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MD520HS-INT Series High-Speed AC Drive

User Guide

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

Data code PS00021808A00

Legal Information

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Disclaimer of Liability

Due to continuous updates and improvements of products and technologies, the content of this documentation may not fully match the actual products. In the event of any discrepancies, the actual products shall prevail.

The contents are subject to change without notice due to product upgrade.

Waste Disposal

The storage, use, and disposal of this product (including optional accessories) must comply with local laws and regulations.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel can identify the risks of the product/system and prevent possible dangers.

Proper Use of the Product

Proper transportation, storage, assembly, installation, commissioning, operation, and maintenance are required to ensure the safe operation of the product without any problems. The required ambient conditions must be met. All operations must follow the guidelines provided in this documentation.

Preface

Introduction

The MD520HS-INT high-speed series is a general-purpose, high-performance vector control AC drive designed for precise speed and torque control in high-speed applications. It supports asynchronous AC induction motors (IM), permanent magnet synchronous motors (PMSM), and synchronous reluctance motors (SynRM), making it ideal for energy-saving upgrades. Compared to previous Inovance products, it offers a wider speed control range and industry-leading torque output accuracy, significantly improving commissioning and operational efficiency. The drive features multiple fault detection and shutdown mechanisms, along with functions such as fault limp mode, position control, and tension control. These ensure personnel and equipment safety during production processes worldwide.

This guide covers product information, mechanical design, electrical design, installation and commissioning, communication methods, communication networking, and communication configuration.

Revision history

Date	Document version	Software version	Revision
January 2026	A00	Model: MD520HS-INT Firmware code: LS0302CP42	Initial release.

Access to the guide

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

- Visit https://www.inovance.com/global, and choose Service&Support > Support > Documentation Download.
- Scan the QR code on the product with your smart phone.
- Scan the QR code below to install My Inovance app, where you can search for and download user guides.

Warranty

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is caused by proper operation of the user. Maintenance will be charged after the warranty expires.

Even within the warranty period, maintenance can be charged for the following product damage:

- Damage caused by operations not following the instructions in the guide
- Damage caused by fire, flood, or abnormal voltage
- Damage caused by using the product for unintended functions
- Damage caused by using the product outside the specified scope
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

When applicable, relevant maintenance fee will be charged according to the latest Price List of Inovance. If otherwise agreed upon, the agreed terms and conditions shall prevail.

For details, see the Warranty Card.

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1 Safety Precautions

1.1 Fundamental Safety Instructions

Safety disclaimer

- This chapter provides essential safety instructions for proper use of the product. Before using this product, read through the guide and comprehend all the safety instructions. Failure to comply with the safety instructions may result in death, severe injury, or equipment damage.
- "DANGER", "WARNING", and "CAUTION" signs in this guide are only supplements to the safety instructions, and do not reflect all safety instructions to be followed.
- 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 injury or property damage caused by improper use.

Safety levels and definitions



Indicates that failure to comply with the notice can result in death or severe personal injury.



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 injury or equipment damage.

Fundamental Safety Instructions

- Drawings in the guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified, and then perform operations in accordance with the instructions.
- The drawings in the guide are shown for illustration only and may be different from the product you purchased.
- Operators must take mechanical protection measures to protect their safety. For example, they must wear safety shoes, safety clothing, safety glasses, protective gloves and sleeves, or other protective equipment.

Unpacking
 • Do not install the product in the case of any damage, rust, or signs of use on the product or accessories upon unpacking. • Do not install the product in the case of water seepage into the product or missing or damaged components upon unpacking. • Do not install the product in the case of any discrepancy between the product you received and the product name on the packing list.
 • Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking. • Unpack the package by following the unpacking sequence. Do not strike the package violently. • Check for damage, rust, or scratches on the surfaces of the product and accessories upon unpacking. • Check whether the package contents are consistent with the packing list after 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 injury 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 product which is being hoisted.
- Hoist the equipment at a constant speed with a steel rope to prevent any vibration or shock to the equipment. Never turn the equipment over or keep it suspended for a long time. Failure to comply may result in personal injury or equipment damage.



- Handle the equipment with care and mind your steps during transportation to prevent personal injury or equipment damage.
- When carrying the equipment with bare hands, hold the enclosure firmly with care to prevent parts from falling. Failure to comply may result in personal injury.
- Store and transport the equipment based on the storage and transportation requirements. Failure to comply may result in equipment damage.
- Do not store or transport the equipment in equipment exposed to splashing water or rain, direct sunlight, strong electric field, strong magnetic field, or strong vibration.
- Do not store the equipment for more than three months. Long-term storage requires stricter protection and necessary inspections.
- Pack the equipment securely and properly before transportation. Use a sealed container for long-distance transportation.
- Never transport the equipment with other devices or items that could impact or cause harm to the equipment.

Installation



- The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed.



- Read through the guide and safety instructions before installation.
- Do not install this product in places with strong electric or magnetic field.
- Before installation, ensure that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply can result in mechanical hazards.
- Do not wear loose clothes or accessories during installation. Failure to comply may result in electric shock.
- Before installing the equipment in an enclosed environment (such as a cabinet or case), use a cooling device (such as a fan or air conditioner) to cool the environment 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 terminal device, appropriate guard devices (guards for fire, electrical, and mechanical protection) meeting applicable IEC standards and local laws and regulations must be provided.
- Before installing devices with strong electromagnetic interference, such as a transformer, install a shielding device for the equipment to prevent malfunction.
- Install the equipment onto an incombustible object such as a metal. Keep the equipment away from combustible objects. Failure to comply may result in a fire.



- Cover the top of the product 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 product and causing faults. After installation, remove the cloth or paper on top of the product 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, switch off all the power supplies of the equipment. Wait for at least the time designated on the equipment warning label before further operations because residual voltage still exists after power-off. Measure the DC voltage of the main circuit and make sure that it is below the safety voltage. Failure to comply may result in an electric shock.
- Do not perform wiring, remove the equipment cover, or touch the PCB with power on. Failure to comply may result in electric shock.
- Make sure that the equipment and product are grounded properly. Failure to comply can result in the risk of electric shock.



- Never connect the power cable to output terminals of the equipment or product. Failure to comply may damage the equipment or even cause a fire.
- When connecting a drive with the motor, make sure that the phase sequences of the drive and motor terminals are consistent to prevent reverse motor rotation.
- Cables used must comply with corresponding cross-sectional area and shielding requirements. The shield of the shielded cable must be grounded at one end properly.
- Fix the terminal screws with the tightening torque specified in the guide. Improper tightening torque may cause the connecting part over-temperature or damage, resulting in a fire.
- After wiring, be sure that all cables are connected properly with no screws, gaskets, or exposed cables inside the product, or it may result in an electric shock or equipment damage.



- During wiring, follow the proper electrostatic discharge (ESD) procedures, and wear an antistatic wrist strap. Failure to comply may result in damage to the equipment or internal circuits.
- Use the shielded twisted pair cable to wire the control circuit, and connect the shield to the grounding terminal of the equipment. Failure to comply may result in equipment malfunction.

Power-on



- Before power-on, check that the equipment is installed properly with reliable wiring and the motor can be restarted.
- Before power-on, make sure that the power supply meets equipment requirements to prevent equipment damage or even a fire.
- After power-on, do not open the cabinet door or protective cover of the equipment. Do not touch any terminals, or remove any part of the equipment at power-on. Failure to comply will result in an electric shock.



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

Operation



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



- Never touch the enclosure, fan, or resistor with a bare hand. Failure to comply may result in burns.
- 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.
- Never maintain the equipment with power-on. Failure to comply may result in an electric shock.
- Before maintenance, disconnect all the power supplies of the equipment and wait for at least the time specified on the warning label.
- In case of a permanent magnet motor, do not touch the motor terminals even after power-off because there is still induced voltage generated during rotation. Failure to comply will result in 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.
- Never repair the equipment with power-on. Failure to comply may result in electric shock.
- Before inspection or repair, disconnect all the power supplies of the equipment and wait for at least the time specified on the warning label.



- Submit a request for repair based on 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 specified on the warning label before power-on or other operations. Failure to comply may result in personal injury or death and equipment damage.
- Troubleshooting and repair of a faulty or damaged equipment must be performed by professionals based on the repair instructions, with the repair records kept properly.
- Replace quick-wear parts of the product in accordance with the replacement instructions.
- Do not operate the damaged equipment. Failure to comply may result in death, personal injury, or severe equipment damage.
- Recheck the wiring and reset the parameters after equipment replacement.

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

Safety labels

To ensure safe operation, comply with equipment-related safety labels. The following table describes the meaning of the safety labels.

Safety labels	Description
	• Before using the equipment, read the guide and safety precautions carefully. Failure to comply may result in personal injury, death, or equipment damage. • Do not touch the terminals or remove the cover with power-on or within 10 min after power-off. Failure to comply may result in an electric shock.

1.2 Industrial Information Security

The product provides an interface to connect to the network and transmit data throughthe network interface. To protect factories, systems, machines, and networks from cyberattacks,a proper industrial information security protection mechanism must beimplemented to ensure safe operation of factories, systems, machines, and networks.

The customer is responsible for providing and continuously ensuring a secure connectionbetween the product and the customer network or any other network to preventunauthorized access to its factories, systems, machines, and networks. The system anddevice can be connected to the corporate network or Internet only when they areconnected securely with appropriate security measures taken (for example, anti-virussoftware and firewall installation).

Inovance is committed to continuous development and improvement of the products andsolutions to improve the level of safety. It is strongly recommended to update the productpromptly and always use the latest version.



Tampering with software (such as viruses, Trojans, and Worms) can lead to unsafe drivestate, which can put the device in an unsafe operation state. This may result in death,serious injury, and property damage. Observe the following strictly.

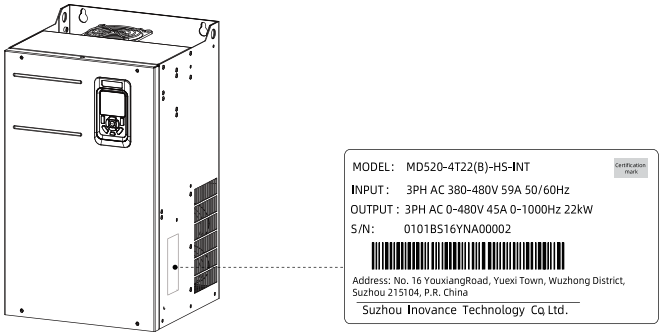
- Always use the latest software version. If the product version is no longersupported or the latest version of the program is not applied, customers are atincreased risk of cyber-attacks.
- Take proper protection measures (including but not limited to deploying antivirussoftware, firewall, WAF, IPS/IDS, situational awareness system, IDverification, and data encryption) to prevent files in the mobile storage devicefrom being damaged by malware and protect products, networks, systems, andinterfaces from unauthorized access, disturbance, intrusion, data disclosure, orinformation theft.
- Check all safety-related interfaces and settings after commissioning.

2 Product Information

2.1 Nameplate and Model

Note

The following nameplate is used as an example. The actual nameplate is subject to the product.



S/N:0101BS16YNA00002

Code	Year
N	2021
...	...
S	2024
*Letter I/L/O/Q are reserved.	

MD520 -4T 22 B - HS - INT
1 2 3 4 5 6

1 **Product name** MD520: AC drive series	4 **Braking Unit** Null: N/A B: With the braking unit
2 **Voltage level** 4T: three-phase 380 V to 480 V	5 **Model configuration** HS: High-speed series
3 **Power rating** 0.4: 0.4 kW ... 450: 450 kW	6 INT: International version

Note

- For three-phase 380 V to 480 V AC drives, reactors are not available for T1 to T5 models, whereas DC reactors are standard for T6 models and above.
- For three-phase 380 V to 480 V AC drives, braking units are standard for T1 to T5 models and optional for T6 to T12 models.

2.2 Components

2.2.1 Components of T1 to T6 Models (0.4 kW to 37 kW)

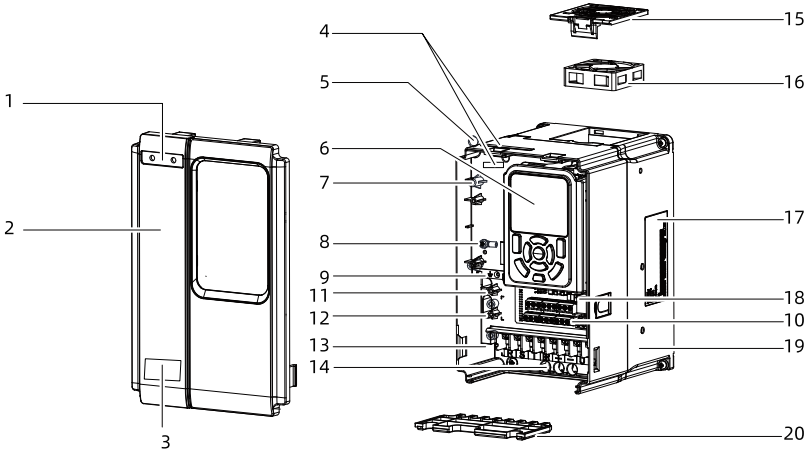


Figure 2-1 Product components (T1 to T4, 0.4 kW to 15 kW)

No.	Name	No.	Name	No.	Name
1	Logo	2	Cover plate	3	Mark Symbol / Description Note: Read through the user guide before installation and operation. Danger: Do not remove the upper cover with power ON or within 10 min after power-off.
4	Equipment bar code Displays the drive bar code and model.	5	Main circuit power supply indicator	6	Operating panel

No.	Name	No.	Name	No.	Name
7	Fixing base of encoder expansion card	8	Cable tray and fixing base for the control board ground cable	9	Grounding sheet metal It is used to ground the PG card and control board.
10	Control circuit terminal	11	Fixing base for the expansion card	12	Grounding screws for safety capacitor and voltage dependent resistor
13	Main circuit terminals	14	Grounding terminal	15	Fan cover
16	Cooling fan	17	Nameplate	18	External operating panel interface
19	Enclosure	20	Comb-type wiring cover	-	-

Note

- The actual position of the equipment bar code may vary with models.
- Connect the control board ground cable to the grounding sheet metal only when the system is reliably grounded; otherwise, connect the control board ground cable to the fixing hole.
- Do not disassemble the machine or perform wiring when the main circuit power supply indicator is ON.
- The quantity and layout of cooling fans vary with models.
  - Each of the T1 and T3 models (7.5 kW) has one cooling fan at the top.
  - T3 models (11 kW) have two cooling fans at the top.

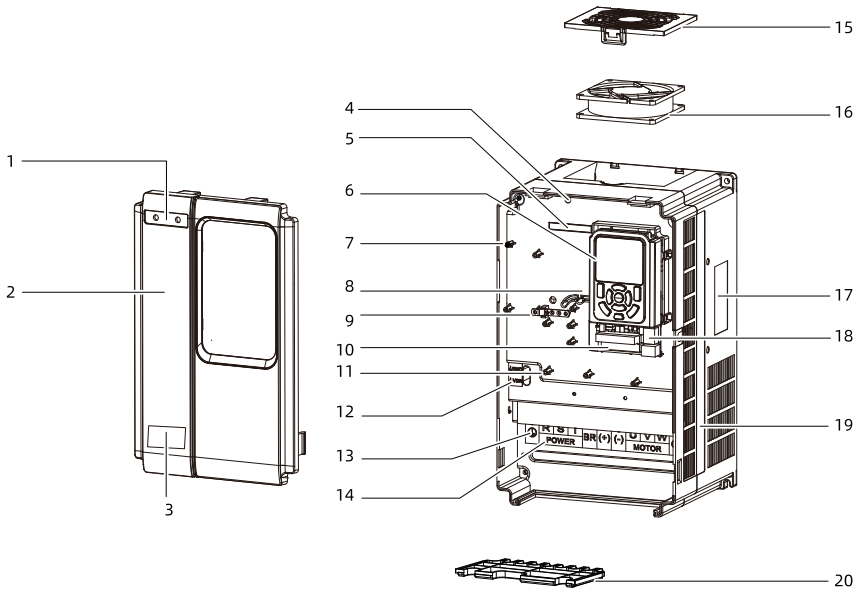


Figure 2-2 Product components (T5 to T6, 18.5 kW to 37 kW)

No.	Name	No.	Name	No.	Name
1	Logo	2	Cover plate	3	Mark Symbol / Description Note: Read through the user guide before installation and operation. Danger: Do not remove the upper cover with power ON or within 10 min after power-off.
4	Main circuit power supply indicator	5	Equipment bar code Displays the drive bar code and model.	6	Operating panel
7	Fixing base of encoder expansion card	8	Cable tray and fixing base for the control board ground cable	9	Grounding sheet metal It is used to ground the PG card and control board.
10	Control circuit terminal	11	Fixing base for the expansion card	12	Grounding screws for safety capacitor and voltage dependent resistor
13	Grounding terminal	14	Main circuit terminals	15	Fan cover
16	Cooling fan	17	Nameplate	18	External operating panel interface
19	Enclosure	20	Comb-type wiring cover	-	-

Note

- The actual position of the equipment bar code may vary with models.
- Connect the control board ground cable to the grounding sheet metal only when the system is reliably grounded; otherwise, connect the control board ground cable to the fixing hole.
- Do not disassemble the machine or perform wiring when the main circuit power supply indicator is ON.
- Each of the T5 and T6 models has one cooling fan at the top.

2.2.2 Components of T7 to T9 Models (45 kW to 200 kW)

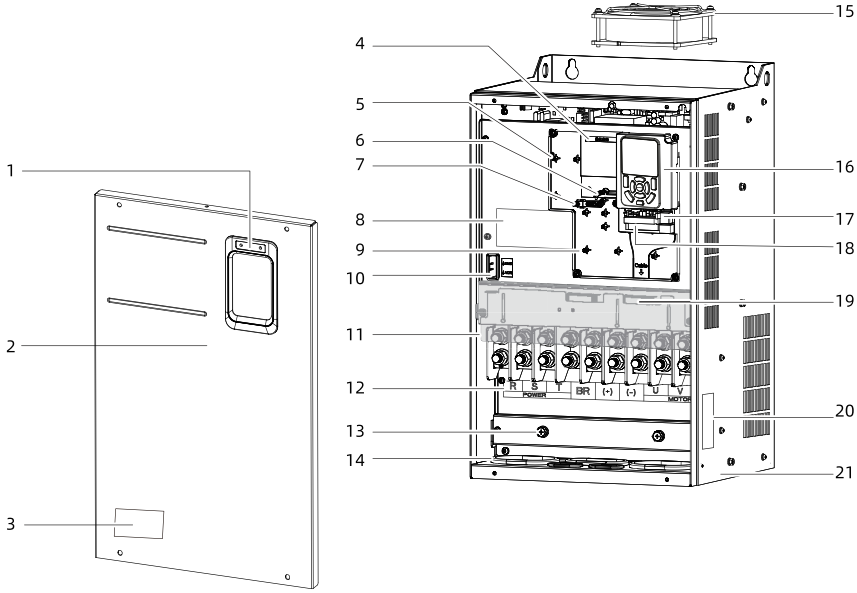


Figure 2-3 Product components (T7 to T9, 45 kW to 200 kW)

<table>
<tr><th>No.</th><th>Name</th><th>No.</th><th>Name</th><th>No.</th><th>Name</th></tr>
<tr><td>1</td><td>Logo</td><td>2</td><td>Cover plate</td><td>3</td><td>Mark
<table><tr><th colspan="2">Symbol</th><th>Description</th></tr><tr><td></td><td></td><td>Note: Read through the user guide before installation and operation.</td></tr><tr><td></td><td>10min</td><td>Danger: Do not remove the upper cover with power ON or within 10 min after power-off.</td></tr></table></td></tr>
<tr><td>4</td><td>Equipment bar code
Displays the drive bar code and model.</td><td>5</td><td>Fixing base of encoder expansion card</td><td>6</td><td>Cable tray and fixing base for the control board ground cable</td></tr>
<tr><td>7</td><td>Grounding sheet metal
It is used to ground the PG card and control board.</td><td>8</td><td>Wiring description</td><td>9</td><td>Fixing base for the expansion card</td></tr>
<tr><td>10</td><td>Grounding screws for safety capacitor and voltage dependent resistor</td><td>11</td><td>Protective cover of the main circuit terminal</td><td>12</td><td>Main circuit terminals</td></tr>
<tr><td>13</td><td>Grounding terminal</td><td>14</td><td>Grommet</td><td>15</td><td>Cooling fan</td></tr>
<tr><td>16</td><td>Operating panel</td><td>17</td><td>External operating panel interface</td><td>18</td><td>Control circuit terminal</td></tr>
<tr><td>19</td><td>Cable tie
It is used to fix the signal cable.</td><td>20</td><td>Nameplate</td><td>21</td><td>Enclosure</td></tr>
</table>

Note

- The actual position of the equipment bar code may vary with models.
- Connect the control board ground cable to the grounding sheet metal only when the system is reliably grounded; otherwise, connect the control board ground cable to the fixing hole.
- The quantity and layout of cooling fans vary with models.
  - For T7 (45 kW to 55 kW) models, there is one cooling fan at the top of the model.
  - For T8 (75 kW to 110 kW) models, there are two cooling fans at the top of the model.
  - For T9 (132 kW to 160 kW) models, there are two cooling fans at the bottom of the model.

2.2.3 Components of T10 to T12 Models (220 kW to 450 kW)

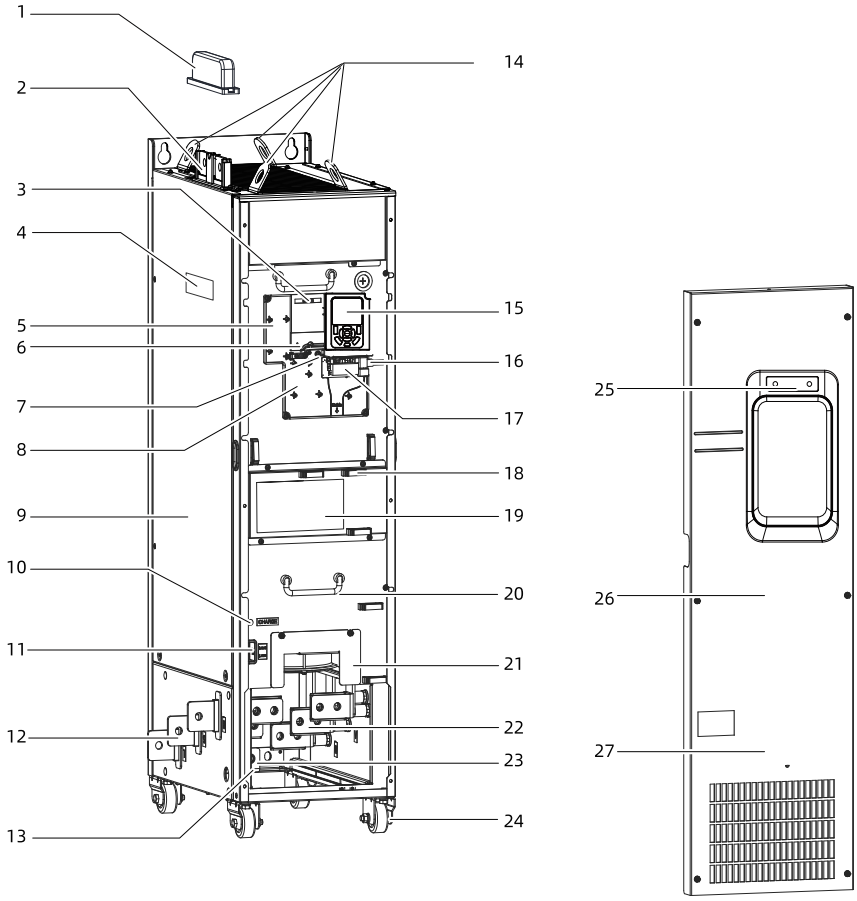
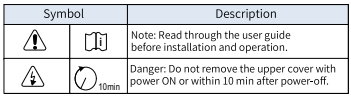


Figure 2-4 Product components (T10 to T12, 220 kW to 450 kW)

No.	Name	No.	Name	No.	Name
1	Protective cover for positive and negative terminals	2	Positive and negative terminals of DC bus	3	Equipment bar code Displays the drive bar code and model.
4	Nameplate	5	Fixing base of encoder expansion card	6	Cable tray and fixing base for the control board ground cable Note: Connect the control board grounding cable to the grounding sheet metal only when the system is reliably grounded; otherwise, connect it to the fixing base.
7	Grounding sheet metal It is used to ground the PG card and control board.	8	Fixing base for the expansion card	9	Enclosure
10	Main circuit power supply indicator Do not disassemble the machine or perform wiring when this indicator is ON.	11	Grounding screws for safety capacitor and voltage dependent resistor	12	Main circuit input terminal
13	Bottom hoisting position	14	Top hoisting position	15	Operating panel
16	External operating panel interface	17	Control circuit terminal	18	Cable tie
19	Wiring description	20	Handle	21	Fan box
22	Main circuit output terminal	23	Grounding terminal	24	Caster
25	Logo	26	Cover plate	27	Mark 

Note

The quantity and layout of cooling fans vary with models.

- T10 models have one cooling fan at the top.
- Each of the T11 and T12 models has two cooling fans at the top.

2.3 Product Model List

The following table lists the mapping between product models and structures.

Table 2–1 Relationship between product models and structures

Structure	Power (kW)	Model (three-phase 380 V to 480 V)	Code
T1	0.4	MD520-4T0.4B-HS-INT	0101CT75
	0.7	MD520-4T0.7B-HS-INT	0101CT74
	1.1	MD520-4T1.1B-HS-INT	0101CT77
	1.5	MD520-4T1.5B-HS-INT	0101CT78
	2.2	MD520-4T2.2B-HS-INT	0101CT79
	3.0	MD520-4T3.0B-HS-INT	0101CT80
T2	3.7	MD520-4T3.7B-HS-INT	0101CT89
	5.5	MD520-4T5.5B-HS-INT	0101CT92
T3	7.5	MD520-4T7.5B-HS-INT	0101CT94
	11	MD520-4T11B-HS-INT	0101CT95
T4	15	MD520-4T15B-HS-INT	0101CT76
T5	18.5	MD520-4T18.5B-HS-INT	0101CT81
	22	MD520-4T22B-HS-INT	0101CT82
T6	30	MD520-4T30-HS-INT	0101CT83
	37	MD520-4T37-HS-INT	0101CT84
T7	45	MD520-4T45-HS-INT	0101CT96
	55	MD520-4T55-HS-INT	0101CT97
T8	75	MD520-4T75-HS-INT	0101CT98
	90	MD520-4T90-HS-INT	0101CT99
	110	MD520-4T110-HS-INT	0101CU00
	132	MD520-4T132-HS-INT	0101CU01
T9	160	MD520-4T160-HS-INT	0101CU02
	200	MD520-4T200-HS-INT	0101CT85
T10	220	MD520-4T220-HS-INT	0101CT86
	250	MD520-4T250-HS-INT	0101CT87
T11	280	MD520-4T280-HS-INT	0101CT88
	315	MD520-4T315-HS-INT	0101CT90

Structure	Power (kW)	Model (three-phase 380 V to 480 V)	Code
T12	355	MD520-4T355-HS-INT	0101CT91
	400	MD520-4T400-HS-INT	0101CT93
	450	MD520-4T450-HS-INT	0101CY58

Note:
- B: With the braking unit
- -HS: High-speed series

3 Mechanical Design

3.1 Product Dimensions

3.1.1 Overall Dimensions of T1 to T9 Models (0.4 kW to 200 kW)

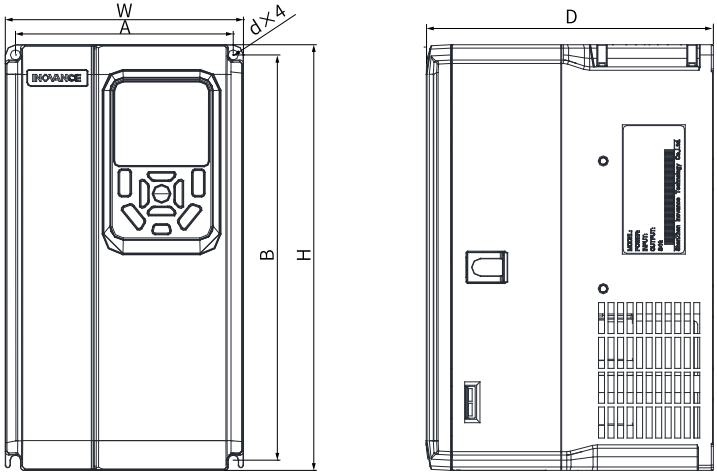


Figure 3-1 Overall and mounting dimensions for T1 to T4 (0.4 kW to 15 kW) models

Table 3–1 Overall and mounting hole dimensions of T1 to T4 (0.4 kW to 15 kW)

Structure	Mounting hole mm (in.)		Overall Dimensions mm (in.)			Mounting hole mm (in.)	Weight kg (lb)
	A	B	H	W	D	d x 4	
T1 (0.4 kW to 3.0 kW)	119 (4.7)	189 (7.5)	200 (7.9)	130 (5.1)	150 (6.0)	Φ5(0.2)	1.6 (3.5)
T2 (3.7 kW to 5.5 kW)	119 (4.7)	189 (7.5)	200 (7.9)	130 (5.1)	160 (6.4)	Φ5(0.2)	2.0 (4.4)
T3 (7.5 kW to 11 kW)	128 (5.0)	238 (9.4)	250 (9.9)	140 (5.5)	168.3 (6.7)	Φ6(0.2)	3.3 (7.3)
T4 (15 kW)	166 (6.5)	266 (10.5)	280 (11.0)	180 (7.1)	169 (6.7)	Φ6(0.2)	4.3 (9.5)

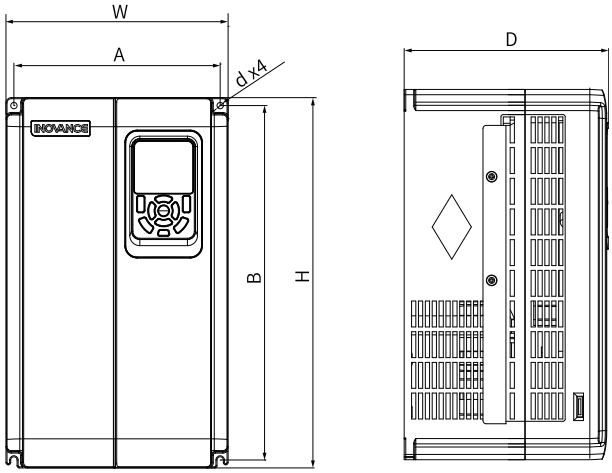


Figure 3-2 Overall and mounting dimensions for T5 to T6 (18.5 kW to 37 kW) models

Table 3–2 Overall and mounting hole dimensions of T5 to T6 (18.5 kW to 37 kW)

Structure	Mounting hole mm (in.)		Overall Dimensions mm (in.)				Mounting hole mm (in.)	Weight kg (lb)
	A	B	H	H1	W	D	d x 4	
T5 (18.5 kW to 22 kW)	195 (7.7)	335 (13.2)	350 (13.8)	-	210 (8.3)	193.4 (7.6)	Φ6(0.2)	7.6 (16.8)
T6 (30 kW to 37 kW)	230 (9.1)	380 (15.0)	400 (15.8)	-	250 (9.9)	220.8 (8.7)	Φ7(0.3)	17.5 (38.6)

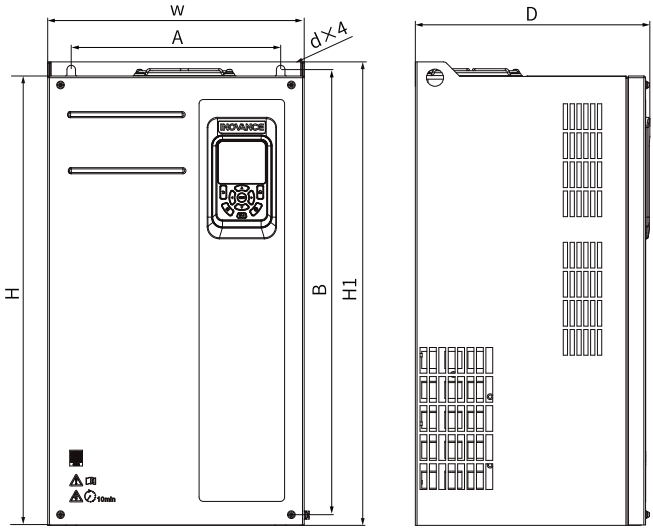


Figure 3-3 Overall and mounting dimensions for T7 to T9 (45 kW to 200 kW) models

Table 3–3 Overall and mounting hole dimensions of T7 to T9 (45 kW to 200 kW)

Structure	Mounting hole mm (in.)		Overall Dimensions mm (in.)				Mounting hole mm (in.)	Weight kg (lb)
	A	B	H	H1	W	D	d x 4	
T7 (45 kW to 55 kW)	245 (9.7)	523 (20.6)	525 (20.7)	542 (21.4)	300 (11.8)	275 (10.8)	Φ10(0.4)	35 (77.2)
T8 (75 kW to 132 kW)	270 (10.6)	560 (22.1)	554 (21.8)	580 (22.9)	338 (13.3)	315 (12.4)	Φ10(0.4)	51.5 (113.5)
T9 (160 kW to 200 kW)	320 (12.6)	890 (35.1)	874 (34.4)	915 (36.1)	400 (15.8)	320 (12.6)	Φ10(0.4)	85 (187.4)

3.1.2 Overall Dimensions of T10 to T12 Models (220 kW to 450 kW)

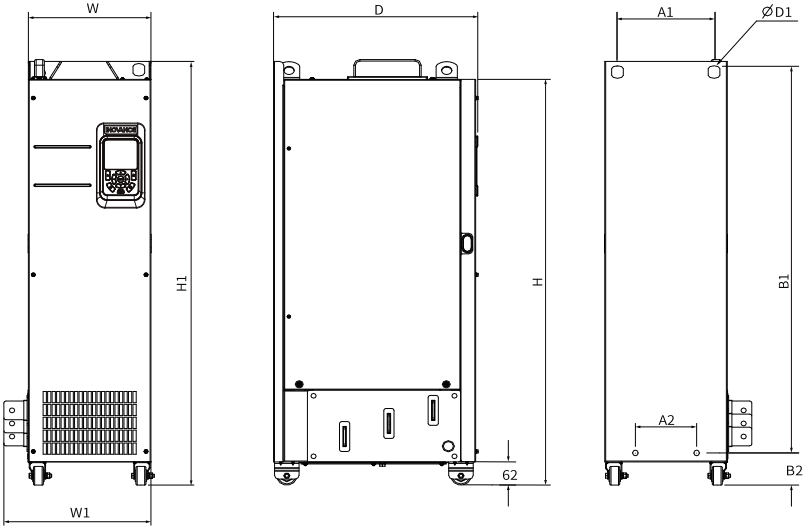


Figure 3-4 Outline dimensions and mounting dimensions of T10 to T12 (220 kW to 450 kW, without AC output reactor)

Table 3–4 Outline dimensions and mounting dimensions of T10 to T12 (220 kW to 450 kW, without AC output reactor)

Structure	Mounting hole mm (in.)				Overall Dimensions mm (in.)					Mounting hole mm (in.)	Weight kg (lb)
	A1	A2	B1	B2	H	H1	W	W1	D	D1	
T10 (200 kW to 250 kW)	240 (9.5)	150 (5.9)	1035 (40.8)	86 (3.4)	1086 (42.8)	1134 (44.7)	300 (11.8)	360 (14.2)	500 (19.7)	Φ13 (0.5)	110 (242.5)
T11 (280 kW to 315 kW)	225 (8.9)	185 (7.3)	1175 (46.3)	97 (3.8)	1248 (49.2)	1284 (50.6)	330 (13)	390 (15.4)	545 (21.5)	Φ13 (0.5)	155 (341.7)
T12 (355 kW to 450 kW)	240 (9.5)	200 (7.9)	1280 (50.4)	101 (4)	1355 (53.4)	1405 (55.4)	340 (13.4)	400 (15.8)	545 (21.5)	Φ16 (0.6)	185 (407.9)

3.2 Installation

3.2.1 Installation Environment

To maximize performance and ensure long service life of the product, install it in an environment specified as follows.

Table 3–5 Environment Requirements

Environment	Conditions
Installation location	Indoors
Grid overvoltage category	Overvoltage category III (OVC III)
Temperature	• Installation/Ambient temperature: -10°C to +50°C. When the temperature ranges from -10°C to +40°C, no derating is required. For temperature above 40°C, derate 1.5% for every additional 1°C. • Storage/Transportation temperature: -20°C to +60°C. • To improve the reliability of the equipment, use the drive in environments without dramatic temperature change. • When installing the drive in an enclosed cabinet, use the cooling fan or air conditioner to keep the incoming air temperature below 50°C. Failure to comply will result in overtemperature or fire. • Install the drive on the surface of an incombustible object and leave sufficient surrounding space for heat dissipation. • Take measures to prevent the drive from being frozen.
Humidity	Storage/Ambient humidity: ≤ 95% RH, non-condensing
Environment	Pollution degree 2 or below Install the drive in a place that meets the following requirements: • Free from direct sunlight, dust, corrosive gas, combustible or explosive gas, oil mist, water vapor, drip, or salt • Insusceptible to vibration (away from equipment that may generate strong vibration, such as a punch press) • Free from unwanted objects such as metal powder, oil, and water that may enter the drive • Free from radioactive substances, combustible materials, harmful gases and liquids, and salt corrosion • Away from combustible materials such as wood • Meeting Class 3C3 requirements in IEC 60721-3-3 in terms of chemically active substances.

Environment	Conditions
Altitude	• No derating is required for altitudes equal to or below 1000 m. • Derating is required for altitudes above 1000 m (derate 1% for every additional 100 m). For 0.4 kW to 3 kW models, the maximum altitude is 2000 m; for altitudes above 2000 m, contact Inovance. For models with the power higher than 3 kW, the maximum altitude is 3000 m; for altitudes above 3000 m, contact Inovance.
Vibration resistance	• For transportation in the package: compliant with class 2M3 in EN 60721-3-2 • During installation without packing box: compliant with ISTA 1H.

3.2.2 Installation Clearance

T1 to T9 models (0.4 kW to 200 kW)

- Installing one drive

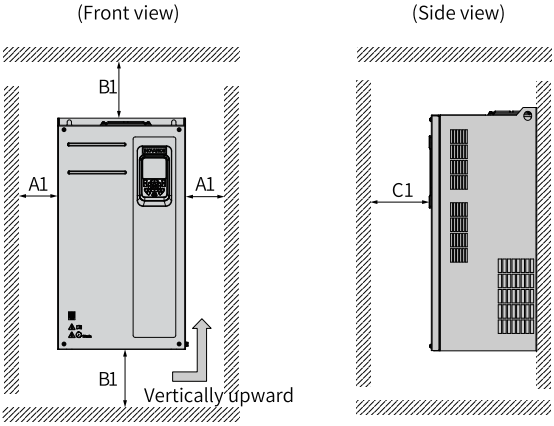


Figure 3-5 Clearance for installing one AC drive (T1 to T9 models)

Table 3–6 Installation clearance

Power rating	Clearance (mm)		
0.4 kW to 15kW	A1 ≥ 10	B1 ≥ 100	C1 ≥ 40
18.5 kW to 22 kW	A1 ≥ 10	B1 ≥ 200	C1 ≥ 40
30 kW to 37 kW	A1 ≥ 50	B1 ≥ 200	C1 ≥ 40
45 kW to 200 kW	A1 ≥ 50	B1 ≥ 300	C1 ≥ 40

Note

The distance between the air inlet and outlet of the AC drive is revered according to the extreme operating conditions. If the distance required by customers is lower than the recommended value, contact Inovance for details.

- Multi-drive installation
  The AC drive dissipates heat upward. When multiple AC drives are required to work together, install them side by side. Keep their tops level with each other, especially for those of different sizes.

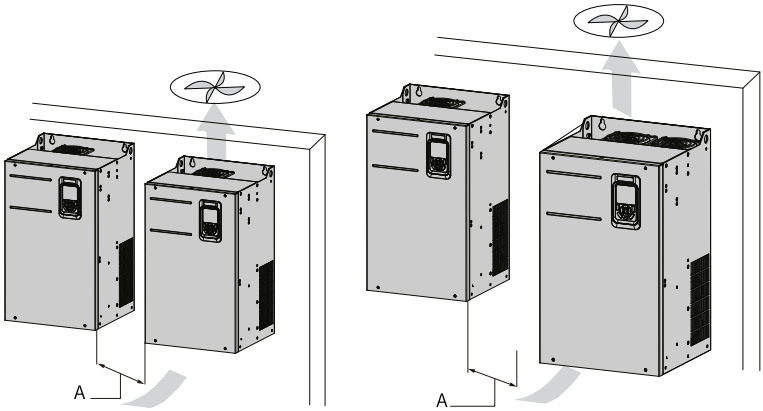


Figure 3-6 Installing multiple AC drives (T1 to T9 models) side by side

Table 3–7 Installation clearance

Power rating	Clearance (mm)
0.4 kW to 15kW	A ≥ 10
18.5 kW to 22 kW	A ≥ 10
30 kW to 37 kW	A ≥ 50
45 kW to 200 kW	A ≥ 50

Note

The distance between the air inlet and outlet of the AC drive is revered according to the extreme operating conditions. If the size required by customers is smaller than the recommended size, contact Inovance engineers for details.

- Multi-layer mounting
  If one drive needs to be installed above another one, install an air guide plate, as shown in *"Figure 3-7 Requirements on dual-row installation" on page 36*. This can

prevent the drive in the lower row from heating that in the upper row, causing overheat or overload faults.

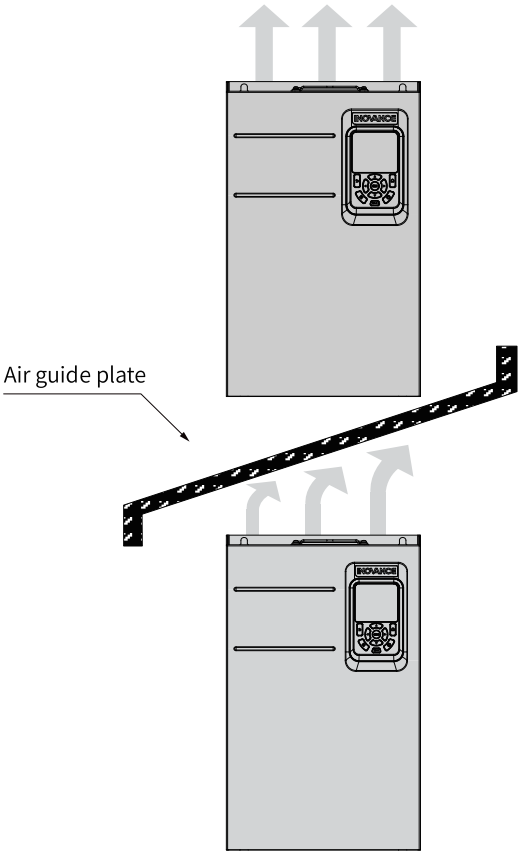


Figure 3-7 Requirements on dual-row installation

Air director design

The following figure shows the air director.

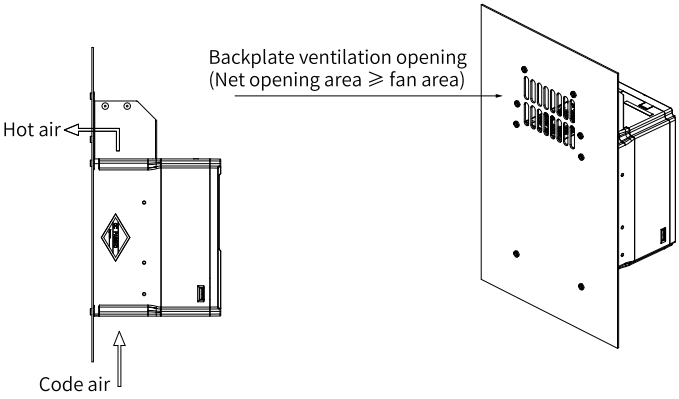


Figure 3-8 Air director

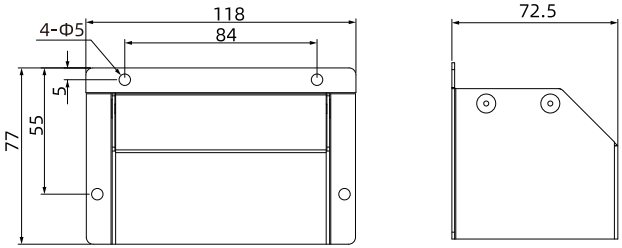


Figure 3-9 Air director dimensions for T1 models (0.4 kW to 3 kW, in mm)

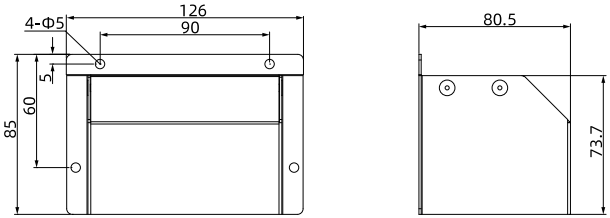


Figure 3-10 Air director dimensions for T2 models (3.7 kW to 5.5 kW, in mm)

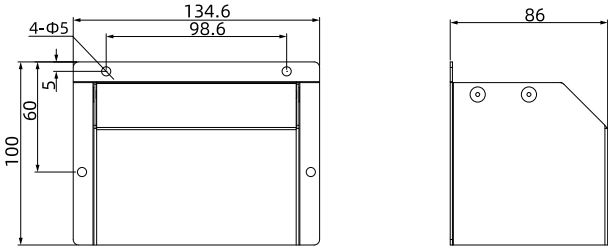


Figure 3-11 Air director dimensions for T3 models (7.5 kW to 11 kW, in mm)

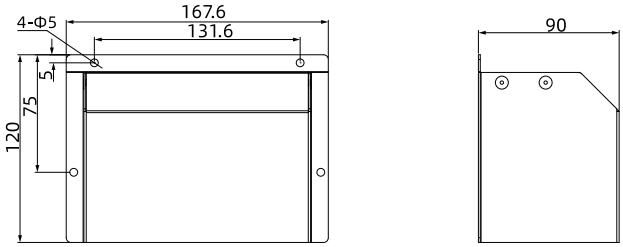


Figure 3-12 Air director dimensions for T4 models (15 kW, in mm)

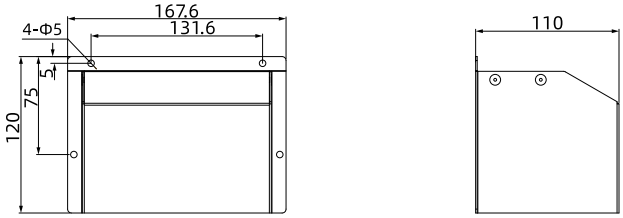


Figure 3-13 Air director dimensions for T5 models (18.5 kW to 22 kW, in unit)

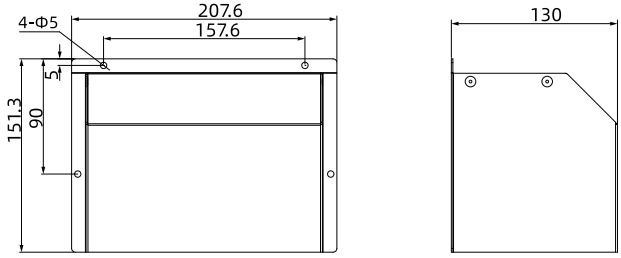


Figure 3-14 Air director dimensions for T6 models (30 kW to 37 kW, in mm)

CAUTION

Where multiple AC drives are installed in one cabinet, if the fan blows air into the air inlet from the outside, air distribution for the drives in the cabinet will be affected, resulting in poor cooling performance. Therefore, do not install a fan at the air inlet of the cabinet to blow air into the cabinet.

The following table describes the minimum effective ventilation area of the cabinet air inlet after the drive is installed in the cabinet.

Table 3–8 Minimum effective ventilation area of the cabinet air inlet

AC drive	Minimum effective ventilation area of the cabinet air inlet (cm^2)
T1 (0.4 kW to 3 kW)	20
T2 (3.7 kW to 5.5 kW)	25
T3 (7.5 kW)	
T3 (11 kW)	50
T4 (15 kW)	
T5 (18.5 kW to 22 kW)	60
T6 to T7 (30 kW to 55 kW)	102
T8 (75 kW to 132 kW)	204
T9 (160 kW to 200 kW)	318

The preceding table applies to situations where only one AC drive is mounted in the cabinet. For a cabinet containing multiple AC drives, calculate the total ventilation area by adding the ventilation area of each drive according to the table. For example, if a cabinet contains eight T3 models (7.5 kW), two T5 models, and one T9 model, the minimum ventilation area of the cabinet air inlet is 638 cm^2 (8 x 25 + 2 x 60 + 1 x 318).

If an air filter is installed at the air inlet, the air inlet resistance will rise significantly. Therefore, the ventilation area of the air inlet must be increased to 1.2 to 1.5 times the value indicated in the table.

The effective area in *"Table 3-8 Minimum effective ventilation area of the cabinet air inlet" on page 39* refers to the actual through-hole area in the opening area, which means the effective area = opening area x opening rate.

T10 to T12 (220 kW to 450 kW)

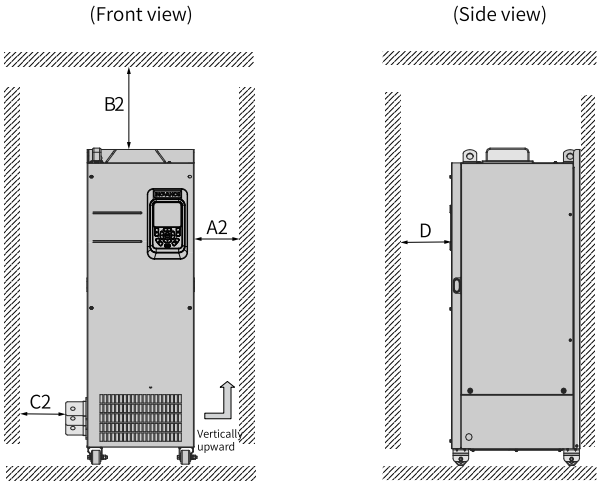


Figure 3-15 Installation Clearance Requirements

Table 3–9 Installation clearance

Power rating	Clearance (mm)			
200 kW to 450 kW	A2 ≥ 10	B2 ≥ 250	C2 ≥ 20	D ≥ 20

Note

T10 to T12 models can only be installed in cabinets individually. They cannot be installed in a side-by-side or up-down way. If side-by-side or up-down installation is required, contact Inovance.

3.2.3 Installation Direction

Install the AC drive vertically upright only, as shown in *"Figure 3-17 " on page 41* . Do not lie down the AC drive horizontally or by its side, or install it in the upside-down direction.

If the AC drive needs to be placed vertically, avoid stressing the sides of the drive or placing it on an inclined surface. If the tilt angle exceeds 5°, the drive is likely to tip over or fall due to its heavy weight (nearly 200 kg) and large size.

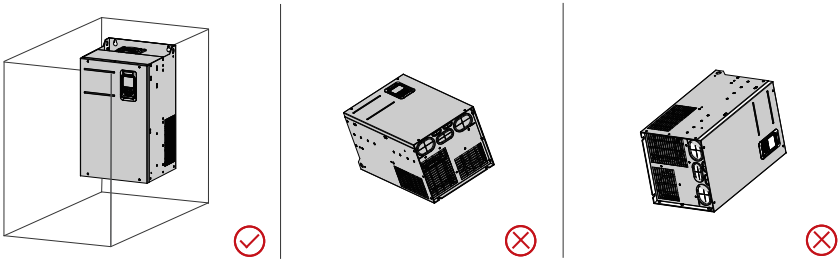


Figure 3-16 Installation direction (T1 to T9, 0.4 kW to 200 kW)

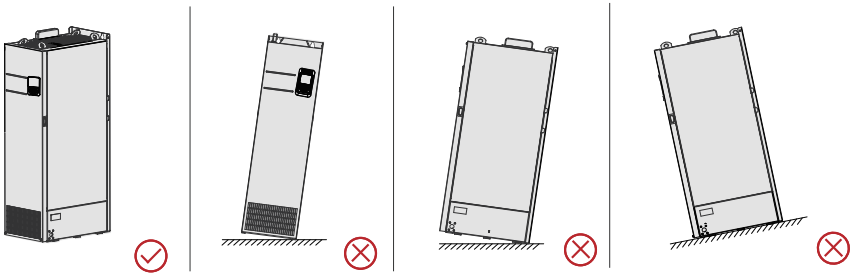


Figure 3-17 Installation direction (T10 to T12, 220 kW to 450 kW)

4 Electrical Design

4.1 AC Drive and Peripherals

When the drive is used to control motors, you must install a variety of electrical devices on the input and output sides of the drive to ensure system safety and stability. The following figure shows the system composition.

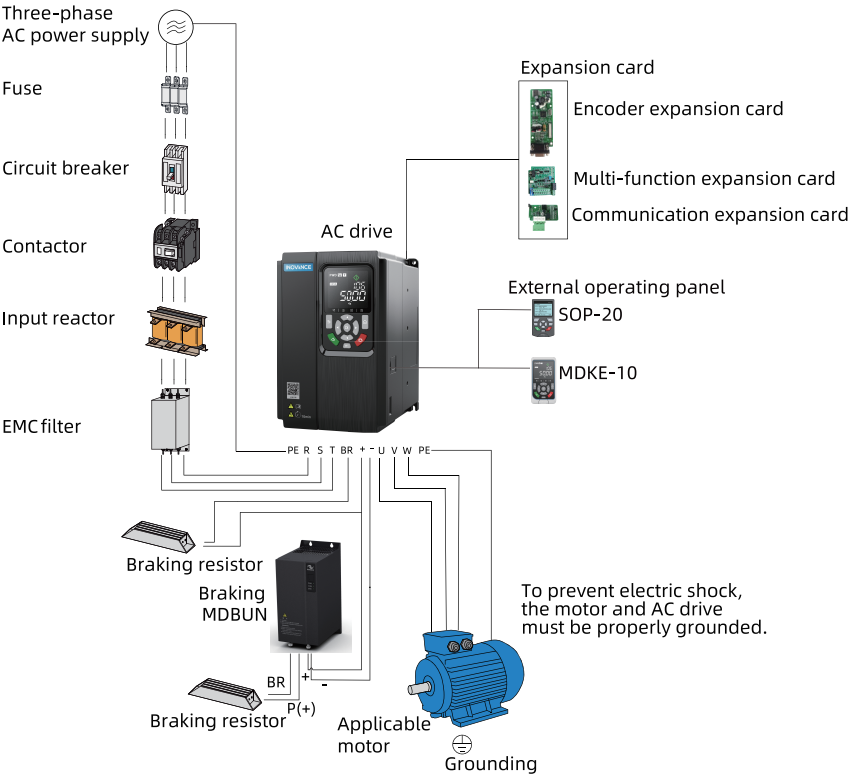


Figure 4-1 System Composition

Table 4-1 Description of electrical peripherals

Name	Installation position	Function
Circuit breaker	Input side of the drive	It is installed between the power supply and the AC drive input side. Short circuit breaker: Cuts off the power supply when overcurrent occurs on downstream devices to prevent accidents. Residual current device (RCD): The drive may generate high-frequency leakage current during running. To prevent electric shock which may cause a fire, select a proper RCD based on actual applications.
Fuse	Input side of the drive	Provides protection in case of short circuit and protects downstream semiconductor components.
Contactor	Input side of the drive	Power-on/-off the AC drive. Do not use the contactor to power-on/-off the AC drive frequently (time interval is at least one hour), nor use it directly to start the AC drive.
Input Reactor	Input side of the drive	It is used to eliminate the higher harmonics of the input side effectively and improve the power factor of the input side.
EMC Filter	Input side of the drive	It reduces the conduction and radiation interference generated by the AC drive to external devices.
Simple Filter	Input side of the drive	It reduces the conduction and radiation interference generated by the AC drive to external devices.
Braking Resistor	Input side of the drive	For AC drive models with the name containing letter B, the optional braking resistor is used. The braking resistor consumes the regenerative energy generated during motor deceleration.
Braking Unit	Input side of the drive	For AC drive models with the name not containing letter B, use the braking unit MDBUN of Inovance and the recommended braking resistor. The braking resistor consumes the regenerative energy generated during motor deceleration.
Active front end (AFE) unit	Input side of the drive	An AFE is an optional unit used to feed the energy generated by the motor during braking back to the power grid. With the AFE installed, the braking unit and braking resistor are not required, which reduces heat emission. Inovance AFE units feature energy saving, low noise, low harmonics pollution, and high power factor.
Magnetic ring and ferrite clamp	Output side of the AC drive	Reduces interference to the outside and the bearing current.
	Signal cable	Improves the anti-interference performance of signals.
Motor	Output side of the AC drive	Use a proper motor.
External Operating Panel	Connecting the external operating panel interface to the J11 interface	External LED operating panel MDKE-10 and LCD operating panel SOP-20 are supported.
Note: For selection of electrical peripherals, see *" Accessory Specifications" on page 448*.		

4.2 Electrical Wiring Diagram

The following figure shows the typical electrical wiring.

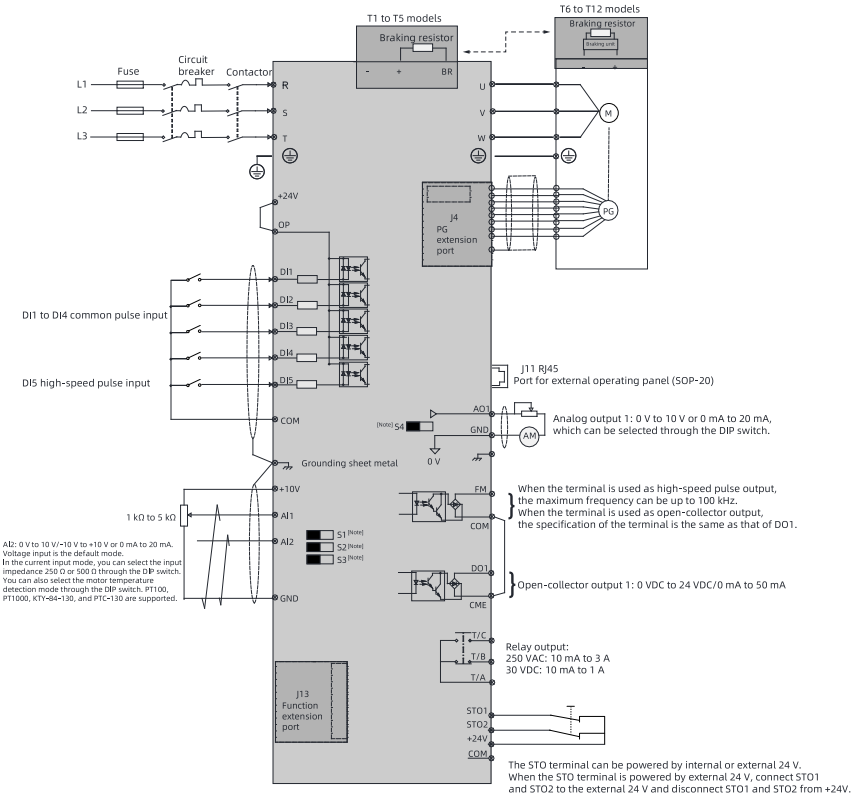


Figure 4-2 Standard wiring (T1 to T12)

Note

- For details on S1 to S4 DIP switches, see *"Table 4-4 Description of control circuit terminals" on page 54*.
- For three-phase 380 V to 480 V AC drives, 0.4 kW to 90 kW models differ from 110 kW to 450 kW models in the wiring detail marked by the double arrows in the figure.

4.3 Main Circuit Connection

4.3.1 Descriptions of Main Circuit Terminals

T1 to T9 models (0.4 kW to 200 kW)

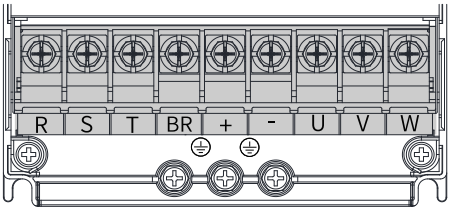


Figure 4-3 Layout of main circuit terminals for T1 to T4 models (three-phase)

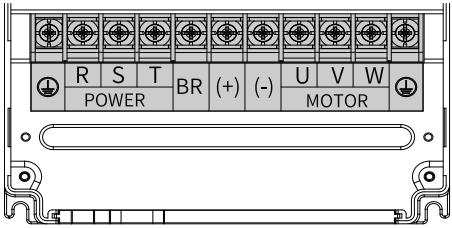


Figure 4-4 Main circuit terminal layout for T5 to T8 models (18.5 kW to 132 kW)

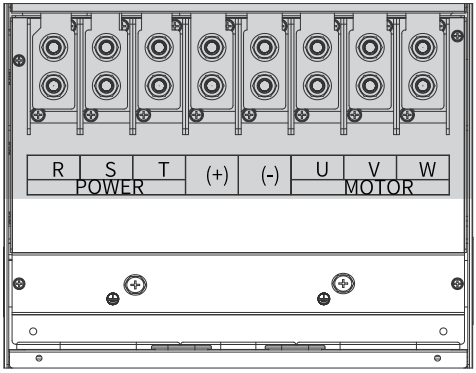


Figure 4-5 Main circuit terminal layout for T9 models (160 kW to 200 kW)

Table 4–2 Descriptions of Main Circuit Terminals

Mark	Name	Function
R, S, T	Three-phase power input terminals	Connected to the three-phase AC power supply.
(+), (-)	Positive and negative terminals of DC bus	Common DC bus input, connected to the external braking unit of T6 models and above.
(+), BR	Braking resistor connection terminals	Connected to the braking resistor of T5 models and below. Note: Only models with the name containing "B" are equipped with brake resistor terminals. For models with the name excluding "B", external brake units are required.
U, V, W	Output terminal	Connected to the three-phase motor.
	Grounding terminal (PE)	Protective grounding

T10 to T12 (220 kW to 450 kW)

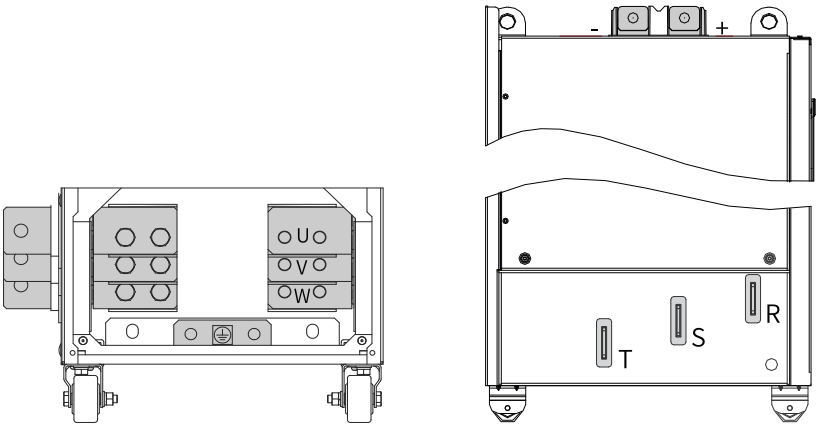


Figure 4-6 Main circuit terminal arrangement of T10 to T12 models

Table 4–3 Descriptions of Main Circuit Terminals

Mark	Name	Function
R, S, T	Three-phase power input terminals	Connected to the three-phase AC power supply.
+, -	Positive and negative terminals of DC bus	The terminals are used to connect to the common DC bus and external braking unit.
U, V, W	Output terminals	Connected to the three-phase motor.
⏚	Grounding terminal (PE)	Protective grounding

4.3.2 Dimensions of Main Circuit Terminals

Dimensions of Main Circuit Terminals

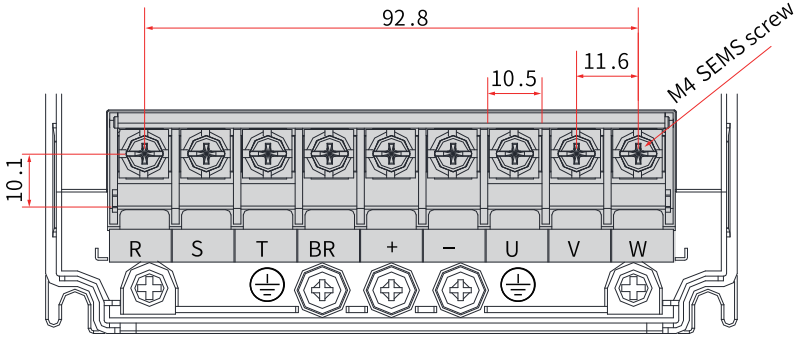


Figure 4-7 Main circuit terminal dimensions for T1 to T2 models (0.4 kW to 5.5 kW, in mm)

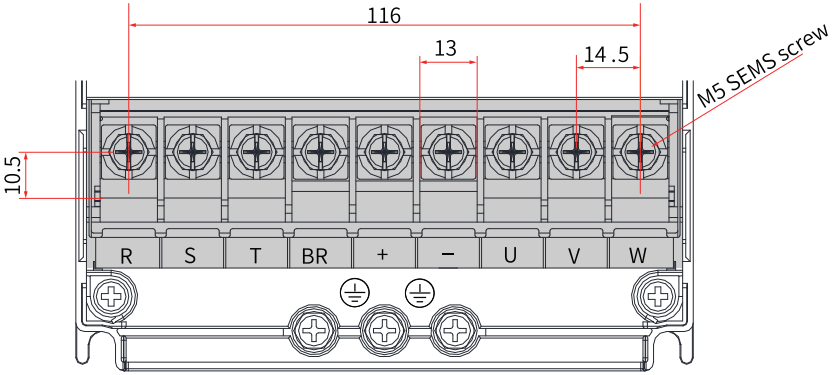


Figure 4-8 Main circuit terminal dimensions for T3 models (7.5 kW to 11 kW, in mm)

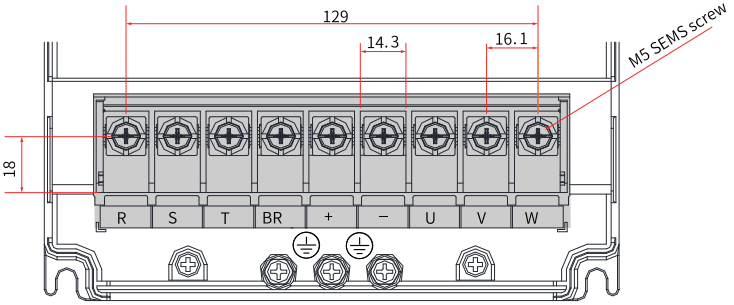


Figure 4-9 Main circuit terminal dimensions for T4 models (15 kW, in mm)

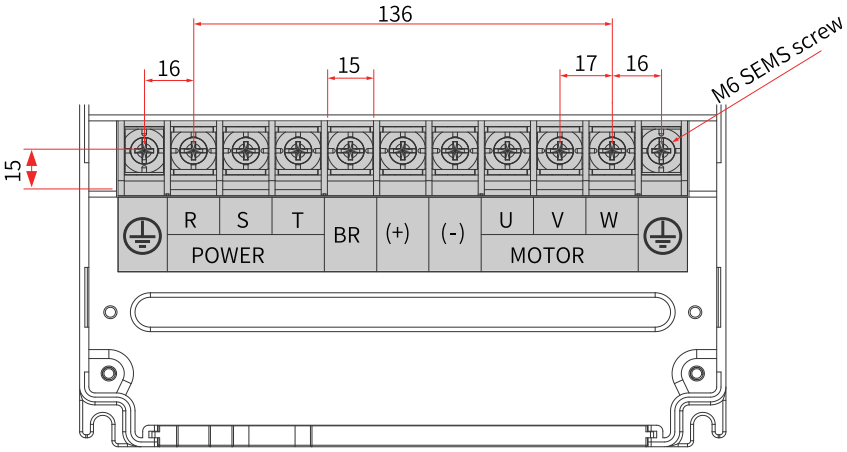


Figure 4-10 Main circuit terminal dimensions for T5 models (18.5 kW to 22 kW, in mm)

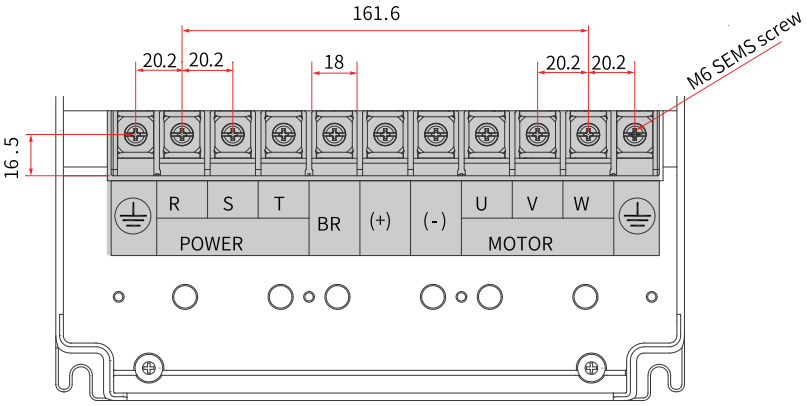


Figure 4-11 Main circuit terminal dimensions for T6 models (30 kW to 37 kW, in mm)

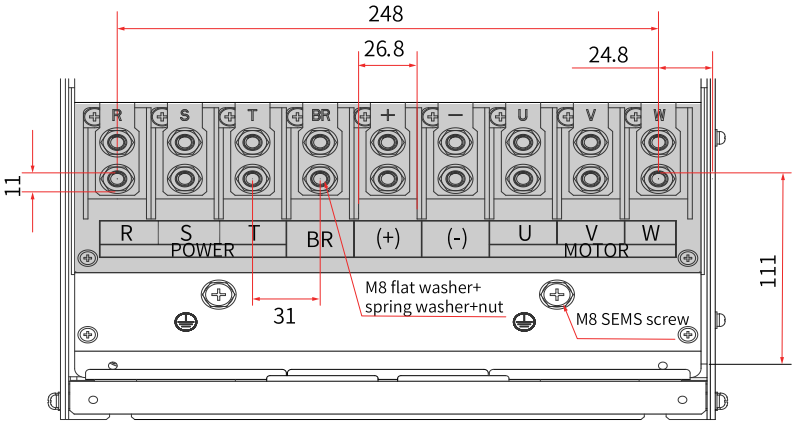


Figure 4-12 Main circuit terminal dimensions for T7 models (45 kW to 55 kW, in mm)

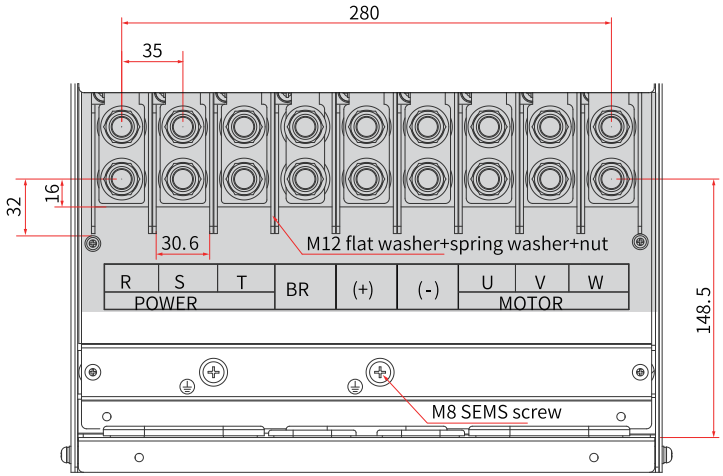


Figure 4-13 Main circuit terminal dimensions for T8 models (75 kW to 132 kW, in mm)

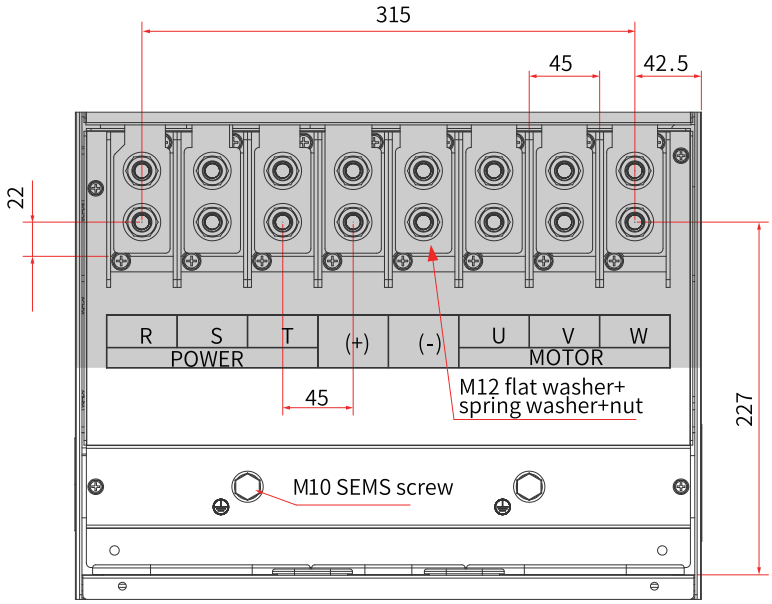


Figure 4-14 Main circuit terminal dimensions for T9 models (160 kW to 200 kW, in mm)

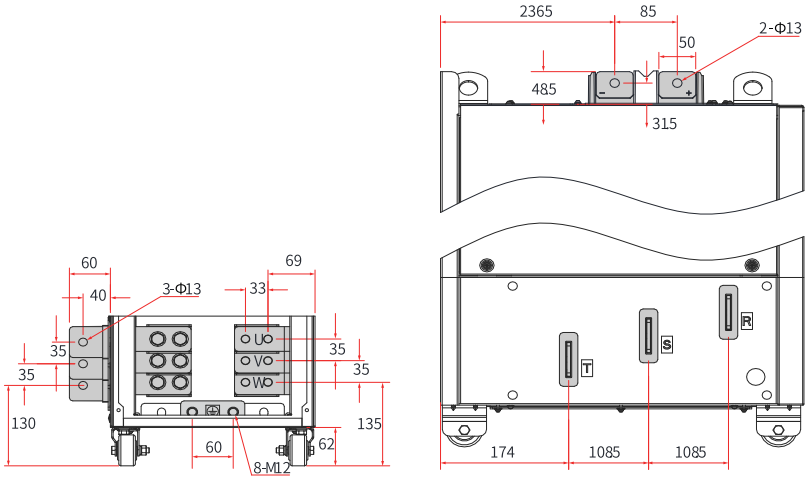


Figure 4-15 Main circuit terminal dimensions for T10 models (220 kW to 250 kW, without output reactor, in mm)

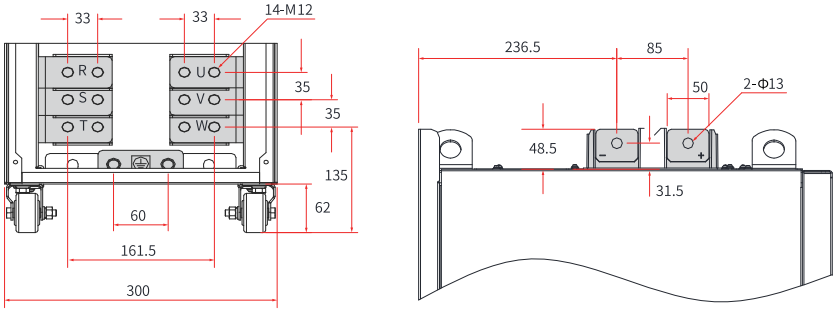


Figure 4-16 Main circuit terminal dimensions for T10 models (220 kW to 250 kW, without output reactor or copper busbar, in mm)

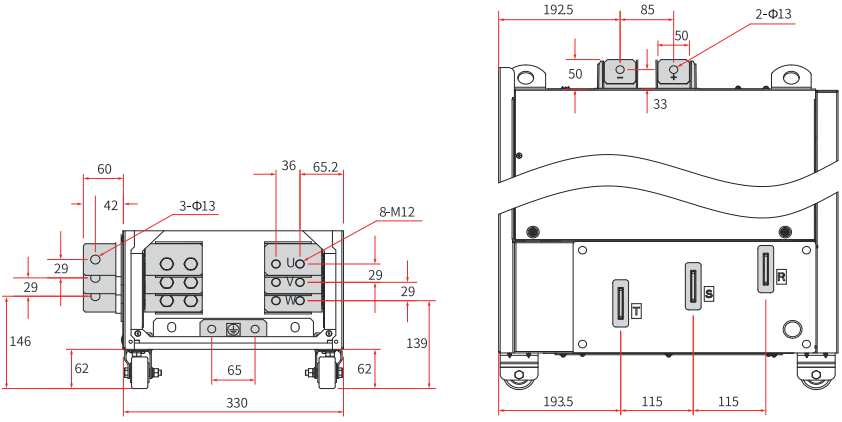


Figure 4-17 Main circuit terminal dimensions for T11 (280 kW to 315 kW, without output reactor, in mm)

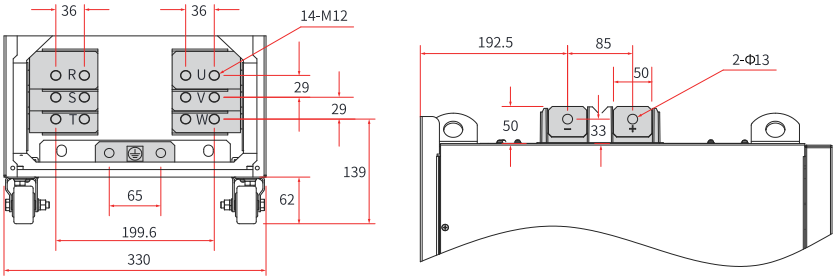


Figure 4-18 Main circuit terminal dimensions for T11 models (280 kW to 315 kW, without output reactor or copper busbar, in mm)

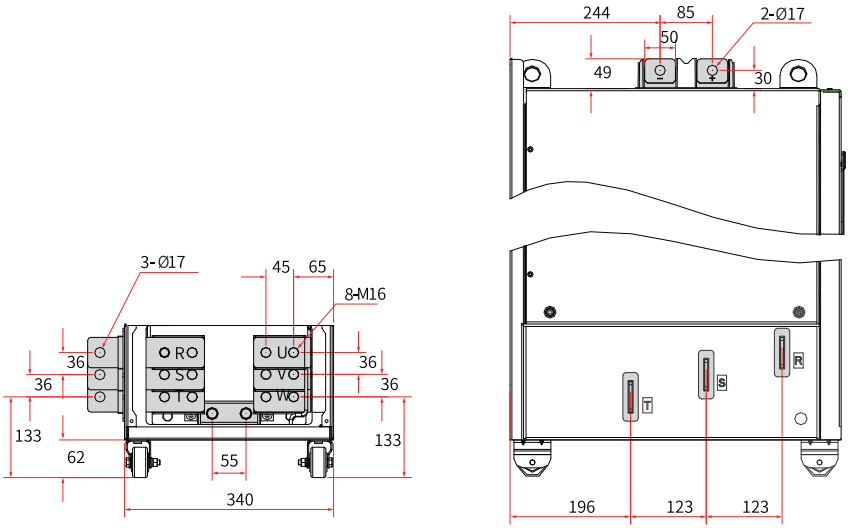


Figure 4-19 Main circuit terminal dimensions for T12 models (355 kW to 450 kW, without output reactor, in mm)

The copper busbars in the preceding figures can be removed as required. The following figure shows the dimensions of the main circuit terminals without copper busbars.

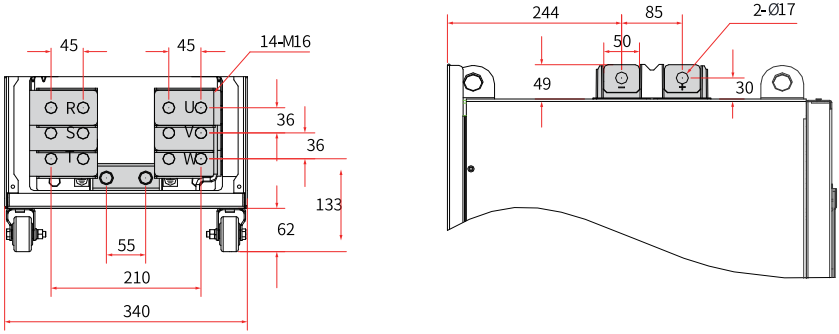


Figure 4-20 Main circuit terminal dimensions for T12 models (355 kW to 450 kW, without output reactor or copper busbar, in mm)

4.4 Descriptions of Control Circuit Terminals

"Table 4-6 " on page 57 shows the layout of control circuit terminals.

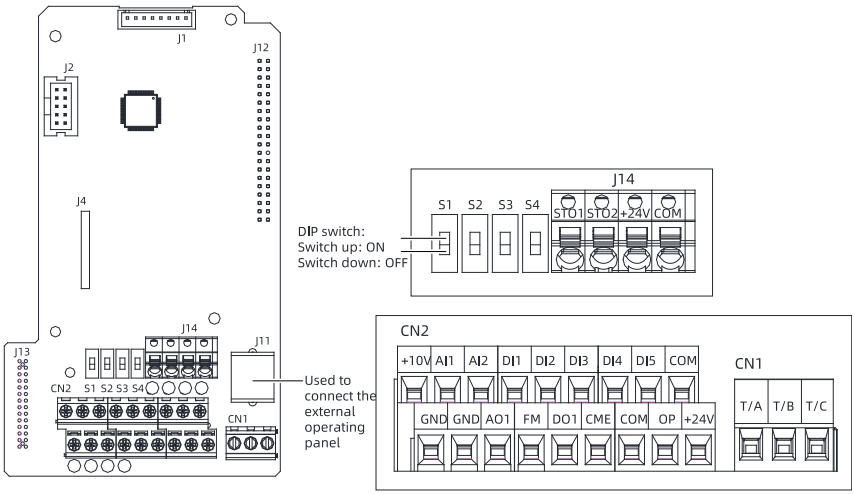


Figure 4-21 Arrangement of control circuit terminals

Table 4–4 Description of control circuit terminals

Type	Mark	Name	**Function**
Power	+10V-GND	External +10 V power supply	The terminal is used to provide +10 V power supply to external devices with the maximum output current of 10 mA. Generally, it is used to power an external potentiometer with resistance ranging from 1 kΩ to 5 kΩ.
	+24V-COM	+24 V external power supply	The terminal is used to provide +24 V power supply to external devices. Generally, it is used to power the DI/DO and external sensor. The maximum output current is 200 mA[1].
	OP	Input terminal for external power supply	Connected to +24V by default. To use an external signal to drive terminals DI1 to DI5, disconnect OP from +24V and connect it to an external power supply.
Analog input (AI)	AI1-GND	AI1	Input voltage range: -10 VDC to +10 VDC Input impedance: 22 kΩ
	AI2-GND	AI2	The terminal supports voltage input (default), current input, and temperature input. When used as voltage/current input, the terminal supports 0 V to 10 V, -10 V to +10 V, or 0 mA to 20 mA, and supports 12-bit resolution and the correction accuracy of 1%. The input impedance is 22 kΩ for voltage input and 500 Ω or 250 Ω for current input, which is set by S2 and S3 DIP switches[2].

Type	Mark	Name	**Function**
Digital input	DI1-OP	DI1	Optocoupler isolation, compatible with dual-polarity input Input impedance: 1.72 kΩ Operating voltage range: 9 V to 30 V
	DI2-OP	DI2	
	DI3-OP	DI3	
	DI4-OP	DI4	
	DI5-OP	DI5	Besides features of DI1-DI4, it can be used for high-speed pulse input. Input impedance: 1.16 kΩ Maximum input frequency: 100 kHz Operating voltage range: 15 V to 30 V
Analog output (AO)	AO1-GND	AO1	The DIP switch S4 on the control board is used to determine voltage output (default) or current output. Output voltage range: 0–10 V Output current range: 0–20 mA
Digital output	DO1-CME	DO1	Optocoupler isolation; dual-polarity open collector output Output voltage range: 0 V to 24V Output current range: 0 mA to 50 mA **Note that digital output ground CME and digital input ground COM are internally insulated, but are shorted externally by default. In this case, DO1 is driven by** +24V by default. To drive DO1 by external power supply, remove the jumper between CME and COM.
	FM-COM	High-speed pulse output	The terminal is set by F5-00 (FM terminal output selection). When the terminal is used for high-speed pulse output, the maximum frequency is 100 kHz. When the terminal is used for collector open output, it has the same specifications as DO1.
Relay output	T/A	Common terminal	Driving capacity of the contact: 250 VAC, 3 A, COS Ø = 0.4 30 VDC, 1 A
	T/B	NC terminal	
	T/C	Normally open terminal	

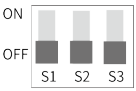
Type	Mark	Name	Function
Auxiliary interface	J4	Local PG card interface	It is used to connect the resolver, ABZ incremental encoder, 23-bit encoder, and sin-cos encoder.
	J11	External operating panel interface	It is used to connect the external LCD operating panel (SOP-20-810) or the LED operating panel (MDKE-10).
	J13	Expansion card interface	28-core terminal used to connect to expansion cards, including I/O cards, communication cards, and PG card
	J14	Safety function terminal	For details, see *"Table 4-5 Description of STO terminals" on page 56*.
DIP switch	S1 S2 S3		For details, see *"Table 4-6 Descriptions of DIP switches S1 to S3" on page 57*.
	S4		Current/Voltage mode selection for AO1 ON: Current output mode OFF: Voltage output mode

Table 4–5 Description of STO terminals

No.	Mark	Name	Performance requirement
1	STO1	STO channel 1	Internal: STO1 and STO2 are connected to +24V by jumpers by default. External: You can connect STO1 and STO2 to an external 24 V power supply. For detailed wiring, see STO-related functions.
2	STO2	STO2	
3	+24V	Power supply+ for STO channels 1 and 2	
4	COM	Power supply ground for STO channels 1 and 2	

Table 4–6 Descriptions of DIP switches S1 to S3

DIP switch status			Function
S1	S2	S3	
OFF	OFF	OFF	Voltage mode with the range of 0 VDC to 10 VDC for AI2
ON	OFF	OFF	Temperature mode for AI2 You can the temperature sensor type through F9-75. 0: No temperature sensor (AI used for analog input) 1: PT100 temperature detection input signal; -25°C to +200°C; accuracy: ±8°C 2: PT1000 temperature detection input signal; -25°C to +200°C; accuracy: ±8°C 3: KTY84-130 temperature detection input signal; -40°C to +260°C; accuracy: ±15°C 4: PTC-130 temperature detection input signal; -20°C to +180°C; accuracy: ±15°C
OFF	ON	OFF	Current mode for AI2; current range: 0 mA to 20 mA; input impedance: 500 Ω
OFF	ON	ON	AI2 current mode, 0 mA to 40 mA; input impedance: 250 Ω

Note

- [1]: If the ambient temperature exceeds 23℃, the output current must be derated by 1.8 mA for every additional 1℃. The maximum output current is 170 mA at 40° C. When OP and +24V are shorted, the maximum output current is calculated by the following formula: 170 mA minus current over the DI.
- [2]: Select the impedance (500 Ω or 250 Ω) based on the maximum output voltage of the signal source. For instance, to select 500 Ω impedance, ensure the maximum output voltage of the signal source is no less than 10 V, so that AI2 can detect a current of 20 mA.
- S1, S2, and S3 are DIP switches used together for the AI. S4 is the DIP switch for the AO.

5 AC Drive Installation

5.1 Pre-installation Inspection

Check the following items before installation:

- Check that the installation environment, space, and direction can meet installation requirements of the product.
- Prepare installation tools and accessories.
- Inspect the package, check the items after unpacking, and handle with care
- Perform the following check items before installation.

Table 5-1 Pre-installation checklist

No.	Check Item	Confirmation
1	The mechanical strength of the mounting position can bear the weight of the equipment.	☐
2	The environment and load-bearing capacity of the mounting position fulfill the installation requirements.	☐
3	Sufficient space for heat dissipation has been reserved, with heat dissipation of other components inside the cabinet being considered.	☐
4	The mounting bracket (if needed) is made of incombustible materials.	☐
5	If the application site is exposed to metal dust, install the equipment in an enclosed cabinet to isolate the equipment from the metal dust. In this case, the space inside the cabinet needs to be as large as possible.	☐
6	Before installing the AC drive, install the bottom mounting bracket in the cabinet and guide rails (optional), and prepare mounting beams with holes reserved to fix the AC drive.	☐
7	Keep combustible and explosive materials away from the equipment.	☐

5.2 T1 to T9 Model (0.4 kW to 200 kW) Installation

5.2.1 Backplate Mounting

In this mode, avoid fastening only the two retaining nuts on the top of the AC drive lest the joints come loose or damaged after long-time operation due to the action of unbalanced force.

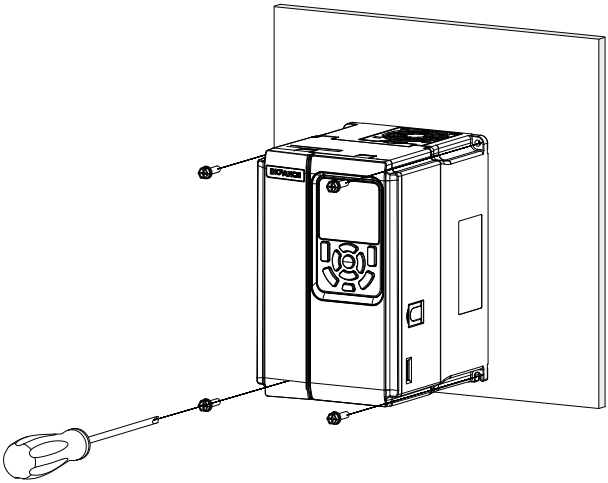


Figure 5-1 Backplate mounting of T1 to T6 models (0.4 kW to 37 kW)

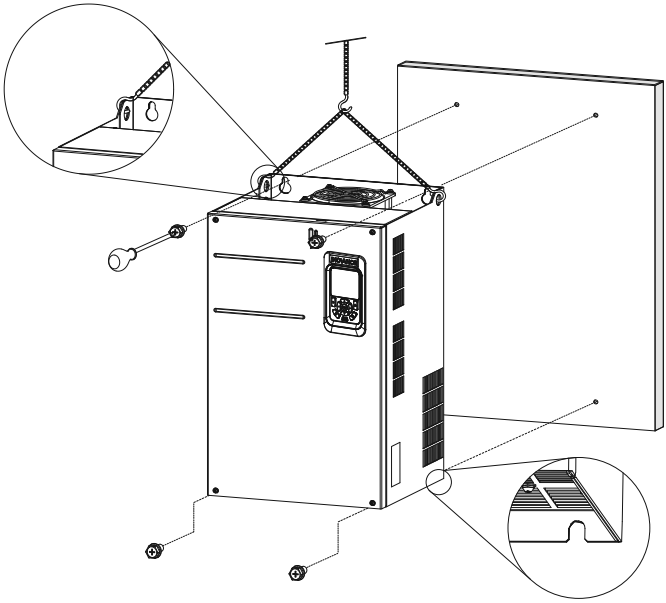
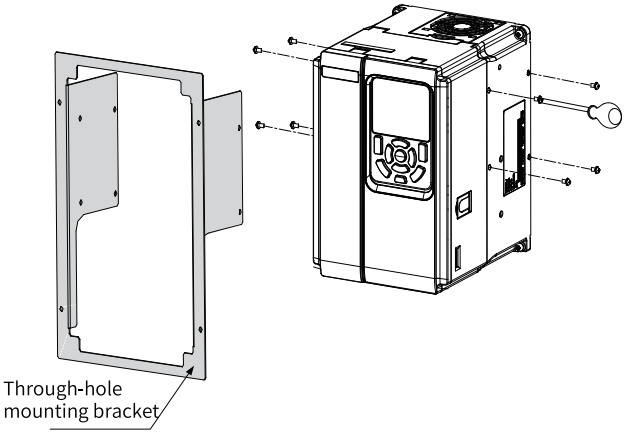


Figure 5-2 Backplate mounting of T7 to T9 models (45 kW to 200 kW)

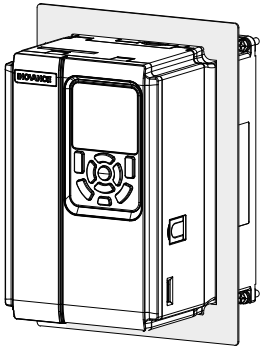
5.2.2 Through-hole Mounting

T1 to T6 models (0.4 kW to 37 kW)

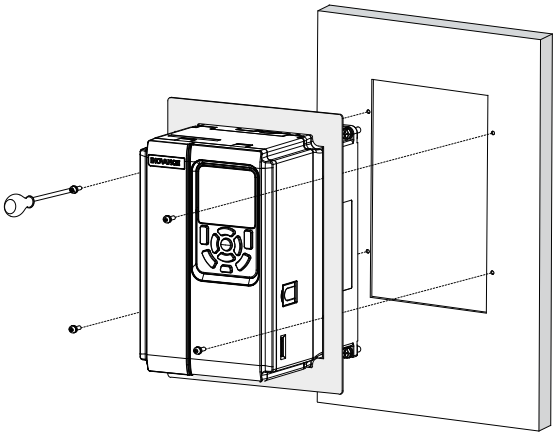
1. Install the AC drive into the mounting bracket, and then fix the screws at both sides of the bracket.



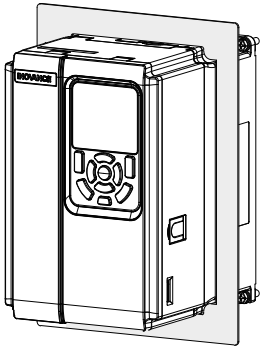
The following figure shows the AC drive with the bracket installed.



2. Fix the AC drive with the bracket to the back of the control cabinet.

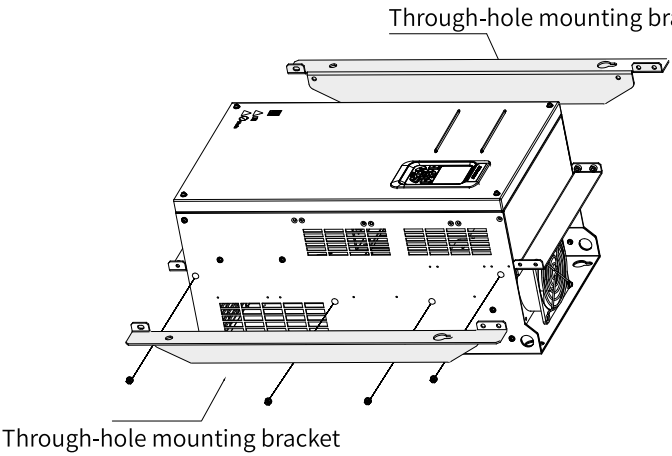


The following figure shows the AC drive installed in the cabinet.

