INOVANCE

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MD200 Series General-Purpose AC Drive

User Guide

Industrial Automation

Intelligent Elevator

New Energy Vehicle

Industrial Robot

Rail Transit

Data code 19012113 C02

Preface

About This Guide

The MD200 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. It can be used to drive textile machines, paper making machines, wire drawing machines, machine tools, packaging machines, food machines, fans, water pumps, and other automated production equipment.

This guide describes the installation, wiring, troubleshooting, dimensions, functions, communication, and parameters of the MD200.

Standard Compliance

The following table lists the certifications and standards that the product may comply with. For details about the acquired certificates, see the certification marks on the product nameplate.

Certification	Directive		Standard
CE certification	EMC directive	2014/30/EU	EN 61800-3
	LVD directive	2014/35/EU	EN 61800-5-1
	RoHS directive	2011/65/EU	EN 50581
UL certification	-		UL61800-5-1
			C22.2 No.14-13
KCC certification	Korea radio law		KN 11

Revision History

Date	Version	Description
January 2023	C02	• Updated the nameplate in section 1.1 Product Information. • Updated descriptions of DI1 to DI4 in section 2.2.2 Terminal Description. • Updated section 3.1 Fault List. • Deleted MDKE9 in section 4.8 Selection of Options. • Updated section 5.1.1 Running Command Setting Source. • Updated section 5.1.3 Setting Running Commands Through Terminals. • Updated section 5.4.2 Power Dip Ride-through. • Updated section 5.5 AO. • Updated section 6.1 Definition of the Communication Data Address. • Updated section 6.2 Modbus Communication Protocol. • Updated section 7 Parameter Description and section 8 Parameter List and changed F7-10 to U12.05, F7-11 to U14.07, F7-15 to 000.00, and F7-16 to 000.00.
March 2022	C01	• Updated the DI and DO descriptions in section 2.2.3 Terminal Wiring. • Updated sections 7 Parameter Descriptions and 8 Parameter List. • Updated descriptions of DI1 to DI4 and DI/DO.
2021–10	C00	• Updated section 8 Parameter List. • Added sections 5 Functions, 6 Communication, and 7 Parameter Groups • Adjusted the sequence of level 1 titles.
March 2021	B10	Updated section 8 Parameter List.
November 2020	B09	Corrected minor errors.
August 2020	B08	Deleted the customer service telephone.
April 2020	B07	• Updated the nameplate in section 1.1 Product Information. • Updated section 2.2.1 Terminal Wiring Diagram. • Updated section 2.2.3 Wiring of Control Signal Input Terminals. • Updated the output voltage in section 5.2.1 Rated Specifications.

Date	Version	Description
September 2019	B06	• Added section 5.6 Selection of Cables and Tightening Torque. • Added section 5.7 Selection of Options. • Added the input fuse specifications in section 5.3 Selection of Peripherals Components. • Optimized the terminal wiring diagram in section 2.2.1 Terminal Wiring Diagram. • Added the thermal design power and air flow in section 5.2.2 Technical Specifications.
December 2018	B05	Changed to the new logo.
September 2017	B04	• Added the single-phase and three-phase -NC models. • Added F4-04. • Added three-phase filters and reactors.
December 2016	B03	• Corrected minor mistakes. • Added three-phase 0.4 kW and 5.5 kW models.
September 2016	B02	• Added three-phase power supply input models. • Updated F7-10 to software version U12.00 and F7-11 to U13.00.
May 2016	B01	• Updated the parameter list to the function software version U0.10 and to the performance software version U10.06. • Added the EMC section.
November 2015	V1.0	• Changed the control circuit terminals AI1 and AO1 to AI and AO. • Changed the default of the maximum output voltage coefficient (A5-05) to 103.
September 2015	V0.0	First release.

Guide Acquisition

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

Log in to Inovance's website (*www.inovance.com*), choose **Support** > **Download**, search by keyword, and then download the PDF file.

Product Warranty Instructions

Under the condition of normal use, if the product is faulty or damaged, Inovance provides the warranty service within the warranty period (specified in the order). After the warranty period expires, maintenance will be charged.

Within the warranty period, maintenance will be charged for the damage caused by the following causes:

- The user does not perform operations in compliance with the user manual of the product.
- Damages caused by fire, flood, and abnormal voltage.
- The user uses the product for abnormal functions.
- The user uses the product outside the specified specification range.
- Damages caused by force majeure, such as natural disasters, earthquakes, or lightning strikes.

The maintenance fee is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

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Fundamental Safety Instructions

Safety Precautions

- 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.
- "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.
- Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
- Inovance shall take no responsibility for any personal injuries or property damage caused by improper use.

Safety Levels and Definitions

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

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

Caution 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
Warning
• 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.

⚠ Caution • 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
⚠ Warning • 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.
⚠ Caution • Handle the equipment with care during transportation and mind your steps to prevent personal injuries or equipment damage. • When carrying the equipment with bare hands, hold the equipment casing firmly with care to prevent parts from falling. Failure to comply may result in personal injuries. • Store and transport the equipment based on the storage and transportation requirements. Failure to comply will result in equipment damage. • Avoid storing or transporting the equipment in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration. • Avoid storing the product for more than three months. 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
⚠ Danger • 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.

Warning

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

Caution

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

Power-on

Danger

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

Warning

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

Operation

⚠ Danger

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

⚠ Warning

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

Maintenance

⚠ Danger

- 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.

⚠ Warning

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

Repair

⚠ Danger

- 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.

Warning

- 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 Label

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

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

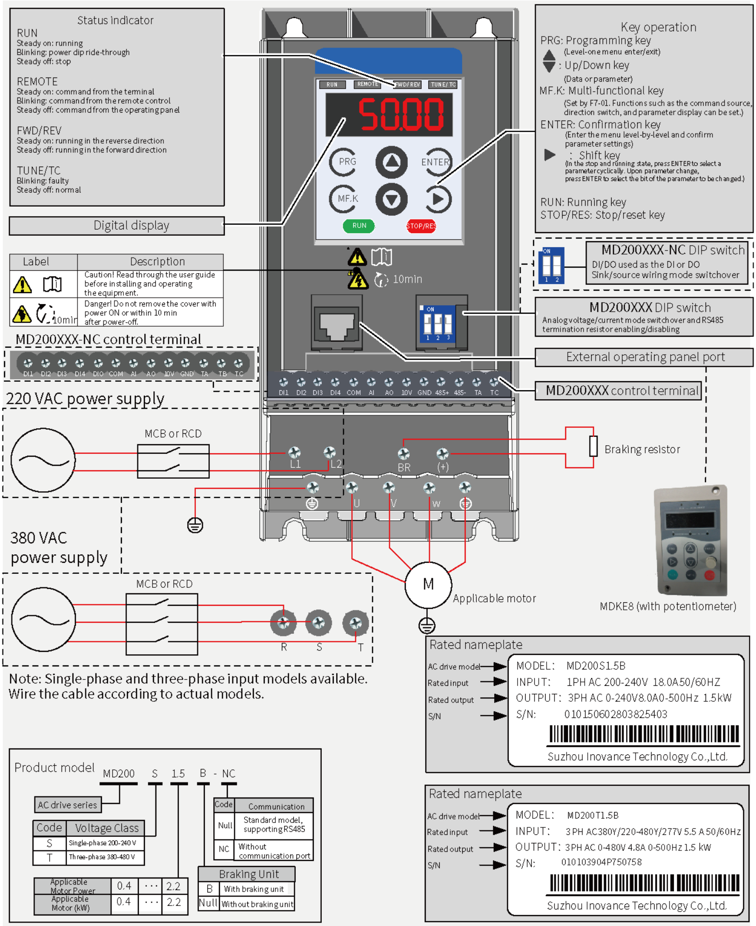
1 Overview

1.1 Product Information

The MD200 is easy to install, supporting seamless parallel installation and guide rail installation. Moreover, its compact size saves space. The wiring terminals are uncovered, simplifying wiring, operation, and maintenance. The input filter is built-in for all series to enhance the anti-jamming ability and reduce external interference. Typical applications can be realized with one key using the macro parameters.

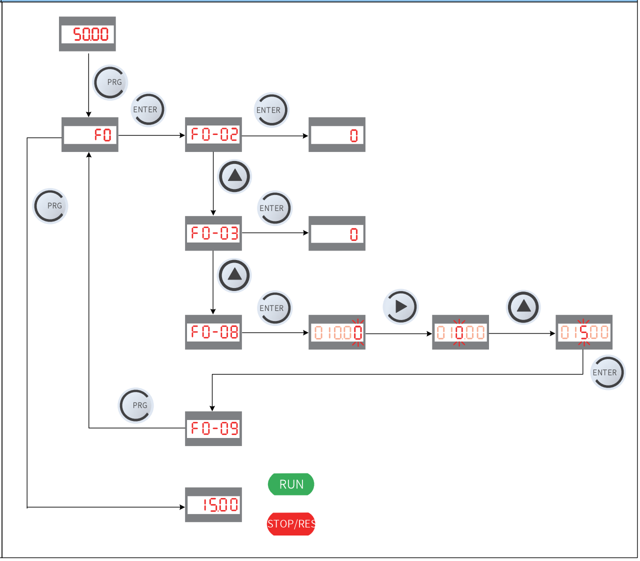
The MD200 series AC drive is a general-purpose high-performance current vector control AC drive. It is designed to control and regulate the speed and torque of three-phase AC asynchronous motors. It can be used to drive textile machines, paper making machines, wire drawing machines, machine tools, packaging machines, food machines, fans, water pumps, and other automated production equipment.

The following figure shows the product model, nameplate, and operating panel of the MD200.

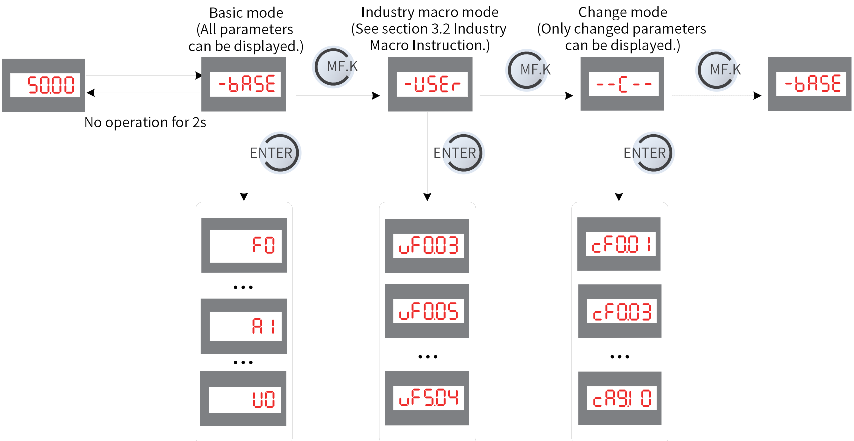


1.2 Operating Panel Operations

Quick commissioning flowchart:

Procedure	Key Operation
1 Power on the AC drive.	
2 Set the command source. (Operating panel)	
3 Set the frequency source. (Digital)	
4 Set the frequency.	
5 Return to the frequency display interface.	
6 Press the RUN or STOP/RES key.	

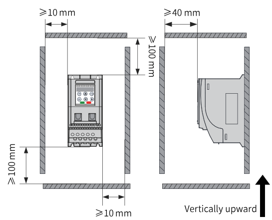
Quick parameter view flowchart:



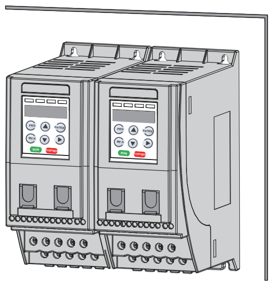
2 Installation and Wiring

2.1 Installation

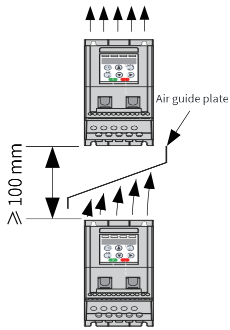
2.1.1 Layout in the Cabinet



Single-row installation

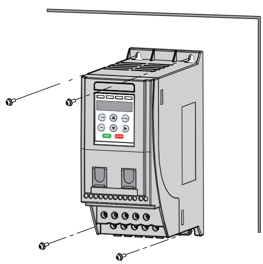


Installation side by side

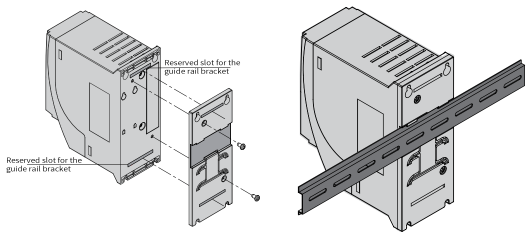


Dual-row installation

2.1.2 Installation Method



Installation by screw



Installation by guide rail

Note

- To install the AC drive with screws, all the four screws must be tightened. Never fix the AC drive with only the two upper screws.
- To install the AC drive with a guide rail, order the DIN guide rail (option). For details, see *"4.8 Selection of Options" on page 51*.

2.1.3 Installation Environment

1. Ambient temperature: The AC drive's service life is greatly influenced by the ambient temperature. Do not run the AC drive under a temperature exceeding the allowed temperature range (-10°C to +50°C).
2. Install the AC drive on a flame-retardant object, with sufficient clearance reserved for heat dissipation. The drive generates significant heat during working. Use screws to install the AC drive on the mounting bracket vertically.
3. Install the AC drive in a place not prone to vibration. The vibration must be less than or equal to 0.6 g. Keep the drive away from equipment such as punch presses.
4. Avoid direct sunlight exposure, moisture, and water drop.
5. Install the AC drive at a place free from corrosive, explosive, and combustible gas.
6. Install the AC drive in a place free from oil and dust.

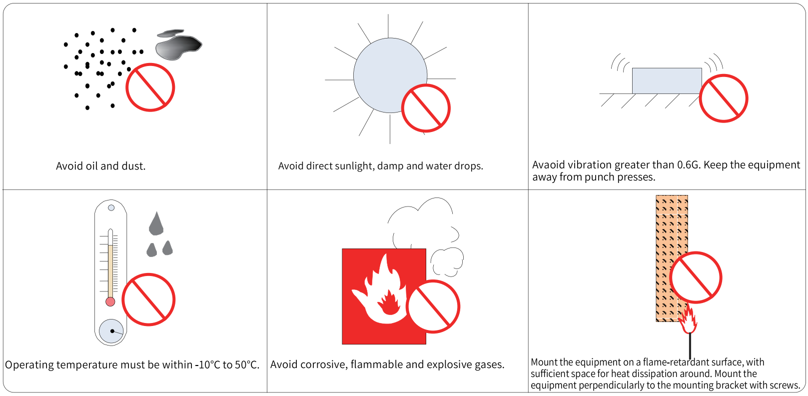


Figure 2-1 Installation location requirements

2.2 Wiring

2.2.1 Terminal Wiring Diagram

MD200XXX terminal wiring diagram

AC Drive Model	Recommended Resistance
MD200S2.2B	70 Ω/100 W
MD200S1.5B	100 Ω/100 W
MD200S0.75B	150 Ω/80 W
MD200S0.4B	200 Ω/80 W

AC Drive Model	Recommended Resistance
MD200T3.7B	130 Ω/400 W
MD200T2.2B	200 Ω/300 W
MD200T1.5B	220 Ω/250 W
MD200T0.75B	300 Ω/150 W
MD200T0.4B	300 Ω/150 W

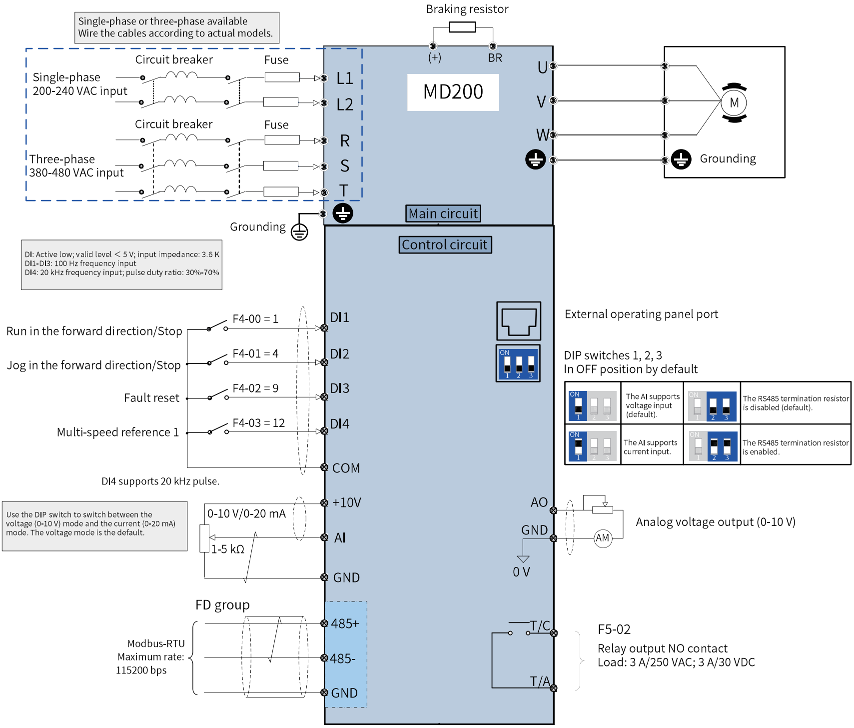


Figure 2-2 Wiring diagram of models (MD200S0.4B to MD200S2.2B and MD200T0.4B to MD200T3.7B) with single-phase/three-phase power input

MD200XXX-NC terminal wiring diagram

AC Drive Model	Recommended Resistance
MD200S2.2B-NC	70 Ω/100 W
MD200S1.5B-NC	100 Ω/100 W
MD200S0.75B-NC	150 Ω/80 W
MD200S0.4B-NC	200 Ω/80 W

AC Drive Model	Recommended Resistance
MD200T3.7B-NC	130 Ω/400 W
MD200T2.2B-NC	200 Ω/300 W
MD200T1.5B-NC	220 Ω/250 W
MD200T0.75B-NC	300 Ω/150 W
MD200T0.4B-NC	300 Ω/150 W

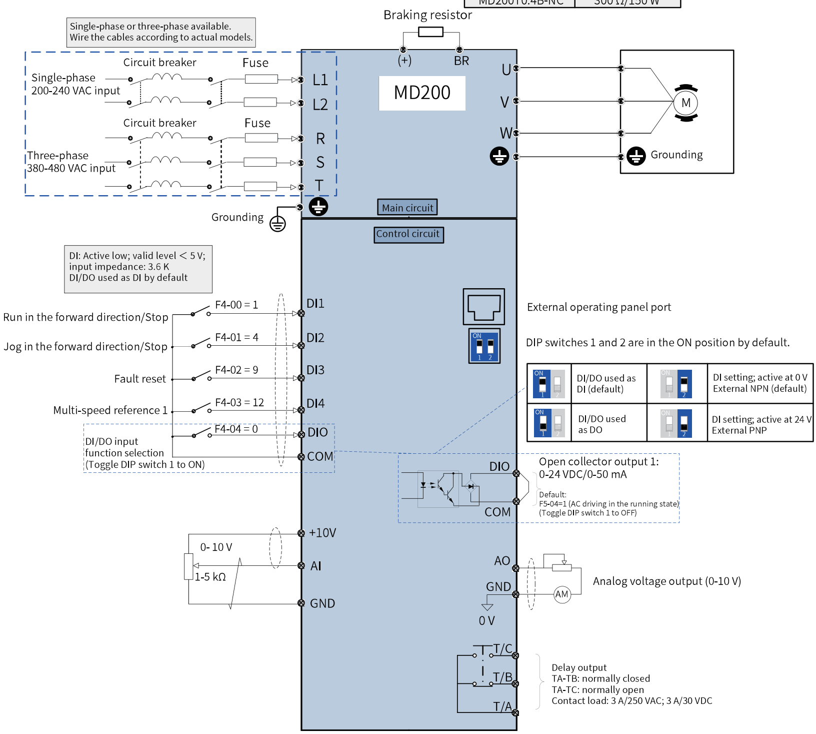


Figure 2-3 Wiring diagram of models (MD200S0.4B-NC to MD200S2.2B-NC and MD200T0.4B-NC to MD200T3.7B-NC) with single-phase/three-phase power input

Caution

- Noise interference may cause malfunctions. Therefore, keep the signal cable at least 10 cm away from the power cable and separately configure the input and output sides of the main circuit.
- Do not leave cuttings inside the drive while wiring. Failure to comply may result in errors, faults, and malfunctions.
- Keep the AC drive clean. Do not drop cuttings or dust into the AC drive while drilling mounting holes on the control cabinet.

2.2.2 Terminal Description

The following table describes the main circuit terminal and control terminal. For details on terminal arrangement, see *"1.1 Product Information" on page 14*.

Terminal Type	Terminal Mark	Terminal Name	Function Description
Main circuit	L1, L2	Single-phase power supply input	The terminals are connected to the power supply. L1 is connected to the live wire and L2 is connected to the neutral wire.
	R, S, T	Three-phase power supply input	The terminals are connected to the power supply.
	U, V, W	AC drive output	The terminals are connected to the motor.
	BR, (+)	Braking resistor connection	The terminals are connected to the braking resistor.
	⏚	Grounding terminal	The terminal is connected to the ground.

Terminal Type	Terminal Mark	Terminal Name	Function Description	
Control circuit	DI1-DI4	Digital input	Multi-functional input terminal	Active low; active level < 5 V MD200XXX models: DI1 to DI3 are low-speed DIs with the frequency lower than 100 Hz. DI4 can be used as either the high-speed pulse input terminal (supports 20 kHz frequency at most) or the DO without settings. To use DI4 as the DO, set F4-41 to 1 and set F5-04 to select a function. MD200XXX-NC models: DI1 to DI4 are low-speed DIs with the frequency lower than 100 Hz. DI4 of the MD200-NC models cannot be used as the DO. The models provide the DI/DO terminal, which can be switched by DIP switch.
	DI/DO	DI/DO	Multi-functional DI/DO	The DI/DO is available only for the MD200XXX-NC models. The DI/DO can be used as the DI or DO (with the common terminal COM), which can be switched over by the DIP switch, as shown in *"Figure 2–3 " on page 20* . When the DI/DO is used as the DI, it is the high-speed pulse terminal with the maximum frequency of 20 kHz.
	COM	24V power ground	Internal 24 V grounding terminal provided by the drive unit	It is internally isolated from GND.
	+10 V	AI and AO	10 V analog voltage output	10 V ± 10%; maximum current: 10 mA

Terminal Type	Terminal Mark	Terminal Name	Function Description	
Continued	GND	AI and AO	Analog ground	It is internally isolated from COM.
	AI		Analog input channel 1	0–10 V or 0–20 mA input; 12-bit resolution; calibration accuracy of 0.5%; response time < 8 ms
	AO		Analog output 1	AO: 0–10 V; calibration accuracy of 100 mV; 10-bit resolution; calibration accuracy of 1%
	TA-TC, TA-TB	Relay output	Relay output	TA-TC: Normally open; TA-TB: Normally closed Contact load: 3 A/250 AC, 3 A/30 VDC TA-TB applies only to MD200XXX-NC models.
	CGND	Communication	It shares the grounding terminal with 10V.	It shares the grounding terminal GND with 10V.
	485+		RS485 positive communication signal	Half-duplex RS485 communication, with the highest baud rate of 115200 for up to 64 nodes Note: The RS485 communication function is applied only to MD200XXX models.
	485-		RS485 negative communication signal	

2.2.3 Terminal Wiring Description

AI

Weak analog voltage signals are prone to external interference. Therefore, a shielded cable is required, and the wiring distance must be as short as possible (no longer than 20 m), as shown in "Figure 2–4 " on page 24 . In scenarios where analog signals are severely interfered, install a filter capacitor or a ferrite core on the analog signal source side, as shown in "Figure 2–5 " on page 25 .

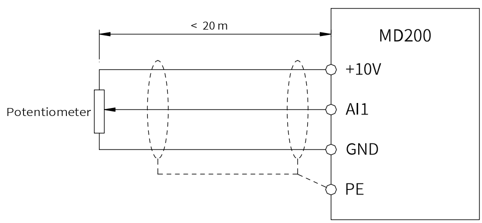


Figure 2-4 AI wiring in normal scenarios

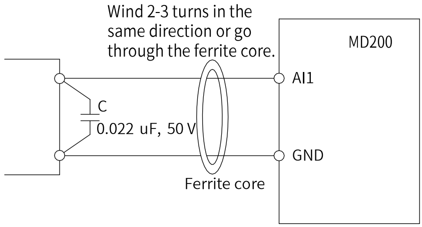


Figure 2-5 AI wiring when analog signals are severely interfered

DI

Generally, use the shielded cable and keep the cable length as short as possible (not longer than 20 m). When the external power supply is adopted, necessary filtering measures must be taken to prevent interference to the power supply. The contact control mode is recommended.

1. MD200XXX models

   DI1 to DI3 are low-speed DIs, and DI4 is the high-speed pulse input terminal when used as the DI.

   MD200XXX models support only sink (NPN) wiring mode, as shown in the following figure.

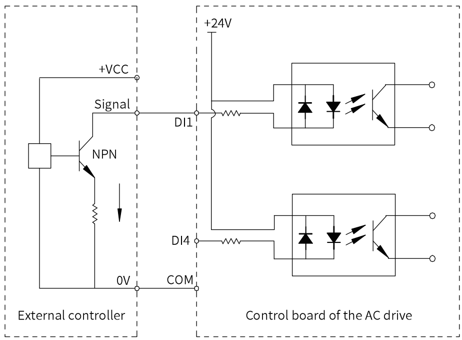


Figure 2-6 Sink (NPN) wiring

In the mode, the DIs of different AC drives cannot be connected in parallel. Otherwise, the DI may malfunction. If DIs of different AC drives must be connected in parallel, connect the anode of a diode to the DI in series and the diode needs to satisfy the requirement: IF > 10 mA and UF < 1 V.

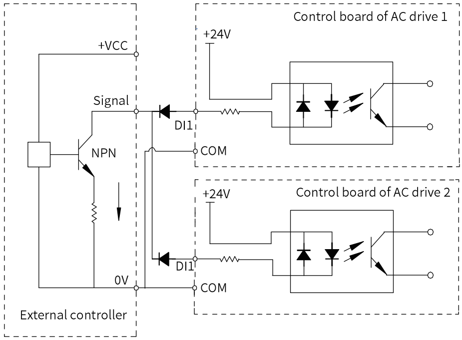


Figure 2-7 Parallel connection of DIs of multiple drives in the sink mode (NPN)

2. MD200XXX-NC models

   DI1 to DI4 are low-speed DIs. When the DI/DO is used as the DI, it is the high-speed pulse input terminal. Its function can be selected by the DIP switch, as shown in *"Figure 2–3 " on page 20* .

   MD200XXX-NC models support sink and source wiring modes, which can be selected by the DIP switch.

   - Sink (NPN) wiring

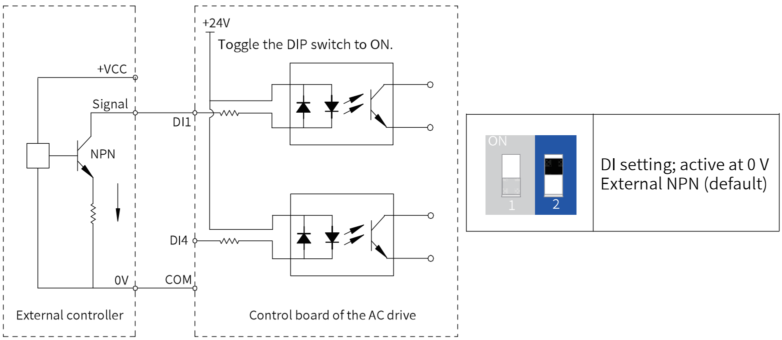


Figure 2-8 Sink (NPN) wiring

In the mode, the DIs of different AC drives cannot be connected in parallel. Otherwise, the DI may malfunction. If DIs of different AC drives must be connected in parallel, connect the anode of a diode to the DI in series and the diode needs to satisfy the requirement: IF > 10 mA and UF < 1 V.

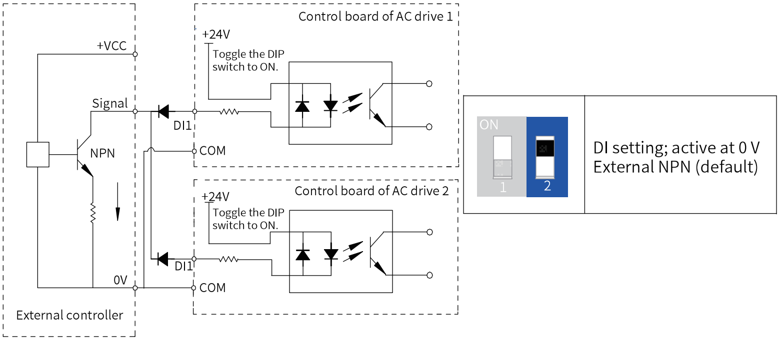


Figure 2-9 Parallel connection of DIs of multiple drives in the sink mode (NPN)

- Source (PNP) wiring

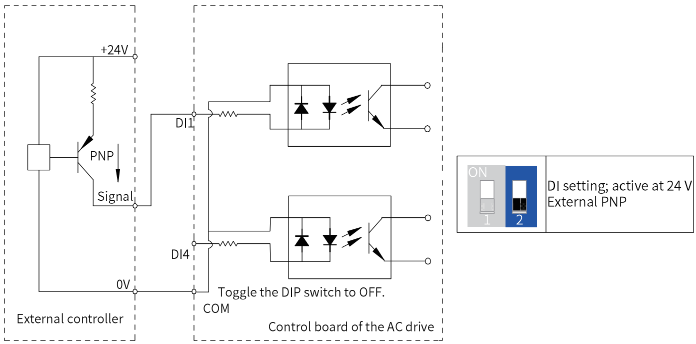


Figure 2-10 Source (PNP) wiring

DO

1. MD200XXX models

   DI4 is the used as the DO for MD200XXX models.

   When the DO needs to drive a relay, connect a snubber diode on both sides of the relay coil. Otherwise, the 24 V DC power supply may be damaged. Ensure that the driving capacity does not exceed 50 mA. Ensure that the polarity of the snubber diode is correct, as shown in the following figure. Otherwise, the 24 VDC power supply will be damaged immediately upon the DO output.

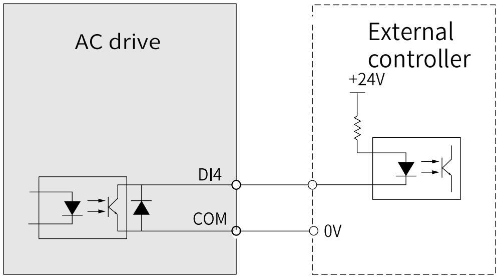


Figure 2-11 DO wiring

The inductive load (relay, contactor, and motor) causes voltage peak after the current is disconnected. Use a VDR at the relay contact for protection and install snubber circuits such as VDRs, RC absorption circuits, and diodes on the inductive load to minimize interference upon cutoff.

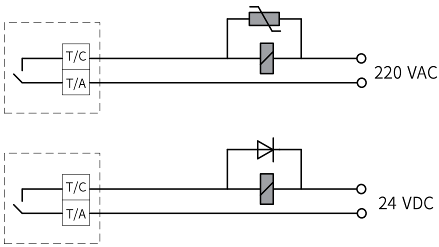


Figure 2-12 Anti-interference processing of relay output terminals

2. MD200XXX-NC models

   DI/DO is used as the DO for MD200XXX-NC models. The function of DI/DO can be selected by the DIP switch, as shown in *"Figure 2–3 " on page 20* .

   When the DO needs to drive a relay, connect a snubber diode on both sides of the relay coil. Otherwise, the 24 V DC power supply may be damaged. Ensure that the driving capacity does not exceed 50 mA. Ensure that the polarity of the snubber diode is correct, as shown in the following figure. Otherwise, the 24 VDC power supply will be damaged immediately upon the DO output.

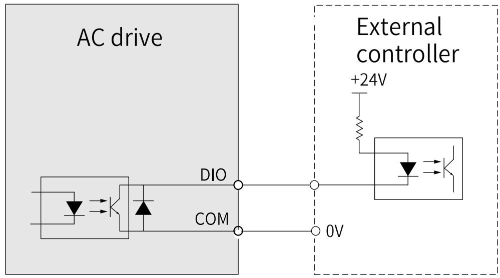


Figure 2-13 DO wiring

The inductive load (relay, contactor, and motor) causes voltage peak after the current is disconnected. Use a VDR at the relay contact for protection and install snubber circuits such as VDRs, RC absorption circuits, and diodes on the inductive load to minimize interference upon cutoff.

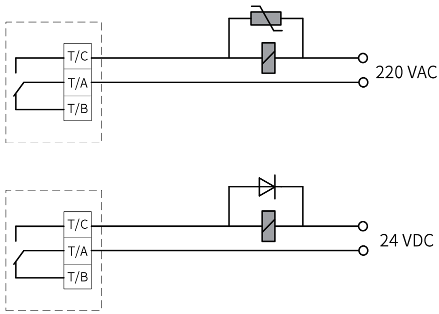


Figure 2-14 Anti-interference processing of relay output terminals

Caution

- Wiring tools: Phillips head or straight screwdriver; main circuit terminal screw ≥ M4; control circuit terminal screw ≥ M3
- It is recommended that L1 be connected with the live wire and L2 be connected with the neutral wire. Connect the output cables and PE cables first.
- For control terminals, cables with the cross sectional area of 0.3 mm^2 to 0.75 mm^2 can be connected.
- The contact leakage current of the AC drive is greater than 3.5 mA. Therefore, the AC drive must be well grounded. Otherwise, electric shocks will be caused.
- Use a screwdriver or other tools rather than using fingers to set the DIP switch .
- If the AC drive is used in an IT power system (with the neutral point ungrounded), the ground jumper (on the left of the AC drive) of the VDR must be removed.

Remove the ground jumper (on the left of the AC drive) of the safety capacitor (EMC) when the AC drive is used in the following cases. The locations of the ground jumpers of the VDR and EMC are shown in the following figure.

1. The AC drive is not grounded, and the bottom heatsink of the AC drive is in direct contact with the metal cabinet, which can easily cause electric shocks.
2. The residual current device trips upon startup after it is installed.

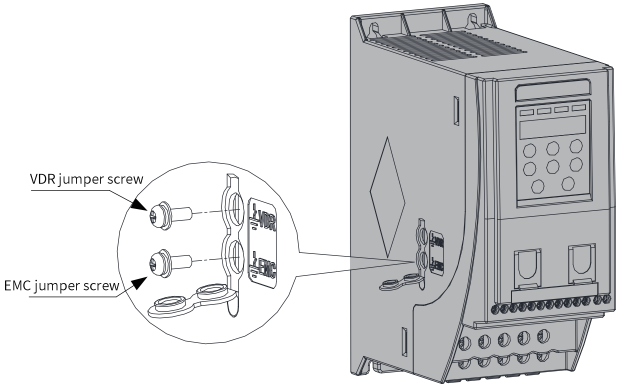


Figure 2-15 Figure 3-7 Positions of VDR and EMC grounding jumpers

3 Fault

3.1 Fault List

The AC drive supports 25 faults and protection functions. If a fault occurs, the protection function is activated, the AC drive stops output, the contact of the fault relay works, and the operating panel displays the fault code. Before seeking help, you can find the possible causes and rectify the fault according to the instructions in this section. If the fault cannot be rectified, contact the agent or Inovance for technical support. The following table describes the faults and solutions.

