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MD500-PLUS Series General-Purpose AC Drive

Quick Installation and Commissioning Guide

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

Data code 19011581 A04

Preface

Introduction

The MD500-PLUS series AC drive is a general-purpose high-performance current vector control AC drive. It is designed to control and regulate the speed and torque of three-phase AC asynchronous motors and permanent magnet synchronous motors. The AC drive can be used to drive textile machines, paper machines, wire drawing machines, machine tools, packaging machines, food machines, fans, water pumps, and other automated production equipment.

This guide introduces the installation, wiring, commissioning, and trial operation of the product, including installation dimensions, mechanical installation, electrical installation, commissioning and trial operation, troubleshooting, and parameter list.

More Documents

Document	Data Code	Description
MD500-PLUS Series General-Purpose AC Drive Quick Installation and Commissioning Guide (delivered with the product)	19011581	This guide introduces the installation, wiring, commissioning, troubleshooting, parameters, fault codes, and others.
MD500-PLUS Series General-Purpose AC Drive Hardware Guide	19011578	This guide describes the system composition, technical specifications, components, dimensions, options (installation accessories, cables, and peripheral electrical components), expansion cards, as well as product-related daily maintenance and maintenance instructions, certifications, standards, and others.
MD500-PLUS Series General-Purpose AC Drive Installation Guide	19011582	This guide introduces the installation dimensions, space design, specific installation steps, wiring requirements, routing requirements, option installation requirements, and troubleshooting of common EMC-related problems.
MD500-PLUS Series General-Purpose AC Drive Commissioning Guide	19011579	This guide introduces the commissioning tool, process, procedure, troubleshooting, fault codes, and parameters of the AC drive.
MD500-PLUS Series General-Purpose AC Drive Software Guide	19011580	This guide introduces function application, communication, fault codes, and parameters of the AC drive.

Revision History

Date	Version	Revision
November 2021	A04	Updated parameters.
September 2021	A03	Updated version on the front cover and back cover.
November 2020	A01	Corrected minor mistakes.
July 2020	A00	First release.

Guide Acquisition

This user guide is not delivered along with the product. You can obtain the PDF version of this document by the following method:

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

Table of Contents

Fundamental Safety Instructions

Safety Precautions

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

Safety Levels and Definitions

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

General Safety Instructions

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

Unpacking

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

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

Storage and Transportation

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

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

Installation

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

WARNING

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

CAUTION

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

Wiring

DANGER

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

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

- During wiring, follow the proper electrostatic discharge (ESD) procedure, and wear an antistatic wrist strap. Failure to comply will damage the equipment or the internal circuits of the equipment.
- Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding purpose. Failure to comply will result in equipment malfunction.

Power-on

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

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

Operation

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

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

Maintenance

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

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

Repair

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

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

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

Safety Labels

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

Safety Signs		Description
T1 to T12 models		• Read through the safety instructions before operating the equipment. Failure to comply may result in equipment damage, personal injuries, or even death. • Do not touch terminals or remove the cover while the power is on or within 10 minutes after the power is turned off. Failure to comply may result in an electric shock.
T13 models		• Read through the safety instructions before operating the equipment. Failure to comply may result in equipment damage, personal injuries, or even death. • Do not touch terminals or remove the cover while the power is on or within 15 minutes after the power is turned off. Failure to comply may result in an electric shock.

1 Mechanical Installation

1.1 Installing T1 to T9 Models

1.1.1 T1 to T9 Models

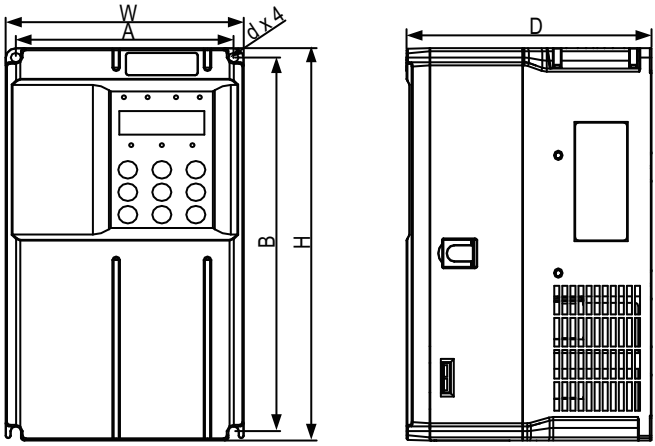


Figure 1-1 Dimension drawing of T1 to T4 models

Table 1–1 Dimensions of T1 to T4 models

Structure	Mounting Hole mm (in.)		Outline Dimensions mm (in.)				Mounting Hole Diameter mm (in.)	Weight kg (lb)
	A	B	H	H1	W	D		
T1	119 (4.7)	189 (7.5)	200 (7.9)	-	130 (5.1)	152 (6.0)	Ø5 (0.2)	1.6 (3.5)
T2	119 (4.7)	189 (7.5)	200 (7.9)	-	130 (5.1)	162 (6.4)	Ø5 (0.2)	2.0 (4.4)
T3	128 (5.0)	238 (9.4)	250 (9.9)	-	140 (5.5)	170 (6.7)	Ø6 (0.2)	3.3 (7.3)
T4	166 (6.5)	266 (10.5)	280 (11.0)	-	180 (7.1)	170 (6.7)	Ø6 (0.2)	4.3 (9.5)

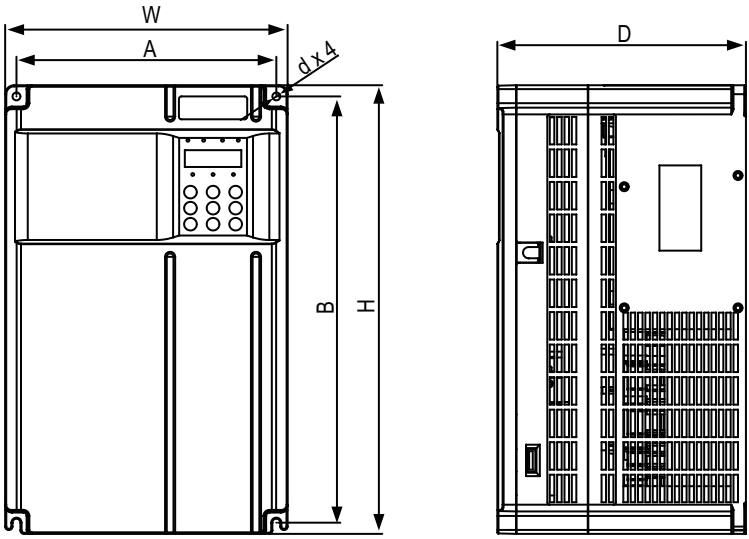


Figure 1-2 Dimension drawing of T5 to T6 models

Table 1–2 Dimensions of T5 to T6 models

Structure	Mounting Hole mm (in.)		Outline Dimensions mm (in.)				Mounting Hole Diameter mm (in.)	Weight kg (lb)
	A	B	H	H1	W	D		
T5 (without DC reactor)	195 (7.7)	335 (13.2)	350 (13.8)	-	210 (8.3)	192 (7.6)	Ø6 (0.2)	7.6 (16.8)
T5 (with DC reactor)	195 (7.7)	335 (13.2)	350 (13.8)	-	210 (8.3)	192 (7.6)	Ø6 (0.2)	10.0 (22.0)
T6	230 (9.1)	380 (15.0)	400 (15.8)	-	250 (9.9)	220 (8.7)	Ø7 (0.3)	17.5 (38.6)

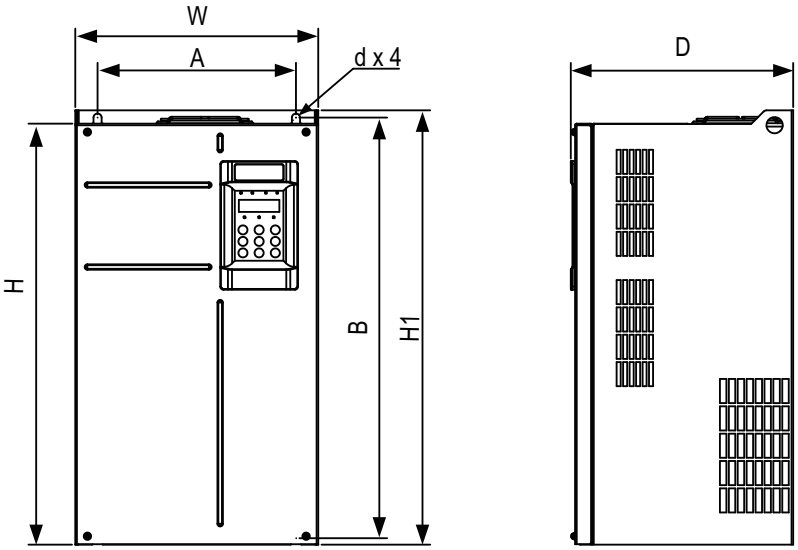


Figure 1-3 Dimension drawing of T7 to T9 models

Table 1–3 Dimensions of T7 to T9 models

Structure	Mounting Hole mm (in.)		Outline Dimensions mm (in.)				Mounting Hole Diameter mm (in.)	Weight kg (lb)
	A	B	H	H1	W	D		
T7	245 (9.7)	523 (20.6)	525 (20.7)	542 (21.4)	300 (11.8)	275 (10.8)	Ø10 (0.4)	35 (77.2)
T8	270 (10.6)	560 (22.1)	554 (21.8)	580 (22.9)	338 (13.3)	315 (12.4)	Ø10 (0.4)	51.5 (113.5)
T9	320 (12.6)	890 (35.1)	874 (34.4)	915 (36.1)	400 (15.8)	320 (12.6)	Ø10 (0.4)	85 (187.4)

1.1.2 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.

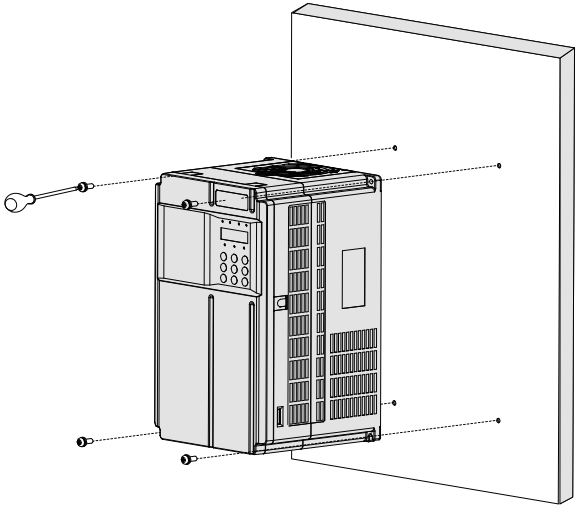


Figure 1-4 Backplate mounting (T1 to T6 models)

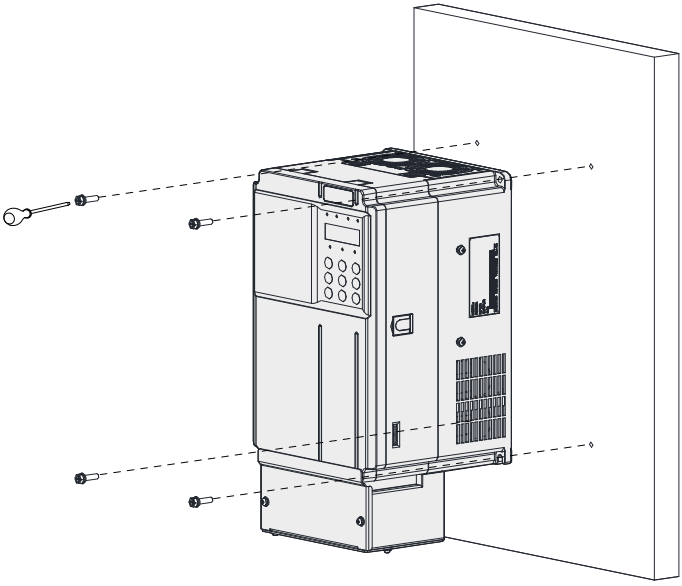


Figure 1-5 Backplate mounting (T1 to T6 models, with conduit boxes)

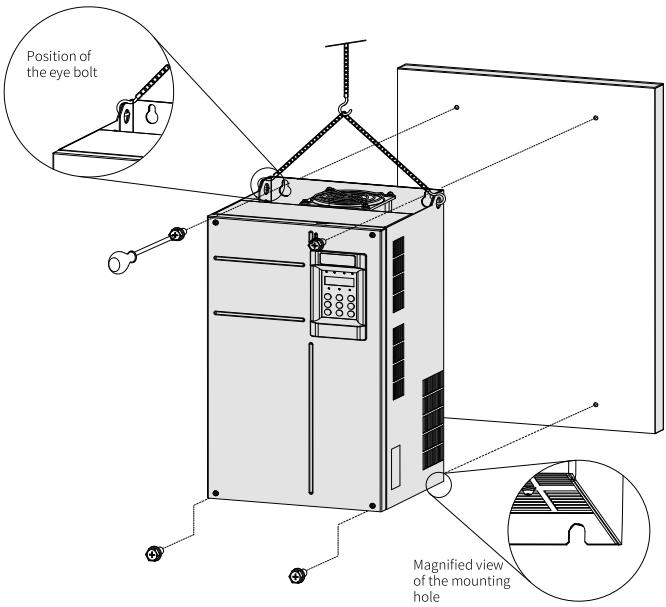
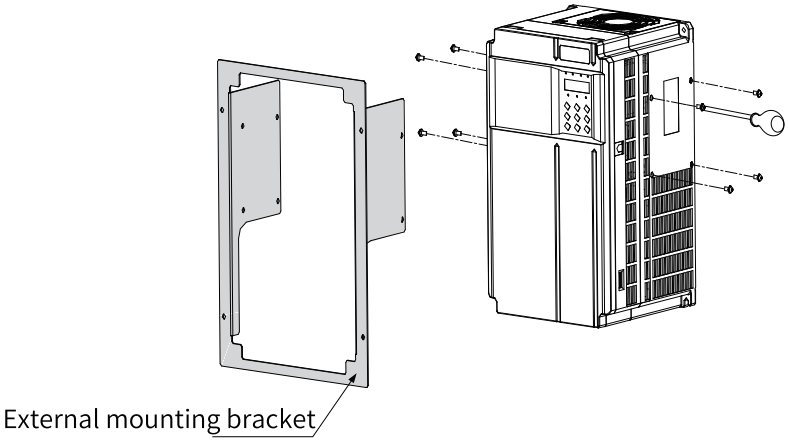


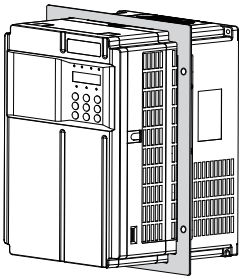
Figure 1-6 Backplate mounting (T7 to T9 models)

1.1.3 Through-Hole Mounting

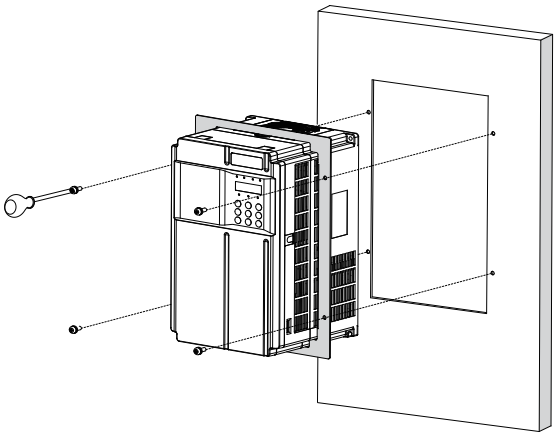
1. T1 to T6 models:
   a. Put the bracket around the AC drive, and tighten the bracket fixing screws on the left and right sides of the AC drive.



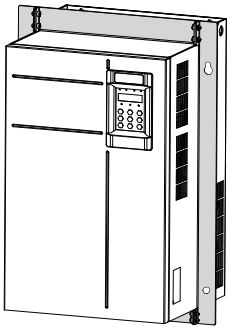
The following figure shows an AC drive with a bracket mounted.



b. Fasten the AC drive with the bracket mounted onto the mounting backplate of the control cabinet.

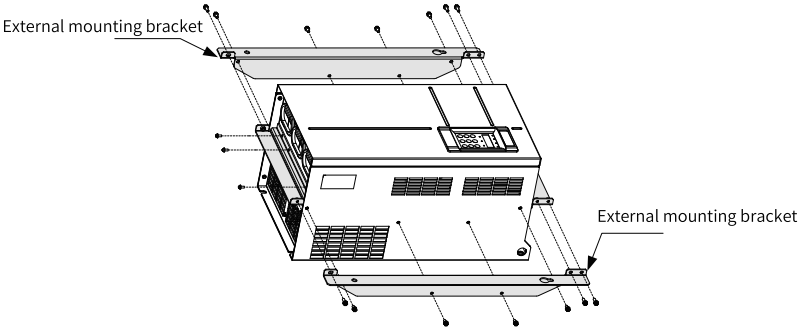


The following figure shows an AC drive that is through-hole mounted.

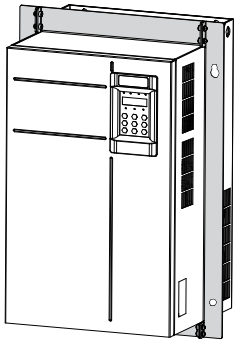


2. T7 to T9 models:

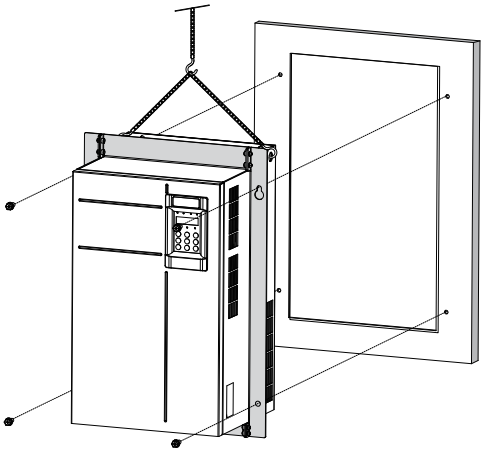
a. Fasten brackets to the two sides of the AC drive.



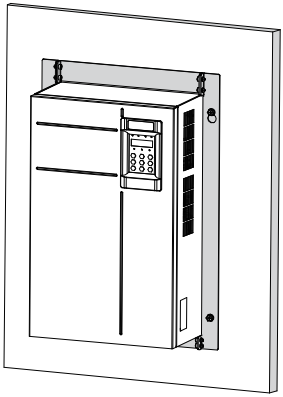
The following figure shows an AC drive with brackets mounted.



b. Fasten the AC drive onto the backplate of the control cabinet from the front of the control cabinet.



The following figure shows an AC drive that is through-hole mounted.



1.2 Installing T10 to T12 Models

1.2.1 T10 to T12 Models (Without AC Output Reactor)

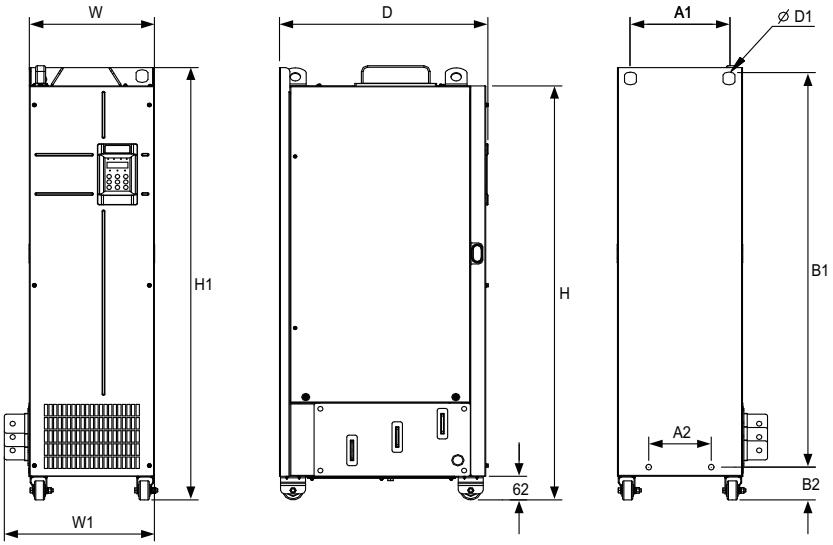


Figure 1-7 Dimension drawing of T10 to T12 models (without AC output reactor)

Table 1–4 Dimensions of T10 to T12 models (without AC output reactor)

Structure	Mounting Hole Spacing mm (in.)				Outline Dimensions mm (in.)					Mounting Hole Diameter mm (in.)	Weight kg (lb)
	A1	A2	B1	B2	H	H1	W	W1	D	D1	
T10	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	225 (8.9)	185 (7.3)	1175 (46.3)	97 (3.8)	1248 (49.2)	1284 (50.6)	330 (13.0)	390 (15.4)	545 (21.5)	ϕ13 (0.5)	155 (341.7)
T12	240 (9.5)	200 (7.9)	1280 (50.4)	101 (4.0)	1355 (53.4)	1405 (55.4)	340 (13.4)	400 (15.8)	545 (21.5)	ϕ16 (0.6)	185 (407.9)

1.2.2 T10 to T12 Models (with AC Output Reactor)

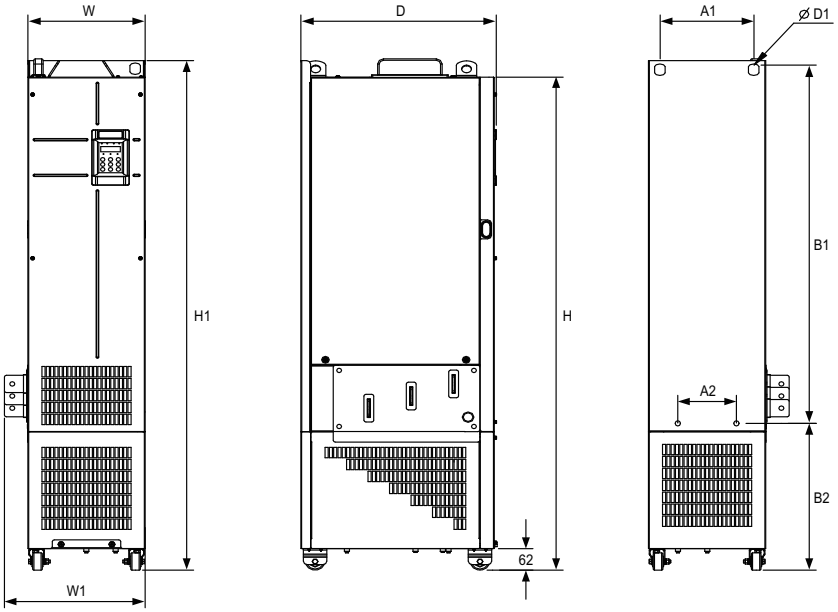


Figure 1-8 Dimension drawing of T10 to T12 models (with AC output reactor)

Table 1–5 Dimensions of T10 to T12 models (with AC output reactor)

Structure	Mounting Hole Spacing mm (in.)				Outline Dimensions mm (in.)					Mounting Hole Diameter mm (in.)	Weight kg (lb)
	A1	A2	B1	B2	H	H1	W	W1	D	D1	
T10	240 (9.5)	150 (5.9)	1035 (40.8)	424 (16.7)	1424 (56.1)	1472 (58.0)	300 (11.8)	360 (14.2)	500 (19.7)	ϕ13 (0.5)	160 (352.7)
T11	225 (8.9)	185 (7.3)	1175 (46.3)	435 (17.1)	1586 (62.5)	1622 (63.9)	330 (13.0)	390 (15.4)	545 (21.5)	ϕ13 (0.5)	215 (474.0)
T12	240 (9.5)	200 (7.9)	1280 (50.4)	432 (17.0)	1683 (66.3)	1733 (68.3)	340 (13.4)	400 (15.8)	545 (21.5)	ϕ16 (0.6)	245 (540.1)

1.2.3 Installation in a Cabinet

Procedure

1. Install the fixing beam for fixing the AC drive in a nine-fold profile cabinet (PS cabinet), with mounting holes reserved in the beam.
   "Figure 1–9 " on page 19 shows the cross section of the nine-fold profile.

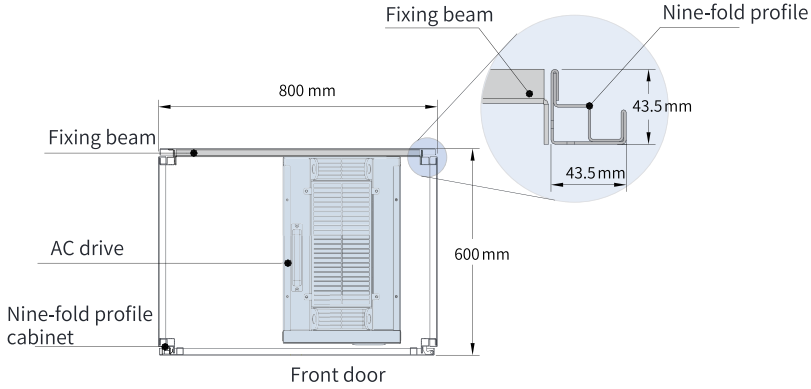


Figure 1-9 Top view of a cabinet for T11 and T12 models

To place the T11 or T12 model in a nine-fold profile cabinet 600 mm in depth, fold the back mounting plate inward, as shown in *"Figure 1–10 " on page 20* , to borrow the space of the column, which does not apply to the installation in a standard cabinet greater than 800 mm in depth. A 600 mm deep cabinet with both front access and back access is unable to house a T11 or T12 model. In this case, a standard cabinet with a depth of 800 mm is recommended.

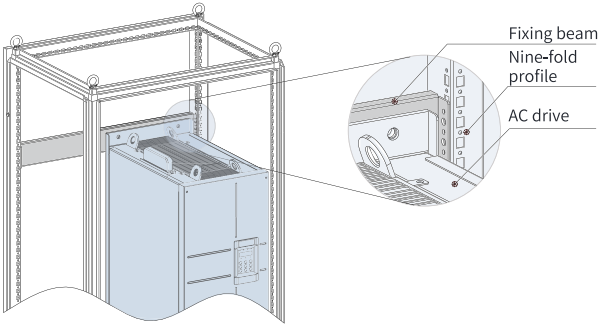


Figure 1-10 Perspective view of a cabinet for T11 and T12 models

2. Fix the bottom mounting bracket in a nine-fold profile cabinet.
   Use six M5 self-tapping screws to fix the mounting bracket onto the rack base of the nine-fold profile cabinet, as shown in *"Figure 1–11 " on page 20* .

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

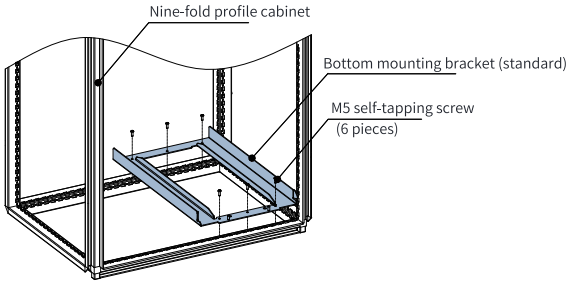


Figure 1-11 Installing the bottom mounting bracket

3. Make a guide rail assembly (model: MD500-AZJ-A3T10) and mount the guide rail assembly to the cabinet.
   a. *"Figure 1–12 " on page 21* shows how to make a guide rail assembly.