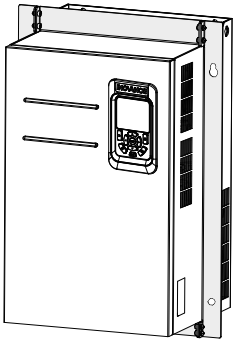


T7 to T9 models (45 kW to 200 kW)

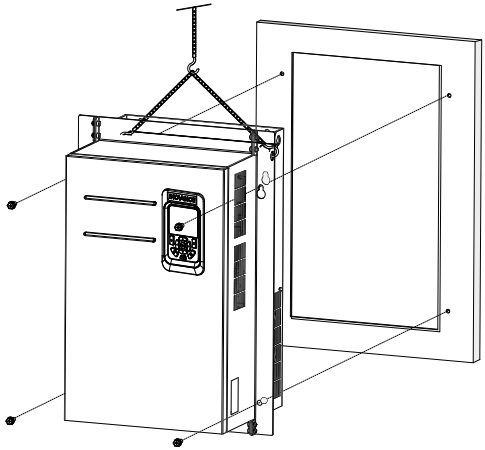
1. Fix the through-hole mounting bracket from both sides of the enclosure.



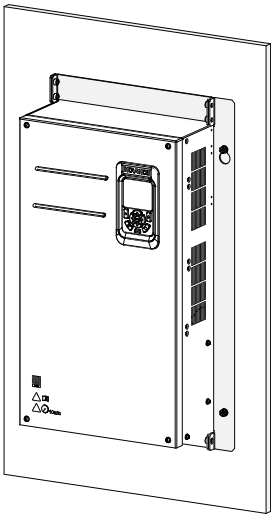
The following figure shows an AC drive with brackets mounted.



2. Fix the drive with brackets to the backplate of the control cabinet.



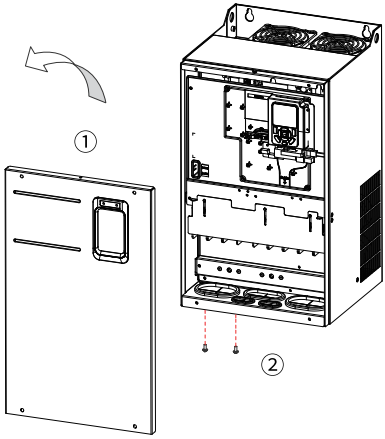
The following figure shows what it looks like when through-hole mounting is done.



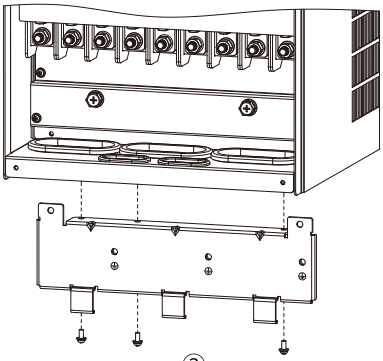
5.2.3 Cable Shield Grounding Bracket Installation

Procedure

1. Remove the cover, as shown in ①. Remove the two M4x12 SEMS screws from the air inlet plate, as shown in ②.

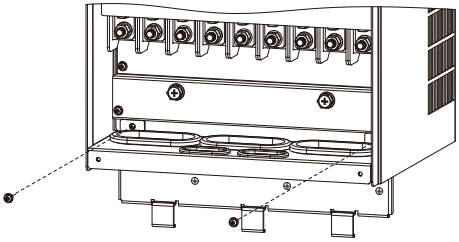


2. Place the ground bracket of the cable shield on the chassis, and fasten the bracket with three M4 x 12 SEMS screws at the positions shown in ③.



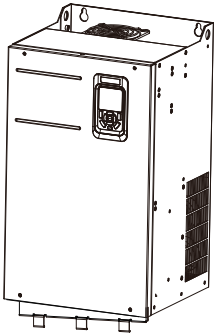
③

3. Tighten two M4x12 SEMS screws at the positions shown in ④.



④

4. Install the cover.



⑤

Note

For selection of the cable shield ground bracket, see *"10.3.1 Option List" on page 448*.

5.2.4 Cover Removal and Installation

5.2.4.1 Removing the Cover

Before wiring the control circuit, for example, connecting the jumper, PG card, or functional expansion card, remove the cover of the AC drive. When removing the cover, hold the cover with your hands and carefully lift the lower part of the cover to prevent it from falling off. Failure to comply can result in equipment damage or personal injury.

Prerequisites

Before removing the cover, ensure that the machine is powered off for over 10 minutes.

Context

The following figure shows the positions of the control board, jumper, and expansion card after the cover is removed.

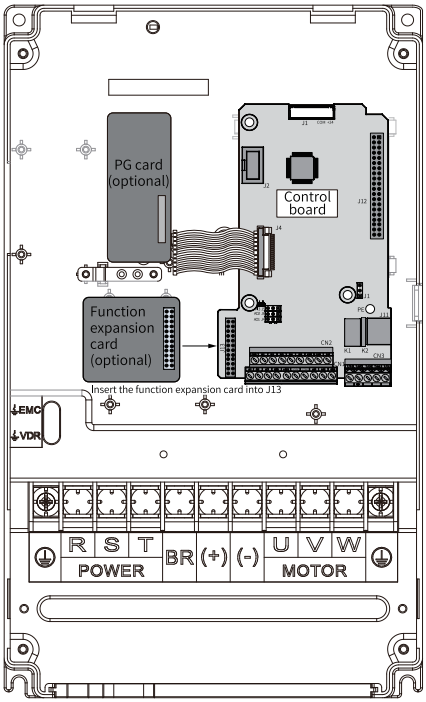
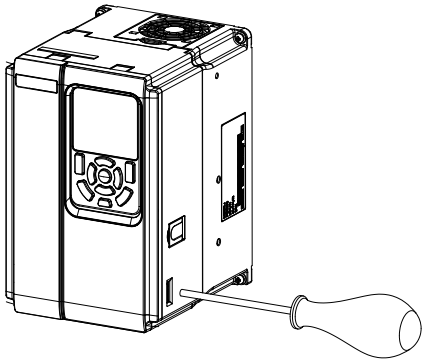
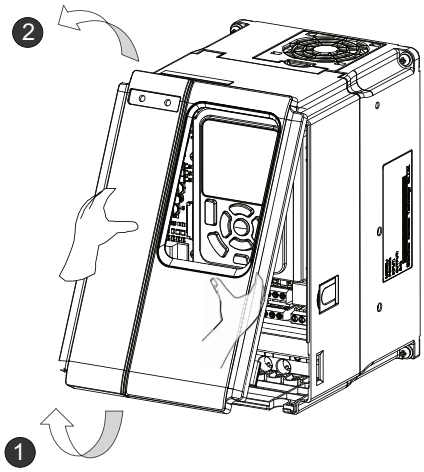


Figure 5-3 Position of the control board

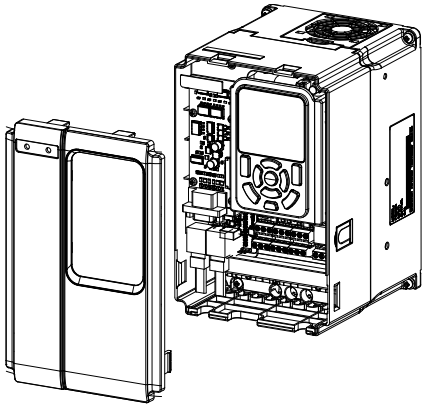
1. Remove covers of T1 to T6 models (0.4-37 kW).
   a. Use a tool to push the snap-fit joints inwards at both sides of the drive to release the cover.



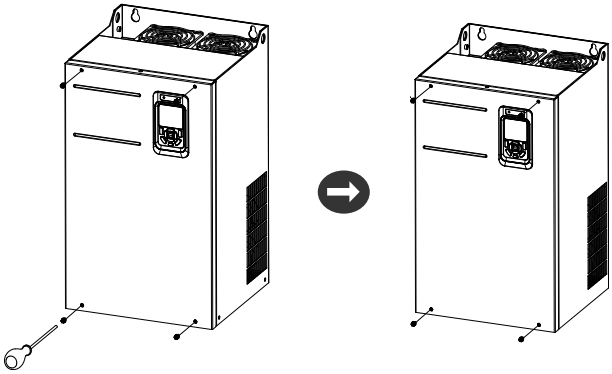
b. Hold the cover with your hands, lift the lower part of the cover (as shown in ①), push the cover upward, and lift the upper part of the cover (as shown in ②).



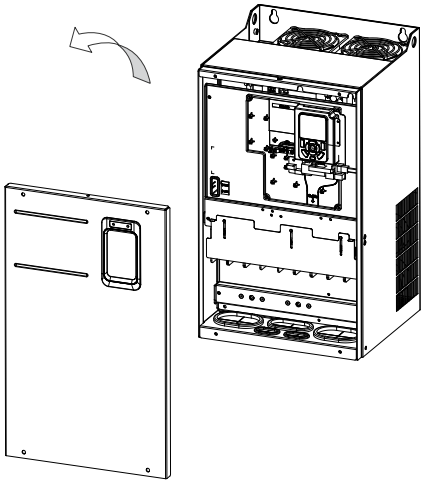
The following figure shows the drive without the cover.



2. Remove covers of T7 to T9 models (45-160 kW).
   a. Use a screwdriver to remove the four fixing screws of the cover.



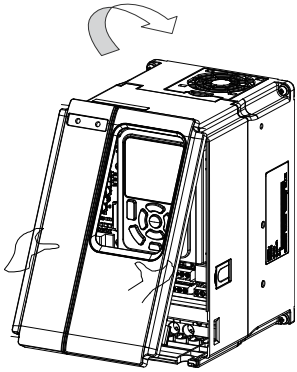
b. Hold the cover with both hands and lift it up in the direction indicated by the arrow.



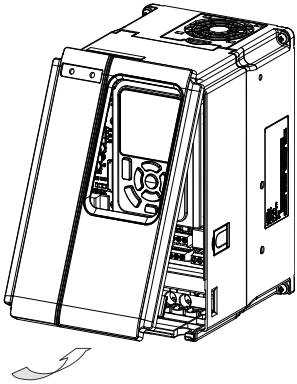
5.2.4.2 Installing the Cover

The cover of the AC drive must be removed before wiring the main circuit and control circuit. After wiring is done, re-install the cover.

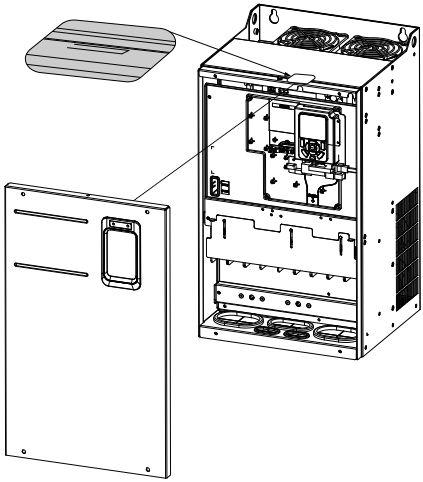
1. Install covers of T1 to T6 models (0.4-37 kW).
   a. Hold the cover with both hands and insert the snap-fit joint on the upper edge of the cover into the hole in the drive.



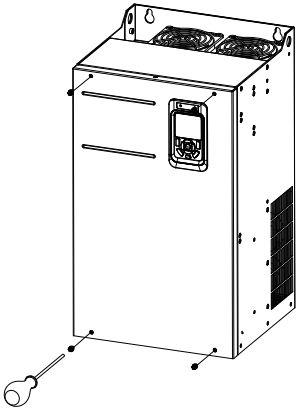
b. Align the cover and push down the lower part of the cover by the arrow direction.



2. Install covers of T7 to T9 models (45-160 kW).
   a. Hold the cover with both hands, align the cover with the upper edge snap-fit joint on the chassis and push it in place as shown in the following figure.



b. Install and fix the four fixing screws with a screwdriver.



5.3 T10 to T12 Model (220 kW to 450 kW) Installation

5.3.1 Installation Method

In-cabinet installation for T10 to T12 (200 kW to 400 kW) models is supported.

5.3.2 Pre-installation Precautions

- Before installing the AC drive, install the bottom mounting bracket and mounting guide rail in the cabinet, prepare mounting beams used for fixing the drive, and

reserve fixing holes on the mounting beam. Reserve sufficient space for connecting the side copper busbar inside the cabinet.

- Use the guide rails and the four casters of the AC drive to move the AC drive into or out of the cabinet. Align the casters with the guide rails before a push or pull operation. To ensure safety, arrange two persons to pull or push the AC drive together.
- Reserve sufficient clearance for heat dissipation, including heat dissipation of other equipment in the cabinet.
- To push the AC drive into or pull it out of the cabinet, arrange two persons to work together. After pushing the AC drive into the cabinet, remove the cardboard from the air outlet of the cabinet to avoid over-temperature caused by failure to exhaust hot air.
- Install an air deflector at the top of the cabinet to avoid circulation of hot air inside the cabinet. Prepare air inlets at the lower part of the cabinet door.
- The cabinet is 2200 mm x 800 mm x 600 mm (including a ventilation top cover with the height of 200 mm). The cabinet needs to be installed on a base that is 100 mm in height.
- When the drive is installed in an enclosed environment, such as a cabinet or casing box, use a cooling fan or air conditioner to keep the temperature of the air taken in below 50℃. Failure to comply will result in overheat or fire.
- Cover the top of the AC drive with a piece of cloth or paper during installation to prevent unwanted objects such as metal chippings, oil, and water from falling into the drive. Failure to comply may cause malfunction of the AC drive. After installation is done, remove the cloth or paper. Failure to comply will degrade ventilation and result in unexpected heat.
- The mounting bracket (if needed) must be made of incombustible materials.
- In environments with metal dust, use an enclosed cabinet that can completely isolate the drive from the metal dust. In this case, ensure the maximum possible space in the cabinet and install cooling devices outside the cabinet.
- Tighten all screws with the specified tightening torque. Failure to comply may result in electric shock or fire.
- Keep combustible and explosive materials away from the AC drive.

5.3.3 Thermal Design

For T10 to T12 models (220 kW to 450 kW), sufficient clearance must be left inside the cabinet for heat dissipation. Cabinets supporting passive exhaust has no fan on the top.

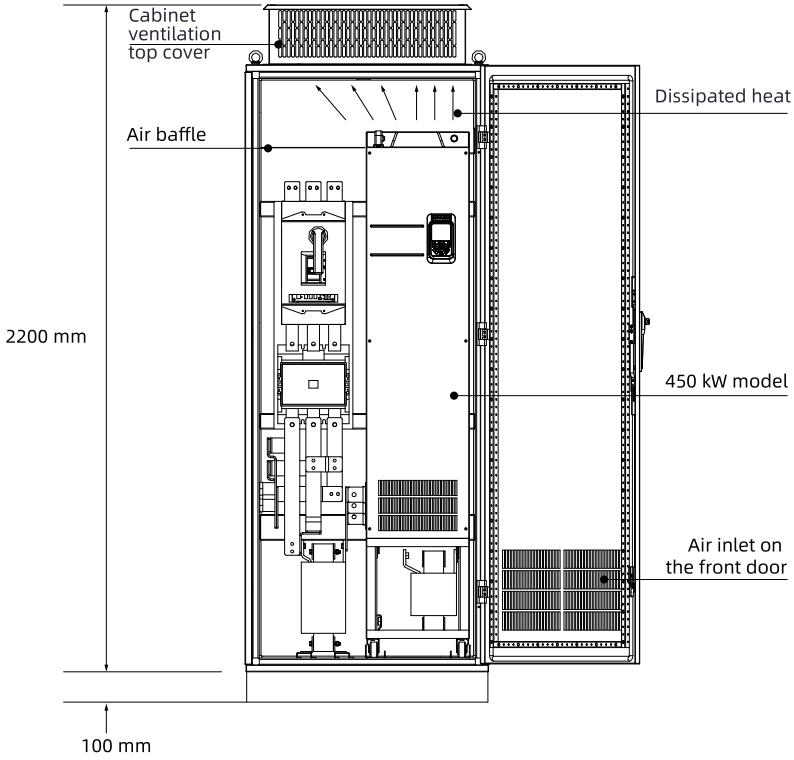


Figure 5-4 Passive-ventilated cabinet

Table 5–2 Specifications of cabinets supporting passive exhaust

Model	Quantity of fans	Total Air Volume (CFM)	Effective area of the cabinet air inlet (mm2)	Effective area of the cabinet air outlet (mm^2)
T9 (160 kW)	2	541	31809	50894
T9 (200 kW)	2	620	31809	50894
T10 (220 kW)	2	586	31809	50894
T10 (250 kW)	2	722	31809	50894
T11 (280 kW)	3	789	47713	76341
T11 (315 kW)	3	882	47713	76341
T12 (355 kW)	3	644	47713	76341
T12 (400 kW)	3	796	47713	76341

Model	Quantity of fans	Total Air Volume (CFM)	Effective area of the cabinet air inlet (mm2)	Effective area of the cabinet air outlet (mm^2)
T12 (450 kW)	3	796	47713	76341

Note

- CFM = 0.0283 m^3/min
- "Effective area" indicates the through-hole area.

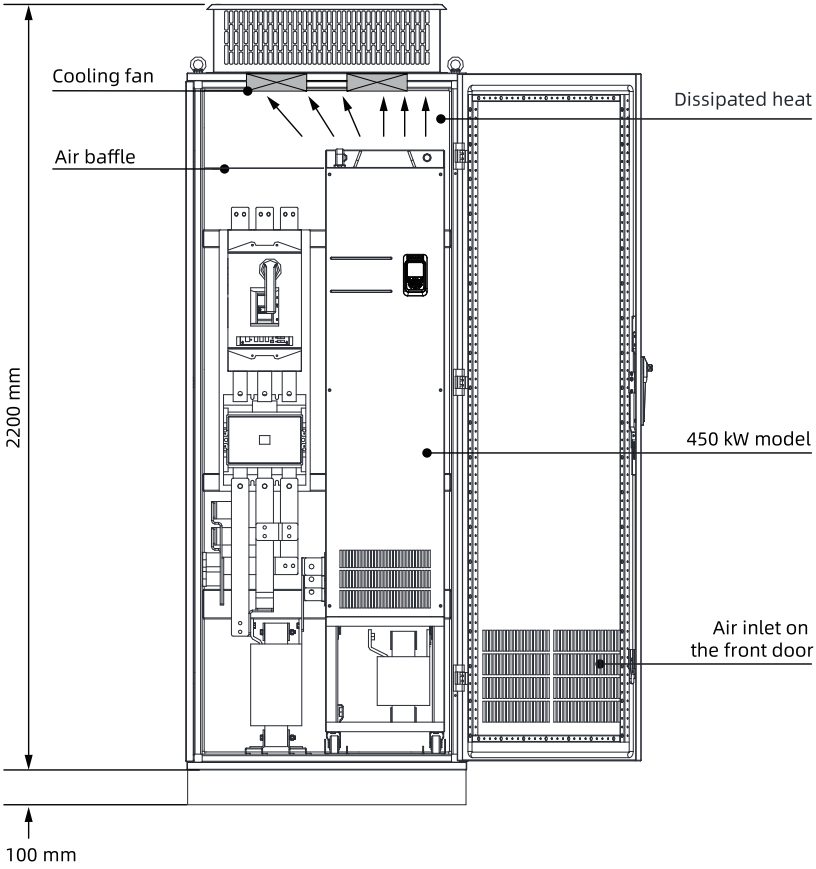


Figure 5-5 Cabinet with fans on the top

Table 5–3 Parameters of a forced-ventilated cabinet

Model	Quantity of fans	Total Air Volume (CFM)	Effective Area of Cabinet Top Air Inlet (mm^2)	Max. Air Volume Required by the Top Fan (CFM)	Effective Area of Cabinet Top Air Outlet (mm^2)
T9 (160 kW)	2	541	31809	649	S = 0.942 x N x ($Dout^2$ - $DHUB^2$) where, N indicates the quantity of fans on the top, Dout indicates the fan diameter, and DHUB indicates the diameter of the fan hub.
T9 (200 kW)	2	620	31809	744	
T10 (220 kW)	2	586	31809	703	
T10 (250 kW)	2	722	31809	866	
T11 (280 kW)	3	789	47713	947	
T11 (315 kW)	3	882	47713	1058	
T12 (355 kW)	3	644	47713	773	
T12 (400 kW)	3	796	47713	955	
T12 (450 kW)	3	796	47713	955	

Note

- CFM = 0.0283 m^3/min
- "Effective area" indicates the through-hole area.

As shown in the following figure, the heat dissipation duct of the drive must be isolated in the cabinet to prevent the hot air from circulating in the cabinet. Use an air deflector for isolation to ensure that the hot air of the drive can be exhausted from the heat dissipation hole on the top of the cabinet.

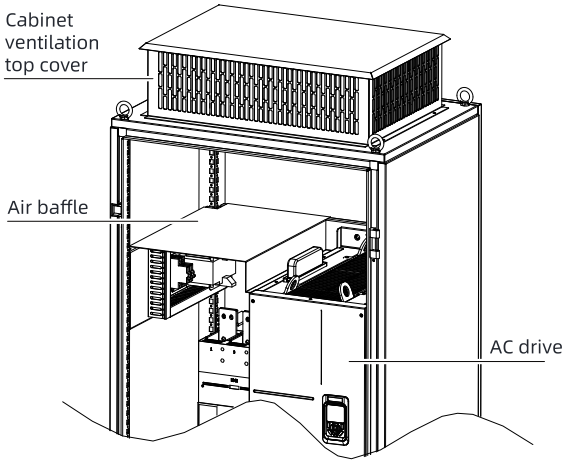


Figure 5-6 Air deflector in the cabinet

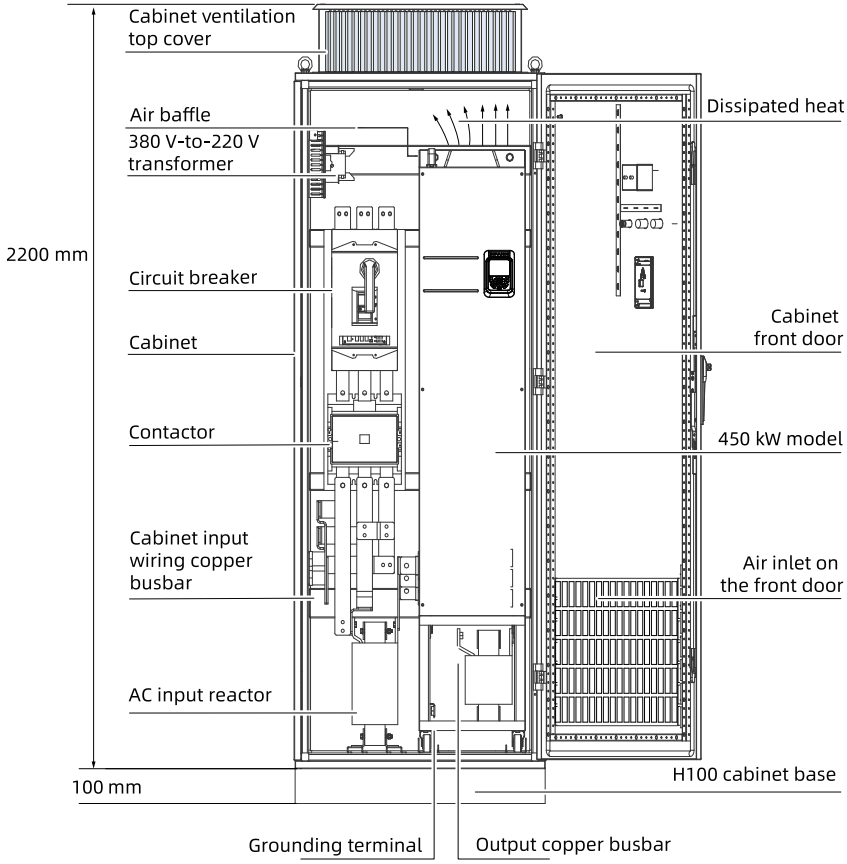


Figure 5-7 Recommended cabinet layout for T12 models (355 kW to 450 kW)

5.3.4 Installation within the Cabinet

Context

The nine-fold profile cabinet (PS cabinet) is recommended. This kind of cabinet is in an assembled structure, which is cost-effective. The openings on the main column of the cabinet meet the general standards, facilitating the design of mounting beams and structure strengthening. In summary, the nine-fold profile cabinet is a kind of industrial standard cabinet with high reliability. *"Figure 5-8 " on page 76* shows the cross section of the nine-fold profile cabinet.

Procedure

1. In the nine-fold profile cabinet (PS cabinet), install the mounting beam for fixing the AC drive and reserve fixed holes.

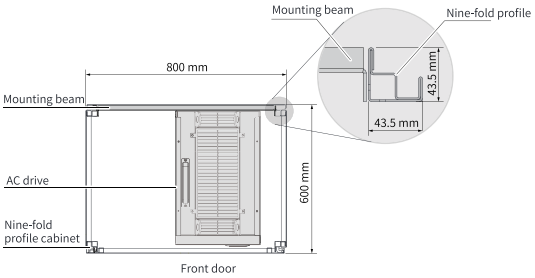


Figure 5-8 Top view of T11 to T12 models (200 kW to 400 kW)

To install T11 to T12 models (200 kW to 400 kW) into the nine-fold profile cabinet with the depth of 600 mm, bend the back mounting board inwards (not required for the cabinet with the depth of 800 mm), as shown in *"Figure 5-9 " on page 76* . However, if the cabinet with the depth of 600 mm has both front and back doors, T11 to T12 models (200 kW to 400 kW) cannot be installed in this kind of cabinet. Instead, install the AC drive into the cabinet with the depth of 800 mm.

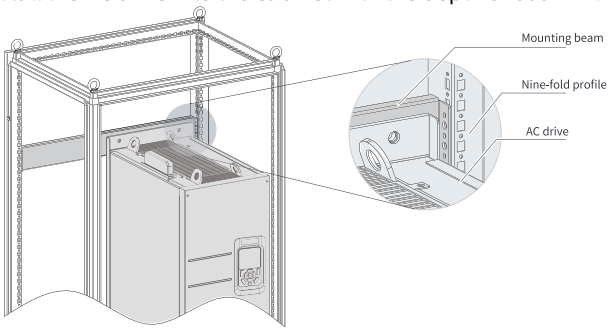


Figure 5-9 3D view of T11 to T12 models (200 kW to 400 kW)

2. Fix the bottom mounting bracket in the nine-fold profile cabinet.
   Fix the mounting bracket to the base of the nine-fold profile cabinet by using six M5 self-tapping screws, as shown in *"Figure 5-10 " on page 76* .

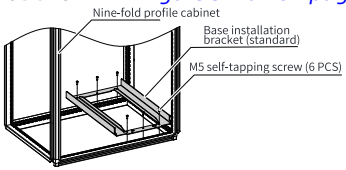


Figure 5-10 Installation of the mounting bracket

Note

Drill holes for the mounting bracket and assemble the bracket on site if the cabinet is not a nine-fold profile one.

3. Assemble a guide rail (model: MD500-AZJ-A3T10) and mount the guide rail assembly to the cabinet.
   a. Assemble the guide rail, as shown in *"Figure 5-11 " on page 77* .

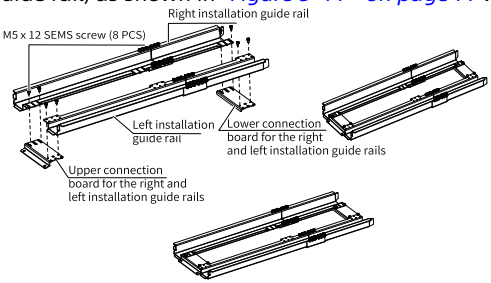


Figure 5-11 Guide rail assembling

   b. Align the two round holes at the front end of the mounting rail with the screws of the mounting bracket, and then lock the guide rail to the cabinet with two M6 nuts, as shown in *"Figure 5-12 " on page 77* .

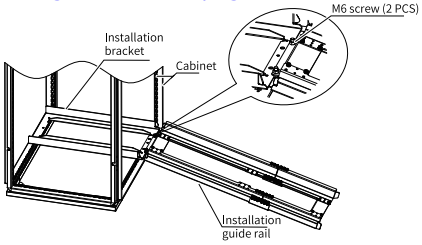


Figure 5-12 Mounting the guide rail to the cabinet

4. Remove the front cover of the AC drive.
   For details, see *"5.3.5.1 Removing the Cover" on page 80*. After the cover is removed, the auxiliary handle will be exposed.
5. Align the AC drive caster with the guide rail and push the drive slowly into the cabinet.
   During the push-in or pull-out process, use the auxiliary strap to prevent the drive from toppling over. It is recommended that two people work together.

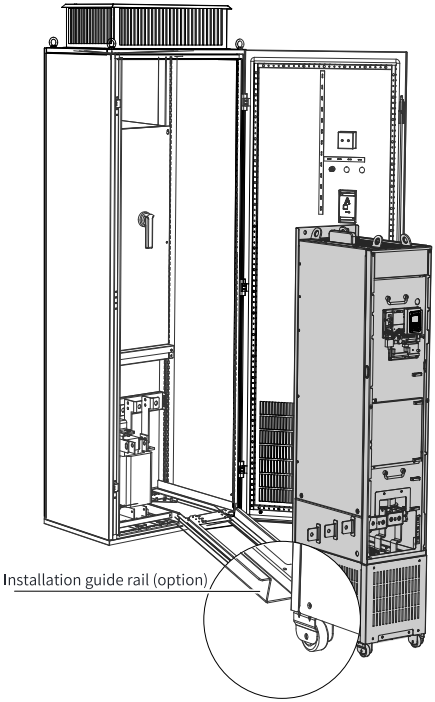


Figure 5-13 Aligning the caster with the guide rail

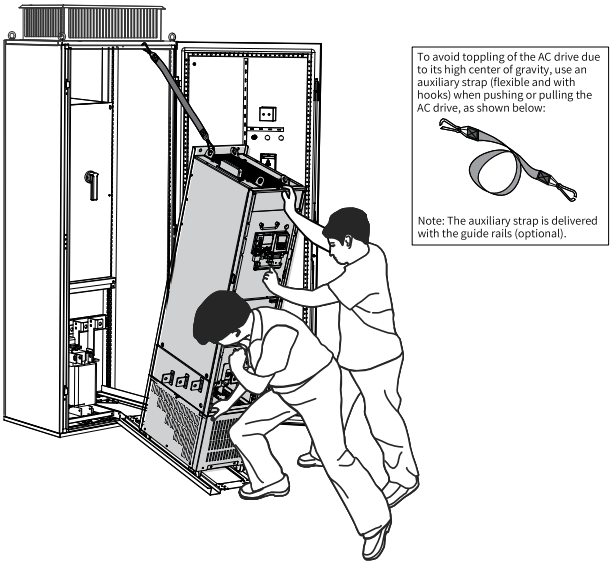


Figure 5-14 Pushing the drive into the cabinet

6. Remove the auxiliary rope, install the four screws on the back of the AC drive to fix it to the beam in the cabinet.

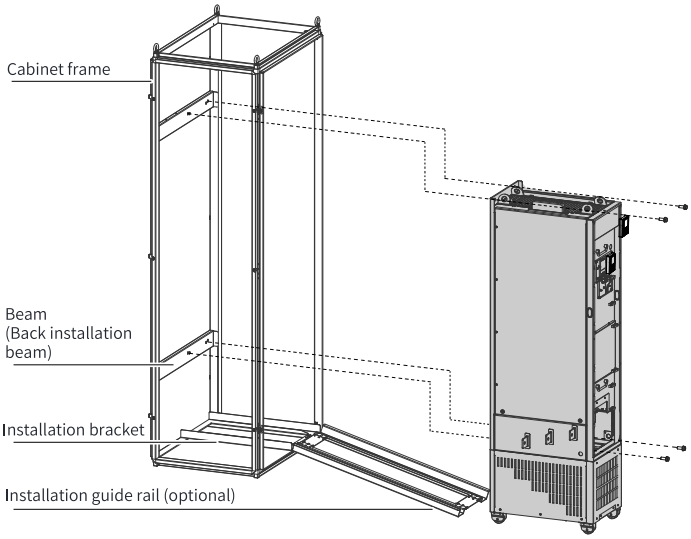


Figure 5-15 Fixing the drive to the mounting beam

7. After installation is done, remove the guide rail.
8. Remove the air duct damper at the top of the AC drive. The air duct damper is used to prevent foreign objects such as screws from falling into the air filter during installation of the AC drive into the cabinet.

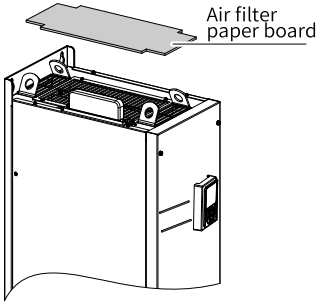


Figure 5-16 Removing the air duct damper

5.3.5 Cover Removal and Installation

5.3.5.1 Removing the Cover

Before wiring the control circuit, such as operating jumpers or connecting PG cards or expansion cards, remove the cover from the AC drive. When removing the cover, hold the cover with your hands and carefully lift the lower part of the cover to

prevent it from falling off. Failure to comply will result in equipment damage or personal injury.

Prerequisites

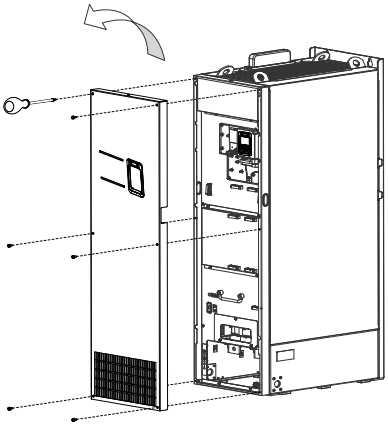
Before removing the cover, ensure that the machine has been powered off for over 10 minutes.

Procedure

1. Use a screwdriver to remove the six fixing screws on the cover.



2. Hold the cover with both hands, and lift it up in the direction indicated by the arrow to remove it.

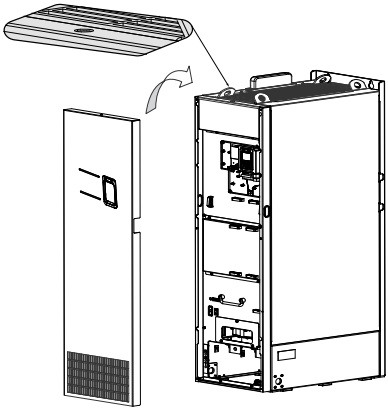


5.3.5.2 Installing the Cover

The cover of the AC drive must be removed before wiring the main circuit and control circuit. After wiring is done, re-install the cover.

Procedure

1. Hold the cover with both hands, align the upper edge of the cover with the upper edge snap-fit joint on the chassis, and snap them together, as shown in the following figure. Then align the six screw mounting holes in the cover with the cover fixing holes in the chassis and press them tightly against each other.



2. Install six fixing screws into the holes with a screwdriver to fasten the cover.



5.4 Post-installation Inspection

After installation is done, check the following items.

Table 5–4 Post-installation checklist

No.	Check Item	Confirmation
1	The minimum ceiling height required for unblocked air passage is reserved. The air inlet and air outlet are unblocked, with sufficient space reserved for dissipation. Sufficient space after the cabinet door opens has been reserved as safety passageway.	☐
2	All the internal and external contact protection devices (such as protective plates) for the cabinet unit have been installed.	☐

6 Quick Commissioning and Trial Operation

6.1 Descriptions of LED Operating Panel

Dimension

The appearance and mounting dimensions are shown below.

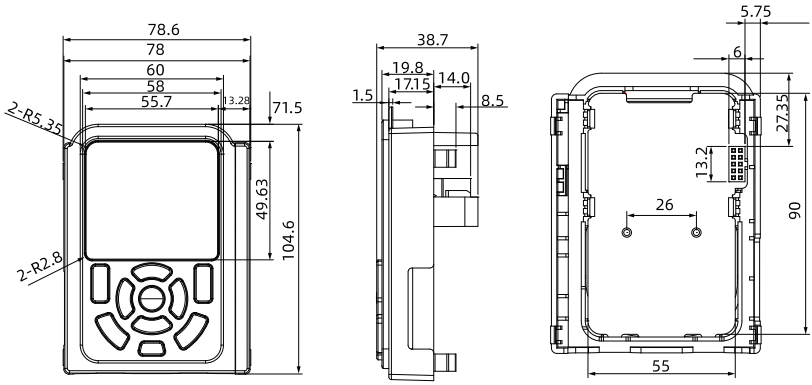


Figure 6-1 Dimensions of LED operating panels for T1 to T4 models (0.4-15 kW) (unit: mm)

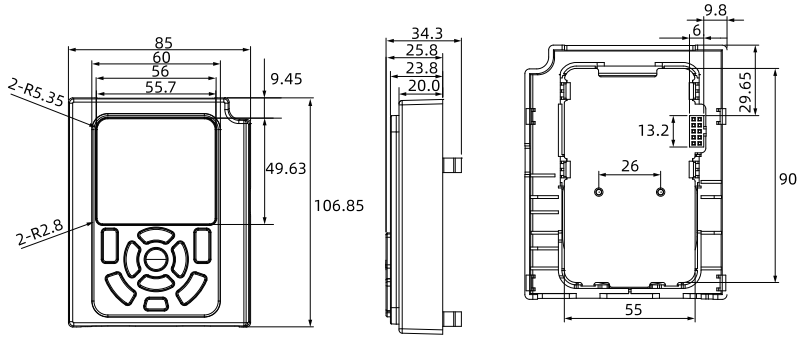


Figure 6-2 Dimensions of LED operating panel for T5 to T12 models (18.5-400 kW) (unit: mm)

Components

The LED operating panel can be used to view the operating status and fault information, set parameters, and so on. The following figure shows the operating panel.

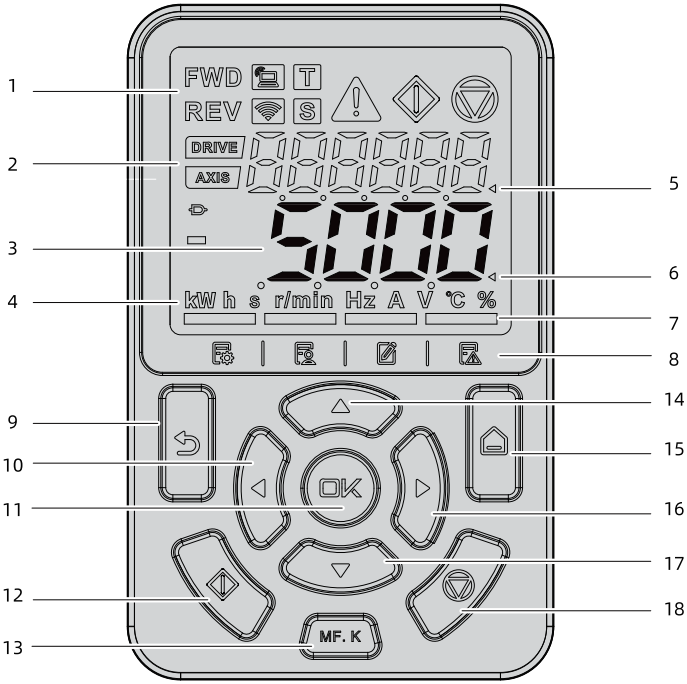


Figure 6-3 Operating panel components

Table 6–1 Operating panel components

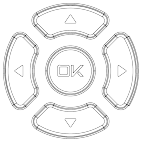
No.	Name	Remarks
1	Status indicator	-
2	Auxiliary display area	It displays the following information: • Prompts related to operating panel tests and motor parameter auto-tuning • Fault and system status monitoring • Station number, motoring status, and STO status
3	Main display area	It displays parameter information.
4	Unit indicator	-
5	Cursor in the auxiliary display area	-
6	Cursor in the main display area	-
7	Menu indicator	It indicates the current menu and can be switched via the menu button. Only one indicator can become on simultaneously.

No.	Name	Remarks
8	Menu icons	From left to right, the icons indicate the basic menu, user-defined parameter, modified parameter (with default values changed), and fault list.
9	Program/Back key	-
10	Left shift key	-
11	OK key	-
12	Run key	-
13	Multi-function key	-
14	Increment key	-
15	Menu key	-
16	Right shift key	-
17	Decrement key	-
18	Stop key	-

Key descriptions

Table 6–2 Key descriptions

Key	Name	Function
	Menu key	Long press the button to switch between the main display area and the auxiliary display area. In the main display area, press the button to switch among different menus, including the basic menu, user-defined parameter, modified parameter (with default values changed), and fault list.
	Program/Back key	Return to the previous interface; Access the level one menu.
	OK key	Enter the settings interface or confirm the settings.

Key	Name	Function
	Navigation buttons	In the auxiliary display area, press the right or left navigation button to switch the display status. Main display area: • Basic menu, user menu, and check menu: In the monitoring interface, the down button is used as the potentiometer, and the left and right buttons are used to switch the monitoring variables. In the parameter interface, press the up or down button to adjust the value, press the left or right button to select the bit, and press the OK button to confirm the setting. • Fault history menu: Press the left or right button to switch the fault history records.
	Multi-function button	You can allocate different functions, such as command source switch, forward run and reverse run switch, or jog to this button.
	Run key	In the operating panel control mode, press the button to operate the drive.
	Stop/Fault reset button	When the drive is running, press the button to stop the drive. When the drive is in the faulty state, press the button to perform a reset operation.

Status indicator

Table 6–3 Status indicator

Status indicator		Description
	Forward running indicator steady on	Forward running
	Reverse running indicator steady on	Reverse running
	Forward/Reverse running indicator blinking	Switching between forward run and reverse run
	Local/Remote indicator off	Local control
	Local/Remote indicator on	Terminal control
	Local/Remote indicator blinking slowly	Communication control
	Local/Remote indicator blinking quickly	Customized control
	Torque control indicator ON	Torque control

Status indicator		Description
	Speed control indicator ON	Speed control
	Fault indicator ON	Fault occurred
	Fault indicator OFF	No fault
	RUN indicator ON	In operation
	Stop indicator kept ON	Stop
	Station indicator steady on	The station number is displayed in the auxiliary display area.
	Station indicator off	The value displayed in the auxiliary display area is not the station number.
	AXIS indicator steady on	The axis No. is displayed in the auxiliary display area.
	AXIS indicator off	The value displayed in the auxiliary display area is not the axis No.
	Connector indicator steady on	The connector variable is displayed in the main display area.
	Connector indicator OFF	The value displayed in the main display area is not the connector variable.
	Minus sign indicator steady on	The value displayed in the main display area is a negative number.
	Minus sign indicator off	The value displayed in the main display area is a positive number.

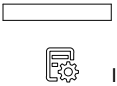
Status indicator		Description
	Cursor indicator in the main display area steady on	The operating area is the main display area.
	Cursor indicator in the auxiliary display area steady on	The operating area is the auxiliary display area.
kW h s r/min Hz A V ℃ %	Unit indicator steady on	The unit of the value displayed in the main display area is that displayed by the indicator, as shown in *"Table 6-4 " on page 89*.
	 Indicator steady on	The main display area displays the basic menu.
	 Indicator steady on	The primary display area displays the user-defined parameter menu.
	 Indicator steady on	The primary display area displays the modified parameter (with the default value changed) menu.
	 Indicator steady on	The primary display area displays the fault menu.

Table 6-4 Description

Unit	Remarks
kW	Power unit
h	Time unit
kWh	Energy unit
s	Time unit
rpm	Speed unit
Hz	Frequency unit
A	Current unit
V	Voltage unit
℃	Temperature unit
%	Percentage

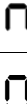
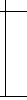
Data display

There are two data display areas in the operating panel: 6-bit auxiliary display area, and 5-bit LED main display area

The auxiliary display area displays the station No., axis No., current state, warning/fault, etc.

The main display area displays the set frequency, output frequency, monitoring data, etc.

Table 6–5 LED display and actual data

Display	Actual data	Display	Actual data	Display	Actual data	Display	Actual data
	0		9		h		r
	1		A		c		t
	2		B		J		U
	3		C		L		y
	4		D		n		T
	5		E		N		u
	6		F		o		-
	7		H		P	-	-
	8		G		q	-	-

Note

The InoDriverShop can be connected via the SOP-20-810 external operating panel.

6.2 Commissioning Process

6.2.1 Basic Commissioning Flowchart

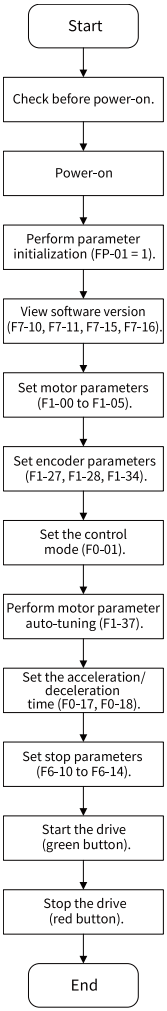


Figure 6-4 Basic commissioning flowchart

Table 6–6 Basic commissioning flowchart

No.	Step	Related Parameter
1	Check before power-on	/
2	Power-on	/

No.	Step	Related Parameter
3	Parameter initialization	FP-01
4	View the software version.	F7-10, F7-11, F7-15, F7-16
5	Set motor parameters.	F1-00 to F1-05 Note that you must set the motor type.
6	Set encoder parameters.	F1-27, F1-28, F1-34
7	Set the control mode.	F0-01
8	Perform motor parameter auto-tuning.	F1-37
9	Set the command source.	F0-02
10	Select the frequency source.	F0-03
11	Set the acceleration and deceleration time.	F0-17, F0-18
12	Set the stop parameters.	F6-10 to F6-14
13	Start	/
14	Stop	/

6.2.2 Commissioning Flowchart in V/f Control Mode

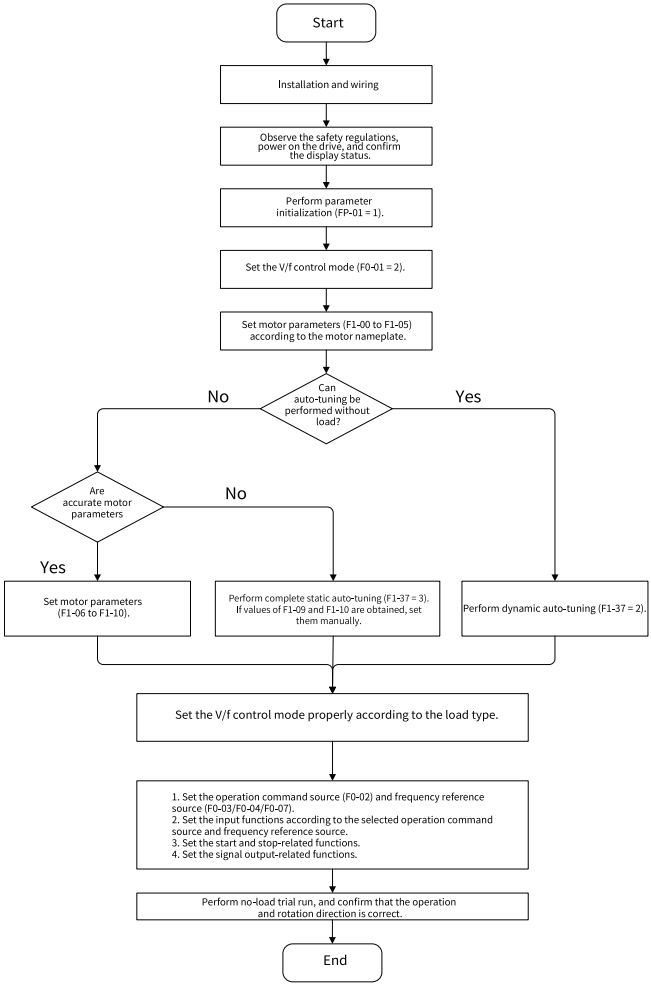


Figure 6-5 Commissioning flowchart in V/f control mode

6.2.3 Commissioning Flowchart in SVC Mode

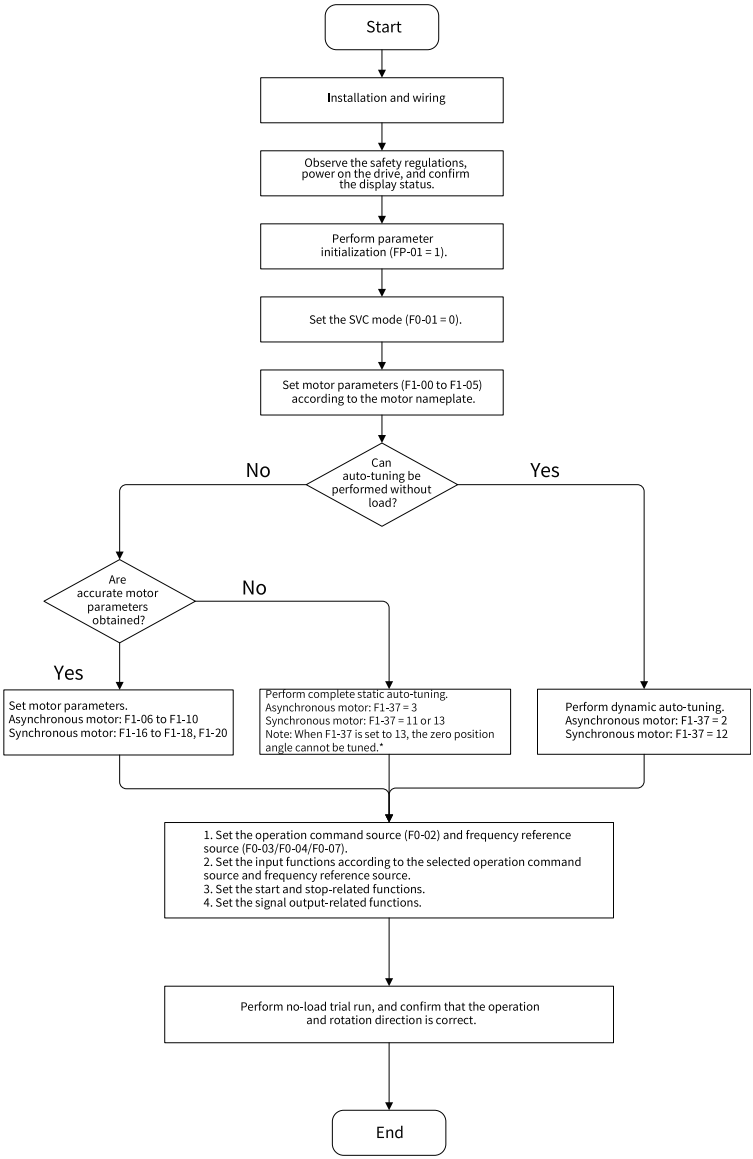


Figure 6-6 Commissioning flowchart in SVC mode

Note

If bit0 of A9-09 is enabled and F1-37 is set to 11, the encoder zero position angle will be tuned, but the encoder rotation direction will be not tuned. If F1-37 is set to 13, the encoder will not be tuned. If bit 0 of A9-09 is enabled and F1-37 is set to 11 or 13, the encoder will not be tuned.

During static auto-tuning, the motor will rotate slowly to a certain position when the encoder zero position angle is tuned.

6.2.4 Commissioning Flowchart in FVC Mode

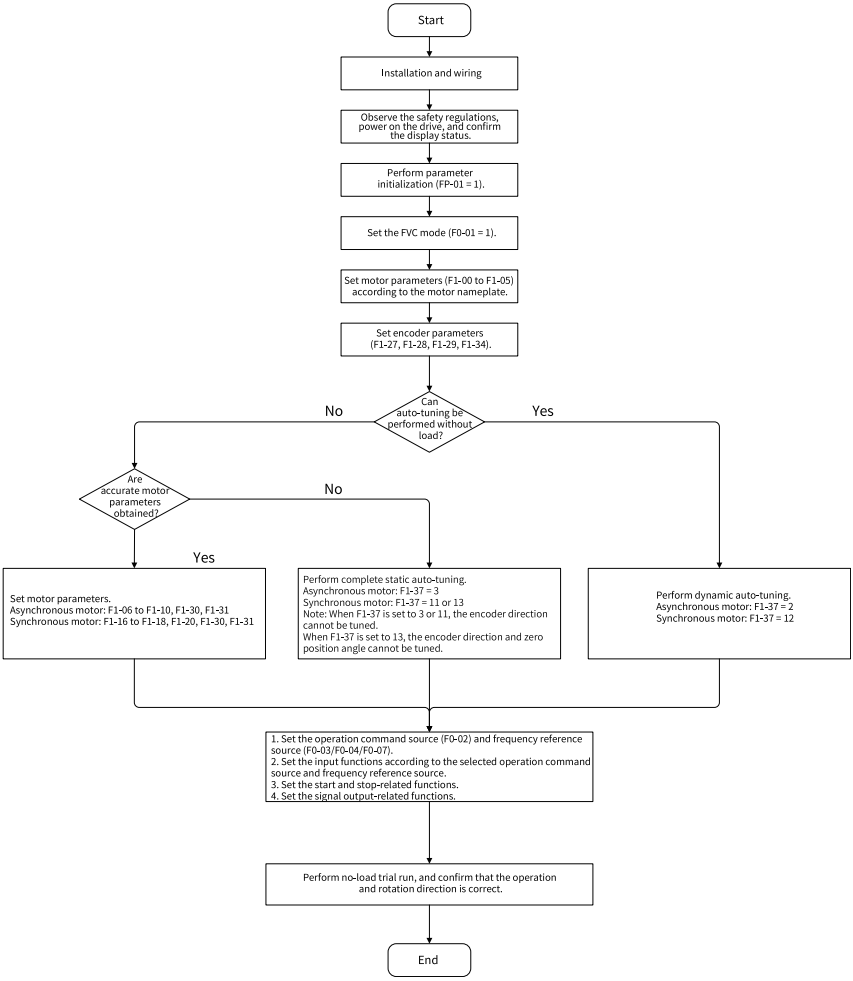


Figure 6-7 Commissioning flowchart in FVC control mode



Note:

1. During static auto-tuning, the motor will rotate slowly to a certain position when the encoder zero position angle is tuned.
2. Before static auto-tuning is performed (F1-37 = 11) to tune the zero position angle, check the encoder running direction (F1-30) and set it correctly. At the same time, the motor will rotate slightly static auto-tuning 11 rotates the motor slightly when the encoder zero position angle is tuned.

Encoder direction: The incorrect encoder direction can affect the precise control of the motor by the AC drive. For example, an incorrect direction may cause motor stall. The AC drive will report overload, overcurrent, overheat, and excessive speed deviation faults, which affects the safety and reliability of the system.

Zero position angle: The zero position angle of the motor indicates the position angle of the motor when the magnetic pole is aligned between the stator and the rotor. The following faults will occur when the zero position angle is incorrect:

1. **Positioning error:** An error will occur between the actual position of the motor and the set position. In this case, the position control system cannot locate the position accurately, affecting the operating accuracy of the equipment.
2. **Instable motion**: Inaccurate zero point angle will cause unsuitability or vibration when the motor executes motion commands, affecting the stability and reliability of the system.
3. **Path deviation**: In applications requiring precise path control (such as manipulators and CNC machines), inaccurate zero position angle may cause path deviation, affecting the quality of processing or operation.
4. **System protection failure**: Some systems may rely on the zero position angle to set the safety boundary or limit position. If the zero position angle is not accurate, the system protection mechanism may fail, increasing the risk of mechanical collision or damage.

6.2.5 Commissioning Flowchart in VVC Mode

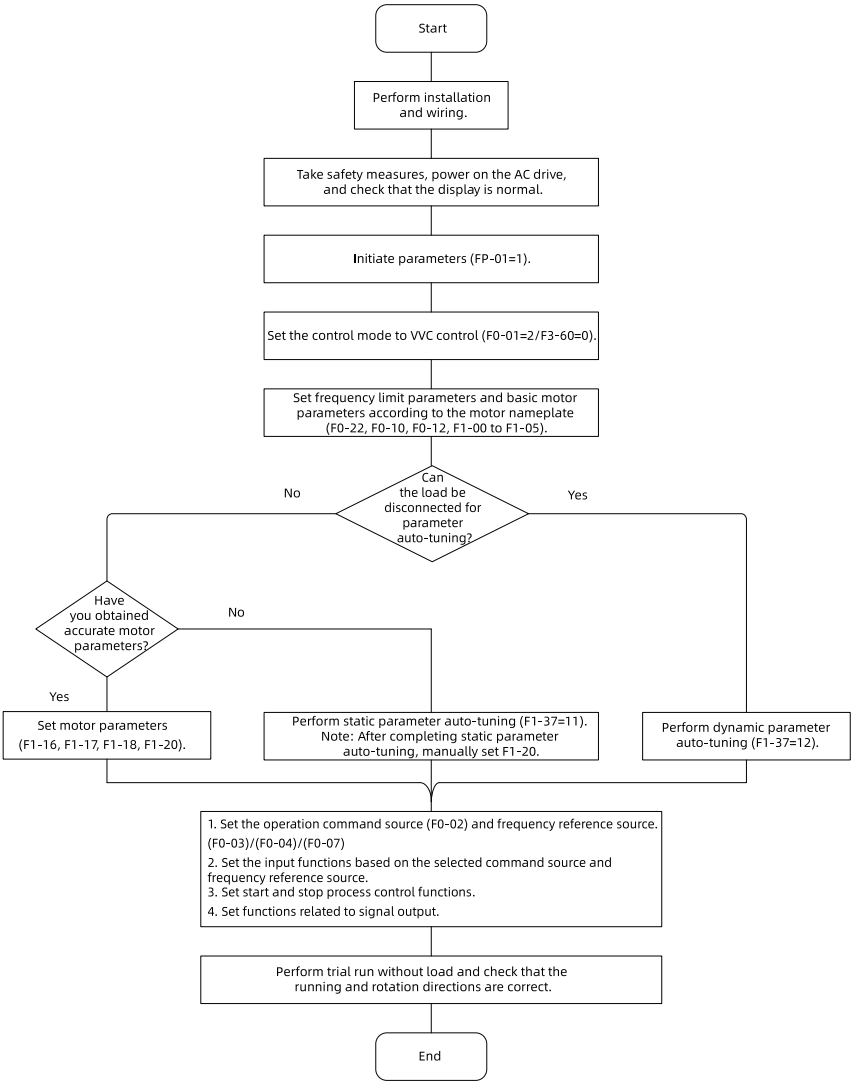


Figure 6-8 Commissioning flowchart for permanent magnet synchronous motors in VVC mode

Note

In the VVC control mode for permanent magnet synchronous motors (PMSM), the PMVVC low-speed IF function is enabled (F3-50=1) by default. The PMVVC low-speed IF current (F3-51) defaults to 60%, which corresponds to 60% of the motor rated current. This setting is suitable for light-load starting conditions. For heavy-load start or rapid acceleration applications, appropriately increase the PMVVC low-speed IF current (F3-51), and reduce the PMVVC low-speed IF switching speed point (F3-52).

7 Communication

7.1 Parameter Communication Address

7.1.1 Introduction to Parameters

The AC drive supports the Modbus RTU communication protocol. The host controller allows you to control the AC drive, such as monitoring states, or viewing and changing parameters through the protocol. The communication data is divided into parameter data and non-parameter data. The latter includes the running commands, running status, running parameters, and alarms.

Parameter data

Parameter data	Group F (Read/ Write)	F0, F1, F2, F3, F4, F5, F6, F7, F8, F9, FA, FB, FC, FD, FP
	Group A (Read/ Write)	A0, A1, A4, A5, A6, A7, A9, AA, AB, AC
	Group B (Read/ Write)	BF
	Group C (read/ write)	C1, C2, C3, C4, C5, C6, C7, C8, C9
	Group D (read/ write)	D5, D6
	Group H (read-only)	H0, H1, H2, H3, H4, H5, H6, H7, H8
	Group U (read-only)	U1, U2, U3
	Group L (read-only)	L0, L1, L2, L3, L4, L5, L6, L7, L8, L9, LB, LC, LD, LE

The communication addresses of parameter data are defined as follows:

1. Reading parameter data through communication
   For groups F0 to FF and A0 to AF, the high-order 8 bits of the communication address indicate the group number and the low-order 8 bits indicate the parameter number.

   Example:

   The communication address of F0-16 is F010H, where F0 represents group F0 and 10 is the hexadecimal data format of serial number 16 in the group.

   The communication address of AC-08 is AC08H, where AC represents group AC and 08 is the hexadecimal data format of serial number 8 in the group.

2. Writing parameter data through communication

For parameters in groups F0 to FF, the high-order 8 bits of the communication address are 00 to 0F or F0 to FF, depending on whether the parameter is written to the EEPROM. The low-order 8 bits indicate the parameter number in the group. Example:

Take writing F0-16 as an example.

If it is not written to the EEPROM, the communication address is 0010H.

If it is written to the EEPROM, the communication address is F010H.

For parameters in groups A0 to AF, the high-order 8 bits of the communication address are 40 to 4F or A0 to AF, depending on whether the parameter is written to the EEPROM. The low-order 8 bits indicate the parameter number in the group. Example:

Take writing AC-08 as an example.

If it is not written to the EEPROM, the communication address is 4C08H.

If it is written to the EEPROM, the communication address is AC08H.

Note

For parameters needing to be saved upon power failure, use the communication address format that allows parameters to be written to EEPROM. However, the number of writing operations must be strictly limited by the host controller to protect the lifetime of the EEPROM chip. For parameters that do not need to be saved upon power failure, use the communication address that prevents parameters from being written to EEPROM.

Non-Parameter Data

Non-Parameter Data	Status data (read-only)	Group U (monitoring parameters), drive fault description, and drive running status
	Control parameter (write-only)	Control commands, communication references, DO control, AO1 control, AO2 control, high-speed pulse (FMP) output control, and parameter initialization

1. Status data

   Status data includes group U (monitoring parameters), AC drive fault description, and AC drive running status.

   - Monitoring parameters in group U

     The high-order 8 bits in the communication address of U0 to UF is 70 to 7F, and the low-order 8 bits indicate the parameter number in the group. For example, the communication address of U0-11 is 700BH.

   - AC drive fault description

     When the drive fault description is read through communication, the communication address is fixed to 8000H. The host controller can obtain the current

fault code of the drive by reading the address. For the fault code description, see definitions of F9-14.

- AC drive operating status
  When the running status of the drive is read through communication, the communication address is fixed to 3000H. The host controller can obtain the current running status of the drive by reading the address. The communication address is defined as follows.

Communication address of drive running status	Definition of the status word
3000H	1: Forward run
	2: Reverse run
	3: At stop

2. Control Parameters
   Control parameters are divided into control commands, communication setpoint, DO control, AO1 control, AO2 control, and parameter initialization.

- Control commands
  When F0-02 (command source) is set to 2 (communication control), the host controller can implement control such as start/stop of the drive through the communication address. The control command is defined as follows.

Communication address of drive running status	Definition of the status word
2000H	1: Forward run 2: Reverse run 3: Forward jog 4: Reverse jog 5: Coast to stop 6: Decelerate to stop 7: Fault reset

- Communication reference value
  The communication setpoint applies when the frequency, torque, torque upper limit, V/f separation voltage, PID reference, and PID feedback of the AC drive are set through communication The communication address is 1000H. When the communication address is set through the host controller, the data range of the address is -10000 to 10000, corresponding to -100.00% to 100.00% of the reference.

- DO control
  When the DO is assigned with function 20, the host controller can control the DO of the AC drive through the communication address in the communication control mode. The communication address is defined as follows.

Communication address for DO control	Command
2001H	bit0: DO1 output control bit1: DO2 output control bit2: Relay 1 output control bit3: Relay 2 output control bit4: FMR output control

- AO1 control, AO2 control, and high-speed pulse (FMP) output control
  When AO1, AO2, and high-speed pulse output FMP terminal are assigned with function 12, the host controller can control the AO and FMP terminal through the communication address in the communication control mode. The communication address is defined as follows.

Output control communication address		Command
AO1	2002H	0 to 7FFF represent 0% to 100%.
AO2	2003H	
FMP	2004H	

- Parameter initialization
  The function of parameter initialization applies when you need to initialize parameters through the host controller.

  If FP-00 (User password) is set to a non-zero value, the password will be verified through communication. After the password verification is successful, the host controller initializes parameters within 30s.

  The communication address of password verification through communication is 1F00H. Directly write the correct user password to this address to perform password verification. The communication address of parameter initialization through communication is 1F01H, as defined in the following table.

Communication address of parameter initialization	Command function
1F01H	0: Inactive 1: Restore default parameter mode 1 2: Clear log information 4: Back up current user parameters 501: Restore user backup parameters 503: Restore parameters to default settings 2

7.1.2 Modbus Communication Protocol

Overview

The MD520HS-INT provides RS485 communication interfaces and supports the Modbus RTU slave communication protocol. You can implement centralized control, such as setting commands, modifying parameters, and reading running state and fault information of the AC drive, by using a computer or PLC.

This protocol defines the content and format of messages transmitted during serial communication, including the master polling (or broadcasting) format and master coding method for the action request, transmission data, and error check. The slave response uses the same structure including action confirmation, returned data, and error check. If an error occurs when the slave receives a message, or the slave cannot perform the action required by the master, the slave returns a fault message as a response to the master.

Application

The AC drive is connected to a "single-master multi-slave" PC or PLC control network with RS485 bus.

Hardware interface

The RS485 extension card MD38TX1 must be inserted into the AC drive.

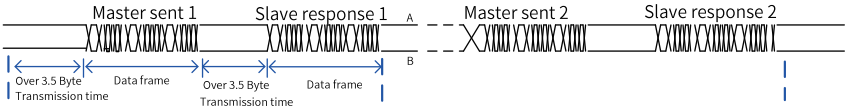
Topology

The network consists of one master and multiple slaves. In the network, each communication device has a unique slave address. One of the devices (usually a PC host controller, a PLC, or an HMI) is the master and initiates communication to perform parameter read or write operations on slaves. Other devices (slaves) provide data to respond to query or operations from the master. At the same moment, only one device can transmit data and the other can only receive data.

The address range of the slaves is 1 to 247, and 0 is a broadcast address. A slave address must be unique in the network.

Transmission mode

The asynchronous serial and half-duplex transmission mode are used. During asynchronous serial communication, data is sent frame by frame in the form of packets. According to the Modbus RTU protocol, an interval that is longer than the transmission time of 3.5 bytes on the communication data line marks the start of a new communication frame.

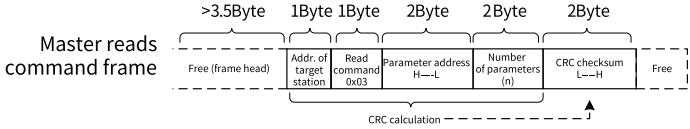


The built-in communication protocol of the drive is the Modbus RTU slave communication protocol, which allows the drive to respond to the query command from the master or execute the action according to query command from the master and respond with communication data.

A master can be a PC, an industrial control device, or a PLC, etc. The master can separately communicate with a slave or issue broadcast information to all slaves. When the master communicates with a single slave, the slave needs to return a message (response) to "query/command" from the master. For a broadcast message sent by the master, the slaves need not return a response.

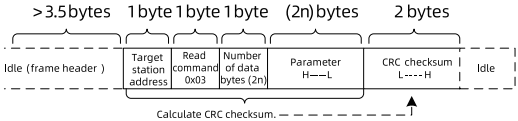
7.1.3 Communication Data Frame Structure

The following figure shows the communication data format of the Modbus RTU protocol. The AC drive supports reading or writing only of word type parameters, and does not support reading or writing of bytes or bits. The read operation command is 0x03, the write operation command is 0x06, and the multi-data write operation command is 0x10.

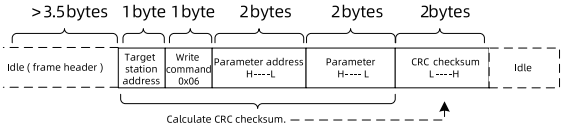


In theory, the host controller can read or write a maximum of 12 consecutive parameters. However, these parameters must be in the same group. Otherwise, an error will be reported in the response.

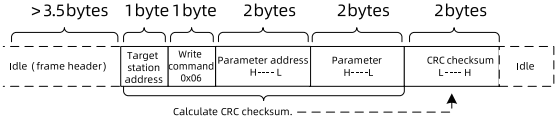
Frame that the slave responds to the read command



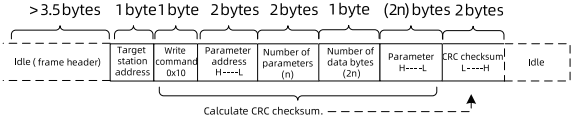
Write command frame sent by master



Frame that the slave responds to the write command

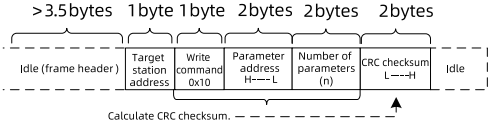


Frame of multi-write command sent by the master



A maximum of 12 consecutive parameters can be read or written.

Frame that the slave responds to the multi-write command



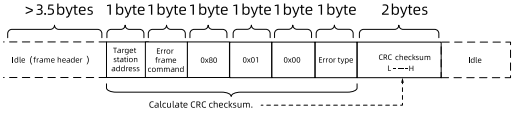
If the slave detects a communication frame error or a reading/writing failure caused by other reasons, an error frame will be returned.

Note

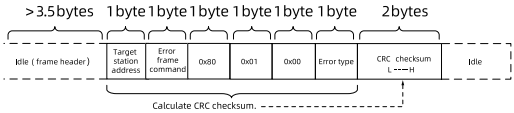
CRC check errors will not be responded.

- When FD-05 is set to 0, the ones place indicates that Modbus is the non-standard protocol version.

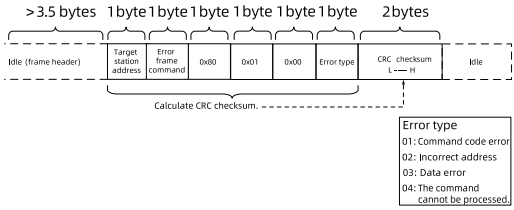
Error frame that the slave responds to the read command



Error frame that the slave responds to the write command

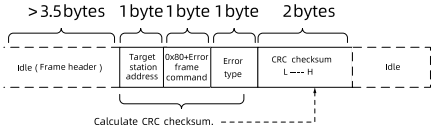


Error frame that the slave responds to the multi-write command

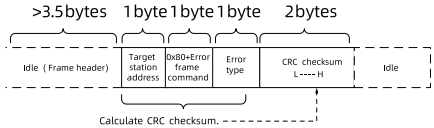


- When FD-05 is set to 1, the ones place indicates that Modbus is the standard protocol version.

Error frame that the slave responds to the read command



Error frame that the slave responds to the write command



Error frame that the slave responds to the multi-write command

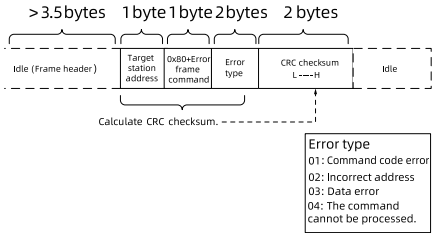


Table 7–1 Description of data frame field

Frame header (START)	Longer than the time for transmitting 3.5 bytes
Slave address (ADR)	Communication address range: 1 to 247; 0: Broadcast address
Command code (CMD)	03: Read a parameter of the slave; 06: Write a parameter of the slave; 10: Write multiple parameters of the slave

Parameter Address H Parameter address (L)	Internal parameter address of the drive are in hexadecimal format, which are divided into parameter type and non-parameter type (such as running status parameters and running commands). See the address definition for details. Low-order bytes follow high-order bytes during transmission.
Number of Parameters H Number of Parameters L	It is the number of parameters read by this frame. If it is 1, one parameter is read. Low-order bytes follow high-order bytes during transmission. When the command word is 06, which indicates write operation on a single parameter, the field does not exist.
Number of bytes	Data length, which is twice the number of parameters When the command word is 03 or 06, the field does not exist.
Data (H) Data (L)	Response data or data to be written. During transmission, low-order bytes follow high-order bytes.
CRC low-order bit CRC high-order bit	Detection value: CRC16 check value. During transmission, high-order bytes follow low-order bytes. For the calculation method, see the details of CRC.
END	3.5 bytes

CRC description:

The cyclical redundancy check (CRC) adopts the RTU frame format. A Modbus message includes a CRC-based error check field. The CRC field detects the content of the entire message. The CRC field, which contains two bytes, is a 16-bit binary value. It is added to the message after being calculated by the transmission device. The reception device recalculates the CRC value in the message, and compares the calculated value with the CRC value in the received CRC field. If the two CRC values are different, transmission errors occur.

The CRC is firstly saved to 0xFFFF. Then, a procedure is invoked to process the consecutive 8 bits in the message and the value in the register. Only the 8-bit data in each byte is valid for the CRC. The start bit, stop bit and the parity bit do not apply to the CRC.

During generation of CRC, every bit is in exclusive or (XOR) with the content in the register. The result is shifted to the least significant bit (LSB), and 0 is filled in the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB is 1, the register then performs XOR with a preset value. If the LSB is 0, no XOR is performed. This process is repeated eight times. After the last bit (eighth bit) is done, the next byte is in XOR with the register's current value. The final value of the register, after all the bytes of the message have been applied, is the CRC value.

When CRC is added in a message, high-order bytes follow low-order bytes. The CRC simple function is as follows:

```
unsigned int crc_chk_value (unsigned char *data_value,unsigned char length)
{
unsigned int crc_value=0xFFFF;
```

```
int i;
while (length--)
{
crc_value^=*data_value++;
for (i=0;i<8;i++)
{
if (crc_value&0x0001)
{
crc_value= (crc_value>>1) ^0xa001;
}
else
{
crc_value=crc_value>>1;
}
}
}
return (crc_value);
}
```

Definition of communication parameter addresses:

The parameters can be read and written (except those which cannot be changed because they are only for factory use or monitoring).

7.1.4 Parameter Address Representation Rules

The parameter group number and parameter identification number are used to represent parameter addresses.

High-order bytes: F0 to FF (group F), A0 to AF (group A), and 70 to 7F (group U)

Low-order bytes: 00 to FF

For example, to access F3-12, the communication address of F3-12 is expressed as 0xF30C.

Group FF: Parameters cannot be read or modified. Group U: Parameters are ready-only and cannot be modified.

Some parameters cannot be modified when the AC drive is running. Some parameters cannot be modified regardless of status of the AC drive. When modifying a parameter, pay attention to the range, unit, and description of the parameter.

Parameter group No.	Access address	Modified RAM Parameter Address through Communication
F0 to FE	0xF000 to 0xFEFF	0x0000 to 0x0EFF
A0 to AC	0xA000 to 0xACFF	0x4000 to 0x4CFF
U0	0x7000 to 0x70FF	-
B0 and B6	0xB000 to 0xB6FF	0x5000 to 0x56FF

Note

Frequent storage to the EEPROM reduces the EEPROM service life. Therefore, in communication mode, there is no need to save the values modified in RAM. It takes about 15 ms to read and write a parameter per time. Frequent EEPROM operations may cause data interaction (read-write) failure.

For parameters in group F, if you want to change a parameter through communication without storing it to the EEPROM, change the high-order F of the parameter address to 0. For parameters in group A, if you want to change a parameter through communication without storing it to the EEPROM, change the high-order A of the parameter address to 4.

The corresponding parameter addresses are expressed as follows:

High-order bytes: 00 to 0F (group F) and 40 to 4F (group A)

Low-order bytes: 00 to FF

For example:

If F3-12 is not to be stored into the EEPROM, the address is expressed as 030C. If A0-05 is not to be stored into the EEPROM, the address is expressed as 4005. This address indicates that the parameter can only be written to RAM. It is invalid when the parameter is read from RAM.

The following table lists some stop/run parameters.

Address	Description	Address	Description
1000H	Communication setting value (decimal) (write-only) -10000 to 10000	1010H	PID reference
1001H	Operating frequency	1011H	PID feedback
1002H	Bus voltage	1012H	PLC stage
1003H	Output voltage	1013H	Pulse input frequency (unit: 0.01 kHz)
1004H	Output current	1014H	Feedback speed (unit: 0.1 Hz)
1005H	Output power	1015H	Remaining operating time

Address	Description	Address	Description
1006H	Output torque	1016H	Non-calibrated AI1 voltage
1007H	Operating speed	1017H	AI2 voltage before correction
1008H	DI input indication	1018H	AI3 voltage before correction
1009H	DO output indication	1019H	Linear speed
100AH	AI1 voltage	101AH	Current power-on time
100BH	AI2 voltage	101BH	Current runtime
100CH	AI3 voltage	101CH	Pulse input frequency (unit: 1 Hz)
100DH	Counting value input	101DH	Current communication setting value (read-only)
100EH	Length value input	101EH	Actual feedback speed
100FH	Load speed	101FH	Main frequency X
-	-	1020H	Auxiliary frequency Y

Note

The communication setting value is expressed as a percentage relative to the base value. +10000 and -10000 correspond to +100.00% and -100.00% respectively. For frequency dimension data, the percentage is the frequency to the maximum frequency (F0-10). For torque dimension data, this percentage is F2-10 or A2-48 (digital setting of torque upper limit of the first or second motor).

F0-03, F0-04, F0-11, F2-11, FA-00, FA-02, and A0-01 are set by H1000 through communication. However, only one parameter can be set through communication at a time. If all the above parameters need to set through communication, use the following method.

Take F0-03 and F0-11 as examples. If F0-03 is set to 9, the operating frequency is controlled by H1000. Then F0-11 cannot be set to 5 and can be set to 0. In this case, you can modify the value of F0-12 through communication.

Control command input to the drive (write-only)

Command word address	Command function
2000H	0001: Forward running
	0002: Reverse run
	0003: Forward jogging
	0004: Reverse jog
	0005: Coast to stop
	0006: Decelerate to stop
	0007: Fault reset

Read AC drive state (read-only)

State word address	State word function
3000H	0001: Forward running
	0002: Reverse run
	0003: Stop

If the value returned is the actual password, the password passes the verification. If no password is set (password = 0), 0000H is returned.

Password address	Input the content of the password
1F00H	*****

DO control (write-only)

Command Address	Command
2001H	bit0: DO1 output control bit1: DO2 output control bit2: Relay 1 output control bit3: Relay 2 output control bit4: FMR output control bit5: VDO1 bit6: VDO2 bit7: VDO3 bit8: VDO4 bit9: VDO5

AO1 control (write-only)

Command Address	Command
2002H	0 to 7FFF indicate 0% to 100%.

AO2 control (write-only)

Command Address	Command
2003H	0 to 7FFF indicate 0% to 100%.

Pulse output control (write-only)

Command Address	Command
2004H	0 to 7FFF indicate 0% to 100%.

Drive fault description:

Fault address	Fault information	
8000H	0002: Overcurrent during acceleration 0005: Overvoltage during acceleration 0008: Pre-charge resistor fault 0009: Undervoltage 000A: AC drive overload 000B: Motor overload 000C: Input phase loss 000D: Output phase loss 000E: Drive overheat 000F: External device fault 0010: Communication fault 0011: Contactor fault 0012: Current detection circuit fault 0013: Motor auto-tuning fault 0014: Encoder fault 0015: EEPROM read/write operation fault 0016: Motor auto-tuning result warning 0017: Drive output short-circuited to ground 0019: Power supply unit fault 001A: Accumulative running time reach 001B: User-defined fault 1 001C: User-defined fault 2 001D: Cumulative power-on time reach 001E: Load loss 001F: PID feedback lost during running 0020: Capacitor capacitance warning 0028: Pulse-by-pulse current limit fault 002A: Excessive speed deviation 002B: Motor over-speed 002D: Motor temperature fault	002E: Motor overload fault during load monitoring 002F: STO fault 0033. Error in auto-tuning of magnetic pole position 0038: VI self-test short circuit 0039: Upper-arm IGBT of phase U or lower-arm IGBT of phase V cannot be turned on. 003A: Reverse installation of module current sensor 003B: Phases V and W imbalance 003D: Braking transistor overload 003E: Braking transistor shoot through 003F: Low liquid level warning 0040: Water cooling system fault 0042: Low liquid level fault 0043: Capacitor leakage 0054: Brake release failure 0055: Time sequence fault 005D: Motor stall 005E: Abnormal rotor resistance range 005F: Carrier frequency too low 008C: Contactor fault 0096: Forward/reverse limit fault 0097: Error in setting cable drum vertical application parameters 0099: Breakage fault 009F: Automatic fault reset failure 00A0: Modbus communication timeout 00A1: CANopen heartbeat timeout 00A2: CANlink heartbeat timeout 00A4: Expansion card fault 00AE: HDI cable breakage 00BB: Excessive position deviation 00C8: Online auto-tuning of no-load current and mutual inductance failure

7.1.5 Group FD Communication Parameters

Parameter FD-00 is used to set transmission speed between the host controller and the drive. Note that the baud rate of the host controller must be the same as that of the drive. Otherwise, communication fails. The higher the baud rate, the faster the communication speed.

Parameters	Parameter name	Default	Setting range
FD-00	Baud rate	5005	0: 300 bps 1: 600 bps 2: 1200 bps 3: 2400 bps 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps 8: 57600 bps 9: 115200 bps

Note that the data format of the host controller must be the same as that of the AC drive. Otherwise, communication fails.

Parameters	Parameter name	Default	Setting range
FD-01	Modbus data format	0	0: No check; data format: <8,N,2> 1: Even parity check; data format: <8,E,1> 2: Odd parity check; data format: <8,O,1> 3: No check; data format <8,N,1>

When the local address is set to 0 (that is, the broadcast address), the broadcasting function of the host computer is implemented. The address must be unique (except the broadcast address), which is the basis for point-to-point communication between the host controller and the drive.

Parameters	Parameter name	Default	Setting range
FD-02	Local address	1	1–247 (0 indicates the broadcast address.)

Response delay refers to the interval between the completion of data reception by the drive and the initiation of data transmission to the host controller. If the response delay is shorter than the system processing time, the system processing time will prevail. If the response delay is longer than the system processing time, the drive will not send data to the host controller unless the response delay elapses.

Parameters	Parameter name	Default	Setting range
FD-03	Response delay	2 ms	0 ms to 20 ms

When this parameter is set to 0.0s, Fd-04 (communication timeout period) is inactive.

When this parameter is set to a valid value, if the interval between two consecutive communications exceeds the configured communication timeout period, the system will trigger a communication fault error (Err16). This parameter is generally set to an invalid value. In a continuous communication system, you can monitor the communication state by setting this parameter.

Parameters	Parameter name	Default	Setting range
FD-04	Communication timeout	0.0s	0.0s (Invalid); 0.1s to 60.0s

8 Solutions to Common Faults

8.1 Troubleshooting During Trial Run in Different Control Modes

- SVC mode (F0-01= 0; default: 0)
  This mode applies to the scenario where the drive controls the motor speed and torque without an encoder for speed feedback. Auto-tuning on motor parameters is required to obtain the motor parameters.

Table 8–1 Troubleshooting in SVC mode

Fault	Solution
Overload or overcurrent during start of the motor	Set motor parameters F1-01 to F1-05 according to the motor nameplate. Perform auto-tuning (F1-37) on motor parameters. If possible, perform auto-tuning on all parameters of the motor in dynamic state.
Slow torque or speed response and motor oscillation occur at a frequency below 5 Hz.	To shorten the response time in the torque/speed control mode, increase the value of F2-00 (Speed loop proportional gain) by the step value of 10 or decrease the value of F2-01 (speed loop integral time) by the step value of 0.05. If oscillation occurs, decrease the value of F2-00 and increase the value of F2-01.
Slow torque or speed response and motor oscillation occur at a frequency above 5 Hz.	To shorten the response time in the torque/speed control mode, increase the value of F2-03 (speed loop proportional gain) by the step value of 10 or decrease the value of F2-04 (speed loop integral time) by the step value of 0.05. If oscillation occurs, decrease the value of F2-03 and increase the value of F2-04.
Low speed accuracy	Increase the value of F2-06 (Slip compensation gain in vector control) by the step value of 10% when the with-load speed deviation of the motor is too large.
Excessive speed fluctuation	Increase the value of A9-05 (Speed filter time) by the step value of 0.001s when motor speed fluctuates abnormally.
Too loud motor noise	Increase the value of F0-15 (Carrier frequency) by the step value of 1.0 kHz. Note that increasing the carrier frequency will lead to an increase in the motor leakage current.
Insufficient motor torque or force output	Check whether the torque upper limit is too low. If yes, increase the value of F2-10 (torque upper limit in speed control mode) in the speed control mode or the value of the torque reference in the torque control mode.

- FVC mode (F0-01 = 1)
  This mode applies to applications with an encoder for speed feedback. Set the encoder pulses per revolution, encoder type and encoder direction correctly to finish motor parameter auto-tuning.

Table 8–2 Troubleshooting in FVC mode

Fault	Solution
Overload or overcurrent fault during start	Set the encoder pulses per revolution, encoder type, and encoder direction correctly.
Overload or overcurrent is detected during motor running.	Set motor parameters F1-01 to F1-05 according to the motor nameplate. Perform auto-tuning (F1-37) on motor parameters. If possible, perform auto-tuning on all parameters of the motor in dynamic state.
Slow torque or speed response and motor oscillation occur at a frequency below 5 Hz.	To shorten the response time in the torque/speed control mode, increase the value of F2-00 (Speed loop proportional gain) by the step value of 10 or decrease the value of F2-01 (speed loop integral time) by the step value of 0.05. If oscillation occurs, decrease the value of F2-00 and F2-01.
Slow torque or speed response and motor oscillation occur at a frequency above 5 Hz.	To shorten the response time in the torque/speed control mode, increase the value of F2-03 (speed loop proportional gain) by the step value of 10 or decrease the value of F2-04 (speed loop integral time) by the step value of 0.05. If oscillation occurred, decrease the value of F2-03 and F2-04.
Excessive speed fluctuation	If motor speed fluctuation is large, increase the value of F2-07 (speed filter time) by the step value of 0.001s gradually.
Too loud motor noise	Increase the value of F0-15 (Carrier frequency) by the step value of 1.0 kHz. Note that increasing the carrier frequency will lead to an increase in the motor leakage current.
Insufficient motor torque or force output	Check whether the torque upper limit is too low. If yes, increase the value of F2-10 (torque upper limit in speed control mode) in the speed control mode or the value of the torque reference in the torque control mode.

- V/f control mode (F0-01 = 2)

  This mode applies to applications without an encoder for speed feedback. You only need to set the rated motor voltage and rated motor frequency correctly.

Table 8–3 Troubleshooting in V/f control mode

Fault	Solution
Motor oscillation during operation	Decrease the value of F3-11 (Oscillation suppression gain in V/f mode) by the step value of 5. The minimum value is 5.
Overcurrent at startup with high power	Decrease the value of F3-01 (torque boost) by the step value of 0.5%.

Fault	Solution
Large current during running	Set F1-02 (Rated motor voltage) and F1-04 (Rated motor frequency) correctly. Decrease the value of F3-01 (torque boost) by the step value of 0.5%.
Too loud motor noise	Increase the value of F0-15 (Carrier frequency) by the step value of 1.0 kHz. Note that increasing the carrier frequency will lead to an increase in the motor leakage current.
Overvoltage upon deceleration or sudden removing of heavy load	Set F3-23 (Overvoltage stall suppression) to 1 (Enable). Increase the value of F3-24/F3-25 (Frequency gain/ Voltage gain for overvoltage stall suppression, 30 by default) by the step value of 10 gradually. The permissible maximum value is 100. Decrease the value of F3-22 (Overvoltage stall suppression action voltage, default: 770 V) by the step value of 10 V. The permissible minimum value is 700 V.
Overcurrent upon acceleration or sudden addition of heavy load	Increase the value of F3-20 (Overcurrent stall suppression gain, default: 20) by the step value of 10. The permissible maximum value is 100. Decrease the value of F3-18 (Overcurrent stall suppression action current, default: 150%) by the step value of 10%. The permissible minimum value is 50%.

