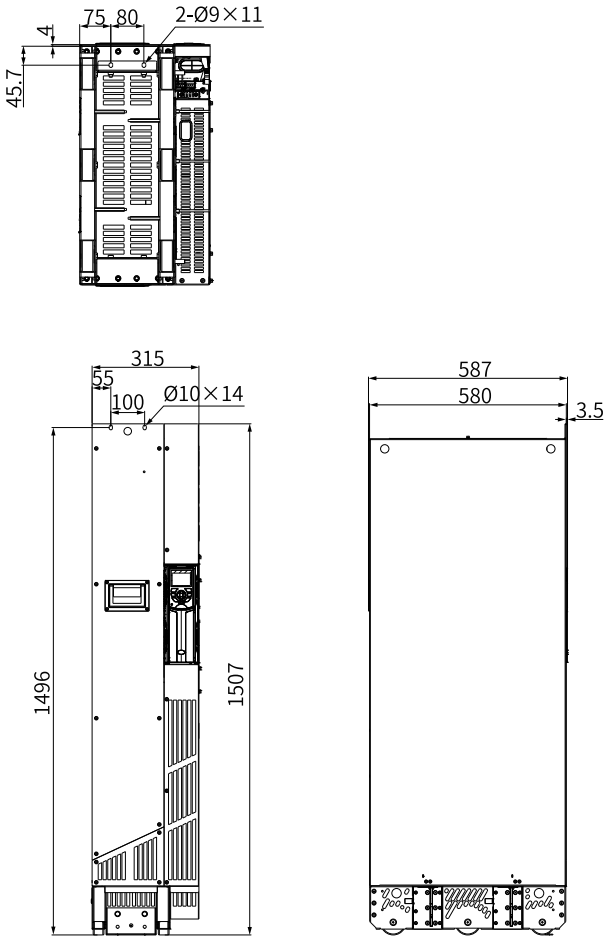


Figure 12-7 Outline dimensions of the S12 AC drive module (unit: mm)

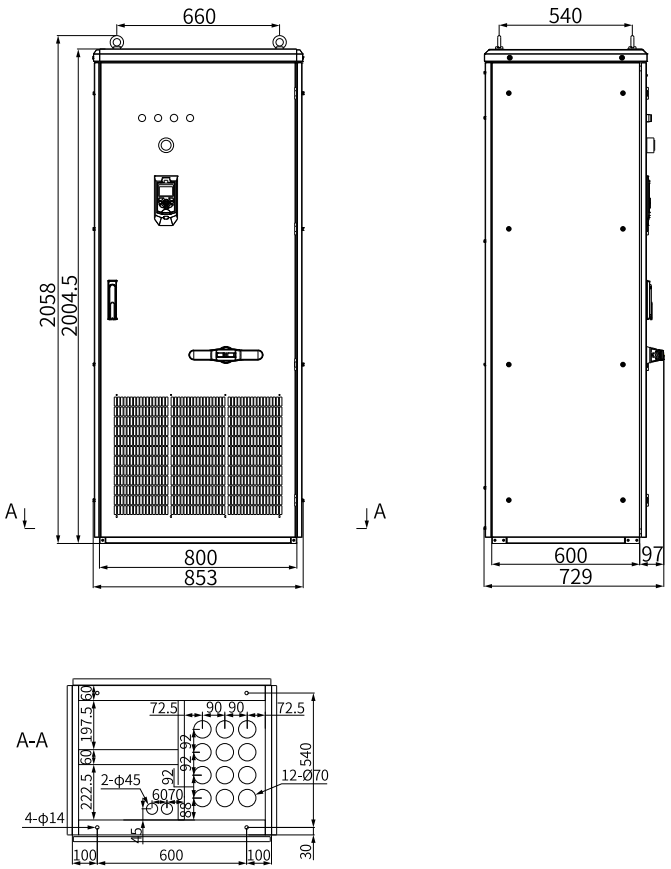


Figure 12-8 Outline dimensions of the S12 AC drive cabinet (unit: mm)

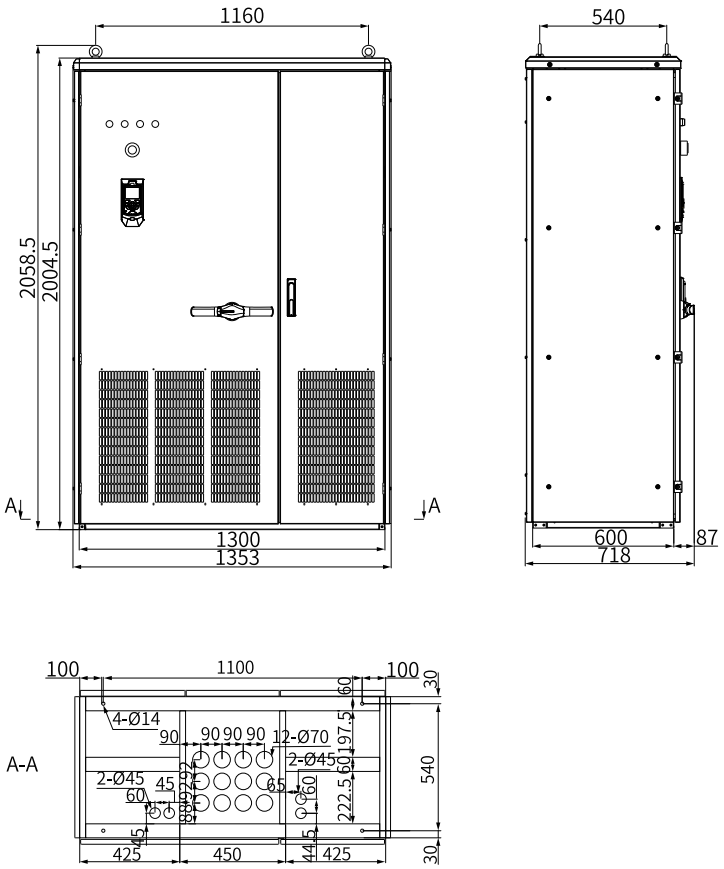


Figure 12-9 Outline dimensions of the 2 x S12 AC drive cabinet (unit: mm)

12.2 Specifications

Table 12–1 Product specifications of the MD880 series 690 VAC high-performance single-drive AC drive

Model	No Overload		Light Overload		Heavy Overload		Loss	Structure
	Current	Power	Current	Power	Current	Power		
	A	kW	A	kW	A	kW	kW	
Rated voltage U_n = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V								
MD880-01S-0340-7-SG	340	315	326	315	255	250	5.35	S12
MD880-01S-0410-7-SG	410	400	394	355	308	315	6.8	
MD880-01S-0530-7-SG	530	500	509	450	398	355	8.5	
MD880-01S-0600-7-SG	600	560	576	560	450	400	9.52	
MD880-01S-0650-7-SG	650	630	624	630	488	450	10.71	
MD880-01S-0721-7-SG	721	710	692	710	541	500	12.07	

Table 12–2 Product specifications of the MD880 series 690 VAC high-performance single-drive AC drive cabinet

Model	No Overload		Light Overload		Heavy Overload		Loss	Structure
	Current	Power	Current	Power	Current	Power		
	A	kW	A	kW	A	kW	kW	
Rated voltage U_n = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V								
MD880-11S-0600-7-SG	600	560	576	560	450	400	11.39	S12
MD880-11S-0650-7-SG	650	630	624	630	488	450	12.62	
MD880-11S-0721-7-SG	721	710	692	710	541	500	14.06	
MD880-11S-1140-7-SG	1140	1100	1094	1050	855	800	21.99	2 x S12
MD880-11S-1235-7-SG	1235	1200	1186	1150	926	900	24.47	
MD880-11S-1370-7-SG	1370	1300	1315	1300	1027	1000	27.29	

12.2.1 Electrical Specifications

Table 12–3 Electrical specifications of the MD880 series 690 VAC single-drive AC drive

Item	Specification
Rated input voltage	525 VAC to 690 VAC, ±10% (−15%, < 1 min)
Input frequency	50 Hz/60 Hz
Output voltage	0 VAC to 690 VAC
Output frequency	0 Hz to 500 Hz

12.2.2 Technical Specifications

Table 12–4 Technical specifications of the MD880 series 690 V single-drive AC drive

Item		Specification
Basic performance	Overload capacity	• Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes • Heavy overload: 150%, 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	690 V system: 1.5 kHz default
	Speed range	V/f control: 1:50
		SVC: 1:200
		FVC: 1:1000
	Speed control accuracy	SVC: ±10% Fsl
		FVC: ±0.01%
	Torque response	SVC: ⩽ 5 ms
		FVC: ⩽ 5 ms
	Torque control accuracy	SVC: ±5% (above 5 Hz)
		FVC: ±3%
	Starting torque	SVC: 0.5 Hz/150%
		FVC: 0 Hz/200%
Mechanical data	Shock and vibration resistance	Class 3M4 in GB/T 4798.3-2007 Displacement of 3 mm at 2 Hz to 9 Hz Acceleration rate of 9.8 m/s^2 at 9 Hz to 200 Hz Shock: 10·g for 11 ms
	Safety performance	EN 61800-5-1
	Cooling method	Forced air cooling (AF) compliant with EN 60146
	Maximum mass	180 kg
Protection functions	Phase loss protection	Input and output phase loss protection
	Overtemperature protection	Triggers protection when the AC drive overheats
	Overload protection	Heavy overload: Stops after 60 seconds of running at 150% of the reference load current for heavy overload Light overload: Stops after 60 seconds of running at 110% of the reference load current for light overload
	Overcurrent protection	Stops when the current exceeds 2.5 times the heavy-load reference current of the AC drive
	Braking protection	It is recommended to use an external braking module.
	Short circuit protection	Protection against output interphase short circuit and output short circuit to ground

Item		Specification
Environment requirements	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate by 1% per 100 m above 1000 m; maximum altitude 4000 m
	Ambient temperature	–10°C to +40°C; derate by 1% per 1°C increase above 40°C; maximum ambient temperature 50°C
	Storage temperature	–40°C to +70°C
	Humidity	< 95% RH, non-condensing
	Pollution degree	PD2
	Power grid system	IT TT/TN (VDR and EMC screws must be installed.)
	Overvoltage category	OVC III
	Protection rating	S12 AC drive module: IP00 S12 or 2 x S12 AC drive cabinet: IP20

12.2.3 Derating Characteristics

Ambient temperature-based derating

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

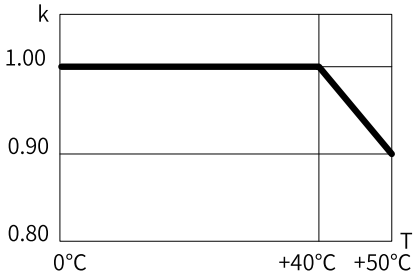


Figure 12-10 Ambient temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the AC drive must be derated by 1% per 100 m increase. Output current = Rated current x Derating coefficient (k).

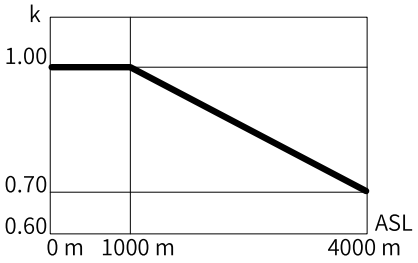


Figure 12-11 Altitude-based derating

Carrier frequency-based derating of the AC drive module

Model	Rated Power	Carrier Frequency (kHz)									
	P (kW)	1.2	1.5	2	2.5	3.2	4	5	6	7	8
MD880-01S-0340-7-SG	315	100%	100%	87%	76%	63%	52%	42%	34%	28%	23%
MD880-01S-0410-7-SG	400	100%	100%	87%	76%	63%	52%	42%	34%	28%	23%
MD880-01S-0530-7-SG	500	100%	100%	87%	76%	63%	52%	42%	34%	28%	23%
MD880-01S-0600-7-SG	560	100%	100%	87%	76%	63%	52%	42%	34%	28%	23%
MD880-01S-0650-7-SG	630	100%	100%	85%	74%	61%	51%	38%	32%	26%	23%
MD880-01S-0721-7-SG	710	100%	100%	85%	72%	60%	47%	38%	29%	24%	19%

Carrier frequency-based derating of the AC drive cabinet

Model	Rated Power	Carrier Frequency (kHz)									
	P (kW)	1.2	1.5	2	2.5	3.2	4	5	6	7	8
MD880-11S-0600-7-SG	560	100%	100%	87%	76%	63%	52%	42%	34%	28%	23%
MD880-11S-0650-7-SG	630	100%	100%	85%	74%	61%	51%	38%	32%	26%	23%
MD880-11S-0721-7-SG	710	100%	100%	85%	72%	60%	47%	38%	29%	24%	19%
MD880-11S-1140-7-SG	1100	100%	100%	87%	76%	63%	52%	42%	34%	28%	23%
MD880-11S-1235-7-SG	1200	100%	100%	85%	74%	61%	51%	38%	32%	26%	23%
MD880-11S-1370-7-SG	1300	100%	100%	85%	72%	60%	47%	38%	29%	24%	19%

Note

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

12.2.4 Overload Characteristics

When the MD880 series 690 VAC single-drive AC drive 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.

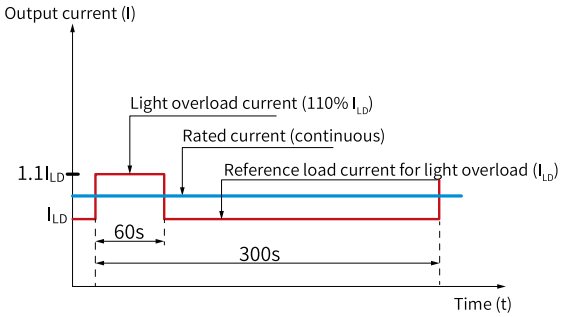


Figure 12-12 Curve of light overload mode

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.

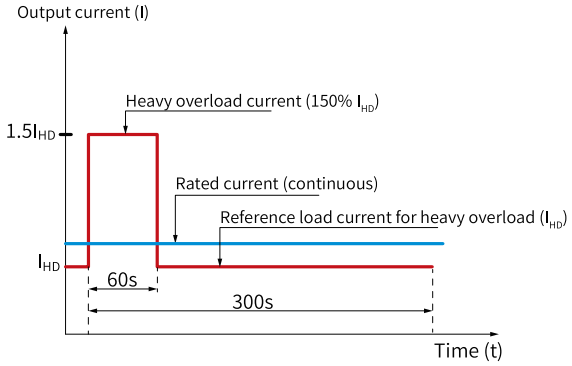


Figure 12-13 Curve of heavy overload mode

13 Water-Cooled Single-Drive Product

The MD880 series 690 VAC water-cooled single-drive AC drive is a low-voltage, high-performance AC drive designed for controlling AC asynchronous induction motors and permanent magnet synchronous motors. It features high power density, compact design, and high reliability. The drive supports V/f control, sensorless vector control (SVC), and vector control with an encoder (FVC). It is suitable for applications such as cutterhead drives, slurry pumps, discharge pumps, offshore drilling platforms, main and auxiliary motors for marine electric propulsion systems, and installation vessels.

13.1 Product Information

13.1.1 Model Number and Nameplate

MD880LC-01S-0530-7
① ② ③ ④

① **Product series** MD880LC: MD880LC water-cooled AC drive series	③ **Rated current** 0530: 530 A
② **Product type** 01S: single-drive AC drive module	④ **Voltage class** 7: 690 VAC system

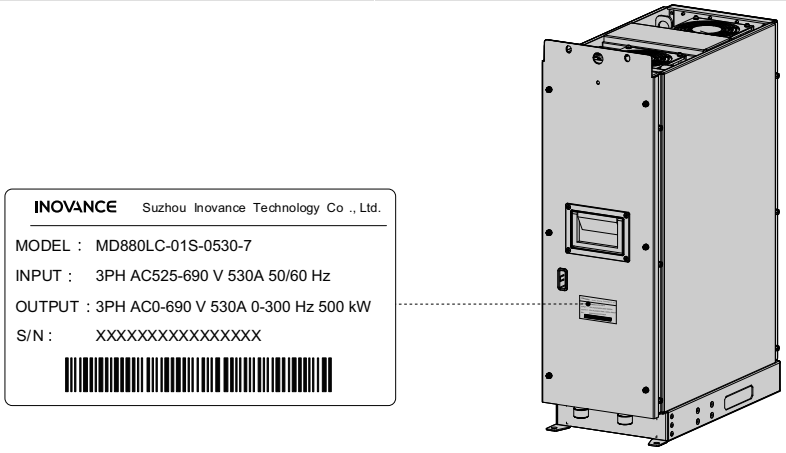


Figure 13-1 Nameplate of the MD880 series 690 VAC single-drive AC drive

13.1.2 Components

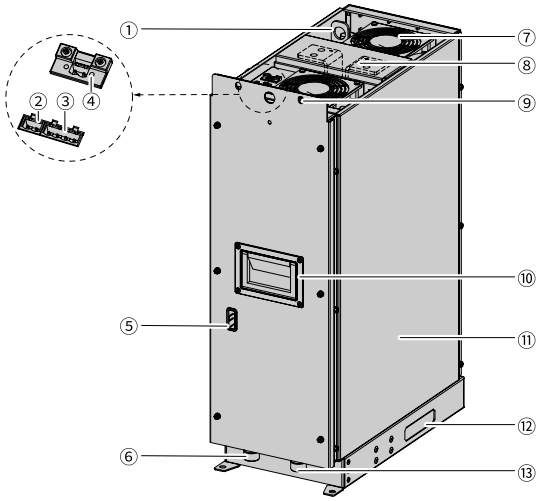


Figure 13-2 Component diagram 1 of the MD880 series 690 VAC water-cooled single-drive AC drive

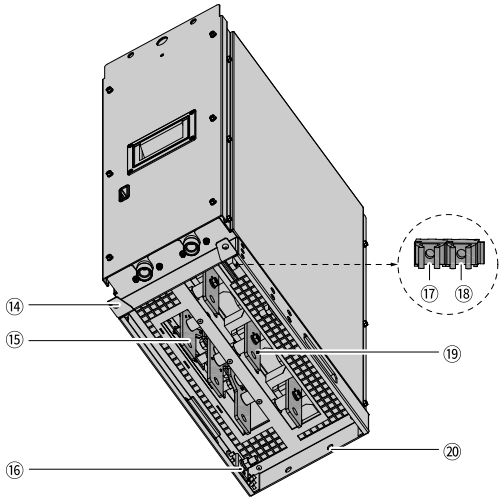


Figure 13-3 Component diagram 2 of the MD880 series 690 VAC water-cooled single-drive AC drive

No.	Name
①	Eyebolt
②	24 VDC external power input terminal
③	STO terminal
④	HCU redundant power supply (24 VDC output)
⑤	Grounding terminal of lightning protection board
⑥	Coolant inlet joint, M26 x 1.5 metric external thread, 24° inner cone
⑦	Auxiliary cooling fan
⑧	Copper busbar (+) and (–)
⑨	Top fixing hole
⑩	Front handle
⑪	Side plate (control chamber inside)
⑫	Bottom handle

No.	Name
⑬	Coolant outlet joint, M26 x 1.5 metric external thread, 24° inner cone
⑭	Bottom fixing hole
⑮	AC input copper busbar terminals (R/S/T)
⑯	PE (grounding) terminal
⑰	VR optical fiber receive terminal
⑱	VT optical fiber transmit terminal
⑲	AC output copper busbar terminals (U/V/W)
⑳	Rear fixing hole (optional)

13.1.3 Product Dimensions

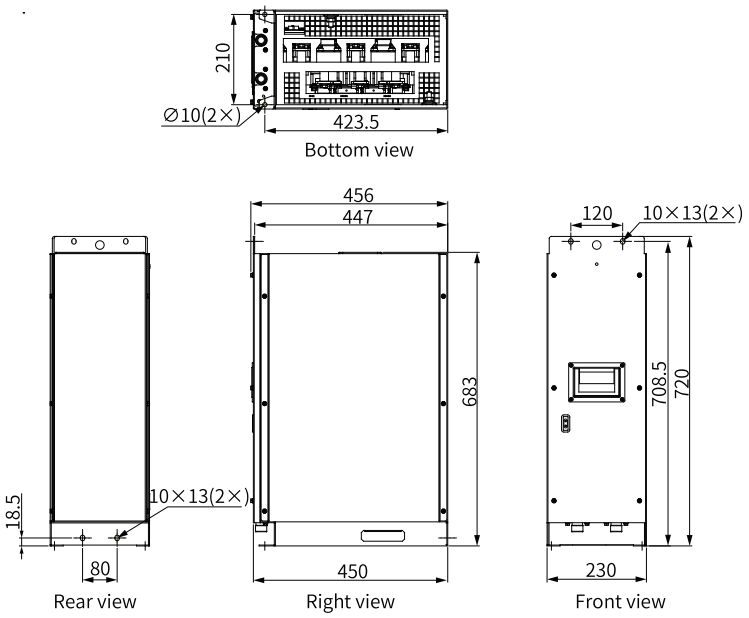


Figure 13-4 Dimensions of the MD880 series 690 VAC water-cooled single-drive AC drive (unit: mm)

13.2 Specifications

Table 13–1 Product specifications

Model	Structure	No Overload		Light Overload		Heavy Overload		Power Loss c/a/T<1> (kW)	Air Volume (CFM)	Net Mass (kg)	Outline Dimensions (W x H x D) (mm)
		Current (A)	Power (kW)	Current (A)	Power (kW)	Current (A)	Power (kW)				
UN: Three-phase 690 VAC (range: 525 VAC to 690 VAC)											
MD880LC-01S-0530-7	H7w	530	500	509	500	424	400	9.0/0.5/9.5	360	55	230 x 720 x 456

Note

- <1>: "c" indicates the power loss dissipated in the coolant; "a" indicates the power loss dissipated in air; "T" indicates the total power loss excluding the power loss of the input reactor.

13.2.1 Electrical Specifications

Table 13–2 Electrical specifications of the MD880 series 690 VAC water-cooled single-drive AC drive

Item	Specification
Rated input voltage	525 VAC to 690 VAC, ±10% (−15%, < 1 min)
Input frequency	50 Hz/60 Hz
Output voltage	0 VAC to 690 VAC
Output frequency	0 Hz to 500 Hz

13.2.2 Technical Specifications

Table 13–3 Technical specifications of the MD880 series 690 VAC water-cooled single-drive AC drive

Item		Specification
Basic performance	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	Voltage/frequency (V/f) control Sensorless vector control (SVC) Feedback vector control (FVC)
	Carrier frequency	2.5 kHz default
	Speed range	V/f control: 1:50
		SVC: 1:200
		FVC: 1:1000
	Speed control accuracy	SVC: ±10% Fsl
		FVC: ±0.01%
	Torque response	SVC: ⩽ 5 ms
		FVC: ⩽ 5 ms
	Torque control accuracy	FVC: ±3% SVC: ±5% (above 5 Hz)
	Starting torque	SVC: 0.5 Hz/150%
		FVC: 0 Hz/200%

Item		Specification
Mechanical data	Shock and vibration resistance	Compliant with GB/T4798.3–Mechanical conditions Amplitude of 3 mm at 2 Hz to 9 Hz Acceleration rate of 9.8 m/s^2 (1 · g) at 9 Hz to 200 Hz Shock: 10 · g for 11 ms
	Safety performance	EN 61800-5-1
	Maximum mass	55 kg
Protection functions	Phase loss protection	Input and output phase loss protection
	Overtemperature protection	Triggers protection when the AC drive overheats
	Overload protection	• Stops after 60 seconds of running at 150% of the reference load current for heavy overload • Stops after 60 seconds of running at 110% of the reference load current for light overload
	Overcurrent protection	Stops when the current exceeds 2.5 times the heavy-load reference current of the AC drive
	Short circuit protection	Protection against output interphase short circuit and output short circuit to ground
Water cooling system	Coolant composition	Purified water or mixture of purified water with ethylene glycol and corrosion inhibitor. For use in ambient temperature below 5°C, antifreeze must be added.
	Maximum pressure	6 bar
	Flow rate requirement	• 100% water: ⩾ 16 L/min • 80% water and 20% ethylene glycol: ⩾ 18 L/min • 60% water and 40% ethylene glycol: ⩾ 21 L/min
Environment requirements	Cooling method	Water cooling
	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate by 1% per 100 m above 1000 m; maximum altitude 4000 m Isolation transformer required above 2000 m
	Ambient temperature	0°C to 60°C; derate by 1% per 1°C increase above 50°C; maximum ambient temperature 60°C
	Cooling water temperature	0°C to 40°C; derate by 2% per 1°C increase above 40°C; maximum cooling water temperature 50°C
	Storage temperature	–40°C to +70°C (recommended to drain the cooling water during storage)
	Storage humidity	< 95% RH, non-condensing
	Pollution degree	PD2
	Power grid system	IT
	Overvoltage category	OVC III
	Protection rating	IP00

Item		Specification
Water quality requirements	Water	Purified water (optional deionized water)+corrosion inhibitor+antifreeze
	pH value	6 to 8
	Hardness	< 10 dH
	Conductivity	< 300 μs/cm
	Chloride	< 50 mg/L
	Fluoride	< 50 mg/L
	Sulfate	< 100 mg/L
	TDS	< 200 mg/L
	Corrosion inhibitor	0.5% Cortec VCI-649 (replaced every two years)

Note

Water quality is critical for normal operation of equipment.

13.2.3 Derating Characteristics

Ambient temperature-based derating

When the temperature is 50°C to 60°C, the rated output current must be derated by 1% per 1°C increase. Output current = Rated current x Derating coefficient (k).

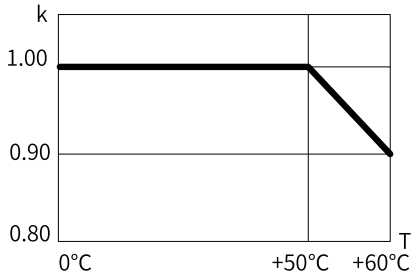


Figure 13-5 Ambient temperature-based derating of the MD880 series 690 VAC water-cooled single-drive AC drive

Coolant temperature-based derating

When the temperature is 40°C to 50°C, the rated output current must be derated by 2% per 1°C increase. Output current = Rated current x Derating coefficient (k).

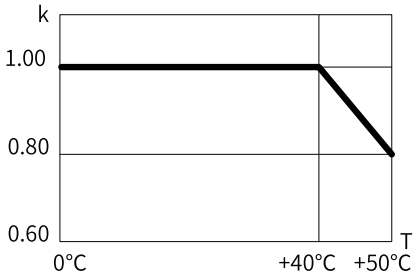


Figure 13-6 Coolant temperature-based derating of the MD880 series 690 VAC water-cooled single-drive AC drive

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the AC drive module must be derated by 1% per 100 m increase.

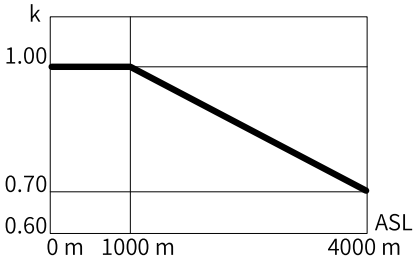


Figure 13-7 Altitude-based derating of the MD880 series 690 VAC water-cooled single-drive AC drive

Carrier frequency-based derating

Table 13–4 Carrier frequency-based derating of the AC drive module

Model	Rated Power	Carrier Frequency (kHz)						
	P (kW)	2.5	3.2	4	5	6	7	8
MD880LC-01S-0530-7	500	1	0.87	0.75	0.62	0.53	0.46	0.4

Note

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

13.2.4 Overload Characteristics

When the MD880 series 690 VAC water-cooled single-drive AC drive 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.

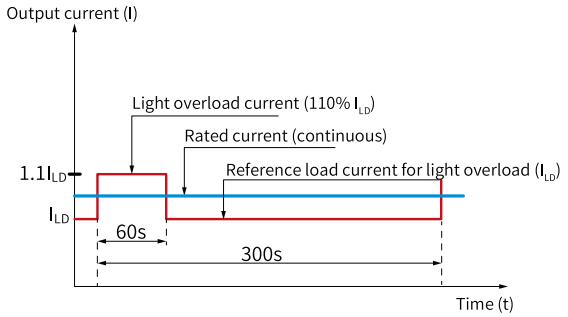


Figure 13-8 Curve of light overload mode

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.

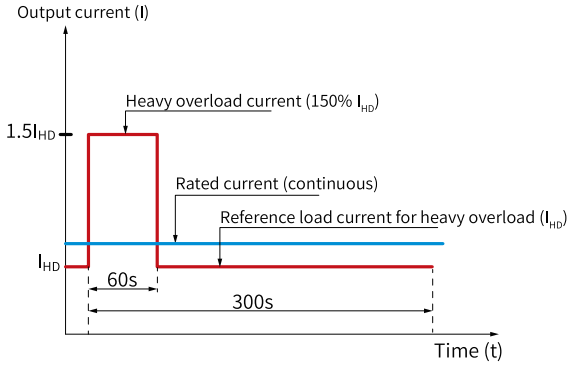


Figure 13-9 Curve of heavy overload mode

14 Water-Cooled Basic Rectifier Module

- The MD880LC-20 series is a low-voltage, water-cooled basic rectifier product characterized by high power density, compact design, and high reliability.
- The MD880LC-20 series includes two types of rectifier products: diode rectifiers and thyristor rectifiers. The primary difference is that the thyristor rectifiers have power-on pre-charge capability, eliminating the need for a separate pre-charge circuit in applications, simplifying system integration. The water-cooled thyristor rectifiers are available in the 690 V voltage class, with a single-unit no-overload rated power of 1689 kW. They support parallel connection of up to four modules, achieving a rated output power of 6285 kW, capable of supplying the required power for one or more inverter modules. The water-cooled diode rectifiers support 6-pulse or 12-pulse input and are available the 690 V voltage class, with a single-unit rated power of 2273 kW. They support parallel connection of up to two modules, achieving a rated output power of 4229 kW, capable of supplying the required power for one or more inverter modules.
- The product is widely applicable across industries, including shield tunneling, petroleum, and shipping.

14.1 Product Information

14.1.1 Model Number and Nameplate

Diode rectifier module

MD880LC-20M-2000-7
① ② ③ ④

①	**Product series** MD880LC: MD880 water-cooled AC drive series	③	**Rated current** 2000: 2000 A
②	**Product type** 20M: Basic rectifier module	④	**Voltage class** 7: 690 VAC

Note

③: The "rated current" code indicates only one current rating.

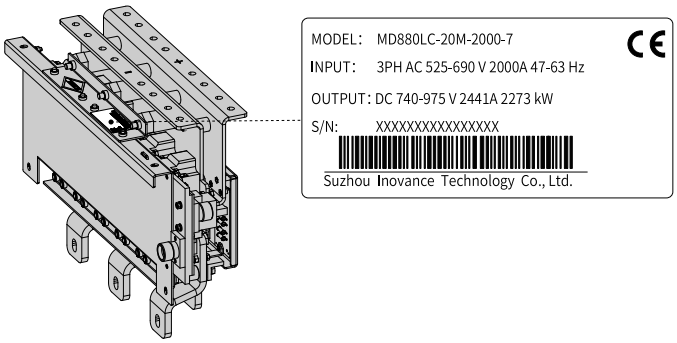


Figure 14-1 Nameplate of the diode rectifier module

Thyristor rectifier module

MD880LC ① - 20M ② - 1520 ③ - 7 ④ + SCR ⑤

① **Product series** MD880LC: MD880 water-cooled AC drive series	④ **Voltage class** 7: 690 VAC
② **Product type** 20M: Basic rectifier module	⑤ **Rectifier type** SCR: Thyristor rectifier
③ **Rated current** 1520: 1520 A	-

Note

③: The "rated current" code indicates only one current rating.

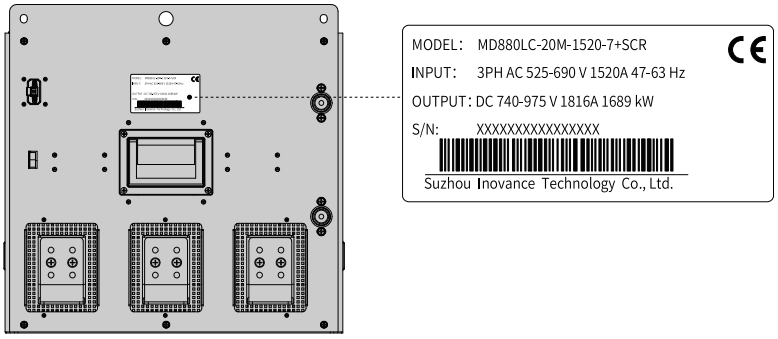


Figure 14-2 Nameplate of the thyristor rectifier module

14.1.2 Components

Components of the diode rectifier module

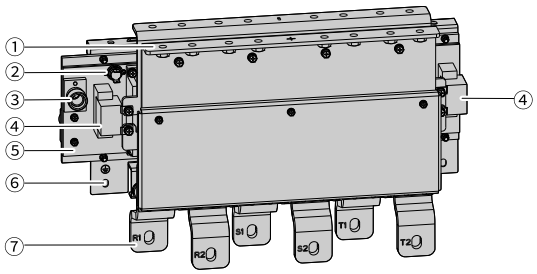


Figure 14-3 Configuration diagram 1 of the diode rectifier module

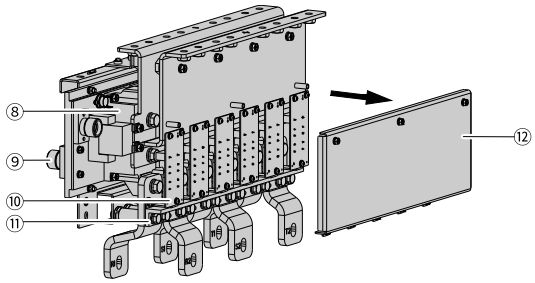


Figure 14-4 Configuration diagram 2 of the diode rectifier module

No.	Name	Description
①	DC bus terminal	-
②	Temperature switch	-
③	Coolant outlet joint	M26 x 1.5 metric external thread, 24° inner cone
④	Snubber capacitor	-
⑤	Heatsink	-
⑥	Sheet metal bed plate	-
⑦	Three-phase power input terminal	-
⑧	Diode	-
⑨	Coolant inlet joint	M26 x 1.5 metric external thread, 24° inner cone
⑩	RC absorption board	-
⑪	Insulation support	-
⑫	PC plate	-

Components of the thyristor rectifier module

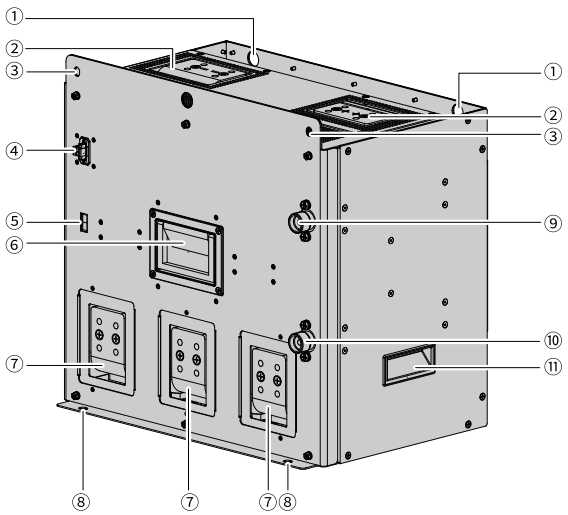


Figure 14-5 Configuration diagram of the thyristor rectifier module

No.	Name	Description
①	Rear auxiliary positioning hole	-
②	DC output port (–/+)	Provided on the top of the module
③	Top fixing hole	-
④	24 VDC external power input port	-

No.	Name	Description
⑤	Optical fiber port (VR optical fiber receive terminal and VT optical fiber transmit terminal)	-
⑥	Front handle	Used to push or pull the module from the front
⑦	AC input port (R/S/T)	-
⑧	Bottom fixing hole	-
⑨	Coolant outlet joint	M26 x 1.5 metric external thread, 24° inner cone
⑩	Coolant inlet joint	M26 x 1.5 metric external thread, 24° inner cone
⑪	Side gripper	-

Note

During commissioning, the thyristor rectifier module control system can be powered by the external 24 VDC/2 A power supply. After the mains power is connected, the basic rectifier module is powered by the internal auxiliary power supply, and the external 24 V power supply provides redundancy.

14.1.3 Product Dimensions

Dimensions of the diode rectifier module

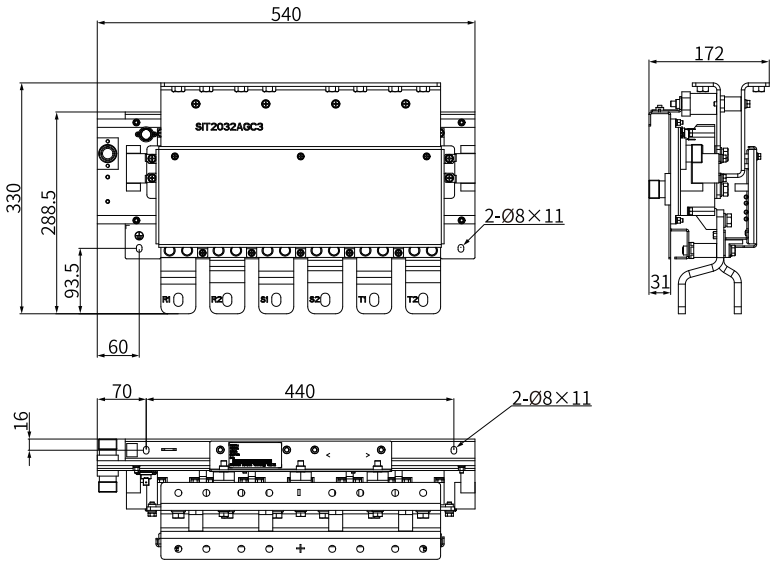


Figure 14-6 Dimensions of the diode rectifier module (mm)

Dimensions of the thyristor rectifier module

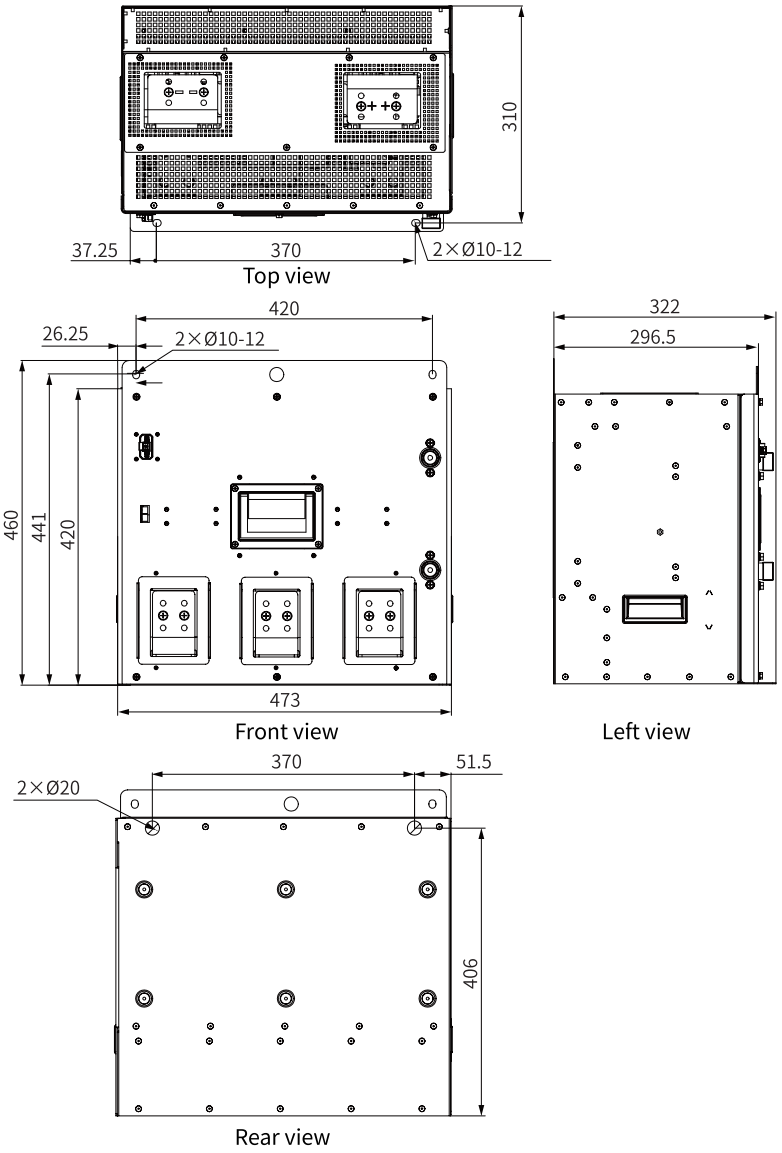


Figure 14-7 Dimensions of the thyristor rectifier module (mm)

14.2 Specifications

Product specifications of the diode rectifier module

Table 14–1 Product specifications of the diode rectifier module

Model MD880LC-20M-	No Overload				Light Overload		Heavy Overload		Rated Power	Structure
	Rated Input Current	Rated Output Current	Apparent Power	Rated Output Power	Output Current	Output Power	Output Current	Output Power		
	I_{AC}	I_{DC}	S_N	P_N	I_{LD}	P_{LD}	I_{HD}	P_{HD}		
	A (AC)	A (DC)	kVA	kW (DC)	A (DC)	kW (DC)	A (DC)	kW (DC)	(kW)	
Rated voltage U_n = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V										
2000-7	2000	2441	2390	2273	2343	2182	1952	1819	11	D3D
3720-7	3720	4540	4446	4229	4358	4059	3632	3383	21	2 x D3D

Product specifications of the thyristor rectifier module

Table 14–2 Product specifications of the thyristor rectifier module

Model MD880LC-20M-	No Overload				Light Overload		Heavy Overload		Rated Power	Structure
	Rated Input Current	Rated Output Current	Apparent Power	Rated Output Power	Output Current	Output Power	Output Current	Output Power		
	I_{AC}	I_{DC}	S_N	P_N	I_{LD}	P_{LD}	I_{HD}	P_{HD}		
	A (AC)	A (DC)	kVA	kW (DC)	A (DC)	kW (DC)	A (DC)	kW (DC)	(kW)	
Rated voltage U_n = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V										
1520-7+SCR	1520	1813	1776	1689	1741	1622	1360	1267	8.5	D3T
2827-7+SCR	2827	3373	3304	3142	3238	3017	2530	2357	16	2 x D3T
4241-7+SCR	4241	5060	4956	4713	4858	4525	3795	3535	24	3 x D3T
5654-7+SCR	5654	6747	6608	6285	6477	6033	5060	4713	32	4 x D3T

Definitions:

Ratings for no-overload applications:

- I_{AC}: Continuous RMS AC input current, with no overload capability when the coolant temperature is 40°C (104°F) and air temperature is 45°C (113°F).
- I_{DC}: Continuous RMS DC output current, with no overload capability when the coolant temperature is 40°C (104°F) and air temperature is 45°C (113°F).
- S_N: Rated apparent (AC) power.
- P_N: Rated output (DC) power.

Ratings for light-overload applications (10% overload):

- I_{LD}: Reference load current. A 10% overload is allowed for 1 minute every 5 minutes.
- P_{LD}: Reference load power.

Ratings for heavy-overload applications (50% overload):

- I_{HD}: Reference load current. A 50% overload is allowed for 1 minute every 5 minutes.

- P_{HD}: Reference load power.

14.2.1 Electrical Specifications

Table 14–3 Electrical specifications of the water-cooled basic rectifier module

Item	Specification
AC input voltage	690 V system: 525 VAC to 690 VAC, ±10% (−15%, < 1 min)
Rated power	Diode rectifier module: 2273 kW, 4229 kW
	Thyristor rectifier module: 1689 kW, 3142 kW, 4713 kW, 6285 kW
Input frequency	47 Hz to 63 Hz (50 Hz/60 Hz±10% required for shipping industry, grid-side protection to be covered)
Unbalance degree	Maximum: ±3% of rated line voltage
Output voltage	690 V system: 740 VDC to 975 VDC

14.2.2 Technical Specifications

Table 14–4 Technical specifications of the water-cooled basic rectifier module

Item		Specification
Basic performance	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	> 99.5% (rated working condition)
	Power factor	> 0.93
	Total harmonic distortion (THD)	THD (I) < 30% to 45% (with a 3% voltage drop AC input reactor)
	Noise	< 70 dB (measured 1 m outside the cabinet under rated load)
Water cooling system	Coolant composition	Purified water or mixture of purified water with ethylene glycol and corrosion inhibitor. For use in ambient temperature below 5°C, antifreeze must be added.
	Maximum pressure	6 bar
	Flow rate requirement	• 100% water: ⩾ 16 L/min • 80% water and 20% ethylene glycol: ⩾ 18 L/min • 60% water and 40% ethylene glycol: ⩾ 21 L/min
Mechanical data	Protection rating	IP00 (module)
	Safety performance	EN 61800-5-1
	Vibration	Usage/Transportation scenario: Tested according to IEC 60068-2-6; amplitude of 3.5 mm at 5 Hz to 8.4 Hz; acceleration rate of 1·g at 8.4 Hz to 200 Hz; 10 cycles/axis direction
	Shock	Usage/Transportation scenario: Tested according to IEC 60068-2-27; acceleration rate of 10·g, pulse width of 11 ms, 18 times across three axes
	Maximum mass	Diode rectifier module: 26.5 kg, 53 kg
		Thyristor rectifier module: 60 kg, 120 kg, 180 kg, 240 kg
	Dimensions (W x H x D)	Diode rectifier module: 540 mm x 330 mm x 172 mm, (2 x) 540 mm x 330 mm x 172 mm
		Thyristor rectifier module: 473 mm x 460 mm x 322 mm, (2 x) 473 mm x 460 mm x 322 mm, (3 x) 473 mm x 460 mm x 322 mm, (4 x) 473 mm x 460 mm x 322 mm

Item		Specification
Protection functions	Fault protection	• Diode: Overtemperature alarm • Thyristor: Overcurrent, overvoltage, undervoltage, phase loss, three-phase imbalance, and overtemperature
Environment requirements	Cooling method	Water cooling
	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate above 1000 m; input isolation transformer required above 2000 m; maximum altitude 4000 m
	Ambient temperature	0°C to 55°C (derate above 45°C)
	Coolant temperature	0°C to 50°C (derate above 40°C)
	Storage temperature	–40°C to +70°C. Drain the coolant from the module when stored below 0°C.
	Storage humidity	5% to 95% RH, non-condensing
	Transportation humidity	< 95% RH at 40°C
	Pollution degree	PD2
	Power grid system	IT TT/TN (VDR and EMC screws must be installed when Inovance lightning protection board is used.)
	Overvoltage category	OVC III
Water quality requirements	pH value	6 to 8
	Hardness	< 10 dH
	Conductivity	< 300 μs/cm
	Chloride	< 50 mg/L
	Fluoride	< 50 mg/L
	Sulfate	< 100 mg/L
	TDS	< 200 mg/L
	Corrosion inhibitor	0.5% Cortec VCI-649 (replaced every two years)
	Maximum particle size	300 μm

Note

Water quality is critical for normal operation of equipment.

14.2.3 Derating Characteristics

Ambient temperature-based derating

When the temperature is 45°C to 55°C, the output current of the water-cooled basic rectifier module must be derated by 0.5% per 1°C increase. Output current = Rated current x Derating coefficient (k).

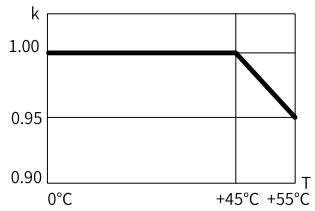


Figure 14-8 Ambient temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the water-cooled basic rectifier module must be derated by 1% per 100 m increase. Output current = Rated current x Derating coefficient (k).

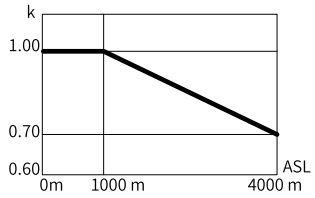


Figure 14-9 Altitude-based derating

Coolant temperature-based derating

When the temperature is 40°C to 50°C, the output current of the water-cooled basic rectifier module must be derated by 2% per 1°C increase. Output current = Rated current x Derating coefficient (k).