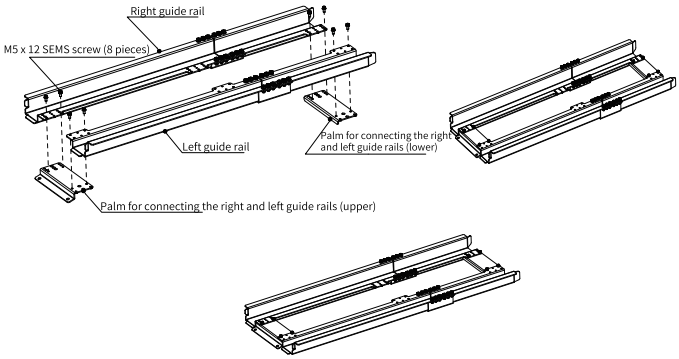


Figure 1-12 Making a guide rail assembly

b. Align the two round holes on the front end of the guide rail assembly with the screws of the mounting bracket, and lock them with two M6 nuts to mount the guide rail assembly to the cabinet, as shown in *"Figure 1–13 " on page 21* .

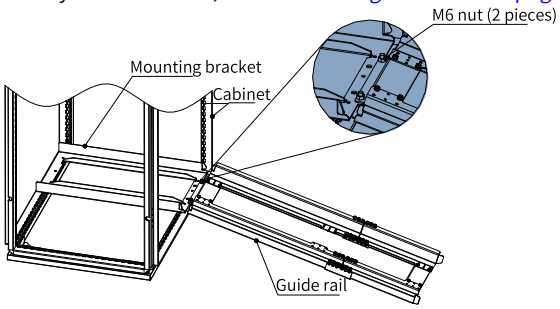


Figure 1-13 Mounting the guide rail assembly to the cabinet

4. Remove the cover from the AC drive.
   For details about how to remove the cover, see "Removing Cover". With the cover removed, the auxiliary handle on the AC drive is exposed.
5. Align the casters of the AC drive with the guide rails and gently push the AC drive into the cabinet.
   Use an auxiliary strap to prevent the AC drive from toppling when it is being pushed in or pulled out. It is recommended that two persons cooperate to complete this job.

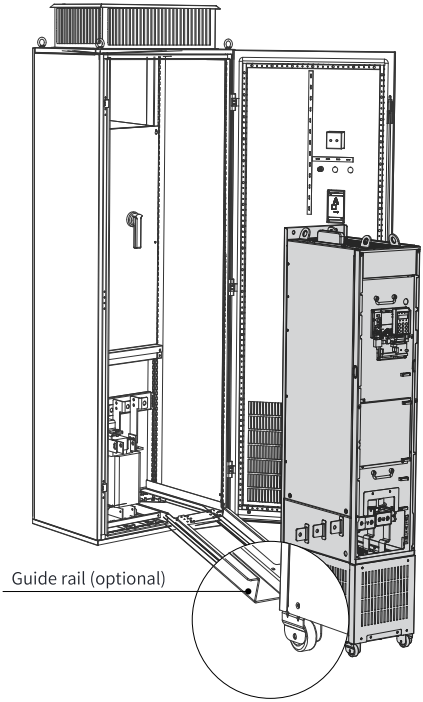


Figure 1-14 Aligning the casters with the guide rails

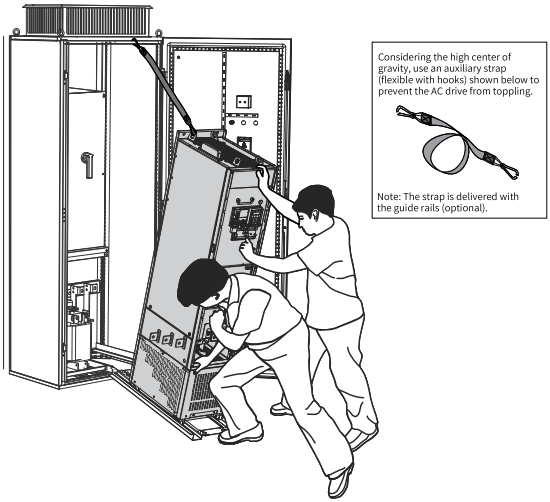


Figure 1-15 Pushing the AC drive into the cabinet

6. Remove the auxiliary strap, and drive screws into the four mounting holes in the back of the AC drive to fasten the AC drive to the fixing beam in the cabinet.

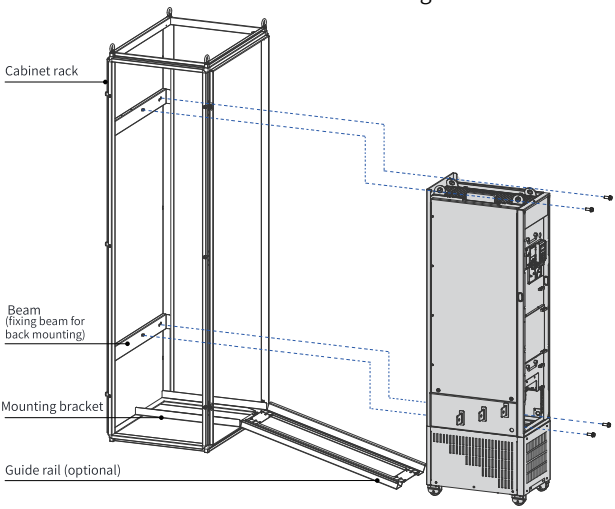


Figure 1-16 Fastening the AC drive to the fixing beam

7. Verify that the AC drive is securely installed, and remove the guide rails.
8. Remove the air filter baffle from the top of the AC drive. The baffle is used to prevent foreign objects such as screws from falling into the air filter when the AC drive is being installed in the cabinet.

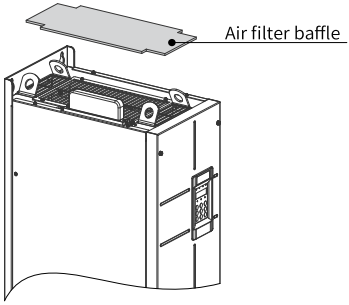


Figure 1-17 Removing the air filter baffle

1.3 Installing T13 Models

1.3.1 T13 Models (Without Auxiliary Power Distribution Cabinet)

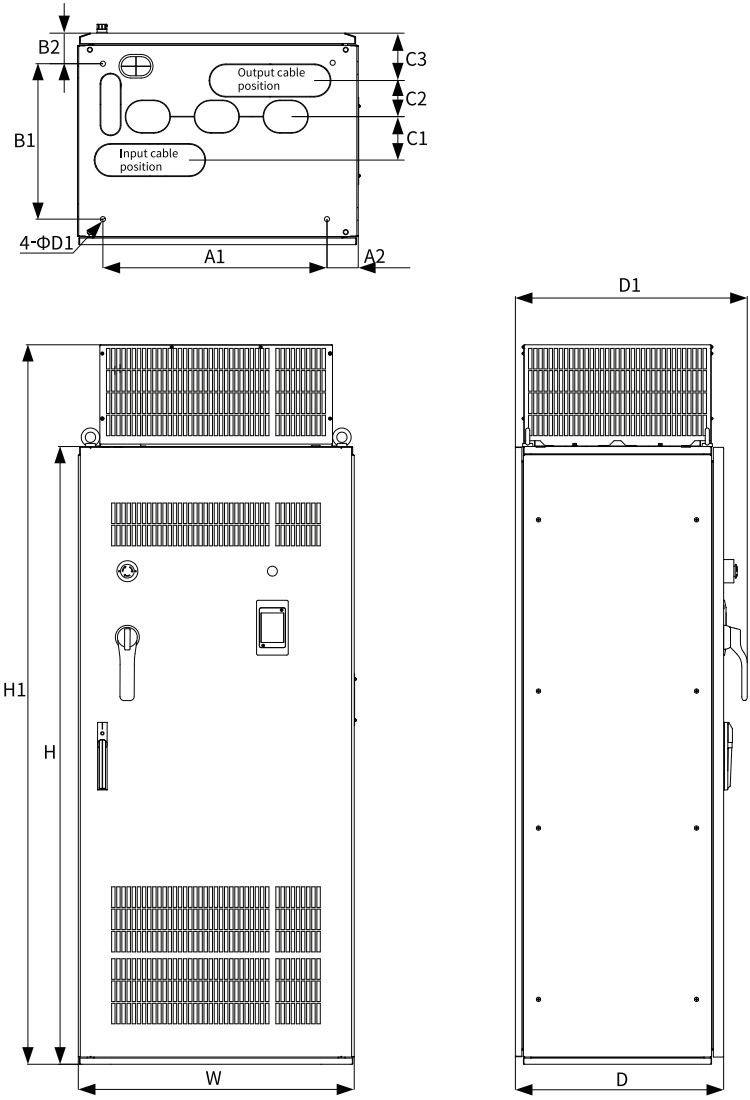


Figure 1-18 Dimension drawing of T13 models (without auxiliary power distribution cabinet)

Table 1–6 Dimensions of T13 models (without auxiliary power distribution cabinet)

Structure	Mounting Hole Spacing mm (in.)							Outline Dimensions mm (in.)					Mounting Hole Diameter mm (in.)	Weight kg (lb)
	A1	A2	B1	B2	C1	C2	C3	H	H1	W	D	D1	D1	
T13	660 (26.0)	73.5 (2.9)	450 (17.7)	85 (3.3)	125 (4.9)	104 (4.1)	136 (5.4)	1800 (70.9)	2100 (82.7)	805 (31.7)	610 (24.0)	680 (26.8)	15 (0.6)	530 (1168.4)

1.3.2 Requirements on Ground Flatness

1. Place the AC drive on a flat and sturdy mounting base able to bear the weight of the AC drive
2. Ensure the normal use of the door lock when opening and closing the cabinet door.
3. When installing cabinets in parallel, ensure that there is no gap between the cabinets and the floor. For any inevitable gap (as shown by ① in the following figure), use a pad (as shown by ② in the following figure) to level the cabinet, and use proper fillings (for example, fireproof mud) to fill the gap.

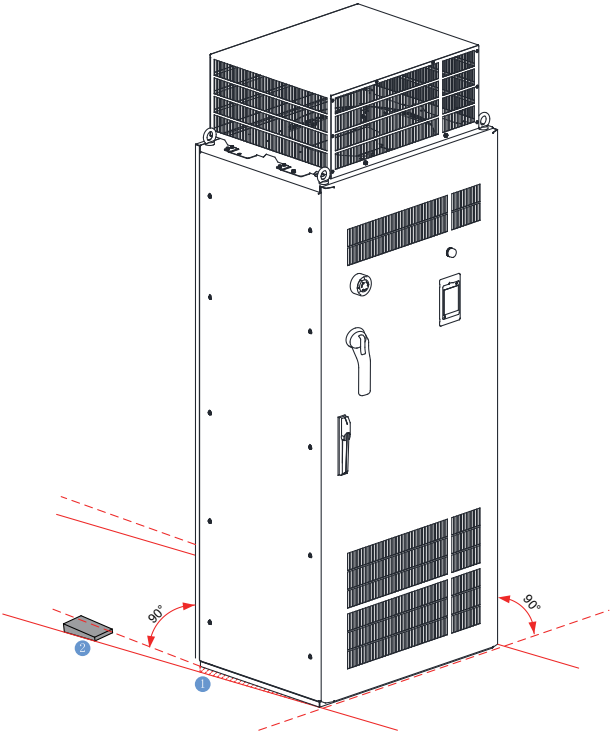


Figure 1-19 Requirements on mounting floor

1.3.3 Installing Expansion Screws

To install the cabinet on a cement floor, embed expansion nuts in advance in the floor at positions corresponding to the fixing holes of the cabinet for fixing the AC drive.

The following figure shows the steps of installing expansion screws, where ① indicates an expansion screw, ② indicates the cabinet, and ③ indicates an M12 bolt.

1. Drill a hole for the expansion screw. The hole diameter shall be slightly smaller than the maximum outer diameter of the screw, and the hole depth shall be greater than the expansion screw length. The expansion screw must be vertical to the ground, as shown by "Step 1" in the following figure.
2. The expansion screw consists of a bolt spring enclosure and a screw part. Use a hammer to knock the expansion screw into the hole and ensure that the screw head is below the ground surface, as shown by "Step 2" in the following figure.
3. Place the cabinet and tighten the M12 screw. The screw part of the expansion screw will be pulled upward, so that the spring enclosure will be deformed outward for fixing, as shown by "Step 3" in the following figure.

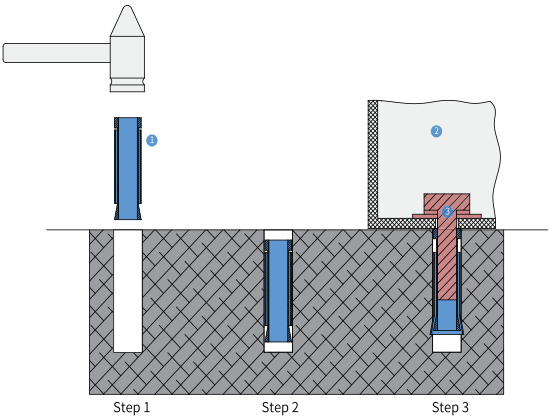


Figure 1-20 Installing an expansion screw

1.3.4 Requirements on Foundation

1. Separate high-voltage cables from low-voltage cables by placing them on different brackets. For failure to do so due to any restrictions, place the low-voltage cables in a completely enclosed metal pipe.
2. Ensure that the cable trench is non-flammable, smooth, and well protected from moisture, dust, and animals.
3. During foundation design, take the following factors into consideration: access space in front of the cabinet, and wiring of power cables, actuating motor cables, and system control cables. The cabinet comes with a cable trench or cable guide. Separate power cables from signal cables. Failure to comply may affect the operation of the AC drive. The following figure shows the routing and related requirements.

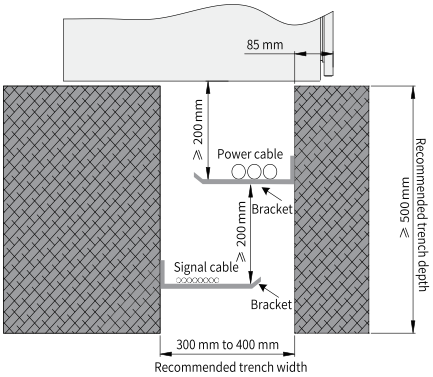
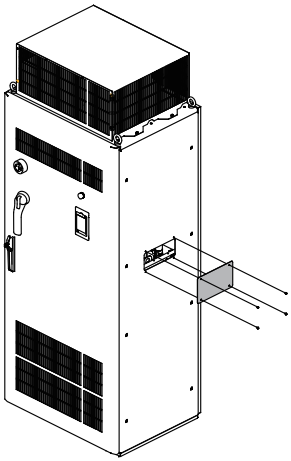
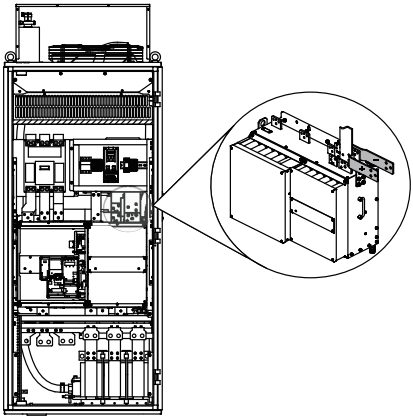
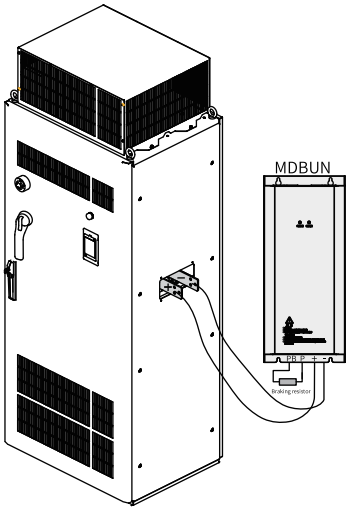
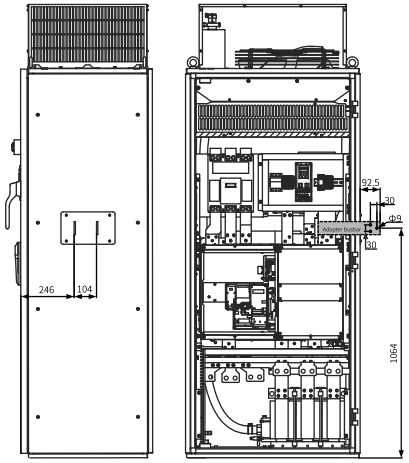


Figure 1-21 Foundation layout

1.3.5 Installing an External Braking Unit

Table 1–7 Procedure

Step	Demonstration
1. Disassemble the closure plate on the side of the AC drive cabinet.	
2. Open the cabinet door to install the adapter busbar of the external braking unit.	

Step	Demonstration
3. Connect the external braking unit. (The number of braking units needed depends on actual needs. Use parallel connection when connecting multiple braking units. The diagrams on the right show how to connect one braking unit.)	  Unit: mm

2 Electrical Installation

2.1 Electrical Wiring Diagram

"Figure 2–1 " on page 31 shows the typical wiring.

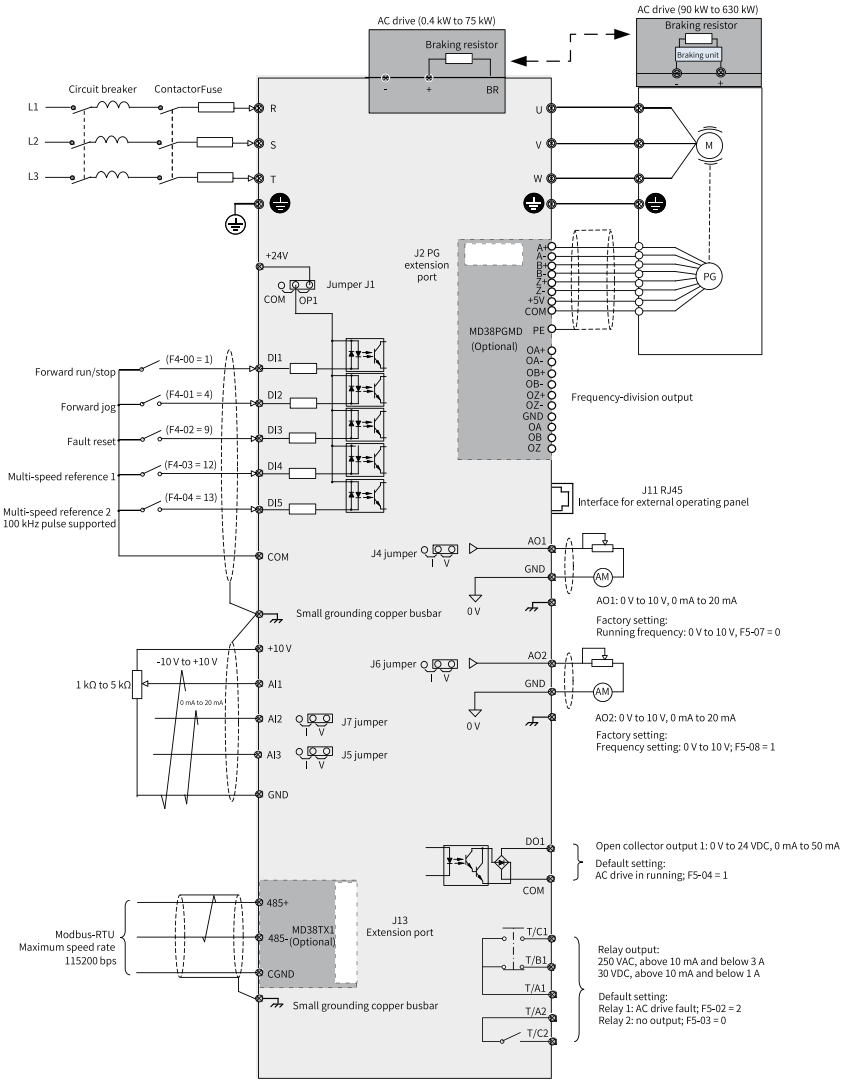


Figure 2-1 Standard wiring

Note

For three-phase 380–480 V AC drives, a 0.4–75 kW model differs from a 90–630 kW model in the wiring detail marked by the double arrows in the figure.

For three-phase 200–240 V AC drives, a 0.4–37 kW model differs from a 45–55 kW model in the wiring detail marked by the double arrows in the figure.

T13 models

"Figure 2–1 " on page 31 shows the standard wiring of a cabinet, and *"Figure 2–2 " on page 32* shows the electrical connection in a cabinet.

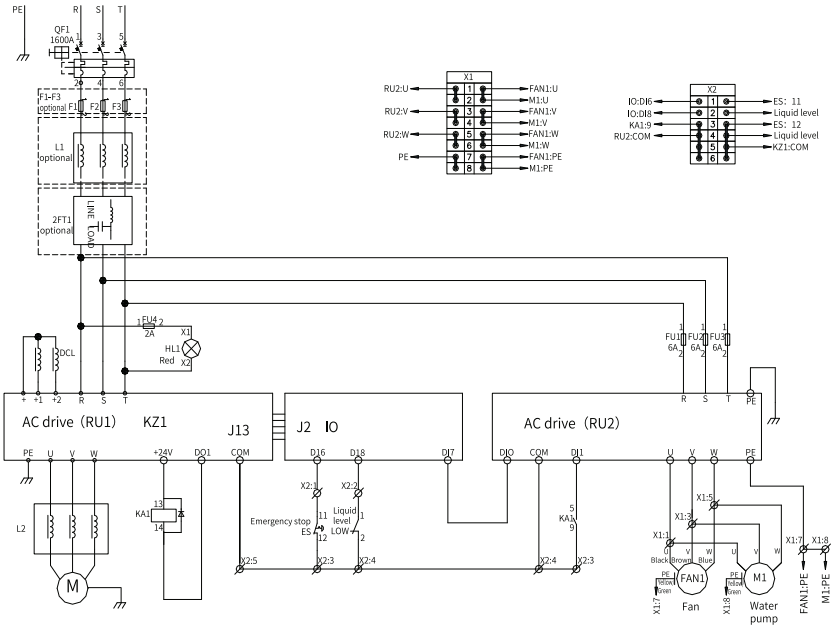


Figure 2-2 Electrical connection in a cabinet (T13 models)

2.2 Main Circuit Terminals

T1 to T9 models

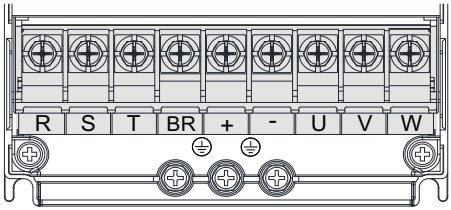


Figure 2-3 Arrangement of main circuit terminals of T1 to T4 models

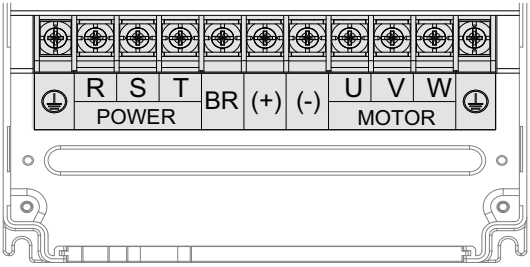


Figure 2-4 Arrangement of main circuit terminals of T5 to T8 models

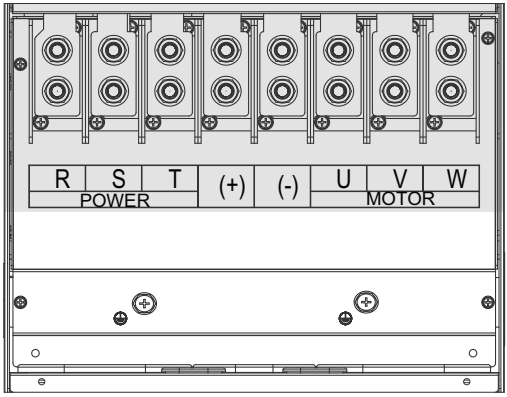


Figure 2-5 Arrangement of main circuit terminals of T9 models

Table 2–1 Main circuit terminals

Terminal	Name	Description
R, S, T	Three-phase power supply input terminals	Connected to AC input three-phase power supply.
(+), (-)	Positive and negative terminals of DC bus	Common DC busbar input point, connected to the external braking unit of T9 models and above.
(+), BR	Braking resistor connection terminals	Connected to the braking resistor of T8 models and below.
U, V, W	Output terminals	Connected to a three-phase motor.
⏚	Grounding terminal (PE)	Used for protective grounding.

T10 to T12 models

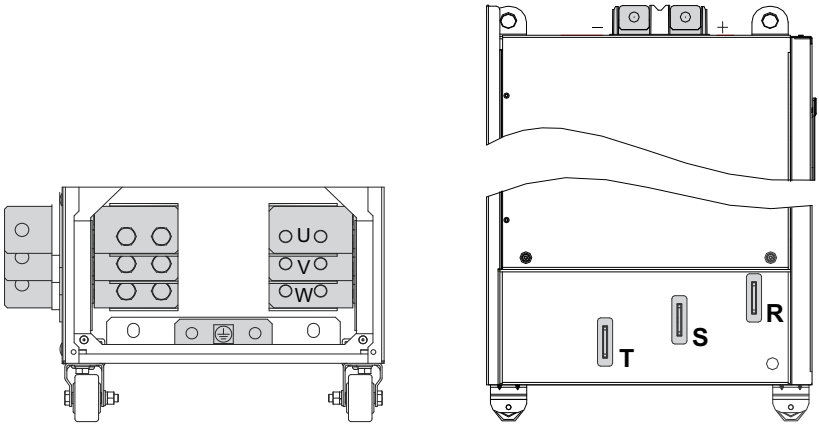


Figure 2-6 Arrangement of main circuit terminals of T10 to T12 models

Table 2–2 Main Circuit Terminals

Terminal	Name	Description
R, S, T	Three-phase power supply input terminals	Connected to AC input three-phase power supply.
+, -	Positive and negative terminals of DC bus	Common DC busbar input point, connected to an external braking unit.

Terminal	Name	Description
U, V, W	AC drive output terminals	Connected to a three-phase motor.
	Grounding terminal (PE)	Used for protective grounding.