8.2 List of Fault Codes

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E002.1	Hardware overcurrent	This fault occurs when the transient current outputted exceeds 2.5 x 1.414 x rated current of the drive.	0: Coast to stop	Output grounded	Check whether three-phase output grounding points are available. Detect the impedance to ground with a tramegger.	Replace the device that may cause the grounding problem.
				Phase-to-phase short circuit	1. Check whether short circuit occurs at the output terminals U/V/W with a multimeter. 2. Check whether power cables are short-circuited with a multimeter. 3. Check whether the motor resistance is symmetric with a multimeter.	1. If the power cable is short-circuited, replace the output cable. 2. If the motor resistance is not symmetrical, replace the motor.
				Auto-tuning is not performed in the vector control mode.	Check whether parameter auto-tuning has been performed. Set F1-37 to select different types of auto-tuning methods based on the motor type.	Set accurate motor parameters correctly and perform auto-tuning again.
				The encoder has been disturbed or disconnected.	1. Confirm whether the encoder wiring is secure. 2. Confirm whether the encoder shield cable is connected to the enclosure of the drive. 3. Check whether the motor enclosure is grounded.	1. Replace the encoder and encoder cable. 2. Ensure the motor enclosure is grounded properly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E002.1	Hardware overcurrent	This fault occurs when the transient current outputted exceeds 2.5 x 1.414 x rated current of the drive.	0: Coast to stop	Output phase loss	1. Check whether cables are connected correctly. 2. When a contactor is connected to the output end, ensure that the contactor is connected correctly.	1. Connect the motor and encoder cables properly. 2. Use the contactor on the output end properly.
				Current detection error	1. Check whether FF-03 (AC drive power) matches the AC drive nameplate. 2. Restart repeatedly to check whether the fault persists.	1. Set the parameters of the drive correctly. Ensure that the power value (FF-03) is consistent with that on the nameplate of the drive by changing the value of FF-01. Note: Parameters in group FF are manufacturer parameters. Incorrect modification may result in product exception. Contact Inovance for technical support. 2. If the AC drive power is set correctly and the fault persists, contact Inovance technical support.
E002.1	Hardware overcurrent	This fault occurs when the transient current outputted exceeds 2.5 x 1.414 x rated current of the drive.	0: Coast to stop	The acceleration/ deceleration time is set to an excessively high setpoint in V/f control mode.	Check whether the acceleration/ deceleration time is appropriate. Increase the acceleration/ deceleration time parameters F0-17 and F0-18 to test whether the output current decreases.	1. Enable the overcurrent suppression function (F3-19 = 1). 2. Increase the acceleration/ deceleration time properly (F0-17 and F0-18).
				Encoder phase sequence error	Change the control mode to V/f or SVC to test whether the encoder feedback frequency is opposite to the set frequency.	If the encoder direction is opposite to the motor operating direction, change the encoder direction by F1-30.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E002.1	Hardware overcurrent	This fault occurs when the transient current outputted exceeds 2.5 x 1.414 x rated current of the drive.	0: Coast to stop	The AC drive model is set improperly.	Check whether FF-03 (AC drive power) matches the AC drive nameplate.	Set the parameters of the drive correctly Ensure that the power value (FF-03) is consistent with that on the nameplate of the drive by changing the value of FF-01. Note: Parameters in group FF are manufacturer parameters. Incorrect modification may result in product exception. Contact Inovance for technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E002.2	Software overcurrent	This fault occurs when the transient current outputted exceeds the overcurrent threshold defined by the software. Note: FF-18 defines the software overcurrent threshold. The default value 100% deactivate the function. The value 100% represents full-range current sampling (rated current of the drive x 2.2 x 1.414). The overcurrent threshold of the synchronous motor is also limited by AA-37. The default value 300% of AA-37 indicates 300% of the rated motor current, which is an instantaneous value. The function of AA-37 is enabled by bit6 of AA-30.	0: Coast to stop	Output grounded	Check whether three-phase output grounding points are available. Detect the impedance to ground with a tramegger.	Replace the device that may cause the grounding problem.
				Phase-to-phase short circuit	1. Check whether short circuit occurs at the output terminal. 2. Check whether power cables are short-circuited. 3. Check whether the motor resistance is symmetric.	1. If the power cable is short-circuited, replace the output cable. 2. If the motor resistance is not symmetrical, replace the motor.
				Auto-tuning is not performed in the vector control mode.	1. Check whether motor auto-tuning is performed.	Set accurate motor parameters correctly and perform auto-tuning again.
				The encoder has been disturbed or disconnected.	1. Confirm whether the encoder wiring is secure. 2. Confirm whether the encoder shield cable is connected to the enclosure of the drive. 3. Check whether the motor enclosure is grounded.	1. Ground the motor enclosure. 2. Replace the encoder and encoder cable.
				Output phase loss	1. Check whether cables are connected correctly. 2. When a contactor is connected to the output end, ensure that the contactor is connected correctly.	1. Connect the motor and encoder cables properly. 2. Use the contactor on the output end properly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E002.2	Software overcurrent	This fault occurs when the transient current outputted exceeds the overcurrent threshold defined by the software. Note: FF-18 defines the software overcurrent threshold. The default value 100% deactivate the function. The value 100% represents full-range current sampling (rated current of the drive x 2.2 x 1.414). The overcurrent threshold of the synchronous motor is also limited by AA-37. The default value 300% of AA-37 indicates 300% of the rated motor current, which is an instantaneous value. The function of AA-37 is enabled by bit6 of AA-30.	0: Coast to stop	Current detection error	1. Access group FF and check whether the AC drive power FF-03 is set correctly. 2. Restart repeatedly to check whether the fault persists.	If the AC drive power is set correctly and the fault persists, contact Inovance technical support.
				The acceleration/ deceleration time is set to an excessively high setpoint in V/f control mode.	Check whether the acceleration/ deceleration time is appropriate. Increase the acceleration/ deceleration time parameters F0-17 and F0-18 to test whether the output current decreases.	1. Enable the overcurrent suppression function (F3-19 = 1). 2. Increase the acceleration/ deceleration time properly (F0-17 and F0-18).
				Encoder phase sequence error	Change the control mode to V/f or SVC, and then check whether the encoder feedback frequency and the set frequency are reversed.	If the encoder direction is opposite to the motor operating direction, change the encoder direction by F1-30.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E002.2	Software overcurrent	This fault occurs when the transient current outputted exceeds the overcurrent threshold defined by the software. Note: FF-18 defines the software overcurrent threshold. The default value 100% deactivate the function. The value 100% represents full-range current sampling (rated current of the drive x 2.2 x 1.414). The overcurrent threshold of the synchronous motor is also limited by AA-37. The default value 300% of AA-37 indicates 300% of the rated motor current, which is an instantaneous value. The function of AA-37 is enabled by bit6 of AA-30.	0: Coast to stop	The AC drive model is set improperly.	Check whether FF-03 (AC drive power) matches the AC drive nameplate.	Set the parameters of the drive correctly Ensure that the power value (FF-03) is consistent with that on the nameplate of the drive by changing the value of FF-01. Note: Parameters in group FF are manufacturer parameters. Incorrect modification may result in product exception. Contact Inovance for technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E005.1	Bus overvoltage	The bus voltage is higher than the overvoltage threshold set by A5-09 (unit: V).	0: Coast to stop	The motor decelerates and is in the generating state.	Check whether the motor is decelerating during overvoltage.	If there is no active load (gravity load or tension load), it is recommended to enable overvoltage suppression. Note: The V/f control overvoltage suppression parameters are F3-23/A3-23/BB-23/CB-23, and the vector control parameters are AB-25/B9-25/BE-25/CE-25/CE-25 (bit 1). The preceding parameters correspond to the first, second, third, and fourth motor parameter groups.
				The drive stops after a runway fault of the synchronous motor is reported.	Check whether the runaway fault occurs on the synchronous motor.	Set F9-67 and F9-68 to set a shorter overspeed protection time to prevent AC drive overvoltage after runaway fault occurs.
				The braking resistor model is incorrect.	1. Determine whether the braking resistor is active in the generating state. 2. When the braking resistor is active, check whether the bus voltage cannot be suppressed.	The power of the braking module cannot be lower than the power of the inverter. Select the braking resister model based on 0.8 x motor power for continuous load. Transient overload of 1.5 x motor power is supported.
				Phase loss occurs on the braking resistor	1. The braking resistor fails. 2. Determine whether the braking resistor is active in the generating state.	Ensure that the braking resistor is connected properly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E005.1	Bus overvolt age	The bus voltage is higher than the overvoltage threshold set by A5-09 (unit: V).	0: Coast to stop	Overshoot occurs upon speed arrival in vector control mode, and the motor changes to the generating state.	Connect the software tool and check whether the feedback speed overshoots through the oscilloscope.	If excessive overshoot occurs on the speed loop, configure a circular RFG and acceleration feedforward to improve the speed loop following performance.
				V/f oscillation	Check whether the output current oscillates.	1. Enable the oscillation suppression function (F3-12 = 1). 2. Optimize the oscillation suppression coefficient in V/f mode (F3-11).
				The AC drive model is set improperly.	Check whether the power of the drive (FF-03) matches that indicated on the nameplate of the drive.	Set the parameters of the drive correctly Ensure that the power value (FF-03) is consistent with that on the nameplate of the drive by changing the value of FF-01.
E008.1	Contactor acts frequently.	The relay closes for multiple times within a short period of time with power ON.	0: Coast to stop	The soft-start circuit is abnormal, and the soft-start contactor acts frequently during operation.	1. Check whether the input grid voltage or power supply is between 342 VAC and 418 VAC. 2. Check that the input power supply does not power on or off repeatedly.	If the external power supply is normal, frequent soft start will lead to soft-start circuit overloaded. Contact the technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E009.1	Undervoltage fault	The bus voltage is lower than the undervoltage threshold set by A5-06 (unit: V).	0: Coast to stop	Instantaneous power failure	1. Check whether the input grid voltage or power supply is between 342 VAC and 418 VAC. 2. Check whether voltage dip occurs.	If there is no active load (gravity load, tension load), you can enable undervoltage suppression. Note: The undervoltage suppression parameters for V/f control is F9-59/B6-42/BC-57/CC-57. The undervoltage suppression parameters for vector control is AB-25/B9-25/BE-25/CE-25/CE-25 (bit 0). The preceding parameters correspond to the first, second, third, and fourth motor parameter groups.
				The input voltage of the AC drive is beyond the specified range.	Check whether the input grid voltage or power supply is within the normal range of 342 VAC to 418 VAC.	Adjust the voltage to a value within the normal range.
				Input phase loss occurs and the output power is excessive.	Check whether phase loss occurs on the input power supply.	Ensure that the input grid voltage is correct.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E009.1	Undervoltage fault	The bus voltage is lower than the undervoltage threshold set by A5-06 (unit: V).	0: Coast to stop	The undervoltage threshold is excessively high.	Check whether A5-06 (undervoltage threshold) is set to an excessively high value. The default value is 350 V.	Lower A5-06 (undervoltage threshold) properly.
				The rectifier bridge, driver board, or control board is faulty.	1. Check whether the effective value of the DC bus voltage is about 1.414 x the effective value of the input voltage. 2. On the basis of Method 1, check whether the bus voltage of the AC drive is consistent with that detected by the multimeter.	1. If it is "no" in Method 1, the rectifier bridge may be faulty. In this case, replace the AC drive. 2. If it is "no" in Method 2, the driver board or control board may be faulty. In this case, replace the AC drive.
E009.3	Pre-drive timeout	The bus is not energized within 5s after the drive starts the motor in the undervoltage state.	0: Coast to stop	Pre-charging is abnormal and the drive is started when bus undervoltage occurs.	Check whether the bus voltage is normal. Note: Check whether the bus voltage is about 1.414 x effective input voltage.	Start the drive after the bus voltage is stabilized. Check whether the main contactor/grid is normal if power-on is not possible for a long time.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E010.1	Drive overload	The drive is considered to be overloaded when the overload time is reached based on the overload curve of the drive.	0: Coast to stop	The load is too heavy or the motor is stalled.	1. Check whether the load (output current) is too heavy during normal operation. 2. When an overload fault occurs, check whether the motor is stalled (the motor does not rotate).	1. Reduce the load and perform testing again. 2. Eliminate the risk of motor stall and perform testing again. If the fault persists, contact Inovance technical support.
				The carrier frequency is excessively high.	Check whether F0-15 (Carrier frequency) is set to a value higher than the default value.	Reduce F0-15 (Carrier frequency).
				The bus voltage is low when the drive runs at high speed and heavy load.	Check whether the deviation between the bus voltage in heavy-load operation and that in the stop state exceeds 60 V.	1. Increase the power grid voltage. 2. Enable the overmodulation function (A5-05, voltage overmodulation coefficient).
				Long-term operation below 5 Hz leads to derating due to low frequency.	Check whether the motor runs below 5 Hz for a long time.	Do not let the motor run at low speed with heavy load for a long time or increase the power of the drive.
				Output grounded	Check whether three-phase output grounding points are available. Detect the impedance to ground with a tramegger.	Replace the device that may cause the grounding problem.
				Output phase loss	1. Check whether cables are connected correctly. 2. When a contactor is connected to the output end, ensure that the contactor is connected correctly.	1. Ensure that cables are connected properly. 2. Use the contactor on the output end properly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E010.1	Drive overload	The drive is considered to be overloaded when the overload time is reached based on the overload curve of the drive.	0: Coast to stop	Motor parameters are incorrect.	Check whether motor parameters (F1-00 to F1-05) are set properly.	Set motor parameters according to the nameplate. Perform motor auto-tuning again.
				The motor is started when the motor rotates.	Check whether the motor is started during motor rotation.	Set F6-00/B6-00/BC-00/CC-00 (Start mode) to flying start. Note: The preceding parameters correspond to the first, second, third, and fourth motor parameter groups.
				Encoder phase sequence error	Change the control mode to V/f or SVC, and then check whether the encoder feedback frequency and the set frequency are reversed.	If the encoder direction is opposite to the motor operating direction, change the encoder direction by F1-30.
				The AC drive model is set improperly.	Check whether the power of the drive (FF-03) matches that indicated on the nameplate of the drive.	Set the parameters of the drive correctly Ensure that the power value (FF-03) is consistent with that on the nameplate of the drive by changing the value of FF-01.
				The power rating of the drive is excessively low.	Check whether the AC drive power is lower than the motor power.	Replace with a drive of a higher power rating.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
L010.3	Drive pre-overload	Pre-overload is reported after the drive overload rate reaches 80%.	6: Not handled	The load is too heavy or the motor is stalled.	1. Check whether the load (output current) is too heavy during normal operation. 2. When an overload fault occurs, check whether the motor is stalled (the motor does not rotate).	1. Reduce the load and perform testing again. 2. Eliminate the risk of motor stall and perform testing again. If the fault persists, contact Inovance technical support.
				The carrier frequency is excessively high.	Check whether F0-15 (Carrier frequency) is set to a value higher than the default value.	Reduce F0-15 (Carrier frequency).
				The bus voltage is low when the drive runs at high speed and heavy load.	Check whether the deviation between the bus voltage in heavy-load operation and that in the stop state exceeds 60 V.	1. Increase the power grid input voltage. 2. Enable the overmodulation function (A5-05, voltage overmodulation coefficient).
				Long-term operation below 5 Hz leads to derating due to low frequency.	Check whether the motor runs below 5 Hz for a long time.	Do not let the motor run at low speed with heavy load for a long time or increase the power of the drive.
				Output grounded	Check whether three-phase output grounding points are available. Detect the impedance to ground with a tramegger.	Replace the device that may cause the grounding problem.
				Output phase loss	1. Check whether cables are connected correctly. 2. When a contactor is connected to the output end, ensure that the contactor is connected correctly.	1. Ensure that cables are connected properly. 2. Use the contactor on the output end properly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
L010.3	Drive pre-overload	Pre-overload is reported after the drive overload rate reaches 80%.	6: Not handled	Motor parameters are incorrect.	Check whether motor parameters (F1-00 to F1-05) are set properly.	Set motor parameters according to the nameplate. Perform motor auto-tuning again.
				The motor is started when the motor rotates.	Check whether the motor is started during rotation.	Set F6-00/B6-00/BC-00/CC-00 (Start mode) to flying start. Note: The preceding parameters correspond to the first, second, third, and fourth motor parameter groups.
				Encoder phase sequence error	Change the control mode to V/f or SVC, and then check whether the encoder feedback frequency and the set frequency are reversed.	If the encoder direction is opposite to the motor operating direction, change the encoder direction by F1-30.
				The AC drive model is set improperly.	Check whether the power of the drive (FF-03) matches that indicated on the nameplate of the drive.	Set the parameters of the drive correctly Ensure that the power value (FF-03) is consistent with that on the nameplate of the drive by changing the value of FF-01.
				The power rating of the drive is excessively low.	Check whether the AC drive power is lower than the motor power.	Replace with a drive of a higher power rating.
				Pre-overload is reported after the drive load rate reaches 80%.	Check whether the average output current in steady state is greater than 1.15 x rated current of the AC drive, and the duration reaches 80% of the design time of the AC drive overload curve.	Replace with a drive of a higher power rating.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E011.1	Motor overload	The motor is considered to be overloaded when the overload time is met based on the motor overload curve.	0: Coast to stop	F9-01 (Motor overload protection gain) is set to an excessively low value.	Check whether F9-01 (Motor overload protection gain) is set to a value lower than 1.0. The default value is 1.0.	Set F9-01 (Motor overload protection gain) properly. It is recommended to set it to 1.0.
				The power rating of the motor is too low.	Check whether the average output current (U0-04) in steady state is greater than 1.15 x rated motor current, and the duration reaches the design time of the motor overload curve.	Replace with a motor of a higher power rating.
				Brake error	Check whether the brake can be applied normally.	Set the brake logic before operation correctly.
				The load is too heavy or the motor is stalled.	1. Check whether the load (output current) is too heavy during normal operation. 2. When an overload fault occurs, check whether the motor is stalled (the motor does not rotate).	1. Reduce the load and perform testing again. 2. Eliminate the risk of motor stall and perform testing again. If the fault persists, contact Inovance technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E011.2 /L011. 2	Motor pre-overload	After the motor overload rate reaches F9-02 (Motor overload pre-alarm coefficient, 80% by default), pre-overload occurs.	6: Not handled	F9-01 (Motor overload protection gain) is set to an excessively low value.	Check whether F9-01 (Motor overload protection gain) is set to a value lower than 1.0. The default value is 1.0.	Set F9-01 (Motor overload protection gain) properly. It is recommended to set it to 1.0.
				The power rating of the motor is too low.	Check whether the average output current (U0-04) in steady state is greater than 1.15 x rated motor current, and the duration reaches the design time of the motor overload curve.	Replace with a motor of a higher power rating.
				Brake error	Check whether the brake can be applied normally.	Set the brake logic before operation correctly.
				The load is too heavy or the motor is stalled.	1. Check whether the load (output current) is too heavy during normal operation. 2. When an overload fault occurs, check whether the motor is stalled (the motor does not rotate).	1. Reduce the load and perform testing again. 2. Eliminate the risk of motor stall and perform testing again. If the fault persists, contact Inovance technical support.
				The pre-overload coefficient (F9-02) is set improperly.	The pre-overload coefficient (F9-02) is to an excessively low value. The default value is 80%.	Increase the motor pre-overload coefficient F9-02. By default, an alarm will be reported upon motor pre-overload and the alarm does not need to be handled.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E012.1 /L012. 1	Input phase loss	If the input phase loss signal is active, the input phase loss occurs.	0: Coast to stop	The three-phase input power supply is abnormal.	Check whether the input grid voltage or power supply is between 342 VAC and 418 VAC.	Check and eliminate faults in peripheral circuits.
				The three-phase power grid is unbalanced.	Use a voltage detection device to check whether the three-phase grid is unbalanced.	Figure the cause for unbalanced grid voltage or perform derating during use.
E013.1	Phase U output loss	The average value of three-phase output current is detected when the operating frequency is higher than 0.8 Hz. If the ratio of the max. value to the min. value is higher than 10 and phase U is the min. value, phase loss occurs on phase U.	0: Coast to stop	Motor fault	Check whether motor phase U is disconnected.	Replace the motor.
				The cable connecting the drive and the motor is faulty.	Check the drain wires that connect phase U of the drive to the motor are proper.	Eliminate the external fault.
				The three-phase outputs of the AC drive are unbalanced during motor running.	Check whether the effective values of the three-phase output current of the AC drive are consistent.	Ensure the motor three-phase winding is correct or replace the motor.
				The drive board or the IGBT module is abnormal.	If the drive output phase loss persists, the driver board and IGBT module are abnormal.	Replace the drive.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E013.2	Phase V output loss	The average value of three-output current is detected when the operating frequency is higher than 0.8 Hz. If the ratio of the max. value to the min. value is higher than 10 and phase V is the min. value, phase loss occurs on phase V.	0: Coast to stop	Motor fault	Check whether motor phase V is disconnected.	Replace the motor.
				The cable connecting the drive and the motor is faulty.	Check the drain wires that connect phase U of the drive to the motor are proper.	Eliminate the external fault.
				The three-phase outputs of the AC drive are unbalanced during motor running.	Check whether the effective values of the three-phase output current of the AC drive are consistent.	Ensure the motor winding is correct or replace the motor.
				The drive board or the IGBT module is abnormal.	If the drive output phase loss persists, the driver board and IGBT module are abnormal.	Replace the drive.
E013.3	The output phase loss occurs on phase W.	The average value of three-output current is detected when the operating frequency is higher than 0.8 Hz. If the ratio of the max. value to the min. value is higher than 10 and phase W is the min. value, phase loss occurs on phase W.	0: Coast to stop	Motor fault	Check whether motor phase W is disconnected.	Replace the motor.
				The cable connecting the drive and the motor is faulty.	Check the drain wires that connect phase U of the drive to the motor are proper.	Eliminate the external fault.
				The three-phase outputs of the AC drive are unbalanced during motor running.	Check whether the effective values of the three-phase output current of the AC drive are consistent.	Ensure the motor winding is correct or replace the motor.
				The drive board or the IGBT module is abnormal.	If the drive output phase loss persists, the driver board and IGBT module are abnormal.	Replace the drive.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E014.1	Drive overtem perature	The heatsink temperature exceeds the overtemperature threshold, leading to a drive overheat fault.	0: Coast to stop	The ambient temperature is excessively high.	1. Check whether the ambient temperature exceeds 40℃. 2. Check whether the drive is derated by 1.5% for every additional 1℃ in the temperature range from 40℃ to 50℃.	1. Lower the ambient temperature to a value below 40℃. 2. Derate the drive in the temperature range from 40℃ to 50℃.
				The air duct is blocked.	-	Clean the air duct.
				The fan is damaged.	Check whether the fan stops running.	Replace the fan.
				The thermistor is damaged.	Stop the drive for more than 1h and check whether the temperature rises or does not fall.	Replace the thermistor.
E014.2	Drive pre-overtem perature	The pre-overtemperature point is the overtemperature point minus BF-14. An alarm is reported when the module temperature exceeds the pre-overtemperature point.	6: Not handled	The ambient temperature is excessively high.	1. Check whether the ambient temperature exceeds 40℃. 2. Check whether the drive is derated by 1.5% for every additional 1℃ in the temperature range from 40℃ to 50℃.	1. Lower the ambient temperature to a value below 40℃. 2. Derate the drive in the temperature range from 40℃ to 50℃.
				The air duct is blocked.	-	Clean the air duct.
				The fan is damaged.	Check whether the fan stops.	Replace the fan.
				The thermistor is damaged.	Stop the drive for more than 1h and check whether the temperature rises or does not fall.	Replace the thermistor.
				The module temperature exceeds the overtemper ature threshold.	Check whether the value of BF-14 is set to an excessively high value (default: 5℃).	1. Lower the ambient temperature. 2. Reduce the pre-overtemperature margin (BF-14).

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E015.1	External fault 1	The DI terminal should be normally open, but it is detected to be closed.	0: Coast to stop	Corresponding DI terminal closed	Check the parameter of the DI terminal (group F4) to see which DI is assigned with function 11, and check whether the corresponding physical DI is closed.	Eliminate external faults and ensure that restart and reset are allowed under the mechanical condition.
E015.2	External fault 2	The DI terminal should be normally closed, but it is detected to be open.	0: Coast to stop	Corresponding DI terminal disconnected	Check the parameter of the DI terminal (group F4) to see which DI is set to function 33, and check whether the corresponding physical DI is disconnected.	Eliminate external faults and ensure that restart and reset are allowed under the mechanical condition.
E017.1 /L017. 1	The buffer contactor is faulty.	The pre-charge contactor is considered to be faulty when abnormal signals are detected continuously for 1s based on hardware contactor exception signal detection.	0: Coast to stop	The driver board and power supply are faulty.	Check whether the input grid voltage is normal. The input voltage of the three-phase 380 V model ranges from 342 VAC to 418 VAC. The input voltage of the three-phase 220 V model ranges from 198 VAC to 235.4 VAC.	If the mains voltage is normal and the fault persists, replace the drive.
				Contactor error	-	Replace the contactor.
				The surge protection board is abnormal.	-	Replace the surge protection board.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E018.1	Current detection circuit fault	Zero drift is detected only in the undervoltage and stop state. If zero drift detection value is greater than 10% of the rated current, the current sampling is abnormal.	0: Coast to stop	The Hall device is abnormal.	In the stop state, check the three-phase output UVW current and check whether the current fluctuation exceeds 10% of the rated current.	Replace the Hall device or the AC drive.
				The synchronous motor is rotating at a high speed, and the drive is in the stopped state.	Check whether the following conditions exist simultaneously: ① The synchronous motor rotates at high speed. ② The drive has stopped.	Bit 8 (Zero drift detection) of BF-07 is disabled.
E019.1	Motor parameter auto-tuning times out.	The auto-tuning process does not end after 300s, leading to auto-tuning timeout fault.	0: Coast to stop	1. Motor parameters and drive model are set incorrectly. 2. Output phase loss occurs.	1. Check whether the motor parameters (F1-00 to F1-05) and AC drive model parameter (FF-01) are consistent with the nameplate. 2. Check whether the output wiring of the motor is normal.	1. Set the motor parameters (F1-00 to F1-05) and the AC drive model parameter (FF-01) correctly according to the motor nameplate and AC drive nameplate. 2. Connect motor cables properly.
E019.2	Motor parameter auto-tuning is interrupted.	The parameter auto-tuning process is interrupted before it is completed.	0: Coast to stop	Check whether a stop command is sent during auto-tuning, leading to auto-tuning interruption.	Check whether the auto-tuning process has been completed.	Perform auto-tuning on all motor parameters again. Note: Do not send a stop command before the auto-tuning process is done. The drive automatically changes to the stop state after auto-tuning is done.
E019.3	Overcurrent during auto-tuning	The detected current exceeds the overcurrent threshold.	0: Coast to stop	The current exceeds the overcurrent threshold during auto-tuning.	Check whether the motor parameters (F1-00 to F1-05) and AC drive model parameter (FF-01) are consistent with the nameplate.	Set the motor parameters (F1-00 to F1-05) and the AC drive model parameter (FF-01) correctly according to the motor nameplate and AC drive nameplate.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E019.4	Back EMF auto-tuning error	If the back EMF is lower than 0.2 x rated voltage or higher than 1.2 x rated voltage, the back EMF auto-tuning is abnormal.	0: Coast to stop	Back EMF auto-tuning error	1. Check whether the motor parameters (F1-00 to F1-05) and AC drive model parameter (FF-01) are consistent with the nameplate. 2. Check whether oscillation occurs during parameter auto-tuning.	1. Set the motor parameters (F1-00 to F1-05) and the AC drive model parameter (FF-01) correctly according to the motor nameplate and AC drive nameplate. 2. Adjust AA-02 (Oscillation suppression) by the step value of 0.5. The default value is 3.2.
E019.5	Incorrect motor type	Check whether the tuned motor type matches the actual motor type. If not, the fault is reported.	0: Coast to stop	The synchronous motor and asynchro nous motor types are set improperly.	Check whether the motor type defined by F1-00 is consistent with the type of the motor in use.	Set the motor type correctly.
E019.6	Current sampling phase gain deviation auto-tuning error	The detected current sampling gain deviation between phases U and V or phases V and W is higher than 5%.	0: Coast to stop	Motor not connected or motor error	1. Check whether the motor is connected properly. 2. Use a multimeter to check whether the motor is short-circuited and the resistance of the three-phase winding is unbalanced.	1. Connect motor cables properly. 2. Replace the motor.
E019.7	Auto-tuned no-load current exceeds the limit.	This fault is reported when the no-load current is excessively high or low compared to the rated current.	0: Coast to stop	The no-load current for motor auto-tuning is out of range.	Check whether motor parameters (F1-00 to F1-05) are set properly.	Set motor parameters and check model parameters according to the motor nameplate.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E020.1 /L020. 1	The encoder cable is disconnect ed.	This fault is reported when the hardware disconnection signal is detected to be active.	0: Coast to stop	The encoder hardware feedback signal is abnormal.	1. Check whether the correct PG card is selected. 2. Check whether the wiring is correct. 3. Check whether the encoder is normal. 4. Check whether the DIP switches of the PG card are proper. 5. Check whether encoder parameters are set properly.	Replace the PG card or encoder. Note: This fault is reported only in FVC control mode.
E020.2	Encoder PPR incorrect	During dynamic auto-tuning, the deviation between the measured encoder speed and the target frequency exceeds 10%.	0: Coast to stop	The encoder feedback speed does not match the actual motor speed.	In the V/f or SVC mode, check whether the speed fed back by the encoder and the actual motor speed are consistent.	If no, set ABZ encoder PPR or the number of resolver pole pairs properly.
E020.3	No feedback from the encoder	This fault is reported when the following conditions are met in the FVC control mode. 1. During dynamic no-load auto-tuning, the encoder feedback frequency is lower than 10% of the target frequency. 2. During dynamic with-load auto-tuning, the encoder feedback frequency is lower than 2% of the rated frequency.	0: Coast to stop	There is no speed feedback from the encoder.	1. Check whether the correct PG card is selected. 2. Check whether the wiring is correct. 3. Check whether the encoder is normal. 4. Check whether the DIP switches of the encoder card are proper. 5. Check whether encoder parameters are set properly.	Replace the PG card or encoder. Note: This fault is reported only in FVC control mode.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E020.4	Encoder direction reversed	The encoder speed measurement value is opposite to the setpoint.	0: Coast to stop	The encoder direction is opposite to the motor direction of rotation.	After parameters are tuned, run the motor in V/f or SVC mode to determine whether the encoder feedback frequency direction is consistent with the set frequency direction.	Set the encoder direction through F1-30 (Encoder AB phase sequence).
E020.5 /L020.5	Encoder software detection disconnected	Encoder software disconnection detection is enabled in FVC control mode. When the number of speed measurement errors detected is higher than A9-10, an encoder software disconnection fault is reported.	0: Coast to stop	The encoder feedback speed changes abruptly, which incurs control fluctuation and results in overcurrent.	1. Check whether the correct PG card is selected. 2. Check whether the wiring is correct. 3. Check whether the encoder is normal. 4. Check whether the DIP switches of the PG card are proper. 5. Check whether encoder parameters are set properly. 6. Check whether the encoder shield is grounded to the drive end. 7. Check whether the motor enclosure is grounded. 8. Check whether the encoder cable is far away from the power cable or install a magnetic ring to the encoder cable. 9. Select a twisted pair cable with a dense metal mesh shield for the encoder cable. Use adapters as few as possible.	1. The software disconnection detection can be enabled through the second bit of A9-09 (Encoder control word). The sudden change threshold of software disconnection detection speed can be set through A9-08 (Encoder disconnection software detection coefficient). You can also set the first bit of A9-09 (removing encoder feedback burrs). 2. If the PG card or encoder is abnormal, replace the PG card or encoder with a new one.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E020.6	The absolute position of sin-cos encoder is wrong.	The received position data is abnormal during sine-cosine encoder direction auto-tuning.	0: Coast to stop	During auto-tuning of the synchronous motor in dynamic state, the position data received by the encoder during direction auto-tuning is abnormal.	1. Check whether the encoder can get the angle and frequency normally. 2. Check whether the red indicator on the encoder PG card blinks.	1. Replace the PG card or encoder. 2. Take measures to enhance the shielding or anti-interference performance.
E020.7	Z signal interfer ence	Z signal interference detection is supported only in FVC control of the synchronous motor. When the Z signal is reached for five consecutive times, the expected reset angle deviates from the current angle by more than 45°.	0: Coast to stop	Accumula tive deviation angle of the Z signal of the ABZ encoder or sine-cosine encoder too large	1. Check whether the encoder shield is grounded properly. 2. Use an oscilloscope to detect whether the encoder output signals are normal.	1. Replace the PG card or encoder. 2. Take measures to enhance the shielding or anti-interference performance.
E020.8	Z signal lost	Number of ABZ encoder Z signals detected not matching the actual number	0: Coast to stop	The Z signal of the ABZ encoder is lost.	Check whether the Z signal is connected to the PG card of the encoder.	Connect the Z signal correctly. Note: This fault is reported only when ABZ encoder is used by the synchronous motor in FVC mode during self-check.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E020.9	Encoder pulse interference	1. For ten consecutive cycles (2 ms), the difference between the encoder feedback frequency adjacent cycles is higher than 2 x threshold value. 2. For four consecutive pulses (2 ms), the difference between the encoder feedback frequency adjacent cycles is higher than 3 x threshold value. The threshold value is the rated frequency.	0: Coast to stop	The encoder feedback speed fluctuates unusually.	Run the motor in V/f or SVC mode to determine whether the encoder feedback frequency fluctuates more than 50% of the rated frequency.	1. Ground the encoder cable shield properly. 2. Replace the encoder.
E021.1	Uninterrupted operation on the EEPROM timeout	The continuous EEPROM operation time exceeds the threshold defined internally.	0: Coast to stop	EEPROM read/write errors occur.	Check whether parameters are operated through communication, and then check whether the RAM address or EEPROM address is operated. Note: For mapping of RAM addresses of each group of parameters, see the section on parameter communication addresses in the user guide.	1. If parameters are operated frequently through communication, operate on the RAM address of the parameter. 2. If the EEPROM chip is damaged. Contact Inovance to replace the control board.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E021.2	EEPROM read error	The time for continuous EEPROM read operations exceeds the threshold defined internally.	0: Coast to stop	EEPROM read/write errors occur.	Check whether parameters are operated through communication, and then check whether the RAM address or EEPROM address is operated. Note: For mapping of RAM addresses of each group of parameters, see the section on parameter communication addresses in the user guide.	1. When reading the EEPROM address of the parameter through communication, do not perform the read operation frequently. 2. If the EEPROM chip is damaged. Contact Inovance to replace the control board.
E021.3	EEPROM write error	The time for continuous EEPROM write operations exceeds the threshold defined internally.	0: Coast to stop	EEPROM read/write errors occur.	Check whether parameters are operated through communication, and then check whether the RAM address or EEPROM address is operated. Note: For mapping of RAM addresses of each group of parameters, see the section on parameter communication addresses in the user guide.	1. When writing the EEPROM address of the parameter through communication, do not perform the write operation frequently. 2. If the EEPROM chip is damaged. Contact Inovance to replace the control board.
E021.4	The number of write-read operations of the EEPROM exceeds the setpoint within 1s.	The number of write-read operations on the EEPROM within 1s exceeds the value of F8-58.	0: Coast to stop	EEPROM read/write errors occur.	Check whether parameters are operated through communication, and then check whether the RAM address or EEPROM address is operated. Note: For mapping of RAM addresses of each group of parameters, see the section on parameter communication addresses in the user guide.	1. Do not operate the EEPROM address of the parameter for a short time. If necessary, operate on the RAM address of the parameter. 2. If the EEPROM chip is damaged. Contact Inovance to replace the control board.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E021.5 /L021. 5	Internal cache of EEPROM exceeding the limit	EEPROM internal cache exceeds the cache queue length defined internally.	0: Coast to stop	Internal cache of EEPROM exceeding the limit	If parameters are written through communication, check whether the write operation is performed frequently.	Contact the technical support to check whether parameters operated through communication can be saved to EEPROM.
E022.1	The encoder card is not activated.	In the FVC control mode, the encoder speed measurement function is not enabled, that is, the speed measurement function (bit 0) of A9-09 is not enabled.	0: Coast to stop	The PG card is not activated during operating in the FVC mode.	Check whether speed measurement (A9-09) is enabled.	Activate PG card speed measurement by setting bit 0 of A9-09 to 1.
E023.1	AC drive output short-circuited to ground	The drive output is short-circuited to ground when the current between the output phase and ground exceeds the designed threshold.	0: Coast to stop	The motor is short-circuited to ground.	Check whether each adapter connector is normal.	Check whether each adapter is normal, and measure the impedance to ground with a megger. Replace the cable or motor if the problem persists. Note: Do not run the motor before the short circuit fault is rectified.
				IGBT short circuit is reported during self-check.	Perform static self-check repeatedly to check whether the fault persists.	If the fault persists, replace the drive. Note: Do not run the motor before the short circuit fault is rectified.
E025.1	Rectifier fault	The rectifier module sends a PL signal to the drive control board for a continuous period of time.	0: Coast to stop	The input grid voltage is abnormal.	Check whether the grid voltage is normal.	If the power supply is provided by customers, check whether the power consumption by local grid system is too large.
E026.1	Cumulative operating time arrival	This fault is reported when the cumulative operating time is longer than or equal to F8-75 + F8-17 x 3600s.	0: Coast to stop	The cumulative operating time reaches the set value.	Check whether this condition is met: F7-09 + F7-28 x 3600 ≥ F8-75 + F8-17 x 3600.	Clear the record by initializing parameters.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E027.1	User-defined fault 1	This fault is reported when H2-04 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-04 is active.	1. Set H2-04 properly. 2. Eliminate external faults and ensure that restart and reset are allowed under the mechanical condition.
E027.2	User-defined fault 2	This fault is reported when H2-05 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-05 is active.	1. Set H2-05 properly. 2. Eliminate external faults and ensure that restart and reset are allowed under the mechanical condition.
E027.3	User-defined fault 3	This fault is reported when H2-06 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-06 is active.	1. Set H2-06 properly. 2. Eliminate external faults and ensure that restart and reset are allowed under the mechanical condition.
E027.4	User-defined fault 4	This fault is reported when H2-07 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-07 is active.	1. Set H2-07 properly. 2. Eliminate external faults and ensure that restart and reset are allowed under the mechanical condition.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E028.1	User-defined alarm 1	This alarm is reported when H2-08 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-08 is active.	Check whether the value of H2-08 is active. You can cancel the alarm by setting H2-08 to 0.
E028.2	User-defined alarm 2	This alarm is reported when H2-09 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-09 is active.	Check whether the value of H2-09 is active. You can cancel the alarm by setting H2-09 to 0.
E028.3	User-defined alarm 3	This alarm is reported when H2-10 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-10 is active.	Check whether the value of H2-10 is active. You can cancel the alarm by setting H2-10 to 0.
E028.4	User-defined alarm 4	This alarm is reported when H2-11 is active.	0: Coast to stop	The signal of a user-defined fault is input through the multi-functional DI, virtual I/O, or connector function.	Check whether the value of H2-11 is active.	Check whether the value of H2-11 is active. You can cancel the alarm by setting H2-11 to 0.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E029.1	Cumulative power-on time arrival	This fault is reported when the cumulative power-on time is greater than or equal to F8-74 + F8-16 x 3600s.	0: Coast to stop	The cumulative power-on time reaches the set value.	Check whether this condition is met: F7-09 + F7-29 x 3600 ≥ F8-74 + F8-16 x 3600.	Clear the record by parameter initialization (FP-01).
E030.1	Load loss	Asynchronous motor: When the output current is lower than 25% of the no-load current and the synchronous frequency is lower than 90% of the rated frequency in the running state, the fault is triggered. Synchronous motor: This fault is triggered when the following two conditions are met: a. The output current is lower than the load loss current threshold (10% by default). b. The reference current is greater than the rated current or the output voltage is greater than the detection threshold, namely, 50% x (back EMF + 0.25 x rated voltage).	0: Coast to stop	Phase loss occurs on the three output phases of the drive.	Check whether the motor cable is disconnected.	Check whether the wiring between the drive and the motor is disconnected. If the wiring is normal, contact the manufacturer.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E031.1	PID feedback loss during operation of PID	If the PID feedback keeps lower than the value of FA-26 (feedback loss detection lower limit) after the time defined by FA-27 (Detection time of PID feedback loss) elapses, the AC drive reports this fault.	0: Coast to stop	The PID feedback is lower than the value of FA-26.	Monitor the feedback channel through the software to check whether the values in the feedback channel is correct.	1. Check the PID feedback signal and analyze the system feedback error. 2. Set FA-26 properly.
E031.2 /L031. 2	DI terminal disconnect ed	If the DI assigned with function 86 is active, the DI disconnection fault is reported.	0: Coast to stop	The terminal assigned with function 86 is active.	Check whether the swing rod touches the limit of the DI terminal or the limit switch of the sensor.	Check whether the hardware of the DI assigned with function 86 is active.
E032.1 /L032. 1	Parameter reset is abnormal.	This fault is reported when an abnormal interruption occurs during parameter initialization through FP-01.	0: Coast to stop	Parameter reset is abnormal.	Check whether this fault is reported every time the parameter initialization is performed through FP-01. If yes, the control board is damaged.	Contact the manufacturer to replace the control board.
E032.2 /L032. 2	Parameter backup error	This fault is reported when parameter backup fails.	0: Coast to stop	Parameter backup error	Check whether this fault is reported every time parameter backup is performed. If yes, the control board is damaged.	Contact the manufacturer to replace the control board.
E032.3 /L032. 3	A parameter power-off error occurs.	This fault is reported when parameters fail to be saved to EEPROM with retention enabled upon a power failure.	6: Not handled	A parameter power-off error occurs.	Check whether this fault is reported every time the drive is powered off. If yes, the control board is damaged.	Contact the manufacturer to replace the control board.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E032.4 /L032. 4	Parameter setting error	1. The "multi-point curve" parameter in the free module is set incorrectly. 2. The user load curve parameter in the auxiliary function is set incorrectly.	0: Coast to stop	Parameters are set improperly.	Check whether L7-60 and L7-61 are set to non-zero values.	When L7-60 ≠ 0, check whether the multi-point curve parameters in group C7 are set properly. When L7-61 ≠ 0, check whether the curve parameters (F8-82 to F8-96) are set properly.
E032.6 /L032. 6	Parameter check error upon power-on	This fault is reported when the parameter value saved by EEPROM is not within the corresponding parameter attribute limit (that is, the value saved by EEPROM is incorrect).	6: Not handled	Parameter check error upon power-on	Restore parameters to default and restart the drive to check whether the fault can be cleared.	If the fault persists, contact Inovance technical support.
E032.7 /L032. 7	Parameter macro setting error	If two parameter macros are activated at the same time, this fault will be reported.	0: Coast to stop	A parameter macro of the drive has already been activated.	Check whether the AC drive has an active parameter macro through FP-18.	Restore parameters to default and reset the new parameter macro through FP-17.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E040.1	Pulse-by-pulse current limit fault	The pulse-by-pulse current limit fault applies only to the V/f control mode of the asynchronous motor. After the current keeps exceeding the pulse-by-pulse current limit threshold for 500 ms, the fault is reported.	0: Coast to stop	The load is excessive, or the motor is stalled.	1. Check whether the load (output current) is too large during normal operation. 2. When an overload fault occurs, the motor is stalled (the motor does not rotate).	Reduce the load and check motor and mechanical conditions.
				Output ground fault	Check whether there is output grounding point and check the impedance to ground with a tramegger.	Remove the output grounding point.
				Motor inter-turn short circuit	Check whether the resistance on the output ends are symmetric with a multimeter.	Perform self-check to check whether inter-turn short circuit occurs. If yes, replace the motor.
				Motor nameplate parameters are set improperly.	Check whether motor parameters are consistent with those indicated on the nameplate.	Set motor parameters correctly.
				Output phase loss	Check for correct cable connection.	Check whether output phase loss occurs.
				V/f oscillation	Check whether oscillation occurs on the three-phase output current of the drive.	Set F3-12 to enable V/f oscillation suppression. If the oscillation persists, decrease the oscillation suppression coefficient of F3-11 by the step value of 5.
				The power rating of the drive is excessively low.	Check whether the AC drive power is lower than the motor power.	Replace with a drive of a higher power rating.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E042.1 /L042. 1	Speed deviation excessively high fault	When the deviation between the actual motor speed and the set frequency is higher than F9-69 (Excessive speed deviation detection value) and such status lasts for the time longer than F9-70, this fault will be reported.	0: Coast to stop	Encoder parameters are set improperly.	Set the encoder type and parameters correctly.	Set encoder parameters properly.
				Parameter auto-tuning is not performed.	Check whether parameter auto-tuning is performed.	Set motor parameters correctly and perform auto-tuning on motor parameters.
				The load is excessive.	Check whether the output current is always equal to the torque upper limit set by F2-10.	Ensure the load is in the proper level.
				Speed deviation detection parameters F9-69 and F9-70 are set improperly.	Speed deviation detection parameters F9-69 and F9-70 are set to excessively low values.	Set detection parameters based on actual conditions.
E043.0	SVC divergence fault	The SVC internal algorithm determines that there is a deviation between the estimated speed and the actual speed.	0: Coast to stop	Motor auto-tuning is not performed or motor auto-tuned motor parameters are incorrect.	Check whether parameter auto-tuning is performed.	Set motor parameters correctly and perform auto-tuning on motor parameters.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E043.1 /L043. 1	Motor overspeed	If the deviation between the estimated frequency and the actual output frequency is greater than 15% of the rated frequency, and the judgment time is longer than the threshold, the motor overspeed fault is reported.	0: Coast to stop	Encoder parameters are set improperly.	Set the encoder type and parameters correctly.	Set encoder parameters properly.
				Parameter auto-tuning is not performed.	Check whether parameter auto-tuning is performed.	Set motor parameters correctly and perform auto-tuning on motor parameters.
				Runaway occurs due to incorrect encoder zero point angle of synchronous motor.	1. Check whether the encoder is connected reliably. 2. Check whether the encoder mounting angle F1-31 changes by more than 10° during multiple times of auto-tuning.	1. Secure the encoder properly. 2. If the fault persists, replace the encoder.
				F9-67 and F9-68 are set improperly.	Speed deviation detection parameters F9-69 and F9-70 are set to excessively low values.	Set detection parameters based on actual conditions.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E043.2	Synchronous motor FVC runaway fault	When D6/7/8/9-30 is enabled in FCV mode, if the AC drive detects that the actual motor speed is consistent with the set frequency direction, when the actual motor speed keeps exceeding the threshold of D6/7/8/9-31 for a period longer than the time defined by D6/7/8/9-32 (detection time for excessive speed deviation), the drive reports a synchronous motor FVC runaway fault. If the drive detects that the actual motor speed is in the opposite direction to the set frequency, the actual motor speed exceeds the threshold of D6/7/8/9-31. If the duration is greater than D6/7/8/9-32 (detection time for excessive speed deviation), the AC drive reports the synchronous motor FVC runaway fault	0: Coast to stop	The encoder mounting angle auto-tuning is not performed, or "13: Synchronous motor with-load rotation auto-tuning" is selected, resulting in the wrong start angle and flying start fault.	Check whether encoder mounting angle auto-tuning is not performed and whether F1-31 encoder mounting angle is set.	If auto-tuning during rotation is not possible, enable speed measurement through bit0 of A9-09, and change the control mode to SVC. Check whether the encoder speed direction is consistent with the actual speed direction and modify F1-30 (phases A and B sequence of encoder) if necessary. After modification, perform "11: Synchronous motor with-load auto-tuning (without back EMF)" again to auto-tune F1-31 (encoder mounting angle). If possible, you can select "12: Synchronous motor dynamic no-load auto-tuning" to tune F1-30 (phases A and B sequence of encoder) and F1-31 (encoder mounting angle).

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E043.2	Synchro nous motor FVC runaway fault	Continued	0: Coast to stop	If F1-30 (phases A and B sequence of encoder) is uncon firmed and opposite to the actual motor direction, performing "11: Synchro nous motor with-load auto-tuning (without back EMF)" may cause a zero position angle auto-tuning error. This can lead to a flying start fault.	You can enable speed measurement through bit0 of A9-09, and change the control mode to SVC. Check whether the encoder speed direction is consistent with the actual speed direction and modify F1-30 (phases A and B sequence of encoder) if necessary. After modification, perform "11: Synchronous motor with-load auto-tuning (without back EMF)" again. Or, if possible, you can select "12: Synchronous motor dynamic no-load auto-tuning" to tune F1-30 (phases A and B sequence of encoder) and F1-31 (encoder mounting angle).	You can enable speed measurement through bit0 of A9-09, and change the control mode to SVC. Check whether the encoder speed direction is consistent with the actual speed direction and modify F1-30 (phases A and B sequence of encoder) if necessary. After modification, perform "11: Synchronous motor with-load auto-tuning (without back EMF)" again. Or, if possible, you can select "12: Synchronous motor dynamic no-load auto-tuning" to tune F1-30 (phases A and B sequence of encoder) and F1-31 (encoder mounting angle).
				The encoder is connected loosely or a communica tion fault occurs, resulting in encoder pulse loss or encoder transmis sion position error.	Check whether the encoder is installed reliably and whether the grounding operation is proper.	Install the encoder properly and ground the encoder.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E045.1	Motor overtem perature fault	The motor temperature transmitted through the AI is higher than the set motor temperature alarm threshold.	0: Coast to stop	The cable of the temperature sensor becomes loose.	Check the wiring of the temperature sensor.	Re-connect the cables.
				Motor overtemper ature occurs.	Check whether the value of U0-90 is higher than F9-76. Check whether the value of U0-34 is higher than F9-57.	Decrease the carrier frequency or take other measures to cool down the motor.
				The value of F9-57 or F9-76 is excessively low.	Check the values of F9-57 or F9-76.	Increase the motor overtemperature protection threshold F9-57 or F9-76 (90℃ to 100℃ for regular motors).
E045.2 /L045. 2	Motor pre-overtem perature	The motor temperature transmitted through AI is higher than the pre-alarm threshold of the motor temperature.	0: Coast to stop	The cable of the temperature sensor becomes loose.	Check the wiring of the temperature sensor.	Re-connect the cables.
				Motor overtemper ature occurs.	Check whether the value of U0-90 is higher than that of F9-77. Check whether the value of U0-34 is higher than that of F9-58.	Decrease the carrier frequency or take other measures to cool down the motor.
				The value of F9-58 or F9-77 is excessively low.	Check the values of F9-58 or F9-77.	Increase the motor pre-overtemperature threshold F9-58 or F9-77.
E046.1	Motor overload fault during load monitoring	This fault is reported when the overload threshold of the load curve that is set through F8-87 to F8-91 is reached and F8-80 (Overload action) is set to "Fault".	0: Coast to stop	The load monitoring parameter is set improperly.	Check whether the load curve overload threshold set in F8-87 to F8-91 are proper.	Set detection parameters based on actual conditions.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E046.2	Load monitoring motor overload alarm	This fault is reported when the overload threshold of the load curve that is set through F8-87 to F8-91 is reached and F8-80 is set to "Alarm".	0: Coast to stop	The load monitoring parameter is set improperly.	Check whether load curve overload threshold set through F8-87 to F8-91 are proper.	Set detection parameters based on actual conditions.
E046.3	Motor load loss fault during load monitoring	This fault is reported when the load curve load loss threshold set through F8-92 to F8-96 is reached and F8-81 is set to "Fault".	0: Coast to stop	The load monitoring parameter is set improperly.	Check whether load curve overload threshold set through F8-87 to F8-91 are proper.	Set detection parameters based on actual conditions.
E046.4	Motor load loss alarm during load monitoring	The load curve load loss threshold set through F8-92 to F8-96 is reached and F8-81 is set to "Alarm".	0: Coast to stop	The load monitoring parameter is set improperly.	Check whether load curve overload threshold set through F8-87 to F8-91 are proper.	Set detection parameters based on actual conditions.
E047.2	STO triggering inconsistency fault	This fault is reported when STO1 or STO2 has been disconnected through hardware detection.	0: Coast to stop	The STO1 or STO2 signal on the control board terminal is disconnected.	Check the wiring of STO1 and STO2.	Restore the 24 V power supply of STO1 or STO2.
E047.3	STO power supply fault	This fault is reported when the supply voltage of the STO circuit does not exceed a certain threshold within the specified voltage range.	0: Coast to stop	Undervoltage or overvoltage occurs on the STO circuit.	Restore the 24 V power supply of STO1 and STO2 and power off and on the drive again.	If the fault is constantly reported and reset cannot be performed, the STO module is damaged. Ask for technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E047.4	The STO circuit input subsystem is faulty.	This fault is reported when the STO circuit hardware pins are abnormal.	0: Coast to stop	The STO circuit input subsystem is abnormal.	Restore the 24 V power supply of STO1 and STO2 and power off and on the drive again.	If the fault is constantly reported and reset cannot be performed, the STO module is damaged. Ask for technical support.
E047.5	STO BUFFER chip fault	This fault is reported when the STO circuit hardware pins are abnormal.	0: Coast to stop	The STO output block chip is abnormal.	Restore the 24 V power supply of STO1 and STO2 and power off and on the drive again.	If the fault is constantly reported and reset cannot be performed, the STO module is damaged. Ask for technical support.
E051.1	Magnetic pole position auto-tuning error	An error is detected during magnetic pole position auto-tuning.	0: Coast to stop	Magnetic pole position auto-tuning error	Check whether motor parameters (F1-00 to F1-05) are set properly.	Set the motor parameters correctly according to the motor nameplate.
E056.2	VI self-check: IGBT U+ short circuit	The IGBT has detected an abnormal VCE signal.	0: Coast to stop	The IGBT has detected an abnormal VCE signal.	Power the AC drive off and on to check if the fault persists.	Contact Inovance for technical support or replace the drive.
E056.3	VI self-check: IGBT U- short circuit	The IGBT has detected an abnormal VCE signal.	0: Coast to stop	The IGBT has detected an abnormal VCE signal.	Power the AC drive off and on to check if the fault persists.	Contact Inovance for technical support or replace the drive.
E056.4	VI self-check: IGBT V+ short circuit	The IGBT has detected an abnormal VCE signal.	0: Coast to stop	The IGBT has detected an abnormal VCE signal.	Power the AC drive off and on to check if the fault persists.	Contact Inovance for technical support or replace the drive.
E056.5	VI self-check: IGBT V- short circuit	The IGBT has detected an abnormal VCE signal.	0: Coast to stop	The IGBT has detected an abnormal VCE signal.	Power the AC drive off and on to check if the fault persists.	Contact Inovance for technical support or replace the drive.
E056.9	Auto-inspection on system output phase loss	Motor output phase loss is detected.	0: Coast to stop	Motor output phase loss occurs.	Check whether the cables of the output three phases are connected properly.	Ensure the motor and output contactor are connected properly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E057.1	The IGBT in the upper arm of phase U or in the lower arm of phase V cannot be conducted.	Open circuit occurs on the IGBT in the upper arm of phase U or in the lower arm of phase V.	0: Coast to stop	Open circuit occurs on the IGBT in the upper arm of phase U or in the lower arm of phase V.	-	Contact Inovance for technical support.
E057.2	The IGBT in the lower arm of phase U or in the upper arm of phase V cannot be conducted.	Open circuit occurs on the IGBT in the lower arm of phase U or in the upper arm of phase V.	0: Coast to stop	Open circuit occurs on the IGBT in the lower arm of phase U or in the upper arm of phase V.	-	Contact Inovance for technical support.
E057.3	The IGBT in the upper arm of phase V or in the lower arm of phase W cannot be conducted.	Open circuit occurs on the IGBT in the upper arm of phase V or in the lower arm of phase W.	0: Coast to stop	Open circuit occurs on the IGBT in the upper arm of phase V or in the lower arm of phase W.	-	Contact Inovance for technical support.
E057.4	The IGBT in the lower arm of phase V or in the upper arm of phase W cannot be conducted.	Open circuit occurs on the IGBT in the lower arm of phase V or in the upper arm of phase W.	0: Coast to stop	Open circuit occurs on the IGBT in the lower arm of phase V or in the upper arm of phase W.	-	Contact Inovance for technical support.
E057.5	The IGBT in the upper arm of phase W or in the lower arm of phase U cannot be conducted.	Open circuit occurs on the IGBT in the upper arm of phase W or in the lower arm of phase U.	0: Coast to stop	Open circuit occurs on the IGBT in the upper arm of phase W or in the lower arm of phase U.	-	Contact Inovance for technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E057.6	The IGBT in the lower arm of phase W or in the upper arm of phase U cannot be conducted.	Open circuit occurs on the IGBT in the lower arm of phase W or in the upper arm of phase U.	0: Coast to stop	Open circuit occurs on the IGBT in the lower arm of phase W or in the upper arm of phase U.	-	Contact Inovance for technical support.
E057.7	A short circuit between output phase U and phase V has been detected.	A short circuit between output phase U and phase V has been detected.	0: Coast to stop	Output phase-to-phase short circuit occurs.	Check whether short circuit occurs between the output phases when the device is powered off through the resistance range of the multimeter.	Replace the cable or motor.
E057.8	A short circuit between output phase W and phase V has been detected.	A short circuit between output phase W and phase V has been detected.	0: Coast to stop	Output phase-to-phase short circuit occurs.	Check whether short circuit occurs between the output phases when the device is powered off through the resistance range of the multimeter.	Replace the cable or motor.
E057.9	A short circuit between output phase W and phase U has been detected.	A short circuit between output phase W and phase U has been detected.	0: Coast to stop	Output phase-to-phase short circuit occurs.	Check whether short circuit occurs between the output phases when the device is powered off through the resistance range of the multimeter.	Replace the cable or motor.
E058.1	Module phase U current sensor installed reversely	Phase U current is reversed.	0: Coast to stop	The current sampling sensor is faulty.	The device is powered on properly. The input voltage of the three-phase 380 V model ranges from 342 VAC to 418 VAC. The input voltage of the three-phase 220 V model ranges from 198 VAC to 235.4 VAC.	Contact Inovance for technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E058.2	Module phase V current sensor installed reversely	Phase V current is reversed.	0: Coast to stop	The current sampling sensor is faulty.	The device is powered on properly. The input voltage of the three-phase 380 V model ranges from 342 VAC to 418 VAC. The input voltage of the three-phase 220 V model ranges from 198 VAC to 235.4 VAC.	Contact Inovance for technical support.
E058.3	Module phase W current sensor installed reversely	Phase W current is reversed.	0: Coast to stop	The current sampling sensor is faulty.	The device is powered on properly. The input voltage of the three-phase 380 V model ranges from 342 VAC to 418 VAC. The input voltage of the three-phase 220 V model ranges from 198 VAC to 235.4 VAC.	Contact Inovance for technical support.
E058.4	Module phase U/V sensors inserted improperly	The phase U/V current sampling is abnormal.	0: Coast to stop	The current sampling sensor is faulty.	The device is powered on properly. The input voltage of the three-phase 380 V model ranges from 342 VAC to 418 VAC. The input voltage of the three-phase 220 V model ranges from 198 VAC to 235.4 VAC.	Contact Inovance for technical support.
E058.5	Module phase V/W sensors inserted improperly	The phase V/W current sampling is abnormal.	0: Coast to stop	The current sampling sensor is faulty.	The device is powered on properly. The input voltage of the three-phase 380 V model ranges from 342 VAC to 418 VAC. The input voltage of the three-phase 220 V model ranges from 198 VAC to 235.4 VAC.	Contact Inovance for technical support.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E058.6	Phase W/U sensor inserted improperly	The phase W/U current sampling is abnormal.	0: Coast to stop	The current sampling sensor is faulty.	The device is powered on properly. The input voltage of the three-phase 380 V model ranges from 342 VAC to 418 VAC. The input voltage of the three-phase 220 V model ranges from 198 VAC to 235.4 VAC.	Contact Inovance for technical support.
E059.1	Phase V/W unbalance	The phase V/U output is unbalanced with the other phase.	0: Coast to stop	The phase U/V output is unbalanced with the other phase.	Check whether phase-to-phase short circuit or motor winding-to-winding short circuit occurs.	Replace the motor.
E059.2	Phase U/W unbalance	The phase V/W output is unbalanced with the other phase.	0: Coast to stop	The phase V/W output is unbalanced with the other phase.	Check whether phase-to-phase short circuit or motor winding-to-winding short circuit occurs.	Replace the motor.
E059.3	Phase U/V unbalance	The phase U/W output is unbalanced with the other phase.	0: Coast to stop	The phase U/W output is unbalanced with the other phase.	Check whether phase-to-phase short circuit or motor winding-to-winding short circuit occurs.	Replace the motor.
E061.1	Braking transistor overload	Determine whether the braking transistor is overloaded based on the overload curve.	0: Coast to stop	The power of the braking resistor is too high (resistance too low).	Check whether the braking resistor model is correct. For details, see the section on the braking resistor in the Hardware Guide.	Use a braking resistor of higher resistance.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E062.2	Braking transistor shoot through	This fault is reported when the brake transistor is turned off and the braking transistor current exceeds 0.375 x rated current of the braking transistor for 4s consecutively.	0: Coast to stop	The braking module is abnormal.	Check the bus voltage through the software tool to determine whether the braking voltage is active.	Contact the technical support.
				The braking resistor is short-circuited.	Use a multimeter to measure the resistance of the braking resistor and check whether it is consistent with the nominal value of the braking resistor. If the deviation is too large, the braking resistor is damaged.	Replace the braking resistor.
E062.3	Braking transistor overcurrent	If the braking transistor current is detected to exceed twice its maximum current multiple times, braking transistor overcurrent occurs.	0: Coast to stop	The braking resistor is connected improperly.	Check whether the braking resistor is connected properly and whether the braking unit operates properly.	Connect the braking resistor properly.
E063.1	External alarm 1	This fault is reported when the value set by H2-02 is active.	0: Coast to stop	The external alarm signal input through the connector is active.	Check the connector setting in H2-02.	Check the connector setting in H2-02 or set H2-02 to 0 to cancel this alarm.
E063.2	External alarm 2	This fault is reported when the value of H2-03 is active.	0: Coast to stop	The external alarm signal input through the connector is active.	Check the connector setting in H2-03.	Check the connector setting in H2-03 or set H2-03 to 1 to cancel this alarm.
E064.1 /L064.1	Water-cooled unit fault	This fault is reported when the terminal assigned with DI function 66 is active.	0: Coast to stop	The water-cooling system control unit is faulty (for T13 model).	Check whether the DI assigned with function 66 is active.	1. Check that the water-cooling system is normal. 2. Perform a reset operation. 3. Replace the control unit.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E066.1 /L066. 1	Low-liquid fault	This fault is reported when the terminal assigned with DI function 67 is active.	0: Coast to stop	The tank liquid level is excessively low (for T13 model).	Check whether the DI assigned with function 67 is active.	Add the coolant.
E067.1	Capacitor leakage occurs.	This fault is reported when the bus voltage fluctuates beyond the set threshold for a certain period of time.	0: Coast to stop	The bus capacitor leakage results in excessive bus fluctuation.	Check whether the capacitor is damaged.	Replace the capacitor.
E084.1	Brake cannot be released.	The brake release command is generated, but there is no feedback signal after the set time elapses.	0: Coast to stop	1. Check signal feedback point or feedback source wiring, or positive and negative logic. 2. Check whether the set time is proper.	1. Check signal feedback point or feedback source wiring, or positive and negative logic. 2. Check whether the set time is proper.	1. The feedback contact of the brake is damaged. Replace the sensor. 2. Set A7-04 to a higher value.
E084.2	Brake apply failure	The brake apply command is generated, but there is no feedback signal after the set time elapses.	0: Coast to stop	1. Check signal feedback point or feedback source wiring, or positive and negative logic. 2. Check whether the set time is proper.	1. Check signal feedback point or feedback source wiring, or positive and negative logic. 2. Check whether the set time is proper.	1. The feedback contact of the brake is damaged. Replace the sensor. 2. Set A7-04 to a higher value.
E085.4	Timing fault	-	0: Coast to stop	Software timing call error	Power off and on the drive again to check whether the fault can be cleared.	Replace the drive.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E093.1 /L093. 1	Motor stall fault	The stall detection threshold is met and the stall detection time is reached. Note: Set the stall detection threshold through AA-31/ B8-31/BC-73/CC-73 and the stall detection time through AA-32/ B8-32/BC-74/CC-74. Enable stall protection through the 6th bit of AA-30/B8-30/BC-72/CC-72. Note: The preceding parameters correspond to the first, second, and third motor parameter groups.	0: Coast to stop	The motor load is excessive or the brake is abnormal.	1. Check whether the brake is switched on. 2. Determine whether the output torque is always equal to the torque upper limit set by F2-10.	Ensure the motor load is within the proper range.
				The torque limit/current limit is low.	Check whether the torque upper limit (F2-10) is excessively low.	Set the torque limit properly.
				Parameter auto-tuning is not performed.	Check whether parameter auto-tuning is performed.	Perform parameter auto-tuning before operation.
				The AC drive model is set improperly.	Check whether the AC drive model is set correctly.	Set the AC drive model correctly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E093.2	Motor step loss	The step loss detection threshold is met and the step loss detection time is reached. Note: Set the motor step loss detection threshold through AA-33/ B8-33/BC-75/CC-75 and the detection time through AA-34/ B8-34/BC-76/CC-76. Enable step loss protection through the 5th bit of AA-30. Note: The preceding parameters correspond to the first, second, and third motor parameter groups.	0: Coast to stop	The encoder is disturbed or disconnected.	Check whether the encoder is disturbed.	Take anti-interference measures, such as shield, magnetic ring, and grounding of the shield.
				The encoder pulses per revolution is incorrect or the encoder is connected loosely.	Check whether the encoder is connected properly.	Set parameters correctly or secure the encoder properly.
				Parameter auto-tuning is not performed.	Check whether parameter auto-tuning is performed.	Set rated motor parameters properly and perform auto-tuning on parameters of the motor in dynamic rotation state if available.
				The drive model is incorrect.	Check whether the AC drive model is set correctly.	Set the drive model correctly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E093.3	Current control error	The current control exception detection threshold is met and the detection time is reached. Note: Set the current control exception detection threshold through AA-35/ B8-35/BC-77/CC-77 and the detection time through AA-36/ B8-36/BC-78/CC-78. Enable current control exception protection through the 4th bit of AA-30. The preceding parameters correspond to the first, second, third, and fourth motor parameter groups.	0: Coast to stop	Output phase loss	Check for correct cable connection.	Check whether output phase loss occurs.
				The encoder is disturbed or disconnected.	Check whether the encoder is disturbed.	Take anti-interference measures, such as shield, magnetic ring, and grounding of the shield.
				The bus voltage drops greatly.	Check whether the grid power supply is normal.	Keep the grid voltage stable.
E094.1	The calculated number of pole pairs does not match the setpoint.	Set A9-02 only when the number of motor pole pairs exceeds 12.	2: Continue operation	The number of motor pole pairs is set incorrectly.	Check whether the motor nameplate parameters are set correctly.	Set the motor nameplate parameters correctly. Note: Set A9-02 only when the number of motor pole pairs exceeds 12.
E094.2	Motor power/ voltage/ current mismatch	If the power factor of the motor parameter is set to a value higher than 1 or lower than 0.5, the fault is reported.	2: Continue operation	The power, voltage, and current of the motor are not match.	Check whether the motor nameplate parameters are set correctly.	Confirm motor nameplate parameters and set motor rating information and power factors correctly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E094.3	No-load current range error	This fault is reported when the no-load current is excessively high or low compared to the rated current.	2: Continue operation	The motor no-load current range is wrong.	Check the motor nameplate parameters to ensure the drive model is set correctly.	Set the motor nameplate parameters and the drive model correctly.
E094.4	The Lm (mutual induc tance) and I0 (no-load current) do not comply with the rated voltage.	The deviation between the rated flux and the flux calculated based on the rated voltage and frequency exceeds 10%.	2: Continue operation	The no-load current or mutual inductance is modified separately, leading to mismatch with the rated voltage.	Confirm motor nameplate parameters.	Set motor nameplate parameter properly and perform parameter auto-tuning.
E094.5	Rotor resistance setting range error	If the rotor resistance is excessively high, the fault is reported.	2: Continue operation	The rotor resistance exceeds the normal range.	Check whether the motor rotates during auto-tuning. Check whether motor nameplate parameters and AC drive model are set correctly.	Set the motor nameplate parameters correctly.
E094.7	Mismatch between the numbers of pole pairs of the resolver and motor	Check whether the number of resolver pole pairs match the number of pole pairs of the synchronous motor.	2: Continue operation	The number of pole pairs of the synchronous motor is incorrect.	Check the parameter used to define the number of resolver pole pairs.	Set the number of resolver pole pairs correctly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E095.1 /L095. 1	The carrier ratio is excessively low.	The lower value between the maximum frequency and actual effective carrier frequency is used as the carrier ratio. If this carrier ratio is lower than the threshold defined by F9-93, a fault will be reported.	2: Continue operation	Carrier frequency excessively low	Calculate whether the ratio of the maximum frequency to the actual effective carrier frequency is lower than F9-93 manually.	Set the carrier frequency correctly to ensure that the carrier ratio is higher than the set carrier ratio threshold.
E140.1	Variable frequency contactor fault	The contactor control signal is not consistent with the feedback signal for more than 2.5s.	0: Coast to stop	The DI valid logic is set incorrectly and the contactor feedback contact is selected incorrectly.	Check F4-38 and check whether the active logic of DI1 and DI2 is consistent with the contactor feedback contact (NO/NC).	When F4-38 is set to 11, connect the contactor to the NC contact.
E140.2	Power frequency contactor fault	The contactor control signal is not consistent with the feedback signal for more than 2.5s.	0: Coast to stop	The DI valid logic is set incorrectly and the contactor feedback contact is selected incorrectly.	Check F4-38 and check whether the active logic of DI1 and DI2 is consistent with the contactor feedback contact (NO/NC).	When F4-38 is set to 0, connect the contactor to the NO contact.
E140.3	Grid frequency fault	This fault is reported when (|D4-31 - Grid frequency detection value|)/ D4-31 keeps higher than or equal to D4-32 for a period longer than or equal to D4-33.	0: Coast to stop	The grid frequency is abnormal, or the grid frequency parameter D4-31 is set incorrectly.	Check the value of D4-31.	Modify the value of D4-31 to the grid frequency value.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E140.4	Grid voltage fault	This fault is reported when the value of |Mains voltage detection value - F1-02| keeps higher than or equal to D4-34 for a period longer than or equal to 100 ms.	0: Coast to stop	The grid voltage and the rated motor voltage exceed the threshold set by D4-34.	Check whether the rated motor voltage is set correctly.	Connect the power supply to the power grid. If the power supply is connected to a self-generation system, check the transformer.
E140.5	Phase synchronization timeout fault	The output phase of the drive is controlled by frequency adjustment to synchronize the output phase with the grid phase. 1. When the phase synchronization state machine is running, if the drive switches from the mains frequency to the variable frequency and the value of |grid phase – drive output phase| keeps higher than or equal to D4-34 for at least 20s, the fault is reported. Continued	0: Coast to stop	The motor load is too large. The output frequency of the AC drive cannot be adjusted normally and phase synchronization fails.	Check current state machine through L6-67 and the difference between L6-63 grid phase and drive phase.	Perform phase synchronization test under no-load condition.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E140.5	Phase synchronization timeout fault	Continued 2. When the phase synchronization state machine is running, if the drive switches from the mains frequency to the variable frequency and the value of |grid phase – drive output phase| keeps higher than or equal to D4-34 for at least 10s, the fault is reported. 3. When the drive tracking state machine is running, if the value of |grid frequency - drive output frequency| keeps higher than or equal to 0.5 Hz for at least 20s, the fault is reported.	0: Coast to stop	The motor load is too large. The output frequency of the AC drive cannot be adjusted normally and phase synchronization fails.	Check current state machine through L6-67 and the difference between L6-63 grid phase and drive phase.	Perform phase synchronization test under no-load condition.
E150.1	Positive limit fault	This fault is reported when the DI assigned with function 64 (Positive limit switch) is activated.	7: Emergency stop	The physical limit switch has been touched.	Check the status of each DI terminal and check whether the terminal assigned with No. 64 function is active.	Control the reverse run of the drive. After the positive limit switched is triggered during reverse run, the fault will be reset automatically.
E150.2	Negative limit fault	This fault is reported when the DI terminal assigned with No. 65 function (Negative limit switch) is active.	7: Emergency stop	The physical negative limit switch has been touched.	Check the status of each DI terminal and check whether the terminal assigned with No. 65 function is active.	Control forward run of the drive. After the negative limit switch is triggered during forward run, the fault will be reset automatically.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E151.1	Cable drum vertical application parameter setting error	The maximum torque for vertical cable drum applications is derived from (maximum tension D2-02) x (minimum reel diameter D1-11)/ (Mechanical gear ratio D1-03)/ (motor rated torque). The minimum torque for vertical cable drum applications is derived from (minimum set tension for vertical cable drum application D1-51) x (maximum reel diameter D1-10)/ (mechanical gear ratio D1-03)/ (motor rated torque). If, after the above calculation, the result is [Minimum torque in vertical cable drum application] > [Maximum torque in vertical cable drum application], then Err150.01 is reported, indicating a fault in vertical application parameter settings.	7: Emergency stop	Reset parameters properly.	The maximum torque for vertical cable drum applications is derived from (maximum tension D2-02) x (minimum reel diameter D1-11)/ (Mechanical gear ratio D1-03)/(motor rated torque). The minimum torque for vertical cable drum applications is derived from (minimum set tension for vertical cable drum application D1-51) x (maximum reel diameter D1-10)/ (mechanical gear ratio D1-03)/(motor rated torque). If, after the above calculation, the result is [Minimum torque in vertical cable drum application] > [Maximum torque in vertical cable drum application], then Err150.01 is reported, indicating a fault in vertical application parameter settings.	Reset parameters properly.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E153.1	Break fault	1. The following conditions must be satisfied for break detection: (1) Line speed is used as the source for calculating the reel diameter; (2) D1-54 (Break automatic detection) is enabled; (3) The line speed during operation exceeds D1-55 (Break automatic detection minimum line speed). 2. When the change of the reel diameter within 2 ms exceeds the value of previous reel diameter multiplied by D1-56 (break automatic detection tolerance), a timer starts. When the cumulated time exceeds D1-57 (break automatic detection judgment delay), the fault is reported.	7: Emergency stop	Check the material condition and re-load the material.	Check whether D1-56 [Error range of automatic material run-out detection] and D1-57 [Automatic material run-out detection judgment delay] are set properly.	If material run-out does not occur, check whether the parameters are set properly. If material run-out occurs, re-feeding the material and check whether the tension is set properly to avoid the material run-out again.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E159.1	Automatic fault reset failure	This fault is reported when the faults on the black list defined by H2-20 to H2-39 are reset by the automatic fault reset function.	6: Not handled	Faults that inhibit automatic fault reset have been reset.	Check whether faults that cannot be reset are set in the black list set by H2-20 to H2-39.	Remove parameters from the black list set by H2-20 to H2-39.
E160.1 /L160. 1	Modbus communi cation timeout	No data is received after communication is established.	1: Stop according to the stop mode	Modbus communica tion timeout	1. Check whether the RS485 communication cable is correctly connected. 2. Check whether Fd-04 (Communication timeout) is proper (Fd-04 = 2 x Number of bytes sent x 10/ (1/ Fd-00).	1. Ensure that the 485 communication cable is connected properly. 2. Check whether Fd-04 (Communication timeout) is proper (Fd-04 = 2 x Number of bytes sent x 10/ (1/Fd-00).
E161.1 /L161. 1	CANopen heartbeat times out.	The heartbeat frame is not received after the CANopen heartbeat is set.	1: Stop according to the stop mode	CANopen communica tion timeout	1. Check whether the CAN communication cable is correctly connected. 2. Check whether the values of FD-15 to FD-17 keep increasing. If yes, interference exists.	1. Ensure that the CAN communication cable is connected correctly. 2. Eliminate interference by taking the following measures: ① Eliminate other interference sources, such as other devices. ② Connect the drive to the grounding cable. ③ Route the signal cable and the power cable through different routes (do not twist them into a strand). ④ Do not cross-connect the power cable and signal cable.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E161.2 /L161. 2	CANopen PDO mapping	The PDO configuration information does not match the setting of the drive parameter.	1: Stop according to the stop mode	Inconsisten cy between PDO mapping configured by CANopen and actual communica tion mapping	1. Check whether the version of the communication configuration file (.eds format) is of the correct version. 2. The parameters in group AF are consistent with the description in the .eds file.	1. Ensure that the communication configuration file (.eds format) is of the correct version. 2. Ensure that the parameters in group AF are consistent with the description in the .eds file.
E162.1 /L162. 1	CANlink heartbeat timeout	The heartbeat times out after heartbeat is configured.	1: Stop according to the stop mode	CANlink heartbeat timeout	1. Check whether the CAN communication cable is correctly connected. 2. Check whether the values of FD-15 to FD-17 keep increasing. If yes, interference exists.	1. Ensure that the CAN communication cable is connected correctly. 2. Eliminate interference by taking the following measures: ① Eliminate other interference sources, such as other devices. ② Connect the drive to the grounding cable. ③ Route the signal cable and the power cable through different routes (do not twist them into a strand). ④ Do not cross-connect the power cable and signal cable.
E162.2 /L162. 2	CANlink station number conflict	The same station number exists.	1: Stop according to the stop mode	CANlink station number conflict	Read the value of Fd-02 to make comparison.	Modify the repeated CAN station numbers through Fd-02.
E164.1 /L164. 1	Extension card fault	The expansion card is faulty.	1: Stop according to the stop mode	The expansion card and the drive are in poor contact.	Check whether the expansion card is connected properly to the drive.	Check whether the expansion card is connected properly to the drive.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E174.1 /L174. 1	HDI disconnect ed	This fault is reported when the pulse frequency detected by DI5 ≤ F4-28 or lower than half of the setpoint set by F4-28 or F4-66.	6: Not handled	HDI input disconnect ed	Check whether HDI input is disconnected.	Perform wiring again.
				The HDI input signal frequency is excessively low, which is much lower than the minimum value set in F4-28 or F4-66.	Check whether the HDI input signal frequency is normal.	Ensure the min. input frequency of HDI is the frequency lower limit of the signal.
E174.3 /L174. 3	AI1 input error protection	This fault is reported when the voltage input of AI1 is outside the range of the lower limit (F8-45) to upper limit (F8-46). Note: This fault is not enabled by default.	6: Not handled	AI1 input signal disconnect ed	Check whether AI1 input signal is disconnected.	Perform wiring again.
				AI1 input signal voltage or current is outside the range of the lower limit (F8-45) to upper limit (F8-46).	Check whether the AI1 input voltage or current signal is normal.	Ensure the upper limit and lower limit for input voltage (current) protection is not exceeded.
E174.4 /L174. 4	AI2 input error protection	This fault is reported when the voltage input of AI2 port is outside the range of the lower limit (A6-52) to upper limit (A6-51). Note: This fault is not enabled by default.	6: Not handled	AI2 input signal disconnect ed	Check whether AI2 input signal is disconnected.	Perform wiring again.
				The AI2 input signal voltage or current is outside the range of A6-52 to A6-51.	Check whether the AI2 input voltage or current signal is normal.	Ensure the upper limit and lower limit for input voltage (current) protection is not exceeded.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E174.5 /L174. 5	AI3 input error protection	This fault is reported when the voltage input of AI3 port is outside the range of the lower limit (A6-58) to upper limit (A6-57). Note: This fault is not enabled by default.	6: Not handled	AI3 input signal disconnect ed	Check whether AI3 input signal is disconnected.	Perform wiring again.
				The AI3 input signal voltage or current is outside the range of A6-58 to A6-57.	Check whether the AI3 input voltage or current signal is normal.	Ensure the upper limit and lower limit for input voltage (current) protection is not exceeded.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E187.1 /L187. 1	Excessive position deviation	This fault is reported when the position deviation (L8-37) is larger than the excessive position deviation threshold (B0-27/ 28) and such status lasts for the time defined by B0-29.	0: Coast to stop	1. The position deviation threshold is set improperly. For example, when a sine-cosine encoder or 23-bit encoder is used, the pulses per revolution is high. In this case, set the threshold to a higher value. 2. If position synchroniza tion is used, the slave (AC drive) cannot respond because the accelera tion/ deceleration time sent by the master is too fast. 3. The speed loop gain or position loop gain is too weak, resulting in insufficient motor perform ance.	1. Check the threshold of B0-27/ 28, and check whether B0-29 is set properly. 2. Check whether the acceleration/ deceleration sent by the master is too fast. 3. Check whether the speed loop gain (F2-00 to F2-05) and the position loop gain (B1-34) are too weak.	1. Adjust the parameter setting (B0-27/28, B0-29, F2-00 to F2-05), and B1-34). 2. Allow the acceleration/ deceleration time of the master to be longer. Some speeds sent by the master may be acceleration/ deceleration at 0s, so it is easy for the slave to report a fault. 3. Check whether the transmission is stuck or the torque is insufficient.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E187.2 /L187. 2	Position completion timeout	This fault is reported when the absolute value of the position deviation (L8-37) is lower than or equal to the set threshold (B2-84/ 85) and such status last for the time defined by B2-83.	0: Coast to stop	1. The positioning completion threshold is set improperly. For example, when a sine-cosine encoder or 23-bit encoder is used, the pulse per revolution is high. In this case, set the threshold to a higher value. 2. B2-83 is set to an excessively low value. 3. The speed loop gain or position loop gain is too weak, resulting in insufficient motor perform ance. 4. Check whether the transmis sion mechanism gets stuck or whether the torque output is insufficient to drive the load.	1. Monitor the real-time deviation value through L8-37 and check whether the threshold of B2-84/85 is set properly. 2. Monitor the real-time deviation in L8-37 and the detection time defined by B2-83. Check whether the deviation keeps exceeding the threshold within the time defined by B2-83.	1. Check whether the parameter settings are properly. 2. Check whether the transmission is stuck or the torque is insufficient.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E187.4 /L187. 4	Homing timeout	When the homing command is executed, the home is not found after the time defined by B4-22 elapses.	0: Coast to stop	1. If the DI limit switch is used as the reference point, the correspond ing DI switch is not set during home searching. 2. If the Z signal is used as the reference point, the Z signal is not received during home searching.	1. If the DI limit switch is used as the reference point, check whether the corresponding DI limit switch is active. 2. If the Z signal is used as the reference point, check whether the PG card has the Z signal.	1. If the DI limit switch is used as the reference point, it is within the travel range. Install the correct limit switch. 2. If the PG card does not have the Z signal, replace the PG card or set the DI limit switch as the reference point. If the PG card has a Z signal, check whether the Z signal cable is connected properly. 3. Check whether the transmission mechanism gets stuck or the torque output is insufficient.
E187.5 /L187. 5	Positioning start without home	This fault is reported when the home is invalid and the positioning start command is executed.	2: Continue operation	This fault is reported when the home is invalid and the positioning start command is executed.	Check whether the home of L3-99 is invalid.	Perform homing first, confirm that the home is active before executing homing start command.
E187.6 /L187. 6	Interrupt positioning without home	If the home is invalid, this fault is reported when the interrupt positioning command is executed.	2: Continue operation	If the home is invalid, this fault is reported when the interrupt positioning command is executed.	Check whether the home of L3-99 is invalid.	Perform homing first, confirm that the home is active before executing the interrupt positioning command.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E187.7 /L187. 7	Reference point lost	When the system operates within the reference point position±B4-34 (Deviation threshold), the reference point signal will be detected to check whether it was deactivated once. If yes, the reference point is lost once. When the cumulative number of reference point loss events reaches or exceeds the value of B4-33, the reference point is lost. In this case, A187.7 is reported.	2: Continue operation	The reference point position is lost continuous ly.	1. If the reference point is set to a DI limit switch, check whether the limit switch is reliable. 2. If the reference point is set to the Z signal, check whether the Z signal of the encoder is reliable.	1. After A187.7 is reported, the alarm cannot be reset. To reset this alarm, you need to set B4-29 to 0. 2. If the reference point is set to a DI limit switch, replace the DI limit switch. 3. If the reference point is set to Z signal, ensure that Z signal is wired properly.
E187.8 /L187. 8	Excessive reference point position deviation	When B4-40 is enabled and the difference is higher than the maximum value of correction (B4-31), this fault is reported. Note: The difference indicates the difference between the current absolute position and the reference point position.	2: Continue operation	PG card pulse loss	Check whether the pulse value per motor revolution is the corresponding encoder PPR.	1. Replace the faulty PG card. 2. Pulse loss occurs on the PG card due to interference on site.

Fault code	Name	Fault mechanism	Default fault level	Cause	Verification method	Solution
E187.9 /L187. 9	Software limit activated or beyond the limit	This fault is reported when current absolute position L8-17/18 exceeds the limit travel range set by B0-37 to B0-40.	2: Continue operation	When the limit function is enabled (B0-36 = 1), the current absolute position L8-17/18 exceeds the limit travel range set by B0-37 to B0-40.	Check current absolute position.	1. If the positive limit is exceeded, control the load to run in the reverse direction. 2. If the negative limit is exceeded, control the load to run in the positive direction. 3. For positioning control, change the target position to a value within the travel range of the positive and negative limits.
A200.1	Online auto-tuning of asynchro nous motor no-load current and mutual inductance is activated.	When the drive is in the online auto-tuning of no-load current of asynchronous motor and mutual inductance, an alarm is displayed on the panel. This alarm is automatically cleared after auto-tuning is done.	2: Continue operation	The no-load current auto-tuning of asynchro nous motor and mutual inductance are enabled. After auto-tuning is done, the alarm is automatical ly cleared.	Check whether F1-15 (Online auto-tuning of asynchronous motor no-load current and mutual inductance) is activated.	This alarm is cleared automatically after auto-tuning is done or you can set F1-15 to 0 to clear the alarm.
A200.2	Online auto-tuning of no-load current of asynchro nous motor and mutual inductance failure	An exception occurs during online auto-tuning of no-load current and mutual inductance.	2: Continue operation	Auto-tuned no-load current and mutual inductance not convergent	Contact the manufacturer.	Contact the manufacturer.

9 Parameters

9.1 Group F0 Basic Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F0-00	0xF000	Load type	0: High-load application 1: Light-load application	0	-	Unchangeable
F0-01	0xF001	Motor 1 control mode	0: SVC 1: FVC 2: V/f	2	-	At stop
F0-02	0xF002	Operation command source	0: Operating panel 1: Terminal 2: Communication 3: Custom	0	-	At stop
F0-03	0xF003	Selection of main frequency X source	0: Digital setting (non-retentive upon power failure) 1: Digital setting (retentive at power failure) 2: AI1 3: AI2 4: Determined by AI3 5: Pulse setting (DI5) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication 10: Pulse synchronization Others: F connector	0	-	At stop
F0-04	0xF004	Selection of auxiliary frequency Y source	Same as F0-03	0	-	At stop
F0-05	0xF005	Base value of auxiliary frequency Y range upon superposition	0: Based on the maximum frequency 1: Relative to main frequency X	0	-	Real time
F0-06	0xF006	Range of auxiliary frequency Y upon superposition	0 to 150	100	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F0-07	0xF007	Frequency superposition selection	Ones: Frequency reference selection 0: Main frequency X 1: Operation result of X and Y (based on tens) 2: Switching between X and Y 3: Switching between main frequency source X and operation result of X and Y 4: Switchover between the auxiliary frequency Y and the main and auxiliary frequency operation result Tens: Main and auxiliary frequency operation 0: Main frequency + auxiliary frequency 1: X - Y 2: Max. (X, Y) 3: Min. (main frequency, auxiliary frequency)	0	-	Real time
F0-08	0xF008	Preset frequency	0.00 to F0-10	50.00	Hz	Real time
F0-09	0xF009	Running direction selection	0: Default direction 1: Direction opposite to the default direction	0	-	Real time
F0-10	0xF00A	Maximum frequency	5.00 to 599.00	50.00	Hz	At stop
F0-11	0xF00B	Frequency upper limit source	0: F0-12 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication Others: F connector	0	-	At stop
F0-12	0xF00C	Frequency upper limit	F0-14 to F0-10	50.00	Hz	Real time
F0-13	0xF00D	Frequency upper limit offset	0.00 to F0-10	0.00	Hz	Real time
F0-14	0xF00E	Frequency lower limit	0.00 to F0-12	0.00	Hz	Real time
F0-15	0xF00F	Carrier frequency	0.5 to 20.0	6.0	kHz	Real time
F0-16	0xF010	Carrier frequency adjusted with temperature	0: No 1: Yes	0	-	Real time
F0-17	0xF011	Acceleration time 1	0.0 to 6500.0	20.0	s	Real time
F0-18	0xF012	Deceleration time 1	0.0 to 6500.0	20.0	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F0-19	0xF013	Acceleration/ Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	-	At stop
F0-20	0xF014	Offset frequency source	0: F0-21 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	At stop
F0-21	0xF015	Digital setting of offset frequency	0.00 to F0-10	0.00	Hz	Real time
F0-22	0xF016	Decimal places of frequency reference	1: 0.1 Hz 2: 0.01 Hz	2	-	At stop
F0-23	0xF017	Retention of digital setting of frequency upon stop	0: Non-retentive at stop 1: Retentive at stop	0	-	Real time
F0-24	0xF018	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2 2: Motor parameter group 3 3: Motor parameter group 4	0	-	At stop
F0-25	0xF019	Base frequency of acceleration/ deceleration time	0: Maximum frequency (F0-10) 1: Frequency reference 2: 100 Hz 3: Rated frequency	0	-	At stop
F0-26	0xF01A	Base of frequency adjusted by UP/ DOWN keys during operation	0: Operating frequency 1: Frequency reference	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F0-27	0xF01B	Bind command source to frequency source	Ones: Bind operation panel to frequency source 0: No binding 1: Digital setting 2: AI1 3: AI2 4: Determined by AI3 5: Pulse setting 6: Multi-reference 7: Simple PLC 8: PID 9: Communication Tens: Bind terminal to frequency source 0: No binding 1: Digital setting 2: AI1 3: AI2 4: Determined by AI3 5: Pulse setting 6: Multi-reference 7: Simple PLC 8: PID 9: Communication Hundreds: Bind communication to frequency source 0: No binding 1: Digital setting 2: AI1 3: AI2 4: Determined by AI3 5: Pulse setting 6: Multi-reference 7: Simple PLC 8: PID 9: Communication	0	-	Real time
F0-28	0xF01C	Communication protocol selection	0: Modbus 1: Expansion communication protocol 2: Inobus protocol (through EtherCAT card)	0	-	At stop
F0-29	0xF01D	Load type	0: High-load application	0	-	At stop
F0-30	0xF01E	Switch for ignoring DI shutdown command	0: Off 1: On	0	-	Real time

9.2 Group F1 Motor 1 Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F1-00	0xF100	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Permanent magnet synchronous motor 3: Synchronous reluctance motor without permanent magnet 4: Electromagnetic coil 5: Permanent magnet assisted synchronous reluctance motor	0	-	At stop
F1-01	0xF101	Rated motor power	0.1 to 1000.0	3.7	kW	At stop
F1-02	0xF102	Rated motor voltage	1 to 2000	380	V	At stop
F1-03	0xF103	Rated motor current	0.01 to 655.35	9.00	A	At stop
F1-04	0xF104	Rated motor frequency	0.01 to F0-10	50.00	Hz	At stop
F1-05	0xF105	Rated motor speed	1 to 65535	1460	rpm	At stop
F1-06	0xF106	Stator resistance of asynchronous motor	0.001 to 65.535	1.204	Ω	Real time
F1-07	0xF107	Rotor resistance of asynchronous motor	0.001 to 65.535	0.908	Ω	Real time
F1-08	0xF108	Leakage inductance of asynchronous motor	0.01 to 655.35	5.28	mH	Real time
F1-09	0xF109	Mutual inductance of asynchronous motor	0.1 to 6553.5	156.8	mH	Real time
F1-10	0xF10A	No-load current of asynchronous motor	0.01 to F1-03	4.20	A	Real time
F1-15	0xF10F	No-load current of asynchronous motor	0: Disable 1: Activation 1 2: Activation 2 (speed limit) 3: Reserved	0	-	At stop
F1-16	0xF110	Stator resistance of synchronous motor	0.001 to 65.535	1.204	Ω	Real time
F1-17	0xF111	D-axis inductance of synchronous motor	0.01 to 655.35	5.28	mH	Real time
F1-18	0xF112	Q-axis inductance of synchronous motor	0.01 to 655.35	5.28	mH	Real time
F1-20	0xF114	Back EMF of synchronous motor	0.0 to 6553.5	350.0	V	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F1-27	0xF11B	Encoder pulses per revolution	1 to 65535	1024	-	At stop
F1-28	0xF11C	Encoder type	0: ABZ incremental encoder 1: 23-bit encoder 2: Resolver 3: External input 4: Sin-cos encoder	0	-	At stop
F1-29	0xF11D	PG card selection for speed feedback	0: Main PG card 1: Auxiliary PG card	0	-	At stop
F1-30	0xF11E	A/B phase sequence of encoder	0: Forward 1: Reverse	0	-	At stop
F1-31	0xF11F	Encoder mounting position angle	0.0 to 359.9	0.0	°	At stop
F1-33	0xF121	Rated speed of high-speed motor	0 to 65535	0	-	At stop
F1-34	0xF122	Number of resolver pole pairs	1 to 65535	1	-	At stop
F1-35	0xF123	Sin-Cos encoder frequency-division output coefficient	4 to 65532	4	-	At stop
F1-36	0xF124	Speed feedback PG open circuit detection time	0.0 to 10.0	0.0	s	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F1-37	0xF125	Motor parameter auto-tuning mode	0: No operation 1: Auto-tuning of some parameters of the asynchronous motor in static state 2: Auto-tuning of parameters of the asynchronous motor in dynamic state 3: Auto-tuning of all parameters of the asynchronous motor in static state 4: Inertia auto-tuning 5: Dead zone auto-tuning 7: Auto-tuning of inductance saturation model 8: Back EMF auto-tuning 11: With-load auto-tuning of parameters of the synchronous motor (back EMF excluded) 12: No-load auto-tuning of parameters of the synchronous motor in dynamic state 13: With-load auto-tuning of parameters of the synchronous motor in rotation (zero point angle excluded) 14: Auto-tuning of gain deviation between phases U and V 15: Reluctance motor MTPA 21: Auto-tuning of parameters of the reluctance motor in static state 22: Auto-tuning of parameters of the reluctance motor in dynamic state	0	-	At stop
F1-38	0xF126	Motor 1 model input window (tuning-free mode)	0: Self-set motor 1: MV33_18.5 kW (for test only)	0	-	At stop
F1-39	0xF127	Motor 1 model display (tuning-free mode)	Same as F1-38	0	-	Unchangeable

9.3 Group F2 Motor 1 Vector Control Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F2-00	0xF200	Speed loop proportional gain 1	1 to 300	30	-	Real-time
F2-01	0xF201	Speed loop integral time 1	0.01 to 10.00	0.50	s	Real-time
F2-02	0xF202	Switchover frequency 1	0.00 to F2-05	5.00	Hz	Real-time
F2-03	0xF203	Speed loop proportional gain 2	1 to 300	20	-	Real-time
F2-04	0xF204	Speed loop integral time 2	0.01 to 10.00	1.00	s	Real-time
F2-05	0xF205	Switchover frequency 2	F2-02 to F0-10	10.00	Hz	Real-time
F2-06	0xF206	Vector control slip gain	50 to 200	100	%	Real-time
F2-07	0xF207	Speed feedback filter time in SVC mode	0.000 to 0.100	0.015	s	Real-time
F2-09	0xF209	Torque upper limit source in speed control mode (motoring)	0: F2-10 1: AI1 2: AI2 3: AI3 4: Pulse reference 5: Communication setting 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) Other: F connector	0	-	Real-time
F2-10	0xF20A	Digital setting of torque upper limit in speed control mode	0.0 to 600.0	150.0	%	Real-time
F2-11	0xF20B	Torque upper limit source in speed control mode (generating)	0: F2-10 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication setting 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) 8: F2-12 Other: F connector	0	-	Real-time
F2-12	0xF20C	Digital setting of torque upper limit in speed control mode (generating)	0.0 to 600.0	150.0	%	Real-time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F2-18	0xF212	Current loop mode of synchronous motor	0: No field weakening 1: Auto-tuning mode 2: Calculation+Auto-tuning 3: Synchronous motor normal mode 4: Asynchronous motor normal mode	1	-	At stop
F2-19	0xF213	Field weakening gain	0.1 to 200.0	20.0	-	Real-time
F2-22	0xF216	Generating power limit	0: Disabled 1: Enabled in the whole process 2: Enabled at constant speed 3: Enabled during deceleration	0	-	Real-time
F2-23	0xF217	Generating power upper limit	0.0 to 200.0	20.0	%	Real-time
F2-24	0xF218	Initial position angle detection current of synchronous motor	50 to 180	80	-	At stop
F2-25	0xF219	Synchronous motor initial position angle detection	0: Detected every time upon operation 1: Not detected 2: Detected upon initial operation after power-on	0	-	Real-time
F2-27	0xF21B	Saliency ratio adjustment gain of synchronous motor	0.20 to 3.00	1.00	-	Real-time
F2-28	0xF21C	Control on maximum ratio of torque to current of synchronous motor	0: Disabled 1: Enabled	1	-	Real-time
F2-32	0xF220	Signal Z correction	0: Disable 1: Enable	1	-	Real-time
F2-37	0xF225	Low speed carrier frequency	0.5 to F0-15	2.0	kHz	Real-time
F2-43	0xF22B	Position lock enable	0 to 1	0	-	Real-time
F2-44	0xF22C	Switchover frequency	0.00 to F2-02	0.30	Hz	Real-time
F2-45	0xF22D	Zero servo speed loop proportional gain	1 to 100	10	-	Real-time
F2-46	0xF22E	Position lock speed loop integral time	0.01 to 10.00	0.50	s	Real-time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F2-49	0xF231	Motor tuning-free mode	0: Auto-tuning disabled 1: Auto-tuning enabled before initial operation after power-on 2: Auto-tuning enabled before operation	0	-	Real-time
F2-50	0xF232	Encoder direction auto-tuning and pre-positioning current	0.0 to 800.0	100.0	%	Real-time
F2-51	0xF233	Initial position compensation angle	0.0 to 359.9	0.0	-	Real-time