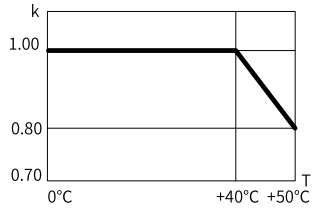


Figure 14-10 Coolant temperature-based derating

14.2.4 Overload Characteristics

When the MD880LC-20 series basic rectifier 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.

The following sections describe two typical overload conditions. Other conditions should conform to the overload curve.

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.

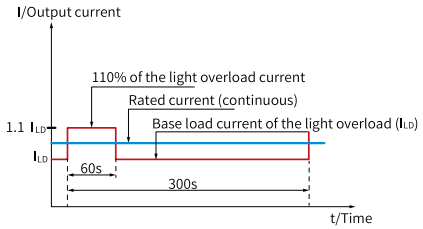


Figure 14-11 Curve of light overload mode

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.

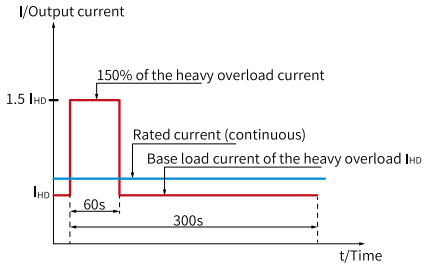


Figure 14-12 Curve of heavy overload mode

15 Water-Cooled Active Rectifier Module

The MD880LC-40M series 690 VAC high-performance water-cooled active rectifier module provides a rated power of 627 kW to 820 kW. This product must be used with the filter module.

- Rated voltage class: 690 VAC
- Rated power range: 627 kW to 1843 kW
- Fast dynamic response and high control accuracy
- Flexible modular structure for easy cabinet assembly
- High power density, easy installation, and easy maintenance
- Low noise
- Applicable in industries with strong water-cooling demands, such as shield tunneling and shipping

15.1 Product Information

15.1.1 Model Number and Nameplate

MD880LC-40M-0650-7
① ② ③ ④

①	**Product series** MD880LC: MD880 water-cooled engineering AC drive series	③	**Rated current** 0650: 650 A
②	**Product type** 40M: Active rectifier module	④	**Voltage class** 7: 690 VAC

Note

- In ③, only one current class is listed.
- This product must be used with the filter module.
- The active rectifier module and active rectifier filter module can be compatible with the PCS.

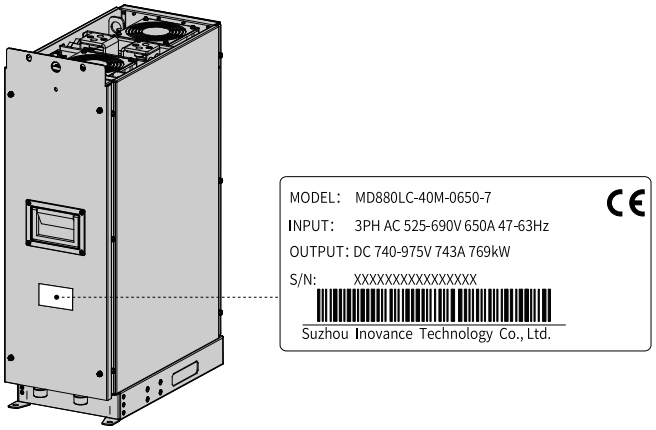


Figure 15-1 Nameplate of the H7w active rectifier module

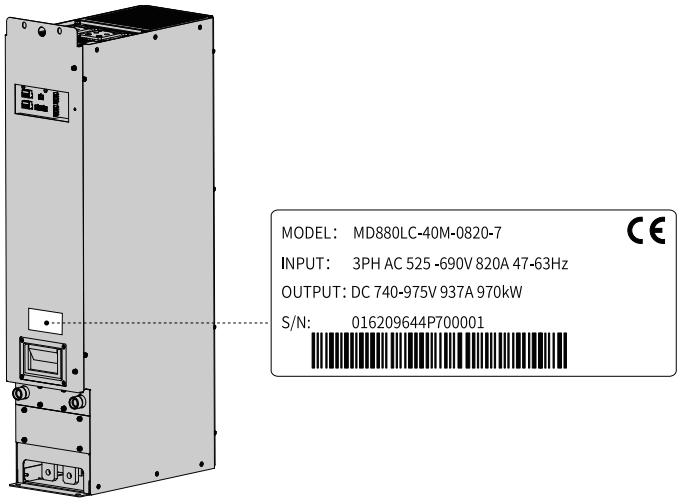


Figure 15-2 Nameplate of the H8w active rectifier module

15.1.2 Components

Components of the active rectifier module

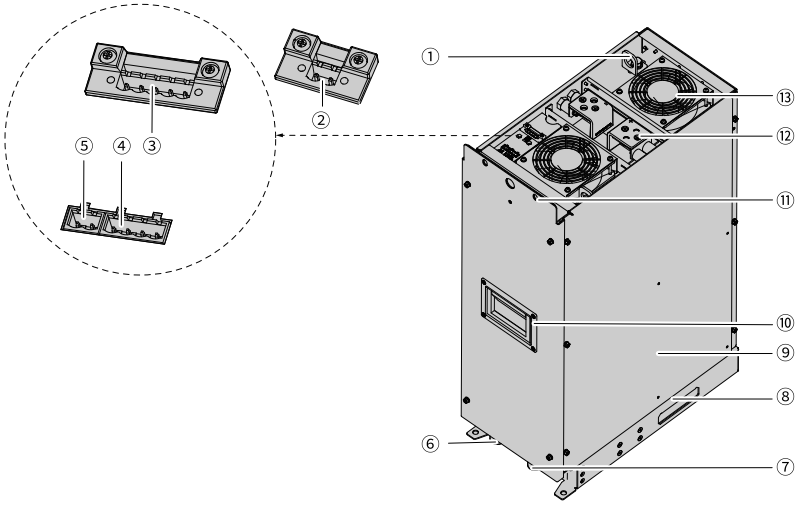


Figure 15-3 Component diagram 1 of the H7w active rectifier module

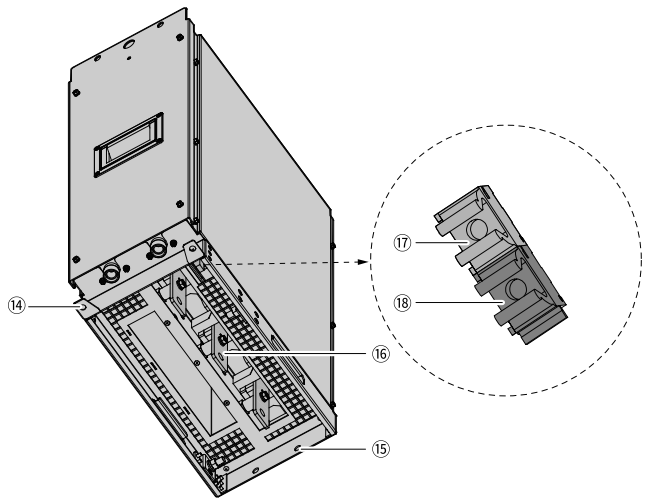


Figure 15-4 Component diagram 2 of the H7w active rectifier module

No.	Name	Description
①	Eyebolt	-
②	HCU redundant power output terminal<1>	-
③	DC pre-charge control terminal (KINOUT)<2>	-
④	STO terminal	-
⑤	24 VDC external power input terminal<3>	-
⑥	Coolant inlet joint, M26 x 1.5 metric external thread, 24° inner cone	-
⑦	Coolant outlet joint, M26 x 1.5 metric external thread, 24° inner cone	-
⑧	Bottom handle	-
⑨	Side plate	The control chamber is located inside the closure plate on the right side of the module.
⑩	Front handle	Used to push or pull the module from the front
⑪	Top fixing hole	-
⑫	DC bus terminal	Located on the upper part of the module
⑬	Auxiliary fan	-
⑭	Bottom fixing hole	-
⑮	Rear fixing hole (optional)	-
⑯	AC input terminal (U/V/W)	Located at the bottom of the module
⑰	VR optical fiber receive terminal	-
⑱	VT optical fiber transmit terminal	-

Note

- <1>: The earlier version of the H7w module is provided with a 2-pin HCU redundant power output terminal.
- <2>: The new version of the H7w module is provided with a 5-pin DC pre-charge control terminal.
- <3>: During commissioning, the active rectifier module control system can be powered by the external 24 VDC/2 A power supply. After the mains power is connected, the active rectifier module is powered by the internal auxiliary power supply, and the external 24 V power supply provides redundancy.

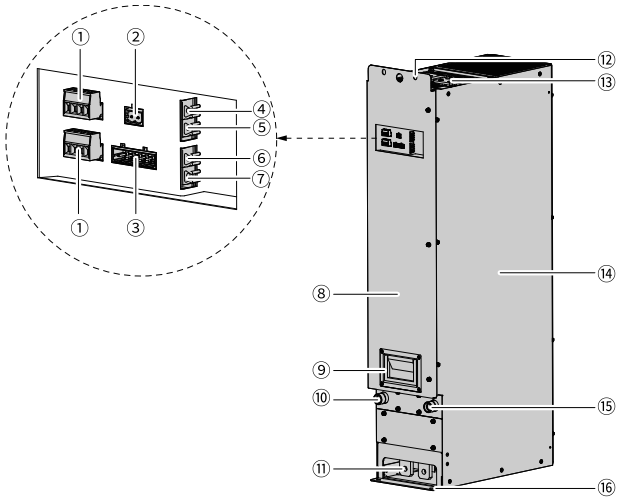


Figure 15-5 Configuration diagram 1 of the H8w active rectifier module

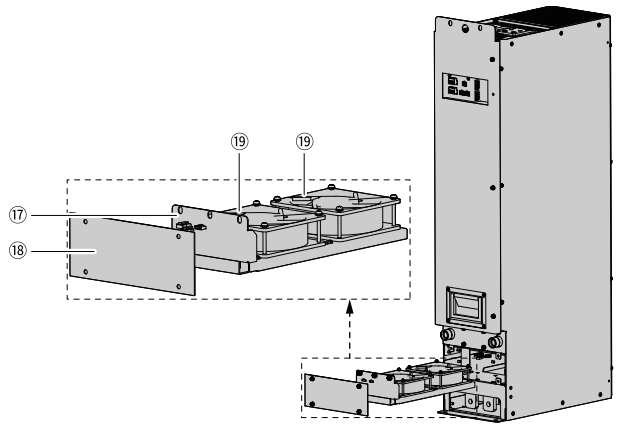


Figure 15-6 Configuration diagram 2 of the H8w active rectifier module

No.	Name
①	STO terminal
②	24 VDC external power input terminal
③	DC pre-charge control terminal (KINOUT)
④	CBC-VT
⑤	CBC-VR
⑥	Drive communication optical fiber transmit terminal (VT)
⑦	Drive communication optical fiber receive terminal (VR)
⑧	Front panel (control chamber inside)
⑨	Handle
⑩	Coolant inlet joint, M26 x 1.5 metric external thread, 24° inner cone
⑪	AC input terminal (U/V/W)
⑫	Top fixing hole
⑬	DC output terminal (-/+)
⑭	Side plate
⑮	Coolant outlet joint, M26 x 1.5 metric external thread, 24° inner cone
⑯	Bottom fixing hole
⑰	Sheet metal of the fan module

No.	Name
⑱	Fan cover
⑲	Fan

15.1.3 Product Dimensions

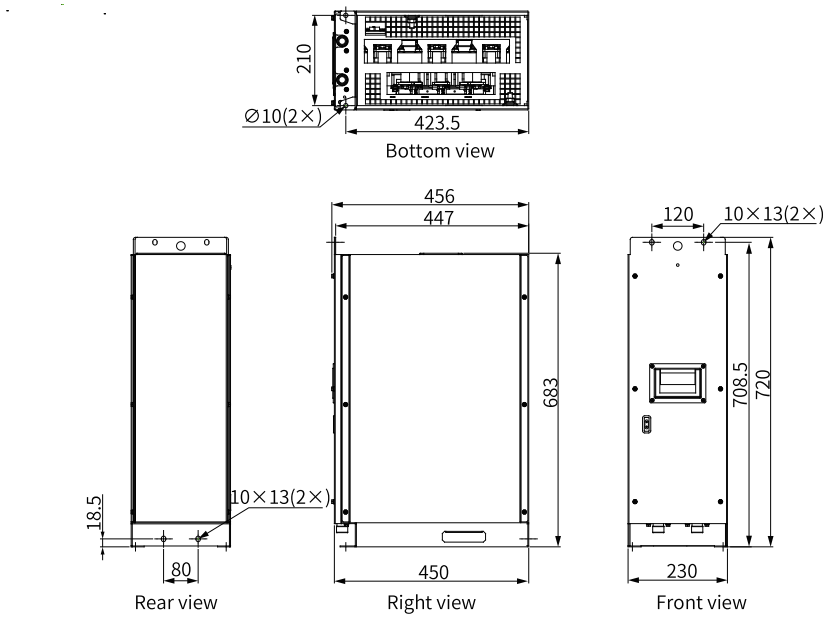


Figure 15-7 Outline dimensions of the H7w module (mm)

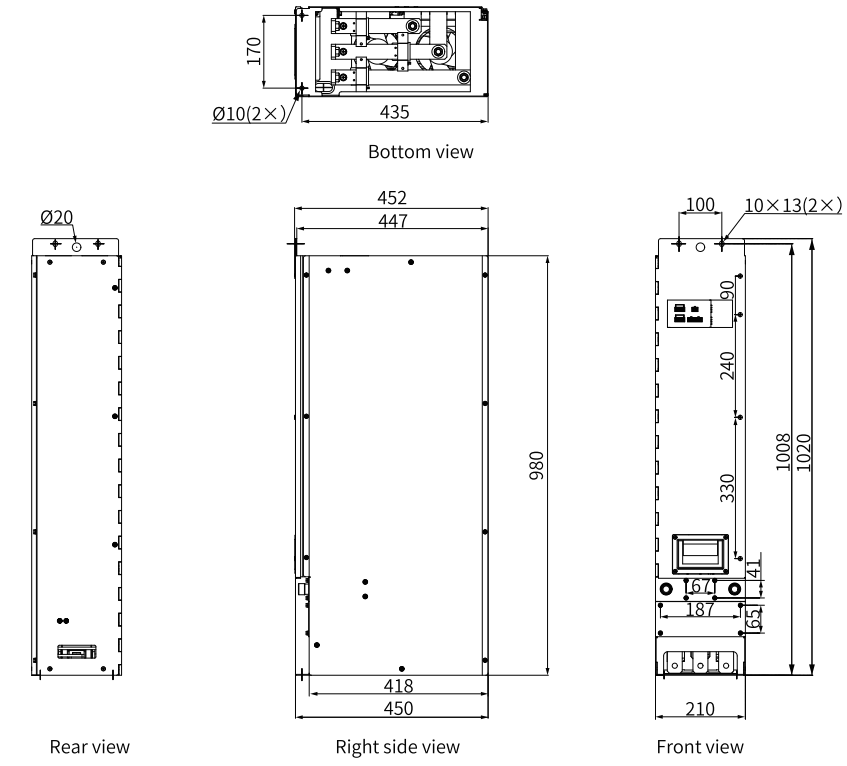


Figure 15-8 Outline dimensions of the H8w module (mm)

15.2 Specifications

Table 15–1 Product specifications of the water-cooled active rectifier module

Model MD880LC-40M...	No Overload				Light Overload		Heavy Overload		Loss	Outline Dimensions	Structure
	Rated Input Current	Rated Output Current	Apparent Power	Rated Output Power	Output Current	Output Power	Output Current	Output Power			
	I_{ac}	I_{dc}	S_N	P_N	I_{LD}	P_{LD}	I_{HD}	P_{HD}	c/a/T<1>	(W x D x H)	
	A (AC)	A (DC)	kVA	kW (DC)	A (DC)	kW (DC)	A (DC)	kW (DC)	kW	(mm)	
Rated voltage U_n = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V											
0530-7	530	606	633	627	509	602	424	502	8.0/0.5/8.5	230 x 456 x 720	H7w
0650-7	650	743	777	769	624	738	520	615	9.8/0.6/10.4		
0820-7	820	937	980	970	787	931	615	1382	10.3/1.8/12.1	210 x 450 x 980	H8w
1558-7	1558	1781	1862	1843	1496	1770	728	1169	19.6/3.4/23		2 x H8w

Note

<1>: "c" indicates the power loss dissipated in the coolant; "a" indicates the power loss dissipated in air; "T" indicates the total power loss excluding the power loss of the input reactor.

Note

Noise test conditions: IP54-rated cabinet, 1 meter in front of the cabinet, dark room, and operation under the rated working conditions

15.2.1 Electrical Specifications

Table 15–2 Electrical specifications of the water-cooled active rectifier module

Item	Specification
AC input voltage	690 V system: 525 VAC to 690 VAC, ±10% (−15%, < 1 min)
Rated power	627 kW to 820 kW
Input frequency	47 Hz to 63 Hz
Unbalance degree	Maximum: ⩽ ± 3% of rated line voltage
Output voltage	690 V system: 740 VDC to 975 VDC
Power factor	> 0.99 (rated working condition)

15.2.2 Technical Specifications

Table 15–3 Technical specifications of the water-cooled active rectifier module

Item		Specification
Basic performance	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% (rated working condition)
	THD	THDI < 3% (RSC < 40, with filter module, compliant with IEEE 519 harmonics standard)
Water cooling system	Coolant composition	Purified water or mixture of purified water with ethylene glycol and corrosion inhibitor. For use in ambient temperature below 5°C, antifreeze must be added.
	Maximum pressure	6 bar
	Flow rate requirement	• 100% water: ⩾ 16 L/min • 80% water and 20% ethylene glycol: ⩾ 18 L/min • 60% water and 40% ethylene glycol: ⩾ 21 L/min
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
	Net mass	49 kg, 88 kg, 176 kg
	Outline dimensions (W x H x D)	230 mm x 720 mm x 456 mm, 210 mm x 980 mm x 450 mm
Protection functions	Protection functions	Protection against short circuit, overcurrent, overvoltage, undervoltage, phase loss, three-phase unbalance, and overtemperature
Environment requirements	Cooling method	Water cooling
	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate above 1000 m; isolation transformer required above 2000 m; maximum altitude 4000 m
	Ambient temperature	0°C to 55°C (derate above 45°C)
	Coolant temperature	0°C to 50°C (derate above 40°C)
	Storage temperature	–40°C to +70°C. Drain the coolant from the module when stored below 0°C.
	Ambient humidity	5% to 95% RH, non-condensing
	Pollution degree	PD2
	Power grid system	IT TT/TN (VDR and EMC screws must be installed.)
	Overvoltage category	OVC III
	Protection rating	IP00

Item		Specification
Water quality requirements	Circulation requirement	Closed-loop circulation, with the coolant isolated from the external environment
	Water	Deionized water, distilled water, or antifreeze
	pH value	6 to 8
	Hardness	< 10 dH
	Conductivity	< 300 μs/cm
	Chloride	< 10 mg/L
	Iron	< 0.1 mg/L
	Sulfate	< 100 mg/L
	TDS	< 200 mg/L
	Maximum particle size	300 μm

Note

Water quality is critical for normal operation of equipment.

Table 15–4 Technical data of the PCS function of the MD880 series water-cooled active rectifier module

Item		Technical Data
DC side	Voltage range	690 V system: 740 VDC to 975 VDC
AC parameters (grid-connected)	AC voltage	690 V system: 525 VAC to 690 VAC, ±10% (−15%, < 1 min)
	Frequency	47 Hz to 63 Hz
	Unbalance degree	Maximum: ⩽ ±3% of rated line voltage
	THD (rated working condition)	THDI < 5% (RSC < 40, compliant with IEEE 519 harmonics standard) THDU < 5% (RSC > 20)
	Power factor	> 0.99 (under rated working condition, grid-connected, and system reactive adjusting not involved)
AC parameters (off-grid)	AC output voltage	690 V system: 525 VAC to 690 VAC
	Rated AC output frequency	50 Hz/60 Hz
	Output voltage accuracy	< 1% U_N (linear balanced load)
	Output frequency accuracy	< 0.5%
	Voltage unbalance degree	Output voltage unbalance: < 2% or < 4% (short time) (three-phase balanced load)
	THD (voltage)	< 5% (linear balanced load)
System	Overload capacity	Light overload: 110%, 1 minute of continuous overload allowed every 5 minutes Heavy overload: 150%, 1 minute of continuous overload allowed every 5 minutes
	Operating efficiency	> 98% (rated working condition)
Protection functions	Protection functions	Protection against short circuit, overcurrent, overvoltage, undervoltage, phase loss, three-phase unbalance, and overtemperature

Item		Technical Data
Operating environment	Ambient temperature	0°C to 55°C; derate the current by 0.5% per 1°C increase above 45°C
	Coolant temperature	0°C to 50°C; derate the current by 2% per 1°C increase above 40°C
	Ambient humidity	5% to 95%, non-condensing
	Installation altitude	⩽ 1000 m; derate by 1% per 100 m increase above 1000 m; isolation transformer required on the grid side above 2000 m; maximum altitude 4000 m
	Ambient condition	Chemical gas: 3C2 (operation) Solid particle: 3S1 (operation)
Storage environment	Storage temperature	–40°C to +70°C
	Storage humidity	5% to 95% RH, non-condensing
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
	Protection rating	IP00 (module)
	Safety performance	EN 61800-5-1
	Cooling method	Water cooling (power module coolant flow: 16 L/min)

15.2.3 Derating Characteristics

Ambient temperature-based derating

When the temperature is 45°C to 55°C, the rated output current of the water-cooled active rectifier module must be derated by 0.5% per 1°C increase. Output current = Rated current x Derating coefficient (k).

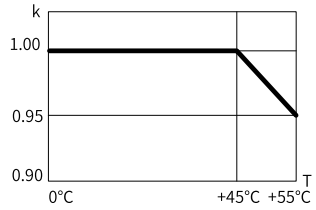


Figure 15-9 Ambient temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the water-cooled active rectifier module must be derated by 1% per 100 m increase. Output current = Rated current x Derating coefficient (k).

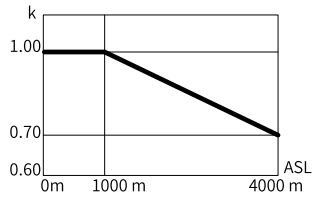


Figure 15-10 Altitude-based derating

Coolant temperature-based derating

When the temperature is 40°C to 50°C, the rated output current of the water-cooled active rectifier module must be derated by 2% per 1°C increase. Output current = Rated current x Derating coefficient (k).

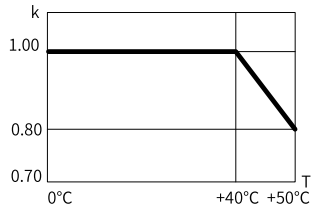


Figure 15-11 Coolant temperature-based derating

15.2.4 Overload Characteristics

When the MD880LC-40 series active rectifier 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.

The following sections describe two typical overload conditions. Other conditions should conform to the overload curve.

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.

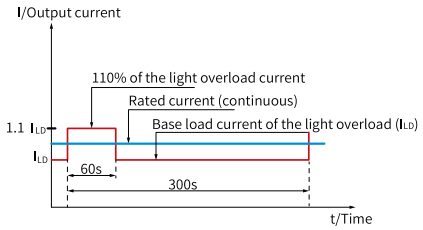


Figure 15-12 Curve of light overload mode

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.

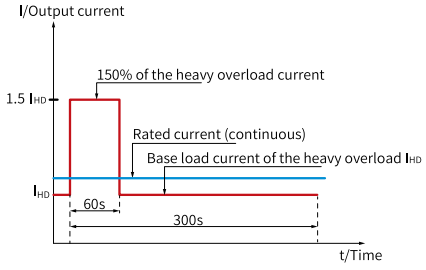


Figure 15-13 Curve of heavy overload mode

16 Water-Cooled Inverter Module

The MD880LC-50M series water-cooled inverter module has a rated voltage of 690 V, a rated current range of 530 A to 900 A, and a rated power range of 500 kW to 900 kW.

- Fast dynamic response, high control accuracy, and high power density
- Flexible modular structure for easy cabinet assembly
- High power density, low noise, and easy installation, maintenance, and cabinet integration
- Suitable for applications requiring water cooling, such as marine electric propulsion, shaft-driven power generation, and shield tunneling cutterheads

16.1 Product Information

16.1.1 Model Number and Nameplate

MD880LC-50M-0530-7
① ② ③ ④

①	**Product series** MD880 water-cooled AC drive series	③	**Rated current** 0530: 530 A
②	**Product type** Inverter module	④	**Voltage class** 690 VAC

Note

In ③, only one current class is listed.

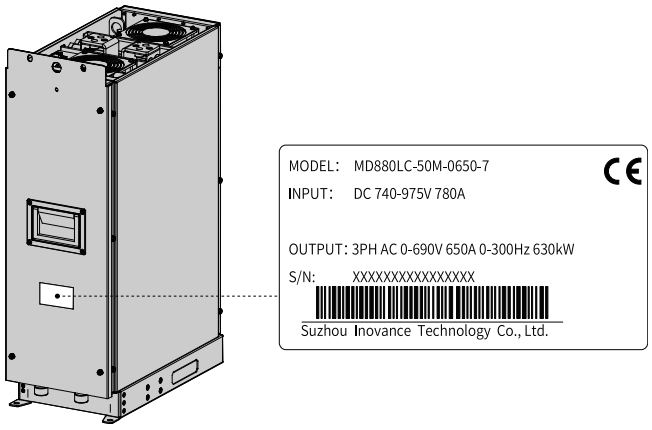


Figure 16-1 Nameplate of the H7w inverter module

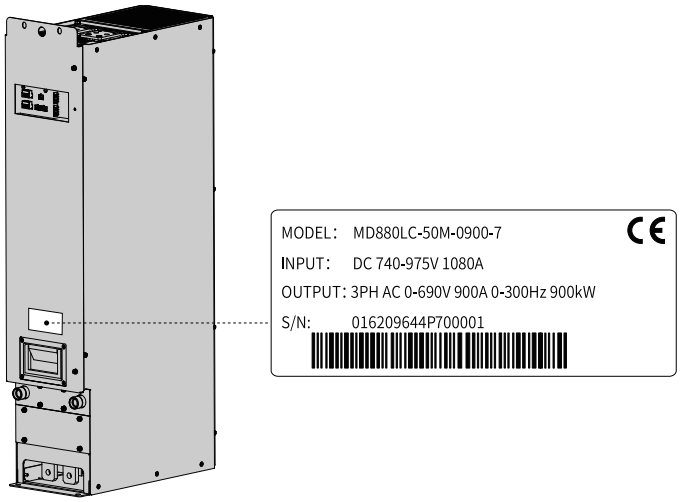


Figure 16-2 Nameplate of the H8w inverter module

16.1.2 Components

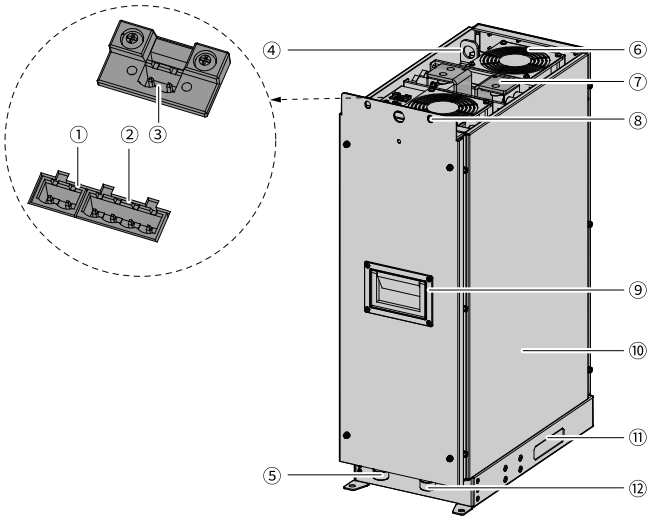


Figure 16-3 Component diagram 1 of the water-cooled inter module

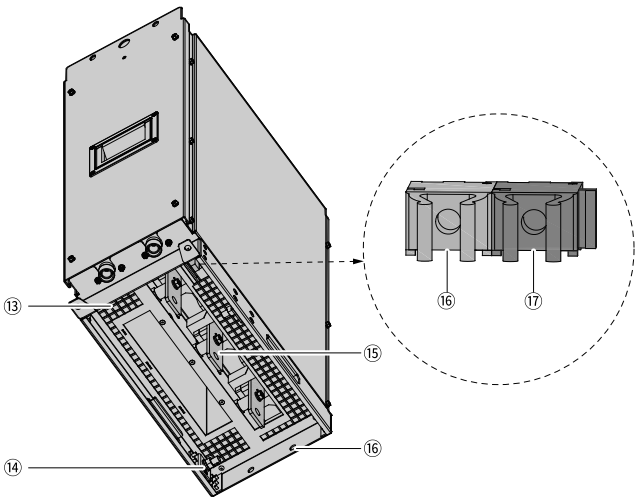


Figure 16-4 Component diagram 2 of the water-cooled inter module

No.	Name
①	24 VDC external power input terminal
②	STO terminal
③	HCU redundant power output terminal
④	Eyebolt
⑤	Coolant inlet joint, M26 x 1.5 metric external thread, 24° inner cone
⑥	Auxiliary fan
⑦	DC bus terminal
⑧	Top fixing hole
⑨	Front handle
⑩	Side plate (control chamber inside)
⑪	Bottom handle
⑫	Coolant outlet joint, M26 x 1.5 metric external thread, 24° inner cone
⑬	Bottom fixing hole
⑭	VT optical fiber transmit terminal
⑮	AC output terminal (U/V/W)
⑯	Rear fixing hole (optional)
⑰	VR optical fiber receive terminal
⑱	Grounding terminal

16.1.3 Product Dimensions

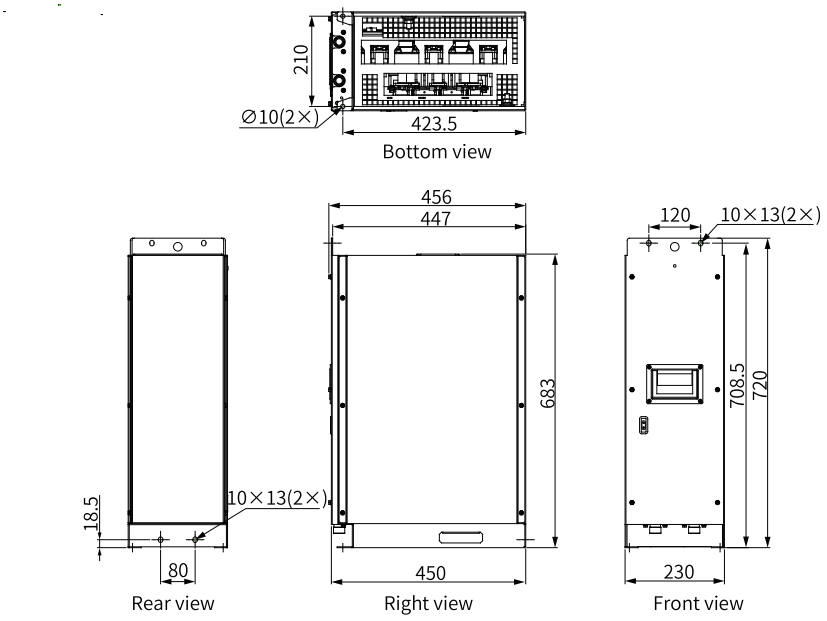


Figure 16-5 Outline dimensions of the H7w module (mm)

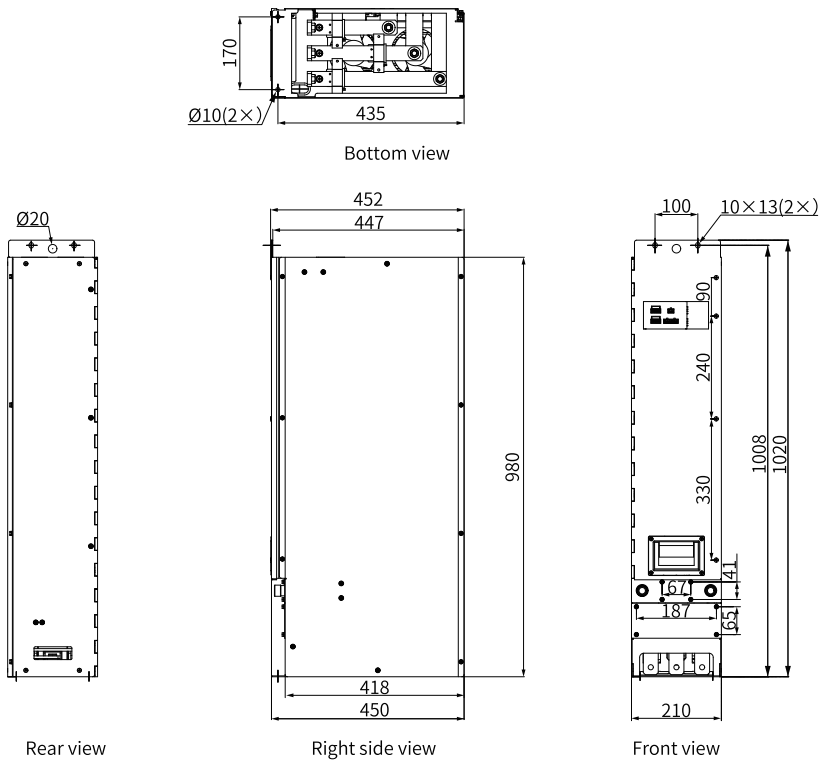


Figure 16-6 Outline dimensions of the H8w module (mm)

16.2 Specifications

Table 16–1 Product specifications of the water-cooled inverter module

Model MD880LC-50M...	No Overload		Light Overload		Heavy Overload		Loss c/a/T<1>	Outline Dimensions	Structure
	Rated Output Current	Rated Output Power	Output Current	Output Power	Output Current	Output Power			
	I_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}		(W x D x H)	
	A (AC)	kW (AC)	A (AC)	kW (AC)	A (AC)	kW (AC)	kW	(mm)	
Rated voltage U_n = 690 V (525 V to 690 V), ±10% (–15%, < 1 min); rated power based on 690 V									
0530-7	530	500	509	500	424	400	9.0/0.5/9.5	230 x 456 x 720	H7w
0650-7	650	630	624	630	520	500	10.7/0.6/11.3		
0900-7	900	900	864	860	675	630	16.2/0.9/17.1	210 x 450 x 980	H8w

Note

- <1>: "c" indicates the power loss dissipated in the coolant; "a" indicates the power loss dissipated in air; "T" indicates the total power loss excluding the power loss of the input reactor.

16.2.1 Electrical Specifications

Table 16–2 Electrical specifications of the water-cooled inverter module

Item	Specification
Rated input voltage	690 V system: 740 VDC to 975 VDC, ±10% (−15%, < 1 min)
Output voltage	0 VAC to 690 VAC
Output frequency	0 Hz to 300 Hz

16.2.2 Technical Specifications

Table 16–3 Technical specifications of the water -cooled inverter module

Item		Specification
Basic performance	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	Voltage/frequency (V/f) control Sensorless vector control (SVC) Feedback vector control (FVC)
	Carrier frequency	2.5 kHz default, 8 kHz maximum
	Speed range	V/f control: 1:50
		SVC: 1:200
		FVC: 1:1000
	Speed control accuracy	SVC: ±10% Fsl
		FVC: ±0.01%
	Torque control accuracy	SVC: ±5% (above 5 Hz)
		FVC: ±3%
	Torque response	SVC: ⩽ 5 ms
		FVC: ⩽ 5 ms
	Starting torque	SVC: 0.5 Hz/150%
		FVC: 0 Hz/200%
Water cooling system	Coolant composition	Purified water or mixture of purified water with ethylene glycol and corrosion inhibitor. For use in ambient temperature below 5°C, antifreeze must be added.
	Maximum pressure	6 bar
	Flow rate requirement	• 100% water: ⩾ 16 L/min • 80% water and 20% ethylene glycol: ⩾ 18 L/min • 60% water and 40% ethylene glycol: ⩾ 21 L/min

Item		Specification
Mechanical data	Shock and vibration resistance	Compliant with GB/T4798.3–Mechanical conditions Amplitude of 3 mm at 2 Hz to 9 Hz Acceleration rate of 9.8 m/s^2 (1 · g) at 9 Hz to 200 Hz Shock: 100 m/s^2 for 11 ms
	Safety performance	Compliant with EN 61800-5-1
	Maximum mass	49 kg, 88 kg
Protection functions	Phase loss protection	Triggers protection upon output phase loss
	Overtemperature protection	Triggers protection when the inverter module overheats
	Overload protection	Stops after 60 seconds of running at 150% of the reference load current for heavy overload Stops after 60 seconds of running at 110% of the reference load current for light overload
	Overcurrent protection	Stops when the current exceeds 2.5 times the heavy-load reference current of the inverter module
Environment requirements	Cooling method	Water cooling
	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate above 1000 m; isolation transformer required above 2000 m; maximum altitude 4000 m
	Ambient temperature	0°C to 55°C (derate above 45°C)
	Coolant temperature	0°C to 50°C (derate above 40°C)
	Storage temperature	–40°C to +70°C. Drain the coolant from the module when stored below 0°C.
	Humidity	5% to 95% RH, non-condensing
	Pollution degree	PD2
	Power grid system	IT TT/TN (VDR and EMC screws must be installed.)
	Overvoltage category	OVC III
	Protection rating	IP00

Item		Specification
Water quality requirements	Circulation requirement	Closed-loop circulation, with the coolant isolated from the external environment
	Water	Deionized water, distilled water, or antifreeze
	pH value	6 to 8
	Hardness	< 10 dH
	Conductivity	< 300 μs/cm
	Chloride	< 10 mg/L
	Iron	< 0.1 mg/L
	Sulfate	< 100 mg/L
	TDS	< 200 mg/L
	Maximum particle size	300 μm

Note

Water quality is critical for normal operation of equipment.

16.2.3 Derating Characteristics

Ambient temperature-based derating

When the temperature is 45°C to 55°C, the rated output current of the water-cooled inverter module must be derated by 0.5% per 1°C increase. Output current = Rated current x Derating coefficient (k).

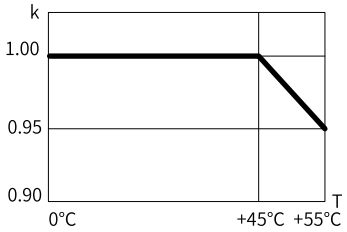


Figure 16-7 Ambient temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the water-cooled inverter module must be derated by 1% per 100 m increase.

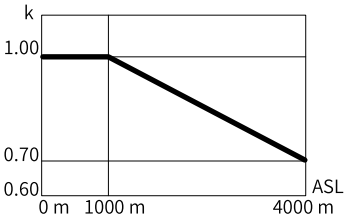


Figure 16-8 Altitude-based derating

Coolant temperature-based derating

When the temperature is 40°C to 50°C, the rated output current must be derated by 2% per 1°C increase. Output current = Rated current x Derating coefficient (k).

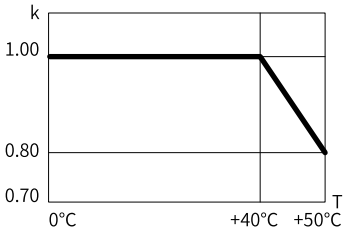


Figure 16-9 Coolant temperature-based derating

Carrier frequency-based derating

Model ...	Rated Power	Carrier Frequency (kHz)						
	(kW)	2.5	3.2	4	5	6	7	8
MD880LC-50M-0530-7	500	100%	87%	75%	62%	53%	46%	40%
MD880LC-50M-0650-7	630	100%	86%	73%	61%	52%	45%	40%
MD880LC-50M-0900-7	900	100%	87%	74%	63%	56%	48%	40%

Note

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

16.2.4 Overload Characteristics

When the MD880LC-50M 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.

The following sections describe two typical overload conditions. Other conditions should conform to the overload curve.

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.

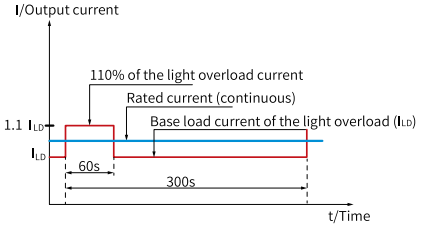


Figure 16-10 Curve of light overload mode

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.

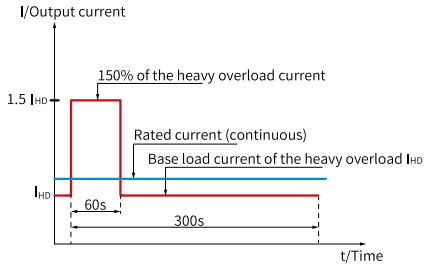


Figure 16-11 Curve of heavy overload mode

17 Water-Cooled DC Chopper Integrated Kit

17.1 Product Features

The MD880LC-80 series water-cooled DC chopper integrated kit features high power density, compact design, and high reliability, meeting the requirements for wide voltage range, high accuracy, rapid dynamic response, and programmable power output. It is available in the 690 V voltage class and offers a power range of 600 kW to 1140 kW. It is suitable for battery charge-discharge controllers, power conversion systems, DC test power supplies, and other similar applications.

17.2 Product Information

17.2.1 Model Number and Nameplate

MD880LC ① - 80M ② - 0600 ③ - 7 ④

Figure 17-1 Model number

① **Product series** MD880LC: MD880 water-cooled AC drive series	③ **Rated current** 0600: 600 A
② **Product type** 80M: DC/DC module	④ **Voltage class** 7: 690 VAC

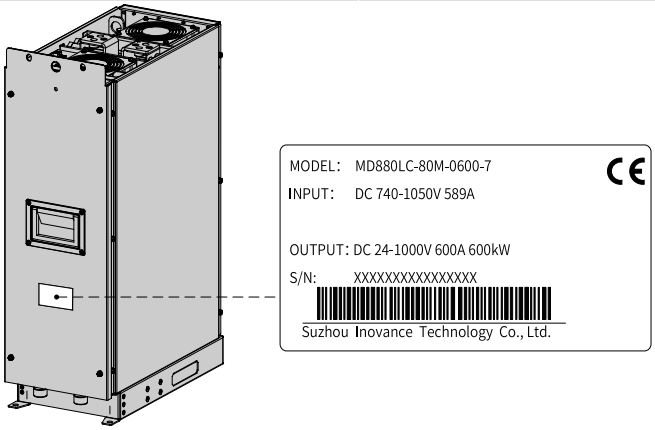


Figure 17-2 Nameplate

17.2.2 Components

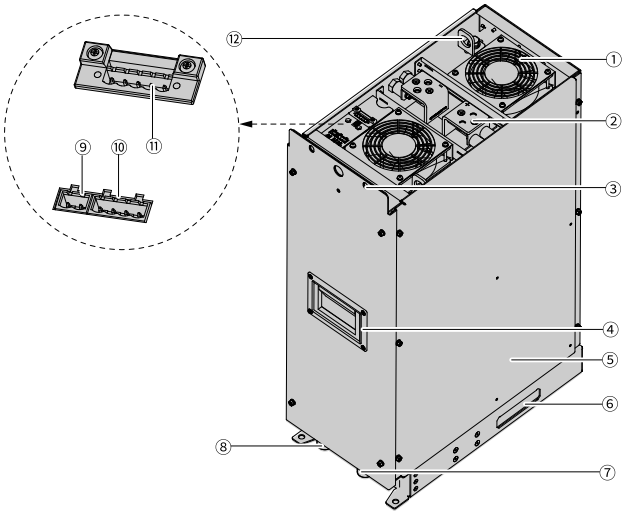


Figure 17-3 Component diagram 1 of the water-cooled DC chopper module

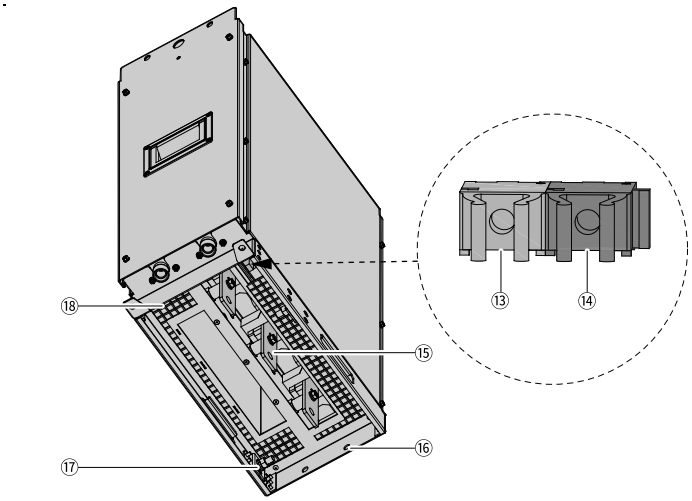


Figure 17-4 Component diagram 2 of the water-cooled DC chopper module

No.	Description	No.	Description
①	Auxiliary fan	⑩	STO terminal
②	DC bus terminal	⑪	DC pre-charge control terminal
③	Top fixing hole	⑫	Eyebolt
④	Front handle	⑬	VR optical fiber receive terminal
⑤	Side plate (control chamber inside)	⑭	VT optical fiber transmit terminal
⑥	Bottom handle	⑮	LVS positive terminal (U/V/W)
⑦	Coolant outlet joint, M26 x 1.5 metric external thread, 24° inner cone	⑯	Rear fixing hole (optional)
⑧	Coolant inlet joint, M26 x 1.5 metric external thread, 24° inner cone	⑰	Grounding terminal
⑨	24 VDC external power input terminal	⑱	Bottom fixing hole

17.2.3 Product Dimensions

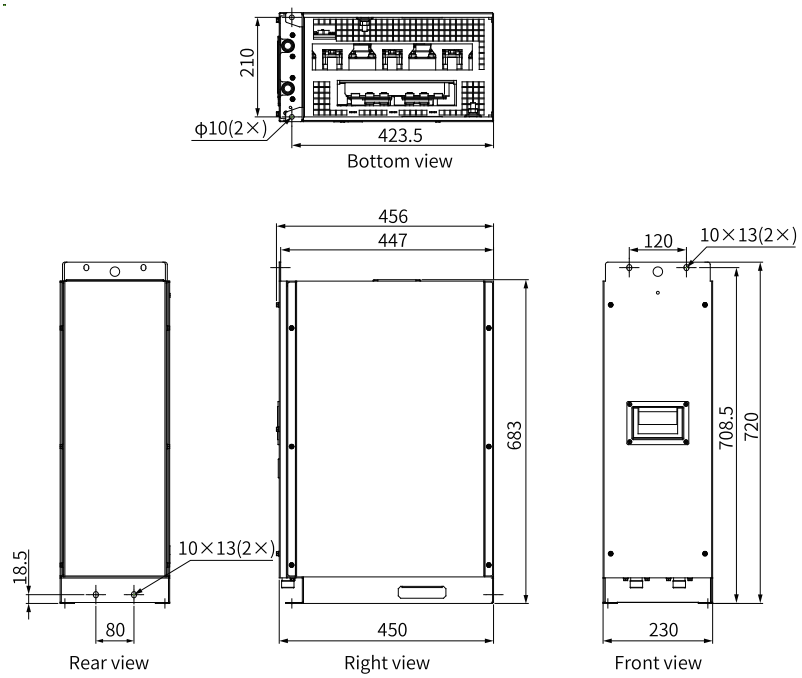


Figure 17-5 Outline dimensions of the water-cooled DC chopper module (mm)

17.3 Specifications

17.3.1 Product Specifications

Table 17–1 Specifications of the water-cooled DC chopper module

Structure	Model	HVS Rated Current (A)	LVS Output Current (Rated Based on 1000 V)									
			No Overload		Fast Overload		Heavy Overload		Power Loss c/a/T<1>	Rated Water Flow	Net Mass	Outline Dimensions (W x H x D)
			Current (A)	Power (kW)	Current (A)	Power (kW)	Current (A)	Power (kW)	kW	L/min	kg	mm
H7	MD880LC-80M-0600-7	589	600	600	450	450	510	510	4.3/0.6/4.9	16	49	230 x 720 x 456
H7 x 2	MD880LC-80M-1140-7	1140	1140	1140	855	855	969	969	8.2/1.2/9.4	32	98	230 x 720 x 457

Note

<1>: "c" indicates the power loss dissipated in the coolant; "a" indicates the power loss dissipated in air; "T" indicates the total power loss.