Fault Name	Display on the Operating Panel	Possible Cause	Solution
Overcurrent during acceleration	Err02	1. The output circuit of the AC drive is grounded or short circuited. 2. The acceleration time is too short. 3. The customized torque boost or V/f curve is not appropriate. 4. The voltage is too low. 5. The motor is started during rotating. 6. A sudden load is applied during acceleration. 7. The AC drive power class is too low. 8. The resistance of the braking resistor is too low or the braking resistor is short circuited. 9. The motor is short-circuited to ground.	1. Eliminate external faults. 2: Increase the acceleration time. 3. Adjust the customized torque boost or V/f curve. 4. Adjust the voltage to a normal range. 5. Enable flying start or start the motor after the motor stops. 6. Remove the added load. 7. Select an AC drive of a higher power class. 8. Replace the braking resistor. 9. Replace the cable or motor.
Overcurrent during deceleration	Err03	1. The output circuit of the AC drive is grounded or short circuited. 2. The deceleration time is too short. 3. The voltage is too low. 4. A sudden load is applied during deceleration. 5. No braking resistor is installed. 6. The resistance of the braking resistor is too low or the braking resistor is short circuited. 7. The motor is short-circuited to ground.	1. Eliminate external faults. 2. Increase the deceleration time. 3. Adjust the voltage to a normal range. 4. Remove the added load. 5. Install a braking resistor. 6. Replace the braking resistor. 7. Replace the cable or motor.

Fault Name	Display on the Operating Panel	Possible Cause	Solution
Overcurrent during operation at constant speed	Err04	1. The output circuit of the AC drive is grounded or short circuited. 2. The voltage is too low. 3. A sudden load is applied during running. 4. The AC drive power class is too low. 5. The resistance of the braking resistor is too low or the braking resistor is short circuited. 6. The motor is short-circuited to ground.	1. Eliminate external faults. 2. Adjust the voltage to a normal range. 3. Remove the added load. 4. Select an AC drive of a higher power class. 5. Replace the braking resistor. 6. Replace the cable or motor.
Overvoltage during acceleration	Err05	1. The input voltage is too high. 2. An external force drives the motor during acceleration. 3. The acceleration time is too short. 4. A braking resistor is not installed.	1. Adjust the voltage to a normal range. 2. Cancel the external force or install a braking resistor. 3. Increase the acceleration time. 4. Install a braking resistor.
Overvoltage during deceleration	Err06	1. The input voltage is too high. 2. An external force drives the motor during deceleration. 3. The deceleration time is too short. 4. A braking resistor is not installed.	1. Adjust the voltage to a normal range. 2. Cancel the external force or install a braking resistor. 3. Increase the deceleration time. 4. Install a braking resistor.
Overvoltage during operation at constant speed	Err07	1. The input voltage is too high. 2. An external force drives the motor during acceleration.	1. Adjust the voltage to a normal range. 2. Cancel the external force or install a braking resistor.
Control power supply fault	Err08	1. The input voltage is not within the specified range.	1. Adjust the voltage to the range required by the specifications.

Fault Name	Display on the Operating Panel	Possible Cause	Solution
Undervoltage	Err09	1. An instantaneous power failure occurs. 2. The AC drive's input voltage is not within the allowable range. 3. The bus voltage is abnormal. 4. The rectifier bridge and pre-charge resistor are faulty. 5. The drive board is faulty. 6. The control board is faulty.	1. Reset the fault. 2. Adjust the voltage to a normal range 3. Contact the agent or Inovance for technical support. 4. Contact the agent or Inovance for technical support. 5. Contact the agent or Inovance for technical support. 6. Contact the agent or Inovance for technical support.
Drive overload	Err10	1. The load is too heavy or locked-rotor occurs on the motor. 2. The AC drive power class is too low.	1. Reduce the load and check the motor and mechanical conditions. 2. Select an AC drive of a higher power class.
Motor overload	Err11	1. The motor protection parameter F9-01 is set improperly. 2. The load is too heavy or locked-rotor occurs on the motor. 3. The AC drive power class is too low.	1. Set F9-01 to a proper value. 2. Reduce the load and check the motor and mechanical conditions. 3. Select an AC drive of a higher power class.
Input phase loss	Err12	1. The three-phase input power supply is abnormal. 2. The drive board is faulty. 3. The surge protection device is abnormal. 4. The control board is abnormal.	1. Remove external faults. 2. Contact the agent or Inovance for technical support. 3. Contact the agent or Inovance for technical support. 4. Contact the agent or Inovance for technical support.

Fault Name	Display on the Operating Panel	Possible Cause	Solution
Output phase loss	Err13	1. The cable connecting the AC drive and the motor is faulty. 2. The three-phase outputs of the AC drive are unbalanced when the motor is running. 3. The drive board is faulty. 4. The module is faulty.	1. Remove external faults. 2. Ensure that the motor three-phase winding is normal. 3. Contact the agent or Inovance for technical support. 4. Contact the agent or Inovance for technical support.
Drive overtempera ture	Err14	1. The ambient temperature is too high. 2. The air filter is blocked. 3. The fan is damaged. 4. The thermistor of the module is damaged. 5. The drive unit is faulty.	1. Lower the ambient temperature. 2. Clean the air filter. 3. Replace the AC drive. 4. Replace the AC drive. 5. Replace the AC drive.
External device fault	Err15	1. The external fault signal is input via the multi-function DI. 2. The external fault signal is input via the virtual I/O terminal.	1. Reset the fault. 2. Reset the fault.
Communica tion error	Err16	1. The host controller is abnormal. 2. The communication cable is abnormal. 3. Communication parameters in group FD are set improperly.	1. Check wiring of the host controller. 2. Check the communication wiring. 3. Set communication parameters in group FD properly.
Current detection fault	Err18	The drive board is abnormal.	Replace the AC drive.
Motor auto-tuning fault	Err19	1. The motor parameters are not set according to the nameplate. 2. The auto-tuning times out.	1. Set the motor parameters according to the nameplate properly. 2. Ensure that the cable connecting the AC drive and the motor is connected properly.
EEPROM read and write fault	Err21	The EEPROM chip is damaged.	Replace the AC drive.

Fault Name	Display on the Operating Panel	Possible Cause	Solution
Output short-circuited to ground	Err23	1. The motor is short-circuited to ground. 2. The upper IGBT of the AC drive is damaged, which needs to be determined by skilled personnel.	1. Replace the cable or motor. 2. Replace the AC drive.
Accumulative running time reach	Err26	1. The accumulative running time has expired.	1. Initialize parameters to clear the record.
User-defined fault 1	Err27	1. The user-defined fault 1 signal is input via the multi-function DI. 2. The user-defined fault 1 signal is input via the virtual I/O terminal.	1. Reset the fault. 2. Reset the fault.
User-defined fault 2	Err28	1. The user-defined fault 2 signal is input via the multi-function DI. 2. The user-defined fault 2 signal is input via the virtual I/O terminal.	1. Reset the fault. 2. Reset the fault.
Accumulative power-on time reach	Err29	The accumulative power-on time has expired.	Initialize parameters to clear the record.
Load loss	Err30	The operation current of the AC drive is lower than the value of F9-64.	Check whether the load is disconnected or whether F9-64 and F9-65 are set based on the actual working condition.
PID feedback loss during running	Err31	The PID feedback is lower than the value of FA-26.	Check the PID feedback signal or set FA-26 to a proper value.
Pulse-by-pulse current limit fault	Err40	1. The load is too heavy or locked-rotor occurs on the motor. 2. The AC drive power class is too low.	1. Reduce the load and check the motor and mechanical conditions. 2. Select an AC drive of a higher power class.

Fault Name	Display on the Operating Panel	Possible Cause	Solution
Excessive speed deviation	Err42	1. Locked-rotor occurs on the motor. 2. F9-69 (detection level of speed error) and F9-70 (detection time of speed error) are set improperly. 3. The cable connecting the output side (U/V/W) of the AC drive and the motor is abnormal.	1. Check the mechanical conditions. Check whether motor auto-tuning is performed and whether F2-10 is set too low. 2. Set F9-69 (detection level of speed error) and F9-70 (detection time of speed error) correctly based on actual conditions. 3. Check and ensure the cable connecting the AC drive and the motor is connected.
Slave fault during speed synchroniza tion	Err55	When the speed synchronization function is enabled, the master receives CAN communication data but fails to detect the slave. Then the master reports Err55 (point-to-point slave fault).	1. Ensure that the CAN communication cable of the slave is connected. 2: Ensure that the CAN communication of the slave is normal.

3.2 Faults and Solutions

The following faults may occur during use of the AC drive. When these faults occur, perform simple analysis and rectify the faults based on the following table.

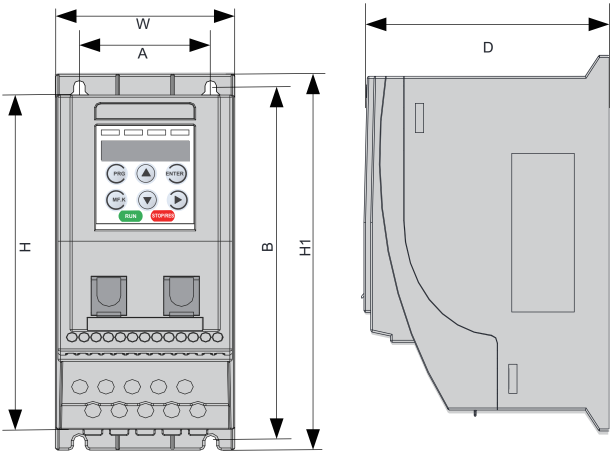
No.	Fault Description	Possible Cause	Solution
1	There is no display upon power-on.	There is no power supply or the power supply voltage is too low. The AC drive is damaged.	Check the input power supply. Replace the AC drive.
2	"HC" is displayed upon power-on.	The cable connecting the drive board and the control board is in poor contact. Related components on the control board are damaged. The motor or the motor cable is short circuited to the ground. The mains voltage is too low.	Re-connect the 4-conductor and 28-conductor cables. Contact the agent or Inovance for technical support.

No.	Fault Description	Possible Cause	Solution
3	Err14 (module overtemperature) is reported frequently.	The carrier frequency is set too high. The cooling fan is damaged, or the air filter is blocked. Components (thermocouple or others) inside the AC drive are damaged.	Reduce the carrier frequency (F0-15). Replace the fan or clean the air filter. Contact the agent or Inovance for technical support.
4	The motor does not rotate after the AC drive runs.	The cable between the AC drive and the motor is connected incorrectly. The motor parameters are set incorrectly. The drive board is faulty.	Ensure that the cable between the AC drive and the motor is connected correctly. Replace the motor or rectify mechanical faults. Check and set the motor parameters again.
5	The DI is inactive.	The related parameters are set incorrectly. The external signal is incorrect. The control board is faulty.	Check and set the parameters in group F4 again. Re-connect the external signal cable. Contact the agent or Inovance for technical support.
6	The AC drive detects overcurrent and overvoltage frequently.	The motor parameters are set improperly. The acceleration/ deceleration time is improper. The load fluctuates.	Set the motor parameters correctly. Set proper acceleration/ deceleration time. Contact the agent or Inovance for technical support.

4 Specifications and Selection

4.1 Outline Dimension

The following figure shows the outline dimensions of the MD200 series AC drive.



Outline Dimension (mm)				Mounting Hole (mm)		Mounting Hole Diameter (mm)	Weight (kg)
H1	H	W	D	A	B		
180	160	75	145	55	170	Φ5.0	1.1

4.2 Specifications

4.2.1 Rated Specifications

Table 4–1 MD200 models and technical data (single-phase 200–240 V)

Item	Specification			
MD200SXX(B)(-NC)	0.4	0.75	1.5	2.2
Applicable motor capacity (kW)	0.4	0.75	1.5	2.2

Item		Specification			
Output	Rated output current (A)	2.5	4.6	8	11
	Output voltage	Three-phase 0 VAC to 240 VAC			
	Max. output frequency	500 Hz (changeable through parameter)			
	Carrier frequency	0.8 kHz to 8.0 kHz (automatically adjusted according to the load)			
	Overload capability	60s at 150% the rated current			
Power supply	Rated input current (A)	6.5	11	18	27
	Rated voltage and frequency	Single-phase 200 V to 240V, 50/60 Hz			
	Allowed voltage fluctuation	-15% to +10%, or 170 VAC to 264 VAC			
	Allowable frequency fluctuation range	±5%			
	Power capacity (kVA)	1.7	3	4.8	7.1
Thermal design	Thermal loss (W)	17.8	34.17	64.8	95.39
	Air flow (CFM)	10.5	10.5	15	15
Overvoltage category		OVCIII			
Pollution degree		PD2			
IP rating		IP20			
Weight (kg)		1.3			

Table 4–2 MD200 models and technical data (three phase 380–480 V)

Item	Specification				
MD200TXX(B)(-NC)	0.4	0.75	1.5	2.2	3.7
Applicable motor capacity (kW)	0.4	0.75	1.5	2.2	3.7

Item		Specification				
Output	Rated output current (A)	1.8	3.4	4.8	5.5	9.5
	Output voltage	Three-phase 0 VAC to 480 VAC				
	Max. output frequency	500 Hz (changeable through parameter)				
	Carrier frequency	0.8 kHz to 8.0 kHz (automatically adjusted according to the load)				
	Overload capability	60s at 150% the rated current				
Power supply	Rated input current (A)	2.6	4.5	5.5	6.5	11
	Rated voltage and frequency	Three phase 380-480 VAC, 50/60 Hz				
	Allowable voltage fluctuation range	-15% to +10%, or 323 VAC to 528 VAC				
	Allowable frequency fluctuation range	±5% or 47.5 Hz to 63 Hz				
	Power capacity (kVA)	1	1.5	3	4	5.9
Thermal design	Thermal loss (W)	17.54	24.98	44.93	58.58	108.91
	Air flow (CFM)	10.5	10.5	15	15	15
Overvoltage category		OVCIII				
Pollution degree		PD2				
IP rating		IP20				
Weight (kg)		1.4				

4.2.2 Technical Specifications

Item		Specification
Basic functions	Maximum frequency	V/f control: 0-500 Hz SVC: 0-500 Hz (only for three-phase models)
	Carrier frequency	0.8-12 kHz The carrier frequency is automatically adjusted based on the load.
	Input frequency resolution	Digital setting: 0.01 Hz; Analog setting: maximum frequency x 0.025%
	Control mode	V/f control SVC (only for three-phase models)
	Overload capability	60s at 150% the rated current; 2s at 180% the rated current
	Torque boost	Automatic boost; manual boost: 0.1 % to 30.0 %.
	V/f curve	Linear V/f curve; Multi-point V/f curve
	Acceleration/ deceleration curve	Linear or dynamic S-curve The acceleration/deceleration time ranges from 0.0s to 6500.0s.
	DC braking	DC braking frequency: 0.00 Hz to 10.00 Hz Braking time: 0.0s to 100.0s Braking current level: 0% to 100%
	Jog control	Frequency range of jogging: 0.00 Hz to 50.00 Hz Acceleration/deceleration time of jogging: 0.0s to 6500.0s
	Multi-speed running	Up to 8 preset speeds can be selected through control terminals.
	Built-in PID	The PID function in the closed-loop control system can be implemented.
	Auto voltage regulation (AVR)	When the mains voltage changes, the output voltage keeps constant automatically.
	Overvoltage/ Overcurrent stall control	The current and voltage are automatically restricted during operation to prevent frequent trips caused by overcurrent or overvoltage.
	Quick current limit	The function minimizes overcurrent to ensure normal operation of the AC drive.
	Power dip ride-through	The load feedback energy compensates for voltage reduction upon instantaneous power failure, allowing the AC drive to continue to operate for a short time. After the power dip ride-through function is enabled, the RUN indicator on the operating panel blinks.
	Timing control	Time range: 0.0-6500.0 minutes
	Communication bus	Two field buses are supported, including RS-485 and CANlink (customizable).

Item		Specification
Running	Running command source	The supported running command source includes the operating panel, control terminal, and serial communication settings. You can switch over among these sources in various ways.
	Frequency source	Five frequency sources available, including digital, analog voltage, analog current, pulse (DI4), and serial communication settings. You can switch over among these sources in various ways.
	Auxiliary frequency source	Five auxiliary frequency sources are provided. The auxiliary frequency can be used together with the main frequency to implement fine adjustment and synthesis of the frequency.
	Input terminal	Four DIs, one of which supports up to 20 kHz high-speed pulse input One AI that supports 0 to 10 V/0 to 20 mA input
	Output terminal	One relay output terminal One AO that supports 0 to 10 V voltage output
	DI/DO terminal	One DI/DO terminal. The DI or DO function is selected by the DIP switch. The DO common terminal is COM. See figure 2-2 for details.
	Communication terminal	One RS-485 communication terminal. Customized CANlink communication is supported.
Display and operation on the operating panel (format)	LED display	It displays parameters.
	Key lock and function selection	You can lock certain or all keys on the operating panel, or assign functions with limited availability range to some keys. This can prevent accidental operation.
	Protection	Protection against motor short circuit at power-on, input/output phase loss, overcurrent, overvoltage, undervoltage, overheat, and overload
Environ ment	Operating location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip, or salt.
	Altitude	The maximum altitude is 3000 m. In places where the altitude exceeds 1000 m, the cooling effect deteriorates due to the thin air. In this case, the AC drive needs to be derated by 1% for every additional 100 m.
	Ambient temperature	-10°C to +50°C (derating required in the range of 40°C to 50°C)
	Relative humidity	Less than 95%RH, without condensing
	Vibration	Lower than 5.9 m/s^2 (0.6g)
	Storage temperature	-20°C to +60°C
	IP rating	IP20

Item		Specification
Power supply grid	Applicable power supply grid	TN or TT

4.3 Selection of Peripheral Components

AC Drive Model	Air Switch (MCCB) A	Recommended Contactor A	Recommended Main Circuit Cable (mm^2)	Recommended Main Circuit Lug Model	Torque of Torque Driver N·m	Recommended Control Circuit Cable (mm^2)	Recommended Input Fuse (Bussmann, Compliant with UL Certification)	
							Rated Current	Option Model
Single-phase power supply: 220 V								
MD200S0.4(B)(-NC)	10	9	0.75	TVS1.25-4S	0.87	0.5	12	JKS-12
MD200S0.75(B)(-NC)	16	12	1.5	TVS1.25-4S	0.87	0.5	20	JKS-20
MD200S1.5(B)(-NC)	32	25	2.5	TVS2.0-4S	0.87	0.5	35	JKS-32
MD200S2.2(B)(-NC)	40	32	4	TVS3.5-4S	0.87	0.5	50	JKS-50
Three-phase power supply: 380 V								
MD200T0.4B(-NC)	6	9	0.75	TVS1.25-4S	0.87	0.5	5	KTK-5
MD200T0.75B(-NC)	10	9	0.75	TVS1.25-4S	0.87	0.5	8	KTK-8
MD200T1.5B(-NC)	10	9	0.75	TVS1.25-4S	0.87	0.5	10	KTK-10
MD200T2.2B(-NC)	10	9	0.75	TVS1.25-4S	0.87	0.5	12	KTK-12
MD200T3.7B(-NC)	16	12	1.5	TVS1.25-4S	0.87	0.5	20	KTK-20

4.4 Selection of EMC Filters

4.4.1 Built-in Filter

With the standard built-in filter, the single-phase models can meet the EN 61800-3 C3 emission requirement and the CE certification requirement. The C3 filter is embedded in the AC drive.

4.4.2 External Filter

Optional external filters for single-phase models

With the external filter installed, single-phase models can meet the EN 61800-3 C2 emission requirement and the CE certification requirement.

Caution

Keep the connection cable between the filter and the AC drive as short as possible (shorter than 30 cm). Ensure that the filter and the AC drive are connected to the same grounding surface. The output grounding terminal of the filter must be connected to the input grounding terminal of the AC drive. The filter must be reliably grounded to ensure the filter effect.

AC Drive Model	Power Capacity (kVA)	Input Current (A)	Recommended Filter Model (Schaffner)	Recommended Filter Model (Jianli)
Single-phase power supply: 220 V, 50/60 Hz; Range: -15% to +10%				
MD200S0.4(B)(-NC)	1.7	6.5	FN 2090-8-06	DL-10TH3
MD200S0.75(B)(-NC)	3.0	11.0	FN 2090-12-06	DL-20TH1
MD200S1.5(B)(-NC)	4.8	18.0	FN 2090-20-08	DL-20TH1
MD200S2.2(B)(-NC)	7.1	27.0	FN 2090-30-08	DL-30TH1

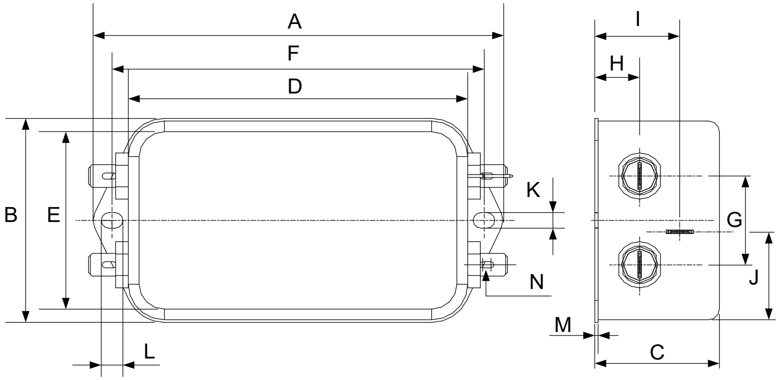
- **Appearance**

Schaffner series filter

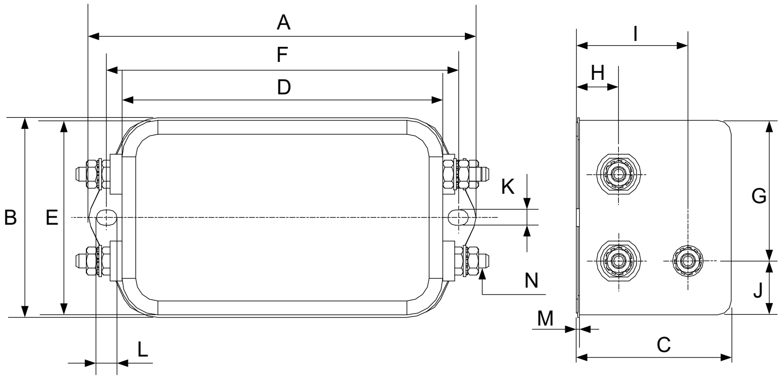
Jianli series filter

- **Mounting dimensions**
  - Dimensions of the Schaffner series filters

    Outline dimensions of FN 2090-8-06 and FN 2090-12-06 models:



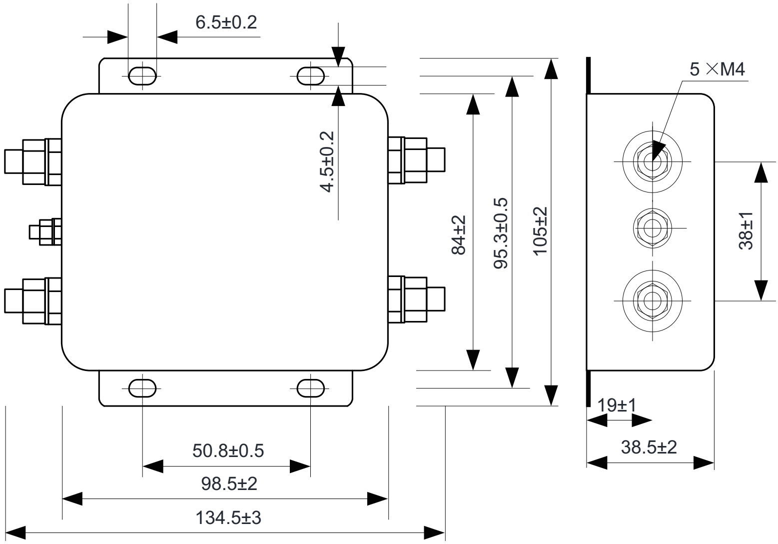
Outline dimensions of FN 2090-20-08 and FN 2090-30-08 models:



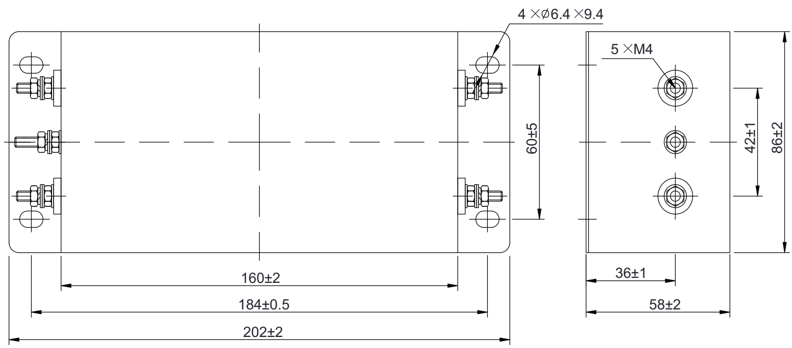
Reactor Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
FN 2090-8-06	113.5	57.5	45.4	94	56	103	25	12.4	32.4	15.5	4.4	6	0.9	6.3 x 0.8
FN 2090-12-06	113.5	57.5	45.4	94	56	103	25	12.4	32.4	15.5	4.4	6	0.9	6.3 x 0.8
FN 2090-20-08	113.5	57.5	45.4	94	56	103	25	12.4	32.4	15.5	4.4	6	0.9	M4
FN 2090-30-08	113.5	57.5	45.4	94	56	103	25	12.4	32.4	15.5	4.4	6	0.9	M4

- Dimensions of Jianli series filters

Outline dimensions of DL-10TH3 models:



Outline dimensions of DL-20TH1 and DL-30TH1 models:



Optional external filters for three-phase models

With the external filter installed, three-phase models can meet the EN 61800-3 C3 emission requirement and the CE certification requirement.

Caution

Keep the connection cable between the filter and the AC drive as short as possible (shorter than 30 cm). Ensure that the filter and the AC drive are connected to the same grounding surface. The output grounding terminal of the filter must be connected to the input grounding terminal of the AC drive. The filter must be reliably grounded to ensure the filter effect.

AC Drive Model	Power Capacity (kVA)	Input Current (A)	Recommended Filter Model (Schaffner)	Recommended Filter Model (Jianli)
Three-phase power supply: 380 V, 50/60 Hz; Range: -15% to +10%				
MD200T0.4B(-NC)	1.0	2.6	FN3258-7-45	DL-5EBK5
MD200T0.75B(-NC)	1.5	4.5	FN3258-7-45	DL-5EBK5
MD200T1.5B(-NC)	3.0	5.5	FN3258-7-45	DL-10EBK5
MD200T2.2B(-NC)	4.0	6.5	FN3258-7-45	DL-10EBK5
MD200T3.7B(-NC)	5.9	11.0	FN3258-16-45	DL-16EBK5

- Appearance

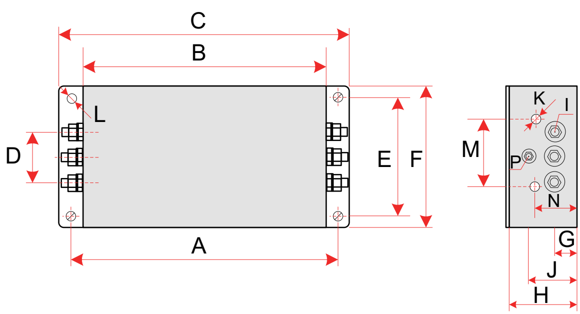
Schaffner series filter

Jianli series filter

- Mounting dimensions
  - Dimensions of the Schaffner series filters

Reactor Model	A	B	C	D	E	F	G	H	I	J	K	L
FN3258-7-45	190	40	70	160	180	20	4.5	1	22	M5	20	29.5
FN3258-16-45	250	45	70	220	235	25	5.4	1	22	M5	22.5	29.5

  - Dimensions of Jianli series filters



Reactor Model	A	B	C	D	E	F	G	H	I	J	K	M	N	P	L
DL-5EBK5	184	160	202	42	60	86	18	58	M4	38	-	-	-	M4	6.9 x 9.4
DL-10EBK5															
DL-16EBK5															

4.5 Selection of the AC Input Reactor

An AC reactor must be connected to the input side of the AC drive in series to reduce the current harmonics.

For the single-phase models, the inductance of the AC reactor must be higher than 8 mH to meet requirements of IEC 61000-3-12.

For the three-phase models, the inductance of the AC reactor must be higher than 5 mH to meet requirements of IEC 61000-3-12.

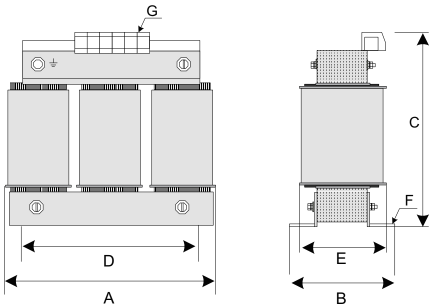
4.6 Selection of the dv/dt Output Reactor

When the motor output cable is longer than 100 m, reflected voltage is generated on the motor by the rising edge of the pulse wave output by the AC drive. This is because the characteristic impedance of the motor does not match with that of the cable. The reflected voltage is added on the high voltage square wave pulse, bringing impact on the stator winding insulation. High-frequency harmonics brings greater heat loss and continuous impact of partial discharge pulses, causing a quick motor insulation failure under the PWM pulse voltage. Therefore, when the motor cable is longer than 100 m, a dv/dt reactor must be installed on the output side.

- Recommended output reactor models

AC Drive Model	Power Capacity kVA	Output current A	Recommended Output dv/dt Reactor Model (SCHAFFNER)	Output Reactor Inductance (mH)	Applicable Cable Length After dv/dt Reactors Are Installed (m)
Single-phase power supply: 220 V, 50/60 Hz; Range: -15% to +10%					
MD200S0.4(B)(-NC)	1.7	2.6	RWK 305-4-KL	1.47	150
MD200S0.75(B)(-NC)	3.0	4.6	RWK 305-7.8-KL	0.754	150
MD200S1.5(B)(-NC)	4.8	8.0	RWK 305-10-KL	0.588	150
MD200S2.2(B)(-NC)	7.1	11.0	RWK 305-14-KL	0.42	150
Three-phase power supply: 380 V, 50/60 Hz; Range: -15% to +10%					
MD200T0.4B(-NC)	1.0	1.8	RWK 305-7.8-KL	0.754	150
MD200T0.75B(-NC)	1.5	3.4	RWK 305-7.8-KL	0.754	150
MD200T1.5B(-NC)	3.0	4.8	RWK 305-7.8-KL	0.754	150
MD200T2.2B(-NC)	4.0	5.5	RWK 305-7.8-KL	0.754	150
MD200T3.7B(-NC)	5.9	9.5	RWK 305-14-KL	0.42	150

- Mounting dimensions of the dv/dt output reactor



Reactor Model	A	B	C	D	E	F	G
RWK 305-4-KL	100	Max. 60	Max. 115	56	34	4.8 x 9	2.5 mm^2
RWK 305-7.8-KL	100	Max. 60	Max. 115	56	34	4.8 x 9	2.5 mm^2
RWK 305-10-KL	100	Max. 70	Max. 115	56	43	4.8 x 9	2.5 mm^2
RWK 305-14-KL	125	Max. 70	Max. 135	100	45	5 x 8	2.5 mm^2

4.7 Selection of Cables and Tightening Torque

Main circuit

<table>
<tr><th>Option Model</th><th>Terminal Mark</th><th>Recommended UL Cable (AWG)</th><th>Screw</th><th>Tightening Torque (N · m)</th></tr>
<tr><td colspan="5">Single-phase power supply: 220 V, 50/60 Hz; Range: -15% to +10%</td></tr>
<tr><td rowspan="3">MD200S0.4(B)(-NC)</td><td>L1, L2</td><td>0.75</td><td rowspan="12">M4</td><td rowspan="12">1.2</td></tr>
<tr><td>U, V, W</td><td>0.75</td></tr>
<tr><td>⏚</td><td>0.75</td></tr>
<tr><td rowspan="3">MD200S0.75(B)(-NC)</td><td>L1, L2</td><td>1.5</td></tr>
<tr><td>U, V, W</td><td>0.75</td></tr>
<tr><td>⏚</td><td>0.75</td></tr>
<tr><td rowspan="3">MD200S1.5(B)(-NC)</td><td>L1, L2</td><td>2.5</td></tr>
<tr><td>U, V, W</td><td>1.5</td></tr>
<tr><td>⏚</td><td>1.5</td></tr>
<tr><td rowspan="3">MD200S2.2(B)(-NC)</td><td>L1, L2</td><td>4</td></tr>
<tr><td>U, V, W</td><td>2.5</td></tr>
<tr><td>⏚</td><td>2.5</td></tr>
<tr><td colspan="5">Three-phase power supply: 380 V, 50/60 Hz; Range: -15% to +10%</td></tr>
</table>

Option Model	Terminal Mark	Recommended UL Cable (AWG)	Screw	Tightening Torque (N · m)
MD200T0.4B(-NC)	R, S, T	0.75	M4	1.2
	U, V, W	0.75		
	⏚	0.75		
MD200T0.75B(-NC)	R, S, T	0.75		
	U, V, W	0.75		
	⏚	0.75		
MD200T1.5B(-NC)	R, S, T	1.5		
	U, V, W	0.75		
	⏚	0.75		
MD200T2.2B(-NC)	R, S, T	2.5		
	U, V, W	1.5		
	⏚	1.5		
MD200T3.7B(-NC)	R, S, T	4		
	U, V, W	2.5		
	⏚	2.5		

Control circuit

Recommended UL Cable (AWG)	Screw	Tightening Torque (N · m)
22 to 18	M3	0.4

4.8 Selection of Options

Name	Option Model	Function	Remarks
External LCD operating panel	MDKE8	External LED operating panel	All models
External operating panel cable	MDCAB	Three-meter cable for the external operating panel	All models
	MDCAB-1.5	1.5-meter cable for the external operating panel	All models
DIN guide rail	MD200-DGJ1 Product code: 01040023	DIN guide rail	All models

5 Function Applications

5.1 Running Command Setting Source

5.1.1 Running Command Setting Source

Running commands are used to control start, stop, forward run, reverse run, and jog of the AC drive. Commands can be given by the operating panel, terminal, and communication. You can select a command source through parameter F0-02.

Code	Name	Default	Value Range	Parameter Description
F0-02	Command source selection	0	0: Operation panel (indicator OFF) 1: Terminal (indicator ON) 2: Communication (indicator blinking)	This parameter specifies the source of the AC drive running commands, including start/stop, forward run, reverse run, and jog. 0: Operating panel Running commands are input using the RUN, STOP/RES, and MF.K keys on the operating panel. This mode is suitable for initial commissioning. 1: Terminal Running commands are input through DIs of the AC drive. The commands that can be input through DIs include start/stop, forward/reverse run, jog, two-wire/ three-wire mode, and multi-speed operation. This mode is suitable for most applications. 2: Communication By selecting this command source, running commands are input through remote communication. The AC drive must be equipped with a communication card to communicate with the host controller. This mode is suitable for remote control or centralized control on multiple equipment.

5.1.2 Setting Commands Through the Operating Panel

Set F0-02 to 0 and use the RUN and STOP RES keys on the operating panel to control the AC drive.

- Press RUN to start the AC drive (the RUN indicator is on).
- When the AC drive is running, press STOP RES to stop the AC drive (the RUN indicator is off).

5.1.3 Setting Running Commands Through Terminals

Set F0-02 to 1 to use terminals to start and stop the AC drive.

Set F4-11 to select a terminal control mode. The AC drive supports four terminal control modes: two-wire mode 1, two-wire mode 2, three-wire mode 1, and three-wire mode 2.