9.4 Group F3 V/f Control Parameter 1

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-00	0xF300	V/f curve setting	0: V/f line 1: Multi-point V/f curve 2-9: Reserved 10: V/f fully-decoupled mode 11: V/f semi-decoupled mode	0	-	At stop
F3-01	0xF301	Torque boost	0.0 to 30.0	3.0	%	Real time
F3-02	0xF302	Cut-off frequency of torque boost	0.00 to F0-10	50.00	Hz	At stop
F3-03	0xF303	Frequency 1 on multi-point V/f curve	0.00 to F3-05	0.00	Hz	At stop
F3-04	0xF304	Voltage 1 on multi-point V/f curve	0.0 to 100.0	0.0	%	At stop
F3-05	0xF305	Frequency 2 on multi-point V/f curve	F3-03 to F3-07	0.00	Hz	At stop
F3-06	0xF306	Voltage 2 on multi-point V/f curve	0.0 to 100.0	0.0	%	At stop
F3-07	0xF307	Frequency point 3 on multi-point V/f curve	F3-05 to F1-04	0.00	Hz	At stop
F3-08	0xF308	Voltage point 3 on multi-point V/f curve	0.0 to 100.0	0.0	%	At stop
F3-09	0xF309	Slip compensation gain in V/f mode	0.0 to 6553.5	0.0	-	Real time
F3-10	0xF30A	Over-excitation gain in V/f mode	0 to 200	64	-	Real time
F3-11	0xF30B	Oscillation suppression gain in V/f mode	0 to 100	40	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-12	0xF30C	Oscillation suppression in V/f mode	0: Disable 1: Enable	1	-	Real time
F3-13	0xF30D	Voltage source in V/f decoupled mode	0: Digital setting (F3-14) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Multi-reference 6: Simple PLC 7: PID 8: Communication Others: F connector	0	-	Real time
F3-14	0xF30E	Voltage digital setting in V/f decoupled mode	0 to F1-02	0	V	Real time
F3-15	0xF30F	Voltage rise time in V/f decoupled mode	0.0 to 1000.0	0.0	s	Real time
F3-16	0xF310	Voltage decline time in V/f decoupled mode	0.0 to 1000.0	0.0	s	Real time
F3-17	0xF311	Stop mode in V/f decoupled mode	0: Frequency and voltage decline to 0. 1: Frequency declines to 0 after voltage declines to 0. 2: Coast to stop (newly added)	0	-	Real time
F3-18	0xF312	Action current of overcurrent stall suppression	50 to 200	150	%	At stop
F3-19	0xF313	Overcurrent stall suppression	0: Disable 1: Enable	1	-	At stop
F3-20	0xF314	Overcurrent stall suppression gain	1 to 500	20	-	Real time
F3-21	0xF315	Action current compensation coefficient for overcurrent stall at multiplied rated frequency	50 to 200	100	%	At stop
F3-22	0xF316	Overvoltage stall suppression action voltage in V/f mode	330.0 to 800.0	770.0	V	Real time
F3-23	0xF317	Overvoltage stall suppression in V/f mode	0: Disable 1: Enable	1	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-24	0xF318	Frequency gain for overvoltage stall suppression in V/f mode	1 to 500	30	-	Real time
F3-25	0xF319	Voltage gain for overvoltage stall suppression in V/f mode	1 to 500	30	-	Real time
F3-26	0xF31A	Frequency rise limit for overvoltage stall suppression in V/f mode	0 to 50	5	Hz	At stop
F7-27	0xF31B	Filter time of slip compensation	0.1 to 10.0	0.5	s	At stop
F3-28	0xF31C	Multi-point curve selection	0: Three-point curve 1: Multi-point curve module A 2: Multi-point curve module B	0	-	At stop
F3-29	0xF31D	Frequency for PWM inhibition at zero speed	0.0 to 100.0	1.0	%	At stop
F3-30	0xF31E	PWM inhibition hysteresis at zero speed	0.0 to 100.0	0.5	%	At stop
F3-31	0xF31F	PWM inhibition at zero speed	0: Inactive 1: Enable	0	-	At stop
F3-33	0xF321	Online torque compensation gain	80 to 150	100	-	At stop
F3-34	0xF322	Overcurrent stall suppression Ki coefficient	10 to 1000	100	%	At stop
F3-35	0xF323	Overcurrent stall suppression threshold (rated motor current as the base)	80 to 300	200	%	At stop
F3-36	0xF324	Frequency for activating field weakening upon overcurrent stall suppression	100 to 500	100	%	At stop
F3-37	0xF325	IT filter time	10 to 1000	100	ms	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-38	0xF326	Slip compensation mode	0: Off 1: Without PG card slip compensation 2: With PG card slip compensation	1	-	At stop
F3-39	0xF327	Permissible operation time upon overvoltage suppression	0.0 to 100.0	0.0	s	At stop
F3-40	0xF328	Voltage upper limit in V/f decoupled mode	50.0 to 200.0	100.0	%	At stop
F3-41	0xF329	RFG time of the frequency in V/f decoupled mode	0: RFG time is forcibly set to zero. 1: Preset RFG time	0	-	At stop
F3-42	0xF32A	Cut-off frequency of oscillation suppression filter in V/f mode	1.0 to 50.0	8.0	Hz	Real time
F3-43	0xF32B	Effective cut-off frequency of oscillation suppression in V/f mode	10 to 3000	200	Hz	Real time
F3-44	0xF32C	Overvoltage suppression feedforward coefficient	0 to 500	0	%	Real time
F3-45	0xF32D	Synchronous motor IF selection	0: Disable 1: Low speed IF 2: High-frequency injection in SVC mode 3: Reserved	0	-	At stop
F3-46	0xF32E	Synchronous motor IF current	0.0 to 200.0	50.0	%	Real time
F3-47	0xF32F	IF switchover frequency of synchronous motor	0.0 to 100.0	2.5	%	Real time
F3-48	0xF330	IF switchover hysteresis frequency of synchronous motor	0.0 to 100.0	2.5	%	Real time
F3-49	0xF331	IF current switchover time of synchronous motor	0.001 to 20.000	1.000	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-50	0xF332	VVCTLC processing at low speed	0: Disable 1: Low-speed IF; IF is not switched back during deceleration. 2: High-frequency injection in TLC mode 3: Low-speed IF; IF is switched back during deceleration.	1	-	At stop
F3-51	0xF333	PMVVC low-speed IF current	0 to 250	60	-	Real time
F3-52	0xF334	PMVVC low-speed IF switchover speed threshold	0.0 to 100.0	10.0	%	Real time
F3-53	0xF335	PMVVC oscillation suppression gain coefficient	0 to 500	100	-	Real time
F3-54	0xF336	PMVVC filter time constant	0 to 500	80	-	Real time
F3-55	0xF337	PMVVC energy-saving control mode	0: Fixed V/f line 1: Fixed to 30% of reactive current 2: MTPA control	2	-	At stop
F3-56	0xF338	VVC current loop adaptation coefficient	0 to 1000	100	%	Real time
F3-57	0xF339	MTPA adaptation coefficient of VVC	0 to 1000	100	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-58	0xF33A	TLC control word	bit0: CPC enable 0: Disable 1: Enable bit1: Speed source 0: Source 1 1: Source 2 bit2: Angle source 0: Source 1 1: Source 2 bit3: Energy-saving mode 0: Mode 1 1: Mode 2 bit4: Inductance calculation 0: Use saturation model 1: Not use saturation model bit5: Inverse curve 0: Enable 1: Disable bit6: Overvoltage suppression optimization 0: Enable 1: Disable bit7: Undervoltage suppression optimization 0: Enable 1: Disable bit8: Switch back to IF mode 0: Default 1: Non-default	1	-	Real time
F3-59	0xF33B	TLC phase lock loop amplification coefficient	0.1 to 5000.0	100.0	%	Real time
F3-60	0xF33C	TLC control enable switch	0 to 1	0	-	At stop
F3-61	0xF33D	Field weakening coefficient for TLC control	0.0 to 5000.0	100.0	%	Real time
F3-62	0xF33E	d-axis proportion of TLC control	0.0 to 5000.0	100.0	%	Real time
F3-63	0xF33F	d-axis integral in TLC control mode	0.0 to 5000.0	100.0	%	Real time
F3-64	0xF340	q-axis proportion in TLC control mode	0.0 to 5000.0	100.0	%	Real time
F3-65	0xF341	q-axis integral in TLC control mode	0.0 to 5000.0	100.0	%	Real time
F3-66	0xF342	Lower limit of TLC setting	0.0 to 1000.0	0.0	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-67	0xF343	Waiting time of TLC switchover	0 to 10000	500	ms	At stop
F3-68	0xF344	TLC setting coefficient	0.1 to 1000.0	100.0	%	Real time
F3-69	0xF345	Coil control mode	0: V/f separation mode 1: IF separation mode	0	-	At stop
F3-70	0xF346	Voltage source for coil IF separation	0: Digital setting (F3-71) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Multi-reference 6: Simple PLC 7: PID 8: Communication Others: F connector	0	-	Real time
F3-71	0xF347	Current reference for coil IF separation	1.00 to 120.00	20.00	%	Real time
F3-72	0xF348	Voltage rise time for coil IF separation	0.000 to 65.000	0.000	s	Real time
F3-73	0xF349	Current fall time for coil IF separation	0.000 to 65.000	0.000	s	Real time
F3-74	0xF34A	Max. current value for coil IF separation	1.00 to 120.00	100.00	%	At stop
F3-75	0xF34B	Stop mode for coil IF separation	0: Frequency and current decline to 0 independently. 1: Frequency declines to 0 after current declines to 0. 2: Coast to stop	2	-	Real time
F3-76	0xF34C	PM observer stator resistance coefficient	0 to 1000	0	%	Real time
F3-77	0xF34D	Waiting time of PM observer auto-tuning	0 to 1000	0	s	Real time
F3-78	0xF34E	Coil IF separation current control coefficient	1 to 1000	50	-	Real time
F3-79	0xF34F	Coil IF separation sub-controller switch	0 to 1	0	-	Real time
F3-80	0xF350	Proportional coefficient of coil IF separation sub-controller	1 to 1000	100	%	Real time
F3-81	0xF351	Integral coefficient of coil IF separation sub-controller	1 to 1000	100	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F3-82	0xF352	Voltage limit of coil IF separation sub-controller	1 to 100	40	%	Real time
F3-83	0xF353	Coil transformer change ratio	1.0 to 100.0	1.0	-	At stop
F3-85	0xF355	Synchronous motor observer switchover	0: Mode 0 1: Mode 1	0	-	Real time
F3-86	0xF356	Switchover frequency of synchronous motor in SVC mode	0.0 to 100.0	10.0	%	Real time
F3-87	0xF357	Switchover hysteresis frequency of synchronous motor in SVC mode	0.0 to 100.0	5.0	%	Real time
F3-88	0xF358	Parameter 0 of synchronous motor in SVC mode	0 to 100	3	-	Real time
F3-89	0xF359	Parameter 1 lower limit of synchronous motor in SVC mode	1 to 100	1	-	Real time
F3-90	0xF35A	Parameter 6 of synchronous motor in SVC mode	1 to 10	10	-	Real time

9.5 Group F4 Input Terminals

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-00	0xF400	DI1 function selection	0: No function 1: Forward run (IN1) 2: Reverse run (IN2) 3: Three-wire control (IN3) 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as UP key for frequency adjustment 7: Function as DOWN key for frequency adjustment 8: Coast to stop 9: Fault reset (RESET) 10: Operation pause 11: External fault NO input 12: Multi-reference terminal 1 13: Multi-reference terminal 2 14: Multi-reference terminal 3 15: Multi-reference terminal 4 16: Acceleration/ Deceleration selection terminal 1 17: Acceleration/ Deceleration selection terminal 2 18: Frequency reference switchover 19: Clear data set by terminal functioning as UP/DOWN key 20: Control command source switchover terminal 1 21: Acceleration/ Deceleration inhibited 22: PID pause 23: Simple PLC status reset 24: Swing frequency pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control inhibited (Continued)	1	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-00	0xF400	DI1 function selection	(Continued) 30: Pulse frequency input (valid only for DI5) 31: Reserved 32: Immediate DC braking 33: External fault NC input 34: Frequency modification enable 35: PID acting direction inversion 36: External stop terminal 1 37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency X and preset frequency 40: Switchover between auxiliary frequency Y and preset frequency 41: Motor selection terminal 1 42: Reserved 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed/Torque control selection 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: Present operating time clear 51: Two-wire/Three-wire mode switchover 52: Reverse running inhibited 53: Thickness accumulation 54: Roll diameter reset (Continued)	1	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-00	0xF400	DI1 function selection	(Continued) 55: Initial roll diameter source selection terminal 1 56: Initial roll diameter source selection terminal 2 57: Pre-driving 58: Switching between winding and unwinding 59: Roll diameter calculation stopped 60: Tension mode deactivated 61: Terminal tension boost 62: Material thickness selection terminal 1 63: Material thickness selection terminal 2 64: Forward limit switch 65: Reverse limit switch 66: Water-cooling fault input 67: Low liquid level fault input 68: Position synchronization - Pulse reference increase 69: Position synchronization - Pulse reference decrease 70: Control channel selection 71: Setting channel selection (reserved) (Continued)	1	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-00	0xF400	DI1 function selection	(Continued) 72: Terminal module A/B selection 73: Startup mode selection bit0 74: Startup mode selection bit1 75: Control command switchover terminal 3 76: Motor selection terminal 2 77: Running enable 78: Forward run permission 79: Reverse run permission 80: RFG input set to zero 81: Passive unwinding compensation 82: Positioning control enable with forward command (IN1) 83: Positioning control enable with reverse command (IN2) 84: Synchronous control enable with forward command (IN1) 85: Synchronous control enable with reverse command (IN2) 86: Wire breakage detection (wire drawing machine) 87: Forward deceleration limit switch 88: Reverse deceleration limit switch 89: Emergency stop PI enable	1	-	At stop
F4-01	0xF401	DI2 function selection	Same as F4-00	4	-	At stop
F4-02	0xF402	DI3 function selection	Same as F4-00	9	-	At stop
F4-03	0xF403	DI4 function selection	Same as F4-00	12	-	At stop
F4-04	0xF404	DI5 function selection	Same as F4-00	13	-	At stop
F4-05	0xF405	DI6 function selection	Same as F4-00	0	-	At stop
F4-06	0xF406	DI7 function selection	Same as F4-00	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-07	0xF407	DI8 function selection	Same as F4-00	0	-	At stop
F4-08	0xF408	DI9 function selection	Same as F4-00	0	-	At stop
F4-09	0xF409	DI10 function selection	Same as F4-00	0	-	At stop
F4-10	0xF40A	DI filter time	0.000 to 1.000	0.010	s	Real time
F4-11	0xF40B	Terminal command mode	0: Two-wire mode 1 1: Two-wire mode 2 2: Three-wire mode 1 3: Three-wire mode 2	0	-	At stop
F4-12	0xF40C	Step value of frequency adjusted by terminal functioning as UP/ DOWN keys	0.001 to 65.535	1.000	Hz/s	Real time
F4-13	0xF40D	Minimum input of AI curve 1	-10.00 to F4-15	0.00	V	Real time
F4-14	0xF40E	Percentage corresponding to the minimum input of AI curve 1	-100.0 to +100.0	0.0	%	Real time
F4-15	0xF40F	Maximum input of AI curve 1	F4-13 to 10.00	10.00	V	Real time
F4-16	0xF410	Percentage corresponding to the maximum input of AI curve 1	-100.0 to +100.0	100.0	%	Real time
F4-17	0xF411	AI1 filter time	0.00 to 10.00	0.10	s	Real time
F4-18	0xF412	Minimum input of AI curve 2	-10.00 to F4-20	0.00	V	Real time
F4-19	0xF413	Percentage corresponding to the minimum input of AI curve 2	-100.0 to +100.0	0.0	%	Real time
F4-20	0xF414	Maximum input of AI curve 2	F4-18 to 10.00 V	10.00	V	Real time
F4-21	0xF415	Percentage corresponding to the maximum input of AI curve 2	-100.0 to +100.0	100.0	%	Real time
F4-22	0xF416	AI2 filter time	0.00 to 10.00	0.10	s	Real time
F4-23	0xF417	Minimum input of AI curve 3	-10.00 to F4-25	-10.00	V	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-24	0xF418	Percentage corresponding to the minimum input of AI curve 3	-100.0 to +100.0	-100.0	%	Real time
F4-25	0xF419	Maximum input of AI curve 3	F4-23 to 10.00	10.00	V	Real time
F4-26	0xF41A	Percentage corresponding to the maximum input of AI curve 3	-100.0 to +100.0	100.0	%	Real time
F4-27	0xF41B	AI3 filter time	0.00 to 10.00	0.10	s	Real time
F4-28	0xF41C	Minimum frequency for pulse input	0.00 to F4-30	0.00	kHz	Real time
F4-29	0xF41D	Scaling of minimum frequency for pulse input	-100.0 to +100.0	0.0	%	Real time
F4-30	0xF41E	Maximum frequency for pulse input	F4-28 to 100.00	50.00	kHz	Real time
F4-31	0xF41F	Scaling of maximum frequency for pulse input	-100.0 to +100.0	100.0	%	Real time
F4-32	0xF420	Pulse filter time	0.00 to 10.00	0.10	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-33	0xF421	AI curve selection	Ones: AI1 curve selection 1: Curve 1 (2 points, see F4-13 to F4-16) 2: Curve 2 (2 points, see F4-18 to F4-21) 3: Curve 3 (2 points, see F4-23 to F4-26) 4: Curve 4 (4 points, see A6-00 to A6-07) 5: Curve 5 (4 points, see A6-08 to A6-15) Tens: AI2 curve selection 1: Curve 1 (2 points, see F4-13 to F4-16) 2: Curve 2 (2 points, see F4-18 to F4-21) 3: Curve 3 (2 points, see F4-23 to F4-26) 4: Curve 4 (4 points, see A6-00 to A6-07) 5: Curve 5 (4 points, see A6-08 to A6-15) Hundreds: AI3 curve selection 1: Curve 1 (2 points, see F4-13 to F4-16) 2: Curve 2 (2 points, see F4-18 to F4-21) 3: Curve 3 (2 points, see F4-23 to F4-26) 4: Curve 4 (4 points, see A6-00 to A6-07) 5: Curve 5 (4 points, see A6-08 to A6-15)	0x321	-	Real time
F4-34	0xF422	AI lower limit selection	Ones: Setting for AI1 lower than minimum input 0: Minimum value 1: 0.0% Tens: Setting for AI2 lower than minimum input 0: Minimum value 1: 0.0% Hundreds: Setting for AI3 lower than minimum input 0: Minimum value 1: 0.0%	0x0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-38	0xF426	DI active mode selection 1	Ones: DI1 0: Active high 1: Active low Tens: DI2 0: Active high 1: Active low Hundreds: DI3 0: Active high 1: Active low Thousands: DI4 0: Active high 1: Active low Ten thousands: DI5 0: Active high 1: Active low	0	-	At stop
F4-39	0xF427	DI active mode selection 2	Ones: DI6 0: Active high 1: Active low Tens: DI7 0: Active high 1: Active low Hundreds: DI8 0: Active high 1: Active low Thousands: DI9 0: Active high 1: Active low Ten thousands: DI10 0: Active high 1: Active low	0	-	At stop
F4-41	0xF429	DI1 switch-on delay	0.0 to 3600.0	0.0	s	At stop
F4-42	0xF42A	DI1 switch-off delay	0.0 to 3600.0	0.0	s	At stop
F4-43	0xF42B	DI2 switch-on delay	0.0 to 3600.0	0.0	s	At stop
F4-44	0xF42C	DI2 switch-off delay	0.0 to 3600.0	0.0	s	At stop
F4-45	0xF42D	DI3 switch-on delay	0.0 to 3600.0	0.0	s	At stop
F4-46	0xF42E	DI3 switch-off delay	0.0 to 3600.0	0.0	s	At stop
F4-47	0xF42F	DI4 switch-on delay	0.0 to 3600.0	0.0	s	At stop
F4-48	0xF430	DI4 switch-off delay	0.0 to 3600.0	0.0	s	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-49	0xF431	Force DI data	bit0: DI1 setting 0: Inactive level 1: Active level bit1: DI2 setting 0: Inactive level 1: Active level bit2: DI3 setting 0: Inactive level 1: Active level bit3: DI4 setting 0: Inactive level 1: Active level bit4: DI5/HDI setting 0: Inactive level 1: Active level bit5: DI6 setting 0: Inactive level 1: Active level bit6: DI7 setting 0: Inactive level 1: Active level bit7: DI8 setting 0: Inactive level 1: Active level bit8: DI9 setting 0: Inactive level 1: Active level bit9: DI10 setting 0: Inactive level 1: Active level bit10 to bit15: Reserved	0x0	-	Real time
F4-52	0xF434	DI2 hardware source	0: Hardware 1: Forced value Others: B connector	0	-	At stop
F4-53	0xF435	DI3 hardware source	Same as F4-52	0	-	At stop
F4-54	0xF436	DI4 hardware source	Same as F4-52	0	-	At stop
F4-55	0xF437	DI5/HDI hardware source	Same as F4-52	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-56	0xF438	DI6 hardware source	0: Hardware 1: Forced value 2: Communication 3: Reserved 4: Determined by AI1 5: AI2 6: AI3 11: DI1 12: DI2 13: DI3 14: DI4 15: DI5/HDI 17: DI7 18: DI8 19: DI9 20: DI10 21: VDI1 22: VDI2 23: VDI3 24: VDI4 25: VDI5 26: VDI6 36: Reserved 38: Reserved 39: Reserved 44: Reserved 51: Relay 1 52: Relay 2 53: DO1 54: Relay on expansion card 55: DO2 on expansion card 56 to 66: VDO1 to VDO11 Others: B connector	0	-	At stop
F4-57	0xF439	DI7 hardware source	Same as F4-56	0	-	At stop
F4-58	0xF43A	DI8 hardware source	Same as F4-56	0	-	At stop
F4-59	0xF43B	DI9 hardware source	Same as F4-56	0	-	At stop
F4-60	0xF43C	DI10 hardware source	Same as F4-56	0	-	At stop
F4-61	0xF43D	DI5/HDI terminal type selection	0: Used as HDI 1: Used as DI	1	-	Unchangeable
F4-62	0xF43E	HDI polarity	0: Normal value 1: Absolute value 2: Inverted value 3: Opposite to absolute value	0	-	Real time
F4-63	0xF43F	HDI input	0: Disable 1: Enable Others: B connector	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F4-64	0xF440	HDI hardware source	0: Hardware sampling 1: Forced value	0	-	Real time
F4-65	0xF441	HDI forced value	0.00 to 100.00	1.00	kHz	Real time
F4-66	0xF442	Minimum input of HDI four-point curve	0.00 to F4-68	10.00	kHz	Real time
F4-67	0xF443	Scaling of minimum input of four-point HDI curve	-100.0 to +100.0	-100.0	%	Real time
F4-68	0xF444	Inflection point 1 input of HDI four-point curve	F4-66 to F4-70	40.00	kHz	Real time
F4-69	0xF445	Scaling of inflection point 1 input of four-point HDI curve	-100.0 to +100.0	-30.0	%	Real time
F4-70	0xF446	Inflection point 2 input of HDI four-point curve	F4-68 to F4-72	70.00	kHz	Real time
F4-71	0xF447	Scaling of inflection point 2 input of four-point HDI curve	-100.0 to +100.0	30.0	%	Real time
F4-72	0xF448	Maximum input of HDI four-point curve	F4-70 to 100.00	100.00	kHz	Real time
F4-73	0xF449	Scaling of maximum input of four-point HDI curve	-100.0 to +100.0	100.0	%	Real time
F4-74	0xF44A	HDI curve setting	Ones: HDI curve selection 0: Two-point curve 1: Four-point curve	0	-	Real time
F4-75	0xF44B	HDI de-noising threshold	0.0 to 10.0	0.0	%	Real time
F4-76	0xF44C	HDI curve upper/ lower limit selection	0: Limited 1: Not limited	0	-	Real time

9.6 Group F5 Output Terminals

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F5-00	0xF500	FM multi-functional terminal output selection	0: Pulse output (FMP) 1: Digital output (FMR)	0	-	Real time
F5-01	0xF501	FMR output function selection	0: No output 1: AC drive in operation 2: Fault 3: Frequency level detection FDT1 4: Frequency arrival 5: Operating at zero speed (OFF at stop) 6: Motor overload pre-alarm 7: AC drive overload pre-alarm 8: Set count value arrival 9: Specified count value arrival 10: Length arrival 11: Simple PLC cycle completed 12: Cumulative running time reached 13: Swing frequency limited 14: Torque limited 15: Ready to run 16: AI1 > AI2 17: Frequency upper limit arrival 18: Frequency lower limit arrival (OFF at stop) 19: Undervoltage state 20: Communication setting 21: Brake output 22: Positioning completed 23: Operating at zero speed (ON at stop) 24: Cumulative power-on time arrival 25: Frequency level detection (FDT2) 26: Frequency 1 arrival 27: Frequency 2 arrival 28: Current 1 arrival (Continued)	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F5-01	0xF501	FMR output function selection	(Continued) 29: Current 2 arrival 30: Timing arrival 31: AI1 input limit exceeded 32: Load loss 33: Reverse run in progress 34: Zero current state 35: Module temperature arrival 36: Output current limit exceeded 37: Frequency lower limit arrival (ON at stop) 38: Alarm (all faults) 39: Motor overtemperature 40: Current operating time arrival 41: Fault (excluding undervoltage) 42: STO 43: Operation limited 44: Brake output at stop (wire drawing machine) 45: Position lock completed Others: B connector	0	-	Real time
F5-02	0xF502	Output function selection of control panel relay (T/A-T/B-T/C)	Same as F5-01	2	-	Real time
F5-03	0xF503	Output function selection of DO4 on expansion card relay (P/A-P/B-P/C)	Same as F5-01	0	-	Real time
F5-04	0xF504	DO1 output function selection	Same as F5-01	1	-	Real time
F5-05	0xF505	Output function selection of DO2 on expansion card	Same as F5-01	4	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F5-06	0xF506	FMP output function selection	0: Operating frequency 1: Frequency reference 2: Output current 3: Output torque (absolute value) 4: Output power 5: Output voltage 6: Pulse input 7: AI1 8: AI2 9: AI3 10: Length 11: Count value 12: Communication 13: Motor speed 14: Output current. 100.0% corresponds to 1000 or 1000.0 A. 15: Bus voltage. 100.0% corresponds to 1000 or 1000.0 V. 16: Output torque (actual value) 17: Taper output 18: Roll diameter output 19: Tension output Others: F connector	0	-	Real time
F5-07	0xF507	AO1 function selection	Same as F5-06	0	-	Real time
F5-08	0xF508	Output function selection of AO2 on expansion card	Same as F5-06	1	-	Real time
F5-09	0xF509	Maximum frequency of FMP output	0.01 to 100.00	50.00	kHz	Real time
F5-10	0xF50A	AO1 zero offset coefficient	-100.0 to +100.0	0.0	%	Real time
F5-11	0xF50B	AO1 gain	-10.00 to +10.00	1.00	-	Real time
F5-12	0xF50C	AO2 zero offset coefficient	-100.0 to +100.0	0.0	%	Real time
F5-13	0xF50D	AO2 gain	-10.00 to +10.00	1.00	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F5-22	0xF516	DO active state selection	Ones: FMR 0: Positive logic 1: Negative logic Tens: Relay 1 (DO3) 0: Positive logic 1: Negative logic Hundreds: Relay 2 (DO4) 0: Positive logic 1: Negative logic Thousands: DO1 0: Positive logic 1: Negative logic Ten thousands: DO2 0: Positive logic 1: Negative logic	0	-	Real time
F5-24	0xF518	Switch-on delay of control board relay (DO3)	0.0 to 3600.0	0.0	s	Real time
F5-25	0xF519	Switch-off delay of control board relay (DO3)	0.0 to 3600.0	0.0	s	Real time
F5-26	0xF51A	FMR output switch-on delay	0.0 to 3600.0	0.0	s	Real time
F5-27	0xF51B	FMR output switch-off delay	0.0 to 3600.0	0.0	s	Real time
F5-28	0xF51C	DO1 output switch-on delay	0.0 to 3600.0	0.0	s	Real time
F5-29	0xF51D	DO1 output switch-off delay	0.0 to 3600.0	0.0	s	Real time
F5-30	0xF51E	Switch-on delay of expansion card relay (DO4)	0.0 to 3600.0	0.0	s	Real time
F5-31	0xF51F	Switch-off delay of expansion card relay (DO4)	0.0 to 3600.0	0.0	s	Real time
F5-32	0xF520	Switch-on delay of expansion card DO2 output	0.0 to 3600.0	0.0	s	Real time
F5-33	0xF521	Switch-off delay of expansion card DO2 output	0.0 to 3600.0	0.0	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F5-34	0xF522	DO/RO output source	bit0: Relay 1 (DO3) output source 0: Output function setting 1: Communication bit1: FMR output source 0: Output function setting 1: Communication bit2: DO1 output source 0: Output function setting 1: Communication bit3: Relay 2 (DO4) output source 0: Output function setting 1: Communication bit4: DO2 output source 0: Output function setting 1: Communication bit5: VDO1 output source 0: Output function setting 1: Communication bit6: VDO2 output source 0: Output function setting 1: Communication bit7: VDO3 output source 0: Output function setting 1: Communication bit8: VDO4 output source 0: Output function setting 1: Communication bit9: VDO5 output source 0: Output function setting 1: Communication bit10: VDO6 output source 0: Output function setting 1: Communication bit11: VDO7 output source 0: Output function setting 1: Communication bit12: VDO8 output source 0: Output function setting 1: Communication bit13: VDO9 output source 0: Output function setting 1: Communication bit14: VDO10 output source 0: Output function setting 1: Communication bit15: VDO11 output source 0: Output function setting 1: Communication	0x0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F5-35	0xF523	DO/RO output terminal communication setting	Same as F5-34	0x0	-	Real time
F5-36	0xF524	Minimum input of AO1 curve	-100.0 to F5-38	0.0	%	Real time
F5-37	0xF525	Percentage corresponding to minimum input of AO1 curve	0.00 to 10.00	0.00	V	Real time
F5-38	0xF526	Maximum input of AO1 curve	F5-36 to 100.0	100.0	%	Real time
F5-39	0xF527	Percentage corresponding to maximum input of AO1 curve	0.00 to 10.00	10.00	V	Real time
F5-40	0xF528	AO1 output offset	-10.00 to +10.00	0.00	V	Real time
F5-41	0xF529	Minimum input of AO2 curve	-100.0 to F5-43	0.0	%	Real time
F5-42	0xF52A	Setting corresponding to AO2 curve minimum input	0.00 to 10.00	0.00	V	Real time
F5-43	0xF52B	Maximum input of AO2 curve	F5-41 to 100.0	100.0	%	Real time
F5-44	0xF52C	Setting corresponding to AO2 curve maximum input	0.00 to 10.00	10.00	V	Real time
F5-45	0xF52D	AO2 output offset	-10.00 to +10.00	0.00	V	Real time
F5-46	0xF52E	AO curve selection	Ones: AO1 curve 0: Two-point curve 1: Gain+Offset Tens: AO2 curve 0: Two-point curve 1: Gain+Offset	11	-	Real time
F5-47	0xF52F	AO polarity selection	Ones: AO1 selection 0: Normal value 1: Absolute value 2: Inverted value 3: Opposite to absolute value Tens: AO2 selection 0: Normal value 1: Absolute value 2: Inverted value 3: Opposite to absolute value	11	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F5-48	0xF530	AO hardware source	Ones: AO1 source 0: Output function setting 1: Forced value Tens: AO2 source 0: Output function setting 1: Forced value	0	-	Real time
F5-49	0xF531	AO forced value 1	0.00 to 10.00	0.00	V	Real time
F5-50	0xF532	AO forced value 2	0.00 to 10.00	0.00	V	Real time
F5-51	0xF533	Minimum input of HDO curve	-100.00 to F5-53	0.00	%	Real time
F5-52	0xF534	Percentage corresponding to the minimum input of HDO curve	0.00 to 100.00	0.00	%	Real time
F5-53	0xF535	Maximum input of HDO curve	F5-51 to 100.00	100.00	%	Real time
F5-54	0xF536	Percentage corresponding to the maximum input of HDO curve	0.00 to 100.00	100.00	%	Real time
F5-55	0xF537	HDO polarity	Ones: HDO selection 0: Normal value 1: Absolute value 2: Inverted value 3: Opposite to absolute value	0	-	Real time
F5-56	0xF538	HDO hardware source	0: Output function setting 1: Forced value	0	-	Real time
F5-57	0xF539	HDO forced value	0.00 to 100.00	0.00	%	Real time

9.7 Group F6 Start/Stop Control

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F6-00	0xF600	Start-up mode	0: Direct start 1: Flying start 2: Pre-excitation start (AC asynchronous motor) 3: SVC quick start	0	-	Real time
F6-01	0xF601	Flying start mode	0: Starting from the stop frequency 1: Starting from the line frequency 2: Starting from the maximum frequency 3: Reserved 4: Field-oriented flying start (MD290)	4	-	Real time
F6-02	0xF602	Flying start speed	1 to 100	20	-	Real time
F6-03	0xF603	Start frequency	0.00 to 10.00	0.00	Hz	Real time
F6-04	0xF604	Start frequency hold time	0.0 to 100.0	0.0	s	At stop
F6-05	0xF605	DC braking current at start	0 to 100	50	%	At stop
F6-06	0xF606	DC braking time at start	0.0 to 100.0	0.0	s	At stop
F6-07	0xF607	Acceleration/ Deceleration mode	0: Linear 1: S-curve	0	-	At stop
F6-08	0xF608	Time proportion of S-curve start segment	0.0 to 100.0	30.0	%	At stop
F6-09	0xF609	Time proportion of S-curve end segment	0.0 to 100.0	30.0	%	At stop
F6-10	0xF60A	Stop mode	0: Decelerate to stop 1: Coast to stop 2: Stop with maximum capability	0	-	Real time
F6-11	0xF60B	Start frequency of DC braking at stop	0.00 to F0-10	0.00	Hz	Real time
F6-12	0xF60C	DC braking waiting time at stop	0.0 to 100.0	0.0	s	Real time
F6-13	0xF60D	DC braking current at stop	0 to 100	50	%	Real time
F6-14	0xF60E	DC braking time at stop	0.0 to 100.0	0.0	s	Real time
F6-15	0xF60F	Braking transistor usage rate	0 to 100	100	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F6-16	0xF610	Frequency sweeping current amplitude closed-loop Kp in speed tracking	0 to 1000	500	-	Real time
F6-17	0xF611	Frequency sweeping current amplitude closed-loop Ki in speed tracking	0 to 1000	800	-	Real time
F6-18	0xF612	Flying start current	30 to 200	80	%	At stop
F6-19	0xF613	Current loop multiple	10 to 600	100	%	Real time
F6-20	0xF614	S curve setting	0: Symmetrical mode 1: Separate setting of acceleration and deceleration arcs	0	-	At stop
F6-21	0xF615	Demagnetization time (applies to asynchronous motors)	0.00 to 5.00	0.50	s	Real time
F6-22	0xF616	Start/Stop frequency follow-up	0: 0 1: 1 2: Reserved 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
F6-23	0xF617	Over-excitation selection	0: Inactive 1: Enabled during deceleration (regenerative) 2: Enabled during deceleration (DC bus overvoltage)	0	-	Real time
F6-24	0xF618	Overexcitation suppression additional current	0 to 200	100	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F6-26	0xF61A	Braking transistor auto-inspection	0: Off 1: Enable	0	-	At stop
F6-28	0xF61C	Manual self-test configuration	bit0: IGBT shoot-through self-check at start 0: Disable 1: Enable bit1: Self-test on ground short circuit at start 0: Disable 1: Enable bit2: Self-test on phase loss at start 0: Disable 1: Enable bit3: Reserved	0x7	-	At stop
F6-29	0xF61D	Manual self-check command	0: None 1: Static self-check 2: Full self-check 3: Static fault automatic diagnosis 4: Fault automatic diagnosis for with-load rotation 5: Fault automatic diagnosis for no-load rotation	0	-	At stop
F6-30	0xF61E	Shut-down delay time	0.00 to 650.00	0.00	s	At stop
F6-31	0xF61F	Active short circuit control	0: Disable 1: Enable	0	-	At stop
F6-32	0xF620	Delay time for entering active short circuit control	0.0 to 5000.0	0.0	ms	At stop
F6-33	0xF621	Holding time of active short circuit control at stop	0.1 to 3600.0	10.0	s	At stop
F6-34	0xF622	Current hysteresis loop high point coefficient in active short circuit control	0.0 to 120.0	80.0	%	At stop
F6-35	0xF623	Current hysteresis loop high/low point coefficient ratio in active short circuit control	0.0 to 99.9	90.0	%	At stop
F6-36	0xF624	Overvoltage threshold in active short circuit control	330.0 to 820.0	780.0	V	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F6-37	0xF625	Voltage control point in active short circuit control	330.0 to F6-36	750.0	V	At stop
F6-38	0xF626	Voltage control bandwidth in active short circuit control	0.00 to 100.00	5.00	Hz	At stop
F6-39	0xF627	Voltage control time constant in active short circuit control	0.001 to 10.000	0.500	s	At stop
F6-40	0xF628	DC braking current rise time	0.00 to 100.00	0.00	s	At stop
F6-41	0xF629	DC braking superposition frequency	0.00 to 100.00	0.00	Hz	Real time
F6-42	0xF62A	Position lock command source	0: Inactive 1: Active 2: Invalid (Reserved) 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
F6-43	0xF62B	Zero speed value of position lock	0.1 to 200.0	2.0	%	Real time
F6-44	0xF62C	Position lock end amplitude	0 to 20000	10	-	At stop
F6-45	0xF62D	Position lock KP1	1 to 1000	100	-	Real time
F6-46	0xF62E	Position lock KP2	1 to 1000	20	-	Real time
F6-47	0xF62F	KP switchover threshold upon position lock	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F6-48	0xF630	Position lock judgment source	0: The real-time frequency is the reference value. 1: The real-time frequency is the feedback value.	0	-	Real time
F6-49	0xF631	Braking transistor enable at stop	0: Disable 1: Enable	0	-	Real time

9.8 Group F7 Operating Panel and Display

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F7-01	0xF701	MF.K key function	0: Inactive 1: Forcibly change to operating panel control 2: Switchover between forward run and reverse run 3: Forward jog 4: Reverse jog	0	-	At stop
F7-02	0xF702	STOP/RESET key function	0: Valid only in the operating panel control mode 1: Valid at OFF1 command 2: Valid at OFF2 command 3: Valid at OFF3 command	1	-	Real time
F7-03	0xF703	Parameter 1 displayed on LED operating panel during operation	bit0: Operating frequency (Hz) bit1: Frequency reference (Hz) bit2: Bus voltage (V) bit3: Output voltage (V) bit4: Output current (A) bit5: Output power (kW) bit6: Output torque (%) bit7: DI input status bit8: DO output status bit9: AI1 voltage (V) bit10: AI2 voltage (V) bit11: AI3 voltage (V) bit12: Counting value bit13: Length value bit14: Load speed bit15: PID reference	0x1F	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F7-04	0xF704	Parameter 2 displayed on LED operating panel during operation	bit0: PID feedback bit1: PLC stage bit2: Pulse input reference (kHz) bit3: Operating frequency 2 (Hz) bit4: Remaining operating time bit5: AI1 voltage before correction (V) bit6: Free mapping 0 bit7: Free mapping 1 bit8: Motor speed bit9: Current power-on time (hour) bit10: Current running time (min) bit11: Pulse input reference (Hz) bit12: Communication setting value bit13: Encoder feedback speed bit14: Main frequency X bit15: Auxiliary frequency Y	0x0	-	Real time
F7-05	0xF705	Parameter displayed on LED operating panel at stop	bit0: Frequency reference (Hz) bit1: Bus voltage (V) bit2: DI input status bit3: DO output status bit4: AI1 voltage (V) bit5: AI2 voltage (V) bit6: AI3 voltage (V) bit7: Counting value bit8: Length value bit9: PLC phase bit10: Load speed bit11: PID reference bit12: Pulse input reference (kHz) bit13: Reserved bit14: Free mapping 0 bit15: Free mapping 1	0x33	-	Real time
F7-06	0xF706	Load speed display coefficient	0.0001 to 6.5000	1.0000	-	Real time
F7-07	0xF707	Inverter heatsink temperature	-20 to 120	0	℃	Unchangeable
F7-08	0xF708	Product code	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F7-09	0xF709	Cumulative operating time	0 to 65535	0	h	Unchangeable
F7-10	0xF70A	Performance software version	0.00 to 655.35	0.00	-	Unchangeable
F7-11	0xF70B	Function software version	0.00 to 655.35	0.00	-	Unchangeable
F7-12	0xF70C	Number of decimal places for load speed display	Ones: Number of decimal places for U0-14/U0-24 0: Zero decimal place 1: One decimal place 2: Two decimal places Tens: Number of decimal places for U0-19/U0-29 1: One decimal place 2: Two decimal places Hundreds: Number of decimal places for U0-30/U0-31 1: One decimal place 2: Two decimal places	220	-	Real time
F7-13	0xF70D	Cumulative power-on time	0 to 65535	0	h	Unchangeable
F7-14	0xF70E	Cumulative power consumption	0 to 65535	0	kWh	Unchangeable
F7-15	0xF70F	Temporary performance software version	0.00 to 655.35	0.00	-	Unchangeable
F7-16	0xF710	Temporary function software version	0.00 to 655.35	0.00	-	Unchangeable
F7-17	0xF711	Level 0 menu display address (free mapping 0)	0: Invalid address Others: K connector	0	-	Real time
F7-18	0xF712	Level 0 menu display address (free mapping 1)	0: Invalid address Others: K connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F7-19	0xF713	Level 0 menu display format (free mapping 0)	Ones: Unit 0: None 1: Hz 2: A 3: rpm 4: V 5: link 6: % 7: s 8: h 9: kW 10: kWh 11: ℃ Tens: Decimal place 0: Zero decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places 4: Four decimal places Hundreds: Enable 0: Disable 1: Enable	0x0	-	Real time
F7-20	0xF714	Level 0 menu display format (free mapping 1)	Same as F7-19	0x0	-	Real time
F7-21	0xF715	LED operating panel button test	0: Inactive 1: Valid	0	-	At stop
F7-22	0xF716	LED display of update cycle	10 to 300	10	-	Real time
F7-23	0xF717	LED direction display	Ones: Whether to display the stop direction 0: Hidden 1: Displayed Tens: Reserved 0: Reserved 1: Reserved	1	-	Real time
F7-28	0xF71C	Cumulative running time (second)	0 to 3599	0	s	Unchangeable
F7-29	0xF71D	Cumulative power-on time (second)	0 to 3599	0	s	Unchangeable
F7-30	0xF71E	Auxiliary calculation of cumulative power consumption	0 to 65535	0	-	Unchangeable
F7-31	0xF71F	Auxiliary calculation of cumulative power consumption of group U0	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F7-32	0xF720	Low-order bits of cumulative power consumption	0.0 to 6553.5	0.0	kWh	Unchangeable
F7-33	0xF721	High-order bits of cumulative power consumption	0 to 65535	0	kWh	Unchangeable
F7-34	0xF722	Cumulative energy saving (GWh)	0 to 65535	0	GWh	Unchangeable
F7-35	0xF723	Cumulative energy saving (MWh)	0 to 999	0	MWh	Unchangeable
F7-36	0xF724	Cumulative energy saving (kWh)	0.0 to 999.9	0.0	kWh	Unchangeable
F7-37	0xF725	Cumulative cost saving (K)	0 to 65535	0	-	Unchangeable
F7-38	0xF726	Cumulative cost saving	0.0 to 999.9	0.0	-	Unchangeable
F7-39	0xF727	Cumulative CO2 reduction (KT)	0 to 65535	0	-	Unchangeable
F7-40	0xF728	Cumulative CO2 reduction (T)	0.0 to 999.9	0.0	-	Unchangeable
F7-41	0xF729	Cumulative energy auxiliary calculation 1	0 to 65535	0	-	Unchangeable
F7-42	0xF72A	Cumulative energy auxiliary calculation 2	0 to 65535	0	-	Unchangeable
F7-43	0xF72B	Energy tax rate 1	0.0 to 6553.5	0.0	-	Real time
F7-44	0xF72C	Energy tax rate 2	0.0 to 6553.5	0.0	-	Real time
F7-45	0xF72D	Tax rate selection	0: Energy tax rate 2 1: Energy tax rate 1	0	-	Real time
F7-46	0xF72E	Currency unit selection	0: RMB 1: EUR 2: USD	0	-	Real time
F7-47	0xF72F	CO2 conversion factor	0.000 to 65.535	0.000	-	Real time
F7-48	0xF730	Reference power	0.0 to 6553.5	0.0	kW	Real time
F7-49	0xF731	Reset of cumulative energy calculation	0 to 1	0	-	Real time
F7-50	0xF732	3000H status word display	0: All status displayed 1: Motor parameter auto-tuning/fault status not displayed	0	-	Real time
F7-51	0xF733	Filter time setting of U0-29	0.000 to 10.000	0.010	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F7-52	0xF734	Relation between frequency display and operating direction	bit0: U0-19 display 0: Related to operation direction 1: Not related to operation direction bit1: U0-29 display 0: Related to operation direction 1: Not related to operation direction bit2: U0-59 display 0: Related to operation direction 1: Not related to operation direction bit3: U0-60 display 0: Related to operation direction 1: Not related to operation direction bit4: U0-69 display 0: Related to operation direction 1: Not related to operation direction bit5: U0-70 display 0: Related to operation direction 1: Not related to operation direction bit6: Relation between reverse frequency prohibition function and running direction (F0-09) 0: The reverse frequency prohibition function is associated with F0-09. 1: The reverse frequency prohibition function is not associated with F0-09.	0	-	Real time
F7-53	0xF735	Synchronous motor SVC version	0 to 65535	0	-	Unchangeable
F7-54	0xF736	Update year of synchronous motor SVC version	0 to 65535	0	-	Unchangeable
F7-55	0xF737	Update date of synchronous motor SVC version	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F7-56	0xF738	Synchronous motor TLC version	0 to 65535	0	-	Unchangeable
F7-57	0xF739	Update year of synchronous motor TLC version	0 to 65535	0	-	Unchangeable
F7-58	0xF73A	Update date of synchronous motor TLC version	0 to 65535	0	-	Unchangeable

9.9 Group F8 Auxiliary Functions

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F8-00	0xF800	Jog frequency	0.00 to F0-10	2.00	Hz	Real time
F8-01	0xF801	Jog acceleration time	0.0 to 6500.0	20.0	s	Real time
F8-02	0xF802	Jog deceleration time	0.0 to 6500.0	20.0	s	Real time
F8-03	0xF803	Acceleration time 2	0.0 to 6500.0	20.0	s	Real time
F8-04	0xF804	Deceleration time 2	0.0 to 6500.0	20.0	s	Real time
F8-05	0xF805	Acceleration time 3	0.0 to 6500.0	20.0	s	Real time
F8-06	0xF806	Deceleration time 3	0.0 to 6500.0	20.0	s	Real time
F8-07	0xF807	Acceleration time 4	0.0 to 6500.0	0.0	s	Real time
F8-08	0xF808	Deceleration time 4	0.0 to 6500.0	0.0	s	Real time
F8-09	0xF809	Jump frequency 1	0.00 to F0-10	0.00	Hz	Real time
F8-10	0xF80A	Jump frequency 2	0.00 to F0-10	0.00	Hz	Real time
F8-11	0xF80B	Jump frequency amplitude	0.00 to F0-10	0.00	Hz	Real time
F8-12	0xF80C	Dead time for forward/reverse run switchover	0.0 to 3000.0	0.0	s	Real time
F8-13	0xF80D	Reverse run frequency inhibited	0: Inactive 1: Valid	0	-	Real time
F8-14	0xF80E	Operation mode at frequencies below the lower limit	0: Run at frequency lower limit 1: Stop 2: Run at zero speed 3: Coast to stop	0	-	Real time
F8-15	0xF80F	Droop control	0.00 to 10.00	0.00	%	Real time
F8-16	0xF810	Power-on time threshold in hours	0 to 65535	0	h	Real time
F8-17	0xF811	Set operating time threshold in hours	0 to 65535	0	h	Real time
F8-18	0xF812	Startup protection	0: Disable 1: Enable	1	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F8-19	0xF813	Frequency detection value (FDT1)	0.00 to F0-10	50.00	Hz	Real time
F8-20	0xF814	Frequency detection hysteresis (FDT1)	0.0 to 100.0	5.0	%	Real time
F8-21	0xF815	Frequency detection window	0.0 to 100.0	0.0	%	Real time
F8-22	0xF816	Jump frequency state during acceleration/ deceleration	0: Inactive 1: Valid	0	-	Real time
F8-23	0xF817	Output voltage filter	1 to 65535	128	-	Real time
F8-24	0xF818	Output power filter	1 to 65535	128	-	Real time
F8-25	0xF819	Frequency for ramp-up time 1/2 switchover	0.00 to F0-10	0.00	Hz	Real time
F8-26	0xF81A	Frequency threshold for ramp-down time 1/2 switchover	0.00 to F0-10	0.00	Hz	Real time
F8-27	0xF81B	JOG priority mode selection	0: Priority not differentiated 1: Jog command has priority. 2: OFF1 command has priority.	0	-	Real time
F8-28	0xF81C	Frequency detection value (FDT2 level)	0.00 to F0-10	50.00	Hz	Real time
F8-29	0xF81D	Frequency detection hysteresis (FDT2)	0.0 to 100.0	5.0	%	Real time
F8-30	0xF81E	Frequency detection value 1	0.00 to F0-10	50.00	Hz	Real time
F8-31	0xF81F	Frequency arrival amplitude 1	0.1 to 100.0	0.1	%	Real time
F8-32	0xF820	Frequency detection value 2	0.00 to F0-10	50.00	Hz	Real time
F8-33	0xF821	Frequency arrival amplitude 2	0.1 to 100.0	0.1	%	Real time
F8-34	0xF822	Zero current detection level	0.0 to 300.0	5.0	%	Real time
F8-35	0xF823	Zero current detection delay time	0.01 to 600.00	0.10	s	Real time
F8-36	0xF824	Output current overlimit threshold	0.0 to 300.0	200.0	%	Real time
F8-37	0xF825	Delay time for output current limit violation detection	0.00 to 600.00	0.00	s	Real time
F8-38	0xF826	Current detection base value 1	0.0 to 300.0	100.0	%	Real time
F8-39	0xF827	Current detection window 1	0.0 to 300.0	0.0	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F8-40	0xF828	Current detection base value 2	0.0 to 300.0	100.0	%	Real time
F8-41	0xF829	Current detection window 2	0.0 to 300.0	0.0	%	Real time
F8-42	0xF82A	Timing function	0: Inactive 1: Valid	0	-	At stop
F8-43	0xF82B	Timing operation time setting source	0: Set by F8-44 (Running time) 1: AI1 2: AI2 3: AI3 Others: F connector	0	-	At stop
F8-44	0xF82C	Timing operation time	0.0 to 6500.0	0.0	min.	At stop
F8-45	0xF82D	Lower limit of AI1 input voltage protection value	0.00 to F8-46	3.10	V	Real time
F8-46	0xF82E	Upper limit of AI1 input voltage protection value	F8-45 to 10.00	6.80	V	Real time
F8-47	0xF82F	Module temperature reach (threshold)	0 to 100	75	°C	Real time
F8-48	0xF830	Fan control	0: Operating during drive running 1: Always operating 2: Reserved	0	-	Real time
F8-49	0xF831	Wakeup frequency source	F8-51 to F0-10	0.00	Hz	Real time
F8-50	0xF832	Wakeup delay time	0.0 to 6500.0	0.0	s	Real time
F8-51	0xF833	Hibernation frequency	0.00 to F8-49	0.00	Hz	Real time
F8-52	0xF834	Hibernation delay time	0.0 to 6500.0	0.0	s	Real time
F8-53	0xF835	Current operating time threshold	0.0 to 6500.0	0.0	min.	At stop
F8-54	0xF836	Output power calibration factor	0.0 to 200.0	100.0	%	Real time
F8-55	0xF837	Ramp-down time for quick stop	0.0 to 6500.0	0.0	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F8-56	0xF838	Real-time target speed source	0: RFG output (default) 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	At stop
F8-57	0xF839	Scaling of undervoltage storage	70 to 120	100	%	Real time
F8-58	0xF83A	EEPROM operation count per unit time	0 to 100	0	-	Real time
F8-59	0xF83B	Forced DI function	0: Non-forced DI function in group F4 (To activate the DI function, set the corresponding parameter to "2: terminal function input".) 1: DI function of parameters in group F4 is forcibly prioritized.	1	-	Real time
F8-60	0xF83C	Main status setting word 1	0: Inactive 1: Set to 1 Others: B connector	0	-	Real time
F8-61	0xF83D	Main status setting word 2	0: Inactive 1: Set to 1 Others: B connector	0	-	Real time
F8-62	0xF83E	Hysteresis value when target speed is reached	0.0 to 600.0	3.0	%	Real time
F8-63	0xF83F	Target speed arrival time	0.00 to 100.00	3.00	s	Real time
F8-64	0xF840	Speed comparison arrival threshold 1	0.0 to 600.0	100.0	%	Real time
F8-65	0xF841	Speed comparison arrival hysteresis 1	0.0 to 600.0	3.0	%	Real time
F8-66	0xF842	Speed comparison arrival time 1	0.00 to 100.00	3.00	s	Real time
F8-67	0xF843	Speed comparison arrival threshold 2	0.0 to 600.0	100.0	%	Real time
F8-68	0xF844	Speed comparison arrival hysteresis 2	0.0 to 600.0	3.0	%	Real time
F8-69	0xF845	Speed comparison arrival time 2	0.00 to 100.00	3.00	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F8-70	0xF846	Output current calibration coefficient	80.0 to 120.0	100.0	%	Real time
F8-71	0xF847	Output current filter	1 to 65535	128	-	Real time
F8-72	0xF848	Jump frequency 3	0.00 to F0-10	0.00	Hz	Real time
F8-73	0xF849	Jump frequency 4	0.00 to F0-10	0.00	Hz	Real time
F8-74	0xF84A	Power-on time threshold in seconds	0 to 3599	0	s	Real time
F8-75	0xF84B	Set operating time threshold in seconds	0 to 3599	0	s	Real time
F8-76	0xF84C	CiA 402 related value selection	Ones: Acceleration/ Deceleration time selection 0: System acceleration/ deceleration time 1: CiA402 acceleration/ deceleration time Tens: Frequency upper and lower limit selection 0: Not written to F0-12/F0-14 through CiA 402 1: Written to F0-12/F0-14 through CiA 402	0	-	At stop
F8-77	0xF84D	Limit function enable	0: Inactive 1: Enable	0	-	At stop

9.10 Group F9 Fault and Protection

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-00	0xF900	Motor overload protection selection	0: Disable 1: Enable	1	-	Real time
F9-01	0xF901	Motor overload protection gain	0.20 to 10.00	1.00	-	Real time
F9-02	0xF902	Motor overload warning coefficient	50 to 100	80	%	Real time
F9-03	0xF903	Overvoltage stall suppression gain	1 to 500	30	-	Real time
F9-04	0xF904	Overvoltage stall suppression protection voltage	330.0 to 800.0	770.0	V	Real time
F9-06	0xF906	Reset mode upon short circuit to ground	0: Reset allowed only after power-off 1: Reset allowed	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-07	0xF907	Protection against short circuit to ground	Ones: Protection against short circuit to ground upon power-on 0: Inactive 1: Active Tens: Protection against short circuit to ground before running 0: Inactive 1: Active	1	-	Real time
F9-08	0xF908	Start voltage for braking unit action	330.0 to 800.0	760.0	V	At stop
F9-09	0xF909	Number of automatic fault resets	0 to 100	0	-	Real time
F9-10	0xF90A	Selection of relay action during automatic fault reset	0: Not act 1: Act	0	-	Real time
F9-11	0xF90B	Interval time of automatic fault reset	0.1 to 600.0	1.0	s	Real time
F9-12	0xF90C	Protective functions	Ones: Protection against input phase loss 0: Disable 1: Protection enabled when both software and hardware input phase loss conditions are met 2: Protection enabled when software input phase loss conditions are met 3: Protection enabled when hardware input phase loss conditions are met Tens: contactor pickup protection 0: Disable 1: Enable Hundreds: T13 rectifier fault protection 0: Disable 1: Enable	11	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-13	0xF90D	Output phase loss protection	Ones: Protection against output phase loss during running 0: Disable 1: Enable Tens: Protection against output phase loss before running 0: Disable 1: Enable	1	-	Real time
F9-14	0xF90E	1st fault type	0 to 65535	0	-	Unchangeable
F9-15	0xF90F	2nd fault type	0 to 65535	0	-	Unchangeable
F9-16	0xF910	Type of the 3rd (latest) fault	0 to 65535	0	-	Unchangeable
F9-17	0xF911	Frequency upon the 3rd (latest) fault	-327.68 to +327.67	0.00	Hz	Unchangeable
F9-18	0xF912	Current upon the 3rd (latest) fault	-327.68 to +327.67	0.00	A	Unchangeable
F9-19	0xF913	Bus voltage upon the 3rd (latest) fault	0.0 to 6553.5	0.0	V	Unchangeable
F9-20	0xF914	Input terminal state upon the 3rd (latest) fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-21	0xF915	Output terminal state upon the 3rd (latest) fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-22	0xF916	AC drive state upon the 3rd (latest) fault	0 to 65535	0	-	Unchangeable
F9-23	0xF917	Power-on duration upon the 3rd (latest) fault	0 to 65535	0	min.	Unchangeable
F9-24	0xF918	Running duration upon the 3rd (latest) fault	0.0 to 6553.5	0.0	min.	Unchangeable
F9-25	0xF919	Status word A upon the 3rd (latest) fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-26	0xF91A	Status word B upon the third (latest) fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-27	0xF91B	Frequency upon the 2nd fault	-327.68 to +327.67	0.00	Hz	Unchangeable
F9-28	0xF91C	Current upon the 2nd fault	-327.68 to +327.67	0.00	A	Unchangeable
F9-29	0xF91D	Bus voltage upon the 2nd fault	0.0 to 6553.5	0.0	V	Unchangeable
F9-30	0xF91E	Input terminal state upon the 2nd fault	0x0 to 0xFFFF	0x0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-31	0xF91F	Output terminal state upon the 2nd fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-32	0xF920	AC drive state upon 2nd fault	0 to 65535	0	-	Unchangeable
F9-33	0xF921	Power-on time upon the 2nd fault	0 to 65535	0	min.	Unchangeable
F9-34	0xF922	Operating time upon the 2nd fault	0.0 to 6553.5	0.0	min.	Unchangeable
F9-35	0xF923	Status word A upon the 2nd fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-36	0xF924	Status word B upon the 2nd fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-37	0xF925	Frequency upon the 1st fault	-327.68 to +327.67	0.00	Hz	Unchangeable
F9-38	0xF926	Current upon the 1st fault	-327.68 to +327.67	0.00	A	Unchangeable
F9-39	0xF927	Bus voltage upon the 1st fault	0.0 to 6553.5	0.0	V	Unchangeable
F9-40	0xF928	Input terminal state upon the 1st fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-41	0xF929	Output terminal state upon the 1st fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-42	0xF92A	AC drive state upon the 1st fault	0 to 65535	0	-	Unchangeable
F9-43	0xF92B	Power-on time upon the 1st fault	0 to 65535	0	min.	Unchangeable
F9-44	0xF92C	Running time upon the 1st fault	0.0 to 6553.5	0.0	min.	Unchangeable
F9-45	0xF92D	Status word A upon the 1st fault	0x0 to 0xFFFF	0x0	-	Unchangeable
F9-46	0xF92E	Status word B upon the 1st fault	0x0 to 0xFFFF	0x0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-47	0xF92F	Fault protection action selection 1	Ones: Motor overload (E011.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Tens: Input phase loss (E012.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Hundreds: Output phase loss (E013.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current Thousands: External fault (E015.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current Ten thousands: Reserved	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-48	0xF930	Fault protection action selection 2	Ones: Encoder/PG card fault (E020.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Tens: Parameter read/write error (E021.x) 0: Coast to stop 1: Stop according to the stop mode Hundreds: PG card error (E024.x) 0: Coast to stop Ten thousands: Rectifier fault (E025.x) 0: Coast to stop Ten thousands: Running time arrival (E026.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-49	0xF931	Fault protection action selection 3	Ones: User-defined fault 1 (E027.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current Tens: User-defined fault 2 (E028.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current Hundreds: Power-on time arrival (E029.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current Continued	20	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-49	0xF931	Fault protection action selection 3	Continued Thousands: Load loss (E030.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Ten thousands: PID feedback loss during running (E031.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current	20	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-50	0xF932	Fault protection action selection 4	Ones: Excessive speed deviation (E042.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Tens: Motor overspeed (E043.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Hundreds: Error in magnetic pole position auto-tuning (E051.x) 0: Coast to stop Thousands: Low liquid level fault (E066.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Ten thousands: Internal fan fault (E65.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current	2000	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-51	0xF933	Fault protection action selection 5	Ones: Modbus timeout (E160.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Tens: CANopen fault (E161.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Hundreds: CANlink fault (E162.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault Thousands: Reserved Ten-thousands: Expansion card fault (E164.x) 0: Coast to stop 1: Stop according to the stop mode 2: Continue operation 3: Operation with limited power 4: Operating with limited current 5: Ignore fault	10111	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-54	0xF936	Operating frequency upon fault	0: Operating at current frequency 1: Operating at set frequency 2: Operating at frequency upper limit 3: Operating at frequency lower limit 4: Backup frequency upon fault (F9-55) 5: Running frequency after being filtered for a period of time (F9-66)	1	-	Real time
F9-55	0xF937	Backup frequency upon fault	0.0 to 100.0	100.0	%	Real time
F9-56	0xF938	AI3 temperature mode - motor temperature sensor type	0: No temperature sensor (AI used for analog input) 1: PT100 2: PT1000	0	-	Real time
F9-57	0xF939	AI3 temperature mode - motor overtemperature protection threshold	F9-58 to 200	110	°C	Real time
F9-58	0xF93A	AI3 temperature mode - motor overheat warning threshold	0 to F9-57	90	°C	Real time
F9-59	0xF93B	Power dip ride-through function	0: Inactive 1: Deceleration (Bus voltage constant control) 2: Decelerate to stop 3: Voltage dip suppression	0	-	At stop
F9-60	0xF93C	Threshold for recovery from power dip ride-through	80 to 100	85	%	At stop
F9-61	0xF93D	Duration for judging voltage recovery from power dip ride-through	0.0 to 100.0	0.5	s	At stop
F9-62	0xF93E	Threshold for enabling power dip ride-through	60 to 100	80	%	At stop
F9-64	0xF940	Load loss detection level	0.0 to 100.0	10.0	%	Real time
F9-65	0xF941	Load loss detection time	0.0 to 60.0	1.0	s	Real time
F9-66	0xF942	Operating frequency filter time upon fault	0.00 to 30.00	0.50	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-67	0xF943	Overspeed detection value	0.0 to 50.0	20.0	%	Real time
F9-68	0xF944	Overspeed detection time	0.0 to 60.0	1.0	s	Real time
F9-69	0xF945	Detection value for excessive speed deviation	0.0 to 50.0	20.0	%	Real time
F9-70	0xF946	Detection time for excessive speed deviation	0.0 to 60.0	5.0	s	Real time
F9-71	0xF947	Power dip ride-through gain Kp	1 to 100	40	-	Real time
F9-72	0xF948	Power dip ride-through integral coefficient Ki	1 to 100	30	-	Real time
F9-73	0xF949	Deceleration time of power dip ride-through	0.0 to 300.0	20.0	s	Real time
F9-74	0xF94A	Voltage dip suppression time	0.1 to 600.0	0.5	s	Real time
F9-75	0xF94B	AI2 temperature mode - Motor temperature sensor type	0: No temperature sensor (AI used for analog input) 1: PT100 2: PT1000 3: KTY84-130 4: Single-conductor PTC-130 5: Three-conductor PTC-130 6: Single-conductor PTC-150 7: Three-conductor PTC-150 8: Three PT100s connected in series 9: KTY83-110	0	-	Real time
F9-76	0xF94C	AI2 temperature mode - Motor overtemperature protection threshold	F9-77 to 200	110	°C	Real time
F9-77	0xF94D	AI2 temperature mode - motor overheat warning threshold	0 to F9-76	90	°C	Real time
F9-78	0xF94E	AI2 temperature mode - Motor temperature arrival	0 to 100	75	°C	Real time
F9-79	0xF94F	Automatic reset of STO status	0: Manual reset 1: Automatic reset	1	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
F9-80	0xF950	AI3 temperature mode - motor temperature reach	0 to 100	75	°C	Real time
F9-87	0xF957	Dual-STO disconnection fault selection	0 to 1	0	-	Real time
F9-88	0xF958	Asynchronous judgment time for disconnection of dual STOs	0.010 to 0.200	0.010	s	Real time
F9-91	0xF95B	Target frequency of deceleration limit	0.00 to 50.00	8.00	Hz	Real time
F9-92	0xF95C	Excessively low carrier ratio alarm	0: Disable 1: Enable	1	-	Real time
F9-93	0xF95D	Excessively low carrier ratio alarm threshold	10.00 to 30.00	10.00	-	Real time
F9-94	0xF95E	Effective time of flux linkage change in energy-saving control	0.10 to 5.00	1.00	-	Real time
F9-95	0xF95F	Frequency lower limit in energy-saving control	0.00 to 0.30	0.10	-	Real time

9.11 Group FA Process Control and PID Function

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FA-00	0xFA00	PID setting source	0: FA-01 1: AI1 2: AI2 3: AI3 4: Pulse input (DI5) 5: Communication 6: Multi-reference Others: F connector	0	-	Real time
FA-01	0xFA01	PID value reference	0.0 to 100.0	50.0	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FA-02	0xFA02	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1 - AI2 4: Pulse reference (DIO1) 5: Communication 6: AI1 + AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|) Others: F connector	0	-	Real time
FA-03	0xFA03	PID acting direction	0: Direct acting 1: Negative Others: B connector	0	-	Real time
FA-04	0xFA04	PID reference and feedback range	0 to 65535	1000	-	Real time
FA-05	0xFA05	Proportional gain KP1	0.0 to 1000.0	20.0	-	Real time
FA-06	0xFA06	Integral time Ti1	0.01 to 10.00	2.00	s	Real time
FA-07	0xFA07	Derivative time Td1	0.000 to 10.000	0.000	s	Real time
FA-08	0xFA08	Cut-off frequency of PID reverse acting	0.00 to F0-10	2.00	Hz	Real time
FA-09	0xFA09	PID deviation limit	0.0 to 100.0	0.0	%	Real time
FA-10	0xFA0A	PID derivative limit	0.00 to 100.00	0.10	%	Real time
FA-11	0xFA0B	PID reference change time	0.00 to 650.00	0.00	s	Real time
FA-12	0xFA0C	PID feedback filter time	0.00 to 60.00	0.00	s	Real time
FA-13	0xFA0D	PID output filter time	0.00 to 60.00	0.00	s	Real time
FA-15	0xFA0F	Proportional gain Kp2	0.0 to 1000.0	20.0	-	Real time
FA-16	0xFA10	Integral time Ti2	0.01 to 10.00	2.00	s	Real time
FA-17	0xFA11	Derivative time Td2	0.000 to 10.000	0.000	s	Real time
FA-18	0xFA12	PID parameter switchover condition	0: No switched 1: Switched by DI 2: Switched automatically based on deviation 3: Switched automatically based on operating frequency 4: Automatic adjustment mode 1 based on roll diameter 5: Automatic adjustment mode 2 based on roll diameter	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FA-19	0xFA13	PID parameter switchover deviation 1	0.0 to FA-20	20.0	%	Real time
FA-20	0xFA14	PID parameter switchover deviation 2	FA-19 to 100.0	80.0	%	Real time
FA-21	0xFA15	PID initial value	0.0 to 100.0	0.0	%	Real time
FA-22	0xFA16	PID initial value hold time	0.00 to 650.00	0.00	s	Real time
FA-25	0xFA19	PID integral property	Ones: Integral separation 0: Inactive 1: Valid Tens: Whether to stop integral operation when the output reaches the limit 0: Continue integral operation 1: Stop integral operation	10	-	Real time
FA-26	0xFA1A	Detection lower limit of PID feedback loss	0.0 to 100.0	0.0	%	Real time
FA-27	0xFA1B	Detection time for PID feedback loss	0.0 to 20.0	0.0	s	Real time
FA-28	0xFA1C	PID operation at stop	0: No operation at stop 1: Operation performed at stop Others: B connector	0	-	Real time
FA-29	0xFA1D	Detection upper limit of PID feedback loss	0.0 to 100.0	100.0	%	Real time
FA-30	0xFA1E	Source of maximum output value	0: [1] 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
FA-31	0xFA1F	Source of minimum output value	0: [0] 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FA-32	0xFA20	Forced output value	Same as FA-31	0	-	Real time
FA-33	0xFA21	Forced output value	0: Inactive 1: Valid Others: B connector	0	-	Real time
FA-34	0xFA22	General PID enable	0: Disable 1: Enable Others: B connector	1	-	Real time
FA-35	0xFA23	PID saturation integral processing mode selection	0: Off 1: On	0	-	Real time
FA-36	0xFA24	PID open circuit detection delay upon start	0.0 to 20.0	6.0	s	Real time
FA-37	0xFA25	Reference value changing from current feedback	0: Off 1: On	0	-	At stop

9.12 Group FB Swing Frequency, Fixed Length and Count

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FB-00	0xFB00	Oscillation setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0	-	Real time
FB-01	0xFB01	Wobble amplitude	0.0 to 100.0	0.0	%	Real time
FB-02	0xFB02	Wobble step	0.0 to 50.0	0.0	%	Real time
FB-03	0xFB03	Wobble frequency cycle	0.1 to 3000.0	10.0	s	Real time
FB-04	0xFB04	Triangular wave rise time of wobble frequency	0.1 to 100.0	50.0	%	Real time
FB-05	0xFB05	Length setpoint	0 to 65535	1000	m	Real time
FB-06	0xFB06	Actual length	0 to 65535	0	m	Unchangeable
FB-07	0xFB07	Number of pulses per meter	0.1 to 6553.5	100.0	-	Real time
FB-08	0xFB08	Set count value	0 to 65535	1000	-	Real time
FB-09	0xFB09	Specified count value	0 to 65535	1000	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FB-20	0xFB14	Motorized potentiometer	0: Inactive 1: Active 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
FB-21	0xFB15	Retention at power failure of motorized potentiometer	0: Inactive 1: Active	0	-	Real time
FB-22	0xFB16	Initial value of motorized potentiometer	-600.0 to 600.0	0.0	%	Real time
FB-23	0xFB17	Motor-driven potentiometer time increase benchmark	0.00 to 655.35	20.00	s	Real time
FB-24	0xFB18	Motor-driven potentiometer time decrease benchmark	0.00 to 655.35	20.00	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FB-25	0xFB19	Source of motorized potentiometer ramp-up command	0: Inactive 1: Active 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
FB-26	0xFB1A	Motor-driven potentiometer decrease command source	Same as FB-25	0	-	Real time
FB-27	0xFB1B	Motor-driven potentiometer max. output	-600.0 to 600.0	600.0	%	Real time
FB-28	0xFB1C	Motor-driven potentiometer min. output	-600.0 to 600.0	-600.0	%	Real time
FB-29	0xFB1D	Motor-driven potentiometer pause command source 1	Same as FB-25	0	-	Real time
FB-30	0xFB1E	Source 2 of motorized potentiometer pause command	Same as FB-25	0	-	Real time
FB-31	0xFB1F	Motor-driven potentiometer reset command source 1	Same as FB-25	0	-	Real time
FB-32	0xFB20	Source 2 of motorized potentiometer reset command	Same as FB-25	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FB-33	0xFB21	Reset value source of motorized potentiometer	0: Digital setting 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
FB-34	0xFB22	Motor-driven potentiometer reset value digital setting	-600.0 to 600.0	0.0	%	Real time
FB-35	0xFB23	Motor-driven potentiometer force command source	Same as FB-25	0	-	Real time
FB-36	0xFB24	Source of motorized potentiometer force value	Same as FB-33	0	-	Real time
FB-37	0xFB25	Digital reference of motorized potentiometer forced value	-600.0 to 600.0	0.0	%	Real time
FB-38	0xFB26	High bits of the value saved by motorized potentiometer	0 to 65535	0	-	Real time
FB-39	0xFB27	High bits of the value saved by motorized potentiometer	0 to 65535	0	-	Real time
FB-45	0xFB2D	SOP timeout detection threshold	0.50 to 655.35	0.50	s	Real time
FB-46	0xFB2E	Adjustment of UP/DOWN key or terminal functioning as UP/DOWN key	-32767 to +32767	0	-	Unchangeable
FB-47	0xFB2F	Encoder counter clear	0: Inactive 1: Cleared	0	-	Real time

9.13 Group FC Multi-reference

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FC-00	0xFC00	Multi-reference 1	-100.0 to +100.0	0.0	%	Real time
FC-01	0xFC01	Multi-reference 2	-100.0 to +100.0	0.0	%	Real time
FC-02	0xFC02	Multi-reference 3	-100.0 to +100.0	0.0	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FC-03	0xFC03	Multi-reference 4	-100.0 to +100.0	0.0	%	Real time
FC-04	0xFC04	Multi-reference 5	-100.0 to +100.0	0.0	%	Real time
FC-05	0xFC05	Multi-reference 6	-100.0 to +100.0	0.0	%	Real time
FC-06	0xFC06	Multi-reference 7	-100.0 to +100.0	0.0	%	Real time
FC-07	0xFC07	Multi-reference 8	-100.0 to +100.0	0.0	%	Real time
FC-08	0xFC08	Multi-reference 9	-100.0 to +100.0	0.0	%	Real time
FC-09	0xFC09	Multi-reference 10	-100.0 to +100.0	0.0	%	Real time
FC-10	0xFC0A	Multi-reference 11	-100.0 to +100.0	0.0	%	Real time
FC-11	0xFC0B	Multi-reference 12	-100.0 to +100.0	0.0	%	Real time
FC-12	0xFC0C	Multi-reference 13	-100.0 to +100.0	0.0	%	Real time
FC-13	0xFC0D	Multi-reference 14	-100.0 to +100.0	0.0	%	Real time
FC-14	0xFC0E	Multi-reference 15	-100.0 to +100.0	0.0	%	Real time
FC-15	0xFC0F	Multi-reference 16	-100.0 to +100.0	0.0	%	Real time
FC-16	0xFC10	Simple PLC operation mode	0: Stop after a single-shot operation 1: Keep final values after single-shot operation 2: Running cyclically	0	-	Real time
FC-17	0xFC11	Simple PLC retention selection	Ones: Retention upon power failure 0: Non-retentive 1: Retentive Tens: Retention at stop 0: No 1: Yes	0	-	Real time
FC-18	0xFC12	Operating time of multi-reference 1 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-19	0xFC13	Acceleration/ Deceleration time of multi-reference 1 set by simple PLC	0 to 3	0	-	Real time
FC-20	0xFC14	Operating time of multi-reference 2 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-21	0xFC15	Acceleration/ Deceleration time of multi-reference 2 set through simple PLC	0 to 3	0	-	Real time
FC-22	0xFC16	Operating time of multi-reference 3 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-23	0xFC17	Acceleration/ Deceleration time of multi-reference 3 set by simple PLC	0 to 3	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FC-24	0xFC18	Operating time of multi-reference 4 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-25	0xFC19	Acceleration/ Deceleration time of multi-reference 4 set by simple PLC	0 to 3	0	-	Real time
FC-26	0xFC1A	Operating time of multi-reference 5 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-27	0xFC1B	Acceleration/ Deceleration time of multi-reference 5 set by simple PLC	0 to 3	0	-	Real time
FC-28	0xFC1C	Operating time of multi-reference 6 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-29	0xFC1D	Acceleration/ Deceleration time of multi-reference 6 set by simple PLC	0 to 3	0	-	Real time
FC-30	0xFC1E	Operating time of multi-reference 7 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-31	0xFC1F	Acceleration/ Deceleration time of multi-reference 7 set by simple PLC	0 to 3	0	-	Real time
FC-32	0xFC20	Operating time of multi-reference 8 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-33	0xFC21	Acceleration/ Deceleration time of multi-reference 8 set by simple PLC	0 to 3	0	-	Real time
FC-34	0xFC22	Operating time of multi-reference 9 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-35	0xFC23	Acceleration/ Deceleration time of multi-reference 9 set by simple PLC	0 to 3	0	-	Real time
FC-36	0xFC24	Running time of multi-reference 10 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FC-37	0xFC25	Acceleration/ Deceleration time of multi-reference 10 set by simple PLC	0 to 3	0	-	Real time
FC-38	0xFC26	Operating time of multi-reference 11 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-39	0xFC27	Acceleration/ Deceleration time of multi-reference 11 set by simple PLC	0 to 3	0	-	Real time
FC-40	0xFC28	Operating time of multi-reference 12 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-41	0xFC29	Acceleration/ Deceleration time of multi-reference 12 set by simple PLC	0 to 3	0	-	Real time
FC-42	0xFC2A	Operating time of multi-reference 13 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-43	0xFC2B	Acceleration/ Deceleration time of multi-reference 13 set by simple PLC	0 to 3	0	-	Real time
FC-44	0xFC2C	Operating time of multi-reference 14 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-45	0xFC2D	Acceleration/ Deceleration time of multi-reference 14 set by simple PLC	0 to 3	0	-	Real time
FC-46	0xFC2E	Operating time of multi-reference 15 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-47	0xFC2F	Acceleration/ Deceleration time of multi-reference 15 set by simple PLC	0 to 3	0	-	Real time
FC-48	0xFC30	Running time of multi-reference 16 set by simple PLC	0.0 to 6553.5	0.0	s (h)	Real time
FC-49	0xFC31	Acceleration/ Deceleration time of multi-reference 16 set by simple PLC	0 to 3	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FC-50	0xFC32	Simple PLC operating time unit	0: s (second) 1: h (hour)	0	-	Real time
FC-51	0xFC33	Multi-reference 1 source	0: FC-00 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: PID 6: Preset frequency (F0-08) Others: F connector	0	-	Real time
FC-52	0xFC34	Current multi-reference	0: Multi-reference 1 1: Multi-reference 2 2: Multi-reference 3 3: Multi-reference 4 4: Multi-reference 5 5: Multi-reference 6 6: Multi-reference 7 7: Multi-reference 8 8: Multi-reference 9 9: Multi-reference 10 10: Multi-reference 11 11: Multi-reference 12 12: Multi-reference 13 13: Multi-reference 14 14: Multi-reference 15 15: Multi-reference 16	0	-	Unchangeable
FC-53	0xFC35	Current multi-reference value	-600.0 to 600.0	0.0	%	Unchangeable
FC-55	0xFC37	Multi-reference selection through K1	0: 0 1: 1 2: Terminal input function 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FC-56	0xFC38	Multi-reference selection through K2	Same as FC-55	0	-	Real time
FC-57	0xFC39	Multi-reference selection through K3	Same as FC-55	0	-	Real time
FC-58	0xFC3A	Multi-reference selection through K4	Same as FC-55	0	-	Real time
FC-59	0xFC3B	Number of segments that the PLC runs upon power failure	0 to 65535	0	-	Unchangeable
FC-60	0xFC3C	High bit of PLC operating time upon power failure	0 to 65535	0	-	Unchangeable
FC-61	0xFC3D	Low bit of PLC operating time upon power failure	0 to 65535	0	-	Unchangeable

9.14 Group FD Communication Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FD-00	0xFD00	Baud rate	Ones: Modbus 0: 300 bps 1: 600 bps 2: 1200 bps 3: 2400 bps 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps 8: 57600 bps 9: 115200 bps Tens: Reserved Hundreds: Reserved Thousands: CANlink/ CANopen baud rate 0: 20 kbps 1: 50 kbps 2: 100 kbps 3: 125 kbps 4: 250 kbps 5: 500 kbps 6: 1 Mbps	5005	-	At stop
FD-01	0xFD01	Modbus data format	0: No check (8-N-2) 1: Even parity check (8-E-1) 2: Odd parity check (8-O-1) 3: No check (8-N-1) 4: No check (7-N-2) 5: Even parity check (7-E-1) 6: Odd parity check (7-O-1) 7: No check (7-N-1)	0	-	Real time
FD-02	0xFD02	Local address	1 to 247	1	-	At stop
FD-03	0xFD03	Modbus response delay time	0 to 20	2	ms	Real time
FD-04	0xFD04	Communication timeout	0.0 to 60.0	0.0	s	Real time
FD-06	0xFD06	Current resolution read through communication	0: 0.01 A (active when the power is lower than or equal to 55 kW) 1: 0.1 A	0	-	Real time
FD-09	0xFD09	Speed reference type	0: Frequency 1: Speed 2: Percentage	0	-	At stop
Fd-10	0xFD0A	CANopen/CANlink switchover	1: CANopen 2: CANlink	2	-	Real time
FD-11	0xFD0B	CiA402 protocol	0 to 1	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FD-14	0xFD0E	Number of frames received per unit time	0 to 65535	0	-	Unchangeable
Fd-15	0xFD0F	Maximum number of error frames received by node	0 to 65535	0	-	Unchangeable
Fd-16	0xFD10	Maximum number of error frame sent by node	0 to 65535	0	-	Unchangeable
Fd-17	0xFD11	Number of bus disconnection times per unit of time	0 to 65535	0	-	Unchangeable
Fd-19	0xFD13	CAN communication disconnection coefficient	1 to 15	3	-	At stop
FD-26	0xFD1A	CIA 402 parameter-write storage	0: Do not save to EEPROM 1: Save to EEPROM	0	-	Real time
FD-27	0xFD1B	Save parameters written through communication	0 to 1	0	-	Real time
FD-28	0xFD1C	Communication fault automatic reset	0 to 1	1	-	Real time
FD-29	0xFD1D	Communication state	0 to 999	0	-	Unchangeable
Fd-34	0xFD22	CANopen mode	0: Default mode 1: Expert mode	0	-	At stop
Fd-35	0xFD23	CANopen disable time	0 to 65535	0	μs	At stop
Fd-36	0xFD24	CANopen event time	0 to 65535	0	ms	At stop
FD-37	0xFD25	DHCP enable	0: Disable 1: Enable	0	-	At stop
FD-38	0xFD26	IP address highest byte	0 to 255	0	-	At stop
Fd-39	0xFD27	IP address second highest byte	0 to 255	0	-	At stop
Fd-40	0xFD28	IP address third byte	0 to 255	0	-	At stop
Fd-41	0xFD29	IP address lowest byte	0 to 255	0	-	At stop
Fd-42	0xFD2A	Subnet mask highest byte	0 to 255	0	-	At stop
Fd-43	0xFD2B	Subnet mask second highest byte	0 to 255	0	-	At stop
Fd-44	0xFD2C	Third byte of subnet mask	0 to 255	0	-	At stop
Fd-45	0xFD2D	Subnet mask lowest byte	0 to 255	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
Fd-46	0xFD2E	Gateway highest byte	0 to 255	0	-	At stop
Fd-47	0xFD2F	Gateway second highest byte	0 to 255	0	-	At stop
Fd-48	0xFD30	Third byte of gateway	0 to 255	0	-	At stop
FD-49	0xFD31	Gateway lowest byte	0 to 255	0	-	At stop
FD-58	0xFD3A	Ethernet expansion card error code	0 to 255	0	-	Unchangeable
Fd-61	0xFD3D	MAC address high byte	0x0 to 0xFFFF	0x0	-	At stop
Fd-62	0xFD3E	MAC address middle byte	0x0 to 0xFFFF	0x0	-	At stop
Fd-63	0xFD3F	MAC address low byte	0x0 to 0xFFFF	0x0	-	At stop
Fd-92	0xFD5C	Slave alias backup	0 to 65535	0	-	Real time
Fd-94	0xFD5E	Communication software version	0.00 to 655.35	0.00	-	Unchangeable

9.15 Group FP Parameter Management

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FP-00	0x1F00	User password	0 to 65535	0	-	Real time
FP-01	0x1F01	Parameter initialization	0: Inactive 1: Restore parameters (excluding motor parameters) to factory settings 2: Clear log information 4: Back up current user parameters 501: Restore user backup parameters 503: Restore parameters (including motor parameters) to factory settings	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FP-02	0x1F02	Function parameter display selection	bit0: Group U 0: Hidden 1: Displayed bit1: Group A 0: Hidden 1: Displayed bit2: Group B 0: Hidden 1: Displayed bit3: Group C 0: Hidden 1: Displayed bit4: Group H 0: Hidden 1: Displayed bit5: Group L 0: Hidden 1: Displayed	63	-	Real time
FP-03	0x1F03	User-defined parameter display	Ones: User-defined parameter group 0: Hidden 1: Displayed Tens: User-modified parameter group 0: Hidden 1: Displayed Hundreds: Error menu 0: Hidden 1: Displayed	111	-	Real time
FP-04	0x1F04	Parameter modification property	0: Enable 1: Disable	0	-	Real time
FP-06	0x1F06	Monitoring password setting	0 to 65535	0	-	Real time
FP-07	0x1F07	Expert password setting	0 to 65535	1430	-	Real time
FP-09	0x1F09	Password input window	0 to 65535	0	-	Real time
FP-10	0x1F0A	Current permission level	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
FP-17	0x1F11	Industry macro selection	0: No selection 1: Air compressor macro 30: Mains synchronization 105: Winding macro (wire drawing machine) 106: Unwinding macro (wire drawing machine)	0	-	At stop
FP-18	0x1F12	Current industry application mode	Same as FP-17	0	-	Unchangeable

9.16 Group A0 Torque Control Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A0-00	0xA000	Speed/Torque control selection	0: Speed control 1: Torque control	0	-	Real time
A0-01	0xA001	Mode A - Torque reference source in torque control (drive torque upper limit source)	0: Digital setting (A0-03) 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) Others: F connector	0	-	At stop
A0-03	0xA003	Mode A - Torque digital setting in torque control	-200.0 to 200.0	150.0	%	Real time
A0-04	0xA004	Mode A- Torque reference filter time (upper limit)	0 to 10000	0	ms	Real time
A0-05	0xA005	Mode A - Maximum positive frequency in torque control	0.00 to F0-10	50.00	Hz	Real time
A0-06	0xA006	Mode A - Maximum negative frequency in torque control	0.00 to F0-10	50.00	Hz	Real time
A0-07	0xA007	Mode A - Torque rise filter time	0.00 to 650.00	0.00	s	Real time
A0-08	0xA008	Mode A - Torque drop filter time	0.00 to 650.00	0.00	s	Real time
A0-10	0xA00A	Used to select the torque mode.	0: Torque upper limit mode in speed control mode (mode A) 1: Torque mode (mode B)	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A0-11	0xA00B	Mode B - Torque acceleration time gain	0: 100% 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
A0-12	0xA00C	Mode B - Torque deceleration time gain	Same as A0-11	0	-	Real time
A0-13	0xA00D	Mode B - Torque reference source	0: Digital setting 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
A0-14	0xA00E	Mode B - Digital setting of torque reference	-400.0 to 400.0	0.0	%	Real time
A0-15	0xA00F	Mode B- Torque control speed limit source	0: Digital setting 1: Speed channel	0	-	Real time
A0-16	0xA010	Mode B - Digital setting of speed limit in torque control	-100.0 to +100.0	100.0	%	Real time
A0-17	0xA011	Mode B - Speed limit offset mode	0: Bidirectional offset 1: Unidirectional bias 2: Compatibility mode	0	-	Real time
A0-18	0xA012	Mode B - Speed limit offset source	Same as A0-13	0	-	Real time
A0-19	0xA013	Mode B - Speed limit digital setting	0.0 to 100.0	5.0	%	Real time
A0-20	0xA014	Source of additional torque reference 1	Same as A0-13	0	-	Real time
A0-21	0xA015	Digital setting of additional torque reference 1	-400.0 to 400.0	0.0	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A0-22	0xA016	Supplementary torque reference 2	0: 0 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
A0-23	0xA017	Enable additional torque reference 2 input	0: Disable 1: Enable 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	1	-	Real time
A0-24	0xA018	Mode B - Torque filter time	0 to 10000	0	ms	Real time
A0-25	0xA019	Mode B - Torque acceleration time	0.000 to 60.000	0.000	s	Real time
A0-26	0xA01A	Mode B - Torque deceleration time	0.000 to 60.000	0.000	s	Real time
A0-27	0xA01B	Mode B - Torque reference gain	0: 100% 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time

9.17 Group A1 Virtual I/O

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-00	0xA100	VDI1 function selection	0: No function 1: Forward run (IN1) 2: Reverse run (IN2) 3: Three-wire control (IN3) 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as UP key for frequency adjustment 7: Function as DOWN key for frequency adjustment 8: Coast to stop 9: Fault reset (RESET) 10: Operation pause 11: External fault NO input 12 to 15: Multi-reference terminals 1 to 4 16: Acceleration/ Deceleration selection terminal 1 17: Acceleration/ Deceleration selection terminal 2 18: Frequency reference switchover 19: Clear data set by terminal functioning as UP/DOWN key 20: Control command source switchover terminal 1 21: Acceleration/ Deceleration inhibited 22: PID pause 23: Simple PLC status reset 24: Swing frequency pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control inhibited (Continued)	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-00	0xA100	VDI1 function selection	(Continued) 30: Pulse frequency input (valid only for DI5) 31: Reserved 32: Immediate DC braking 33: External fault NC input 34: Frequency modification enable 35: PID acting direction inversion 36: External stop terminal 1 37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency X and preset frequency 40: Switchover between auxiliary frequency Y and preset frequency 41: Motor selection terminal 1 42: Reserved 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed/Torque control selection (Continued)	0	-	At stop
A1-00	0xA100	VDI1 function selection	(Continued) 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: Present operating time clear 51: Two-wire/Three-wire mode switchover 52: Reverse running inhibited 53: Thickness accumulation 54: Roll diameter reset 55: Initial roll diameter source selection terminal 1 56: Initial roll diameter source selection terminal 2 57: Pre-driving 58: Switching between winding and unwinding (Continued)	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-00	0xA100	VDI1 function selection	(Continued) 59: Roll diameter calculation stopped 60: Tension mode deactivated 61: Terminal tension boost 62: Material thickness selection terminal 1 63: Material thickness selection terminal 2 64: Forward limit switch 65: Reverse limit switch 66: Water-cooling fault input 67: Low liquid level fault input 68: Position synchronization - Pulse reference increase 69: Position synchronization - Pulse reference decrease 70: Control channel selection 71: Setting channel selection (reserved) 72: Terminal module A/B selection 73: Startup mode selection bit0 74: Startup mode selection bit1 (Continued)	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-00	0xA100	VDI1 function selection	(Continued) 75: Control command switchover terminal 3 76: Motor selection terminal 2 77: Running enable 78: Forward run permission 79: Reverse run permission 80: RFG input set to zero 81: Passive unwinding compensation 82: Positioning control enable with forward command (IN1) 83: Positioning control enable with reverse command (IN2) 84: Synchronous control enable with forward command (IN1) 85: Synchronous control enable with reverse command (IN2) 86: Wire breakage detection (wire drawing machine) 87: Forward deceleration limit switch 88: Reverse deceleration limit switch 89: Emergency stop PI enable	0	-	At stop
A1-01	0xA101	VDI2 function selection	Same as A1-00	0	-	At stop
A1-02	0xA102	VDI3 function selection	Same as A1-00	0	-	At stop
A1-03	0xA103	VDI4 function selection	Same as A1-00	0	-	At stop
A1-04	0xA104	VDI5 function selection	Same as A1-00	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-05	0xA105	Virtual VDI state setting mode	Ones: VDI1 state 0: Determined by VDO1 state 1: Determined by A1-06 2: Determined by DI1 state 3: Determined by communication value (bit10 of F4-50) 4: Determined by AI1 5: Reserved Tens: VDI2 state 0: Determined by VDO2 state 1: Determined by A1-06 2: Determined by DI2 state 3: Determined by communication value (bit11 of F4-50) 4: Determined by AI2 5: Reserved Hundreds: VDI3 state 0: Determined by VDO3 state 1: Determined by A1-06 2: Determined by DI3 state 3: Determined by communication value (bit12 of F4-50) 4: Determined by AI3 5: Reserved Thousands: VDI4 state 0: Determined by VDO4 state 1: Determined by A1-06 2: Determined by DI4 state 3: Determined by communication value (bit13 of F4-50) 4: Reserved 5: Reserved (Continued)	0	-	At stop
A1-05	0xA105	Virtual VDI state setting mode	(Continued) Ten thousands: VDI5 state 0: Determined by VDO5 state 1: Determined by A1-06 2: Determined by DI5 state 3: Determined by communication value (bit14 of F4-50) 4: Reserved 5: Reserved	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-06	0xA106	VDI state setting	Ones: VDI1 state 0: Inactive 1: Active Tens: VDI2 state 0: Inactive 1: Active Hundreds: VDI3 state 0: Inactive 1: Active Thousands: VDI4 state 0: Inactive 1: Active Ten thousands: VDI5 state 0: Inactive 1: Active	0	-	Real time
A1-07	0xA107	AI1 (used as DI) function	Same as A1-00	0	-	At stop
A1-08	0xA108	AI2 (used as DI) function	Same as A1-00	0	-	At stop
A1-09	0xA109	AI3 (used as DI) function	Same as A1-00	0	-	At stop
A1-10	0xA10A	Active state selection for AI used as DI	Ones: AI1 0: Active low 1: Active high Tens: AI2 0: Active low 1: Active high Hundreds: AI3 0: Active low 1: Active high	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-11	0xA10B	VDO1 output selection	0: No output 1: AC drive in operation 2: Fault 3: Frequency level detection FDT1 4: Frequency arrival 5: Operating at zero speed (OFF at stop) 6: Motor overload pre-alarm 7: AC drive overload pre-alarm 8: Set count value arrival 9: Specified count value arrival 10: Length arrival 11: Simple PLC cycle completed 12: Cumulative running time reached 13: Swing frequency limited 14: Torque limited 15: Ready to run 16: AI1 > AI2 17: Frequency upper limit arrival 18: Frequency lower limit arrival (OFF at stop) 19: Undervoltage state 20: Communication setting 21: Brake output 22: Positioning completed 23: Operating at zero speed (ON at stop) 24: Cumulative power-on time arrival 25: Frequency level detection (FDT2) 26: Frequency 1 arrival 27: Frequency 2 arrival 28: Current 1 arrival 29: Current 2 arrival Continued	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-11	0xA10B	VDO1 output selection	Continued 30: Timing arrival 31: AI1 input limit exceeded 32: Load loss 33: Reverse run in progress 34: Zero current state 35: Module temperature arrival 36: Output current limit exceeded 37: Frequency lower limit arrival (ON at stop) 38: Alarm (all faults) 39: Motor overtemperature 40: Current operating time arrival 41: Fault (excluding undervoltage) 42: STO 43: Operation limited 44: Brake output at stop (wire drawing machine) 45: Position lock completed Others: B connector	0	-	Real time
A1-12	0xA10C	VDO2 output selection	Same as A1-11	0	-	Real time
A1-13	0xA10D	VDO3 output selection	Same as A1-11	0	-	Real time
A1-14	0xA10E	VDO4 output selection	Same as A1-11	0	-	Real time
A1-15	0xA10F	VDO5 output selection	Same as A1-11	0	-	Real time
A1-21	0xA115	VDO active mode selection	Ones: VDO1 0: Positive logic 1: Negative logic Tens position: VDO2 0: Positive logic 1: Negative logic Hundreds: VDO3 0: Positive logic 1: Negative logic Thousands: VDO4 0: Positive logic 1: Negative logic Ten thousands: VDO5 0: Positive logic 1: Negative logic	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-22	0xA116	VDO1 output switch-on delay	0.0 to 3600.0	0.0	s	Real time
A1-23	0xA117	VDO2 output switch-on delay	0.0 to 3600.0	0.0	s	Real time
A1-24	0xA118	VDO3 output switch-on delay	0.0 to 3600.0	0.0	s	Real time
A1-25	0xA119	VDO4 output switch-on delay	0.0 to 3600.0	0.0	s	Real time
A1-26	0xA11A	VDO5 output switch-on delay	0.0 to 3600.0	0.0	s	Real time
A1-27	0xA11B	VDO1 output switch-off delay time	0.0 to 3600.0	0.0	s	Real time
A1-28	0xA11C	VDO2 output switch-off delay time	0.0 to 3600.0	0.0	s	Real time
A1-29	0xA11D	VDO3 output switch-off delay time	0.0 to 3600.0	0.0	s	Real time
A1-30	0xA11E	VDO4 output switch-off delay time	0.0 to 3600.0	0.0	s	Real time
A1-31	0xA11F	VDO5 output switch-off delay time	0.0 to 3600.0	0.0	s	Real time
A1-32	0xA120	VDO6 function selection	Same as A1-11	0	-	Real time
A1-33	0xA121	VDO7 function selection	Same as A1-11	0	-	Real time
A1-34	0xA122	VDO8 function selection	Same as A1-11	0	-	Real time
A1-35	0xA123	VDO9 function selection	Same as A1-11	0	-	Real time
A1-36	0xA124	VDO10 function selection	Same as A1-11	0	-	Real time
A1-37	0xA125	VDO11 function selection	Same as A1-11	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-38	0xA126	VDO6 to VDO10 active mode selection	Ones: VDO6 0: Positive logic 1: Negative logic Tens: VDO7 0: Positive logic 1: Negative logic Hundreds: VDO8 0: Positive logic 1: Negative logic Thousands: VDO9 0: Positive logic 1: Negative logic Ten thousands: VDO10 0: Positive logic 1: Negative logic	0	-	Real time
A1-39	0xA127	VDO11 active mode selection	0: Positive logic 1: Negative logic	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-40	0xA128	VDI6 function selection	0: No function 1: Forward run (IN1) 2: Reverse run (IN2) 3: Three-wire control (IN3) 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as UP key for frequency adjustment 7: Function as DOWN key for frequency adjustment 8: Coast to stop 9: Fault reset (RESET) 10: Operation pause 11: External fault NO input 12: Multi-reference terminal 1 13: Multi-reference terminal 2 14: Multi-reference terminal 3 15: Multi-reference terminal 4 16: Acceleration/ Deceleration selection terminal 1 17: Acceleration/ Deceleration selection terminal 2 18: Frequency reference switchover 19: Clear data set by terminal functioning as UP/DOWN key 20: Control command source switchover terminal 1 21: Acceleration/ Deceleration inhibited 22: PID pause 23: Simple PLC status reset 24: Swing frequency pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control inhibited 31: Reserved 32: Immediate DC braking 33: External fault NC input (Continued)	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-40	0xA128	VDI6 function selection	(Continued) 34: Frequency modification enable 35: PID acting direction inversion 36: External stop terminal 1 37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency X and preset frequency 40: Switchover between auxiliary frequency Y and preset frequency 41: Motor selection terminal 1 42: Reserved 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed/Torque control selection 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: Present operating time clear (Continued)	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-40	0xA128	VDI6 function selection	(Continued) 51: Reserved 52: Reverse running inhibited 64: Forward limit switch 65: Reverse limit switch 66: Water-cooling fault input 67: Low liquid level fault input 70: Control channel selection 71: Setting channel selection (reserved) 72: Terminal module A/B selection 73: Startup mode selection bit0 74: Startup mode selection bit1 75: Control command switchover terminal 3 76: Motor selection terminal 2 77: Running enable 78: Forward run permission 79: Reverse run permission 80: RFG input set to zero 86: Wire breakage detection (wire drawing machine)	0	-	At stop
A1-41	0xA129	VDI6 hardware source	Ones: VDI6 state 0: Determined by VDO6 state 1: Determined by A1-42 2: Determined by DI6 state 3: Determined by communication value (bit15 of F4-50) 4: Reserved 5: Reserved	0	-	At stop
A1-42	0xA12A	VDI6 state setting	Ones: VDI6 state 0: Inactive 1: Active	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-43	0xA12B	VDI1 to VDI5 active mode	Ones: VDI1 0: Active low 1: Active high Tens: VDI2 0: Active low 1: Active high Hundreds: VDI3 0: Active low 1: Active high Thousands: VDI4 0: Active low 1: Active high Ten thousands: VDI5 0: Active low 1: Active high	0	-	At stop
A1-44	0xA12C	VDI6 active mode	Ones: VDI6 0: Active low 1: Active high	0	-	At stop
A1-50	0xA132	DIO edge counting reset	0: Disable 1: First counting module 2: Second counting module 3: Third counting module 4: Fourth counting module 5: All counting modules	0	-	Real time
A1-51	0xA133	Channel selection for DIO edge counting module 1	0: Disable 1 to 10: DI1 to DI10 11 to 16: VDI1 to VDI6 17: RELAY1 (DO3) 18: FMR 19: DO1 20: RELAY2 (DO4) 21: DO2 22 to 32: VDO1 to VDO11	0	-	Real time
A1-52	0xA134	Channel selection for DIO edge counting module 2	Same as A1-51	0	-	Real time
A1-53	0xA135	Channel selection for DIO edge counting module 3	Same as A1-51	0	-	Real time
A1-54	0xA136	Channel selection for DIO edge counting module 4	Same as A1-51	0	-	Real time
A1-55	0xA137	Comparison value of DIO edge counting module 1	0 to 65535	0	-	Real time
A1-56	0xA138	Comparison value of DIO edge counting module 2	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A1-57	0xA139	Comparison value of DIO edge counting module 3	0 to 65535	0	-	Real time
A1-58	0xA13A	Comparison value of DIO edge counting module 4	0 to 65535	0	-	Real time
A1-59	0xA13B	Counting value of DIO edge counting module 1	0 to 65535	0	-	Unchangeable
A1-60	0xA13C	Counting value of DIO edge counting module 2	0 to 65535	0	-	Unchangeable
A1-61	0xA13D	Counting value of DIO edge counting module 3	0 to 65535	0	-	Unchangeable
A1-62	0xA13E	Counting value of DIO edge counting module 4	0 to 65535	0	-	Unchangeable