17.3.2 Electrical Specifications

Table 17–2 Electrical specifications of the water-cooled DC chopper module

Item	Specification
High-voltage side (HVS) voltage	690 V system: 740 VDC to 1050 VDC
Low-voltage side (LVS) voltage	690 V system: 24 VDC to 1000 VDC
Regenerative power	100%
Voltage accuracy	LVS: ⩽ 0.1% Fs HVS: ⩽ 1% Fs
Voltage ripple (Vrms)	LVS: ⩽ 0.2% Fs HVS: ⩽ 0.5% Fs
Current accuracy	⩽ 1% Fs

17.3.3 Technical Specifications

Table 17–3 Technical specifications of the water-cooled DC chopper module

Item		Specification
Basic performance	Overload capacity	Heavy overload: 150%, 60 seconds of continuous overload allowed every 300 seconds Fast overload: 200%, 10 seconds of continuous overload allowed every 60 seconds
	Operating efficiency	⩾ 97%
	Response time	⩽ 5 ms (sudden load change by 10% to 90% under rated voltage)
	Switching time	⩽ 10 ms (sudden switching between –90% and +90% under rated voltage)
Water cooling system	Coolant composition	Purified water or mixture of purified water with ethylene glycol and corrosion inhibitor. For use in ambient temperature below 5°C, antifreeze must be added.
	Maximum working pressure	6 bar
	Flow rate requirement	100% water: ⩾ 16 L/min 80% water and 20% ethylene glycol: ⩾ 18 L/min 60% water and 40% ethylene glycol: ⩾ 21 L/min
Mechanical data	Shock and vibration resistance	Compliant with GB/T4798.3–Mechanical conditions Amplitude of 3 mm at 2 Hz to 9 Hz Acceleration rate of 9.8 m/s^2 (1·g) at 9 Hz to 200 Hz Shock: 100 m/s^2 for 11 ms
	Safety performance	EN 61800-5-1
	Cooling method	Water cooling
Protection functions	Protection functions	Protection against short circuit, overcurrent, overvoltage, undervoltage, and overtemperature

Item		Specification
Environment requirements	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Installation altitude	⩽ 1000 m; derate by 1% per 100 m increase above 1000 m; maximum altitude 4000 m
	Ambient temperature	–10°C to +50°C; derate by 2% per 1°C increase above 40°C; maximum ambient temperature 50°C
	Module noise	⩽ 60 dB
	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	IP00

Note

- Due to the basic topological characteristics of DC choppers, the HVS voltage is at least 50 V higher than the LVS voltage.
- Fast overload and heavy overload each are based on an appropriate reference current. For details, see *"17.3.5 Overload Characteristics" on page 167*.
- When the MD880LC-80M DC chopper unit is used in ultra-capacitor or battery charging and discharging conditions, no additional configuration is required.
- When the MD880LC-80M DC chopper unit is used in test bench conditions, a capacitor box is needed additionally to meet performance requirements.

17.3.4 Derating Characteristics

Ambient temperature-based derating

When the temperature is 45°C to 55°C, the rated output current of the DC chopper module must be derated by 0.5% per 1°C increase. The output current can be calculated by multiplying the rated current by the derating coefficient (k).

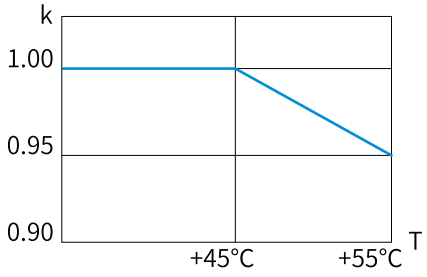


Figure 17-6 Ambient temperature-based derating

Coolant temperature-based derating

When the temperature is 40°C to 50°C, the rated output current must be derated by 2% per 1°C increase. The output current can be calculated by multiplying the rated current by the derating coefficient (k).

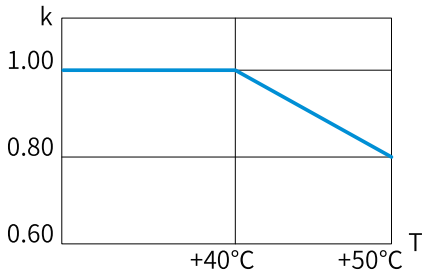


Figure 17-7 Coolant temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the DC chopper module must be derated by 1% per 100 m increase.

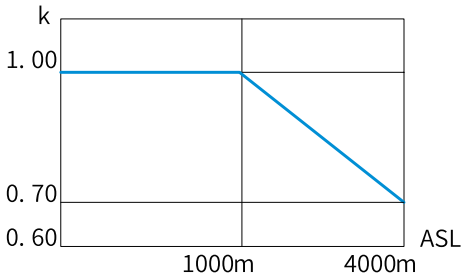


Figure 17-8 Altitude-based derating

17.3.5 Overload Characteristics

When the MD880LC series DC chopper 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 system operates at the reference load current before and after an overload event.

Curve of fast overload mode

I_{fast} indicates the reference load current for fast overload mode. In this mode, the system operates at 200% of the reference load current for 10 seconds per 60 seconds.

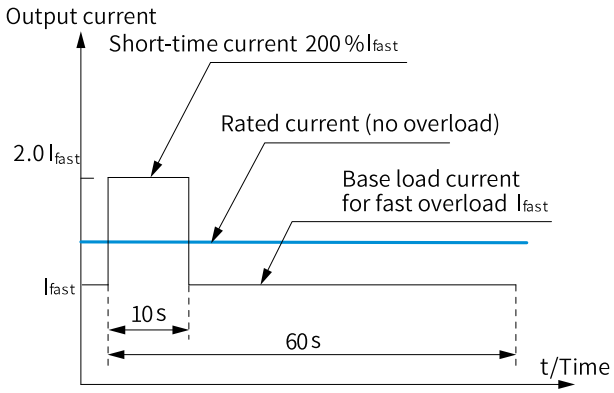


Figure 17-9 Curve of fast overload mode

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 seconds per 300 seconds.

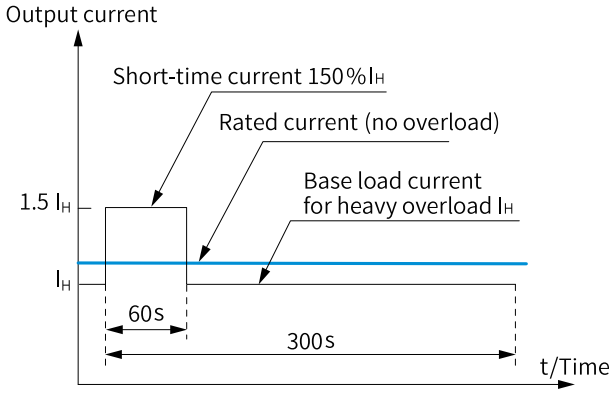


Figure 17-10 Curve of heavy overload mode

18 Multi-Drive Cabinet Model Selection

18.1 Cabinet Model

MD880-50C-800-0800
① ② ③ ④

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

18.2 Auxiliary cabinet

Auxiliary Cabinet Layout

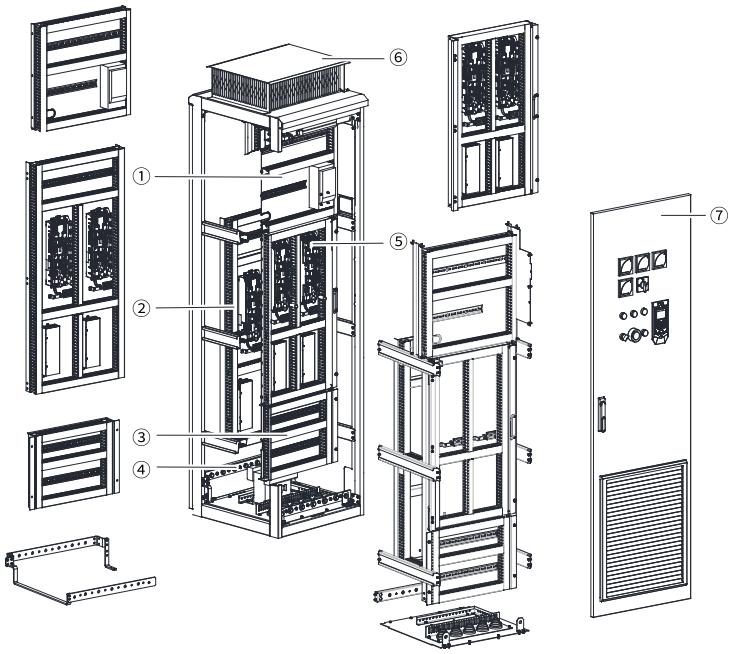


Figure 18-1 Auxiliary Cabinet Layout

No.	Name
①	Terminal mounting plate on top of cabinet, which is used for installation of terminals, air switches, and fuse switches
②	HCU mounting plate in front of the cabinet that used for installation of the HCU and HPCU
③	Control terminal mounting plate
④	Copper busbar kit of the auxiliary cabinet
⑤	HCU mounting plate at the rear of the cabinet that used for installation of the HCU and HPCU
⑥	Top cover with an IP rating of IP21
⑦	Auxiliary cabinet door plate that used for installation of electric meters and smart operating panel SOP-20-880

Dimensions of the auxiliary cabinet

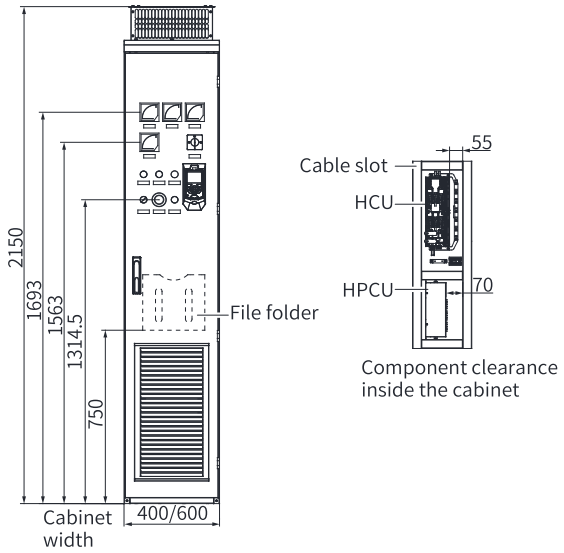


Figure 18-2 Dimensions of auxiliary cabinet (unit: mm)

18.3 Incoming Cabinet

Layout of Cable Inlet Cabinet

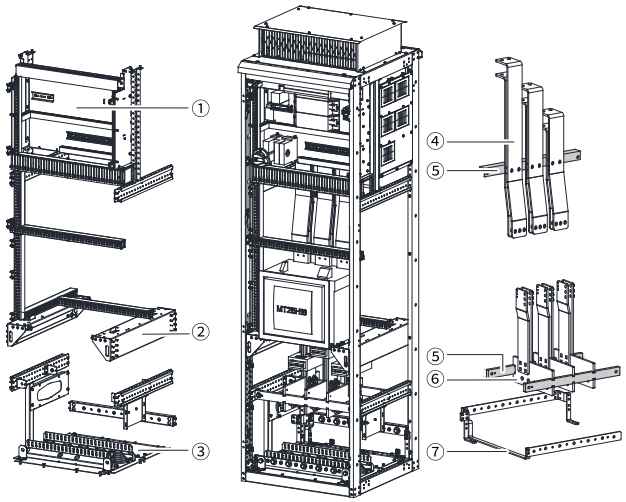


Figure 18-3 Layout of Cable Inlet Cabinet

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

Dimensions of the incoming cabinet

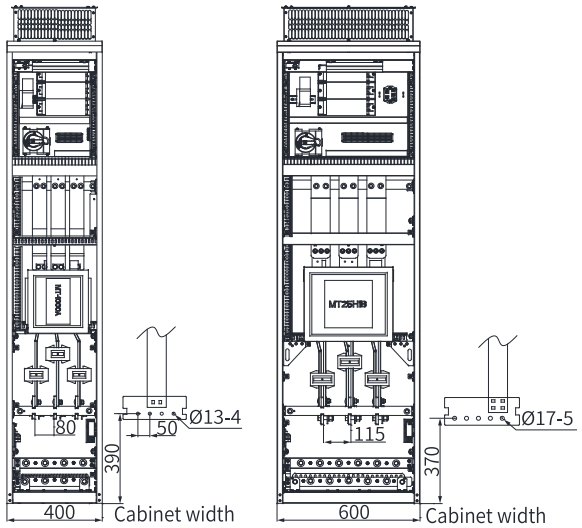


Figure 18-4 Dimensions of the inlet cabinet (unit: mm)

18.4 Basic Rectifier Cabinet

Layout of the basic rectifier cabinet

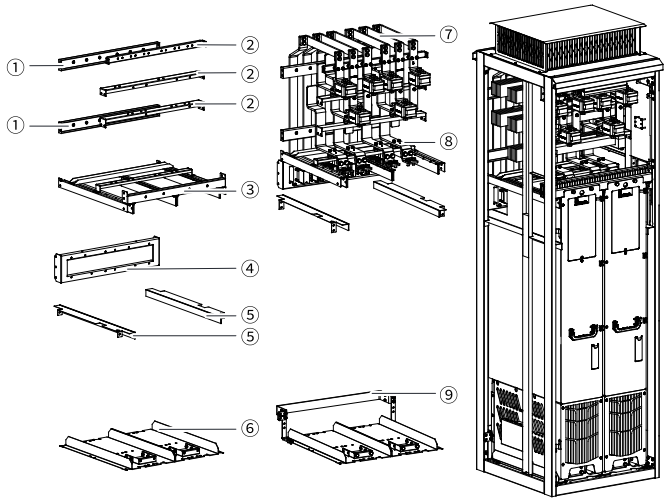


Figure 18-5 Layout of the basic rectifier cabinet

No.	Name
①	Beam for installing copper busbar on back of the cabinet
②	Beam for fixing the copper busbar in front of the cabinet
③	Module mounting bracket
④	Quick connecting terminal
⑤	Mounting bracket
⑥	General module mounting baseplate
⑦	Input copper busbar of T2 basic rectifier module

No.	Name
⑧	Output copper busbar of T2 basic rectifier module
⑨	PE copper busbar of the rectifier cabinet

Dimensions of basic rectifier cabinet

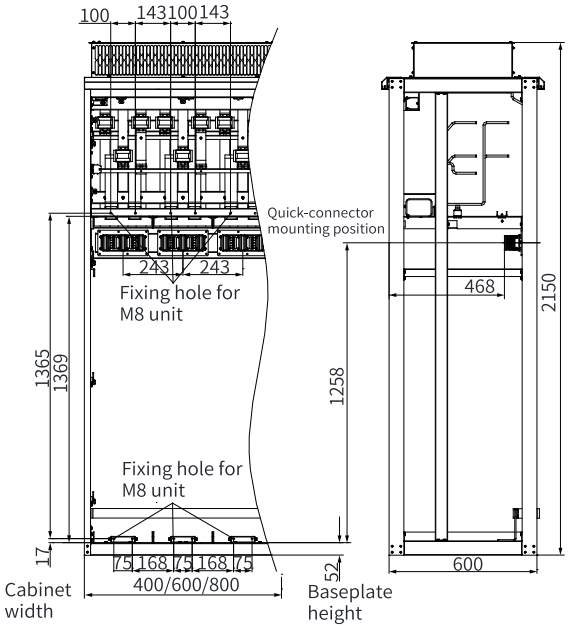


Figure 18-6 Dimensions of basic rectifier cabinet (unit: mm)

18.5 Regenerative Rectifier Cabinet

Layout of regenerative rectifier cabinet

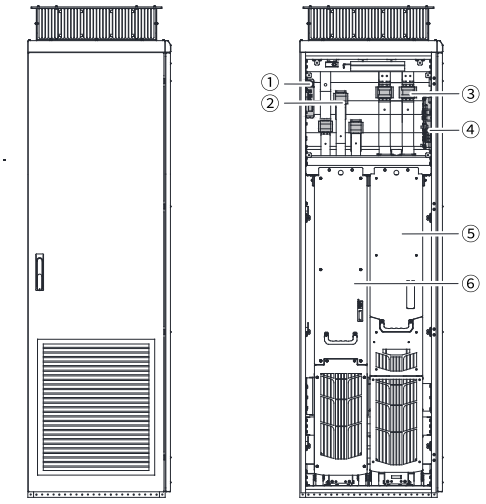


Figure 18-7 Layout of the regenerative rectifier cabinet (L+H8)

No.	Name
①	HSVM synchronous voltage detection module
②	Fuse on the AC side

No.	Name
③	Fuse on the DC side
④	Fan power supply
⑤	Regenerative rectifier module
⑥	Regenerative rectifier filter module

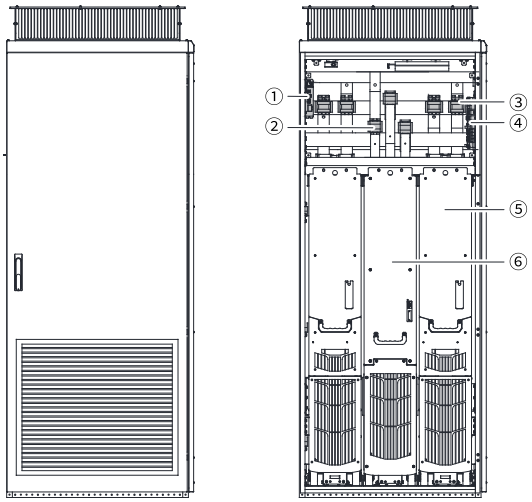


Figure 18-8 Layout of the regenerative rectifier cabinet (L+2H8)

No.	Name
①	HSVM synchronous voltage detection module
②	Fuse on the AC side
③	Fuse on the DC side
④	Fan power supply
⑤	Regenerative rectifier module
⑥	Regenerative rectifier filter module

Dimensions of the regenerative rectifier cabinet

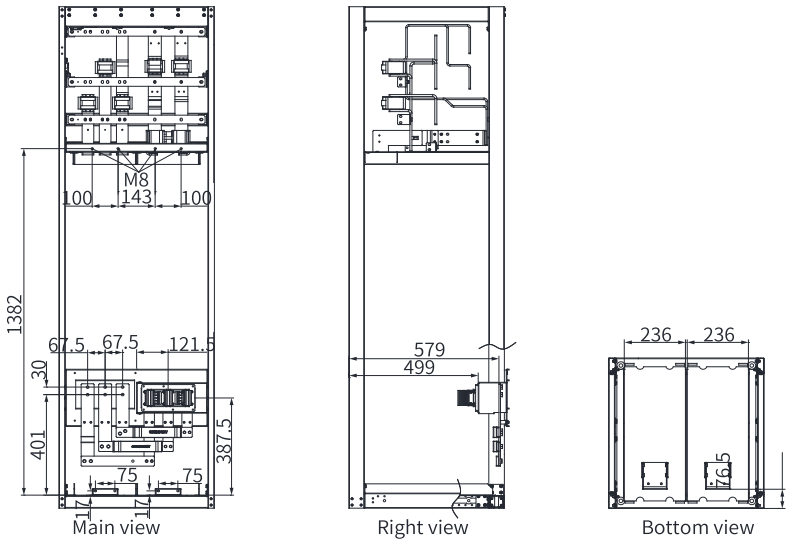


Figure 18-9 Dimensions of regenerative rectifier cabinet with a width of 400 mm

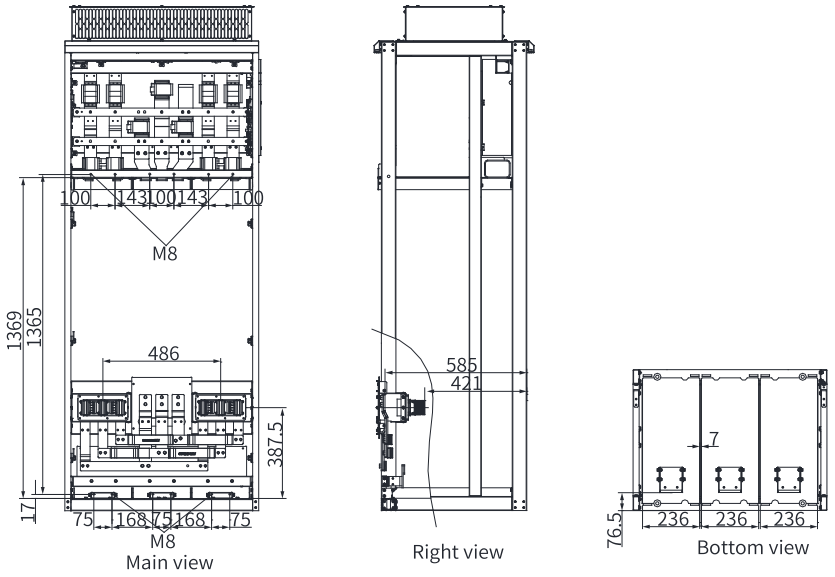


Figure 18-10 Dimensions of regenerative rectifier cabinet with a width of 600 mm

18.6 Active Rectifier Cabinet

Layout of the active rectifier cabinet

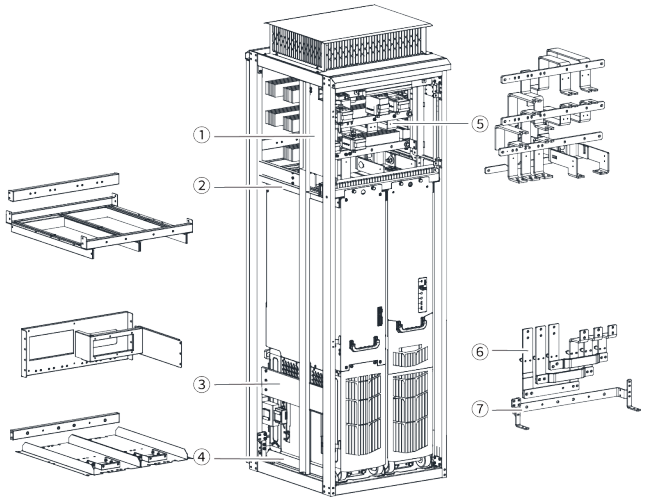


Figure 18-11 Layout of the active rectifier cabinet

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

Dimensions of the active rectifier cabinet

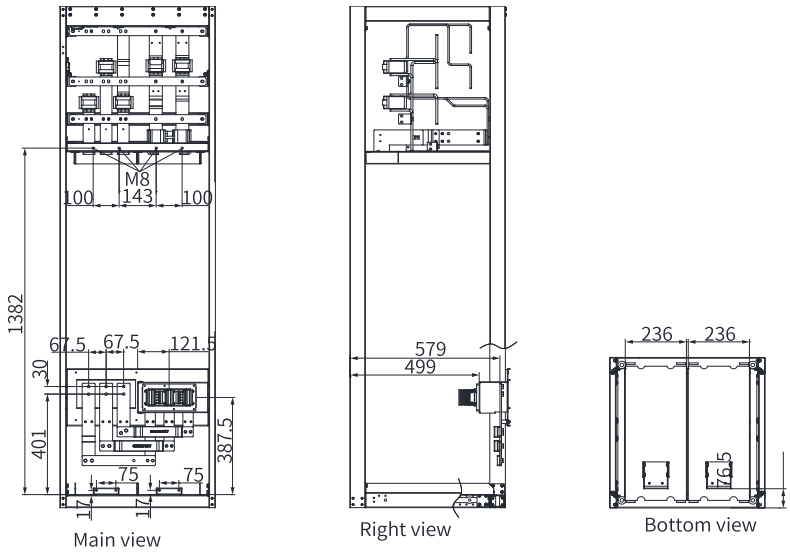


Figure 18-12 Dimensions of active rectifier cabinet with a width of 600 mm

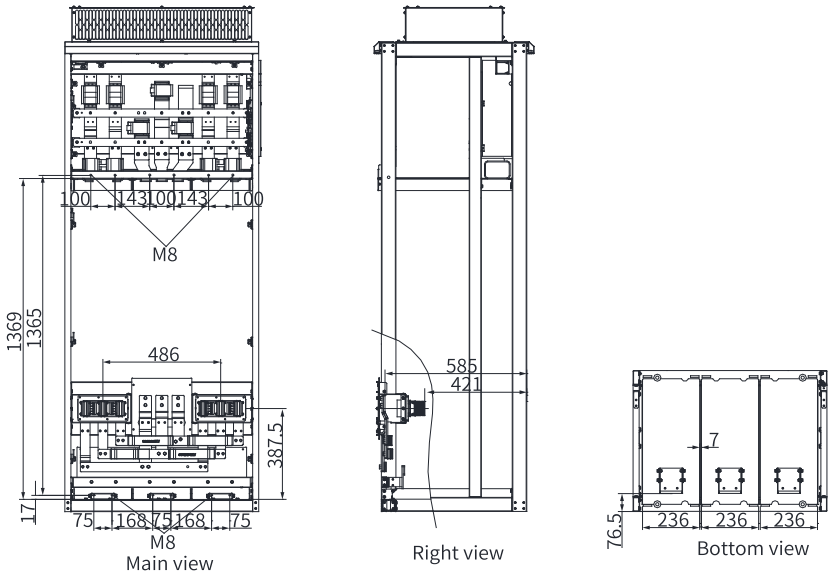


Figure 18-13 Dimensions of active rectifier cabinet with a width of 800 mm

18.7 Inverter Cabinet

Layout of the inverter cabinet

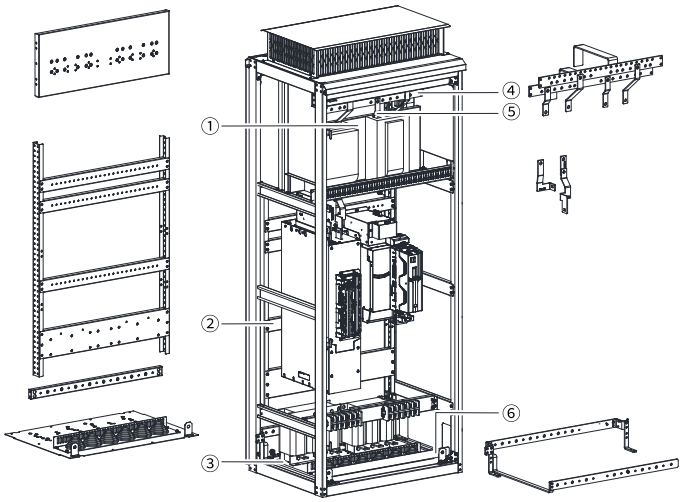


Figure 18-14 Layout of H1 and H6 inverter cabinets

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

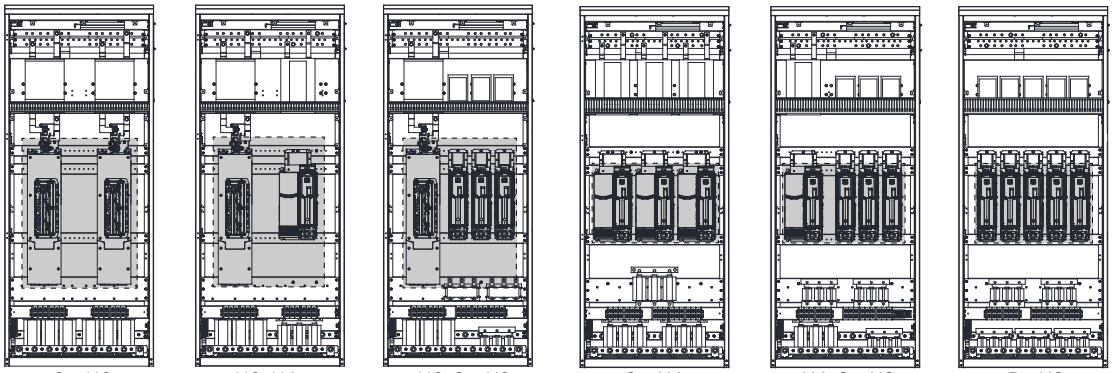


Figure 18-15 Mounting mode for H1 to H6 inverter modules (800-mm wide)

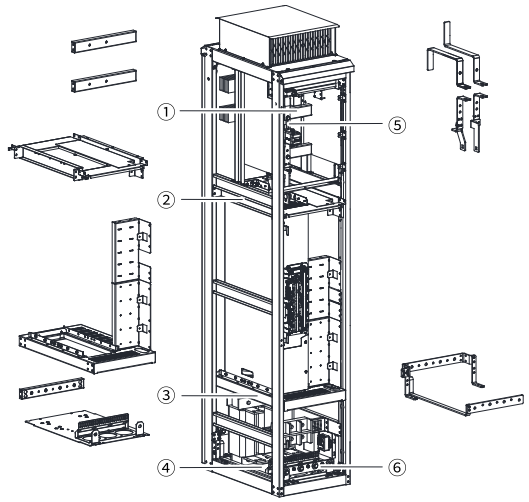


Figure 18-16 Layout of H6 and H7 inverter cabinets

No.	Name
①	Beam for fixing the copper busbar
②	Module mounting bracket
③	Mounting pallet
④	Bottom plate for 400-mm wide cabinets
⑤	Module input copper busbar
⑥	PE copper busbar for 400-mm wide cabinets

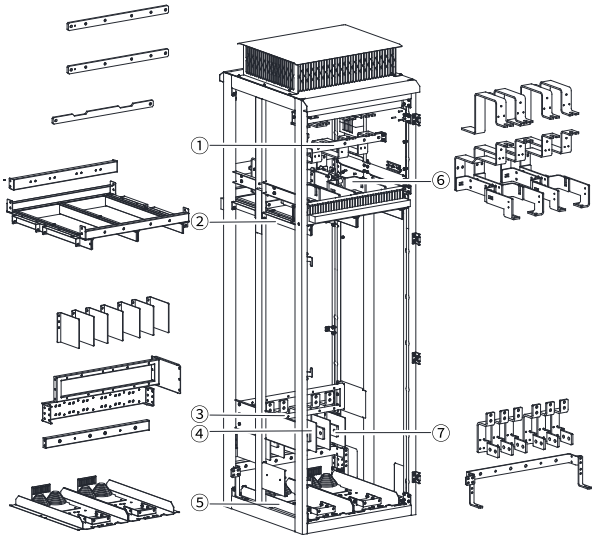


Figure 18-17 Layout of 2 x H8 inverter cabinets

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

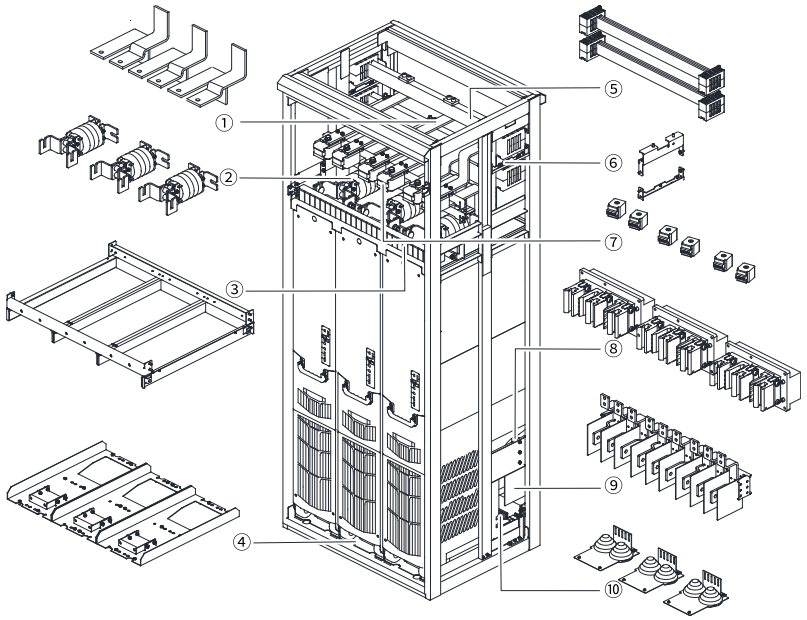


Figure 18-18 Layout of 3 x H8 inverter cabinets

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

Dimensions of inverter cabinet

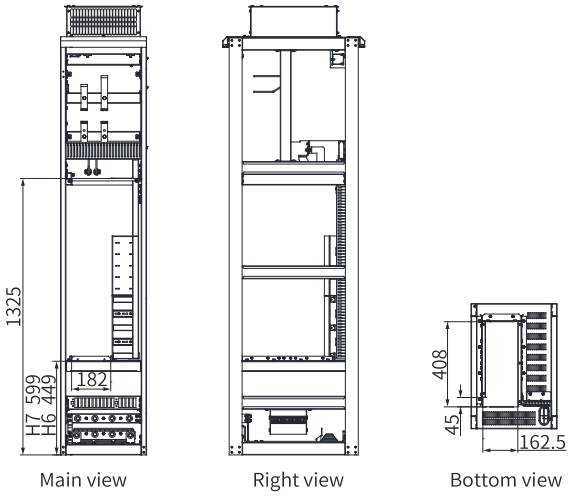


Figure 18-19 Dimensions of H6/H7 inverter cabinets with a width of 400 mm

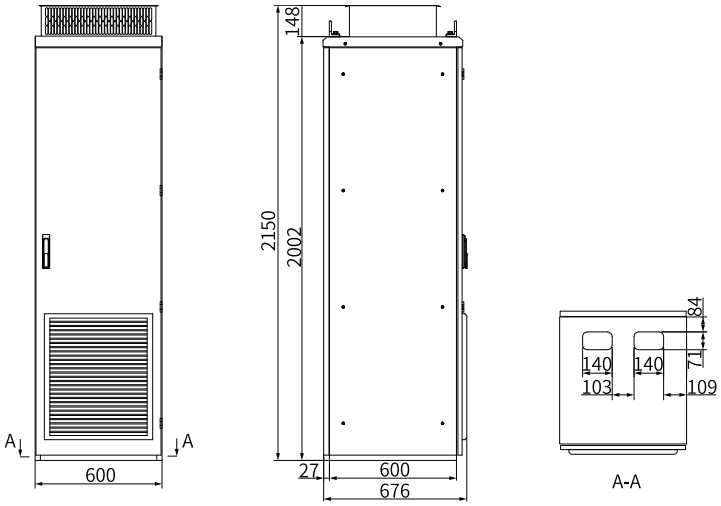


Figure 18-20 Dimensions of 2 x H8 inverter cabinets (mm)

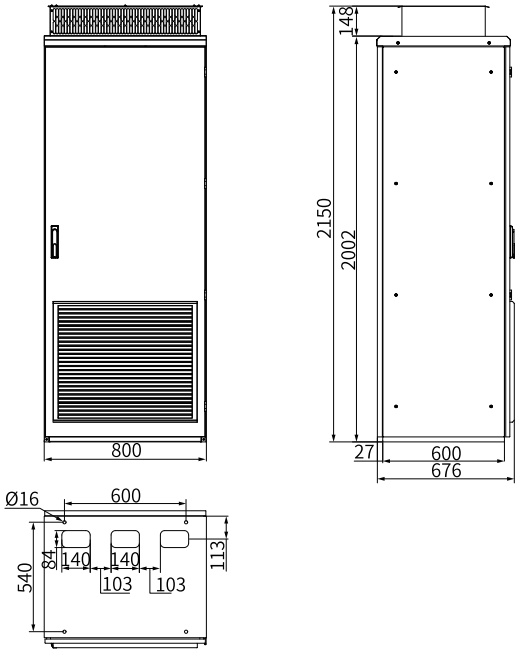


Figure 18-21 Dimensions of 3 x H8 inverter cabinets (mm)

18.8 Braking Cabinet

Layout of the braking cabinet

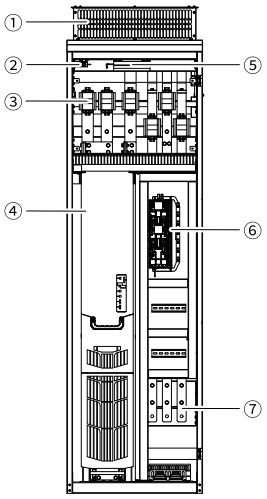


Figure 18-22 Layout of the braking cabinet_1

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

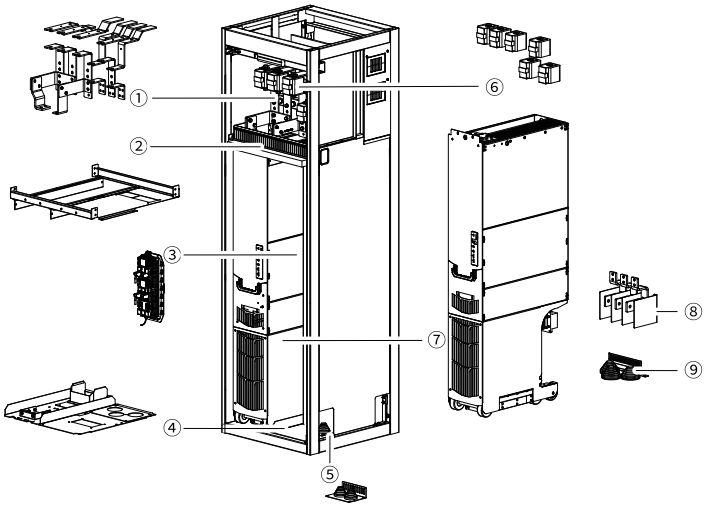


Figure 18-23 Layout of the braking cabinet_2

No.	Name
①	Branch copper busbar
②	Mounting guide rail
③	HCU
④	Bottom plate guide rail

No.	Name
⑤	Control cable outlet hole
⑥	Fuse
⑦	Braking module
⑧	Wiring copper busbar of the power cable
⑨	Power cable inlet/outlet hole

Dimensions of the braking cabinet

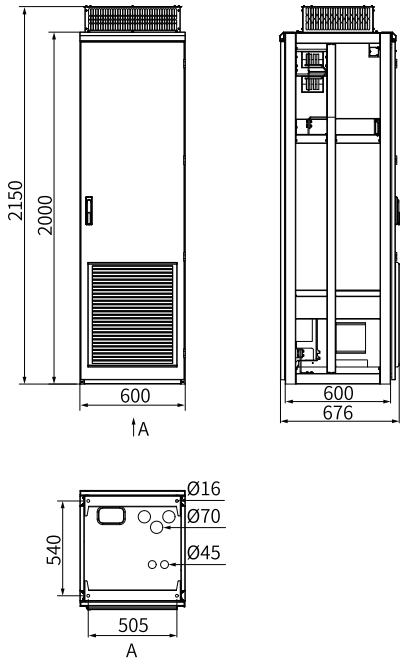


Figure 18-24 Dimensions of the braking cabinet (unit: mm)

18.9 Connection Cabinet

Layout of the connection cabinet

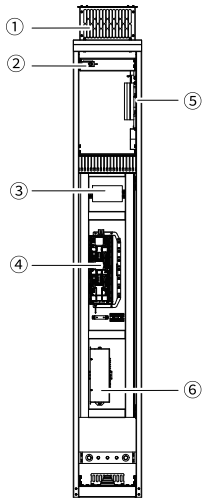


Figure 18-25 Layout of the connection cabinet_1

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

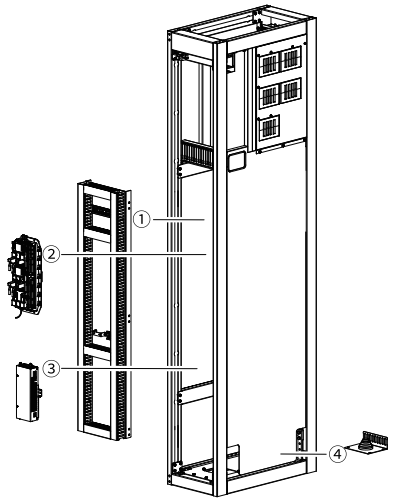


Figure 18-26 Layout of the connection cabinet_2

No.	Name
①	Component installation board
②	HCU
③	HPCU
④	Cable inlet hole

Dimensions of the connection cabinet

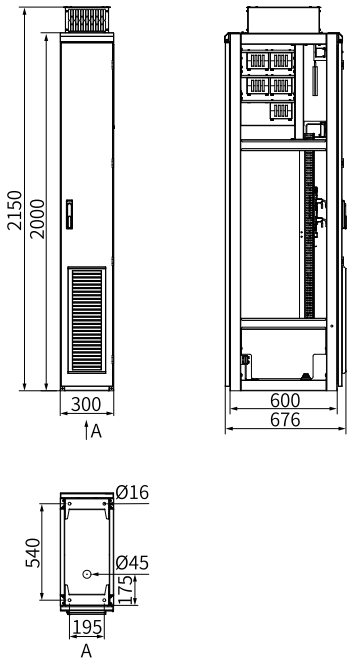


Figure 18-27 Dimensions of the connection cabinet (mm)

19 Single-Drive Cabinet Model Selection

Currently, the MD880 series single-drive products only have standard cabinets available for the 690 V voltage class.

The 690 V single-drive standard cabinets come in two structural configurations, with the differences outlined in the table below. Functional expansion cards for both cabinet configurations must be ordered separately.

For the layouts of single-module AC drive cabinets and dual-parallel AC drive cabinets, see *"12.1.2 Components" on page 114*. For the cabinet dimensions, see *"12.1.3 Product Dimensions" on page 117*.

Table 19–1 Differences between the single-drive cabinet configurations

Cabinet Structure	Function	Default Standard Configuration	Outline Dimensions (W x D x H)
S12	Single-module AC drive cabinet	Disconnector, AC fuse, and optional contactor and output reactor	853 mm x 729 mm x 2058 mm
2 x S12	Dual-parallel AC drive cabinet	Disconnector, AC fuse, output reactor (-L), and optional braking unit (-B)	1353 mm x 718 mm x 2058 mm

20 Options

20.1 Option List

For cable selection, see the "Recommended Cables" section.

Table 20–1 Option list 1

Category	Module Name	Module Model	Function	Applicable Model
Function expansion module	Control module	HCU-20	Basic rectifier control module	Basic rectifier module
		HCU-30	Regenerative rectifier control module	Regenerative rectifier module
		HCU-40	Active rectifier control module	Active rectifier module
		HCU-41	Active rectifier control module	Low-power active rectifier module
		HCU-50S	Second-generation inverter control module	H8 and H8A inverter modules
		HCU-51S	Second-generation inverter control module (electrical interface)	H1 to H7 inverter modules
		HCU-60	Three-phase braking control module	Three-phase braking module
		HCU-70	Shore power control module	Shore power
		HCU-80	DC chopper control module	DC chopper module
	Parallel control module	HPCU-40	Supports parallel connection of 2 to 4 modules	All parallel-capable modules
		HPCU-60	Supports parallel connection of 2 to 6 modules	All parallel-capable modules
		HPCU-A0	Supports parallel connection of 2 to 10 modules	All parallel-capable modules
	Function expansion module	HESD-10	Expands one slot	All models
	Voltage or current detection module	HSVM-10	Three-phase AC input voltage detection	Regenerative rectifier module All active rectifier modules
		HSVM-20	DC voltage detection module (supports one voltage channel and two current channels)	DC chopper module
	Encoder detection module	HPG-10	HTL incremental differential, single-ended, OC, or OE encoder detection, frequency-division output	All inverter modules
		HPG-40	Resolver encoder signal detection module	
		HPG-50	TTL incremental OC or differential encoder detection, frequency-division output	

Category	Module Name	Module Model	Function	Applicable Model
Function expansion module	Inobus optical fiber expansion module	HOFM-10	One pair of 50 M optical fiber interfaces	All models
		HOFM-30	Three pairs of 50 M optical fiber interfaces	All models
	Fieldbus module	HCAN-10	CANopen fieldbus adapter	All models
		HCAN-30	CAN 2.0 bus adapter	All models
		HMBA-10	Modbus RTU fieldbus adapter	All models
		HDP-10	PROFIBUS DP bus adapter	All models
	Industrial Ethernet module	HPFN-10	PROFINET IO industrial Ethernet	All models
		HMBT-10	Modbus TCP industrial Ethernet	All models
		HETC-10	EtherCAT industrial Ethernet	All models
Function expansion module	Ethernet commissioning module	HETN-10	Ethernet commissioning module	All models
	Optical fiber router module	HOFR-50	Data exchange between two to five HCUs (master-slave communication through optical fiber)	Dedicated for shore power
	I/O expansion module	HIO-10	2-channel AI 2-channel AO 2-channel DIO 1-channel relay output	All models
	Process data collection module	HIBA-10	PDA collection module	All models
	Remote service gateway	HGW-10	Centralized monitoring module	All models
Smart operating panel (SOP)	Smart operating panel	SOP-20-880	Human-machine interaction panel	All models

Table 20–2 Option list 2

Category	Name	Position	Applicable Model	Function
Peripheral electrical device	Fuse	Drive input side	Regenerative rectifier module Active rectifier module Inverter module	Protects downstream semiconductor devices in case of short circuit to prevent incidents.
		Drive output side	Basic rectifier module Regenerative rectifier module Active rectifier module Single-drive product	Prevents accidents due to short circuits and prevents accident escalation.
	Disconnector	Drive input side	Single-drive product	Safely isolates the power grid from electrical equipment.
	Contactor	Drive input side	Single-drive product	Connects/Disconnects the power supply to the AC drive. Avoid frequent power cycling of the AC drive through the contactor (minimum interval of one hour) or using the contactor to directly start the drive.
	Circuit breaker	Drive input side	Basic rectifier module Regenerative rectifier module Active rectifier module Single-drive product	Installed between the power supply and the AC drive input side. Short-circuit breaker: Disconnects the power supply during overcurrent in downstream devices to prevent accidents. Earth leakage circuit breaker (ELCB): The AC drive may generate high-frequency leakage current during operation. To prevent electric shock and fire accidents, install a proper ELCB based on actual applications.
	AC input reactor	Drive input side	Single-drive product Regenerative rectifier module Water-cooled basic rectifier module	Effectively eliminates high-order harmonics on the input side and improves the input-side power factor.
	EMC filter	Drive input side	Single-drive product	Reduces conducted and radiated disturbance from the drive to the external environment.
	Simple filter	Drive input side	Single-drive product	Reduces conducted and radiated disturbance from the drive to the external environment.
	Output reactor	Drive output side	Single-drive product Inverter module	Protects motor insulation and extends motor service life.
	Magnetic ring	Drive output side	Single-drive product Multi-drive product	Reduces external interference and lowers bearing currents.

20.2 Function Expansion Modules

20.2.1 HCU Control Module

20.2.1.1 Introduction

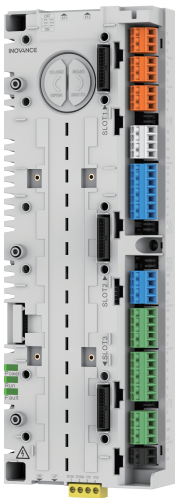


Figure 20-1 Appearance of the HCU control module

- The HCU control module is designed for the MD880 series AC drives. It transmits control signals to the power module through optical fiber or RS422 communication. It receives operating parameters, module faults, and working status information uploaded from the power module. It supports multiple external control channels, including user I/O, SOP-20-880 smart operating panel, fieldbus modules, and industrial Ethernet modules. It is an intermediate repeater for internal information collection, control, and monitoring, as well as external information exchange and control.
- The HCU control module comes with ports for DI, HDI, HDO, AI, AO, InoLink communication network (master-slave communication), SOP-20-880 smart operating panel communication, and Safe Torque Off (STO) functionality. The module also comes with an SD memory card as standard, capable of storing real-time data on the card. The SD memory card is used to store black box data and parameter backups.
- The HCU control module adopts a modular design for function expansion. It has three general-purpose slots and one dedicated slot, enabling flexible, rapid, and convenient expansion with function modules. The general-purpose slots support fieldbus function modules, analog or digital I/O modules, encoder detection modules, and optical fiber expansion modules. The dedicated slot is specifically designed for functional safety modules.
- The HCU control module requires an external 24 VDC power supply. It internally implements multi-channel power isolation, providing isolated digital power, master-slave RS485 isolated power, and power for the SOP-20-880 operating panel.