Parameter Code	Parameter Name	Default	Value Range	Parameter Description
F4-11	Terminal control mode	0	0: Two-wire mode 1 1: Two-wire mode 2 2: Three-wire mode 1 3: Three-wire mode 2	This parameter indicates the mode in which the AC drive is controlled through external terminals.

You can use any multi-functional input terminals, DI1 to DI4 and DI/DO (applicable only to MD200XXX-NC models), as external input terminals. Set parameters F4-00 to F4-04 to select functions for DI1 to DI4 and DI/DO. For details about function definitions, see F4-00 (DI1) to F4-04 (DI/DO) descriptions in *"8.1 Parameter List" on page 285*.

Two-wire mode 1

Two-wire mode 1: Set F4-11 to 0. This is the most commonly used two-wire mode.

For example, the DI1 is assigned with the forward run function, and the DI2 is assigned with the reverse run function. Connect the forward run switch to the DI1 and the reverse run switch to the DI2.

Parameter Code	Parameter Name	Value	Description
F4-11	Terminal control mode	0	Two-wire mode 1
F4-00	DI1 function selection	1	Forward run (FWD)
F4-01	DI2 function selection	2	Reverse run (REV)

In this mode, when the control switch SW1 is closed and the control switch SW2 is open, the motor runs in the forward direction. When SW1 is open and SW2 is closed, the motor runs in the reverse direction. When both SW1 and SW2 are open or closed, the motor does not run. See the following figure for details.

SW1	SW2	Command
1	0	Forward
0	1	Reverse
1	1	Stop
0	0	Stop

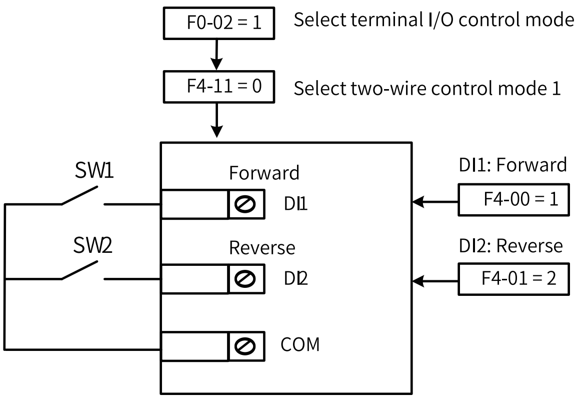


Figure 5-1 Wiring and parameter settings for two-wire mode 1

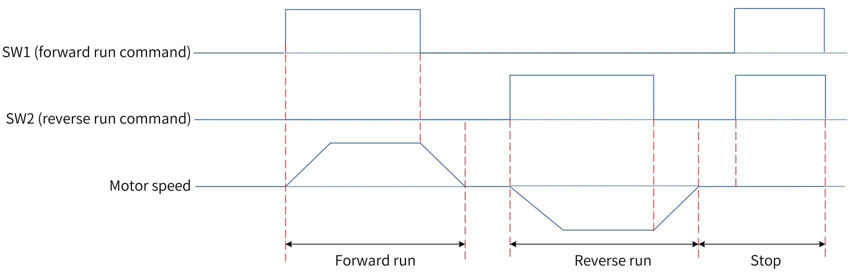


Figure 5-2 Two-wire mode 1 sequence (normal)

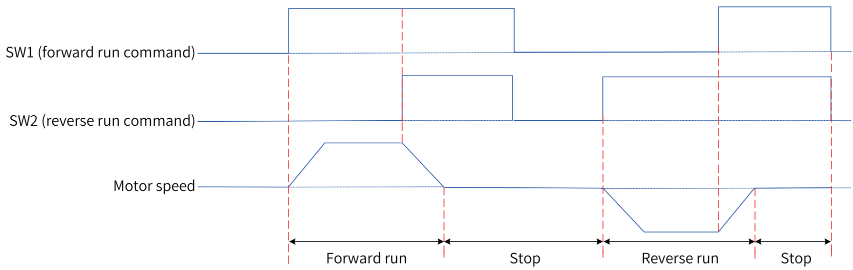


Figure 5-3 Two-wire mode 1 sequence (normal)

Two-wire mode 2

For example, the DI1 is assigned with the running command function, and the DI2 is assigned with the forward/reverse running function. The related parameters are as follows.

Parameter Code	Parameter Name	Value	Description
F4-11	Terminal control mode	1	Two-wire mode 2
F4-00	DI1 function selection	1	Running command
F4-01	DI2 function selection	2	Forward/reverse running direction

In this mode, when SW1 is closed, the motor runs. When SW2 is open, the motor runs in the forward direction. When SW2 is closed, the motor runs in the reverse direction. When SW1 is open, the motor does not run no matter whether SW2 is open. See the following figure for details.

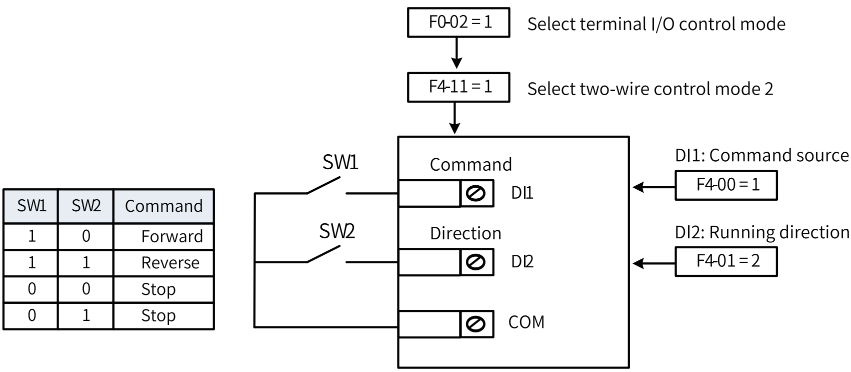


Figure 5-4 Wiring and parameter settings for two-wire 2

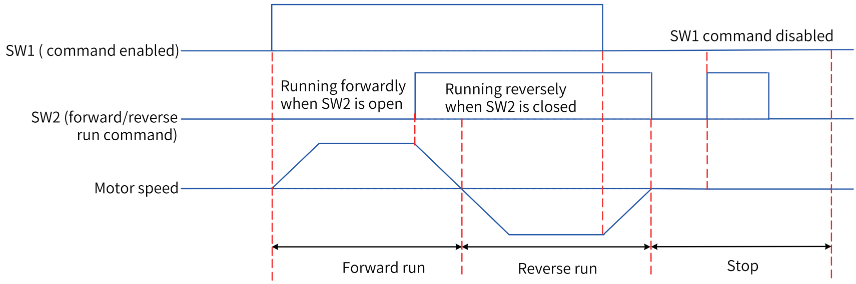


Figure 5-5 Two-wire mode 2 sequence

Three-wire mode 1

For example, the DI3 is assigned with the three-wire operation control function, the DI1 is assigned with the forward run function, and the DI2 is assigned with the reverse run function. In this mode, start and stop of the AC drive must be controlled by keys on the AC drive. Connect the start/stop key to the DI3, the forward run key to the DI1, and the reverse run key to the DI2. The related parameters are as follows.

Parameter Code	Parameter Name	Value	Description
F4-11	Terminal control mode	2	Three-wire mode 1
F4-00	DI1 function selection	1	Forward run (FWD)
F4-01	DI2 function selection	2	Reverse run (REV)
F4-02	DI3 function selection	3	Three-wire mode

SW3 is a normally-closed control switch and SW1 and SW2 are normally-open control switches. When SW3 is closed, the motor runs in the forward direction if SW1 is pressed, and in the reverse direction if SW2 is pressed. The motor stops immediately after SW3 is open. SW3 must remain closed when the AC drive starts or is running. Commands from SW1 or SW2 take effect immediately after SW1 or SW2 is closed.

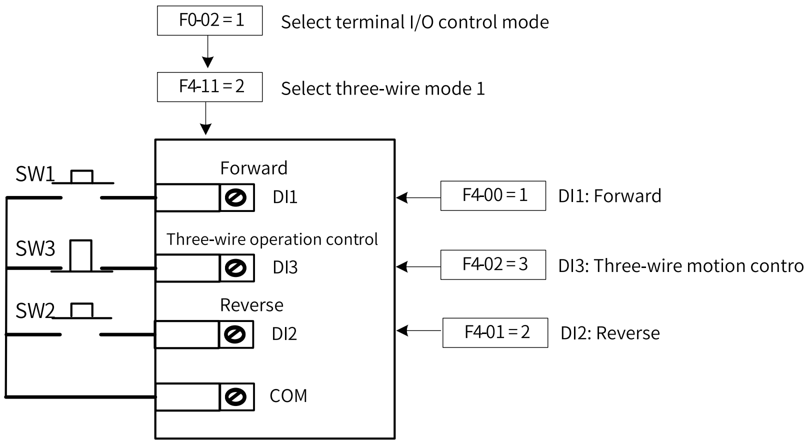


Figure 5-6 Wiring and parameter settings for three-wire mode 1

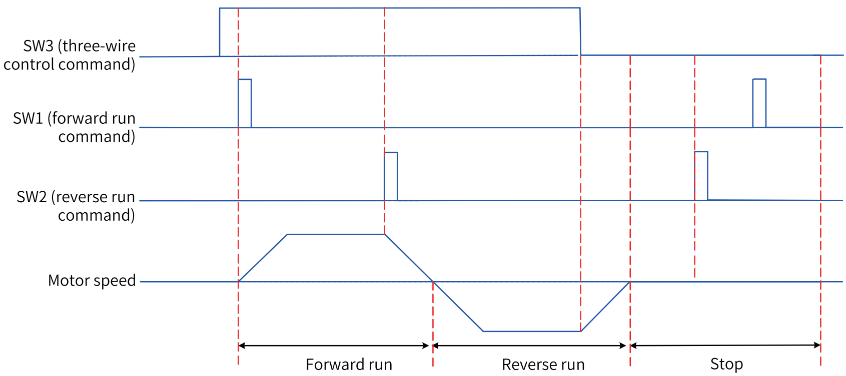


Figure 5-7 Three-wire mode 1 sequence

Three-wire mode 2

For example, the DI3 is assigned with the three-wire operation control function, the DI1 is assigned with the running command function, and the DI2 is assigned with the forward/reverse running function. Connect the start/stop key to the DI3, the running enabling key to the DI1, and the forward/reverse run key to the DI2. The related parameters are as follows.

Parameter Code	Parameter Name	Value	Description
F4-11	Terminal control mode	3	Three-wire mode 2
F4-00	DI1 function selection	1	Running command
F4-01	DI2 function selection	2	Forward/reverse running direction
F4-02	DI3 function selection	3	Three-wire mode

When SW3 is closed and SW1 is pressed, the motor runs. If SW2 is open, the motor runs in the forward direction. If SW2 is closed, the motor runs in the reverse direction. The motor stops immediately after SW3 is open. SW3 must remain closed when the AC drive starts or is running. Commands from SW1 take effect immediately after SW1 is closed.

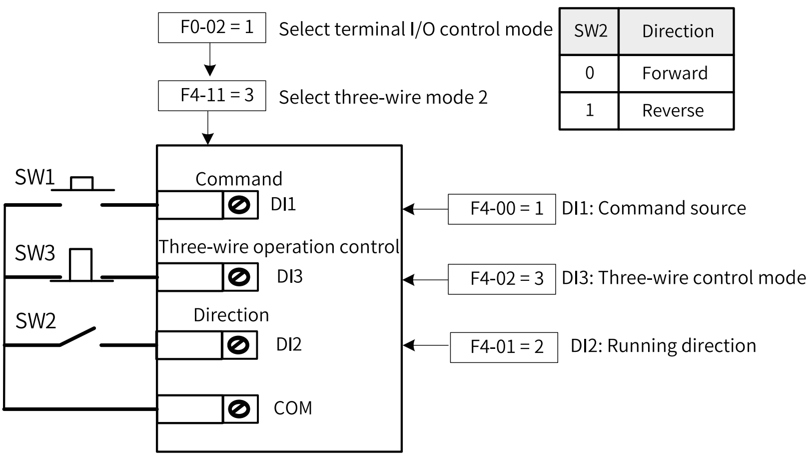


Figure 5-8 Wiring and parameter settings for three-wire mode 2

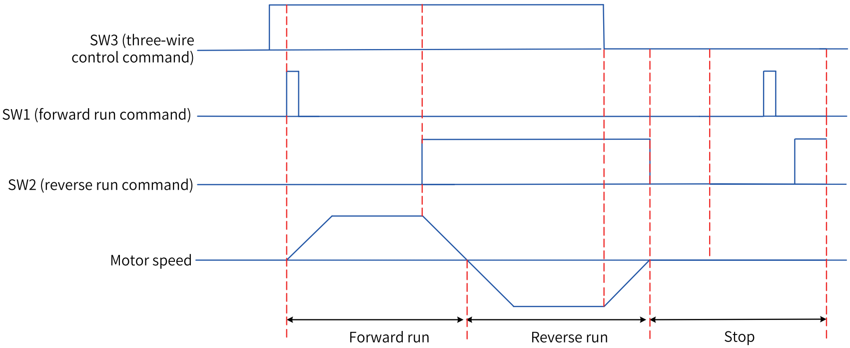


Figure 5-9 Three-wire mode 2 sequence

5.1.4 Setting Running Commands Through Communication

You can set F0-02 to 2 to select communication as the command source to start or stop the AC drive.

The AC drive supports the Modbus protocol to communicate with the host controller.

When the AC drive is controlled through communication, the host controller must send a write command to the AC drive. The following section describes the process of sending running commands through communication.

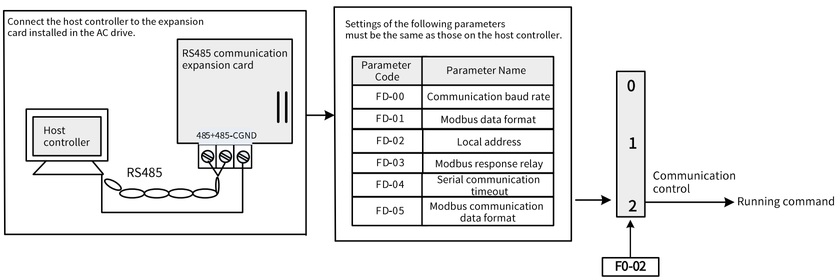


Figure 5-10 Sending running commands through communication

To make the AC drive run in the reverse direction, the host controller sends the write command 01 06 20 00 00 02 03 CB. The following table describes the definition of each byte. The command is in the hexadecimal format. For other communication addresses and control commands, see the communication section.

Command	Description
01H (settable)	AC drive address
06H	Write command
2000H	Control command communication address

Command	Description
02H (reverse run)	Control command
03CBH	CRC

The following table describes the commands from the master and slave.

Command from the Master		Response from the Slave	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
Parameter address (H)	20H	Parameter address (H)	20H
Parameter address (L)	00H	Parameter address (L)	00H
Data content (H)	00H	Data content (H)	00H
Data content (L)	02H	Data content (L)	02H
CRC (H)	03H	CRC (H)	03H
CRC (L)	CBH	CRC (L)	CBH

5.2 Setting the Main Frequency Through PID

PID control, which is a common process control method, calculates the proportion, integral, and differential of the difference between feedback signals and target signals of the controlled variable, and adjusts the output frequency of the AC drive accordingly. This method finally creates a closed-loop system to stabilize the controlled variable at the target value. Generally, PID control output can be used as the frequency reference for on-site closed-loop process control applications, such as closed-loop pressure and tension control.

- Proportional gain Kp: When there is a deviation between the PID input and output, the PID regulator adjusts the output to reduce the deviation of the controlled variable. The deviation reduction speed depends on the proportionality coefficient Kp. A greater Kp value means faster deviation reduction but causes oscillation, especially in the case of long hysteresis. A smaller Kp value means lower probability of oscillation but leads to slow adjustment. The value 100.0 indicates that when the deviation between PID feedback and PID reference is 100.0%, the adjustment amplitude of the PID regulator on the output frequency reference is the maximum frequency.
- Integral time Ti: It determines the intensity of integral adjustment by the PID regulator. The shorter the integral time, the greater the adjustment intensity. The integral time means that when the deviation between the PID feedback and the PID reference is 100.0%, the integral regulator performs continuous adjustment for the integral time to reach the maximum frequency.

- Differential time Td: Td determines the strength of deviation change rate adjustment by the PID regulator. The longer the differential time, the greater the regulation intensity. The differential time refers to the period during which the feedback value changes by 100.0%. The differential regulator adjusts the output frequency at an amplitude of the maximum frequency.

Example

Step 1: Set both F0-03 and F0-04 to 8 to use PID as the main and auxiliary frequency input sources.

Step 2: Set FA-00 to select the source of PID target reference. When FA-00 is set to 0, set FA-01 (PID digital setting). The value 100% of this parameter corresponds to the maximum PID feedback.

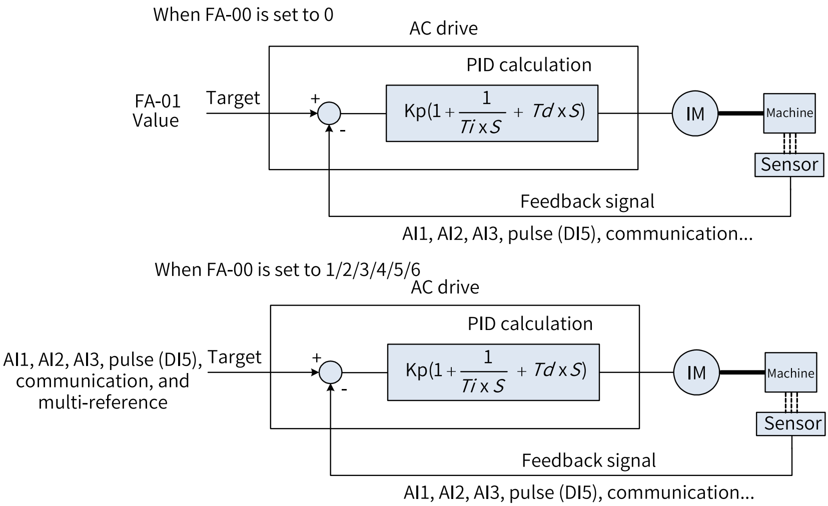


Figure 5-11 Process PID control

Step 3: Set FA-02 to select the PID feedback source.

Step 4: Set FA-03 to select the PID action direction.

The following figure shows the logic of parameter settings for process PID control.

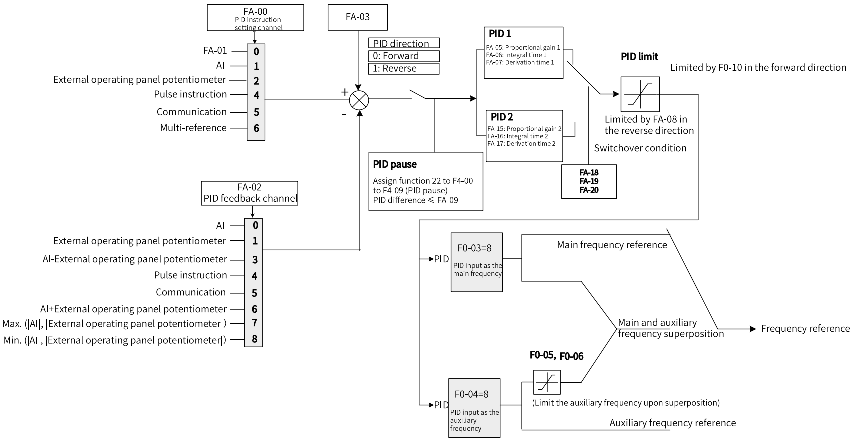


Figure 5-12 Logic of parameter settings for process PID control

The upper limit, lower limit, and range of the output frequency are described as follows when PID (or main frequency+PID) is used as the main frequency source.

- When the reverse cut-off frequency is 0 or reverse running is inhibited (that is, under one of the following three conditions):
  (1) FA-08 = 0, F8-13 = 0; (2) FA-08 = 0, F8-13 = 1; (3) FA-08 ≠ 0, F8-13 = 1

  Output upper limit = Frequency upper limit

  Output lower limit = Frequency lower limit

  Output range = Frequency lower limit to frequency upper limit (F0-14 to F0-12)

- When the reverse cut-off frequency is not 0 and reverse running is allowed (FA-08 ≠ 0, F8-13 = 0):
  Output upper limit = Frequency upper limit; Output lower limit = -Reverse cut-off frequency

  Output range = -Reverse cut-off frequency to +frequency upper limit (-FA-08 to +F0-12)

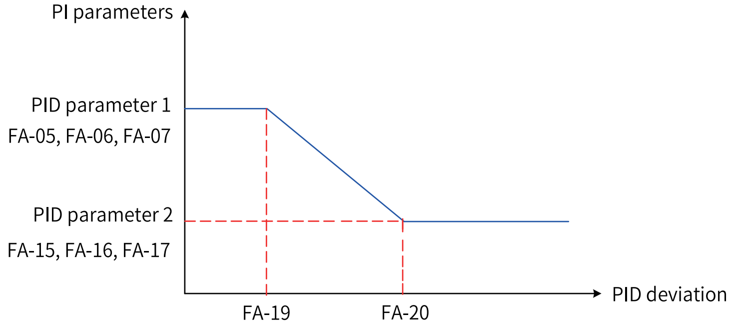


Figure 5-13 PID parameter switchover

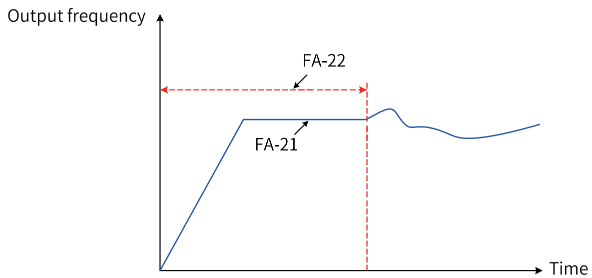


Figure 5-14 PID initial value function

5.3 Control Performance

5.3.1 Output Current (Torque) Limit

During acceleration, operation at constant speed, or deceleration, if the current exceeds the overcurrent stall action current (default: 150%, indicating 1.5 times the rated AC drive current), the overcurrent stall acts. In this case, the output frequency decreases until the current drops below the overcurrent stall action current. Then, the output frequency increases to the target frequency. Therefore, the acceleration is prolonged. If the actual acceleration time cannot meet your requirement, increase the value of overcurrent stall action current (F3-18) accordingly.

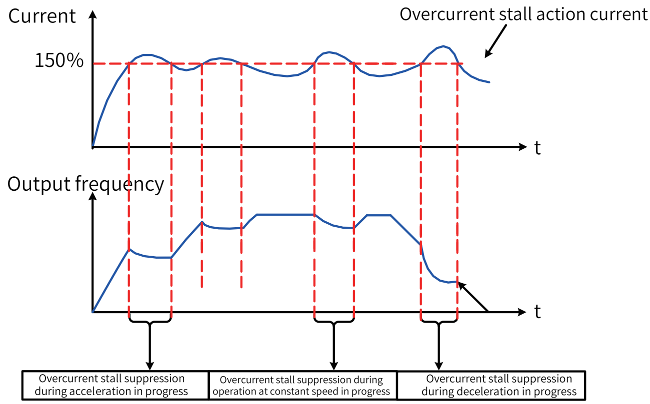


Figure 5-15 Overcurrent stall action

Table 5–1 Parameter list

Parameter Code	Parameter Name	Default	Value Range	Parameter Description
F3-18	Overcurrent stall action current	150%	50% to 200%	When the motor current reaches this value, the AC drive activates the overcurrent stall function. The default value is 150%, corresponding to 1.5 times the rated current of the AC drive.
F3-19	Overcurrent stall suppression	1	0: Disable 1: Enable	This parameter determines whether to enable the overcurrent stall suppression function.

Parameter Code	Parameter Name	Default	Value Range	Parameter Description
F3-20	Overcurrent stall suppression gain	20	0 to 100	When the current exceeds the overcurrent stall action current, the overcurrent stall suppression function is triggered, and the output frequency decreases. When the current falls below the overcurrent stall threshold, the output frequency increases to the target frequency, and the actual acceleration time prolongs automatically. A larger parameter value indicates better suppression effect.
F3-21	Compensation coefficient for overcurrent stall action current at multiplied rated frequency	50%	50% to 200%	This parameter reduces the overcurrent stall action current at high speed. It is invalid when set to 50%. The recommended value for F3-18 in the flux weakening area is 100%.

In the high frequency area, the motor drive current is small. At the same stall current, the motor speed drops faster when the motor runs below the rated frequency than when the motor runs above the rated frequency. To improve motor running characteristic, you can lower down the stall action current when the motor runs above the rated frequency. The method improves acceleration performance and prevents the motor from stall in the application where high running frequency and several times the field weakening are required and load inertia is large, such as centrifuges.

Overcurrent stall action current when the frequency is above the rated frequency = (fs/fn) x k x LimitCur

fs: running frequency; fn: rated motor frequency; k: compensation coefficient for overcurrent stall action current at multiplied rated frequency (F3-21); LimitCur: overcurrent stall action current (F3-18)

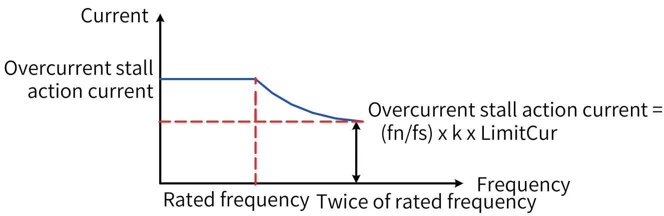


Figure 5-16 Overcurrent stall action at multiplied rated frequency

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Note

For high-power motors with carrier frequency below 2 kHz, lower the overcurrent stall action current. Otherwise, the pulse-by-pulse current limit function is enabled before the overcurrent stall prevention function as ripple current increases, resulting in insufficient torque output.

5.3.2 Overvoltage Stall Suppression

When the bus voltage rises above the value of F3-22 (overvoltage stall action voltage), the motor enters the generating state (motor speed > output frequency). In this case, the overvoltage stall function is activated, which adjusts the output frequency and extends the deceleration time to prevent trip. If the actual deceleration time cannot satisfy the requirement, increase the over-excitation gain.

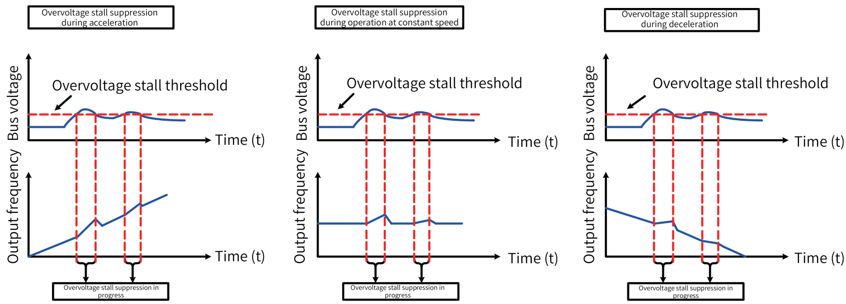


Figure 5-17 Overvoltage stall action

Parameter Code	Parameter Name	Default	Value Range	Parameter Description
F3-22	Overvoltage stall action voltage	770.0 V	650.0 V to 800.0 V	When the bus voltage reaches the value of this parameter, the AC drive activates overvoltage stall protection.
F3-23	Overvoltage stall suppression	1	0: Disable 1: Enable	0: Disable 1: Enable (default) The function of F3-23 is the same as that of F9-04. When a braking resistor, braking unit, or energy feedback unit is used, set this parameter to 0. Otherwise, the deceleration time may be prolonged.

Parameter Code	Parameter Name	Default	Value Range	Parameter Description
F3-24	Overvoltage stall suppression frequency gain	30	0 to 100	Increasing F3-24 improves the control accuracy on the bus voltage, but leads to fluctuation of the output frequency. If the output frequency fluctuates greatly, reduce F3-24 appropriately. The function of F3-24 is the same as that of F9-03.
F3-25	Voltage gain during overvoltage stall suppression	30	0 to 100	This parameter suppresses the bus voltage. Increasing the parameter value can reduce the overshoot of the bus voltage.
F3-26	Frequency rise threshold during overvoltage stall suppression	5 Hz	0–50 Hz	The running frequency may increase during overvoltage stall suppression. This parameter is used to limit the increase of the running frequency.
F3-10	V/f over-excitation gain	64	0 to 200	A larger over-excitation gain means better suppression effect. When a braking resistor, additional braking unit, or energy feedback unit is used, set this parameter to 0. Failure to comply may result in overcurrent during operation.
F3-11	V/f oscillation suppression gain	40	0 to 100	A larger oscillation gain means better suppression effect.

Note

Observe the following requirements when using the braking resistor or energy feedback unit.

- Set F3–10 (Overexcitation gain) to 0. Failure to comply may lead to overcurrent during operation.
- Set F3–23 (Overvoltage stall selection) to 0. Failure to comply may prolong the deceleration time.

5.4 Protection Functions

5.4.1 Overload Protection

To provide effective protection for motors with different loads, set the motor overload protection gain properly based on the overload capacity of a motor. The motor overload protection curve is an inverse time lag curve, as shown in the following figure.

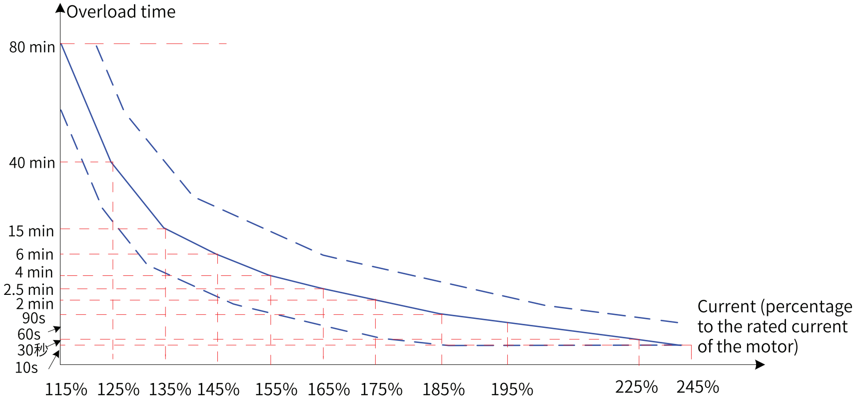


Figure 5-18 Inverse time lag curve of motor overload protection

When the motor running current reaches 175% of the rated motor current and lasts for 2 minutes, E11.00 (motor overload) is reported. When the motor running current reaches 115% of the rated motor current and lasts for 80 minutes, E11.00 is reported.

1. Example 1

- Assume that the rated motor current is 100 A. If F9-01 is set to 1.00, according to the preceding figure, the AC drive reports a motor overload alarm (E11.00) after the motor runs at 125% of 100 A (125 A) continuously for 40 minutes.
- If F9-01 is set to 1.20, according to the preceding figure, the AC drive reports a motor overload alarm (E11.00) after the motor runs at 125% of 100 A (125 A) continuously for 48 minutes (40 x 1.2).

Note

The maximum overload time is 80 minutes and the minimum overload time is 10 seconds.

---

2. Example 2

Assume that the application requires an overload alarm when the motor runs at 150% of rated motor current for 2 minutes. According to the motor overload protection curve, 150% (I) of the rated motor current is between 145% (I1) and 155% (I2) of the rated motor current. As the overload time is 6 minutes (T1) at the 145% point and 4 minutes (T2) at the 155% point, the overload time at 150% of the rated motor current is 5 minutes under the default settings. The overload time is calculated using the following formula:

T = T1 + (T2 - T1) x (I - I1)/(I2 - I1) = 4 + (6 - 4) x (150% - 145%)/(155% - 145%) = 5 minutes

Therefore, to have an overload alarm reported when the motor runs at 150% of rated motor current for 2 minutes, set the motor overload protection gain (F9-01) to 0.4 (2/5 = 0.4).

Caution

Set F9–01 properly based on the actual overload capacity of the motor. Note that setting F9–01 to an excessively high value may easily result in motor damage caused by overtemperature without warning.

Motor overload pre-warning coefficient: When the motor overload detection level reaches the value of this parameter, the corresponding multi-functional output terminal (DO) or fault relay outputs a motor overload pre-warning signal. The value of this parameter is a percentage of the time during which the motor runs continuously at an overload point without triggering an overload alarm.

On the condition that F9-01 (motor overload protection gain) is set to 1.00 and F9-02 (motor overload pre-warning coefficient) is set to 80%, when the motor running current reaches 145% of the rated motor current and the motor runs at this level for 4.8 minutes (80% x 6), the multi-functional DO terminal or fault relay outputs a motor overload pre-warning signal.

The motor overload pre-warning function enables the control system to receive a pre-warning signal from a DO terminal before motor overload protection is triggered. The pre-warning coefficient determines how long in advance the AC drive triggers a pre-warning ahead of motor overload protection. A larger coefficient means later transmission of the pre-warning signal. When the accumulative output current of the AC drive exceeds the product of overload time (value Y on the inverse time lag curve of motor overload protection) multiplied by the motor overload pre-warning coefficient (F9-02), the multi-functional DO terminal of the AC drive outputs a motor overload pre-warning signal. When F9-02 is set to 100%, the motor overload pre-warning signal is transmitted the same time when overload protection is triggered.

Related parameters

Para. No.	Function	Default	Value Range	Description
F9-00	AC drive overload protection	0	0: Disabled 1: Enabled	Used to enable or disable the motor overload protection function. The AC drive judges whether the motor is overloaded based on the inverse time-lag curve. When motor overload is detected, the AC drive reports an overload fault. 0: Disabled Motor overload protection is disabled. When this parameter is set to 0, install a thermal relay upstream the motor for protection. 1: Enabled Motor overload protection is enabled.
F9-01	Motor overload protection gain	1.00	0.20 to 10.00	The value of motor overload protection gain is calculated according to the percentage of time during which the motor runs continuously at a certain overload point without reporting an overload fault. This parameter is used to adjust the actual overload fault report time of the AC drive when motor overload occurs.
F9-02	Motor overload pre-warning coefficient	80%	50% to 100%	The value of motor overload pre-warning coefficient is calculated according to the percentage of time during which the motor runs continuously at a certain overload point without reporting overload pre-warning. This function is used to send a pre-warning signal to the control system through a DO terminal before the motor overload protection is triggered. This signal is used to determine how long in advance to send the pre-warning signal before the motor overload protection is triggered. A larger coefficient means later transmission of the pre-warning signal. When the accumulative output current of the AC drive exceeds the product of overload time (value Y on the inverse time lag curve of motor overload protection) multiplied by the motor overload pre-warning coefficient (F9-02), the multi-functional DO terminal of the AC drive outputs a motor overload pre-warning signal.

5.4.2 Power Dip Ride-Through

The power dip ride-through function ensures continuous system running upon an instantaneous power failure. When a power failure occurs, the AC drive makes the motor work in the generating state to keep the bus voltage around the "threshold for enabling power dip ride-through". This function prevents the AC drive from stopping due to input undervoltage, as shown in the following figure.

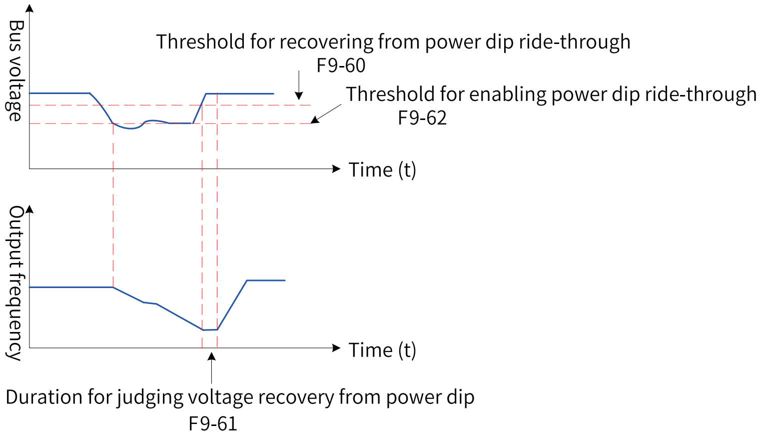


Figure 5-19 Power dip ride-through

In the "bus voltage constant control" mode, when the power grid recovers from the failure, the AC drive restores the output frequency to the target output frequency based on the acceleration time. In the "decelerate to stop" mode, when the grid resumes power supply, the AC drive decelerates to 0 Hz and stops, and will restart only after receiving a start command.