9.18 Group A4 Control Channels

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A4-00	0xA400	Control channel selection	0: Control channel 1 1: Control channel 2	0	-	Real time
A4-01	0xA401	User-defined OFF1 source	0: Inactive 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A4-02	0xA402	User-defined OFF2 source 1	0: Active 1: Inactive 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	1	-	Real time
A4-03	0xA403	Self-defined OFF3 source 1	Same as A4-02	1	-	Real time
A4-04	0xA404	Custom operation permission source	0: Operation inhibited 1: Operation allowed 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	1	-	Real time
A4-05	0xA405	User-defined fault reset command source 1	Same as A4-01	0	-	Real time
A4-06	0xA406	User-defined JOG1 source	Same as A4-01	0	-	Real time
A4-07	0xA407	User-defined JOG2 source	Same as A4-01	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A4-08	0xA408	Custom speed inversion source	Same as A4-01	0	-	Real time
A4-10	0xA40A	OFF2 source 2	Same as A4-02	1	-	Real time
A4-11	0xA40B	OFF2 source 3	Same as A4-02	1	-	Real time
A4-12	0xA40C	OFF3 source 2	Same as A4-02	1	-	Real time
A4-13	0xA40D	OFF3 source 3	Same as A4-02	1	-	Real time
A4-14	0xA40E	Fault reset source 2	Same as A4-01	0	-	Real time
A4-15	0xA40F	Fault reset source 3	Same as A4-01	0	-	Real time
A4-16	0xA410	RFG inhibition source	Same as A4-02	1	-	Real time
A4-17	0xA411	RFG pause source	Same as A4-02	1	-	Real time
A4-18	0xA412	Source of setting RFG reference to 0	Same as A4-02	1	-	Real time
A4-21	0xA415	User-defined OFF1 source	Same as A4-01	0	-	Real time
A4-22	0xA416	User-defined OFF2 source 1	Same as A4-02	1	-	Real time
A4-23	0xA417	Self-defined OFF3 source 1	Same as A4-02	1	-	Real time
A4-24	0xA418	Custom operation permission source	Same as A4-04	1	-	Real time
A4-25	0xA419	User-defined fault reset command source 1	Same as A4-01	0	-	Real time
A4-26	0xA41A	User-defined JOG1 source	Same as A4-01	0	-	Real time
A4-27	0xA41B	User-defined JOG2 source	Same as A4-01	0	-	Real time
A4-28	0xA41C	Custom speed inversion source	Same as A4-01	0	-	Real time
A4-30	0xA41E	OFF2 source 2	Same as A4-02	1	-	Real time
A4-31	0xA41F	OFF2 source 3	Same as A4-02	1	-	Real time
A4-32	0xA420	OFF3 source 2	Same as A4-02	1	-	Real time
A4-33	0xA421	OFF3 source 3	Same as A4-02	1	-	Real time
A4-34	0xA422	Fault reset source 2	Same as A4-01	0	-	Real time
A4-35	0xA423	Fault reset source 3	Same as A4-01	0	-	Real time
A4-36	0xA424	RFG inhibition source	Same as A4-02	1	-	Real time
A4-37	0xA425	RFG pause source	Same as A4-02	1	-	Real time
A4-38	0xA426	Source of setting RFG reference to 0	Same as A4-02	1	-	Real time
A4-41	0xA429	Terminal start/stop module A/B selection	0: Module A 1: Module B	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A4-43	0xA42B	Terminal start/stop module A input 1	Same as A4-01	2	-	Real time
A4-44	0xA42C	Terminal start/stop module A input 2	Same as A4-01	2	-	Real time
A4-45	0xA42D	Terminal start/stop module A input 3	Same as A4-01	2	-	Real time
A4-46	0xA42E	Operation permission source of terminal start/stop module A	Same as A4-01	1	-	Real time
A4-47	0xA42F	Fault reset source of terminal start/stop module A	Same as A4-01	0	-	Real time
A4-48	0xA430	JOG1 source of terminal start/stop module A	Same as A4-01	2	-	Real time
A4-49	0xA431	JOG2 source of terminal start/stop module A	Same as A4-01	2	-	Real time
A4-50	0xA432	Mode of terminal start/stop module B	0: Two-wire mode 1 1: Two-wire mode 2 2: Three-wire mode 1 3: Three-wire mode 2	0	-	Real time
A4-51	0xA433	Terminal start/stop module B input 1	Same as A4-01	2	-	Real time
A4-52	0xA434	Terminal start/stop module B input 2	Same as A4-01	2	-	Real time
A4-53	0xA435	Terminal start/stop module B input 3	Same as A4-01	2	-	Real time
A4-54	0xA436	Operation permission source of terminal start/stop module B	Same as A4-01	1	-	Real time
A4-55	0xA437	Fault reset source of terminal start/stop module B	Same as A4-01	2	-	Real time
A4-56	0xA438	JOG1 source of terminal start/stop module B	Same as A4-01	2	-	Real time
A4-57	0xA439	JOG2 source of terminal start/stop module B	Same as A4-01	2	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A4-61	0xA43D	Speed control supplementary speed source	0: 0 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
A4-62	0xA43E	Jog 1 speed source	0: Digital setting 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
A4-65	0xA441	Ramp arc mode	0: Discontinuous smoothing 1: Continuous smoothing	0	-	Real time
A4-66	0xA442	Jog ramp source	0: Ramp time of normal operation 1: Ramp time of jog	1	-	Real time
A4-67	0xA443	Initial arc ratio at the start of acceleration	0.0 to 100.0	30.0	%	At stop
A4-68	0xA444	Arc ratio at the end of acceleration	0.0 to 100.0	30.0	%	At stop
A4-69	0xA445	Arc ratio at the start of deceleration	0.0 to 100.0	30.0	%	At stop
A4-70	0xA446	Arc ratio at the end of deceleration	0.0 to 100.0	30.0	%	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A4-71	0xA447	Forcible enable of ramp output	0: Disable 1: Enable 2: Reserved 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
A4-72	0xA448	Forced value of ramp output	0: 100% 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
A4-73	0xA449	Ramp change enable of ramp input	Same as A4-71	0	-	Real time
A4-74	0xA44A	Ramp input update interval	2 to 10000	50	ms	Real time
A4-75	0xA44B	Ramp tracking	0: Disable 1: Enable	0	-	Real time
A4-76	0xA44C	Ramp tracking error	0.0 to 100.0	10.0	%	Real time
A4-77	0xA44D	Frequency acceleration time in torque control	0.0 to 6500.0	0.0	s	Real time
A4-78	0xA44E	Frequency deceleration time in torque control	0.0 to 6500.0	0.0	s	Real time
A4-79	0xA44F	The fourth set of time is used by torque control forcibly.	0 to 1	1	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A4-80	0xA450	Operation with the limited speed	0: Limit the maximum operation speed 1: Run at a specified safe speed	1	-	Real time
A4-81	0xA451	Forward speed limit in limited operation mode	0.0 to 100.0	100.0	%	Real time
A4-82	0xA452	Reverse speed limit in limited operation mode	0.0 to 100.0	100.0	%	Real time
A4-83	0xA453	Maximum motoring power in limited operation mode	0.0 to 400.0	50.0	%	Real time
A4-84	0xA454	Maximum regenerative power in limited operation mode	0.0 to 400.0	50.0	%	Real time
A4-85	0xA455	Used to limit the positive torque limit during operation.	0.0 to 400.0	50.0	%	Real time
A4-86	0xA456	Used to limit the negative torque limit during operation.	0.0 to 400.0	50.0	%	Real time
A4-87	0xA457	Used to limit the max. permissible current during operation.	0.0 to 400.0	90.0	%	Real time

9.19 Group A5: Control Optimization Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A5-00	0xA500	Frequency upper limit for DPWM switchover	5.0 to 6000.0	2000.0	Hz	Real time
A5-01	0xA501	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	-	Real time
A5-02	0xA502	Dead time compensation mode	0: No compensation 1: Compensation mode 1	1	-	Real time
A5-03	0xA503	Random PWM depth	0 to 10	0	-	Real time
A5-04	0xA504	Pulse-by-pulse current limit protection	0: Disable 1: Enable	1	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A5-05	0xA505	Voltage overmodulation coefficient	100 to 115	103	%	Real time
A5-06	0xA506	Undervoltage threshold	140.0 to 420.0	350.0	V	Real time
A5-08	0xA508	Low speed carrier frequency upper limit	0.0 to 8.0	2.0	kHz	Real time
A5-09	0xA509	Overvoltage threshold	330.0 to 820.0	820.0	V	Real time
A5-10	0xA50A	Energy-saving control	0: Inactive 1: Active	0	-	Real time
A5-11	0xA50B	Udc filtering for the previous or next cycle	0: Disable 1: Enable	1	-	Real time
A5-12	0xA50C	Carrier frequency of single/dual pulsing switchover	0 to 24	0	kHz	At stop
A5-16	0xA510	Stall detection sensitivity	0 to 20	0	-	Real time

9.20 Group A6 AI Curve Settings

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A6-00	0xA600	Minimum input of AI curve 4	-10.00 to A6-02	0.00	V	Real time
A6-01	0xA601	Scaling of the minimum input of AI curve 4	-100.0 to +100.0	0.0	%	Real time
A6-02	0xA602	Inflection point 1 input of AI curve 4	A6-00 to A6-04	3.00	V	Real time
A6-03	0xA603	Scaling of inflection point 1 input of AI curve 4	-100.0 to +100.0	30.0	%	Real time
A6-04	0xA604	Inflection point 2 input of AI curve 4	A6-02 to A6-06	6.00	V	Real time
A6-05	0xA605	Scaling of inflection point 2 input of AI curve 4	-100.0 to +100.0	60.0	%	Real time
A6-06	0xA606	Maximum input of AI curve 4	A6-04 to 10.00	10.00	V	Real time
A6-07	0xA607	Scaling of the maximum input of AI curve 4	-100.0 to +100.0	100.0	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A6-08	0xA608	Minimum input of AI curve 5	-10.00 to A6-10	-10.00	V	Real time
A6-09	0xA609	Scaling of the minimum input of AI curve 5	-100.0 to +100.0	-100.0	%	Real time
A6-10	0xA60A	Inflection point 1 input of AI curve 5	A6-08 to A6-12	-3.00	V	Real time
A6-11	0xA60B	Scaling of inflection point 1 input of AI curve 5	-100.0 to +100.0	-30.0	%	Real time
A6-12	0xA60C	Inflection point 2 input of AI curve 5	A6-10 to A6-14	3.00	V	Real time
A6-13	0xA60D	Scaling of inflection point 2 input of AI curve 5	-100.0 to +100.0	30.0	%	Real time
A6-14	0xA60E	Maximum input of AI curve 5	A6-12 to 10.00	10.00	V	Real time
A6-15	0xA60F	Scaling of the maximum input of AI curve 5	-100.0 to +100.0	100.0	%	Real time
A6-24	0xA618	AI1 jump point	-100.0 to +100.0	0.0	%	Real time
A6-25	0xA619	AI1 jump amplitude	0.0 to 100.0	0.1	%	Real time
A6-26	0xA61A	AI2 jump point	-100.0 to +100.0	0.0	%	Real time
A6-27	0xA61B	AI2 jump amplitude	0.0 to 100.0	0.1	%	Real time
A6-28	0xA61C	AI3 jump point	-100.0 to +100.0	0.0	%	Real time
A6-29	0xA61D	AI3 jump amplitude	0.0 to 100.0	0.1	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A6-30	0xA61E	AI automatic adjustment curve	Ones: Point selection (for setting) 0: Off 1: Point 1 2: Point 2 3: Point 3 4: Point 4 Tens: AI channel selection (for setting) 0: Off 1: AI1 2: AI2 3: AI3 Hundreds: Enable control (for setting) 0: Disable 1: Enable Thousands: X-point curve (for display) 0: The control function is disabled or the channel is not selected. 2: Two-point curve 4: Four-point curve Ten thousands: Reserved	0	-	Real time
A6-31	0xA61F	AI1 input	0: Disable 1: Enable Others: B connector	1	-	Real time
A6-32	0xA620	AI2 input	0: Disable 1: Enable Others: B connector	1	-	Real time
A6-33	0xA621	AI3 input	0: Disable 1: Enable Others: B connector	1	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A6-34	0xA622	AI polarity selection	Ones: AI1 selection 0: Normal value 1: Absolute value 2: Inverted value 3: Opposite to absolute value Tens: AI2 selection 0: Normal value 1: Absolute value 2: Inverted value 3: Opposite to absolute value Hundreds: AI3 polarity 0: Normal value 1: Absolute value 2: Inverted value 3: Opposite to absolute value	0	-	Real time
A6-35	0xA623	AI hardware source selection	Ones: AI1 source 0: Hardware sampling 1: Forced value Tens: AI2 source 0: Hardware sampling 1: Forced value Hundreds: AI3 source 0: Hardware sampling 1: Forced value	0	-	At stop
A6-36	0xA624	AI1 forced value	-10.00 to +10.00	0.00	V	Real time
A6-37	0xA625	AI2 forced value	-10.00 to +10.00	0.00	V	Real time
A6-38	0xA626	AI3 forced value	-10.00 to +10.00	0.00	V	Real time
A6-39	0xA627	High level judgment threshold when AI uses as DI	5.5 to 9.0	7.0	V	Real time
A6-40	0xA628	Low level judgment threshold when AI uses as DI	1.0 to 4.5	3.0	V	Real time
A6-41	0xA629	AI1 gain	-10.00 to +10.00	1.00	-	Real time
A6-42	0xA62A	AI1 offset	-10.00 to +10.00	0.00	V	Real time
A6-43	0xA62B	AI1 denoising threshold	0.0 to 100.0	0.0	%	Real time
A6-44	0xA62C	AI1 dead zone width	0.0 to 100.0	0.0	%	Real time
A6-47	0xA62F	AI2 gain	-10.00 to +10.00	1.00	-	Real time
A6-48	0xA630	AI2 offset	-10.00 to +10.00	0.00	V	Real time
A6-49	0xA631	AI2 denoising threshold	0.0 to 100.0	0.0	%	Real time
A6-50	0xA632	AI2 dead zone width	0.0 to 100.0	0.0	%	Real time
A6-51	0xA633	Upper limit of AI2 input protection	A6-52 to 10.00	8.00	V	Real time
A6-52	0xA634	Lower limit of AI2 input protection	0.00 to A6-51	2.00	V	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A6-53	0xA635	AI3 gain	-10.00 to +10.00	1.00	-	Real time
A6-54	0xA636	AI3 offset	-10.00 to +10.00	0.00	V	Real time
A6-55	0xA637	AI3 denoising threshold	0.0 to 100.0	0.0	%	Real time
A6-56	0xA638	AI3 dead zone width	0.0 to 100.0	0.0	%	Real time
A6-57	0xA639	Upper limit of AI3 input protection	A6-58 to 10.00	8.00	V	Real time
A6-58	0xA63A	Lower limit of AI3 input protection	0.00 to A6-57	2.00	V	Real time
A6-59	0xA63B	AI input protection time	0.00 to 1.00	0.01	s	Real time

9.21 Group A7 Brake Control

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A7-00	0xA700	Brake function selection	0: Disable brake 1: Enable brake without detection information 2: Enable brake with detection information	0	-	At stop
A7-01	0xA701	Brake release action time	0.00 to 30.00	0.30	s	Real time
A7-02	0xA702	Brake apply action time (Actuating time of brake-apply)	0.00 to 30.00	0.30	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A7-03	0xA703	Brake feedback point source	0: Inactive 1: Active 2: Invalid 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
A7-04	0xA704	Brake feedback fault delay	0.00 to 30.00	2.00	s	Real time
A7-05	0xA705	Start torque direction	0: Digital reference of starting torque 1: Defined by digital reference of starting torque and motor operating direction	0	-	Real time
A7-06	0xA706	Starting torque source in the vector control mode	0: Disable 1: Retentive torque 2: Digital setting of starting torque Others: F connector	0	-	Real time
A7-07	0xA707	Digital setting of starting torque	-200.0 to 200.0	0.0	%	Real time
A7-08	0xA708	Retentive starting torque gain factor	0.0 to 300.0	100.0	%	Real time
A7-09	0xA709	Starting speed source	0: Disable 1: Digital setting of starting speed 2: Defined by digital reference of starting speed and motor operating direction	0	-	Real time
A7-10	0xA70A	Digital setting of torque reference	-30.0 to 30.0	0.0	%	Real time
A7-11	0xA70B	Forced brake close command source	Same as A7-03	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A7-12	0xA70C	Actual speed monitoring threshold for brake apply	0.0 to 100.0	3.0	%	Real time
A7-13	0xA70D	Actual speed monitoring time for brake apply	0.00 to 300.00	0.10	s	Real time
A7-14	0xA70E	Set speed monitoring threshold for brake apply	0.0 to 100.0	0.0	%	Real time
A7-15	0xA70F	Set speed monitoring time for brake apply	0.00 to 60.00	5.00	s	Real time
A7-16	0xA710	Brake open command source	Same as A7-03	1	-	Real time
A7-17	0xA711	Comparison value source of brake release	0: Disable 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
A7-18	0xA712	Comparison threshold for brake release	0.0 to 300.0	0.0	%	Real time
A7-19	0xA713	Brake release delay	0.00 to 30.00	0.20	s	Real time
A7-20	0xA714	Acceleration time of starting torque	0.01 to 5.00	0.30	s	At stop
A7-21	0xA715	Stop torque deceleration time	0.01 to 5.00	0.20	s	At stop
A7-30	0xA71E	Brake action frequency at stop (wire drawing machine)	0.00 to F0-10	1.5	Hz	Real time
A7-31	0xA71F	Brake action delay at stop (wire drawing machine)	0.0 to 20.0	6.0	s	Real time
A7-32	0xA720	DI terminal open circuit detection delay (wire drawing machine)	0.0 to 20.0	6.0	s	Real time

9.22 Group A9 Motor Parameter 1

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A9-00	0xA900	Number of parallel motors	1 to 200	1	-	At stop
A9-01	0xA901	Motor information command word	bit0: Mutual inductance curve enable 0: Disable 1: Enable bit1: D/Q inductance curve enable 0: Disable 1: Enable bit2: Online rotor resistance auto-tuning 0: Disable 1: Enable bit3: Online rotor resistance auto-tuning method 0: Amplitude 1: Phase bit4: Motor thermal model 0: Disable 1: Enable bit5: Motor thermal model temperature source 0: Estimated temperature 1: Sensor detected temperature bit6: Torque coefficient calculation method of asynchronous motor 0: Torque formula 1: Current distribution bit7: Torque coefficient calculation method of synchronous motor 0: Torque formula 1: Rated value match bit8: Zero-speed friction torque calculation method 0: Linearly decreased to zero 1: Maintain minimum speed torque Continued	0x3	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A9-01	0xA901	Motor information command word	Continued bit9: Enable model parameter calculation based on nameplate parameters 0: Disable 1: Enable bit10: Parameter confirmation key of nameplate parameter calculation model 0: Default 1: OK bit11: Reserved bit12: Ld curve selection of the reluctance motor 0: Dynamic auto-tuning result 1: Static auto-tuning result bit13: Synchronous motor torque accuracy calibration 0: Disable 1: Enable	0x3	-	At stop
A9-02	0xA902	Defines the number of motor pole pairs.	0 to 64	0	-	At stop
A9-03	0xA903	Power factor of the motor	0.600 to 1.000	0.860	-	At stop
A9-05	0xA905	Expansion card selection	1: Expansion card 1 2: Expansion card 2	1	-	At stop
A9-06	0xA906	ABZ low-speed speed measurement mode	0: Maintain 1: Attenuate 2: Optimize	2	-	At stop
A9-07	0xA907	Filter time constant for encoder speed measurement	0.000 to 10.000	0.004	s	Real time
A9-08	0xA908	Software detection coefficient for encoder open circuit	0.000 to 8.000	1.000	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A9-09	0xA909	Encoder control word	bit0: Speed measurement enable 0: Disable 1: Enable bit1: Software open circuit detection 0: Disable 1: Enable bit2: Deburring 0: Disable 1: Enable bit3: ABZ speed measurement mode selection 0: 4x 1: Single pulse bit4: AB pulse input mode 0: A/B quadrature 1: A for pulse and B for direction bit5: Pulse (A) +direction (B) function selection 1 0: Counting at falling edge of A 1: Counting at rising edge of A bit6: Pulse (A) +direction (B) function selection 2 0: Forward running at high level of B and reverse running at low level of B 1: Reverse running at high level of B and forward running at low level of B bit7: Speed filter mode selection 0: Low-pass filter 1: Moving average filter bit8: Position glitch rejection function selection 0: Determined by glitch rejection function 1: Disable bit9: Hardware open circuit detection 0: Disable 1: Enable	0	-	At stop
A9-10	0xA90A	Threshold of speed error events	1 to 100	10	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A9-11	0xA90B	Motor gear ratio numerator	1 to 65535	1	-	At stop
A9-12	0xA90C	Motor gear ratio denominator	1 to 65535	1	-	At stop
A9-13	0xA90D	Encoder external input source	0: 0 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	At stop
A9-15	0xA90F	Stator leakage inductance	0.000 to 65.535	6.540	mH	At stop
A9-16	0xA910	Electromechanical time constant	0.01 to 655.35	1.00	s	Unchangeable
A9-17	0xA911	Inertia ratio	0.0 to 6553.5	120.0	%	At stop
A9-18	0xA912	Friction torque	0.0 to 6553.5	2.0	%	At stop
A9-19	0xA913	Excitation current coefficient 1 (within rated current range) of mutual inductance curve.	5.0 to 100.0	50.0	%	At stop
A9-20	0xA914	Excitation current coefficient 2 (within rated current range) of mutual inductance curve	5.0 to 100.0	75.0	%	At stop
A9-21	0xA915	Excitation current coefficient 3 of mutual inductance curve	100.0 to 800.0	150.0	%	At stop
A9-22	0xA916	Excitation current coefficient 4 of mutual inductance curve	100.0 to 800.0	210.0	%	At stop
A9-23	0xA917	Flux coefficient 1 (within rated range) of mutual inductance curve	10.0 to 100.0	50.0	%	At stop
A9-24	0xA918	Flux coefficient 2 (within rated range) of mutual inductance curve	10.0 to 100.0	85.0	%	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A9-25	0xA919	Flux coefficient 3 of mutual inductance curve	100.0 to 300.0	115.0	%	At stop
A9-26	0xA91A	Flux coefficient 4 of mutual inductance curve	100.0 to 300.0	125.0	%	At stop
A9-27	0xA91B	Speed point 1 of friction curve	0 to 30000	15	rpm	At stop
A9-28	0xA91C	Speed point 2 of friction curve	0 to 30000	30	rpm	At stop
A9-29	0xA91D	Speed point 3 of friction curve	0 to 30000	60	rpm	At stop
A9-30	0xA91E	Speed point 4 of friction curve	0 to 30000	120	rpm	At stop
A9-31	0xA91F	Speed point 5 of friction curve	0 to 30000	150	rpm	At stop
A9-32	0xA920	Speed point 6 of friction curve	0 to 30000	300	rpm	At stop
A9-33	0xA921	Speed point 7 of friction curve	0 to 30000	600	rpm	At stop
A9-34	0xA922	Speed point 8 of friction curve	0 to 30000	1200	rpm	At stop
A9-35	0xA923	Speed point 9 of friction curve	0 to 30000	1500	rpm	At stop
A9-36	0xA924	Speed point 10 of friction curve	0 to 30000	3000	rpm	At stop
A9-37	0xA925	Torque point 1 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-38	0xA926	Torque point 2 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-39	0xA927	Torque point 3 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-40	0xA928	Torque point 4 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-41	0xA929	Torque point 5 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-42	0xA92A	Torque point 6 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-43	0xA92B	Torque point 7 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-44	0xA92C	Torque point 8 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-45	0xA92D	Torque point 9 of friction curve	-320.00 to 320.00	0.00	N·m	At stop
A9-46	0xA92E	Torque point 10 of friction curve	-320.00 to 320.00	0.00	N·m	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A9-47	0xA92F	Defines the starting point of D/Q-axis inductance curve current coefficient.	-800.0 to 800.0	-200.0	%	At stop
A9-48	0xA930	Defines the end point of D/Q-axis inductance curve current coefficient.	-800.0 to 800.0	200.0	%	At stop
A9-49	0xA931	D-axis inductance 1 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-50	0xA932	D-axis inductance 2 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-51	0xA933	D-axis inductance 3 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-52	0xA934	D-axis inductance 4 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-53	0xA935	D-axis inductance 5 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-54	0xA936	D-axis inductance 6 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-55	0xA937	D-axis inductance 7 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-56	0xA938	D-axis inductance 8 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-57	0xA939	D-axis inductance 9 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-58	0xA93A	D-axis inductance 10 of D/Q-axis inductance curve.	0.0 to 6553.5	100.0	%	At stop
A9-59	0xA93B	D-axis inductance 11 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-60	0xA93C	D-axis inductance 12 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-61	0xA93D	Q-axis inductance 1 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
A9-62	0xA93E	Q-axis inductance 2 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-63	0xA93F	Q-axis inductance 3 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-64	0xA940	Q-axis inductance 4 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-65	0xA941	Q-axis inductance 5 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-66	0xA942	Q-axis inductance 6 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-67	0xA943	Q-axis inductance 7 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-68	0xA944	Q-axis inductance 8 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-69	0xA945	Q-axis inductance 9 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-70	0xA946	Q-axis inductance 10 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-71	0xA947	Q-axis inductance 11 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop
A9-72	0xA948	Q-axis inductance 12 of D/Q-axis inductance curve	0.0 to 6553.5	100.0	%	At stop

9.23 Group AA Control Auxiliary Parameters

AA-00	0xAA00	Parameter auto-tuning before startup	bit0: Magnetic pole position auto-tuning of synchronous motor before startup 0: Disable 1: Enable bit1: Quick auto-tuning of stator resistance before startup 0: Disable 1: Enable bit2: Magnetic pole position auto-tuning based on high-frequency injection before startup 0: Disable 1: Enable 2: Adaptive bit4: IGBT shoot-through self-check before start 0: Disable 1: Enable bit5: Short-circuit to ground self-check before start (reserved) 0: Disable 1: Enable bit6: Phase loss self-check before start (reserved) 0: Disable 1: Enable bit7: Pre-positioning before synchronous motor start 0: Disable 1: Enable bit8: Auto-tuning of stator resistance before startup 0: Disable 1: Enable	1	-	At stop
AA-01	0xAA01	Motor parameter auto-tuning direction	0 to 1	1	-	At stop
AA-02	0xAA02	Vibration suppression gain during back EMF auto-tuning of synchronous motor	0.0 to 30.0	3.2	-	At stop
AA-03	0xAA03	Target speed during dynamic rotation auto-tuning	30.0 to 100.0	70.0	%	At stop

AA-04	0xAA04	Target speed 1 of rotation inertia auto-tuning	10.0 to AA-05	40.0	%	At stop
AA-05	0xAA05	Target speed 2 of rotation inertia auto-tuning	AA-04 to 100.0	60.0	%	At stop
AA-06	0xAA06	Motor parameter auto-tuning item configuration 2	bit0: Overcurrent prevention during auto-tuning of mutual inductance saturation curve 0: Off 1: On bit1: Auto-tuning scheme switchover 0: Scheme 1 1: Scheme 2 bit2: Auto-tuning calibration switch 0: Enable 1: Disable bit3: Second-segment auto-tuning switchover 0: Off 1: On bit4: Auto-tuning method 0: Fixed 1: Adjustable bit5: Reserved 0: Off 1: On bit6: DC injection during inductance auto-tuning 0: Injected 1: Not injected bit7: Adaptive magnetic pole position auto-tuning based on high-frequency injection (reserved) 0: Determined by bit7 of AA-07 1: Forcibly adaptive bit8: Current limit for rotor resistance leakage inductance auto-tuning 0: High current 1: Low current bit9: Leakage inductance auto-tuning of small motor/high-speed motor 0: Scheme 1 1: Scheme 2 (Continued)	5121	-	At stop

AA-06	0xAA06	Motor parameter auto-tuning item configuration 2	(Continued) bit10: Frequency adaptation based on rotor resistance auto-tuning of small/high-peed motor 0: Off 1: On bit11: Frequency adaptation based on rotor resistance auto-tuning of all motors 0: Off 1: On bit12: Calculation scheme selection for small motor/high-speed motor rotor resistance auto-tuning result 0: Scheme 1 1: Scheme 2 bit13: Calculation scheme selection for rotor resistance auto-tuning result of all motors 0: Scheme 1 1: Scheme 2 bit14: Current search based on high-frequency injection 0: Disable 1: Enable bit15: Rotor resistance and leakage inductance auto-tuning scheme switchover 0: No switched 1: Switch	5121	-	At stop

AA-07	0xAA07	Motor parameter auto-tuning item configuration	bit0: Speed loop parameter adaptation 0: Disable 1: Enable bit1: Current loop parameter adaptation 0: Disable 1: Enable bit2: Non-linear auto-tuning of the drive 0: Disable 1: Enable bit3: Auto-tuning of phase-to-phase deviation coefficient 0: Disable 1: Enable bit4: Initial magnetic pole position auto-tuning of synchronous motor 0: Disable 1: Enable bit5: D/Q-axis inductance model auto-tuning of synchronous motor 0: Disable 1: Enable bit6: System moment of inertia auto-tuning 0: Disable 1: Enable bit7:Magnetic pole position auto-tuning based on high-frequency injection 0: Disable 1: Enable Continued	125	-	At stop

AA-07	0xAA07	Motor parameter auto-tuning item configuration	Continued bit8: DC injection auto-tuning 0: Disable 1: Enable bit9: No-load current vector auto-tuning 0: Disable 1: Enable bit10: Speed reference source for no-load current vector auto-tuning 0: User-defined 1: Internal-defined bit11: Back EMF calculation 0: Disable 1: Enable bit12: Back EMF auto-tuning calculation mode 0: Mode 0 1: Mode 1 bit13: Encoder direction auto-tuning 0: Disable 1: Enable	125	-	At stop
AA-08	0xAA08	OFF3 stop mode	0: Quick stop 1: Stop with maximum capability	0	-	At stop
AA-09	0xAA09	Permissible stop mode during operation	0: OFF1 stop mode 1: OFF2 stop mode 2: OFF3 stop mode	1	-	At stop
AA-10	0xAA0A	Stop mode in torque control mode	0: Coast to stop forcibly 1: Switch to speed control mode and stop 2: Keep in the torque mode until the zero speed is reached and then stop	1	-	At stop
AA-11	0xAA0B	MTPA filter time	0 to 8000	20	-	Real time
AA-12	0xAA0C	Proportional gain tuning coefficient	0.1 to 2.0	1.0	-	Real time
AA-13	0xAA0D	Integral gain tuning coefficient	0.1 to 2.0	1.0	-	Real time
AA-14	0xAA0E	Zero speed threshold	0.1 to 200.0	2.0	%	Real time
AA-15	0xAA0F	Zero speed determination time	0.00 to 10.00	0.10	s	At stop
AA-16	0xAA10	Set channel execution interval	0 to 20	4	-	At stop

AA-17	0xAA11	Trial current of flying start for synchronous motor	5.0 to 50.0	10.0	%	At stop
AA-18	0xAA12	Minimum frequency for flying start of synchronous motor	0.0 to 100.0	0.0	Hz	At stop
AA-19	0xAA13	Angle compensation for flying start of synchronous motor	0 to 360	0	-	At stop
AA-20	0xAA14	Parameter auto-tuning of synchronous motor before startup	0 to 1	0	-	Real time
AA-21	0xAA15	Present motor angle	0 to 65535	0	-	Unchangeable
AA-22	0xAA16	Forward torque limit 1	0.0 to 400.0	150.0	%	Real time
AA-23	0xAA17	Reverse torque limit 1	0.0 to 400.0	150.0	%	Real time
AA-24	0xAA18	Source of positive torque limit 2	0: 400% Others: F connector	0	-	Real time
AA-25	0xAA19	Source of negative torque limit 2	0: -400% Others: F connector	0	-	Real time
AA-26	0xAA1A	Ramp (FRG) selection bit0	0: 0 1: 1 2: Terminal input function 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
AA-27	0xAA1B	Ramp (FRG) selection bit1	Same as AA-26	0	-	Real time

AA-30	0xAA1E	Motor protection	bit0: Motor overload judgment (reserved) bit1: Motor overheat detection (reserved) bit2: PG fault detection (reserved) Bit 3: Current control error detection Bit 4: Motor step loss error detection Bit 5: Motor stall detection Bit 6: Demagnetization protection for synchronous motor bit7: Demagnetization protection for permanent magnet motor bit8: Reserved Bit 9: Parameter setting error bit10: Output load loss detection (reserved) bit11: Divergent runaway protection bit12: Excessive speed deviation (reserved) bit13: Speed reversal protection (reserved) bit14: Overspeed protection (reserved) bit15: Demagnetization protection for reluctance motor with permanent magnet	65	-	Real time
AA-31	0xAA1F	Stall fault time	0.0 to 65.0	2.0	s	Real time
AA-32	0xAA20	Frequency upon stall fault	0.0 to 600.0	6.0	%	Real time
AA-33	0xAA21	Step loss detection time	0.0 to 10.0	0.5	s	Real time
AA-34	0xAA22	Step loss detection threshold	0.0 to 100.0	30.0	%	Real time
AA-35	0xAA23	Detection time for current control fault	0.00 to 1.00	0.05	s	Real time
AA-36	0xAA24	Detection threshold for current control fault	0.0 to 200.0	25.0	%	Real time
AA-37	0xAA25	Synchronous motor overcurrent threshold	0.0 to 500.0	300.0	%	Real time

AA-39	0xAA27	Speed deviation detection	0 to 1	1	-	Real time
AA-40	0xAA28	Frequency for FVC mode switchover of asynchronous motor	0 to 1000	20	%	At stop
AA-41	0xAA29	Hysteresis frequency for FVC mode switchover of asynchronous motor	10 to 50	20	%	At stop
AA-42	0xAA2A	Observer filter time of asynchronous motor in FVC mode	5 to 100	15	ms	At stop
AA-43	0xAA2B	Current mode of asynchronous motor in FVC mode	0 to 1	0	-	At stop
AA-44	0xAA2C	Pre-excitation output observation angle mode of asynchronous motor in FVC mode	0 to 1	0	-	At stop
AA-45	0xAA2D	Frequency for SVC mode switchover of asynchronous motor	10 to 20	15	%	At stop
AA-46	0xAA2E	DC starting frequency of asynchronous motor in SVC mode	0.1 to 20.0	0.5	%	Real time
AA-47	0xAA2F	Defines the asynchronous motor SVC observer gain 1.	10 to 500	100	%	Real time
AA-48	0xAA30	Observer gain 2 of asynchronous motor in SVC mode	10 to 100	20	%	Real time
AA-49	0xAA31	Observer mode of asynchronous motor in SVC mode	0 to 3	0	-	At stop
AA-50	0xAA32	Pre-excitation of asynchronous motor in SVC mode	0 to 1	0	-	At stop
AA-51	0xAA33	Flying start of asynchronous motor in SVC mode	0 to 1	0	-	At stop
AA-52	0xAA34	High-speed gain of asynchronous motor	0.0 to 3.0	0.5	-	At stop

AA-54	0xAA36	Synchronous motor 1 model control	bit0: Low-speed handling bit1: Low-speed handling 1 bit2: Online auto-tuning of resistance bit3: Online auto-tuning of back EMF bit4: KS	5	-	Real time
AA-55	0xAA37	Synchronous motor model K1	10 to 3000	200	Hz	Real time
AA-56	0xAA38	Synchronous motor model K1Max	100 to 6000	3000	%	Real time
AA-57	0xAA39	Synchronous motor model KsMin	0.0 to 4.0	0.3	-	Real time
AA-58	0xAA3A	Synchronous motor model Kspeed	50 to 2000	400	Hz	Real time
AA-59	0xAA3B	Frequency filter time constant of synchronous motor	2 to 100	10	ms	Real time
AA-60	0xAA3C	Rs online auto-tuning frequency upper limit of synchronous motor	1.0 to 20.0	3.5	%	Real time
AA-61	0xAA3D	Synchronous motor model Kr	0 to 50	10	-	Real time
AA-62	0xAA3E	Synchronous motor model Kr1	0 to 50	5	%	Real time
AA-63	0xAA3F	Low-speed d-axis injection current of synchronous motor	0 to 100	20	%	Real time
AA-64	0xAA40	Synchronous motor model LowFreqTime1	0 to 500	50	-	Real time
AA-67	0xAA43	Online auto-tuning frequency lower limit of back EMF	10 to 100	25	%	Real time
AA-68	0xAA44	Synchronous motor model LowFreq	0.0 to 2.0	0.3	%	Real time
AA-69	0xAA45	Synchronous motor model LowFreqTime	0 to 100	10	-	Real time
AA-70	0xAA46	Magnetic pole auto-tuning current percentage	30 to 200	130	%	Real time
AA-71	0xAA47	High frequency response current percentage	0 to 100	25	%	Real time

AA-72	0xAA48	HFI-to-SVC switchover frequency percentage	0 to 30	10	%	Real time
AA-73	0xAA49	Observer parameter	10 to 200	100	-	Real time
AA-74	0xAA4A	Speed filter cut-off frequency	1 to 200	10	Hz	Real time
AA-75	0xAA4B	Carrier frequency during NS auto-tuning	2.00 to 16.00	8.00	Hz	Real time
AA-76	0xAA4C	Automatic calculation of NS auto-tuning voltage	0 to 1	1	-	Real time
AA-77	0xAA4D	Percentage of NS auto-tuning voltage set manually	0 to 100	10	%	Real time
AA-78	0xAA4E	Duration of high frequency injection stage 1	50 to 500	150	ms	Real time
AA-80	0xAA50	Speed loop command word	bit0: Speed loop enable 0: Disable 1: Enable bit1: Integral mode 0: Traditional integral 1: Position-type integral Bit 2: Torque feedforward 0: Disable 1: Enable bit3: Acceleration source selection 0: Acceleration set by parameter 1: Automatic calculation 2: Acceleration set by parameter Bit 5: Anti-load disturbance 0: Disable 1: Enable bit9: Speed loop output torque limit adjustment with additional torque 0: Disable 1: Enable bit10: Balanced filter 0: Disable 1: Enable	19	-	Real time
AA-81	0xAA51	Fast integral cancel coefficient upon stalled motor	0.0 to 100.0	0.0	%	Real time

AA-82	0xAA52	Digital setting of integral torque	-100.0 to +100.0	0.0	%	Real time
AA-83	0xAA53	Frequency window of speed controller	0.00 to 10.00	0.00	Hz	At stop
AA-84	0xAA54	Current filter time for torque reference	0.0 to 100.0	0.0	ms	At stop
AA-85	0xAA55	Acceleration torque (reserved)	0: Inactive 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
AA-87	0xAA57	See the bandwidth of the model.	0.00 to 300.00	0.00	Hz	Real time
AA-88	0xAA58	Torque feedforward coefficient	0.0 to 6553.5	100.0	%	Real time
AA-89	0xAA59	Frequency filter time in vector control	0.0 to 100.0	0.0	ms	At stop
AA-90	0xAA5A	Filter time for feedback frequency in vector control	0.0 to 100.0	0.0	ms	At stop
AA-91	0xAA5B	Load observation bandwidth	0.00 to 300.00	0.00	Hz	Real time
AA-92	0xAA5C	Load observation coefficient	0.0 to 1000.0	100.0	%	Real time
AA-93	0xAA5D	Pseudo-integral coefficient	0.000 to 10.000	1.000	-	Real time
AA-94	0xAA5E	Torque coefficient	0: Disable 1: Enable	1	-	Real time

AA-95	0xAA5F	Low-frequency Kp switchover selection	0: 0 1: 1 2: Terminal input function 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
AA-96	0xAA60	Center frequency of notch filter 1	0.0 to 4000.0	4000.0	-	Real time
AA-97	0xAA61	Center frequency of notch filter 2	0.0 to 4000.0	4000.0	-	Real time
AA-98	0xAA62	Integral setting control word	0: Inactive 1: Valid Others: B connector	0	-	Real time
AA-99	0xAA63	Integral setting source	0: Digital setting 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time

9.24 Group AB Motor Control Parameter 1

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-00	0xAB00	Externally transferred acceleration (reserved)	0: Inactive 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication 6: Multi-reference 7: Motorized potentiometer 8: PID Others: F connector	0	-	Real time
AB-01	0xAB01	Current deviation threshold	0.3 to 2.0	0.5	-	At stop
AB-02	0xAB02	Current filter cycle setting	0 to 100	1	-	At stop
AB-03	0xAB03	Breakdown torque limit coefficient	0.0 to 400.0	100.0	%	Real time
AB-04	0xAB04	Motoring load power limit coefficient	0.0 to 400.0	400.0	%	Real time
AB-05	0xAB05	Generating load power limit coefficient.	0.0 to 400.0	400.0	%	Real time
AB-06	0xAB06	Overspeed limit	0 to 1	1	-	Real time
AB-07	0xAB07	Sine frequency setting of bandwidth test	0 to 1000	0	Hz	Real time
AB-08	0xAB08	Sine amplitude setting of bandwidth test	0 to 100	0	%	Real time
AB-09	0xAB09	Bandwidth test enabling	0 to 4	0	-	Real time
AB-10	0xAB0A	Torque coefficient adjustment value	0.0 to 200.0	100.0	%	Real time
AB-11	0xAB0B	Speed loop parameter calculation mode	0: New solution 1: Compatible mode	1	-	At stop
AB-12	0xAB0C	FVC speed loop proportional gain	0.00 to 100.00	8.00	Hz	Real time
AB-13	0xAB0D	FVC speed loop integral time	0.000 to 20.000	0.080	s	Real time
AB-14	0xAB0E	Speed loop proportional gain in SVC mode	0.00 to 100.00	5.00	Hz	Real time
AB-15	0xAB0F	Speed loop integral time in SVC mode	0.000 to 20.000	0.127	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-16	0xAB10	Low frequency scaling correction coefficient	0.0 to 1000.0	100.0	%	Real time
AB-17	0xAB11	Low frequency integral correction coefficient	0.0 to 1000.0	100.0	%	Real time
AB-18	0xAB12	Speed loop adaptive factor	Same as AB-00	0	-	Real time
AB-19	0xAB13	Lower limit of speed loop adaptive switchover	0.000 to 10.000	0.400	-	Real time
AB-20	0xAB14	Upper limit of speed loop adaptive switchover	0.000 to 10.000	1.000	-	Real time
AB-21	0xAB15	Upper limit of speed loop adaptive correction	0.0 to 1000.0	100.0	%	Real time
AB-22	0xAB16	Lower limit of speed loop adaptive correction	0.0 to 1000.0	100.0	%	Real time
AB-23	0xAB17	Magnetic flux adaptation	0 to 1	1	-	Real time
AB-24	0xAB18	Overspeed controller correction coefficient	0.0 to 1000.0	100.0	%	Real time
AB-25	0xAB19	Overvoltage/ Undervoltage suppression control command word in vector control	bit0: Undervoltage suppression (reserved) 0: Disable 1: Enable bit1: Overvoltage suppression 0: Disable 1: Enable bit2: Automatic calculation of overvoltage/undervoltage suppression threshold 0: Disable 1: Enable bit3: Overvoltage/ undervoltage suppression integral action 0: Disable 1: Enable	0	-	Real time
AB-26	0xAB1A	Bus capacitance ratio	50.0 to 1000.0	100.0	%	Real time
AB-27	0xAB1B	Hysteresis frequency for exiting power dip ride-through in vector control	0.00 to 10.00	3.00	Hz	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-28	0xAB1C	Speed threshold for disabling power dip ride-through in vector control mode	0.00 to 20.00	2.00	Hz	Real time
AB-29	0xAB1D	Dynamic tuning coefficient of overvoltage/ undervoltage suppression in vector control (reserved)	0.0 to 1000.0	100.0	%	Real time
AB-30	0xAB1E	Activation voltage for undervoltage suppression in vector control (reserved)	320.0 to 540.0	430.0	V	Real time
AB-31	0xAB1F	Activation voltage of vector overvoltage suppression	650.0 to 800.0	770.0	V	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-32	0xAB20	Flux linkage control command word	bit0: Filtering method for output voltage limit calculation 0: Symmetric filtering 1: Asymmetric filtering bit1: Asynchronous motor inverse curve calculation method 0: Decrease inversely proportional to synchronous frequency 1: Decrease inversely proportional to speed bit2: Flux linkage feedforward calculation inversely proportional to speed 0: Disable 1: Enable bit3 to bit4: Reserved bit5: Field weakening adjustment 0: Disable 1: Field weakening adjustment enable bit6: Flux derivative feedforward 0: Disable 1: Enable bit7: Energy conservation control 0: Disable 1: Enable bit8: Asynchronous motor flux closed-loop 0: Disable 1: Enable bit9: Reserved Continued	18741	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-32	0xAB20	Flux linkage control command word	Continued bit10: Reserved bit11: Asynchronous motor pre-excitation mode 0: Time-based pre-excitation 1: Current-based pre-excitation bit12: Asynchronous motor pre-excitation current mode 0: Current reference-based pre-excitation 1: Maximum current allowed by the platform bit13: Reserved bit14: Voltage outer loop mode 0: Voltage outer loop mode 0 1: Voltage outer loop mode 1 bit15: MTPA inductance 0: Saturation 1: Unsaturation	18741	-	Real time
AB-33	0xAB21	Voltage margin	1 to 50	3	%	Real time
AB-34	0xAB22	Margin of output voltage upper limit of synchronous motor through automatic adjustment	1 to 20	3	%	Real time
AB-35	0xAB23	Filter time calculation of max. output voltage	0 to 3000	10	ms	Real time
AB-36	0xAB24	Rated flux adjustment coefficient calculated	0.1 to 2.0	1.0	-	Real time
AB-37	0xAB25	Field weakening frequency threshold adjustment coefficient calculated	0.8 to 1.2	1.1	-	Real time
AB-38	0xAB26	Slip filter time of field weakening frequency threshold calculation	0 to 3000	62	ms	Real time
AB-39	0xAB27	Feedback speed filter	0 to 8000	50	ms	Real time
AB-40	0xAB28	Flux linkage rise filter time	0 to 8000	20	ms	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-41	0xAB29	Field weakening control gain	1 to 200	50	ms	Real time
AB-42	0xAB2A	Feedback voltage filter time	0 to 3000	0	ms	Real time
AB-43	0xAB2B	Maximum demagnetization current of synchronous motor	0 to 500	300	%	Real time
AB-44	0xAB2C	Voltage outer loop lower limit coefficient	0 to 500	50	-	Real time
AB-45	0xAB2D	Flux linkage differential feedforward coefficient	0.0 to 1.5	1.0	-	Real time
AB-46	0xAB2E	Flux linkage differential feedforward filter time	0 to 3000	6	ms	Real time
AB-47	0xAB2F	Filter time upon energy-saving control torque current rise	0 to 3000	50	ms	Real time
AB-48	0xAB30	Filter time upon energy-saving control torque current drop	0 to 3000	100	ms	Real time
AB-49	0xAB31	Flux linkage lower limit coefficient under energy conservation control	0.00 to 1.00	0.10	-	Real time
AB-50	0xAB32	Switchover frequency coefficient	0.0 to 10.0	1.0	-	At stop
AB-51	0xAB33	Pre-excitation current	1 to 200	100	%	Real time
AB-52	0xAB34	Pre-excitation time	1 to 30000	1000	ms	Real time
AB-53	0xAB35	Flux linkage closed loop bandwidth frequency	0.0 to 100.0	1.0	Hz	Real time
AB-54	0xAB36	Feedback flux linkage filter time coefficient	0 to 200	4	-	Real time
AB-55	0xAB37	Static output flux linkage filter time	0 to 5000	10	ms	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-57	0xAB39	The PI regulator proportion gain changes automatically with the load.	0: Inactive 1: Active	0	-	At stop
AB-58	0xAB3A	Current loop damping	0.2 to 10.0	0.8	-	Real time
AB-59	0xAB3B	Current loop Kp adjustment at low speed	0.1 to 10.0	1.0	-	Real time
AB-60	0xAB3C	Current loop Kp adjustment at high speed	0.1 to 10.0	1.0	-	Real time
AB-61	0xAB3D	Current loop Ki adjustment at low speed	0.1 to 10.0	1.0	-	Real time
AB-62	0xAB3E	Current loop Ki adjustment at high speed	0.1 to 10.0	2.0	-	Real time
AB-63	0xAB3F	Used to set D-axis current loop complex vector adjustment.	0.1 to 10.0	1.0	-	Real time
AB-64	0xAB40	Used to set Q-axis current loop complex vector adjustment.	0.1 to 10.0	1.0	-	Real time
AB-65	0xAB41	Used to set the lower limit of complex vector hysteresis frequency, which is a percentage of rated frequency.	0 to AB-66	0	%	Real time
AB-66	0xAB42	Used to set the upper limit of complex vector hysteresis frequency, which is a percentage of rated frequency.	AB-65 to 150	0	%	Real time
AB-67	0xAB43	Used to set the upper limit voltage for ImCsr2 hysteresis switchover, which is a percentage of saturation voltage.	AB-68 to 95	89	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-68	0xAB44	Used to set the lower limit voltage for ImCsr2 hysteresis switchover, which is a percentage of saturation voltage.	60 to AB-67	79	%	Real time
AB-69	0xAB45	Used to set ImCsr2 hysteresis range of hysteresis switchover frequency, which is a percentage of rated frequency.	1 to 30	10	%	Real time
AB-70	0xAB46	Used to set the lower limit of ImCsr2 hysteresis switchover frequency. The frequency hysteresis condition does not activate when this value is not reached. The setpoint is a percentage of rated frequency.	20 to 150	75	%	Real time
AB-71	0xAB47	Used to adjust Kss of ImCsr2 current loop.	0.1 to 10.0	1.0	-	Real time
AB-72	0xAB48	Used to set the proportional gain adjustment coefficient corresponding to the max. torque.	0.1 to 1.0	0.5	-	Real time
AB-73	0xAB49	Used to set the torque upper limit, which is a percentage of the rated torque.	AB-74 to 300	200	%	Real time
AB-74	0xAB4A	Used to set the torque lower limit, which is a percentage of the rated torque.	10 to AB-73	100	%	Real time
AB-75	0xAB4B	Used to adjust differential feedforward.	0.0 to 1.0	0.0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-76	0xAB4C	Used to set decoupling control starting frequency, which is a percentage of rated frequency.	20 to 150	60	%	Real time
AB-77	0xAB4D	Used to set the filter time adjustment coefficient of decoupling control.	0.1 to 3.0	1.0	-	Real time
AB-78	0xAB4E	Used to set decoupling control output adjustment coefficient.	0.0 to 1.0	0.7	-	Real time
AB-79	0xAB4F	CPC feedforward	0: Disable 1: Enable	0	-	Real time
AB-80	0xAB50	Current loop auxiliary command word	bit0: Complex vector angle limit 0: Disable 1: Enable bit1: Voltage angle limit selection 0: Limited internally 1: Parameter setting bit2: Default value 0 0: No limit on excitation current lower limit during dynamic process 1: Limit on excitation current lower limit during dynamic process in ImCsr2 mode bit3: Default value 0 reserved	0	-	Real time
AB-81	0xAB51	Defines voltage angle upper limit.	90 to 180	150	°	Real time
AB-82	0xAB52	Defines voltage angle lower limit.	0 to 90	30	°	Real time
AB-83	0xAB53	Defines asynchronous motor D-axis integral limit.	0.500 to 1.000	0.707	-	Real time
AB-84	0xAB54	Defines current loop carrier frequency upper limit.	5.0 to 16.0	8.0	-	Real time
AB-85	0xAB55	Droop enable	0 to 1	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-86	0xAB56	Soften source	0: Line current 1: Torque reference 2: Speed regulator output 3: Integral component of speed regulator	1	-	At stop
AB-87	0xAB57	Frequency droop coefficient reference	0.0 to 50.0	0.0	%	Real time
AB-88	0xAB58	Switch FVC to SVC	0: Not switched 1: Switched actively 2: Switched passively 3: Switched passively (reserved)	0	-	At stop
AB-89	0xAB59	Frequency for switching from FVC to SVC	10 to 500	50	%	At stop
AB-90	0xAB5A	Hysteresis for switching from FVC to SVC	10 to 100	10	%	At stop
AB-91	0xAB5B	Synchronous motor SVC model parameter 1	1 to 10000	10	-	Real time
AB-92	0xAB5C	Synchronous motor SVC model parameter 2	1 to 10000	5	-	Real time
AB-93	0xAB5D	Synchronous motor SVC model parameter 3	1 to 100	30	-	Real time
AB-94	0xAB5E	Synchronous motor SVC model parameter 4	-100 to +100	20	-	Real time
AB-95	0xAB5F	Synchronous motor SVC model parameter 5	0 to 50000	30	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AB-96	0xAB60	Synchronous motor SVC command word	bit0 to bit1: Low-speed processing method 0: Disable 1: Method 1 2: Method 2 bit2: Energy-saving optimization 0: Disable 1: Enable bit3: Online auto-tuning of back EMF 0: Disable 1: Enable bit4 to bit5: Inductance mode 0: Fixed value 1: Saturation value 2: Mode 1 3: Mode 2	54	-	At stop
AB-97	0xAB61	Low speed threshold 1 of synchronous motor in SVC mode	0.0 to 10.0	0.5	%	Real time
AB-98	0xAB62	Low speed threshold 2 of synchronous motor in SVC mode	0.0 to 10.0	0.0	%	Real time
AB-99	0xAB63	Synchronous motor SVC low speed voltage coefficient	0 to 100	50	%	Real time

9.25 Group AC AI/AO Correction

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AC-00	0xAC00	AI1 measured voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-01	0xAC01	AI1 displayed voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-02	0xAC02	AI1 measured voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-03	0xAC03	AI1 displayed voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-04	0xAC04	AI2 measured voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-05	0xAC05	AI2 displayed voltage 1	-10.000 to +10.000	2.000	V	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
AC-06	0xAC06	AI2 measured voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-07	0xAC07	AI2 displayed voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-08	0xAC08	AI3 measured voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-09	0xAC09	AI3 displayed voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-10	0xAC0A	AI3 measured voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-11	0xAC0B	AI3 displayed voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-12	0xAC0C	AO1 target voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-13	0xAC0D	AO1 measured voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-14	0xAC0E	AO1 target voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-15	0xAC0F	AO1 measured voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-16	0xAC10	AO2 target voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-17	0xAC11	AO2 measured voltage 1	-10.000 to +10.000	2.000	V	At stop
AC-18	0xAC12	AO2 target voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-19	0xAC13	AO2 measured voltage 2	-10.000 to +10.000	8.000	V	At stop
AC-40	0xAC28	AI2 verification resistance 1	0.0 to 6553.5	200.0	Ω	At stop
AC-41	0xAC29	Measured voltage of AI2 verification resistance 1	0.000 to 65.535	0.985	V	At stop
AC-42	0xAC2A	AI2 verification resistance 1	0.0 to 6553.5	1100.0	Ω	At stop
AC-43	0xAC2B	Measured voltage of AI2 verification resistance 2	0.000 to 65.535	2.312	V	At stop

9.26 Group BF AC Drive Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
BF-01	0xBF01	Dynamic parameter adaptive factor	20.0 to 200.0	100.0	%	At stop
BF-02	0xBF02	Used to set the auto-tuning voltage setting mode of saturation model.	0 to 1	1	-	Real time
BF-03	0xBF03	Used to set the auto-tuning carrier frequency of saturation model.	0.0 to 10.0	6.0	-	Real time
BF-04	0xBF04	Used to set the auto-tuning target rated current multiplier of saturation model.	0 to 250	200	%	Real time
BF-05	0xBF05	Used to set the auto-tuning manual voltage setting value of saturation model.	0 to 4096	2000	-	Real time
BF-06	0xBF06	DC bus voltage filter time	0 to 10000	0	ms	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
BF-07	0xBF07	Inverter protection	bit0: Pulse-by-pulse current limit protection (reserved) 0: Disable 1: Enable bit1: Output phase loss (Reserved) 0: Disable 1: Enable bit2: Leakage current protection (reserved) 0: Disable 1: Enable bit3: PL signal input phase loss detection (reserved) 0: Disable 1: Enable bit4: Bus input phase loss detection (reserved) 0: Disable 1: Enable bit5: Disable derating at low frequency 0: Disable 1: Enable bit6: Overvoltage report at stop 0: Yes 1: No bit7: Zero drift fault detection 0: Disable 1: Enable bit8: Pre-charge fault detection (reserved) 0: Disable 1: Enable Continued	24704	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
BF-07	0xBF07	Inverter protection	Continued bit9: Bus voltage acquisition analysis 0: Disable 1: Enable bit10: Reserved 0: Disable 1: Enable bit11: Reserved 0: Disable 1: Enable bit12: Reserved 0: Disable 1: Enable bit13: Derating reference 0: Five-segment pulse generation 1: Seven-segment pulse generation bit10: Capacitor leakage detection 0: Disable 1: Enable	24704	-	Real time
BF-09	0xBF09	Drive pre-overload threshold	0.0 to 100.0	90.0	%	Real time
BF-12	0xBF0C	Detection time of input phase loss	1.0 to 10.0	2.0	s	Real time
BF-13	0xBF0D	Allowable bus fluctuation range	10.0 to 500.0	65.0	V	Real time
BF-14	0xBF0E	Pre-overtemperature to overtemperature margin of the drive	0.0 to 60.0	5.0	°C	Real time
BF-15	0xBF0F	Maximum output current	0.0 to 1000.0	1000.0	%	Real time
BF-16	0xBF10	PWM setting	bit0: Reserved bit1: Carrier frequency adjusted with synchronous frequency 0: Disable 1: Enable bit2 to bit7: Reserved bit8: Overmodulation mode 0: Amplitude 1: Phase bit9: CPWM carrier frequency fixed association 0: Disable 1: Enable	514	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
BF-17	0xBF11	Hysteresis for adjusting carrier frequency with synchronous frequency	0.0 to 100.0	3.0	Hz	Real time
BF-18	0xBF12	Cut-off frequency for dead band compensation	0.0 to 2000.0	250.0	Hz	Real time
BF-20	0xBF14	Start frequency for adjusting carrier frequency with synchronous frequency	0.0 to 600.0	5.0	Hz	Real time
BF-21	0xBF15	Modulation ratio limit	A5-05 to 115.5	105.0	%	Real time
BF-22	0xBF16	Drive transistor voltage drop	0.00 to 5.00	0.80	V	At stop
BF-23	0xBF17	Dead zone time curve current 1	0.0 to 150.0	1.0	%	At stop
BF-24	0xBF18	Dead zone time curve current 2	0.0 to 150.0	2.0	%	At stop
BF-25	0xBF19	Dead zone time curve current 3	0.0 to 150.0	5.0	%	At stop
BF-26	0xBF1A	Dead zone time curve current 4	0.0 to 150.0	10.0	%	At stop
BF-27	0xBF1B	Dead zone time curve current 5	0.0 to 150.0	20.0	%	At stop
BF-28	0xBF1C	Dead zone time curve current 6	0.0 to 150.0	40.0	%	At stop
BF-29	0xBF1D	Dead zone time curve current 7	0.0 to 150.0	60.0	%	At stop
BF-30	0xBF1E	Dead zone time curve current 8	0.0 to 150.0	80.0	%	At stop
BF-31	0xBF1F	Time 1 of dead zone time curve	0.0 to 300.0	10.0	%	At stop
BF-32	0xBF20	Dead zone time curve time 2	0.0 to 300.0	20.0	%	At stop
BF-33	0xBF21	Dead zone time curve time 3	0.0 to 300.0	50.0	%	At stop
BF-34	0xBF22	Dead zone time curve time 4	0.0 to 300.0	80.0	%	At stop
BF-35	0xBF23	Dead zone time curve time 5	0.0 to 300.0	90.0	%	At stop
BF-36	0xBF24	Dead zone time curve time 6	0.0 to 300.0	90.0	%	At stop
BF-37	0xBF25	Dead zone time curve time 7	0.0 to 300.0	90.0	%	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
BF-38	0xBF26	Dead zone time curve time 8	0.0 to 300.0	90.0	%	At stop
BF-39	0xBF27	Excessive leakage current detection	0: Off 1: On	0	-	At stop
BF-40	0xBF28	Excessive leakage current threshold gain	50.0 to 100.0	100.0	%	Real time
BF-41	0xBF29	Common mode noise suppression width	0 to 100	0	-	Real time

9.27 Group C1 Word-to-Bit Conversion

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C1-00	0xC100	Word-to-bit module A input	0: 0 Others: K connector	0	-	Real time
C1-01	0xC101	Word-to-bit module B input	0: 0 Others: K connector	0	-	Real time
C1-02	0xC102	Word-to-bit module C input	0: 0 Others: K connector	0	-	Real time
C1-03	0xC103	Word-to-bit module D input	0: 0 Others: K connector	0	-	Real time
C1-04	0xC104	Word-to-bit module E input	0: 0 Others: K connector	0	-	Real time
C1-05	0xC105	Word-to-bit module F input	0: 0 Others: K connector	0	-	Real time
C1-06	0xC106	Word-to-bit module G input	0: 0 Others: K connector	0	-	Real time
C1-07	0xC107	Word-to-bit module H input	0: 0 Others: K connector	0	-	Real time
C1-12	0xC10C	Bit-to-word module A enable	0: Disable 1: Enable	0	-	Real time
C1-13	0xC10D	Inversion flag for bit-to-word module A	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C1-14	0xC10E	Bit 00 selection of bit-to-word module A	0: 0 1: 1 2: 0 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C1-15	0xC10F	bit1 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-16	0xC110	Bit 02 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-17	0xC111	Bit 03 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-18	0xC112	Bit 04 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-19	0xC113	Bit 05 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-20	0xC114	Bit 06 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-21	0xC115	Bit 07 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-22	0xC116	Bit 08 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-23	0xC117	Bit 09 selection of bit-to-word module A	Same as C1-14	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C1-24	0xC118	Bit 10 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-25	0xC119	Bit 11 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-26	0xC11A	Bit 12 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-27	0xC11B	Bit 13 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-28	0xC11C	Bit 14 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-29	0xC11D	Bit 15 selection of bit-to-word module A	Same as C1-14	0	-	Real time
C1-30	0xC11E	Bit-to-word module B enable	0: Disable 1: Enable	0	-	Real time
C1-31	0xC11F	Inversion flag for bit-to-word module B	0 to 65535	0	-	Real time
C1-32	0xC120	bit0 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-33	0xC121	bit1 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-34	0xC122	bit2 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-35	0xC123	bit3 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-36	0xC124	bit4 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-37	0xC125	Bit 05 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-38	0xC126	Bit 06 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-39	0xC127	Bit 07 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-40	0xC128	Bit 08 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-41	0xC129	Bit 09 selection of bit-to-word module B	Same as C1-14	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C1-42	0xC12A	Bit 10 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-43	0xC12B	Bit 11 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-44	0xC12C	Bit 12 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-45	0xC12D	Bit 13 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-46	0xC12E	Bit 14 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-47	0xC12F	Bit 15 selection of bit-to-word module B	Same as C1-14	0	-	Real time
C1-48	0xC130	Bit-to-word module C enable	0: Disable 1: Enable	0	-	Real time
C1-49	0xC131	Inversion flag for bit-to-word module C	0 to 65535	0	-	Real time
C1-50	0xC132	Bit 00 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-51	0xC133	Bit 01 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-52	0xC134	Bit 02 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-53	0xC135	Bit 03 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-54	0xC136	Bit 04 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-55	0xC137	Bit 05 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-56	0xC138	Bit 06 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-57	0xC139	Bit 07 selection of bit-to-word module C	Same as C1-14	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C1-58	0xC13A	Bit 08 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-59	0xC13B	Bit 09 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-60	0xC13C	Bit 10 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-61	0xC13D	Bit 11 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-62	0xC13E	Bit 12 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-63	0xC13F	Bit 13 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-64	0xC140	Bit 14 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-65	0xC141	Bit 15 selection of bit-to-word module C	Same as C1-14	0	-	Real time
C1-66	0xC142	Bit-to-word module D enable	0: Disable 1: Enable	0	-	Real time
C1-67	0xC143	Inversion flag for bit-to-word module D	0 to 65535	0	-	Real time
C1-68	0xC144	Bit 00 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-69	0xC145	Bit 01 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-70	0xC146	Bit 02 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-71	0xC147	Bit 03 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-72	0xC148	Bit 04 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-73	0xC149	Bit 05 selection of bit-to-word module D	Same as C1-14	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C1-74	0xC14A	Bit 06 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-75	0xC14B	Bit 07 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-76	0xC14C	Bit 08 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-77	0xC14D	Bit 09 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-78	0xC14E	Bit 10 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-79	0xC14F	Bit 11 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-80	0xC150	Bit 12 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-81	0xC151	Bit 13 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-82	0xC152	Bit 14 selection of bit-to-word module D	Same as C1-14	0	-	Real time
C1-83	0xC153	Bit 15 selection of bit-to-word module D	Same as C1-14	0	-	Real time

9.28 Group C2 Word-to-Double Word Conversion

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C2-00	0xC200	Low word of word-to-double word module A	0: 0 Others: K connector	0	-	Real time
C2-01	0xC201	High word of word-to-double word module A	0: Module disabled Others: K connector	0	-	Real time
C2-02	0xC202	Low bit of the base value of word-to-double-word module A	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C2-03	0xC203	High bit of base value of word-to-double-word module A	0 to 65535	0	-	Real time
C2-04	0xC204	Low word of word-to-double word module B	0: 0 Others: K connector	0	-	Real time
C2-05	0xC205	High word of word-to-double word module B	0: Module disabled Others: K connector	0	-	Real time
C2-06	0xC206	Low bit of base value of word-to-double-word module B	0 to 65535	0	-	Real time
C2-07	0xC207	High bit of base value of word-to-double-word B	0 to 65535	0	-	Real time
C2-08	0xC208	Low word of word-to-double word module C	0: 0 Others: K connector	0	-	Real time
C2-09	0xC209	High word of word-to-double word module C	0: Module disabled Others: K connector	0	-	Real time
C2-10	0xC20A	Low bit of base value of word-to-double-word module C	0 to 65535	0	-	Real time
C2-11	0xC20B	High bit of base value of word-to-double-word module C	0 to 65535	0	-	Real time
C2-12	0xC20C	Low word of word-to-double word module D	0: 0 Others: K connector	0	-	Real time
C2-13	0xC20D	High word of word-to-double word module D	0: Module disabled Others: K connector	0	-	Real time
C2-14	0xC20E	Low bit of base value of word-to-double-word module D	0 to 65535	0	-	Real time
C2-15	0xC20F	High bit of base value of word-to-double-word module D	0 to 65535	0	-	Real time
C2-32	0xC220	Double word-to-word module selection	0: Module disabled Others: K connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C2-33	0xC221	Low bit of the base value of double-word-to-word module A	0 to 65535	0	-	Real time
C2-34	0xC222	High bit of base value of double-word-to-word module A	0 to 65535	0	-	Real time
C2-35	0xC223	Double word-to-word module B selection	0: Module disabled Others: K connector	0	-	Real time
C2-36	0xC224	Low bit of base value of double-word-to-word module B	0 to 65535	0	-	Real time
C2-37	0xC225	High bit of base value of double-word-to-word module B	0 to 65535	0	-	Real time
C2-38	0xC226	Double word-to-word module C selection	0: Module disabled Others: K connector	0	-	Real time
C2-39	0xC227	Low bit of base value of double-word-to-word module C	0 to 65535	0	-	Real time
C2-40	0xC228	High bit of base value of double-word-to-word module C	0 to 65535	0	-	Real time
C2-41	0xC229	Double word-to-word module D selection	0: Module disabled Others: K connector	0	-	Real time
C2-42	0xC22A	Low bit of base value of double-word-to-word module D	0 to 65535	0	-	Real time
C2-43	0xC22B	High bit of base value of double-word-to-word module D	0 to 65535	0	-	Real time

9.29 Group C3 Logic Operation

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C3-00	0xC300	Function selection for logic AND/OR module A	0: Disable 1: AND 2: OR	0	-	Real time
C3-01	0xC301	Input 1 of logic AND/OR module A	0: Logic 0 1: Logic 1 2: Logic 0 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C3-02	0xC302	Input 2 of logical AND/OR module A	Same as C3-01	0	-	Real time
C3-03	0xC303	Input 3 of logical AND/OR module A	Same as C3-01	0	-	Real time
C3-04	0xC304	Input 4 of logical AND/OR module A	Same as C3-01	0	-	Real time
C3-05	0xC305	Function selection for logic AND/OR module B	0: Disable 1: AND 2: OR	0	-	Real time
C3-06	0xC306	Input 1 of logic AND/OR module B	Same as C3-01	0	-	Real time
C3-07	0xC307	Input 2 of logical AND/OR module B	Same as C3-01	0	-	Real time
C3-08	0xC308	Input 3 of logical AND/OR module B	Same as C3-01	0	-	Real time
C3-09	0xC309	Input 4 of logical AND/OR module B	Same as C3-01	0	-	Real time
C3-10	0xC30A	Function selection for logic AND/OR module C	0: Disable 1: AND 2: OR	0	-	Real time
C3-11	0xC30B	Input 1 of logic AND/OR module C	Same as C3-01	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C3-12	0xC30C	Input 2 of logical AND/OR module C	Same as C3-01	0	-	Real time
C3-13	0xC30D	Input 3 of logical AND/OR module C	Same as C3-01	0	-	Real time
C3-14	0xC30E	Input 4 of logical AND/OR module C	Same as C3-01	0	-	Real time
C3-15	0xC30F	Function selection for logic AND/OR module D	0: Disable 1: AND 2: OR	0	-	Real time
C3-16	0xC310	Input 1 of logic AND/OR module D	Same as C3-01	0	-	Real time
C3-17	0xC311	Input 2 of logic AND/OR module D	Same as C3-01	0	-	Real time
C3-18	0xC312	Input 3 of logic AND/OR module D	Same as C3-01	0	-	Real time
C3-19	0xC313	Input 4 of logic AND/OR module D	Same as C3-01	0	-	Real time
C3-20	0xC314	Function selection for logic AND/OR module E	0: Disable 1: AND 2: OR	0	-	Real time
C3-21	0xC315	Input 1 of logic AND/OR module E	Same as C3-01	0	-	Real time
C3-22	0xC316	Input 2 of logic AND/OR module E	Same as C3-01	0	-	Real time
C3-23	0xC317	Input 3 of logic AND/OR module E	Same as C3-01	0	-	Real time
C3-24	0xC318	Function selection for logic AND/OR module F	0: Disable 1: AND 2: OR	0	-	Real time
C3-25	0xC319	Input 1 of logic AND/OR module F	Same as C3-01	0	-	Real time
C3-26	0xC31A	Input 2 of logic AND/OR module F	Same as C3-01	0	-	Real time
C3-27	0xC31B	Input 3 of logic AND/OR module F	Same as C3-01	0	-	Real time
C3-28	0xC31C	Function selection for logic AND/OR module G	0: Disable 1: AND 2: OR	0	-	Real time
C3-29	0xC31D	Input 1 of logic AND/OR module G	Same as C3-01	0	-	Real time
C3-30	0xC31E	Input 2 of logic AND/OR module G	Same as C3-01	0	-	Real time
C3-31	0xC31F	Input 3 of logic AND/OR module G	Same as C3-01	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C3-32	0xC320	Function selection for logic AND/OR module H	0: Disable 1: AND 2: OR	0	-	Real time
C3-33	0xC321	Input 1 of logic AND/OR module H	Same as C3-01	0	-	Real time
C3-34	0xC322	Input 2 of logic AND/OR module H	Same as C3-01	0	-	Real time
C3-35	0xC323	Input 3 of logic AND/OR module H	Same as C3-01	0	-	Real time
C3-36	0xC324	Function of logic AND/OR module I	0: Disable 1: AND 2: OR	0	-	Real time
C3-37	0xC325	Input 1 of logic AND/OR module I	Same as C3-01	0	-	Real time
C3-38	0xC326	Input 2 of logic AND/OR module I	Same as C3-01	0	-	Real time
C3-39	0xC327	Input 3 of logic AND/OR module I	Same as C3-01	0	-	Real time
C3-40	0xC328	Function of logic AND/OR module J	0: Disable 1: AND 2: OR	0	-	Real time
C3-41	0xC329	Input 1 of logic AND/OR module J	Same as C3-01	0	-	Real time
C3-42	0xC32A	Input 2 of logic AND/OR module J	Same as C3-01	0	-	Real time
C3-43	0xC32B	Input 3 of logic AND/OR module J	Same as C3-01	0	-	Real time
C3-44	0xC32C	Function of logic AND/OR module K	0: Disable 1: AND 2: OR	0	-	Real time
C3-45	0xC32D	Input 1 of logic AND/OR module K	Same as C3-01	0	-	Real time
C3-46	0xC32E	Input 2 of logic AND/OR module K	Same as C3-01	0	-	Real time
C3-47	0xC32F	Input 3 of logic AND/OR module K	Same as C3-01	0	-	Real time
C3-48	0xC330	Function of logic AND/OR module L	0: Disable 1: AND 2: OR	0	-	Real time
C3-49	0xC331	Input 1 of logic AND/OR module L	Same as C3-01	0	-	Real time
C3-50	0xC332	Input 2 of logic AND/OR module L	Same as C3-01	0	-	Real time
C3-51	0xC333	Input 3 of logic AND/OR module L	Same as C3-01	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C3-56	0xC338	Input of logic NOT module A	0: Disable 1: Logic 1 2: Logic 0 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C3-57	0xC339	Input of logic NOT module B	Same as C3-56	0	-	Real time
C3-58	0xC33A	Input of logic NOT module C	Same as C3-56	0	-	Real time
C3-59	0xC33B	Input of logic NOT module D	Same as C3-56	0	-	Real time
C3-60	0xC33C	Input of logic NOT module E	Same as C3-56	0	-	Real time
C3-61	0xC33D	Input of logic NOT module F	Same as C3-56	0	-	Real time
C3-62	0xC33E	Input of logic NOT module G	Same as C3-56	0	-	Real time
C3-63	0xC33F	Input of logic NOT module H	Same as C3-56	0	-	Real time
C3-64	0xC340	Input of logical NOT module I	Same as C3-56	0	-	Real time
C3-65	0xC341	Input of logical NOT module J	Same as C3-56	0	-	Real time
C3-66	0xC342	Input of logical NOT module K	Same as C3-56	0	-	Real time
C3-67	0xC343	Input of logical NOT module L	Same as C3-56	0	-	Real time
C3-68	0xC344	Input of logical NOT module M	Same as C3-56	0	-	Real time
C3-69	0xC345	Input of logical NOT module N	Same as C3-56	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C3-70	0xC346	Input of logical NOT module O	Same as C3-56	0	-	Real time
C3-71	0xC347	Input of logical NOT module P	Same as C3-56	0	-	Real time
C3-72	0xC348	Function of logic XOR/XNOR module A	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-73	0xC349	Input 1 of logic XOR/ XNOR module A	Same as C3-01	0	-	Real time
C3-74	0xC34A	Input 2 of logic XOR/ XNOR module A	Same as C3-01	0	-	Real time
C3-75	0xC34B	Function of logic XOR/XNOR module B	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-76	0xC34C	Input 1 of logic XOR/ XNOR module B	Same as C3-01	0	-	Real time
C3-77	0xC34D	Input 2 of logic XOR/ XNOR module B	Same as C3-01	0	-	Real time
C3-78	0xC34E	Function of logic XOR/XNOR module C	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-79	0xC34F	Input 1 of logic XOR/ XNOR module C	Same as C3-01	0	-	Real time
C3-80	0xC350	Input 2 of logic XOR/ XNOR module C	Same as C3-01	0	-	Real time
C3-81	0xC351	Function of logic XOR/XNOR module D	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-82	0xC352	Input 1 of logic XOR/ XNOR module D	Same as C3-01	0	-	Real time
C3-83	0xC353	Input 2 of logic XOR/ XNOR module D	Same as C3-01	0	-	Real time
C3-84	0xC354	Function of logic XOR/XNOR module E	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-85	0xC355	Input 1 of logic XOR/ XNOR module E	Same as C3-01	0	-	Real time
C3-86	0xC356	Input 2 of logic XOR/ XNOR module E	Same as C3-01	0	-	Real time
C3-87	0xC357	Function of logic XOR/XNOR module F	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-88	0xC358	Input 1 of logic XOR/ XNOR module F	Same as C3-01	0	-	Real time
C3-89	0xC359	Input 2 of logic XOR/ XNOR module F	Same as C3-01	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C3-90	0xC35A	Function of logic XOR/XNOR module G	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-91	0xC35B	Input 1 of logic XOR/ XNOR module G	Same as C3-01	0	-	Real time
C3-92	0xC35C	Input 2 of logic XOR/ XNOR module G	Same as C3-01	0	-	Real time
C3-93	0xC35D	Function of logic XOR/XNOR module H	0: Disable 1: XOR 2: XNOR	0	-	Real time
C3-94	0xC35E	Input 1 of logic XOR/ XNOR module H	Same as C3-01	0	-	Real time
C3-95	0xC35F	Input 2 of logic XOR/ XNOR module H	Same as C3-01	0	-	Real time

9.30 Group C4 Arithmetic Operation

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-00	0xC400	Input of floating-point absolute module A	0: Disable 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C4-01	0xC401	Input of floating-point absolute module B	Same as C4-00	0	-	Real time
C4-02	0xC402	Input of floating-point absolute module C	Same as C4-00	0	-	Real time
C4-03	0xC403	Input of floating-point absolute module D	Same as C4-00	0	-	Real time
C4-04	0xC404	Input of floating-point absolute module E	Same as C4-00	0	-	Real time
C4-05	0xC405	Input of fixed-point absolute module F	0: Disable Others: K connector	0	-	Real time
C4-06	0xC406	Input of fixed-point absolute module G	Same as C4-05	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-07	0xC407	Input of fixed-point absolute module H	Same as C4-05	0	-	Real time
C4-08	0xC408	Input 1 of floating-point ADD/SUBTRACT module A	0: Module disabled 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C4-09	0xC409	ADD/SUBTRACT module A input 2 (ADD)	0: 0 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C4-10	0xC40A	ADD/SUBTRACT module A input 3 (ADD)	Same as C4-09	0	-	Real time
C4-11	0xC40B	Addition and subtraction module A input 4 (subtraction)	Same as C4-09	0	-	Real time
C4-12	0xC40C	Floating-point ADD/SUBTRACT module B input 1	Same as C4-08	0	-	Real time
C4-13	0xC40D	Input 2 of addition and subtraction module B (ADD)	Same as C4-09	0	-	Real time
C4-14	0xC40E	ADD/SUBTRACT module B input 3 (ADD)	Same as C4-09	0	-	Real time
C4-15	0xC40F	Input 4 of addition and subtraction module B (SUBTRACT)	Same as C4-09	0	-	Real time
C4-16	0xC410	Floating-point ADD/SUBTRACT module C input 1	Same as C4-08	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-17	0xC411	Input 2 of addition and subtraction module C (ADD)	Same as C4-09	0	-	Real time
C4-18	0xC412	Input 3 of addition and subtraction module C (ADD)	Same as C4-09	0	-	Real time
C4-19	0xC413	Input 4 of addition and subtraction module C (SUBTRACT)	Same as C4-09	0	-	Real time
C4-20	0xC414	Floating-point ADD/ SUBTRACT module D input 1	Same as C4-08	0	-	Real time
C4-21	0xC415	Input 2 of addition and subtraction module D (ADD)	Same as C4-09	0	-	Real time
C4-22	0xC416	Input 3 of addition and subtraction module D (ADD)	Same as C4-09	0	-	Real time
C4-23	0xC417	Input 4 of addition and subtraction module D (SUBTRACT)	Same as C4-09	0	-	Real time
C4-24	0xC418	Floating-point ADD/ SUBTRACT module E input 1	Same as C4-08	0	-	Real time
C4-25	0xC419	Input 2 of addition and subtraction module E (ADD)	Same as C4-09	0	-	Real time
C4-26	0xC41A	Input 3 of addition and subtraction module E (ADD)	Same as C4-09	0	-	Real time
C4-27	0xC41B	Input 4 of addition and subtraction module E (SUBTRACT)	Same as C4-09	0	-	Real time
C4-28	0xC41C	Fixed-point ADD/ SUBTRACT module F input 1	0: Module disabled Others: K connector	0	-	Real time
C4-29	0xC41D	Input 2 of addition and subtraction module F (ADD)	0: 0 Others: K connector	0	-	Real time
C4-30	0xC41E	Input 3 of addition and subtraction module F (ADD)	0: 0 Others: K connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-31	0xC41F	Input 4 of addition and subtraction module F (SUBTRACT)	0: 0 Others: K connector	0	-	Real time
C4-32	0xC420	Input 1 of fixed-point ADD/SUBTRACT module G	0: Module disabled Others: K connector	0	-	Real time
C4-33	0xC421	Input 2 of addition and subtraction module G (ADD)	0: 0 Others: K connector	0	-	Real time
C4-34	0xC422	Input 3 of addition and subtraction module G (ADD)	0: 0 Others: K connector	0	-	Real time
C4-35	0xC423	Input 4 of addition and subtraction module G (SUBTRACT)	0: 0 Others: K connector	0	-	Real time
C4-36	0xC424	Input 1 of fixed-point ADD/SUBTRACT module H	0: Module disabled Others: K connector	0	-	Real time
C4-37	0xC425	Input 2 of addition and subtraction module H (ADD)	0: 0 Others: K connector	0	-	Real time
C4-38	0xC426	Input 3 of addition and subtraction module H (ADD)	0: 0 Others: K connector	0	-	Real time
C4-39	0xC427	Input 4 of addition and subtraction module H (SUBTRACT)	0: 0 Others: K connector	0	-	Real time
C4-40	0xC428	Floating-point MULTIPLY/DIVIDE module A input 1	Same as C4-08	0	-	Real time
C4-41	0xC429	Input 2 of multiplication and division module A (MULTIPLY)	0: 1 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-42	0xC42A	Input 3 of multiplication and division module A (DIVIDE)	Same as C4-41	0	-	Real time
C4-43	0xC42B	Floating-point MULTIPLY/DIVIDE module B input 1	0: Module disabled 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C4-44	0xC42C	Input 2 of multiplication and division module B (MULTIPLY)	Same as C4-41	0	-	Real time
C4-45	0xC42D	Input 3 of multiplication and division module B (DIVIDE)	Same as C4-41	0	-	Real time
C4-46	0xC42E	Floating-point MULTIPLY/DIVIDE module C input 1	Same as C4-08	0	-	Real time
C4-47	0xC42F	Input 2 of multiplication and division module C (MULTIPLY)	Same as C4-41	0	-	Real time
C4-48	0xC430	Input 3 of multiplication and division module C (DIVIDE)	Same as C4-41	0	-	Real time
C4-49	0xC431	Floating-point MULTIPLY/DIVIDE module D input 1	Same as C4-08	0	-	Real time
C4-50	0xC432	Input 2 of multiplication and division module D (MULTIPLY)	Same as C4-41	0	-	Real time
C4-51	0xC433	Input 3 of multiplication and division module D (DIVIDE)	Same as C4-41	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-52	0xC434	Floating-point MULTIPLY/DIVIDE module E input 1	Same as C4-08	0	-	Real time
C4-53	0xC435	Input 2 of multiplication and division module E (MULTIPLY)	Same as C4-41	0	-	Real time
C4-54	0xC436	Input 3 of multiplication and division module E (DIVIDE)	Same as C4-41	0	-	Real time
C4-55	0xC437	Fixed-point MULTIPLY/DIVIDE module F input 1	0: Module disabled Others: K connector	0	-	Real time
C4-56	0xC438	Input 2 of multiplication and division module F (MULTIPLY)	0: 1 Others: K connector	0	-	Real time
C4-57	0xC439	Input 3 of multiplication and division module F (DIVIDE)	0: 1 Others: K connector	0	-	Real time
C4-58	0xC43A	Fixed-point MULTIPLY/DIVIDE module G input 1	0: Module disabled Others: K connector	0	-	Real time
C4-59	0xC43B	Input 2 of multiplication and division module G (MULTIPLY)	0: 1 Others: K connector	0	-	Real time
C4-60	0xC43C	Input 3 of multiplication and division module G (DIVIDE)	0: 1 Others: K connector	0	-	Real time
C4-61	0xC43D	Fixed-point MULTIPLY/DIVIDE module H input 1	0: Module disabled Others: K connector	0	-	Real time
C4-62	0xC43E	Input 2 of multiplication and division module H (MULTIPLY)	0: 1 Others: K connector	0	-	Real time
C4-63	0xC43F	Input 3 of multiplication and division module H (DIVIDE)	0: 1 Others: K connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-64	0xC440	Function selection for floating-point comparison module A	0: Module disabled 1: Input 1 > Input 2 2: Input 1 < Input 2 3: Input 1 = Input 2	0	-	Real time
C4-65	0xC441	Input 1 of floating-point comparison module A	Same as C4-09	0	-	Real time
C4-66	0xC442	Input 2 of floating-point comparison module A	Same as C4-09	0	-	Real time
C4-67	0xC443	Hysteresis input of floating-point comparison module A	0.00 to 655.35	0.00	%	Real time
C4-68	0xC444	Function selection for floating-point comparison module B	0: Module disabled 1: Input 1 > Input 2 2: Input 1 < Input 2 3: Input 1 = Input 2	0	-	Real time
C4-69	0xC445	Input 1 of floating-point comparison module B	Same as C4-09	0	-	Real time
C4-70	0xC446	Input 2 of floating-point comparison module B	Same as C4-09	0	-	Real time
C4-71	0xC447	Hysteresis input of floating-point comparison module B	0.00 to 655.35	0.00	%	Real time
C4-72	0xC448	Function selection for floating-point comparison module C	Same as C4-68	0	-	Real time
C4-73	0xC449	Input 1 of floating-point comparison module C	Same as C4-09	0	-	Real time
C4-74	0xC44A	Input 2 of floating-point comparison module C	Same as C4-09	0	-	Real time
C4-75	0xC44B	Hysteresis input of floating-point comparison module C	0.00 to 655.35	0.00	%	Real time
C4-76	0xC44C	Function selection for floating-point comparison module D	Same as C4-68	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-77	0xC44D	Input 1 of floating-point comparison module D	Same as C4-09	0	-	Real time
C4-78	0xC44E	Input 2 of floating-point comparison module D	Same as C4-09	0	-	Real time
C4-79	0xC44F	Hysteresis input of floating-point comparison module D	0.00 to 655.35	0.00	%	Real time
C4-80	0xC450	Function selection for fixed-point comparison module E	Same as C4-68	0	-	Real time
C4-81	0xC451	Input 1 of fixed-point comparison module E	0: 0 Others: K connector	0	-	Real time
C4-82	0xC452	Input 2 of fixed-point comparison module E	0: 0 Others: K connector	0	-	Real time
C4-83	0xC453	Hysteresis input of fixed-point comparison module E	0.00 to 655.35	0.00	%	Real time
C4-84	0xC454	Function selection for fixed-point comparison module F	Same as C4-68	0	-	Real time
C4-85	0xC455	Input 1 of fixed-point comparison module F	0: 0 Others: K connector	0	-	Real time
C4-86	0xC456	Input 2 of fixed-point comparison module F	0: 0 Others: K connector	0	-	Real time
C4-87	0xC457	Hysteresis input of fixed-point comparison module F	0.00 to 655.35	0.00	%	Real time
C4-88	0xC458	Function selection for fixed-point comparison module G	Same as C4-68	0	-	Real time
C4-89	0xC459	Input 1 of fixed-point comparison module G	0: 0 Others: K connector	0	-	Real time
C4-90	0xC45A	Input 2 of fixed-point comparison module G	0: 0 Others: K connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C4-91	0xC45B	Hysteresis input of fixed-point comparison module G	0.00 to 655.35	0.00	%	Real time
C4-92	0xC45C	Function selection for fixed-point comparison module H	Same as C4-68	0	-	Real time
C4-93	0xC45D	Input 1 of fixed-point comparison module H	0: 0 Others: K connector	0	-	Real time
C4-94	0xC45E	Input 2 of fixed-point comparison module H	0: 0 Others: K connector	0	-	Real time
C4-95	0xC45F	Hysteresis input of fixed-point comparison module H	0.00 to 655.35	0.00	%	Real time