The HCU control module can be used with other modules to achieve corresponding functions, as detailed in the following table.

Table 20–3 Function modules used with the HCU

Name	Model	Function	Connection Method	Dimensions (mm)
Encoder detection module	HPG-10	HTL incremental differential, single-ended, OC, or OE encoder detection, frequency-division output	Slot	105 x 73 x 24
	HPG-30	Sine-cosine incremental encoder signal detection module	Slot	104 x 73 x 30.6
	HPG-40	Resolver encoder signal detection module	Slot	105 x 73 x 24
	HPG-50	TTL incremental OC or differential encoder detection, frequency-division output	Slot	105 x 73 x 24
I/O module	HIO-10	2-channel AI 2-channel AO 2-channel DIO 1-channel relay output	Slot	105 x 73 x 24
PROFIBUS DP module	HDP-10	PROFIBUS DP bus adapter	Slot	75 x 73 x 24
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
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
Modbus RTU module	HMBA-10	Modbus RTU bus adapter	Slot	75 x 73 x 24
EtherCAT module	HETC-10	EtherCAT bus adapter	Slot	75 x 73 x 24
Ethernet module	HETN-10	Ethernet commissioning module	Slot	75 x 73 x 24
PROFINET IO module	HPFN-10	PROFINET IO industrial Ethernet adapter	Slot	75 x 73 x 24
Modbus TCP module	HMBT-10	Modbus TCP industrial Ethernet adaptation	Slot	75 x 73 x 24
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
Function expansion module	HESD-10	Expansion of one slot	Optical fiber	105 x 75 x 70
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
Digital gateway commissioning and monitoring module	HGW-10	Supports centralized commissioning and operation data collection	Network cable	180 x 100 x 50

Name	Model	Function	Connection Method	Dimensions (mm)
Smart operating panel	SOP-20-880	Human-machine interaction panel	Network cable	73 x 125 x 25
Optical fiber router control module	HOFR-50	Supports data exchange between two to five HCU control modules	Optical fiber	232 x 86 x 40

20.2.1.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Relative humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation altitude	⩽ 2000 m
Installation method	Wall-mounted
Vibration	< 20 Hz: 9.8 m/s^2 (1 · g) 20 Hz to 50 Hz: 5.9 m/s^2 (0.6 · g)
Protection	Enclosure IP rating: IP10 IEC/EN 60529
	Overvoltage category: II IEC 60664-1
	Protection rating: I IEC/EN 61800-5-1
Compliance	EN 61800-5-1:2007 EN 61800-3:2004 IEC/EN 62109-1:2010 UL508C:2002

20.2.1.3 Outline Dimensions

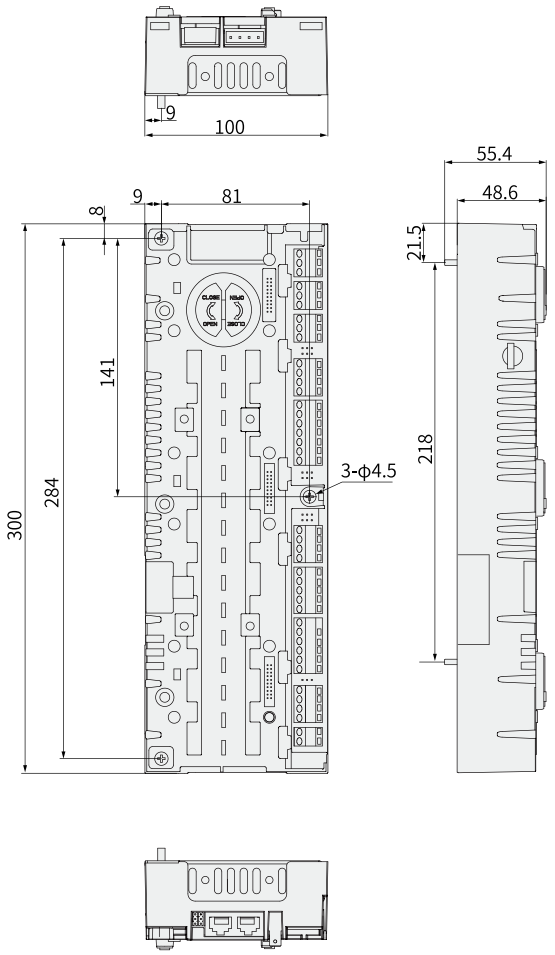


Figure 20-2 Outline dimensions of the HCU control module (unit: mm)

20.2.1.4 Components

The HCU control module comes with ports for DI, HDI, HDO, AI, AO, InoLink communication network (master-slave communication), SOP-20-880 smart operating panel communication, and Safe Torque Off (STO) functionality. The module also comes with an SD memory card as standard, capable of storing real-time data on the card.

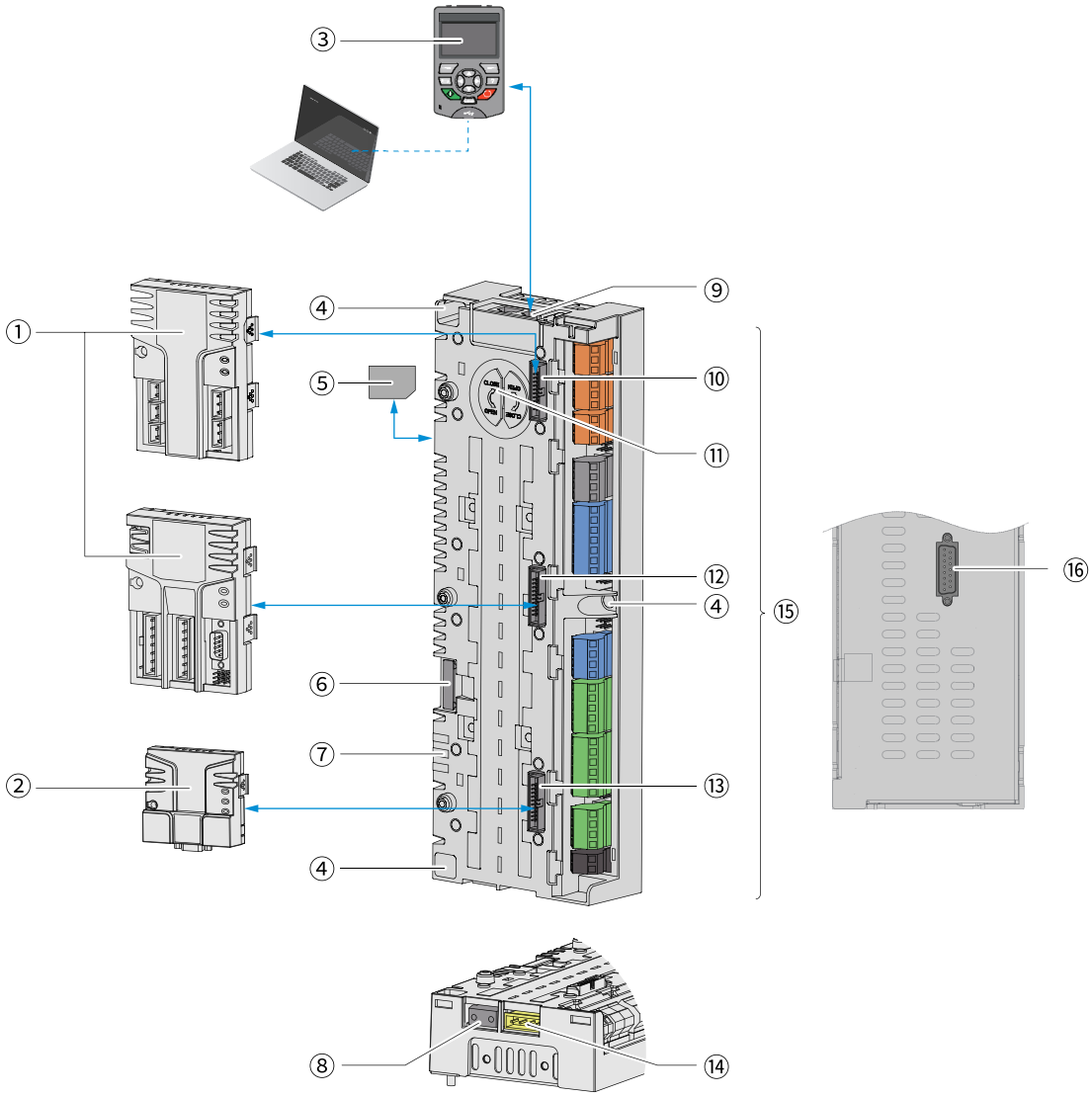


Figure 20-3 HCU control module composition

Table 20–4 HCU control module composition

No.	Name	Function
①	Function module SIZE1	105 x 73 x 24 (mm) function module
②	Function module SIZE2	75 x 73 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, facilitating cascading
⑩	SLOT1	Function module ports: SLOT1_1, SLOT1_2 and SLOT1_3

No.	Name	Function
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	STO input terminal (model dependent)
⑮	User terminal	User I/O terminal in standard HCU configuration
⑯	DB15 terminal	Communication interface between the HCU-51S module and the power module

Table 20–5 Standard ports of the HCU control module

Name	Terminal	Description
Input power supply	XPWR: 24VI	HCU power supply
Digital output power supply	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	RJ45 terminals with identical assignment to cascade multiple HCU modules 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: (multi-drive: CS model; single-drive: 690 V air-cooled; 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

20.2.2 HPCU Parallel Control Module

20.2.2.1 Introduction

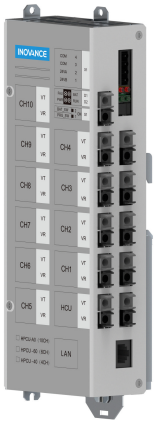


Figure 20-4 Appearance of the HPCU parallel control module

The HPCU parallel control module is mainly used for parallel connection of MD880 series products. It supports up to 10 paralleled power modules. This module plays a pivotal role in the parallel system: it communicates with the HCU module through optical fibers, receiving IGBT drive signals and control signals from the HCU and synchronously transmitting them to each power module. Simultaneously, it rapidly collects and uploads information, such as current, voltage, and module status, from each power module to the HCU.

Features:

- Enables synchronized control and current equalizing among the power modules.
- Available in multiple variants: 4-unit parallel control module (HPCU-40), 6-unit parallel control module (HPCU-60), and 10-unit parallel control module (HPCU-A0), allowing flexible configuration based on system requirements.
- Communicates with the HCU module and parallel power modules through optical fibers, enhancing system operational reliability.
- Comes standard with an SD card, capable of storing operational data during faults on the SD card.
- Features a built-in time chip to record the timestamp of fault occurrences and transmissions.
- Supports guide rail mounting, offering great flexibility in installation and layout.

20.2.2.2 Technical Specifications

Item	Description
Input voltage	24.0 V±10%, 0.5 A
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Guide rail mounting

Item	Description
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.2.3 Outline Dimensions

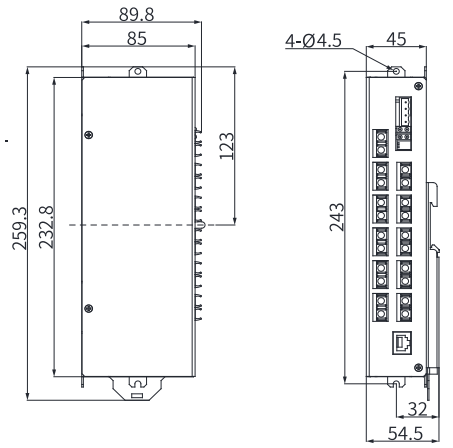


Figure 20-5 Outline dimensions of the HPCU parallel control module (unit: mm)

20.2.2.4 Components

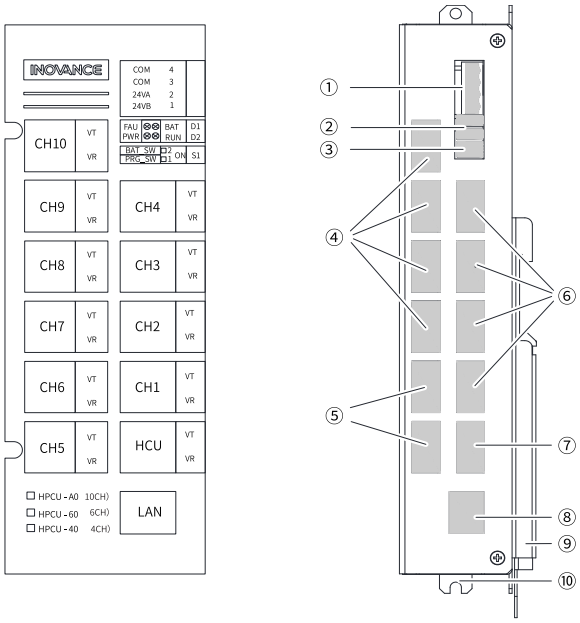


Figure 20-6 HPCU parallel control module

No.	Name	Port	Description	Remarks
①	Power supply X1	COM	GND	External power supply of 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	-
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 to CH6	Parallel module channels 5 to 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	-

20.2.3 HESD-10 SLOT Expansion Module

20.2.3.1 Introduction



Figure 20-7 Appearance of the HESD-10 SLOT expansion module

The HESD-10 SLOT expansion module is mainly used for expanding controller function modules in the MD880 AC drive system. When the system requires more than three function modules on a single HCU module, the HESD-10 SLOT can be used to enable the expansion and use of multiple function modules.

Features:

- The HESD must be used with an HOFM-10/30 optical fiber expansion module.
- All function modules expanded by the HESD use the Inobus communication protocol.
- The HOFM module must not be installed in the HESD-10 slot.
- The HESD needs a 24 V/1 A power supply.
- The maximum optical fiber extension distance is 20 m.

20.2.3.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Secured on standard guide rail
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.3.3 Outline Dimensions

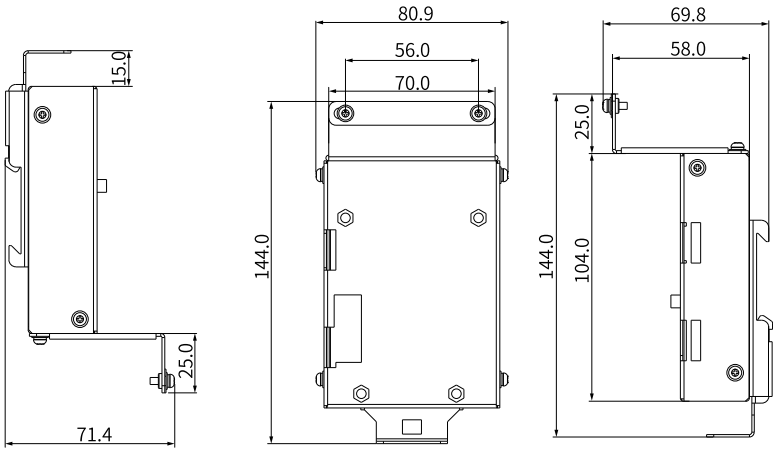


Figure 20-8 Outline dimensions (unit: mm)

20.2.3.4 Components

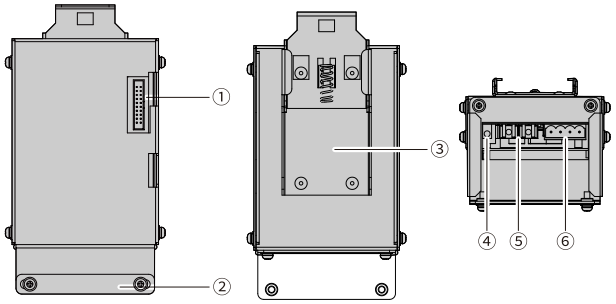


Figure 20-9 Product diagram

No.	Name	Description
①	Slot	Connects to the expansion card
②	Fixing clamp	Cable shield clamp, used to secure the cable and crimp its shield
③	Guide rail groove	Secures the module
④	Optical fiber transceiver terminal	Connects to the optical fiber of the HOFM module
⑤	Status indicator	Indicates the power status of the module
⑥	24 V power input terminal	24 V power input terminal (24 VDC±10%)

20.2.4 HSVM-10 Sync Voltage Detection Module

20.2.4.1 Introduction



Figure 20-10 Appearance of the HSVM-10 sync voltage detection module

The HSVM-10 sync voltage detection module is designed for AC line voltage detection in MD880 series products, such as active rectifiers and regenerative rectifiers. It transmits detected signals to the HCU control module through optical fiber, enabling control and protection of the rectification system. This module supports detection inputs for two voltage classes: 690 VAC and 100 VAC.

Features:

- Supports two input voltage detection ranges with high voltage detection accuracy.
- Communicates with the HCU control module through optical fiber, ensuring stable and reliable system operation.
- Supports side mounting and backplate mounting, offering flexibility for layout.

20.2.4.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Relative humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation altitude	⩽ 2000 m
Installation method	Wall-mounted
Vibration	Class 3M4 in GB/T 4798.3-2007
Protection	Enclosure IP rating: IP20 IEC/EN 60529
	Overvoltage category: II IEC 60664-1
Compliance	EN 61800-5-1:2007 EN 61800-3:2004 IEC/EN 62109-1:2010 UL508C:2002

20.2.4.3 Outline Dimensions

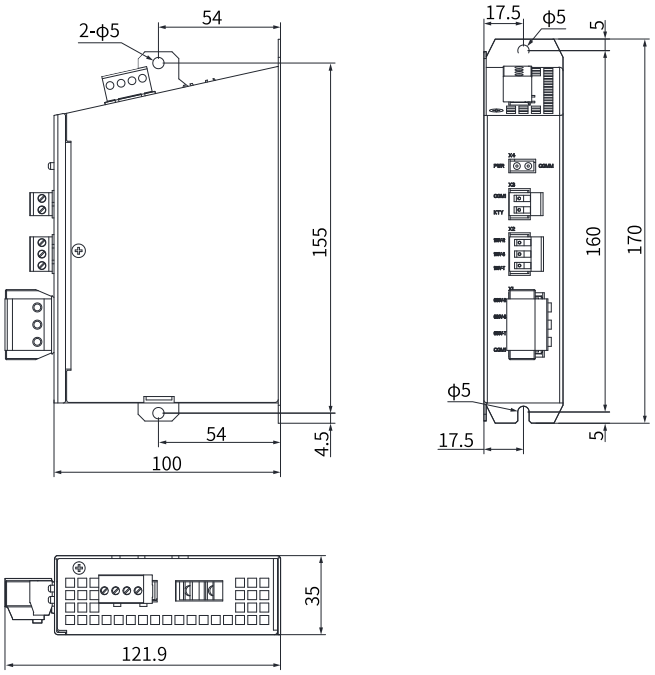


Figure 20-11 Outline dimensions (unit: mm)

20.2.4.4 Components

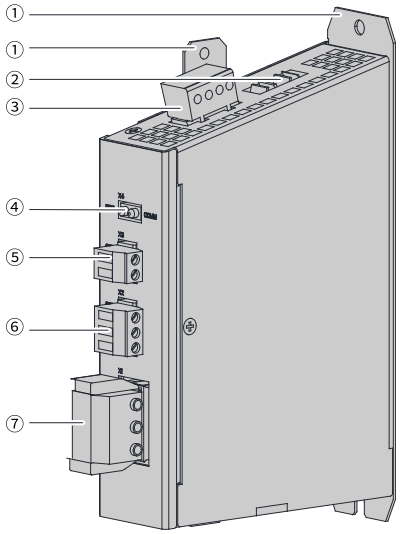
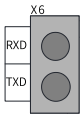
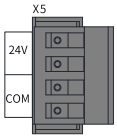
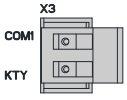
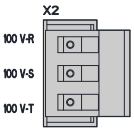
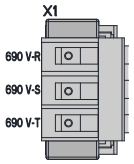


Figure 20-12 HSVM-10 interfaces

Table 20–6 Interfaces

No.	Name	Port		Description	Remarks
①	PE (rear)	-	-	-	-
②	X6: Optical fiber terminal		RXD	Receive optical fiber	Uses the dedicated Inobus communication protocol; communicates with the HCU through the HOFM optical fiber expansion module Plastic optical fiber (POF)
			TXD	Transmit optical fiber	
③	X5: 24 VDC power input		24V	24 VDC	External power supply: 24 VDC±10%, 0.2 A Dual-conductor twisted pair cables recommended Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
			COM	GND	
④	X4: Status indicator		PWR	Power supply status indicator	Green light steady ON: Powered normally
					Green light OFF: Not powered or power supply abnormal
			COMM	Communication status indicator	Green light flashing at 1 Hz: Communication normal
					Green indicator OFF: Communication abnormal
⑤	X3: Temperature sensor input (reserved)		KTY	Temperature sensor+	-
			COM1	Temperature sensor–	

<table>
<tr><th>No.</th><th>Name</th><th colspan="2">Port</th><th>Description</th><th>Remarks</th></tr>
<tr><td rowspan="3">⑥</td><td rowspan="3">X2: Three-phase AC line voltage detection (100 VAC maximum)</td><td rowspan="3">
</td><td>100V-R</td><td>R phase voltage input</td><td rowspan="3">Used in synchronous transformers or voltage transformer detection scenarios, with an input voltage range of 0 VAC to 100 VAC
Cross-sectional area: 0.5 mm^2 to 2.5 mm^2</td></tr>
<tr><td>100V-S</td><td>S phase voltage input</td></tr>
<tr><td>100V-T</td><td>T phase voltage input</td></tr>
<tr><td colspan="6">Note
The X1 and X2 interfaces must not be used simultaneously.</td></tr>
<tr><td rowspan="3">⑦</td><td rowspan="3">X1: Three-phase AC line voltage detection (690 VAC maximum)</td><td rowspan="3">
</td><td>690V-R</td><td>R phase voltage input</td><td rowspan="3">Input voltage range: 0 VAC to 690 VAC
Cross-sectional area: 0.5 mm^2 to 6mm^2</td></tr>
<tr><td>690V-S</td><td>S phase voltage input</td></tr>
<tr><td>690V-T</td><td>T phase voltage input</td></tr>
<tr><td colspan="6">Note
• The phase sequence of the three-phase AC voltage on the HSVM-10 must match the phase sequence of the incoming line to the rectifier filter module. Otherwise, overcurrent faults may occur on the rectifier module.
• The X1 terminal must be connected to the AC voltage sampling terminal of the active rectifier filter module or regenerative rectifier filter module (see the MD880-40 Series Active Rectifier Hardware Guide and the MD880-30 Series Regenerative Rectifier Hardware Guide).</td></tr>
</table>

20.2.5 HSVM-20 Sync Voltage Detection Module

20.2.5.1 Introduction



Figure 20-13 Appearance of the HSVM-20 sync voltage detection module

The HSVM-20 sync voltage detection module is mainly used in DC/DC bi-directional power supply products to detect system input/output voltage and current. It transmits detected signals to the HCU control module through optical fiber for processing, enabling control and protection of the system voltage and current.

Features:

- Supports detection of one DC voltage rated at 1000 V.
- Supports detection of two voltage-type open-loop Hall signals.
- Uses optical fiber in communication, offering fast communication rate and high reliability.

- Supports side mounting, backplate mounting, and guide rail mounting, offering flexibility for layout.

20.2.5.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Guide rail mounting, side mounting, and backplate mounting
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.5.3 Outline Dimensions

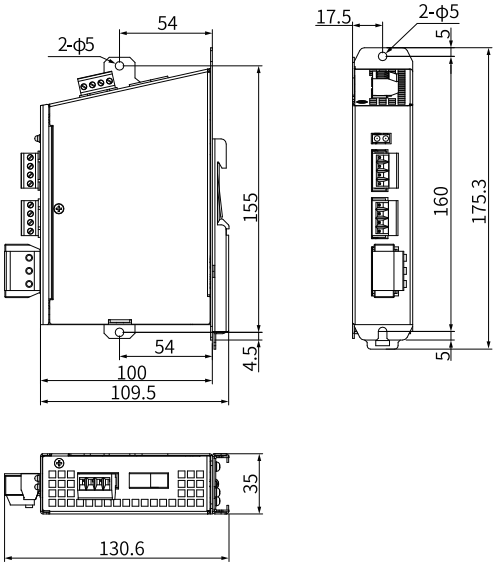


Figure 20-14 Outline dimensions (unit: mm)

20.2.5.4 Components

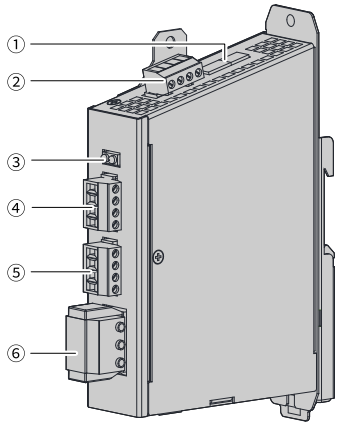


Figure 20-15 HSVM-20 interfaces

Table 20–7 Interfaces

No.	Name	Port	Description	Remarks
①	X5: Optical fiber transceiver	RXD	Receive optical fiber	Uses the dedicated Inobus communication protocol; communicates with the HCU through the HOFM optical fiber expansion module Plastic optical fiber (POF)
		TXD	Transmit optical fiber	
②	X4: 24 VDC external power terminal	24V	24 VDC	External power supply: 24 VDC±10%, 0.5 A Dual-conductor twisted pair cables recommended Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
		COM	Power ground	
③	Status indicator	PWR	Power supply status indicator	Green light steady ON: Powered normally
				Green light OFF: Not powered or power supply abnormal
		RUN	Running status indicator	Green light flashing slowly: Optical fiber communication normal
				Green light flashing fast: Optical fiber communication disconnected
				Green light steady ON/OFF: Operation abnormal
④	X3: Current detection terminal B	+15V	+15 VDC voltage	Terminal B of the Hall component for current detection Cross-sectional area: 0.5 mm^2 to 2.5 mm^2 Use a four-conductor shielded twisted pair cable with both ends grounded. The total cable length must be shorter than 1.5 m.
		–15V	–15 VDC voltage	
		GND	GND	
		IN-B	Detection current input B	
⑤	X2: Current detection terminal A	+15V	+15 VDC voltage	Terminal A of the Hall component for current detection Cross-sectional area: 0.5 mm^2 to 2.5 mm^2 Use a four-conductor shielded twisted pair cable with both ends grounded. The total cable length must be shorter than 1.5 m.
		–15V	–15 VDC voltage	
		GND	GND	
		IN-A	Detection current input A	
⑥	X1: DC voltage detection terminal	DC+	Positive input of voltage	Input voltage range: 0 VDC to 1000 VDC Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
		NC	Reserved	
		DC–	Negative input of voltage	

Note

- The positive and negative DC voltage terminals on the HSVM-20 must be consistent with those of the DC/DC output cable.
- The cable selection must meet the insulation class requirements.

20.2.6 HPG-10 HTL Incremental Encoder Signal Detection Module

20.2.6.1 Introduction



Figure 20-16 Appearance of the HPG-10 HTL incremental encoder signal detection module

The HPG-10 HTL incremental encoder signal detection module is designed to detect signals from HTL incremental encoders. It must be used with the HCU control module to provide real-time speed feedback for accurate speed control.

Features:

- Supports multi-channel signal detection for incremental encoders: A+, A–, B+, B–, Z+, and Z–.
- Supports multiple input signal types: HTL differential, HTL single-ended, open collector (OC), and open emitter (OE).
- Provides power for encoders: 5.2 VDC±5%, 200 mA; 15 VDC±10%, 200 mA; 24 VDC±10%, 200 mA.
- Allows synchronous frequency-division outputs: TTL differential or OC signal output.
- Features disconnection detection for differential input HTL encoders.
- Capable of detecting signals from one KTY84 or PTC temperature sensor to monitor motor temperature.
- Equipped with functions, such as adaptive filtering and orthogonal interlock, to improve the detection stability of the module.
- Powered by the HCU control module, requiring no external power supply.

20.2.6.2 Technical Specifications

Table 20–8 General parameters

Item		Description
Operating environment	Ambient temperature	–10°C to +55°C
	Ambient humidity	5% to 95% RH, non-condensing
Storage environment	Ambient temperature	–40°C to +70°C
	Ambient humidity	5% to 95% RH, non-condensing

Item		Description
Mechanical data	Mounting and fixing	Snap-fit joint and screw
	Protection rating	IP20
	Shock and vibration resistance	Class 3M4 in GB/T 4798.3-2007
	Safety performance	IEC/EN 61800-5-1
Power consumption	Maximum power consumption	24 VDC, 350 mA, including encoder, DI, and line losses

HTL encoder signal input terminals (X31 and X32)

Item	Description
Power supply	15 VDC±10%, 200 mA (max)
	24 VDC±10%, 200 mA (max)
	External supply voltage range: 10 VDC to 24 VDC
A, B, Z signal level range and bandwidth	Maximum signal frequency: 300 kHz
	For encoders with excessively long circuit or single-ended signals, the stability of the maximum signal frequency may be degraded.
	Level range: "0" < 1.0 V; "1" > 7.5 V

Frequency-division output (X33)

Frequency-division output signals are used to apply frequency division on encoder input signals. The frequency-division output function supports differential TTL level output and OC output, but only one output form can be used at a time.

Item	Maximum Cable Length	Frequency Division Coefficient	Frequency-Division Output Pulses
Differential TTL level output	100 m	1 to 64	The number of frequency-division output pulses refers to the number of pulses output per motor revolution.
OC output	50 m		

Disconnection detection

The HPG-10 module supports disconnection detection for differential HTL encoders, enabling online detection of whether the encoder signal or power lines are disconnected. The disconnection detection function is enabled by default. If the encoder used is not a differential HTL type, the disconnection detection function must be disabled.

20.2.6.3 Outline Dimensions

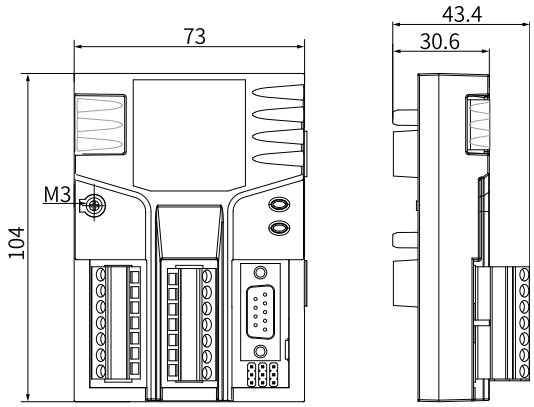


Figure 20-17 Outline dimensions (unit: mm)

20.2.6.4 Components

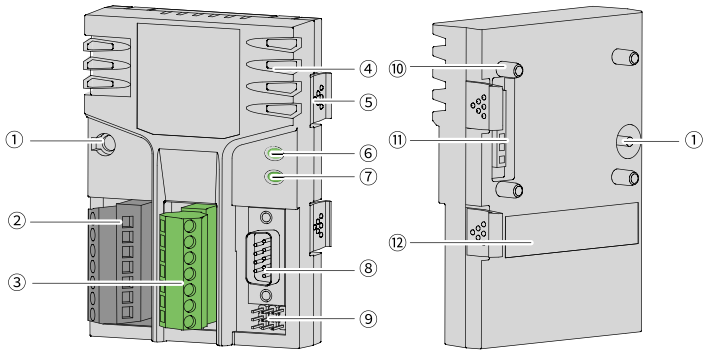


Figure 20-18 Interfaces of the HPG-10 HTL incremental encoder

Table 20–9 Interfaces of the HPG-10 HTL incremental encoder

No.	Name	Description
①	Fixing screw hole	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	X31 encoder power supply selection terminal	7-pin pluggable black terminal for encoder power output and motor temperature KTY84/ PTC signal input
③	X32 encoder signal input terminal	7-pin pluggable green terminal for HTL incremental encoder signal input
④	Heat dissipation hole	Dissipates heat
⑤	Snap-fit joint	Two in total for guiding and securing the HPG-10 module during installation
⑥	INOBUS indicator	Green light steady ON: Normal communication with the HCU control module
		Red light steady ON: Establishing communication with the HCU control module or communication failure
		Orange: Reserved
⑦	Encoder indicator	Green light steady ON: Encoder functioning normally
		Red light steady ON: Encoder disconnection fault
		Orange: Reserved

No.	Name	Description
⑧	X33 frequency-division output terminal	SUB-DB9 (pin), frequency-division output terminal, TTL differential or OC output
⑨	Frequency-division output type selection	Three 3-pin jumpers for selecting the frequency-division output type: TTL differential or OC
⑩	Guide post	Four in total for aligning the HPG-10 module with the HCU control module for easy installation
⑪	Slot terminal	Implements electrical connection between the HPG-10 module and the HCU control module
⑫	Nameplate	Includes the HPG-10 module model number and serial number

20.2.7 HPG-30 Sine/Cosine Incremental Encoder Signal Detection Module

20.2.7.1 Introduction



Figure 20-19 Appearance of the HPG-30 sine/cosine incremental encoder signal detection module

The HPG-30 sine-cosine incremental encoder signal detection module is designed to detect signals from sine-cosine incremental encoders. It also supports detection of TTL or RS422 incremental encoders<1>, 23-bit optical encoders, and EnDat 2.2 bi-directional interface/SSI serial interface absolute encoders. It must be used with the HCU control module to provide real-time speed feedback for accurate speed control.

Note

<1>: Software supporting TTL or RS422 incremental encoder functions is being developed.

Features:

- Supports multiple encoder types, including sine-cosine incremental encoders, TTL or RS422 incremental encoders, 23-bit optical encoders, and EnDat 2.2 bi-directional interface/SSI serial interface absolute encoders.
- Provides power for encoders.
- Allows synchronous frequency-division outputs: TTL differential or OC signal output.
- Features encoder disconnection detection.
- Capable of detecting signals from one external KTY84 temperature sensor to monitor motor temperature.
- Equipped with functions, such as adaptive filtering and orthogonal interlock, to improve the detection stability of the module.
- Powered by the HCU control module, requiring no external power supply.

20.2.7.2 Technical Specifications

Table 20–10 General parameters

Item		Description
Operating environment	Ambient temperature	–10°C to +55°C
	Ambient humidity	5% to 95% RH, non-condensing
Storage environment	Ambient temperature	–40°C to +70°C
	Ambient humidity	5% to 95% RH, non-condensing
Mechanical data	Installation method	Snap-fit joint and screw
	Protection rating	IP20
	Shock and vibration resistance	GB/T 2423.10-2008 Below 20 Hz: 9.8 m/s^2 (1 · g) 20 Hz to 50 Hz: 5.9 m/s^2 (0.6 · g)
	Safety performance	IEC/EN 61800-5-1
Power consumption	Maximum power consumption	5.5 VDC, 450 mA, including encoder and line losses

TTL encoder signal input terminal (X81)

Item	Description
Power supply	5.5 VDC, +5%, –8%, 180 mA (max)
Level range and bandwidth of TTL incremental encoder	Maximum signal frequency: 500 kHz
	For encoders with excessively long circuit, the stability of the maximum signal frequency may be degraded.
	Level range: "0" < 1.0 V; "1" > 3.0 V

Signal input terminal (X82) of sine-cosine incremental encoder, 23-bit optical encoder, or EnDat 2.2 bi-directional interface/SSI serial interface absolute encoder

Item	Description
Power supply	5.5 VDC, +5%, –8%, 250 mA (max)
Signal amplitude range and bandwidth of sin-cosine incremental encoder	Maximum signal frequency: 500 kHz
	For encoders with excessively long circuit, the stability of the maximum signal frequency may be degraded.
	Signal amplitude: 0.6 Vpp to 1.2 Vpp, typical: 1 Vpp
Signal amplitude range and communication rate of EnDat 2.2 absolute encoder	Maximum communication rate: 8 Mbps
	For encoders with excessively long circuit, the stability of the maximum communication rate may be degraded.
	Data input: Differential line receiver, compliant with EIA RS485 requirements on signals CLOCK+/CLOCK– and DATA+/DATA–
	Data output: Differential line receiver, compliant with EIA RS485 requirements on signals DATA+ and DATA–

Item	Description
Signal amplitude range and communication rate of SSI absolute encoder	Maximum communication rate: 2 Mbps
	For encoders with excessively long circuit, the stability of the maximum communication rate may be degraded.
	Data input: Differential line receiver, compliant with EIA RS485 requirements on signals CLOCK+ and CLOCK–
	Data output: Differential line receiver, compliant with EIA RS485 requirements on signals DATA+ and DATA–
Signal amplitude range and communication rate of 23-bit encoder	Maximum communication rate: 4 Mbps
	Data input: Differential line receiver, compliant with EIA RS485 requirements on signals CLOCK+ and CLOCK–
	Data output: Differential line receiver, compliant with EIA RS485 requirements on signals DATA+ and DATA–

Frequency-division output terminal (X83)

Frequency-division output signals are used to apply frequency division on encoder input signals. The frequency-division output function supports differential TTL level output and OC output, but only one output form can be used at a time.

Item	Maximum Cable Length	Frequency Division Coefficient	Frequency-Division Output Pulses
Differential TTL level output	100 m	1 to 64	The number of frequency-division output pulses refers to the number of pulses output per motor revolution. For more information, see the *MD880 Series High-Speed AC Drive Function Guide (HCU-50T).*
OC output	50 m		

Disconnection detection

The HPG-30 module supports disconnection detection for TTL incremental encoders, sine-cosine incremental encoders, 23-bit encoders, and EnDat 2.2 bi-directional interface/SSI serial interface absolute encoders, enabling online detection of whether the encoder signal is disconnected. The disconnection detection function is enabled by default. If the disconnection detection function is not needed, it must be disabled. For specific parameter settings, see the *MD880 Series High-Speed AC Drive Function Guide (HCU-50T)*.

20.2.7.3 Outline Dimensions

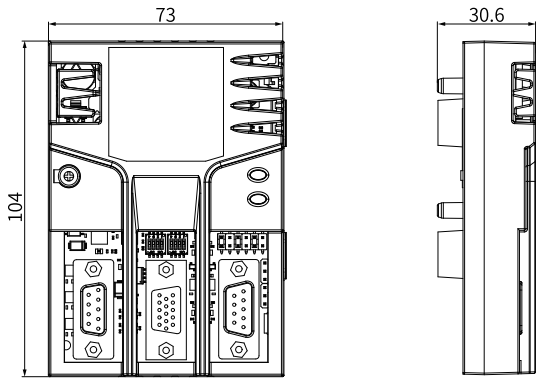


Figure 20-20 Product dimensions (unit: mm)

20.2.7.4 Components

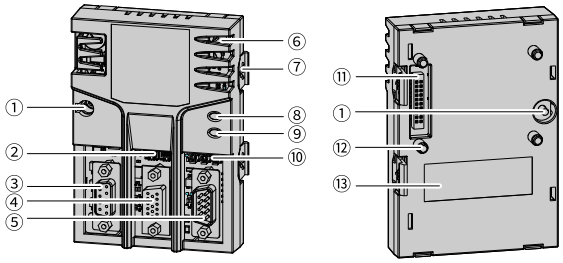


Figure 20-21 Product diagram

Table 20–11 HPG-30 module components

No.	Name	Description
①	Fixing screw hole	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	Encoder type selection	Two 4-bit DIP switches for selecting the connection to a sine-cosine incremental encoder, 23-bit optical encoder, or EnDat 2.2 bi-directional interface/SSI serial interface absolute encoder
③	X81 encoder signal input terminal	SUB-DB9 (hole) for signal input from TTL incremental encoders
④	X82 encoder signal input terminal	SUB-DB15 (hole) for signal input from sine-cosine incremental encoders, 23-bit optical encoders, or EnDat 2.2 bi-directional interface/SSI serial interface absolute encoders
⑤	X83 frequency-division output terminal	SUB-DB9 (pin), frequency-division output terminal, TTL differential or OC output
⑥	Heat dissipation hole	Dissipates heat
⑦	Snap-fit joint	Two in total for guiding and securing the HPG-30 module during installation
⑧	INOBUS indicator	Green light steady ON: Normal communication with the HCU control module
		Red light steady ON: Establishing communication with the HCU control module or communication failure
		Orange: Reserved
⑨	Encoder indicator	Green light steady ON: Encoder functioning normally
		Red light steady ON: Encoder disconnection fault
		Orange light flashing: Reserved
⑩	Frequency-division output type selection	One dual-row 6-pin jumper for selecting the frequency-division output type: TTL differential or OC
⑪	Slot terminal	Implements electrical connection between the HPG-30 module and the HCU control module
⑫	Guide post	Four in total for aligning the HPG-30 module with the HCU control module for easy installation
⑬	Nameplate	Includes the HPG-30 module model number and serial number

20.2.8 HPG-40 Resolver Signal Detection Module

20.2.8.1 Introduction

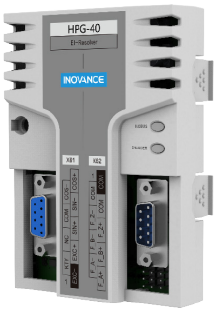


Figure 20-22 Appearance of the HPG-40 HTL resolver signal detection module

The HPG-40 resolver signal detection module is mainly used for the MD880 series AC drives. It works with the HCU control module of the drive to measure the motor rotational speed by detecting resolver output signals, providing real-time speed feedback for accurate speed control.

Features:

- Supports resolvers with various transformation ratios and amplitudes.
- Offers two types of external synchronous frequency-division signal outputs: TTL differential or OC signal output.
- Features disconnection detection for resolver feedback signals.
- Supports detection of signals from one external KTY84 temperature sensor.
- Installed directly onto the HCU control module without the need for an external power supply.

20.2.8.2 Technical Specifications

Table 20–12 General parameters

Item	Description
Ambient temperature	–10°C to +55°C
Ambient humidity	5% to 95% RH, non-condensing
Storage temperature	–40°C to +70°C
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Cooling method	Naturally ventilated

Resolver signal terminal (X61)

The resolver signal terminal includes one set of excitation signals (EXC), one KTY84 temperature sensor detection signal, and two sets of feedback signals (SIN and COS).

Table 20–13 Resolver signal terminal

Item	Description
Excitation signal output	Resolver excitation signals EXC+ and EXC–
	Maximum output current Ipeak: 120 mA
Resolver feedback signal input	Feedback signals SIN+ and SIN–
	Feedback signals COS+ and COS–
Temperature detection	KTY84 temperature sensor signal detection function

Frequency-division output terminal (X62)

Frequency-division output signals are used to apply frequency division on resolver input signals. The frequency-division output function supports differential TTL level output and OC output, but only one output form can be used at a time.

Table 20–14 Frequency-division output terminal

Item	Maximum Cable Length	Frequency Division Coefficient	Frequency-Division Output Pulses
Differential TTL level output	100 m	1 to 64 (n4-09)	The number of pulses output per motor revolution is calculated by dividing a base of 1024 pulses by the division coefficient for frequency division output. The default division coefficient is 1.
OC output	50 m		

20.2.8.3 Outline Dimensions

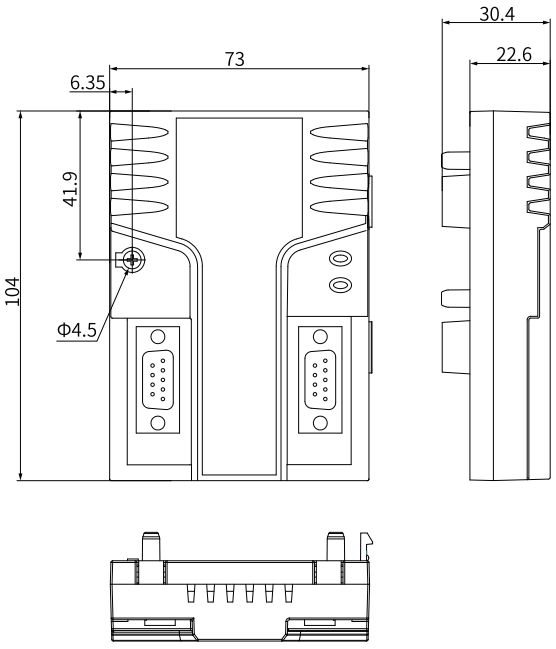


Figure 20-23 Outline dimensions (unit: mm)

20.2.8.4 Components

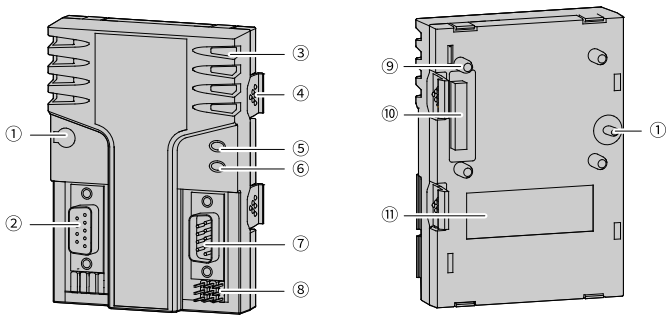


Figure 20-24 Product diagram

No.	Name	Description
①	Fixing screw hole	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	X61 resolver signal terminal	SUB-DB9 (hole) for resolver excitation voltage output, sine/cosine feedback signal input, and KTY84 temperature sensor signal input
③	Heat dissipation hole	Dissipates heat
④	Snap-fit joint	Two in total for guiding and securing the HPG-40 module during installation
⑤	INOBUS indicator	Green light steady ON: Normal communication with the HCU control module
		Red light steady ON: Establishing communication with the HCU control module or communication failure
⑥	Encoder indicator	Green light steady ON: Encoder functioning normally
		Red light steady ON: Encoder disconnection fault
		Yellow light steady ON: Encoder signal weak or tracking failed
⑦	X62 frequency-division output terminal	SUB-DB9 (pin), frequency-division output terminal, TTL differential or OC output
⑧	Frequency-division output type selection	Three 3-pin jumpers for selecting the frequency-division output type: TTL differential or OC
⑨	Guide post	Four in total for aligning the HPG-40 module with the HCU control module for easy installation
⑩	Slot terminal	Implements electrical connection between the HPG-40 module and the HCU control module
⑪	Nameplate	Includes the HPG-40 module model number and serial number

20.2.9 HPG-50 TTL Incremental Encoder Signal Detection Module

20.2.9.1 Introduction



Figure 20-25 Appearance of the HPG-50 TTL incremental encoder signal detection module

The HPG-50 TTL/RS422 incremental encoder signal detection module is designed to detect signals from TTL or RS422 incremental encoders. It must be used with the HCU control module to provide real-time speed feedback for accurate speed control.

Features:

- Supports multi-channel signal detection for incremental encoders: A+, A–, B+, B–, Z+, and Z–.
- Provides power for encoders: 5.2 VDC±5%, 200 mA; 15 VDC±10%, 200 mA; 24 VDC±10%, 200 mA.
- Supports TTL differential signal input and RS422 signal input.
- Offers two types of external synchronous frequency-division signal outputs: TTL differential or OC signal output.
- Features disconnection detection for encoder power, ground, and signals.
- Capable of detecting signals from one KTY84 or PTC temperature sensor to monitor motor temperature.
- Equipped with functions, such as adaptive filtering and orthogonal interlock, to improve the detection stability of the module.
- Powered by the HCU control module, requiring no external power supply.

20.2.9.2 Technical Specifications

Table 20–15 General parameters

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Maximum power consumption	24 VDC, 350 mA, including encoder and line losses
Cooling method	Naturally ventilated

TTL encoder signal input terminals (X81 and X82)

Item	Description
Power supply	5.2 VDC±5%, 200 mA (max)
	15 VDC±10%, 200 mA (max)
	24 VDC±10%, 200 mA (max)
	External supply voltage range: 10 VDC to 24 VDC
A, B, Z signal level range and bandwidth	Maximum signal frequency: 300 kHz
	For encoders with excessively long circuit or single-ended signals, the stability of the maximum signal frequency may be degraded.
	Level range: "0" < 1.0 V; "1" > 3.0 V

Frequency-division output (X83)

Frequency-division output signals are used to apply frequency division on encoder input signals. The frequency-division output function supports differential TTL level output and OC output, but only one output form can be used at a time.