Parameters

Para.	Parameter Name	Default	Value Range	Parameter Description
F9-59	Power dip ride-through function	0	0: Disable 1: Bus voltage constant control 2: Decelerate to stop	The function enables the AC drive to keep running upon an instantaneous power failure. When a power failure occurs, the AC drive makes the motor work in the generating state to keep the bus voltage around the "threshold for enabling power dip ride-through". This function prevents the AC drive from stopping due to input undervoltage. 0: Disable Power dip ride-through is disabled. 1: Bus voltage constant control When a power failure occurs, the AC drive keeps the bus voltage around the "threshold for enabling power dip ride-through". In this mode, when the power grid recovers from the failure, the AC drive restores the target output frequency based on the acceleration time. 2: Decelerate to stop When a power failure occurs, the AC drive decelerates to stop. In this mode, when the power grid recovers from the failure, the AC drive continues decelerating to 0 Hz and stops, and will restart only after receiving a start command.
F9-60	Threshold for recovery from power dip ride-through	85%	80% to 100%	This parameter is used to set the threshold for recovering from power dip ride-through for the AC drive. 100% corresponds to 540 V. This value is slightly lower than the bus voltage before power failure. Upon power loss, the bus voltage is maintained at about F9-62 (threshold for enabling power dip ride-through). When the power grid recovers from the failure, the bus voltage rises from F9-62 (threshold for enabling power dip ride-through) to F9-60 (threshold for recovery from power dip ride-through). During this period, the output frequency of the AC drive keeps decreasing until the bus voltage reaches F9-60 (threshold for recovery from power dip ride-through).
F9-61	Duration for judging voltage recovery from power dip ride-through	0.5s	0.0s to 100.0s	This parameter is used to set the time required for the bus voltage to rise from F9-60 (threshold for recovery from power dip ride-through) to the voltage before power failure.

Para.	Parameter Name	Default	Value Range	Parameter Description
F9-62	Threshold for enabling power dip ride-through	80%	60% to 100%	This parameter is used to set the voltage level at which the bus voltage is maintained upon power failure. When a power loss occurs, the bus voltage is retained at a value around F9-62 (threshold for enabling power dip ride-through).
F9-71	Power dip ride-through gain Kp	40	0 to 100	This parameter is valid only when F9-59 (power dip ride-through function) is set to 1 (bus voltage constant control). If undervoltage is likely to occur during power dip ride-through, increase the power dip ride-through gain and the power dip ride-through integral coefficient.
F9-72	Power dip ride-through integral coefficient Ki	30	0 to 100	This parameter is valid only when F9-59 (power dip ride-through function) is set to 1 (bus voltage constant control). If undervoltage is likely to occur during power dip ride-through, increase the power dip ride-through gain and the power dip ride-through integral coefficient.
F9-73	Deceleration time of power dip ride-through	20.0s	0 to 300.0s	This parameter is active only when F9-59 (power dip ride-through function) is set to 2 (decelerate to stop). When the bus voltage is below F9-62, the AC drive decelerates to stop. The deceleration time is determined by F9-73 but not F0-18.

5.5 AO

The following parameters are used to rectify the zero drift of analog output and the deviation of output amplitude. They can also be used to customize AO output curves.

Table 5–2 Parameter list

Parameter Code	Parameter Name	Default	Value Range	Parameter Description
F5-07	AO1 function selection	0	0: Running frequency 1: Frequency reference 2: Output current 3: Output torque (absolute value) 4: Output power 5: Output voltage 6: Pulse input 7: AI1 12: Communication settings 13: Motor speed 14: Output current 15: Bus voltage	For details about application, see *"Table 5–3 " on page 75*.
F5-10	AO1 zero offset coefficient	0.0%	-100.0% to +100.0%	On the AO curve, if b indicates zero offset, k indicates gain, and X indicates standard output, the actual output Y equals to kX + b. The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value of the analog output at 0 V to 10 V (or 0 mA to 20 mA) output without zero offset or gain adjustment. Zero offset = Zero offset coefficient x 10 V (20 mA) The AC drive supports two AOs, namely, AO1 and AO2. AO1 and AO2 can be used to indicate the internal running parameters in the analog mode. The indicated parameters are defined by F5-07 and F5-08.

Parameter Code	Parameter Name	Default	Value Range	Parameter Description
F5-11	AO1 gain	1.00	-10.00 to +10.00	On the AO curve, if b indicates zero offset, k indicates gain, and X indicates standard output, the actual output Y equals to kX + b. The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value of the analog output at 0 V to 10 V (or 0 mA to 20 mA) output without zero offset or gain adjustment. Zero offset = Zero offset coefficient x 10 V (20 mA) The AC drive supports two AOs, namely, AO1 and AO2. AO1 and AO2 can be used to indicate the internal running parameters in the analog mode. The indicated parameters are defined by F5-07 and F5-09.

The analog output ranges from 0 V to 10 V (0% to 100%). When the AO function is set to 1 (frequency setting), and the AC drive frequency is set to 50% of the maximum frequency, the output voltage of the AO is 5 V (50% x 10 V).

Table 5–3 Pulse/analog output functions

Value	Name	Description
0	Running frequency	0 to maximum output frequency. 100.0% corresponds to the maximum frequency F0-10.
1	Frequency reference	0 to maximum output frequency
2	Output current	0 to two times the rated motor current. 100% corresponds to two times the rated motor current.
3	Output torque (absolute value)	0 to two times the rated motor torque. 100% corresponds to two times the rated motor torque (absolute value, a percentage).
4	Output power	0 to two times the rated motor power. 100% corresponds to two times the rated motor power.
5	Output voltage	0 to 1.2 times the rated AC drive voltage. 100% corresponds to 1.2 times the rated AC drive voltage.

Value	Name	Description
6	Pulse input	0.01 kHz to 100.00 kHz. 100% corresponds to 100.00 kHz.
7	AI	-10 V to +10 V. 100% corresponds to 10 V.
12	Communication setting	0.0% to 100.0%. 100% corresponds to the value set by AO communication.
13	Motor speed	0 to speed at the maximum output frequency. 100.0% corresponds to the maximum output frequency F0-10.
14	Output current	0.0 A to 1000.0 A. 100.0% corresponds to 1000.0 A.
15	Bus voltage	0.0 V to 1000.0 V. 100% corresponds to 1000.0 V.

The AO zero offset coefficient (F5-10) and AO gain (F5-11) are calculated in the following way.

Assume that the AO outputs the running frequency. The rectified output needs to be 8 V (Y1) when the frequency is 0 Hz (X1) and 4 V (Y2) when the frequency is 40 Hz (X2).

Gain formula:

$$K = \frac{(Y1\text{-}Y2) \text{ x } Xmax}{(X1\text{-}X2) \text{ x } Ymax}$$

Zero offset coefficient formula:

$$b= \frac{(X1 \text{ x } Y2)(\text{-}X2 \text{ x } Y1)}{(X1\text{-}X2) \text{ x } Ymax} \times 100\%$$

Xmax indicates the maximum output frequency 50 Hz (assume that the maximum output frequency F0-10 is 50 Hz), and Ymax (voltage) is 10 V.

In this case, the AO gain (F5-11) must be set to -0.5 and the AO zero offset coefficient (F5-10) must be set to 80%.

Table 5–4 Relationship between analog output signals and the corresponding maximum values (Ymax)

Analog Output Signal Type	Corresponding Max. Value (Ymax)
Voltage	10 V
Current	20 mA

Table 5–5 Relationship between analog output content and the corresponding maximum values (Xmax)

Analog Output Content	Corresponding Max. Value (Xmax)
Running frequency	Maximum output frequency
Frequency reference	Maximum output frequency
Output current	Two times the rated motor current
Output torque (absolute value)	Two times the rated motor torque
Output power	Two times the rated power
Output voltage	1.2 times the rated AC drive voltage
Pulse input	20.00 kHz
AI	10 V or 20 mA
Communication setting	100.0%
Motor speed	Rotation speed at to the maximum output frequency
Output current	1000.0 A
Bus voltage	1000.0 V

5.6 Industry Macro

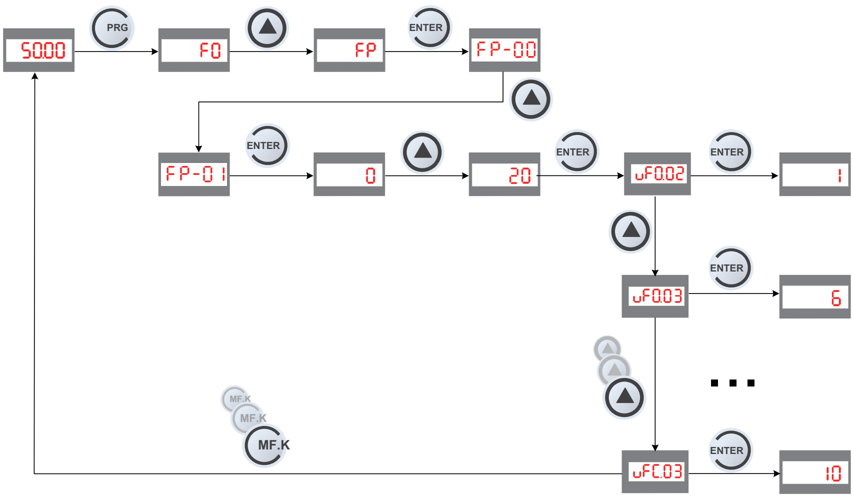
The MD200 series AC drive supports industry macro instruction parameters, which can be set to optimal values with one key for different industries.

FP-01 is used as the application parameter of each industry. Each value of FP-01 is associated with an industry. You can set parameters in an industry macro instruction to optimal values with one key.

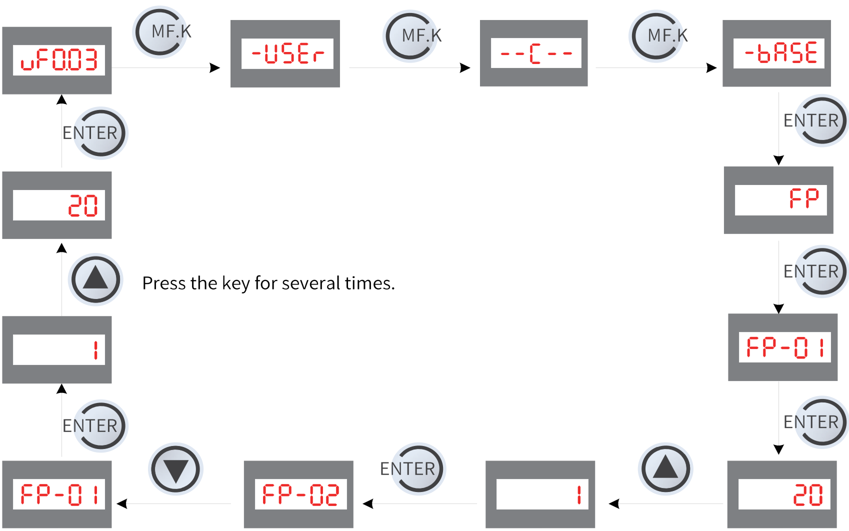
Mechanical moving (conveyor belt) industry: multi-speed, short starting time, and smooth acceleration/deceleration (FP-01 = 20).

Inertia (fan) industry: Analog control applicable and reverse running prohibited (FP-01 = 21).

The following figure shows the settings for enabling the industry macro mode.



The following figure shows the settings for disabling the industry macro mode.



The following table lists the industry macro parameters and optimal settings.

Industry Macro Instruction	Related Parameter	Optimal Value
FP-01 = 20 Mechanical moving (conveyor belt) industry Multi-speed, short starting time, and smooth acceleration/deceleration	F0-02 (command source)	1: Terminal
	F0-03 (frequency source selection)	6: Multi-reference
	F0-08 (preset frequency)	50 Hz
	F0-10 (maximum frequency)	50 Hz
	F0-17 (acceleration time)	3.0s
	F0-18 (deceleration time)	3.0s
	F3-18 (overcurrent stall action current)	150%
	F3-20 (overcurrent stall suppression gain)	20
	F4-01 (DI2 function selection)	2
	F4-02 (DI3 function selection)	12
	F4-03 (DI4 function selection)	13
	F4-10 (DI filter time)	0.100s
	F6-07 (acceleration/ deceleration mode)	2: Dynamic S-curve acceleration/deceleration
	F6-11 (DC brake frequency at stop)	0.5 Hz
	F6-13 (DC braking current at stop)	50%
	F6-14 (DC braking time at stop)	1s
	FC-00 (multi-reference 0)	10%
	FC-01 (multi-reference 1)	100%
	FC-02 (multi-reference 2)	75%
	FC-03 (multi-reference 3)	10%

Industry Macro Instruction	Related Parameter	Optimal Value
FP-01 = 21 Inertia (fan) industry Analog control applicable and reverse running prohibited	F0-02 (command source)	1: Terminal
	F0-03 (frequency source selection)	2: AI
	F0-08 (preset frequency)	50 Hz
	F0-10 (maximum frequency)	50 Hz
	F0-15 (carrier frequency)	6.0 kHz
	F3-00 (V/f curve setting)	0: Linear V/f
	F3-18 (overcurrent stall action current)	150%
	F3-20 (overcurrent stall suppression gain)	20
	F6-00 (startup mode)	1: Flying start
	F8-13 (reverse run prohibited)	1: Disable
	F9-09 (number of automatic fault reset times)	3
	F9-11 (interval for automatic fault reset)	1.0s
	F9-59 (power dip ride-through function)	1: Decelerate

6 Communication

6.1 Definition of the Communication Data Address

The MD200 series AC drive provides the RS232/RS485 communication interface and supports the Modbus communication protocol. You can carry out centralized control by using a PC or PLC. Through the communication protocol, you can also set the running commands, modify or read parameters, and read the operating status and fault information of the drive.

The communication data of the MD200 can be divided into parameter data and non-parameter data. The latter includes the running commands, running status, running parameters, and alarms.

Parameter data

Group F (read/ write)	F0, F1, F2, F3, F4, F5, F6, F7, F8, F9, FA, FB, FC, FD, FE, FP
Group A (read/ write)	A1, A5, A6, AA, AC

- Reading parameters
  For parameters in groups F0 to FP and A1 to AC, the high-order eight bits of the communication address indicate the parameter group code, while the low-order eight bits indicate the hexadecimal number converted from the parameter No. in the parameter group. For example, the communication address of F0-16 is F010H, in which F0H indicates parameter group F0 and 10H is the hexadecimal number converted from 16. The communication address of AC-08 is AC08H, in which ACH indicates parameter group AC and 08H is the hexadecimal number converted from 8.

  To read parameters, the host controllers needs to send a read command to the AC drive. The Modbus protocol is exemplified to describe the communication process that the host controller reads the drive data.

  For example, to read F0-10 (maximum frequency), the host controller sends the read command 01 03 F0 0A 01 DE D7 to the drive. In the command, 01H (settable) indicates the AC drive address; 03H indicates the read command; F0 0AH indicates the communication address of F0-10; 01H indicates the number of parameters; DE D7H indicates the CRC. Other parameters are read in the same way as the F0-10.

Table 6–1 Reading the AC drive data by the host controller

Command Frame Read by the Master		Response Frame Returned by the Slave	
Address	01H	Address	01H
Read command	03H	Read command	03H

<table>
<tr><th colspan="2">Command Frame Read by the Master</th><th colspan="2">Response Frame Returned by the Slave</th></tr>
<tr><td rowspan="2">F0-10 address</td><td>F0H</td><td>Number of bytes</td><td>02H</td></tr>
<tr><td>0AH</td><td rowspan="2">Parameter content</td><td>13H</td></tr>
<tr><td>Number of parameters (H)</td><td>00H</td><td>88H</td></tr>
<tr><td>Number of parameters (L)</td><td>01H</td><td>CRC (H)</td><td>B5H</td></tr>
<tr><td>CRC (H)</td><td>97H</td><td>CRC (L)</td><td>12H</td></tr>
<tr><td>CRC (L)</td><td>08H</td><td>-</td><td>-</td></tr>
</table>

- Writing parameters

  For parameter groups F0 to FF, the high-order 8 bits of the communication address are 00 to 0F or F0 to FF, which is decided by whether the parameter is written to the EEPROM. The low-order 8 bits indicate the hexadecimal value converted from the parameter No. in the parameter group. For example, if the F0-16 does not need to be written to the EEPROM, the communication address of the F0-16 is 0010H; otherwise, the communication address of the F0-16 is F010H.

  For parameter groups A0 to AD, the high-order 8 bits of the communication address are 40 to 4F or A0 to AD, which is decided by whether the parameter is written to the EEPROM. The low-order 8 bits indicate the hexadecimal value converted from the parameter No. in the parameter group. For example, if the AC-08 does not need to be written to the EEPROM, the communication address of the AC-08 is 4C08H; otherwise, the communication address of the AC-08 is AC08H.

  To write data to the parameter, the host controller needs to send a write command to the AC drive. The Modbus protocol is exemplified to describe the communication process that the host controller writes data to the drive.

  For example, to write 2 (writing to the EEPROM is not required) to AC-16 (AO2 target voltage 1), the host controller sends the following write command to the AC drive:

  01 06 4C 10 00 02 1F 5E

  In the command, 01H (settable) indicates the AC drive address; 06H indicates the write command; 4C 10H indicates the communication address of the AC-16; 0002H indicates the write value; 1F 5EH indicates the CRC. Other parameters are written in the same way as the AC-16.

<table>
<tr><th colspan="2">Command Frame Written by the Master</th><th colspan="2">Response Frame Returned by the Slave</th></tr>
<tr><td>ADDR</td><td>01H</td><td>ADDR</td><td>01H</td></tr>
<tr><td>CMD</td><td>06H</td><td>CMD</td><td>06H</td></tr>
<tr><td>Parameter address (H)</td><td>4CH</td><td>Parameter address (H)</td><td>4CH</td></tr>
</table>

Command Frame Written by the Master		Response Frame Returned by the Slave	
Parameter address (L)	10H	Parameter address (L)	10H
Write data (H)	00H	Write data (H)	00H
Write data (H)	02H	Write data (H)	02H
CRC (H)	1FH	CRC (H)	1FH
CRC (L)	5EH	CRC (L)	5EH

Non-parameter data

Status data (read-only)	Group U (monitoring parameters), AC drive fault description, and AC drive operation status
Control parameters (write-only)	Control commands, communication setting values, DO control, AO control, and parameter initialization

1. Status data
   - The high-order 8 bits of the communication address of parameters in groups U0 to UF is 70 to 7F. The low-order 8 bits indicate the hexadecimal number converted from the parameter No. in the parameter group. For example, the communication address of U0-11 is 700BH.
   - The host controller can obtain the fault code of the AC drive by reading the communication address of 8000H, which is fixed. For the fault code description, see the definition of F9-14 in *"8.1 Parameter List" on page 285*.
   - The host controller can obtain the running status of the AC drive by reading the communication address of 3000H, which is fixed. The status word is defined as follows: 1: forward run; 2: reverse run; 3: stop.
2. Control parameters
   - Control commands
     When F0-02 is set to 2, the host controller can send running commands through communication to control the AC drive to start, stop, and run forward or reversely. Communication addresses and descriptions of running commands are defined in the following table.

Type	Communication Address	Read/Write Range		
Control command input (write-only)	2000	0001: Forward run 0002: Reverse run 0003: Forward jog	0004: Reverse jogging 0005: Coast to stop	0006: Decelerate to stop 0007: Fault reset

- Communication settings

Parameters that can be set through communication include the frequency source, torque upper limit, V/f separation voltage, PID reference source, and PID feedback. If the communication address is 1000H, its range is -10000 to +10000, corresponding to -100.00% to +100.00%.

For example, when the main frequency source (F0-03) is set to communication, the host controller needs to send the write command to the AC drive upon writing the frequency. The following description takes Modbus as an example to illustrate how to set the main frequency through communication. For example, to set the frequency reference to 8000 through communication, send the write command 01 06 10 00 1F 40 84 CA.

In the command, 01H (settable) indicates the AC drive address; 06H indicates the write command; 1000H indicates the communication address of frequency reference; 1F40H (10000 in decimal format) indicates the target frequency; 84CAH indicates the CRC. To set torque reference to -8000, send the write command

01 06 10 00 E0 C0 C4 9A. In this command, E0C0 is the low-order four bits of the hexadecimal number converted from -8000.

Caution

The range of frequency reference set through communication is from -10000 to +10000 (decimal), corresponding to -100.00% to +100.00%. -100.00% corresponds to the negative maximum frequency, 0.00% corresponds to the minimum frequency, and +100.00% corresponds the maximum frequency. Suppose that F0-10 = 50 Hz. If the frequency reference in the write command is 1F40H, which is 8000 in decimal format, the frequency reference that is written is 40 Hz (50 x 80.00%).

- DO control
  If function 20 (communication control) is allocated to a DO, the host controller can control the DO through communication. The communication address and command of the DO are defined in the following table.

Type	Communication Address	Read/Write Range
DO control (write-only)	2001	Bit 0: Reserved Bit 1: Reserved Bit 2: Relay 1 output control Bit 3: Reserved Bit 4: Reserved

- AO control
  When function 12 (communication setting) is allocated to the AO, the host controller can control analog and high-speed pulse output of the AC drive

through communication. The following table describes the control communication address and command.

Type	Communication Address	Command
AO control (write-only)	2002	0 to 7FFF indicate 0% to 100%.

- Parameter initialization

  The MD200 series AC drive supports industry macro instruction parameters, which can be set for optimal applications. This function is required when you need to initialize parameters of the drive by using the host controller. When the factory settings are restored through communication, the user password verification is required no matter whether the user password is 0 or not. After the verification is passed, the host controller performs parameter initialization within 30 seconds. The communication address of password verification is 1F00H. Directly write the correct user password to this address to complete verification. The following table describes the data.

Communication Address of Parameter Initialization	Command
1F01H	0: No action 01: Restore to factory settings (excluding motor parameters) 02: Clear records 03: Reserved 04: Back up current user parameters 05 to 19: Reserved 20: Mechanical moving (conveyor belt) industry 21: Inertia (fan) industry 22 to 500: Reserved 501: Restore user backup parameters

6.2 Modbus Communication Protocol

The MD200 series AC drive provides the RS232/RS485 communication interface and supports the Modbus communication protocol. You can carry out centralized control by using a PC or PLC. Through the communication protocol, you can also set the running commands, modify or read parameters, and read the operating status and fault information of the drive.

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

Application mode

The AC drive is connected to a "single-master multi-slave" PC/PLC control network equipped with the RS485 bus to act as a communication slave.

Bus structure

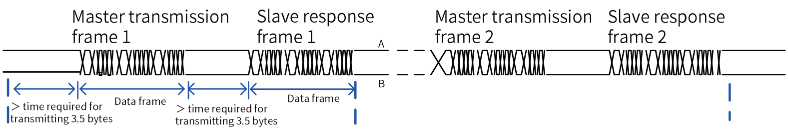
Topological structure

The system consists of a single master and multiple slaves. In the network, each communication device has a unique slave address. A device (usually a PC, a PLC, or an HMI) serves as the master and performs parameter read or write operations on slaves. The other devices serve as slaves to respond to queries or operations from the master. At the same moment, only one device can transmit data and the other can only receive data.

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

Communication transmission mode

The asynchronous serial and half-duplex transmission mode are used. In the serial asynchronous communication process, a frame of data is sent in a message each time. According to the Modbus-RTU protocol, when the idle time during which no data is transmitted exceeds the time for transmitting 3.5 bytes, it indicates the start of a new communication frame.

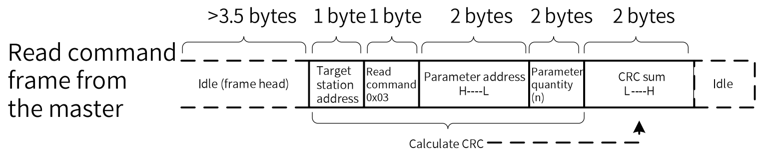


The built-in communication protocol of the MD200 series AC drive is the Modbus-RTU slave communication protocol. The drive can respond to an "inquiry/command" of the master, perform corresponding actions, and return with communication data.

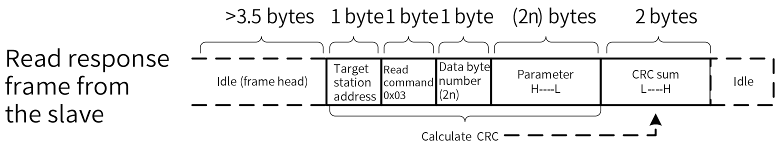
The master can be a PC, an industrial control device, or a PLC. The master can communicate with a single slave or broadcast messages to all slaves. When the master sends an "query/command" to a single slave, the slave needs to return a response frame. For a broadcast message sent by the master, the slaves do not need to respond.

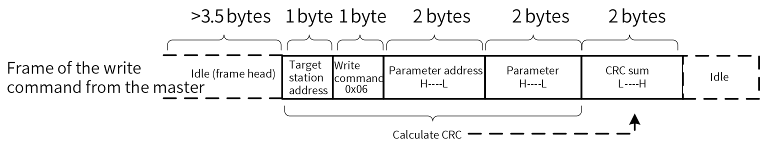
6.3 Communication Data Structure

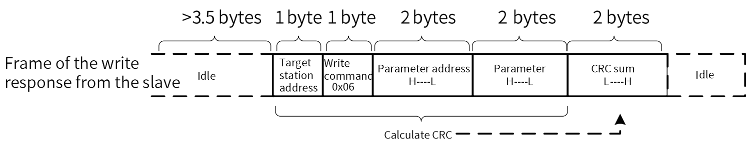
The drive supports reading and writing only of word-type parameters, and does not support reading and writing of bytes or bits. The reading command is 0x03 and writing command is 0x06. The communication data format in the Modbus-RTU protocol supported by the AC drive is shown below.



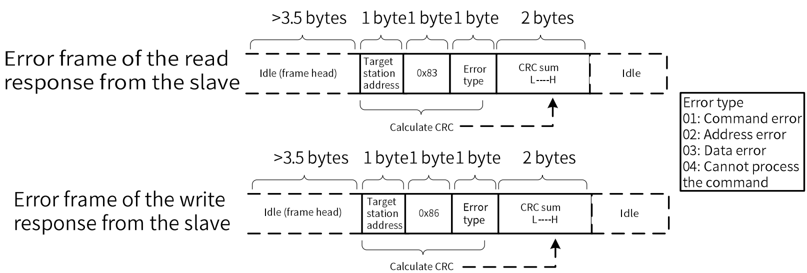
In theory, the host controller can read a maximum of 12 consecutive parameters, which must be in the same group. Otherwise, a response error will occur.







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



The data frame fields are described as follows.

Frame Header (START)	Longer than the time for transmitting 3.5 bytes
Slave Address ADR	Communication address range: 1 to 247; 0 = Broadcast address
Command CMD	03: Read slave parameters; 06: Write slave parameters
Parameter Address (H)	Internal parameter address of the AC drive, expressed in hexadecimal; parameter type and non-parameter type (for example, operation status parameters and operation commands) parameters supported. See the address definition. During transmission, low-order bytes follow high-order bytes.
Parameter Address (L)	
Number of Parameters (H)	The field indicates the number of parameters read in this frame. The value 1 indicates reading one parameter. Low-order bytes follow high-order bytes during transmission. In the present protocol, only one parameter is written or read at a time.
Number of Parameters (L)	
Data (H)	Response data or data to be written. During transmission, low-order bytes follow high-order bytes.
Data (L)	
CRC CHK low order	Detection value: CRC16 check value. During transmission, high-order bytes follow low-order bytes. For the calculation method, see the details of the CRC.
CRC CHK High-Order Byte	
END	Time required for transmitting 3.5 bytes

CRC description:

The cyclical redundancy check (CRC) uses the RTU frame format. The message includes the CRC-based error check field. The CRC field checks the content of the entire message. The CRC field is two-byte, containing a 16-bit binary value. It is added to the message after being calculated by the transmission device. The receiving device recalculates a CRC value in the message, and compares the calculated value with the CRC value in the received CRC field. If the two CRC values are different, transmission errors occur.

The CRC is first stored to 0xFFFF. Then a process is invoked to handle the successive 8-bit byte in the message and the value in the register. Only the eight bits in each character are used for the CRC. The start bit, stop bit, and parity bit do not apply to the CRC.

During CRC, each eight-bit character is in exclusive or (XOR) with the content in the register. The result is shifted to the least significant bit (LSB), and 0 is filled in the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB is 1, the register then performs XOR with a preset value. If the LSB is 0, no XOR is performed. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is in XOR with the register's current value, and the process repeats for eight more shifts as described above. The final value of the register is the CRC value after all the bytes of the message have been applied. The

CRC is added to the message from the low-order byte to the high-order byte. The CRC simple function is as follows:

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

Definition of communication parameter addresses

Except those which cannot be changed because they are only for the factory use or for monitoring, parameters can be read and written.

6.4 Parameter Address Expression Rules

The parameter group No. and parameter identification No. are used to express parameter addresses.

- High-order bytes: F0 to FF (group F), A0 to AF (group A), and 70 to 7F (group U)
- Low-order bytes: 00 to FF

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

Caution

- Group FF: The parameters cannot be read or changed.
- Group U: These parameters can only be read.

Some parameters cannot be modified when the AC drive is running or regardless of status of the AC drive. To modify parameters, pay attention to the setting range, unit, and description of the parameters.

Parameter Group No.	Communication Access Address	Parameter Address in RAM Modified Through Communication
F0 to FE	0xF000 to 0xFEFF	0x0000 to 0x0EFF
A0 to AC	0xA000 to 0xACFF	0x4000 to 0x4CFF
U0 group	0x7000 to 0x70FF	

Caution

Frequent storing to the EEPROM reduces its service life. Therefore, in communication mode, you only need to change values of certain parameters in RAM without storing the settings to the EEPROM.

- To implement the function of the parameter in group F, change the high-order F of the parameter address to 0.
- To implement the function of the parameter in group A, change the high-order A of the parameter address to 4.

The parameter addresses are expressed as follows:

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

For example,

- If F3-12 is not stored in the EEPROM, the address is expressed as 030C.
- If A0-05 is not stored in the EEPROM, the address is expressed as 4005.

This address supports only RAM writing and does not support RAM reading. It is an invalid address when being read.

The communication address definitions for the stop/run parameters are as follows.

Parameter Address	Parameter Description	Parameter Address	Parameter Description
1000	Communication setting value (-10000 to +10000) (decimal)	1011	PID feedback
1001	Running frequency	1012	PLC procedure
1002	Bus voltage	1013	Pulse input frequency (unit: 0.01 kHz)
1003	Output voltage	1014	Feedback speed (unit: 0.01 Hz)
1004	Output current	1015	Remaining running time
1005	Output power	1016	AI voltage before correction
1006	Output torque	1017	External operating panel potentiometer voltage before correction
1007	Running speed	1018	Reserved
1008	DI input flag	1019	Motor speed
1009	DO output flag	101A	Current power-on time
100A	AI1 voltage	101B	Current running time
100B	Reserved	101C	Pulse input frequency (unit: 1 Hz)
100C	External operating panel potentiometer voltage	101D	Communication setting
100D	Counting value input	101E	Reserved
100E	Length value input	101F	Display of main frequency X
100F	Load speed	1020	Display of auxiliary frequency Y
1010	PID reference		

Caution

- Communication setting values correspond to percentages. +10000 and –10000 correspond to +100.00% and –100.00% respectively.
- For frequency dimension data, this percentage corresponds to the maximum frequency (F0-10).

<table>
<tr><th>Type</th><th>Communication Address</th><th colspan="3">Read/Write Range</th></tr>
<tr><td>Control command input (write-only)</td><td>2000</td><td>0001: Forward run
0002: Reverse run
0003: Forward jog</td><td>0004: Reverse jog
0005: Coast to stop</td><td>0006: Decelerate to stop
0007: Fault reset</td></tr>
<tr><td>State reading (read-only)</td><td>3000</td><td>0001: Forward run</td><td>0002: Reverse run</td><td>0003: Stop</td></tr>
<tr><td>Parameter lock with password verification required</td><td>1F00</td><td colspan="3">*****(If 8888H is returned, the password verification is passed.)</td></tr>
<tr><td>DO control (write-only)</td><td>2001</td><td colspan="3">Bit 0: Reserved
Bit 1: Reserved
Bit 2: Relay 1 output control
Bit 3: Reserved
Bit 4: Reserved</td></tr>
</table>

Type	Communication Address	Read/Write Range		
AO control (write-only):	2002	0 to 7FFF indicate 0% to 100%.		
AC drive fault	8000	0000: No fault 0001: Reserved 0002: Overcurrent during acceleration 0003: Overcurrent during deceleration 0004: Overcurrent at constant speed 0005: Overvoltage during acceleration 0006: Overvoltage during deceleration 0007: Overvoltage during at constant speed 0008: Pre-charge resistor overload 0009: Undervoltage 000A: AC drive overload 000B: Motor overload 000C: Input phase loss	000D: Output phase loss 000E: Module overtemperature 000F: External fault 0010: Communication fault 0011: Reserved 0012: Current detection fault 0013: Motor auto-tuning fault 0014: Reserved 0015: Parameter read-write fault 0016: Reserved 0017: Motor short-circuited to ground 0018: Reserved 0019: Reserved	001A: Running time reach 001B: User-defined fault 1 001C: User-defined fault 2 001D: Power-on time reach 001E: Load loss 001F: PID feedback loss during running 0028: Fast current limit timeout 0029: Reserved 002A: Reserved 002B: Reserved 002D: Reserved 0033: Reserved 0037: Slave fault during speed synchronization process

When FD-05 is set to 1 (standard Modbus), the relationships between the error codes in the standard protocol and the current error codes are as below.

Error Code in the Standard Protocol	Current Error Code
01: Command code incorrect	0002: Command code incorrect
02: Address incorrect	0004: Invalid address
03: Data error	0005: Parameter invalid; 0001: Password incorrect
04: Commands cannot be processed.	0006: Parameter modification invalid; 0007: System locked

6.5 Descriptions of Group FD Communication Parameters

The AC drive provides the RS232/RS485 communication port and supports the Modbus communication protocol. Based on this protocol, you can control, monitor, and change or view parameters of the AC drive by using a host controller. Make sure to set communication parameters correctly. Otherwise, communication may fail.

Code	Name	Default	Value Range	Parameter Description
FD-00	Baud rate	5005	Ones: Modbus 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 Tens: Reserved Hundreds: Reserved Thousands: CANlink baud rate 0: 20 kbps 1: 50 kbps 2: 100 kbps 3: 125 kbps 4: 250 kbps 5: 500 kbps 6: 1 Mbps	This parameter defines the speed of data transmission between the host controller and the AC drive. The higher the baud rate, the faster the communication speed. Note that the baud rate of the host controller must be the same as that of the AC drive. Otherwise, communication fails.
FD-01	Modbus data format	0	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)	This parameter defines the format of Modbus data transmitted between the host controller and the AC drive. Note that the data format of the host controller must be the same as that of the AC drive. Otherwise, communication fails.
FD-02	Local address	1	0 to 247	The local address must be unique in the range of 1 to 247, which is the basis for point-point communication between the AC drive and the host controller.