9.31 Group C5 Switch Function

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C5-00	0xC500	Input selection for binary selector module A	0: Disable 1: Logic 1 2: Logic 0 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C5-01	0xC501	Input 1 of binary selector module A	0: Logic 0 1: Logic 1 2: Logic 0 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C5-02	0xC502	Input 2 of binary selector module A	Same as C5-01	0	-	Real time
C5-03	0xC503	Input selection for binary switch module B	Same as C5-00	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C5-04	0xC504	Input 1 of binary selector module B	Same as C5-01	0	-	Real time
C5-05	0xC505	Input 2 of binary selector module B	Same as C5-01	0	-	Real time
C5-06	0xC506	Input selection for binary switch module C	Same as C5-00	0	-	Real time
C5-07	0xC507	Input 1 of binary switch module C	Same as C5-01	0	-	Real time
C5-08	0xC508	Input 2 of binary switch module C	Same as C5-01	0	-	Real time
C5-09	0xC509	Input selection for binary switch module D	Same as C5-00	0	-	Real time
C5-10	0xC50A	Input 1 of binary switch module D	Same as C5-01	0	-	Real time
C5-11	0xC50B	Input 2 of binary switch module D	Same as C5-01	0	-	Real time
C5-12	0xC50C	Input selection for binary switch module E	Same as C5-00	0	-	Real time
C5-13	0xC50D	Input 1 of binary switch module E	Same as C5-01	0	-	Real time
C5-14	0xC50E	Input 2 of binary switch module E	Same as C5-01	0	-	Real time
C5-15	0xC50F	Input selection for binary switch module F	Same as C5-00	0	-	Real time
C5-16	0xC510	Input 1 of binary switch module F	Same as C5-01	0	-	Real time
C5-17	0xC511	Input 2 of binary switch module F	Same as C5-01	0	-	Real time
C5-18	0xC512	Input selection for binary switch module G	Same as C5-00	0	-	Real time
C5-19	0xC513	Input 1 of binary switch module G	Same as C5-01	0	-	Real time
C5-20	0xC514	Input 2 of binary switch module G	Same as C5-01	0	-	Real time
C5-21	0xC515	Input selection for binary switch module H	Same as C5-00	0	-	Real time
C5-22	0xC516	Input 1 of binary switch module H	Same as C5-01	0	-	Real time
C5-23	0xC517	Input 2 of binary switch module H	Same as C5-01	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C5-24	0xC518	Input selection for single-word selector module A	Same as C5-00	0	-	Real time
C5-25	0xC519	Input 1 of single-word selector module A	0: 0 Others: K connector	0	-	Real time
C5-26	0xC51A	Input 2 of single-word selector module A	0: 0 Others: K connector	0	-	Real time
C5-27	0xC51B	Input selection for single-word selector module B	Same as C5-00	0	-	Real time
C5-28	0xC51C	Input 1 of single-word selector module B	0: 0 Others: K connector	0	-	Real time
C5-29	0xC51D	Input 2 of single-word selector module B	0: 0 Others: K connector	0	-	Real time
C5-30	0xC51E	Input selection for single-word selector module C	Same as C5-00	0	-	Real time
C5-31	0xC51F	Input 1 of single-word selector module C	0: 0 Others: K connector	0	-	Real time
C5-32	0xC520	Input 2 of single-word selector module C	0: 0 Others: K connector	0	-	Real time
C5-33	0xC521	Input selection for single-word selector module D	Same as C5-00	0	-	Real time
C5-34	0xC522	Input 1 of single-word selector module D	0: 0 Others: K connector	0	-	Real time
C5-35	0xC523	Input 2 of single-word selector module D	0: 0 Others: K connector	0	-	Real time
C5-36	0xC524	Input selection for double-word selector module A	Same as C5-00	0	-	Real time
C5-37	0xC525	Input 1 of double-word selector module A	0: 0 Others: K connector	0	-	Real time
C5-38	0xC526	Input 2 of double-word selector module A	0: 0 Others: K connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C5-39	0xC527	Input selection for double-word selector module B	Same as C5-00	0	-	Real time
C5-40	0xC528	Input 1 of double-word selector module B	0: 0 Others: K connector	0	-	Real time
C5-41	0xC529	Input 2 of double-word selector module B	0: 0 Others: K connector	0	-	Real time
C5-42	0xC52A	Input selection for double-word selector module C	Same as C5-00	0	-	Real time
C5-43	0xC52B	Input 1 of double-word selector module C	0: 0 Others: K connector	0	-	Real time
C5-44	0xC52C	Input 2 of double-word selector module C	0: 0 Others: K connector	0	-	Real time
C5-45	0xC52D	Input selection for double-word selector module D	Same as C5-00	0	-	Real time
C5-46	0xC52E	Input 1 of double-word selector module D	0: 0 Others: K connector	0	-	Real time
C5-47	0xC52F	Input 2 of double-word selector module D	0: 0 Others: K connector	0	-	Real time
C5-48	0xC530	Input selection for floating-point selector module A	Same as C5-00	0	-	Real time
C5-49	0xC531	Input 1 of floating-point selector module A	0: 0 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C5-50	0xC532	Input 2 of floating-point selector module A	Same as C5-49	0	-	Real time
C5-51	0xC533	Input selection for floating-point selector module B	Same as C5-00	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C5-52	0xC534	Input 1 of floating-point selector module B	Same as C5-49	0	-	Real time
C5-53	0xC535	Input 2 of floating-point selector module B	Same as C5-49	0	-	Real time
C5-54	0xC536	Input selection for floating-point selector module C	Same as C5-00	0	-	Real time
C5-55	0xC537	Input 1 of floating-point selector module C	Same as C5-49	0	-	Real time
C5-56	0xC538	Input 2 of floating-point selector module C	Same as C5-49	0	-	Real time
C5-57	0xC539	Input selection for floating-point selector module D	Same as C5-00	0	-	Real time
C5-58	0xC53A	Input 1 of floating-point selector module D	Same as C5-49	0	-	Real time
C5-59	0xC53B	Input 2 of floating-point selector module D	Same as C5-49	0	-	Real time
C5-60	0xC53C	Input selection for floating-point selector module E	Same as C5-00	0	-	Real time
C5-61	0xC53D	Input 1 of floating-point selector module E	Same as C5-49	0	-	Real time
C5-62	0xC53E	Input 2 of floating-point selector module E	Same as C5-49	0	-	Real time
C5-63	0xC53F	Input selection for floating-point selector module F	Same as C5-00	0	-	Real time
C5-64	0xC540	Input 1 of floating-point selector module F	Same as C5-49	0	-	Real time
C5-65	0xC541	Input 2 of floating-point selector module F	Same as C5-49	0	-	Real time
C5-66	0xC542	Input selection for floating-point selector module G	Same as C5-00	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C5-67	0xC543	Input 1 of floating-point selector module G	Same as C5-49	0	-	Real time
C5-68	0xC544	Input 2 of floating-point selector module G	Same as C5-49	0	-	Real time
C5-69	0xC545	Input selection for floating-point selector module H	Same as C5-00	0	-	Real time
C5-70	0xC546	Input 1 of floating-point selector module H	Same as C5-49	0	-	Real time
C5-71	0xC547	Input 2 of floating-point selector module H	Same as C5-49	0	-	Real time

9.32 Group C6 Control Function

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C6-00	0xC600	Floating-point filter module A selection	0: Module disabled 1: Disable 2: Enable 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C6-01	0xC601	Input of floating-point filter module A	0: 0 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C6-02	0xC602	Filter time of filter module A	0.002 to 65.535	0.002	s	Real time
C6-03	0xC603	Floating-point filter module B selection	Same as C6-00	0	-	Real time
C6-04	0xC604	Input of floating-point filter module B	Same as C6-01	0	-	Real time
C6-05	0xC605	Filter time of filter module B	0.002 to 65.535	0.002	s	Real time
C6-06	0xC606	Floating-point filter module C selection	Same as C6-00	0	-	Real time
C6-07	0xC607	Input of floating-point filter module C	Same as C6-01	0	-	Real time
C6-08	0xC608	Filter time of filter module C	0.002 to 65.535	0.002	s	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C6-09	0xC609	Floating-point filter module D selection	Same as C6-00	0	-	Real time
C6-10	0xC60A	Input of floating-point filter module D	Same as C6-01	0	-	Real time
C6-11	0xC60B	Filter time of filter module D	0.002 to 65.535	0.002	s	Real time
C6-12	0xC60C	Fixed-point filter module E selection	Same as C6-00	0	-	Real time
C6-13	0xC60D	Input of fixed-point filter module E	0: 0 Others: K connector	0	-	Real time
C6-14	0xC60E	Filter time of fixed-point filter module E	0.002 to 65.535	0.002	s	Real time
C6-15	0xC60F	Fixed-point filter module F selection	Same as C6-00	0	-	Real time
C6-16	0xC610	Input of fixed-point filter module F	0: 0 Others: K connector	0	-	Real time
C6-17	0xC611	Filter time of fixed-point filter module F	0.002 to 65.535	0.002	s	Real time
C6-24	0xC618	Function of level-to-pulse conversion module A	0: Module disabled 1: Level to pulse 2: Pulse to level	0	-	Real time
C6-25	0xC619	Input of level-to-pulse module A	0: Logic 0 1: Logic 1 2: Logic 0 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C6-26	0xC61A	Pulse Width of level-pulse conversion module A	0.00 to 655.35	0.00	s	Real time
C6-27	0xC61B	Function of level-to-pulse conversion module B	0: Module disabled 1: Level to pulse 2: Pulse to level	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C6-28	0xC61C	Input of level-pulse conversion module B	Same as C6-25	0	-	Real time
C6-29	0xC61D	Pulse Width of level-pulse conversion module B	0.00 to 655.35	0.00	s	Real time
C6-30	0xC61E	Function of level-to-pulse conversion module C	0: Module disabled 1: Level to pulse 2: Pulse to level	0	-	Real time
C6-31	0xC61F	Input of level-pulse conversion module C	Same as C6-25	0	-	Real time
C6-32	0xC620	Pulse Width of level-pulse conversion module C	0.00 to 655.35	0.00	s	Real time
C6-33	0xC621	Function of level-to-pulse conversion module D	0: Module disabled 1: Level to pulse 2: Pulse to level	0	-	Real time
C6-34	0xC622	Input of level-pulse conversion module D	Same as C6-25	0	-	Real time
C6-35	0xC623	Pulse Width of level-pulse conversion module D	0.00 to 655.35	0.00	s	Real time
C6-36	0xC624	Input of floating-point limiter module A	0: Disable 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C6-37	0xC625	Upper limit of floating-point limiter module A	0: Disable 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C6-38	0xC626	Lower limit of floating-point limiter module A	0: Disable 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C6-39	0xC627	Input of floating point limiter module B	0: Disable 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C6-40	0xC628	Upper limit of floating-point limiter module B	Same as C6-37	0	-	Real time
C6-41	0xC629	Lower limit of floating-point limiter module B	Same as C6-38	0	-	Real time
C6-42	0xC62A	Input of floating-point limiter module C	0: Disable 1: AI1 2: AI2 3: AI3 4: HDI 5: Aim 6: Multi-reference output 7: Motorized potentiometer output 8: PID Others: F connector	0	-	Real time
C6-43	0xC62B	Upper limit of floating-point limiter module C	Same as C6-37	0	-	Real time
C6-44	0xC62C	Lower limit of floating-point limiter module C	Same as C6-38	0	-	Real time
C6-45	0xC62D	Input of floating-point limiter module D	Same as C6-42	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C6-46	0xC62E	Upper limit of floating-point limiter module D	Same as C6-37	0	-	Real time
C6-47	0xC62F	Lower limit of floating-point limiter module D	Same as C6-38	0	-	Real time
C6-48	0xC630	Input of fixed-point limiter module E	0: Disable Others: K connector	0	-	Real time
C6-49	0xC631	Upper limit of fixed-point limiter module E	0: Disable Others: K connector	0	-	Real time
C6-50	0xC632	Lower limit of fixed-point limiter module E	0: Disable Others: K connector	0	-	Real time
C6-51	0xC633	Input of fixed-point limiter module F	0: Disable Others: K connector	0	-	Real time
C6-52	0xC634	Upper limit of fixed-point limiter module F	0: Disable Others: K connector	0	-	Real time
C6-53	0xC635	Lower limit of fixed-point limiter module F	0: Disable Others: K connector	0	-	Real time
C6-54	0xC636	Input of logic delay module A	0: Disable 1: Logic 1 2: Logic 0 3: DI1 4: DI2 5: DI3 6: DI4 7: DI5 8: DI6 9: DI7 10: DI8 11: DI9 12: DI10 13: DI11 14: DI12 15: DI13 16: DI14 17: DI15 18: DI16 Others: B connector	0	-	Real time
C6-55	0xC637	Switch-on delay time of logic delay module A	0 to 65535	0	-	Real time
C6-56	0xC638	Switch-off delay time of logic delay module A	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C6-57	0xC639	Delay time unit of logic delay module A	0 to 12000	1	-	Real time
C6-58	0xC63A	Input of logic delay module B	Same as C6-54	0	-	Real time
C6-59	0xC63B	Switch-on delay of logic delay module B	0 to 65535	0	-	Real time
C6-60	0xC63C	Switch-off delay of logic delay module B	0 to 65535	0	-	Real time
C6-61	0xC63D	Delay time unit of logic delay module B	0 to 12000	1	-	Real time
C6-62	0xC63E	Input of logic delay module C	Same as C6-54	0	-	Real time
C6-63	0xC63F	Switch-on delay of logic delay module C	0 to 65535	0	-	Real time
C6-64	0xC640	Switch-off delay of logic delay module C	0 to 65535	0	-	Real time
C6-65	0xC641	Delay time unit of logic delay module C	0 to 12000	1	-	Real time
C6-66	0xC642	Input of logic delay module D	Same as C6-54	0	-	Real time
C6-67	0xC643	Switch-on delay time of logic delay module D	0 to 65535	0	-	Real time
C6-68	0xC644	Switch-off delay of logic delay module D	0 to 65535	0	-	Real time
C6-69	0xC645	Delay time unit of logic delay module D	0 to 12000	1	-	Real time
C6-70	0xC646	Input of logical delay module E	Same as C6-54	0	-	Real time
C6-71	0xC647	Switch-on delay time of logic delay module E	0 to 65535	0	-	Real time
C6-72	0xC648	Switch-off delay time of logic delay module E	0 to 65535	0	-	Real time
C6-73	0xC649	Delay time unit of logic delay module E	0 to 12000	1	-	Real time
C6-74	0xC64A	Input of logical delay module F	Same as C6-54	0	-	Real time
C6-75	0xC64B	Switch-on delay time of logic delay module F	0 to 65535	0	-	Real time
C6-76	0xC64C	Switch-off delay time of logic delay module F	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C6-77	0xC64D	Delay time unit of logic delay module F	0 to 12000	1	-	Real time
C6-78	0xC64E	Input of logical delay module G	Same as C6-54	0	-	Real time
C6-79	0xC64F	Switch-on delay time of logic delay module G	0 to 65535	0	-	Real time
C6-80	0xC650	Switch-off delay time of logic delay module G	0 to 65535	0	-	Real time
C6-81	0xC651	Delay time unit of logic delay module G	0 to 12000	1	-	Real time
C6-82	0xC652	Input of logic delay module H	Same as C6-54	0	-	Real time
C6-83	0xC653	Switch-on delay time of logic delay module H	0 to 65535	0	-	Real time
C6-84	0xC654	Switch-off delay time of logic delay module H	0 to 65535	0	-	Real time
C6-85	0xC655	Delay time unit of logic delay module H	0 to 12000	1	-	Real time

9.33 Group C7 Multi-point Curve

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C7-00	0xC700	Input of multi-point curve module A	0: Module disabled Others: F connector	0	-	Real time
C7-01	0xC701	Configuration X1 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-02	0xC702	Configuration X2 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-03	0xC703	Setpoint X3 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-04	0xC704	Setpoint X4 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-05	0xC705	Setpoint X5 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C7-06	0xC706	Setpoint X6 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-07	0xC707	Setpoint X7 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-08	0xC708	Setpoint X8 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-09	0xC709	Setpoint X9 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-10	0xC70A	Setpoint X10 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-11	0xC70B	Setpoint Y1 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-12	0xC70C	Setpoint Y2 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-13	0xC70D	Setpoint Y3 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-14	0xC70E	Setpoint Y4 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-15	0xC70F	Setpoint Y5 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-16	0xC710	Setpoint Y6 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-17	0xC711	Setpoint Y7 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-18	0xC712	Setpoint Y8 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-19	0xC713	Setpoint Y9 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-20	0xC714	Setpoint Y10 of multi-point curve module A	-600.0 to +600.0	0.0	%	Real time
C7-21	0xC715	Input of multi-point curve module B	0: Module disabled Others: F connector	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C7-22	0xC716	Setpoint X1 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-23	0xC717	Setpoint X2 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-24	0xC718	Setpoint X3 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-25	0xC719	Setpoint X4 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-26	0xC71A	Setpoint X5 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-27	0xC71B	Setpoint X6 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-28	0xC71C	Setpoint X7 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-29	0xC71D	Setpoint X8 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-30	0xC71E	Setpoint X9 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-31	0xC71F	Setpoint X10 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-32	0xC720	Setpoint Y1 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-33	0xC721	Setpoint Y2 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-34	0xC722	Setpoint Y3 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-35	0xC723	Setpoint Y4 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-36	0xC724	Setpoint Y5 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-37	0xC725	Setpoint Y6 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-38	0xC726	Setpoint Y7 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-39	0xC727	Setpoint Y8 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-40	0xC728	Setpoint Y9 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time
C7-41	0xC729	Setpoint Y10 of multi-point curve module B	-600.0 to +600.0	0.0	%	Real time

9.34 Group C8 Constant Values

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C8-00	0xC800	Constant reference 1	-300.00 to +300.00	0.00	%	Real time
C8-01	0xC801	Constant reference 2	-300.00 to +300.00	100.00	%	Real time
C8-02	0xC802	Constant reference 3	-300.00 to +300.00	-100.00	%	Real time
C8-03	0xC803	Constant reference 4	-300.00 to +300.00	200.00	%	Real time
C8-04	0xC804	Constant reference 5	-300.00 to +300.00	-200.00	%	Real time
C8-05	0xC805	Constant reference 6	-3000.0 to +3000.0	0.0	%	Real time
C8-06	0xC806	Constant reference 7	-3000.0 to +3000.0	0.0	%	Real time
C8-07	0xC807	Constant reference 8	-3000.0 to +3000.0	0.0	%	Real time
C8-08	0xC808	Constant reference 9	-3000.0 to +3000.0	0.0	%	Real time
C8-09	0xC809	Constant reference 10	-3000.0 to +3000.0	0.0	%	Real time
C8-10	0xC80A	Constant reference 11	-3000.0 to +3000.0	0.0	%	Real time
C8-11	0xC80B	Constant reference 12	-3000.0 to +3000.0	0.0	%	Real time
C8-12	0xC80C	Constant reference 13	-3000.0 to +3000.0	0.0	%	Real time
C8-13	0xC80D	Constant reference 14	-3000.0 to +3000.0	0.0	%	Real time
C8-14	0xC80E	Constant reference 15	-3000.0 to +3000.0	0.0	%	Real time
C8-15	0xC80F	Constant reference 16	-3000.0 to +3000.0	0.0	%	Real time
C8-16	0xC810	Constant reference 17	-3000.0 to +3000.0	0.0	%	Real time
C8-17	0xC811	Constant reference 18	-3000.0 to +3000.0	0.0	%	Real time
C8-18	0xC812	Constant reference 19	-3000.0 to +3000.0	0.0	%	Real time
C8-19	0xC813	Constant reference 20	-3000.0 to +3000.0	0.0	%	Real time
C8-20	0xC814	Constant reference 21	-3000.0 to +3000.0	0.0	%	Real time
C8-26	0xC81A	Constant reference 27	0 to 65535	0	-	Real time
C8-27	0xC81B	Constant reference 28	0 to 65535	0	-	Real time
C8-28	0xC81C	Constant reference 29	0 to 65535	0	-	Real time
C8-29	0xC81D	Constant reference 30	0 to 65535	0	-	Real time
C8-30	0xC81E	Constant reference 31	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C8-31	0xC81F	Constant reference 32	0 to 65535	0	-	Real time
C8-32	0xC820	Constant reference 33	0 to 65535	0	-	Real time
C8-33	0xC821	Constant reference 34	0 to 65535	0	-	Real time
C8-34	0xC822	Constant reference 35	0 to 65535	0	-	Real time
C8-35	0xC823	Constant reference 36	0 to 65535	0	-	Real time
C8-36	0xC824	Constant reference 37	0 to 65535	0	-	Real time
C8-37	0xC825	Constant reference 38	0 to 65535	0	-	Real time
C8-38	0xC826	Constant reference 39	0 to 65535	0	-	Real time
C8-39	0xC827	Constant reference 40	0 to 65535	0	-	Real time
C8-40	0xC828	Constant reference 41	0 to 65535	0	-	Real time
C8-41	0xC829	Constant reference 42	0 to 65535	0	-	Real time

9.35 Group C9 Random Monitoring Parameters, Monitoring Parameters, and Commissioning Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C9-00	0xC900	Low word of any 16-bit data at RAM address 1	0x0 to 0xFFFF	0x0	-	Real time
C9-01	0xC901	High word of any 16-bit data at RAM address 1	0x0 to 0xFFFF	0x0	-	Real time
C9-02	0xC902	Low word of any 16-bit data at RAM address 2	0x0 to 0xFFFF	0x0	-	Real time
C9-03	0xC903	High word of any 16-bit data at RAM address 2	0x0 to 0xFFFF	0x0	-	Real time
C9-04	0xC904	Low word of any 16-bit data at RAM address 3	0x0 to 0xFFFF	0x0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C9-05	0xC905	High word of any 16-bit data at RAM address 3	0x0 to 0xFFFF	0x0	-	Real time
C9-06	0xC906	Low word of any 16-bit data at RAM address 4	0x0 to 0xFFFF	0x0	-	Real time
C9-07	0xC907	High word of any 16-bit data at RAM address 4	0x0 to 0xFFFF	0x0	-	Real time
C9-08	0xC908	Low word of any 16-bit data at RAM address 5	0x0 to 0xFFFF	0x0	-	Real time
C9-09	0xC909	High word of any 16-bit data at RAM address 5	0x0 to 0xFFFF	0x0	-	Real time
C9-10	0xC90A	32-bit data type selection 1	0 to 1	0	-	Real time
C9-11	0xC90B	32-bit data scaling factor 1	0 to 10000	0	-	Real time
C9-12	0xC90C	Low word of any 32-bit data at RAM address 1	0x0 to 0xFFFF	0x0	-	Real time
C9-13	0xC90D	High word of any 32-bit data at RAM address 1	0x0 to 0xFFFF	0x0	-	Real time
C9-14	0xC90E	32-bit data type selection 2	0 to 1	0	-	Real time
C9-15	0xC90F	32-bit data scaling factor 2	0 to 10000	0	-	Real time
C9-16	0xC910	Low word of any 32-bit data at RAM address 2	0x0 to 0xFFFF	0x0	-	Real time
C9-17	0xC911	High word of any 32-bit data at RAM address 2	0x0 to 0xFFFF	0x0	-	Real time
C9-18	0xC912	32-bit data type selection 3	0 to 1	0	-	Real time
C9-19	0xC913	32-bit data scaling factor 3	0 to 10000	0	-	Real time
C9-20	0xC914	Low word of any 32-bit data at RAM address 3	0x0 to 0xFFFF	0x0	-	Real time
C9-21	0xC915	High word of any 32-bit data at RAM address 3	0x0 to 0xFFFF	0x0	-	Real time
C9-22	0xC916	32-bit data type selection 4	0 to 1	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C9-23	0xC917	32-bit data scaling factor 4	0 to 10000	0	-	Real time
C9-24	0xC918	Low word of any 32-bit data at RAM address 4	0x0 to 0xFFFF	0x0	-	Real time
C9-25	0xC919	High word of any 32-bit data at RAM address 4	0x0 to 0xFFFF	0x0	-	Real time
C9-26	0xC91A	32-bit data type selection 5	0 to 1	0	-	Real time
C9-27	0xC91B	32-bit data scaling factor 5	0 to 10000	0	-	Real time
C9-28	0xC91C	Low word of any 32-bit data at RAM address 5	0x0 to 0xFFFF	0x0	-	Real time
C9-29	0xC91D	High word of any 32-bit data at RAM address 5	0x0 to 0xFFFF	0x0	-	Real time
C9-30	0xC91E	Internal parameter monitoring parameter input 1	0 to 97	0	-	Real time
C9-31	0xC91F	Internal parameter monitoring input 2	0 to 97	0	-	Real time
C9-32	0xC920	Internal parameter monitoring input 3	0 to 97	0	-	Real time
C9-33	0xC921	Internal parameter monitoring input 4	0 to 97	0	-	Real time
C9-34	0xC922	Internal parameter monitoring input 5	0 to 97	0	-	Real time
C9-35	0xC923	Internal parameter monitoring input 6	0 to 97	0	-	Real time
C9-36	0xC924	Internal parameter monitoring input 7	0 to 97	0	-	Real time
C9-37	0xC925	Internal parameter monitoring input 8	0 to 97	0	-	Real time
C9-40	0xC928	Variable connector value input 1	0 to 65535	0	-	Real time
C9-41	0xC929	Variable connector value input 2	0 to 65535	0	-	Real time
C9-42	0xC92A	Variable connector value input 3	0 to 65535	0	-	Real time
C9-43	0xC92B	Variable connector value input 4	0 to 65535	0	-	Real time
C9-44	0xC92C	Variable connector value input 5	0 to 65535	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
C9-45	0xC92D	Variable connector value input 6	0 to 65535	0	-	Real time
C9-46	0xC92E	Variable connector value input 7	0 to 65535	0	-	Real time
C9-47	0xC92F	Variable connector value input 8	0 to 65535	0	-	Real time
C9-50	0xC932	Monitoring variable 0	-32768 to +32767	0	-	Unchangeable
C9-51	0xC933	Monitoring variable 1	-32768 to +32767	0	-	Unchangeable
C9-52	0xC934	Monitoring variable 2	-32768 to +32767	0	-	Unchangeable
C9-53	0xC935	Monitoring variable 3	-32768 to +32767	0	-	Unchangeable
C9-54	0xC936	Monitoring variable 4	-32768 to +32767	0	-	Unchangeable
C9-55	0xC937	Monitoring variable 5	-32768 to +32767	0	-	Unchangeable
C9-56	0xC938	Monitoring variable 6	-32768 to +32767	0	-	Unchangeable
C9-57	0xC939	Monitoring variable 7	-32768 to +32767	0	-	Unchangeable
C9-58	0xC93A	Monitoring variable 8	-32768 to +32767	0	-	Unchangeable
C9-59	0xC93B	Monitoring variable 9	-32768 to +32767	0	-	Unchangeable
C9-70	0xC946	Commissioning variable 0	-32768 to +32767	0	-	Real time
C9-71	0xC947	Commissioning variable 1	-32768 to +32767	0	-	Real time
C9-72	0xC948	Commissioning variable 2	-32768 to +32767	0	-	Real time
C9-73	0xC949	Commissioning variable 3	-32768 to +32767	0	-	Real time
C9-74	0xC94A	Commissioning variable 4	-32768 to +32767	0	-	Real time
C9-75	0xC94B	Commissioning variable 5	-32768 to +32767	0	-	Real time
C9-76	0xC94C	Commissioning variable 6	-32768 to +32767	0	-	Real time
C9-77	0xC94D	Commissioning variable 7	-32768 to +32767	0	-	Real time
C9-78	0xC94E	Commissioning variable 8	-32768 to +32767	0	-	Real time
C9-79	0xC94F	Commissioning variable 9	-32768 to +32767	0	-	Real time

9.36 Group D5 Frequency Processing Parameter Group

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
D5-00	0xD500	Overcurrent frequency reduction enable switch	Ones: Overcurrent frequency reduction switch 0: Disable 1: Enable Tens: Pre-overtemperature frequency reduction switch 0: Disable 1: Enable	0	-	Real time
D5-01	0xD501	Current upper limit	D5-02 to 200.00	105.00	%	Real time
D5-02	0xD502	Current lower limit	D5-03 to D5-01	80.00	%	Real time
D5-03	0xD503	Current exit value	0.00 to D5-02	10.00	%	Real time
D5-04	0xD504	Delay for exiting overcurrent frequency reduction	0.00 to 655.35	20.00	s	Real time
D5-05	0xD505	Frequency increase amount	0.00 to 100.00	5.00	Hz	Real time
D5-06	0xD506	Frequency decrease amount	0.00 to 100.00	5.00	Hz	Real time
D5-07	0xD507	Frequency increase action time	0.00 to 655.35	5.00	s	Real time
D5-08	0xD508	Frequency decrease action time	0.00 to 655.35	5.00	s	Real time
D5-09	0xD509	Reserved (drive current temperature - for test)	-500 to 500	0	-	Real time
D5-10	0xD50A	Minimum reachable frequency limit	0.00 to F0-10	2.00	Hz	Real time
D5-11	0xD50B	Auxiliary function	0 to 1	0	-	Real time

9.37 Group D6 Motor 1 Control Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
D6-00	0xD600	Speed open loop compensation coefficient	-0.50 to +0.50	0.00	-	Real time
D6-02	0xD602	TB start	0: Inactive 1: OK	0	-	At stop
D6-03	0xD603	Maximum current of TB	0.0 to 1000.0	200.0	%	At stop
D6-04	0xD604	Maximum d-axis current of TB	0.0 to 500.0	150.0	%	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
D6-05	0xD605	TB coefficient	0 to 200	50	-	Real time
D6-06	0xD606	TB test parameter 1	0.0 to 500.0	0.0	%	At stop
D6-07	0xD607	TB test parameter 2	0.0 to 1000.0	0.0	%	At stop
D6-08	0xD608	HFI control word	bit0 and bit1: Configuration 1 0: Scheme 1 1: Scheme 2 2: Scheme 3 3: Reserved bit2 and bit3: Configuration 2 0: Scheme 1 1: Scheme 2 2: Scheme 3 3: Reserved	10	-	At stop
D6-09	0xD609	HFI coefficient 1	0 to 100	20	-	Real time
D6-10	0xD60A	HFI coefficient 2	0 to 10000	500	-	Real time
D6-11	0xD60B	HFI coefficient 3	0 to 10000	800	-	Real time
D6-12	0xD60C	HFI coefficient 4	-50.0 to 50.0	0.0	-	Real time
D6-13	0xD60D	HFI coefficient 5	0.00 to 100.00	5.00	-	Real time
D6-14	0xD60E	HFI coefficient 6	0.00 to 100.00	2.50	-	Real time
D6-15	0xD60F	HFI coefficient 7	0.00 to 100.00	2.50	-	Real time
D6-16	0xD610	HFI coefficient 8	0.00 to 100.00	2.50	-	Real time
D6-17	0xD611	Automatic calculation interval of feedforward torque acceleration	0 to 50	20	-	Real time
D6-18	0xD612	Speed open loop of asynchronous motor	0: Off 1: Enable	0	-	At stop
D6-19	0xD613	Speed open loop current of asynchronous motor	0 to 600	100	%	Real time
D6-20	0xD614	Acceleration current for speed open loop of asynchronous motor	0 to 100	30	%	Real time
D6-21	0xD615	Switchover frequency for speed open loop of asynchronous motor	1.0 to 10.0	2.0	%	At stop
D6-22	0xD616	Switchover hysteresis frequency for speed open loop of asynchronous motor	1.0 to 10.0	3.0	%	At stop
D6-23	0xD617	Waiting time for speed open loop of asynchronous motor	0.00 to 5.00	0.50	s	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
D6-24	0xD618	Minimum acceleration/ deceleration time for frequency for speed open loop of asynchronous motor	0.0 to 50.0	2.0	s	At stop
D6-25	0xD619	Current ramp time for speed open loop of asynchronous motor	0.000 to 1.000	0.030	s	At stop
D6-26	0xD61A	Configuration word for speed open loop of asynchronous motor	bit0: Start with speed open loop 0: Off 1: On bit1: Stop with speed open loop 0: Off 1: On bit2: Keep speed closed loop during stall 0: Off 1: On bit3: Ignore waiting time for speed open loop 0: Off 1: On bit4: Slip compensation 0: Enable 1: Disable bit5: Low-speed slip compensation 0: Disable 1: Enable bit6: Speed fluctuation suppression 0: Enable 1: Disable bit7: Oscillation suppression 0: Enable 1: Disable bit8: Oscillation suppression mode 0: Mode 1 1: Mode 2 2: Mode 3 3: Mode 4 Continued	0	-	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
D6-26	0xD61A	Configuration word for speed open loop of asynchronous motor	Continued bit10: Convergence time selection 0: 1 1: 2 2: 3 3: 4 bit12: Stable frequency 1 selection 0: 1 1: 2 2: 3 3: 4 bit14: Stable frequency 2 selection 0: 1 1: 2	0	-	At stop
D6-27	0xD61B	Speed fluctuation suppression coefficient for speed open loop of asynchronous motor	0 to 400	100	%	Real time
D6-28	0xD61C	Oscillation suppression gain coefficient for speed open loop of asynchronous motor	0 to 400	100	%	Real time
D6-29	0xD61D	Oscillation suppression filter cut-off frequency for speed open loop of asynchronous motor	0.2 to 50.0	1.0	Hz	At stop
D6-33	0xD621	Overcurrent threshold for demagnetization protection of reluctance motor	0.0 to 500.0	350.0	%	Real time
D6-37	0xD625	Time for torque cancellation upon decelerate-to-stop	0.00 to 100.00	0.00	s	At stop
D6-38	0xD626	LPT limit coefficient	0.0 to 1000.0	90.0	%	Real time
D6-39	0xD627	Injected reactive current at low speed in VVC mode	0 to 80	30	%	At stop
D6-40	0xD628	Injected reactive current at high speed in VVC mode	0 to 80	10	%	At stop

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
D6-41	0xD629	Energy saving control Ki adjustment coefficient in VVC mode	0 to 1000	100	%	Real time
D6-42	0xD62A	Calculated carrier frequency upper limit in current loop in VVC mode	2.0 to 40.0	16.0	-	Real time
D6-43	0xD62B	Overvoltage/ Undervoltage oscillation suppression coefficient in VVC mode	0 to 5000	100	%	Real time
D6-44	0xD62C	IF overvoltage/ undervoltage oscillation suppression coefficient in VVC mode	0 to 5000	100	%	Real time
D6-45	0xD62D	IF oscillation suppression coefficient in VVC mode	0 to 5000	100	%	Real time

9.38 Group H0 Fault Information

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H0-00	0x8000	Fault code 1 in fault log 1	0 to 65535	0	-	Unchangeable
H0-01	0x8001	Fault sub-code 1 in fault log 1	0 to 65535	0	-	Unchangeable
H0-03	0x8003	Fault code 2 in fault log 1	0 to 65535	0	-	Unchangeable
H0-04	0x8004	Fault sub-code 2 in fault log 1	0 to 65535	0	-	Unchangeable
H0-06	0x8006	Fault code 3 in fault log 1	0 to 65535	0	-	Unchangeable
H0-07	0x8007	Fault sub-code 3 in fault log 1	0 to 65535	0	-	Unchangeable
H0-09	0x8009	Fault code 4 in fault log 1	0 to 65535	0	-	Unchangeable
H0-10	0x800A	Fault sub-code 4 in fault log 1	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H0-12	0x800C	Fault code 5 in fault log 1	0 to 65535	0	-	Unchangeable
H0-13	0x800D	Fault sub-code 5 in fault log 1	0 to 65535	0	-	Unchangeable
H0-15	0x800F	Fault code 6 in fault log 1	0 to 65535	0	-	Unchangeable
H0-16	0x8010	Fault sub-code 6 in fault log 1	0 to 65535	0	-	Unchangeable
H0-18	0x8012	Minor fault code 1 in fault log 1	0 to 65535	0	-	Unchangeable
H0-19	0x8013	Minor fault sub-code 1 in fault log 1	0 to 65535	0	-	Unchangeable
H0-21	0x8015	Minor fault code 2 in fault log 1	0 to 65535	0	-	Unchangeable
H0-22	0x8016	Minor fault sub-code 2 in fault log 1	0 to 65535	0	-	Unchangeable
H0-24	0x8018	Minor fault code 3 in fault log 1	0 to 65535	0	-	Unchangeable
H0-25	0x8019	Minor fault sub-code 3 in fault log 1	0 to 65535	0	-	Unchangeable
H0-27	0x801B	Minor fault code 4 in fault log 1	0 to 65535	0	-	Unchangeable
H0-28	0x801C	Minor fault sub-code 4 in fault log 1	0 to 65535	0	-	Unchangeable
H0-30	0x801E	Minor fault code 5 in fault log 1	0 to 65535	0	-	Unchangeable
H0-31	0x801F	Minor fault sub-code 5 in fault log 1	0 to 65535	0	-	Unchangeable
H0-33	0x8021	Minor fault code 6 in fault log 1	0 to 65535	0	-	Unchangeable
H0-34	0x8022	Minor fault sub-code 6 in fault log 1	0 to 65535	0	-	Unchangeable
H0-36	0x8024	Alarm code 1 in fault log 1	0 to 65535	0	-	Unchangeable
H0-37	0x8025	Alarm sub-code 1 in fault log 1	0 to 65535	0	-	Unchangeable
H0-39	0x8027	Alarm code 2 in fault log 1	0 to 65535	0	-	Unchangeable
H0-40	0x8028	Alarm sub-code 2 in fault log 1	0 to 65535	0	-	Unchangeable
H0-42	0x802A	Alarm code 3 in fault log 1	0 to 65535	0	-	Unchangeable
H0-43	0x802B	Alarm sub-code 3 in fault log 1	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H0-45	0x802D	Alarm code 4 in fault log 1	0 to 65535	0	-	Unchangeable
H0-46	0x802E	Alarm sub-code 4 in fault log 1	0 to 65535	0	-	Unchangeable
H0-48	0x8030	Alarm code 5 in fault log 1	0 to 65535	0	-	Unchangeable
H0-49	0x8031	Alarm sub-code 5 in fault log 1	0 to 65535	0	-	Unchangeable
H0-51	0x8033	Alarm code 6 in fault log 1	0 to 65535	0	-	Unchangeable
H0-52	0x8034	Alarm sub-code 6 in fault log 1	0 to 65535	0	-	Unchangeable

9.39 Group H1 Fault Setting Information

H1-00	0x8100	1st set of fault code	0.0 to 199.9	0.0	-	At stop
H1-01	0x8101	1st set of fault level	0: Coast to stop 1: Stop according to the stop mode 2: Continue to run 3: Run with power limit 4: Run with current limit 5: Ignore 6: No action	6	-	At stop
H1-02	0x8102	2nd set of fault code	0.0 to 199.9	0.0	-	At stop
H1-03	0x8103	2nd set of fault level	Same as H1-01	6	-	At stop
H1-04	0x8104	3rd set of fault code	0.0 to 199.9	0.0	-	At stop
H1-05	0x8105	3rd set of fault level	Same as H1-01	6	-	At stop
H1-06	0x8106	4th set of fault code	0.0 to 199.9	0.0	-	At stop
H1-07	0x8107	4th set of fault level	Same as H1-01	6	-	At stop
H1-08	0x8108	5th set of fault code	0.0 to 199.9	0.0	-	At stop
H1-09	0x8109	5th set of fault level	Same as H1-01	6	-	At stop
H1-10	0x810A	6th set of fault code	0.0 to 199.9	0.0	-	At stop
H1-11	0x810B	6th set of fault level	Same as H1-01	6	-	At stop
H1-12	0x810C	7th group of exception master code	0.0 to 199.9	0.0	-	At stop
H1-13	0x810D	7th set of fault level	Same as H1-01	6	-	At stop
H1-14	0x810E	8th set of fault code	0.0 to 199.9	0.0	-	At stop
H1-15	0x810F	8th set of fault level	Same as H1-01	6	-	At stop
H1-16	0x8110	9th set of fault code	0.0 to 199.9	0.0	-	At stop
H1-17	0x8111	9th set of fault level	Same as H1-01	6	-	At stop

H1-18	0x8112	10th set of fault code	0.0 to 199.9	0.0	-	At stop
H1-19	0x8113	10th set of fault level	Same as H1-01	6	-	At stop

9.40 Group H2 Fault Setting Information

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H2-00	0x8200	Source of external fault 1 (NO)	0: Invalid 1: Valid Other: B connector	0	-	Real time
H2-01	0x8201	Source of external fault 2 (NC)	0: Invalid 1: Valid Other: B connector	1	-	Real time
H2-02	0x8202	Source of external minor fault 1	0: Reserved Other: B connector	0	-	Real time
H2-03	0x8203	Source of external minor fault 2	0: Reserved Other: B connector	0	-	Real time
H2-04	0x8204	Source of user-defined fault 1	0: Invalid 1: Valid Other: B connector	0	-	Real time
H2-05	0x8205	Source of user-defined fault 2	0: Invalid 1: Valid Other: B connector	0	-	Real time
H2-06	0x8206	Source of user-defined fault 3	0: Reserved Other: B connector	0	-	Real time
H2-07	0x8207	Source of user-defined fault 4	0: Reserved Other: B connector	0	-	Real time
H2-08	0x8208	Source of user-defined minor fault 1	0: Reserved Other: B connector	0	-	Real time
H2-09	0x8209	Source of user-defined minor fault 1	0: Reserved Other: B connector	0	-	Real time
H2-10	0x820A	Source of user-defined minor fault 1	0: Reserved Other: B connector	0	-	Real time
H2-11	0x820B	Source of user-defined minor fault 1	0: Reserved Other: B connector	0	-	Real time
H2-12	0x820C	Automatic fault reset	0: Disable 1: Enable	1	-	Real time
H2-15	0x820F	Disable automatic reset upon manual reset	0: Yes 1: No	1	-	Real time
H2-16	0x8210	Time for recovering the number of automatic resets	0 to 6000	10	min.	Real time
H2-17	0x8211	Cumulative number of fault resets	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H2-18	0x8212	Action upon exhausting the number of fault resets	0: Reset automatic reset count 1: Not reset automatic reset count	0	-	Real time
H2-20	0x8214	Code of non-resettable fault 1	0 to 200	0	-	Real time
H2-21	0x8215	Sub-code of non-resettable fault 1	0 to 9	0	-	Real time
H2-22	0x8216	Master code of non-resettable exception code 2	0 to 200	0	-	Real time
H2-23	0x8217	Subcode of non-resettable exception code 2	0 to 9	0	-	Real time
H2-24	0x8218	Master code of non-resettable exception code 3	0 to 200	0	-	Real time
H2-25	0x8219	Subcode of non-resettable exception code 3	0 to 9	0	-	Real time
H2-26	0x821A	Master code of non-resettable exception code 4	0 to 200	0	-	Real time
H2-27	0x821B	Subcode of non-resettable exception code 4	0 to 9	0	-	Real time
H2-28	0x821C	Master code of non-resettable exception code 5	0 to 200	0	-	Real time
H2-29	0x821D	Subcode of non-resettable exception code 5	0 to 9	0	-	Real time
H2-30	0x821E	Master code of non-resettable exception code 6	0 to 200	0	-	Real time
H2-31	0x821F	Subcode of non-resettable exception code 6	0 to 9	0	-	Real time
H2-32	0x8220	Master code of non-resettable exception code 7	0 to 200	0	-	Real time
H2-33	0x8221	Subcode of non-resettable exception code 7	0 to 9	0	-	Real time
H2-34	0x8222	Master code of non-resettable exception code 8	0 to 200	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H2-35	0x8223	Subcode of non-resettable exception code 8	0 to 9	0	-	Real time
H2-36	0x8224	Master code of non-resettable exception code 9	0 to 200	0	-	Real time
H2-37	0x8225	Subcode of non-resettable exception code 9	0 to 9	0	-	Real time
H2-38	0x8226	Master code of non-resettable exception code 10	0 to 200	0	-	Real time
H2-39	0x8227	Subcode of non-resettable exception code 10	0 to 9	0	-	Real time
H2-42	0x822A	Restart after automatic reset	0: Disable 1: Enable	0	-	Real time
H2-43	0x822B	Waiting time for restart after automatic fault reset	0.0 to 600.0	0.5	s	Real time
H2-44	0x822C	Forced flying start upon automatic restart	0: Disable 1: Enable	0	-	Real time
H2-45	0x822D	Fault codes that allow restart	0: White list 1: Black list	1	-	Real time
H2-46	0x822E	Code of designated fault 1	0 to 200	0	-	Real time
H2-47	0x822F	Sub-code of designated fault 1	0 to 9	0	-	Real time
H2-48	0x8230	Code of designated fault 2	0 to 200	0	-	Real time
H2-49	0x8231	Sub-code of designated fault 2	0 to 9	0	-	Real time
H2-50	0x8232	Code of designated fault 3	0 to 200	0	-	Real time
H2-51	0x8233	Sub-code of designated fault 3	0 to 9	0	-	Real time
H2-52	0x8234	Code of designated fault 4	0 to 200	0	-	Real time
H2-53	0x8235	Sub-code of designated fault 4	0 to 9	0	-	Real time
H2-54	0x8236	Code of designated fault 5	0 to 200	0	-	Real time
H2-55	0x8237	Sub-code of designated fault 5	0 to 9	0	-	Real time

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H2-56	0x8238	Code of designated fault 6	0 to 200	0	-	Real time
H2-57	0x8239	Sub-code of designated fault 6	0 to 9	0	-	Real time

9.41 Group H3 Current Fault Record

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H3-00	0x8300	Fault code 1 in fault log 1	0 to 65535	0	-	Read only
H3-01	0x8301	Fault sub-code 1 in fault log 1	0 to 65535	0	-	Read only
H3-07	0x8307	Fault code 2 in fault log 1	0 to 65535	0	-	Read only
H3-08	0x8308	Fault sub-code 2 in fault log 1	0 to 65535	0	-	Read only
H3-14	0x830E	Fault code 3 in fault log 1	0 to 65535	0	-	Read only
H3-15	0x830F	Fault sub-code 3 in fault log 1	0 to 65535	0	-	Read only
H3-21	0x8315	Fault code 4 in fault log 1	0 to 65535	0	-	Read only
H3-22	0x8316	Fault sub-code 4 in fault log 1	0 to 65535	0	-	Read only
H3-28	0x831C	Fault code 5 in fault log 1	0 to 65535	0	-	Read only
H3-29	0x831D	Fault sub-code 5 in fault log 1	0 to 65535	0	-	Read only
H3-35	0x8323	Fault code 6 in fault log 1	0 to 65535	0	-	Read only
H3-36	0x8324	Fault sub-code 6 in fault log 1	0 to 65535	0	-	Read only
H3-42	0x832A	Frequency upon fault log 1	-327.68 to +327.67	0.00	Hz	Read only
H3-43	0x832B	Current upon fault log 1	-327.68 to +327.67	0.00	A	Read only
H3-44	0x832C	Bus voltage upon fault log 1	0.0 to 6553.5	0.0	V	Read only
H3-45	0x832D	Input terminal status upon fault log 1	0x0 to 0xFFFF	0x0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H3-46	0x832E	Output terminal status upon fault log 1	0x0 to 0xFFFF	0x0	-	Read only
H3-47	0x832F	AC drive status upon fault log 1	0 to 65535	0	-	Read only
H3-48	0x8330	Power-on time upon fault log 1	0 to 65535	0	min.	Read only
H3-49	0x8331	Operating time upon fault log 1	0.0 to 6553.5	0.0	min.	Read only
H3-50	0x8332	Status word A upon fault log 1	0x0 to 0xFFFF	0x0	-	Read only
H3-51	0x8333	Status word B upon fault log 1	0x0 to 0xFFFF	0x0	-	Read only
H3-52	0x8334	Command word upon fault log 1	0x0 to 0xFFFF	0x0	-	Read only

9.42 Group H4 Last Fault Record

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
H4-00	0x8400	Fault code 1 in fault log 2	0 to 65535	0	-	Read only
H4-01	0x8401	Fault sub-code 1 in fault log 2	0 to 65535	0	-	Read only
H4-07	0x8407	Fault code 2 in fault log 2	0 to 65535	0	-	Read only
H4-08	0x8408	Fault sub-code 2 in fault log 2	0 to 65535	0	-	Read only
H4-14	0x840E	Fault code 3 in fault log 2	0 to 65535	0	-	Read only
H4-15	0x840F	Fault sub-code 3 in fault log 2	0 to 65535	0	-	Read only
H4-21	0x8415	Fault code 4 in fault log 2	0 to 65535	0	-	Read only
H4-22	0x8416	Fault sub-code 4 in fault log 2	0 to 65535	0	-	Read only
H4-28	0x841C	Fault code 5 in fault log 2	0 to 65535	0	-	Read only
H4-29	0x841D	Fault sub-code 5 in fault log 2	0 to 65535	0	-	Read only
H4-35	0x8423	Fault code 6 in fault log 2	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
H4-36	0x8424	Fault sub-code 6 in fault log 2	0 to 65535	0	-	Read only
H4-42	0x842A	Frequency upon fault log 2	-327.68 to 327.67	0.00	Hz	Read only
H4-43	0x842B	Current upon fault log 2	-327.68 to 327.67	0.00	A	Read only
H4-44	0x842C	Bus voltage upon fault log 2	0.0 to 6553.5	0.0	V	Read only
H4-45	0x842D	Input terminal status upon fault log 2	0x0 to 0xFFFF	0x0	-	Read only
H4-46	0x842E	Output terminal status upon fault log 2	0x0 to 0xFFFF	0x0	-	Read only
H4-47	0x842F	AC drive status upon fault log 2	0 to 65535	0	-	Read only
H4-48	0x8430	Power-on time upon fault log 2	0 to 65535	0	min.	Read only
H4-49	0x8431	Operating time upon fault log 2	0.0 to 6553.5	0.0	min.	Read only
H4-50	0x8432	Status word A upon fault log 2	0x0 to 0xFFFF	0x0	-	Read only
H4-51	0x8433	Status word B upon fault log 2	0x0 to 0xFFFF	0x0	-	Read only
H4-52	0x8434	Command word upon fault log 2	0x0 to 0xFFFF	0x0	-	Read only

9.43 Group H5 Second Last Fault Record

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
H5-00	0x8500	Fault code 1 in fault log 3	0 to 65535	0	-	Read only
H5-01	0x8501	Fault sub-code 1 in fault log 3	0 to 65535	0	-	Read only
H5-07	0x8507	Fault code 2 in fault log 3	0 to 65535	0	-	Read only
H5-08	0x8508	Fault sub-code 2 in fault log 3	0 to 65535	0	-	Read only
H5-14	0x850E	Fault code 3 in fault log 3	0 to 65535	0	-	Read only
H5-15	0x850F	Fault sub-code 3 in fault log 3	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
H5-21	0x8515	Fault code 4 in fault log 3	0 to 65535	0	-	Read only
H5-22	0x8516	Fault sub-code 4 in fault log 3	0 to 65535	0	-	Read only
H5-28	0x851C	Fault code 5 in fault log 3	0 to 65535	0	-	Read only
H5-29	0x851D	Fault sub-code 5 in fault log 3	0 to 65535	0	-	Read only
H5-35	0x8523	Fault code 6 in fault log 3	0 to 65535	0	-	Read only
H5-36	0x8524	Fault sub-code 6 in fault log 3	0 to 65535	0	-	Read only
H5-42	0x852A	Frequency upon fault log 3	-327.68 to 327.67	0.00	Hz	Read only
H5-43	0x852B	Current upon fault log 3	-327.68 to 327.67	0.00	A	Read only
H5-44	0x852C	Bus voltage upon fault log 3	0.0 to 6553.5	0.0	V	Read only
H5-45	0x852D	Input terminal status upon fault log 3	0x0 to 0xFFFF	0x0	-	Read only
H5-46	0x852E	Output terminal status upon fault log 3	0x0 to 0xFFFF	0x0	-	Read only
H5-47	0x852F	AC drive status upon fault log 3	0 to 65535	0	-	Read only
H5-48	0x8530	Power-on time upon fault log 3	0 to 65535	0	min.	Read only
H5-49	0x8531	Operating time upon fault log 3	0.0 to 6553.5	0.0	min.	Read only
H5-50	0x8532	Status word A upon fault log 3	0x0 to 0xFFFF	0x0	-	Read only
H5-51	0x8533	Status word B upon fault log 3	0x0 to 0xFFFF	0x0	-	Read only
H5-52	0x8534	Command word upon fault log 3	0x0 to 0xFFFF	0x0	-	Read only

9.44 Group H6 Third Last Fault Record

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H6-00	0x8600	Fault code 1 in fault log 4	0 to 65535	0	-	Read only
H6-01	0x8601	Fault sub-code 1 in fault log 4	0 to 65535	0	-	Read only
H6-07	0x8607	Fault code 2 in fault log 4	0 to 65535	0	-	Read only
H6-08	0x8608	Fault sub-code 2 in fault log 4	0 to 65535	0	-	Read only
H6-14	0x860E	Fault code 3 in fault log 4	0 to 65535	0	-	Read only
H6-15	0x860F	Fault sub-code 3 in fault log 4	0 to 65535	0	-	Read only
H6-21	0x8615	Fault code 3 in fault log 4	0 to 65535	0	-	Read only
H6-22	0x8616	Fault sub-code 4 in fault log 4	0 to 65535	0	-	Read only
H6-28	0x861C	Fault code 5 in fault log 4	0 to 65535	0	-	Read only
H6-29	0x861D	Fault sub-code 5 in fault log 4	0 to 65535	0	-	Read only
H6-35	0x8623	Fault code 6 in fault log 4	0 to 65535	0	-	Read only
H6-36	0x8624	Fault sub-code 6 in fault log 4	0 to 65535	0	-	Read only
H6-42	0x862A	Frequency upon fault log 4	-327.68 to 327.67	0.00	Hz	Read only
H6-43	0x862B	Current upon fault log 4	-327.68 to 327.67	0.00	A	Read only
H6-44	0x862C	Bus voltage upon fault log 4	0.0 to 6553.5	0.0	V	Read only
H6-45	0x862D	Input terminal status upon fault log 4	0x0 to 0xFFFF	0x0	-	Read only
H6-46	0x862E	Output terminal status upon fault log 4	0x0 to 0xFFFF	0x0	-	Read only
H6-47	0x862F	AC drive status upon fault log 4	0 to 65535	0	-	Read only
H6-48	0x8630	Power-on time upon fault log 4	0 to 65535	0	min.	Read only
H6-49	0x8631	Operating time upon fault log 4	0.0 to 6553.5	0.0	min.	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H6-50	0x8632	Status word A upon fault log 4	0x0 to 0xFFFF	0x0	-	Read only
H6-51	0x8633	Status word B upon fault log 4	0x0 to 0xFFFF	0x0	-	Read only
H6-52	0x8634	Command word upon fault log 4	0x0 to 0xFFFF	0x0	-	Read only

9.45 Group H7 Fourth Last Fault Record

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H7-00	0x8700	Fault code 1 in fault log 5	0 to 65535	0	-	Read only
H7-01	0x8701	Fault sub-code 1 in fault log 5	0 to 65535	0	-	Read only
H7-07	0x8707	Fault code 2 in fault log 5	0 to 65535	0	-	Read only
H7-08	0x8708	Fault sub-code 2 in fault log 5	0 to 65535	0	-	Read only
H7-14	0x870E	Fault code 3 in fault log 4	0 to 65535	0	-	Read only
H7-15	0x870F	Fault sub-code 3 in fault log 4	0 to 65535	0	-	Read only
H7-21	0x8715	Fault code 4 in fault log 5	0 to 65535	0	-	Read only
H7-22	0x8716	Fault sub-code 4 in fault log 5	0 to 65535	0	-	Read only
H7-28	0x871C	Fault code 5 in fault log 5	0 to 65535	0	-	Read only
H7-29	0x871D	Fault sub-code 5 in fault log 5	0 to 65535	0	-	Read only
H7-35	0x8723	Fault code 6 in fault log 5	0 to 65535	0	-	Read only
H7-36	0x8724	Fault sub-code 6 in fault log 5	0 to 65535	0	-	Read only
H7-42	0x872A	Frequency upon fault log 5	-327.68 to 327.67	0.00	Hz	Read only
H7-43	0x872B	Current upon fault log 5	-327.68 to 327.67	0.00	A	Read only
H7-44	0x872C	Bus voltage upon fault log 5	0.0 to 6553.5	0.0	V	Read only
H7-45	0x872D	Input terminal status upon fault log 5	0x0 to 0xFFFF	0x0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H7-46	0x872E	Output terminal status upon fault log 5	0x0 to 0xFFFF	0x0	-	Read only
H7-47	0x872F	AC drive status upon fault log 5	0 to 65535	0	-	Read only
H7-48	0x8730	Power-on time upon fault log 5	0 to 65535	0	min.	Read only
H7-49	0x8731	Operating time upon fault log 5	0.0 to 6553.5	0.0	min.	Read only
H7-50	0x8732	Status word A upon fault log 5	0x0 to 0xFFFF	0x0	-	Read only
H7-51	0x8733	Status word B upon fault log 5	0x0 to 0xFFFF	0x0	-	Read only
H7-52	0x8734	Command word upon fault log 5	0x0 to 0xFFFF	0x0	-	Read only

9.46 Group H8 Fifth Last Fault Record

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H8-00	0x8800	Fault code 1 in fault log 6	0 to 65535	0	-	Read only
H8-01	0x8801	Fault sub-code 1 in fault log 6	0 to 65535	0	-	Read only
H8-07	0x8807	Fault code 2 in fault log 6	0 to 65535	0	-	Read only
H8-08	0x8808	Fault sub-code 2 in fault log 6	0 to 65535	0	-	Read only
H8-14	0x880E	Fault code 3 in fault log 6	0 to 65535	0	-	Read only
H8-15	0x880F	Fault sub-code 3 in fault log 6	0 to 65535	0	-	Read only
H8-21	0x8815	Fault code 4 in fault log 6	0 to 65535	0	-	Read only
H8-22	0x8816	Fault sub-code 4 in fault log 6	0 to 65535	0	-	Read only
H8-28	0x881C	Fault code 5 in fault log 6	0 to 65535	0	-	Read only
H8-29	0x881D	Fault sub-code 5 in fault log 6	0 to 65535	0	-	Read only
H8-35	0x8823	Fault code 6 in fault log 6	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
H8-36	0x8824	Fault sub-code 6 in fault log 6	0 to 65535	0	-	Read only
H8-42	0x882A	Frequency upon fault log 6	-327.68 to +327.67	0.00	Hz	Read only
H8-43	0x882B	Current upon fault log 6	-327.68 to +327.67	0.00	A	Read only
H8-44	0x882C	Bus voltage upon fault log 6	0.0 to 6553.5	0.0	V	Read only
H8-45	0x882D	Input terminal status upon fault log 6	0x0 to 0xFFFF	0x0	-	Read only
H8-46	0x882E	Output terminal status upon fault log 6	0x0 to 0xFFFF	0x0	-	Read only
H8-47	0x882F	AC drive status upon fault log 6	0 to 65535	0	-	Read only
H8-48	0x8830	Power-on time upon fault log 6	0 to 65535	0	min.	Read only
H8-49	0x8831	Operating time upon fault log 6	0.0 to 6553.5	0.0	min.	Read only
H8-50	0x8832	Status word A upon fault log 6	0x0 to 0xFFFF	0x0	-	Read only
H8-51	0x8833	Status word B upon fault log 6	0x0 to 0xFFFF	0x0	-	Read only
H8-52	0x8834	Command word upon fault log 6	0x0 to 0xFFFF	0x0	-	Read only

9.47 Group U0 Monitoring Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
U0-00	0x7000	Operating frequency	0.00 to 655.35	0.00	Hz	Unchangeable
U0-01	0x7001	Frequency reference	0.00 to 655.35	0.00	Hz	Unchangeable
U0-02	0x7002	Bus voltage	0.0 to 6553.5	0.0	V	Unchangeable
U0-03	0x7003	Output voltage	0 to 65535	0	V	Unchangeable
U0-04	0x7004	Output current	0.00 to 655.35	0.00	A	Unchangeable
U0-05	0x7005	Output power	-3276.8 to +3276.7	0.0	kW	Unchangeable
U0-06	0x7006	Output torque	-3276.8 to +3276.7	0.0	%	Unchangeable
U0-07	0x7007	DI state	0x0 to 0xFFFF	0x0	-	Unchangeable
U0-08	0x7008	DO state	0x0 to 0xFFFF	0x0	-	Unchangeable
U0-09	0x7009	AI1 voltage	-10.57 to +10.57	0.00	V	Unchangeable
U0-10	0x700A	AI2 voltage	-10.57 to +10.57	0.00	V	Unchangeable
U0-11	0x700B	AI3 voltage	-10.57 to +10.57	0.00	V	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
U0-12	0x700C	Counting value	0 to 65535	0	-	Unchangeable
U0-13	0x700D	Length value	0 to 65535	0	-	Unchangeable
U0-14	0x700E	Load speed display	0 to 65535	0	-	Unchangeable
U0-15	0x700F	PID setting	-32768 to +32767	0	-	Unchangeable
U0-16	0x7010	PID feedback	-32768 to +32767	0	-	Unchangeable
U0-17	0x7011	PLC stage	0 to 15	0	-	Unchangeable
U0-18	0x7012	Pulse input frequency	0.00 to 655.35	0.00	kHz	Unchangeable
U0-19	0x7013	Feedback speed	-327.68 to +327.67	0.00	Hz	Unchangeable
U0-20	0x7014	Remaining operating time	0.0 to 6553.5	0.0	min.	Unchangeable
U0-21	0x7015	Non-calibrated AI1 voltage	-32.768 to +32.767	0.000	V	Unchangeable
U0-22	0x7016	AI2 voltage before correction	-32.768 to +32.767	0.000	V	Unchangeable
U0-23	0x7017	AI3 voltage before correction	-32.768 to +32.767	0.000	V	Unchangeable
U0-24	0x7018	Motor speed	0 to 65535	0	rpm	Unchangeable
U0-25	0x7019	Current power-on time	0 to 65535	0	min.	Unchangeable
U0-26	0x701A	Current runtime	0.0 to 6553.5	0.0	min.	Unchangeable
U0-27	0x701B	Pulse input frequency	0 to 65535	0	Hz	Unchangeable
U0-28	0x701C	Communication setpoint	-100.00 to +100.00	0.00	%	Unchangeable
U0-29	0x701D	Encoder feedback speed	-599.00 to +599.00	0.00	Hz	Unchangeable
U0-30	0x701E	Main frequency X	-599.00 to +599.00	0.00	Hz	Unchangeable
U0-31	0x701F	Auxiliary frequency Y	-599.00 to +599.00	0.00	Hz	Unchangeable
U0-32	0x7020	Memory address view	0 to 65535	0	-	Unchangeable
U0-33	0x7021	Synchronous motor rotor position	0.0 to 360.0	0.0	°	Unchangeable
U0-34	0x7022	AI3 temperature mode - motor temperature value	-50 to 300	0	℃	Unchangeable
U0-35	0x7023	Target torque	-600.0 to +600.0	0.0	%	Unchangeable
U0-36	0x7024	Resolver position	0 to 360	0	-	Unchangeable
U0-37	0x7025	Power factor angle	-3276.8 to +3276.7	0.0	°	Unchangeable
U0-38	0x7026	ABZ position	0 to 360	0	-	Unchangeable
U0-39	0x7027	Target voltage upon decoupled V/f	0 to F1-02	0	V	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
U0-40	0x7028	Output voltage upon separated V/f	0 to F1-02	0	V	Unchangeable
U0-45	0x702D	Subcode	0 to 9	0	-	Unchangeable
U0-46	0x702E	Minor fault code	0.0 to 6553.5	0.0	-	Unchangeable
U0-47	0x702F	Encoder position feedback (high-order 16 bits)	0 to 65535	0	-	Unchangeable
U0-48	0x7030	Encoder position feedback (low-order 16 bits)	0 to 65535	0	-	Unchangeable
U0-49	0x7031	Alarm code	0.0 to 6553.5	0.0	-	Unchangeable
U0-57	0x7039	No-load current of asynchronous motor	0 to 65535	0	-	Unchangeable
U0-58	0x703A	Motor running revolutions	0 to 65535	0	-	Unchangeable
U0-59	0x703B	Frequency reference	-100.00 to +100.00	0.00	%	Unchangeable
U0-60	0x703C	Operating frequency	-100.00 to +100.00	0.00	%	Unchangeable
U0-61	0x703D	Drive state	0 to 65535	0	-	Unchangeable
U0-62	0x703E	Master code of current fault	0 to 65535	0	-	Unchangeable
U0-63	0x703F	Torque sent in point-to-point communication	-327.68 to +327.67	0.00	%	Unchangeable
U0-65	0x7041	Torque upper limit	-600.0 to +600.0	0.0	%	Unchangeable
U0-66	0x7042	Communication expansion card type	0 to 65535	0	-	Unchangeable
U0-67	0x7043	Software version of communication expansion card	0 to 65535	0	-	Unchangeable
U0-68	0x7044	Drive state read through DP card	0 to 65535	0	-	Unchangeable
U0-69	0x7045	Frequency read through communication expansion card	-327.68 to +327.67	0.00	Hz	Unchangeable
U0-70	0x7046	Speed read through communication expansion card	-32768 to +32767	0	rpm	Unchangeable
U0-71	0x7047	Specific current display for communication card	0.0 to 6553.5	0.0	A	Unchangeable
U0-73	0x7049	Motor S/N	0 to 65535	0	-	Unchangeable
U0-76	0x704C	Low bits of accumulative power consumption	0.0 to 6553.5	0.0	kWh	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
U0-77	0x704D	High bit of cumulative power consumption	0 to 65535	0	kWh	Unchangeable
U0-80	0x7050	This parameter indicates the EtherCAT slave name.	0 to 65535	0	-	Unchangeable
U0-81	0x7051	This parameter indicates the EtherCAT slave alias.	0 to 65535	0	-	Unchangeable
U0-83	0x7053	EtherCAT XML file version	0 to 65535	0	-	Unchangeable
U0-84	0x7054	EtherCAT synchronization loss times	0 to 65535	0	-	Unchangeable
U0-85	0x7055	Maximum error value and invalid frames of EtherCAT port 0 per unit time	0 to 65535	0	-	Unchangeable
U0-86	0x7056	Maximum number of error frames and invalid frames over EtherCAT port 1 per unit time	0 to 65535	0	-	Unchangeable
U0-87	0x7057	Maximum transfer error of EtherCAT port per unit time	0 to 65535	0	-	Unchangeable
U0-88	0x7058	Maximum EtherCAT data frame processing unit error per unit time	0 to 65535	0	-	Unchangeable
U0-89	0x7059	Maximum link loss of EtherCAT port per unit time	0 to 65535	0	-	Unchangeable
U0-90	0x705A	AI2 temperature mode-motor temperature value	-50 to 300	0	℃	Unchangeable
U0-91	0x705B	AC drive running frequency (unsigned)	0.00 to 655.35	0.00	Hz	Unchangeable
U0-92	0x705C	AI2 temperature mode - motor temperature (0.1)	-50.0 to 300.0	0.0	℃	Unchangeable
U0-93	0x705D	Mains power synchronization contactor DI signal output	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
U0-94	0x705E	Mains power synchronization contactor DI signal output	0 to 65535	0	-	Unchangeable
U0-95	0x705F	STO initialization flag	0 to 65535	0	-	Unchangeable
U0-96	0x7060	STO status word monitoring	0 to 65535	0	-	Unchangeable
U0-97	0x7061	STO model	0x0 to 0xFFFF	0x0	-	Unchangeable
U0-98	0x7062	STO AD sampling value (1.2 V)	0 to 65535	0	-	Unchangeable
U0-99	0x7063	STO AD sampling value (5 V)	0 to 65535	0	-	Unchangeable

9.48 Group U1 Tension Process Monitoring Parameters

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
U1-00	0x7100	Linear speed	0.0 to 6553.5	0.0	m/min	Read only
U1-01	0x7101	Current reel diameter	0.0 to 6553.5	0.0	mm	Read only
U1-02	0x7102	Linear speed synchronization frequency	-327.68 to +327.67	0.00	Hz	Read only
U1-03	0x7103	Closed loop speed output	-327.68 to +327.67	0.00	Hz	Read only
U1-04	0x7104	Tension reference (before taper)	0 to 65535	0	N	Read only
U1-05	0x7105	Tension reference (after taper)	0 to 65535	0	N	Read only
U1-06	0x7106	Torque reference	-3276.8 to +3276.7	0.0	%	Read only
U1-07	0x7107	Closed loop torque output	-3276.8 to +3276.7	0.0	%	Read only
U1-08	0x7108	Tension control state machine	0 to 65535	0	-	Read only
U1-09	0x7109	Closed loop tension (speed/torque) PID setting display	-3276.8 to +3276.7	0.0	%	Read only
U1-10	0x710A	Closed loop tension (speed/torque) PID feedback display	-3276.8 to +3276.7	0.0	%	Read only
U1-11	0x710B	Closed loop tension (speed/torque) PID proportional output	-3276.8 to +3276.7	0.0	%	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
U1-12	0x710C	Closed loop tension (speed/torque) PID integral output	-3276.8 to +3276.7	0.0	%	Read only
U1-13	0x710D	Closed loop tension (speed/torque) PID derivative output	-3276.8 to +3276.7	0.0	%	Read only
U1-14	0x710E	Tension process execution time	0 to 65535	0	-	Read only
U1-15	0x710F	Winding mode	0 to 65535	0	-	Read only
U1-16	0x7110	Tension torque setpoint	-3276.8 to +3276.7	0.0	%	Read only
U1-17	0x7111	Static friction torque	-3276.8 to +3276.7	0.0	%	Read only
U1-18	0x7112	Dynamic friction torque	-3276.8 to +3276.7	0.0	%	Read only
U1-19	0x7113	Inertia torque	-3276.8 to +3276.7	0.0	%	Read only
U1-20	0x7114	Terminal lift torque	-3276.8 to +3276.7	0.0	%	Read only
U1-21	0x7115	Torque upper limit in vertical cable drum application (calculated value)	-3276.8 to +3276.7	0.0	%	Read only
U1-22	0x7116	Torque lower limit in vertical cable drum application (calculated value)	-3276.8 to +3276.7	0.0	%	Read only
U1-23	0x7117	Torque upper limit in vertical cable drum application (actual value)	-3276.8 to +3276.7	0.0	%	Read only
U1-24	0x7118	Torque lower limit in vertical cable drum application (actual value)	-3276.8 to +3276.7	0.0	%	Read only
U1-25	0x7119	Closed loop tension (speed/torque) PID output	-3276.8 to +3276.7	0.0	%	Read only
U1-26	0x711A	Linear acceleration	-32768 to +32767	0	-	Read only

9.49 Group U2 System Information

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
U2-00	0x7200	Current motor parameter group selection	0 to 65535	0	-	Read only
U2-05	0x7205	Current multi-reference selection	0 to 65535	0	-	Read only
U2-06	0x7206	Current multi-speed effective value	0 to 65535	0	-	Read only
U2-67	0x7243	Current state of brake control	0: Initializing 1: Inhibited 2: Applying 3: Applied 4: Waiting for switch-on 5: Switching on 6: Switched on 7: Waiting for switch-off	0	-	Read only
U2-68	0x7244	Brake module control word	0 to 65535	0	-	Read only
U2-69	0x7245	Brake module status word	0 to 65535	0	-	Read only
U2-70	0x7246	Status word for brake release not done	0 to 65535	0	-	Read only
U2-71	0x7247	Status word for brake apply not done	0 to 65535	0	-	Read only
U2-72	0x7248	Starting frequency state of brake module	0 to 65535	0	-	Read only
U2-73	0x7249	Starting torque state of brake module	0 to 65535	0	-	Read only
U2-78	0x724E	Effective carrier frequency	0.000 to 65.535	0.000	kHz	Read only

9.50 Group U3 System Information

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
U3-12	0x730C	Master state	0 to 65535	0	-	Read only
U3-13	0x730D	Master frequency	0 to 65535	0	-	Read only
U3-14	0x730E	Master torque	0 to 65535	0	-	Read only
U3-15	0x730F	Master phase sequence	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
U3-16	0x7310	Frequency set through communication	-320.00 to 320.00	0.00	Hz	Read only
U3-17	0x7311	Control word set through communication	0 to 65535	0	-	Read only

9.51 Group L0 Bit Connector 1

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L0-10	0x900A	AI1AsDI final output state	0 to 1	0	-	Read only
L0-11	0x900B	AI2AsDI final output state	0 to 1	0	-	Read only
L0-12	0x900C	AI3AsDI final output state	0 to 1	0	-	Read only
L0-13	0x900D	AI1AsDI inversion state	0 to 1	0	-	Read only
L0-14	0x900E	AI2AsDI inversion state	0 to 1	0	-	Read only
L0-15	0x900F	AI3AsDI inversion state	0 to 1	0	-	Read only
L0-32	0x9020	DI1 final output state	0 to 1	0	-	Read only
L0-33	0x9021	Final output state of DI2	0 to 1	0	-	Read only
L0-34	0x9022	Final output state of DI3	0 to 1	0	-	Read only
L0-35	0x9023	Final output state of DI4	0 to 1	0	-	Read only
L0-36	0x9024	Final output state of DI5	0 to 1	0	-	Read only
L0-37	0x9025	Final output state of DI6	0 to 1	0	-	Read only
L0-38	0x9026	Final output state of DI7	0 to 1	0	-	Read only
L0-39	0x9027	Final output state of DI8	0 to 1	0	-	Read only
L0-40	0x9028	Final output state of DI9	0 to 1	0	-	Read only
L0-41	0x9029	Final output state of DI10	0 to 1	0	-	Read only
L0-42	0x902A	Final output state of VDI1	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L0-43	0x902B	Final output state of VDI2	0 to 1	0	-	Read only
L0-44	0x902C	Final output state of VDI3	0 to 1	0	-	Read only
L0-45	0x902D	Final output state of VDI4	0 to 1	0	-	Read only
L0-46	0x902E	Final output state of VDI5	0 to 1	0	-	Read only
L0-47	0x902F	Final output state of VDI6	0 to 1	0	-	Read only
L0-48	0x9030	DI1 inversion state	0 to 1	0	-	Read only
L0-49	0x9031	DI2 inversion state	0 to 1	0	-	Read only
L0-50	0x9032	DI3 inversion state	0 to 1	0	-	Read only
L0-51	0x9033	DI4 inversion state	0 to 1	0	-	Read only
L0-52	0x9034	DI5 inversion state	0 to 1	0	-	Read only
L0-53	0x9035	DI6 inversion state	0 to 1	0	-	Read only
L0-54	0x9036	DI7 inversion state	0 to 1	0	-	Read only
L0-55	0x9037	DI8 inversion state	0 to 1	0	-	Read only
L0-56	0x9038	DI9 inversion state	0 to 1	0	-	Read only
L0-57	0x9039	DI10 inversion state	0 to 1	0	-	Read only
L0-58	0x903A	VDI1 inversion state	0 to 1	0	-	Read only
L0-59	0x903B	VDI2 inversion state	0 to 1	0	-	Read only
L0-60	0x903C	VDI3 inversion state	0 to 1	0	-	Read only
L0-61	0x903D	VDI4 inversion state	0 to 1	0	-	Read only
L0-62	0x903E	VDI5 inversion state	0 to 1	0	-	Read only
L0-63	0x903F	VDI6 inversion state	0 to 1	0	-	Read only
L0-80	0x9050	Final output state of RELAY1 (DO3)	0 to 1	0	-	Read only
L0-81	0x9051	Final output state of FMR	0 to 1	0	-	Read only
L0-82	0x9052	Final output state of DO1	0 to 1	0	-	Read only
L0-83	0x9053	Final output state of RELAY2 (DO4)	0 to 1	0	-	Read only
L0-84	0x9054	Final output state of DO2	0 to 1	0	-	Read only
L0-85	0x9055	Final output state of VDO1	0 to 1	0	-	Read only
L0-86	0x9056	Final output state of VDO2	0 to 1	0	-	Read only
L0-87	0x9057	Final output state of VDO3	0 to 1	0	-	Read only
L0-88	0x9058	Final output state of VDO4	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L0-89	0x9059	Final output state of VDO5	0 to 1	0	-	Read only
L0-90	0x905A	Final output state of VDO6	0 to 1	0	-	Read only
L0-91	0x905B	Final output state of VDO7	0 to 1	0	-	Read only
L0-92	0x905C	Final output state of VDO8	0 to 1	0	-	Read only
L0-93	0x905D	Final output state of VDO9	0 to 1	0	-	Read only
L0-94	0x905E	Final output state of VDO10	0 to 1	0	-	Read only
L0-95	0x905F	Final output state of VDO11	0 to 1	0	-	Read only
L0-96	0x9060	AI1 input overlimit	0 to 1	0	-	Read only
L0-97	0x9061	AI2 input overlimit	0 to 1	0	-	Read only
L0-98	0x9062	AI3 input overlimit	0 to 1	0	-	Read only
L0-99	0x9063	HDI input wire breakage	0 to 1	0	-	Read only

9.52 Group L1 Bit Connector 2

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L1-00	0x9100	Set count value arrival	0 to 1	0	-	Read only
L1-01	0x9101	Specified count value arrival	0 to 1	0	-	Read only
L1-02	0x9102	Length comparison value arrival	0 to 1	0	-	Read only
L1-03	0x9103	Comparison result of the first DIO edge counting module	0 to 1	0	-	Read only
L1-04	0x9104	Comparison result of the 2nd DIO edge counting module	0 to 1	0	-	Read only
L1-05	0x9105	Comparison result of the 3rd DIO edge counting module	0 to 1	0	-	Read only
L1-06	0x9106	Comparison result of the 4th DIO edge counting module	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L1-07	0x9107	AI2 or AI3 temperature mode - motor temperature reached	0 to 1	0	-	Read only
L1-08	0x9108	AI2 or AI3 temperature mode - motor overtemperature fault	0 to 1	0	-	Read only
L1-09	0x9109	AI2 or AI3 temperature mode - motor overtemperature warning	0 to 1	0	-	Read only
L1-10	0x910A	AI3 temperature mode - Motor overtemperature fault	0 to 1	0	-	Read only
L1-11	0x910B	Drive temperature reached (flag)	0 to 1	0	-	Read only
L1-12	0x910C	Ready to switch on	0 to 1	0	-	Read only
L1-13	0x910D	Ready to run	0 to 1	0	-	Read only
L1-14	0x910E	Running	0 to 1	0	-	Read only
L1-15	0x910F	Faulty	0 to 1	0	-	Read only
L1-16	0x9110	OFF2 invalid	0 to 1	0	-	Read only
L1-17	0x9111	OFF3 disabled	0 to 1	0	-	Read only
L1-18	0x9112	Switch-on lockout	0 to 1	0	-	Read only
L1-19	0x9113	Minor fault/alarm activated	0 to 1	0	-	Read only
L1-20	0x9114	Actual speed following reference speed	0 to 1	0	-	Read only
L1-21	0x9115	Local/remote control	0: Local 1: Remote	0	-	Read only
L1-22	0x9116	Target speed arrival	0 to 1	0	-	Read only
L1-23	0x9117	Torque reach limit	0 to 1	0	-	Read only
L1-24	0x9118	Positive speed	0 to 1	0	-	Read only
L1-25	0x9119	Negative speed	0 to 1	0	-	Read only
L1-26	0x911A	Motor operation flag	0: Stopped 1: Running (pulsing)	0	-	Read only
L1-27	0x911B	User setting 1	0 to 1	0	-	Read only
L1-28	0x911C	Self-test	0 to 1	0	-	Read only
L1-29	0x911D	Motor Parameter Auto-tuning	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L1-30	0x911E	Minor fault (operation limited) activated	0 to 1	0	-	Read only
L1-31	0x911F	Error activation	0 to 1	0	-	Read only
L1-32	0x9120	Speed control mode	0 to 1	0	-	Read only
L1-33	0x9121	Torque control mode	0 to 1	0	-	Read only
L1-35	0x9123	RFG function selection	0 to 1	0	-	Read only
L1-36	0x9124	RFG module operation	0 to 1	0	-	Read only
L1-37	0x9125	Stop upon fault	0 to 1	0	-	Read only
L1-38	0x9126	Normal operation	0 to 1	0	-	Read only
L1-39	0x9127	Jog	0 to 1	0	-	Read only
L1-42	0x912A	Terminal control flag	0 to 1	0	-	Read only
L1-43	0x912B	User setting 2	0 to 1	0	-	Read only
L1-44	0x912C	Control channel selection	0: Control channel 1 1: Control channel 2	0	-	Read only
L1-45	0x912D	Reference channel selection	0: Reference channel 1 1: Reference channel 2	0	-	Read only
L1-60	0x913C	Excessive speed deviation	0 to 1	0	-	Read only
L1-61	0x913D	Overspeed	0 to 1	0	-	Read only
L1-62	0x913E	Target speed arrival	0 to 1	0	-	Read only
L1-63	0x913F	Speed comparison reached 0	0 to 1	0	-	Read only
L1-64	0x9140	Speed comparison reach 1	0 to 1	0	-	Read only
L1-65	0x9141	Forward motor speed	0 to 1	0	-	Read only
L1-66	0x9142	Reverse motor speed	0 to 1	0	-	Read only
L1-76	0x914C	bit0 of word-to-bit A	0 to 1	0	-	Read only
L1-77	0x914D	bit1 of word-to-bit A	0 to 1	0	-	Read only
L1-78	0x914E	bit2 of word-to-bit A	0 to 1	0	-	Read only
L1-79	0x914F	bit3 of word-to-bit A	0 to 1	0	-	Read only
L1-80	0x9150	bit4 of word-to-bit A	0 to 1	0	-	Read only
L1-81	0x9151	bit5 of word-to-bit A	0 to 1	0	-	Read only
L1-82	0x9152	bit6 of word-to-bit A	0 to 1	0	-	Read only
L1-83	0x9153	bit7 of word-to-bit A	0 to 1	0	-	Read only
L1-84	0x9154	bit8 of word-to-bit A	0 to 1	0	-	Read only
L1-85	0x9155	bit9 of word-to-bit A	0 to 1	0	-	Read only
L1-86	0x9156	bit10 of word-to-bit A	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L1-87	0x9157	bit11 of word-to-bit A	0 to 1	0	-	Read only
L1-88	0x9158	bit12 of word-to-bit A	0 to 1	0	-	Read only
L1-89	0x9159	bit13 of word-to-bit A	0 to 1	0	-	Read only
L1-90	0x915A	bit14 of word-to-bit A	0 to 1	0	-	Read only
L1-91	0x915B	bit15 of word-to-bit A	0 to 1	0	-	Read only
L1-92	0x915C	bit0 of word-to-bit B	0 to 1	0	-	Read only
L1-93	0x915D	bit1 of word-to-bit B	0 to 1	0	-	Read only
L1-94	0x915E	bit2 of word-to-bit B	0 to 1	0	-	Read only
L1-95	0x915F	bit3 of word-to-bit B	0 to 1	0	-	Read only
L1-96	0x9160	bit4 of word-to-bit B	0 to 1	0	-	Read only
L1-97	0x9161	bit5 of word-to-bit B	0 to 1	0	-	Read only
L1-98	0x9162	bit6 of word-to-bit B	0 to 1	0	-	Read only
L1-99	0x9163	bit7 of word-to-bit B	0 to 1	0	-	Read only

9.53 Group L2 Bit Connector 3

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L2-00	0x9200	bit8 of word-to-bit B	0 to 1	0	-	Read only
L2-01	0x9201	bit9 of word-to-bit B	0 to 1	0	-	Read only
L2-02	0x9202	bit10 of word-to-bit B	0 to 1	0	-	Read only
L2-03	0x9203	bit11 of word-to-bit B	0 to 1	0	-	Read only
L2-04	0x9204	bit12 of word-to-bit B	0 to 1	0	-	Read only
L2-05	0x9205	bit13 of word-to-bit B	0 to 1	0	-	Read only
L2-06	0x9206	bit14 of word-to-bit B	0 to 1	0	-	Read only
L2-07	0x9207	bit15 of word-to-bit B	0 to 1	0	-	Read only
L2-08	0x9208	bit0 of word-to-bit C	0 to 1	0	-	Read only
L2-09	0x9209	bit1 of word-to-bit C	0 to 1	0	-	Read only
L2-10	0x920A	bit2 of word-to-bit C	0 to 1	0	-	Read only
L2-11	0x920B	bit3 of word-to-bit C	0 to 1	0	-	Read only
L2-12	0x920C	bit4 of word-to-bit C	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L2-13	0x920D	bit5 of word-to-bit C	0 to 1	0	-	Read only
L2-14	0x920E	bit6 of word-to-bit C	0 to 1	0	-	Read only
L2-15	0x920F	bit7 of word-to-bit C	0 to 1	0	-	Read only
L2-16	0x9210	bit8 of word-to-bit C	0 to 1	0	-	Read only
L2-17	0x9211	bit9 of word-to-bit C	0 to 1	0	-	Read only
L2-18	0x9212	bit10 of word-to-bit C	0 to 1	0	-	Read only
L2-19	0x9213	bit11 of word-to-bit C	0 to 1	0	-	Read only
L2-20	0x9214	bit12 of word-to-bit C	0 to 1	0	-	Read only
L2-21	0x9215	bit13 of word-to-bit C	0 to 1	0	-	Read only
L2-22	0x9216	bit14 of word-to-bit C	0 to 1	0	-	Read only
L2-23	0x9217	bit15 of word-to-bit C	0 to 1	0	-	Read only
L2-24	0x9218	bit0 of word-to-bit D	0 to 1	0	-	Read only
L2-25	0x9219	bit1 of word-to-bit D	0 to 1	0	-	Read only
L2-26	0x921A	bit2 of word-to-bit D	0 to 1	0	-	Read only
L2-27	0x921B	bit3 of word-to-bit D	0 to 1	0	-	Read only
L2-28	0x921C	bit4 of word-to-bit D	0 to 1	0	-	Read only
L2-29	0x921D	bit5 of word-to-bit D	0 to 1	0	-	Read only
L2-30	0x921E	bit6 of word-to-bit D	0 to 1	0	-	Read only
L2-31	0x921F	bit7 of word-to-bit D	0 to 1	0	-	Read only
L2-32	0x9220	bit8 of word-to-bit D	0 to 1	0	-	Read only
L2-33	0x9221	bit9 of word-to-bit D	0 to 1	0	-	Read only
L2-34	0x9222	bit10 of word-to-bit D	0 to 1	0	-	Read only
L2-35	0x9223	bit11 of word-to-bit D	0 to 1	0	-	Read only
L2-36	0x9224	bit12 of word-to-bit D	0 to 1	0	-	Read only
L2-37	0x9225	bit13 of word-to-bit D	0 to 1	0	-	Read only
L2-38	0x9226	bit14 of word-to-bit D	0 to 1	0	-	Read only
L2-39	0x9227	bit15 of word-to-bit D	0 to 1	0	-	Read only
L2-40	0x9228	bit0 of word-to-bit E	0 to 1	0	-	Read only
L2-41	0x9229	bit1 of word-to-bit E	0 to 1	0	-	Read only
L2-42	0x922A	bit2 of word-to-bit E	0 to 1	0	-	Read only
L2-43	0x922B	bit3 of word-to-bit E	0 to 1	0	-	Read only
L2-44	0x922C	bit4 of word-to-bit E	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L2-45	0x922D	bit5 of word-to-bit E	0 to 1	0	-	Read only
L2-46	0x922E	bit6 of word-to-bit E	0 to 1	0	-	Read only
L2-47	0x922F	bit7 of word-to-bit E	0 to 1	0	-	Read only
L2-48	0x9230	bit8 of word-to-bit E	0 to 1	0	-	Read only
L2-49	0x9231	bit9 of word-to-bit E	0 to 1	0	-	Read only
L2-50	0x9232	bit10 of word-to-bit E	0 to 1	0	-	Read only
L2-51	0x9233	bit11 of word-to-bit E	0 to 1	0	-	Read only
L2-52	0x9234	bit12 of word-to-bit E	0 to 1	0	-	Read only
L2-53	0x9235	bit13 of word-to-bit E	0 to 1	0	-	Read only
L2-54	0x9236	bit14 of word-to-bit E	0 to 1	0	-	Read only
L2-55	0x9237	bit15 of word-to-bit E	0 to 1	0	-	Read only
L2-56	0x9238	bit0 of word-to-bit F	0 to 1	0	-	Read only
L2-57	0x9239	bit1 of word-to-bit F	0 to 1	0	-	Read only
L2-58	0x923A	bit2 of word-to-bit F	0 to 1	0	-	Read only
L2-59	0x923B	bit3 of word-to-bit F	0 to 1	0	-	Read only
L2-60	0x923C	bit4 of word-to-bit F	0 to 1	0	-	Read only
L2-61	0x923D	bit5 of word-to-bit F	0 to 1	0	-	Read only
L2-62	0x923E	bit6 of word-to-bit F	0 to 1	0	-	Read only
L2-63	0x923F	bit7 of word-to-bit F	0 to 1	0	-	Read only
L2-64	0x9240	bit8 of word-to-bit F	0 to 1	0	-	Read only
L2-65	0x9241	bit9 of word-to-bit F	0 to 1	0	-	Read only
L2-66	0x9242	bit10 of word-to-bit F	0 to 1	0	-	Read only
L2-67	0x9243	bit11 of word-to-bit F	0 to 1	0	-	Read only
L2-68	0x9244	bit12 of word-to-bit F	0 to 1	0	-	Read only
L2-69	0x9245	bit13 of word-to-bit F	0 to 1	0	-	Read only
L2-70	0x9246	bit14 of word-to-bit F	0 to 1	0	-	Read only
L2-71	0x9247	bit15 of word-to-bit F	0 to 1	0	-	Read only
L2-72	0x9248	bit0 of word-to-bit G	0 to 1	0	-	Read only
L2-73	0x9249	bit1 of word-to-bit G	0 to 1	0	-	Read only
L2-74	0x924A	bit2 of word-to-bit G	0 to 1	0	-	Read only
L2-75	0x924B	bit3 of word-to-bit G	0 to 1	0	-	Read only
L2-76	0x924C	bit4 of word-to-bit G	0 to 1	0	-	Read only
L2-77	0x924D	bit5 of word-to-bit G	0 to 1	0	-	Read only
L2-78	0x924E	bit6 of word-to-bit G	0 to 1	0	-	Read only
L2-79	0x924F	bit7 of word-to-bit G	0 to 1	0	-	Read only
L2-80	0x9250	bit8 of word-to-bit G	0 to 1	0	-	Read only
L2-81	0x9251	bit9 of word-to-bit G	0 to 1	0	-	Read only
L2-82	0x9252	bit10 of word-to-bit G	0 to 1	0	-	Read only
L2-83	0x9253	bit11 of word-to-bit G	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L2-84	0x9254	bit12 of word-to-bit G	0 to 1	0	-	Read only
L2-85	0x9255	bit13 of word-to-bit G	0 to 1	0	-	Read only
L2-86	0x9256	bit14 of word-to-bit G	0 to 1	0	-	Read only
L2-87	0x9257	bit15 of word-to-bit G	0 to 1	0	-	Read only
L2-88	0x9258	bit0 of word-to-bit H	0 to 1	0	-	Read only
L2-89	0x9259	bit1 of word-to-bit H	0 to 1	0	-	Read only
L2-90	0x925A	bit2 of word-to-bit H	0 to 1	0	-	Read only
L2-91	0x925B	bit3 of word-to-bit H	0 to 1	0	-	Read only
L2-92	0x925C	bit4 of word-to-bit H	0 to 1	0	-	Read only
L2-93	0x925D	bit5 of word-to-bit H	0 to 1	0	-	Read only
L2-94	0x925E	bit6 of word-to-bit H	0 to 1	0	-	Read only
L2-95	0x925F	bit7 of word-to-bit H	0 to 1	0	-	Read only
L2-96	0x9260	bit8 of word-to-bit H	0 to 1	0	-	Read only
L2-97	0x9261	bit9 of word-to-bit H	0 to 1	0	-	Read only
L2-98	0x9262	bit10 of word-to-bit H	0 to 1	0	-	Read only
L2-99	0x9263	bit11 of word-to-bit H	0 to 1	0	-	Read only

9.54 Group L3 Bit Connector 4

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L3-00	0x9300	bit12 of word-to-bit H	0 to 1	0	-	Read only
L3-01	0x9301	bit13 of word-to-bit H	0 to 1	0	-	Read only
L3-02	0x9302	bit14 of word-to-bit H	0 to 1	0	-	Read only
L3-03	0x9303	bit15 of word-to-bit H	0 to 1	0	-	Read only
L3-04	0x9304	Output of binary switch module A	0 to 1	0	-	Read only
L3-05	0x9305	Output of binary switch module B	0 to 1	0	-	Read only
L3-06	0x9306	Output of binary switch module C	0 to 1	0	-	Read only
L3-07	0x9307	Output of binary switch module D	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L3-08	0x9308	Output of binary switch module E	0 to 1	0	-	Read only
L3-09	0x9309	Output of binary switch module F	0 to 1	0	-	Read only
L3-10	0x930A	Output of binary switch module G	0 to 1	0	-	Read only
L3-11	0x930B	Output of binary switch module H	0 to 1	0	-	Read only
L3-20	0x9314	Output of logic delay module A	0 to 1	0	-	Read only
L3-21	0x9315	Output of logic delay module B	0 to 1	0	-	Read only
L3-22	0x9316	Output of logic delay module C	0 to 1	0	-	Read only
L3-23	0x9317	Output of logic delay module D	0 to 1	0	-	Read only
L3-24	0x9318	Output of logic delay module E	0 to 1	0	-	Read only
L3-25	0x9319	Output of logic delay module F	0 to 1	0	-	Read only
L3-26	0x931A	Output of logic delay module G	0 to 1	0	-	Read only
L3-27	0x931B	Output of logic delay module H	0 to 1	0	-	Read only
L3-36	0x9324	Output of logic AND-OR module A	0 to 1	0	-	Read only
L3-37	0x9325	Output of logic AND/OR module B	0 to 1	0	-	Read only
L3-38	0x9326	Output of logic AND/OR module C	0 to 1	0	-	Read only
L3-39	0x9327	Output of logic AND-OR module D	0 to 1	0	-	Read only
L3-40	0x9328	Output of logic AND-OR module E	0 to 1	0	-	Read only
L3-41	0x9329	Output of logic AND-OR module F	0 to 1	0	-	Read only
L3-42	0x932A	Output of logic AND-OR module G	0 to 1	0	-	Read only
L3-43	0x932B	Output of logic AND-OR module H	0 to 1	0	-	Read only
L3-44	0x932C	Output of logic AND-OR module I	0 to 1	0	-	Read only
L3-45	0x932D	Output of logic AND-OR module J	0 to 1	0	-	Read only
L3-46	0x932E	Output of logic AND-OR module K	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L3-47	0x932F	Output of logic AND-OR module L	0 to 1	0	-	Read only
L3-52	0x9334	Output of logic NOT module A	0 to 1	0	-	Read only
L3-53	0x9335	Output of Logic NOT module B	0 to 1	0	-	Read only
L3-54	0x9336	Output of logic NOT module C	0 to 1	0	-	Read only
L3-55	0x9337	Output of logic NOT module D	0 to 1	0	-	Read only
L3-56	0x9338	Output of logic NOT module E	0 to 1	0	-	Read only
L3-57	0x9339	Output of logic NOT module F	0 to 1	0	-	Read only
L3-58	0x933A	Output of logic NOT module G	0 to 1	0	-	Read only
L3-59	0x933B	Output of logic NOT module H	0 to 1	0	-	Read only
L3-60	0x933C	Output of logic NOT module I	0 to 1	0	-	Read only
L3-61	0x933D	Output of logic NOT module J	0 to 1	0	-	Read only
L3-62	0x933E	Output of logic NOT module K	0 to 1	0	-	Read only
L3-63	0x933F	Output of logic NOT module L	0 to 1	0	-	Read only
L3-64	0x9340	Output of logic NOT module M	0 to 1	0	-	Read only
L3-65	0x9341	Output of logic NOT module N	0 to 1	0	-	Read only
L3-66	0x9342	Output of logic NOT module O	0 to 1	0	-	Read only
L3-67	0x9343	Output of logic NOT module P	0 to 1	0	-	Read only
L3-68	0x9344	Output of logic XOR/XNOR module A	0 to 1	0	-	Read only
L3-69	0x9345	Output of logic XOR/XNOR module B	0 to 1	0	-	Read only
L3-70	0x9346	Output of logic XOR/XNOR module C	0 to 1	0	-	Read only
L3-71	0x9347	Output of logic XOR/XNOR module D	0 to 1	0	-	Read only
L3-72	0x9348	Output of logic XOR/XNOR module E	0 to 1	0	-	Read only
L3-73	0x9349	Output of logic XOR/XNOR module F	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L3-74	0x934A	Output of logic XOR/ XNOR module G	0 to 1	0	-	Read only
L3-75	0x934B	Output of logic XOR/ XNOR module H	0 to 1	0	-	Read only
L3-78	0x934E	Position control software limit activated	0 to 1	0	-	Read only
L3-79	0x934F	Position lock state in position control	0 to 1	0	-	Read only
L3-80	0x9350	Position control pause enabled	0 to 1	0	-	Read only
L3-81	0x9351	Position synchronization control - Deviation monitoring reached	0 to 1	0	-	Read only
L3-82	0x9352	Positive speed limited in position control	0 to 1	0	-	Read only
L3-83	0x9353	Negative speed limited in position control	0 to 1	0	-	Read only
L3-84	0x9354	Output of level-pulse conversion module A	0 to 1	0	-	Read only
L3-85	0x9355	Output of level-pulse conversion module B	0 to 1	0	-	Read only
L3-86	0x9356	Output of level-pulse conversion module C	0 to 1	0	-	Read only
L3-87	0x9357	Output of level-pulse conversion module D	0 to 1	0	-	Read only
L3-88	0x9358	Position control in progress	0 to 1	0	-	Read only
L3-89	0x9359	Ready for positioning control	0 to 1	0	-	Read only
L3-90	0x935A	Positioning control in progress	0 to 1	0	-	Read only
L3-91	0x935B	Interrupt positioning	0 to 1	0	-	Read only
L3-92	0x935C	Sync control ready	0 to 1	0	-	Read only
L3-93	0x935D	Synchronous control in progress	0 to 1	0	-	Read only
L3-94	0x935E	Positioning almost completed	0 to 1	0	-	Read only
L3-95	0x935F	Positioning completed	0 to 1	0	-	Read only
L3-96	0x9360	Current positioning completed (after the waiting time)	0 to 1	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L3-97	0x9361	Current position synchronization completed	0 to 1	0	-	Read only
L3-98	0x9362	Excessive position deviation	0 to 1	0	-	Read only
L3-99	0x9363	Activation of the home in position control	0 to 1	0	-	Read only