T13 models

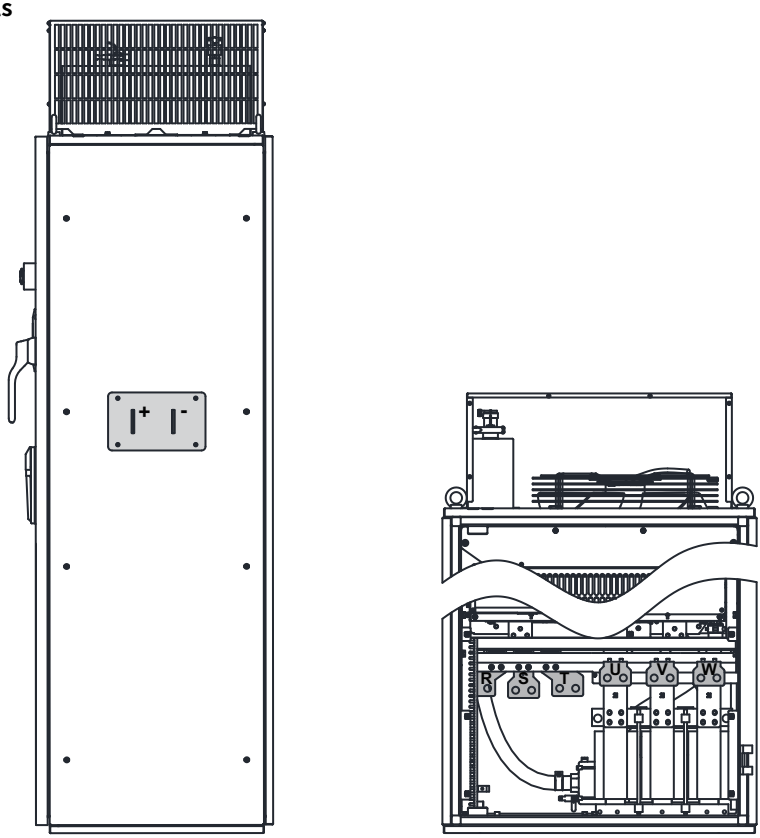


Figure 2-7 Arrangement of main circuit terminals of T13 models

Table 2–3 Main Circuit Terminals

Terminal	Name	Description
R, S, T	Three-phase power supply input terminals	Connected to AC input three-phase power supply.
+, -	Positive and negative terminals of DC bus	Common DC busbar input point, connected to an external braking unit.

Terminal	Name	Description
U, V, W	AC drive output terminals	Connected to a three-phase motor.
	Grounding terminal (PE)	Used for protective grounding.

2.3 Control Circuit Terminals

"Figure 2–8 " on page 36 shows the arrangement of control circuit terminals.

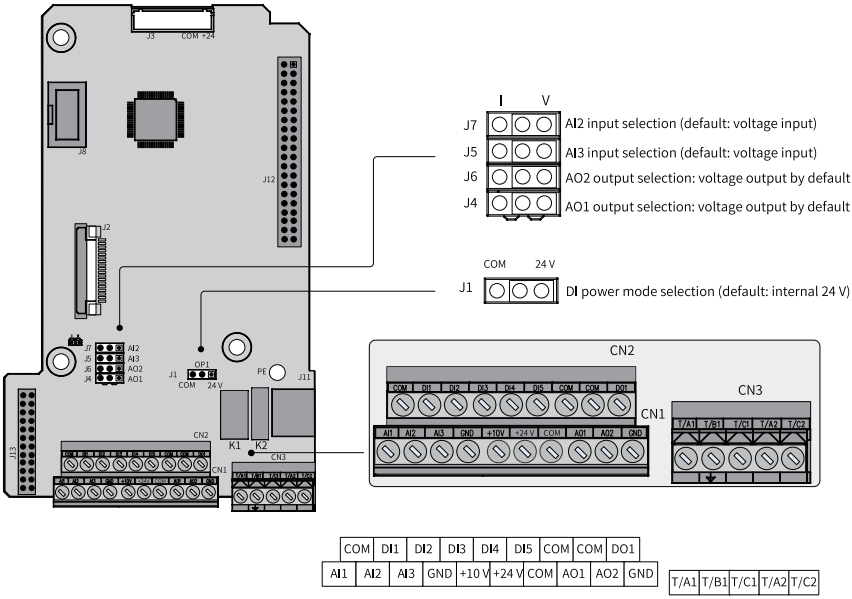


Figure 2-8 Arrangement of control circuit terminals

Table 2–4 Description of control circuit terminals

Item	Terminal Code	Terminal Name	Description
Power supply	+10 V-GND	External +10 V power supply	Provides +10 V power supply to an external unit. Its maximum output current is 10 mA. It is generally used to supply power to an external potentiometer with resistance ranging from 1 kΩ to 5 kΩ.
	+24 V-COM	External +24V power supply	Provides +24 V power supply to an external unit. It is generally used to supply power to digital input/output terminals and external sensors. Maximum output current: 200 mA
Analog input	AI1-GND	Analog input terminal 1	Input voltage range: –10 VDC to +10 VDC Input impedance: 22 kΩ
	AI2-GND	Analog input terminal 2	Input range: –10 VDC to +10 VDC or 0–20 mA, as determined by the J7 jumper on the control board Input impedance: 22 kΩ (voltage input) or 500 Ω (current input)
	AI3-GND	Analog input terminal 3	Input range: –10 VDC to +10 VDC/0–20 mA, as determined by the J5 jumper on the control board Input impedance: 22 kΩ (voltage input) or 500 Ω (current input)
Digital input	DI1-COM	Digital input 1	Photocoupler isolation enabled with an input frequency less than 100 Hz. It is driven by external or internal power as determined by the J1 jumper on the control board. Input impedance: 1.39 kΩ Voltage range with effective level input: 9–30 V
	DI2-COM	Digital input 2	
	DI3-COM	Digital input 3	
	DI4-COM	Digital input 4	
	DI5-COM	Digital input 5	
Analog output	AO1-GND	Analog output 1	Whether voltage or current is output is determined by the J4 jumper on the control board. The maximum load resistance is 500 Ω. Output voltage range: 0–10 V Output current range: 0–20 mA
	AO2-GND	Analog output 2	Whether voltage or current is output is determined by the J6 jumper on the control board. The maximum load resistance is less than 500 Ω. Output voltage range: 0–10 V Output current range: 0–20 mA

Item	Terminal Code	Terminal Name	Description
Digital output	DO1-COM	Digital output 1	Dual polarity open collector output with photocoupler isolation Output voltage range: 0–24 V Output current range: 0–50 mA
Relay output	T/A1-T/B1	Normally closed terminal	Contact driving capacity: 250 VAC, 3 A, COSø = 0.4 30 VDC, 1 A
	T/A1-T/C1	Normally open terminal	
	T/A2-T/C2	Normally open terminal	
Auxiliary ports	J13	Extension card port	A 28-conductor terminal, which interfaces to optional cards (such as bus cards)
	J2	PG card port	Connects resolver and differential encoders.
	J11	Port for external operating panel	Connects an external operating panel.
Jumper	J1	DI terminal power mode selection	Determines the power mode of DI terminals. The internal 24 V power supply is used by default.
	J4	AO1 output selection	The options are voltage output (default output) and current output.
	J6	AO2 output	The options are voltage output (default output) and current output.
	J5	AI3 input selection	The options are voltage input (default input) and current input.
	J7	AI2 input selection	The options are voltage input (default input) and current input.

3 Commissioning Process

3.1 Basic Commissioning Process

For different modes, see related sections.

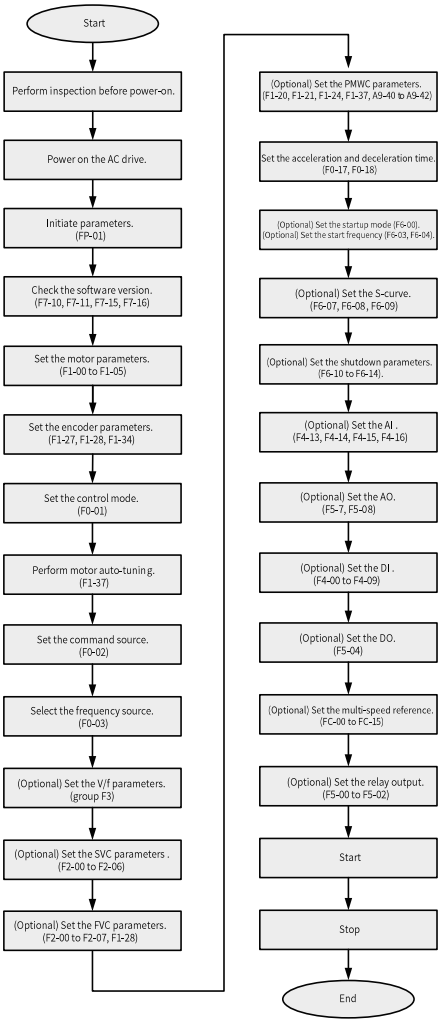


Figure 3-1 Basic commissioning flowchart

Table 3–1 Basic commissioning process

No.	Step	Related Parameter
1	Perform inspection before power-on.	None
2	Power on the AC drive.	None
3	Initiate parameters.	FP-01
4	Check the software versions	F7-10, F7-11, F7–15, and F7–16
5	Set the motor parameters.	F1-00 to F1-05 You also need to set the motor type.
6	Set the encoder parameters.	F1–27, F1–28, and F1–34
7	Set the control mode.	F0-01
8	Perform motor auto-tuning.	F1-37
10	Select the command source.	F0-02
11	Select the frequency source.	F0-03
12	(Optional) Set the V/f parameters.	Parameters in group F3
13	(Optional) Set the SVC parameters.	F2-00 to F2-06
14	(Optional) Set the FVC parameters.	F2-00 to F2-07, and F1-28
15	(Optional) Set the PMVVC parameters.	F0-01, F1-00, F1-20, F1-21, F1-24, F1-37, and A9-40 to A9-42
16	Set the acceleration and deceleration time.	F0-17 and F0-18
17	(Optional) Set the startup mode.	F6-00
18	(Optional) Set the startup frequency.	F6-03 and F6-04
19	(Optional) Set the S-curve.	F6-07, F6-08, and F6-09
20	Set the shutdown parameters.	F6-10 to F6-14
21	(Optional) Set the AI.	F4-13, F4-14, F4-15, and F4-16
22	(Optional) Set the AO.	F5-07 and F5-08
23	(Optional) Set the DI.	F4-00 to F4-09
24	(Optional) Set the DO.	F5-04
25	(Optional) Set the multi-speed reference.	FC-00 to FC-15
26	(Optional) Set the replay output.	F5-00, F5-01, and F5-02
27	Start the AC drive.	None
28	Stop the AC drive.	None

3.2 Commissioning Process in V/f Control Mode

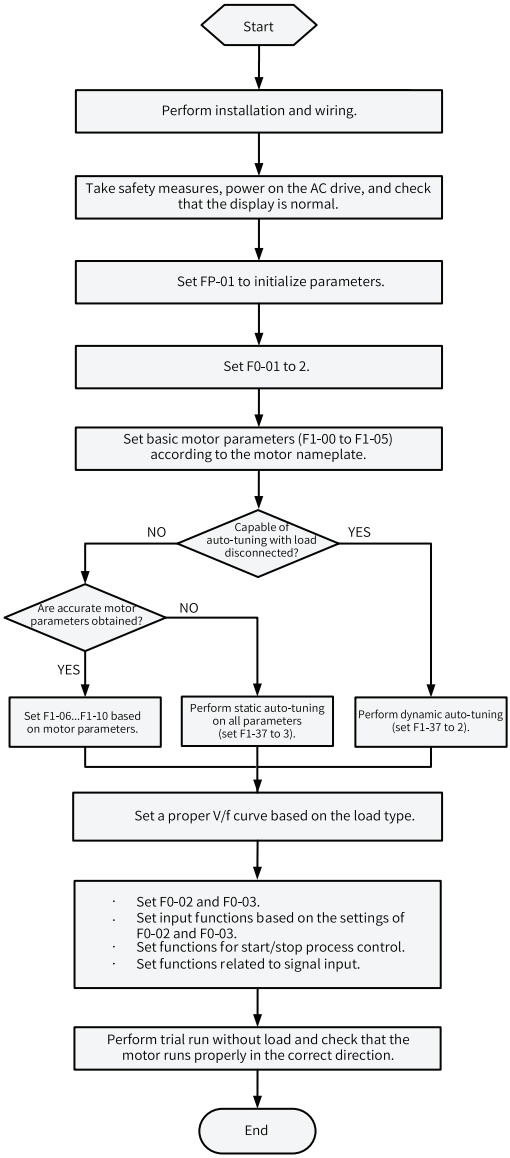


Figure 3-2 AC drive commissioning flowchart (in V/f control mode)

3.3 Commissioning Process in SVC/FVC Mode

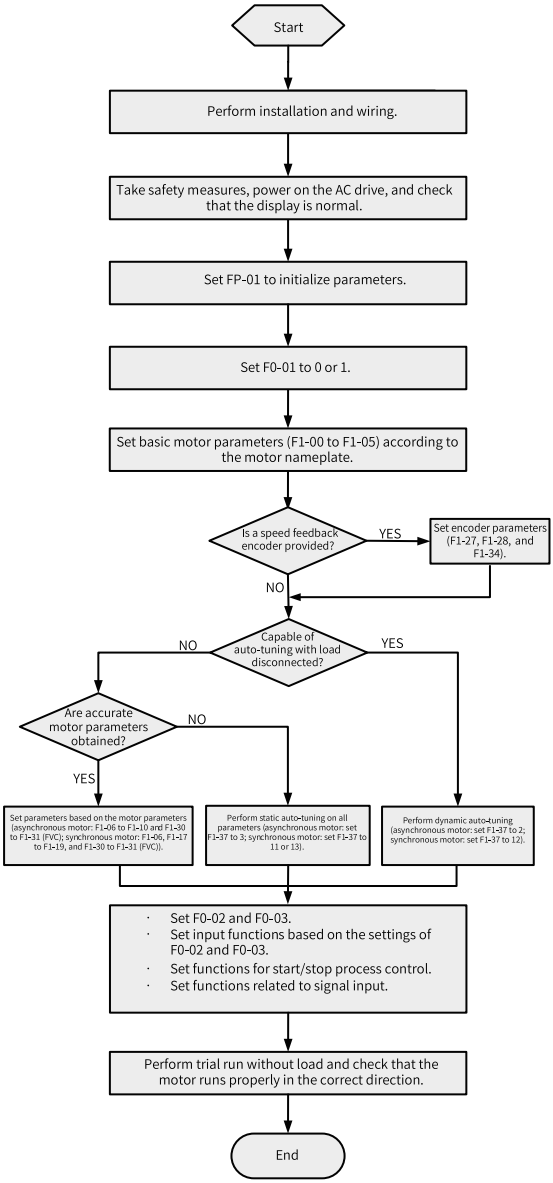


Figure 3-3 AC drive commissioning flowchart (in SVC/FVC mode)

3.4 Commissioning Process in PMVVC Mode

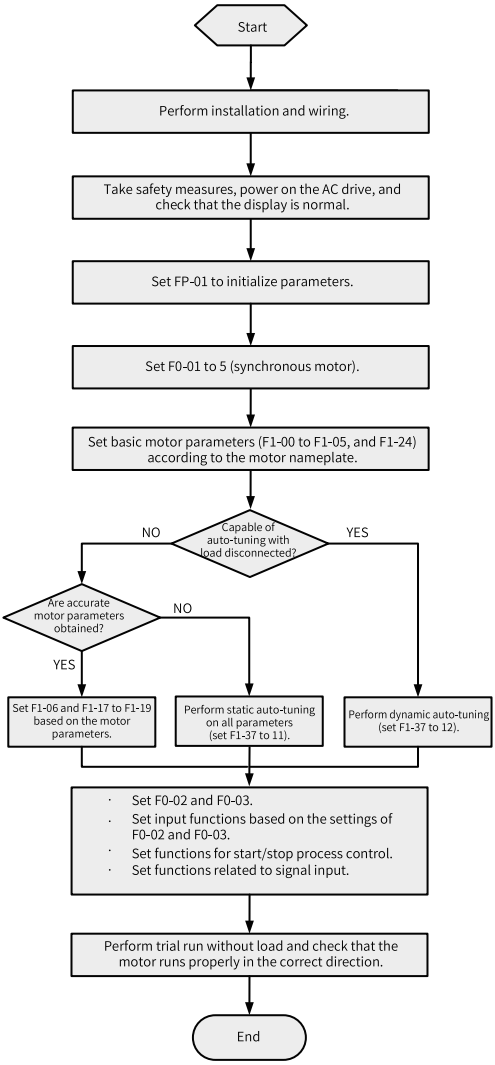


Figure 3-4 AC drive commissioning flowchart (in PMVVC mode)

4 Troubleshooting

4.1 Common Faults and Diagnosis

4.1.1 Display of Alarms and Faults

Upon exceptions, the AC drive stops output immediately, the fault indicator 

blinks, and the contact of the fault relay acts. The operating panel of the AC drive displays a fault code (example: 

), as shown in the following figure.

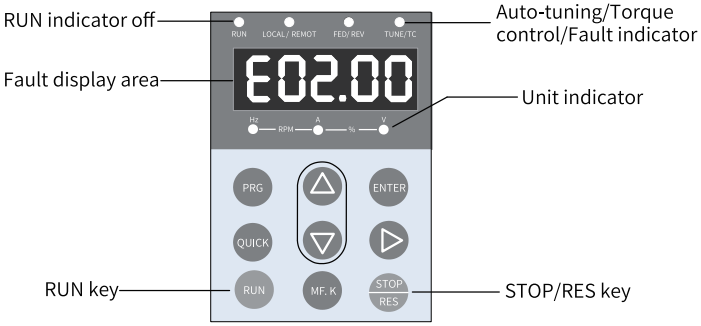


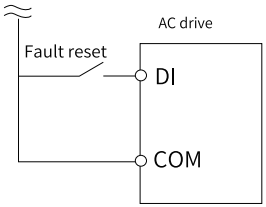
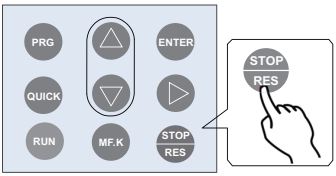
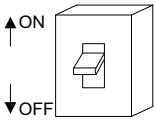
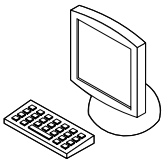
Figure 4-1 Display of faults

Caution

Do not repair or modify the AC drive by yourself. In case of any fault that cannot be rectified, contact the agent or Inovance for technical support.

4.1.2 Restart upon Faults

Table 4–1 Restart methods upon faults

Stage	Solution	Description
When a fault occurs	Check the operating panel for detailed information about the last three faults, such as the fault time, fault type, and frequency, current, bus voltage, input/output terminal state, accumulative power-on time, and accumulative running time upon the faults.	View the information through F9-14 to F9-44. 
Before fault reset	Locate and rectify the fault cause based on the fault code displayed on the operating panel. Then reset to clear the fault.	-
During fault reset	1. Set any of F4-00 to F4-09 to 9 (fault reset).	
	2. Verify that F7-02 is set to 1 (default value), that is, the STOP/RES key is available in any operating mode.	Press the STOP/RES key on the operating panel. 
	3. Power off and then power on the AC drive for automatic reset. Disconnect the main circuit power supply and connect the power supply again after the display on the operating panel disappears.	
	4. Use a host controller for reset (for communication control mode). Verify that F0-02 is set to 2 (communication control mode) and write "7" to the communication address 2000H by using the host controller.	

4.1.3 Common Troubleshooting

Table 4–2 Symptoms and troubleshooting

No.	Symptom	Possible Cause	Action
1	The display does not work upon power-on. 	The grid voltage is not input or too low.	Check the input power supply.
		The switched-mode power supply (SMPS) on the driver board of the AC drive is faulty.	Check whether the 24 V output voltage and 10 V output voltage on the control board are normal.
		The control board is disconnected from the driver board or the operating panel.	Re-connect the 8-conductor and 40-conductor flat cables.
		The pre-charge resistor of the AC drive is damaged.	Contact Inovance.
		The control board or operating panel is faulty.	
		The rectifier bridge is damaged.	
2	"HC" is displayed upon power-on. 	The connection between the driver board and the control board is poor.	Re-connect the 8-conductor and 28-conductor flat cables.
		Related components on the control board are damaged.	Contact Inovance.
		The motor or motor cable is short-circuited to ground.	
		The Hall device is faulty.	
		The grid voltage is too low.	
3	"E23.00" is displayed upon power-on. 	The motor or motor cable is short-circuited to the ground.	Use a megger to measure the insulation resistance of the motor and motor cable.
		The AC drive is damaged.	Contact Inovance.

No.	Symptom	Possible Cause	Action
4	The display is normal upon power-on, but "HC" is displayed and the AC drive stops immediately after startup. 	The fan is damaged, or locked-rotor occurs.	Replace the damaged fan.
		Wiring of any external control terminals is short-circuited.	Rectify the short circuit fault.
5	E14.00 (IGBT overtemperature) is reported frequently.	The carrier frequency is set too high.	Reduce the carrier frequency (F0-15).
		The fan is damaged, or the air filter is blocked.	Replace the fan or clean the air filter.
		Devices (thermistor or other devices) inside the AC drive are damaged.	Contact Inovance.
6	The motor does not rotate when the AC drive is running.	The AC drive and motor are incorrectly connected.	Double check the connection between the AC drive and motor.
		Related AC drive parameters (motor parameters) are set incorrectly.	Restore the AC drive to factory settings and re-set the following parameters correctly:
			Encoder parameters and rated motor specifications (such as rated motor frequency and rated motor speed)
			F0-01 and F0-02
			F3-01 for heavy-load start in V/f control mode
		The connection between the driver board and the control board is poor.	Re-connect the cables and ensure secure wiring.
		The driver board is faulty.	Contact Inovance.
7	DI terminals are inactive.	Related parameters are set incorrectly.	Check and set parameters in group F4 again.
		External signals are incorrect.	Re-connect external signal cables.
		The jumper across OP and +24 V becomes loose.	Check and ensure secure connection of the jumper across OP and +24V.
		The control board is faulty.	Contact Inovance.

No.	Symptom	Possible Cause	Action
8	In FVC mode, the motor cannot speed up.	The encoder is faulty.	Replace the encoder and double check the wiring.
		The encoder wiring is incorrect or in poor contact.	Reconnect the encoder to ensure good contact.
		The PG card is faulty.	Replace the PG card.
		The driver board is faulty.	Contact Inovance.
9	The AC drive detects overcurrent and overvoltage frequently.	Motor parameters are incorrectly set.	Set motor parameters or perform motor auto-tuning again.
		The acceleration/ deceleration time is improper.	Set proper acceleration/ deceleration time.
		The load fluctuates.	Contact Inovance.
10	E17.00 is reported upon power-on or during running.	The soft start contactor is not closed.	Check whether the contactor cable is loose.
			Check whether the contactor is faulty.
			Check whether 24 V power supply of the contactor is faulty.
			Contact Inovance.
11	The motor coasts to stop, or braking is disabled during deceleration or deceleration to stop.	The encoder is disconnected, or overvoltage stall protection is enabled.	Check the encoder wiring in FVC mode (F0-01 is set to 1).
			If a braking resistor is configured, set F3-23 to 0.

4.1.4 Troubleshooting During Trial Run in Different Control Modes

- SVC mode (F0-01 set to 0 (default))
  This mode is used to control the speed and torque of motor in scenarios without an encoder for speed feedback. In this control mode, motor auto-tuning is required to obtain motor-related parameters.

Table 4–3 Troubleshooting in SVC mode

Problem	Action
Overload or overcurrent reported during motor startup	Set motor parameters F1-01 to F1-05 according to motor nameplate. Perform motor auto-tuning (by setting F1-37). Dynamic auto-tuning on all parameters of the motor is preferred when possible.
Slow torque or speed response and motor vibration at frequencies below 5 Hz	In the case of slow motor torque and speed response, increase the value of F2-00 in increments of 10 or decrease the value of F2-01 in increments of 0.05. In the case of motor vibration, decrease the value of F2-00 and increase the value of F2-01.
Slow torque or speed response and motor vibration at frequencies above 5 Hz	In the case of slow motor torque and speed response, increase the value of F2-03 in increments of 10 or decrease the value of F2-04 in increments of 0.05. In the case of motor vibration, decrease the value of F2-03 and increase the value of F2-04.
Low speed accuracy	In the case of excessive speed deviation during with-load running, increase the value of F2-06 in increments of 10%.
Obvious speed fluctuation	In the case of abnormal motor speed fluctuation, increase the value of A9-05 in increments of 0.001s.
Loud motor noise	Increase the value of F0-15 in increments of 1.0 kHz. Note that an increase in the carrier frequency will result in an increase in the leakage current of the motor.
Insufficient motor torque	Check whether the torque upper limit is set too low. If yes, increase the value of F2-10 in speed control mode or increase the torque reference in torque control mode.

- FVC mode (F0-01 set to 1)
  This mode is applicable to scenarios with an encoder for speed feedback. In this mode, you need to set the encoder pulses per revolution, encoder type and encoder direction correctly and perform auto-tuning on motor parameters.

Table 4–4 Troubleshooting in FVC mode

Problem	Action
Overload or overcurrent reported during motor startup	Set the encoder pulses per revolution, encoder type, and signal direction correctly.
Overload or overcurrent reported during motor rotation	Set motor parameters F1-01 to F1-05 according to motor nameplate. Perform motor auto-tuning (by setting F1-37). Dynamic auto-tuning on all parameters of the motor is preferred when possible.

Problem	Action
Slow torque or speed response and motor vibration at frequencies below 5 Hz	In the case of slow motor torque and speed response, increase the value of F2-00 in increments of 10 or decrease the value of F2-01 in increments of 0.05. In the case of motor vibration, decrease the values of F2-00 and F2-01.
Slow torque or speed response and motor vibration at frequencies above 5 Hz	In the case of slow motor torque and speed response, increase the value of F2-03 in increments of 10 or decrease the value of F2-04 in increments of 0.05. In the case of motor vibration, decrease the values of F2-03 and F2-04.
Obvious speed fluctuation	In the case of abnormal motor speed fluctuation, increase the value of F2-07 in increments of 0.001s.
Loud motor noise	Increase the value of F0-15 in increments of 1.0kHz. Note that an increase in the carrier frequency will result in an increase in the leakage current of the motor.
Insufficient motor torque	Check whether the torque upper limit is set too low. If yes, increase the value of F2-10 in speed control mode or increase the torque reference in torque control mode.

- V/f control mode (F0-01 set to 2)
  This mode is applicable to scenarios without an encoder for speed feedback. You need to set rated motor voltage and rated motor frequency only because this mode is not sensitive to motor parameters.

Table 4–5 Troubleshooting in V/f control mode

Problem	Action
Motor oscillation during running	Decrease the value of F3-11 in increments of 5. The minimum value is 5.
Overcurrent during high-power startup	Decrease the value of F3-01 in increments of 0.5%.
High current during running	Set the rated motor voltage (F1-02) and rated motor frequency (F1-04) correctly. Decrease the value of F3-01 in increments of 0.5%.
Loud motor noise	Increase the value of F0-15 in increments of 1.0kHz. Note that an increase in the carrier frequency will result in an increase in the leakage current of the motor.
Overvoltage reported during deceleration or sudden removal of heavy loads	Verify that the overvoltage stall selection (F3-23) is enabled. Increase the overvoltage stall gain (F3-24/F3-25; default value: 30) in increments of 10 (the maximum value is 100). Decrease the value of F3-22 (default value: 770 V) in increments of 10 V (the minimum value is 700 V).
Overcurrent reported during acceleration or sudden connection of heavy loads	Increase the value of F3-20 (default value: 20) in increments of 10 (the maximum value is 100). Decrease the value of F3-18 (default value: 150%) in increments of 10% (the minimum value is 50%).

4.2 List of Fault Codes

The following faults may occur during the use of the AC drive. Troubleshoot and rectify faults by taking actions described in the following table.