Code	Name	Default	Value Range	Parameter Description
FD-03	Modbus response delay	2	0-20 ms	This parameter defines the interval from the end of data receiving by the AC drive to the start of data transmission to the host controller. If the response delay is shorter than the drive processing time, the drive processing time prevails. That is, after the drive finishes data processing, it sends data to the host controller. If the response delay is longer than the drive processing time, the response delay prevails. That is, after the drive finishes data processing, it waits until the response delay expires before sending the data to the host controller.
FD-04	Communication timeout time	0.0	0.0s–60.0s	When it is set to 0.0s, the Modbus communication timeout time is invalid. It is set to 0.0s under normal circumstances. This parameter can be used to monitor communication status in a system with continuous communication. When it is set to an effective value, if the time interval between the current communication and the next communication exceeds FD-04 (Modbus communication interruption detection time), the system reports a communication fault (Err16).

Code	Name	Default	Value Range	Parameter Description
FD-05	Communication protocol	30	Ones: Modbus 0: Non-standard Modbus 1: Standard Modbus	Ones: Modbus 0: Non-standard Modbus. The number of bytes returned by the slave is one byte more than the byte stipulated in the standard Modbus protocol. Other read/ write operations are the same as those stipulated in the standard Modbus protocol. 1: Standard Modbus. Reading and writing of only word-type parameters are supported. The reading command is 0x03 and writing command is 0x06. Reading and writing of bytes or bits are not supported.
FD-06	Current resolution read by communication	0	0: 0.01 A (valid when the power is equal to or lower than 55 kW) 1: 0.1 A	This parameter is used to determine the current unit when the output current is read through communication.

When FD-05 is set to 0 or 1, the non-standard Modbus protocol or standard Modbus protocol is selected, respectively. The following table describes the difference between the standard and non-standard Modbus protocols.

Non-standard Modbus Protocol (FD-05=0)		Standard Modbus Protocol (FD-05=1)	
ADR	01H	ADR	01H
CMD	03H	CMD	03H
High order of the number of bytes	00H	Number of bytes	04H
Low order of the number of bytes	04H	-	-
High order of data F002H	00H	High order of data F002H	00H
Low order of data F002H	00H	Low order of data F002H	00H
High order of data F003H	00H	Low order of data F003H	00H
High order of data F003H	01H	Low order of data F003H	01H
CRC CHK low order	82H	CRC CHK low order	3BH
CRC CHK high order	C7H	CRC CHK high order	F3H

7 Parameter Description

7.1 F0 Basic Function

F0-01 **Motor 1 control mode**

Address:	0xF001	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Sensorless vector control (SVC, applicable only to three-phase MD200TXX models)

1: Reserved

2: V/f control

Description

0: Sensorless vector control (SVC)

It is a type of open-loop vector control applicable to high-performance control applications, where one AC drive can drive only one motor. It is used for loads such as machine tools, centrifuges, wire drawing machines, and injection molding machines.

1: Reserved

2: V/f control (open loop speed control)

It is applicable to scenarios with low requirements on load control performance, such as fans and pumps. If one AC drive controls multiple motors, only the V/f control mode can be used.

F0-02 **Command source**

Address:	0xF002	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Operation panel (indicator OFF)

1: Terminal (indicator ON)

2: Communication (indicator blinking)

Description

This parameter is used to determine the input channel of the AC drive control commands, including start/stop, forward run, reverse run, and jog.

0: Operating panel (indicator OFF)

Control commands are input by using the RUN, STOP/RES, and MF.K keys on the operating panel. It is applicable to initial commissioning.

1: Terminal (indicator ON)

Control commands are input through the DIs of the AC drive. The control commands input through the DIs can be set according to different scenarios, such as start/stop, forward/reverse run, jog, two-wire/three-wire mode, and multi-speed. It is suitable for most applications.

2: Communication (indicator blinking)

Control commands are input through remote communication. The AC drive must be equipped with a communication card to communicate with the host controller. This mode is suitable for remote control or centralized control on multiple equipment.

F0-03 **Main frequency source X selection**

Address:	0xF003	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Digital setting (non-retentive at power failure)

1: Digital setting (retentive at power failure)

2: AI1

3: External operating panel potentiometer

4: Reserved

5: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

6: Multi-reference

7: Simple PLC

8: PID

9: Communication

Description

0: Digital setting (non-retentive at power failure)

The initial value of the frequency reference is the value of F0-08 (preset frequency). The value can be changed by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN keys. When the AC drive is powered on again after power-off, the frequency reference is restored to the value of F0-08.

1: Digital setting (retentive at power failure)
The initial value of the frequency reference is set by F0-08 (preset frequency). The value can be changed by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN keys. When the AC drive is powered on again after power-off, the frequency reference is that before the last power failure. That is, the value set by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN keys is retained.
2: AI1
The frequency reference is input by the AI1 through current or voltage signals. The frequency is calculated according to the preset AI curve.
3: External operating panel potentiometer
The frequency reference is input by the external operating panel potentiometer through current or voltage signals. The frequency is calculated according to the preset AI curve.
4: Reserved
5: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
The frequency reference is set by the pulse frequency over the DI4 or DI/DO. The DI4 is applicable to MD200XXX models and DI/DO to MD200XXX-NC models. The frequency is calculated according to the relationship curve between the pulse frequency and the operating frequency.
6: Multi-reference
In multi-reference control mode, different combinations of DI terminal states correspond to different frequency references. The four multi-reference terminals can provide 16 states, corresponding to 16 frequency references.
7: Simple PLC
The simple PLC is a multi-speed running command that can control the running time and the acceleration and deceleration time. Parameters FC-00 to FC-15 are used to set the values of each frequency. FC-18 to FC-49 are used to set the running time and the acceleration and deceleration time of each frequency. Up to 16 speeds can be set.
8: PID
PID is selected as the frequency reference. PID control is a common process control method, which calculates the proportion, integral, and differential of the difference between feedback signals and target signals of the controlled variable, and adjusts the output frequency of the AC drive accordingly. This method finally creates a closed-loop system to stabilize the controlled variable at the target value. Generally, PID control output can be used as the frequency reference for on-site closed-loop process control applications, such as closed-loop pressure control and closed-loop tension control.

9: Communication

The frequency reference is set through communication. The frequency reference is input through remote communication. The AC drive must be equipped with a communication card to communicate with the host controller. It is suitable for remote control or centralized control of multiple equipment.

F0-04 **Auxiliary frequency source Y selection**

Address:	0xF004	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Digital setting (non-retentive at power failure)
1: Digital setting (retentive at power failure)
2: AI1
3: External operating panel potentiometer
4: Reserved
5: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
6: Multi-reference
7: Simple PLC
8: PID
9: Communication

Description

0: Digital setting (non-retentive at power failure)

The initial value of the frequency reference is the value of F0-08 (preset frequency). The value can be changed by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN keys. When the AC drive is powered on again after power-off, the frequency reference is restored to the value of F0-08.

1: Digital setting (retentive at power failure)

The initial value of the frequency reference is set by F0-08 (preset frequency). The value can be changed by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN keys. When the AC drive is powered on again after power-off, the frequency reference is that before the last power failure. That is, the value set by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN keys is retained.

2: AI1

The frequency reference is input by the AI1 through current or voltage signals. The frequency is calculated according to the preset AI curve.

3: External operating panel potentiometer
The frequency reference is input by the external operating panel potentiometer through current or voltage signals. The frequency is calculated according to the preset AI curve.
4: Reserved
5: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
The frequency reference is set by the pulse frequency over the DI4 or DI/DO. The DI4 is applicable to MD200XXX models and DI/DO to MD200XXX-NC models. The frequency is calculated according to the relationship curve between the pulse frequency and the operating frequency.
6: Multi-reference
In multi-reference control mode, different combinations of DI terminal states correspond to different frequency references. The four multi-reference terminals can provide 16 states, corresponding to 16 frequency references.
7: Simple PLC
The simple PLC is a multi-speed running command that can control the running time and the acceleration and deceleration time. Parameters FC-00 to FC-15 are used to set the values of each frequency. FC-18 to FC-49 are used to set the running time and the acceleration and deceleration time of each frequency. Up to 16 speeds can be set.
8: PID
PID is selected as the frequency reference. PID control is a common process control method, which calculates the proportion, integral, and differential of the difference between feedback signals and target signals of the controlled variable, and adjusts the output frequency of the AC drive accordingly. This method finally creates a closed-loop system to stabilize the controlled variable at the target value. Generally, PID control output can be used as the frequency reference for on-site closed-loop process control applications, such as closed-loop pressure control and closed-loop tension control.
9: Communication
The frequency reference is set through communication. The frequency reference is input through remote communication. The AC drive must be equipped with a communication card to communicate with the host controller. It is suitable for remote control or centralized control of multiple equipment.

F0-05 **Auxiliary frequency source Y at superposition**

Address:	0xF005	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16

Default mode:	0	Change mode:	At once

Value range:

0: Relative to the maximum frequency

1: Relative to the main frequency source X

Description

0: Relative to the maximum frequency

The auxiliary frequency at superposition is equal to the value of auxiliary frequency source Y at superposition (F0-06) multiplied by the maximum frequency (F0-10).

1: Relative to the main frequency source X

The auxiliary frequency at superposition is equal to the value of auxiliary frequency source Y at superposition (F0-06) multiplied by the main frequency source X.

F0-06 **Value of auxiliary frequency source Y at superposition**

Address:	0xF006	Effective mode:	-
Min.:	0	Unit:	%
Max.:	150	Data type:	UInt16
Default mode:	100	Change mode:	At once

Value range:

0% to 150%

Description

-

F0-07 **Frequency source superposition selection**

Address:	0xF007	Effective mode:	-
Min.:	0	Unit:	-
Max.:	34	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Ones: Frequency reference selection
0: Main frequency source X
1: Main and auxiliary operation result (based on tens position)
2: Switchover between the main frequency source X and the auxiliary frequency source Y
3: Switchover between the main frequency source X and the main and auxiliary operation result
4: Switchover between the auxiliary frequency source Y and the main and auxiliary operation result
Tens (position): Main and auxiliary operation of the frequency reference
0: Main + Auxiliary
1: Main – Auxiliary
2: Max. (main, auxiliary)
3: Min. (main, auxiliary)

Description

Ones:
0: Main frequency reference X
The running frequency of the AC drive is determined by the main frequency reference X.
1: Main and auxiliary operation result (based on the tens place)
The running frequency of the AC drive is the operation result of the main and auxiliary frequencies, and the operation method is determined by the tens position of F0-07.
2: Switchover between the main frequency source X and the auxiliary frequency source Y
The running frequency of the AC drive is selected or switched between the main frequency source X and the auxiliary frequency source Y through the DI. In this case, the function of the DI must be set to the frequency source switching function. For example, if the DI2 is used for switchover, set F4-01 to 18.
3: Switchover between the main frequency source X and the main and auxiliary operation result
The running frequency of the AC drive is selected or switched between the main frequency source X and the main and auxiliary operation result through the DI.
4: Switchover between the auxiliary frequency source Y and the main and auxiliary operation result
The running frequency of the AC drive is selected or switched between the auxiliary frequency source Y and the main and auxiliary operation result through the DI.
Tens position:
0: Main + Auxiliary
The main and auxiliary operation result is the main frequency source X plus the auxiliary frequency source Y.

1: Main + Auxiliary
The main and auxiliary operation result is the main frequency source X minus the auxiliary frequency source Y.
2: Max. (main, auxiliary)
The main and auxiliary operation result is the larger value between the main frequency source X and the auxiliary frequency source Y.
3: Min. (main, auxiliary)
The main and auxiliary operation result is the smaller value between the main frequency source X and the auxiliary frequency source Y.

F0-08 **Preset frequency**

Address:	0xF008	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	50.00	Change mode:	At once

Value range:
0.00 Hz to 500.00 Hz
Description
This parameter defines the target frequency.

F0-09 **Running direction selection**

Address:	0xF009	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0: Default direction
1: Opposite to the default direction
Description
You can change the rotation direction of the motor by modifying this parameter, which equals to exchanging the connection sequence of any two of the motor's U, V, and W cables.

F0-10 **Max. frequency**

Address:	0xF00A	Effective mode:	-

Min.:	50.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	50.00	Change mode:	At stop

Value range:

50.00 Hz to 500.00 Hz

Description

This parameter defines the maximum output frequency of the AC drive.

F0-11 **Source of the frequency upper limit**

Address:	0xF00B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	5	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: F0-12 (frequency upper limit)

1: AI1

2: Reserved

3: Reserved

4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

5: Communication

Description

0: F0-12 (frequency upper limit)

The frequency upper limit is set by F0-12.

1: AI1

The frequency upper limit is input by the AI1 through current or voltage signals. The frequency is calculated according to the set AI curve.

4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

The frequency upper limit is input by the pulse frequency over the DI4 or DI/DO terminal. The frequency is calculated according to the corresponding relationship curve between the pulse frequency and the maximum frequency.

5: Communication

The frequency upper limit is set through communication.

F0-12 **Frequency upper limit**

Address:	0xF00C	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500.00	Data type:	UInt16

Default mode:	50.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter defines the maximum operating frequency of motors.

F0-14 **Frequency lower limit**

Address:	0xF00E	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter defines the minimum operating frequency of motors.

F0-15 **Carrier frequency**

Address:	0xF00F	Effective mode:	-
Min.:	0.5	Unit:	kHz
Max.:	16.0	Data type:	UInt16
Default mode:	6.0	Change mode:	At once

Value range:

0.5 kHz to 16.0 kHz

Description

The carrier frequency of the AC drive determines the number of times that the power switching device (such as IGBT) of the drive unit is turned on and off, so it is also called the switching frequency. It mainly affects the following aspects:

The power loss of the power module IGBT is related to the carrier frequency. As the carrier frequency increases, the power loss increases and the power module heats up, which is unfavorable to the AC drive.

When the carrier frequency is high, the current waveform is sinusoidal and smooth. In this way, the harmonic is low, but the interference is relatively strong, and the vice versa. When the carrier frequency is too low, the effective torque of the motor decreases, the loss increases, and the temperature rises. On the contrary, when the carrier frequency is too high, the loss of the AC drive increases, the IGBT temperature rises, and the change rate dv/dt of the output voltage increases, which affects the motor insulation performance.

F0-16 **Carrier frequency change with temperature**

Address:	0xF010	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

This parameter indicates whether the carrier frequency changes with the temperature.

F0-17 **Acceleration time 1**

Address:	0xF011	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

This parameter indicates the time required for the output frequency to increase from 0 to the acceleration/deceleration base frequency (F0-25). The frequency reference rise rate must be limited to prevent overcurrent during acceleration of the motor.

The acceleration time must be set to ensure that the acceleration current is below the overcurrent capacity of the AC drive to avoid that the AC drive trips due to overcurrent stall.

F0-18 **Deceleration time 1**

Address:	0xF012	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

This parameter indicates the time required for the output frequency to decrease from the acceleration/deceleration base frequency (F0-25) to 0. The frequency reference drop rate must be limited to prevent overvoltage during deceleration of the motor.
The deceleration time must be set to ensure that the smooth circuit voltage will not be excessive to avoid that the AC drive trips due to overvoltage stall.

F0-19 **Acceleration/Deceleration time unit**

Address:	0xF013	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	1	Change mode:	At stop

Value range:

0: 1s

1: 0.1s

2: 0.01s

Description

This parameter indicates the acceleration/Deceleration time unit.

F0-23 **Retentive selection of frequency set by digit**

Address:	0xF017	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Non-retentive

1: Retentive

Description

0: Non-retentive

F0-08 (preset frequency) is set through the operating panel and the frequency is modified by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN key. When the AC drive stops, the modification will be cleared.

1: Retentive

F0-08 (preset frequency) is set through the operating panel and the frequency is modified by using the ▲ and ▼ keys on the operating panel or the terminal functioning as the UP/DOWN key. When the AC drive stops, the modification will be retained.

F0-25 **Acceleration/Deceleration time base frequency**

Address:	0xF019	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Maximum frequency (F0-10)

1: Frequency reference

2: 100 Hz

Description

This parameter defines the target frequency during acceleration and the start frequency during deceleration.

F0-26 **Base of frequency adjusted by UP/DOWN keys during running**

Address:	0xF01A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Running frequency

1: Frequency reference

Description

This parameter defines the base value when the target frequency is adjusted by using the UP/DOWN key of the operating panel during operation.

If it is set to 0 and the running frequency is 25 Hz, the target frequency will change from 25 Hz at a certain rate when the UP key is pressed.

If it is set to 1, the target frequency will change from the original target frequency when the UP key is pressed.

7.2 F1 Motor Parameters

F1-01 **Rated motor power**

Address:	0xF101	Effective mode:	-
Min.:	0.1	Unit:	kW
Max.:	1000.0	Data type:	UInt16

Default mode:	3.7	Change mode:	At stop

Value range:

0.1 kW to 1000.0 kW

Description

This parameter indicates the power of the motor during normal operation. Its value is the motor rated voltage multiplied by the motor rated current. Select a proper motor power on the premise that the motor can meet the requirements of mechanical load. Factors such as motor heating, allowable overload capacity, and starting capacity must be considered.

F1-02 **Rated motor voltage**

Address:	0xF102	Effective mode:	-
Min.:	1	Unit:	V
Max.:	2000	Data type:	UInt16
Default mode:	380	Change mode:	At stop

Value range:

1 V to 2000 V

Description

This parameter indicates the voltage of the motor during normal operation, which usually refers to the line voltage.

F1-03 **Rated motor current**

Address:	0xF103	Effective mode:	-
Min.:	0.1	Unit:	A
Max.:	6553.5	Data type:	UInt16
Default mode:	9.0	Change mode:	At stop

Value range:

0.1 A to 6553.5 A

Description

This parameter indicates the current of the motor during normal operation, which usually refers to the line current.

F1-04 **Rated motor frequency**

Address:	0xF104	Effective mode:	-
Min.:	0.01	Unit:	Hz
Max.:	500	Data type:	UInt16

Default mode:	50.00	Change mode:	At stop

Value range:

0.01 Hz to 500.00 Hz

Description

This parameter indicates the frequency of the power supply connected to the stator winding in the rated operation state of the motor.

F1-05 **Rated motor speed**

Address:	0xF105	Effective mode:	-
Min.:	1	Unit:	RPM
Max.:	65535	Data type:	UInt16
Default mode:	1460	Change mode:	At stop

Value range:

1 RPM to 65535 RPM

Description

This parameter indicates the speed of the rotor (RPM) in the rated operating state of the motor.

F1-06 **Asynchronous motor stator resistance**

Address:	0xF106	Effective mode:	-
Min.:	0.001	Unit:	Ω
Max.:	65.535	Data type:	UInt16
Default mode:	1.204	Change mode:	At stop

Value range:

0.001 Ω to 65.535 Ω

Description

This parameter indicates the DC resistance of stator winding of the asynchronous motor. The parameter can be obtained by motor auto-tuning.

F1-07 **Asynchronous motor rotor resistance**

Address:	0xF107	Effective mode:	-
Min.:	0.001	Unit:	Ω
Max.:	65.535	Data type:	UInt16
Default mode:	0.908	Change mode:	At stop

Value range:

0.001 Ω to 65.535 Ω

Description

This parameter indicates the DC resistance of rotor winding of the asynchronous motor. The parameter can be obtained by static or dynamic auto-tuning of the motor.

F1-08 **Asynchronous motor leakage inductance**

Address:	0xF108	Effective mode:	-
Min.:	0.01	Unit:	mH
Max.:	655.35	Data type:	UInt16
Default mode:	5.28	Change mode:	At stop

Value range:

0.01 mH to 655.35 mH

Description

The leakage inductance of the asynchronous motor is caused by the leakage flux of motor winding. The winding of the motor produces magnetic flux when current is introduced. According to the path, the magnetic flux can be divided into main flux and leakage flux. The leakage flux can be described by an inductance, namely, leakage inductance. The parameter value can be obtained by static or dynamic auto-tuning of the motor.

F1-09 **Asynchronous motor mutual inductance**

Address:	0xF109	Effective mode:	-
Min.:	0.01	Unit:	mH
Max.:	655.35	Data type:	UInt16
Default mode:	156.80	Change mode:	At stop

Value range:

0.01mH to 655.35mH

Description

When the current in one coil of the motor changes, induced electromotive force is generated in the other adjacent coil. The mutual inductance electromotive force can be represented by the mutual inductance.

The mutual inductance of a motor can be roughly divided into two types. One is the inter-phase inductance of the stator or rotor, which is the reactance between two phases of the stator or rotor. The other is the inductance between the stator and the rotor. The inductance of the first type does not change with the rotation of the rotor, while the inductance of the second type changes accordingly with the rotation of the rotor.
Both types of mutual inductance can be obtained through static or dynamic auto-tuning of the motor.

F1-10 **Asynchronous motor no-load current**

Address:	0xF10A	Effective mode:	-
Min.:	0.1	Unit:	A
Max.:	6553.5	Data type:	UInt16
Default mode:	4.2	Change mode:	At stop

Value range:
0.1 A to 6553.5 A

Description
This parameter indicates the current passing through the three-phase winding of stator when the motor is operating without load. The parameter can be obtained by dynamic motor auto-tuning.

F1-37 **Auto-tuning selection**

Address:	0xF125	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:
0: No operation
1: Static auto-tuning on partial parameters of asynchronous motors
2: Dynamic auto-tuning on all parameters of asynchronous motors (applicable only to three-phase MD200TXX models)

Description
0: No auto-tuning
Auto-tuning is not performed.

1: Static auto-tuning on partial parameters of asynchronous motors
This option applies to applications where the motor cannot be disconnected from the load and dynamic auto-tuning is not allowed. Motor parameters that are auto-tuned include F1-06 (asynchronous motor stator resistance), F1-07 (asynchronous motor rotor resistance), and F1-08 (asynchronous motor leakage inductance).
2: Dynamic auto-tuning on all parameters of asynchronous motors (applicable only to three-phase MD200TXX models)
This option applies to applications where motors can be disconnected from the load. All motor parameters are auto-tuned, including F1-06 (asynchronous motor stator resistance), F1-07 (asynchronous motor rotor resistance), F1-08 (asynchronous motor leakage inductance), F1-09 (asynchronous motor mutual inductance), and F1-10 (asynchronous motor no-load current).

7.3 F2 Vector Control Parameters

F2-00 **Speed loop proportional gain 1**

Address:	0xF200	Effective mode:	-
Min.:	1	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	30	Change mode:	At once

Value range:
1 to 100
Description
The speed loop PID control parameter Kp affects the response speed of the motor speed. The larger the Kp value, the higher the adjustment sensitivity and intensity. The smaller the Kp value, the lower the adjustment sensitivity and intensity. The low-speed speed loop Kp is used at low speed.

F2-01 **Speed loop integral time 1**

Address:	0xF201	Effective mode:	-
Min.:	0.01	Unit:	s
Max.:	10.00	Data type:	UInt16
Default mode:	0.50	Change mode:	At once

Value range:
0.01s to 10.00s

Description

The reciprocal of the speed loop integral time constant is the integral gain. The speed loop integral time constant affects the steady-state speed error of the motor and the stability of the speed loop system. If the speed loop integral time constant increases, the speed loop response slows down. At this time, the proportional gain of the speed loop needs to be increased to shorten the speed loop response time. The low speed loop Ti is used at low speed.

F2-02 **Switchover frequency 1**

Address:	0xF202	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	5.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

Speed loop PI parameters are divided into low-speed and high-speed groups. If the running frequency is lower than F2-02 (switchover frequency 1), the speed loop PI parameters are adjusted by F2-00 and F2-01. If the running frequency is higher than F2-05 (switchover frequency 2), the speed loop PI parameters are adjusted by F2-03 and F2-04.

When the running frequency is between switchover frequency 1 and switchover frequency 2, the speed loop PI parameters switch linearly between the two groups of PI parameters.

This parameter must be set to a value lower than F2-05 (switchover frequency 2).

F2-03 **Speed loop proportional gain 2**

Address:	0xF203	Effective mode:	-
Min.:	1	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	20	Change mode:	At once

Value range:

1 to 100

Description

The speed loop PID control parameter Kp affects the response speed of the motor speed. The larger the Kp value, the higher the adjustment sensitivity and intensity. The smaller the Kp value, the lower the adjustment sensitivity and intensity. The high-speed speed loop Kp is used at high speed.

F2-04 **Speed loop integral time 2**

Address:	0xF204	Effective mode:	-
Min.:	0.01	Unit:	s
Max.:	10.00	Data type:	UInt16
Default mode:	1.00	Change mode:	At once

Value range:

0.01s to 10.00s

Description

The reciprocal of the speed loop integral time constant is the integral gain. The speed loop integral time constant affects the steady-state speed error of the motor and the stability of the speed loop system. If the speed loop integral time constant increases, the speed loop response slows down. At this time, the proportional gain of the speed loop needs to be increased to shorten the speed loop response time. The high speed loop Ti is used at high speed.

F2-05 **Switchover frequency 2**

Address:	0xF205	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	10.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

The speed loop PI parameters are divided into low-speed and high-speed groups. When the running frequency is lower than F2-02 (switchover frequency 1), the speed loop PI parameters are adjusted by F2-00 and F2-01. When the running frequency is higher than F2-05 (switchover frequency 2), the speed loop PI parameters are adjusted by F2-03 and F2-04. When the running frequency is between switchover frequency 1 and switchover frequency 2, the speed loop PI parameters switch linearly between the two groups of PI parameters. This parameter must be set to a value lower than F2-05 (switchover frequency 2).

F2-06 Slip gain in vector control mode

Address:	0xF206	Effective mode:	-
Min.:	50	Unit:	%
Max.:	200	Data type:	UInt16
Default mode:	100	Change mode:	At once

Value range:

50% to 200%

Description

In the SVC mode, this parameter is used to adjust the speed stability accuracy. For example, when the running frequency of the motor is lower than the output frequency of the AC drive, increase the value of this parameter.

In the FVC mode, this parameter is used to adjust output current of the AC drive. For example, when a high-power AC drive is used to control a motor with low load capacity, decrease the value of this parameter gradually. Generally, you do not need to change the value of this parameter.

F2-08 Over-excitation gain in vector control mode

Address:	0xF208	Effective mode:	-
Min.:	0	Unit:	-
Max.:	200	Data type:	UInt16
Default mode:	64	Change mode:	At once

Value range:

0 to 200

Description

-

F2-09 Torque upper limit source in speed control mode

Address:	0xF209	Effective mode:	-
Min.:	0	Unit:	-
Max.:	7	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: F2-10
1: AI1
2: External operating panel potentiometer
3: Reserved
4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
5: Communication
6: Min. (AI1, external operating panel potentiometer)
7: Max. (AI1, external operating panel potentiometer)

Description

0: F2-10
The torque upper limit in the speed control mode is set by F2-10 (digital setting of torque upper limit in speed control).

1: AI1
The torque upper limit in the speed control mode is input by the AI1 through current or voltage signals. The torque is calculated according to the set AI curve.
2: External operating panel potentiometer
The torque upper limit in the speed control mode is input by the external operating panel potentiometer through current or voltage signals. The torque is calculated according to the set AI curve.
3: Reserved
4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
The torque upper limit in the speed control mode is set by the pulse frequency over the DI4 or the DI/DO. The DI4 is applicable to MD200XXX models and the DI/DO is applicable to MD200XXX-NC models.
5: Communication setting
The torque upper limit in the speed control mode is set through communication. The running frequency is input through remote communication. The AC drive must be equipped with a communication card to communicate with the host controller. This mode applies to remote control or centralized control of multiple equipment.
6: Min. (AI1, external operating panel potentiometer)
The torque upper limit in the speed control mode is set by the smaller value between the AI1 input and the external operating panel potentiometer input.
7: Max. (AI1, external operating panel potentiometer)
The torque upper limit in the speed control mode is set by the larger value between the AI1 input and the external operating panel potentiometer input.

F2-10 **Digital setting of torque upper limit in speed control mode**

Address:	0xF20A	Effective mode:	-
Min.:	0.0	Unit:	%

Max.:	200.0	Data type:	UInt16
Default mode:	150.0	Change mode:	At once

Value range:

0.0% to 200.0%

Description

The torque upper limit in the motoring state takes the rated current of the AC drive as the base value.

F2-11 **(Regenerative) torque upper limit settings in speed control mode**

Address:	0xF20B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	8	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: F2-10
1: AI1
2: External operating panel potentiometer
3: Reserved
4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
5: Communication
6: Min. (AI1, external operating panel potentiometer)
7: Max. (AI1, external operating panel potentiometer)
8: F2-12

Description

0: F2-10

The torque upper limit in the speed control mode is set by F2-10 (digital setting of torque upper limit in speed control).

1: AI1

The torque upper limit in the speed control mode is input by the AI1 through current or voltage signals. The frequency is calculated according to the preset AI curve.

2: External operating panel potentiometer

The torque upper limit in the speed control mode is input by the external operating panel potentiometer through current or voltage signals. The frequency is calculated according to the preset AI curve.

3: Reserved
4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
The torque upper limit in the speed control mode is set by the pulse frequency over the DI4 or DI/DO. The DI4 is applicable to MD200XXX models and DI/DO to MD200XXX-NC models. The frequency is calculated according to the relationship curve between the pulse frequency and the operating frequency.
5: Communication
The main frequency is set through communication. The running frequency is input through remote communication. The AC drive must be equipped with a communication card to communicate with the host controller.
This mode is suitable for remote control or centralized control on multiple equipment.
6: Min. (AI1, external operating panel potentiometer)
The torque upper limit in the speed control mode is set by the smaller value between the AI1 input and the external operating panel potentiometer input.
7: Max. (AI1, external operating panel potentiometer)
The torque upper limit in the speed control mode is set by the larger value between the AI1 input and the external operating panel potentiometer input.
8: F2-12
The torque upper limit in the speed control mode is set by F2-12 (digital setting of regenerative torque limit).

F2-12 **Digital setting of (regenerative) torque upper limit**

Address:	0xF20C	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	200.0	Data type:	UInt16
Default mode:	150.0	Change mode:	At once

Value range:
0.0% to 200.0%
Description
The torque upper limit in the generating state takes the rated current of the AC drive as the base value.

F2-13 **Excitation adjustment proportional gain**

Address:	0xF20D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	60000	Data type:	UInt16
Default mode:	2000	Change mode:	At once

Value range:
0 to 60000
Description
-

F2-14 Excitation adjustment integral gain

Address:	0xF20E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	60000	Data type:	UInt16
Default mode:	1300	Change mode:	At once

Value range:
0 to 60000
Description
-

F2-15 Torque adjustment proportional gain

Address:	0xF20F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	60000	Data type:	UInt16
Default mode:	2000	Change mode:	At once

Value range:
0 to 60000
Description
-

F2-16 Torque adjustment integral gain

Address:	0xF210	Effective mode:	-
Min.:	0	Unit:	-
Max.:	60000	Data type:	UInt16
Default mode:	1300	Change mode:	At once

Value range:
0 to 60000
Description
-

F2-17 Speed loop integral attribute

Address:	0xF211	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

0: Disable

The speed loop integral separation is disabled.

1: Enable

The speed loop integral separation is enabled.

F2-19 Torque feedforward filter time

Address:	0xF213	Effective mode:	-
Min.:	1	Unit:	-
Max.:	50	Data type:	UInt16
Default mode:	5	Change mode:	Unchangeable

Value range:

1 to 50

Description

-

F2-21 Maximum torque coefficient in field weakening area

Address:	0xF215	Effective mode:	-
Min.:	50	Unit:	-
Max.:	200	Data type:	UInt16
Default mode:	100	Change mode:	At once

Value range:

50 to 200

Description

-

F2-22 **Generating power upper limit (applicable only to single-phase MD200SXX models)**

Address:	0xF216	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	2000.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0% to 2000.0%

Description

-

7.4 F3 V/f Control Parameters

F3-00 **V/f curve setting**

Address:	0xF300	Effective mode:	-
Min.:	0	Unit:	-
Max.:	11	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Linear V/f curve
1: Multi-point V/f curve
2-9: Reserved
10: V/f complete separation mode
11: V/f half-separation mode

Description

0: Linear V/f curve

Under the rated frequency, the output voltage of the AC drive changes linearly with the output frequency. This curve is suitable for general mechanical drive applications such as large-inertia fan acceleration, punch presses, centrifuges, and water pumps.

1: Multi-point V/f curve

The frequency ranges from 0.00 Hz to the rated motor frequency. The range of the voltage point is from 0.0% to 100.0%, which corresponds to the range from 0 V to the rated motor voltage. The multi-point V/f curve is typically determined based on the motor load. Ensure that the settings apply to the following formula: F3-03 ⩽ F3-05 ⩽ F3-07.

2-9: Reserved
10: V/f complete separation mode
The output frequency and output voltage of the AC drive are independent of each other. The output frequency is determined by the frequency source, and the output voltage is determined by V/f separation voltage source. This mode is applicable to scenarios such as motor torque control.
11: V/f half separation mode
In this mode, the voltage and the frequency are proportional and can be set through the voltage source. The relationship between the voltage and the frequency is also related to the rated motor voltage and rated motor frequency in group F1. Assume that the voltage source input is X (0 to 100%), the relationship between the voltage and the frequency is as follows: V/f = 2 x X x (Rated motor voltage)/(Rated motor frequency)

F3-01 **Torque boost**

Address:	0xF301	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	30.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:
0.0% to 30.0%
Description
The torque boost function is generally applicable to the AC drive at low frequency. In the V/f control mode, the output torque of the AC drive is proportional to the frequency. Under the condition of low frequency, the torque of the motor is very low when the motor runs at low speed. The output voltage of the AC drive can be increased through this parameter, thereby increasing the current and output torque.
Set this parameter to a proper value to avoid triggering the overload protection function.

F3-02 **Cutoff frequency of torque boost**

Address:	0xF302	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	50.00	Change mode:	At stop

Value range:
0.00 Hz to 500.00 Hz

Description

When the running frequency reaches the cutoff frequency of torque boost, the torque boost function is disabled.

F3-03 Frequency 1 on multi-point V/f curve

Address:	0xF303	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At stop

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter indicates frequency 1 set on the multi-point V/f curve.

F3-04 Voltage 1 on multi-point V/f curve

Address:	0xF304	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0% to 100.0%

Description

This parameter indicates voltage 1 set on the multi-point V/f curve.

F3-05 Frequency 2 on multi-point V/f curve

Address:	0xF305	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At stop

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter indicates frequency 2 set on the multi-point V/f curve.

F3-06 Voltage 2 on multi-point V/f curve

Address:	0xF306	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0% to 100.0%

Description

This parameter indicates voltage 2 set on the multi-point V/f curve.

F3-07 Frequency 3 on multi-point V/f curve

Address:	0xF307	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At stop

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter indicates frequency 3 set on the multi-point V/f curve.

F3-08 Voltage 3 on multi-point V/f curve

Address:	0xF308	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0% to 100.0%

Description

This parameter indicates voltage 3 set on the multi-point V/f curve.

F3-10 V/f over-excitation gain

Address:	0xF30A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	200	Data type:	UInt16

Default mode:	64	Change mode:	At once

Value range:

0 to 200

Description

Larger over-excitation gain indicates better suppression effect. When a braking resistor, additional braking unit, or energy feedback unit is used, set over-excitation gain to 0. Failure to comply may result in overcurrent during operation.

F3-11 **V/f oscillation suppression gain**

Address:	0xF30B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	40	Change mode:	At once

Value range:

0 to 100

Description

The higher the oscillation gain, the better the suppression effect.