9.55 Group L4 Bit Connector 5

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L4-00	0x9400	Output of float comparison module A	0 to 1	0	-	Unchangeable
L4-01	0x9401	Output of float comparison module B	0 to 1	0	-	Unchangeable
L4-02	0x9402	Output of float comparison module C	0 to 1	0	-	Unchangeable
L4-03	0x9403	Output of float comparison module D	0 to 1	0	-	Unchangeable
L4-04	0x9404	Fix comparison module E output	0 to 1	0	-	Unchangeable
L4-05	0x9405	Fix comparison module F output	0 to 1	0	-	Unchangeable
L4-06	0x9406	Fix comparison module G output	0 to 1	0	-	Unchangeable
L4-07	0x9407	Fix comparison module H output	0 to 1	0	-	Unchangeable
L4-08	0x9408	Drive relay	0 to 65535	0	-	Unchangeable
L4-09	0x9409	Grid relay	0 to 65535	0	-	Unchangeable
L4-10	0x940A	Grid synchronization off1 control source	0 to 65535	0	-	Unchangeable
L4-16	0x9410	Input of floating-point absolute module A being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable
L4-17	0x9411	Input of float absolute module B being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L4-18	0x9412	Input of float absolute module C being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable
L4-19	0x9413	Input of float absolute module D being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable
L4-20	0x9414	Input of float absolute module E being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable
L4-21	0x9415	Input of fixed absolute module F being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable
L4-22	0x9416	Input of fixed absolute module G being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable
L4-23	0x9417	Input of fixed absolute module H being negative	0: Non-negative value 1: Negative value	0	-	Unchangeable
L4-32	0x9420	MULTIPLY/DIVIDE module A divisor being 0 flag	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-33	0x9421	Divide-by-zero flag of MULTIPLY/DIVIDE module B	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-34	0x9422	Divide-by-zero flag of MULTIPLY/DIVIDE module C	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-35	0x9423	Divide-by-zero flag of MULTIPLY/DIVIDE module D	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-36	0x9424	Divide-by-zero flag of MULTIPLY/DIVIDE module E	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-37	0x9425	Divide-by-zero flag of MULTIPLY/DIVIDE module F	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-38	0x9426	Divide-by-zero flag of MULTIPLY/DIVIDE module G	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-39	0x9427	Divide-by-zero flag of MULTIPLY/DIVIDE module H	0: Non-zero value 1: Zero	0	-	Unchangeable
L4-48	0x9430	Lower limit flag of limiter module A	0 to 1	0	-	Unchangeable
L4-49	0x9431	Upper limit flag of limit module A	0 to 1	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L4-50	0x9432	Lower limit flag of limit module B	0 to 1	0	-	Unchangeable
L4-51	0x9433	Upper limit flag of limit module B	0 to 1	0	-	Unchangeable
L4-52	0x9434	Lower limit flag of limit module C	0 to 1	0	-	Unchangeable
L4-53	0x9435	Upper limit flag of limit module C	0 to 1	0	-	Unchangeable
L4-54	0x9436	Lower limit flag of limit module D	0 to 1	0	-	Unchangeable
L4-55	0x9437	Upper limit flag of limit module D	0 to 1	0	-	Unchangeable
L4-56	0x9438	Lower limit flag of limit module E	0 to 1	0	-	Unchangeable
L4-57	0x9439	Upper limit flag of limit module E	0 to 1	0	-	Unchangeable
L4-58	0x943A	Lower limit flag of limit module F	0 to 1	0	-	Unchangeable
L4-59	0x943B	Upper limit flag of limit module F	0 to 1	0	-	Unchangeable
L4-64	0x9440	Wake-up from sleep	0 to 1	0	-	Unchangeable
L4-66	0x9442	Starting frequency forced RFG	0 to 1	0	-	Unchangeable
L4-67	0x9443	Stop at frequencies lower than lower limit/starting frequency	0 to 1	0	-	Unchangeable
L4-68	0x9444	Coast to stop at frequencies lower than lower limit	0 to 1	0	-	Unchangeable
L4-69	0x9445	Power dip ride-through deceleration and clear	0 to 1	0	-	Unchangeable
L4-70	0x9446	Decelerate to stop upon power dip ride-through	0 to 1	0	-	Unchangeable
L4-71	0x9447	Individual stop of simple PLC	0 to 1	0	-	Unchangeable
L4-72	0x9448	Power-on time arrival	0 to 1	0	-	Unchangeable
L4-73	0x9449	Operating time arrival	0 to 1	0	-	Unchangeable
L4-74	0x944A	Timing duration reached	0 to 1	0	-	Unchangeable
L4-75	0x944B	Current operating time arrival	0 to 1	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L4-76	0x944C	Brake command output	0: Brake close 1: Brake open	0	-	Unchangeable
L4-77	0x944D	Brake released	0 to 1	0	-	Unchangeable
L4-78	0x944E	Brake applied	0 to 1	0	-	Unchangeable
L4-79	0x944F	Power dip ride-through in V/f mode	0 to 1	0	-	Unchangeable
L4-80	0x9450	Operating at zero speed (inactive at stop)	0 to 1	0	-	Unchangeable
L4-81	0x9451	Zero speed (active at stop)	0 to 1	0	-	Unchangeable
L4-82	0x9452	Frequency detection value 1	0 to 1	0	-	Unchangeable
L4-83	0x9453	Frequency level detection FDT2 output	0 to 1	0	-	Unchangeable
L4-84	0x9454	AI1 larger than AI2	0 to 1	0	-	Unchangeable
L4-85	0x9455	Simple PLC cycle completed	0 to 1	0	-	Unchangeable
L4-87	0x9457	STO	0 to 1	0	-	Unchangeable
L4-88	0x9458	Current 1 reached	0 to 1	0	-	Unchangeable
L4-89	0x9459	Current 2 reached	0 to 1	0	-	Unchangeable
L4-90	0x945A	Zero current state	0 to 1	0	-	Unchangeable
L4-91	0x945B	Output current limit violation	0 to 1	0	-	Unchangeable
L4-92	0x945C	Motor overload pre-alarm	0 to 1	0	-	Unchangeable
L4-93	0x945D	Drive overload pre-alarm	0 to 1	0	-	Unchangeable
L4-94	0x945E	Undervoltage	0 to 1	0	-	Unchangeable
L4-95	0x945F	Load loss	0 to 1	0	-	Unchangeable

9.56 Group L5 Word Connector 1

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L5-00	0x9500	System status word 1	bit0: Ready for switch-on bit1: Ready to run bit2: Running bit3: Faulty bit4: OFF2 bit5: OFF3 bit6: Switch-on inhibited bit7: Operation limit upon warning bit8: No speed deviation bit9: Local/Remote bit10: Target speed reached bit11: Torque limited bit12: Forward speed bit13: Reverse speed bit14: Running (wave generation) bit15: Custom state 0	0	-	Unchangeable
L5-01	0x9501	System status word 2	bit0: Self-testing bit1: Parameter auto-tuning bit2: Light fault state bit3: Alarm state bit4: Speed mode bit5: Torque mode bit6: Position mode bit7: RFG enable bit8: RFG operating bit9: Stop at fault bit10: Normal operation bit11: Jogging bit12: Decelerate to stop bit13: Brake closed bit14: Terminal control bit15: Custom state 1	0	-	Unchangeable
L5-02	0x9502	AC drive main status word	bit0 to bit1: Operation status bit2: Hardware information status bit3: Operation state bit4: Output locked out forcibly at fault bit5: Bus undervoltage state bit6 to bit15: Reserved	0	-	Unchangeable
L5-03	0x9503	AC drive auxiliary status word	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L5-04	0x9504	Main status word of motor	bit0: Operation mode 0: Stop 1: Normal operation 2: Special operation 3: Auto-tuning 4: System self-test bit4: Control method. 0: SVC; 1: FVC; 2: V/f bit7: Control target. 0: Speed control; 1: Torque control bit9: Hardware information status bit10: Motor operation permission bit11: Speed mode applied forcibly bit12: Decelerate forcibly	0	-	Unchangeable
L5-05	0x9505	Auxiliary status word of motor	bit0: Speed tracking in progress bit1: Speed tracking completed bit2: Pre-excitation in progress bit3: Pre-excitation completed bit4: DC braking in progress bit5: DC braking completed bit7: IF control in progress bit8: Short-circuit braking in progress bit9: Short-circuit braking completed bit10: Initial magnetic pole position auto-tuning completed bit11: Power-on inductance and other parameter calculation completed bit12: Fast encoder zero position angle auto-tuning bit13: Synchronous motor flying start flag bit14: Pre-positioning completed bit15: Reserved	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L5-06	0x9506	Current state of the system state machine	0: Initialization 1: Switch-on inhibited 2: Switch-on allowed 3: Operation permission 4: Start 5: Run 6: Stop 7: Self-test 8: Motor parameter auto-tuning	0	-	Unchangeable
L5-07	0x9507	Switchover command of system state machine	bit0: Active at start command bit1: Active at stop command bit2: Active at OFF2 stop command bit3: Active at OFF3 stop command bit4: Active at operation permission command (non-sleep state) bit5: Active at operation inhibition command bit6: Active at stop at fault	0	-	Unchangeable
L5-08	0x9508	System operation state	0 to 65535	0	-	Unchangeable
L5-09	0x9509	Active stop mode	0: Coast to stop 1: Stop with maximum capability 2: Quick stop 3: Decelerate to stop	0	-	Unchangeable
L5-10	0x950A	Decelerate to stop/ DC braking	0 to 65535	0	-	Unchangeable
L5-17	0x9511	Bus voltage	0.0 to 6553.5	0.0	V	Unchangeable
L5-20	0x9514	Module temperature	-3276.8 to +3276.7	0.0	℃	Unchangeable
L5-21	0x9515	LED control word	0 to 65535	0	-	Unchangeable
L5-22	0x9516	IDS control word	0 to 65535	0	-	Unchangeable
L5-23	0x9517	SOP control word	0 to 65535	0	-	Unchangeable
L5-24	0x9518	Command channel system command	0 to 65535	0	-	Unchangeable
L5-25	0x9519	LED command clear flag	0 to 65535	0	-	Unchangeable
L5-26	0x951A	Clear SOP command	0 to 65535	0	-	Unchangeable
L5-27	0x951B	IDS command clear flag	0 to 65535	0	-	Unchangeable
L5-28	0x951C	Terminal module command	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L5-29	0x951D	Terminal Module A Input State	0 to 65535	0	-	Unchangeable
L5-30	0x951E	Terminal module B input state	0 to 65535	0	-	Unchangeable
L5-31	0x951F	Running mode (normal jogging)	0 to 65535	0	-	Unchangeable
L5-32	0x9520	Jogging source 12	0 to 65535	0	-	Unchangeable
L5-33	0x9521	Control target	0 to 65535	0	-	Unchangeable
L5-34	0x9522	RFG status word	0 to 65535	0	-	Unchangeable
L5-35	0x9523	RFG command word	0 to 65535	0	-	Unchangeable
L5-38	0x9526	V/f separation time set to 0	0 to 65535	0	-	Unchangeable
L5-40	0x9528	Original AI1 sampling value	-32.768 to +32.767	0.000	V	Unchangeable
L5-41	0x9529	Original AI2 sampling value	-32.768 to +32.767	0.000	V	Unchangeable
L5-42	0x952A	Original AI3 sampling value	-32.768 to +32.767	0.000	V	Unchangeable
L5-43	0x952B	AI1 sampling value after correction	-327.68 to +327.67	0.00	V	Unchangeable
L5-44	0x952C	AI2 sampling value after correction	-327.68 to +327.67	0.00	V	Unchangeable
L5-45	0x952D	AI3 sampling value after correction	-327.68 to +327.67	0.00	V	Unchangeable
L5-46	0x952E	AI1 curve input value	-327.68 to +327.67	0.00	V	Unchangeable
L5-47	0x952F	Input value of AI2 curve	-327.68 to +327.67	0.00	V	Unchangeable
L5-48	0x9530	AI3 curve input value	-327.68 to +327.67	0.00	V	Unchangeable
L5-49	0x9531	AO1 output (before correction)	-327.68 to +327.67	0.00	V	Unchangeable
L5-50	0x9532	AO2 output (before correction)	-327.68 to +327.67	0.00	V	Unchangeable
L5-51	0x9533	AO1 output (after correction)	-32.768 to +32.767	0.000	V	Unchangeable
L5-52	0x9534	AO2 output (corrected)	-32.768 to +32.767	0.000	V	Unchangeable
L5-53	0x9535	HDI input frequency	0.00 to 655.35	0.00	kHz	Unchangeable
L5-54	0x9536	Counter output	0 to 65535	0	-	Unchangeable
L5-55	0x9537	Length counting	0 to 65535	0	-	Unchangeable
L5-56	0x9538	Displays the communication reference command word.	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L5-57	0x9539	Display of references set through communication	-3276.8 to +3276.7	0.0	%	Unchangeable
L5-58	0x953A	Clear communication command	0 to 65535	0	-	Unchangeable
L5-59	0x953B	RFG performance enabled forcibly	0 to 65535	0	-	Unchangeable
L5-60	0x953C	Pre-motor parameter auto-tuning command	0 to 65535	0	-	Unchangeable
L5-62	0x953E	Immediate DC braking triggered by DI	0 to 65535	0	-	Unchangeable
L5-70	0x9546	Main speed display	-327.68 to +327.67	0.00	Hz	Unchangeable
L5-71	0x9547	Auxiliary speed display	-327.68 to +327.67	0.00	Hz	Unchangeable

9.57 Group L6 Word Connector 2

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L6-00	0x9600	Rated motor speed	0 to 65535	0	rpm	Unchangeable
L6-01	0x9601	Rated motor frequency	0.0 to 6553.5	0.0	Hz	Unchangeable
L6-02	0x9602	Rated voltage	0.0 to 6553.5	0.0	V	Unchangeable
L6-03	0x9603	Rated Current	0.0 to 6553.5	0.0	A	Unchangeable
L6-04	0x9604	Rated power	0.0 to 6553.5	0.0	kW	Unchangeable
L6-05	0x9605	System main status word C	bit0: Control channel selection bit1: Setting channel selection bit2: Motor selection bit0 bit3: Motor selection bit1 bit4: Abnormality (fault/ alarm) bit5: EEPROM idle bit8: Actual internal IGBT pulsing state. 0: Stop; 1: Operate (including deceleration) bit9: 0-Forward 1-Reverse bit12: Reserved	0	-	Unchangeable
L6-06	0x9606	Motor object auxiliary status word 2	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L6-07	0x9607	Stop frequency control for V/f separation	0 to 65535	0	-	Unchangeable
L6-08	0x9608	Frequency offset mode in torque control	0 to 65535	0	-	Unchangeable
L6-09	0x9609	RFG acceleration/ deceleration state	0 to 65535	0	-	Unchangeable
L6-10	0x960A	RFG arc state	0 to 65535	0	-	Unchangeable
L6-11	0x960B	Drive protection state monitoring	0 to 65535	0	-	Unchangeable
L6-12	0x960C	Modulation module status word	0 to 65535	0	-	Unchangeable
L6-13	0x960D	Sampling status word	0 to 65535	0	-	Unchangeable
L6-14	0x960E	AI2 temperature mode - Motor temperature sampling value	-32768 to +32767	0	℃	Unchangeable
L6-15	0x960F	AI3 temperature mode - Motor temperature sampling value	-32768 to +32767	0	℃	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L6-16	0x9610	Motor protection status word	bit0: Motor in overload state bit1: Motor in pre-overload state bit2: Output phase loss state (reserved) bit3: PG detection fault (reserved) bit4: Current control error bit5: Motor stall bit6: Motor open circuit, two-phase or three-phase loss (reserved) bit7: Motor constant current load too large (reserved) bit8: VC operation step loss caused by motor flux abnormality bit9: Speed measurement fluctuation abnormal (reserved) bit10: Motor parameter setting error (reserved) bit11: HSVM sampling card open circuit or phase error (reserved) bit12: Synchronous motor overcurrent (reserved)	0	-	Unchangeable
L6-17	0x9611	Speed controller status word	bit0: Speed loop enable bit2: Integral forced to take effect bit3: Feedforward torque active bit4: Forward limit reach bit5: Reverse limit reach bit6: Integral kept active bit7: Quick integral reset activation bit8: Anti-load disturbance activated bit9: Last cycle integration method bit10: Reserved	0	-	Unchangeable
L6-18	0x9612	Vector overvoltage/ undervoltage suppression status word	bit0: Undervoltage suppression bit1: Overvoltage suppression bit2: Enter low frequency limit during undervoltage suppression bit3: Reserved	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L6-19	0x9613	Excitation module status word	0 to 65535	0	-	Unchangeable
L6-20	0x9614	Motor model status word	0 to 65535	0	-	Unchangeable
L6-21	0x9615	Motor current loop status word	0 to 65535	0	-	Unchangeable
L6-22	0x9616	Motor V/f control status word	0 to 65535	0	-	Unchangeable
L6-23	0x9617	Defines the frequency per-unit value after display source is selected for HDO.	0.00 to 655.35	0.00	%	Unchangeable
L6-24	0x9618	Defines the frequency per-unit value before correction of HDO curve	0.00 to 655.35	0.00	%	Unchangeable
L6-25	0x9619	Defines the final frequency per-unit value of HDO	0.00 to 655.35	0.00	%	Unchangeable
L6-26	0x961A	Defines the actual frequency outputted finally by HDO.	0.00 to 655.35	0.00	kHz	Unchangeable
L6-27	0x961B	Flag for power-related decimal place change	0 to 65535	0	-	Unchangeable
L6-28	0x961C	Torque limit status word	0 to 65535	0	-	Unchangeable
L6-29	0x961D	IF control enable	0 to 65535	0	-	Unchangeable
L6-30	0x961E	Master state	0 to 65535	0	-	Unchangeable
L6-31	0x961F	Master phase sequence	0 to 65535	0	-	Unchangeable
L6-32	0x9620	Slave-follow-master command flag	0 to 65535	0	-	Unchangeable
L6-33	0x9621	Active control mode	0 to 65535	0	-	Unchangeable
L6-34	0x9622	STO state	0 to 65535	0	-	Unchangeable
L6-35	0x9623	System main status word D	0 to 65535	0	-	Unchangeable
L6-36	0x9624	Undervoltage fault flag	0 to 65535	0	-	Unchangeable
L6-37	0x9625	Fault restart clear command	0 to 65535	0	-	Unchangeable
L6-38	0x9626	Wiring mode of effective module A	0 to 65535	0	-	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change Mode
L6-39	0x9627	Wiring mode of effective module B	0 to 65535	0	-	Unchangeable
L6-40	0x9628	Effective external command source	0 to 65535	0	-	Unchangeable
L6-41	0x9629	CiA 402 mode	0 to 65535	0	-	Unchangeable
L6-42	0x962A	Limit flag	0 to 65535	0	-	Unchangeable
L6-43	0x962B	Communication fault reset enable	0 to 65535	0	-	Unchangeable
L6-50	0x9632	Tension process control mode	0 to 65535	0	-	Unchangeable
L6-51	0x9633	Operation mode of tension process	0 to 65535	0	-	Unchangeable
L6-52	0x9634	Initial reel diameter	0.0 to 6553.5	0.0	mm	Unchangeable
L6-53	0x9635	Taper setting	0.0 to 6553.5	0.0	%	Unchangeable
L6-54	0x9636	Constant linear speed	0.0 to 6553.5	0.0	m/min	Unchangeable
L6-55	0x9637	Tension process mask	0 to 65535	0	-	Unchangeable

9.58 Group L7 Word Connector 3

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L7-05	0x9705	Per-unit constant value 27	0 to 65535	0	-	Read only
L7-06	0x9706	Per-unit constant value 28	0 to 65535	0	-	Read only
L7-07	0x9707	Per-unit constant value 29	0 to 65535	0	-	Read only
L7-08	0x9708	Per-unit constant value 30	0 to 65535	0	-	Read only
L7-09	0x9709	Per-unit constant value 31	0 to 65535	0	-	Read only
L7-10	0x970A	Per-unit constant value 32	0 to 65535	0	-	Read only
L7-11	0x970B	Per-unit constant value 33	0 to 65535	0	-	Read only
L7-12	0x970C	Per-unit constant value 34	0 to 65535	0	-	Read only
L7-13	0x970D	Per-unit constant value 35	0 to 65535	0	-	Read only
L7-14	0x970E	Per-unit constant value 36	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L7-15	0x970F	Per-unit constant value 37	0 to 65535	0	-	Read only
L7-16	0x9710	Per-unit constant value 38	0 to 65535	0	-	Read only
L7-17	0x9711	Per-unit constant value 39	0 to 65535	0	-	Read only
L7-18	0x9712	Per-unit constant value 40	0 to 65535	0	-	Read only
L7-19	0x9713	Per-unit constant value 41	0 to 65535	0	-	Read only
L7-20	0x9714	Per-unit constant value 42	0 to 65535	0	-	Read only
L7-21	0x9715	bit-to-word A	0 to 65535	0	-	Read only
L7-22	0x9716	bit-to-word B	0 to 65535	0	-	Read only
L7-23	0x9717	bit-to-word C	0 to 65535	0	-	Read only
L7-24	0x9718	bit-to-word D	0 to 65535	0	-	Read only
L7-25	0x9719	Double word-to-high word A	0 to 65535	0	-	Read only
L7-26	0x971A	Double word-to-low word A	0 to 65535	0	-	Read only
L7-27	0x971B	Double word-to-high word B	0 to 65535	0	-	Read only
L7-28	0x971C	Double word-to-low word B	0 to 65535	0	-	Read only
L7-29	0x971D	Double word-to-high word C	0 to 65535	0	-	Read only
L7-30	0x971E	Double word-to-low word C	-32768 to +32767	0	-	Read only
L7-31	0x971F	Double word-to-high word D	-32768 to +32767	0	-	Read only
L7-32	0x9720	Double word-to-low word D	-32768 to +32767	0	-	Read only
L7-36	0x9724	16-bit parameter monitoring 1	-32768 to +32767	0	-	Read only
L7-37	0x9725	16-bit parameter monitoring address 2	-32768 to +32767	0	-	Read only
L7-38	0x9726	16-bit parameter monitoring address 3	0 to 65535	0	-	Read only
L7-39	0x9727	16-bit parameter monitoring address 4	0 to 65535	0	-	Read only
L7-40	0x9728	16-bit parameter monitoring address 5	0 to 65535	0	-	Read only
L7-41	0x9729	Word selector A output	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L7-42	0x972A	Word multiplexer B output	0 to 65535	0	-	Read only
L7-43	0x972B	Word multiplexer C output	0 to 65535	0	-	Read only
L7-44	0x972C	Single word selector module D output	0 to 65535	0	-	Read only
L7-50	0x9732	Internal parameter monitoring output 1	0 to 1	0	-	Read only
L7-51	0x9733	Output of monitored internal variable 2	0 to 1	0	-	Read only
L7-52	0x9734	Output of monitored internal variable 3	0 to 1	0	-	Read only
L7-53	0x9735	Output of monitored internal variable 4	0 to 1	0	-	Read only
L7-54	0x9736	Output of monitored internal variable 5	0 to 1	0	-	Read only
L7-55	0x9737	Output of monitored internal variable 6	0 to 1	0	-	Read only
L7-56	0x9738	Output of monitored internal variable 7	0 to 1	0	-	Read only
L7-57	0x9739	Output of monitored internal variable 8	0 to 1	0	-	Read only

9.59 Group L8 Word Connector 4

9.60 Group L9 Double-Word Connector 1

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L9-00	0x9900	W-DW module A output	0 to 65535	0	-	Read only
L9-01	0x9901	W-DW module B output	0 to 65535	0	-	Read only
L9-02	0x9902	W-DW module C output	0 to 65535	0	-	Read only
L9-03	0x9903	W-DW module D output	0 to 65535	0	-	Read only
L9-04	0x9904	Double word selector module A output	0 to 65535	0	-	Read only
L9-05	0x9905	Double word selector module B output	0 to 65535	0	-	Read only
L9-06	0x9906	Double word selector module C output	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L9-07	0x9907	Double word selector module D output	0 to 65535	0	-	Read only
L9-08	0x9908	Fixed-point absolute value module F output	0 to 65535	0	-	Read only
L9-09	0x9909	Fixed-point absolute value module G output	0 to 65535	0	-	Read only
L9-10	0x990A	Fixed-point absolute value module H output	0 to 65535	0	-	Read only
L9-11	0x990B	Fixed-point addition/ subtraction module F output	0 to 65535	0	-	Read only
L9-12	0x990C	Fixed-point addition/ subtraction module G output	0 to 65535	0	-	Read only
L9-13	0x990D	Fixed-point addition/ subtraction module H output	0 to 65535	0	-	Read only
L9-14	0x990E	Fixed-point multiplication/ division module F output	0 to 65535	0	-	Read only
L9-15	0x990F	Fixed-point multiplication/ division module G output	0 to 65535	0	-	Read only
L9-16	0x9910	Fixed-point multiplication/ division module H output	0 to 65535	0	-	Read only
L9-17	0x9911	Fixed-point filter module E output	0 to 65535	0	-	Read only
L9-18	0x9912	Fixed-point filter module F output	0 to 65535	0	-	Read only
L9-19	0x9913	Fixed-point limit module E output	0 to 65535	0	-	Read only
L9-20	0x9914	Fixed-point limit module F output	0 to 65535	0	-	Read only
L9-21	0x9915	32-bit parameter monitoring value 1	0 to 65535	0	-	Read only
L9-22	0x9916	32-bit parameter monitoring value 2	0 to 65535	0	-	Read only

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
L9-23	0x9917	32-bit parameter monitoring value 3	0 to 65535	0	-	Read only
L9-24	0x9918	32-bit parameter monitoring value 4	0 to 65535	0	-	Read only
L9-25	0x9919	32-bit parameter monitoring value 5	0 to 65535	0	-	Read only
L9-30	0x991E	Indicates variable connector output view 1	0 to 65535	0	-	Read only
L9-31	0x991F	Output 2 viewed through variable connector	0 to 65535	0	-	Read only
L9-32	0x9920	Output 3 viewed through variable connector	0 to 65535	0	-	Read only
L9-33	0x9921	Output 4 viewed through variable connector	0 to 65535	0	-	Read only
L9-34	0x9922	Output 5 viewed through variable connector	0 to 65535	0	-	Read only
L9-35	0x9923	Output 6 viewed through variable connector	0 to 65535	0	-	Read only
L9-36	0x9924	Output 7 viewed through variable connector	0 to 65535	0	-	Read only
L9-37	0x9925	Output 8 viewed through variable connector	0 to 65535	0	-	Read only

9.61 Group LB Floating Connector 1

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LB-00	0x9B00	AI1 input per-unit value	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-01	0x9B01	AI2 input per-unit value	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-02	0x9B02	AI3 input per-unit value	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-03	0x9B03	HDI input per-unit value	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LB-04	0x9B04	Per unit value of frequency set through communication	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-05	0x9B05	Main speed reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-06	0x9B06	Auxiliary speed reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-07	0x9B07	Channel target speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-08	0x9B08	Channel additional speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-09	0x9B09	Additional speed reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-10	0x9B0A	Maximum positive speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-11	0x9B0B	Forward minimum speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-12	0x9B0C	Reverse maximum speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-13	0x9B0D	Reverse minimum speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-14	0x9B0E	Forward limit	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-15	0x9B0F	Reverse limit	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-16	0x9B10	Set speed-original	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-17	0x9B11	Set speed-Direction limit	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-18	0x9B12	Set speed - After limit	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-19	0x9B13	Set speed-After frequency hopping	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-20	0x9B14	Set speed - After slope change	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-21	0x9B15	Torque reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-22	0x9B16	Additional torque	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-23	0x9B17	Filtered torque reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-24	0x9B18	Target torque reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-25	0x9B19	Maximum torque	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-26	0x9B1A	Minimum torque	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-27	0x9B1B	RFG setting input	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-28	0x9B1C	RFG calculation input	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-29	0x9B1D	RFG actual target	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-30	0x9B1E	RFG calculation output	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LB-31	0x9B1F	Final RFG output (maximum per-unit value)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-32	0x9B20	Final RFG output (rated per-unit)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-33	0x9B21	Upper limit of frequency adjusted by UP/DOWN key	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-34	0x9B22	Updown lower limit	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-35	0x9B23	RFG acceleration	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-36	0x9B24	V/f separation voltage output	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-37	0x9B25	RFG forced value of starting frequency function	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-38	0x9B26	Speed limit in torque control	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-39	0x9B27	Torque control frequency offset	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-40	0x9B28	Operating frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-41	0x9B29	Frequency reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-42	0x9B2A	Set speed (set by UP/DOWN key)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-43	0x9B2B	Main frequency + Auxiliary frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-44	0x9B2C	Main frequency - Auxiliary frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-45	0x9B2D	Main frequency x Auxiliary frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-46	0x9B2E	Maximum between primary and secondary frequencies	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-47	0x9B2F	Minimum between primary and secondary frequencies	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-48	0x9B30	Original setting of main frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-49	0x9B31	Original setting of auxiliary frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-51	0x9B33	Maximum negative frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-52	0x9B34	Maximum between AI1 and AI2	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LB-53	0x9B35	Minimum between AI1 and AI2	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-54	0x9B36	Torque upper limit in motoring state	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-55	0x9B37	Torque upper limit in generative state	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-56	0x9B38	Target voltage upon decoupled V/f	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-57	0x9B39	Target torque in compatible torque mode	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-58	0x9B3A	Forward jog frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-59	0x9B3B	Reverse jog frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-60	0x9B3C	Intermediate value of operating frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-61	0x9B3D	Speed setpoint after being limited	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-62	0x9B3E	Output current display	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-64	0x9B40	Output power display	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-65	0x9B41	Output torque display	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-66	0x9B42	Motor rotational speed display	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-67	0x9B43	Y-channel adjustment range	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-68	0x9B44	Input speed (position control)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-69	0x9B45	Input acceleration (position control)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-70	0x9B46	Position Kp adjustment (position control)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-71	0x9B47	Speed Kv feedforward (position control)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-72	0x9B48	Acceleration Ka feedforward (position control)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-73	0x9B49	Position control output speed (non-limited)	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LB-74	0x9B4A	Position control output speed (limited)	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-75	0x9B4B	Local PG measurement speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-76	0x9B4C	Extended PG measurement speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-77	0x9B4D	HDI pulse measurement speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-78	0x9B4E	Acceleration segment	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-79	0x9B4F	Constant speed segment	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-80	0x9B50	Deceleration segment	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-81	0x9B51	Sum	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-82	0x9B52	Acceleration target	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-83	0x9B53	Constant speed target	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-84	0x9B54	Deceleration target	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-85	0x9B55	Current pulse input measurement speed in synchronization control	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-93	0x9B5D	Master frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-94	0x9B5E	Master torque	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-95	0x9B5F	Indicates the speed base value.	-3276.8 to +3276.7	0.0	%	Unchangeable
LB-96	0x9B60	Frequency base value	-3276.8 to +3276.7	0.0	%	Unchangeable

9.62 Group LC Floating Connector 2

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LC-00	0x9C00	Final frequency setpoint control	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-01	0x9C01	Final voltage setpoint control	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-02	0x9C02	Unlimited output voltage	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-03	0x9C03	Voltage phase angle	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-04	0x9C04	Max. output voltage	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LC-05	0x9C05	Current loop saturation voltage	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-06	0x9C06	Control torque reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-07	0x9C07	Control final flux reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-08	0x9C08	Excitation current reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-09	0x9C09	Torque current reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-10	0x9C0A	Rotor speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-11	0x9C0B	Encoder speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-12	0x9C0C	Output torque	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-13	0x9C0D	Flux amplitude	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-14	0x9C0E	Flux angle	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-15	0x9C0F	Synchronous frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-16	0x9C10	Synchronous rotation angle	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-17	0x9C11	Motor object output power	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-18	0x9C12	Output voltage amplitude	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-19	0x9C13	Output current amplitude	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-20	0x9C14	Actual excitation current of the motor	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-21	0x9C15	Actual torque current of the motor	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-22	0x9C16	Output electric power	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-23	0x9C17	PWMU	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-24	0x9C18	PWMV	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-25	0x9C19	PWMW	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-26	0x9C1A	IU	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-27	0x9C1B	IV	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-28	0x9C1C	IW	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-31	0x9C1F	Drive bus voltage	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-32	0x9C20	Drive overload accumulative value	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-33	0x9C21	Motor overload accumulation	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-34	0x9C22	Output voltage phase	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LC-35	0x9C23	Output current phase	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-36	0x9C24	General PID output	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-37	0x9C25	General PID error	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-38	0x9C26	General PID reference	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-39	0x9C27	General PID feedback	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-40	0x9C28	General PID proportional output	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-41	0x9C29	General PID integral output	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-42	0x9C2A	General PID derivative output	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-92	0x9C5C	Indicates variable connector output view 1	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-93	0x9C5D	Output 2 viewed through variable connector	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-94	0x9C5E	Output 3 viewed through variable connector	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-95	0x9C5F	Output 4 viewed through variable connector	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-96	0x9C60	Output 5 viewed through variable connector	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-97	0x9C61	Output 6 viewed through variable connector	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-98	0x9C62	Output 7 viewed through variable connector	-3276.8 to +3276.7	0.0	%	Unchangeable
LC-99	0x9C63	Output 8 viewed through variable connector	-3276.8 to +3276.7	0.0	%	Unchangeable

9.63 Group LD Floating Connector 3

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LD-00	0x9D00	Float selector module A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-01	0x9D01	Float selector module B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-02	0x9D02	Float selector module C output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-03	0x9D03	Float selector module D output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-04	0x9D04	Float selector module E output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-05	0x9D05	Float selector module F output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-06	0x9D06	Float selector module G output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-07	0x9D07	Float selector module H output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-08	0x9D08	Floating point absolute module A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-09	0x9D09	Floating point absolute module B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-10	0x9D0A	Floating point absolute module C output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-11	0x9D0B	Floating point absolute module D output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-12	0x9D0C	Floating point absolute module E output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-13	0x9D0D	Floating point addition/subtraction module A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-14	0x9D0E	Floating point addition/subtraction module B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-15	0x9D0F	Floating point addition/subtraction module C output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-16	0x9D10	Floating point addition/subtraction module D output	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LD-17	0x9D11	Floating point addition/subtraction module E output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-18	0x9D12	Floating point multiplication/ division module A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-19	0x9D13	Floating point multiplication/ division module B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-20	0x9D14	Floating point multiplication/ division module C output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-21	0x9D15	Floating point multiplication/ division module D output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-22	0x9D16	Floating point multiplication/ division module E output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-23	0x9D17	Floating point filter module A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-24	0x9D18	Floating point filter module B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-25	0x9D19	Floating point filter module C output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-26	0x9D1A	Floating point filter module D output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-27	0x9D1B	Floating point limit module A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-28	0x9D1C	Floating point limit module B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-29	0x9D1D	Floating point limit module C output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-30	0x9D1E	Floating point limit module D output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-31	0x9D1F	Single word-to-float A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-32	0x9D20	Single word-to-float B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-33	0x9D21	Single word-to-float C output	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LD-34	0x9D22	Single word-to-float D output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-35	0x9D23	Dual word-to-float A output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-36	0x9D24	Dual word-to-float B output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-37	0x9D25	Dual word-to-float C output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-38	0x9D26	Dual word-to-float D output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-39	0x9D27	Motorized potentiometer forced value	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-40	0x9D28	Motorized potentiometer reset value	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-41	0x9D29	Max. value of motorized potentiometer	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-42	0x9D2A	Min. value of motorized potentiometer	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-43	0x9D2B	Initial value of motorized potentiometer	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-44	0x9D2C	Motorized potentiometer process calculation output value	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-45	0x9D2D	Motorized potentiometer final output value	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-46	0x9D2E	Output of multi-point curve module A	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-47	0x9D2F	Output of multi-point curve module B	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-48	0x9D30	Multi-step reference selection output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-49	0x9D31	Multi-reference 1 output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-50	0x9D32	Output corresponding to multi-reference 2	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-51	0x9D33	Output corresponding to multi-reference 3	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LD-52	0x9D34	Output corresponding to multi-reference 4	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-53	0x9D35	Output corresponding to multi-reference 5	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-54	0x9D36	Output corresponding to multi-reference 6	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-55	0x9D37	Multi-reference 7 output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-56	0x9D38	Output corresponding to multi-reference 8	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-57	0x9D39	Output corresponding to multi-reference 9	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-58	0x9D3A	Output corresponding to multi-reference 10	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-59	0x9D3B	Output corresponding to multi-reference 11	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-60	0x9D3C	Output corresponding to multi-reference 12	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-61	0x9D3D	Output corresponding to multi-reference 13	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-62	0x9D3E	Output corresponding to multi-reference 14	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-63	0x9D3F	Output corresponding to multi-reference 15	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-64	0x9D40	Output corresponding to multi-reference 16	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-65	0x9D41	Per-unit constant value 1	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-66	0x9D42	Per-unit constant value 2	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-67	0x9D43	Per-unit constant value 3	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-68	0x9D44	Per-unit constant value 4	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LD-69	0x9D45	Per-unit constant value 5	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-70	0x9D46	Per-unit constant value 6	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-71	0x9D47	Per-unit constant value 7	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-72	0x9D48	Per-unit constant value 8	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-73	0x9D49	Per-unit constant value 9	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-74	0x9D4A	Per-unit constant value 10	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-75	0x9D4B	Per-unit constant value 11	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-76	0x9D4C	Per-unit constant value 12	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-77	0x9D4D	Per-unit constant value 13	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-78	0x9D4E	Per-unit constant value 14	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-79	0x9D4F	Per-unit constant value 15	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-80	0x9D50	Per-unit constant value 16	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-81	0x9D51	Per-unit constant value 17	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-82	0x9D52	Per-unit constant value 18	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-83	0x9D53	Per-unit constant value 19	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-84	0x9D54	Per-unit constant value 20	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-85	0x9D55	Per-unit constant value 21	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-86	0x9D56	Offset of frequency adjusted by UP/ DOWN key	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-87	0x9D57	Percentage of current length to set target length	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-88	0x9D58	Percentage of current counting value to set target counting value	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-89	0x9D59	AO1 value percentage written via communication	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LD-90	0x9D5A	AO2 value percentage written via communication	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-91	0x9D5B	HDO value percentage written through communication	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-92	0x9D5C	Per unit current value based on 1000 A at maximum	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-93	0x9D5D	Per unit voltage value based on 1000 V at maximum	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-94	0x9D5E	AO output torque absolute output	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-95	0x9D5F	AO output torque -200.0% to +200.0%	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-98	0x9D62	Real-time current reference of IF separation	-3276.8 to +3276.7	0.0	%	Unchangeable
LD-99	0x9D63	Reference set through communication	-3276.8 to +3276.7	0.0	%	Unchangeable

9.64 Group LE Floating Connector 4

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LE-00	0x9E00	Tension process target speed	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-01	0x9E01	Tension process target torque	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-02	0x9E02	Tension process speed limit	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-03	0x9E03	Tension process speed limit offset	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-04	0x9E04	Tension process torque limit	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-05	0x9E05	Taper AO output	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-06	0x9E06	Roll diameter AO output	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-07	0x9E07	Tension AO output	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-08	0x9E08	Closed loop tension PID limit	-3276.8 to +3276.7	0.0	%	Unchangeable

Parameters	Communication address	Parameter name	Range	Default	Unit	Change mode
LE-09	0x9E09	Closed loop tension PID proportional coefficient	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-10	0x9E0A	Closed loop tension PID integral coefficient	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-11	0x9E0B	Closed loop tension PID derivative coefficient	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-12	0x9E0C	Tension Torque Compensation	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-20	0x9E14	Monitored frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-21	0x9E15	Monitored phase	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-22	0x9E16	Voltage rise for switching from power frequency to variable frequency	-3276.8 to +3276.7	0.0	%	Unchangeable
LE-31	0x9E1F	Position lock output	-3276.8 to +3276.7	0.0	%	Unchangeable

10 Technical Data

10.1 Electrical Specifications

Note

In the following tables, the rated power of the AC drive is measured under the following conditions:

For three-phase 380 V to 480 V models, the input voltage is 440 VAC.

Three-phase 380 V to 480 V

Table 10–1 Electrical parameters of T1 models (three-phase 380 V to 480 V)

Project		Specification					
Module: MD520-4Txxxxx-HS-INT		0.4 B	0.7 B	1.1 B	1.5 B	2.2 B	3.0 B
Structure		T1					
Output	Power (kW) (light load)	0.4	0.75	1.1	1.5	2.2	3
	Rated output current (A) (light load)	1.5	2.1	3.1	3.8	5.1	7.2
	Output voltage	Three-phase 0 V to input voltage					
	Maximum output frequency	Rated: 1000 Hz; maximum: 1500 Hz (Contact Inovance technical support if the output frequency needs to be higher than 1000 Hz.)					
	Carrier frequency	Range: 0.5 kHz to 16.0 kHz; default: 8 kHz (automatically adjusted according to the load)					
	Overload capacity	Light load: 60s at 110% of the rated current continuously					
Input	Rated input current (A) (light load)	1.8	2.5	3.7	4.6	6.4	9.1
	Rated voltage/Rated frequency	Three-phase 380 VAC to 480 VAC, 50/60 Hz					
	Permissible voltage fluctuation range	-15% to +10%; actual permissible range: 323 VAC to 528 VAC					
	Permissible frequency fluctuation range	±5%, or 47.5 Hz to 63.0 Hz					
	Power capacity (kVA) (light load)	2	2.8	4.1	5	6.7	9.5
	Grid type	TN, TT, IT (Y)					
Thermal design	Thermal design power (kW) (light load)	0.039	0.046	0.057	0.068	0.081	0.109
	Exhaust airflow (CFM)	9	9	9	9	9	9
Overvoltage category	OVC III						

Project		Specification					
Module: MD520-4Txxxxx-HS-INT		0.4 B	0.7 B	1.1 B	1.5 B	2.2 B	3.0 B
Pollution degree	PD2						
IP rating	IP20 (open type, applicable to IEC-compliant products) Type 1 (enclosed type, applicable to UL-certified products)						
Protection category	Class I						

Table 10–2 Electrical parameters of T2 to T4 models (three-phase 380 V to 480 V)

Project		Specification				
Module: MD520-4Txxxxx-HS-INT		3.7 B	5.5 B	7.5 B	11 B	15 B
Structure		T2		T3		T4
Output	Power (kW) (light load)	3.7	5.5	7.5	11	15
	Rated output current (A) (light load)	9	13	17	25	32
	Output voltage	Three-phase 0 V to input voltage				
	Maximum output frequency	Rated: 1000 Hz; maximum: 1500 Hz (Contact Inovance technical support if the output frequency needs to be higher than 1000 Hz.)				
	Carrier frequency	0.5 kHz to 16.0 kHz (automatically adjusted according to the load)				
	Overload capacity	Light load: 60s at 110% of the rated current continuously				
Input	Rated input current (A) (light load)	11.3	15.9	22.4	32.9	39.7
	Rated voltage/Rated frequency	Three-phase 380 VAC to 480 VAC, 50/60 Hz				
	Permissible voltage fluctuation range	-15% to +10%; actual permissible range: 323 VAC to 528 VAC				
	Permissible frequency fluctuation range	±5%, or 47.5 Hz to 63.0 Hz				
	Power supply capacity (kVA) (light load)	12	17.5	22.8	33.4	42.8
	Grid type	TN, TT, IT (Y)				
Thermal design	Thermal design power (kW) (light load)	0.138	0.201	0.24	0.355	0.454
	Exhaust airflow (CFM)	9	20	24	30	40
Overvoltage category	OVC III					
Pollution degree	PD2					
IP rating	IP20 (open type, applicable to IEC-compliant products) Type 1 (enclosed type, applicable to UL-certified products)					
Protection category	Class I					

Table 10–3 Electrical specifications of T5 to T6 models (three-phase 380-480 V)

Project		Specification			
Module: MD520-4Txxxxx-HS-INT		18.5 B	22B	30	37
Structure		T5		T6	
Output	Power (kW) (light load)	18.5	22	30	37
	Rated output current (A) (light load)	37	45	60	75
	Output voltage	Three-phase 0 V to input voltage			
	Maximum output frequency	Rated: 1000 Hz; maximum: 1500 Hz (Contact Inovance technical support if the output frequency needs to be higher than 1000 Hz.)			
	Carrier frequency	0.5 kHz to 16.0 kHz (automatically adjusted according to the load)			
	Overload capacity	Light load: 60s at 110% of the rated current continuously			
Input	Rated input current (A) (light load)	48.6	59	65.8	71
	Rated voltage/Rated frequency	Three-phase 380 VAC to 480 VAC, 50/60 Hz			
	Permissible voltage fluctuation range	-15% to +10%; actual permissible range: 323 VAC to 528 VAC			
	Permissible frequency fluctuation range	±5%, or 47.5 Hz to 63.0 Hz			
	Power capacity (kVA) (light load)	36	44	52	63
	Grid type	TN, TT, IT (Y)			
Thermal design	Thermal design power (kW) (light load)	0.478	0.551	0.694	0.815
	Exhaust airflow (CFM)	40	51.9	57.4	118.5
Overvoltage category	OVC III				
Pollution degree	PD2				
IP rating	IP20 (open type, applicable to IEC-compliant products) Type 1 (enclosed type, applicable to UL-certified products)				
Protection category	Class I				

Table 10–4 Electrical specifications of T7 to T9 models (three-phase 380-480 V)

Project		Specification							
Module: MD520-4Txxxxx-HS-INT		45	55	75	90	110	132	160	200
Structure		T7		T8				T9	
Output	Power (kW) (light load)	45	55	75	90	110	132	160	200
	Rated output current (A) (light load)	91	112	150	176	210	253	304	377
	Output voltage	Three-phase 0 V to input voltage							
	Maximum output frequency	Rated: 1000 Hz; maximum: 1500 Hz (Contact Inovance technical support if the output frequency needs to be higher than 1000 Hz.)							
	Carrier frequency	0.5 kHz to 16.0 kHz (automatically adjusted according to the load)							
	Overload capacity	Light load: 60s at 110% of the rated current continuously							
Input	Rated input current (A) (light load)	86	111	143	167	198	239	295	359
	Rated voltage/Rated frequency	Three-phase 380 VAC to 480 VAC, 50/60 Hz							
	Permissible voltage fluctuation range	-15% to +10%; actual permissible range: 323 VAC to 528 VAC							
	Permissible frequency fluctuation range	±5%, or 47.5 Hz to 63.0 Hz							
	Power capacity (kVA) (light load)	81	97	127	150	179	220	263	334
	Grid type	TN, TT, IT (Y)							
Thermal design	Thermal design power (kW) (light load)	1.01	1.21	1.57	1.81	2.14	2.85	3.56	4.15
	Exhaust airflow (CFM)	118.5	122.2	122.2	218.6	287.2	354.2	547	627
Overvoltage category	OVC III								
Pollution degree	PD2								
IP rating	IP20 (open type, applicable to IEC-compliant products)								
Protection category	Class I								

Table 10–5 Electrical specifications of T10 to T11 models (three-phase 380-480 V)

Project		Specification			
Module: MD520-4Txxxxx-HS-INT		220	250	280	315
Structure		T10		T11	
Output	Power (kW) (light load)	220	250	280	315
	Rated output current (A) (light load)	426	465	520	585
	Output voltage	Three-phase 0 V to input voltage			
	Maximum output frequency	Rated: 1000 Hz; maximum: 1500 Hz (Contact Inovance technical support if the output frequency needs to be higher than 1000 Hz.)			
	Carrier frequency	0.5 kHz to 16.0 kHz (automatically adjusted according to the load)			
	Overload capacity	Light load: 60s at 110% of the rated current continuously			
Input	Rated input current (A) (light load)	410	456	507	559
	Rated voltage/Rated frequency	Three-phase 380 VAC to 480 VAC, 50/60 Hz			
	Permissible voltage fluctuation range	-15% to +10%; actual permissible range: 323 VAC to 528 VAC			
	Permissible frequency fluctuation range	±5%, or 47.5 Hz to 63.0 Hz			
	Power capacity (kVA) (light load)	375	404	453	517
	Grid type	TN, TT, IT (Y)			
Thermal design	Thermal design power (kW) (light load)	4.55	5.06	5.33	5.69
	Exhaust airflow (CFM)	638.4	722.5	789.4	789.4
Overvoltage category	OVC III				
Pollution degree	PD2				
IP rating	IP00 (open type, applicable to IEC-compliant products)				
Protection category	Class I				

Table 10–6 Electrical specifications of T12 models (three-phase 380-480 V)

Project		Specification		
Module: MD520-4Txxxxx-HS-INT		355	400	450
Structure		T12		
Output	Power (kW) (light load)	355	400	450
	Rated output current (A) (light load)	650	725	820
	Output voltage	Three-phase 0 V to input voltage		
	Maximum output frequency	Rated: 1000 Hz; maximum: 1500 Hz (Contact Inovance technical support if the output frequency needs to be higher than 1000 Hz.)		
	Carrier frequency	0.5 kHz to 16.0 kHz (automatically adjusted according to the load)		
	Overload capacity	Light load: 60s at 110% of the rated current continuously		
Input	Rated input current (A) (light load)	624	708	782
	Rated voltage/Rated frequency	Three-phase 380 VAC to 480 VAC, 50/60 Hz		
	Permissible voltage fluctuation range	-15% to +10%; actual permissible range: 323 VAC to 528 VAC		
	Permissible frequency fluctuation range	±5%, or 47.5 Hz to 63.0 Hz		
	Power capacity (kVA) (light load)	565	629	716
	Grid type	TN, TT, IT (Y)		
Thermal design	Thermal design power (kW) (light load)	6.31	6.91	9.94
	Exhaust airflow (CFM)	645	860	860
Overvoltage category	OVC III			
Pollution degree	PD2			
IP rating	IP00 (open type, applicable to IEC-compliant products)			
Protection category	Class I			

10.2 General Specifications

Item			Technical specification
Control Performance	Applicable motor type		Asynchronous induction motors (IM), permanent magnet synchronous motors (PMSM), and synchronous reluctance motors (SynRM)
	Control mode		Sensorless vector control (SVC), feedback vector control (FVC), voltage/frequency (V/f) control, and VVC control
	Asynchronous motor (V/f)	Supported function	Energy saving control, overvoltage suppression, overcurrent suppression, voltage dip suppression, oscillation suppression, torque boost, slip compensation, different V/f curve selection, V/f separation, DC braking, random PWM, overexcitation fast deceleration, and droop control
Control Performance	Asynchronous motor (FVC)	Supported function	Energy saving control, inertia auto-tuning, acceleration feedforward, droop control, free programming and self-adaption of speed loop parameters, load observer, overvoltage suppression, voltage dip suppression, overexcitation fast deceleration, automatic voltage adjustment (AVR generator bus voltage control), DC braking, continuous operation after smooth switchover to SVC upon encoder abnormality, and FVC-to-SVC switchover at designated frequency (This can avoid abnormal operation caused by high-speed jitter of the encoder.)
		Applicable encoders	23-bit communication encoder, ABZ encoder (differential, collector, push-pull), resolver, and sin-cos encoder
		Starting torque	200%
		Torque step response	Within 2 ms
		Speed stability accuracy	0.02% (without motor or encoder defects)
		Speed fluctuation	0.05% (without motor or encoder defects)
		Torque control accuracy	±2%
		Flux weakening magnification	5 x field weakening

Item			Technical specification
Control Performance	Asynchronous motor (SVC)	Supported function	Energy saving control, inertia auto-tuning, acceleration feedforward, droop control, master-slave control, free programming and self-adaption of speed loop parameters, load observer, overvoltage suppression, voltage dip suppression, overexcitation fast deceleration, automatic voltage adjustment (AVR generator bus voltage control), flying start, DC braking, continuous operation after smooth switchover to SVC upon encoder abnormality, and FVC-to-SVC switchover at designated frequency (This can avoid abnormal operation caused by high-speed jitter of the encoder.)
		Speed regulation range	1:500
		Starting torque	200%
		Torque step response	Within 2 ms
		Torque control accuracy	±3% at frequencies above 5 Hz
		Speed stability accuracy	Within 10% of the rated slip value
		Flux weakening magnification	5 x field weakening

Item			Technical specification
Control Performance	Synchronous motor (FVC)	Supported function	Electronic motor stator shorting, overexcitation fast deceleration, maximum torque per ampere (MTPA) control, inertia auto-tuning, acceleration feedforward, droop control, free programming and self-adaption of speed loop parameters, overvoltage suppression, voltage dip suppression, automatic voltage adjustment (AVR generator bus voltage control), DC braking, continuous operation after smooth switchover to SVC upon encoder abnormality, and FVC-to-SVC switchover at designated frequency (This can avoid abnormal operation caused by high-speed jitter of the encoder.)
		Applicable encoders	23-bit communication encoder, ABZ encoder (differential, collector, push-pull), resolver, and sin-cos encoder
		Starting torque	200%
		Torque step response	Within 2 ms
		Speed stability accuracy	0.02% (without motor or encoder defects)
		Speed fluctuation	0.05% (without motor or encoder defects)
		Torque control accuracy	±2%

Item			Technical specification
Control Performance	Synchronous motor (SVC)	Supported function	Flying start, electronic motor stator shorting, overexcitation fast deceleration, master-slave control, MTPA control, inertia auto-tuning, acceleration feedforward, droop control, free programming and self-adaption of speed loop parameters, overvoltage suppression, voltage dip suppression, automatic voltage adjustment (AVR generator bus voltage control), DC braking, continuous operation after smooth switchover to SVC upon encoder abnormality, and FVC-to-SVC switchover at designated frequency (This can avoid abnormal operation caused by high-speed jitter of the encoder.)
		Speed regulation range	1:200
		Starting torque	200%
		Torque step response	Within 2 ms
		Speed stability accuracy	0.05% (without motor defects)
		Torque control accuracy	±3% at frequencies above 5 Hz

Item			Technical specification
Basic functions	Command source		The commands are used to start or stop the motor. The command sources include the DI, DO, virtual DI, virtual DO, and DI/DO on the external expansion card. Switchover among four different sets of motor parameters and control parameters is supported. Start and stop commands can be set through programming.
	Reference channel	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: maximum frequency x 0.1%
		Speed/ Torque reference	Acceleration and deceleration curve, dynamic switchover among multiple acceleration and deceleration time sets, acceleration and deceleration S curve, external PID reference, AI (2 channels, supporting ±10 V or 0-20 mA), speed and torque set through communication, pulse reference (DI5), multi-reference, speed/torque set through programming
	Communication mode		Modbus (Modbus RTU, Modbus ASCII, Modbus TCP/IP), PROFIBUS DP, CANlink, CANopen, PROFINET, EtherCAT, and Ethernet/IP
	Output limit		Torque limit, power limit, current limit, maximum/ minimum torque limit, speed limit, and jump frequency
	Process control	PID	Hibernation, configurable reference and feedback sources, 2-segment PID parameter switchover, feedback loss detection, configuration of output limit, configuration initialization
		Brake	Brake with or without feedback, start speed, start torque, and brake judgment condition settings
	Protection		AC drive and motor protection, including protection against overvoltage, overcurrent, overload, motor overheating (PT100, PT1000, KTY-84-130, PTC-130, PTC-150), and load loss, as well as automatic fault reset, automatic restart, and limp mode upon fault

Item		Technical specification
Individualized functions	Programming	Programming is supported. Word and bit conversion, word and double word conversion, logic (AND, OR, NOT, XOR, XNOT), arithmetic operations (fixed point and floating point addition/subtraction/ multiplication/division, absolute value, numerical comparison), selector switch, free filtering, switch-on and switch-off delay through logic, multi-point curve, and constant value
	Self-check	The AC drive and motor support self-check. IGBT shoot through, short circuit to ground, phase loss, and inter-phase short circuit tests are supported.
	Long-cable drive	The AC drive supports long-distance driving of the motor and various types of output filters.
	Reluctance motor	The drive can control reluctance motors in FVC/SVC mode, ferrite motors with magnet, pure reluctance motors, and permanent magnet and ferrite hybrid reluctance motors.
	Electromagnetic coil	The current and frequency are set separately. The three-phase AC power supply with variable frequency is provided, which applies mainly to electromagnetic mixers and welding equipment.
	Powerful software	The software InoDriverShop allows you to upload and download AC drive parameters and supports the oscilloscope function. In addition, the InoDriverShop supports remote commissioning and fault diagnosis. With the oscilloscope function, you can monitor the internal state of the AC drive.

Item		Technical specification
In operation	Operation Command	Operating panel, control terminal, and serial communication port (switchable in multiple ways)
	Frequency reference	The drive supports 10 frequency reference sources, including digital setting, analog voltage, analog current, pulse setting, and serial communication ports (switchable in multiple ways).
	Auxiliary frequency reference setting channel	Ten auxiliary frequency references are available. The auxiliary frequency reference can be used together with the main frequency reference to implement fine adjustment and frequency superposition.
	Input terminal	Standard: Five DIs Two AIs, AI1 and AI2. AI1 supports only voltage input of -10 V to +10 V. AI2 supports voltage input of -10 V to +10 V, current input of 0 mA to 20 mA, and temperature input, which can be switched over through the DIP switch. Extension capacity: Five DIs
	Output terminal	Standard: One DO One relay output terminal One FM (can be set with high-speed pulse output or common DO function) One AO, supporting current output of 0 mA to 20 mA or voltage output of 0 V to 10 V Extension capacity: One DO One relay output terminal
Display and operations on the operating panel	LED operating panel	It can display parameters and AC drive status (forward running, reverse running, stop, operating panel/ terminal/communication control, speed/torque control, STO state) and can be used to modify parameters.
	External LCD operating panel	It is optional and displays content in Chinese, English, or Russian. You can use it to modify parameters.
	Parameter copy	You can use the LCD operating panel to implement quick parameter upload and download.
	Key lock and function	To prevent inadvertent operations, some keys on the operating panel can be locked, and functions with limited availability range can be assigned to some keys.

Item		Technical specification
Environment	Operating site	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Altitude	For altitudes equal to or below 1000 m, derating is not required. For altitude ranging from 1000 m to 3000 m, derate 1% for every additional 100 m. For altitude above 3000 m, contact Inovance. ***Note*** The maximum altitude for T1 models is 2000 m. If the altitude is above 2000 m, contact Inovance.
	Ambient temperature	-10°C to +50°C. 40°C to 50°C: derate by 1.5% for every additional 1°C.
	Humidity	Storage/Ambient humidity: ≤ 95% RH, non-condensing
	Vibration	Operating scenario: Test according to IEC 60068-2-6. Vibration amplitude at 5 Hz to 8.4 Hz: 3.5 mm; acceleration at 8.4 Hz to 200 Hz: 1 g; 10 cycles/axis Transport scenario: Test according to IEC 60068-2-64. Power spectrum density at 5 Hz to 100 Hz: 0.01 g^2/Hz; power spectrum density at 200 Hz: 0.001 g^2/Hz; Grms: 1.14 g
	Shock	Operating/Transport scenario: Test according to IEC 60068-2-27. Acceleration: 15 g; pulse width; 11 ms; 18 times in total in each of X, Y, Z axes
	Storage temperature	-20 °C to +60°C

10.3 Accessory Specifications

10.3.1 Option List

Optional peripherals include braking units, function expansion cards, and external operating panels. For use of each option, see the related user guide. If any option is needed, specify it in your order.

Table 10–7 Option List

Name		Option model	Ordering no.	Supported drive model	Description
Braking component	External braking unit [1]	MDBUN-60-T	01013133	All models	60 A, 380 VAC series
		MDBUN-60-5T	0101AR57	All models	60 A, 480 VAC series
		MDBUN-90-T	01013126	All models	90 A, 380 VAC series
		MDBUN-90-5T	0101AR58	All models	90 A, 480 VAC series
		MDBUN-200-T	01040104	All models	200 A, 380 VAC series
		MDBUN-200-5T	01040160	All models	200 A, 480 VAC series
	Built-in braking unit	Model with the name containing letter "B"	/	T1 to T5 (22 kW)	Three-phase 380 V to 480 V: T1 to T5 models come with built-in braking units as standard.

Name		Option model	Ordering no.	Supported drive model	Description
Expansion card	I/O expansion card 1	MD38IO1	01013098	T4 and above	Five DIs, one DO, one RO, one AO, one AI (PT100/PT1000), and one RS485 or CAN communication signal isolation input terminal
	I/O expansion card 2	MD38IO2	01013103	All models	Three DIs
	I/O expansion card 3	MD38IO3	01040051	All models	Three DIs, one RO, and one RS485 communication signal isolation input terminal
	I/O expansion card 4	MD520IO1	01040250	All models	Three DIs, one RS485 communication signal isolation input terminal, one normally open relay output terminal, and one AO
	RS485 communication card	MD38TX1	01013112	All models	Modbus communication card with the isolation feature
	CANopen/ CANlink communication card	MD38CAN1	01013100	All models	CANopen/CANlink communication card
	PROFIBUS DP communication card	MD-SI-DP2	01040249	All models	PROFIBUS DP communication card
		MD38DP2	01013144	T4 and above	PROFIBUS DP communication card
	PROFINET communication card <1>	MD500-PN1	01040098	All models	PROFINET communication card
		MD500-PN2	01040198	All models	PROFINET communication card
	EtherCAT communication card	MD500-ECAT	01040113	All models	EtherCAT communication card
	Ethernet/IP communication card	MD500-EN1	01040167	All models	Ethernet/IP communication card
	Modbus TCP communication card	MD500-EM1	01040201	All models	Modbus TCP communication card

Name		Option model	Ordering no.	Supported drive model	Description
Expansion card	Positioning expansion card 1	MD38DW1	01013096	T4 and above	Multi-function pulse input expansion card Five DIs, one DO, one RO, one AO, one AI, one RS485 or CAN communication signal isolation input terminal, and one differential ABZ terminal
	Positioning expansion card 2	MD38DW2	01013097	All models	Mini pulse input expansion card One RS485 communication terminal and one differential ABZ terminal (positioning)
	Resolver frequency division encoder card	MD38PG4D	01040008	Applicable to T4 models, and T7 models and above	The MD38PG4D card is a PG card specially developed for resolvers. Featuring differential frequency division, it is suitable for various applications such as machine tool electric master axis and synchronous control. Matching encoder type: resolver
	Resolver interface card	MD38PG4	01013081	All models	It is applicable to the resolver with the excitation frequency of 10 kHz and with the DB9 interface To meet the MD38PG4 requirements, the excitation input DC resistance of the resolver must be greater than 17 Ω. Failure to comply will result in MD38PG4 malfunction. Select a resolver with a maximum of four pole pairs. Otherwise, the MD38PG4 card will be overloaded. The number of resolver pole pairs must be less than or equal to the number of motor pole pairs, and the number of motor pole pairs divided by the number of resolver pole pairs must be an integer.

Name		Option model	Ordering no.	Supported drive model	Description
Expansion card	Multi-functional encoder card	MD38PGMD	01013147	All models	The card is an encoder interface card with the optional multiplied frequency division output function and supports 5 V or 15 V power supply. The card supports differential input, collector input, and push-pull input, as well as differential output and collector output; therefore, it can be used to connect to different encoders and supports A/B phase input of the host controller.
	23-bit PG card	ES510-PG-CT1	01320007	All models	Applicable to 23-bit encoders of Inovance; with a DB9 interface
	Sin-cos encoder	MD520-PG-S1	01040237	All models	The MD520-PG-S1 is a PG card that decodes sine-cosine encoders. Working with the AC drive, it can measure the motor speed, and realize speed and position closed loop control and encoder frequency division output.
	Bus adaption card	MD520-CClick	01040283	All models	The MD520-CClink communication expansion card (hereinafter referred to as the MD520-CClink card) is an open fieldbus adaption card for MD520 series AC drives. It communicates with the CClink master through a dedicated interface to achieve efficient data interaction between CClink master and slave. It features flexible topology and easy operation.

Name		Option model	Ordering no.	Supported drive model	Description
Mounting accessories	Through-hole mounting bracket	MD500-AZJ-A1T1	01040072	T1	Fulfills the through-hole mounting needs. It is applicable only to T1 to T9 models.
		MD500-AZJ-A1T2	01040073	T2	
		MD500-AZJ-A1T3	01040074	T3	
		MD500-AZJ-A1T4	01040075	T4	
		MD500-AZJ-A1T5	01040001	T5	
		MD500-AZJ-A1T6	01040002	T6	
		MD500-AZJ-A1T7	01040003	T7	
		MD500-AZJ-A1T8	01040004	T8	
		MD500-AZJ-A1T9	01040005	T9	
	Grounding bracket of cable shield	MD500-AZJ-A2T1	01040085	T1	The accessory is used for re-fixing the power cable and stable grounding of the shield in 360°. It is applicable only to T1 to T9 models.
		MD500-AZJ-A2T2	01040088	T2	
		MD500-AZJ-A2T3	01040083	T3	
		MD500-AZJ-A2T4	01040082	T4	
		MD500-AZJ-A2T5	01040081	T5	
		MD500-AZJ-A2T6	01040086	T6	
		MD500-AZJ-A2T7	01040087	T7	
		MD500-AZJ-A2T8	01040084	T8	
		MD500-AZJ-A2T9	01040089	T9	
	Mounting guide rail	MD500-AZJ-A3T10	01040009	T10~T12	The accessory is used for installing the AC drive in a cabinet. For T10 models and models above T10, it is recommended that a guide rail be used to push the AC drive into the cabinet.
	UVW output copper busbar	MD500-TP-T10	01040125	T10	MD520 models excluding that with the base (-L) are delivered with the UVW output copper busbar.
		MD500-TP-T11	01040126	T11	
		MD500-TP-T12	01040127	T12	

Name		Option model	Ordering no.	Supported drive model	Description
Cable	Main circuit cable	Terminals manufactured by Suzhou Yuanli are recommended. For details on terminal selection, see *"10.3.8 Cable" on page 496*.			It is recommended that the input and output main circuit cables use symmetrical shielded cables. Compared with four-conductor cables, symmetrical shielded cables can reduce electromagnetic radiation in the whole transmission system. It is recommended that power cables also use symmetrical shielded cables.
	Control circuit cable	All control circuit cables must be shielded cables. Use separate shielded cables for different analog signals. It is recommended that digital signal cables use shielded twisted pair (STP) cables.			
	External LED operating panel	MDKE-10	01040182	All models	It supports parameter display and modification. Note: The operating panel must be used with the mounting base.
	External LCD operating panel	SOP-20	01040028	All models	It supports parameter copy and download, and supports English and Chinese. Note: The operating panel must be used with the mounting base.
	SOP-20 mounting base	CP600-BASE1	01040022	All models	It is used to install the SOP-20 to the cabinet door.
	MDKE-10 mounting base	MD580-AZJ1	01040202	All models	It is used to install the MDKE-10 to the cabinet door.
	Extension cable	MDCAB	01013008	All models	Standard eight-core, three-meter network cable used to connect the external operating panel, including the LED operating panel MDKE-10 and the LCD operating panel SOP-20.
		MDCAB-1.5	15048471	All models	1.5-meter cable for the external operating panel
Transparent Protective Cover	Protective cover on the input side	MD500-FHZ-L-T10	01040336	T10	The protective cover only on the left input side is supported.
		MD500-FHZ-L-T11	01040337	T11	
		MD500-FHZ-L-T12	01040338	T12	
	Top protective cover	MD500-FHZ-T-T11	01040344	T11	-

Note

For details on models and specifications of other peripheral electrical components, such as input reactors, EMC filters, output reactors, and fuses, see the section of peripheral electrical components.

[1]The differences between the MD500-PN1 and MD500-PN2 are as follows:

1. Power-on time: The power-on time of the MD500-PN1 is 3s, while that of the MD500-PN2 is 30s.
2. GSD file: The GSD files of the MD500-PN1 and MD500-PN2 are different.
3. Media redundancy protocol: The MD500-PN1 supports the media redundancy protocol, whereas the MD500-PN2 does not support the media redundancy protocol.

10.3.2Fuse, Contactor, and Circuit Breaker



To avoid electric shock, do not power on the drive or operate peripherals immediately after a fuse is blown or a circuit breaker trips. Instead, wait for at least a period of time specified on the product warning label before further operations. Failure to comply can result in product damage, severe injury, or even death.

To comply with EN 61800-5-1 and UL 61800-5-1 standards, install a fuse/circuit breaker on the input side of the drive to prevent accidents caused by short circuit in the internal circuit.

The following table lists the recommended models.

Table 10–8 Selection of fuses, contactors, and circuit breakers (three-phase 380 V to 480 V, compliant with CE certification)

Structure	Option model	Recommended fuse specification BUSSMANN		Recommended contactor specification (A series of ABB)	Recommended circuit breaker specification (Tmax series of ABB)
		Rated current (A)	Option model	Rated current (A)	Rated current (A)
T1	MD520-4T0.4B-HS-INT	5	FWP-5B	9	4
	MD520-4T0.7B-HS-INT	5	FWP-5B	9	4
	MD520-4T1.1B-HS-INT	5	FWP-5B	9	6.3
	MD520-4T1.5B-HS-INT	10	FWP-10B	9	6.3
	MD520-4T2.2B-HS-INT	10	FWP-10B	9	10
	MD520-4T3.0B-HS-INT	15	FWP-15B	12	16
T2	MD520-4T3.7B-HS-INT	15	FWP-15B	16	16
	MD520-4T5.5B-HS-INT	20	FWP-20B	26	25
T3	MD520-4T7.5B-HS-INT	30	FWP-30B	26	32
	MD520-4T11B-HS-INT	50	FWP-50D	38	50
T4	MD520-4T15B-HS-INT	50	FWP-50D	50	63
T5	MD520-4T18.5B-HS-INT	70	FWP-70B	63	63
	MD520-4T22B-HS-INT	80	FWP-80B	75	80
T6	MD520-4T30-HS-INT	90	FWP-90B	75	80
	MD520-4T37-HS-INT	90	FWP-90B	95	100
T7	MD520-4T45-HS-INT	125	FWP-125A	110	125
	MD520-4T55-HS-INT	150	FWP-150A	145	160
T8	MD520-4T75-HS-INT	175	FWP-175A	185	200
	MD520-4T90-HS-INT	225	FWP-225A	185	250
	MD520-4T110-HS-INT	250	FWP-250A	260	250
	MD520-4T132-HS-INT	300	FWP-300A	300	320
T9	MD520-4T160-HS-INT	400	FWP-400A	400	400
	MD520-4T200-HS-INT	450	FWP-450A	400	500
T10	MD520-4T220-HS-INT	600	FWP-600A	460	630
	MD520-4T250-HS-INT	600	FWP-600A	580	630
T11	MD520-4T280-HS-INT	700	FWP-700A	580	630
	MD520-4T315-HS-INT	800	FWP-800A	750	800
T12	MD520-4T355-HS-INT	800	FWP-800A	750	800
	MD520-4T400-HS-INT	900	FWP-900A	750	1000
	MD520-4T450-HS-INT*	1000	FWP-1000A	1250	1000

Note

The recommended values in the preceding table are based on the following conditions.

- The ambient temperature of the device is 40℃ and there is no forced air cooling method.
- The altitude is 2000 m.
- An individual drive is installed.
- The current-carrying density of the conductor or copper busbar is 1.3 A/mm².
- If the conditions vary, select the model according to actual conditions.

Table 10–9 Selection of fuses, contactors, and circuit breakers (three-phase 380 V to 480 V, compliant with UL certification)

Structure	Option model	Recommended fuse specification BUSSMANN		Recommended contactor specification (A series of ABB)	Recommended circuit breaker specification (Tmax series of ABB)
		Rated current (A)	Option model	Rated current (A)	Rated current (A)
T1	MD520-4T0.4B-HS-INT	3	FWP-3A14F	9	4
	MD520-4T0.7B-HS-INT	4	FWP-4A14F	9	4
	MD520-4T1.1B-HS-INT	6	FWP-6A14F	9	6.3
	MD520-4T1.5B-HS-INT	10	FWP-10B	9	6.3
	MD520-4T2.2B-HS-INT	10	FWP-10B	9	10
	MD520-4T3.0B-HS-INT	15	FWP-15B	12	16
T2	MD520-4T3.7B-HS-INT	20	FWP-20B	16	16
	MD520-4T5.5B-HS-INT	25	FWP-25B	26	25
T3	MD520-4T7.5B-HS-INT	35	FWP-35D	26	32
	MD520-4T11B-HS-INT	50	FWP-50D	38	50
T4	MD520-4T15B-HS-INT	60	FWP-60D	50	63
T5	MD520-4T18.5B-HS-INT	80	FWP-80B	63	63
	MD520-4T22B-HS-INT	90	FWP-90B	75	80
T6	MD520-4T30-HS-INT	100	FWP-100B	75	80
	MD520-4T37-HS-INT	125	FWP-125A	95	100
T7	MD520-4T45-HS-INT	150	FWP-150A	110	125
	MD520-4T55-HS-INT	175	FWP-175A	145	160
T8	MD520-4T75-HS-INT	225	FWP-225A	185	200
	MD520-4T90-HS-INT	250	FWP-250A	185	250
	MD520-4T110-HS-INT	300	FWP-300A	260	250
	MD520-4T132-HS-INT	400	FWP-400A	300	320
T9	MD520-4T160-HS-INT	450	FWP-450A	400	400
	MD520-4T200-HS-INT	600	FWP-600A	400	500
T10	MD520-4T220-HS-INT	700	FWP-700A	460	630
	MD520-4T250-HS-INT	700	FWP-700A	580	630

Structure	Option model	Recommended fuse specification BUSSMANN		Recommended contactor specification (A series of ABB)	Recommended circuit breaker specification (Tmax series of ABB)
		Rated current (A)	Option model	Rated current (A)	Rated current (A)
T11	MD520-4T280-HS-INT	800	FWP-800A	580	630
	MD520-4T315-HS-INT	900	FWP-900A	750	800
T12	MD520-4T355-HS-INT	1000	FWP-1000A	750	800
	MD520-4T400-HS-INT	1200	FWP-1200A	750	1000
	MD520-4T450-HS-INT*	1200	FWP-1200A	1250	1000

Note

The recommended values in the preceding table are based on the following conditions.

- The ambient temperature of the device is 40℃ and there is no forced air cooling method.
- The altitude is 2000 m.
- An individual drive is installed.
- The current-carrying density of the conductor or copper busbar is 1.3 A/mm².
- If the conditions vary, select the model according to actual conditions.

10.3.3AC Input Reactor

The optional AC input reactor is mainly used to reduce harmonics in the input current. In applications where harmonics need to be suppressed, install an external reactor.

If an AC input reactor is required for models with the power over 200 kW, reserve sufficient installation space in the cabinet for the reactor.

Model

Recommended AC input reactor manufacturers and models are listed in the following tables.

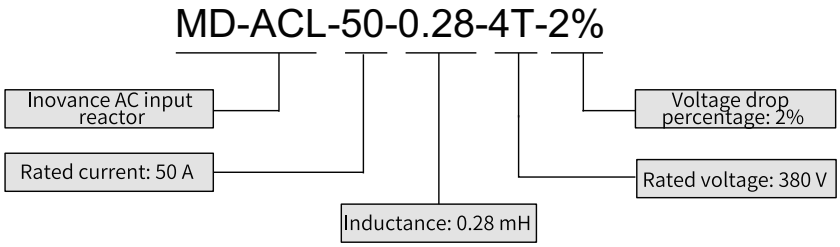


Figure 10-1 AC input reactor model

Table 10–10 Selection of Eagtop AC input reactors (three-phase 380-480 V)

Structure	Model	Applicable Reactor	Inductance (mH)	Power consumption (W)
T1	MD520-4T0.4B-HS-INT	ACL-0003-EISC-9561A	7.2	12
	MD520-4T0.7B-HS-INT	ACL-0004-EISC-9561A	5.8	18
	MD520-4T1.1B-HS-INT	ACL-0005-EISC-9561A	4.4	15
	MD520-4T1.5B-HS-INT	ACL-0007-EISC-9561A	3.1	17
	MD520-4T2.2B-HS-INT	ACL-0009-EISC-9561B	1.7	19
	MD520-4T3.0B-HS-INT	ACL-0013-EISC-9561B	1.2	22
T2	MD520-4T3.7B-HS-INT	ACL-0017-EISHL-9561A	1.3	30
	MD520-4T5.5B-HS-INT	ACL-0025-EISHL-9561B	0.79	42
T3	MD520-4T7.5B-HS-INT	ACL-0032-EISHL-9561B	0.64	46
	MD520-4T11B-HS-INT	ACL-0045-EISHL-9561B	0.44	56
T4	MD520-4T15B-HS-INT	ACL-0045-EISHL-9561B	0.44	56
T5	MD520-4T18.5B-HS-INT	ACL-0060-EISHL-9561A	0.37	76
	MD520-4T22B-HS-INT	ACL-0060-EISHL-9561A	0.37	76
T6	MD520-4T30-HS-INT	ACL-0090-EISCL-EM16DNC	0.16	81
	MD520-4T37-HS-INT	ACL-0090-EISCL-EM16DNC	0.16	81
T7	MD520-4T45-HS-INT	ACL-0120-EISCL-EM12DNC	0.12	122
	MD520-4T55-HS-INT	ACL-0150-EISCL-E95UDNC	0.095	191
T8	MD520-4T75-HS-INT	ACL-0200-EISCL-E70UDNC	0.07	212
	MD520-4T90-HS-INT	ACL-0250-EISH-E56UDNC	0.056	175
	MD520-4T110-HS-INT	ACL-0250-EISH-E56UDNC	0.056	175
	MD520-4T132-HS-INT	ACL-0330-EISH-E42UDNC	0.042	222
T9	MD520-4T160-HS-INT	ACL-0390-EISH-E36UDNC	0.036	282
	MD520-4T200-HS-INT	ACL-0490-EISH-E28UDNC	0.028	246
T10	MD520-4T220-HS-INT	ACL-0490-EISH-E28UDNC	0.028	246
	MD520-4T250-HS-INT	ACL-0530-EISH-E26UDNC	0.026	268
T11	MD520-4T280-HS-INT	ACL-0600-EISH-E23UDNC	0.023	334
	MD520-4T315-HS-INT	ACL-0660-EISH-E21UDNC	0.021	381
T12	MD520-4T355-HS-INT	ACL-0800-EISH-E17UDNC	0.017	389
	MD520-4T400-HS-INT	ACL-1000-EISH-E14UDNC	0.014	499
	MD520-4T450-HS-INT	ACL-1000-EISH-E14UDNC	0.014	499

Dimensions

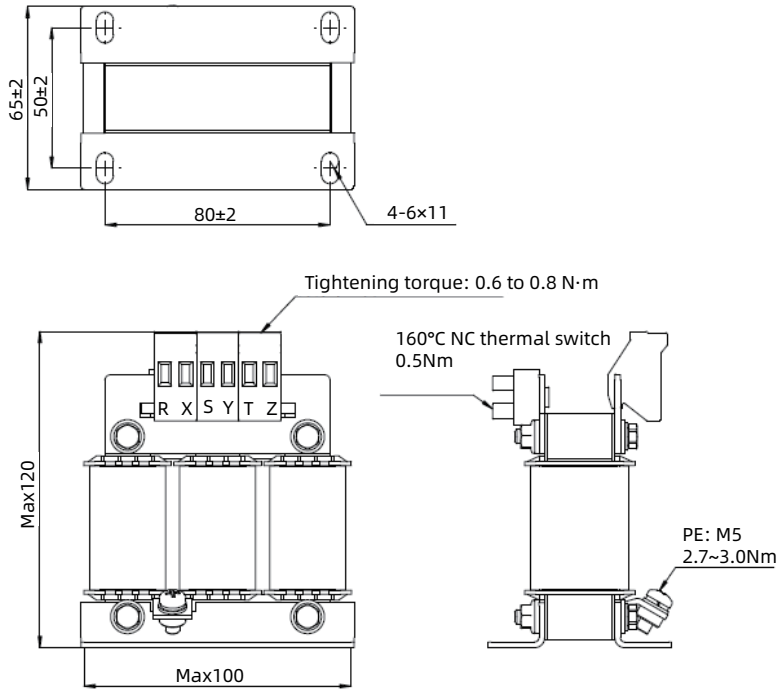


Figure 10-2 Dimensions of the AC input reactor (3 A and 4 A)

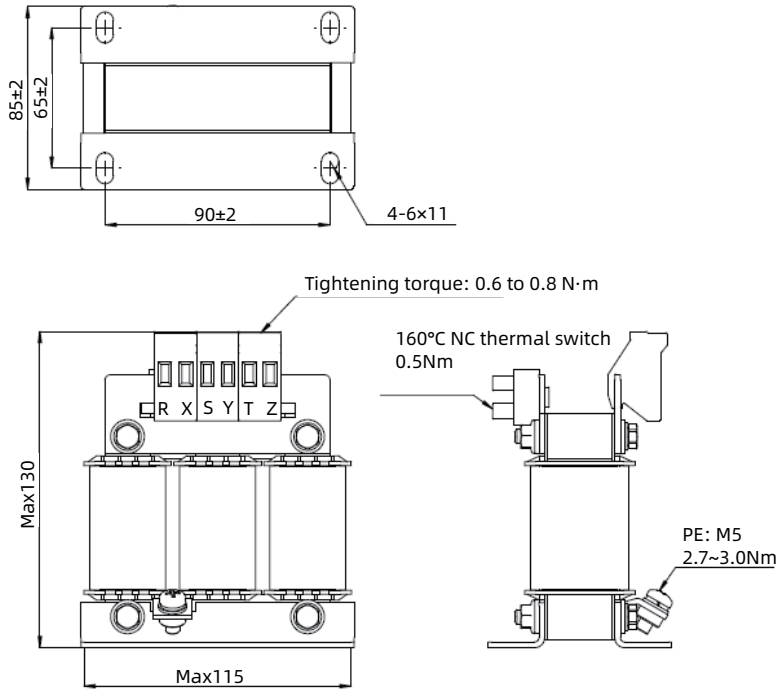


Figure 10-3 Dimensions of the AC input reactor (5 A and 7 A)

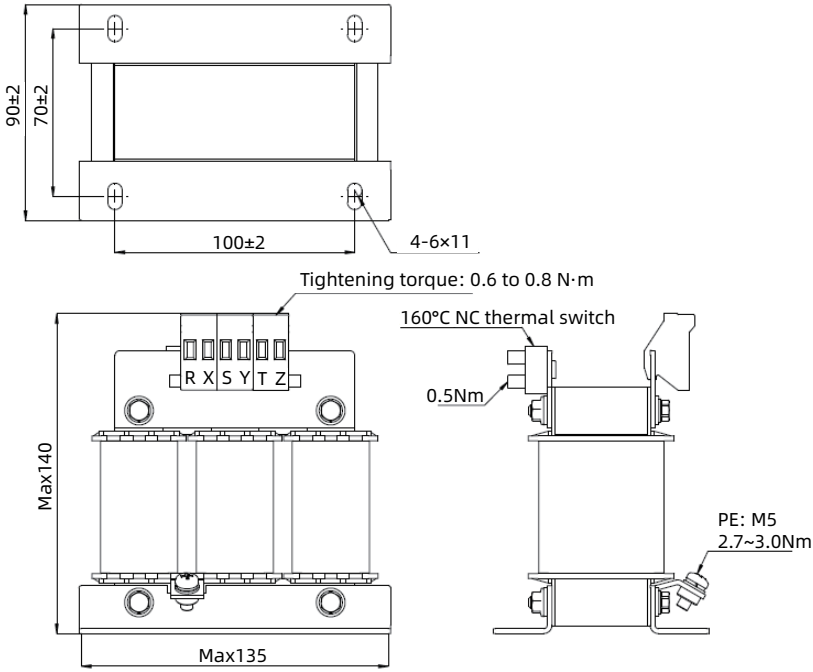


Figure 10-4 Dimensions of the AC input reactor (9 A and 13 A)

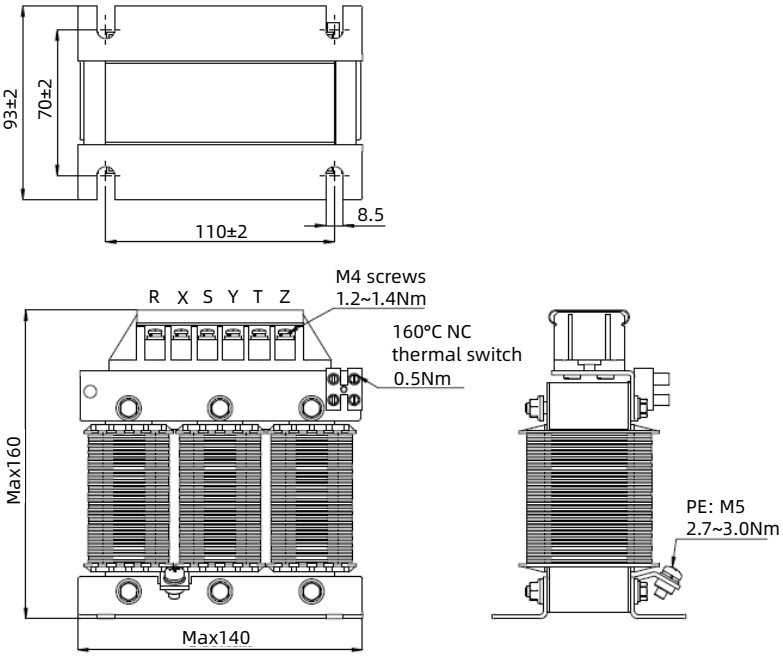


Figure 10-5 Dimensions of the AC input reactor (17 A)

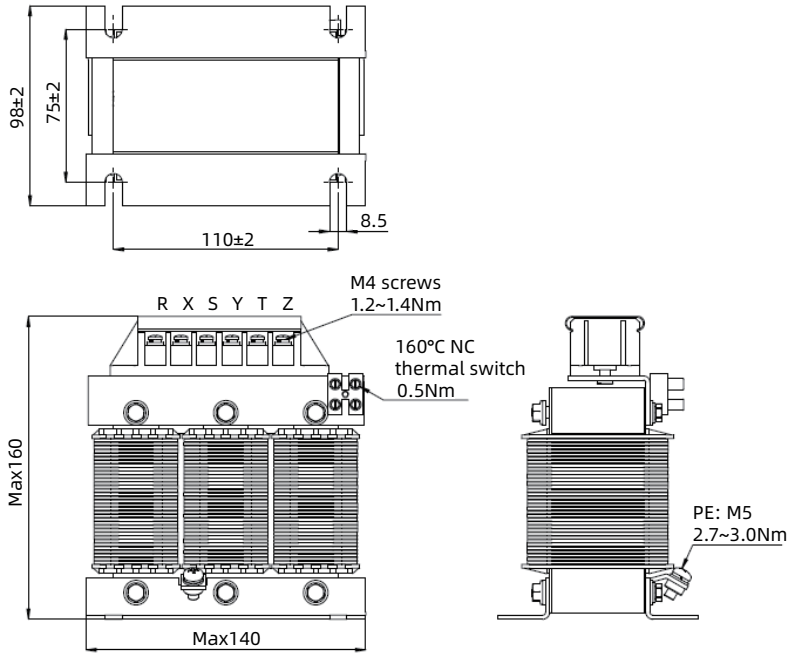


Figure 10-6 Dimensions of the AC input reactor (25 A)

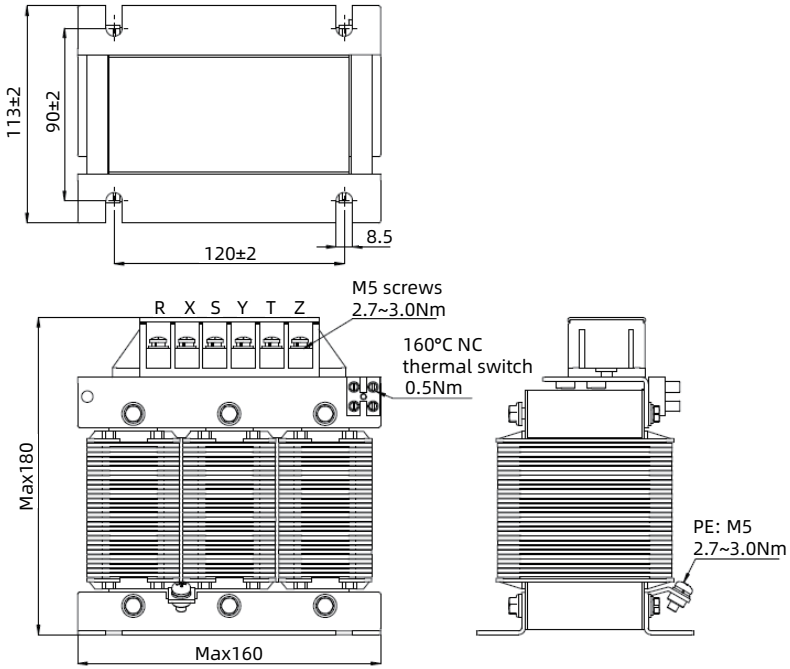


Figure 10-7 Dimensions of the AC input reactor (32 A)

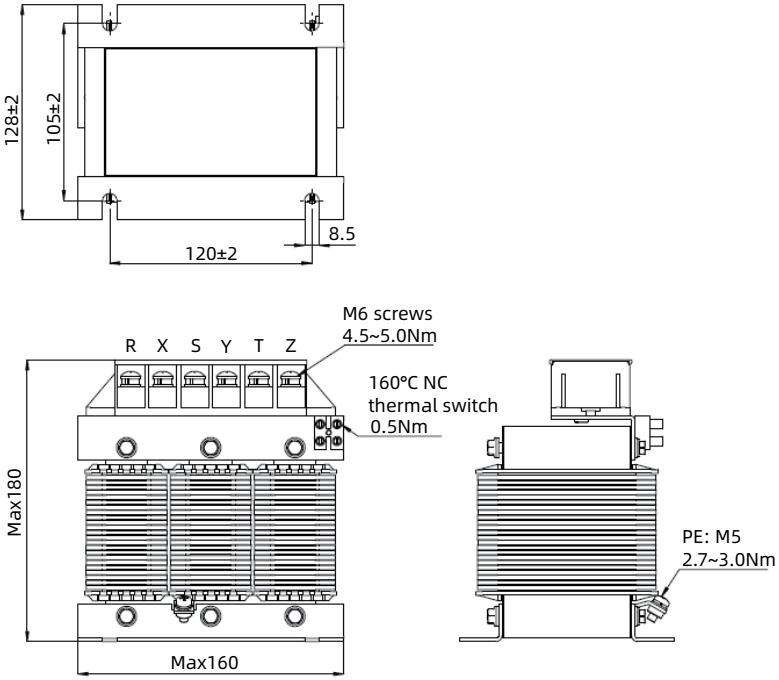


Figure 10-8 Dimensions of the AC input reactor (45 A and 60 A)