Table 4–6 Fault codes

Fault Name	Display	Possible Cause	Action
Overcurrent during acceleration	E02.00	Grounded or short-circuited output circuit of the AC drive	Check whether the motor or relay contactor is short-circuited.
		Auto-tuning is not performed in SVC or FVC control mode.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		Excessively short acceleration time	Increase the acceleration time (F0-17).
		Inappropriate overcurrent stall suppression	Ensure that overcurrent stall suppression (F3-19) is enabled. If the value of F3-18 (overcurrent stall suppression level) is too large, adjust it to a level between 120% and 160%. If the value of F3-20 (overcurrent stall suppression gain) is too small, adjust it to a level between 20 and 40.
		Inappropriate customized torque boost or V/f curve	Adjust the customized torque boost or V/f curve.
		Startup of a running motor	Use flying start or restart the motor after the motor stops.
		External interference to the AC drive	View the fault records to check whether the fault current has ever reached the overcurrent suppression level (F3-18). If not, check for external interference source. If no external interference source is found, the driver board or Hall device might be damaged. Contact Inovance for replacement.

Fault Name	Display	Possible Cause	Action
Overcurrent during deceleration	E03.00	Grounded or short-circuited output circuit of the AC drive	Check whether the motor is short-circuited or open-circuited.
		Auto-tuning is not performed in SVC or FVC control mode.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		Excessively short deceleration time	Increase the deceleration time (F0-18).
		Inappropriate overcurrent stall suppression	Ensure that overcurrent stall suppression (F3-19) is enabled. If the value of F3-18 (overcurrent stall suppression level) is too large, adjust it to a level between 120% and 150%. If the value of F3-20 (overcurrent stall suppression gain) is too small, adjust it to a level between 20 and 40.
		The braking unit and braking resistor are not installed.	Install a braking unit and a braking resistor.
		External interference to the AC drive	View the fault records to check whether the fault current has ever reached the overcurrent suppression level (F3-18). If not, check for external interference source. If no external interference source is found, the driver board or Hall device might be damaged. Contact Inovance for replacement.
Overcurrent during operation at constant speed	E04.00	Grounded or short-circuited output circuit of the AC drive	Check whether the motor is short-circuited or open-circuited.
		Auto-tuning is not performed in SVC or FVC control mode.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		Inappropriate overcurrent stall suppression	Ensure that overcurrent stall suppression (F3-19) is enabled. If the value of F3-18 (overcurrent stall suppression level) is too large, adjust it to a level between 120% and 150%. If the value of F3-20 (overcurrent stall suppression gain) is too small, adjust it to a level between 20 and 40.
		Inadequate power rating of the AC drive	If the running current exceeds the rated motor current or rated output current of the AC drive during stable running, select an AC drive with a higher power rating.
		External interference to the AC drive	View the fault records to check whether the fault current has ever reached the overcurrent suppression level (F3-18). If not, check for external interference source. If no external interference source is found, the driver board or Hall device might be damaged. Contact Inovance for replacement.

Fault Name	Display	Possible Cause	Action
Overvoltage during acceleration	E05.00	High input grid voltage	Adjust the voltage to the normal range.
		External force driving the motor during acceleration	Cancel the external force or install a braking resistor. If the value of F3-26 (frequency rise threshold during overvoltage suppression) is too small, adjust it to a level between 5 Hz to 15 Hz when an external force drives the motor.
		Inappropriate overvoltage suppression	Ensure that overvoltage suppression (F3-23) is enabled. If the value of F3-22 (overvoltage suppression) is too large, adjust it to a level between 700 V and 770 V. If the value of F3-24 (frequency gain for overvoltage suppression) is too small, adjust it to a level between 30 and 50.
		The braking unit and braking resistor are not installed.	Install a braking unit and a braking resistor.
		Excessively short acceleration time	Increase the acceleration time.
Overvoltage during deceleration	E06.00	Inappropriate overvoltage suppression	Ensure that overvoltage suppression (F3-23) is enabled. If the value of F3-22 (overvoltage suppression) is too large, adjust it to a level between 700 V and 770 V. If the value of F3-24 (frequency gain for overvoltage suppression) is too small, adjust it to a level between 30 and 50.
		External force driving the motor during deceleration	Cancel the external force or install a braking resistor. If the value of F3-26 (frequency rise threshold during overvoltage suppression) is too small, adjust it to a level between 5 Hz to 15 Hz when an external force drives the motor.
		Excessively short deceleration time	Increase the deceleration time.
		The braking unit and braking resistor are not installed.	Install a braking unit and a braking resistor.

Fault Name	Display	Possible Cause	Action
Overvoltage during operation at constant speed	E07.00	Inappropriate overvoltage suppression	Ensure that overvoltage suppression (F3-23) is enabled. If the value of F3-22 (overvoltage suppression) is too large, adjust it to a level between 700 V and 770 V. If the value of F3-24 (frequency gain for overvoltage suppression) is too small, adjust it to a level between 30 and 50.
		External force driving the motor during operation	Cancel the external force or install a braking resistor. If the value of F3-26 (frequency rise threshold during overvoltage suppression) is too small, adjust it to a level between 5 Hz to 15 Hz when an external force drives the motor.
Undervoltage	E09.00	Instantaneous power failure	Enable the power dip ride-through function (F9-59).
		AC drive input voltage out of range	Adjust the voltage to a value within the normal range.
		Abnormal bus voltage	Contact Inovance for technical support.
		Abnormal rectifier, IGBT driver board, or IGBT control board	Contact Inovance for technical support.
AC drive overload	E10.00	Excessively heavy load or stalled motor	Reduce the load and check the motor and mechanical conditions.
		Inadequate power rating of the AC drive	Use an AC drive with a higher power rating.
		Auto-tuning is not performed in SVC or FVC control mode.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		Excessively high torque boost (F3-01) in V/f control mode	Decrease the value of F3-01 by 1.0% each time or set F3-01 to 0 (automatic torque boost).
		Output phase loss on the AC drive	Check the output wiring of the AC drive.
Motor overload	E11.00	Inappropriate F9-01 (motor overload protection gain) setting.	Increase the value of F9-01 to prolong the motor overload time.
		Excessively heavy load or stalled motor	Reduce the load and check the motor and mechanical conditions.
Input phase loss	E12.00	Input phase loss	Ensure proper input RST cables and three-phase input voltage.
Output phase loss	E13.00	Motor fault	Check whether the motor is disconnected.
		Abnormal lead wire connecting the AC drive to the motor	Rectify external faults.
		Unbalanced three-phase output of the AC drive during motor operation	Ensure proper functioning of the motor three-phase winding.
		Abnormal driver board or IGBT	Contact the agent or Inovance for technical support.

Fault Name	Display	Possible Cause	Action
IGBT overtemperature	E14.00	High ambient temperature	Lower the ambient temperature.
		Blocked air filter	Clean the air filter.
		Damaged fan	Replace the damaged fan.
		Damaged thermistor of the IGBT	Contact the agent or Inovance for technical support.
		Damaged IGBT	Contact the agent or Inovance for technical support.
External fault	E15.01	External fault signal input to the multi-function DI terminal (normally open)	Rectify the external fault, and ensure that the mechanical condition allows restart (F8-18).
	E15.02	External fault signal input to the multi-function DI terminal (normally closed)	Rectify the external fault, and ensure that the mechanical condition allows restart (F8-18).
Communication fault	E16.01	Modbus communication timeout	Ensure proper wiring of the RS485 communication cable. Ensure proper settings of FD-04 and PLC communication cycle.
	E16.11	CANopen communication timeout	Ensure proper connection of the CAN communication cable. Check the values of FD-15 to FD-17 and eliminate interference.
	E16.12	Inconsistency between the configured CANopen-based PDO mapping and the actual mapping	Check the PDO mapping of parameters in group AF.
	E16.21	CANlink heartbeat timeout	Ensure proper connection of the CAN communication cable. Check the values of FD-15 to FD-17 and eliminate interference.
	E16.22	CANlink station number conflict	Change the value of FD-13 to make CANlink station numbers different from each other.
Contactor fault	E17.00	Abnormal driver board and power supply	Replace the driver board or power supply board.
		Abnormal contactor	Replace the contactor.
		Abnormal lightning protection board	Replace the lightning protection board.
Damaged current sampling circuit	E18.00	Abnormal AC drive current sampling	Power on the main circuit.
			If the Hall sensor or sampling current circuit is damaged, contact Inovance.

Fault Name	Display	Possible Cause	Action
Motor auto-tuning fault	E19.02	Fault in auto-tuning on the magnetic pole position angle of the synchronous motor	Ensure that the motor is connected and there is no output phase loss.
	E19.06 E19.07 E19.08	Fault in auto-tuning on the stator resistance	Ensure that the motor is connected. Set F1-03 (rated motor current) according to the motor nameplate.
	E19.09 E19.10	Fault in auto-tuning on the transient leakage inductance of the asynchronous motor	Check whether the motor is connected or output phase is normal without loss. Ensure that the motor is connected properly.
	E19.11	Inertia auto-tuning fault	Set F1-03 (rated motor current) according to the motor nameplate. Increase the value of F2-43 (inertia auto-tuning and dynamic speed reference).
	E19.20	Timeout of auto-tuning on the no-load zero position angle of the synchronous motor	Check the Z feedback signal.
	E19.23	Fault in auto-tuning on the magnetic pole position of the synchronous motor	Set F1-03 (rated motor current) according to the motor nameplate. Decrease the value of F2-29 (synchronous motor initial angle detection current).
	E19.24	Errors in auto-tuning on the transient leakage inductance of the asynchronous motor	Check whether the power rating of the AC drive is low. If yes, use an AC drive with a proper power rating matching the motor power.

Fault Name	Display	Possible Cause	Action
Encoder fault	E20.00	Encoder disconnected	Restore the connection. Ensure proper wiring of the PG cable. Ensure proper wiring of the PG cable and power supply. Ensure consistency between the encoder pulses per revolution and the value of F1-27. Ensure proper wiring of the AB signal cable.
	E20.01	Encoder fault	
	E20.02	Encoder disconnected	
	E20.03	Encoder fault during no-load auto-tuning of the synchronous motor	
	E20.04	Encoder fault during no-load auto-tuning of the synchronous motor	
	E20.06	Encoder fault during with-load auto-tuning of the synchronous motor	
	E20.07	Encoder fault during no-load auto-tuning of the synchronous motor	
	E20.08	Encoder fault during no-load auto-tuning of the synchronous motor	
	E20.09	Encoder fault during auto-tuning of the synchronous motor	Check the encoder Z signal and wiring of the PG card.
	E20.10	Synchronous motor encoder fault	
	E20.11	The encoder is faulty during FVC no-load auto-tuning of the asynchronous motor.	Ensure that the encoder is properly connected. Ensure consistency between the encoder pulses per revolution and the value of F1-27.
	E20.12	Excessive deviation between the encoder feedback speed and the speed estimated by SVC	Check for encoder disconnection. Ensure proper setting of motor parameters. Ensure that motor auto-tuning is performed.
	E20.13	Resolver encoder disconnected	Check the wiring of the encoder.
	E20.17	23-bit encoder disconnected	Check the wiring of the 23-bit encoder.
EEPROM read/write fault	E21.01	EEPROM read/write abnormality	For communication write parameters, check the RAM addresses and the RAM address mapping of the parameters. For details, see 6.2.4 Parameter Address Rules. If the EEPROM chip is damaged, contact Inovance to replace the control board.
	E21.02		
	E21.03		
	E21.04		

Fault Name	Display	Possible Cause	Action
Motor auto-tuning error	E22.00	Auto-tuned stator resistance out of range	Correctly set F1-02 (rated motor voltage) and F1-03 (rated motor current) in group F1 according to the motor nameplate.
	E22.01	Auto-tuned rotor resistance of the asynchronous motor out of range	Ensure that auto-tuning is performed after the motor stops.
	E22.02	The no-load current and mutual inductance of the asynchronous motor obtained through auto-tuning exceed the allowed range. If this alarm is reported, the AC drive calculates the mutual inductance and no-load current values based on known motor parameters. The calculated values may not be the optimal values.	Set motor parameters in group F1 according to the motor nameplate. Ensure that the motor has no load before auto-tuning.
	E22.03	Auto-tuned back EMF of the synchronous motor out of range.	Set F1-02 (rated motor voltage) according to the motor nameplate. Ensure that the motor has no load before auto-tuning.
	E22.04	Inertia auto-tuning fault	Set F1-03 (rated motor current) according to the motor nameplate.
Short circuit to ground	E23.00	Motor shorted to the ground	Check and replace the motor cables and motor if necessary.
Motor inter-phase short circuit	E24.00	Motor inter-phase short circuit	Check whether a two-phase short circuit occurs on the output UVW.
Rectifier fault	E25.00	Rectifier fault	Rectify corresponding faults, such as input phase loss and overtemperature. 1: Operation enabled 2: Incoming circuit breaker feedback 3: Auxiliary circuit breaker feedback 4: Leakage protection switch feedback. If there is no feedback signal, an alarm is reported. 6: Inverter unit operation inhibited 7: Inverter unit coast-to-stop 8: User-defined inverter unit stop. If the terminal is active, an alarm is reported.
Accumulative running time reach	E26.00	The accumulative running time has reached the reference value.	Clear the record through parameter initialization.
User-defined fault 1	E27.00	The user-defined fault 1 signal is input via the DI.	Perform a reset.
		The user-defined fault 1 signal is input through the virtual I/O function.	Perform a reset.

Fault Name	Display	Possible Cause	Action
User-defined fault 2	E28.00	The user-defined fault 2 signal is input via the DI.	Perform a reset.
		The user-defined fault 2 signal is input through the virtual I/O function.	Perform a reset.
Accumulative power-on time reach	E29.00	The accumulative power-on time has reached the reference value.	Clear the record through parameter initialization.
Load lost	E30.00	Running current of the AC drive less than the value of F9-64	Check for load disconnection and mismatching between the values of F9-64 and F9-65 and actual working conditions.
PID feedback loss during operation	E31.00	PID feedback less than the value of FA-26	Check the PID feedback signals or set FA-26 to a proper value.
Pulse-by-pulse current limit fault	E40.00	Excessively heavy load or stalled motor	Reduce the load and check the motor and mechanical conditions.
		Inadequate power rating of the AC drive	Use an AC drive with a higher power rating.
Excessive speed deviation	E42.00	Incorrect setting of encoder parameters	Set encoder parameters properly.
		Auto-tuning is not performed on parameters.	Perform motor parameter auto-tuning.
		Inappropriate setting of F9-69 and F9-70	Set the parameters correctly based on actual conditions.
Motor overspeed	E43.00	Incorrect setting of encoder parameters	Set encoder parameters properly.
		Auto-tuning is not performed on parameters.	Perform motor parameter auto-tuning.
		Inappropriate setting of F9-67 and F9-68	Set the parameters correctly based on actual conditions.
Motor overtemperature	E45.00	Temperature sensor loosely connected	Check the wiring of the temperature sensor.
		High motor temperature	Increase the carrier frequency or take other heat dissipation measures to cool the motor.
		Excessively low value of F9-57 (motor overtemperature protection threshold)	Adjust the threshold to a level between 90°C and 100°C.
AC drive overtemperature	E60.00	High internal temperature of the AC drive	Replace the fan in the AC drive.
			Contact Inovance.
Braking transistor overload	E61.00	Excessively low resistance of the braking resistor	Use a braking resistor with higher resistance.
Braking transistor short circuit	E62.00	Braking transistor short circuit	Ensure proper functioning of the braking transistor.
			Check whether an external braking resistor is installed.
Low liquid level alarm	E63.00	Low liquid level of the water tank	Add coolant.

Fault Name	Display	Possible Cause	Action
Water cooling system fault	E64.00	Water-cooling system control unit fault	Perform a reset.
			Replace the control unit.

5 Parameter List

5.1 Parameter List

If FP-00 is set to a non-zero value (password protection is enabled), the parameter menu is accessible in parameter mode and user-modification mode only after the correct password is entered. To disable password protection, set FP-00 to 0.

The password is used to lock the operating panel. After the password is set, the password is required every time you exit and then try to read or write parameters using the operating panel. During communication, the values of parameters (excluding parameters in groups FP and FF) can be read and written without password authentication.

Password protection is not available for the parameter menu in user-defined mode.

Groups F and A contain basic function parameters, and group U contains the monitoring parameters. The following symbols are used in the parameter table:

- Non-modifiable
- At stop
- In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F0-00	0xF000	G/P type	1: G type (constant-torque load) 2: P type (fan and pump type load)	1	-	At stop
F0-01	0xF001	Motor 1 control mode	0: Sensorless vector control (SVC) 1: Feedback vector control (FVC) 2: Voltage/Frequency control (V/f control) 3: Reserved 4: Reserved 5: Synchronous motor speed open loop control (PMVVC)	0	-	At stop
F0-02	0xF002	Command source selection	0: LED operating panel/LCD operating panel/Software tool 1: Terminal 2: Communication	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F0-03	0xF003	Main frequency source X selection	0: Digital setting (preset frequency F0-08 can be changed by pressing **UP**/**DOWN** key; non-retentive upon power failure) 1: Digital setting (preset frequency F0-08 can be changed by pressing **UP**/**DOWN** key; retentive at power failure) 2: AI1 3: AI2 4: AI3 5: Pulse reference (DI5) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication 10: Reserved	0	-	At stop
F0-04	0xF004	Auxiliary frequency source Y	0: Digital setting (preset frequency F0-08 can be changed by pressing **UP**/**DOWN** key; non-retentive upon power failure) 1: Digital setting (preset frequency F0-08 can be changed by pressing **UP**/**DOWN** key; retentive at power failure) 2: AI1 3: AI2 4: AI3 5: Pulse reference (DI5) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication 10: Reserved	0	-	At stop
F0-05	0xF005	Range selection of auxiliary frequency source Y for superposition	0: Relative to the maximum frequency 1: Relative to main frequency source X	0	-	In real time
F0-06	0xF006	Range of auxiliary frequency source Y for superposition	0% to 150%	100	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F0-07	0xF007	Frequency source superposition	Ones: Frequency reference selection 0: Main frequency source X 1: Main and auxiliary operation result (based on tens) 2: Switchover between main frequency source X and auxiliary frequency source Y 3: Switchover between main frequency source X and the main and auxiliary operation result 4: Switchover between auxiliary frequency source Y and the main and auxiliary operation result Tens: Operation result of main and auxiliary frequency reference 0: Main + Auxiliary 1: Main – Auxiliary 2: Max. (main, auxiliary) 3: Min. (main, auxiliary) 4: Main x Auxiliary	0	-	In real time
F0-08	0xF008	Preset frequency	0.00 Hz to F0-10	50	Hz	In real time
F0-09	0xF009	Running direction	0: Same as the default direction 1: Reverse to the default direction	0	-	In real time
F0-10	0xF00A	Maximum frequency	5.00 Hz to 599.00 Hz	50	Hz	At stop
F0-11	0xF00B	Frequency source upper limit	0: Frequency upper limit (F0-12) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication 6: Multi-speed reference	0	-	At stop
F0-12	0xF00C	Frequency upper limit	F0-14 to F0-10	50	Hz	In real time
F0-13	0xF00D	Frequency upper limit offset	0.00 Hz to F0-10	0	Hz	In real time
F0-14	0xF00E	Frequency lower limit	0.00 Hz to F0-12	0	Hz	In real time
F0-15	0xF00F	Carrier frequency	0.8 kHz to 16.0 kHz	6	kHz	In real time
F0-16	0xF010	Carrier frequency adjusted with temperature	0: No 1: Yes	1	-	In real time
F0-17	0xF011	Acceleration time 1	0.0s to 6500.0s	20	s	In real time
F0-18	0xF012	Deceleration time 1	0.0s to 6500.0s	20	s	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F0-19	0xF013	Acceleration/ Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	-	At stop
F0-21	0xF015	Offset of auxiliary frequency source during superposition	0.00 Hz to F0-10	0	Hz	In real time
F0-22	0xF016	Frequency reference resolution	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 1: Retentive	0	-	In real time
F0-25	0xF019	Acceleration/ Deceleration time base frequency	0: Maximum frequency (F0-10) 1: Frequency reference 2: 100 Hz	0	-	At stop
F0-26	0xF01A	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Frequency reference	0	-	At stop
F0-27	0xF01B	Main frequency coefficient	0.00% to 100.00%	10	%	In real time
F0-28	0xF01C	Auxiliary frequency coefficient	0.00% to 100.00%	10	%	In real time
F1-00	0xF100	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Synchronous motor	0	-	At stop
F1-01	0xF101	Rated motor power	0.1 kW to 1000.0 kW	1.5	kW	At stop
F1-02	0xF102	Rated motor voltage	1 V to 2000 V	380	V	At stop
F1-03	0xF103	Rated motor current	0.1 A to 6553.5 A	9	A	At stop
F1-04	0xF104	Rated motor frequency	0.01 Hz to F0-10	50	Hz	At stop
F1-05	0xF105	Rated motor speed	1 RPM to 65535 RPM	1460	RPM	At stop
F1-06	0xF106	Asynchronous/ Synchronous motor stator resistance	0.001 Ω to 65.535 Ω	1.204	Ω	At stop
F1-07	0xF107	Asynchronous motor rotor resistance	0.001 Ω to 65.535 Ω	0.908	Ω	At stop
F1-08	0xF108	Asynchronous motor leakage inductance	0.01 mH to 655.35 mH	5.28	mH	At stop
F1-09	0xF109	Asynchronous motor mutual inductance	0.1 mH to 6553.5 mH	156.8	mH	At stop
F1-10	0xF10A	Asynchronous motor no-load current	0.1 A to F1-03	4.2	A	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F1-11	0xF10B	Asynchronous motor core saturation coefficient 1	50.0% to 100.0%	86	%	In real time
F1-12	0xF10C	Asynchronous motor core saturation coefficient 2	100.0% to 150.0%	130	%	In real time
F1-13	0xF10D	Asynchronous motor core saturation coefficient 3	100.0% to 170.0%	140	%	In real time
F1-14	0xF10E	Asynchronous motor core saturation coefficient 4	100.0% to 180.0%	150	%	In real time
F1-17	0xF111	Synchronous motor axis D inductance	0.01 mH to 655.35 mH	15.86	mH	At stop
F1-18	0xF112	Synchronous motor axis Q inductance	0.01 mH to 655.35 mH	15.86	mH	At stop
F1-19	0xF113	Synchronous motor back EMF coefficient	0.0 V to 6553.5 V	0	V	At stop
F1-20	0xF114	Filter time constant (PMVVC)	0.003 to 65.535	0.1	-	In real time
F1-21	0xF115	Oscillation suppression gain (PMVVC)	0 to 65535	100	-	In real time
F1-23	0xF117	Percentage of the frictional moment	0.00% to 100.00%	0	%	At stop
F1-24	0xF118	Number of motor pole pairs	0 to 65535	2	-	In real time
F1-26	0xF11A	Auto-tuning direction (inertia auto-tuning and synchronous motor auto-tuning)	0: Reverse run 1: Forward run	1	-	At stop
F1-27	0xF11B	Encoder pulses per revolution	1 to 20000	1024	-	At stop
F1-28	0xF11C	Encoder type	0: ABZ incremental encoder 1: 23-bit encoder 2: Resolver	0	-	At stop
F1-29	0xF11D	PG signal filter	0: Non-adaptive filter 1: Adaptive filter 2: Fixed interlock 3: Automatic interlock	1	-	At stop
F1-30	0xF11E	Encoder wiring flag	Ones (position): AB signal direction or rotational direction 0: Forward direction 1: Reverse direction Tens (position): Reserved	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F1-31	0xF11F	Encoder zero position angle	0.0° to 359.9°	0	°	At stop
F1-32	0xF120	Motor gear ratio numerator	1 to 65535	1	-	At stop
F1-33	0xF121	Motor gear ratio denominator	1 to 65535	1	-	At stop
F1-34	0xF122	Number of pole pairs of resolver	1 to 32	1	-	At stop
F1-36	0xF124	PG open circuit detection	0 to 11	1	-	At stop
F1-37	0xF125	Auto-tuning selection	0: No auto-tuning 1: Static auto-tuning of the asynchronous motor (Rs, Rr, L0) 2: Dynamic auto-tuning of the asynchronous motor (supporting dynamic auto-tuning with load) 3: Static auto-tuning on all parameters of the asynchronous motor (Rs, Rr, L0, Lm, IO) 4: Dynamic auto-tuning of the asynchronous motor 2 (inertia auto-tuning supported only in FVC mode) 5: Dynamic auto-tuning of the asynchronous motor 3 (mutual inductance curve auto-tuning requires no-load, light load, or pure inertia load; supporting the V/f, SVC, and FVC modes) 11: Static auto-tuning on partial parameters of the synchronous motor (excluding back EMF) 12: Dynamic auto-tuning on all parameters of the synchronous motor 13: Static auto-tuning on all parameters of the synchronous motor (excluding the encoder installation angle) 14: Synchronous motor inertia auto-tuning (only in FVC mode)	0	-	At stop
F2-00	0xF200	Low-speed speed loop Kp	1 to 200	30	-	In real time
F2-01	0xF201	Low-speed speed loop Ti	0.001s to 10.000s	0.5	s	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F2-02	0xF202	Switchover frequency 1	0.00 Hz to F2-05	5	Hz	In real time
F2-03	0xF203	High-speed speed loop Kp	1 to 200	20	-	In real time
F2-04	0xF204	High-speed speed loop Ti	0.001s to 10.000s	1	s	In real time
F2-05	0xF205	Switchover frequency 2	F2-02 to F0-10	10	Hz	In real time
F2-06	0xF206	VC slip compensation gain	50% to 200%	100	%	In real time
F2-07	0xF207	Speed feedback filter time	0.000s to 0.1s	0.004	s	In real time
F2-08	0xF208	VC deceleration over-excitation gain	0 to 200	64	-	In real time
F2-09	0xF209	Torque upper limit source in speed control (motoring)	0: Digital setting (F2-10) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication 6: Min. (AI1, AI2) 7: Max. (AI1, AI2)	0	-	In real time
F2-10	0xF20A	Torque upper limit reference in speed control (motoring)	0.0% to 200.0%	150	%	In real time
F2-11	0xF20B	Torque upper limit source in speed control (generating)	0: Digital setting (F2-10) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) 8: Digital setting (F2-12)	0	-	In real time
F2-12	0xF20C	Torque upper limit reference in speed control (generating)	0.0% to 200.0%	150	%	In real time
F2-13	0xF20D	Low-speed current loop Kp adjustment	0.1–10.0	1	-	In real time
F2-14	0xF20E	Low-speed current loop Ki adjustment	0.1 to 10.0	1	-	In real time
F2-15	0xF20F	High-speed current loop Kp adjustment	0.1 to 10.0	1	-	In real time
F2-16	0xF210	High-speed current loop Ki adjustment	0.1 to 10.0	1	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F2-17	0xF211	Speed loop Kp upon zero speed lock	1 to 100	30	-	In real time
F2-18	0xF212	Speed loop Ti upon zero speed lock	0.001s to 10.000s	0.5	s	In real time
F2-19	0xF213	Inertia compensation gain	1 to 200	1	-	In real time
F2-20	0xF214	Speed loop switchover frequency upon zero speed lock	0.00 Hz to F2-02	0.05	Hz	In real time
F2-21	0xF215	Maximum output voltage coefficient	100 to 110	100	-	In real time
F2-22	0xF216	Output voltage filter time	0.000s to 0.01s	0	s	In real time
F2-23	0xF217	Zero speed lock	0: Disabled 1: Enabled	0	-	At stop
F2-24	0xF218	Overvoltage suppression Kp in vector control mode	0 to 1000	40	-	In real time
F2-25	0xF219	Acceleration compensation gain	0 to 200	0	-	In real time
F2-26	0xF21A	Acceleration compensation filter time	0 to 500	10	-	In real time
F2-27	0xF21B	Overvoltage suppression in vector control mode	0: Disabled 1: Enabled	1	-	In real time
F2-28	0xF21C	Torque filter cut-off frequency	50 Hz to 1000 Hz	500	Hz	At stop
F2-29	0xF21D	Synchronous motor initial angle detection current	50 to 180	80	-	In real time
F2-30	0xF21E	Speed loop parameter auto-calculation	0: Disabled 1: Enabled	0	-	At stop
F2-31	0xF21F	Expected speed loop bandwidth (high speed)	0 Hz to 3 Hz	0	Hz	At stop
F2-32	0xF220	Expected speed loop bandwidth (low speed)	1 Hz to 10000 Hz	100	Hz	In real time
F2-33	0xF221	Expected speed loop bandwidth (zero speed)	1 Hz to 10000 Hz	100	Hz	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F2-34	0xF222	Damping ratio of expected speed loop (unchanged generally)	0.1 to 65.000	1	-	In real time
F2-35	0xF223	System inertia (equivalent to the start time)	0.001s to 50.000s	0.1	s	At stop
F2-36	0xF224	Single motor inertia ($kg*m^2$)	0.001 $kg*m^2$ to 50.000 $kg*m^2$	0.001	$kg*m^2$	At stop
F2-37	0xF225	Inertia auto-tuning maximum frequency	20%–100%	80	%	At stop
F2-38	0xF226	Inertia auto-tuning acceleration time	1.0s to 50.0s	10	s	At stop
F2-39	0xF227	Bandwidth 1 of speed loop dynamic optimization test	1.0 Hz to 200.0 Hz	5	Hz	Non-modifiable
F2-40	0xF228	Bandwidth 2 of speed loop dynamic optimization test	1.0 Hz to 200.0 Hz	10	Hz	Non-modifiable
F2-41	0xF229	Bandwidth 3 of speed loop dynamic optimization test	1.0 Hz to 100.0 Hz	15	Hz	Non-modifiable
F2-42	0xF22A	Bandwidth 4 of speed loop dynamic optimization test	1.0 Hz to 200.0 Hz	20	Hz	Non-modifiable
F2-43	0xF22B	Inertia auto-tuning and dynamic speed reference	0 to 100	30	-	At stop
F2-44	0xF22C	Rotor time constant check	0: Disabled 1: Enabled	0	-	Non-modifiable
F2-45	0xF22D	Torque amplitude of rotor time constant check	10% to 100%	30	%	Non-modifiable
F2-46	0xF22E	Number of times of rotor constant check	1 to 6	3	-	Non-modifiable
F2-47	0xF22F	Inertia auto-tuning	0: Disabled 1: Enabled	0	-	At stop
F2-48	0xF230	Speed loop bandwidth during inertia auto-tuning	0.1 Hz to 100.0 Hz	10	Hz	At stop
F2-49	0xF231	Back EMF calculation	0: Disabled 1: Enabled	0	-	Non-modifiable
F2-50	0xF232	Inertia auto-tuning mode	0: Acceleration/Deceleration mode 1: Triangular wave mode	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F2-51	0xF233	Inertia auto-tuning acceleration/ deceleration coefficient	0.1–10.0	1	-	At stop
F2-52	0xF234	Decoupling control	0: Disabled 1: Enabled	0	-	At stop
F2-53	0xF235	Power limit during generating	0: Disabled 1: Enabled	0	-	At stop
F2-54	0xF236	Power limit during generating	0.0% to 200.0%	20	%	At stop
F2-55	0xF237	Flux closed loop and torque linearity optimization in FVC mode	Ones (position): Flux closed loop in torque control mode 0: Disabled 1: Enabled Tens (position): Flux closed loop in speed control mode 0: Disabled 1: Enabled Hundreds (position): Torque upper limit and torque linearity in speed control mode 0: Disabled 1: Enabled	10	-	At stop
F2-56	0xF238	AC drive output current upper limit	0.0% to 170.0%	150	%	At stop
F3-00	0xF300	V/f curve setting	0: Linear V/f curve 1: Multi-point V/f curve 2: Square V/f curve 3: 1.2-power V/f curve 4: 1.4-power V/f curve 6: 1.6-power V/f curve 8: 1.8-power V/f curve 10: V/f complete separation mode 11: V/f half separation mode	0	-	At stop
F3-01	0xF301	Torque boost	0.0% to 30.0%	0	%	In real time
F3-02	0xF302	Cutoff frequency of torque boost	0.00 Hz to F0-10	50	Hz	At stop
F3-03	0xF303	Multi-point V/f frequency 1	0.00 Hz to F3-05	0	Hz	At stop
F3-04	0xF304	Multi-point V/f voltage 1	0.0% to 100.0%	0	%	At stop
F3-05	0xF305	Multi-point V/f frequency 2	F3-03 to F3-07	0	Hz	At stop
F3-06	0xF306	Multi-point V/f voltage 2	0.0% to 100.0%	0	%	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F3-07	0xF307	Multi-point V/f frequency 3	F3-05 to F1-04	0	Hz	At stop
F3-08	0xF308	Multi-point V/f voltage 3	0.0% to 100.0%	0	%	At stop
F3-09	0xF309	V/f slip compensation gain	0.0% to 200.0%	0	%	In real time
F3-10	0xF30A	V/f over-excitation gain	0 to 200	64	-	In real time
F3-11	0xF30B	V/f oscillation suppression gain	0 to 100	0	-	In real time
F3-12	0xF30C	Oscillation suppression gain mode	0: Invalid 1: Reserved 2: Reserved 3: Valid	3	-	At stop
F3-13	0xF30D	Voltage source for V/f separation	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 (1000H)	0	-	In real time
F3-14	0xF30E	Digital setting of voltage for V/f separation	0 V to F1-02	0	V	In real time
F3-15	0xF30F	Voltage rise time of V/f separation	0.0s to 1000.0s	0	s	In real time
F3-16	0xF310	Voltage decline time of V/f separation	0.0s to 1000.0s	0	s	In real time
F3-17	0xF311	Stop mode selection for V/f separation	0: Frequency and voltage decline to 0 independently 1: Frequency declines to 0 after voltage declines to 0	0	-	At stop
F3-18	0xF312	V/f overcurrent stall action current	50% to 200%	150	%	At stop
F3-19	0xF313	V/f overcurrent stall	0: Disabled 1: Enabled	1	-	At stop
F3-20	0xF314	V/f overcurrent stall suppression gain	0 to 100	20	-	In real time
F3-21	0xF315	Compensation coefficient of V/f speed multiplying overcurrent stall action current	50 to 200	50	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F3-22	0xF316	V/f overvoltage stall action voltage	200.0 V to 2000.0 V	770	V	At stop
F3-23	0xF317	V/f overvoltage stall	0: Disabled 1: Enabled	1	-	At stop
F3-24	0xF318	V/f overvoltage stall suppression frequency gain	0 to 100	30	-	In real time
F3-25	0xF319	V/f overvoltage stall suppression voltage gain	0 to 100	30	-	In real time
F3-26	0xF31A	Frequency rise threshold during overvoltage stall suppression	0 to 50	5	-	At stop
F3-27	0xF31B	Slip compensation time constant	0.1 Hz to 10.0 Hz	0.5	Hz	In real time
F3-28	0xF31C	V/f parameter setting inertia coefficient	0.00 to 10.00	0.1	-	At stop
F3-29	0xF31D	Minimum motoring torque current	10 to 100	50	-	At stop
F3-30	0xF31E	Maximum generating torque current	10 to 100	20	-	At stop
F3-31	0xF31F	Automatic frequency rise Kp	0 to 100	50	-	In real time
F3-32	0xF320	Automatic frequency rise Ki	0 to 100	50	-	In real time
F3-33	0xF321	Online torque compensation gain	80 to 150	100	-	At stop
F4-00	0xF400	DI1 function selection	0: No function 1: Forward run (FWD) 2: Reverse run (REV) 3: Three-wire control 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6:Terminal (UP) 7:Terminal (DOWN) 8: Coast to stop 9: Fault reset (RESET) 10: Running pause 11:NO input of external fault 12: Multi-reference terminal 1 13: Multi-reference terminal 2 14: Multi-reference terminal 3	1	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
Continued	Continued	Continued	15: Multi-reference terminal 4 16:Terminal 1 for acceleration/ deceleration selection 17: Terminal 2 for acceleration/ deceleration selection 18: Frequency source switchover 19: UP and DOWN setting clear (terminal, operating panel) 20: Command source switchover terminal 21: Acceleration/Deceleration inhibited 22: PID pause 23: PLC state reset 24: Wobble pause 25:Counter input (DI5) 26: Counter reset 27: Length count input (DI5) 28: Length reset	Continued	Continued	Continued
Continued	Continued	Continued	29: Torque control inhibited 30: Pulse input 31: Reserved 32: Immediate DC braking 33: NC input of external fault 34: Frequency modification enabled 35: PID action direction reversal 36: External stop terminal 1 37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency source X and preset frequency	1	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
Continued	Continued	Continued	40: Switchover between auxiliary frequency source Y and preset frequency 41: Reserved 42: Position lock enabled 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/Torque control switchover 47: Emergency stop 48: External STOP terminal 2 49: Deceleration DC braking 50: Clear the current running time	Continued	Continued	Continued
Continued	Continued	Continued	51: Two-wire/three-wire control switchover 52: Electromagnetic shorting 53: Thickness overlaying 54: Roll diameter reset 55: Initial roll diameter 1 56: Initial roll diameter 2 57: Pre-drive 58: Winding/Unwinding switchover 59: Roll diameter calculation disabled 60: Exit tension control 61: Terminal tension rise 62: Thickness selection 1 63: Thickness selection 2 90: Water cooling system fault 91: Low liquid level fault 92: Revolution count reset 93: Reserved	Continued	Continued	Continued
F4-01	0xF401	DI2 function selection	0 to 93	4	-	At stop
F4-02	0xF402	DI3 function selection	0 to 93	9	-	At stop
F4-03	0xF403	DI4 function selection	0 to 93	12	-	At stop
F4-04	0xF404	DI5 function selection	0 to 93	13	-	At stop
F4-05	0xF405	DI6 function selection	0 to 93	0	-	At stop
F4-06	0xF406	DI7 function selection	0 to 93	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F4-07	0xF407	DI8 function selection	0 to 93	0	-	At stop
F4-08	0xF408	DI9 function selection	0 to 93	0	-	At stop
F4-09	0xF409	DI10 function selection	0 to 93	0	-	At stop
F4-10	0xF40A	DI filter time	0.000s to 1.000s	0.01	s	In real time
F4-11	0xF40B	Terminal control 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	Terminal UP/DOWN change rate	0.001 Hz/s to 65.535 Hz/s	1	Hz/s	In real time
F4-13	0xF40D	AI curve 1 minimum input	-10.00 V to F4-15	-10	V	In real time
F4-14	0xF40E	Percentage corresponding to AI curve 1 minimum input	-100.0% to +100.0%	-100	%	In real time
F4-15	0xF40F	AI curve 1 maximum input	F4-13 to 10.00 V	10	V	In real time
F4-16	0xF410	Percentage corresponding to AI curve 1 maximum input	-100.0% to +100.0%	100	%	In real time
F4-17	0xF411	AI1 fitter time	0.00s to 10.00s	0.1	s	In real time
F4-18	0xF412	AI curve 2 minimum input	–10.00 V to F4-20	-10	V	In real time
F4-19	0xF413	Percentage corresponding to AI curve 2 minimum input	-100.0% to +100.0%	-100	%	In real time
F4-20	0xF414	AI curve 2 maximum input	F4-18 to 10.00 V	10	V	In real time
F4-21	0xF415	Percentage corresponding to AI curve 2 maximum input	-100.0% to +100.0%	100	%	In real time
F4-22	0xF416	AI2 fitter time	0.00s to 10.00s	0.1	s	In real time
F4-23	0xF417	AI curve 3 minimum input	–10.00 V to F4-25	-10	V	In real time
F4-24	0xF418	Percentage corresponding to AI curve 3 minimum input	-100.0% to +100.0%	-100	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F4-25	0xF419	AI curve 3 maximum input	F4-23 to 10.00 V	10	V	In real time
F4-26	0xF41A	Percentage corresponding to AI curve 3 maximum input	-100.0% to +100.0%	100	%	In real time
F4-27	0xF41B	AI3 filter time	0.00s to 10.00s	0.1	s	In real time
F4-28	0xF41C	Pulse minimum input	0.00 kHz to F4-30	0	kHz	In real time
F4-29	0xF41D	Percentage corresponding to pulse minimum input	-100.0% to +100.0%	0	%	In real time
F4-30	0xF41E	Pulse maximum input	F4-28 to 100.00 kHz	50	kHz	In real time
F4-31	0xF41F	Percentage corresponding to pulse maximum input	-100.0% to +100.0%	100	%	In real time
F4-32	0xF420	Pulse filter time	0.00s to 10.00s	0.1	s	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F4-33	0xF421	AI curve selection	Ones: AI1 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, A6-08 to A6-15) Tens: AI2 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 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	-	In real time
F4-34	0xF422	Setting for AI lower than the minimum input	Ones: AI1 0: Percentage corresponding to the minimum input 1: 0.0% Tens: AI2 0: Percentage corresponding to the minimum input 1: 0.0% Hundreds: AI3 0: Percentage corresponding to the minimum input 1: 0.0%	0	-	In real time
F4-35	0xF423	DI1 delay	0.0s to 3600.0s	0	s	In real time
F4-36	0xF424	DI2 delay	0.0s to 3600.0s	0	s	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F4-37	0xF425	DI3 delay	0.0s to 3600.0s	0	s	In real time
F4-38	0xF426	DI active mode setting 1	Ones: DI1 active mode setting 0: Active high 1: Active low Tens: DI2 active mode setting 0: Active high 1: Active low Hundreds: DI3 active mode setting 0: Active high 1: Active low Thousands: DI4 active mode setting 0: Active high 1: Active low Ten thousands: DI5 active mode setting 0: Active high 1: Active low	0	-	At stop
F4-39	0xF427	DI active mode setting 2	Ones: DI6 active mode setting 0: Active high 1: Active low Tens: DI7 active mode setting 0: Active high 1: Active low Hundreds: DI8 active mode setting 0: Active high 1: Active low Thousands: DI9 active mode setting 0: Active high 1: Active low Ten thousands: DI10 active mode setting 0: Active high 1: Active low	0	-	At stop
F4-42	0xF42A	AI input range selection	0: -10 V to +10 V 1: 0 V to 10 V	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F5-01	0xF501	Expansion card relay output function selection	0: No output 1: AC drive running 2: Fault output (stop at fault) 3: Frequency level detection FDT1 output 4: Frequency reach 5: Zero-speed running (no output at stop) 6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Set count value reach 9: Designated count value reach 10: Length reach 11: PLC cycle completed 12: Accumulative running time reach 13: Frequency limited 14: Torque limited	0	-	In real time
Continued	Continued	Continued	15: Ready to run 16: AI1 > AI2 17: Frequency upper limit reach 18: Frequency lower limit reach (operation related) 19: Undervoltage output 20: Communication setting 21: Reserved 22: Reserved 23: Zero-speed running 2 (at stop) 24: Accumulative power-on time reach 25: Frequency level detection FDT2 output 26: Frequency 1 reach output 27: Frequency 2 reach output 28: Current 1 reach output 29: Current 2 reach output	Continued	Continued	Continued

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
Continued	Continued	Continued	30: Timing reach output 31: AI1 input limit exceeded 32: AC drive output load lost 33: Reverse running 34: Zero current state 35: Module temperature reach 36: Output current limit exceeded 37: Frequency lower limit reach (output at stop) 38: Alarm output (direct output at fault or alarm) 39: Current over-temperature pre-warning 40: Current running time reach 41: Fault output 2 42: Fault output 3	Continued	Continued	Continued
F5-02	0xF502	Control board relay 1 function selection (T/A1-T/B1-TC1)	0 to 42	2	-	In real time
F5-03	0xF503	Control board relay 2 function selection (T/A2-TC2)	0 to 42	0	-	In real time
F5-04	0xF504	DO1 function selection	0 to 42	1	-	In real time
F5-05	0xF505	Expansion card DO2 output selection	0 to 42	4	-	In real time
F5-06	0xF506	FMP output function selection	0: Running frequency 1: Frequency reference 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: Pulse input (100.0% corresponds to 100.0 kHz) 7: AI1 8: AI2 9: AI3 10: Length	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
Continued	Continued	Continued	11: Count value 12: Communication 13: Motor speed 14: Output current (100.0% corresponds to 1000.0 A) 15: Output voltage (100.0% corresponds to 1000.0 V) 16: Output torque (directional) 19: Taper output 20: Roll diameter output 21: Tension output 22: Encoder feedback frequency	Continued	Continued	Continued
F5-07	0xF507	AO1 function selection	0: Running frequency 1: Frequency reference 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: Pulse input (100.0% corresponds to 100.0 kHz) 7: AI1 8: AI2 9: AI3	0	-	In real time
Continued	Continued	Continued	10: Length 11: Count value 12: Communication 13: Motor speed 14: Output current (100.0% corresponds to 1000.0 A) 15: Output voltage (100.0% corresponds to 1000.0 V) 16: Output torque (directional) 19: Taper output 20: Roll diameter output 21: Tension output 22: Encoder feedback frequency	Continued	Continued	Continued
F5-08	0xF508	AO1 output selection	0: Running frequency 1: Frequency reference 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: Pulse input (100.0% corresponds to 100.0 kHz) 7: AI1 8: AI2 9: AI3	1	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
Continued	Continued	Continued	10: Length 11: Count value 12: Communication 13: Motor speed 14: Output current (100.0% corresponds to 1000.0 A) 15: Output voltage (100.0% corresponds to 1000.0 V) 16: Output torque (directional) 19: Taper output 20: Roll diameter output 21: Tension output 22: Encoder feedback frequency	Continued	Continued	Continued
F5-09	0xF509	Maximum FMP output frequency	0.01 kHz to 100.00 kHz	50	kHz	In real time
F5-10	0xF50A	AO1 zero offset coefficient	-100.0% to +100.0%	0	%	In real time
F5-11	0xF50B	AO1 gain	–10.00 to +10.00	1	-	In real time
F5-12	0xF50C	AO2 zero offset coefficient	-100.0% to +100.0%	0	%	In real time
F5-13	0xF50D	AO2 gain	–10.00 to +10.00	1	-	In real time
F5-17	0xF511	Expansion card relay output delay	0.0s to 3600.0s	0	s	In real time
F5-18	0xF512	Control board relay 1 output delay	0.0s to 3600.0s	0	s	In real time
F5-19	0xF513	Control board relay 2 output delay	0.0s to 3600.0s	0	s	In real time
F5-20	0xF514	DO1 output delay	0.0s to 3600.0s	0	s	In real time
F5-21	0xF515	Expansion card DO2 output delay	0.0s to 3600.0s	0	s	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F5-22	0xF516	DO active mode selection	Ones (position): Expansion card relay 0: Positive logic 1: Negative logic Tens (position): Control board relay 1 0: Positive logic 1: Negative logic Hundreds (position): Control board relay 2 0: Positive logic 1: Negative logic Thousands (position): Control board DO1 0: Positive logic 1: Negative logic Ten thousands (position): Expansion card DO2 0: Positive logic 1: Negative logic	0	-	In real time
F6-00	0xF600	Start Modes	0: Direct start 1: Flying start 2: Vector pre-excited start (asynchronous motor)	0	-	In real time
F6-01	0xF601	Speed tracking mode	0: From stop frequency 1: From 50 Hz 2: From the maximum frequency 3: Reserved	0	-	At stop
F6-02	0xF602	Speed of speed tracking	1 to 100	20	-	In real time
F6-03	0xF603	Startup frequency	0.00 Hz to 10.00 Hz	0	Hz	In real time
F6-04	0xF604	Startup frequency hold time	0.0s to 100.0s	0	s	At stop
F6-05	0xF605	DC braking current/ Pre-excitation current at startup	0% to 150%	0	%	At stop
F6-06	0xF606	DC braking time/pre-excitation time at startup	0.0s to 100.0s	0	s	At stop
F6-07	0xF607	Acceleration/ Deceleration mode	0: Linear acceleration/ deceleration 1: S-curve acceleration/ deceleration	0	-	At stop
F6-08	0xF608	Time proportion of S-curve start segment	0.0% to 70.0%	30	%	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F6-09	0xF609	Time proportion of S-curve end segment	0.0% to 70.0%	30	%	At stop
F6-10	0xF60A	Stop mode	0: Decelerate to stop 1: Coast to stop	0	-	In real time
F6-11	0xF60B	Start frequency of DC braking at stop	0.00 Hz to F0-10	0	Hz	In real time
F6-12	0xF60C	Waiting time of DC braking at stop	0.0s to 100.0s	0	s	In real time
F6-13	0xF60D	DC braking current at stop	0% to 150%	0	%	In real time
F6-14	0xF60E	DC braking time at stop	0.0s to 100.0s	0	s	In real time
F6-15	0xF60F	Brake usage	0% to 100%	100	%	At stop
F6-16	0xF610	Closed-loop current Kp of speed tracking	0 to 1000	500	-	In real time
F6-17	0xF611	Closed-loop current Ki of speed tracking	0 to 1000	800	-	In real time
F6-18	0xF612	Current of speed tracking	30 to 200	100	-	In real time
F6-21	0xF615	Demagnetization time	0.00s to 10.00s	1	s	In real time
F6-22	0xF616	Start pre-torque setting	0.0% to 200.0%	0	%	In real time
F6-26	0xF61A	Electromagnetic shorting current	0% to 200%	100	%	In real time
F6-27	0xF61B	Electromagnetic shorting time upon startup	0.0s to 100.0s	0	s	At stop
F6-28	0xF61C	Electromagnetic shorting time upon stop	0.0s to 100.0s	0	s	At stop
F6-29	0xF61D	Electromagnetic shorting voltage reserve	20.0 V to 100.0 V	20	V	At stop
F6-30	0xF61E	Trial current for synchronous motor speed tracking	5.0 to 50.0	10	-	At stop
F6-31	0xF61F	Minimum tracking frequency for synchronous motor speed tracking	0.0 to 100.0	0	-	At stop
F6-32	0xF620	Angle compensation for synchronous motor speed tracking	0 to 360	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F6-33	0xF621	Proportion of synchronous motor speed tracking	0.1 to 10.0	1	-	At stop
F6-34	0xF622	Integral of synchronous motor speed tracking	0.1 to 10.0	1	-	At stop
F6-35	0xF623	Maximum current limit for DC braking	80% to 135%	80	%	At stop
F6-36	0xF624	Speed loop feedforward	-200.0% to +200.0%	0	%	In real time
F7-01	0xF701	MF.K key function	0: MF.K key disabled 1: Switchover between operating panel control and remote command control (terminal or communication) 2: Switchover between forward and reverse running 3: Forward jog 4: Reverse jog	0	-	At stop
F7-02	0xF702	STOP/RES key function	0: STOP/RES key enabled only in operating panel control mode 1: STOP/RES key enabled in any operating mode	0	-	In real time
F7-03	0xF703	LED display 1 in running state	Bit 00: Running frequency (Hz) Bit 01: Frequency reference (Hz) Bit 02: Bus voltage (V) Bit 03: Output voltage (V) Bit 04: Output current (A) Bit 05: Output power (kW) Bit 06: Output torque (%) Bit 07: DI status Bit 08: DO status Bit 09: AI1 voltage (V) Bit 10: AI2 voltage (V) Bit 11: AI3 voltage (V) Bit 12: Count value Bit 13: Length value Bit 14: Load speed display Bit 15: PID reference	0x1F	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F7-04	0xF704	LED display 2 in running state	Bit 00: PID feedback Bit 01: PLC stage Bit 02: Pulse input reference (kHz) Bit 03: Running frequency 2 (Hz) Bit 04: Remaining running time Bit 05: AI1 voltage before correction (V) Bit 06: AI2 voltage before correction (V) Bit 07: AI3 voltage before correction (V) Bit 08: Linear speed Bit 09: Current power-on time (hour) Bit 10: Current running time (min.) Bit 11: Pulse input reference (Hz) Bit 12: Communication Bit 13: Encoder feedback speed (Hz) Bit 14: Roll diameter (mm) Bit 15: Taper tension (N)	0	-	In real time
F7-05	0xF705	LED display in stop state	Bit 00: Frequency reference (Hz) Bit 01: Bus voltage (V) Bit 02: DI state Bit 03: DO state Bit 04: AI1 voltage (V) Bit 05: AI2 voltage (V) Bit 06: AI3 voltage (V) Bit 07: Count value Bit 08: Length Bit 09: PLC state Bit 10: Load speed display Bit 11: PID setting Bit 12: Pulse input frequency (kHz) Bit 13: Roll diameter (mm) Bit 14: Tension (N)	0x33	-	In real time
F7-06	0xF706	Load speed display coefficient	0.0000 to 6.5	1	-	In real time
F7-07	0xF707	Heatsink temperature of the inverter	-20°C to +120°C	0	°C	Non-modifiable
F7-08	0xF708	Product SN	0 to 999	0	-	Non-modifiable
F7-09	0xF709	Accumulative running time	0 h to 65535 h	0	h	Non-modifiable
F7-10	0xF70A	Performance software version	-	0	-	Non-modifiable