F3-13 **Voltage source for V/f separation**

Address:	0xF30D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	8	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Digital setting (F3-14)

1: AI1

2: Reserved

3: Reserved

4: Pulse setting (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

5: Multi-reference

6: Simple PLC

7: PID

8: Communication setting

Description

This parameter sets the target voltage source in the V/f separation mode.

0: Digital setting (F3-14)
The V/f separation voltage is set by F3-14 (voltage digital setting of V/f separation).
1: AI1
The V/f separation voltage is input by the AI1 through current or voltage signals. The frequency is calculated according to the AI curve.
2: Reserved
3: Reserved
4: Pulse setting (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
The V/f separation voltage is set by DI4 or DI/DO pulse reference. The DI4 is applicable to MD200XXX models and DI/DO is applicable to MD200XXX-NC models. The frequency is calculated according to the relationship curve between the pulse frequency and the operating frequency.
5: Multi-reference
In multi-reference mode, different combinations of DI terminal states correspond to different reference values. The four multi-reference terminals can provide 16 states, corresponding to 16 reference values (percentage x maximum frequency) of parameters in group FC.
6: Simple PLC
The V/f separation voltage is set by simple PLC. For details, see the function description of simple PLC.
7: PID
The V/f separation voltage is set through PID. For details, see descriptions of the PID function.
8: Communication setting
The main frequency is set through communication. The running frequency is input through remote communication. The AC drive must be equipped with a communication card to communicate with the host controller. This mode applies to remote control or centralized control of multiple equipment.

F3-14 **Voltage source digital setting for V/f separation**

Address:	0xF30E	Effective mode:	-
Min.:	0	Unit:	V
Max.:	2000	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 V to 2000 V
Description
The parameter value is from 0 V to the rated voltage.

F3-15 **Voltage rise time of V/F separation**

Address:	0xF30F	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	1000.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 1000.0s

Description

This parameter indicates the time required for the output voltage to increase from 0 V to the set V/f separation voltage.

F3-16 **Voltage decline time of V/f separation**

Address:	0xF310	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	1000.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 1000.0s

Description

This parameter indicates the time required for the output voltage to decline from the set V/f separation voltage to 0.

F3-17 **Stop mode for V/f separation**

Address:	0xF311	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Frequency and voltage decline to 0.

1: Frequency declines after voltage declines to 0.

Description

0: Frequency and voltage decline to 0.

1: Frequency declines after voltage declines to 0.

F3-18 **Overcurrent stall action current**

Address:	0xF312	Effective mode:	-
Min.:	50	Unit:	%
Max.:	200	Data type:	UInt16
Default mode:	150	Change mode:	At stop

Value range:

50% to 200%

Description

When the motor current reaches the value of this parameter, the AC drive enables the overcurrent stall function. The default value is 150%, corresponding to 1.5 times the rated current of the AC drive.

F3-19 **Overcurrent stall suppression**

Address:	0xF313	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At stop

Value range:

0: Disable

1: Enable

Description

This parameter determines whether to enable overcurrent stall suppression in the V/f mode.

F3-20 **Overcurrent stall suppression gain**

Address:	0xF314	Effective mode:	-
Min.:	0	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	20	Change mode:	At once

Value range:

0 to 100

Description

When the current exceeds the overcurrent stall action current, the overcurrent stall suppression function is triggered, and the output frequency decreases. When the current falls below the overcurrent stall threshold, the output frequency increases to the target frequency, and the actual acceleration time prolongs automatically. A larger parameter value indicates better suppression effect.

F3-21 Compensation coefficient for overcurrent stall action current at multiplied rated frequency

Address:	0xF315	Effective mode:	-
Min.:	50	Unit:	%
Max.:	200	Data type:	UInt16
Default mode:	50	Change mode:	At stop

Value range:

50% to 200%

Description

This parameter reduces the overcurrent stall action current at high speed. It is invalid when set to 50%. The recommended value for F3-18 in the flux weakening area is 100%.

F3-22 Overvoltage stall action voltage

Address:	0xF316	Effective mode:	-
Min.:	650.0	Unit:	V
Max.:	800.0	Data type:	UInt16
Default mode:	770.0	Change mode:	At stop

Value range:

650.0 V to 800.0 V

Description

When the bus voltage reaches the value of this parameter, the AC drive activates the overvoltage stall protection function.

F3-23 Overvoltage stall suppression

Address:	0xF317	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16

Default mode:	1	Change mode:	At stop

Value range:

0: Disable

1: Enable

Description

0: Disable

1: Enable (default)

The function of F3-23 is the same as that of F9-04 (overvoltage stall protection voltage).

When a braking resistor, braking unit, or energy feedback unit is used, set this parameter to 0. Otherwise, the deceleration time may be prolonged.

F3-24 **Frequency gain during overvoltage stall suppression**

Address:	0xF318	Effective mode:	-
Min.:	0	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	30	Change mode:	At once

Value range:

0 to 100

Description

Increasing F3-24 improves the control performance on the bus voltage, but leads to fluctuation of the output frequency. If the output frequency fluctuates greatly, reduce F3-24 appropriately. F3-24 has the same function as F9-03 (overvoltage stall gain).

F3-25 **Voltage gain during overvoltage stall suppression**

Address:	0xF319	Effective mode:	-
Min.:	0	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	30	Change mode:	At once

Value range:

0 to 100

Description

This parameter suppresses the bus voltage. By increasing the parameter value, the overshoot of the bus voltage can be reduced.

F3-26 **Frequency rise threshold during overvoltage stall suppression**

Address:	0xF31A	Effective mode:	-
Min.:	0	Unit:	Hz
Max.:	50	Data type:	UInt16
Default mode:	5	Change mode:	At stop

Value range:

0 Hz to 50 Hz

Description

The running frequency may increase during overvoltage stall suppression. This parameter is used to limit the increase of the running frequency.

F3-27 **Slip compensation time constant**

Address:	0xF31B	Effective mode:	-
Min.:	0.1	Unit:	-
Max.:	10.0	Data type:	UInt16
Default mode:	0.5	Change mode:	Unchangeable

Value range:

0.1 to 10.0

Description

The shorter the slip compensation response time, the quicker the response speed.

7.5 F4 Input Terminal

F4-00 **DI1 function selection**

Address:	0xF400	Effective mode:	-
Min.:	0	Unit:	-
Max.:	59	Data type:	UInt16
Default mode:	1	Change mode:	At stop

Value range:

0: No function
1: Forward run (FWD)
2: Reverse run (REV)
3: Three-wire operation control
4: Forward jog (FJOG)
5: Reverse jog (RJOG)
6: Function as the UP key
7: Function as the DOWN key
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
15: Multi-reference terminal 4
16: Acceleration/deceleration terminal 1
18: Frequency reference switchover
19: Clear information set by UP/DOWN keys
20: Command source switchover terminal 1
21: Acceleration/Deceleration inhibited
22: PID pause
23: Simple PLC state reset
30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
32: Immediate DC braking
33: NC input of external fault
34: Frequency modification enable
35: PID operation direction reversal
36: External stop terminal 1
37: Control command switchover terminal 2

38: PID integral pause
39: Switchover between frequency source X and preset frequency
40: Switchover between frequency source Y and preset frequency
43: PID parameter switchover
47: Emergency stop
48: External stop terminal 2
49: Decelerate to DC braking
50: Clear current operating time
51: Two-wire/Three-wire control switchover
52: Reverse running prohibited
53: Reserved
54: Reserved
55: Reserved
56: Reserved
57: Reserved
58: Reserved
59: Reserved

Description

0: No function

The DI has no function.

1: Forward run (FWD)

The AC drive runs in the forward direction. FWD indicates forward run. In two-wire mode 1 (F4-11 = 0), activating the terminal sets the AC drive to forward run. In two-wire mode 2 (F4-11 = 1), activating the terminal gives a running command.

2: Reverse run

The AC drive runs in the reverse direction. REV indicates reverse run. In three-wire mode 1 (F4-11 = 2), activating the terminal sets the AC drive to reversely run. In three-wire mode 2 (F4-11 = 3), activating the terminal sets the forward/ reverse run direction.

3: Three-wire operation control

The AC drive operation mode is three-wire control mode. To set the running command through the terminal, set F4-11 (terminal control mode) to 2 (three-wire mode 1) or 3 (three-wire mode 2), and set F4-00 to 3. The three-wire control modes include three-wire mode 1 and three-wire mode 2.

4: Forward jog (FJOG)

The operating mode of the AC drive is forward jog. In jog mode, the AC drive runs at low speed for a short time, which is typically used for maintenance and commissioning of field equipment.

5: Reverse jog (RJOG)

The operation mode of the AC drive is reverse jog.

6: Function as the UP key
The terminal is used to increase the frequency when the frequency is set through the terminal. When the terminal is active, the effect is equivalent to holding down the UP key. When the terminal is inactive, the effect is equivalent to releasing the UP key.
7: Function as the DOWN key
The terminal is used to decrease the frequency when the frequency is set through the terminal. When the terminal is active, the effect is equivalent to holding down the DOWN key. When the terminal is inactive, the effect is equivalent to releasing the DOWN key.
8: Coast to stop
Once the AC drive receives a stop command, it immediately stops output and the load then coasts to stop based on the mechanical inertia. The AC drive stops by stopping output. In this case, the motor is powered off, and the drive system enters the free braking state. Since the stop time is determined by the inertia of the drive system, coast to stop is also called inertia stop.
9: Fault reset (RESET). Activating the terminal resets the AC drive upon a fault. This function is the same as that of the STOP/RES key on the operating panel. Remote reset of the AC drive upon a fault is supported.
10: Running pause
The AC drive decelerates to stop with all running parameters retained (such as PLC, wobble, and PID parameters). When the terminal is inactive, the AC drive resumes its running status before stop.
11: NO input of external fault
The AC drive reports Err15 upon receiving an external signal.
12-15: Multi-reference terminals 1–4
The AC drive selects the multi-reference as the main frequency. You can set the 16 states of the four terminals to 16 speeds or 16 references. This function is applicable to scenarios where continuous adjustment of the AC drive running frequency is not required and only several frequency values are required.
16: Acceleration/deceleration terminals 1
The terminal is used to switch between two groups of acceleration and deceleration time.
The acceleration time is the time required by the AC drive to accelerate from zero frequency to the acceleration/deceleration base frequency (F0-25). The deceleration time is the time required by the AC drive to decelerate from the acceleration/deceleration base frequency (F0-25) to zero frequency.
18: Frequency source switchover
This function is used to switch among different frequency reference input modes. The frequency reference is set by F0-07 (frequency reference superposition).

19: Clear information set by UP/DOWN keys
When the main frequency is set through the operating panel and the terminal is active, the terminal can be used to clear the frequency set through the UP/DOWN key on the operating panel or the terminal functioning as the UP/DOWN key. In this case, the frequency is reset to the value of F0-08.
20: Command source switchover terminal 1
When the running command is set through the terminal (F0-02=1) and the terminal is active, the terminal can be used to switch between the terminal control mode and the operating panel control mode.
When the running command is set through communication (F0-02 = 2) and the terminal is active, the terminal can be used to switch between the communication control mode and the operating panel control mode.
21: Acceleration/Deceleration inhibited
The terminal is used to maintain the current running frequency of the AC drive regardless of changes of the external input frequency (unless a stop command is received).
22: PID pause
PID is invalid temporarily. The AC drive maintains the current output frequency without supporting PID adjustment of frequency source.
23: PLC state reset
The terminal is used to restore the AC drive to the initial state of the simple PLC.
30: Pulse input
When the DI4 or DI/DO is used as the pulse input terminal, the DI4 or DI/DO must be allocated with function 30. DI4 is used for MD200XXX models and the DI/DO for MD200XXX-NC models.
31: Reserved
32: Immediate DC braking
The AC drive directly switches to the DC braking state. DC braking means that the AC drive outputs DC to the stator winding of the asynchronous motor to form a static magnetic field, enabling the motor to brake with energy consumption. In this state, the rotor cuts the static magnetic field to generate braking torque, which stops the motor quickly.
33: NC input of external fault
The AC drive reports Err15 upon receiving an external signal.
34: Frequency modification enable
When the terminal is active, the frequency can be modified. When the terminal is inactive, the frequency cannot be modified.
35: PID action direction reversal
The PID action direction is reversed to the direction set by FA-03 (PID action direction).

36: External stop terminal 1

When the running command is set through the operating panel (F0-02 = 0), this terminal is used to stop the AC drive, which functions in the same way as the STOP/RES key on the operating panel.

37: Command source switchover terminal 2

The terminal is used to switch between the terminal control mode and the communication control mode.

If the terminal is used to give running commands, the system switches to communication control when this terminal is active.

If communication is used to give running commands, the system switches to terminal control when this terminal is active.

38: PID integral pause

When the terminal is active, the integral adjustment function of the PID pauses. However, the proportional and derivative adjustment functions are still valid.

39: Switchover between frequency source X and preset frequency

This function is used to switch from main frequency reference X to F0-08 (preset frequency).

40: Switchover between frequency reference Y and preset frequency

This function is used to switch from auxiliary frequency reference Y to F0-08 (preset frequency).

43: PID parameter switchover

If PID parameters are switched over through DI (FA-18 = 1), the PID parameter values vary with the terminal state. When the terminal is inactive, PID parameters are FA-05 to FA-07 (proportional gain Kp1, integral time Ti1, and differential time Td1). When the terminal is active, PID parameters are FA-15 to FA-17 (proportional gain Kp2, integral time Ti2, and differential time Td2).

47: Emergency stop

When the system is in the emergency state, the AC drive decelerates according to F8-55 (terminal deceleration time for emergency stop). When the deceleration time for emergency stop is 0s in V/f mode, the AC drive decelerates according to the minimum unit time. The input terminal does not need to be in the closed state continuously. Even if it is closed only for a moment, an emergency stop will occur immediately. Different from general deceleration, the emergency stop input terminal is opened after the deceleration time for emergency stop expires. If the running signal is still active on the AC drive terminal at this time, the AC drive will not restart. To restart the AC drive in this case, disconnect the running terminal and input the running command.

48: External stop terminal 2

The terminal is used to make the AC drive decelerate to stop in any control mode (operating panel, terminal, or communication control). In this mode, the deceleration time is fixed to deceleration time 4 (F8-08).

49: Deceleration DC braking
The AC drive decelerates to F6-11 (shutdown DC injection braking start frequency) and then enters the DC braking state.
50: Clear the current running time
The terminal is used to clear the current running time of the AC drive. If the current running time is less than the value (greater than 0) of F8-53 (current running time reach), the current running timing is cleared when the terminal is active. If the current running time is greater than the value (greater than 0) of F8-53, the current running time is not cleared when the terminal is active.
51: Two-wire/Three-wire mode switchover
The terminal is used to switch between the two-wire control mode and the three-wire control mode.
When F4-11 is set to 0 (two-wire mode 1) and the terminal is active, the AC drive switches to three-wire mode 1. When the terminal is inactive, two-wire mode 1 is used.
When F4-11 is set to 1 (two-wire mode 2) and the terminal is active, the AC drive switches to three-wire mode 2.
When F4-11 is set to 2 (three-wire 1) and the terminal is active, the AC drive switches to two-wire mode 1.
When F4-11 is set to 3 (three-wire 2) and the terminal is active, the AC drive switches to two-wire mode 2.
52: Reverse frequency inhibited
When the terminal is active, even if the reverse frequency is set, the actual frequency of the AC drive is fixed to 0.
It functions the same as F8-13 (reverse frequency prohibited).

F4-01 **DI2 function selection**

Address:	0xF401	Effective mode:	-
Min.:	0	Unit:	-
Max.:	59	Data type:	UInt16
Default mode:	4	Change mode:	At stop

Value range:

0: No function
1: Forward run (FWD)
2: Reverse run (REV)
3: Three-wire operation control
4: Forward jog (FJOG)
5: Reverse jog (RJOG)
6: Function as the UP key
7: Function as the DOWN key
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
15: Multi-reference terminal 4
16: Acceleration/deceleration terminal 1
18: Frequency reference switchover
19: Clear information set by UP/DOWN keys
20: Command source switchover terminal 1
21: Acceleration/Deceleration inhibited
22: PID pause
23: Simple PLC state reset
30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
32: Immediate DC braking
33: NC input of external fault
34: Frequency modification enable
35: PID operation direction reversal
36: External stop terminal 1
37: Control command switchover terminal 2
38: PID integral pause

39: Switchover between frequency source X and preset frequency
40: Switchover between frequency source Y and preset frequency
43: PID parameter switchover
47: Emergency stop
48: External stop terminal 2
49: Decelerate to DC braking
50: Clear current operating time
51: Two-wire/Three-wire control switchover
52: Reverse running prohibited
53: Reserved
54: Reserved
55: Reserved
56: Reserved
57: Reserved
58: Reserved
59: Reserved

Description

Same as F4-00

F4-02 **DI3 function selection**

Address:	0xF402	Effective mode:	-
Min.:	0	Unit:	-
Max.:	59	Data type:	UInt16
Default mode:	9	Change mode:	At stop

Value range:

0: No function
1: Forward run (FWD)
2: Reverse run (REV)
3: Three-wire operation control
4: Forward jog (FJOG)
5: Reverse jog (RJOG)
6: Function as the UP key
7: Function as the DOWN key
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
15: Multi-reference terminal 4

16: Acceleration/deceleration terminal 1
18: Frequency reference switchover
19: Clear information set by UP/DOWN keys
20: Command source switchover terminal 1
21: Acceleration/Deceleration inhibited
22: PID pause
23: Simple PLC state reset
30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
32: Immediate DC braking
33: NC input of external fault
34: Frequency modification enable
35: PID operation direction reversal
36: External stop terminal 1
37: Control command switchover terminal 2
38: PID integral pause
39: Switchover between frequency source X and preset frequency
40: Switchover between frequency source Y and preset frequency
43: PID parameter switchover
47: Emergency stop
48: External stop terminal 2
49: Decelerate to DC braking
50: Clear current operating time
51: Two-wire/Three-wire control switchover
52: Reverse running prohibited
53: Reserved
54: Reserved
55: Reserved
56: Reserved
57: Reserved
58: Reserved
59: Reserved

Description

Same as F4-00

F4-03 **DI4 function selection**

Address:	0xF403	Effective mode:	-
Min.:	0	Unit:	-
Max.:	59	Data type:	UInt16
Default mode:	12	Change mode:	At stop

Value range:

0: No function

1: Forward run (FWD)

2: Reverse run (REV)

3: Three-wire operation control

4: Forward jog (FJOG)

5: Reverse jog (RJOG)

6: Function as the UP key

7: Function as the DOWN key

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

15: Multi-reference terminal 4

16: Acceleration/deceleration terminal 1

18: Frequency reference switchover

19: Clear information set by UP/DOWN keys

20: Command source switchover terminal 1

21: Acceleration/Deceleration inhibited

22: PID pause

23: Simple PLC state reset

30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

32: Immediate DC braking

33: NC input of external fault

34: Frequency modification enable

35: PID operation direction reversal

36: External stop terminal 1

37: Control command switchover terminal 2
38: PID integral pause
39: Switchover between frequency source X and preset frequency
40: Switchover between frequency source Y and preset frequency
43: PID parameter switchover
47: Emergency stop
48: External stop terminal 2
49: Decelerate to DC braking
50: Clear current operating time
51: Two-wire/Three-wire control switchover
52: Reverse running prohibited
53: Reserved
54: Reserved
55: Reserved
56: Reserved
57: Reserved
58: Reserved
59: Reserved

Description

Same as F4-00

F4-04 **DI/DO input function selection (applicable only to MD200XXX-NC models)**

Address:	0xF404	Effective mode:	-
Min.:	0	Unit:	-
Max.:	59	Data type:	UInt16
Default mode:	13	Change mode:	At stop

Value range:

0: No function
1: Forward run (FWD)
2: Reverse run (REV)
3: Three-wire operation control
4: Forward jog (FJOG)
5: Reverse jog (RJOG)
6: Function as the UP key
7: Function as the DOWN key
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
15: Multi-reference terminal 4
16: Acceleration/deceleration terminal 1
18: Frequency reference switchover
19: Clear information set by UP/DOWN keys
20: Command source switchover terminal 1
21: Acceleration/Deceleration inhibited
22: PID pause
23: Simple PLC state reset
30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
32: Immediate DC braking
33: NC input of external fault
34: Frequency modification enable
35: PID operation direction reversal
36: External stop terminal 1

37: Control command switchover terminal 2
38: PID integral pause
39: Switchover between frequency source X and preset frequency
40: Switchover between frequency source Y and preset frequency
43: PID parameter switchover
47: Emergency stop
48: External stop terminal 2
49: Decelerate to DC braking
50: Clear current operating time
51: Two-wire/Three-wire control switchover
52: Reverse running prohibited
53: Reserved
54: Reserved
55: Reserved
56: Reserved
57: Reserved
58: Reserved
59: Reserved

Description

Same as F4-00

F4-10 **DI filter time**

Address:	0xF40A	Effective mode:	-
Min.:	0.000	Unit:	s
Max.:	1.000	Data type:	UInt16
Default mode:	0.010	Change mode:	At once

Value range:

0.000s to 1.000s

Description

This parameter indicates the DI filter time. It is valid only when F9-59 is set to 2 (decelerate to stop).

F4-11 **Terminal control mode**

Address:	0xF40B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Two-wire mode 1
1: Two-wire mode 2
2: Three-wire mode 1
3: Three-wire mode 2

Description

This parameter is used to set the mode in which the AC drive is controlled by external terminals.

0: Two-wire mode 1

Two DIs are connected. One is used to start/stop the AC drive in the forward run mode, and the other is used to start/stop the AC drive in the reverse run mode.

1: Two-wire mode 2

Two DIs are connected. One is used to start/stop the AC drive, and the other is used to control the running direction.

2: Three-wire mode 1

Three DIs are connected. One is used to start/stop the AC drive, and the other two are used to control the running direction.

3: Three-wire mode 2

Three DIs are connected. One is used to start the AC drive, one is used to stop the AC drive, and the other is used to control the running direction.

F4-12 **Step of adjustment through terminal functioning as UP/DOWN keys**

Address:	0xF40C	Effective mode:	-
Min.:	0.001	Unit:	Hz/s
Max.:	65.535	Data type:	UInt16
Default mode:	1.000	Change mode:	At once

Value range:

0.001–65.535 Hz/s

Description

This parameter defines the step when the frequency is adjusted through the terminal functioning as the UP/DOWN key.

When the DI functions as the UP or DOWN key, this parameter must be set (values of F4-00 to F4-09 are 6 or 7).

F4-13 **Minimum input of AI curve 1**

Address:	0xF40D	Effective mode:	-
Min.:	0.00	Unit:	V
Max.:	10.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 V to 10.00 V

Description

When the main frequency is set by AI, each AI supports five types of AI curves. The AI curve is used to set the mapping between the analog input voltage (or current) and the percentage corresponding to the maximum frequency (F0-10). The x axis of AI curve represents the analog input voltage or current, and the y axis represents the set value corresponding to the analog input, which is the percentage to the maximum frequency (F0-10).

Five AI curves are provided. Curves 1 to 3 are two-point curves, and their relevant parameters are F4-13 to F4-27. Curves 4 and 5 are four-point curves, and their relevant parameters are A6-00 to A6-15.

The two points on curves 1 to 3 are the minimum input point and the maximum input point. F4-13 corresponds to the x axis of the AI curve 1 minimum input, that is, the minimum analog input voltage or current.

F4-14 **Percentage corresponding to minimum input of AI curve 1**

Address:	0xF40E	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

F4-14 corresponds to the y axis of the AI curve 1 minimum input, that is, the set value corresponding to the minimum analog input.

F4-15 **Maximum input of AI curve 1**

Address:	0xF40F	Effective mode:	-

Min.:	0.00	Unit:	V
Max.:	10.00	Data type:	UInt16
Default mode:	10.00	Change mode:	At once

Value range:

0.00 V to 10.00 V

Description

F4-15 corresponds to the x axis of AI curve 1 maximum input, that is, the maximum analog input voltage or current.

F4-16 **Percentage corresponding to maximum input of AI curve 1**

Address:	0xF410	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	100.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

F4-16 corresponds to the y axis of the AI curve 1 maximum input, that is, the set value corresponding to the maximum analog input.

F4-17 **AI1 fitter time**

Address:	0xF411	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	10.00	Data type:	UInt16
Default mode:	0.10	Change mode:	At once

Value range:

0.00s to 10.00s

Description

This parameter indicates the software filter time of AI1. The longer the AI filter time, the stronger the anti-interference capability and the slower the response to analog detection. The shorter the AI filter time, the weaker the anti-interference capability and the faster the response to analog detection.

When analog signals on the site are susceptible to interference, increase the AI filter time to enhance the stability of analog signals.

F4-28 **Pulse minimum input**

Address:	0xF41C	Effective mode:	-
Min.:	0.00	Unit:	kHz
Max.:	100.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 kHz to 100.00 kHz

Description

When the terminal high-speed pulse is used to set the main frequency, the relationship curve between the pulse frequency and the frequency reference must be set. The frequency reference is a percentage corresponding to the maximum frequency (F0-10).

The x axis of the curve represents the pulse frequency and the y axis represents the percentage corresponding to the maximum frequency (F0-10).

The curve is a two-point straight line, which includes the minimum and maximum pulse input points.

F4-28 corresponds to the x axis of the minimum pulse input, that is, the minimum input frequency of the pulse.

F4-29 **Settings corresponding to pulse minimum input**

Address:	0xF41D	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

This parameter corresponds to the y axis of the minimum pulse input, that is, the set value corresponding to the minimum pulse input.

F4-30 **Pulse maximum input**

Address:	0xF41E	Effective mode:	-
Min.:	0.00	Unit:	kHz
Max.:	100.00	Data type:	UInt16
Default mode:	50.00	Change mode:	At once

Value range:

0.00 kHz to 100.00 kHz

Description

This parameter corresponds to the x axis of the maximum pulse input, that is, the maximum input frequency of the pulse.

F4-31 **Settings corresponding to pulse maximum input**

Address:	0xF41F	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	100.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

This parameter corresponds to the y axis of the maximum pulse input, that is, the set value corresponding to the maximum pulse input.

F4-32 **Pulse filter time**

Address:	0xF420	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	10.00	Data type:	UInt16
Default mode:	0.10	Change mode:	At once

Value range:

0.00s to 10.00s

Description

This parameter defines the frequency filter time.

F4-33 **AI curve selection**

Address:	0xF421	Effective mode:	-
Min.:	0	Unit:	-
Max.:	555	Data type:	UInt16
Default mode:	321	Change mode:	At once

Value range:

Ones: AI1 curve selection
1: Curve 1 (2 points, see F4-13 to F4-16)
2: Curve 2 (2 points, see F4-18 to F4-21)
3: Curve 3 (2 points, see F4-23 to F4-26)
4: Curve 4 (4 points, see A6-00 to A6-07)
5: Curve 5 (4 points, see A6-08 to A6-15)
Tens: Curve selection for the external operating panel potentiometer
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: Reserved
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)

Description

The ones, tens, and hundreds of this parameter are used to set one of five curves for AI1 and the external operating panel potentiometer. When the main frequency is set by AI, each AI supports five types of AI curves.

F4-34 **Selection when AI < min. input (applicable only to single-phase MD200SXX models)**

Address:	0xF422	Effective mode:	-
Min.:	0	Unit:	-
Max.:	111	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Ones:
0: Minimum input value
1: 0.0%
Tens: Selection when external operating panel potentiometer input value < min. input value. The tens position values are the same as the ones position values.

Description

-

F4-35 **DI1 delay (applicable only to single-phase MD200SXX models)**

Address:	0xF423	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	3600.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0s to 3600.0s

Description

This parameter defines the delay of the DI state change. The delay setting function is available only for DI1, DI2, and DI3.

F4-36 **DI2 delay (applicable only to single-phase MD200SXX models)**

Address:	0xF424	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	3600.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0s to 3600.0s

Description

This parameter defines the delay of the DI state change. The delay setting function is available only for DI1, DI2, and DI3.

F4-37 **DI3 delay (applicable only to single-phase MD200SXX models)**

Address:	0xF425	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	3600.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0s to 3600.0s

Description

This parameter defines the delay of the DI state change. The delay setting function is available only for DI1, DI2, and DI3.

F4-38 **DI active mode selection 1**

Address:	0xF426	Effective mode:	-

Min.:	0	Unit:	-
Max.:	11111	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

Ones: DI1
0: Active high
1: Active low
Tens: DI2
0: Active high
1: Active low
Hundreds: DI3
0: Active high
1: Active low
Thousands: DI4
0: Active high
1: Active low
Ten thousands: DI/DO (applicable only to MD200XXX-NC models)
0: Active high
1: Active low

Description

The ones, tens, hundreds, thousands, and ten thousands positions of F4-38 are used to set the active mode of DI1 to DI4 and DI/DO.

0: Active high

The DI (DI1 to DI4, DI/DO) is active when connected to the COM terminal and inactive when disconnected from the COM terminal.

1: Active low

The DI (DI1 to DI4, DI/DO) is inactive when connected to the COM terminal and active when disconnected from the COM terminal.

F4-41 **DI/DO type (applicable only to MD200XXX-NC models)**

Address:	0xF429	Effective mode:	-
Min.:	0	Unit:	-
Max.:	11111	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

Ones:
0: DI/PULSE
1: DO

Description

-

7.6 F5 Output Terminal

F5-02 **Control board relay output function selection**

Address:	0xF502	Effective mode:	-
Min.:	0	Unit:	-
Max.:	41	Data type:	UInt16
Default mode:	2	Change mode:	At once

Value range:

0: No output
1: AC drive running
2: Fault output (coast to stop)
3: Frequency level detection FDT1 output
4: Frequency reach
5: Zero-speed running (no output at stop)
6: Motor overload warning
7: AC drive overload warning
11: Simple PLC cycle completed
12: Accumulative running time reach
13: Frequency limited
15: Ready to run
17: Frequency upper limit reach
18: Frequency lower limit reach (no output at stop)
19: Undervoltage output
20: Communication
24: Accumulative power-on time reach
26: Output upon frequency 1 reach
28: Output upon current 1 reach
30: Output upon expiration of scheduled time
31: AI1 input limit exceeded
32: Load loss
33: Reverse running
34: Zero current state
36: Output current limit exceeded
37: Frequency lower limit reach (output at stop)
38: Fault output (all faults)
40: Present running time reach
41: Fault (excluding undervoltage) output

Description

0: No output
The DO has no function.

1: AC drive running
When the AC drive is running with output frequency (can be 0), the DO outputs an active signal.
2: Fault output (coast to stop)
When the AC drive stops upon a fault, the DO outputs an active signal.
3: Frequency level detection FDT1 output
When the running frequency is higher than the detected value, the DO outputs an active signal. When the running frequency is lower than the result of the detected value minus the FDT hysteresis value (F8-19 x F8-20), the DO stops outputting an active signal.
4: Frequency reach
When the running frequency of the AC drive is within a certain range (target frequency ± F8-21 x maximum frequency), the DO outputs an active signal.
5: Zero speed running (no output at stop)
When the output frequency is 0 during AC drive running, the DO outputs an active signal. The DO outputs an inactive signal when the AC drive is stopped.
6: Motor overload warning
The AC drive determines whether the motor load exceeds the overload pre-warning threshold according to the overload warning coefficient (F9-02) before performing the protection action. The DO outputs an active signal when the overload warning threshold is exceeded.
7: AC drive overload warning
The DO outputs an active signal 10s before the AC drive performs overload protection.
11: Simple PLC cycle completed
The DO outputs a pulse signal with the width of 250 ms when the simple PLC completes one cycle.
12: Accumulative running time reach
The DO outputs an active signal when the accumulative running time of the AC drive exceeds the value of F8-17 (accumulative running time threshold).
13: Frequency limited
The DO outputs an active signal when the frequency reference exceeds the frequency upper or lower limit, and the output frequency of AC drive reaches the upper or lower limit.
15: Ready to run
The DO outputs an active signal when the AC drive is ready for running without any fault after power-on.
17: Frequency upper limit reach
The DO outputs an active signal when the running frequency reaches the frequency upper limit (F0-12).

18: Frequency lower limit reach (no output at stop)
If F8-14 (running mode when frequency reference is below lower limit) is set to 1 (stop), the DO outputs an inactive signal no matter whether the running frequency reaches the frequency lower limit.
When F8-14 is set to 0 (run at the lower limit frequency) or 2 (run at zero speed) and the running frequency reaches the lower limit, the DO outputs an active signal.
19: Undervoltage state
The DO outputs an active signal when undervoltage occurs on the AC drive.
20: Communication
Whether the DO is active or inactive is determined by communication address 0x2001.
24: Accumulative power-on time reached
The DO outputs an active signal when the accumulative power-on time of the AC drive (F7-13) exceeds the value of F8-16 (accumulative power-on time threshold).
26: Output upon frequency 1 reach
When the running frequency of the AC drive is within the detection range set by F8-30 (frequency detection value 1), the DO outputs an active signal.
Frequency detection range: F8-30 - F8-31 x F0-10 (Maximum frequency) to F8-30 + F8-31 x F0-10
28: Output upon current 1 reach
When the output current of the AC drive is within the detection range set by F8-38 (detection level of current 1), the DO outputs an active signal.
Current detection range: F8-38 – F8-39 x F1-03 (rated motor current) to F8-38 + F8-39 x F1-03
30: Output upon expiration of scheduled time
With the timing function (F8-42) enabled, when the present running time of the AC drive reaches the set time, the DO outputs an active signal. The timing duration is set by F8-43 and F8-44.
31: AI1 input limit exceeded
The DO outputs an active signal when AI1 input is higher than the value of F8-46 (AI1 input voltage upper limit) or lower than the value of F8-45 (AI1 input voltage lower limit).
32: Load loss
The DO outputs an active signal when load loss occurs.
33: Reverse running
The DO outputs an active signal when the AC drive runs in the reverse direction.
34: Zero current state
When the output current of the AC drive is within the zero-current range for a period exceeding F8-35 (zero current detection delay), the DO outputs an active signal. Zero current detection range = 0 to F8-34 x F1-03

36: Output current limit exceeded
When the output current of the AC drive is greater than F8-36 (output overcurrent threshold) for a period exceeding F8-37 (output overcurrent detection delay), the DO outputs an active signal.
37: Frequency lower limit reached (output at stop)
The DO outputs an active signal when the running frequency reaches the frequency lower limit (F0--14). The DO also outputs an active signal when the AC drive stops.
38: Fault output (all faults)
If a fault occurs on the AC drive and the AC drive continues to run upon fault, the DO outputs an active signal.
For details about the fault protection action, see F9-47 to F9-50.
40: Present running time reach
The DO outputs an active signal when the present running time of the AC drive is longer than the value of F8-53 (current running time threshold).
41: Fault (excluding undervoltage) output
When a fault occurs on the AC drive (excluding undervoltage), the DO outputs an active signal.