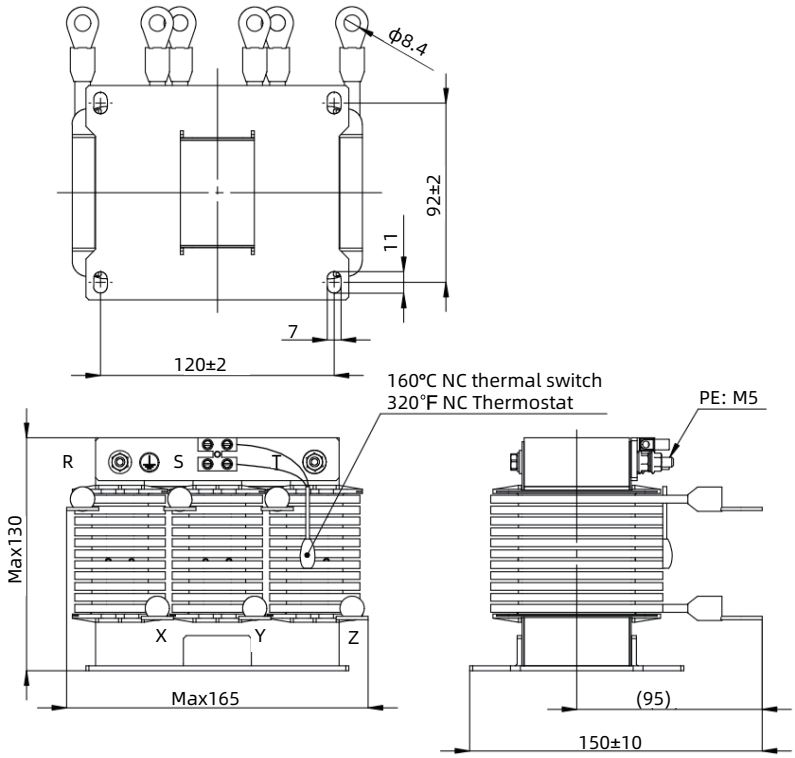


Figure 10-9 Dimensions of 90 A/120 A AC input reactors

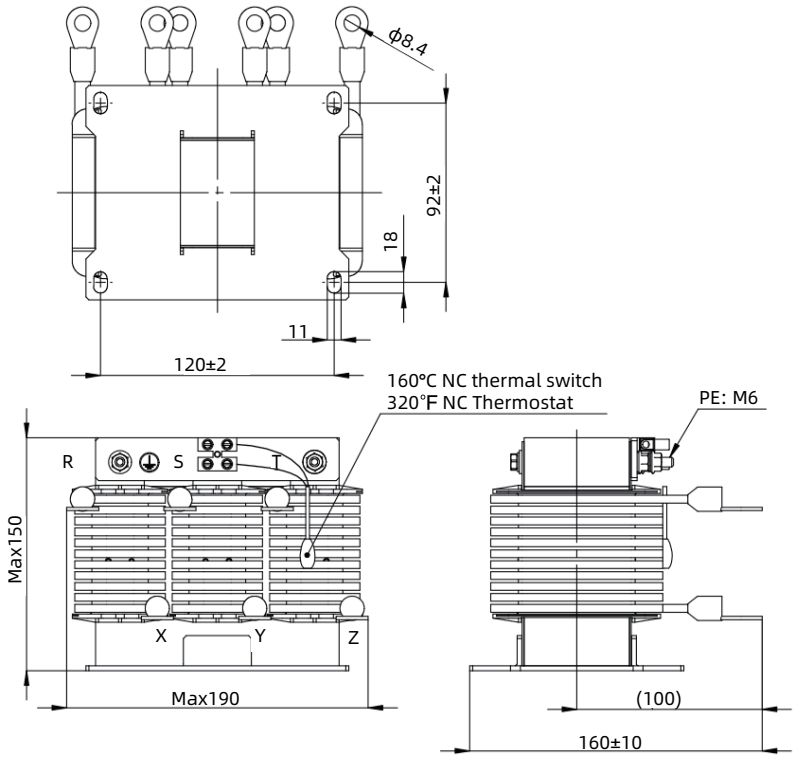


Figure 10-10 Dimensions of the AC input reactor (150 A)

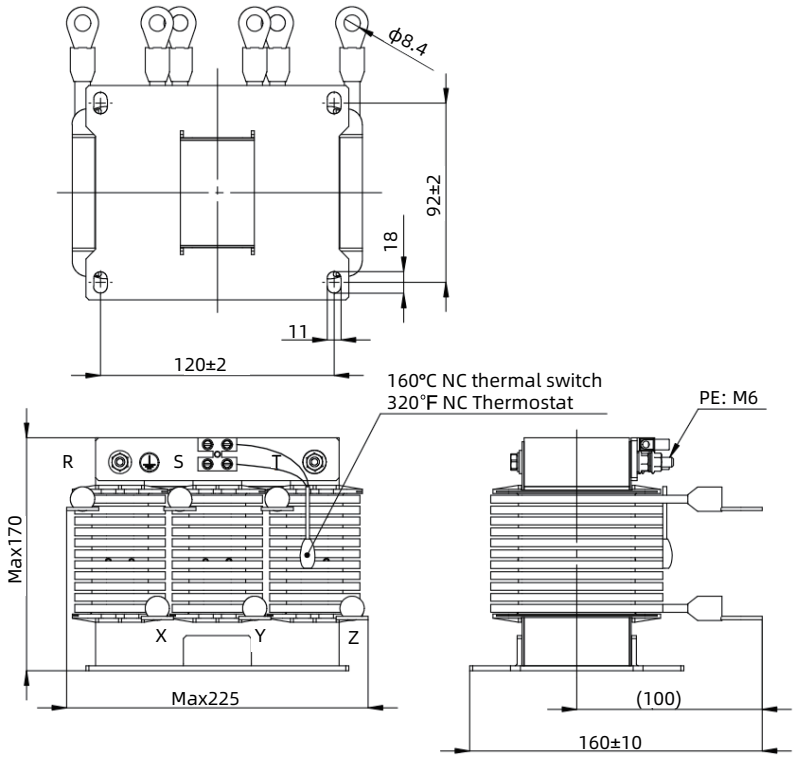


Figure 10-11 Dimensions of the AC input reactor (200 A)

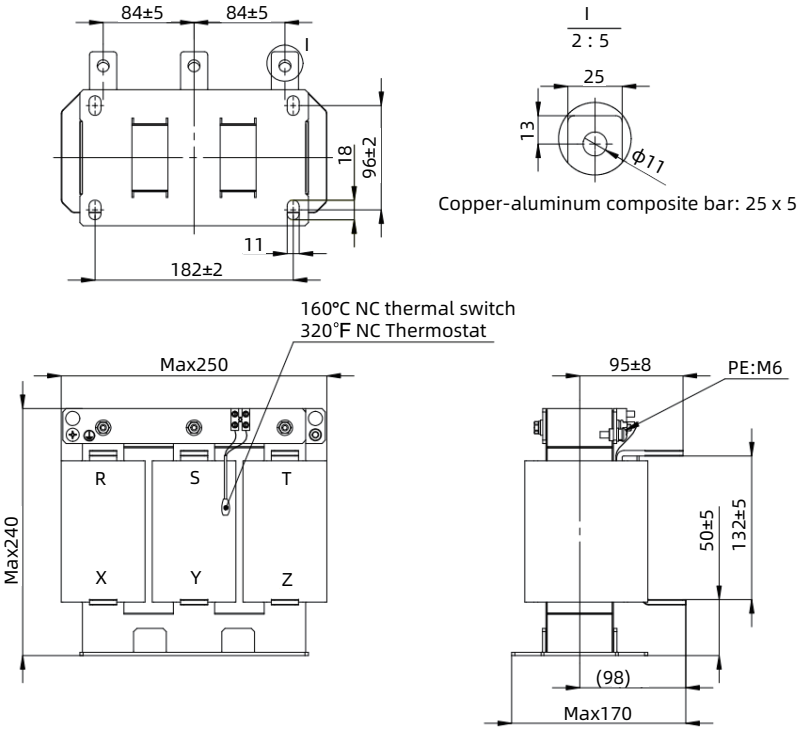


Figure 10-12 Dimensions of the AC input reactor (250 A and 330 A)

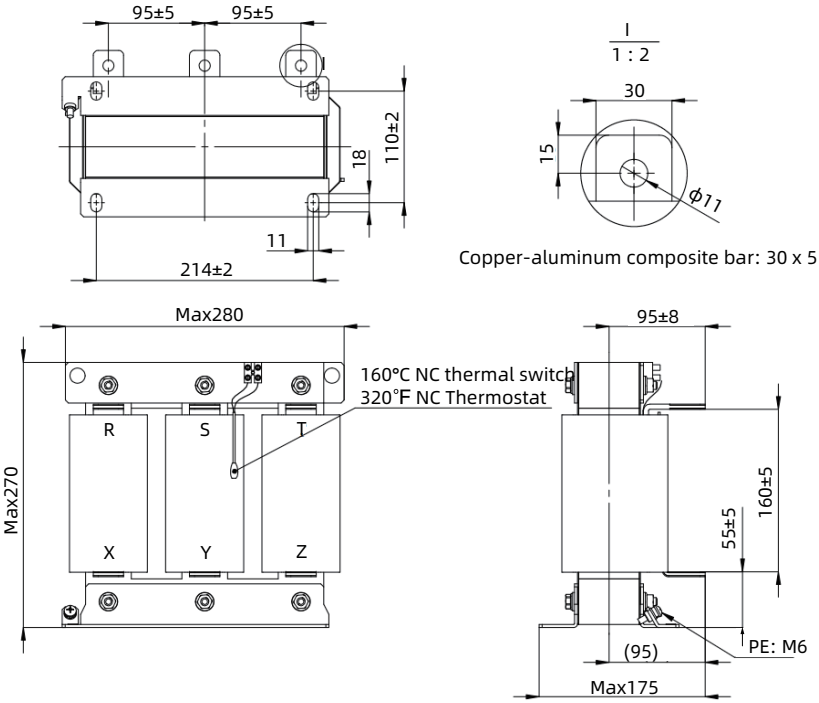


Figure 10-13 Dimensions of the AC input reactor (390 A)

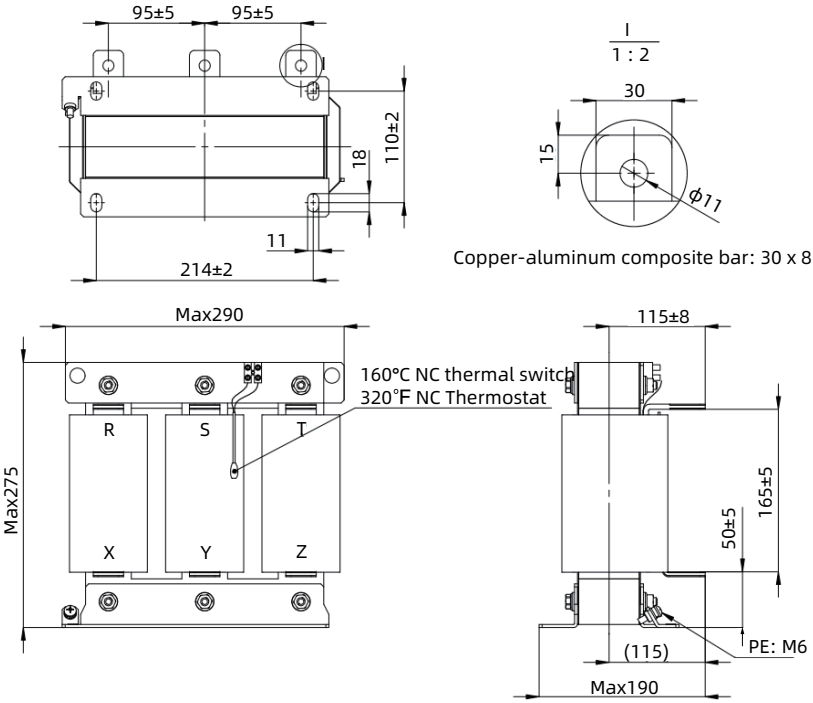


Figure 10-14 Dimensions of the AC input reactor (490 A and 530 A)

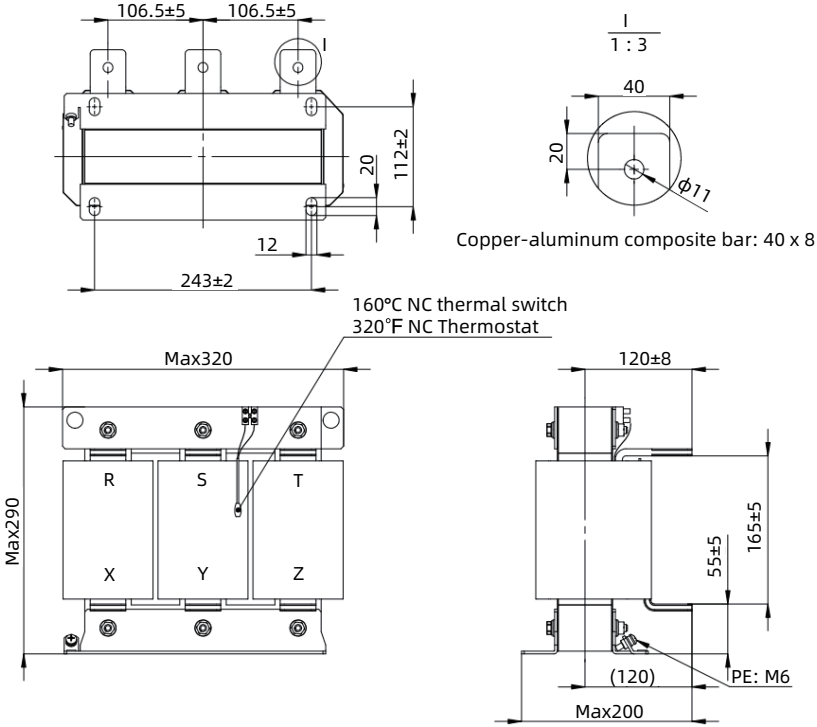


Figure 10-15 Dimensions of the AC input reactor (600 A and 660 A)

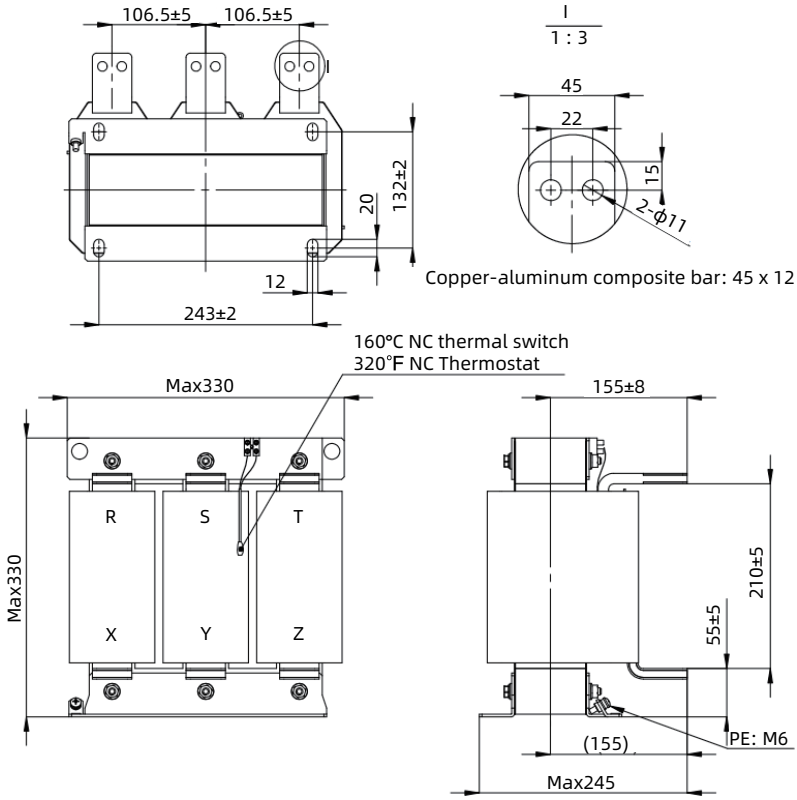


Figure 10-16 Dimensions of the AC input reactor (800 A and 1000 A)

The dimensions provided here are for reference only. Actual product may vary.

10.3.4EMC Filter

Overview

To comply with the radiated and conducted emission requirements of EN IEC 61800-3, install the EMC filter listed in the following table. The following EMC filters can be used.

- For AC drives with the power equal to or lower than 15 kW, built-in filters can meet requirements of EN IEC 61800-3 C3. Therefore, external filters are not required.
- For 18.5 kW to 132 kW AC drives, install external filters to meet requirements of EN IEC 61800-3 C3.
- For AC drives with the power equal to or higher than 160 kW, built-in filters can meet requirements of EN IEC 61800-3 C3. Therefore, external filters are not required.

Table 10–11 Standard EMC filter model and appearance

Filter model		Appearance
Schaffner	FN 2090 series	
	FN 3258 series	
	FN 3359 series	
Jianli	TH series	
	EBK5 series	

Models and dimensions of Schaffner filters

Table 10–12 Selection of Schaffner filters (three-phase 380 V to 480 V)

Structure	Model	Filter model	Power consumption (W)
T1	MD520-4T0.4B-HS-INT	FN 3258-7-44	3.8
	MD520-4T0.7B-HS-INT	FN 3258-7-44	3.8
	MD520-4T1.1B-HS-INT	FN 3258-7-44	3.8
	MD520-4T1.5B-HS-INT	FN 3258-7-44	3.8
	MD520-4T2.2B-HS-INT	FN 3258-7-44	3.8
	MD520-4T3.0B-HS-INT	FN 3258-16-44	6.1
T2	MD520-4T3.7B-HS-INT	FN 3258-16-44	6.1
	MD520-4T5.5B-HS-INT	FN 3258-30-33	11.8
T3	MD520-4T7.5B-HS-INT	FN 3258-30-33	11.8
	MD520-4T11B-HS-INT	FN3258-42-33	15.7
T4	MD520-4T15B-HS-INT	FN3258-42-33	15.7
T5	MD520-4T18.5B-HS-INT	FN 3258-55-34	25.9
	MD520-4T22B-HS-INT	FN 3258-75-34	31.2
T6	MD520-4T30-HS-INT	FN 3258-75-34	32.2
	MD520-4T37-HS-INT	FN 3258-75-34	32.2
T7	MD520-4T45-HS-INT	FN 3258-100-35	34.5
	MD520-4T55-HS-INT	FN 3258-130-35	43.1
T8	MD520-4T75-HS-INT	FN 3258-180-40	58.3
	MD520-4T90-HS-INT	FN 3258-180-40	58.3
	MD520-4T110-HS-INT	FN 3258-180-40	49
	MD520-4T132-HS-INT	FN 3359-250-40	49
T9	MD520-4T160-HS-INT	FN 3359-250-99	19
	MD520-4T200-HS-INT	FN 3359-320-99	29
T10	MD520-4T220-HS-INT	FN 3359-400-99	44
	MD520-4T250-HS-INT	FN 3359-600-99	44
T11	MD520-4T280-HS-INT	FN 3359-600-99	44
	MD520-4T315-HS-INT	FN 3359-600-99	44
T12	MD520-4T355-HS-INT	FN 3359-600-99	39
	MD520-4T400-HS-INT	FN 3359-800-99	39
	MD520-4T450-HS-INT	FN 3359-800-99	39

The following figure shows the dimensions of FN 3258 series filters (7 A to 180 A).

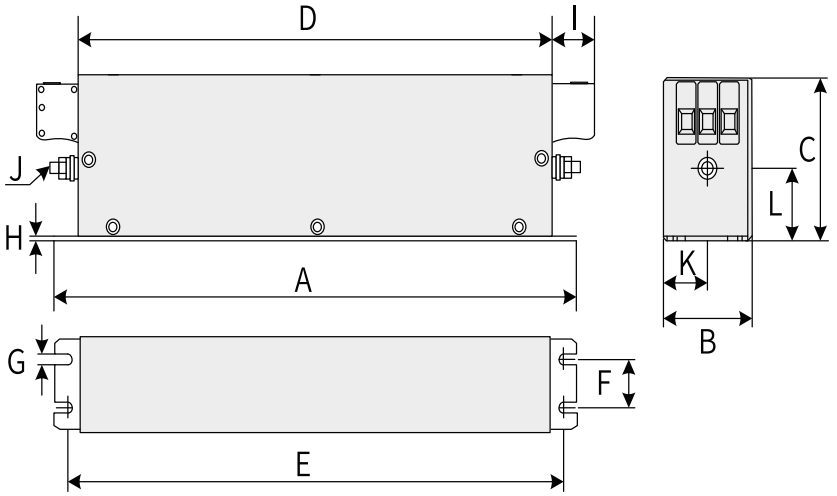


Figure 10-17 Dimensions of FN 3258 series filters (7 A to 180 A)

Table 10–13 Dimensions of FN 3258 series filters (7 A to 180 A, unit: mm)

Rated Current (A)	A	B	C	D	E	F	G	H	I	J	K	L
7	190	40	70	160	180	20	4.5	1	22	M5	20	29.5
16	250	45	70	220	235	25	5.4	1	22	M5	22.5	29.5
30	270	50	85	240	255	30	5.4	1	25	M5	25	39.5
42	310	50	85	280	295	30	5.4	1	25	M6	25	37.5
55	250	85	90	220	235	60	5.4	1	39	M6	42.5	26.5
75	270	80	135	240	255	60	6.5	1.5	39	M6	40	70.5
100	270	90	150	240	255	65	6.5	1.5	45	M10	45	64
130	270	90	150	240	255	65	6.5	1.5	45	M10	45	64
180	380	120	170	350	365	102	6.5	1.5	51	M10	60	47

The following figure shows the dimensions of FN 3359 series filters (150 A to 250 A).

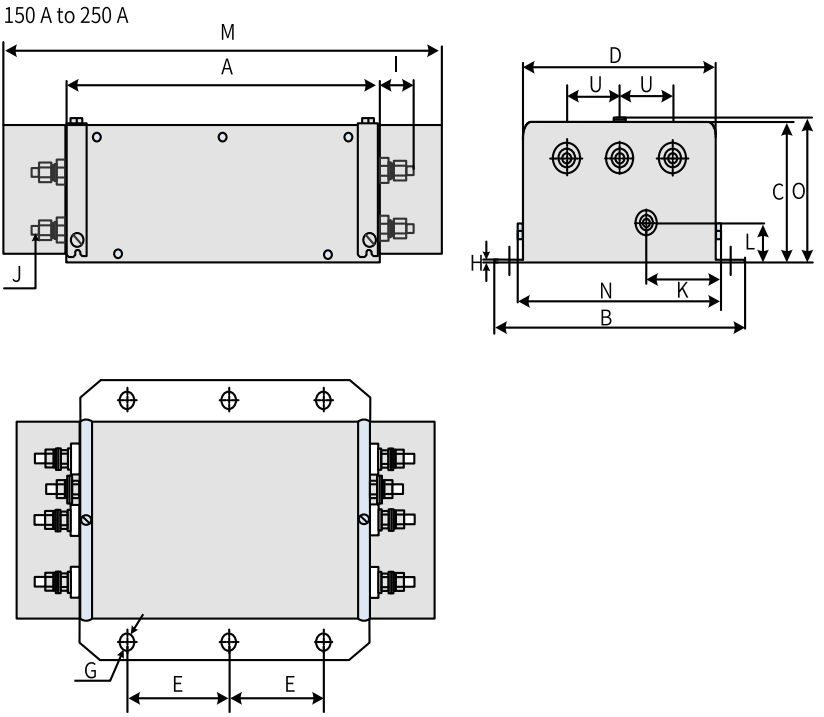


Figure 10-18 Dimension drawing of FN 3359 series filters (150 A to 250 A)

Table 10–14 Dimensions of FN 3359 series filters (150 A to 250 A, unit: mm)

Mark	Rated Current		
	150 A	180 A	250 A
A	300	300	300
B	210	210	230
C	120	120	125
D	160	160	180
E	120	120	120
F	185	185	205
G	Φ12	Φ12	Φ12
H	2	2	2
I	33	33	33
J	M10	M10	M10
K	55	55	62.5
L	30	30	35
M	420	420	420
N	171	171	191
O	127	127	132

Mark	Rated Current		
	150 A	180 A	250 A
S	-	-	-
T	-	-	-
U	50	50	55
V	-	-	-
W	-	-	-
X	-	-	-
Y	-	-	-
Z	-	-	-

The following figure shows the dimensions of FN 3359 series filters (320 A to 2500 A).

320 A to 2500 A

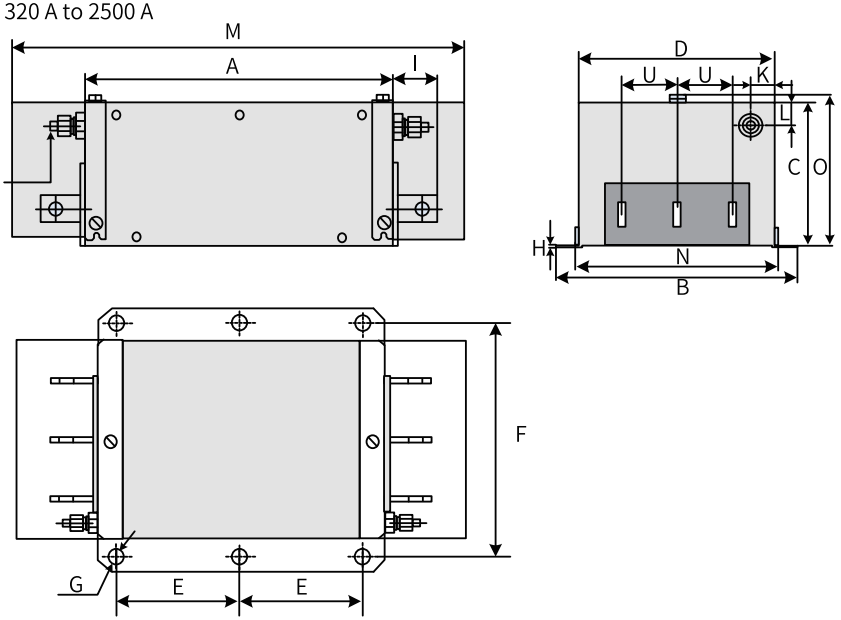


Figure 10-19 Dimensions of FN 3359 series filters (320 A to 2500 A)

The following figure shows the dimensions of the copper busbar.

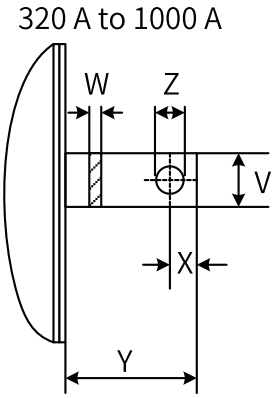


Figure 10-20 Dimensions of the copper busbar

Table 10–15 Dimensions of FN 3359 series filters (320 A to 2500 A, unit: mm)

Mark	Rated Current						
	320 A	400 A	600 A	800 A	1000 A	1600 A	2500 A
A	300	300	300	350	350	400	600
B	260	260	260	280	280	300	370
C	115	115	135	170	170	160	200
D	210	210	210	230	230	250	300
E	120	120	120	145	145	170	250
F	235	235	235	255	255	275	330
G	Φ12	Φ12	Φ12	Φ12	Φ12	Φ12	Φ14
H	2	2	2	3	3	3	3
I	43	43	43	53	53	93	98
J	M12	M12	M12	M12	M12	M12	M16
K	20	20	20	25	25	25	25
L	20	20	20	25	25	25	25
M	440	440	440	510	510	-	-
N	221	221	221	241	241	-	-
O	122	122	142	177	177	-	-
S	-	-	-	-	-	26	35
T	-	-	-	-	-	26	35
U	60	60	60	60	60	60	100
V	25	25	25	40	40	60	70
W	6	6	8	8	8	10	15
X	15	15	15	20	20	17	20
Y	40	40	40	50	50	90	95
Z	Φ10.5	Φ10.5	Φ10.5	Φ14	Φ14	Φ14	Φ14

Models and dimensions of Jianli filters

Table 10–16 Selection of Jianli filters (three-phase 380 V to 480 V)

Structure	Model	Filter model	Power consumption (W)
T1	MD520-4T0.4B-HS-INT	DL-5EBK5	6.9
	MD520-4T0.7B-HS-INT	DL-5EBK5	6.9
	MD520-4T1.1B-HS-INT	DL-5EBK5	6.9
	MD520-4T1.5B-HS-INT	DL-5EBK5	6.9
	MD520-4T2.2B-HS-INT	DL-10EBK5	6.9
	MD520-4T3.0B-HS-INT	DL-10EBK5	6.9
T2	MD520-4T3.7B-HS-INT	DL-16EBK5	8.5
	MD520-4T5.5B-HS-INT	DL-25EBK5	9.4
T3	MD520-4T7.5B-HS-INT	DL-25EBK5	11
	MD520-4T11B-HS-INT	DL-35EBK5	19.2
T4	MD520-4T15B-HS-INT	DL-50EBK5	21.7
T5	MD520-4T18.5B-HS-INT	DL-50EBK5	21.7
	MD520-4T22B-HS-INT	DL-65EBK5	27.4
T6	MD520-4T30-HS-INT	DL-65EBK5	27.4
	MD520-4T37-HS-INT	DL-80EBK5	32.6
T7	MD520-4T45-HS-INT	DL-100EBK5	33
	MD520-4T55-HS-INT	DL-130EBK5	37.5
T8	MD520-4T75-HS-INT	DL-160EBK5	38.4
	MD520-4T90-HS-INT	DL-160EBK5	38.4
	MD520-4T110-HS-INT	DL-200EBK5	34
	MD520-4T132-HS-INT	DL-250EBK5	49
T9	MD520-4T160-HS-INT	DL-300EBK3	49
	MD520-4T200-HS-INT	DL-400EBK3	19
T10	MD520-4T220-HS-INT	DL-400EBK3	29
	MD520-4T250-HS-INT	DL-600EBK3	44
T11	MD520-4T280-HS-INT	DL-600EBK3	44
	MD520-4T315-HS-INT	DL-600EBK3	44
T12	MD520-4T355-HS-INT	DL-600EBK3	44
	MD520-4T400-HS-INT	DL-700EBK3	39
	MD520-4T450-HS-INT	DL-700EBK3	39

The following figure shows the dimensions of Jianli filters (25 A to 200 A).

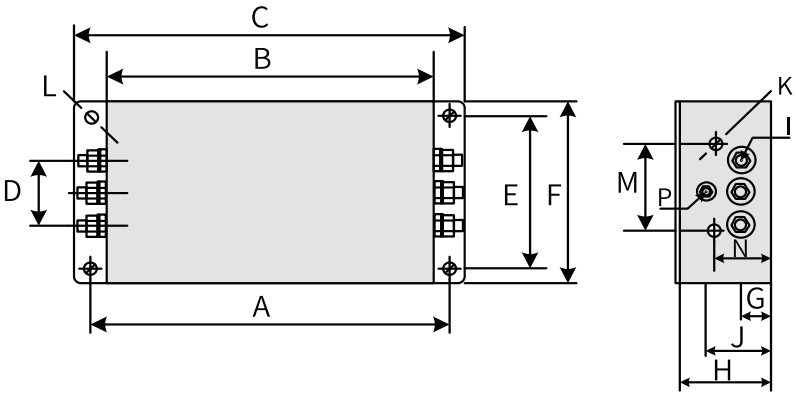


Figure 10-21 Dimensions of Jianli filters (25 A to 200 A, unit: mm)

Table 10–17 Dimensions of Jianli filters (25 A to 200 A, unit: mm)

Model	A	B	C	D	E	F	G	H	I	J	K	M	N	P	L
DL-25EBK5	243	224	265	58	70	102	25	92	M6	58	M4	74	49	M6	6.4x9.4
DL-35EBK5															
DL-50EBK5															
DL-65EBK5															
DL-80EBK5	354	323	388	66	155	188	30	92	M8	62	M4	86	56	M8	6.4x9.4
DL-100EBK5															
DL-130EBK5															
DL-160EBK5															
DL-200EBK5															

The following figure shows the dimensions of Jianli filters (250-800 A).

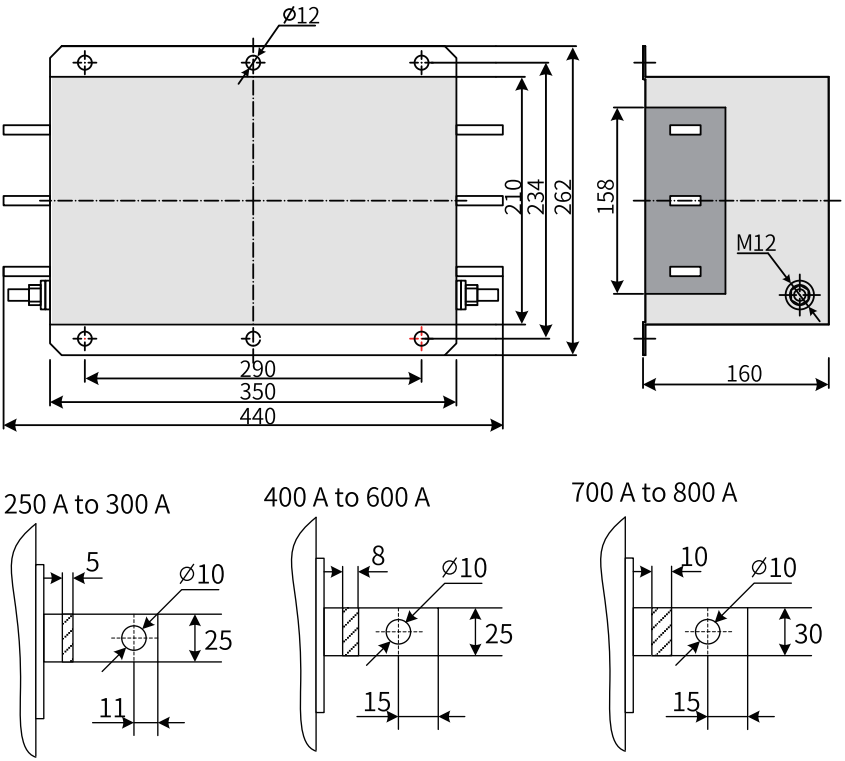


Figure 10-22 Dimensions of Jianli filters (250 A to 800 A, unit: mm)

The following figure shows the dimensions of Jianli filters (1000 A).

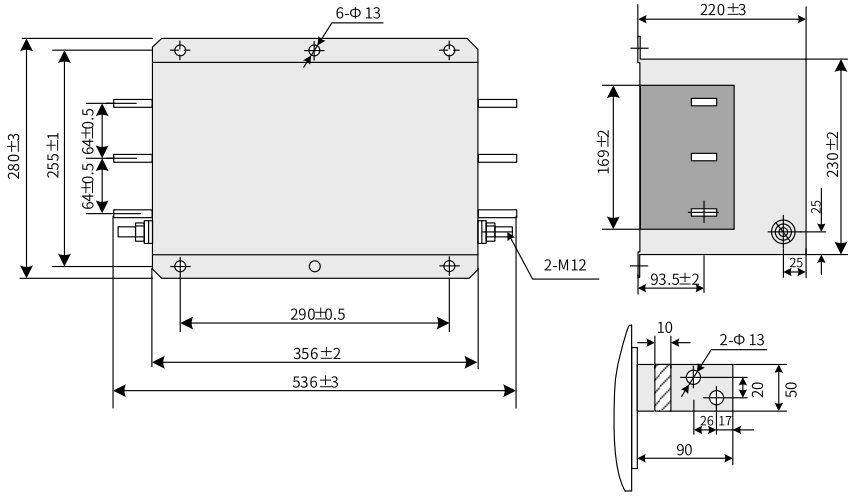
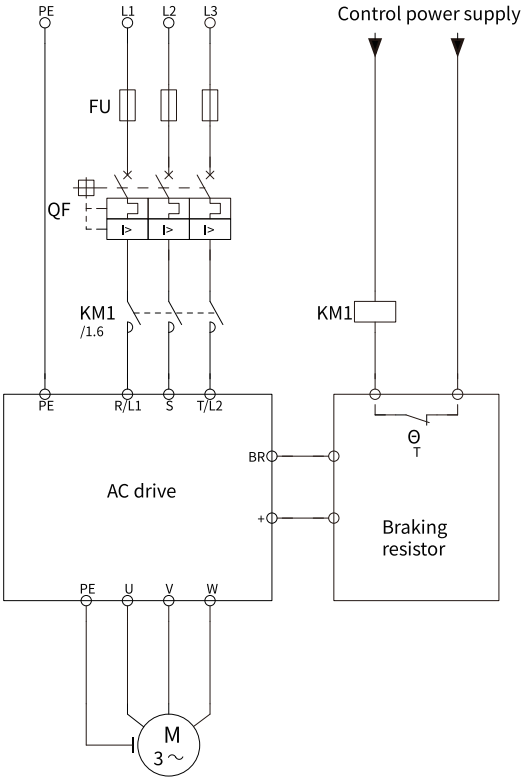


Figure 10-23 Dimensions of Jianli filters (1000 A, unit: mm)

10.3.5Braking Component

Braking resistor protection

In applications where a braking resistor is installed, it is recommended to use a resistor with a temperature switch to ensure safety and avoid overheating and burning of the braking resistor. Connect the temperature switch output to the electromagnetic contactor control circuit on the front end of the AC drive (as shown in the following figure) to implement the interlock protection function. When the resistor overheats, a tripping fault occurs, avoiding the resistor to be burned.



Selecting the resistance of the braking resistor

During braking, almost all the regenerative energy of the motor is consumed by the braking resistor. The resistance of the braking resistor is calculated by the following formula: U x U/R = Pb.

U indicates the braking voltage used to stabilize the system braking. The value of U varies with systems. The default braking voltage of the AC drive is 760 V, which can be adjusted through F9-08.

Pb indicates the braking power.

Selecting the power of the braking resistor

In theory, the power of the braking resistor is consistent with the braking power. However, in consideration of the derating value K, the following equation comes true: K x Pr = Pb x D

K: about 50%

Pr: power of the braking resistor

D: braking frequency, which is the proportion of the regenerative process to the whole working process

The power of the braking resistor Pr can be calculated based on the following equations:

K x Pr=Pb x D= (U x U)/R x D

Pr = (U x U x D)/(R x K)

You can then calculate the power of the braking resistor.

K is the derating factor of the braking resistor. A low K ensures that the braking resistor does not overheat. You can increase K properly in case of good heat dissipation of the braking resistor. Make sure that K does not exceed 50%. Otherwise, the braking resistor will overheat, which may cause fire.

The braking frequency D is determined based on actual applications. *"Table 10-18 " on page 486* lists the typical values in common applications.

Table 10–18 Braking frequencies in common applications

Common application	Elevator	Winding and unwinding	Centrifuge	Occasional braking load	General application
Braking frequency	20% to 30%	20% to 30%	50% to 60%	5%	10%

Outline dimensions of the braking unit

The braking unit has two types of outline dimensions.

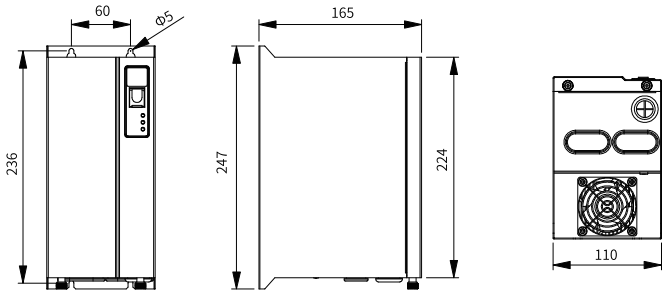


Figure 10-24 Dimensions of MDBUN series braking units (MDBUN-45-2T to MDBUN-90-2T; MDBUN-45-T to MDBUN-90-T; MDBUN-45-5T to MDBUN-90-5T) (mm)

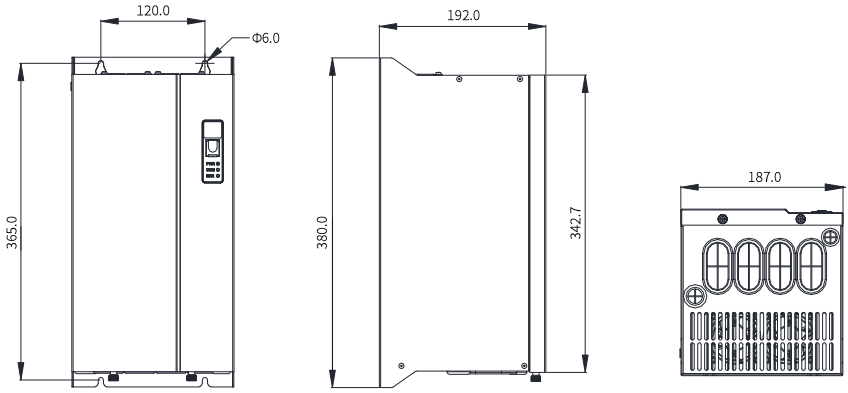


Figure 10-25 Dimensions of MDBUN series braking units (MDBUN-200-T, MDBUN-200-5T, MDBUN-200-7T) (mm)

Braking unit models

Note

The value in the table is obtained under working conditions featuring a braking usage ratio of 10% for heavy overload G-type equipment and a maximum braking time of 10s.

Table 10–19 Selection of braking components (three-phase 380 V to 480 V)

Model	Braking Unit		125% of braking torque (ED: 10%; max. 10s)		Remarks	Minimum Braking Resistance (Ω)
	Model	Quantity	Recommended braking resistor specifications	Quantity of braking resistors		
MD520-4T0.4B-HS-INT	Built-in as standard		80 W, 40 Ω	1	AC drive model with the model name containing "B"	96
MD520-4T0.7B-HS-INT			140 W 800 Ω	1		96
MD520-4T1.1B-HS-INT			220 W 500 Ω	1		96
MD520-4T1.5B-HS-INT			300 W 380 Ω	1		96
MD520-4T2.2B-HS-INT			440 W 260 Ω	1		64
MD520-4T3.0B-HS-INT			600 W 190 Ω	1		64
MD520-4T3.7B-HS-INT			740 W 150 Ω	1		32
MD520-4T5.5B-HS-INT			1100 W 100 Ω	1		32
MD520-4T7.5B-HS-INT			1500 W 75 Ω	1		32
MD520-4T11B-HS-INT			2200 W 50 Ω	1		24
MD520-4T15B-HS-INT			3000 W 38 Ω	1		24
MD520-4T18.5B-HS-INT	Built-in, optional		4000 W 32 Ω	1	AC drive model with the model name containing "B"	24
MD520-4T22B-HS-INT			4500 W 27 Ω	1		24
MD520-4T30-HS-INT			6000 W 20 Ω	1		19.2
MD520-4T37-HS-INT			7000 W 16 Ω	1		14.8
MD520-4T45-HS-INT			9000 W 13 Ω	1		12.8
MD520-4T55-HS-INT			11000 W, 10.5 Ω	1		9.6
MD520-4T75-HS-INT			15000 W, 7.7 Ω	1		6.8
MD520-4T90-HS-INT						
MD520-4T110-HS-INT	MDBUN-60-T	2	9000 W 10.2 Ω	2	Input voltage ≤ 440 VAC	10.2x2
	MDBUN-60-5T	2	9000 W 12.8 Ω	2	Input voltage > 440 VAC	11.4x2
MD520-4T132-HS-INT	MDBUN-90-T	2	11000 W 8.0 Ω	2	Input voltage ≤ 440 VAC	6.8x2
	MDBUN-90-5T	2	11000 W, 10.5 Ω	2	Input voltage > 440 VAC	7.7x2

Model	Braking Unit		125% of braking torque (ED: 10%; max. 10s)		Remarks	Minimum Braking Resistance (Ω)
	Model	Quantity	Recommended braking resistor specifications	Quantity of braking resistors		
MD520-4T160-HS-INT	MDBUN-90-T	2	13000 W 6.8 Ω	2	Input voltage ≤ 440 VAC	6.8x2
	MDBUN-90-5T	2	13000 W 8.8 Ω	2	Input voltage > 440 VAC	7.7x2
MD520-4T200-HS-INT	MDBUN-200-T	2	16000 W 2.8 Ω	2	Input voltage ≤ 440 VAC	2.5x2
	MDBUN-200-5T	2	16000 W 3.6 Ω	2	Input voltage > 440 VAC	2.8x2
MD520-4T220-HS-INT	MDBUN-200-T	2	21000 W 4.1 Ω	2	Input voltage ≤ 440 VAC	2.5x2
	MDBUN-200-5T	2	21000 W 5.3 Ω	2	Input voltage > 440 VAC	3.0x2
MD520-4T250-HS-INT	MDBUN-200-T	2	27000 W 3.2 Ω	2	Input voltage ≤ 440 VAC	2.5x2
	MDBUN-200-5T	2	27000 W 4.1 Ω	2	Input voltage > 440 VAC	3.0x2
MD520-4T280-HS-INT	MDBUN-200-T	3	20000 W 4.3 Ω	3	Input voltage ≤ 440 VAC	2.5x3
	MDBUN-200-5T	3	20000 W 5.5 Ω	3	Input voltage > 440 VAC	3.0x3
MD520-4T315-HS-INT	MDBUN-200-T	3	23000 W 3.8 Ω	3	Input voltage ≤ 440 VAC	2.5x3
	MDBUN-200-5T	3	23000 W 4.9 Ω	3	Input voltage > 440 VAC	3.0x3
MD520-4T355-HS-INT	MDBUN-200-T	3	26000 W 3.4 Ω	3	Input voltage ≤ 440 VAC	2.5x3
	MDBUN-200-5T	3	26000 W 4.3 Ω	3	Input voltage > 440 VAC	3.0x3
MD520-4T400-HS-INT	MDBUN-200-T	3	29000 W 3.0 Ω	3	Input voltage ≤ 440 VAC	2.5x3
	MDBUN-200-5T	3	29000 W 3.9 Ω	3	Input voltage > 440 VAC	3.0x3
MD520-4T450-HS-INT	MDBUN-200-T	3	29000 W 3.0 Ω	3	Input voltage ≤ 440 VAC	2.5x3
	MDBUN-200-5T	3	29000 W 3.9 Ω	3	Input voltage > 440 VAC	3.0x3

Note

- For models of 380 V to 480 V, the default starting braking voltage for the built-in braking unit is 760 V.
- The default initial braking voltage of the external braking units MDBUN-60-T, MDBUN-90-T, and MDBUN-200-T is 670 V. These braking units apply to grids with the input voltage lower than or equal to 440 VAC. The default initial braking voltage of the external braking units MDBUN-60-5T, MDBUN-90-5T, and MDBUN-200-5T is 760 V. These braking units apply to grids with the input voltage higher than 440 VAC. You can adjust the initial braking voltage based on the grid voltage. Higher initial braking voltage requires higher braking resistance.
- The data in the preceding table is only for reference. You can select the resistance and power of the braking resistor as required. (Note that the resistance cannot be lower than the recommended minimum value, whereas the power can exceed or be equal to the recommended value.) Select the braking resistor based on the generation power of the motor in the actual system, system inertia, deceleration time, and potential energy load.
- Larger system inertia requires shorter deceleration time and more frequent braking. In this case, select a braking resistor with a higher power rating and lower resistance.
- For details about how to install and use MDBUN, see *MDBUN Series Braking Unit User Guide*.

10.3.6Simple Filter

The simple EMC filter effectively attenuates radio frequency noise from the power grid and running AC drive. In addition, for devices equipped with the residual current device (RCD), if the RCD trips incorrectly, install a simple filter on the input side of the drive for suppression.

Ground the simple filter properly and use a cable shorter than 30 cm to connect the filter and the drive. Its grounding terminal must be connected to the PE terminal of the AC drive, and the grounding cable (< 30 cm) must be as short as possible.

Dimension

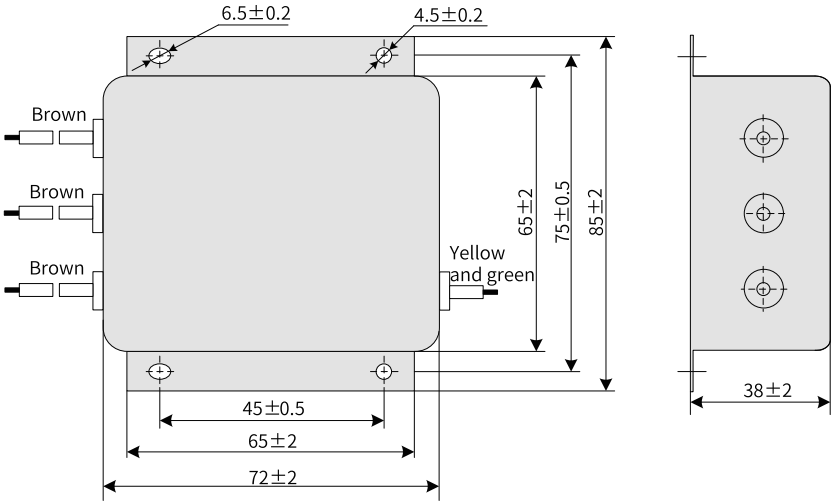


Figure 10-26 Outline dimensions of the simple filter (unit: mm)

Table 10–20 Outline dimensions of the simple filter

Model	Encoding	Outline dimensions (width x depth x height, in unit: mm)	Mounting dimensions (width x depth, in mm)
Cxy-1-1	11025018	85 x 72 x 38	45 x 75

Installation method

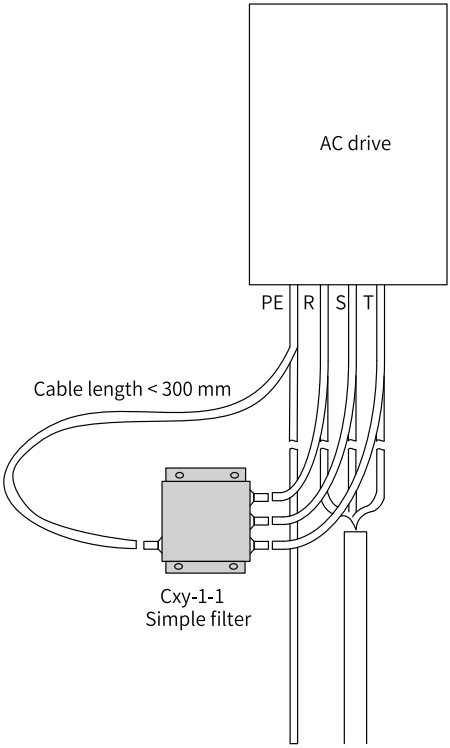


Figure 10-27 Simple filter installation

10.3.7External Operating Panel

Model	Description	Appearance
MDKE-10	It is an optional LED operating panel that supports parameter display and modification. The dimensions are shown below.	
SOP-20-810	SOP-20 is an LCD operating panel (optional) through which you can copy and download parameters. The LCD operating panel offers an easy way of parameter modification and displays information in Chinese and English. It is easy to use. The dimensions are shown below.	

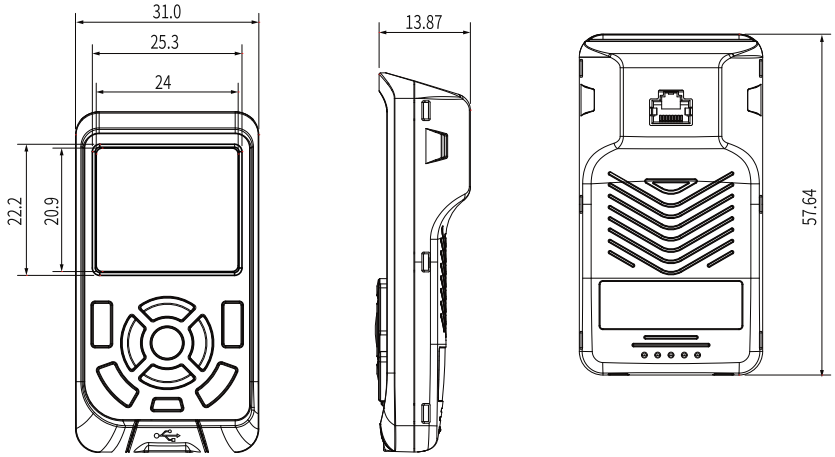


Figure 10-28 Dimensions (unit: mm) of the MDKE-10

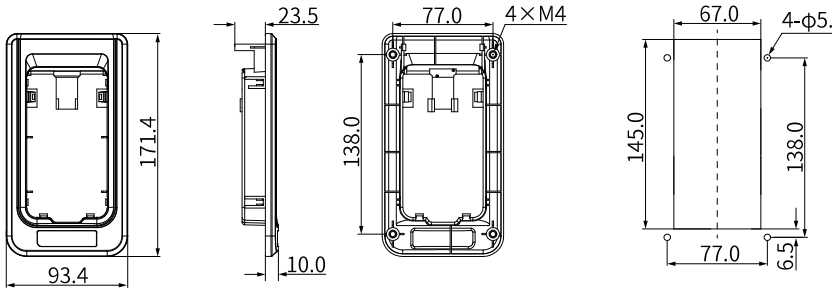


Figure 10-29 Mounting bracket dimensions and hole sizes (mm) of the MDKE-10

Note

If the thickness of the door is 1.5 mm, no bolts are required.

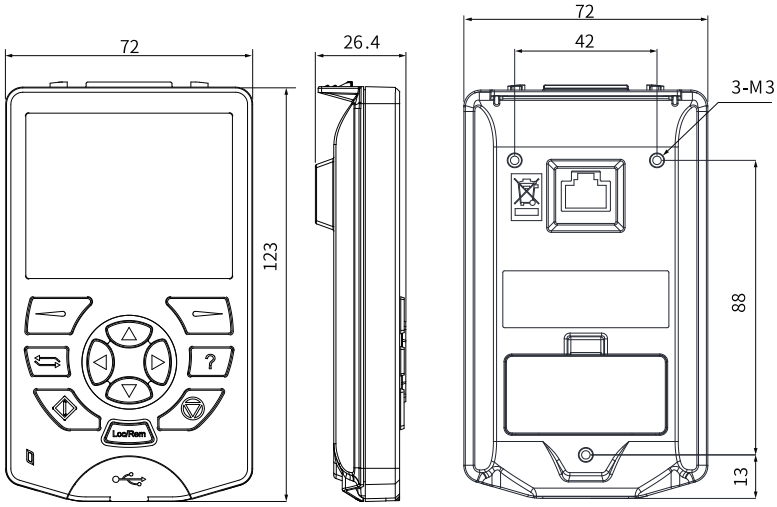


Figure 10-30 Dimensions (unit: mm) of the SOP-20-810

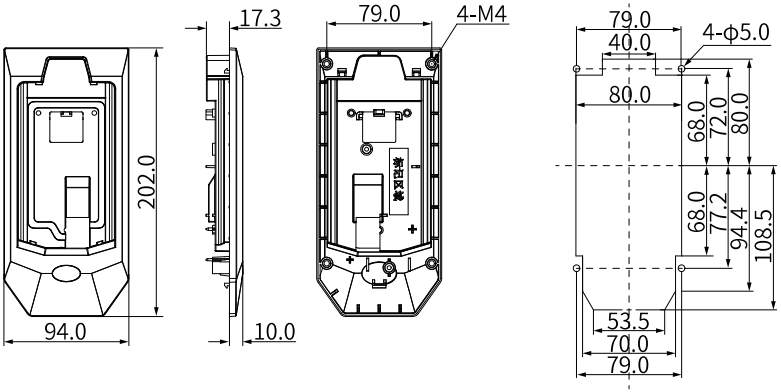
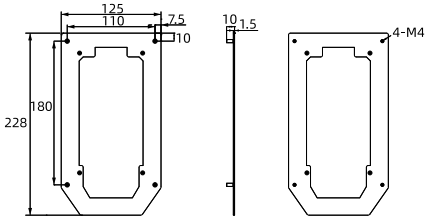
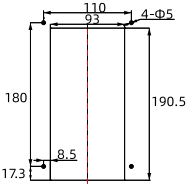


Figure 10-31 Base mounting bracket dimensions and hole sizes (mm) of the SOP-20-810



Adapter plate outline dimensions



Recommended cutout dimensions on the sheet metal for installing base-mounted cabinet door

Figure 10-32 Adapter plate dimensions and hole sizes (mm) of the SOP-20-810

10.3.8Cable

Power cable selection requirements

For selection of power cables, follow national or regional regulations. Select IEC cables according to the following requirements:

- Compliant with EN 60204-1 and IEC 60364-5-52 standards
- PVC insulated cables with copper conductors
- Heat resistance: ambient temperature of 40°C and cable surface temperature of 70°C (Note: Contact the manufacturer when the ambient temperature exceeds 40°.)
- Symmetric cable with copper-braided shield

If the recommended cables for peripheral equipment or options are not suitable for the product, contact Inovance.

To meet the EMC requirements, the cable with the shield must be used. The shielded cables are divided into three-conductor cables and four-conductor cables, as shown below. If the conductivity of three-conductor cable shield cannot meet requirements, add an independent PE cable. Alternatively, use a four-conductor cable with one conductor as the PE. The shield of the shielded cable consists of coaxial cooper braids to suppress radio frequency interference. The braided density of the cooper braid should be greater than 90% to enhance the shielding efficiency and conductivity.

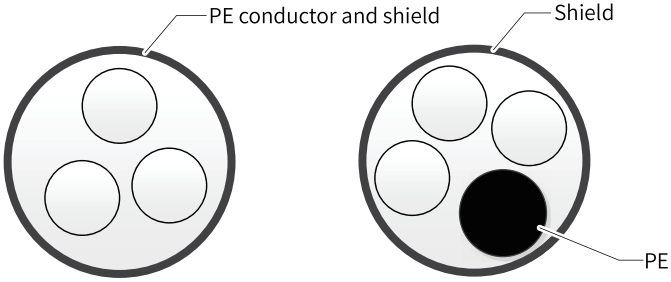


Figure 10-33 Recommended power cable

Recommended cable

Table 10–21 Cable selection (three-phase 380–480 V, with CE certification)

Structure	Option model	Rated input current (A)	Rated output current (A)	RST/UVW		Ground cable		RST/UVW terminal width (mm)	Screw specification	Tightening torque (N·m) (lb.in)
				Recommended cable (mm^2)[1]	Recommended terminal model	Recommended cable (mm^2)[1]	Recommended terminal model			
T1	MD520-4T0.4B-HS-INT	1.8	1.5	3x1.5	TNR1.25-4	1.5	TNR1.25-4	8	M4	1.2 (10.6)
	MD520-4T0.7B-HS-INT	2.5	2.1	3x1.5	TNR1.25-4	1.5	TNR1.25-4		M4	1.2 (10.6)
	MD520-4T1.1B-HS-INT	3.7	3.1	3x1.5	TNR1.25-4	1.5	TNR1.25-4		M4	1.2 (10.6)
	MD520-4T1.5B-HS-INT	4.6	3.8	3x1.5	TNR1.25-4	1.5	TNR1.25-4		M4	1.2 (10.6)
	MD520-4T2.2B-HS-INT	6.4	5.1	3x1.5	TNR1.25-4	1.5	TNR1.25-4		M4	1.2 (10.6)
	MD520-4T3.0B-HS-INT	9.1	7.2	3x1.5	TNR1.25-4	1.5	TNR1.25-4		M4	1.2 (10.6)
T2	MD520-4T3.7B-HS-INT	11.4	9	3x2.5	TNR2-4	2.5	TNR2-4	8.5	M4	1.2 (10.6)
	MD520-4T5.5B-HS-INT	15.9	13	3x2.5	TNR2-4	2.5	TNR2-4	8.5	M4	1.2 (10.6)
T3	MD520-4T7.5B-HS-INT	22.4	17	3x4	TNR3.5-4	4	TNR3.5-5	9.5	M5	2.8 (24.8)
	MD520-4T11B-HS-INT	32.9	25	3x6	TNR5.5-5	6	TNR5.5-5	9.5	M5	2.8 (24.8)
T4	MD520-4T15B-HS-INT	39.7	32	3 x 10	TNR8-5	10	TNR8-5	12	M5	2.8 (24.8)
T5	MD520-4T18.5B-HS-INT	49.5	37	3 x 10	TNR8-5	10	TNR8-6	12	M6	4.8 (42.5)
	MD520-4T22B-HS-INT	59	45	3 x 16	GTNR16-6	16	GTNR16-6	12.4	M6	4.8 (42.5)
T6	MD520-4T30-HS-INT	57.0	60.0	3 x 16	GTNR16-6	16	GTNR16-6	12.4	M6	4.8 (42.5)
	MD520-4T37-HS-INT	69.0	75.0	3 x 25	GTNR25-6	16	GTNR16-6	14	M6	4.8 (42.5)
T7	MD520-4T45-HS-INT	89.0	91.0	3x35	GTNR35-6	16	GTNR16-8	16.5	M8	13.0 (115.2)
	MD520-4T55-HS-INT	106.0	112.0	3 x 50	GTNR50-8	25	GTNR25-8	18	M8	13.0 (115.2)

Structure	Option model	Rated input current (A)	Rated output current (A)	RST/UVW		Ground cable		RST/UVW terminal width (mm)	Screw specification	Tightening torque (N·m) (lb.in)
				Recommended cable (mm^2)[1]	Recommended terminal model	Recommended cable (mm^2)[1]	Recommended terminal model			
T8	MD520-4T75-HS-INT	139.0	150.0	3 x 70	GTNR70-12	35	GTNR35-8	21.8	M12 (main power)	35.0 (310.1) 13.0 (115.2)
									M8 (grounding)	35.0 (310.1) 13.0 (115.2)
	MD520-4T90-HS-INT	164.0	176.0	3 x 95	GTNR95-12	50	GTNR50-8	25	M12 (main power)	35.0 (310.1) 13.0 (115.2)
									M8 (grounding)	13.0 (115.2)
	MD520-4T110-HS-INT	196.0	210.0	3 x 120	GTNR120-12	70	GTNR70-8	28.4	M12 (main power)	35.0 (310.1)
									M8 (grounding)	13.0 (115.2)
	MD520-4T132-HS-INT	240.0	253.0	3 x 150	BC150-12	95	GTNR95-10	30	M12 (main power)	35.0 (310.1)
									M8 (grounding)	13.0 (115.2)

Structure	Option model	Rated input current (A)	Rated output current (A)	RST/UVW		Ground cable		RST/UVW terminal width (mm)	Screw specification	Tightening torque (N·m) (lb.in)
				Recommended cable (mm^2)[1]	Recommended terminal model	Recommended cable (mm^2)[1]	Recommended terminal model			
T9	MD520-4T160-HS-INT*	287.0	304.0	3 x 185	BC185-12	95	BC95-10	33.5	M12 (main power)	35.0 (310.1)
									M10 (grounding)	20 (117)
	MD520-4T200-HS-INT	287.0	304.0	3 x 240	BC240-12	120	BC120-10	37.7	M12 (main power)	35.0 (310.1)
									M10 (grounding)	20 (117)
T10	MD520-4T220-HS-INT	365.0	377.0	2 x (3 x 150)	BC150-12	150	BC150-12	30	M12	35.0 (310.1)
	MD520-4T250-HS-INT*	410.0	426.0	2 x (3 x 150)	BC150-12	150	BC150-12	30	M12	35.0 (310.1)
T11	MD520-4T280-HS-INT*	441.0	465.0	2 x (3 x 185)	BC185-12	185	BC185-12	33.5	M12	35.0 (310.1)
	MD520-4T315-HS-INT*	495.0	520.0	2 x (3 x 240)	BC240-14	240	BC240-14	37.7	M12	35.0 (310.1)
T12	MD520-4T355-HS-INT*	565.0	585.0	2 x (3 x 240)	BC240-16	240	BC240-16	37.7	M16	85.0 (753.1)
	MD520-4T400-HS-INT*	617.0	650.0	2x (3 x 300)	BC300-16	300	BC300-16	41	M16	85.0 (753.1)
	MD520-4T450-HS-INT*	780.0	820.0	4 x (3 x 150)	BC240-16	2x150	BC240-16	30	M16	85.0 (753.1)

Note

[1] applies to standards in China, where 3 x 10 means one three-core 10 mm² cable, and 2 x (3 x 120) means two three-core 120 mm² cables. The preceding recommended lugs are the TNR, GTNR, and BC series lugs from Suzhou Yuanli. The preceding recommended terminals are the TNR, GTNR, and BC series of Suzhou Yuanli.

Note:

1. Observe national or regional regulations.
   - Cables with PVC insulation and copper conductor
   - Heat resistance: ambient temperature of 40°C and cable surface temperature of 70°C (Note: When the ambient temperature exceeds 40°C, contact Inovance.)
   - Cable routing method is E (see standard IEC60204-1)
2. Cables marked with an asterisk (*) require copper busbar for connection.
3. If the conditions vary, select the model according to actual conditions.

Table 10–22 Cable selection (three-phase 380–480 V) (with UL certification)

Structure	Option model	Rated input current (A)	Rated output current (A)	RST/UVW		Ground cable		RST/UVW terminal width (mm)	Screw specification	Tightening torque (N·m) (lb.in)
				Recommended cable (AWG/kcmil)[2]	Recommended terminal model	Recommended cable (AWG/kcmil)[2]	Recommended terminal model			
T1	MD520-4T0.4B-HS-INT	1.8	1.5	3x14	TLK2.5-4	14	TLK2.5-4	7.5	M4	1.2 (10.6)
	MD520-4T0.7B-HS-INT	2.5	2.1	3x14	TLK2.5-4	14	TLK2.5-4	7.5	M4	1.2 (10.6)
	MD520-4T1.1B-HS-INT	3.7	3.1	3x14	TLK2.5-4	14	TLK2.5-4	7.5	M4	1.2 (10.6)
	MD520-4T1.5B-HS-INT	4.6	3.8	3x14	TLK2.5-4	14	TLK2.5-4	7.5	M4	1.2 (10.6)
	MD520-4T2.2B-HS-INT	6.4	5.1	3x14	TLK2.5-4	14	TLK2.5-4	7.5	M4	1.2 (10.6)
	MD520-4T3.0B-HS-INT	9.1	7.2	3x14	TLK2.5-4	14	TLK2.5-4	7.5	M4	1.2 (10.6)
T2	MD520-4T3.7B-HS-INT	11.4	9	3x14	TLK2.5-4	14	TLK2.5-4	7.5	M4	1.2 (10.6)
	MD520-4T5.5B-HS-INT	15.9	13	3x12	TLK4-4	12	TLK4-4	8.5	M4	1.2 (10.6)
T3	MD520-4T7.5B-HS-INT	22.4	17	3x10	TLK6-5	10	TLK6-5	10	M5	2.8 (24.8)
	MD520-4T11B-HS-INT	32.9	25	3x8	TLK10-5	8	TLK10-5	12	M5	2.8 (24.8)

Structure	Option model	Rated input current (A)	Rated output current (A)	RST/UVW		Ground cable		RST/UVW terminal width (mm)	Screw specification	Tightening torque (N·m) (lb.in)
				Recommended cable (AWG/kcmil)[2]	Recommended terminal model	Recommended cable (AWG/kcmil)[2]	Recommended terminal model			
T4	MD520-4T15B-HS-INT	39.7	32	3x8	TLK10-5	8	TLK10-5	12	M5	2.8 (24.8)
T5	MD520-4T18.5B-HS-INT	49.5	37	3x6	TLK16-6	6	TLK16-6	12	M6	4.8 (42.5)
	MD520-4T22B-HS-INT	59	45	3x6	TLK16-6	6	TLK16-6	12	M6	4.8 (42.5)
T6	MD520-4T30-HS-INT	57.0	60.0	3x6	TLK16-6	6	TLK16-6	12	M6	4.8 (42.5)
	MD520-4T37-HS-INT	69.0	75.0	3x4	TLK25-6	6	TLK16-6	14	M6	4.8 (42.5)
T7	MD520-4T45-HS-INT	89.0	91.0	3x2	TLK35-8	4	TLK25-8	17	M8	13.0 (115.2)
	MD520-4T55-HS-INT	106.0	112.0	3x2	TLK35-8	4	TLK25-8	17	M8	13.0 (115.2)
T8	MD520-4T75-HS-INT	139.0	150.0	3x1/0	TLK50-12	2	TLK35-8	23	M12 (main power)	35.0 (310.1)
									M8 (grounding)	13.0 (115.2)
	MD520-4T90-HS-INT	164.0	176.0	3x3/0	TLK85-12	1/0	TLK50-8	26	M12 (main power)	35.0 (310.1)
									M8 (grounding)	13.0 (115.2)
	MD520-4T110-HS-INT	196.0	210.0	3 x 4/0	TLK120-12	2/0	TLK70-8	28	M12 (main power)	35.0 (310.1)
									M8 (grounding)	13.0 (115.2)
	MD520-4T132-HS-INT	240.0	253.0	3x250 kcmil	SQNBS150-12	3/0	TLK85-10	22	M12 (main power)	35.0 (310.1)
									M8 (grounding)	13.0 (115.2)

Structure	Option model	Rated input current (A)	Rated output current (A)	RST/UVW		Ground cable		RST/UVW terminal width (mm)	Screw specification	Tightening torque (N·m) (lb.in)
				Recommended cable (AWG/kcmil)[2]	Recommended terminal model	Recommended cable (AWG/kcmil)[2]	Recommended terminal model			
T9	MD520-4T160-HS-INT*	287.0	304.0	3x350 kcmil	TLK185-12	4/0	TLK120-10	35	M12 (main power)	35.0 (310.1)
									M10 (grounding)	20 (117)
	MD520-4T200-HS-INT	359	377	3×500kcmil	SQNBS325-12	250 kcmil	TLK150-10	37.2	M12	35.0 (310.1)
T10	MD520-4T220-HS-INT	410	426	2x(3x250 kcmil)	TLK150-12	250 kcmil	TLK150-12	31	M12	35.0 (310.1)
	MD520-4T250-HS-INT*	441	465	2x(3x300 kcmil)	TLK150-12	300 kcmil	TLK150-12	31	M12	35.0 (310.1)
T11	MD520-4T280-HS-INT*	495	520	2x(3x350 kcmil)	TLK185-12	350 kcmil	TLK185-12	35	M12	35.0 (310.1)
	MD520-4T315-HS-INT*	565	585	2x(3x400 kcmil)	SQNBS200-14	400 kcmil	SQNBS200-14	35.5	M16	85.0 (753.1)
T12	MD520-4T355-HS-INT*	617	650	2x(3x500 kcmil)	TLK300-16	500 kcmil	TLK300-16	43	M16	85.0 (753.1)
	MD520-4T400-HS-INT*	687	725	2x(3x600 kcmil)	SQNBS325-16	600 kcmil	SQNBS325-16	37.2	M16	85.0 (753.1)
	MD520-4T450-HS-INT*	782	820	4 x (3 x 300 kcmil)	TLK150-16	2 x 300 kcmil	TLK150-16	31	M16	85.0 (753.1)

Note

[2] applies to standards in the USA, where 3x8 means one three-core 8AWG cable, 3x1/0 means one three-core 1/0AWG cable, and 2x(3x250 kcmil) means two three-core 250 kcmil cables. The preceding recommended cable lugs are TLK and SQNBS series lugs from KST.

Note:

1. Observe national or regional regulations.
   - Cables with PVC insulation and copper conductor
   - Heat resistance: ambient temperature of 40°C and cable surface temperature of 75°C (Note: When the ambient temperature exceeds 40°C, contact Inovance.)
   - Cable routing method is E (see standard IEC60204-1)
2. Cables marked with an asterisk (*) require copper busbar for connection.
3. If the conditions vary, select the model according to actual conditions.

Recommended terminal

The following table describes recommended terminals, including the TNR, GTNR, and BC series of Suzhou Yuanli. The terminals with UL certifications are TLK and SQNBS series of KST.

Table 10–23 Appearances, models, and dimensions of the TNR series terminals (unit: mm)

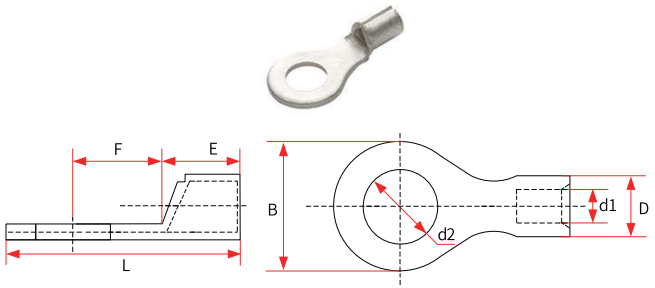
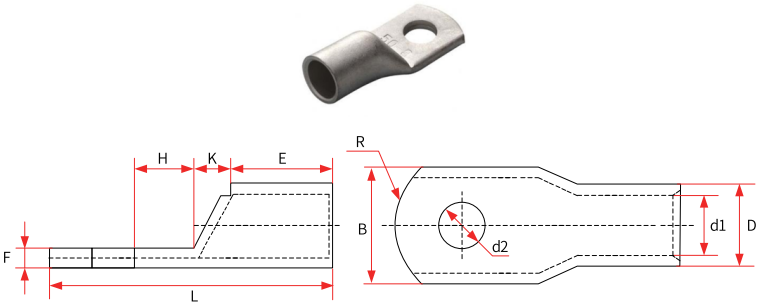
Model	Specification		D	d1	E	F	B	d2	L	Current (A)	Crimping tool
	AWG/ MCM	mm^2									
											
TNR0.75-4	22-16	0.25-1.0	2.8	1.3	4.5	6.6	8.0	4.3	15.0	10	RYO-8 AK-1M
TNR1.25-4	22-16	0.25-1.65	3.4	1.7	4.5	7.3	8	5.3	15.8	19	

Table 10–24 Appearances, models, and dimensions of the GTNR series terminals (unit: mm)

Model	D	d1	E	H	K	B	d2	F	L	R	Crimping tool
											
GTNR1.5-5	4.0	2.2	5.0	5.0	2.0	8.0	5.3	1.0	16.0	5	RYO-8 YYT-8 RYO-14
GTNR2.5-4	4.5	2.9	7.0	5.0	2.0	8.0	4.3	1.0	18.0	5	
GTNR2.5-5	4.5	2.9	7.0	6.0	2.0	8.0	5.3	1.0	20.0	7	
GTNR2.5-6	4.5	2.9	7.0	6.0	2.0	10.2	6.4	0.8	20.0	7	
GTNR4-5	5.2	3.6	7.0	6.0	2.0	10.0	5.3	1.0	20.0	7	
GTNR4-6	5.2	3.6	7.0	6.0	2.0	10.0	6.4	1.0	20.0	7	
GTNR6-5	6.0	4.2	9.0	6.0	3.0	10.0	5.3	1.2	23.0	7	
GTNR6-6	6.0	4.2	9.0	7.5	3.0	10.0	6.4	1.2	26.0	7	
GTNR6-8	6.0	4.2	9.0	7.5	3.0	12.0	8.4	1.0	26.0	7	
GTNR10-6	7.0	5.0	9.0	8.0	3.5	12.4	6.4	1.3	26.5	7	
GTNR10-8	7.0	5.0	9.0	8.0	3.5	12.4	8.4	1.3	27.5	7	
GTNR16-6	7.8	5.8	12.0	8.0	4.0	12.4	6.4	1.3	31.0	7	CT-38 CT-100
GTNR16-8	7.8	5.8	12.0	8.0	4.0	12.4	8.4	1.3	31.0	7	
GTNR25-6	9.5	7.5	12.0	8.0	4.5	14.0	6.4	2.0	32.0	10	
GTNR25-8	9.5	7.5	12.0	9.0	4.5	15.5	8.4	1.6	34.0	10	
GTNR25-10	9.5	7.5	12.0	10.5	4.5	17.5	10.5	1.4	37.0	10	
GTNR35-6	11.4	8.6	15.0	9.0	5.0	15.5	6.4	2.8	38.0	10	
GTNR35-8	11.4	8.6	15.0	9.0	5.0	15.5	8.4	2.8	38.0	10	
GTNR35-10	11.4	8.6	15.0	10.5	5.0	17.5	10.5	2.5	40.5	10	
GTNR50-8	12.6	9.6	16.0	11.0	6.0	18.0	8.4	2.8	43.5	10	CT-100
GTNR50-10	12.6	9.6	16.0	11.0	6.0	18.0	10.5	2.8	43.5	10	
GTNR70-8	15.0	12.0	18.0	13.0	7.0	21.0	8.4	2.8	50.0	14	
GTNR70-10	15.0	12.0	18.0	13.0	7.0	21.0	10.5	2.8	50.0	14	
GTNR70-12	15.0	12.0	18.0	13.0	7.0	21.0	13.0	2.8	50.0	14	
GTNR95-10	17.4	13.5	20.0	13.0	9.0	25.0	10.5	3.9	55.0	14	
GTNR95-12	17.4	13.5	20.0	13.0	9.0	25.0	13.0	3.9	55.0	14	

Model	D	d1	E	H	K	B	d2	F	L	R	Crimping tool
GTNR120-12	19.8	15.0	22.0	14.0	10.0	28.0	13.0	4.7	60.0	16	RYC-150
GTNR120-16	19.8	15.0	22.0	16.0	10.0	28.0	17.0	4.7	64.0	16	
GTNR150-12	21.2	16.5	26.0	16.0	11.0	30.0	13.0	4.7	69.0	24	
GTNR150-16	21.2	16.5	26.0	16.0	11.0	30.0	17.0	4.7	69.0	24	
GTNR185-16	23.5	18.5	32.0	17.0	12.0	34.0	17.0	5.0	78.0	24	
GTNR240-16	26.5	21.5	38.0	20.0	14.0	38.0	17.0	5.5	92.0	24	
GTNR240-20	26.5	21.5	38.0	20.0	14.0	38.0	21.0	5.5	92.0	24	

Table 10–25 Appearances, models, and dimensions of the BC series terminals (unit: mm)

Model	A	B	W	E	D	L	T	C	F
120-8	19.0	15.0	27.2	16.5	27.0	73.0	4.0	8.5	16.5
120-10								10.5	
120-12								12.8	
120-14								14.7	
120-16								16.7	
120-20				18.8				20.7	14.3
150-8	21.0	16.5	30.0	16.5	27.0	78.0	4.5	8.5	16.5
150-10								10.5	
150-12								12.8	
150-14								14.7	
150-16								16.7	
150-20				18.8				20.7	14.3

Model	A	B	W	E	D	L	T	C	F
185-10	23	18.5	33.5	16.5	30	82	4.5	10.5	16.5
185-12								12.8	
185-14								14.7	
185-16								16.7	
185-20				18.8				20.7	14.3
240-10	26	21	37.7	18.0	32.0	88.0	5.0	10.5	17.0
240-12								12.8	
240-14								14.7	
240-16								16.7	
240-20								20.7	
300-10	28.0	23.0	41.0	18.0	37.0	97.0	5.0	10.5	17.0
300-12								12.8	
300-14								14.7	
300-16								16.7	
300-20								20.7	

11 Maintenance and Repair

11.1 Routine Check

11.1.1 Daily Checklist

The ambient temperature, humidity, dust, and vibration will cause aging of components inside the drive, which leads to potential faults and shortens the service life of the drive. Therefore, routine maintenance on the device is required. The maintenance interval must be shortened when the drive is used in environments suffering from high ambient temperature, frequent startup and stop, violent fluctuation in the AC power supply and the load, strong vibration or shock, and intrusive and corrosive substances such as dust, metal dust, and hydrochloric acid.

Check the following items daily to ensure a proper operation of the device. It is recommended to make a copy of this checklist and sign the "Checked" column after each inspection.

Item	Content	Solution	Checked
Motor	Check for unusual vibration or noise.	• Check whether the mechanical connection is normal. • Check whether phase loss occurs on the motor. • Check whether motor screws are tightened.	
Fan	Check whether the fan of the AC drive and motor operates normally.	• Check whether the fan of the AC drive operates properly. • Check whether the fan of the motor operates properly. • Check whether the air duct is blocked. • Check whether the ambient temperature is within the permissible range.	
Installation environment	Check whether the control cabinet and cable ducts are normal.	• Check for insulation damage of input and output cables. • Check the mounting bracket for vibration. • Check whether copper bars and terminals become loose or get corroded.	
Load	Check whether the operating current of the drive exceeds the rated current of the drive and motor.	• Check for settings of motor parameters. • Check whether the motor is overloaded. • Check whether the mechanical vibration is severe (normal condition: < 0.6 g).	
Input voltage	Check whether the power supply voltage between the main circuit and control circuit is normal.	• Check whether the input voltage is within the permissible range. • Check whether heavy load starts around.	

11.1.2Regular Checklist

The following shows items to be checked every one or two years. Determine the actual inspection cycle based on actual application and operating environment. Regular maintenance helps detect product function deterioration and damage.

Make a copy of the following checklist and sign the "Checked" column after each inspection.



Do not perform inspection or connection work with power on. Failure to do so may result in an electric shock. Cut off the power supplies of all equipment before wiring or repair. 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 safety voltage range. Failure to do so may result in an electric shock.

Item	Content	Solution	Checked
AC drive	Check for waste, dirt and dust on the surface of the drive.	• Check whether the controller cabinet has been powered off. • Use a vacuum cleaner to suck up waste and dust to prevent direct contact with the components. • Wipe the surface dirt that is difficult to clean with alcohol and wait until the surface becomes dry.	
Cable	• Check power cables and connections for discoloration. • Check whether the insulation is aged or cracked.	• Replace the cracked cable. • Replace the damaged terminals.	
Peripherals of the electromagnetic contactor	• Check whether the contactor closes tightly or generates unusual noise during closing. • Check whether short circuit, water seepage, swelling, or cracking occurs on any peripheral device.	Replace the abnormal components.	

Item	Content	Solution	Checked
Air duct	• Check whether the air duct and heatsink are blocked. • Check whether the fan is damaged.	• Clean the air duct. • Replace the fan.	
Control circuit	• Check whether control components are in poor contact. • Check whether terminal screws are loose. • Check whether the insulation of the control cable is cracked.	• Remove foreign objects on the surface of control cables and terminals. • Replace the damaged or corroded control cables.	

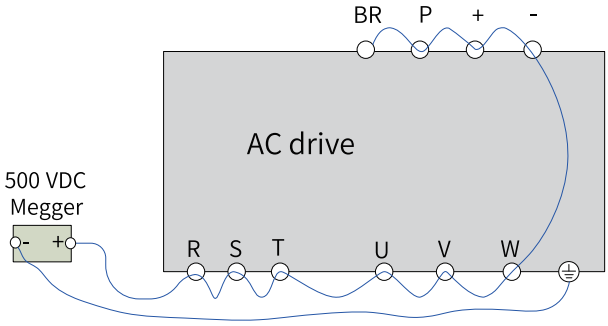
11.2 Main Circuit Insulation Test

Note

Do not perform high voltage test (> 500 V) again because it has been done before delivery.

Remove the voltage dependent resistor screw before test and disconnect the voltage dependent resistor.

Before measuring insulation resistance with a megameter (500 VDC megameter recommended), disconnect the main circuit from the AC drive. Do not use the insulation resistance meter to test the insulation of the control circuit. See the following figure.



The measured insulation resistance must be greater than 5 MΩ.

CAUTION

Disconnect the optional grounding screw of VDR before performing a voltage resistance test. Otherwise, the test may fail.

11.3 Quick-Wear Parts Replacement

11.3.1Service Life of Quick-Wear Parts

The quick-wear parts of the AC drive include the cooling fan and filter electrolytic capacitor. The service life of such devices is closely related to the operating environment and maintenance conditions. Generally, the service life is as follows.

Name	Service Life [Note]
Fan	≥ 5 years
Filter electrolytic Capacitor	≥ 5 years
Note: The service life indicates the time when the part is used in the following conditions. You can determine when to replace the part according to the actual operating time. Ambient temperature: 40°C Load rate: 80% Operating rate: 24 hours per day	

11.3.2Replacing the Cooling Fan

Fan quantity

- The fan may be damaged due to worn-out bearing or aging blades.
- How to determine whether the fan needs to be replaced: (1) Check for signs of cracks on the blade. (2) Check for unexpected noise upon start. (3) Check whether the blade works properly.
- How to replace the fan: Press down the snap-fit joint of the fan cover and pull the fan outward. After replacing the fan, ensure the fan blows the air upwards.

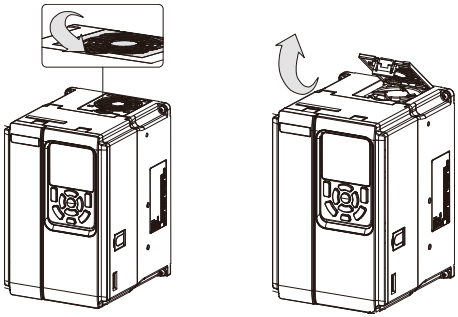
Table 11–1 Number of fans

Model	Cooling fan
T1 T2 T3 (7.5 kW) T5 to T7	1
T3 (11 kW) T4 T8 to T10	2
T11 to T12	3

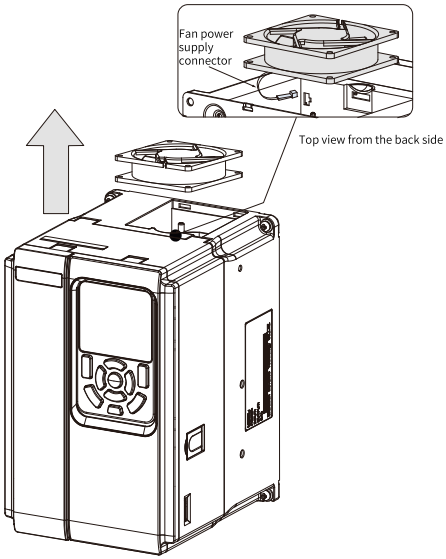
Removing and installing the fan of T1 to T6 models

Removing the fan

1. Press the snap-fit joint on the fan cover gently and remove the cover.



2. Pull the fan upward and disconnect the plug of the power cable.

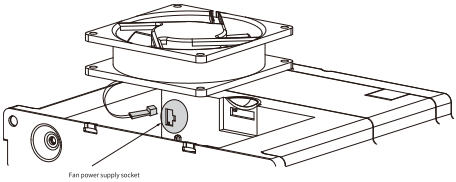


Installing the fan

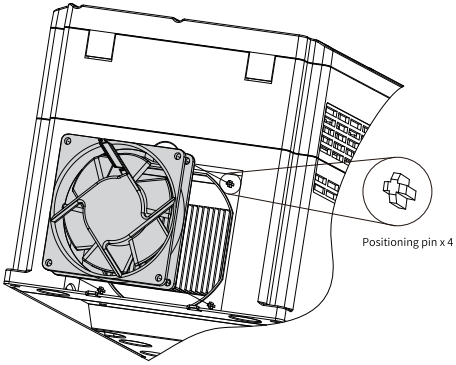
Note

- Install the fan in the reverse order of removal and ensure the correct direction of the fan.
- The fan should rotate clockwise to blow air into the motor air duct when viewed from the rear cover of the fan.

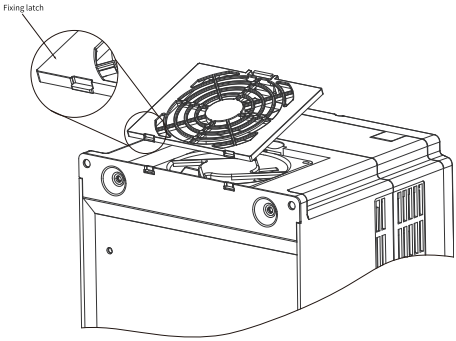
1. Plug the fan power cable connector to the socket.



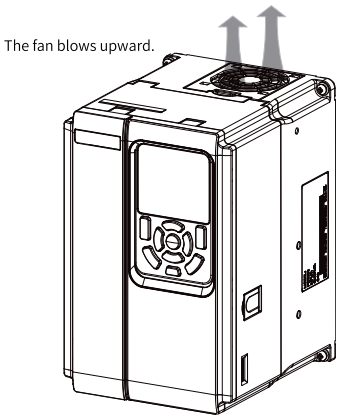
2. Install the fan into the drive, with the four fixing holes at the bottom of the fan aligned with the positioning pins.



3. Insert the two small snap-fit joints on the fan cover into the slot and then press down to fix the snap-fit joints.



4. After replacing the fan, ensure the fan blows the air upwards.



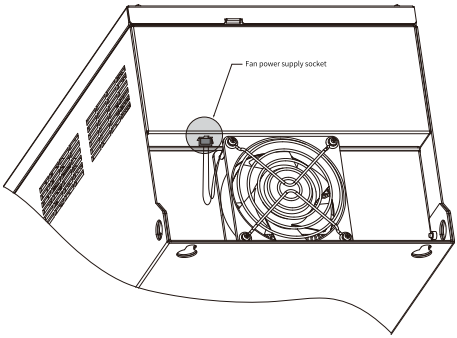
Removing and installing cooling fans of T7 to T9 Models

Note

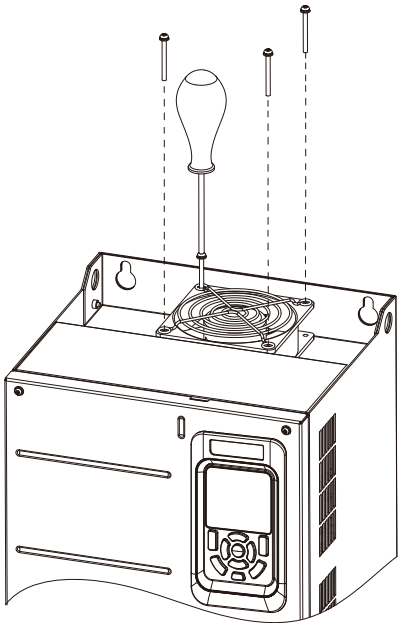
The number and location of cooling fans vary with product models, but the fans are removed and installed in the same way.

Removing the fan

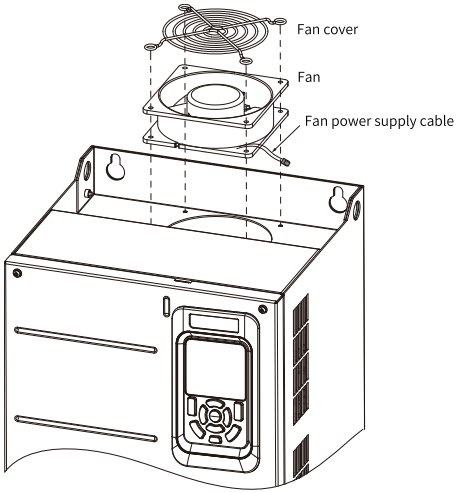
1. Disconnect the power cable connector of the fan (top view).



2. Remove the four fixing screws on the fan cover with a screwdriver.



3. Remove the fan and fan cover from the drive.

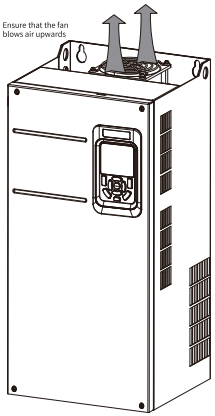


Installing the fan

1. Install the fan in the reverse order of removal and ensure the correct direction of the fan.

2. Align the fixing holes of the fan cover and the fan with those on the drive during installation.

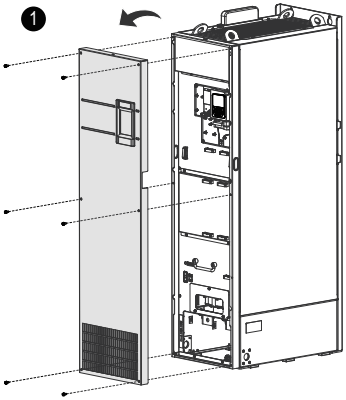
3. After replacing the fan, ensure the fan blows the air upwards.



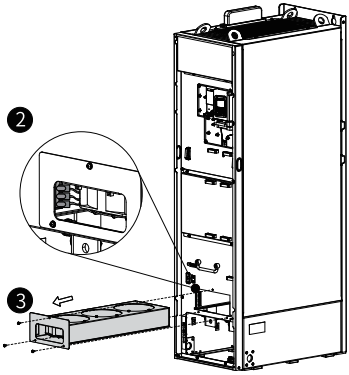
Removing and installing cooling fans of T10 to T12 models

Removing the fan

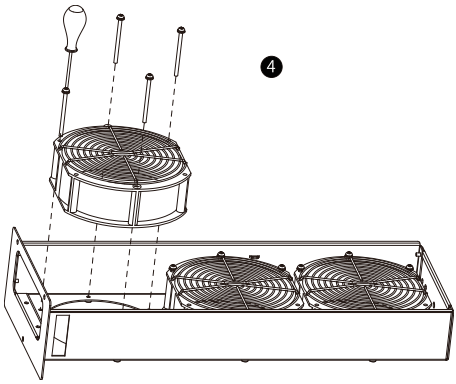
1. Remove the six fixing screws on the cover. Then, hold the cover with both hands and lift it up in the direction indicated by the arrow to remove the cover.



2. Disconnect the power cable connectors of all fans. Remove the three fixing screws from the fan box and pull out the fan box in the direction indicated by the arrow.



3. Remove the four fixing screws from each fan cover and remove the fan.

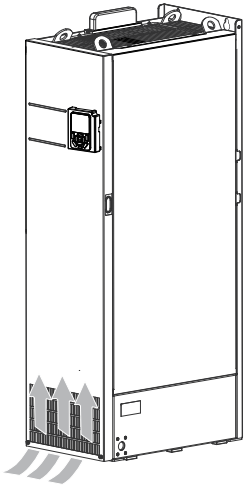


Installing the fan

1. Install the fan in the reverse order of removal and ensure the correct direction of the fan.

2. Align the fan box with the rail and push it into the drive.

3. Connect the fan power cable connector first and then fix the fan box. After replacing the fan, ensure the fan blows the air upwards.



11.3.3Replacing the Filter Electrolytic Capacitor

- Possible damage causes: input power supply in poor quality, high ambient temperature, frequent load jumping, and electrolytic aging
- Condition to determine whether the capacitor needs to be replaced: 1) Check whether there is liquid leakage. 2) Check whether the safety valve has protruded. 3) Measure the static capacitance and the insulation resistance.
- Replacement: As the capacitor involves the internal parts, never replace the capacitor by yourself. Contact Inovance for replacement.

11.4 Storage and Warranty

Storage

To store the AC drive properly, observe the following:

- Store the AC drive with the original packing carton provided by Inovance.
- Do not expose the AC drive to environments with moisture, high temperatures, or direct sunlight for a long time.
- The electrolytic capacitor will deteriorate after long-term storage. Therefore, switch on the AC drive once for at least 5 hours every 6 months. Increase the input voltage slowly to the rated value by using a voltage regulator. Contact Inovance for technical support if necessary.

Warranty

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is caused by proper operation of the user. Maintenance will be charged after the warranty expires.

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

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

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

For details, see Product Warranty Card.

Service and Support

Should you encounter a safety accident during the use or operation of the product, or face challenges in operating and maintaining the equipment, which remain unresolved after the relevant documentation is consulted, we provide multiple channels to ensure prompt resolution:

- Channel #1: Contact service@inovance.com.
- Channel #2: Visit https://www.inovance.com/global to access document downloads, after-sales support, spare parts ordering, repair applications, and authenticity verification services.
- Channel #3: Download My Inovance app (https://zshc-eu.inovance.com/download-pc/) where you can access products info and documentation, and query product parameters.

We are committed to providing you with quick and professional technical support, and we look forward to your satisfaction and trust.

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