Item	Maximum Cable Length	Frequency Division Coefficient	Frequency-Division Output Pulses
Differential TTL level output	100 m	1 to 64	The number of frequency-division output pulses refers to the number of pulses output per motor revolution. For more information, see the *MD880-50 Series Inverter Hardware Guide*.
OC output	50 m		

Disconnection detection

The HPG-50 module supports encoder disconnection detection, enabling online detection of whether the encoder signal or power lines are disconnected. The disconnection detection function is enabled by default. There are options to disable the detection or select ABZ differential or AB differential disconnection detection modes. For specific parameter settings, see the *MD880-50 Series Inverter Software Guide*.

20.2.9.3 Outline Dimensions

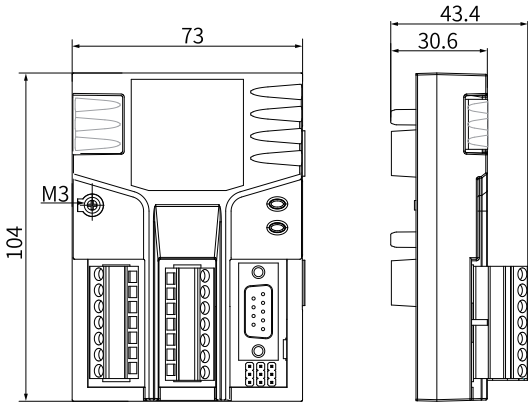


Figure 20-26 Outline dimensions (unit: mm)

20.2.9.4 Components

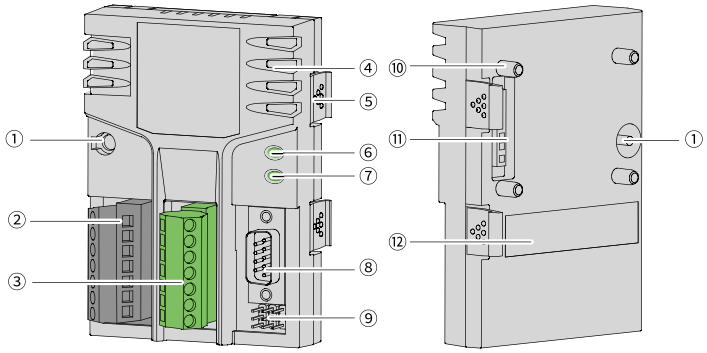


Figure 20-27 Interfaces of the HPG-50 TTL encoder

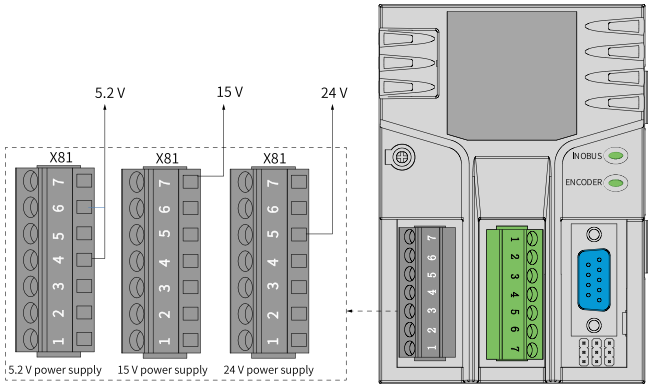


Figure 20-28 Diagram of short-circuiting the encoder power supply

Table 20–16 Interfaces of the HPG-50 TTL incremental encoder

No.	Name	Description
①	Fixing screw hole	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	X81 encoder power supply selection terminal	7-pin pluggable black terminal for encoder power output and motor temperature KTY84/ PTC signal input
③	X82 encoder signal input terminal	7-pin pluggable green terminal for TTL incremental encoder signal input
④	Heat dissipation hole	Dissipates heat
⑤	Snap-fit joint	Two in total for guiding and securing the HPG-50 module during installation
⑥	INOBUS indicator	Green light steady ON: Normal communication with the HCU control module
		Red light steady ON: Establishing communication with the HCU control module or communication failure
		Orange: Reserved
⑦	Encoder indicator	Green light steady ON: Encoder functioning normally
		Red light steady ON: Encoder disconnection fault
		Orange: Reserved
⑧	X83 frequency-division output terminal	SUB-DB9 (pin), frequency-division output terminal, TTL differential or OC output

No.	Name	Description
⑨	Frequency-division output type selection	Three 3-pin jumpers for selecting the frequency-division output type: TTL differential or OC. See the table of frequency-division output type selection.
⑩	Guide post	Four in total for aligning the HPG-50 module with the HCU control module for easy installation
⑪	Slot terminal	Implements electrical connection between the HPG-50 module and the HCU control module
⑫	Nameplate	Includes the HPG-50 module model number and serial number

Table 20–17 Assignment of the encoder power terminal X81

X81	Assignment	Function
X81-1	SHELD	Shielding
X81-2	COM	Grounding
X81-3	KTY84	Motor temperature KTY84/PTC
X81-4	VCC_EN	5.2 VDC power supply
X81-5	24 VDC	24 VDC power supply
X81-6	VCC_EN	5.2 VDC power supply
X81-7	15 VDC	15 VDC power supply

Caution

Choosing an inappropriate power supply voltage may damage the encoder.

Table 20–18 Correspondence between encoder signals and HPG-50 pins

Encoder Signal	Terminal Pin	Wiring	Recommended Cable Specifications
A+	X82-1	Twisted pair	Eight-conductor shielded twisted pair cable Cross-sectional area: 0.5 mm^2 to 2.5 mm^2 It is recommended to use a cable with a large cross-sectional area to reduce loss of power and signals on the cable.
A–	X82-2		
B+	X82-3	Twisted pair	
B–	X82-4		
Z+	X82-5	Twisted pair	
Z–	X82-6		
VCC	X81-4	Twisted pair	
0 V	X81-2		
SHELD	X81-1	Shield	

Table 20–19 Assignment of the frequency-division differential signal output terminal

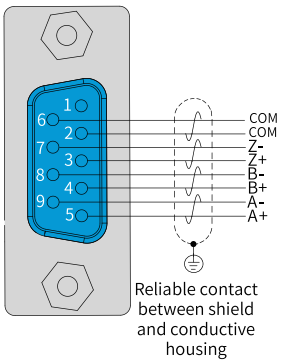
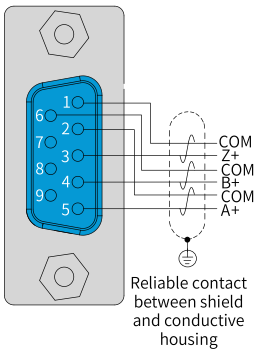
X83	Assignment	Function	Wiring	Recommended Cable Specifications
X83-1	COM	GND	-	Eight-conductor shielded twisted pair cable Cross-sectional area: 0.5 mm^2 to 1.0 mm^2 
X83-2	COM	GND	Twisted pair	
X83-6	COM	GND		
X83-5	FO_A+	A+	Twisted pair	
X83-9	FO_A–	A–		
X83-4	FO_B+	B+	Twisted pair	
X83-8	FO_B–	B–		
X83-3	FO_Z+	Z+	Twisted pair	
X83-7	FO_Z–	Z–		

Table 20–20 Assignment of the frequency-division OC signal output terminal

X83	Assignment	Function	Wiring	Recommended Cable Specifications
X83-1	COM	GND	Twisted pair	Six-conductor shielded twisted pair cable Cross-sectional area: 0.5 mm2 to 1.0 mm2 
X83-3	FO_Z+	Z+		
X83-2	COM	GND	Twisted pair	
X83-4	FO_B+	B+		
X83-5	FO_A+	A+	Twisted pair	
X83-6	COM	GND		

20.2.10 HOFM-10/30 Optical Fiber Expansion Module

20.2.10.1 Introduction

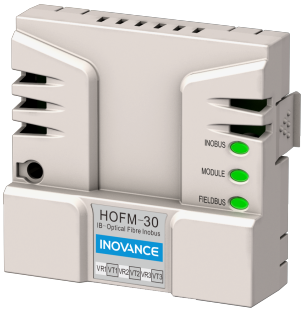


Figure 20-29 Appearance of the HOFM-10/30 optical fiber expansion module

The HOFM-10/30 optical fiber expansion module is mainly used for function module expansion. The HOFM-10 provides one pair of optical fiber interfaces, while the HOFM-30 provides three pairs of optical fiber interfaces. The maximum optical fiber transmit and receive rate is 10 Mbps for both modules. These modules must be used with the function expansion slot of the HCU control module.

Features:

- Can be directly installed in a slot of the HCU control module, powered by the HCU control module without requiring an external power supply, enabling optical fiber expansion.
- Works with the HESD module to enable slot expansion for the HCU control module.
- Works with the HSVM module to enable AC line voltage detection for MD880 active rectifiers and regenerative rectifiers.
- Works with the HCU control module to enable communication with the interface board of the HE200 series products.
- Works with the HCU and HOFR modules to enable information interaction or master-slave synchronization for up to 10 HCU modules.

20.2.10.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Relative humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation altitude	⩽ 2000 m
Installation method	Snap-fit joint and screw tightening
Vibration	< 20 Hz: 9.8 m/s^2 20 Hz to 50 Hz: 5.9 m/s^2

Item	Description
Protection rating	Enclosure IP rating: IP20
Compliance	EN 61800-5-1:2007 EN 61800-3:2004 IEC/EN 62109-1:2010 UL508C:2002

20.2.10.3 Outline Dimensions

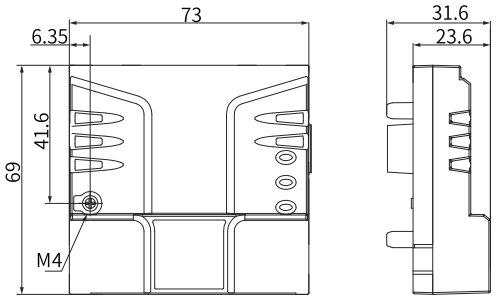


Figure 20-30 Outline dimensions (unit: mm)

20.2.10.4 Components

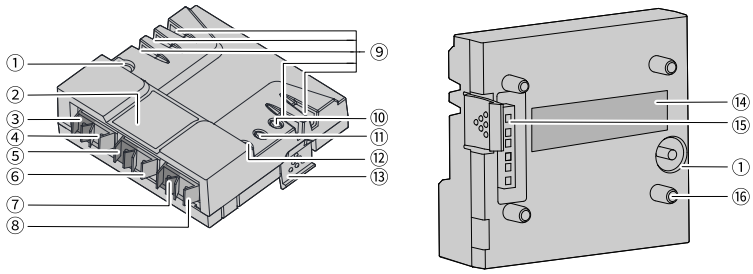


Figure 20-31 Interfaces of the HOFM-10/30 optical fiber expansion module

Table 20–21 Interfaces of the HOFM-10/30 optical fiber expansion module

No.	Name	Description
①	Grounding and fixing screw	Module grounding and fastening
②	Label	Module name and description of the optical fiber interface function
③	VR1	No. 1 receive interface for HOFM-30 optical fiber communication; black Communication rate: 10 Mbps; communication protocol: Inobus
④	VT1	No. 1 transmit interface for HOFM-30 optical fiber communication; gray Communication rate: 10 Mbps; communication protocol: Inobus
⑤	VR2	No. 2 receive interface for HOFM-10/30 optical fiber communication; black Communication rate: 10 Mbps; communication protocol: Inobus
⑥	VT2	No. 2 transmit interface for HOFM-10/30 optical fiber communication; gray Communication rate: 10 Mbps; communication protocol: Inobus

No.	Name	Description
⑦	VR3	No. 3 receive interface for HOFM-30 optical fiber communication; black Communication rate: 10 Mbps; communication protocol: Inobus
⑧	VT3	No. 3 transmit interface for HOFM-30 optical fiber communication; gray Communication rate: 10 Mbps; communication protocol: Inobus
⑨	Heat dissipation hole	Dissipates heat
⑩	INOBUS indicator	Reserved
⑪	MODULE indicator	Indicates power supply status: Green light steady ON: HCU power supply normal OFF: Power supply abnormal
⑫	FIELDBUS indicator	Reserved
⑬	Snap-fit joint	Mechanically fixes the HOFM-10/30 to the HCU control module
⑭	Nameplate	Includes the product model number and serial number
⑮	Slot connector	Connects the HOFM-10/30 to the HCU control module
⑯	Guide post	Aligns the HOFM-10/30 with the HCU control module for easy installation

20.2.11 HCAN-10 Fieldbus Adapter Module

20.2.11.1 Introduction

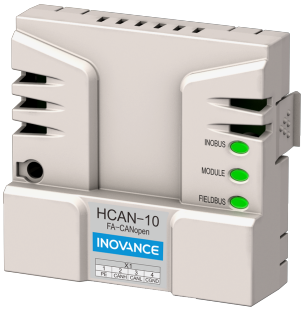


Figure 20-32 Appearance of the HCAN-10 fieldbus adapter module

The HCAN-10 is a new-generation fieldbus adapter module from Inovance. It works with the HCU control module for the MD880 series products to enable networking and remote control of multi-drive systems through the CANopen fieldbus communication network.

Features:

- Supports the Node Guard protocol, based on which the master station can read device status.
- Supports the Heartbeat protocol, based on which the slave station periodically reports its status to the master station.
- Supports transmission of PDO data which is 16-bit.
- Supports transmission of SDO data only through the expedited transfer mechanism. Up to four channels of data can be transmitted per frame.
- All command CANIDs follow the default values of the DS301 pre-defined connection set.

- Directly installed in the expansion slot of the HCU control module, requiring no external power supply.

20.2.11.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw tightening
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.11.3 Outline Dimensions

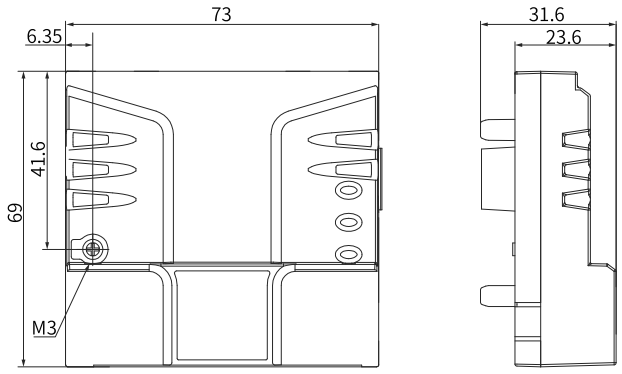


Figure 20-33 Outline dimensions (unit: mm)

20.2.11.4 Components

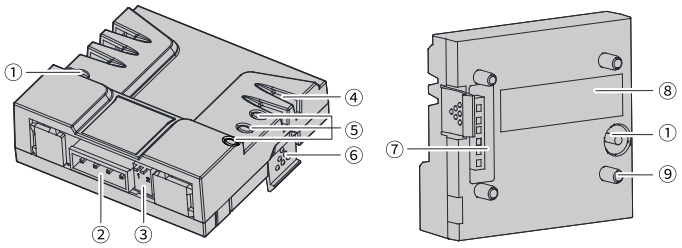


Figure 20-34 HCAN-10 diagram

No.	Name	Description
①	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	Bus communication terminal	CANopen bus communication terminal
③	Resistor DIP switch	CAN bus termination resistor
④	Heat dissipation hole	Dissipates heat

No.	Name	Description
⑤	Status indicator	Indicates module running status
⑥	Snap-fit joint	Fastens the module
⑦	Slot terminal	Implements electrical connection to the HCU control module
⑧	Nameplate	Includes the HCAN-10 module model number and serial number
⑨	Guide post	Aligns the HCAN-10 module with the HCU control module for easy installation

20.2.12 HCAN-30 Fieldbus Adapter Module

20.2.12.1 Introduction



Figure 20-35 Appearance of the HCAN-30 fieldbus adapter module

The HCAN-30 is a new-generation fieldbus adapter module from Inovance. It works with the HCU control module for the MD880 series products to enable networking and remote control of multi-drive systems through the CAN 2.0 fieldbus communication network. The HCAN-30 offers excellent compatibility and is suitable for the MD880 series products.

Features:

- Supports standard frame and extended frame types.
- Supports transmission of up to 16 PDOs and receiving of up to 16 PDOs, with all data being 16-bit.
- Supports SDO-based parameter read/write.
- Directly installed in the expansion slot of the HCU control module, requiring no external power supply.

20.2.12.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw tightening
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.12.3 Outline Dimensions

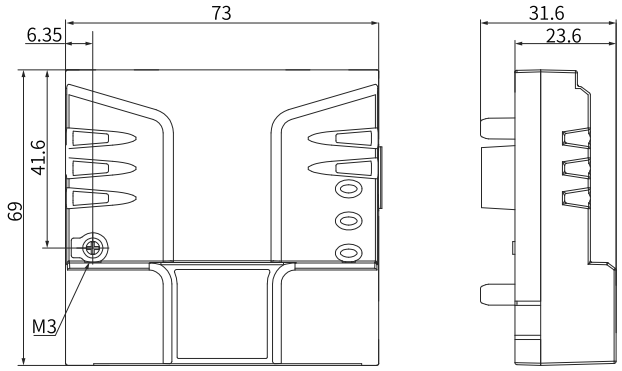


Figure 20-36 Outline dimensions (unit: mm)

20.2.12.4 Components

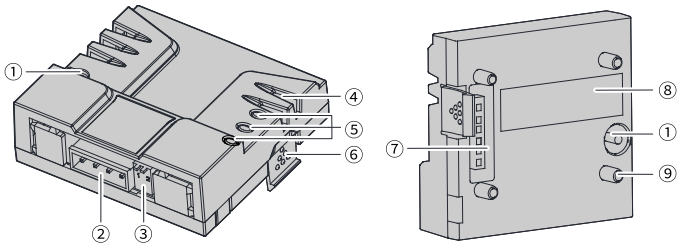


Figure 20-37 HCAN-30 diagram

No.	Name	Description
①	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	Bus communication terminal	CAN 2.0 bus communication terminals
③	Resistor DIP switch	CAN bus termination resistor
④	Heat dissipation hole	Dissipates heat
⑤	Status indicator	Indicates module running status
⑥	Snap-fit joint	Fastens the module
⑦	Slot terminal	Implements electrical connection to the HCU control module
⑧	Nameplate	Includes the HCAN-30 module model number and serial number
⑨	Guide post	Aligns the HCAN-30 module with the HCU control module for easy installation

20.2.13 HMBA-10 Modbus RTU Fieldbus Adapter

20.2.13.1 Introduction

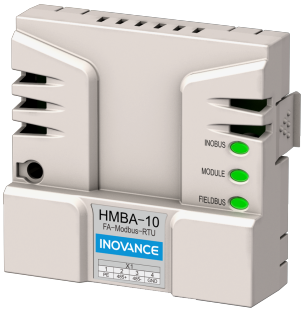


Figure 20-38 Appearance of the HMBA-10 Modbus RTU fieldbus adapter

- The HMBA-10 is a new-generation fieldbus adapter module from Inovance. It works with the HCU control module to enable networking and remote control of multi-drive systems through the Modbus RTU communication network.

20.2.13.2 Technical Specifications

Table 20–22 Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Relative humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation altitude	⩽ 2000 m
Installation method	Snap-fit joint and screw tightening
Vibration	< 20 Hz: 9.8 m/s^2 20 Hz to 50 Hz: 5.9 m/s^2
Protection rating	Enclosure IP rating: IP20
Compliance	EN 61800-5-1:2007 EN 61800-3:2004 IEC/EN 62109-1:2010 UL508C:2002

20.2.13.3 Outline Dimensions

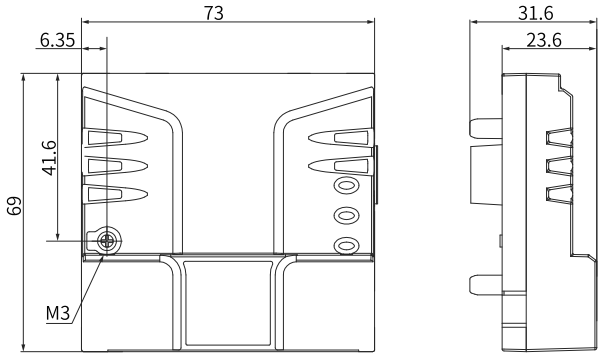


Figure 20-39 Outline dimensions (unit: mm)

20.2.13.4 Components

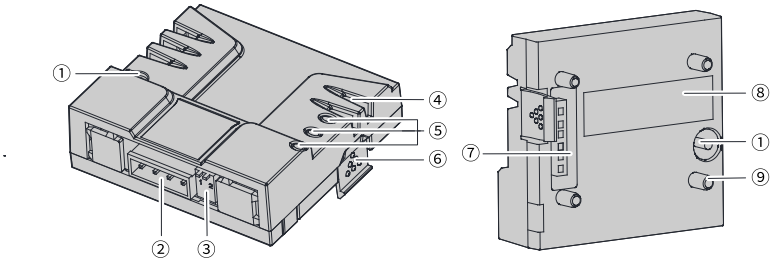


Figure 20-40 Product diagram

Table 20–23 Interfaces

No.	Name	Description
①	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	Bus communication terminal	Modbus RTU bus communication terminal
③	Resistor DIP switch	Termination resistor
④	Heat dissipation hole	Dissipates heat
⑤	Status indicator	Indicates module running status
⑥	Snap-fit joint	Fastens the module
⑦	Slot terminal	Implements electrical connection to the HCU control module
⑧	Nameplate	Includes the module model number and serial number
⑨	Guide post	Aligns the HMBA-10 module with the HCU control module for easy installation

20.2.14 HDP-10 PROFIBUS DP Fieldbus Adapter Module

20.2.14.1 Introduction

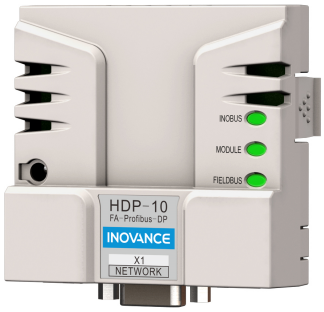


Figure 20-41 Appearance of the HDP-10 PROFIBUS DP fieldbus adapter module

The HDP-10 is a PROFIBUS DP fieldbus adapter module that must be used with the HCU control module from Inovance. It is installed and fixed in a slot of the HCU or HESD-10 function expansion module. It communicates with the bus master through the PROFIBUS DP communication protocol.

- Automatically defects the bus baud rate, supporting a communication rate range of 9.6 kbps to 12 Mbps.
- In a bus topology, supports up to 32 nodes (including the master) without a repeater; with a repeater, supports up to 122 nodes (31 nodes per segment plus 1 repeater).
- Complies with the EMC standard EN 61800-3:2004.
- Supports cyclic and acyclic data exchange methods.
- Powered by the HCU or HESD-10 module, requiring no external power supply.

20.2.14.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw tightening
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.14.3 Outline Dimensions

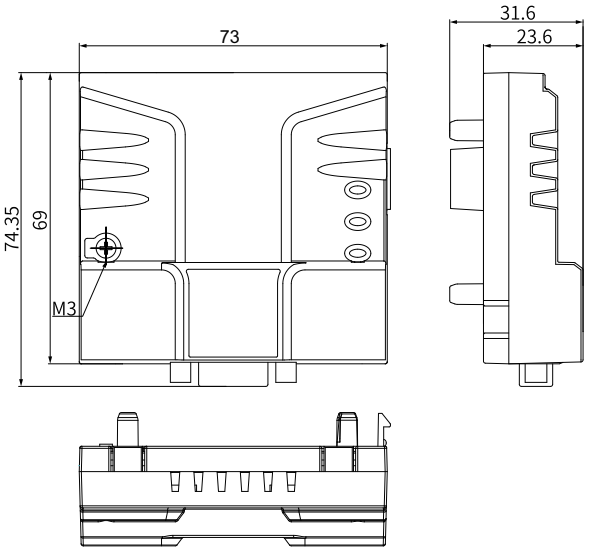


Figure 20-42 Outline dimensions (unit: mm)

20.2.14.4 Components

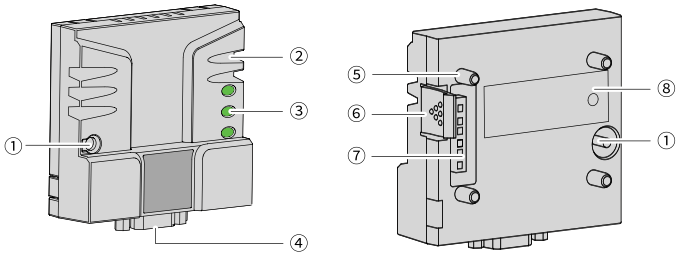


Figure 20-43 Product diagram

Table 20–24 Interfaces

No.	Name	Description
①	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	Heat dissipation hole	Dissipates heat
③	Communication status indicator	Indicates module communication status
④	Bus communication terminal	PROFIBUS DP bus communication terminal
⑤	Guide post	Aligns the HDP-10 module with the HCU control module for easy installation
⑥	Snap-fit joint	Fastens the module
⑦	Slot terminal	Implements electrical connection to the HCU
⑧	Nameplate	Includes the module model number and serial number

20.2.15 HPFN-10 PROFINET IO Industrial Ethernet Adapter Module

20.2.15.1 Introduction



Figure 20-44 Appearance of the HPFN-10 PROFINET IO industrial Ethernet adapter module

This PROFINET IO industrial Ethernet adapter module (hereinafter referred to as "HPFN-10") complies with the internationally recognized PROFINET IO industrial Ethernet standard. The HPFN-10 can be used on MD880 series AC multidrive to turn the drive into a PROFINET IO slave controlled by the PROFINET IO master. This improves the communication efficiency of the system and enriches the networking functions of the MD880 series drives.

- Up to 100 Mbps bus communication rate and short communication cycle.
- Supports almost all types of topologies including chain, bus, tree, and star topologies.
- Adopts the distributed clock, with data exchange implemented through a pure hardware mechanism, improving the timing accuracy of data exchange.
- Directly installed in the expansion slot of the HCU control module, requiring no external power supply.

20.2.15.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.15.3 Outline Dimensions

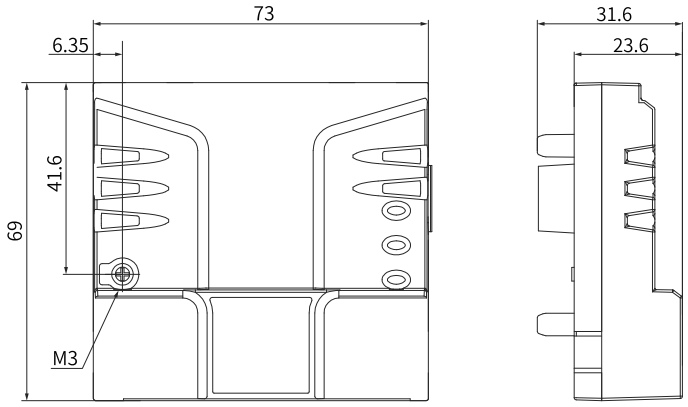


Figure 20-45 Outline dimensions (unit: mm)

20.2.15.4 Components

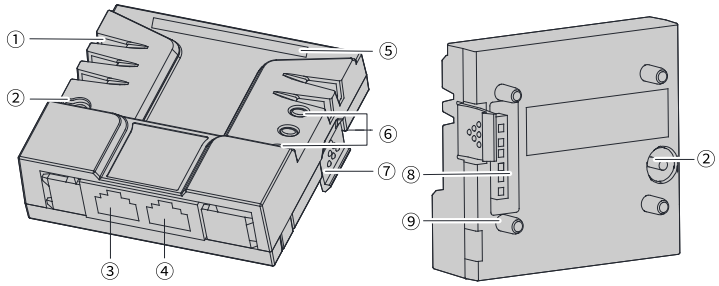


Figure 20-46 Product diagram

Table 20–25 Interfaces

No.	Name	Description
①	Heat dissipation hole	Dissipates heat
②	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
③	PROFINET IO communication terminal X1	Communication terminal 1
④	PROFINET IO communication terminal X2	Communication terminal 2
⑤	MAC address label	Indicates local MAC address
⑥	Status indicator	Indicates module and bus running status
⑦	Snap-fit joint	Fastens the module
⑧	Slot terminal	Implements electrical connection to the HCU control module
⑨	Guide post	Aligns the HPFN-10 module with the HCU control module for easy installation

20.2.16 HMBT-10 Modbus TCP Adapter Module

20.2.16.1 Introduction

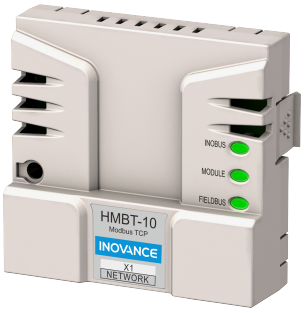


Figure 20-47 Appearance of the HMBT-10 Modbus TCP adapter module

This Modbus TCP adapter module (hereinafter referred to as "HMBT-10") complies with the internationally recognized Modbus TCP standard. The HMBT-10 can be used on MD880 series AC drives to turn the drive into a Modbus TCP slave controlled by the Modbus TCP master. This improves the communication efficiency of the system and enriches the networking functions of the MD880 series drives.

- Supports switch networking instead of router networking.
- Supports up to two Modbus TCP client connections, with a minimum communication cycle of 6 ms, or 12 ms when two clients are connected.
- Supports reading of up to 123 parameters in a single operation.
- Supports networking of up to 253 devices.
- Supports up to 100 m transmission distance between the module and the switch.

20.2.16.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.16.3 Outline Dimensions

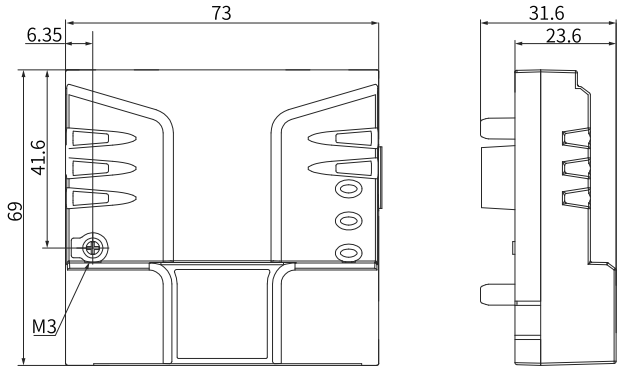


Figure 20-48 Outline dimensions (unit: mm)

20.2.16.4 Components

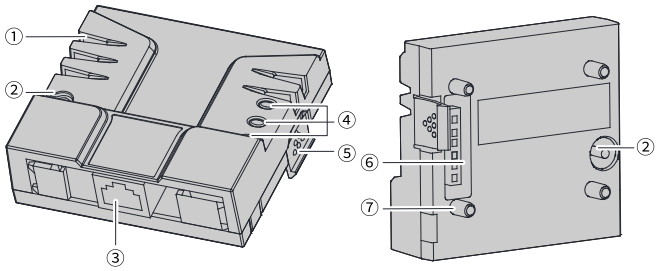


Figure 20-49 Product diagram

Table 20–26 Interfaces

No.	Name	Description
①	Heat dissipation hole	Dissipates heat
②	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
③	Modbus TCP communication terminal X1	Standard Ethernet RJ45 communication terminal
④	Status indicator	Indicates module and bus running status
⑤	Snap-fit joint	Fastens the module
⑥	Slot terminal	Implements electrical connection to the HCU control module
⑦	Guide post	Aligns the HMBT-10 module with the HCU control module for easy installation

20.2.17 HETC-10 EtherCAT Industrial Bus Module

20.2.17.1 Introduction



Figure 20-50 Appearance of the HETC-10 EtherCAT industrial bus module

This EtherCAT industrial Ethernet bus slave module (hereinafter referred to as "HETC-10") complies with the internationally recognized EtherCAT industrial Ethernet standard. The HETC-10 can be used on MD880 series AC drives to turn the drive into an EtherCAT slave controlled by the EtherCAT master. This improves the communication efficiency of the system and enriches the networking functions of the MD880 series drives.

- Passed the Conformance Test Tool (CTT) test.
- Supports up to 16 RXPDOs and 16 TXPDOs, and supports dynamic configuration of PDOs.
- Supports DC synchronous clock mode.
- Supports CoE protocol (PDO+SDO).
- Features a minimum DC cycle of 250 μs (standard version).
- Supports multiple types of topologies including chain, bus, tree, and star topologies.
- Directly installed in the expansion slot of the HCU control module, requiring no external power supply.

20.2.17.2 Technical Specifications

Table 20–27 Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.17.3 Outline Dimensions

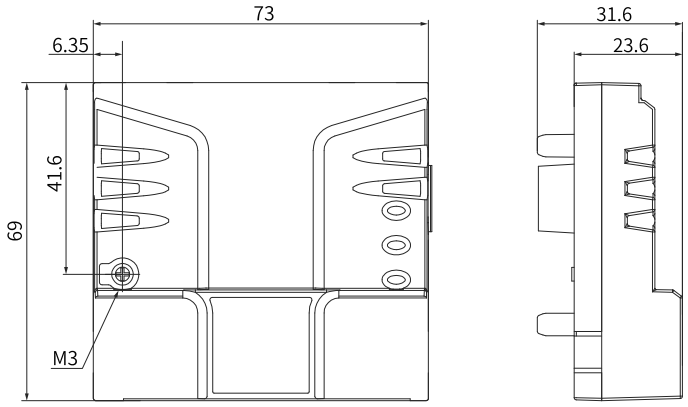


Figure 20-51 Outline dimensions (unit: mm)

20.2.17.4 Components

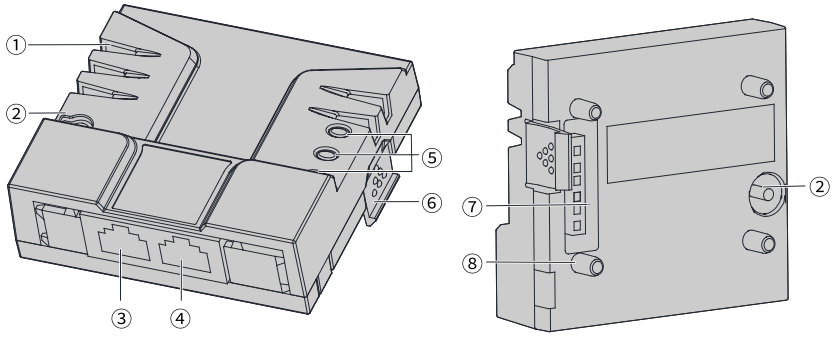


Figure 20-52 Product diagram

Table 20–28 Interfaces

No.	Name	Description
①	Heat dissipation hole	Dissipates heat
②	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
③	EtherCAT communication terminal X1	Communication input terminal
④	EtherCAT communication terminal X2	Communication output terminal
⑤	Status indicator	Indicates module and bus running status
⑥	Snap-fit joint	Fastens the module
⑦	Slot terminal	Implements electrical connection to the HCU control module
⑧	Guide post	Aligns the HETC-10 module with the HCU control module for easy installation

20.2.18 HETN-10 Ethernet Commissioning Module

20.2.18.1 Introduction

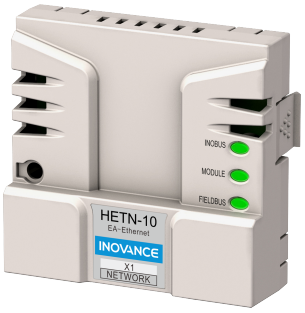


Figure 20-53 Appearance of the HETN-10 Ethernet commissioning module

This Ethernet commissioning module (hereinafter referred to as "HETN-10") complies with the internationally recognized Ethernet standard. The HETN-10 can be used on MD880 series AC multidrive to turn the drive into an Ethernet slave controlled by the Ethernet master. This improves the communication efficiency of the system and enriches the networking functions of the MD880 series drives.

Features:

- Supports switch networking instead of router networking.
- Supports the 100 Mbps full-duplex network.
- Works with InoDriveStudio to implement commissioning functions.
- Supports networking of up to 253 devices.
- Supports up to 100 m transmission distance between the module and the switch.

20.2.18.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.18.3 Outline Dimensions

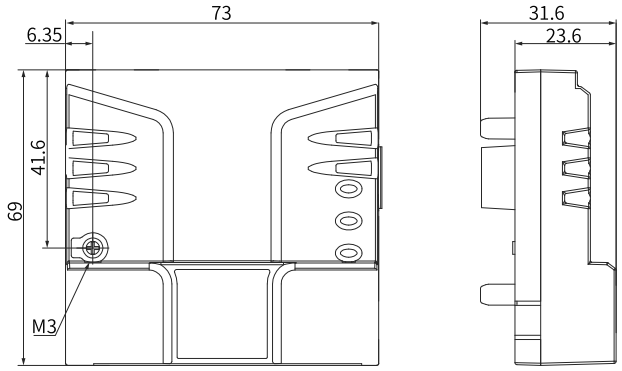


Figure 20-54 Outline dimensions (unit: mm)

20.2.18.4 Components

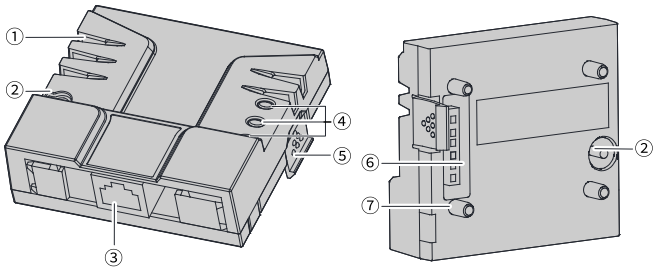


Figure 20-55 Product diagram

No.	Name	Description
①	Heat dissipation hole	Dissipates heat from the module
②	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
③	Ethernet communication terminal X1	Standard Ethernet RJ45 communication terminal
④	Status indicator	Indicates module and bus running status
⑤	Snap-fit joint	Fastens the module
⑥	Slot terminal	Implements electrical connection to the HCU control module
⑦	Guide post	Aligns the HETN-10 module with the HCU control module for easy installation

20.2.19 HOFR-50 Optical Fiber Router Control Module

20.2.19.1 Introduction

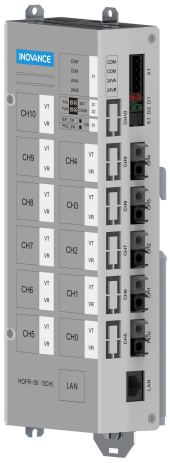


Figure 20-56 Appearance of the HOFR-50 optical fiber routing control module

The HOFR-50 optical fiber router control module is mainly used for data exchange between MD880 series drives.

The HOFR-50 module can achieve data exchange among up to five HCU control modules, in which each HCU control module serves as a network node that can be combined with data of any other three nodes for easy control. There is no master/slave relationship among the nodes. The module acts as a data switch.

Features:

- Adopts optical fiber communication with fast communication rates and high system reliability.
- Supports data exchange among up to five HCU control modules.
- Supports each node to read data of any other three nodes.
- Supports guide rail mounting for flexible installation.

20.2.19.2 Technical Specifications

Item	Description
Input voltage	24.0 V±10%, 0.5 A
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Guide rail mounting
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.19.3 Outline Dimensions

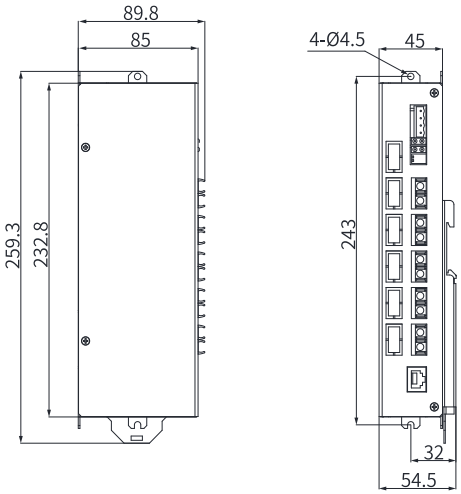


Figure 20-57 Outline dimensions (unit: mm)

20.2.19.4 Components

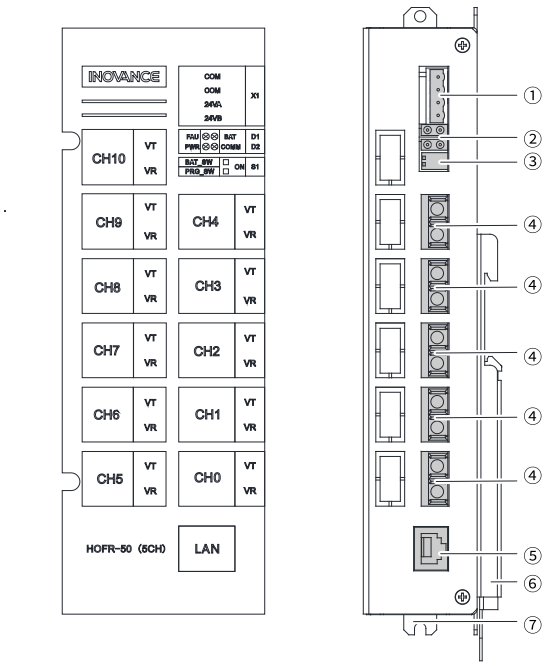


Figure 20-58 Product diagram

Table 20–29 Interfaces of the HOFR-50 optical fiber router control module

No.	Name	Port	Description	Remarks
①	Power supply X1	COM	24 V power supply ground	External power supply of HOFR X1 terminal: 5.08 mm pitch, 4-pin black pluggable terminal Twisted pair cable is recommended. Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
		COM	24 V power supply ground	
		24VA	24 V power supply +	
		24VB	24 V power supply +	
②	LED indicator	PWR	Green light steady ON	The power supply of the HOFR-50 module is normal.
			OFF	The HOFR-50 module does not have a power supply or the power supply is faulty.
		RUN	Green light flashing	The HOFR-50 module is in the operational state.
			OFF	The HOFR-50 module is in the stop state.
		FAU	Reserved	-
		BAT	Reserved	-
③	DIP switch S1	BAT_SW	Reserved	-
		PRG_SW	Reserved	-
④	Optical fiber transceiver	CH0 to CH4	Channel 0 to channel 4	VT: 50 M transmit optical fiber communication VR: 50 M receive optical fiber communication Optical fiber type: Plastic optical fiber (POF)
⑤	LAN	-	Reserved	-
⑥	Guide rail groove	-	For guide rail mounting	-
⑦	Mounting hole	-	Four holes for securing installation	-

20.2.20 HIO-10 I/O Function Module

20.2.20.1 Introduction

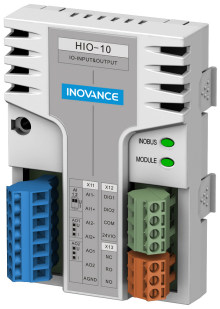


Figure 20-59 Appearance of the HIO-10 I/O function module

The HIO-10 I/O function module is used to expand the input/output interface of the HCU control module, including digital input/output, analog input/output, and relay output.

Features:

- Supports voltage/current type analog input detection: AI1 and AI2.
- Supports voltage/current type analog output: AO1 and AO2.
- Supports configurable digital input/output: DIO1, DIO2, and relay output.
- Provides power supply for DIO: 24 VDC±10%, 150 mA.
- Supports configurable AI and DI filter time to improve the detection stability of the module.
- Powered by the HCU control module, requiring no external power supply.

20.2.20.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.20.3 Outline Dimensions

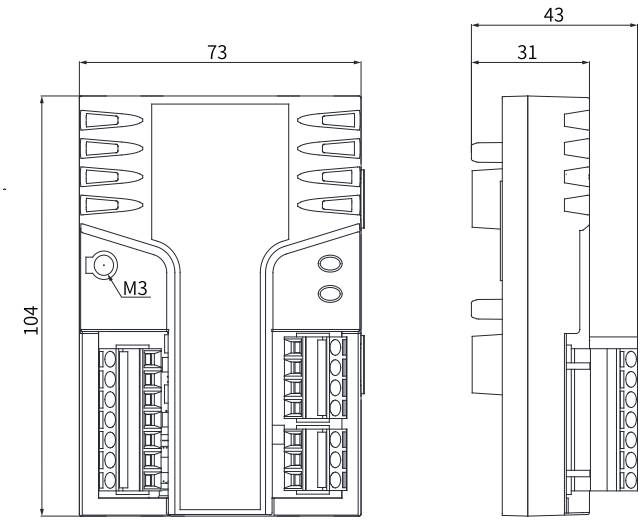


Figure 20-60 Outline dimensions (unit: mm)

20.2.20.4 Components

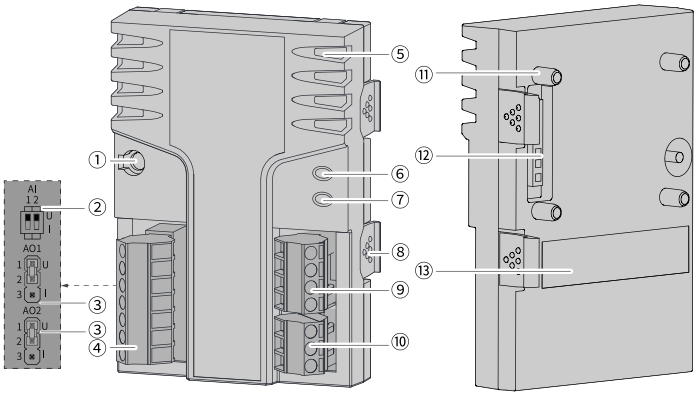


Figure 20-61 Interfaces of the HIO-10 I/O function module

No.	Name	Description
①	Fixing screw hole	Fastens the module to the HCU control module to ensure proper connection of the PE layer
②	Analog input mode selection	2-bit DIP switch for switching between voltage and current input modes
③	Analog output mode selection	3-pin jumper for switching between voltage and current output modes
④	X11 analog input/output terminal	7-pin pluggable blue terminal for analog input and output
⑤	Heat dissipation hole	Dissipates heat
⑥	INOBUS indicator	Green light steady ON: Communication with the HCU control module is normal.
		Red light steady ON: Communication with the HCU control module has failed.
		Orange light steady ON: Establishing communication with the HCU control module.
⑦	MODULE indicator	Red light flashing: Module operating properly
		Red light steady ON or OFF: Module error
⑧	Snap-fit joint	Two in total for guiding and securing the HIO-10 module during installation
⑨	X12 digital input/output terminal	4-pin pluggable green terminal for digital input and output
⑩	X13 relay output terminal	3-pin pluggable orange terminal for relay output
⑪	Guide post	Four in total for aligning the HIO-10 module with the HCU control module to facilitate installation
⑫	Slot terminal	Implements electrical connection between the HIO-10 module and the HCU control module
⑬	Nameplate	Includes the HIO-10 module model number and serial number

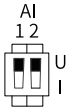


Figure 20-62 Position of the analog input DIP switch

Table 20–30 Assignment of the X11 analog input terminal

X11 Terminal	Assignment	Description
X11-7	AI1–	AI1 differential input (–)
X11-6	AI1+	AI1 differential input (+)
X11-5	AI2–	AI2 differential input (–)
X11-4	AI2+	AI2 differential input (+)

Table 20–31 DIP switch use instructions

DIP Switch	Description	Channel Selection	Remarks
	AI1/AI2 current or voltage signal input selection	1	U: AI1 voltage signal input (default)
			I: AI1 current signal input
		2	U: AI2 voltage signal input (default)
			I: AI2 current signal input

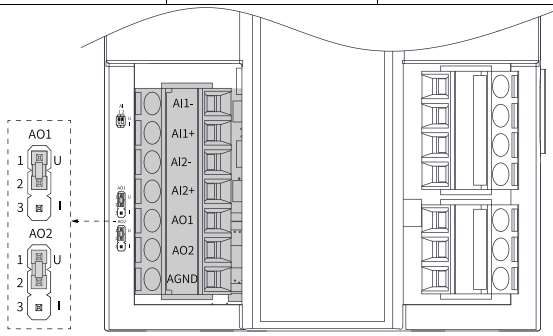


Figure 20-63 Position of the analog output jumper

Table 20–32 Assignment of the X11 analog output terminal

X11 Terminal	Assignment	Description
X11-3	AO1	Analog output 1
X11-2	AO2	Analog output 2
X11-1	AGND	Analog reference ground

Table 20–33 Jumper use instructions

Jumper Switch	Description	Position Setting
AO1	AO1 current/voltage signal output selection	 Voltage signal output applies when 1 and 2 are shorted (default).
		 Current signal output applies when 2 and 3 shorted.
AO2	AO2 current/voltage signal output selection	 Voltage signal output applies when 1 and 2 are shorted (default).
		 Current signal output applies when 2 and 3 shorted.