F5-04 **DI/DO output function selection (applicable only to MD200XXX-NC models)**

Address:	0xF504	Effective mode:	-
Min.:	0	Unit:	-
Max.:	41	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0: No output
1: AC drive running
2: Fault output (coast to stop)
3: Frequency level detection FDT1 output
4: Frequency reach
5: Zero-speed running (no output at stop)
6: Motor overload warning
7: AC drive overload warning
11: Simple PLC cycle completed
12: Accumulative running time reach
13: Frequency limited
15: Ready to run
17: Frequency upper limit reach
18: Frequency lower limit reach (no output at stop)
19: Undervoltage output
20: Communication
24: Accumulative power-on time reach
26: Output upon frequency 1 reach
28: Output upon current 1 reach
30: Output upon expiration of scheduled time
31: AI1 input limit exceeded
32: Load loss
33: Reverse running
34: Zero current state
36: Output current limit exceeded
37: Frequency lower limit reach (output at stop)
38: Fault output (all faults)
40: Present running time reach
41: Fault (excluding undervoltage) output

Description

Same as F5-02

F5-07 **AO1 function selection**

Address:	0xF507	Effective mode:	-
Min.:	0	Unit:	-
Max.:	16	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Running frequency
1: Frequency reference
2: Output current (0 to two times the rated motor current)
3: Output torque (absolute value)
4: Output power
5: Output voltage
6: Pulse input
7: AI1
12: Communication settings
13: Motor speed
14: Output current (0.0-1000.0 A)
15: Bus voltage

Description

-

F5-10 **AO1 zero offset coefficient**

Address:	0xF50A	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

In the AO curve, if "b" represents the zero offset, "k" represents the gain, "Y" represents the actual output, and "X" represents the standard output, the actual output is as follows: Y = kX + b. The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value of the analog output at 0 V to 10 V (or 0 mA to 20 mA) output without zero offset or gain adjustment.

Zero offset = Zero offset coefficient x 10 V (20 mA)

The AC drive supports two AOs, namely, AO1 and AO2. AO1 and AO2 can be used to indicate the internal running parameters in the analog mode. The indicated parameters are defined by F5-07 and F5-08.

F5-11 **AO1 gain**

Address:	0xF50B	Effective mode:	-
Min.:	-10.00	Unit:	-
Max.:	10.00	Data type:	Int16

Default mode:	1.00	Change mode:	At once

Value range:

-10.00 to +10.00

Description

In the AO curve, if "b" represents the zero offset, "k" represents the gain, "Y" represents the actual output, and "X" represents the standard output, the actual output is as follows: Y = kX + b. The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value of analog output at 0 V to 10 V (or 0 mA to 20 mA) output without zero offset or gain adjustment.

Zero offset = Zero offset coefficient x 10 V (20 mA)

The AC drive supports two AOs, namely, AO1 and AO2. AO1 and AO2 can be used to indicate the internal running parameters in the analog mode. The indicated parameters are defined by F5-07 and F5-09.

F5-18 **Relay 1 output delay**

Address:	0xF512	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	3600.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0 to 3600.0

Description

This parameter indicates the output delay of relay 1 on the control board. Relay 1 on the control board outputs an active signal after the time set by F5-18 expires.

F5-20 **DI/DO output delay (applicable only to MD200XXX-NC models)**

Address:	0xF514	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	3600.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0 to 3600.0

Description

This parameter indicates the DI/DO output delay. The DI/DO outputs an active signal after the time set by F5-20 expires.

F5-22 **DO active mode settings**

Address:	0xF516	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1111	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Ones: Reserved
0: Positive logic
1: Negative logic
Tens: Relay 1
0: Positive logic
1: Negative logic
Hundreds: Reserved
0: Positive logic
1: Negative logic
Thousands: DI/DO
0: Positive logic
1: Negative logic
Ten thousands: Reserved
0: Positive logic
1: Negative logic

Description

The tens and thousands positions of F5-22 are used to set the active mode of DOs to which F5-02 and F5-04 correspond.

0: Positive logic (same as NO contact)
Active state: The DO and the COM/CME terminal are internally connected.
Inactive state: The DO is disconnected from the COM/CME terminal.
1: Negative logic (same as NC contact)
Active state: The DO is disconnected from the COM/CME terminal.
Inactive state: The DO and the COM/CME terminal are internally connected.

7.7 F6 Start/Stop Control

F6-00 **Start mode**

Address:	0xF600	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16

Default mode:	0	Change mode:	At once

Value range:

0: Direct start

1: Flying start

Description

0: Direct start

This mode is applicable to most load applications. Startup with the startup frequency is applicable to load hoisting applications such as elevators and cranes.

1: Flying start

In some applications, the motor rotates before the AC drive is started. In flying start, the AC drive tracks the motor speed and direction automatically to start the spinning motor without impact. For example, when an instantaneous power failure of the grid occurs, the AC drive in the running state is powered off, but the motor is still running due to inertia. In this case, the AC drive must detect the actual speed of the motor to control the asynchronous motor again. Otherwise, overcurrent or overvoltage can occur on the AC drive during start, which may damage the power transistor of the AC drive.

F6-01 **Flying start mode**

Address:	0xF601	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: From the stop frequency

1: From the mains frequency

2: From the maximum frequency

Description

The start frequency of flying start upon restart varies with different modes.

The motor rotation direction cannot be detected during flying start. Therefore, the direction defined by the present start command must be the same as the direction at the last stop event. Otherwise, flying start fails.

The search mode from the stop frequency is to search for 0 Hz from the frequency at the previous stop. If external force drives the motor to a higher speed than the speed at stop, the flying start mode is not applicable.

F6-03 **Startup frequency**

Address:	0xF603	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	10.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 10.00 Hz

Description

This parameter defines the startup frequency for direct start of the AC drive. When the startup frequency is lower than the frequency reference, the AC drive stays in the standby state and does not start.

F6-04 **Startup frequency hold time**

Address:	0xF604	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0s to 100.0s

Description

This parameter defines the hold time during which the output frequency remains at the startup frequency. After this hold time expires, the AC drive accelerates to the frequency reference.

F6-07 **Acceleration/Deceleration mode**

Address:	0xF607	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Linear acceleration/deceleration

1: Static S-curve acceleration/deceleration

2: Dynamic S-curve acceleration/deceleration

Description

It is used to set the frequency change mode during the AC drive start and stop process.
0: The output frequency increases or decreases linearly.
1: The output frequency increases or decreases according to the S-curve when the target frequency changes dynamically. This mode is applicable to applications requiring smooth running and quick response in real time.

F6-08 **Time proportion of S-curve start segment**

Address:	0xF608	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	30.0	Change mode:	At stop

Value range:
0.0% to 100.0%
Description
The sum of F6-08 (time proportion of S-curve start segment) and F6-09 (time proportion of S-curve end segment) must be lower than or equal to 100%.

F6-09 **Time proportion of S-curve end segment**

Address:	0xF609	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	30.0	Change mode:	At stop

Value range:
0.0% to 100.0%
Description
The sum of F6-08 (time proportion of S-curve start segment) and F6-09 (time proportion of S-curve end segment) must be lower than or equal to 100%.

F6-10 **Stop mode**

Address:	0xF60A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Decelerate to stop
1: Coast to stop

Description

0: Decelerate to stop
Upon receiving the stop command, the AC drive decreases the output frequency to 0 and then stops based on the deceleration time.
1: Coast to stop
Upon receiving the stop command, the AC drive immediately stops output. The motor then coasts to stop according to the mechanical inertia.

F6-11 **Start frequency of DC braking at stop**

Address:	0xF60B	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

In a decelerate-to-stop process, the AC drive starts DC braking when the running frequency drops to the frequency set by F6-11.

F6-12 **Waiting time of DC braking at stop**

Address:	0xF60C	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 100.0s

Description

When the running frequency decreases to the start frequency of DC braking at stop, the AC drive stops output for a period and then starts DC braking. This parameter is used to prevent faults such as overcurrent when DC braking starts at a high speed.

F6-13 **DC braking current at stop**

Address:	0xF60D	Effective mode:	-

Min.:	0	Unit:	%
Max.:	100	Data type:	UInt16
Default mode:	50	Change mode:	At once

Value range:

0% to 100%

Description

A larger DC braking current at stop indicates greater braking force. 100% corresponds to the rated motor current. The upper limit of the DC braking current is 80% the rated current of the AC drive by default.

F6-14 **DC braking time at stop**

Address:	0xF60E	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 100.0s

Description

This parameter specifies the hold time of DC braking. If it is set to 0, DC braking is disabled.

F6-21 **Demagnetization time (valid in SVC mode)**

Address:	0xF615	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	5.00	Data type:	UInt16
Default mode:	0.50	Change mode:	At once

Value range:

0.00s to 5.00s

Description

In the vector mode, when flying start is enabled (F6-00 = 1) and the motor has residual magnetism, the AC drive cannot be started. After the voltage output of the AC drive is disconnected for at least the time set by F6-21, the AC drive can be started.

F6-22 **Min. output frequency**

Address:	0xF616	Effective mode:	-

Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

-

7.8 F7 Operating Panel and Display

F7-00 **LED default display check**

Address:	0xF700	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 1

Description

This parameter is used to enable or disable the LED default display check.

F7-01 **MF.K key function selection**

Address:	0xF701	Effective mode:	-
Min.:	0	Unit:	-
Max.:	5	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: MF.K key unavailable

1: Switchover between the operating panel control mode and remote command control mode

2: Switchover between forward run and reverse run

3: Forward jog (long press MF.K to start jog and release the key to end)

4: Reverse jog (long press MF.K to start jog and release the key to end)

5: Reserved

Description

The MF.K key is a multi-functional key. This parameter is used to set the function of the MF.K key.

0: MF.K key unavailable
The MF.K key does not work.
1: Switchover between the operating panel control mode and remote command control mode (terminal or communication). When F0-02 is set to 0 (operating panel), the MF.K key does not work. When F0-02 is set to 1 (terminal), the MF.K key is used for switchover between the terminal control mode and the operating panel control mode. When F0-02 is set to 2 (communication), the MF.K key is used for switchover between the communication control mode and operating panel control mode.
2: Switchover between forward run and reverse run
The MF.K key is used for changing the direction of the frequency reference. This function is valid only when the operating panel is set as the command source.
3: Forward jog
The MF.K key is used for enabling forward jog (FJOG). This function is valid only when the operating panel is set as the command source.
4: Reverse jog
The MF.K key is used for enabling reverse jog (RJOG). This function is valid only when the operating panel is set as the command source.
5: Reserved

F7-02 **STOP/RESET key availability**

Address:	0xF702	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:
0: STOP/RESET key available only in keypad control mode
1: STOP/RESET key available in any operation mode
Description
The STOP/RESET key on the operating panel is used for stop/reset. This parameter is used to set the availability of the STOP/RESET key.
0: STOP/RESET key available only in keypad control mode
The STOP/RESET key is valid only in the keypad control mode.
1: STOP/RESET key available in any operating mode
The STOP/RESET key is valid in any operating mode.

F7-03 **Parameter 1 display on LED during operation**

Address:	0xF703	Effective mode:	-

Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	31	Change mode:	At once

Value range:

Bit 0: Running frequency (Hz)
Bit 1: Frequency reference (Hz)
Bit 2: Bus voltage (V)
Bit 3: Output voltage (V)
Bit 4: Output current (A)
Bit 5: Output power (kW)
Bit 6: Output torque (%)
Bit 7: DI status
Bit 8: DO status
Bit 9: AI1 voltage (V)
Bit 10: Reserved
Bit 11: Voltage of external operating panel potentiometer (V)
Bit 12: Count value
Bit 13: Length value
Bit 14: Load speed display
Bit 15: PID reference

Description

If a parameter needs to be displayed during running, set its corresponding bit to 1. After converting the binary number to a hexadecimal number, set it in F7-03. To show the PID reference, DO status, DI status, and running frequency (Hz), set the corresponding bit to 1. The binary number is 1000 0001 1000 0001, which is 8181H in hexadecimal after conversion.

F7-04 **Parameter 2 display on LED during operation**

Address:	0xF704	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Bit 0: PID feedback
Bit 1: PLC stage
Bit 2: Pulse input frequency (kHz)
Bit 3: Running frequency 2 (Hz)
Bit 4: Remaining running time
Bit 5: AI1 voltage before correction (V)
Bit 6: Voltage of external operating panel potentiometer before correction (V)
Bit 7: Reserved
Bit 8: Motor speed (applicable only to single-phase MD200SXX models)
Bit 9: Current power-on time (hour)
Bit 10: Current running time (min.)
Bit 11: Pulse input frequency (Hz)
Bit 12: Communication setting value
Bit 13: Reserved
Bit 14: Main frequency X display
Bit 15: Auxiliary frequency Y display

Description

If a parameter needs to be displayed during running, set its corresponding bit to 1. After converting the binary number to a hexadecimal number, set it in F7-04. For example, to show the main frequency X, communication setting value, current running time (min.), current power-on time (hour), and pulse input reference (kHz), set the corresponding bit to 1. The binary number is 0101 0110 0000 0100, which is 5604H in hexadecimal after conversion.

F7-05 **Parameter display on LED upon stop**

Address:	0xF705	Effective mode:	-
Min.:	0	Unit:	-
Max.:	8191	Data type:	UInt16
Default mode:	51	Change mode:	At once

Value range:

Bit 0: Frequency reference (Hz)
Bit 1: Bus voltage (V)
Bit 2: DI state
Bit 3: DO state
Bit 4: AI1 voltage (V)
Bit 5: Reserved
Bit 6: Voltage (V) of external operating panel potentiometer
Bit 7: Count value
Bit 8: Length value
Bit 9: PLC stage
Bit 10: Load speed
Bit 11: PID reference
Bit 12: Pulse input frequency (kHz)

Description

If a parameter needs to be displayed when the AC drive stops, set its corresponding bit to 1. After converting the binary number to a hexadecimal number, set it in F7-05.

For example, to show the length value, count value, AI1 voltage (V), DI status, bus voltage (V), and frequency reference (Hz), set the corresponding bit to 1. The binary number is 0000 0001 1001 0111, which is 0197H in hexadecimal after conversion.

F7-06 **Load transmission ratio**

Address:	0xF706	Effective mode:	-
Min.:	0.001	Unit:	-
Max.:	65.000	Data type:	UInt16
Default mode:	1.000	Change mode:	At once

Value range:

0.001 to 65.000

Description

This parameter defines the ratio of the actual load to the motor speed.

F7-07 **Drive unit heatsink temperature**

Address:	0xF707	Effective mode:	-
Min.:	0	Unit:	°C
Max.:	999	Data type:	Int16
Default mode:	0	Change mode:	Unchangeable

Value range:

0°C to 999°C

Description

This parameter indicates the heatsink temperature of the drive unit.

F7-08 **Product No.**

Address:	0xF708	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 to 655.35

Description

This parameter shows the product No. of the AC drive.

F7-09 **Accumulative running time**

Address:	0xF709	Effective mode:	-
Min.:	0	Unit:	h
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 h to 65535 h

Description

This parameter indicates the accumulative running time of the AC drive.

F7-10 **Performance software version**

Address:	0xF70A	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 to 655.35

Description

This parameter indicates the performance software version of the AC drive.

F7-11 **Function software version**

Address:	0xF70B	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 to 655.35

Description

This parameter indicates the function software version of the AC drive.

F7-12 **Number of decimal places for load speed display**

Address:	0xF70C	Effective mode:	-
Min.:	10	Unit:	-
Max.:	22	Data type:	UInt16
Default mode:	20	Change mode:	At once

Value range:

Ones: Number of decimal places for U0-14
0: 0 decimal place
1: 1 decimal place
2: 2 decimal places
Tens: Number of decimal places for U0-19
0: 0 decimal place
1: 1 decimal place
2: 2 decimal places

Description

The ones position of this parameter is used to set the number of decimal places for U0-14 (load speed), and the tens position of this parameter is used to set the number of decimal places for U0-19 (feedback speed).

0: 0 decimal place
No decimal places are retained.
1: 1 decimal place
One decimal place is retained.
2: 2 decimal places
Two decimal places are retained.

F7-13 **Accumulative power-on time**

Address:	0xF70D	Effective mode:	-
Min.:	0	Unit:	h
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0h to 65535h

Description

This parameter indicates the accumulative power-on time of the AC drive.

F7-14 **Accumulative power consumption**

Address:	0xF70E	Effective mode:	-
Min.:	0	Unit:	kW h
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0-65535 kW h

Description

This parameter indicates the accumulative power consumption of the AC drive.

F7-15 **Temporary performance software version**

Address:	0xF70F	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 to 655.35

Description

This parameter indicates the temporary performance software version of the AC drive.

F7-16 **Temporary function software version**

Address:	0xF710	Effective mode:	-
Min.:	0.00	Unit:	-
Max.:	655.35	Data type:	UInt16

Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 to 655.35

Description

This parameter indicates the temporary function software version of the AC drive.

7.9 F8 Supplementary Functions

F8-00 **Jog frequency**

Address:	0xF800	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	2.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter defines the running frequency of the AC drive in the jog mode.

F8-01 **Jog acceleration time**

Address:	0xF801	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	20.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

This parameter defines the acceleration time of the AC drive in the jog mode.

F8-02 **Jog deceleration time**

Address:	0xF802	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	20.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

This parameter defines the deceleration time of the AC drive in the jog mode.

F8-03 **Acceleration time 2**

Address:	0xF803	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

The AC drive provides four groups of acceleration time, which can be switched by the DI. This parameter defines the second group of acceleration time.

F8-04 **Deceleration time 2**

Address:	0xF804	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

The AC drive provides four groups of deceleration time, which can be switched by using the DI. This parameter defines the second group of deceleration time.

F8-07 **Acceleration time 4 (applicable only to single-phase MD200SXX models)**

Address:	0xF807	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

The AC drive provides four groups of acceleration time, which can be switched by the DI. This parameter defines the fourth group of acceleration time.

F8-08 **Deceleration time 4 (applicable only to single-phase MD200SXX models)**

Address:	0xF808	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

The AC drive provides four groups of deceleration time, which can be switched by the DI. This parameter defines the fourth group of deceleration time.

F8-12 **Dead-zone time of forward/reverse run**

Address:	0xF80C	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	3000.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 3000.0s

Description

This parameter defines the transition time at 0 Hz output during transition between forward running and reverse running.

F8-13 **Reverse running prohibition**

Address:	0xF80D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

When F8-13 is valid, the motor runs at zero frequency after a reverse command is input to the AC drive.

F8-14 Running mode when running frequency is below the frequency lower limit

Address:	0xF80E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Run at frequency lower limit

1: Stop

2: Run at zero speed

Description

0: Run at frequency lower limit

If the running frequency is lower than the frequency lower limit, the AC drive operates at the frequency lower limit.

1: Stop

If the running frequency is lower than the frequency lower limit, the AC drive stops in the mode set by F6-10.

2: Run at zero speed

If the running frequency is lower than the frequency lower limit, the AC drive operates at zero speed.

F8-16 Accumulative power-on time threshold

Address:	0xF810	Effective mode:	-
Min.:	0	Unit:	h
Max.:	65000	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0h to 65000h

Description

This parameter is used to set the accumulative power-on time threshold of the AC drive. When F7-13 (accumulative power-on time) exceeds F8-16 (accumulative power-on time threshold), the DO outputs an active signal.

F8-17 Accumulative running time threshold

Address:	0xF811	Effective mode:	-
Min.:	0	Unit:	h
Max.:	65000	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0h to 65000h

Description

This parameter is used to set the accumulative running time threshold of the AC drive. When F7-09 (accumulative running time) exceeds F8-17 (accumulative running time threshold), the DO outputs an active signal.

F8-18 Protection upon start

Address:	0xF812	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

The AC drive is equipped with startup protection to prevent the motor from responding to commands upon unexpected power-on or fault reset.

F8-19 Frequency detection value (FDT1)

Address:	0xF813	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500.00	Data type:	UInt16
Default mode:	50.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

When the running frequency is higher than the frequency detection value (FDT1), the DO outputs an active signal. When the running frequency is lower than the result of frequency detection value (FDT1) minus frequency detection hysteresis (FDT1), the DO outputs an inactive signal. The valid range is from 0.00 Hz to F0-10 (maximum frequency).

F8-20 **Frequency detection hysteresis (FDT1)**

Address:	0xF814	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	5.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

Frequency detection hysteresis (FDT1) = F8-19 x F8-20 When the running frequency is higher than F8-19, the DO outputs an active signal. When the running frequency is lower than a specific value (F8-19 - F8-19 x F8-20), the DO outputs an inactive signal.

F8-21 **Detection frequency amplitude**

Address:	0xF815	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

When the running frequency of the AC drive is in the specific range (frequency reference ± F0-10 x F8-21), the DO outputs an active signal.

F8-25 **Switchover frequency between acceleration time 1 and acceleration time 2**

Address:	0xF819	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter is used to select the acceleration/deceleration time based on the running frequency range during operation. It is valid only when motor 1 is selected (F0-24 motor parameter group selection = 0) and the DI function is not set to 16 (acceleration/deceleration time selection terminal 1) or 17 (acceleration/deceleration time selection terminal 2). The valid range is from 0.00 Hz to F0-10 (Maximum frequency).

F8-26 **Switchover frequency between deceleration time 1 and deceleration time 2**

Address:	0xF81A	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter is used to select the acceleration/deceleration time based on the running frequency range during operation. It is valid only when motor 1 is selected (F0-24 motor parameter group selection = 0) and the DI function is not set to 16 (acceleration/deceleration time selection terminal 1) or 17 (acceleration/deceleration time selection terminal 2). The valid range is from 0.00 Hz to F0-10 (Maximum frequency).

F8-27 **Priority setting of jog through terminal**

Address:	0xF81B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

This parameter defines whether to set the highest priority to the jog function allocated to the terminal. When F8-27 is set to 1 and any of F4-00 to F4-09 is set to 4 (forward jog) or 5 (reverse jog) during operation, the AC drive enters the jog state immediately.

F8-30 Detection frequency 1

Address:	0xF81E	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	50.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

When the running frequency of the AC drive is within the frequency detection range, the DO outputs an active signal. The valid value range of this parameter is from 0.00 Hz to F0-10 (Maximum frequency).

F8-31 Detection frequency amplitude 1

Address:	0xF81F	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

When the running frequency ranges from the value of (F8-30 - F8-31 x F0-10) to the value of (F8-30 + F8-31 x F0-10), the DO outputs an active signal.

F8-34 Zero current detection value

Address:	0xF822	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	300.0	Data type:	UInt16
Default mode:	5.0	Change mode:	At once

Value range:

0.0% to 300.0%

Description

When the output current of the AC drive is lower than or equal to F8-34 (zero current detection value) for a period exceeding F8-35 (zero current detection delay), the DO outputs an active signal.

F8-35 **Zero current detection delay**

Address:	0xF823	Effective mode:	-
Min.:	0.01	Unit:	s
Max.:	600.00	Data type:	UInt16
Default mode:	0.10	Change mode:	At once

Value range:

0.01s to 600.00s

Description

When the output current of the AC drive is lower than or equal to F8-34 (zero current detection value) for a period exceeding F8-35 (zero current detection delay), the DO outputs an active signal.

F8-36 **Output overcurrent threshold**

Address:	0xF824	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	300.0	Data type:	UInt16
Default mode:	200.0	Change mode:	At once

Value range:

0.0% to 300.0%

Description

When the output current of the AC drive is higher than F8-36 (output current threshold) for a period exceeding F8-37 (output overcurrent detection delay), the DO outputs an active signal.

F8-37 **Output overcurrent detection delay**

Address:	0xF825	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	600.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00s to 600.00s

Description

When the output current of the AC drive is higher than F8-36 (output current threshold) for a period exceeding F8-37 (output overcurrent detection delay), the DO outputs an active signal.

F8-38 **Detection current 1**

Address:	0xF826	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	300.0	Data type:	UInt16
Default mode:	100.0	Change mode:	At once

Value range:

0.0% to 300.0%

Description

When the output current of the AC drive ranges from the value of (F8-38 - F8-39 x F1-03) to the value of (F8-38 + F8-39 x F1-03), the DO outputs an active signal.

F8-39 **Detection current amplitude 1**

Address:	0xF827	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	300.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0% to 300.0%

Description

When the output current of the AC drive ranges from the value of (F8-38 - F8-39 x F1-03) to the value of (F8-38 + F8-39 x F1-03), the DO outputs an active signal.

F8-42 **Timing function**

Address:	0xF82A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Disable

1: Enable

Description

When F8-42 is set to 1 and the current running time of the AC drive reaches the set timing duration, the DO outputs an active signal. The timing duration is set by F8-43 and F8-44.

F8-43 **Scheduled running time setting**

Address:	0xF82B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: F8-44

1: AI1

2: Reserved

3: Reserved

Description

When this parameter is set to 0, the scheduled running time is set by F8-44.

When this parameter is set to 1, the scheduled running time equals to the result of (AI1 voltage/10 V) x F8-44. 100% of analog input corresponds to the value of F8-44.

F8-44 **Scheduled running time**

Address:	0xF82C	Effective mode:	-
Min.:	0.0	Unit:	Minute
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0-6500.0 minutes

Description

The scheduled running time is set by F8-43 and F8-44.

F8-45 **Lower limit of AI1 input voltage**

Address:	0xF82D	Effective mode:	-
Min.:	0.00	Unit:	V
Max.:	11.00	Data type:	UInt16
Default mode:	3.10	Change mode:	At once

Value range:

0.00 V to 11.00 V

Description

When the AI1 value is higher than F8-46 (upper limit of AI1 input voltage) or lower than F8-45 (lower limit of AI1 input voltage), the DO outputs an "AI1 input limit exceeded" active signal to indicate whether the AI1 input voltage is in the setting range.

F8-46 **Upper limit of AI1 input voltage**

Address:	0xF82E	Effective mode:	-
Min.:	0.00	Unit:	V
Max.:	11.00	Data type:	UInt16
Default mode:	6.80	Change mode:	At once

Value range:

0.00 V to 11.00 V

Description

When the AI1 value is higher than F8-46 (upper limit of AI1 input voltage) or lower than F8-45 (lower limit of AI1 input voltage), the DO outputs an "AI1 input limit exceeded" active signal to indicate whether the AI1 input voltage is in the setting range.

F8-48 **Fan working mode**

Address:	0xF830	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Fan working during AC drive operation

1: Fan working continuously

2: Fan working at specified temperature

Description

When this parameter is set to 0, the fan works when the AC drive is running. When the AC drive stops, the fan works if the heatsink temperature is higher than 40°C and stops if the heatsink temperature is lower than 40°C.

When this parameter is set to 1, the fan keeps working after power-on.

F8-49 **Wakeup frequency (applicable only to single-phase MD200SXX models)**

Address:	0xF831	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

In the hibernating state, when the frequency reference is equal to or larger than F8-49 (wakeup frequency) and the current running command is valid, the AC drive starts directly after the time set by F8-50 (wakeup delay) expires.

F8-50 **Wakeup delay (applicable only to single-phase MD200SXX models)**

Address:	0xF832	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

In the hibernating state, when the frequency reference is equal to or larger than F8-49 (wakeup frequency) and the current running command is valid, the AC drive starts directly after the time set by F8-50 (wakeup delay) expires.

F8-51 **Hibernation frequency (applicable only to single-phase MD200SXX models)**

Address:	0xF833	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

During AC drive running, when the frequency reference is lower than or equal to F8-51 (hibernation frequency) for the time longer than the value of F8-52 (hibernation delay), the AC drive enters the hibernating state and coasts to stop.

F8-52 **Hibernation delay (applicable only to single-phase MD200SXX models)**

Address:	0xF834	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6500.0s

Description

During AC drive running, when the frequency reference is lower than or equal to F8-51 (hibernation frequency) for the time longer than the value of F8-52 (hibernation delay), the AC drive enters the hibernating state and coasts to stop.

F8-53 **Present running time reach settings**

Address:	0xF835	Effective mode:	-
Min.:	0.0	Unit:	Minute
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At stop

Value range:

0.0-6500.0 minutes

Description

When the present running time reaches the value of F8-53, the DO outputs an active signal. This parameter is valid only for the present AC drive running time. The previous running time is not accumulated.

F8-54 **Output power correction coefficient**

Address:	0xF836	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	200.0	Data type:	UInt16
Default mode:	100.0	Change mode:	At once

Value range:

0.0% to 200.0%

Description

When the output power (U0-05) is not equal to the expected value, this parameter can be used to correct the output power linearly.

F8-55 Deceleration time for emergency stop

Address:	0xF837	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 6553.5s

Description

This parameter defines the deceleration time for emergency stop.

F8-57 Speed proportional synchronous control

Address:	0xF839	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

-

F8-58 Master/Slave selection in synchronous control

Address:	0xF83A	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0: Master

1: Slave

Description

-

7.10 F9 Fault and Protection

F9-00 **Motor overload protection**

Address:	0xF900	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

This parameter specifies whether to enable the motor overload protection function. The AC drive judges whether the motor is overloaded based on the inverse time-lag curve. When motor overload is detected, the AC drive reports an overload fault.

0: Disable

Motor overload protection is disabled. When this parameter is set to 0, install a thermal relay between the drive and the motor for protection.

1: Enable

Motor overload protection is enabled.

F9-01 **Motor overload protection gain**

Address:	0xF901	Effective mode:	-
Min.:	0.20	Unit:	-
Max.:	10.00	Data type:	UInt16
Default mode:	1.00	Change mode:	At once

Value range:

0.20 to 10.00

Description

The motor overload protection gain is calculated according to the percentage of time when the motor runs continuously at a certain overload point without reporting an overload fault.

This parameter is used to adjust the actual overload fault report time of the AC drive when motor overload occurs.

F9-02 **Motor overload warning coefficient**

Address:	0xF902	Effective mode:	-

Min.:	50	Unit:	%
Max.:	100	Data type:	UInt16
Default mode:	80	Change mode:	At once

Value range:

50% to 100%

Description

The motor overload warning coefficient is calculated according to the percentage of time during which the motor runs continuously at a certain overload threshold without reporting the overload warning. A warning signal is sent to the control system through the DO before motor overload protection. The signal is used to determine how long in advance to send the warning signal before the motor overload protection is triggered. A larger coefficient means later transmission of the warning signal.

When the accumulative output current of the AC drive is higher than the value of the overload time (value Y of motor overload protection inverse time-lag curve) multiplied by F9-02 (motor overload warning coefficient), the multi-functional DO of the AC drive outputs a motor overload warning signal.

F9-07 **Protection against short circuit to ground**

Address:	0xF907	Effective mode:	-
Min.:	0	Unit:	-
Max.:	11	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

Ones: Protection against short circuit to ground upon power-on

0: Inactive

1: Active

Tens: Protection against short circuit to ground before operation

0: Inactive

1: Active

Description

This parameter defines whether to activate short circuit protection upon power-on and before operation through the ones and tens positions of this parameter.

F9-08 **Braking unit action start voltage**

Address:	0xF908	Effective mode:	-
Min.:	650	Unit:	V
Max.:	800	Data type:	UInt16

Default mode:	760	Change mode:	At stop

Value range:

650 V to 800 V

Description

This parameter defines the start voltage for brake unit actions to adjust the energy consumption efficiency of the braking resistor. When the motor is in the generation state, the DC bus voltage in the AC drive will rise. The braking unit can be used to control the DC bus voltage to consume the regenerative energy generated by the motor or feeds the regenerative energy back to the power supply.

Application scenarios:

In the V/f control mode, if the actual deceleration time of the motor is far longer than the set deceleration time, the motor decelerates too slowly. To enable the motor to decelerate quickly by enhancing the energy consumption of the braking resistor, you can set F9-08 to 690 V if the following conditions are met: The AC drive is equipped with a braking resistor or an energy feedback unit; The input voltage of the AC drive is 360 V to 420 V.

F9-09 **Number of automatic reset times**

Address:	0xF909	Effective mode:	-
Min.:	0	Unit:	-
Max.:	20	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 20

Description

This parameter defines the number of automatic fault reset times of the AC drive. If the number is exceeded, the AC drive stays in the faulty state.

F9-10 **Relay action selection upon automatic reset**

Address:	0xF90A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

This parameter is used to determine whether the fault output function of the DO takes effect during the automatic fault reset of the AC drive. The fault output function of the DO is defined by setting F5-04 to 2.

F9-11 **Fault automatic reset interval**

Address:	0xF90B	Effective mode:	-
Min.:	0.1	Unit:	s
Max.:	100.0	Data type:	UInt16
Default mode:	1.0	Change mode:	At once

Value range:

0.1s to 100.0s

Description

This parameter defines the duration from the time when the AC drive reports a fault to the time when an automatic fault reset is performed.

F9-12 **Input phase loss protection (applicable only to single-phase MD200TXX models)**

Address:	0xF90C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0 to 1

Description

This parameter is used to determine whether to enable input phase loss protection.

After the input phase loss protection function is enabled, if the three-phase input power supply, driver board, lightning protection board, main control board, or rectifier bridge is abnormal, the AC drive will report E12.00 (input phase loss).

F9-13 **Output phase loss protection**

Address:	0xF90D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	11	Data type:	UInt16

Default mode:	1	Change mode:	At once

Value range:

0 to 11

Description

This parameter is used to determine whether to enable output phase loss protection.

F9-14 **Type of the 1st fault**

Address:	0xF90E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	99	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0: No fault

1: Reserved

2: Overcurrent during acceleration (Err02)

3: Overcurrent during deceleration (Err03)

4: Overcurrent at constant speed (Err04)

5: Overvoltage during acceleration (Err05)

6: Overcurrent during deceleration (Err06)

7: Overvoltage at constant speed (Err07)

8: Pre-charge resistor overload (Err08)

9: Undervoltage (Err09)

10: AC drive overload (Err10)

11: Motor overload (Err11)

12: Input phase loss (Err12)

13: Output phase loss (Err13)

14: Module overheat (Err14)

15: External fault (Err15)

16: Communication error (Err16)
17: Reserved (Err17)
18: Current detection error (Err18)
19: Motor auto-tuning error (Err19)
20: Reserved (Err20)
21: Parameter read/write error (Err21)
22: Reserved (Err22)
23: Motor short-circuited to ground (Err23)
24: Reserved (Err24)
25: Reserved (Err25)
26: Running time reached (Err26)
27: User-defined fault 1
28: User-defined fault 2
29: Power-on time reached (Err29)
30: Load loss (Err30)
31: PID feedback loss during running (Err31)
32: Reserved (Err32)
33: Reserved (Err33)
34: Reserved (Err34)
35: Reserved (Err35)
36: Reserved (Err36)
37: Reserved (Err37)
38: Reserved (Err38)
39: Reserved (Err39)
40: Fast current limit timeout (Err40)
41: Reserved (Err41)
42: Excessive speed deviation (Err42)
43: Reserved (Err43)
44: Reserved (Err44)
45: Reserved (Err45)
46: Reserved (Err46)
47: Reserved (Err47)
48: Reserved (Err48)
49: Reserved (Err49)
50: Reserved (Err50)
51: Reserved (Err51)
52: Reserved (Err52)
53: Reserved (Err53)
55: Slave fault under master/slave control (Err55)

Description

This parameter displays the fault codes of the latest three (1st, 2nd, and 3rd or latest) faults. The host controller reads the communication address to obtain the fault code of the AC drive and triggers the AC drive to report the fault. The fault code can be viewed through the operating panel.

F9-15 **Type of the 2nd fault**

Address:	0xF90F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	99	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0: No fault
1: Reserved
2: Overcurrent during acceleration (Err02)
3: Overcurrent during deceleration (Err03)
4: Overcurrent at constant speed (Err04)
5: Overvoltage during acceleration (Err05)
6: Overcurrent during deceleration (Err06)
7: Overvoltage at constant speed (Err07)
8: Pre-charge resistor overload (Err08)
9: Undervoltage (Err09)
10: AC drive overload (Err10)
11: Motor overload (Err11)
12: Input phase loss (Err12)
13: Output phase loss (Err13)
14: Module overheat (Err14)
15: External fault (Err15)

16: Communication error (Err16)
17: Reserved (Err17)
18: Current detection error (Err18)
19: Motor auto-tuning error (Err19)
20: Reserved (Err20)
21: Parameter read/write error (Err21)
22: Reserved (Err22)
23: Motor short-circuited to ground (Err23)
24: Reserved (Err24)
25: Reserved (Err25)
26: Running time reached (Err26)
27: User-defined fault 1
28: User-defined fault 2
29: Power-on time reached (Err29)
30: Load loss (Err30)
31: PID feedback loss during running (Err31)
32: Reserved (Err32)
33: Reserved (Err33)
34: Reserved (Err34)
35: Reserved (Err35)
36: Reserved (Err36)
37: Reserved (Err37)
38: Reserved (Err38)
39: Reserved (Err39)
40: Fast current limit timeout (Err40)
41: Reserved (Err41)
42: Excessive speed deviation (Err42)
43: Reserved (Err43)
44: Reserved (Err44)
45: Reserved (Err45)
46: Reserved (Err46)
47: Reserved (Err47)
48: Reserved (Err48)
49: Reserved (Err49)
50: Reserved (Err50)
51: Reserved (Err51)
52: Reserved (Err52)
53: Reserved (Err53)
55: Slave fault under master/slave control (Err55)

Description

This parameter displays the fault codes of the latest three (1st, 2nd, and 3rd or latest) faults. The host controller reads the communication address to obtain the fault code of the AC drive and triggers the AC drive to report the fault. The fault code can be viewed through the operating panel.