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F7-11	0xF70B	Function software version	-	0	-	Non-modifiable
F7-12	0xF70C	Number of decimal places for load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	-	In real time
F7-13	0xF70D	Accumulative power-on time	0 h to 65535 h	0	h	Non-modifiable
F7-14	0xF70E	Accumulative power consumption	0 kWh to 65535 kWh	0	kWh	Non-modifiable
F7-15	0xF70F	Temporary performance software version	-	0	-	Non-modifiable
F7-16	0xF710	Temporary function software version	-	0	-	Non-modifiable
F8-00	0xF800	Jog frequency	0.00 Hz to F0-10	2	Hz	In real time
F8-01	0xF801	Jog acceleration time	0.0s to 6500.0s	20	s	In real time
F8-02	0xF802	Jog deceleration time	0.0s to 6500.0s	20	s	In real time
F8-03	0xF803	Acceleration time 2	0.0s to 6500.0s	20	s	In real time
F8-04	0xF804	Deceleration time 2	0.0s to 6500.0s	20	s	In real time
F8-05	0xF805	Acceleration time 3	0.0s to 6500.0s	20	s	In real time
F8-06	0xF806	Deceleration time 3	0.0s to 6500.0s	20	s	In real time
F8-07	0xF807	Acceleration time 4	0.0s to 6500.0s	20	s	In real time
F8-08	0xF808	Deceleration time 4	0.0s to 6500.0s	20	s	In real time
F8-09	0xF809	Jump frequency 1	0.00 Hz to F0-10	0	Hz	In real time
F8-10	0xF80A	Jump frequency 2	0.00 Hz to F0-10	0	Hz	In real time
F8-11	0xF80B	Jump frequency amplitude	0.00 Hz to 5.00 Hz	0	Hz	In real time
F8-12	0xF80C	Forward/Reverse run dead-zone time	0.0s to 3000.0s	0	s	In real time
F8-13	0xF80D	Reverse running	0: Reverse running allowed 1: Reverse running inhibited	0	-	In real time
F8-14	0xF80E	Running mode when the frequency reference is below the lower limit	0: Frequency lower limit 1: Stop by the way specified by F6-10 2: Zero speed running 3: Coast to stop	0	-	In real time
F8-15	0xF80F	Mechanical braking frequency	0.00 Hz to 10.00 Hz	0	Hz	In real time
F8-16	0xF810	Accumulative power-on time threshold setting	0 h to 65000 h	0	h	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F8-17	0xF811	Accumulative running time threshold setting	0 h to 65000 h	0	h	In real time
F8-18	0xF812	Startup protection selection	0: Disabled 1: Enabled	0	-	In real time
F8-19	0xF813	Frequency detection value (FDT1)	0.00 Hz to F0-10	50	Hz	In real time
F8-20	0xF814	Frequency detection hysteresis (FDT1)	0.0% to 100.0%	5	%	In real time
F8-21	0xF815	Detection width for frequency reach	0.0% to 100.0%	0	%	In real time
F8-22	0xF816	Jump frequency validity during acceleration/ deceleration	0: Inactive 1: Active	0	-	In real time
F8-25	0xF819	Switchover frequency of acceleration time 1 and acceleration time 2	0.00 Hz to F0-10	0	Hz	In real time
F8-26	0xF81A	Switchover frequency of deceleration time 1 and deceleration time 2	0.00 Hz to F0-10	0	Hz	In real time
F8-27	0xF81B	Jog preferred	0: No 1: Yes	0	-	In real time
F8-28	0xF81C	Frequency detection value (FDT2)	0.00 Hz to F0-10	50	Hz	In real time
F8-29	0xF81D	Frequency detection hysteresis (FDT2)	0.0% to 100.0%	5	%	In real time
F8-30	0xF81E	Detection value 1 for frequency reach	0.00 Hz to F0-10	50	Hz	In real time
F8-31	0xF81F	Detection width 1 for frequency reach	0.0% to 100.0%	0	%	In real time
F8-32	0xF820	Detection value 2 for frequency reach	0.00 Hz to F0-10	50	Hz	In real time
F8-33	0xF821	Detection width 2 for frequency reach	0.0% to 100.0%	0	%	In real time
F8-34	0xF822	Zero current detection level	0.0% to 300.0%	5	%	In real time
F8-35	0xF823	Zero current detection delay	0.01s to 600.00s	0.1	s	In real time
F8-36	0xF824	Output overcurrent threshold	0.0% to 300.0%	200	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F8-37	0xF825	Software overcurrent detection delay	0.00s to 600.00s	0	s	In real time
F8-38	0xF826	Detection level of current 1	0.0% to 300.0%	100	%	In real time
F8-39	0xF827	Detection width of current 1	0.0% to 300.0%	0	%	In real time
F8-40	0xF828	Detection level of current 2	0.0% to 300.0%	100	%	In real time
F8-41	0xF829	Detection width of current 2	0.0% to 300.0%	0	%	In real time
F8-42	0xF82A	Timing function	0: Inactive 1: Active	0	-	At stop
F8-43	0xF82B	Timing duration source	0: Timing duration (specified by F8-44) 1: AI1 2: AI2 3: AI3	0	-	At stop
F8-44	0xF82C	Timing duration	0.0 min to 6500.0 min	0	min	At stop
F8-45	0xF82D	AI1 input voltage lower limit	0.00 V to F8-46	3.1	V	In real time
F8-46	0xF82E	AI1 input voltage upper limit	F8-45 to 11.00 V	6.8	V	In real time
F8-47	0xF82F	Module temperature reach	0°C to 100°C	75	°C	In real time
F8-48	0xF830	Cooling fan control	0: Working during drive running 1: Working continuously	0	-	In real time
F8-49	0xF831	Wakeup frequency	F8-51 to F0-10	0	Hz	In real time
F8-50	0xF832	Wakeup delay	0.0s to 6500.0s	0	s	In real time
F8-51	0xF833	Hibernation frequency	0.00 Hz to F8-49	0	Hz	In real time
F8-52	0xF834	Hibernation delay	0.0s to 6500.0s	0	s	In real time
F8-53	0xF835	Current running time threshold	0.0 min to 6500.0 min	0	min	In real time
F8-55	0xF837	Emergency stop deceleration time	0.0s to 6500.0s	0	s	In real time
F8-57	0xF839	Accumulative power consumption clearing	0: Clearing inactive Clearing active	0	-	At stop
F8-58	0xF83A	Output power correction coefficient	0.0% to 200.0%	100	%	At stop
F9-00	0xF900	AC drive overload suppression protection	0: Disabled 1: Enabled	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F9-01	0xF901	Motor overload protection gain	0.2 to 10.00	1	-	In real time
F9-02	0xF902	Motor overload pre-warning coefficient	50% to 100%	80	%	In real time
F9-04	0xF904	Overvoltage threshold	350.0 V to 820.0 V	820	V	In real time
F9-06	0xF906	Output phase loss detection before startup	0: Invalid 1: Active	0	-	In real time
F9-07	0xF907	Detection of short circuit to ground	0: No detection 1: Detection before power-on 2: Detection before running 3: Detection before power-on and running	1	-	At stop
F9-08	0xF908	Braking unit action start voltage	200.0 V to 2000.0 V	760	V	In real time
F9-09	0xF909	Fault auto reset attempts	0 to 20	0	-	In real time
F9-10	0xF90A	DO action during auto fault reset	0: Not act 1: Act	0	-	In real time
F9-11	0xF90B	Interval for fault auto reset	0.1s to 100.0s	1	s	In real time
F9-12	0xF90C	Input phase loss/ Contactor close protection	Ones (position): Input phase loss protection selection 0: Input phase loss detection inhibited 1: Input phase loss detected by software and hardware 2: Input phase loss detected by software 3: Input phase loss detected by hardware Tens (position): Contactor close/ Fan fault protection 0: Inhibited 1: Enabled	11	-	In real time
F9-13	0xF90D	Restart interval upon fault reset	0.0s to 600.0s	10	s	In real time
F9-14	0xF90E	1st fault type	0 to 99	0	-	Non-modifiable
F9-15	0xF90F	2nd fault type	0 to 99	0	-	Non-modifiable
F9-16	0xF910	3rd (latest) fault type	0 to 99	0	-	Non-modifiable
F9-17	0xF911	Frequency upon the 3rd (latest) fault	0 Hz to 65535 Hz	0	Hz	Non-modifiable

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F9-18	0xF912	Current upon the 3rd (latest) fault	0.0 A to 6553.5 A	0	A	Non-modifiable
F9-19	0xF913	Bus voltage upon the 3rd (latest) fault	0.0 V to 6553.5 V	0	V	Non-modifiable
F9-20	0xF914	Input terminal state upon the 3rd (latest) fault	0 to 65535	0	-	Non-modifiable
F9-21	0xF915	Output terminal state upon the 3rd (latest) fault	0 to 65535	0	-	Non-modifiable
F9-22	0xF916	AC drive state upon the 3rd (latest) fault	0 to 65535	0	-	Non-modifiable
F9-23	0xF917	Power-on time upon the 3rd (latest) fault	0 to 65535	0	-	Non-modifiable
F9-24	0xF918	Running time upon the 3rd (latest) fault	0.0 to 6553.5	0	-	Non-modifiable
F9-25	0xF919	IGBT temperature upon the 3rd (latest) fault	-20°C to +120°C	0	°C	Non-modifiable
F9-26	0xF91A	Fault subcode of the 3rd (latest) fault	0 to 65535	0	-	Non-modifiable
F9-27	0xF91B	Frequency upon the 2nd fault	0 Hz to 65535 Hz	0	Hz	Non-modifiable
F9-28	0xF91C	Current upon the 2nd fault	0.0 A to 6553.5 A	0	A	Non-modifiable
F9-29	0xF91D	Bus voltage upon the 2nd fault	0.0 V to 6553.5V	0	V	Non-modifiable
F9-30	0xF91E	Input terminal state upon the 2nd fault	0 to 65535	0	-	Non-modifiable
F9-31	0xF91F	Output terminal state upon the 2nd fault	0 to 65535	0	-	Non-modifiable
F9-32	0xF920	AC drive state upon 2nd fault	0 to 65535	0	-	Non-modifiable
F9-33	0xF921	Power-on time upon the 2nd fault	0 to 65535	0	-	Non-modifiable
F9-34	0xF922	Running time upon the 2nd fault	0.0 to 6553.5	0	-	Non-modifiable
F9-35	0xF923	IGBT temperature upon the 2nd fault	-20°C to +120°C	0	°C	Non-modifiable
F9-36	0xF924	Fault subcode of the 2nd fault	0 to 65535	0	-	Non-modifiable
F9-37	0xF925	Frequency upon the 1st fault	0 Hz to 65535 Hz	0	Hz	Non-modifiable
F9-38	0xF926	Current upon the 1st fault	0.0 A to 6553.5 A	0	A	Non-modifiable

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F9-39	0xF927	Bus voltage upon the 1st fault	0.0 V to 6553.5V	0	V	Non-modifiable
F9-40	0xF928	Input terminal state upon the 1st fault	0 to 65535	0	-	Non-modifiable
F9-41	0xF929	Output terminal state upon the 1st fault	0 to 65535	0	-	Non-modifiable
F9-42	0xF92A	AC drive status upon 1st fault	0 to 65535	0	-	Non-modifiable
F9-43	0xF92B	Power-on time upon the 1st fault	0 to 65535	0	-	Non-modifiable
F9-44	0xF92C	Running time upon the 1st fault	0.0 to 6553.5	0	-	Non-modifiable
F9-45	0xF92D	IGBT temperature upon the 1st fault	-20°C to +120°C	0	°C	Non-modifiable
F9-46	0xF92E	Fault subcode of the 1st fault	0 to 65535	0	-	Non-modifiable
F9-47	0xF92F	Fault protection action selection 0	Ones (position): Value of E02/E03/E04 0: Coast to stop 2: Fault reset Tens (position): Value of E05/E06/E07 0: Coast to stop 2: Fault reset Hundreds (position): Value of E08 0: Coast to stop Thousands (position): Value of E09 0: Coast to stop 2: Fault reset Ten thousands (position): Value of E10 0: Coast to stop 2: Fault reset	0	-	At stop
F9-48	0xF930	Fault protection action selection 1	Ones (position): Value of E11 0: Coast to stop 1: Decelerate to stop 2: Fault reset 4: Warning 5: Canceled Tens (position): Value of E12 0: Coast to stop 1: Decelerate to stop 2: Fault reset 4: Warning 5: Canceled	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
Continued	Continued	Continued	Hundreds (position): Value of E13 0: Coast to stop 1: Decelerate to stop 2: Fault reset 4: Warning 5: Canceled Thousands (position): Value of E14 0: Coast to stop Ten thousands (position): Value of E15 0: Coast to stop 1: Decelerate to stop 3: Electromagnetic shorting 4: Warning 5: Canceled	Continued	Continued	Continued
F9-49	0xF931	Fault protection action selection 2	Ones (position): Value of E16 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Tens (position): Value of E17 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled	0	-	At stop
Continued	Continued	Continued	Hundreds (position): Value of E18 0: Coast to stop Thousands (position): Value of E19 0: Coast to stop 3: Electromagnetic shorting 4: Warning 5: Canceled Ten thousands (position): Value of E20 0: Coast to stop 3: Electromagnetic shorting 4: Warning 5: Canceled	Continued	Continued	Continued

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F9-50	0xF932	Fault protection action selection 3	Ones (position): Reserved 0: Coast to stop Tens (position): Value of E63 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Hundreds (position): Value of E23 0: Coast to stop 5: Canceled Thousands (position): Value of E24 0: Coast to stop 5: Canceled Ten thousands (position): Value of E25 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled	5040	-	At stop
F9-51	0xF933	Fault protection action selection 4	Ones (position): Value of E26 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Tens position: Value of E27 0: Coast to stop 1: Decelerate to stop 3: Electromagnetic shorting 4: Warning 5: Canceled Hundreds (position): Value of E28 0: Coast to stop 1: Decelerate to stop 3: Electromagnetic shorting 4: Warning 5: Canceled	51111	-	At stop
Continued	Continued	Continued	Thousands (position): Value of E29 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Ten thousands (position): Value of E30 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled	Continued	Continued	Continued

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F9-52	0xF934	Fault protection action selection 5	Ones (position): Value of E31 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Tens (position): Value of E40 0: Coast to stop 2: Fault reset Hundreds (position): Value of E41 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled	101	-	At stop
Continued	Continued	Continued	Thousands (position): Value of E42 0: Coast to stop 1: Decelerate to stop 2: Fault reset 3: Electromagnetic shorting 4: Warning 5: Canceled Ten thousands (position): Value of E43 0: Coast to stop 1: Decelerate to stop 3: Electromagnetic shorting 4: Warning 5: Canceled	Continued	Continued	Continued
F9-53	0xF935	Fault protection action selection 6	Ones (position): Value of E45 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Tens (position): Value of E60 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Hundreds (position): Value of E61 0: Coast to stop 1: Decelerate to stop 4: Warning 5: Canceled Thousands (position): Value of E62 0: Coast to stop 5: Canceled Ten thousands (position): Reserved 5: Canceled	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F9-54	0xF936	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Frequency reference 2: Frequency upper limit 3: Frequency lower limit 4: Alternative frequency upon exception	1	-	In real time
F9-55	0xF937	Backup frequency reference	0.0% to 100.0%	100	%	In real time
F9-56	0xF938	Type of motor temperature sensor	0: No sensor (AI3 available) 1: PT100 2: PT1000 3: KTY84 4: PTC130	0	-	In real time
F9-57	0xF939	Motor overtemperature protection threshold	0°C to 200°C	110	°C	In real time
F9-58	0xF93A	Motor overtemperature pre-warning threshold	0°C to 200°C	90	°C	In real time
F9-59	0xF93B	Selection of power dip ride-through	0: Disabled 1: Bus voltage constant control 2: Decelerate to stop 3: Voltage dip depression	0	-	At stop
F9-60	0xF93C	Voltage threshold for pause upon power dip ride-through	80% to 100%	85	%	In real time
F9-61	0xF93D	Duration for judging voltage recovery from power dip ride-through	0.0s to 100.0s	0.5	s	In real time
F9-62	0xF93E	Threshold for enabling the power dip ride-through function	60% to 100%	80	%	In real time
F9-63	0xF93F	Runaway protection time in FVC mode	0 to 10000	0	-	At stop
F9-64	0xF940	Load loss detection level	0.0% to 100.0%	10	%	In real time
F9-65	0xF941	Load loss detection time	0.0s to 60.0s	1	s	In real time
F9-66	0xF942	Voltage dip suppression time	0.0s to 600.0s	0	s	Non-modifiable
F9-67	0xF943	Overspeed threshold	0.0% to 50.0%	5	%	In real time
F9-68	0xF944	Overspeed detection time	0.0 to 60.0	1	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
F9-69	0xF945	Excessive speed deviation threshold	0.0% to 50.0%	20	%	In real time
F9-70	0xF946	Excessive speed deviation detection time	0.0s to 60.0s	5	s	In real time
F9-71	0xF947	Power dip ride-through gain	0 to 100	40	-	In real time
F9-72	0xF948	Power dip ride-through integral	0 to 100	30	-	In real time
F9-73	0xF949	Deceleration time of power dip ride-through	0.0s to 300.0s	20	s	In real time
FA-00	0xFA00	PID reference source	0: Digital setting of PID (FA-01) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication (1000H) 6: Multi-reference	0	-	In real time
FA-01	0xFA01	Digital setting of PID	0.0% to 100.0%	50	%	In real time
FA-02	0xFA02	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1 – AI2 4: Pulse reference (DI5) 5: Communication 6:AI1 + AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|)	0	-	In real time
FA-03	0xFA03	PID action direction	0: Forward 1: Reverse	0	-	In real time
FA-04	0xFA04	PID reference and feedback range	0 to 65535	1000	-	In real time
FA-05	0xFA05	Proportional gain Kp1	0.0 to 1000.0	20	-	In real time
FA-06	0xFA06	Integral time Ti1	0.01s to 100.00s	2	s	In real time
FA-07	0xFA07	Derivative time Td1	0.000s to 10.000s	0	s	In real time
FA-08	0xFA08	PID cut-off frequency in reverse direction	0.00 Hz to F0-10	2	Hz	In real time
FA-09	0xFA09	PID deviation limit	0.0% to 100.0%	0	%	In real time
FA-10	0xFA0A	PID differential limit	0.00% to 100.00%	0.1	%	In real time
FA-11	0xFA0B	PID reference change time	0.00s to 650.00s	0	s	In real time
FA-12	0xFA0C	PID feedback filter time	0.00s to 60.00s	0	s	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FA-13	0xFA0D	PID deviation gain	0.0% to 100.0%	100	%	In real time
FA-14	0xFA0E	PID optimization	0 to 100	0	-	In real time
FA-15	0xFA0F	Proportional gain Kp2	0.0 to 1000.0	20	-	In real time
FA-16	0xFA10	Integral time Ti2	0.01s to 100.00s	2	s	In real time
FA-17	0xFA11	Differential time Td2	0.000s to 10.000s	0	s	In real time
FA-18	0xFA12	PID parameter switchover condition	0: No switchover 1: Switchover by DI 2: Automatic switchover based on deviation 3: Switchover based on running frequency 6: Automatic adjustment based on roll diameter 7: Automatic adjustment based on maximum roll diameter percentage	0	-	In real time
FA-19	0xFA13	PID parameter switchover deviation 1	0.0% to FA-20	20	%	In real time
FA-20	0xFA14	PID parameter switchover deviation 2	FA-19 to 100.0%	80	%	In real time
FA-21	0xFA15	PID initial value	0.0% to 100.0%	0	%	In real time
FA-22	0xFA16	Hold time of PID initial value	0.00s to 650.00s	0	s	In real time
FA-23	0xFA17	Maximum value (positive) between two output deviations	0.00% to 100.00%	1	%	In real time
FA-24	0xFA18	Minimum value (negative) between two output deviations	0.00% to 100.00%	1	%	In real time
FA-25	0xFA19	PID integral property	0: Inactive 1: Active	0	-	In real time
FA-26	0xFA1A	Detection level of PID feedback loss	0.0% to 100.0%	0	%	In real time
FA-27	0xFA1B	Detection time of PID feedback loss	0.0s to 20.0s	0	s	In real time
FB-00	0xFB00	Wobble setting mode	0: Relative to the center frequency 1: Relative to the maximum frequency	0	-	In real time
FB-01	0xFB01	Wobble amplitude	0.0% to 100.0%	0	%	In real time
FB-02	0xFB02	Wobble step	0.0% to 50.0%	0	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FB-03	0xFB03	Wobble cycle	0.1s to 3000.0s	10	s	In real time
FB-04	0xFB04	Triangular wave rise time of wobble	0.1% to 100.0%	50	%	In real time
FB-05	0xFB05	Reference length	0 m to 65535 m	1000	m	In real time
FB-06	0xFB06	Actual length	0 m to 65535 m	0	m	In real time
FB-07	0xFB07	Number of pulses per meter	0.1 to 6553.5	100	-	In real time
FB-08	0xFB08	Reference count value	1 to 65535	1000	-	In real time
FB-09	0xFB09	Designated count value	1 to 65535	1000	-	In real time
FB-10	0xFB0A	Revolution count reset mode	0: Rising edge trigger 1: Level trigger	0	-	In real time
FB-11	0xFB0B	Revolution count reset signal	0: Disable 1: Enable	0	-	In real time
FB-12	0xFB0C	Revolution count retentive at power failure	0: Non-retentive 1: Retentive	0	-	In real time
FB-13	0xFB0D	Revolution count clear	0 to 65535	0	-	In real time
FB-14	0xFB0E	Transmission ratio numerator	1 to 65535	1	-	In real time
FB-15	0xFB0F	Transmission ratio denominator	1 to 65535	1	-	In real time
FB-16	0xFB10	Actual running revolutions	0 to 65535	0	-	Non-modifiable
FB-17	0xFB11	Running revolutions	0 to 65535	0	-	Non-modifiable
FB-18	0xFB12	Running revolution accuracy	0: 1 revolution 1: 0.1 revolution	0	-	In real time
FB-19	0xFB13	Revolution direction	0: Forward 1: Reverse	0	-	In real time
FC-00	0xFC00	Multi-reference 0	-100.0% to +100.0%	0	%	In real time
FC-01	0xFC01	Multi-reference 1	-100.0% to +100.0%	0	%	In real time
FC-02	0xFC02	Multi-reference 2	-100.0% to +100.0%	0	%	In real time
FC-03	0xFC03	Multi-reference 3	-100.0% to +100.0%	0	%	In real time
FC-04	0xFC04	Multi-reference 4	-100.0% to +100.0%	0	%	In real time
FC-05	0xFC05	Multi-reference 5	-100.0% to +100.0%	0	%	In real time
FC-06	0xFC06	Multi-reference 6	-100.0% to +100.0%	0	%	In real time
FC-07	0xFC07	Multi-reference 7	-100.0% to +100.0%	0	%	In real time
FC-08	0xFC08	Multi-reference 8	-100.0% to +100.0%	0	%	In real time
FC-09	0xFC09	Multi-reference 9	-100.0% to +100.0%	0	%	In real time
FC-10	0xFC0A	Multi-reference 10	-100.0% to +100.0%	0	%	In real time
FC-11	0xFC0B	Multi-reference 11	-100.0% to +100.0%	0	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FC-12	0xFC0C	Multi-reference 12	-100.0% to +100.0%	0	%	In real time
FC-13	0xFC0D	Multi-reference 13	-100.0% to +100.0%	0	%	In real time
FC-14	0xFC0E	Multi-reference 14	-100.0% to +100.0%	0	%	In real time
FC-15	0xFC0F	Multi-reference 15	-100.0% to +100.0%	0	%	In real time
FC-16	0xFC10	Simple PLC running mode	0: Stop after running for one cycle 1: Keep final values after running for one cycle 2: Repeat after running for one cycle	0	-	In real time
FC-17	0xFC11	Simple PLC memory retention	Ones (position): Retentive upon power failure 0: No 1: Yes Tens (position): Retentive upon stop 0: No 1: Yes	0	-	In real time
FC-18	0xFC12	Running time of PLC reference 0	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-19	0xFC13	Acceleration/ Deceleration time of PLC reference 0	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-20	0xFC14	Running time of PLC reference 1	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-21	0xFC15	Acceleration/ Deceleration time of PLC reference 1	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FC-22	0xFC16	Running time of PLC reference 2	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-23	0xFC17	Acceleration/ Deceleration time of PLC reference 2	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-24	0xFC18	Running time of PLC reference 3	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-25	0xFC19	Acceleration/ Deceleration time of PLC reference 3	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-26	0xFC1A	Running time of PLC reference 4	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-27	0xFC1B	Acceleration/ Deceleration time of PLC reference 4	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-28	0xFC1C	Running time of PLC reference 5	0.0s (h) to 6553.5s (h)	0	s (h)	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FC-29	0xFC1D	Acceleration/ Deceleration time of PLC reference 5	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-30	0xFC1E	Running time of PLC reference 6	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-31	0xFC1F	Acceleration/ Deceleration time of PLC reference 6	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-32	0xFC20	Running time of PLC reference 7	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-33	0xFC21	Acceleration/ Deceleration time of PLC reference 7	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-34	0xFC22	Running time of PLC reference 8	0.0s (h) to 6553.5s (h)	0	s (h)	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FC-35	0xFC23	Acceleration/ Deceleration time of PLC reference 8	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-36	0xFC24	Running time of PLC reference 9	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-37	0xFC25	Acceleration/ Deceleration time of PLC reference 9	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-38	0xFC26	Running time of PLC reference 10	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-39	0xFC27	Acceleration/ Deceleration time of PLC reference 10	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-40	0xFC28	Running time of PLC reference 11	0.0s (h) to 6553.5s (h)	0	s (h)	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FC-41	0xFC29	Acceleration/ Deceleration time of PLC reference 11	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-42	0xFC2A	Running time of PLC reference 12	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-43	0xFC2B	Acceleration/ Deceleration time of PLC reference 12	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-44	0xFC2C	Running time of PLC reference 13	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-45	0xFC2D	Acceleration/ Deceleration time of PLC reference 13	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-46	0xFC2E	Running time of PLC reference 14	0.0s (h) to 6553.5s (h)	0	s (h)	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FC-47	0xFC2F	Acceleration/ Deceleration time of PLC reference 14	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-48	0xFC30	Running time of PLC reference 15	0.0s (h) to 6553.5s (h)	0	s (h)	In real time
FC-49	0xFC31	Acceleration/ Deceleration time of PLC reference 15	0: Group 1 acceleration/ deceleration time (F0-17 and F0-18) 1: Group 2 acceleration/ deceleration time (F8-03 and F8-04) 2: Group 3 acceleration/ deceleration time (F8-05 and F8-06) 3: Group 4 acceleration/ deceleration time (F8-07 and F8-08)	0	-	In real time
FC-50	0xFC32	PLC running time unit	0: s (second) 1: h (hour)	0	-	In real time
FC-51	0xFC33	Multi-reference 0 source	0: Multi-reference 0 (FC-00) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: PID 6: Preset frequency (value of F0-08 that can be changed by pressing UP/DOWN)	0	-	In real time
FD-00	0xFD00	Baud rate	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	5	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
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)	0	-	In real time
FD-02	0xFD02	Local address	1 to 247	1	-	In real time
FD-03	0xFD03	Response delay	0 ms to 20 ms	2	ms	In real time
FD-04	0xFD04	Modbus communication timeout time	0.0s to 60.0s	0	s	In real time
FD-06	0xFD06	Communication fault reset	0: Disabled 1: Enabled	1	-	At stop
FD-09	0xFD09	CANopen/CANlink communication state	Ones: CANopen 0: Stop 1: Initializing 2: Pre-running 8: Running Tens: CANlink 0: Stop 1: Initializing 2: Pre-running 8: Running Hundreds: Reserved	2	-	Non-modifiable
FD-10	0xFD0A	CANopen/CANlink switchover	1: CANopen 2: CANlink	1	-	At stop
FD-12	0xFD0C	CAN baud rate	0: 20 kbps 1: 50 kbps 2: 100 kbps 3: 125 kbps 4: 250 kbps 5: 500 kbps 6: 1 Mbps	5	-	At stop
FD-13	0xFD0D	CAN station number	1 to 127	1	-	At stop
FD-14	0xFD0E	Number of CAN frames received per unit time	0 to 65535	0	-	Non-modifiable
FD-15	0xFD0F	Maximum value of error counters received by node	0 to 65535	0	-	Non-modifiable
FD-16	0xFD10	Maximum value of error counters sent by node	0 to 65535	0	-	Non-modifiable
FD-17	0xFD11	Bus disconnection times per unit time	0 to 65535	0	-	Non-modifiable
FD-19	0xFD13	CAN communication failure coefficient	1 to 15	3	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FD-37	0xFD25	DHCP function	0: Disabled 1: Enabled	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 highest 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	Subnet mask third highest byte	0 to 255	0	-	At stop
FD-45	0xFD2D	Subnet mask lowest byte	0 to 255	0	-	At stop
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	Gateway third highest byte	0 to 255	0	-	At stop
FD-49	0xFD31	Gateway lowest byte	0 to 255	0	-	At stop
FD-58	0xFD3A	Internet IP expansion card error code	0 to 255	0	-	Non-modifiable
FD-61	0xFD3D	MAC address highest byte	0 to value of 0xFFFF	0	-	At stop
FD-62	0xFD3E	MAC address middle byte	0 to value of 0xFFFF	0	-	At stop
FD-63	0xFD3F	MAC address lowest byte	0 to value of 0xFFFF	0	-	At stop
FD-94	0xFD5E	Modbus software version	0 to 65535	0	-	Non-modifiable
FD-95	0xFD5F	CANlink software version	0 to 65535	0	-	Non-modifiable
FD-96	0xFD60	CANopen software version	0 to 65535	0	-	Non-modifiable
FE-00	0xFE00	User-defined parameter 0	0 to 65535	7017	-	In real time
FE-01	0xFE01	User-defined parameter 1	0 to 65535	7016	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FE-02	0xFE02	User-defined parameter 2	0 to 65535	0	-	In real time
FE-03	0xFE03	User-defined parameter 3	0 to 65535	0	-	In real time
FE-04	0xFE04	User-defined parameter 4	0 to 65535	0	-	In real time
FE-05	0xFE05	User-defined parameter 5	0 to 65535	0	-	In real time
FE-06	0xFE06	User-defined parameter 6	0 to 65535	0	-	In real time
FE-07	0xFE07	User-defined parameter 7	0 to 65535	0	-	In real time
FE-08	0xFE08	User-defined parameter 8	0 to 65535	0	-	In real time
FE-09	0xFE09	User-defined parameter 9	0 to 65535	0	-	In real time
FE-10	0xFE0A	User-defined parameter 10	0 to 65535	0	-	In real time
FE-11	0xFE0B	User-defined parameter 11	0 to 65535	0	-	In real time
FE-12	0xFE0C	User-defined parameter 12	0 to 65535	0	-	In real time
FE-13	0xFE0D	User-defined parameter 13	0 to 65535	0	-	In real time
FE-14	0xFE0E	User-defined parameter 14	0 to 65535	0	-	In real time
FE-15	0xFE0F	User-defined parameter 15	0 to 65535	0	-	In real time
FE-16	0xFE10	User-defined parameter 16	0 to 65535	0	-	In real time
FE-17	0xFE11	User-defined parameter 17	0 to 65535	0	-	In real time
FE-18	0xFE12	User-defined parameter 18	0 to 65535	0	-	In real time
FE-19	0xFE13	User-defined parameter 19	0 to 65535	0	-	In real time
FE-20	0xFE14	User-defined parameter 20	0 to 65535	6768	-	In real time
FE-21	0xFE15	User-defined parameter 21	0 to 65535	6769	-	In real time
FE-22	0xFE16	User-defined parameter 22	0 to 65535	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FE-23	0xFE17	User-defined parameter 23	0 to 65535	0	-	In real time
FE-24	0xFE18	User-defined parameter 24	0 to 65535	0	-	In real time
FE-25	0xFE19	User-defined parameter 25	0 to 65535	0	-	In real time
FE-26	0xFE1A	User-defined parameter 26	0 to 65535	0	-	In real time
FE-27	0xFE1B	User-defined parameter 27	0 to 65535	0	-	In real time
FE-28	0xFE1C	User-defined parameter 28	0 to 65535	0	-	In real time
FE-29	0xFE1D	User-defined parameter 29	0 to 65535	0	-	In real time
FE-30	0xFE1E	User-defined parameter 30	0 to 65535	0	-	In real time
FE-31	0xFE1F	User-defined parameter 31	0 to 65535	0	-	In real time
FP-00	0x1F00	User password	0 to 65535	0	-	In real time
FP-01	0x1F01	Parameter initialization	0: No action 1:Restore default settings (mode 1) 2: Clear records 4: Back up current user parameters 501: Restore user backup parameters 503:Restore default settings (mode 2)	1	-	At stop
FP-02	0x1F02	Parameter display	Ones (position): Group U display 0: Hide 1: Display Tens (position): Group A display 0: Hide 1: Display Hundreds (position): Group B display 0: Hide 1:Display Thousands (position): Reserved	111	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
FP-03	0x1F03	Individualized parameter display mode	Ones (position): User-defined parameter group display 0: Hide 1: Display Tens (position): User-modified parameter group display 0: Hide 1: Display	11	-	In real time
FP-04	0x1F04	Parameter modification	0: Modification allowed 1: Modification prohibited	0	-	In real time
A0-00	0xA000	Speed/Torque control mode	0: Speed control 1: Torque control	0	-	At stop
A0-01	0xA001	Torque reference source	0: Digital setting (A0-03) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication (1000H) 6: Min. (AI1, AI2) 7: Max. (AI1, AI2)	0	-	At stop
A0-03	0xA003	Torque digital setting	-200.0% to +200.0%	100	%	In real time
A0-04	0xA004	Torque filter time	0.000s to 5.000s	0	s	In real time
A0-05	0xA005	Speed limit digital setting	-120.0% to +120.0%	0	%	In real time
A0-06	0xA006	Frequency modulation coefficient in window mode	0.0 to 50.0	0	-	In real time
A0-07	0xA007	Torque acceleration time	0.00s to 650.00s	1	s	In real time
A0-08	0xA008	Torque deceleration time	0.00s to 650.00s	1	s	In real time
A0-09	0xA009	Speed limit reference source	0: A0-05 1: Frequency source	0	-	In real time
A0-10	0xA00A	Speed limit offset/ Windows frequency	0.00 Hz to F0-10	5	Hz	In real time
A0-11	0xA00B	Effective mode of speed limit offset	0: Bidirectional offset valid 1: Unidirectional offset valid 2: Windows mode	1	-	At stop
A0-12	0xA00C	Acceleration time (frequency)	0.0s to 6500.0s	1	s	In real time
A0-13	0xA00D	Frequency deceleration time	0.0s to 6500.0s	1	s	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A0-14	0xA00E	Torque mode switchover	0: Not switched 1: Switched to speed mode upon stop 2: Target torque changed to 0 upon stop	1	-	At stop
A1-00	0xA100	VDI1 function	Same as F4-00	0	-	At stop
A1-01	0xA101	VDI2 function	Same as F4-00	0	-	At stop
A1-02	0xA102	VDI3 function	Same as F4-00	0	-	At stop
A1-03	0xA103	VDI4 function	Same as F4-00	0	-	At stop
A1-04	0xA104	VDI5 function	Same as F4-00	0	-	At stop
A1-05	0xA105	VDI terminal state setting mode	Ones: VDI1 0: Parameter setting (A1-06) 1: DO state 2: DI state Tens: VDI2 0: Parameter setting (A1-06) 1: DO state 2: DI state	0	-	At stop
Continued	Continued	Continued	Hundreds: VDI3 0: Parameter setting (A1-06) 1: DO state 2: DI state Thousands: VDI4 0: Parameter setting (A1-06) 1: DO state 2: DI state Ten thousands: VDI5 0: Parameter setting (A1-06) 1: DO state 2: DI state	Continued	Continued	Continued