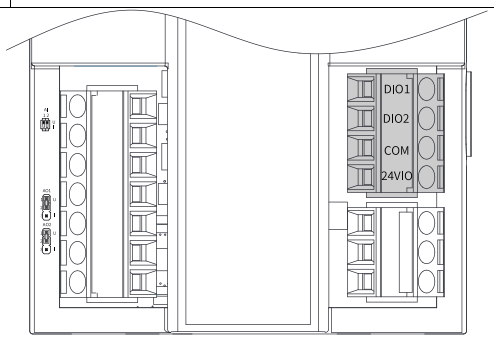


Figure 20-64 Position of the digital input/output signal terminal

Table 20–34 Assignment of the X12 digital input/output terminal

X12 Terminal	Assignment	Description
X12-1	DIO1	Digital input/output 1
X12-2	DIO2	Digital input/output 2
X12-3	COM	Digital reference ground
X12-4	24VIO	24 V power supply

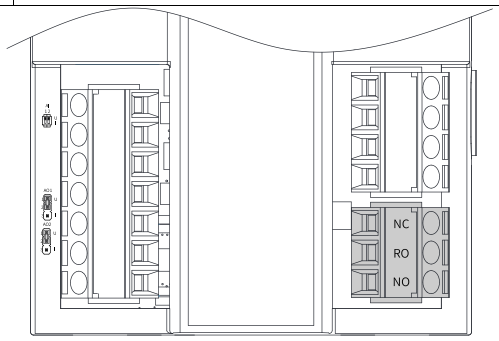


Figure 20-65 Position of the relay output signal terminal

Table 20–35 Assignment of the X13 digital input/output terminal

X13 Terminal	Assignment	Description
X13-1	NC	Normally closed contact
X13-2	RO	Common point
X13-3	NO	Normally open contact

20.2.21 HIBA-10 Data Conversion Module

20.2.21.1 Introduction



Figure 20-66 Appearance of the HIBA-10 data conversion module

The HIBA-10 is a new-generation data conversion module from Inovance. It works with the HCU control module for the MD880 series products, utilizing the InoLink communication network to enable remote monitoring of parameters from multiple HCU control modules by a PC host.

The HIBA-10 provides a data interface compliant with the standard TCP/IP protocol (UDP) and can be used with data analysis software.

Features:

- Supports data monitoring for up to 16 HCUs.
- Supports monitoring of eight 16-bit data points from any single HCU.
- Supports 2 ms monitoring data acquisition and configurable monitoring cycles.
- Directly installed in the expansion slot of the HCU control module, requiring no external power supply.
- Supports standard Ethernet switch/router networking, with monitoring data being transmitted through Ethernet.
- Supports up to 100 m transmission distance between the HIBA module and the switch.

20.2.21.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw

Item	Description
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.21.3 Outline Dimensions

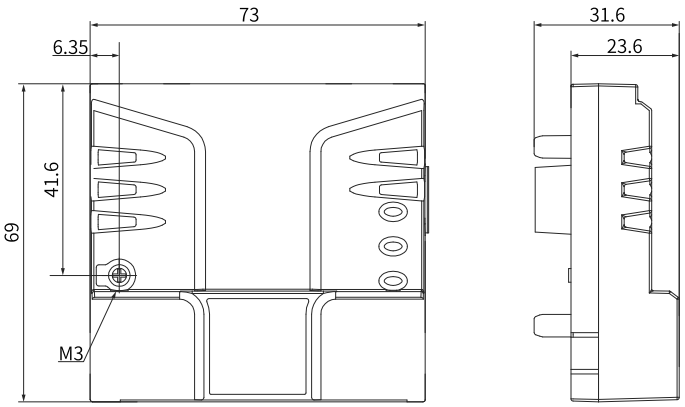


Figure 20-67 Outline dimensions (unit: mm)

20.2.21.4 Components

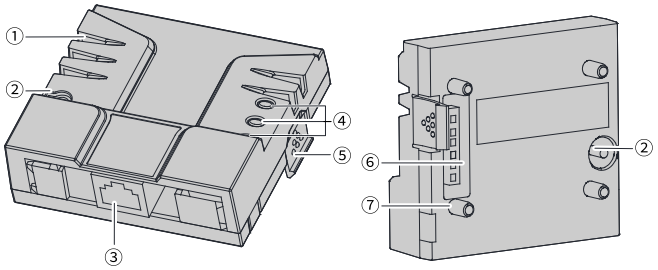


Figure 20-68 Product diagram

No.	Name	Description
①	Heat dissipation hole	Dissipates heat from the module
②	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
③	Communication terminal X1	Standard Ethernet RJ45 communication terminal
④	Status indicator	Indicates module and bus running status
⑤	Snap-fit joint	Fastens the module
⑥	Slot terminal	Implements electrical connection to the HCU control module
⑦	Guide post	Aligns the HIBA-10 module with the HCU control module for easy installation

20.2.22 HGW-10 Digital Gateway Commissioning and Monitoring Module

20.2.22.1 Introduction



Figure 20-69 Appearance of the HGW-10 digital gateway commissioning and monitoring module

The HGW-10 digital gateway commissioning and monitoring module is a dedicated gateway for data exchange between Ethernet and commissioning networks or data acquisition systems, with the Ethernet complying with the internationally recognized industrial Ethernet standard. This module is mainly applied in MD880 series drives to enable centralized commissioning and operation data acquisition functions of the MD880 series. Remote local area network (LAN) can be set up using the HGW-10 together with the IoT module to enable remote commissioning and maintenance. The HGW-10 improves the networking capability of the system and enriches the commissioning and maintenance methods for MD880 drives, improving user experience.

Features:

- Ethernet 10/100 Mbps adaptive.
- Requires manual IP address setting; does not support DHCP IP address assignment.
- Works with InoDriveStudio commissioning software to support functions such as parameter upload/download, black box reading, and oscilloscope features.
- Supports cascade commissioning of up to 64 devices.
- Supports data acquisition for up to 32 devices, with a minimum acquisition cycle of 2 ms and support for up to 192 channels.
- Works with the IoT module to enable remote commissioning and maintenance.

20.2.22.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint or screw
Protection rating	IP20

Item	Description
Cooling method	Naturally ventilated
Power supply	24 VDC±10%, 500 mA
Ethernet port	10/100 Base-Tx
RJ45-A port	RS485; maximum baud rate: 4 Mbps
	Network bridge mode: Connects to the SOP-20-880 Relay mode: Connects to the drive; supports up to 32 node connections
RJ45-B port	RS485; maximum baud rate: 4 Mbps Connects to the drive; supports up to 32 node connections
InoLink-A port	RS485; maximum baud rate: 5 Mbps; supports up to 16 node connections
InoLink-B port	RS485; maximum baud rate: 5 Mbps; supports up to 16 node connections

20.2.22.3 Outline Dimensions

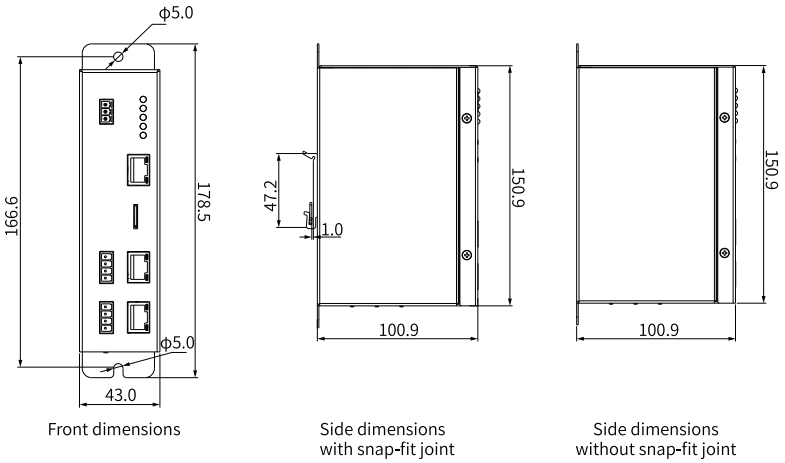


Figure 20-70 Outline dimensions (unit: mm)

20.2.22.4 Components

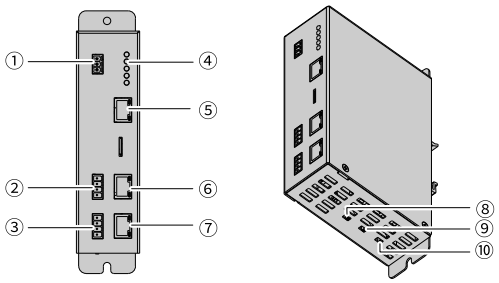


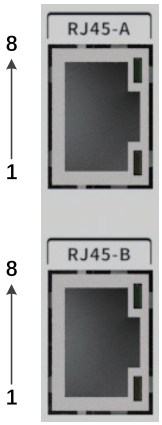
Figure 20-71 Product diagram

Table 20–36 Interfaces

No.	Name	Description
①	24 V power input	-
②	Data acquisition network interface A	Connects to the InoLink network, RS485

No.	Name	Description
③	Data acquisition network interface B	Connects to the InoLink network, RS485
④	LED indicator	-
⑤	Ethernet port	-
⑥	Commissioning network interface A	Connects to the commissioning network interface of the MD880 series drive
⑦	Commissioning network interface B	Connects to the commissioning network interface of the MD880 series drive
⑧	DIP switch SW1	-
⑨	DIP switch SW2	-
⑩	DIP switch SW3	-

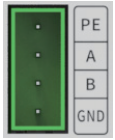
Table 20–37 Commissioning network interface (RJ45-A, RJ45-B)

Diagram	No.	Name	Description
	1	CAN_H	CAN communication H
	2	CAN_L	CAN communication L
	3	CGND	Signal ground
	4	RS485_A	RS485 communication positive
	5	RS485_B	RS485 communication negative
	6	V+	Power output
	7	V+	Power output
	8	CGND	Signal ground

Note

- Do not short-circuit the RJ45 commissioning port to the RJ45 Ethernet port with a network cable. Otherwise, the gateway will be damaged.
- Do not connect the RJ45 commissioning port to the RJ45 Ethernet port. Otherwise, the Ethernet device will be damaged.

Table 20–38 Data acquisition network interface (InoLink-A, InoLink-B)

Diagram	No.	Name	Description
	1	GND	Signal ground
	2	B	RS485 communication negative
	3	A	RS485 communication positive
	4	PE	Shield

20.2.23 HEIP-10 EtherNet/IP Adapter Module

20.2.23.1 Introduction

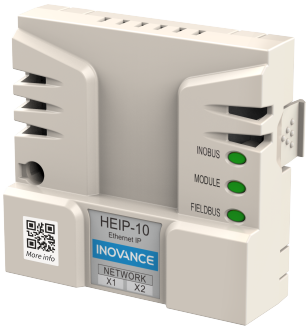


Figure 20-72 Appearance of the HEIP-10

The HEIP-10 EtherNet/IP fieldbus adapter is a bus communication module for the MD880 series. It complies with the internationally recognized EtherNet/IP bus standard and features high efficiency, flexible topology, and easy operation. When used on the MD880 series drives, the HEIP-10 turns the drive into a fieldbus slave controlled by the fieldbus master. This improves the communication efficiency and implement drive networking functions.

- Supports switch and DLR networking.
- Supports the 100 Mbps full-duplex network.
- Powered by the HCU, requiring no external power supply.
- Supports a minimum communication cycle of 1 ms.

20.2.23.2 Technical Specifications

Item	Description
Ambient temperature	–10°C to +55°C
Storage temperature	–40°C to +70°C
Ambient humidity	5% to 95% RH, non-condensing
Operating environment	No corrosive gas
Installation method	Snap-fit joint and screw
Protection rating	IP20
Cooling method	Naturally ventilated

20.2.23.3 Outline Dimensions

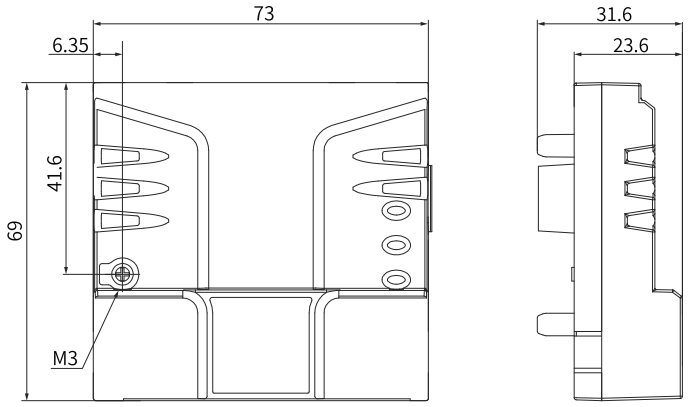


Figure 20-73 Outline dimensions (unit: mm)

20.2.23.4 Components

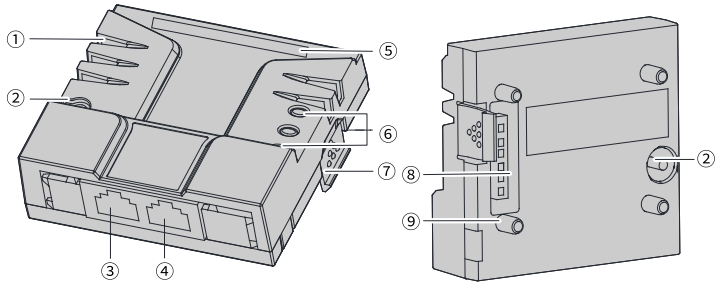


Figure 20-74 Product diagram

Table 20–39 Interfaces

No.	Name	Description
①	Heat dissipation hole	Dissipates heat
②	Fixing screw	Fastens the module to the HCU control module to ensure proper connection of the PE layer
③	Communication terminal X1	Communication terminal 1
④	Communication terminal X2	Communication terminal 2
⑤	MAC address label	Indicates local MAC address
⑥	Status indicator	Indicates module and bus running status
⑦	Snap-fit joint	Fastens the module
⑧	Slot terminal	Implements electrical connection to the HCU control module
⑨	Guide post	Aligns the HEIP-10 module with the HCU control module for easy installation

20.3 SOP-20-880 Smart Operating Panel

20.3.1 Introduction

The SOP-20-880 smart operating panel is a commissioning assistant designed by Inovance for the new generation of frequency control systems, including the HE and MD880 series products.

The SOP-20-880 features a wide power supply range, an LCD display, and support for multiple bus systems. It is suitable for single-drive and multi-drive systems, offering functions such as parameter settings, status monitoring, parameter copying, fault analysis and localization, program downloading, USB relay, and mass storage.

20.3.2 Technical Specifications

No.	Category	Operation	Storage	Transportation
1	Ambient temperature range	–20°C to +55°C	–40°C to +70°C	–40°C to +70°C
2	Installation altitude	< 4000 m	-	-
3	Relative humidity	95%, non-condensing		
4	Pollution degree	3C3 (IEC 60721-3-3, IEC 60721-3-2, and IEC 60721-1-3-1)		
5	Vibration	EN 61800-5-1 ed 2 and EN 60082-2-6 Test Fc (1·g)	-	Class 2M3 (according to EN 60082-2-6)
6	Shock	Class 3M4 (according to EN 60062-2-27)	-	Class 2M2 (according to EN 60082-2-27)
7	Free drop	Drop height of 1 m according to IEC-60068-2-32	-	-
8	Protection rating	Drive connected: IP54 (Select IP54 accessories.) Unconnected: IP20		
9	Electromagnetic compatibility	IEC 61800-3		
10	Material	Disposal: All the materials of the operating panel are recyclable. Observe international and local laws and regulations for disposal and recycling.		

20.3.3 Outline Dimensions

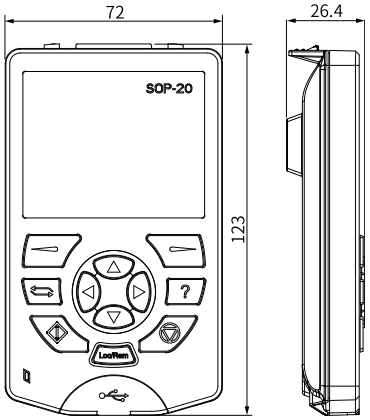


Figure 20-75 Outline dimensions (unit: mm)

20.3.4 Components

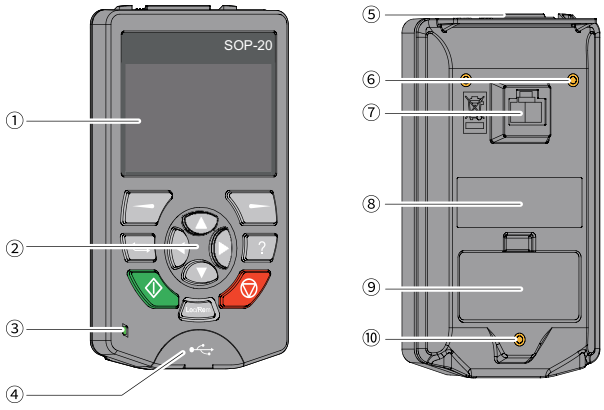


Figure 20-76 Product diagram

No.	Name	Description
①	Display	-
②	Keypad	-
③	Status indicator	-
④	USB terminal	The USB terminal is used to connect the SOP-20-880 to a PC through a USB cable for data exchange. When connected to the PC, the SOP-20-880 can work in relay mode for data communication between the PC tool (InoDriveStudio) and the drive, or in mass storage mode for the PC to perform file operations on the SD card in the SOP-20-880.
⑤	Snap-fit joint	The snap-fit joint at the top is used to secure the SOP-20-880 to the mounting base.
⑥	Fixing screw	The SOP-20-880 can be installed on the cabinet door by using the installation kit. The protection rating is IP20. For systems with a higher protection rating (IP54), you may select the optional high-protection installation kit (IP54 SOP-20-880 mounting base) and secure it with fixing screws.

No.	Name	Description
⑦	RJ45 port	The RJ45 port is used to connect the SOP-20-880 to the drive. Mechanical connection is achieved through the snap-fit joint at the top.
⑧	Nameplate	The nameplate displays the product model and serial number.
⑨	Battery cover	The battery and SD card compartment is beneath the cover. The battery powers the real-time clock, while the SD card stores factory parameters and records real-time data of the drive, which helps in fault diagnosis and analysis. The SD card can also be used to store user programs, update firmware, and program the equipment.
⑩	Fixing screw	-

20.4 Recommended Mounting Accessories

20.4.1 Quick Installation Kit for the T2 Basic Rectifier Module

The T2 quick installation kit is an option installed inside the cabinet. It is used to secure the quick connector (which is fixed in the cabinet as a part of the cabinet), facilitating independent cabinet assembly.

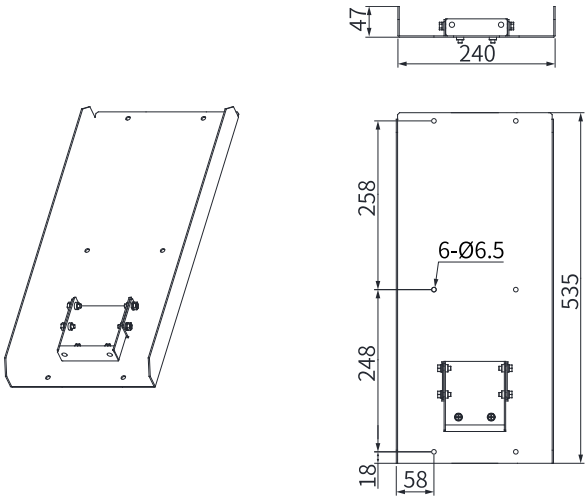


Figure 20-77 Dimensions of the lower part of the T2 quick installation kit (unit: mm)

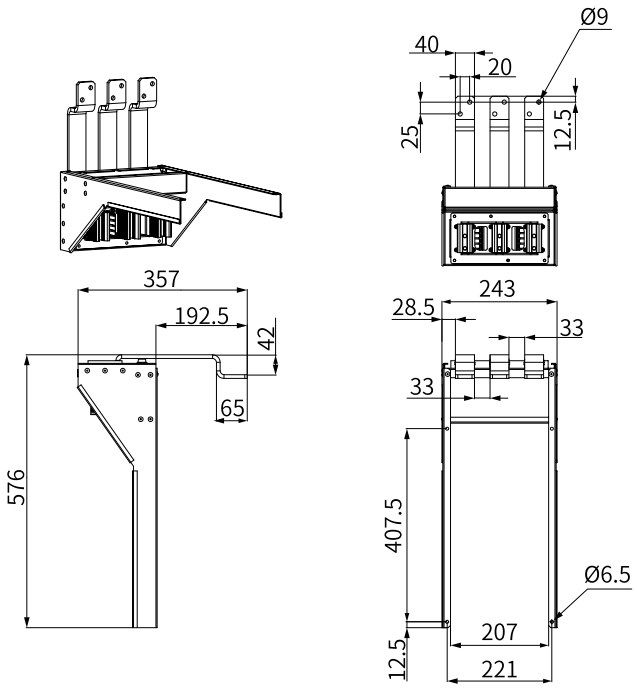


Figure 20-78 Dimensions of the upper part of the T2 quick installation kit (unit: mm)

20.4.2 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.

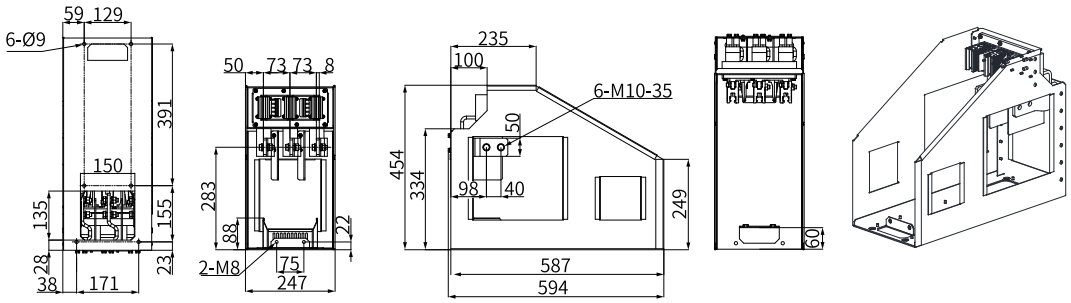


Figure 20-79 Dimensions of the quick installation kit for the H8 inverter module (unit: mm)

20.4.3 Quick Installation Kit for the H8A Inverter Module

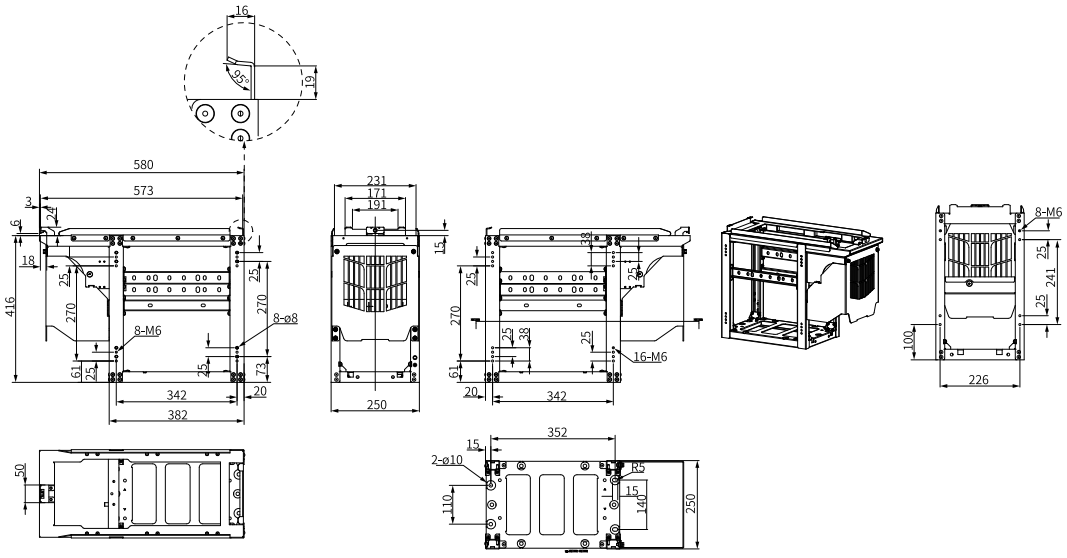


Figure 20-80 Dimensions of the quick installation kit for the H8A inverter module (unit: mm)

20.4.4 Mounting Guide Rail for the H8 Inverter Module

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

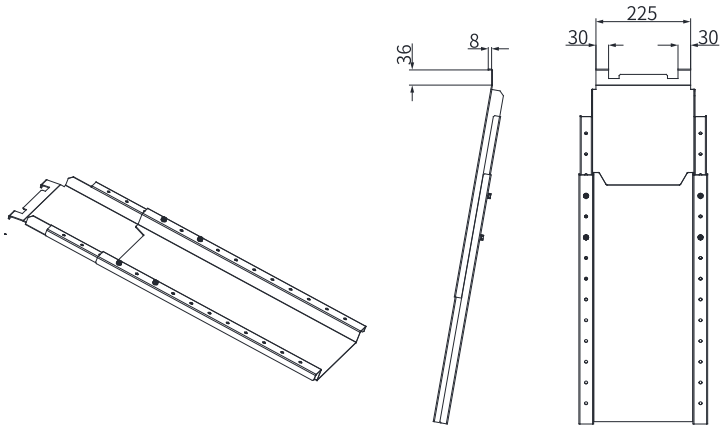


Figure 20-81 Dimensions of the guide rail (unit: mm)

Table 20–40 Mounting guide rail model

Mounting Guide Rail Model	Applicable Model
mounting-rail	All models with the H8 structure

20.5 Recommended Cables

20.5.1 Main Circuit Cable

Table 20–41 Recommended main circuit cables

Rated Output Current (A)	Recommended Cable Quantity and Cross-sectional Area (mm^2)	Terminal
U_n: Three-phase 400 V (range: 380 V to 415 V)		
9	1 x 2.5	OT/2.5-5
13	1 x 4	OT/4-5
17	1 x 6	OT/6-5
23	1 x 6	OT/6-5
33	1 x 10	OT/10-6
38	1 x 10	OT/10-6
48	1 x 10	OT/10-6
60	1 x 16	OT/16-6
78	1 x 16	OT/16-6
94	1 x 25	OT/25-6
116	1 x 35	OT/35-10
149	1 x 50	OT/50-10
183	1 x 70	OT/70-10
245	1 x 120	OT/120-10
299	2 x 70	OT/50-10
349	2 x 70	OT/50-10
395	2 x 95	OT/95-10
516	3 x 95	OT/95-12
639	3 x 120	OT/120-12
757	4 x 120	OT/120-12
900	4 x 120	OT/120-12
U_n: Three-phase 500 V (range: 380 V to 500 V)		
349	2 x 70	OT/70-10
590	3 x 120	OT/120-12
617	3 x 120	OT/120-12
810	4 x 120	OT/120-12
U_n: Three-phase 690 V (range: 525 V to 690 V)		
62	1 x 16	OT/16-10
82	1 x 25	OT/25-10
99	1 x 35	OT/35-10
125	1 x 50	OT/50-10

Rated Output Current (A)	Recommended Cable Quantity and Cross-sectional Area (mm^2)	Terminal
144	1 x 50	OT/50-10
192	1 x 95	OT/95-10
217	2 x 50	OT/50-10
270	2 x 70	OT/70-10
340	3 x 70	OT/70-10
410	3 x 70	OT/70-10
530	3 x 95	OT/95-12
600	3 x 120	OT/120-12
650	3 x 120	OT/120-12
721	3 x 150	OT/150-12

Note

- 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 ⩽ 16 mm^2, PE wire's cross-sectional area = S.
  - When 16 mm^2 < S ⩽ 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 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.

20.5.2 Control Circuit Cable

Table 20–42 Recommended control circuit cables

Terminal Type	Recommended IEC Cable Specification (mm^2)	Recommended NEC Cable Specification (AWG)	Recommended Lug Specification
Control signal terminal	0.5	20	Cord end terminal
24 V input terminal	0.5 to 1.5	22 to 16	

20.5.3 Optical Fiber Selection

Use plastic optical fiber cables with a diameter of 1 mm (model of optical fiber head: HFBR-4531Z or HFBR-4535Z).

MD880-Fiber-1.5
① ② ③

① **Product series** MD880: MD880 AC drive	③ **Optical fiber length** 1.5: 1.5 m
② **Product type** Fiber: Optical fiber	

Name	Model
Optical fiber cable set	MD880–Fiber-1.5m
	MD880–Fiber-3m
	MD880–Fiber-5m
	MD880–Fiber-7m
	MD880–Fiber-10m
	MD880–Fiber-15m
	MD880–Fiber-20m

20.5.4 Network Cable Selection

Use shielded Cat 5e Ethernet cable. The registered jack used for crimping must have a metal shell as grounding shield protection.

20.6 Peripheral Electrical Devices

20.6.1 Fuse, Disconnector, Contactor, and Circuit Breaker

Caution

To avoid electric shock, do not power on the AC drive or operate peripherals immediately after a fuse burns or a circuit breaker trips. Instead, wait at least the time specified on the warning label before further operations. Failure to comply will result in product damage, several injuries, or even death.

To meet the requirements of European safety standard EN 61800-5-1 and North American safety standard UL61800-5-1, connect a fuse/circuit breaker on the input side to prevent accidents caused by internal short circuits.

20.6.1.1 Basic Rectifier Module

Refer to the following table when selecting DC fuses.

Table 20–43 DC fuse models

Product Model	Recommended DC Fuse Model				
	Model (BUSSMANN)	Model (SINOFUSE)	UN (V)	IN (A)	Quantity
MD880-20M-0718-4	170M5499	RS306-3-S1P-1100A690V	1100	900	4
MD880-20M-0982-4	170M5499	RS306-3-S1P-1500A690V	1100	900	4
MD880-20M-0570-7	170M5499	RS306-3-S1P-900A690V	1100	900	2
MD880-20M-0815-7	170M5499	RS306-3-S1P-1250A690V	1100	900	4

20.6.1.2 Regenerative Rectifier Product

AC fuse models

Table 20–44 Recommended AC fuse models

Product Model MD880-30...	Structure	AC Fuse						Quantity
		Manufacturer	Rated Current (A)	Model	Manufacturer	Rated Current (A)	Model	
0640-4	L+H8	BUSSMANN	1100	170M6415	SINO FUSE	1100	RS306-3-S1P-1100A690V	3
0900-4	L+H8	BUSSMANN	1500	170M6418	SINO FUSE	1500	RS306-3-S1P-1500A690V	3
1190-4	L+2H8	BUSSMANN	900	170M6413	SINO FUSE	900	RS306-3-S1P-900A690V	6
1674-4	L+2H8	BUSSMANN	1250	170M6416	SINO FUSE	1250	RS306-3-S1P-1250A690V	6
0600-7	L+H8	BUSSMANN	900	170M6413	SINO FUSE	900	RS306-3-S1P-900A690V	3
0900-7	L+H8	BUSSMANN	1500	170M6418	SINO FUSE	1500	RS306-3-S1P-1500A690V	3
1167-7	L+2H8	BUSSMANN	900	170M6413	SINO FUSE	900	RS306-3-S1P-900A690V	6
1674-7	L+2H8	BUSSMANN	1500	170M6418	SINO FUSE	1500	RS306-3-S1P-1500A690V	6

Table 20–45 AC fuse models (UL-compliant)

Regenerative Rectifier Frame Kit Model MD880-30K-...	Structure	AC Fuse	Quantity	Specification
		BUSSMANN		
0900-7	L+H8	170M6418	3	1500 A, 690 V, size: 3, single-hole flush-ended
1674-7	L+2H8	170M6418	6	1250 A, 690 V, size: 3, single-hole flush-ended

DC fuse models

Table 20–46 Recommended DC fuse models

Product Model MD880-30...	Structure	DC Fuse						Quantity
		Manufacturer	Rated Current (A)	Model	Manufacturer	Rated Current (A)	Model	
0640-4	H8	BUSSMANN	1250	170M6416	SINO FUSE	1250	RS306-3-S1P-1250A690V	2
0900-4	H8	BUSSMANN	900	170M6413	SINO FUSE	900	RS306-3-S1P-900A690V	4
0600-7	H8	BUSSMANN	1100	170M6649	SINO FUSE	1100	RS306-3-S5P-1100A1250V-D	2
0900-7	H8	BUSSMANN	900	170M6547	SINO FUSE	900	RS306-3-S5P-900A1250V-D	4

Pre-charge circuit fuse and contactor models

Table 20–47 Pre-charge resistor models

Voltage Class	Rated Current (A)	Pre-charge Resistor Resistance (Ω)	Pulse Load Power (W)
400 V	640 to 1674	2	36000
690 V	600 to 1674	5	36000

Table 20–48 Pre-charge circuit fuse and contactor models

Type	Manufacturer	Model	Quantity	Specification
Fuse	Vicfuse	NT00C-40A690V-gG	3	40 A/690 V, square tube blade plug-in
Pre-charge contactor	Schneider	LC1D32M7C	1	32 A/690 V, 3P, 1NO1NC

Note

- To prevent overheating of the pre-charge resistor, the interval between two times of switch-on must not be shorter than three minutes.
- The regenerative rectifier can support inverters with up to four times the rectifier power.

20.6.1.3 Active Rectifier Product

AC fuse models

Table 20–49 Recommended AC fuse models

Product Model	Structure	AC Fuse						Quantity
		Manufacturer	Rated Current (A)	Model	Manufacturer	Rated Current (A)	Model	
MD880-40K-0575-4	BLCL+H8	BUSSMANN	900	170M6413	SINOFUSE	900	RS306-3-S1P-900A690V	3
MD880-40K-0810-4	BLCL+H8	BUSSMANN	1250	170M6416	SINOFUSE	1250	RS306-3-S1P-1250A690V	3
MD880-40K-1092-4	BLCL+2H8	BUSSMANN	900	170M6413	SINOFUSE	900	RS306-3-S1P-900A690V	6
MD880-40K-1539-4	BLCL+2H8	BUSSMANN	1250	170M6416	SINOFUSE	1250	RS306-3-S1P-1250A690V	6
MD880-40K-0369-7	BLCL+H8	BUSSMANN	630	170M6416	SINOFUSE	630	RS306-1-S1P-630A690V	3
MD880-40K-0540-7	BLCL+H8	BUSSMANN	900	170M6413	SINOFUSE	900	RS306-3-S1P-900A690V	3
MD880-40K-0701-7	BLCL+2H8	BUSSMANN	1100	170M6415	SINOFUSE	1100	RS306-3-S1P-1100A690V	3
MD880-40K-1026-7	BLCL+2H8	BUSSMANN	900	170M6413	SINOFUSE	900	RS306-3-S1P-900A690V	6
MD880-40D-0094-4	-	-	-	-	SINOFUSE	125	RS306-1-W1Z-125A690V	3
MD880-40D-0149-4	-	-	-	-	SINOFUSE	200	RS306-1-W1Z-200A690V	3
MD880-40D-0183-4	-	-	-	-	SINOFUSE	250	RS306-1-W1Z-250A690V	3
MD880-40D-0299-4	-	-	-	-	SINOFUSE	400	RS306-1-W1Z-400A690V	3
MD880-40D-0395-4	-	-	-	-	SINOFUSE	550	RS306-1-W1Z-550A690V	3

Table 20–50 AC fuse models (UL-compliant)

Product Model	Structure	AC Fuse			Quantity
		Manufacturer	Rated Current (A)	Model	
MD880-40K-0540-7	BLCL+H8	BUSSMANN	900	170M6413	3
MD880-40K-1026-7	BLCL+2H8	BUSSMANN	900	170M6413	6

DC fuse models

Table 20–51 Recommended DC fuse models

Product Model MD880-40...	Structure	DC fuse						Quantity
		Manufacturer	Rated Current (A)	Model	Manufacturer	Rated Current (A)	Model	
MD880-40M-575-4	H8	BUSSMANN	1100	170M6415	SINOFUSE	1100	RS306-3-S1P-1100A690V	2
MD880-40M-0810-4	H8	BUSSMANN	1500	170M6418	SINOFUSE	1500	RS306-3-S1P-1500A690V	2
MD880-40M-0369-7	H8	BUSSMANN	700	170M6545	SINOFUSE	700	RS306-3-S5P-700A1250V-D	2
MD880-40M-0540-7	H8	BUSSMANN	1000	170M6548	SINOFUSE	1000	RS306-3-S5P-1000A1250V-D	4
MD880-40D-0094-4	-	-	-	-	SINOFUSE	160	RS306-1-W1Z-160A690V	2
MD880-40D-0149-4	-	-	-	-	SINOFUSE	250	RS306-1-W1Z-250A690V	2
MD880-40D-0183-4	-	-	-	-	SINOFUSE	315	RS306-1-W1Z-315A690V	2
MD880-40D-0299-4	-	-	-	-	SINOFUSE	450	RS306-1-W1Z-450A690V	2
MD880-40D-0395-4	-	-	-	-	SINOFUSE	630	RS306-1-W1Z-630A690V	2

Pre-charge resistor and rectifier bridge models

Table 20–52 Pre-charge resistor models

Voltage Class	Rated Current (A)	Pre-charge Resistor Resistance (Ω)	Pulse Load Power (W·s)	Three-Phase Rectifier Bridge
400 V	575 to 1539	2	36000	100 A/1800 V
690 V	369 to 1026	5	36000	100 A/1800 V

Note

- Configurations for the same voltage class can be the same.
- To prevent overtemperature of the pre-charge resistor, the interval between two consecutive switch-on operations must be no less than 3 minutes.

20.6.1.4 Inverter Module

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.

DC fuse models

Table 20–53 Recommended DC fuse models

Product Model MD880-50...	DC fuse							Quantity
	Manufacturer	Rated Current (A)	Model	Manufacturer	Rated Current (A)	SINOFUSE	Specification	
U_N : Three-phase 400 VAC (range: 380 V to 415 V)								
0009-4	BUSSMANN	9	170M1559	SINOFUSE	9	RS306-00-C1Z-16A-690V	16 A, 690 V, size: 000	2
0013-4	BUSSMANN	13	170M1561	SINOFUSE	13	RS306-00-C1Z-25A-690V	25 A, 690 V, size: 000	2
0017-4	BUSSMANN	17	170M1562	SINOFUSE	17	RS306-00-C1Z-32A-690V	32 A, 690 V, size: 000	2
0023-4	BUSSMANN	23	170M1563	SINOFUSE	23	RS306-00-C1Z-40A-690V	40 A, 690 V, size: 000	2
0033-4	BUSSMANN	33	170M1565	SINOFUSE	33	RS306-00-C1Z-63A-690V	63 A, 690 V, size: 000	2
0038-4	BUSSMANN	38	170M1566	SINOFUSE	38	RS306-00-C1Z-80A-690V	80 A, 690 V, size: 000	2
0048-4	BUSSMANN	48	170M1567	SINOFUSE	48	RS306-00-C1Z-100A-690V	100 A, 690 V, size: 000	2
0060-4	BUSSMANN	60	170M1568	SINOFUSE	60	RS306-00-C1Z-125A-690V	125 A, 690 V, size: 000	2
0078-4	BUSSMANN	78	170M1569	SINOFUSE	78	RS306-00-C1Z-160A-690V	160 A, 690 V, size: 000	2
0094-4	BUSSMANN	94	170M1569	SINOFUSE	94	RS306-00-C1Z-160A-690V	160 A, 690 V, size: 000	2
0116-4	BUSSMANN	116	170M1570	SINOFUSE	116	RS306-00-C1Z-200A-690V	200 A, 690 V, size: 000	2
0149-4	BUSSMANN	149	170M1571	SINOFUSE	149	RS306-00-C1Z-250A-690V	250 A, 690 V, size: 000	2
0183-4	BUSSMANN	183	170M1572	SINOFUSE	183	RS306-00-C1Z-315A-690V	315 A, 690 V, size: 000	2
0245-4	BUSSMANN	245	170M4413	SINOFUSE	245	RS306-1-S1P-450A690V	450 A, 690 V, size: 1	2
0299-4	BUSSMANN	299	170M4413	SINOFUSE	299	RS306-1-S1P-450A690V	450 A, 690 V, size: 1	2
0349-4	BUSSMANN	349	170M4416	SINOFUSE	349	RS306-1-S1P-630A690V	630 A, 690 V, size: 1	2
0395-4	BUSSMANN	395	170M4416	SINOFUSE	395	RS306-1-S1P-630A690V	630 A, 690 V, size: 1	2

Product Model MD880-50...	DC fuse							Quantity
	Manufacturer	Rated Current (A)	Model	Manufacturer	Rated Current (A)	SINOFUSE	Specification	
0516-4	BUSSMANN	516	170M6413	SINOFUSE	516	RS306-3-S1P-900A690V	900 A, 690 V, size: 3	2
0639-4	BUSSMANN	639	170M6415	SINOFUSE	639	RS306-3-S1P-1100A690V	1100 A, 690 V, size: 3	2
0757-4	BUSSMANN	757	170M6416	SINOFUSE	757	RS306-3-S1P-1250A690V	1250 A, 690 V, size: 3	2
0900-4	BUSSMANN	900	170M6418	SINOFUSE	900	RS306-3-S1P-1500A690V	1500 A, 690 V, size: 3	2
U_N : Three-phase 500 VAC (range: 380 V to 500 V)								
0349-5	BUSSMANN	349	170M4416	-	-	-	630 A, 690 V, size: 1	2
0590-5	BUSSMANN	590	170M6415	-	-	-	1100 A, 690 V, size: 3	2
0810-5	BUSSMANN	810	170M6418	-	-	-	1500 A, 690 V, size: 3	2
U_N : Three-phase 690 VAC (range: 525 V to 690 V)								
0062-7	BUSSMANN	62	170M4437	SINOFUSE	62	RS306-1-S5P-125A1250V-D	125 A, 1250 V, size: 1	2
0082-7	BUSSMANN	82	170M4438	SINOFUSE	82	RS306-1-S5P-160A1250V-D	160 A, 1250 V, size: 1	2
0099-7	BUSSMANN	99	170M4438	SINOFUSE	99	RS306-1-S5P-160A1250V-D	160 A, 1250 V, size: 1	2
0125-7	BUSSMANN	125	170M4440	SINOFUSE	125	RS306-1-S5P-250A1250V-D	250 A, 1250 V, size: 1	2
0144-7	BUSSMANN	144	170M4441	SINOFUSE	144	RS306-1-S5P-315A1250V-D	315 A, 1250 V, size: 1	2
0192-7	BUSSMANN	192	170M4441	SINOFUSE	192	RS306-1-S5P-450A1250V-D	315 A, 1250 V, size: 1	2
0217-7	BUSSMANN	217	170M4444	SINOFUSE	217	RS306-1-S5P-450A1250V-D	450 A, 1250 V, size: 1	2
0270-7	BUSSMANN	270	170M4444	SINOFUSE	270	RS306-1-S5P-450A1250V-D	450 A, 1250 V, size: 1	2
0340-7	BUSSMANN	340	170M6543	SINOFUSE	340	RS306-3-S5P-550A1250V-D	550 A, 1250 V, size: 3	2
0410-7	BUSSMANN	410	170M6545	SINOFUSE	410	RS306-3-S5P-700A1250V-D	700 A, 1250 V, size: 3	2
0530-7	BUSSMANN	530	170M6547	SINOFUSE	530	RS306-3-S5P-900A1250V-D	900 A, 1250 V, size: 3	2
0600-7	BUSSMANN	600	170M6548	SINOFUSE	600	RS306-3-S5P-1000A1250V-D	1000 A, 1250 V, size: 3	2

Product Model MD880-50...	DC fuse							Quantity
	Manufacturer	Rated Current (A)	Model	Manufacturer	Rated Current (A)	SINOFUSE	Specification	
0650-7	BUSSMANN	650	170M6549	SINOFUSE	650	RS306-3-S5P-1100A1250V-D	1100 A, 1250 V, size: 3	2
0721-7	BUSSMANN	721	170M6500	SINOFUSE	721	RS306-3-J5P-1250A1100V-D	1250 A, 1100 V, size: 3	2

Table 20–54 Recommended fuse switch and built-in fuse models (H8)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Specification	Quantity	Model (BUSSMANN)	Specification	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
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

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Specification	Quantity	Model (BUSSMANN)	Specification	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
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

Disconnector models

Table 20–55 Recommended fuse switch and built-in fuse models (H1 to H4)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Specification	Quantity	Model (BUSSMANN)	Specification	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 20–56 Recommended fuse switch and built-in fuse models (H6)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Specification	Quantity	Model (BUSSMANN)	Specification	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
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

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Specification	Quantity	Model (BUSSMANN)	Specification	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
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 20–57 Recommended fuse switch and built-in fuse models (H7)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Specification	Quantity	Model (BUSSMANN)	Specification	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

20.6.1.5 Water-Cooled Basic Rectifier Module

Fuse models

To meet the requirements of European safety standard EN 61800-5-1 and North American safety standard UL61800-5-1, connect a fuse on the input side to prevent accidents caused by internal short circuits.

Refer to the following table when selecting fuses for the AC side.

Table 20–58 AC fuse models

Module Model	AC Fuse Model (SINOFUSE)	Specification	Quantity
MD880LC-20M-2000-7	RS306-3-S1P-1500A690V	1500 A, 690 V, size: 3	6
MD880LC-20M-1520-7+SCR	RS306-3-S1P-1250A690V	1250 A, 690 V	6

Refer to the following table when selecting fuses for the DC side.

Table 20–59 DC fuse models

Module Model	DC Fuse Model (SINOFUSE)	Specification	Quantity
MD880LC-20M-2000-7	170M7595-2500A/1250V DC	2500 A, 1250 VDC, SIZE: 4	4
MD880LC-20M-1520-7+SCR	RSZ307-5-W7P-1800A1200V	1800 A, 1200 V	4

Circuit breaker models

Table 20–60 Circuit breaker models

Module Model	Recommended Circuit Breaker		
	Specification	Breaking Capacity	Quantity
MD880LC-20M-2000-7	690 V, 2500 A	65 kA	1
MD880LC-20M-3720-7	690 V, 4000 A	100 kA	1
MD880LC-20M-1520-7+SCR	690 V, 2000 A	65 kA	1

20.6.1.6 Water-Cooled Active Rectifier Module

Refer to the following table when selecting fuses for the AC side.

Table 20–61 Fuse models (AC side)

Module Model	Fuse Model (BUSSMANN)	Fuse Model (SINOFUSE)	Quantity
MD880LC-40M-0530-7	170M6413 (900 A/690 V)	RS306-3-S1P-900A690V	3
MD880LC-40M-0650-7	170M6415 (1100 A/690 V)	RS306-3-S1P-1100A690V	3
MD880LC-40M-0820-7	170M6416 (1250 A/690 V)	RS306-3-S1P-1250A690V	3
MD880LC-40M-1558-7	170M6417 (1400 A/690 V)	RS306-3-S1P-1400A 690V	6

Refer to the following table when selecting fuses for the DC side.