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A1-06	0xA106	VDI terminal state setting	Ones: VDI1 0: Inactive 1: Active Tens: VDI2 0: Inactive 1: Active Hundreds: VDI3 0: Inactive 1: Active Thousands: VDI4 0: Inactive 1: Active Ten thousands: VDI5 0: Inactive 1: Active	0	-	In real time
A1-07	0xA107	AI1 function (used as DI)	Same as F4-00	0	-	At stop
A1-08	0xA108	AI2 function (used as DI)	Same as F4-00	0	-	At stop
A1-09	0xA109	AI3 function (used as DI)	Same as F4-00	0	-	At stop
A1-10	0xA10A	AI active mode (used as DI)	Ones: AI1 0: Active high 1: Active low Tens: AI2 0: Active high 1: Active low Hundreds: AI3 0: Active high 1: Active low	0	-	At stop
A5-00	0xA500	DPWM switchover frequency upper limit	0.00 Hz to F0-10	12	Hz	In real time
A5-01	0xA501	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation 2: Synchronous modulation mode 2 3: Synchronous modulation mode 3	0	-	In real time
A5-02	0xA502	Dead-zone compensation	0: Disabled 1: Enabled	2	-	At stop
A5-03	0xA503	Random PWM depth	0 to 10	0	-	In real time
A5-04	0xA504	Fast current limit	0: Disabled 1: Enabled	0	-	In real time
A5-05	0xA505	Sampling delay	1 to 13	5	-	In real time
A5-06	0xA506	Undervoltage threshold	150.0 V to 700.0 V	350	V	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A5-07	0xA507	SVC optimization mode	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	1	-	At stop
A5-13	0xA50D	Bus voltage in function part	100 to 20000	5310	-	Non-modifiable
A5-14	0xA50E	Temperature correction	0 to 1	0	-	At stop
A5-16	0xA510	Display parameter address 1	0 to 100	0	-	Non-modifiable
A5-17	0xA511	Display parameter address 2	0 to 100	1	-	Non-modifiable
A5-18	0xA512	Display parameter address 3	0 to 100	2	-	Non-modifiable
A5-19	0xA513	Display parameter address 4	0 to 100	3	-	Non-modifiable
A5-21	0xA515	Low speed carrier frequency	0.0 to 16.0	0	-	In real time
A5-22	0xA516	Dead-zone compensation auto-tuning	0: Disabled 1: Enabled	0	-	At stop
A6-00	0xA600	Curve 4 minimum input	–10.00 V to value of A6-02	0	V	In real time
A6-01	0xA601	Percentage corresponding to curve 4 minimum input	-100.0% to +100.0%	0	%	In real time
A6-02	0xA602	Curve 4 inflection point 1 input	A6-00 to A6-04	3	V	In real time
A6-03	0xA603	Percentage corresponding to curve 4 inflection point 1 input	-100.0% to +100.0%	30	%	In real time
A6-04	0xA604	Curve 4 inflection point 2 input	A6-02 to A6-06	6	V	In real time
A6-05	0xA605	Percentage corresponding to curve 4 inflection point 2 input	-100.0% to +100.0%	60	%	In real time
A6-06	0xA606	Curve 4 maximum input	A6-04 to 10.00 V	10	V	In real time
A6-07	0xA607	Percentage corresponding to curve 4 maximum input	-100.0% to +100.0%	100	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A6-08	0xA608	Curve 5 minimum input	-10.00 V to A6-10	-10	V	In real time
A6-09	0xA609	Percentage corresponding to curve 5 minimum input	-100.0% to +100.0%	-100	%	In real time
A6-10	0xA60A	Curve 5 inflection point 1 input	A6-08 to A6-12	-3	V	In real time
A6-11	0xA60B	Percentage corresponding to curve 5 inflection point 1 input	-100.0% to +100.0%	-30	%	In real time
A6-12	0xA60C	Curve 5 inflection point 2 input	A6-10 to A6-14	3	V	In real time
A6-13	0xA60D	Percentage corresponding to curve 5 inflection point 2 input	-100.0% to +100.0%	30	%	In real time
A6-14	0xA60E	Curve 5 maximum input	A6-12 to 10.00 V	10	V	In real time
A6-15	0xA60F	Percentage corresponding to curve 5 maximum input	-100.0% to +100.0%	100	%	In real time
A6-16	0xA610	AI1 gain	–10.00 to +10.00	1	-	In real time
A6-17	0xA611	AI1 offset	-100.0% to +100.0%	0	%	In real time
A6-18	0xA612	AI2 gain	–10.00 to +10.00	1	-	In real time
A6-19	0xA613	AI2 offset	-100.0% to +100.0%	0	%	In real time
A6-20	0xA614	AI3 gain	–10.00 to +10.00	1	-	In real time
A6-21	0xA615	AI3 offset	-100.0% to +100.0%	0	%	In real time
A6-22	0xA616	AI disconnection detection threshold	0.0% to 100.0%	0	%	In real time
A6-23	0xA617	AI disconnection detection time	0.0s to 6553.5s	0	s	In real time
A6-24	0xA618	Jump point of AI1 setting	-100.0% to +100.0%	0	%	In real time
A6-25	0xA619	Jump amplitude of AI1 setting	0.0% to 100.0%	0.1	%	In real time
A6-26	0xA61A	Jump point of AI2 setting	-100.0% to +100.0%	0	%	In real time
A6-27	0xA61B	Jump amplitude of AI2 setting	0.0% to 100.0%	0.1	%	In real time
A6-28	0xA61C	Jump point of AI3 setting	-100.0% to +100.0%	0	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A6-29	0xA61D	Jump amplitude of AI3 setting	0.0% to 100.0%	0.1	%	In real time
A6-30	0xA61E	AI disconnection detection	Ones: AI1 disconnection detection 0: Disable 1: Enable Tens: AI2 disconnection detection 0: Disable 1: Enable Hundreds: AI3 disconnection detection 0: Disable 1: Enable	0	-	In real time
A9-00	0xA900	Online auto-tuning on rotor time constant of asynchronous motors	0: Disabled 1: Enabled	0	-	In real time
A9-01	0xA901	Auto-tuning on rotor resistance gain of asynchronous motors in FVC mode	0 to 100	5	-	In real time
A9-02	0xA902	Auto-tuning on rotor resistance start frequency for asynchronous motors in FVC mode	2 Hz to 100 Hz	7	Hz	In real time
A9-03	0xA903	Observation magnetic field coefficient for asynchronous motors in FVC mode	30 to 150	40	-	In real time
A9-04	0xA904	Maximum torque limit coefficient for the field-weakening range of asynchronous motors	30 to 150	80	-	In real time
A9-05	0xA905	Speed filter time of asynchronous motors in SVC mode	5 ms to 32 ms	15	ms	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A9-06	0xA906	Speed feedback processing of asynchronous motors in SVC mode	0: No specific processing 1: Limit minimum synchronization frequency based on load change 2: Output fixed current during low-speed running 3: Output fixed current during low-speed running 4: Perform fine torque optimization	0	-	In real time
A9-07	0xA907	Magnetic field adjustment bandwidth of asynchronous motors in SVC mode	0.0 to 8.0	2	-	In real time
A9-08	0xA908	Low-speed running current of asynchronous motors in SVC mode	30 to 170	100	-	In real time
A9-09	0xA909	Switchover frequency of fixed current output for asynchronous motors in SVC mode	0.1 Hz to 1.0 Hz	0.3	Hz	At stop
A9-10	0xA90A	Speed fluctuation suppression coefficient of asynchronous motors in SVC mode	80 to 100	95	-	At stop
A9-11	0xA90B	Acceleration/ Deceleration time of asynchronous motors in SVC mode	10s to 3000s	200	s	At stop
A9-12	0xA90C	Quick auto-tuning of stator resistance before asynchronous motor startup	0: Disabled 1: Enabled	0	-	At stop
A9-13	0xA90D	Quick auto-tuning of stator resistance coefficient 1 for asynchronous motors	0 to 65535	10	-	At stop
A9-14	0xA90E	Quick auto-tuning of stator resistance coefficient 2 for asynchronous motors	0 to 65535	10	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A9-17	0xA911	Synchronous motor real-time angle	0.0 to 359.9	0	-	Non-modifiable
A9-18	0xA912	Initial position angle detection of synchronous motors	0: Detected upon running 1: Not detected 2: Detected upon initial running after power-on	0	-	In real time
A9-20	0xA914	Flux weakening mode	0: Automatic mode 1: Synchronous motor adjustment mode 2: Synchronous motor hybrid mode 3: Disabled	1	-	At stop
A9-21	0xA915	Flux weakening gain of synchronous motors	0 to 50	5	-	In real time
A9-22	0xA916	Output voltage upper limit margin of synchronous motors	0% to 50%	5	%	In real time
A9-23	0xA917	Maximum output adjustment gain of synchronous motors	20% to 300%	100	%	In real time
A9-24	0xA918	Exciting current adjustment gain calculated by synchronous motors	40% to 200%	100	%	In real time
A9-25	0xA919	Estimated speed integral gain of synchronous motors in SVC mode	5% to 1000%	30	%	In real time
A9-26	0xA91A	Estimated speed proportional gain of synchronous motors in SVC mode	5% to 300%	20	%	In real time
A9-27	0xA91B	Estimated speed filter of synchronous motors in SVC mode	10 to 2000	100	-	In real time
A9-28	0xA91C	Minimum carrier frequency of synchronous motors in SVC mode	0.8 to F0-15	2	-	In real time
A9-29	0xA91D	Low-speed excitation current of synchronous motors in SVC mode	0% to 80%	30	%	In real time
A9-30	0xA91E	Low-speed closed-loop current (for VVC)	0% to 65535%	0	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A9-31	0xA91F	Oscillation suppression damping coefficient (for VVC)	0% to 65535%	0	%	In real time
A9-32	0xA920	Reserved parameter 8 for synchronous motor control	0 to 65535	0	-	In real time
A9-33	0xA921	Reserved parameter 9 for synchronous motor control	0 to 5	0	-	At stop
A9-34	0xA922	Reserved parameter 10 for synchronous motor control	0% to 65535%	0	%	In real time
A9-35	0xA923	Performance fault subcode upon 1st fault	0 to 65535	0	-	Non-modifiable
A9-36	0xA924	Performance fault subcode upon 2nd fault	0 to 65535	0	-	Non-modifiable
A9-37	0xA925	Performance fault subcode upon 3rd fault	0 to 65535	0	-	Non-modifiable
A9-40	0xA928	Low-speed closed-loop current selection (for VVC)	0: Disabled 1: Enabled	0	-	At stop
A9-41	0xA929	Low-speed closed-loop current (for VVC)	30% to 200%	50	%	At stop
A9-42	0xA92A	Oscillation suppression damping coefficient (for VVC)	0% to 500%	100	%	In real time
A9-43	0xA92B	Initial position compensation angle (for VVC)	0 to 5	0	-	At stop
A9-44	0xA92C	Initial position compensation angle of synchronous motors	0.0 to 360.0	0	-	In real time
A9-45	0xA92D	Synchronous motor low-speed handling	0: Disabled 1: Enabled	0	-	At stop
A9-46	0xA92E	Switchover frequency for synchronous motor low-speed handling	0.01 to F0-10	5	-	At stop
A9-47	0xA92F	Low-speed handling current of synchronous motors	10 to 200	100	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A9-48	0xA930	Feedback suppression coefficient of low-speed handling for synchronous motors	0 to 300	32	-	At stop
A9-49	0xA931	Energy-saving control for synchronous motors	0: Disabled 1: Enabled	0	-	At stop
A9-50	0xA932	Limit margin for the maximum flux weakening current	200 to 1000	1000	-	At stop
A9-51	0xA933	Advanced settings for auto-tuning of asynchronous motor parameters	Ones: Rotor resistance and leakage inductance DC offset 0: Standard offset 1: Large offset Tens: New rotor resistance and leakage inductance auto-tuning algorithm 0: Disabled 1: Enabled Hundreds: New mutual inductance static auto-tuning algorithm 0: Disabled 1: Enabled Thousands: Stator resistance auto-tuning algorithm 0: Current open loop 1: Current closed loop	111	-	At stop
A9-52	0xA934	U0-06 feedback torque selection	0: Motoring torque being positive and generating torque being negative 1: Torque direction being positive in the case of positive speed direction; torque direction being negative in the case of negative speed direction	1	-	In real time
A9-54	0xA936	Transistor voltage drop	0 to 10000	700	-	At stop
A9-55	0xA937	Dead-zone time 0	0 to 10000	352	-	At stop
A9-56	0xA938	Dead-zone time 1	0 to 10000	1052	-	At stop
A9-57	0xA939	Dead-zone time 2	0 to 10000	1270	-	At stop
A9-58	0xA93A	Dead-zone time 3	0 to 10000	1358	-	At stop
A9-59	0xA93B	Dead-zone time 4	0 to 10000	1404	-	At stop
A9-60	0xA93C	Dead-zone time 5	0 to 10000	1449	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
A9-61	0xA93D	Dead-zone time 6	0 to 10000	1661	-	At stop
A9-62	0xA93E	Dead-zone time 7	0 to 10000	1689	-	At stop
A9-63	0xA93F	Dead-zone compensation current 0	0 to 10000	94	-	At stop
A9-64	0xA940	Dead-zone compensation current 1	0 to 10000	376	-	At stop
A9-65	0xA941	Dead-zone compensation current 2	0 to 10000	658	-	At stop
A9-66	0xA942	Dead-zone compensation current 3	0 to 10000	940	-	At stop
A9-67	0xA943	Dead-zone compensation current 4	0 to 10000	1222	-	At stop
A9-68	0xA944	Dead-zone compensation current 5	0 to 10000	1504	-	At stop
A9-69	0xA945	Dead-zone compensation current 6	0 to 10000	3478	-	At stop
A9-70	0xA946	Dead-zone compensation current 7	0 to 10000	5452	-	At stop
A9-71	0xA944	Flexible oscillation suppression	0: Disabled 1: Target frequency 2: Reference frequency	0	-	At stop
A9-72	0xA945	Filter time of flexible oscillation suppression	20 ms to 1000 ms	300	ms	In real time
A9-73	0xA946	Flexible oscillation suppression gain	10 to 1000	100	-	In real time
AC-00	0xAC00	AI1 measured voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-01	0xAC01	AI1 displayed voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-02	0xAC02	AI1 measured voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-03	0xAC03	AI1 displayed voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-04	0xAC04	AI2 measured voltage 1	-10.000 V to +10.000 V	2	V	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
AC-05	0xAC05	AI2 displayed voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-06	0xAC06	AI2 measured voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-07	0xAC07	AI2 displayed voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-08	0xAC08	AI3 measured voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-09	0xAC09	AI3 displayed voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-10	0xAC0A	AI3 measured voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-11	0xAC0B	AI3 displayed voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-12	0xAC0C	AO1 measured voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-13	0xAC0D	AO1 target voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-14	0xAC0E	AO1 measured voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-15	0xAC0F	AO1 target voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-16	0xAC10	AO2 measured voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-17	0xAC11	AO2 target voltage 1	-10.000 V to +10.000 V	2	V	In real time
AC-18	0xAC12	AO2 measured voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-19	0xAC13	AO2 target voltage 2	-10.000 V to +10.000 V	8	V	In real time
AC-20	0xAC14	PT100 measured voltage 1	0.000 V to 3.3 V	0.44	V	In real time
AC-21	0xAC15	PT100 displayed voltage 1	0.000 V to 3.3 V	0.44	V	In real time
AC-22	0xAC16	PT100 measured voltage 2	0.000 V to 3.3 V	2.16	V	In real time
AC-23	0xAC17	PT100 displayed voltage 2	0.000 V to 3.3 V	2.16	V	In real time
AC-24	0xAC18	PT1000 measured voltage 1	0.000 V to 3.3 V	1.136	V	In real time
AC-25	0xAC19	PT1000 displayed voltage 1	0.000 V to 3.3 V	1.136	V	In real time
AC-26	0xAC1A	PT1000 measured voltage 2	0.000 V to 3.3 V	2.122	V	In real time
AC-27	0xAC1B	PT1000 displayed voltage 2	0.000 V to 3.3 V	2.122	V	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
AC-28	0xAC1C	AO1 measured current 1	0.000 mA to 20.000 mA	4	mA	In real time
AC-29	0xAC1D	AO1 target current 1	0.000 mA to 20.000 mA	4	mA	In real time
AC-30	0xAC1E	AO1 measured current 2	0.000 mA to 20.000 mA	16	mA	In real time
AC-31	0xAC1F	AO1 target current 2	0.000 mA to 20.000 mA	16	mA	In real time
AF-00	0xAF00	RPDO1-SubIndex0-H	0 to value of 0xFFFF	0	-	In real time
AF-01	0xAF01	RPDO1-SubIndex0-L	0 to value of 0xFFFF	0	-	In real time
AF-02	0xAF02	RPDO1-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-03	0xAF03	RPDO1-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-04	0xAF04	RPDO1-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-05	0xAF05	RPDO1-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time
AF-06	0xAF06	RPDO1-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-07	0xAF07	RPDO1-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-08	0xAF08	RPDO2-SubIndex0-H	0 to value of 0xFFFF	0	-	In real time
AF-09	0xAF09	RPDO2-SubIndex0-L	0 to value of 0xFFFF	0	-	In real time
AF-10	0xAF0A	RPDO2-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-11	0xAF0B	RPDO2-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-12	0xAF0C	RPDO2-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-13	0xAF0D	RPDO2-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time
AF-14	0xAF0E	RPDO2-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-15	0xAF0F	RPDO2-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-16	0xAF10	RPDO3-SubIndex0-H	0 to value of 0xFFFF	0	-	In real time
AF-17	0xAF11	RPDO3-SubIndex0-L	0 to value of 0xFFFF	0	-	In real time
AF-18	0xAF12	RPDO3-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-19	0xAF13	RPDO3-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-20	0xAF14	RPDO3-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-21	0xAF15	RPDO3-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time
AF-22	0xAF16	RPDO3-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-23	0xAF17	RPDO3-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-24	0xAF18	RPDO4-SubIndex0-H	0 to value of 0xFFFF	0	-	In real time
AF-25	0xAF19	RPDO4-SubIndex0-L	0 to value of 0xFFFF	0	-	In real time
AF-26	0xAF1A	RPDO4-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-27	0xAF1B	RPDO4-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-28	0xAF1C	RPDO4-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-29	0xAF1D	RPDO4-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time
AF-30	0xAF1E	RPDO4-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-31	0xAF1F	RPDO4-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-32	0xAF20	TPDO1-SubIndexO-H	0 to value of 0xFFFF	0	-	In real time
AF-33	0xAF21	TPDO1-SubIndexO-L	0 to value of 0xFFFF	0	-	In real time
AF-34	0xAF22	TPDO1-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-35	0xAF23	TPDO1-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-36	0xAF24	TPDO1-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-37	0xAF25	TPDO1-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
AF-38	0xAF26	TPDO1-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-39	0xAF27	TPDO1-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-40	0xAF28	TPDO2-SubIndex0-H	0 to value of 0xFFFF	0	-	In real time
AF-41	0xAF29	TPDO2-SubIndex0-L	0 to value of 0xFFFF	0	-	In real time
AF-42	0xAF2A	TPDO2-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-43	0xAF2B	TPDO2-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-44	0xAF2C	TPDO2-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-45	0xAF2D	TPDO2-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time
AF-46	0xAF2E	TPDO2-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-47	0xAF2F	TPDO2-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-48	0xAF30	TPDO3-SubIndex0-H	0 to value of 0xFFFF	0	-	In real time
AF-49	0xAF31	TPDO3-SubIndex0-L	0 to value of 0xFFFF	0	-	In real time
AF-50	0xAF32	TPDO3-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-51	0xAF33	TPDO3-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-52	0xAF34	TPDO3-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-53	0xAF35	TPDO3-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time
AF-54	0xAF36	TPDO3-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-55	0xAF37	TPDO3-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-56	0xAF38	TPDO4-SubIndex0-H	0 to value of 0xFFFF	0	-	In real time
AF-57	0xAF39	TPDO4-SubIndex0-L	0 to value of 0xFFFF	0	-	In real time
AF-58	0xAF3A	TPDO4-SubIndex1-H	0 to value of 0xFFFF	0	-	In real time
AF-59	0xAF3B	TPDO4-SubIndex1-L	0 to value of 0xFFFF	0	-	In real time
AF-60	0xAF3C	TPDO4-SubIndex2-H	0 to value of 0xFFFF	0	-	In real time
AF-61	0xAF3D	TPDO4-SubIndex2-L	0 to value of 0xFFFF	0	-	In real time
AF-62	0xAF3E	TPDO4-SubIndex3-H	0 to value of 0xFFFF	0	-	In real time
AF-63	0xAF3F	TPDO4-SubIndex3-L	0 to value of 0xFFFF	0	-	In real time
AF-66	0xAF42	Number of valid RPDOs	0 to value of 0xFFFF	0	-	Non-modifiable
AF-67	0xAF43	Number of valid TPDOs	0 to value of 0xFFFF	0	-	Non-modifiable
B0-00	0xB000	Tension control mode	0: Disabled 1: Open loop torque control 2: Closed loop speed control 3: Closed loop torque control 4: Constant linear speed control	0	-	At stop
B0-01	0xB001	Winding mode	0: Winding 1: Unwinding	0	-	In real time
B0-02	0xB002	Unwinding reverse tightening selection	0.0 m/min to 500.0 m/min	0	m/min	In real time
B0-03	0xB003	Mechanical transmission ratio	0.01 to 300.00	1	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B0-04	0xB004	Linear speed input source	0: No input 1: AI1 2: AI2 3: AI3 4: Pulse input (DI5) 5: Communication (1000H) 6: Communication (731AH)	0	-	At stop
B0-05	0xB005	Maximum linear speed	0.0 m/min to 6500.0 m/min	1000	m/min	In real time
B0-06	0xB006	Minimum linear speed for roll diameter calculation	0.0 m/min to 6500.0 m/min	20	m/min	In real time
B0-07	0xB007	Roll diameter calculation method	0: Calculated based on linear speed 1:Calculated based on accumulative thickness 2: AI1 3: AI2 4: AI3 5: Pulse input (DI5) 6: Communication 7: Specified by B0-14	0	-	At stop
B0-08	0xB008	Maximum roll diameter	0.1 mm to 6000.0 mm	500	mm	In real time
B0-09	0xB009	Empty roll diameter	0.1 mm to 6000.0 mm	100	mm	In real time
B0-10	0xB00A	Initial roll diameter source	0: Specified by B0-11 to B0-13 1: AI1 2: AI2 3: AI3 4: Communication (1000H)	0	-	At stop
B0-11	0xB00B	Initial roll diameter 1	0.1 mm to 6000.0 mm	100	mm	In real time
B0-12	0xB00C	Initial roll diameter 2	0.1 mm to 6000.0 mm	100	mm	In real time
B0-13	0xB00D	Initial roll diameter 3	0.1 mm to 6000.0 mm	100	mm	In real time
B0-14	0xB00E	Current roll diameter	0.1 mm to 6000.0 mm	100	mm	In real time
B0-15	0xB00F	Roll diameter filter time	0.00s to 10.00s	5	s	In real time
B0-16	0xB010	Roll diameter change rate	0.0 to 1000.0	0	-	In real time
B0-17	0xB011	Roll diameter change direction limit	0: Disabled 1: Decrease disabled during winding, and increase disabled during unwinding	0	-	In real time
B0-18	0xB012	Roll diameter reset during running	0 to 1	0	-	In real time
B0-19	0xB013	Pre-drive speed gain	-100.0% to +200.0%	0	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B0-20	0xB014	Pre-drive torque limit source	0: Based on the value of F2-09 1: Based on tension control torque	1	-	At stop
B0-21	0xB015	Pre-drive torque correction	-100.0% to +100.0%	0	%	In real time
B0-23	0xB017	Pre-drive acceleration time	0.0s to 6000.0s	20	s	In real time
B0-24	0xB018	Pre-drive deceleration time	0.0s to 6000.0s	20	s	In real time
B0-25	0xB019	Pre-drive roll diameter calculation	0: Disabled 1: Enabled	0	-	In real time
B0-26	0xB01A	Tension frequency limit range	0.0% to 100.0%	50	%	In real time
B0-27	0xB01B	Tension frequency limit offset	0.00 Hz to 100.00 Hz	5	Hz	In real time
B0-28	0xB01C	Tension frequency limit	0: Disabled 1: Enabled	0	-	In real time
B0-29	0xB01D	Pulses per revolution	1 to 60000	1	-	In real time
B0-30	0xB01E	Revolutions per layer	1 to 10000	1	-	In real time
B0-31	0xB01F	Material thickness reference source	0: Digital setting 1: AI1 2: AI2 3: AI3	0	-	At stop
B0-32	0xB020	Material thickness 0	0.01 mm to 100.00 mm	0.01	mm	In real time
B0-33	0xB021	Material thickness 1	0.01 mm to 100.00 mm	0.01	mm	In real time
B0-34	0xB022	Material thickness 2	0.01 mm to 100.00 mm	0.01	mm	In real time
B0-35	0xB023	Material thickness 3	0.01 mm to 100.00 mm	0.01	mm	In real time
B0-36	0xB024	Maximum thickness	0.01 mm to 100.00 mm	1	mm	In real time
B0-37	0xB025	Roll diameter not reset upon stop	0: Disabled 1: Enabled	0	-	In real time
B0-38	0xB026	Closed-loop tension torque mode selection	0: Torque calculated through PID only 1: Torque calculated through main + PID	0	-	At stop
B0-40	0xB028	Minimum pre-drive torque limit	0.0% to 100.0%	0	%	In real time
B0-41	0xB029	Constant linear speed source selection	0: AI1 1: AI2 2: AI3 3: Pulse reference (DI5) 4: Communication (1000H) 5: Communication (731AH)	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B1-00	0xB100	Tension reference source	0: Specified by B0-01 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication (1000H)	0	-	At stop
B1-01	0xB101	Tension digital setting	0 N to 65000 N	50	N	In real time
B1-02	0xB102	Maximum tension	0 N to 65000 N	500	N	In real time
B1-03	0xB103	Zero-speed threshold	0.0% to 20.0%	0	%	In real time
B1-04	0xB104	Zero-speed tension rise	0.0% to 100.0%	0	%	In real time
B1-05	0xB105	Frequency acceleration time in torque control mode	0.0s to 6500.0s	0	s	In real time
B1-06	0xB106	Frequency deceleration time in torque control mode	0.0s to 6500.0s	0	s	In real time
B1-07	0xB107	Friction force compensation	0.0% to 50.0%	0	%	In real time
B1-08	0xB108	Mechanical inertia compensation coefficient	0 N m^2 to 65535 N m^2	0	N•m^2	In real time
B1-09	0xB109	Correction coefficient of acceleration inertia compensation	0.0% to 200.0%	100	%	In real time
B1-10	0xB10A	Correction coefficient of deceleration inertia compensation	0.0% to 200.0%	100	%	In real time
B1-11	0xB10B	Material density	0 kg/m^3 to 65535 kg/m^3	0	kg/m^3	In real time
B1-12	0xB10C	Material width	0 mm to 65535 mm	0	mm	In real time
B1-13	0xB10D	Inertia compensation exit delay	0 ms to 1000 ms	0	ms	In real time
B1-14	0xB10E	Transition frequency for zero speed compensation	0.00 Hz to 20.00 Hz	2	Hz	In real time
B1-15	0xB10F	Open-loop torque reverse	0: Disabled 1: Enabled	0	-	In real time
B1-16	0xB110	Tension closed-loop torque limit	0.0% to 200.0%	100	%	In real time
B1-17	0xB111	Friction force compensation correction coefficient	-50.0 to +50.0	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B1-18	0xB112	Friction force compensation curve	0: Frequency 1: Linear speed 2: Multi-friction compensation curve 1 3: Multi-friction compensation curve 2	0	-	At stop
B1-19	0xB113	Multi-friction force compensation torque 1	0.0 to 50.0	0	-	In real time
B1-20	0xB114	Multi-friction force compensation torque 2	0.0 to 50.0	0	-	In real time
B1-21	0xB115	Multi-friction force compensation torque 3	0.0 to 50.0	0	-	In real time
B1-22	0xB116	Multi-friction force compensation torque 4	0.0 to 50.0	0	-	In real time
B1-23	0xB117	Multi-friction force compensation torque 5	0.0–50.0	0	-	In real time
B1-24	0xB118	Multi-friction force compensation torque 6	0.0–50.0	0	-	In real time
B1-25	0xB119	Multi-friction force compensation inflection point 1	0.00 Hz to F0-10	0	Hz	In real time
B1-26	0xB11A	Multi-friction force compensation inflection point 2	0.00 Hz to F0-10	0	Hz	In real time
B1-27	0xB11B	Multi-friction force compensation inflection point 3	0.00 Hz to F0-10	0	Hz	In real time
B1-28	0xB11C	Multi-friction force compensation inflection point 4	0.00 Hz to F0-10	0	Hz	In real time
B1-29	0xB11D	Multi-friction force compensation inflection point 5	0.00 Hz to F0-10	0	Hz	In real time
B1-30	0xB11E	Multi-friction force compensation inflection point 6	0.00 Hz to F0-10	0	Hz	In real time
B1-31	0xB11F	Tension establishment	0: Disabled 1: Enabled	0	-	At stop