Table 20–62 Fuse models (DC side)

Module Model	Fuse Model (BUSSMANN)	Fuse Model (SINOFUSE)	Quantity
MD880LC-40M-0530-7	170M6548 (1000 A/1250 V)	RS306-3-S5P-900A1250V-D	2
MD880LC-40M-0650-7	170M6549 (1100 A/1250 V)	RS306-3-S5P-1100A1250V-D	2
MD880LC-40M-0820-7	170M7597 (1500 A/1250 V)	RSZ307-5-W7P-1500A1200V	2
MD880LC-40M-1558-7	170M7597 (1500 A/1250 V)	RSZ307-5-W7P-1500A1200V	4

20.6.1.7 Water-Cooled Inverter Module

Table 20–63 Fuse models for the inverter module

Module Model	Fuse Model (BUSSMANN)	Fuse Model (SINOFUSE)	Quantity
MD880LC-50M-0530-7	900 A/1250 V	RS306-3-S5P-900A1250V-D	2
MD880LC-50M-0650-7	1100 A/1250 V	RS306-3-S5P-1100A1250V-D	2
MD880LC-50M-0900-7	1500 A/1200 V	RSZ307-5-W7P-1500A1200V	2

Table 20–64 Fuse switch models for the inverter module

Module Model	Recommended Fuse Switch for DC			Recommended Built-in Fuse		
	Brand: SOCOMEC	Specification	Quantity	Model (BUSSMANN)	Specification	Quantity
MD880LC-50M-0530-7	Body: 38S12080 Lever: 14333111 Extension rod: 14031240	800 A 1250 VDC	1	RS306-3-C4Z-900A-1000V	900 A	2
MD880LC-50M-0650-7	Body: 38S12080 Lever: 14333111 Extension rod: 14031240	800 A 1250 VDC	1	RS306-2-C4Z-1100A-1000V	1100 A	2
MD880LC-50M-0900-7	Body: 38S14160 Lever: 14333111 Extension rod: 14031240	1600 A 1250 VDC	1	RS306-2-C4Z-900A-1000V	900 A	2

20.6.1.8 Air-Cooled Single-Drive Product (400 V)

Fuse, contactor, and circuit breaker models

Table 20–65 Fuse, contactor, and circuit breaker models

Product Model	Fuse			Contactor	Circuit Breaker
MD880-01S-	Manufacturer	Rated Current (A)	Model	Rated Current (A)	Rated Current (A)
0012-4-B-SG	BUSSMANN	30	FWP-30B	26	25
0017-4-B-SG	BUSSMANN	40	FWP-40B	26	32
0024-4-B-SG	BUSSMANN	60	FWP-60B	38	50
0033-4-B-SG	BUSSMANN	70	FWP-70B	50	50
0038-4-B-SG	BUSSMANN	90	FWP-90B	65	63
0048-4-B-SG	BUSSMANN	100	FWH-100C	65	80
0060-4-B-SG	BUSSMANN	125	FWH-125C	80	80
0078-4-B-SG	BUSSMANN	125	FWH-125C	95	100
0094-4-B-SG	BUSSMANN	150	FWH-150C	115	160
0116-4-B-SG	BUSSMANN	200	FWH-200C	150	160
0149-4-B-SG	BUSSMANN	250	FWH-250C	205	250
0183-4-B-SG	BUSSMANN	275	FWH-275C	245	250
0217-4-SG	BUSSMANN	350	FWH-350C	300	250
0262-4-SG	BUSSMANN	400	FWH-400C	410	400
0314-4-SG	BUSSMANN	500	FWH-500C	410	400
0383-4-SG	BUSSMANN	600	FWH-600C	475	500
0441-4-L-SG	BUSSMANN	700	FWH-700C	620	630
0481-4-L-SG	BUSSMANN	800	FWH-800C	620	630
0538-4-L-SG	BUSSMANN	900	170M5015	800	630

Product Model	Fuse			Contactor	Circuit Breaker
MD880-01S-	Manufacturer	Rated Current (A)	Model	Rated Current (A)	Rated Current (A)
0605-4-L-SG	BUSSMANN	1000	170M5016	800	800
0673-4-L-SG	BUSSMANN	1100	170M5017	800	800
0751-4-L-SG	BUSSMANN	1400	170M6017	1000	1000
0849-4-L-SG	BUSSMANN	1400	170M6017	1000	1000

Guide for selecting earth leakage circuit breakers (ELCBs):

The earth leakage current of the AC drive exceeds 3.5 mA, requiring grounding for protection.

The AC drive may generate DC leakage current in the protective conductor, necessitating the use of a Type B (delayed type) ELCB.

If the ELCB malfunctions:

- Use an ELCB with a higher operating current rating or use a delayed type ELCB.
- Reduce the carrier frequency of the AC drive.
- Shorten the length of the motor drive cable.
- Take additional leakage current suppression measures.

Note

Recommended earth leakage circuit breaker brands are Chint and Schneider.

20.6.1.9 Water-Cooled Single-Drive Product

MD880LC-01S-	Fuse (SINOFUSE)	Fuse (BUSSMAN)	Disconnector	Contactor	Circuit Breaker
0530-7	RS306-3-S1P-900A690V	170M6413	630 A	580 A	630 A

20.6.2 AC Input Reactor

20.6.2.1 Regenerative Rectifier Product

The regenerative rectifier reactor shall be selected based on a 4% relative short-circuit impedance. Due to the inductance of the equalizing reactor in the regenerative rectifier module, the actual relative short-circuit impedance will be slightly smaller.

The regenerative rectifier frame kit includes a regenerative rectifier filter (L) and a regenerative rectifier power module (H8), so no additional reactor is required. For such a kit, the AC input reactor is optional and mainly used to reduce harmonics in the input current. However, for regenerative rectifier modules, you must design and install an input reactor according to the following table. For better thermal design and filtering performance, it is recommended to purchase a standard regenerative rectifier filter.

Table 20–66 AC input reactor models

Regenerative Rectifier Frame Kit Model	Regenerative Rectifier Module Model (H8)	Rated Voltage (V)	Rated Current (A)	Inductance (μH)
MD880-30K-0640-4	MD880-30M-0640-4 x 1	400	640	40
MD880-30K-0900-4	MD880-30M-0900-4 x 1	400	900	25
MD880-30K-1190-4	MD880-30M-0640-4 x 2	400	1190	22
MD880-30K-1674-4	MD880-30M-0900-4 x 2	400	1674	14
MD880-30K-0600-7	MD880-30M-0600-7 x 1	690	600	79
MD880-30K-0900-7	MD880-30M-0900-7 x 1	690	900	42
MD880-30K-1116-7	MD880-30M-0600-7 x 2	690	1116	42
MD880-30K-1674-7	MD880-30M-0900-7 x 2	690	1674	26

20.6.2.2 Water-Cooled Basic Rectifier Module

The front end of the water-cooled basic rectifier must be paired with a power supply transformer or generator. No additional input reactor is needed if the following requirements are met:

A single module supports 6-pulse/12-pulse rectification and does not include an input reactor. Therefore, the short-circuit impedance Z_k of the power supply transformer must be determined based on the apparent power S_N (D3D) of the rectifier unit and the capacity S_N (trafo) of the power supply transformer. The rated impedance of the power supply calculated using the rated apparent power of the rectifier unit must be at least 5% x (SN (trafo)/SN (D3D)). The rated short-circuit impedance of the transformer must comply with the following formula for 6-pulse systems. If the generator is used as the power supply, the same impedance requirements also apply to the generator.

$$Z_k(\text{D3D}) \geqslant 5\% \times \frac{S_N(\text{trafo})}{S_N(\text{D3D})}$$

Definitions:

S_N (trafo) indicates apparent power of the transformer or generator.

S_N (D3D) indicates apparent power of the basic rectifier module.

Z_k (D3D) indicates rated short-circuit impedance of the transformer or generator.

For example, for the MD880LC-20M-2000-7 basic rectifier module with an apparent power S_N (D3D) of 2390 kVA, assume the apparent power S_N (trafo) of the transformer is 3000 kVA. Then:

$$Z_k(\text{D3D}) \geqslant 5\% \times \frac{3000}{2390} = 6.28\%$$

For 12-pulse rectification applications, S_N (D3D) is taken as the total rectifier capacity, and S_N (trafo) is taken as half of the total transformer capacity. This means the calculated short-circuit impedance of each winding in the 12-pulse transformer must be no less than 2.5% x (SN (trafo)/SN (D3D)). In the preceding example, the calculation shows that a rated impedance of 3.14% for each winding on the secondary side is sufficient.

Refer to the following table when selecting AC input reactors.

Module Model	Inductance	Reactor Model	Insulation Class	Cooling Method	Rated Loss at 20°C	Mass
MD880LC-20M-2000-7	27 μH	LD-HE300-110-1000-7-L1	H	Forced air cooling	550 W	105 kg
MD880LC-20M-1520-7+SCR	24 μH	YF-MD880LC-20M-1520-7-L1	H	Forced air cooling	1720 W	180 kg

Note

The MD880LC-20M-2000-7 diode rectifier module requires two 1000 A reactors.

20.6.2.3 Air-Cooled Single-Drive Product (400 V)

Model selection

The AC input reactor is used to reduce harmonics in the input current. Install an AC reactor when strict harmonic suppression is needed. For models above 220 kW, ensure that the cabinet has sufficient space for installing the reactor. The following table lists the recommended manufacturers and models of input reactors.

Table 20–67 Inovance AC input reactor models (three-phase 380 V to 480 V)

Drive Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Input AC Reactor Model	Inductance (mH)
0012-4-B-SG	5.5	12	MD-ACL-40-1.45-4T	1.45
0017-4-B-SG	7.5	17	MD-ACL-40-1.45-4T	1.45
0024-4-B-SG	11	24	MD-ACL-40-1.45-4T	1.45
0033-4-B-SG	15	33	MD-ACL-40-1.45-4T	1.45
0038-4-B-SG	18.5	38	MD-ACL-50-0.28-4T-2%	0.28
0048-4-B-SG	22	48	MD-ACL-60-0.24-4T-2%	0.24
0060-4-B-SG	30	60	MD-ACL-90-0.16-4T-2%	0.16
0078-4-B-SG	37	78	MD-ACL-90-0.16-4T-2%	0.16
0094-4-B-SG	45	94	MD-ACL-90-0.16-4T-2%	0.16
0116-4-B-SG	55	116	MD-ACL-120-0.12-4T-2%	0.12
0149-4-B-SG	75	149	MD-ACL-150-0.095-4T-2%	0.095
0183-4-B-SG	90	183	MD-ACL-200-0.07-4T-2%	0.07
0217-4-B-SG	110	217	MD-ACL-200-0.07-4T-2%	0.07
0262-4-B-SG	132	262	MD-ACL-200-0.07-4T-2%	0.07
0314-4-B-SG	160	314	MD-ACL-330-0.042-4T-2%	0.042
0383-4-B-SG	200	383	MD-ACL-490-0.028-4T-2%	0.028
0441-4-L-SG	220	441	MD-ACL-490-0.028-4T-2%	0.028
0481-4-L-SG	250	481	MD-ACL-490-0.028-4T-2%	0.028
0538-4-L-SG	280	538	MD-ACL-660-0.021-4T-2%	0.021
0605-4-L-SG	315	605	MD-ACL-660-0.021-4T-2%	0.021
0673-4-L-SG	355	673	MD-ACL-660-0.021-4T-2%	0.021

Drive Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Input AC Reactor Model	Inductance (mH)
0751-4-L-SG	400	751	MD-ACL-800-0.017-4T-2%	0.017
0849-4-L-SG	450	849	MD-ACL-800-0.017-4T-2%	0.017

Dimensions

Inovance input reactors

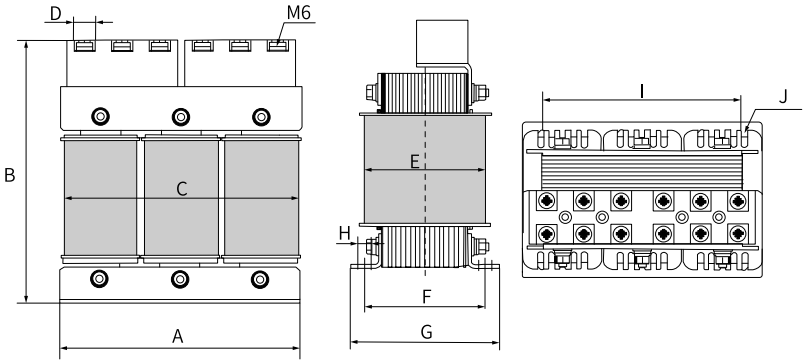


Figure 20-82 Dimensions of AC input reactors (40 A)

Table 20–68 Dimensions of AC input reactors (40 A) (unit: mm)

Model	A	B	C	D	E	F	G	H	I	J
MD-ACL-40-1.45-4T	180±2	200	185	16	105	95±2	117±2	13	150±1	Ø8 x 13

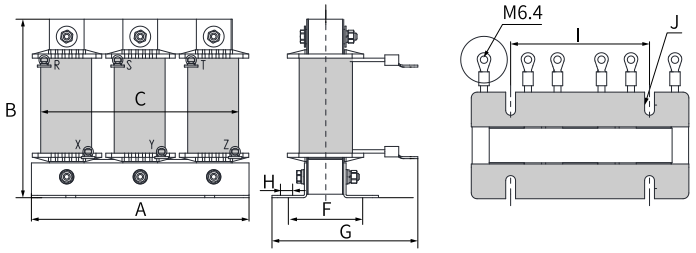


Figure 20-83 Dimensions of AC input reactors (50 A to 60 A)

Table 20–69 Dimensions of AC input reactors (50 A to 60 A) (unit: mm)

Model	A	B	C	F	G	H	I	J
MD-ACL-50-0.28-4T	195	160	188±1	72±2	135	8.5	120±1	Ø8.5 x 20
MD-ACL-60-0.24-4T	195	160	188±1	72±2	135	8.5	120±1	Ø8.5 x 20

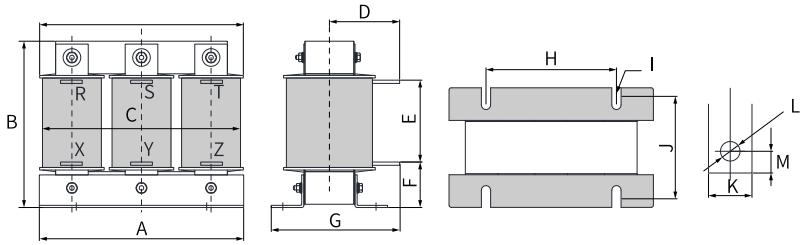


Figure 20-84 Dimensions of AC input reactors (90 A to 120 A)

Table 20–70 Dimensions of AC input reactors (90 A to 120 A) (unit: mm)

Model	A	B	C	F	G	H	I	J
MD-ACL-90-0.28-4T	195	160	188±1	72±2	150	8.5	120±1	Ø8.5 x 20
MD-ACL-120-0.24-4T	195	160	188±1	72±2	-	8.5	120±1	Ø8.5 x 20

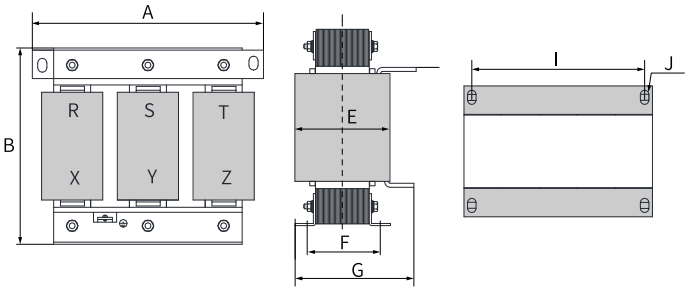


Figure 20-85 Dimensions of AC input reactors (150 A to 660 A)

Table 20–71 Dimensions of AC input reactors (150 A to 660 A) (unit: mm)

Model	A	B	E	F	G	I	J
MD-ACL-150-0.095-4T	250	230	102±2	76±2	155	182±1	Ø11 x 18
MD-ACL-200-0.07-4T	250	230	122±2	96±2	175	182±1	Ø11 x 18
MD-ACL-330-0.042-4T	290	275	126±2	100±2	180	214±1	Ø11 x 18
MD-ACL-490-0.028-4T	320	305	152±2	122±2	220	243±1	Ø12 x 20
MD-ACL-660-0.021-4T	320	305	167±2	137±2	240	243±1	Ø12 x 20

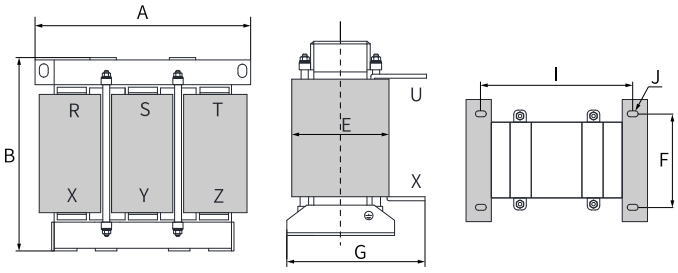


Figure 20-86 Dimensions of AC input reactors (800 A to 1000 A)

Table 20–72 Dimensions of Inovance AC input reactors (unit: mm)

Model	A	B	E	F	G	I	J
MD-ACL-800-0.017-4T	385	390	198±1	175±1	250	260±2	Ø12 x 20
MD-ACL-1000-0.014-4T	385	390	198±1	175±1	250	260±2	Ø12 x 20

Note Note: The dimensions of AC input reactor models provided here are for reference only. Actual dimensions may vary with models.

20.6.2.4 Water-Cooled Single-Drive Product

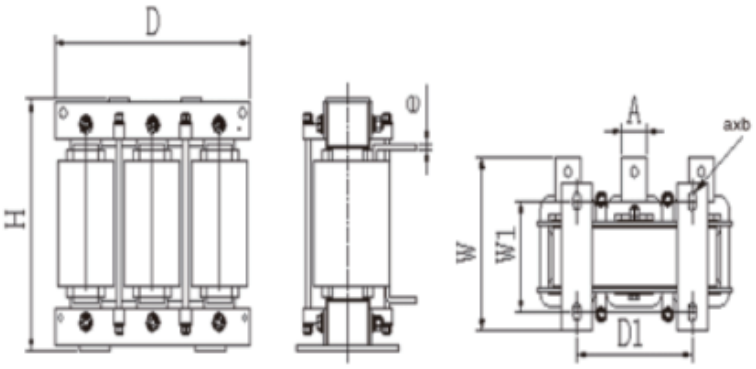
Model selection

The AC input reactor is optional and mainly used to reduce harmonics in the input current. The MD880 water-cooled single-drive system does not include an internal AC input reactor. When integrating the system into a cabinet, an external AC input reactor is required. It is recommended to use an AC reactor with an equivalent voltage drop of 2%, cooled by forced air cooling. The following table lists the recommended manufacturers and models of input reactors.

Table 20–73 AC input reactor models

Model MD880LC-01S...	Rated Power (kW)	Rated Current (A)	Applicable Reactor	Inductance (mH)	Loss (W)
0530-7	500	530	ACL-0600-EISH-E47UA	0.047	500

Dimensions



ACL-0530-EISH-E53U

Figure 20-87 Dimensions of input reactors

Table 20–74 Dimensions of input reactors

MD880LC-01S-	Rated Current (A)	Equivalent Voltage Drop	Inductance (μH)	Insulation Class	Input Reactor Model	D x H x W (mm)	D1 x W1 (mm)	a x b (mm)	Mounting Hole Diameter Ø (mm)	A x e (mm)	Material	Mass (kg)	Loss (W)
0530-7	530	2%	47	F	ACL-0600-EISH-E47UA	370 x 355 x 265	272 x 160	12 x 20	12	50 x 8	Al	80	500

20.6.3 EMC Filter

20.6.3.1 Air-Cooled Single-Drive Product (400 V)

This series of filters are optional and used to meet the C2 emission requirements in EN 61800-3. The filter must be grounded securely and the cable connecting the filter to the AC drive must be shorter than 30 cm.

Note

- The cable between the filter and the AC drive must be as short as possible, less than 30 cm. The filter and AC drive must be connected to the same ground reference plane, and the filter must be reliably grounded. Otherwise, the performance of the filter will be affected.
- For AC drives from MD880-01S-0314-4-SG to MD880-01S-0751-4(-L)-SG, an external filter is not required, as the standard built-in filter board can meet the requirements of EN 61800-3 C3.

Standard EMC filter



Figure 20-88 SCHAFFNER FN3258 series filter



Figure 20-89 SCHAFFNER FN3359 series filter



Figure 20-90 JIANLI series filter

Recommended models

Table 20–75 SCHAFFNER filter models (three-phase 380 V to 480 V)

Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Filter Model
0012-4-B-SG	5.5	12	FN 3258-16-33
0017-4-B-SG	7.5	17	FN 3258-30-33
0024-4-B-SG	11	24	FN 3258-30-33
0033-4-B-SG	15	33	FN 3258-42-33

Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Filter Model
0038-4-B-SG	18.5	38	FN 3258-42-33
0048-4-B-SG	22	48	FN 3258-55-34
0060-4-B-SG	30	60	FN 3258-75-34
0078-4-B-SG	37	78	FN 3258-75-34
0094-4-B-SG	45	94	FN 3258-100-35
0116-4-B-SG	55	116	FN 3258-100-35
0149-4-B-SG	75	149	FN 3258-130-35
0183-4-B-SG	90	183	FN 3258-180-40
0217-4-SG	110	217	FN 3258-180-40
0262-4-SG	132	262	FN 3258-250-28
0314-4-SG	160	314	FN 3359-250-28
0383-4-SG	200	383	FN 3359-320-99
0441-4-L-SG	220	441	FN 3359-400-99
0481-4-L-SG	250	481	FN 3359-600-99
0538-4-L-SG	280	538	FN 3359-600-99
0605-4-L-SG	315	605	FN 3359-600-99
0673-4-L-SG	355	673	FN 3359-600-99
0751-4-L-SG	400	751	FN 3359-800-99
0849-4-L-SG	450	849	FN 3359-800-99

Table 20–76 JIANLI filter models (three-phase 380 V to 480 V)

Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Filter Model
0012-4-B-SG	5.5	12	DL-16EBK5
0017-4-B-SG	7.5	17	DL-25EBK5
0024-4-B-SG	11	24	DL-25EBK5
0033-4-B-SG	15	33	DL-35EBK5
0038-4-B-SG	18.5	38	DL-50EBK5
0048-4-B-SG	22	48	DL-50EBK5
0060-4-B-SG	30	60	DL-65EBK5
0078-4-B-SG	37	78	DL-65EBK5
0094-4-B-SG	45	94	DL-80EBK5
0116-4-B-SG	55	116	DL-100EBK5
0149-4-B-SG	75	149	DL-130EBK5
0183-4-B-SG	90	183	DL-160EBK5
0217-4-SG	110	217	DL-200EBK5
0262-4-SG	132	262	DL-250EBK5
0314-4-SG	160	314	DL-300EBK3
0383-4-SG	200	383	DL-400EBK3
0441-4-L-SG	220	441	DL-400EBK3

Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Filter Model
0481-4-L-SG	250	481	DL-600EBK3
0538-4-L-SG	280	538	DL-600EBK3
0605-4-L-SG	315	605	DL-600EBK3
0673-4-L-SG	355	673	DL-600EBK3
0751-4-L-SG	400	751	DL-700EBK3
0849-4-L-SG	450	849	DL-800EBK3

20.6.4 Simple Filter

20.6.4.1 Air-Cooled Single-Drive Product (400 V)

Model selection

The simple EMC input filter can efficiently suppress the field interference and the interference generated by the AC drive during running. Ground the simple EMC input filter securely and ensure that the cable connecting the filter and AC drive is shorter than 30 cm.

Table 20–77 Simple filter models (three-phase 380 V to 480 V)

Product Model MD880-01S-	Simple AC Input Filter Model
0012-4-B-SG	DL-35EB1/10
0017-4-B-SG	DL-35EB1/10
0024-4-B-SG	DL-35EB1/10
0033-4-B-SG	DL-35EB1/10
0038-4-B-SG	DL-65EB1/10
0048-4-B-SG	DL-65EB1/10
0060-4-B-SG	DL-65EB1/10
0078-4-B-SG	DL-65EB1/10
0094-4-B-SG	DL-120EB1/10
0149-4-B-SG	DL-180EB1/10
0183-4-B-SG	DL-180EB1/10

Dimensions

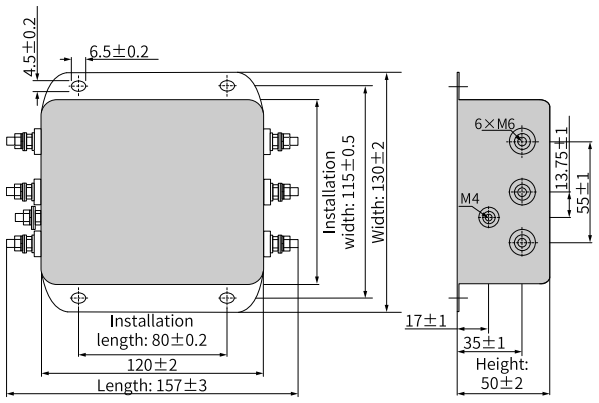


Figure 20-91 Installation dimensions of the simple EMC filter (unit: mm)

Table 20–78 Dimensions of the simple EMC filter (unit: mm)

Filter Model	Dimensions (L x W x H)	Installation Dimensions (Installation Length x Installation Width)
DL-15EB1/10	157 x 130 x 50	80 x 115
DL-35EB1/10	218 x 140 x 80	184 x 112
DL-65EB1/10	218 x 140 x 80	184 x 112
DL-120EB1/10	334 x 185 x 90	304 x 155
DL-180EB1/10	388 x 220 x 100	354 x 190

20.6.5 Output Reactor

20.6.5.1 Water-Cooled Inverter Module

- Whether to install an AC equalizing reactor at the output side of the inverter module depends on actual situations.
- For inverter modules in parallel connection, install an AC equalizing reactor close to the module.
- When the output cable is too long, install an equalizing reactor. Specifically, if the cable is 150 m or even longer, install an AC equalizing reactor close to the inverter module.

Model selection

Installing an output reactor at the output side of the drive helps reduce excessive dV/dt and voltage stress on the motor winding, protecting the motor winding, lowering the motor temperature, and prolonging the service life of the motor.

AC output reactor designation rule:

MD-OCL-50-0.14-4T-1%
① ② ③ ④ ⑤

① **Product series** MD-OCL: Inovance AC output reactor	③ **Inductance** 0.14: 0.14 mH	⑤ **Voltage drop percentage** 1%: 1%
② **Rated current** 50: 50 A	④ **Rated voltage** 4T: 380 V	

Product Model MD880LC-50M-	Motor Capacity (kW)	Rated Current (A)	Reactor Model	Insulation Class	Inductance	Cooling Method	Rated Loss at 20°C (W)	Mass
0530-7	500	530	MD880-OCL-008U-0900-7	H	8 μH	Forced air cooling	300	22 kg
0650-7	630	650	MD880-OCL-008U-0900-7	H	8 μH	Forced air cooling	450	22 kg
0900-7	900	900	The reactor is integrated in the product.					

For the listed equalizing reactors, add a water-to-air heat exchanger and cooling fan in the cabinet to cool the equalizing reactors.

The MD880-OCL-008U has an internal temperature switch (NC contact that becomes open when the temperature exceeds 160°C) for overtemperature detection. It is strongly recommended to connect the temperature switch to the DI terminal of HCU or other controllers for reactor overtemperature detection.

Dimensions

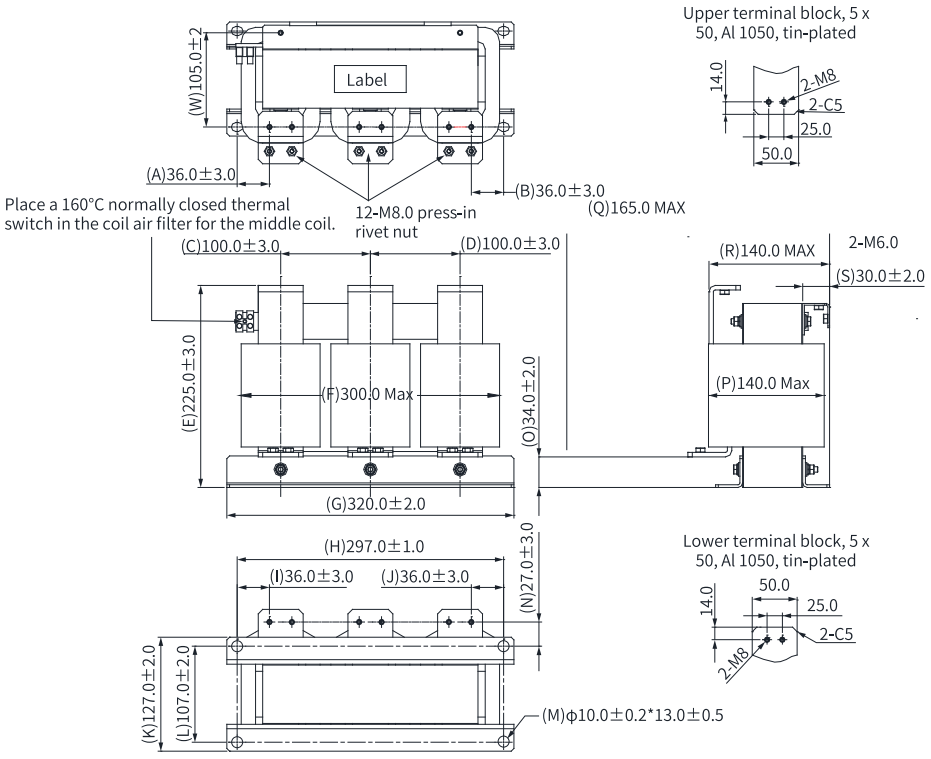


Figure 20-92 MD880-OCL-008U dimensions (unit: mm)

20.6.5.2 Air-Cooled Single-Drive Product (400 V)

Model selection

Whether to install an AC output reactor at the output side of the AC drive depends on actual situations. The cable between the AC drive and motor must not be too long. Overlong cables cause large distributed capacitance and therefore high harmonic current.

When the output cable length reaches or exceeds the limits in the following table, install an AC output reactor near the AC drive.

Table 20–79 Cable length limit (three-phase 380 V to 480 V)

AC Drive Power	Rated Voltage (V)	Cable Length Limit (m)
0.4 to 4	200 to 500	50
5.5	200 to 500	70
7.5	200 to 500	100
11	200 to 500	110
15	200 to 500	125
18.5	200 to 500	135
22	200 to 500	150
⩾ 30	280 to 690	150

Table 20–80 Cable length limit (three-phase 200 V to 240 V)

AC Drive Power	Rated Voltage (V)	Cable Length Limit (m)
0.4 to 3	200 to 500	50
3.7	200 to 500	70
5.5	200 to 500	110
7.5	200 to 500	125
⩾ 11	200 to 500	150

Recommended manufacturers and models are listed in the following table.

MD-OCL-50-0.14-4T-1%
① ② ③ ④ ⑤

① **Product series** MD-OCL: Inovance AC output reactor	③ **Inductance** 0.14: 0.14 mH	⑤ **Voltage drop percentage** 1%: 1%
② **Rated current** 50: Single 50 A	④ **Rated voltage** 4T: 380 V	

Table 20–81 Inovance output reactor models (three-phase 380 V to 480 V)

Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Applicable Reactor	Inductance (mH)
0012-4-B-SG	5.5	12	MD-OCL-15-0.47-4T-1%	0.47
0017-4-B-SG	7.5	17	MD-OCL-20-0.35-4T-1%	0.35
0024-4-B-SG	11	24	MD-OCL-30-0.23-4T-1%	0.23

Model MD880-01S-	Rated Power (kW)	Rated Current (A)	Applicable Reactor	Inductance (mH)
0033-4-B-SG	15	33	MD-OCL-40-0.18-4T-1%	0.18
0038-4-B-SG	18.5	38	MD-OCL-40-0.18-4T-1%	0.18
0048-4-B-SG	22	48	MD-OCL-50-0.14-4T-1%	0.14
0060-4-B-SG	30	60	MD-OCL-60-0.12-4T-1%	0.12
0078-4-B-SG	37	78	MD-OCL-80-0.087-4T-1%	0.087
0094-4-B-SG	45	94	MD-OCL-120-0.058-4T-1%	0.058
0116-4-B-SG	55	116	MD-OCL-120-0.058-4T-1%	0.058
0149-4-B-SG	75	149	MD-OCL-150-0.047-4T-1%	0.047
0183-4-B-SG	90	183	MD-OCL-200-0.035-4T-1%	0.035
0217-4-SG	110	217	MD-OCL-250-0.028-4T-1%	0.028
0262-4-SG	132	262	MD-OCL-330-0.021-4T-1%	0.021
0314-4-SG	160	314	MD-OCL-330-0.021-4T-1%	0.021
0383-4-SG	200	383	MD-OCL-490-0.014-4T-1%	0.014

Note

If you need to install AC output reactors to the MD880-01S-0441-4-SG...MD880-01S-0849-4-SG models, you can order the MD880-01S-0441-4-L-SG...MD880-01S-0849-4-L-SG models directly.

Dimensions

Dimensions of AC output reactors (15 A)

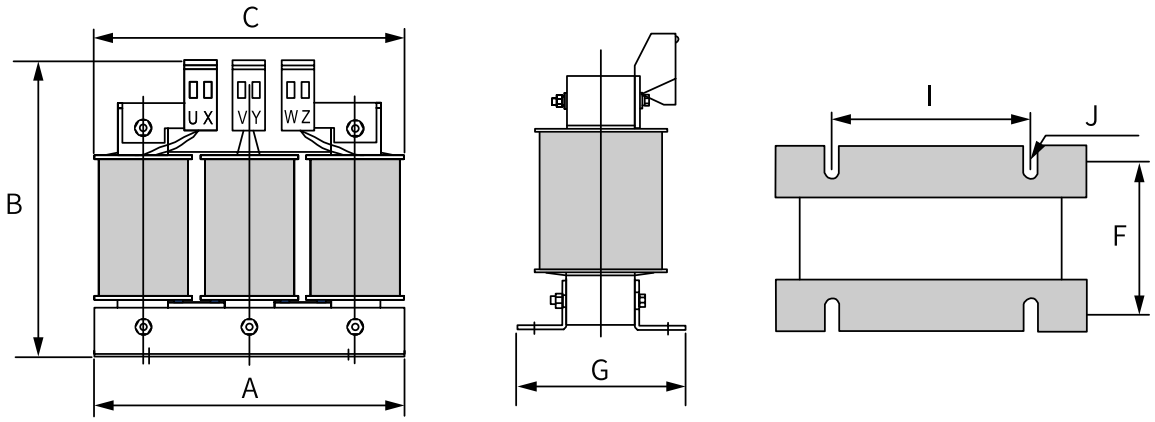


Figure 20-93 Dimensions of AC output reactors (unit: mm)

Model	Rated Current (A)	A	B	C	G	F	I	J
MD-OCL-15-0.47-4T-1%	15	148±1	140	155	76±2	61±2	95±2	Ø6 x 15

Dimensions of AC output reactors (20 A)

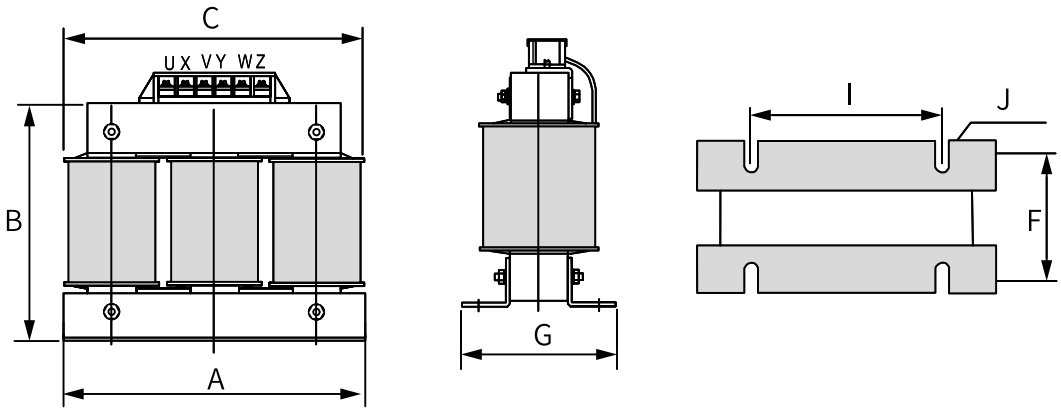


Figure 20-94 Dimensions of AC output reactors (unit: mm)

Model	Rated Current (A)	A	B	C	G	F	I	J
MD-OCL-20-0.35-4T-1%	20	148±1	165	155	76±2	61±2	95±1	Ø6 x 15

Dimensions of AC output reactors (30 A to 60 A)

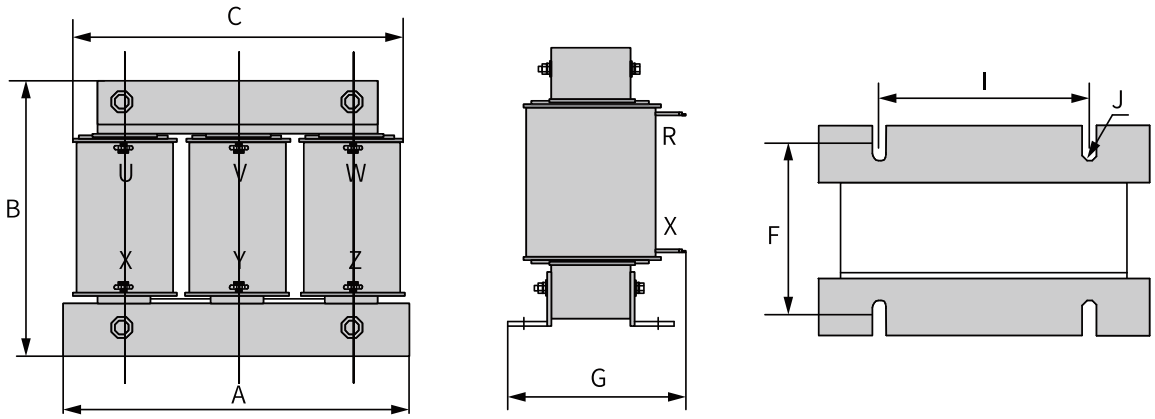


Figure 20-95 Dimensions of AC output reactors (unit: mm)

Model	Rated Current (A)	A	B	C	G	F	I	J
MD-OCL-30-0.23-4T-1%	30	155	130	148±1	135	80±2	95±1	Ø6 x 15
MD-OCL-40-0.18-4T-1%	40	155	130	148±1	135	80±2	95±1	Ø6 x 15
MD-OCL-50-0.14-4T-1%	50	155	130	148±1	135	80±2	95±1	Ø6 x 15
MD-OCL-60-0.12-4T-1%	60	195	165	188±1	130	72±2	120±1	Ø8.5 x 20

Dimensions of AC output reactors (80 A to 120 A)

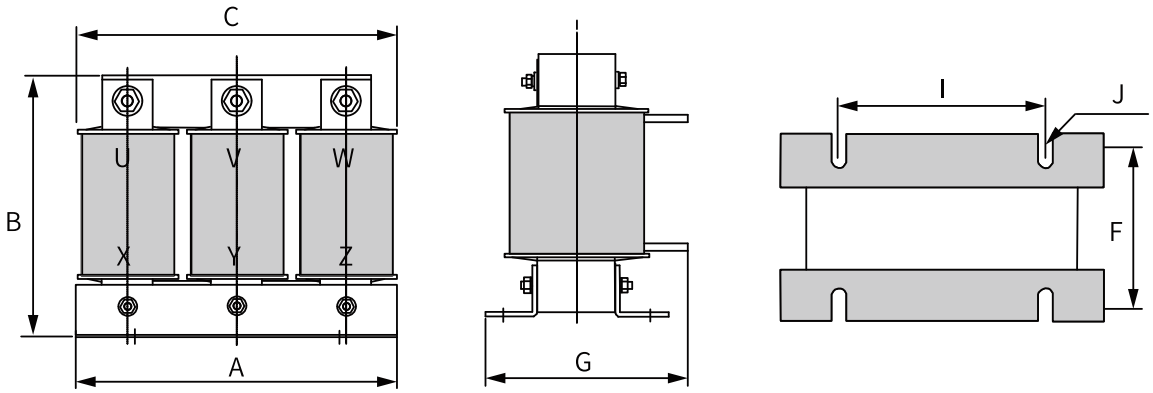


Figure 20-96 Dimensions of AC output reactors (unit: mm)

Model	Rated Current (A)	A	B	C	G	F	I	J
MD-OCL-80-0.087-4T-1%	80	195	165	188±1	130	72±2	120±1	Ø8.5 x 20
MD-OCL-120-0.058-4T-1%	120	195	165	188±1	140	72±2	120±1	Ø8.5 x 20

Dimensions of AC output reactors (150 A to 490 A)

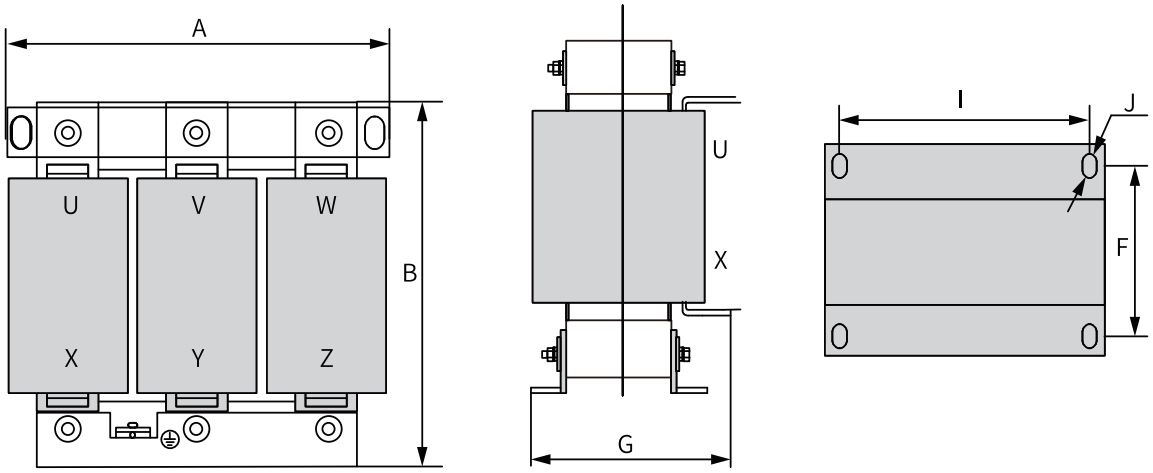


Figure 20-97 Dimensions of AC output reactors (unit: mm)

Model	Rated Current (A)	A	B	G	F	I	J
MD-OCL-150-0.047-4T-1%	150	250	230	170	87±2	182±1	Ø11 x 18
MD-OCL-200-0.035-4T-1%	200	250	230	175	97±2	182±1	Ø11 x 18
MD-OCL-250-0.028-4T-1%	250	250	230	175	97±2	182±1	Ø11 x 18
MD-OCL-330-0.021-4T-1%	330	290	250	190	106±2	214±1	Ø11 x 18
MD-OCL-490-0.014-4T-1%	490	320	320	220	113±2	243±1	Ø12 x 20

Note

The dimensions of AC input reactor models provided here are for reference only. Actual dimensions may vary with models.

20.6.5.3 Water-Cooled Single-Drive Product

Model selection

Installing an output reactor at the output side of the drive helps reduce excessive dV/dt and voltage stress on the motor winding, protecting the motor winding, lowering the motor temperature, and prolonging the service life of the motor.

Whether to install an AC output reactor at the output side of the AC drive depends on actual situations. The cable between the AC drive and motor must not be too long. Overlong cables cause excessive dV/dt and voltage stress, and also reduces the output power due to excessive leakage current.

When the output cable is excessively long, install an output reactor. Specifically, if the cable is 150 m or even longer, install an AC output reactor close to the AC drive.

Recommended manufacturers and models are listed in the following table.

MD-OCL-50-0.14-4T-1%
① ② ③ ④ ⑤

① **Product series** MD-OCL: Inovance AC output reactor	③ **Inductance** 0.14: 0.14 mH	⑤ **Voltage drop percentage** 1%: 1%
② **Rated current** 50: 50 A	④ **Rated voltage** 4T: 380 V	

Table 20–82 Output reactor models

Model MD880LC-01S...	Motor Capacity (kW)	Inductance (mH)	Applicable Reactor	Inductance (mH)	Loss (W)
0340-7	315	0.036	OCL-0390-EISH-E36UA	0.036	450
0530-7	500	0.023	OCL-0600-EISH-E23UA	0.023	700

Dimensions

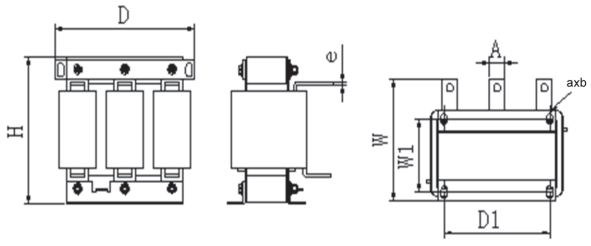


Figure 20-98 Dimensions of output reactor models (unit: mm)

Table 20–83 Dimensions of AC output reactors (unit: mm)

Input Reactor Model	D x H x W	D1 x W1	a x b	Mounting Hole Diameter ϕ	A x e
OCL-0390-EISH-E36UA	240 x 260 x 211	182 x 131	11 x 18	11	30 x 6
OCL-0600-EISH-E23UA	287 x 325 x 234	214 x 135	11 x 18	11	40 x 8

20.6.5.4 Inverter Module

Due to the distributed capacitance in motor cables, the high dV/dt during high-speed switching of the switching tube 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	

Module Model	Rated Current	Reactor Model	Inductance	Remarks
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				
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	

20.6.6 Magnetic Ring

Magnetic rings can be optionally installed on the DC bus of multi-drive products and on air-cooled single-drive products (400 V).

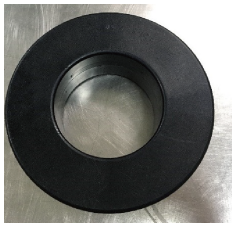
Model selection

The magnetic ring is mainly used at the input or output side of the drive. Install it as close to the drive as possible. Installing a magnetic ring at the input side can suppress noise in the input power system of the drive. Installing a magnetic ring at the output side can reduce the bearing current and interference that escapes to the outside.

The magnetic ring or ferrite clamp can also be used to suppress the leakage current or other signal cable interference in some applications.

In some applications, you can wind R/T/S wires (excluding the PE wire) on a magnetic ring near the port to partially filter out interference generated by the AC drive during running.

- Amorphous magnetic ring: Exhibits high permeability below 1 MHz, offering excellent suppression of drive interference, but at a higher cost.
- Ferrite clamp: Performs well in frequency bands above 1 MHz, effectively suppressing interference noise on various signal lines, with the advantages of low cost, easy installation, and an aesthetically pleasing appearance.

Magnetic Ring		Appearance
Magnetic ring	DY644020H	
	DY805020H	
	DY1207030H	

Dimensions

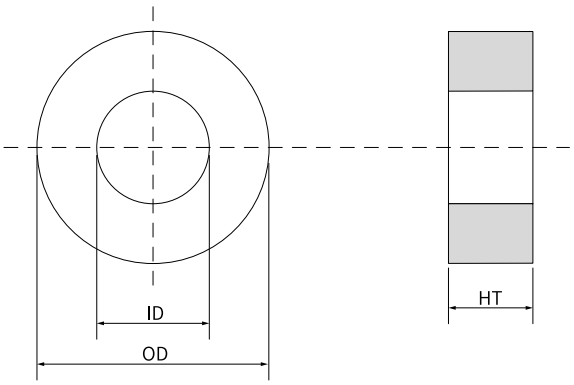


Figure 20-99 Dimensions of the magnetic ring

Table 20–84 Dimensions of the magnetic ring

Magnetic Ring Model	Dimensions (OD x ID x HT) (mm)
DY644020H	64 x 40 x 20
DY805020H	80 x 50 x 20
DY1207030H	120 x 70 x 30

21 Compliance List

Mark	Certification	Directive		Standard	Compliant Module
	CE Certification	EMC Directive	2014/30/EU	EN IEC 61800-3	Basic rectifier module Regenerative rectifier module Active rectifier module<1> Inverter module Three-phase braking module Water-cooled basic rectifier module Water-cooled active rectifier module Water-cooled inverter module Single-drive product<2>
		LVD Directive	2014/35/EU	EN 61800-5-1	Basic rectifier module Regenerative rectifier module Active rectifier module<1> Inverter module Three-phase braking module Water-cooled basic rectifier module Water-cooled active rectifier module Water-cooled inverter module Single-drive product<2>
		RoHS Directive	2011/65/EU	EN 50581	Basic rectifier module Regenerative rectifier module Active rectifier module<1> Inverter module Three-phase braking module Water-cooled basic rectifier module Water-cooled active rectifier module Water-cooled inverter module Single-drive product<2>

Note

The product meets the requirements of the latest directives and standards for the CE certification.

22 Ordering Guide

22.1 Basic Rectifier Module

Table 22–1 Ordering guide for basic rectifier modules

Model MD880-20...	Frame	Part No.	Quantity	Remarks
0718-4	T2	MD880-20M-0718-4	1	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		T2-quick-kit	1	T2 quick installation kit (option)
0982-4	T2	MD880-20M-0982-4	1	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		T2-quick-kit	1	T2 quick installation kit (option)
1336-4	2 x T2	MD880-20M-0718-4	2	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	2	T2 quick installation kit (option)
1826-4	2 x T2	MD880-20M-0982-4	2	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	2	T2 quick installation kit (option)
2739-4	3 x T2	MD880-20M-0982-4	3	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	3	T2 quick installation kit (option)
3651-4	4 x T2	MD880-20M-0982-4	4	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	4	T2 quick installation kit (option)
4564-4	5 x T2	MD880-20M-0982-4	5	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-60	1	Parallel control module
		T2-quick-kit	5	T2 quick installation kit (option)
5477-4	6 x T2	MD880-20M-0982-4	6	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-60	1	Parallel control module
		T2-quick-kit	6	T2 quick installation kit (option)
0570-7	T2	MD880-20M-0570-7	1	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		T2-quick-kit	1	T2 quick installation kit (option)

Model MD880-20...	Frame	Part No.	Quantity	Remarks
0815-7	T2	MD880-20M-0815-7	1	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		T2-quick-kit	1	T2 quick installation kit (option)
1061-7	2 x T2	MD880-20M-0570-7	2	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	2	T2 quick installation kit (option)
1515-7	2 x T2	MD880-20M-0815-7	2	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	2	T2 quick installation kit (option)
2273-7	3 x T2	MD880-20M-0815-7	3	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	3	T2 quick installation kit (option)
3031-7	4 x T2	MD880-20M-0815-7	4	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-40	1	Parallel control module
		T2-quick-kit	4	T2 quick installation kit (option)
3788-7	5 x T2	MD880-20M-0815-7	5	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-60	1	Parallel control module
		T2-quick-kit	5	T2 quick installation kit (option)
4546-7	6 x T2	MD880-20M-0815-7	6	Basic rectifier module
		HCU-20	1	Basic rectifier control module
		HPCU-60	1	Parallel control module
		T2-quick-kit	6	T2 quick installation kit (option)

22.2 Regenerative Rectifier Product

Table 22–2 Ordering guide for regenerative rectifier products

Model MD880-30...	Frame	Part No.	Quantity	Remarks
0640-4	L+H8	MD880-30K-0640-4	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0900-4	L+H8	MD880-30K-0900-4	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1190-4	L+2 x H8	MD880-30K-1190-4	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1674-4	L+2 x H8	MD880-30K-1674-4	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
2380-4	2 x (L+2 x H8)	MD880-30K-1190-4	2	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
3348-4	2 x (L+2 x H8)	MD880-30K-1674-4	2	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
5022-4	3 x (L+2 x H8)	MD880-30K-1674-4	3	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-60	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module

Model MD880-30...	Frame	Part No.	Quantity	Remarks
0600-7	L+H8	MD880-30K-0600-7	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0900-7	L+H8	MD880-30K-0900-7	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1116-7	L+2 x H8	MD880-30K-1116-7	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1674-7	L+2 x H8	MD880-30K-1674-7	1	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
2232-7	2 x (L+2 x H8)	MD880-30K-1116-7	2	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
3348-7	2 x (L+2 x H8)	MD880-30K-1674-7	2	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
5022-7	3 x (L+2 x H8)	MD880-30K-1674-7	3	Regenerative rectifier frame kit
		HCU-30	1	Regenerative rectifier control module
		HPCU-60	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module

Note

If you need a standard regenerative rectifier cabinet, contact Inovance.

If you prepare the reactor yourself, you need to purchase a regenerative rectifier module as well as optional parts such as HCU-30, HSVM-10 and HOFM-10. If you need the parallel mode, purchase an HPCU parallel control module.

22.3 Active Rectifier Product

Table 22–3 Ordering guide for active rectifier products

Model MD880-40-	Frame	Part No.	Quantity	Remarks
0094-4	Unassembled LCL+H3 integration	MD880-40D-0094-4	1	Active rectifier power module, filter reactor, filter capacitor, pre-charge module, and control detection unit. Packaged as unassembled finished products and to be integrated by customers. To order PCS software, add the "+PCS" suffix to the module number for models up to -0395, for example, MD880-40D-0094-4+PCS.
0149-4	Unassembled LCL+H4 integration	MD880-40D-0149-4	1	
0183-4	Unassembled LCL+H4 integration	MD880-40D-0183-4	1	
0299-4	Unassembled LCL+H6 integration	MD880-40D-0299-4	1	
0395-4	Unassembled LCL+H7 integration	MD880-40D-0395-4	1	
0094-4+JC	LCL+H3	MD880-40D-0094-4+JC	1	Active rectifier power module, LCL filter module, pre-charge module, and control detection unit. Packaged as unassembled finished products and to be integrated by customers.
0149-4+JC	LCL+H4	MD880-40D-0149-4+JC	1	
0183-4+JC	LCL+H4	MD880-40D-0183-4+JC	1	
0299-4+JC	LCL+H6	MD880-40D-0299-4+JC	1	
0395-4+JC	LCL+H7	MD880-40D-0395-4+JC	1	
0575-4	BLCL+H8	MD880-40K-0575-4	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0810-4	BLCL+H8	MD880-40K-0810-4	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module

Model MD880-40-	Frame	Part No.	Quantity	Remarks
1092-4	BLCL+2H8	MD880-40K-1092-4	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1539-4	BLCL+2H8	MD880-40K-1539-4	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
2185-4	2 x (BLCL+2H8)	MD880-40K-1092-4	2	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
3078-4	2 x (BLCL+2H8)	MD880-40K-1539-4	2	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
4617-4	3 x (BLCL+2H8)	MD880-40K-1539-4	3	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-60	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0540-5-CS	BLCL+H8	MD880-40K-0540-5-CS	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0810-5-CS	BLCL+H8	MD880-40K-0810-5-CS	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module

Model MD880-40-	Frame	Part No.	Quantity	Remarks
1026-5-CS	BLCL+2H8	MD880-40K-1026-5-CS	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1539-5-CS	2 x (BLCL+H8)	MD880-40K-0810-5-CS	2	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
2052-5-CS	2 x (BLCL+2H8)	MD880-40K-1026-5-CS	2	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
2052-5-CS	2 x (BLCL+2H8)	MD880-40K-1026-5-CS	2	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
2309-5-CS	3 x (BLCL+H8)	MD880-40K-0810-5-CS	3	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
3078-5-CS	3 x (BLCL+2H8)	MD880-40K-1026-5-CS	3	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
3848-5-CS	4 x (BLCL+2H8)	MD880-40K-1026-5-CS	4	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module

Model MD880-40-	Frame	Part No.	Quantity	Remarks
4617-5-CS	5 x (BLCL+2H8)	MD880-40K-1026-5-CS	5	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0369-7	BLCL+H8	MD880-40K-0369-7	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0540-7	BLCL+H8	MD880-40K-0540-7	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
0701-7	BLCL+2H8	MD880-40K-0701-7	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1026-7	BLCL+2H8	MD880-40K-1026-7	1	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
1402-7	2 x (BLCL+2H8)	MD880-40K-0701-7	2	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
2052-7	2 x (BLCL+2H8)	MD880-40K-1026-7	2	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-40	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module

Model MD880-40-	Frame	Part No.	Quantity	Remarks
3078-7	3 x (BLCL+2H8)	MD880-40K-1026-7	3	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-60	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
4104-7	4 x (BLCL+2H8)	MD880-40K-1026-7	4	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-A0	1	Parallel expansion module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module
5130-7	5 x (BLCL+2H8)	MD880-40K-1026-7	5	Active rectifier frame kit
		HCU-40/HCU-40+PCS	1	Active rectifier control module
		HPCU-A0	1	Parallel control module
		HOFM-10	1	Optical fiber expansion module
		HSVM-10	1	Sync voltage detection module

22.4 Inverter Module

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 22–4 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

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
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
0516-4	H8	1. MD880-50M-0516-4-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0639-4	H8	1. MD880-50M-0639-4-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0757-4	H8	1. MD880-50M-0757-4-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0900-4	H8	1. MD880-50M-0900-4-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
1214-4	2 x H8	1. MD880-50M-0639-4- L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation base (option)
1439-4	2 x H8	1. MD880-50M-0757-4- L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation base (option)
1710-4	2 x H8	1. MD880-50M-0900-4- L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation base (option)
2158-4	3 x H8	1. MD880-50M-0757-4- L-CS	3	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation base (option)
2565-4	3 x H8	1. MD880-50M-0900-4- L-CS	3	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
3420-4	4 x H8	1. MD880-50M-0900-4- L-CS	4	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation base (option)
4275-4	5 x H8	1. MD880-50M-0900-4- L-CS	5	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	5	H8 quick installation base (option)
5130-4	6 x H8	1. MD880-50M-0900-4-L-CS	6	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	6	H8 quick installation base (option)
0516-4	H8A	3. MD880-50M-0516-4-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0639-4	H8A	1. MD880-50M-0516-4-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0757-4	H8A	1. MD880-50M-0516-4-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0900-4	H8A	1. MD880-50M-0516-4-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
1214-4	2 x H8A	1. MD880-50M-0639-4-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A quick installation base with reactor (option)
1439-4	2 x H8A	1. MD880-50M-0757-4-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A quick installation base with reactor (option)
1710-4	2 x H8A	1. MD880-50M-0900-4-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A quick installation base with reactor (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
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)
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)
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)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
2309-5	3 x H8A	1. MD880-50M-0810-5-CS	3	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel
		4. H8A-kit-L	3	H8A quick installation base (option)
3078-5	4 x H8A	1. MD880-50M-0810-5-CS	4	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel
		4. H8A-kit-L	4	H8A quick installation base (option)
3848-5	5 x H8A	1. MD880-50M-0810-5-CS	5	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel
		4. H8A-kit-L	5	H8A quick installation base (option)
4617-5	6 x H8A	1. MD880-50M-0810-5-CS	6	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel
		4. H8A-kit-L	6	H8A quick installation base (option)
5387-5	7 x H8A	1. MD880-50M-0810-5-CS	7	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel
		4. H8A-kit-L	7	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
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	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0410-7	H8	1. MD880-50M-0410-7-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0530-7	H8	1. MD880-50M-0530-7-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0600-7	H8	1. MD880-50M-0650-7-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0650-7	H8	1. MD880-50M-0650-7-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
0721-7	H8	1. MD880-50M-0721-7-L-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8-quick-kit	1	H8 quick installation base (option)
0779-7	2 x H8	1. MD880-50M-0410-7-L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel
		4. H8-quick-kit	2	H8 quick installation base (option)
1007-7	2 x H8	1. MD880-50M-0530-7- L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation base (option)
1140-7	2 x H8	1. MD880-50M-0600-7- L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation base (option)
1235-7	2 x H8	1. MD880-50M-0650-7- L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation base (option)
1370-7	2 x H8	1. MD880-50M-0721-7- L-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation base (option)
1510-7	3 x H8	1. MD880-50M-0530-7- L-CS	3	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation base (option)
1710-7	3 x H8	1. MD880-50M-0600-7- L-CS	3	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation base (option)
1853-7	3 x H8	1. MD880-50M-0650-7- L-CS	3	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation base (option)
2055-7	3 x H8	1. MD880-50M-0721-7- L-CS	3	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
2280-7	4 x H8	1. MD880-50M-0600-7- L-CS	4	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	4	H8 quick installation base (option)
2470-7	4 x H8	1. MD880-50M-0650-7- L-CS	4	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	4	H8 quick installation base (option)
2740-7	4 x H8	1. MD880-50M-0721-7- L-CS	4	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	4	H8 quick installation base (option)
3088-7	5 x H8	1. MD880-50M-0650-7- L-CS	5	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	5	H8 quick installation base (option)
3425-7	5 x H8	1. MD880-50M-0721-7- L-CS	5	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	5	H8 quick installation base (option)
3705-7	6 x H8	1. MD880-50M-0650-7- L-CS	6	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	6	H8 quick installation base (option)
4110-7	6 x H8	1. MD880-50M-0721-7- L-CS	6	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	6	H8 quick installation base (option)
4323-7	7 x H8	1. MD880-50M-0650-7- L-CS	7	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	7	H8 quick installation base (option)
4795-7	7 x H8	1. MD880-50M-0721-7- L-CS	7	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	7	H8 quick installation base (option)
4940-7	8 x H8	1. MD880-50M-0650-7- L-CS	8	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	8	H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
5480-7	8 x H8	1. MD880-50M-0721-7- L-CS	8	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	8	H8 quick installation base (option)
0340-7	H8A	2. MD880-50M-0340-7-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0410-7	H8A	1. MD880-50M-0410-7-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0530-7	H8A	1. MD880-50M-0530-7-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0600-7	H8A	1. MD880-50M-0650-7-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0650-7	H8A	1. MD880-50M-0650-7-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0721-7	H8A	1. MD880-50M-0721-7-CS	1	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. H8A-kit	1	H8A quick installation base (option)
0779-7	2 x H8A	1. MD880-50M-0410-7-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A quick installation base with reactor (option)
1007-7	2 x H8A	1. MD880-50M-0530-7-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A quick installation base with reactor (option)
1140-7	2 x H8A	1. MD880-50M-0600-7-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A quick installation base with reactor (option)
1235-7	2 x H8A	1. MD880-50M-0650-7-CS	2	Inverter module
		2. HCU-50S-CS	1	Inverter controller (for cranes)
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A quick installation base with reactor (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
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)
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)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
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)
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)

Table 22–5 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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)

Model MD880-50-...	Frame	Part No.	Quanti ty	Remarks
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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
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 (optional)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
1007-7	2 x H8	1. MD880-50M-0530-7-SG	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation kit (optional)
1007-7	2 x H8A	1. MD880-50M-0530-7-SG-N	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A mounting base with reactor (optional)
1140-7	2 x H8	1. MD880-50M-0600-7-SG	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation kit (optional)
1140-7	2 x H8A	1. MD880-50M-0600-7-SG-N	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A mounting base with reactor (optional)
1235-7	2 x H8	1. MD880-50M-0650-7-SG	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation kit (optional)
1235-7	2 x H8A	1. MD880-50M-0650-7-SG-N	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A mounting base with reactor (optional)
1370-7	2 x H8	1. MD880-50M-0721-7-SG	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	2	H8 quick installation kit (optional)
1370-7	2 x H8A	1. MD880-50M-0721-7-SG-N	2	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	2	H8A mounting base with reactor (optional)
1510-7	3 x H8	1. MD880-50M-0530-7-SG	3	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	3	H8 quick installation kit (optional)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
2470-7	4 x H8	1. MD880-50M-0650-7-SG	4	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	4	H8 quick installation kit (optional)
2470-7	4 x H8A	1. MD880-50M-0650-7-SG-N	4	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8A-kit-L	4	H8A mounting base with reactor (optional)
2740-7	4 x H8	1. MD880-50M-0721-7-SG	4	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
		4. H8-quick-kit	4	H8 quick installation kit (optional)
3088-7	5 x H8	1. MD880-50M-0650-7-SG	5	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	5	H8 quick installation kit (optional)
3088-7	5 x H8A	1. MD880-50M-0650-7-SG-N	5	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
		4. H8A-kit-L	5	H8A mounting base with reactor (optional)
3425-7	5 x H8	1. MD880-50M-0721-7-SG	5	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	5	H8 quick installation kit (optional)
3425-7	5 x H8A	1. MD880-50M-0721-7-SG-N	5	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
		4. H8A-kit-L	5	H8A mounting base with reactor (optional)
3705-7	6 x H8	1. MD880-50M-0650-7-SG	6	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
		4. H8-quick-kit	6	H8 quick installation kit (optional)
3705-7	6 x H8A	1. MD880-50M-0650-7-SG-N	6	Inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
		4. H8A-kit-L	6	H8A mounting base with reactor (optional)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)
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 (optional)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
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 (optional)
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 (optional)

22.5 Three-Phase Braking Module

Table 22–6 Ordering guide for three-phase braking modules

Model MD880-60...	Frame	Part No.	Quantity	Remarks
0500-4	H8	MD880-60M-0500-4	1	Three-phase braking module
		HCU-60	1	Three-phase braking control module
		H8-quick-kit	1	H8 quick installation kit (option)
0750-4	H8	MD880-60M-0750-4	1	Three-phase braking module
		HCU-60	1	Three-phase braking control module
		H8-quick-kit	1	H8 quick installation kit (option)
0870-7	H8	MD880-60M-0870-7	1	Three-phase braking module
		HCU-60	1	Three-phase braking control module
		H8-quick-kit	1	H8 quick installation kit (option)
1300-7	H8	MD880-60M-1300-7	1	Three-phase braking module
		HCU-60	1	Three-phase braking control module
		H8-quick-kit	1	H8 quick installation kit (option)
0870-7-SG-N	H8A	MD880-60M-0870-7-SG-N	1	Three-phase braking module
		HCU-60	1	Three-phase braking control module
1300-7-SG-N	H8A	MD880-60M-1300-7-SG-N	1	Three-phase braking module
		HCU-60	1	Three-phase braking control module

22.6 Single-Phase Braking Module

Table 22–7 Ordering guide for single-phase braking modules

Model MD880-61...	Part No.	Quantity	Remarks
0400-7	MD880-61M-0400-7	1	Single-phase braking module

22.7 DC Chopper Integrated Kit

Table 22–8 Ordering guide for DC chopper integrated kits

Model MD880-80D...	Part Name	Part No.	Quantity
0100-4	MD880-80D-0100-4 chopper module	01620431	1
	Metal film capacitor	05030113	1
	DC reactor	11070348	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, 100 A	80090530	1
0200-4	MD880-80D-0200-4 chopper module	01620321	1
	Metal film capacitor	05030113	1
	DC reactor	11070289	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, open loop, 200 A	80090531	1

Model MD880-80D...	Part Name	Part No.	Quantity
0300-4	MD880-80D-0300-4 chopper module	01620322	1
	Metal film capacitor	05030113	1
	DC reactor	11070288	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall sensor kit, 300 A	80090532	1
	MD880 integrated kit system wiring diagram	19060311	1
0400-4	MD880-80D-0400-4 chopper module	01620369	1
	Metal film capacitor	05030113	1
	DC reactor	11070297	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall sensor kit, 400 A	80090533	1

Model MD880-80D...	Part Name	Part No.	Quantity
0500-4	MD880-80D-0500-4 chopper module	01620370	1
	Metal film capacitor	05030113	1
	DC reactor	11070298	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall sensor kit, 500 A	80090534	1
0600-4	MD880-80D-0600-4 chopper module	01620428	1
	Metal film capacitor	05030113	1
	DC reactor	11070323	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall sensor kit, 600 A	80090535	1

Model MD880-80D...	Part Name	Part No.	Quantity
0800-4	MD880-80D-0800-4-SG-N chopper module	01620454	1
	Metal film capacitor	05030113	2
	DC reactor	11070351	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall sensor kit, 800 A	80090536	1
	MD880 integrated kit system wiring diagram	19060311	1
	HCU-80 power control module	01620278	1
1000-4	MD880-80D-1000-4-SG-N chopper module	01620453	1
	Metal film capacitor	05030113	2
	DC reactor	11070372	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	HCU-80 power control module	01620278	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall sensor kit, 1000 A	80090537	1
	Chopper module packaging component	19101279	1

Model MD880-80D...	Part Name	Part No.	Quantity
0100-7	MD880-80D-0100-7 chopper module	01620450	1
	Metal film capacitor	05030068	1
	DC reactor	11070348	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, 100 A	80090530	1
0200-7	MD880-80D-0200-7 chopper module	01620451	1
	Metal film capacitor	05030068	1
	DC reactor	11070289	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, open loop, 200 A	80090531	1

Model MD880-80D...	Part Name	Part No.	Quantity
0300-7	MD880-80D-0300-7 chopper module	01620458	1
	Metal film capacitor	05030068	1
	DC reactor	11070288	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, 300 A	80090532	1
0400-7	MD880-80D-0400-7 chopper module	01620457	1
	Metal film capacitor	05030068	1
	DC reactor	11070297	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, 400 A	80090533	1

Model MD880-80D...	Part Name	Part No.	Quantity
0500-7	MD880-80D-0500-7 chopper module	01620456	1
	Metal film capacitor	05030068	1
	DC reactor	11070298	3
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, 500 A	80090533	1
0600-7	MD880-80D-0600-7 chopper module	01620426	1
	Metal film capacitor	05030068	2
	Packing list	19060389	1
	HSVM-20 sync voltage detection module	01620308	1
	HOFM-30 optical fiber expansion adapter module	01620040	1
	Optional SOP-20-880 smart operating panel	01610168	1
	SOP-20-MP-IP20 operating panel base (option)	01620002	1
	Pre-charge contactor AC-3P-380V-38A-1NO1NC-220VAC	12020277	1
	Hall sampling cable set	1504AX18	1
	Pre-charge resistor cable set	1504AX19	1
	3 m network cable	1504AG17	1
	Hall current sensor kit, 600 A	80090535	1

22.8 Air-Cooled Single-Drive Product (400 V)

Table 22–9 Ordering guide for air-cooled single-drive products

Model MD880-01S-	Frame	Part No.	Quantity	Remarks
0012-4-B-SG	T2	MD880-01S-0012-4-B-SG	1	400 VAC single-drive AC drive unit
0017-4-B-SG	T2	MD880-01S-0017-4-B-SG	1	400 VAC single-drive AC drive unit
0024-4-B-SG	T3	MD880-01S-0024-4-B-SG	1	400 VAC single-drive AC drive unit
0033-4-B-SG	T3	MD880-01S-0033-4-B-SG	1	400 VAC single-drive AC drive unit
0038-4-B-SG	T4	MD880-01S-0038-4-B-SG	1	400 VAC single-drive AC drive unit
0048-4-B-SG	T5	MD880-01S-0048-4-B-SG	1	400 VAC single-drive AC drive unit
0060-4-B-SG	T5	MD880-01S-0060-4-B-SG	1	400 VAC single-drive AC drive unit
0078-4-B-SG	T6	MD880-01S-0078-4-B-SG	1	400 VAC single-drive AC drive unit
0094-4-B-SG	T6	MD880-01S-0094-4-B-SG	1	400 VAC single-drive AC drive unit
0116-4-B-SG	T7	MD880-01S-0116-4-B-SG	1	400 VAC single-drive AC drive unit
0149-4-B-SG	T7	MD880-01S-0149-4-B-SG	1	400 VAC single-drive AC drive unit
0183-4-B-SG	T8	MD880-01S-0183-4-B-SG	1	400 VAC single-drive AC drive unit
0217-4-SG	T8	MD880-01S-0217-4-SG	1	400 VAC single-drive AC drive unit
0262-4-SG	T8	MD880-01S-0262-4-SG	1	400 VAC single-drive AC drive unit
0314-4-SG	T9	MD880-01S-0314-4-SG	1	400 VAC single-drive AC drive unit
0383-4-SG	T9	MD880-01S-0383-4-SG	1	400 VAC single-drive AC drive unit
0441-4-SG	T10	MD880-01S-0441-4-SG	1	400 VAC single-drive AC drive unit
0481-4-SG	T10	MD880-01S-0481-4-SG	1	400 VAC single-drive AC drive unit
0441-4-L-SG	T10	MD880-01S-0441-4-L-SG	1	400 VAC single-drive AC drive unit
0481-4-L-SG	T10	MD880-01S-0481-4-L-SG	1	400 VAC single-drive AC drive unit
0538-4-SG	T11	MD880-01S-0538-4-SG	1	400 VAC single-drive AC drive unit
0605-4-SG	T11	MD880-01S-0605-4-SG	1	400 VAC single-drive AC drive unit
0538-4-L-SG	T11	MD880-01S-0538-4-L-SG	1	400 VAC single-drive AC drive unit
0605-4-L-SG	T11	MD880-01S-0605-4-L-SG	1	400 VAC single-drive AC drive unit
0673-4-SG	T12	MD880-01S-0673-4-SG	1	400 VAC single-drive AC drive unit
0751-4-SG	T12	MD880-01S-0751-4-SG	1	400 VAC single-drive AC drive unit
0849-4-SG	T12	MD880-01S-0849-4-SG	1	400 VAC single-drive AC drive unit
0673-4-L-SG	T12	MD880-01S-0673-4-L-SG	1	400 VAC single-drive AC drive unit
0751-4-L-SG	T12	MD880-01S-0751-4-L-SG	1	400 VAC single-drive AC drive unit
0849-4-L-SG	T12	MD880-01S-0849-4-L-SG	1	400 VAC single-drive AC drive unit

22.9 Air-Cooled Single-Drive Product (690 V)

Table 22–10 Ordering guide for air-cooled single-drive AC drives

Model	Structure	Part No.	Remarks
MD880-01S-0340-7-SG	S12	MD880-01S-0340-7-SG	690 VAC single-drive AC drive unit
MD880-01S-0410-7-SG	S12	MD880-01S-0410-7-SG	690 VAC single-drive AC drive unit
MD880-01S-0530-7-SG	S12	MD880-01S-0530-7-SG	690 VAC single-drive AC drive unit
MD880-01S-0600-7-SG	S12	MD880-01S-0600-7-SG	690 VAC single-drive AC drive unit
MD880-01S-0650-7-SG	S12	MD880-01S-0650-7-SG	690 VAC single-drive AC drive unit
MD880-01S-0721-7-SG	S12	MD880-01S-0721-7-SG	690 VAC single-drive AC drive unit
MD880-11S-0600-7	S12	MD880-11S-0600-7	690 VAC single-drive AC drive cabinet, with the output reactor, input contactor, and braking module options available for selection
MD880-11S-0650-7	S12	MD880-11S-0650-7	690 VAC single-drive AC drive cabinet, with the output reactor, input contactor, and braking module options available for selection
MD880-11S-0721-7	S12	MD880-11S-0721-7	690 VAC single-drive AC drive cabinet, with the output reactor, input contactor, and braking module options available for selection
MD880-11S-1140-7	2 x S12	MD880-11S-1140-7	690 VAC single-drive AC drive cabinet, with the braking module option available for selection
MD880-11S-1235-7	2 x S12	MD880-11S-1235-7	690 VAC single-drive AC drive cabinet, with the braking module option available for selection
MD880-11S-1370-7	2 x S12	MD880-11S-1370-7	690 VAC single-drive AC drive cabinet, with the braking module option available for selection

22.10 Water-Cooled Single-Drive Product

Table 22–11 Ordering guide for water-cooled single-drive products

Model MD880LC-01S...	Frame	Part No.	Remarks
0340-7	H7w	MD880LC-01S-0340-7	Single-drive water-cooled AC drive module
0530-7	H7w	MD880LC-01S-0530-7	Single-drive water-cooled AC drive module

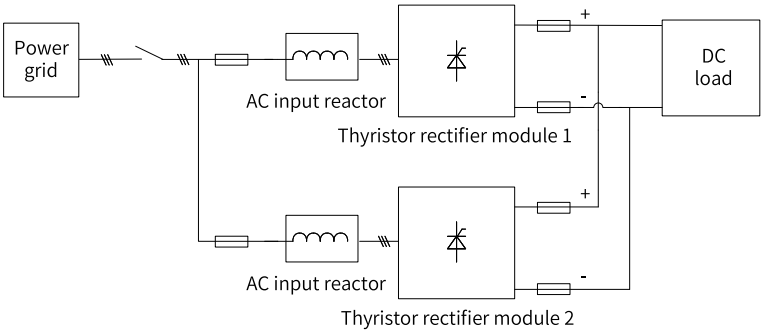
22.11 Water-Cooled Basic Rectifier Module

Note

The water-cooled basic rectifier modules include two types: diode rectifiers and thyristor rectifiers. The model number of thyristor rectifiers ends with "+SCR".

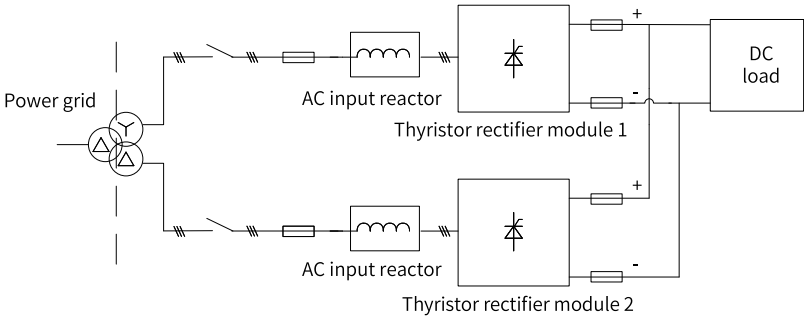
Two 6-pulse thyristor rectifiers in parallel

When two 6-pulse 1520 A/690 V thyristor rectifier modules are paralleled, the no-overload current is derated to 2827 A based on a derating coefficient of 0.93. The system topology is shown in the following figure.



Two 12-pulse thyristor rectifiers in parallel

When two 12-pulse 1520 A/690 V thyristor rectifier modules are paralleled, the no-overload current is derated to 2827 A based on a derating coefficient of 0.93. The 12-pulse rectifier module can eliminate the fifth and seventh harmonics, significantly reducing the harmonic distortion of the line current and the conducted emissions. The 12-pulse basic rectifier system requires a phase-shifting transformer or two separate transformers. The primary and secondary sides have the same transformation ratio, and there is a phase difference of 30° between the windings on the secondary side. The system topology is shown in the following figure.



Model list

See the following table for the model list of the MD880 series 690 VAC high-performance water-cooled basic rectifier modules.

Table 22–12 Ordering guide

Model MD880LC-20M-...	Frame	Part No.	Quantity	Remarks
2000-7	D3D	1. MD880LC-20M-2000-7	1	Basic rectifier module
		2. MD880LC-WAHE-1.8kW	1	Water-to-air heat exchanger including a fan (option)
		3. HE300-110-1000-7-L1	2	AC input reactor (option)
3720-7	2 x D3D	1. MD880LC-20M-2000-7	2	Basic rectifier module
		2. MD880LC-WAHE-1.8kW	2	Water-to-air heat exchanger including a fan (option)
		3. HE300-110-1000-7-L1	4	AC input reactor (option)
1520-7+SCR	D3T	1. MD880LC-20M-1520-7+SCR	1	Basic rectifier module
		2. HCU-20	1	Basic rectifier control module
		3. HFAN-10	1	Fan fault detection module (option)
		4. MD880LC-20M-1520-7-L1	2	AC input reactor (option)
		5. MD880LC-WAHE-3.4kW	2	Water-to-air heat exchanger including a fan (option)
2827-7+SCR	2 x D3T	1. MD880LC-20M-1520-7+SCR	2	Basic rectifier module
		2. HCU-20	1	Basic rectifier control module
		3. HPCU-40	1	Parallel control module
		4. HFAN-10	2	Fan fault detection module (option)
		5. MD880LC-20M-1520-7-L1	2	AC input reactor (option)
		6. MD880LC-WAHE-3.4kW	2	Water-to-air heat exchanger including a fan (option)
4241-7+SCR	3 x D3T	1. MD880LC-20M-1520-7-SCR	3	Basic rectifier module
		2. HCU-20	1	Basic rectifier control module
		3. HPCU-40	1	Parallel control module
		4. HFAN-10	2	Fan fault detection module (option)
		5. MD880LC-20M-1520-7-L1	3	AC input reactor (option)
		6. MD880LC-WAHE-3.4kW	3	Water-to-air heat exchanger including a fan (option)
5654-7+SCR	4 x D3T	1. MD880LC-20M-1520-7-SCR	4	Basic rectifier module
		2. HCU-20	1	Basic rectifier control module
		3. HPCU-40	1	Parallel control module
		4. HFAN-10	3	Fan fault detection module (option)
		5. MD880LC-20M-1520-7-L1	4	AC input reactor (option)
		6. MD880LC-WAHE-3.4kW	4	Water-to-air heat exchanger including a fan (option)

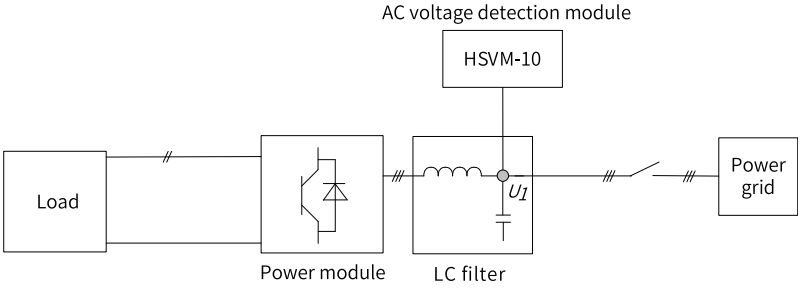
Note

When four parallel units are configured with three fan fault detection modules, three slots on the HCU will be occupied. If additional function modules are needed, slot expansion can be achieved by using an optical fiber expansion module (HOFM-10 or HOFM-30) and a function expansion module (HESD-10) in combination. For specific model selection and usage instructions, see the *HCU Control Module Hardware Guide*.

22.12 Water-Cooled Active Rectifier Module

Active rectifier selection example

Figure 22-1 Topology of the active rectifier system



When two 530 A/690 V active rectifiers are paralleled, the no-overload rated current is derated to 1007 A based on a derating coefficient of 0.95.

Model	Structure	Part No.	Quantity	Name
MD880LC-40M-1007-7	(ALC+H7) x 2	1. MD880LC-40M-0530-7	2	Active rectifier module
		2. MD880LC-40F-0650-7	2	Active rectifier filter module
		3. HCU‑40	1	Active rectifier control module
		4. HPCU‑40	1	Parallel control module
		5. HSVM‑10	1	AC voltage detection module
		6. MD880LC-SR-7	3	AC pre-charge resistor (mandatory)
		7. HOFM-10	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module

PCS selection example

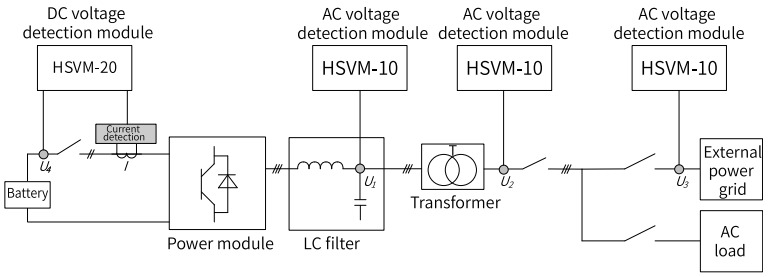


Figure 22-2 PCS topology

When two 530 A/690 V PCSs are paralleled, the no-overload rated current is derated to 1007 A based on a derating coefficient of 0.95. The topology is shown in the preceding figure, and the model list is shown in the following table. In this topology, three AC voltage detection modules are required for grid-connected sampling from the filter capacitor, load side, and grid connection point, respectively. Two AC voltage detection modules are required for off-grid sampling from the filter capacitor and load side, respectively. The number of AC voltage detection modules depends on the actual application requirements.

Model	Structure	Part No.	Quantity	Name
MD880LC-40M-1007-7	(ALC+H7w) x 2	1. MD880LC-40M-0530-7	2	Active rectifier module
		2. MD880LC-40F-0650-7	2	Active rectifier filter module
		3. HCU-40+PCS	1	PCS control module
		4. HPCU‑40	1	Parallel control module
		5. HSVM‑10	3 (grid-connected)	AC voltage detection module
			2 (off-grid)	
		6. MD880LC-SR-7	3	AC pre-charge resistor (mandatory)
		7. HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module

Table 22–13 MD880 series 690 VAC high-performance water-cooled active rectifier and PCS application models

Model	Structure	Part No.	Quantity	Remarks
MD880LC-40M-0530-7	ALC+H7w	1. MD880LC-40M-0530-7	1	Active rectifier module
		2. MD880LC-40F-0650-7	1	Filter module
		3. HCU-40<1>/HCU-40+PCS<2>	1	Active rectifier control module/PCS control module
		4. HSVM-10<3>	1	AC voltage detection module
		5. MD880LC-SR-7	2	AC pre-charge resistor (mandatory)
		6. HOFM-10<4>/HOFM-30<5>	1	Optical fiber expansion module
		7. HFAN-10<6>	1	Fan fault detection module
MD880LC-40M-0650-7	ALC+H7w	1. MD880LC-40M-0650-7	1	Active rectifier module
		2. MD880LC-40F-0650-7	1	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HSVM‐10	1	AC voltage detection module
		5. MD880LC-SR-7	2	AC pre-charge resistor (mandatory)
		6. HOFM-10/HOFM-30	1	Optical fiber expansion module
		7. HFAN-10	1	Fan fault detection module
MD880LC-40M-0820-7	ALC+H8w	1. MD880LC-40M-0820-7	1	Active rectifier module
		2. MD880LC-40F-0820-7	1	Filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HSVM‐10	1	AC voltage detection module
		5. MD880LC-SR-7	3	AC pre-charge resistor (mandatory)
		6. HOFM-10/HOFM-30	1	Optical fiber expansion module
		7. HFAN-10	1	Fan fault detection module

Model	Structure	Part No.	Quantity	Remarks
MD880LC-40M-1007-7	(ALC+H7w) x 2	1. MD880LC-40M-0530-7	2	Active rectifier module
		2. MD880LC-40F-0650-7	2	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	3	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module
MD880LC-40M-1235-7	(ALC+H7w) x 2	1. MD880LC-40M-0650-7	3	Active rectifier module
		2. MD880LC-40F-0650-7	2	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	3	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module
MD880LC-40M-1510-7	(ALC+H7w) x 3	1. MD880LC-40M-0530-7	3	Active rectifier module
		2. MD880LC-40F-0650-7	3	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	5	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module

Model	Structure	Part No.	Quantity	Remarks
MD880LC-40M-1558-7	(ALC+H8w) x 2	1. MD880LC-40M-820-7	2	Active rectifier module
		2. MD880LC-40F-1558-7	1	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HSVM‐40	1	Parallel control module
		5. HSVM-10	1	AC voltage detection module
		5. MD880LC-SR-7	5	AC pre-charge resistor (mandatory)
		6. HOFM-10/HOFM-30	1	Optical fiber expansion module
		7. HFAN-10	1	Fan fault detection module
MD880LC-40M-1852-7	(ALC+H7w) x 3	1. MD880LC-40M-0650-7	3	Active rectifier module
		2. MD880LC-40F-0650-7	3	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	5	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module
MD880LC-40M-2014-7	(ALC+H7w) x 4	1. MD880LC-40M-0530-7	4	Active rectifier module
		2. MD880LC-40F-0650-7	4	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	6	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	2	Fan fault detection module

Model	Structure	Part No.	Quantity	Remarks
MD880LC-40M-2337-7	(ALC+H8w) x 3	1. MD880LC-40M-0820-7	3	Active rectifier module
		2. MD880LC-40F-0820-7	3	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	8	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module
MD880LC-40M-2470-7	(ALC+H7w) x 4	1. MD880LC-40M-0650-7	4	Active rectifier module
		2. MD880LC-40F-0650-7	4	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	6	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	2	Fan fault detection module
MD880LC-40M-2517-7	(ALC+H7w) x 5	1. MD880LC-40M-0530-7	5	Active rectifier module
		2. MD880LC-40F-0650-7	5	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	8	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	2	Fan fault detection module

Model	Structure	Part No.	Quantity	Remarks
MD880LC-40M-3021-7	(ALC+H7w) x 6	1. MD880LC-40M-0530-7	6	Active rectifier module
		2. MD880LC-40F-0650-7	6	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	9	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	2	Fan fault detection module
MD880LC-40M-3087-7	(ALC+H7w) x 5	1. MD880LC-40M-0650-7	5	Active rectifier module
		2. MD880LC-40F-0650-7	5	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	8	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	2	Fan fault detection module
MD880LC-40M-3116-7	(ALC+H8w) x 2	1. MD880LC-40M-1558-7	2	Active rectifier module
		2. MD880LC-40F-1558-7	2	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	9	AC pre-charge resistor (mandatory)
		7. HOFM-10/ HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	1	Fan fault detection module

Model	Structure	Part No.	Quantity	Remarks
MD880LC-40M-3705-7	(ALC+H7w) x 6	1. MD880LC-40M-0650-7	6	Active rectifier module
		2. MD880LC-40F-0650-7	6	Active rectifier filter module
		3. HCU-40/HCU-40+PCS	1	Active rectifier control module/PCS control module
		4. HPCU‐40	1	Parallel control module
		5. HSVM‐10	1	AC voltage detection module
		6. MD880LC-SR-7	9	AC pre-charge resistor (mandatory)
		7. HOFM-10/HOFM-30	1	Optical fiber expansion module
		8. HFAN-10	2	Fan fault detection module

Note

- <1> and <2>: The active rectifier and the PCS control module are different. The active rectifier is HCU-40 and the PCS is HCU-40+PCS.
- <3>: For the active rectifier, one HSVM-10 can meet the requirements in most cases. The number of the PCSs depends on the number of AC and DC voltage sampling points and other application scenarios.
- <4>: The HOFM-10 supports expansion of one HSVM-10 through optical fiber.
- <5>: The HOFM-30 supports expansion of three HSVM-10/HSVM-20 through optical fiber. Generally, using one HOFM-10 for the active rectifier can meet the application requirements. HSVM-30 is recommended for the PCS.
- <6>: A fan fault detection module supports six detection channels and supports fan fault detection of up to three parallel system filters. It is recommended to use a fan fault detection module with an HESD-10 function expansion module.

22.13 Water-Cooled Inverter Module

Inverter module selection example

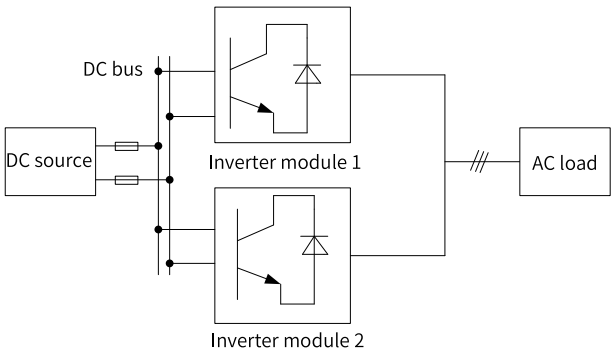


Figure 22-3 Topology of two inverter modules in parallel

When two 900 A/690 V inverters are paralleled, the no-overload current is derated to 1710 A based on a derating coefficient of 0.95. The system topology is shown in the preceding figure, and the model list is shown in the following table. The inverter modules 1 and 2 require one HPCU-40 (parallel expansion module) and one HCU-50 to be used in parallel.

Table 22–14 Ordering guide for MD880 series 690 VAC high-performance water-cooled inverter modules

Model	Structure	Part No.	Quantity	Remarks
MD880LC-50M-0530-7	H7w	1. MD880LC-50M-0530-7	1	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
MD880LC-50M-0650-7	H7w	1. MD880LC-50M-0650-7	1	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
MD880LC-50M-0900-7	H8w	1. MD880LC-50M-0900-7	1	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
MD880LC-50M-1007-7	2 x H7w	1. MD880LC-50M-0530-7	2	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-1235-7	2 x H7w	1. MD880LC-50M-0650-7	2	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-1510-7	3 x H7w	1. MD880LC-50M-0530-7	3	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-1710-7	2 x H8w	1. MD880LC-50M-0900-7	2	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-1852-7	3 x H7w	1. MD880LC-50M-0650-7	3	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-2014-7	4 x H7w	1. MD880LC-50M-0530-7	4	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-2470-7	4 x H7w	1. MD880LC-50M-0650-7	4	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-2517-7	5 x H7w	1. MD880LC-50M-0530-7	5	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module

Model	Structure	Part No.	Quanti ty	Remarks
MD880LC-50M-2565-7	3 x H8w	1. MD880LC-50M-0900-7	3	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-3021-7	6 x H7w	1. MD880LC-50M-0530-7	6	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
MD880LC-50M-3087-7	5 x H7w	1. MD880LC-50M-0650-7	5	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
MD880LC-50M-3420-7	4 x H8w	1. MD880LC-50M-0900-7	4	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-40	1	Parallel expansion module
MD880LC-50M-3524-7	7 x H7w	1. MD880LC-50M-0530-7	7	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-A0	1	Parallel expansion module
MD880LC-50M-3705-7	6 x H7w	1. MD880LC-50M-0650-7	6	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
MD880LC-50M-4028-7	8 x H7w	1. MD880LC-50M-0530-7	8	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-A0	1	Parallel expansion module
MD880LC-50M-4275-7	5 x H8w	1. MD880LC-50M-0900-7	5	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-60	1	Parallel expansion module
MD880LC-50M-4322-7	7 x H7w	1. MD880LC-50M-0650-7	7	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-A0	1	Parallel expansion module
MD880LC-50M-4940-7	8 x H7w	1. MD880LC-50M-0650-7	8	Water-cooled inverter module
		2. HCU-50S	1	Inverter controller
		3. HPCU-A0	1	Parallel expansion module

22.14 Control System and Function Module Options

Table 22–15 Ordering guide for control system and function module options

Module Name	Module Model	Part No.	Quantity	Remarks
Control module	HCU-20	HCU-20	1	Basic rectifier control module
	HCU-30	HCU-30	1	Regenerative rectifier control module
	HCU-40	HCU-40	1	Active rectifier control module
	HCU-50S	HCU-50S	1	Second-generation inverter control module
	HCU-51S	HCU-51S	1	Second-generation inverter control module (electrical interface)
	HCU-60	HCU-60	1	Three-phase braking control module
Parallel control module	HPCU-40	HPCU-40	1	Supports parallel connection of 2 to 4 modules
	HPCU-60	HPCU-60	1	Supports parallel connection of 2 to 6 modules
	HPCU-A0	HPCU-A0	1	Supports parallel connection of 2 to 10 modules
Function expansion module	HESD-10	HESD-10	1	Expands one slot
Sync voltage detection module	HSVM-10	HSVM-10	1	Three-phase AC input voltage detection
Encoder detection module	HPG-10	HPG-10	1	HTL incremental differential, single-ended, OC, or OE encoder detection, frequency-division output
	HPG-30	HPG-30	1	Sine-cosine incremental encoder signal detection module
	HPG-40	HPG-40	1	Resolver encoder detection module
	HPG-50	HPG-50	1	TTL incremental OC or differential encoder detection, frequency-division output
Inobus optical fiber expansion module	HOFM-10	HOFM-10	1	One pair of 50 M optical fiber interfaces
	HOFM-30	HOFM-30	1	Three pairs of 50 M optical fiber interfaces
Smart operating panel	SOP-20-880	SOP-20-880	1	Operating panel for commissioning and monitoring
Fieldbus adapter	HCAN-10	HCAN-10	1	CANopen fieldbus adapter
	HMBA-10	HMBA-10	1	Modbus RTU fieldbus adapter
	HDP-10	HDP-10	1	PROFIBUS DP fieldbus adapter
Industrial Ethernet module	HPFN-10	HPFN-10	1	PROFIBUS IO industrial Ethernet
	HMBT-10	HMBT-10	1	Modbus TCP industrial Ethernet
	HETC-10	HETC-10	1	EtherCAT industrial Ethernet
Ethernet commissioning module	HETN-10	HETN-10	1	Ethernet commissioning module
Optical fiber router module	HOFR-50	HOFR-50	1	Data exchange between two to five HCU control modules

Module Name	Module Model	Part No.	Quantity	Remarks
I/O expansion module	HIO-10	HIO-10	1	Two AIs, two AOs, two DIOs, and one relay output
Process data collection module	HIBA-10	HIBA-10	1	PDA collection module
Remote service gateway	HGW-10	HGW-10	1	Centralized monitoring module

23 Service and Support

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