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B1-32	0xB120	Tension establishment dead zone	0.0% to 100.0%	2	%	In real time
B1-33	0xB121	Tension establishment frequency	0.00 Hz to F0-10	0.1	Hz	In real time
B1-34	0xB122	Terminal torque boost proportion	0.0% to 500.0%	50	%	In real time
B1-35	0xB123	Terminal torque boost cancellation time	0.0s to 50.0s	0	s	In real time
B1-37	0xB125	Initial roll diameter auto-tuning	0: Disabled 1: Enabled	0	-	At stop
B1-38	0xB126	Rod length	1 mm to 65535 mm	300	mm	At stop
B1-39	0xB127	Rod angle	0.1° to 360.0°	40	°	At stop
B2-00	0xB200	Taper curve	0: Curve taper 1: Multi-linear taper	0	-	At stop
B2-01	0xB201	Tension taper source selection	0: Specified by B2-02 1: AI1 2: AI2 3: AI3 4: Communication (1000H)	0	-	At stop
B2-02	0xB202	Digital setting of taper	0.0% to 100.0%	0	%	In real time
B2-03	0xB203	Correction coefficient of taper compensation	0 mm to 10000 mm	0	mm	In real time
B2-05	0xB205	Setting channel of external taper AO	0: Specified by B2-06 1: AI1 2: AI2 3: AI3 4: Communication (1000H)	0	-	At stop
B2-06	0xB206	External taper setting	0.0% to 100.0%	100	%	In real time
B2-08	0xB208	Minimum roll diameter taper	0.0% to 100.0%	100	%	In real time
B2-09	0xB209	Linear taper switchover point 1	B0-09 to B0-08	150	mm	In real time
B2-10	0xB20A	Taper of switchover point 1	0.0% to 100.0%	100	%	In real time
B2-11	0xB20B	Linear taper switchover point 2	B2-09 to B0-08	200	mm	In real time
B2-12	0xB20C	Taper of switchover point 2	0.0% to 100.0%	90	%	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B2-13	0xB20D	Linear taper switchover point 3	B2-11 to B0-08	250	mm	In real time
B2-14	0xB20E	Taper of switchover point 3	0.0% to 100.0%	80	%	In real time
B2-15	0xB20F	Linear taper switchover point 4	B2-13 to B0-08	300	mm	In real time
B2-16	0xB210	Taper of switchover point 4	0.0% to 100.0%	70	%	In real time
B2-17	0xB211	Linear taper switchover point 5	B2-15 to B0-08	400	mm	In real time
B2-18	0xB212	Taper of switchover point 5	0.0% to 100.0%	50	%	In real time
B2-19	0xB213	Taper at maximum roll diameter	0.0 to 100.0	30	-	In real time
B6-00	0xB600	Source address 1	0 to 0xFFFF	0xE012	-	In real time
B6-01	0xB601	Mapping address 1	0 to 0xFFFF	0x500E	-	In real time
B6-02	0xB602	Write gain 1	0.00 to 100.00	10	-	In real time
B6-03	0xB603	Read gain 1	0.00 to 100.00	0.1	-	In real time
B6-04	0xB604	Source address 2	0 to 0xFFFF	0	-	In real time
B6-05	0xB605	Mapping address 2	0 to 0xFFFF	0	-	In real time
B6-06	0xB606	Write gain 2	0.00 to 100.00	0	-	In real time
B6-07	0xB607	Read gain 2	0.00 to 100.00	0	-	In real time
B6-08	0xB608	Source address 3	0 to 0xFFFF	0	-	In real time
B6-09	0xB609	Mapping address 3	0 to 0xFFFF	0	-	In real time
B6-10	0xB60A	Write gain 3	0.00 to 100.00	0	-	In real time
B6-11	0xB60B	Read gain 3	0.00 to 100.00	0	-	In real time
B6-12	0xB60C	Source address 4	0 to 0xFFFF	0	-	In real time
B6-13	0xB60D	Mapping address 4	0 to 0xFFFF	0	-	In real time
B6-14	0xB60E	Write gain 4	0.00 to 100.00	0	-	In real time
B6-15	0xB60F	Read gain 4	0.00 to 100.00	0	-	In real time
B6-16	0xB610	Source address 5	0 to 0xFFFF	0	-	In real time
B6-17	0xB611	Mapping address 5	0 to 0xFFFF	0	-	In real time
B6-18	0xB612	Write gain 5	0.00 to 100.00	0	-	In real time
B6-19	0xB613	Read gain 5	0.00 to 100.00	0	-	In real time
B6-20	0xB614	Source address 6	0 to 0xFFFF	0	-	In real time
B6-21	0xB615	Mapping address 6	0 to 0xFFFF	0	-	In real time
B6-22	0xB616	Write gain 6	0.00 to 100.00	0	-	In real time
B6-23	0xB617	Read gain 6	0.00 to 100.00	0	-	In real time
B6-24	0xB618	Source address 7	0 to 0xFFFF	0	-	In real time
B6-25	0xB619	Mapping address 7	0 to 0xFFFF	0	-	In real time
B6-26	0xB61A	Write gain 7	0.00 to 100.00	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B6-27	0xB61B	Read gain 7	0.00 to 100.00	0	-	In real time
B6-28	0xB61C	Source address 8	0 to 0xFFFF	0	-	In real time
B6-29	0xB61D	Mapping address 8	0 to 0xFFFF	0	-	In real time
B6-30	0xB61E	Write gain 8	0.00 to 100.00	0	-	In real time
B6-31	0xB61F	Read gain 8	0.00 to 100.00	0	-	In real time
B6-32	0xB620	Source address 9	0 to 0xFFFF	0	-	In real time
B6-33	0xB621	Mapping address 9	0 to 0xFFFF	0	-	In real time
B6-34	0xB622	Write gain 9	0.00 to 100.00	0	-	In real time
B6-35	0xB623	Read gain 9	0.00 to 100.00	0	-	In real time
B6-36	0xB624	Source address 10	0 to 0xFFFF	0	-	In real time
B6-37	0xB625	Mapping address 10	0 to 0xFFFF	0	-	In real time
B6-38	0xB626	Write gain 10	0.00 to 100.00	0	-	In real time
B6-39	0xB627	Read gain 10	0.00 to 100.00	0	-	In real time
B6-40	0xB628	Source address 11	0 to 0xFFFF	0	-	In real time
B6-41	0xB629	Mapping address 11	0 to 0xFFFF	0	-	In real time
B6-42	0xB62A	Write gain 11	0.00 to 100.00	0	-	In real time
B6-43	0xB62B	Read gain 11	0.00 to 100.00	0	-	In real time
B6-44	0xB62C	Source address 12	0 to 0xFFFF	0	-	In real time
B6-45	0xB62D	Mapping address 12	0 to 0xFFFF	0	-	In real time
B6-46	0xB62E	Write gain 12	0.00 to 100.00	0	-	In real time
B6-47	0xB62F	Read gain 12	0.00 to 100.00	0	-	In real time
B6-48	0xB630	Source address 13	0 to 0xFFFF	0	-	In real time
B6-49	0xB631	Mapping address 13	0 to 0xFFFF	0	-	In real time
B6-50	0xB632	Write gain 13	0.00 to 100.00	0	-	In real time
B6-51	0xB633	Read gain 13	0.00 to 100.00	0	-	In real time
B6-52	0xB634	Source address 14	0 to 0xFFFF	0	-	In real time
B6-53	0xB635	Mapping address 14	0 to 0xFFFF	0	-	In real time
B6-54	0xB636	Write gain 14	0.00 to 100.00	0	-	In real time
B6-55	0xB637	Read gain 14	0.00 to 100.00	0	-	In real time
B6-56	0xB638	Source address 15	0 to 0xFFFF	0	-	In real time
B6-57	0xB639	Mapping address 15	0 to 0xFFFF	0	-	In real time
B6-58	0xB63A	Write gain 15	0.00 to 100.00	0	-	In real time
B6-59	0xB63B	Read gain 15	0.00 to 100.00	0	-	In real time
B6-60	0xB63C	Source address 16	0 to 0xFFFF	0	-	In real time
B6-61	0xB63D	Mapping address 16	0 to 0xFFFF	0	-	In real time
B6-62	0xB63E	Write gain 16	0.00 to 100.00	0	-	In real time
B6-63	0xB63F	Read gain 16	0.00 to 100.00	0	-	In real time
B6-64	0xB640	Source address 17	0 to 0xFFFF	0	-	In real time
B6-65	0xB641	Mapping address 17	0 to 0xFFFF	0	-	In real time
B6-66	0xB642	Write gain 17	0.00 to 100.00	0	-	In real time

Parameter	Communication Address	Name	Value Range	Default	Unit	Change Property
B6-67	0xB643	Read gain 17	0.00 to 100.00	0	-	In real time
B6-68	0xB644	Source address 18	0 to 0xFFFF	0	-	In real time
B6-69	0xB645	Mapping address 18	0 to 0xFFFF	0	-	In real time
B6-70	0xB646	Write gain 18	0.00 to 100.00	0	-	In real time
B6-71	0xB647	Read gain 18	0.00 to 100.00	0	-	In real time
B6-72	0xB648	Source address 19	0 to 0xFFFF	0	-	In real time
B6-73	0xB649	Mapping address 19	0 to 0xFFFF	0	-	In real time
B6-74	0xB64A	Write gain 19	0.00 to 100.00	0	-	In real time
B6-75	0xB64B	Read gain 19	0.00 to 100.00	0	-	In real time
B6-76	0xB64C	Source address 20	0 to 0xFFFF	0	-	In real time
B6-77	0xB64D	Mapping address 20	0 to 0xFFFF	0	-	In real time
B6-78	0xB64E	Write gain 20	0.00 to 100.00	0	-	In real time
B6-79	0xB64F	Read gain 20	0.00 to 100.00	0	-	In real time
B6-80	0xB650	Source address 21	0 to 0xFFFF	0	-	In real time
B6-81	0xB651	Mapping address 21	0 to 0xFFFF	0	-	In real time
B6-82	0xB652	Write gain 21	0.00 to 100.00	0	-	In real time
B6-83	0xB653	Read gain 21	0.00 to 100.00	0	-	In real time
B6-84	0xB654	Source address 22	0 to 0xFFFF	0	-	In real time
B6-85	0xB655	Mapping address 22	0 to 0xFFFF	0	-	In real time
B6-86	0xB656	Write gain 22	0.00 to 100.00	0	-	In real time
B6-87	0xB657	Read gain 22	0.00 to 100.00	0	-	In real time
B6-88	0xB658	Source address 23	0 to 0xFFFF	0	-	In real time
B6-89	0xB659	Mapping address 23	0 to 0xFFFF	0	-	In real time
B6-90	0xB65A	Write gain 23	0.00 to 100.00	0	-	In real time
B6-91	0xB65B	Read gain 23	0.00 to 100.00	0	-	In real time
B6-92	0xB65C	Source address 24	0 to 0xFFFF	0	-	In real time
B6-93	0xB65D	Mapping address 24	0 to 0xFFFF	0	-	In real time
B6-94	0xB65E	Write gain 24	0.00 to 100.00	0	-	In real time
B6-95	0xB65F	Read gain 24	0.00 to 100.00	0	-	In real time
B6-96	0xB660	Source address 25	0 to 0xFFFF	0	-	In real time
B6-97	0xB661	Mapping address 25	0 to 0xFFFF	0	-	In real time
B6-98	0xB662	Write gain 25	0.00 to 100.00	0	-	In real time
B6-99	0xB663	Read gain 25	0.00 to 100.00	0	-	In real time

5.2 List of Monitoring Parameters

Table 5–1 Monitoring parameters

Parameter	Name	Basic Unit	Communication Address
Group U0: basic monitoring parameters			
U0-00	Running frequency (Hz)	0.01 Hz	0x7000
U0-01	Frequency reference (Hz)	0.01 Hz	0x7001
U0-02	Bus voltage (V)	0.1 V	0x7002
U0-03	Output voltage (V)	1 V	0x7003
U0-04	Output current (A)	0.1 A	0x7004
U0-05	Output power (kW)	0.1 kW	0x7005
U0-06	Output torque (%)	0.1%	0x7006
U0-07	DI state	1	0x7007
U0-08	DO state	1	0x7008
U0-09	AI1 voltage (V)	0.01 V	0x7009
U0-10	AI2 voltage (V)	0.01 V	0x700A
U0-11	AI3 voltage (V)	0.01 V	0x700B
U0-12	Count value	1	0x700C
U0-13	Length value	1	0x700D
U0-14	Load speed display	1	0x700E
U0-15	PID reference	1	0x700F
U0-16	PID feedback	1	0x7010
U0-17	PLC stage	1	0x7011
U0-18	Pulse input reference (kHz)	0.01 kHz	0x7012
U0-19	Feedback speed (Hz)	0.01 Hz	0x7013
U0-20	Remaining running time	0.1 min	0x7014
U0-21	AI1 voltage before correction	0.001 V	0x7015
U0-22	AI2 voltage (V)/current (mA) before correction	0.001 V	0x7016
U0-23	AI3 voltage before correction	0.001 V	0x7017
U0-24	Linear speed	1 m/min	0x7018
U0-25	Current power-on time	1 min	0x7019
U0-26	Current running time	0.1 min	0x701A
U0-27	Pulse input reference (Hz)	1Hz	0x701B
U0-28	Communication	0.01%	0x701C
U0-29	Encoder feedback speed (Hz)	0.01 Hz	0x701D
U0-30	Display of main frequency X	0.01 Hz	0x701E
U0-31	Display of auxiliary frequency Y	0.01 Hz	0x701F
U0-32	Any memory address	1	0x7020
U0-33	Synchronous motor rotor position	0.1°	0x7021
U0-34	Motor temperature	1°C	0x7022

Parameter	Name	Basic Unit	Communication Address
U0-35	Target torque (%)	0.1%	0x7023
U0-36	Resolver position	1	0x7024
U0-37	Power factor angle	0.1°	0x7025
U0-38	ABZ position	1	0x7026
U0-39	Target voltage upon V/f separation	1 V	0x7027
U0-40	Output voltage upon V/f separation	1 V	0x7028
U0-41	DI state display	1	0x7029
U0-42	DO state display	1	0x702A
U0-43	DI function state display 1 (function 01 to 40)	1	0x702B
U0-44	DI function state display 2 (functions 41 to 80)	1	0x702C
U0-45	Fault information	1	0x702D
U0-46	Inverter unit temperature	1°C	0x702E
U0-47	PTC channel voltage before correction	0.001 V	0x702F
U0-48	PTC channel voltage after correction	0.001 V	0x7030
U0-49	Number of offset pulses of position lock	1	0x7031
U0-50	Roll diameter	1 mm	0x7032
U0-51	Tension (after taper setting)	1 N	0x7033
U0-58	Z signal counting	1	0x7034
U0-59	Frequency reference (%)	0.01%	0x7035
U0-60	Running frequency (%)	0.01%	0x7036
U0-61	AC drive state	1	0x7037
U0-62	Current fault code	1	0x7038
U0-63	Running frequency (after droop)	0.01 Hz	0x7039
U0-64	Back EMF	0.1 V	0x703A
U0-65	Stator resistance auto-tuning upon startup	1	0x703B
U0-66	Communication extension card model	1	0x703C
U0-67	Software version of the communication extension card	1	0x703D
U0-68	AC drive state on the communication extension card	1	0x703E
U0-69	Frequency transmitted to the communication extension card/0.01 Hz	1	0x703F
U0-70	Speed transmitted to the communication extension card/RPM	1 RPM	0x7040
U0-71	Current specific to communication extension card (A)	1	0x7041
U0-72	Communication card error state	1	0x7042
U0-73	Target torque before filter	0.1	0x7043
U0-74	Target torque after filter	0.1	0x7044

Parameter	Name	Basic Unit	Communication Address
U0-75	Torque reference after acceleration/ deceleration	0.1	0x7045
U0-76	Torque upper limit in the motoring state	0.1	0x7046
U0-77	Torque upper limit in the generating state	0.01	0x7047
U0-80	EtherCAT slave name	1	0x7048
U0-81	EtherCAT slave alias	1	0x7049
U0-82	EtherCAT ESM transmission fault code	1	0x704A
U0-83	EtherCAT XML file version	0.01	0x704B
U0-84	Times of EtherCAT synchronization loss	1	0x704C
U0-85	Maximum error value and invalid frames of EtherCAT port 0 per unit time	1	0x704D
U0-86	Maximum error value and invalid frames of EtherCAT port 1 per unit time	1	0x7050
U0-87	Maximum forwarding error of the EtherCAT port per unit time	1	0x7051
U0-88	Maximum error of the EtherCAT data frame processing unit per unit time	1	0x7058
U0-89	Maximum link loss of the EtherCAT port per unit time	1	0x7059
U0-96	No-load current of asynchronous motor vector online observation	0.1	0x7060
U0-97	Mutual inductive reactance of asynchronous motor vector online observation	0.1	0x7061
Group U1: tension control monitoring parameters			
U1-00	Linear speed	0.1 m/min	0x7100
U1-01	Current roll diameter	0.1 mm	0x7101
U1-02	Linear speed synchronous frequency	0.01 Hz	0x7102
U1-03	PID output frequency	0.01 Hz	0x7103
U1-04	Current tension reference	1 N	0x7104
U1-05	Tension reference after taper	1 N	0x7105
U1-06	Open-loop torque	0.1%	0x7106
U1-07	PID output torque	0.1%	0x7107
U1-08	Tension control mode	1	0x7108
U1-09	PID reference	0.1%	0x7109
U1-10	PID feedback	0.1%	0x710A
U1-11	Tension PID proportional gain	1	0x710B
U1-12	Tension PID integral time Ti	1s	0x710C
U1-13	Tension PID differential time Td	1s	0x710D
U1-14	Tension time	1s	0x710E
U1-15	Winding/Unwinding mode	1	0x710F

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