F9-16 **Type of the 3rd (latest) fault**

Address:	0xF910	Effective mode:	-
Min.:	0	Unit:	-
Max.:	99	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0: No fault
1: Reserved
2: Overcurrent during acceleration (Err02)
3: Overcurrent during deceleration (Err03)
4: Overcurrent at constant speed (Err04)
5: Overvoltage during acceleration (Err05)
6: Overcurrent during deceleration (Err06)
7: Overvoltage at constant speed (Err07)
8: Pre-charge resistor overload (Err08)
9: Undervoltage (Err09)
10: AC drive overload (Err10)
11: Motor overload (Err11)
12: Input phase loss (Err12)
13: Output phase loss (Err13)
14: Module overheat (Err14)
15: External fault (Err15)

16: Communication error (Err16)
17: Reserved (Err17)
18: Current detection error (Err18)
19: Motor auto-tuning error (Err19)
20: Reserved (Err20)
21: Parameter read/write error (Err21)
22: Reserved (Err22)
23: Motor short-circuited to ground (Err23)
24: Reserved (Err24)
25: Reserved (Err25)
26: Running time reached (Err26)
27: User-defined fault 1
28: User-defined fault 2
29: Power-on time reached (Err29)
30: Load loss (Err30)
31: PID feedback loss during running (Err31)
32: Reserved (Err32)
33: Reserved (Err33)
34: Reserved (Err34)
35: Reserved (Err35)
36: Reserved (Err36)
37: Reserved (Err37)
38: Reserved (Err38)
39: Reserved (Err39)
40: Fast current limit timeout (Err40)
41: Reserved (Err41)
42: Excessive speed deviation (Err42)
43: Reserved (Err43)
44: Reserved (Err44)
45: Reserved (Err45)
46: Reserved (Err46)
47: Reserved (Err47)
48: Reserved (Err48)
49: Reserved (Err49)
50: Reserved (Err50)
51: Reserved (Err51)
52: Reserved (Err52)
53: Reserved (Err53)
55: Slave fault under master/slave control (Err55)

Description

This parameter displays the fault codes of the latest three (1st, 2nd, and 3rd or latest) faults. The host controller reads the communication address to obtain the fault code of the AC drive and triggers the AC drive to report the fault. The fault code can be viewed through the operating panel.

F9-17 **Frequency upon the latest fault**

Address:	0xF911	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 Hz to 655.35 Hz

Description

This parameter indicates the frequency of the AC drive upon the latest fault.

F9-18 **Current upon the latest fault**

Address:	0xF912	Effective mode:	-
Min.:	0.00	Unit:	A
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 A to 655.35 A

Description

This parameter indicates the current of the AC drive upon the latest fault.

F9-19 **Bus voltage upon the latest fault**

Address:	0xF913	Effective mode:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0 V to 6553.5 V

Description

This parameter indicates the bus voltage of the AC drive upon the latest fault.

F9-20 **DI state upon the latest fault**

Address:	0xF914	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9999	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 9999

Description

This parameter indicates the input terminal state of the AC drive upon the latest fault.

F9-21 **DO state upon the latest fault**

Address:	0xF915	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9999	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 9999

Description

This parameter indicate the output terminal state of the AC drive upon the latest fault.

F9-22 **AC drive state upon the latest fault**

Address:	0xF916	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter indicates the state of the AC drive upon the latest fault.

F9-23 **Power-on time upon the latest fault**

Address:	0xF917	Effective mode:	-
Min.:	0	Unit:	Minute

Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0-65535 minutes

Description

This parameter indicates the power-on duration of the AC drive upon the latest fault.

F9-24 **Running time upon the latest fault**

Address:	0xF918	Effective mode:	-
Min.:	0.0	Unit:	Minute
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0-6553.5 minutes

Description

This parameter indicates the running time of the AC drive upon the latest fault.

F9-27 **Frequency upon the 2nd fault**

Address:	0xF91B	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 Hz to 655.35 Hz

Description

This parameter indicates the frequency of the AC drive upon the second fault.

F9-28 **Current upon the 2nd fault**

Address:	0xF91C	Effective mode:	-
Min.:	0.00	Unit:	A
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 A to 655.35 A

Description

This parameter indicates the current of the AC drive upon the second fault.

F9-29 **Bus voltage upon the 2nd fault**

Address:	0xF91D	Effective mode:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0 V to 6553.5 V

Description

This parameter indicates the bus voltage of the AC drive upon the second fault.

F9-30 **Input terminal state upon the 2nd fault**

Address:	0xF91E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9999	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 9999

Description

This parameter indicates the input terminal state of the AC drive upon the second fault.

F9-31 **Output terminal state upon the 2nd fault**

Address:	0xF91F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9999	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 9999

Description

This parameter indicates the output terminal state of the AC drive upon the second fault.

F9-32 **AC drive state upon the 2nd fault**

Address:	0xF920	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter indicates the state of the AC drive upon the second fault.

F9-33 **Power-on time upon the 2nd fault**

Address:	0xF921	Effective mode:	-
Min.:	0	Unit:	Minute
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0-65535 minutes

Description

This parameter indicates the power-on duration of the AC drive upon the second fault.

F9-34 **Running time upon the 2nd fault**

Address:	0xF922	Effective mode:	-
Min.:	0	Unit:	Minute
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0-65535 minutes

Description

This parameter indicates the running time of the AC drive upon the second fault.

F9-37 **Frequency upon the 1st fault**

Address:	0xF925	Effective mode:	-
Min.:	0.00	Unit:	Hz

Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 Hz to 655.35 Hz

Description

This parameter indicates the frequency of the AC drive upon the first fault.

F9-38 **Current upon the 1st fault**

Address:	0xF926	Effective mode:	-
Min.:	0.00	Unit:	A
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 A to 655.35 A

Description

This parameter indicates the current of the AC drive upon the first fault.

F9-39 **Bus voltage upon the 1st fault**

Address:	0xF927	Effective mode:	-
Min.:	0.0	Unit:	V
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0 V to 6553.5 V

Description

This parameter indicates the bus voltage of the AC drive upon the first fault.

F9-40 **Input terminal state upon the 1st fault**

Address:	0xF928	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9999	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 9999

Description

This parameter indicates the input terminal state of the AC drive upon the first fault.

F9-41 **Output terminal state upon the 1st fault**

Address:	0xF929	Effective mode:	-
Min.:	0	Unit:	-
Max.:	9999	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 9999

Description

This parameter indicates the output terminal state of the AC drive upon the first fault.

F9-42 **Drive state upon the 1st fault**

Address:	0xF92A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter indicates the state of the AC drive upon the first fault.

F9-43 **Power-on time upon the 1st fault**

Address:	0xF92B	Effective mode:	-
Min.:	0	Unit:	Minute
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0-65535 minutes

Description

This parameter indicates the power-on time of the AC drive upon the first fault.

F9-44 Running time upon the 1st fault

Address:	0xF92C	Effective mode:	-
Min.:	0	Unit:	Minute
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0-65535 minutes

Description

This parameter indicates the running time of the AC drive upon the first fault.

F9-47 Fault protection action selection 1

Address:	0xF92F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	22222	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Ones: Motor overload (Err11)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Tens: Input phase loss (Err12)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Hundreds: Output phase loss (Err13)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Thousands: External fault (Err15)
0: Coast to Stop
1: Stop according to the stop mode
2: Continue to run
Ten thousands: Communication error (Err16)
0: Coast to Stop
1: Stop according to the stop mode
2: Continue to run

Description

The fault protection actions are set by the ones, tens, hundreds, thousands, and ten thousands places of this parameter.

0: Coast to stop
The AC drive coasts to stop.
1: Stop according to the stop mode
The AC drive stops according the specified stop mode.
2: Continue to run
The AC drive continues to run.

F9-48 **Fault protection action selection 2**

Address:	0xF930	Effective mode:	-
Min.:	0	Unit:	-
Max.:	22210	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
Ones: Reserved
0: Coast to stop
Tens: Parameter read/write abnormal (Err21)
0: Coast to stop
1: Stop according to the stop mode
Hundreds: Reserved
0: Coast to stop
1: Stop according to the stop mode
Thousands: Reserved
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Ten thousands: Running time reach (Err26)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Description
The fault protection actions are set by the ones, tens, hundreds, thousands, and ten thousands places of this parameter.
0: Coast to stop
The AC drive coasts to stop.
1: Stop according to the stop mode
The AC drive stops according the specified stop mode.
2: Continue to run
The AC drive continues to run.

F9-49 **Fault protection action selection 3**

Address:	0xF931	Effective mode:	-
Min.:	0	Unit:	-
Max.:	22222	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Ones: User-defined fault 1 (Err27)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Tens: User-defined fault 2 (Err28)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Hundreds: Power-on time reach (Err29)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run
Thousands: Load loss (Err30)
0: Coast to stop
1: Decelerate to stop
2: Continue to run at 7% of the rated motor frequency after deceleration and resume to the set frequency if the load recovers
Ten thousands: PID loss during running (Err31)
0: Coast to stop
1: Stop according to the stop mode
2: Continue to run

Description

The fault protection actions are set by the ones, tens, hundreds, thousands, and ten thousands places of this parameter.
0: Coast to stop
The AC drive coasts to stop.
1: Stop according to the stop mode
The AC drive stops according the specified stop mode.
2: Continue to run
The AC drive continues to run.

F9-54 **Frequency for continuing to run upon fault**

Address:	0xF936	Effective mode:	-

Min.:	0	Unit:	-
Max.:	4	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Current running frequency
1: Frequency reference
2: Frequency upper limit
3: Frequency lower limit
4: Backup frequency upon fault

Description

This parameter is used to select the frequency when the AC drive is faulty. If a fault occurs during the operation of the AC drive and the fault protection action is set to "Continue to run", the AC drive displays A** and continues to run at the frequency set through F9-54.

F9-55 **Backup frequency upon fault**

Address:	0xF937	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	100.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

This parameter defines the backup frequency of the AC drive upon a fault. If a fault occurs during the operation of the AC drive and the fault protection action is set to "Run at the backup frequency" (F9-54 = 4), the AC drive displays A** and continues to run at the backup frequency.

F9-59 **Power dip ride-through function**

Address:	0xF93B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: Disable
1: Bus voltage constant control
2: Decelerate to stop

Description

The function enables the AC drive to keep running upon instantaneous power failure. When a power failure occurs, the AC drive makes the motor work in the generating state to keep the bus voltage around the "threshold for enabling power dip ride-through". This function prevents the AC drive from stopping due to input undervoltage.

0: Disable

The power dip ride-through function is disabled.

1: Bus voltage constant control

When power failure occurs, the bus voltage stays at a value around the "threshold for enabling power dip ride-through". In this mode, when the power grid recovers from the failure, the AC drive restores the target output frequency based on the acceleration time.

2: Decelerate to stop

When a power failure occurs, the AC drive decelerates to stop. In this mode, when the power grid recovers from the failure, the AC drive continues decelerating to 0 Hz and stops, and will restart only after receiving a start command.

F9-60 **Threshold for recovery from power dip ride-through**

Address:	0xF93C	Effective mode:	-
Min.:	80	Unit:	%
Max.:	100	Data type:	UInt16
Default mode:	85	Change mode:	At stop

Value range:

80% to 100%

Description

This parameter is used to set the threshold for recovery from power dip ride-through for the AC drive. 100% corresponds to 540 V. This value is slightly lower than the bus voltage before power failure.

Upon power loss, the bus voltage is maintained at about F9-62 (threshold for enabling power dip ride-through). When the power supply recovers, the bus voltage rises from F9-62 (threshold for enabling power dip ride-through) to F9-60 (threshold for recovery from power dip ride-through). During this period, the output frequency of the AC drive keeps decreasing until the bus voltage reaches F9-60 (threshold for recovery from power dip ride-through).

F9-61 **Duration for judging voltage recovery from power dip ride-through**

Address:	0xF93D	Effective mode:	-

Min.:	0.0	Unit:	s
Max.:	100.0	Data type:	UInt16
Default mode:	0.5	Change mode:	At stop

Value range:

0.0s to 100.0s

Description

This parameter is used to set the time required for the bus voltage to rise from F9-60 (threshold for recovery from power dip ride-through) to the voltage before power failure.

F9-62 **Threshold for enabling power dip ride-through**

Address:	0xF93E	Effective mode:	-
Min.:	60	Unit:	%
Max.:	100	Data type:	UInt16
Default mode:	80	Change mode:	At stop

Value range:

60% to 100%

Description

This parameter defines the bus voltage level upon power failure. When a power failure occurs, the bus voltage is retained at a value around F9-62 (Threshold for enabling power dip ride-through).

F9-63 **Protection against load loss**

Address:	0xF93F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

This parameter defines whether to enable the load loss protection function. After this function is enabled, when the output current of the AC drive falls below F9-64 for the time longer than the value of F9-65, the AC drive performs the load loss protection action (selected by F9-49, coast to stop by default). Once the load recovers during protection, the AC drive will restore to run at the frequency reference.

F9-64 **Load loss detection value**

Address:	0xF940	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	10.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

When the output current of the AC drive falls below F9-64 (load loss detection value) for the time longer than the value of F9-65 (load loss detection time), the AC drive performs the load loss protection action (selected through F9-49, coast to stop by default).

Once the load recovers during protection, the AC drive will restore to run at the frequency reference.

F9-65 **Load loss detection time**

Address:	0xF941	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	60.0	Data type:	UInt16
Default mode:	1.0	Change mode:	At once

Value range:

0.0s–60.0s

Description

When the output current of the AC drive falls below F9-64 (load loss detection value) for the time longer than the value of F9-65 (load loss detection time), the AC drive performs the load loss protection action (selected through F9-49, coast to stop by default).

Once the load recovers during protection, the AC drive will restore to run at the frequency reference.

F9-71 **Power dip ride-through gain Kp**

Address:	0xF947	Effective mode:	-
Min.:	0	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	40	Change mode:	At once

Value range:

0 to 100

Description

This parameter is valid only when F9-59 (Power dip ride-through function selection) is set to 1 (Decelerate).

If undervoltage is likely to occur during power dip ride-through, increase the power dip ride-through gain and the power dip ride-through integral coefficient.

F9-72 **Power dip ride-through integral coefficient Ki**

Address:	0xF948	Effective mode:	-
Min.:	0	Unit:	-
Max.:	100	Data type:	UInt16
Default mode:	30	Change mode:	At once

Value range:

0 to 100

Description

This parameter is valid only when F9-59 (Power dip ride-through function selection) is set to 2 (Decelerate).

If undervoltage is likely to occur during power dip ride-through, increase the power dip ride-through gain and the power dip ride-through integral coefficient.

F9-73 **Deceleration time of power dip ride-through**

Address:	0xF949	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	300.0	Data type:	UInt16
Default mode:	20.0	Change mode:	At once

Value range:

0.0s to 300.0s

Description

It is valid only when F9-59 is set to 2 (decelerate to stop).

When the bus voltage is below F9-62, the AC drive decelerates to stop. The deceleration time is determined by F9-73 but not F0-18.

7.11 FA PID

FA-00 **PID reference source**

Address:	0xFA00	Effective mode:	-

Min.:	0	Unit:	-
Max.:	6	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: FA-01

1: AI1

External operating panel potentiometer

3: Reserved

4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

5: Communication

6: Multi-reference

Description

This parameter is used to select the PID reference source. The PID reference source is a relative value. The value 100% corresponds to 100% of the feedback signal of the controlled system.

0: FA-01

The PID reference source is set by FA-01 (PID reference).

1: AI1

The PID reference source is set by AI1.

2: External operating panel potentiometer

The PID reference source is set by external operating panel potentiometer.

3: Reserved

4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

The PID reference source is set by DI4 (applicable to MD200XXX models) or DI/DO (applicable to MD200XXX-NC models). The frequency is calculated according to the relationship curve between the pulse frequency and the operating frequency.

5: Communication (1000H)

The PID reference source is set by remote communication.

6: Multi-reference

The PID reference source is set by multi-reference. In this case, different combinations of DI states correspond to different frequency references. The four multi-reference terminals can provide 16 state combinations, corresponding to 16 frequency references. Note: When FA-00 is set to 6 (multi-reference), FC-51 (multi-reference 0 source) cannot be set to 5 (PID reference).

FA-01 **PID digital reference**

Address:	0xFA01	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16

Default mode:	50.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

When FA-00 (PID reference source) is set to 0, this parameter must be set. When the parameter value is set to 100%, it corresponds to the maximum feedback value.

FA-02 **PID feedback source**

Address:	0xFA02	Effective mode:	-
Min.:	0	Unit:	-
Max.:	8	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: AI1

1: External operating panel potentiometer

2: Reserved

3: Reserved

4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)

5: Communication

6: Reserved

7: Reserved

8: Reserved

Description

This parameter defines the PID feedback source.

FA-03 **PID action direction**

Address:	0xFA03	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Positive effect

1: Negative effect

Description

0: Positive effect
When the feedback signal value is lower than the PID reference signal value, the output frequency of the AC drive rises.
1: Negative effect
When the feedback signal value is lower than the PID reference signal value, the output frequency of the AC drive declines.

FA-04 **PID reference and feedback range**

Address:	0xFA04	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	1000	Change mode:	At once

Value range:
0 to 65535
Description
This parameter is used for display of the PID reference and feedback, which are dimensionless. For example, if this parameter is set to 1000, the PID reference (0% to 100%) corresponds linearly to the feedback value (0 to 1000).

FA-05 **Proportional gain Kp1**

Address:	0xFA05	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	1000.0	Data type:	UInt16
Default mode:	20.0	Change mode:	At once

Value range:
0.0 to 1000.0
Description
This parameter defines the proportional gain Kp in PID control. The deviation reduction speed depends on the proportional coefficient Kp. A larger Kp value indicates faster deviation reduction but higher possibility of oscillation. A smaller Kp value indicates lower possibility of oscillation but slower deviation reduction.

FA-06 **Integral time Ti1**

Address:	0xFA06	Effective mode:	-
Min.:	0.01	Unit:	s
Max.:	10.00	Data type:	UInt16

Default mode:	2.00	Change mode:	At once

Value range:

0.01s to 10.00s

Description

This parameter defines the integral time Ti in PID control. It decides the integral regulating intensity of the PID regulator. Shorter integral time indicates greater adjustment intensity.

FA-07 **Differential time Td1**

Address:	0xFA07	Effective mode:	-
Min.:	0.000	Unit:	s
Max.:	10.000	Data type:	UInt16
Default mode:	0.000	Change mode:	At once

Value range:

0.000s to 10.000s

Description

This parameter defines the differential time Td in PID control. It decides the regulating intensity of the PID regulator on the deviation change. Longer differential time indicates greater adjustment intensity.

FA-08 **PID reverse cut-off frequency**

Address:	0xFA08	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00 Hz to 500.00 Hz

Description

When the frequency source is only the PID, the PID reverse cut-off frequency is the minimum value of the current PID output. When the frequency source is main frequency + PID, FA-08 acts on the main frequency + PID and outputs the minimum frequency value after "main frequency + PID" operation.

FA-09 **PID deviation limit**

Address:	0xFA09	Effective mode:	-
Min.:	0.0	Unit:	%

Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

When the deviation is within the PID deviation limit, no adjustment is required. This parameter helps balance the accuracy and stability of the system output.

FA-10 **PID differential limit**

Address:	0xFA0A	Effective mode:	-
Min.:	0.00	Unit:	%
Max.:	100.00	Data type:	UInt16
Default mode:	0.10	Change mode:	At once

Value range:

0.00% to 100.00%

Description

This parameter is used to set the PID differential output range. In PID control, the differential operation is prone to cause system oscillation. Therefore, the PID differential output is restricted to a specific range.

FA-11 **PID reference change time**

Address:	0xFA0B	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	650.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00s to 650.00s

Description

This parameter defines the time required for the PID reference to change from 0.0% to 100.0%.

FA-12 **PID feedback filter time**

Address:	0xFA0C	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	60.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00s to 60.00s

Description

This parameter defines the filter time of PID feedback. The filter helps to reduce interference on the feedback but degrades the responsive performance of the process closed-loop system.

FA-13 **PID output filter time**

Address:	0xFA0D	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	60.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00s to 60.00s

Description

This parameter defines the filter time of PID output frequency. The filter helps to weaken sudden change of the AC drive output frequency but degrades the responsive performance of the process closed-loop system.

FA-15 **Proportional gain Kp2**

Address:	0xFA0F	Effective mode:	-
Min.:	0.0	Unit:	-
Max.:	1000.0	Data type:	UInt16
Default mode:	20.0	Change mode:	At once

Value range:

0.0 to 1000.0

Description

This parameter defines the proportional gain Kp in PID control. The deviation reduction speed depends on the proportional coefficient Kp. A larger Kp value indicates faster deviation reduction but higher possibility of oscillation. A smaller Kp value indicates lower possibility of oscillation but slower deviation reduction.

FA-16 **Integral time Ti2**

Address:	0xFA10	Effective mode:	-
Min.:	0.01	Unit:	s
Max.:	10.00	Data type:	UInt16

Default mode:	2.00	Change mode:	At once

Value range:

0.01s to 10.00s

Description

This parameter defines the integral time Ti in PID control. It decides the integral regulating intensity of the PID regulator. Shorter integral time indicates greater adjustment intensity.

FA-17 **Differential time Td2**

Address:	0xFA11	Effective mode:	-
Min.:	0.000	Unit:	s
Max.:	10.000	Data type:	UInt16
Default mode:	0.000	Change mode:	At once

Value range:

0.000s to 10.000s

Description

This parameter defines the differential time Td in PID control. It decides the regulating intensity of the PID regulator on the deviation change. Longer differential time indicates greater adjustment intensity.

FA-18 **PID parameter switchover condition**

Address:	0xFA12	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable switchover

1: Switchover by DI

2: Automatic switchover based on deviation

3: Automatic switchover based on operating frequency

Description

This parameter is used for switchover between two groups of PID parameters.

0: Disable switchover

No switchover is performed.

1: Switchover by DI
To use this function, assign function 43 (PID parameter switchover) to the DI. If the DI is inactive, parameter group 1 (FA-05 to FA-07) is selected. If the DI is active, parameter group 2 (FA-15 to FA-17) is selected.
2: Automatic switchover based on deviation
If the absolute value of the deviation between the reference and the feedback is smaller than FA-19 (PID parameter switchover deviation 1), parameter group 1 is selected. If the absolute value of the deviation between the reference and the feedback is greater than FA-20 (PID parameter switchover deviation 2), parameter group 2 is selected. If the absolute value of the deviation between the reference and the feedback is between FA-19 (PID parameter switchover deviation 1) and FA-20 (PID parameter switchover deviation 2), the PID parameters are linear interpolation values of the two sets of PID parameters.
3: Automatic switchover based on operating frequency
PID parameters are switched automatically based on the running frequency of the AC drive.

FA-19 **PID parameter switchover deviation 1**

Address:	0xFA13	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	20.0	Change mode:	At once

Value range:
0.0% to 100.0%
Description
The value 100% corresponds to the maximum deviation between the reference and feedback. The setting range is from 0.0% to FA-20 (PID parameter switchover deviation 2).

FA-20 **PID parameter switchover deviation 2**

Address:	0xFA14	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	80.0	Change mode:	At once

Value range:
0.0% to 100.0%

Description

The value 100% corresponds to the maximum deviation between the reference and feedback. The setting range is from FA-19 (PID parameter switchover deviation 1) to 100%.

FA-21 PID initial value

Address:	0xFA15	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

When the AC drive starts up, the PID starts closed-loop calculation only after the PID output is fixed to the PID initial value (FA-21) and lasts the time longer than the value of FA-22 (PID initial value active time).

FA-22 PID initial value active time

Address:	0xFA16	Effective mode:	-
Min.:	0.00	Unit:	s
Max.:	650.00	Data type:	UInt16
Default mode:	0.00	Change mode:	At once

Value range:

0.00s to 650.00s

Description

When the AC drive starts up, the PID starts closed-loop calculation only after the PID output is fixed to the PID initial value (FA-21) and lasts the time longer than the value of FA-22 (PID initial value active time).

FA-23 Max. error between two outputs

Address:	0xFA17	Effective mode:	-
Min.:	0.00	Unit:	%
Max.:	100.00	Data type:	UInt16
Default mode:	1.00	Change mode:	At once

Value range:

0.00% to 100.00%

Description

-

FA-24 **Min. error between two outputs**

Address:	0xFA18	Effective mode:	-
Min.:	0.00	Unit:	%
Max.:	100.00	Data type:	UInt16
Default mode:	1.00	Change mode:	At once

Value range:

0.00% to 100.00%

Description

-

FA-25 **PID integral**

Address:	0xFA19	Effective mode:	-
Min.:	0	Unit:	-
Max.:	11	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Ones: Integral separation
0: Inactive
1: Active
Tens: Whether integral operations stop when the output reaches the limit
0: Continue integral operation
1: Stop integral operation

Description

Ones: Integral separation
0: Inactive. When integral separation is inactive, the integral separation remains inactive no matter whether the DI is active.
1: Active. When integral separation is active and the DI allocated with the PID integral pause function is active (F4-00 = 22), the PID integral operation stops. In this case, only proportional and differential operations take effect.
Tens: Whether integral operations stop when the output reaches the limit
0: Continue integral operation
1: Stop integral operation
After the PID operation output reaches the maximum or minimum value, you can choose whether to stop the integral operation. If you choose to stop the PID integral operation, the PID overshoot can be reduced.

FA-26 **Detection value of PID feedback loss**

Address:	0xFA1A	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0% to 100.0%

Description

This parameter is used to determine whether the PID feedback is lost. When the PID feedback remains lower than the value of FA-26 (detection value of PID feedback loss) for the time longer than the value of FA-27 (detection time of PID feedback loss), the AC drive reports E31.00.

When this parameter is set to 0, PID feedback loss detection is disabled.

FA-27 **Detection time of PID feedback loss**

Address:	0xFA1B	Effective mode:	-
Min.:	0.0	Unit:	s
Max.:	20.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s to 20.0s

Description

This parameter is used to determine whether the PID feedback is lost. When the PID feedback remains lower than the value of FA-26 (detection value of PID feedback loss) for the time longer than the value of FA-27 (detection time of PID feedback loss), the AC drive reports E31.00.

FA-28 **Selection of PID operation at stop**

Address:	0xFA1C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

This parameter is used to determine whether to continue PID operation when the AC drive stops. Generally, the PID operation is disabled when the drive stops.

7.12 FB Wobble, Fixed Length, and Counting

FB-00 **Wobble setting mode**

Address:	0xFB00	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0: Relative to the central frequency

1: Relative to the maximum frequency

Description

0: Relative to the center frequency (F0-07, frequency reference superposition). This option applies to variable wobble systems, in which the wobble changes with the center frequency (frequency reference).

1: Relative to the maximum frequency (F0-10). This option applies to fixed wobble systems, in which the wobble is a fixed value calculated based on the maximum frequency.

FB-01 **Wobble amplitude**

Address:	0xFB01	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0% to 100.0%

Description

When FB-01 is set to 0, the wobble function is disabled.

FB-02 **Jump frequency amplitude**

Address:	0xFB02	Effective mode:	-

Min.:	0.0	Unit:	%
Max.:	50.0	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0% to 50.0%

Description

This parameter and the wobble are used to define the jump frequency, namely, jump frequency = wobble x FB-02. The wobble running frequency is limited by the frequency upper limit and frequency lower limit.

FB-03 **Wobble cycle**

Address:	0xFB03	Effective mode:	-
Min.:	0.1	Unit:	s
Max.:	3000.0	Data type:	UInt16
Default mode:	10.0	Change mode:	Unchangeable

Value range:

0.1s to 3000.0s

Description

This parameter defines the time of a complete wobble cycle.

FB-04 **Triangular wave rising time coefficient**

Address:	0xFB04	Effective mode:	-
Min.:	0.1	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	50.0	Change mode:	Unchangeable

Value range:

0.1% to 100.0%

Description

This parameter indicates the percentage of triangular wave rising time to FB-03 (wobble cycle).

FB-05 **Reference length**

Address:	0xFB05	Effective mode:	-
Min.:	0	Unit:	(m)
Max.:	65535	Data type:	UInt16

Default mode:	1000	Change mode:	At once

Value range:

0 m to 65535 m

Description

This parameter specifies the length to be controlled in the fixed length control mode.

FB-06 **Actual length**

Address:	0xFB06	Effective mode:	-
Min.:	0	Unit:	(m)
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 m to 65535 m

Description

The actual length is a monitored value. Actual length (FB-06) = Number of pulses sampled by terminal/Number of pulses per each meter (FB-07)

FB-07 **Number of pulses per meter**

Address:	0xFB07	Effective mode:	-
Min.:	0.1	Unit:	-
Max.:	6553.5	Data type:	UInt16
Default mode:	100.0	Change mode:	At once

Value range:

0.1 to 6553.5

Description

This parameter indicates the number of pulses output per one meter. The length pulse is sampled by DI4 or DI/DO, which must be allocated with the length count input function (F4-04 = 27). DI4 is used for MD200XXX models and DI/DO for MD200XXX-NC models.

FB-08 **Set count value**

Address:	0xFB08	Effective mode:	-
Min.:	1	Unit:	-
Max.:	65535	Data type:	UInt16

Default mode:	1000	Change mode:	At once

Value range:

1 to 65535

Description

When the count value reaches FB-08, the DO outputs an active signal indicating that the set count value has reached.

FB-09 **Designated count value**

Address:	0xFB09	Effective mode:	-
Min.:	1	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	1000	Change mode:	At once

Value range:

1 to 65535

Description

When the count value reaches FB-09, the DO outputs an active signal indicating that the designated count value has reached. FB-09 must be lower than or equal to FB-08 (set count value).

7.13 FC Multi-reference and Simple PLC

FC-00 **Multi-reference 0**

Address:	0xFC00	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

This parameter indicates the frequency reference of each speed. FC-00 to FC-15 correspond to 16 (from 0 to 15) frequency references. The frequency references are calculated as percentages corresponding to the maximum frequency. The value 100% corresponds to F0-10 (Maximum frequency). The AC drive provides four multi-reference terminals, which have 16 state combinations, corresponding to 16 frequency references.

The parameters in group FC are applicable to applications where the simple PLC is used as the main frequency. In some industrial applications, the AC motor supports the functions of start/stop, time- and segment-based speed regulation, and simple automatic forward and reverse run. To implement other control functions, you need to install a PLC. However, using the simple PLC can provide the control functions without a PLC. Simple PLCs are typically used in industrial equipment such as mixture mixing and industrial washing machines. When the simple PLC is used as the main frequency (F0-03 = 7),
the parameters in group FC need to be set.

FC-01 **Multi-reference 1**

Address:	0xFC01	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

Same as FC-00

FC-02 **Multi-reference 2**

Address:	0xFC02	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

Same as FC-00

FC-03 **Multi-reference 3**

Address:	0xFC03	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

Same as FC-00

FC-04 **Multi-reference 4**

Address:	0xFC04	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

Same as FC-00

FC-05 **Multi-reference 5**

Address:	0xFC05	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

Same as FC-00

FC-06 **Multi-reference 6**

Address:	0xFC06	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

Same as FC-00

FC-07 **Multi-reference 7**

Address:	0xFC07	Effective mode:	-

Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

Same as FC-00

FC-16 **Simple PLC running mode**

Address:	0xFC10	Effective mode:	-
Min.:	0	Unit:	-
Max.:	2	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Stop after running for one cycle

1: Keep final values after running for one cycle

2: Repeat after running for one cycle

Description

When the simple PLC is used as the main frequency, the running mode of the simple PLC is set by FC-16. FC-17 is used to determine whether the running stage and running frequency of the PLC are retained upon power failure or shutdown.

0: Stop after running for one cycle

The AC drive stops automatically after running for one cycle and starts again only after receiving a running command.

1: Keep final values after running for one cycle

The AC drive keeps the final running frequency and direction after running for one cycle and starts to run from the initial PLC state upon restart.

2: Repeat after running for one cycle

The AC drive automatically starts another cycle after running for one cycle and stops only after receiving a stop command.

FC-17 **Simple PLC retention selection upon power failure**

Address:	0xFC11	Effective mode:	-
Min.:	0	Unit:	-
Max.:	11	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

Ones: Retentive upon power failure

0: No

1: Yes

Tens: Retentive upon stop

0: No

1: Yes

Description

When the simple PLC is used as the main frequency, the running mode of the simple PLC is set by FC-16.

FC-17 is used to determine whether the running stage and running frequency of the PLC are retained upon power failure or shutdown.

Ones: Retention selection upon power failure

This parameter defines whether the PLC process starts again upon power-on. When it is set to 1, the AC drive retains the PLC running stage and running frequency upon power failure and continues to run from the retained values after the drive is powered on again.

Tens: Retention selection upon stop

This parameter defines whether the PLC process starts again upon power-on. When it is set to 1, the AC drive retains the PLC running stage and running frequency upon stop and continues to run from the retained values after the drive is started again.

FC-18 **Running time of speed reference 0 by simple PLC**

Address:	0xFC12	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-19 **Acceleration/deceleration time of speed reference 0 set by simple PLC**

Address:	0xFC13	Effective mode:	-

Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-20 **Running time of speed reference 1 by simple PLC**

Address:	0xFC14	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-21 **Acceleration/deceleration time of speed reference 1 set by simple PLC**

Address:	0xFC15	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-22 **Running time of speed reference 2 by simple PLC**

Address:	0xFC16	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-23 **Acceleration/deceleration time of speed reference 2 set by simple PLC**

Address:	0xFC17	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-24 **Running time of speed reference 3 by simple PLC**

Address:	0xFC18	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-25 Acceleration/deceleration time of speed reference 3 set by simple PLC

Address:	0xFC19	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-26 Running time of speed reference 4 by simple PLC

Address:	0xFC1A	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-27 Acceleration/deceleration time of speed reference 4 set by simple PLC

Address:	0xFC1B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16

Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-28 **Running time of speed reference 5 by simple PLC**

Address:	0xFC1C	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-29 **Acceleration/deceleration time of speed reference 5 set by simple PLC**

Address:	0xFC1D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-30 **Running time of speed reference 6 by simple PLC**

Address:	0xFC1E	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-31 **Acceleration/deceleration time of speed reference 6 set by simple PLC**

Address:	0xFC1F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-32 **Running time of speed reference 7 set by simple PLC**

Address:	0xFC20	Effective mode:	-
Min.:	0.0	Unit:	s (h)
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s (h) to 6500.0s (h)

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-33 **Acceleration/deceleration time of speed reference 7 set by simple PLC**

Address:	0xFC21	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

FC-18 to FC-49 define the running time and acceleration and deceleration time of 16 multi-speed references. The running time of each speed reference is the sum of acceleration or deceleration time and running time at constant speed and target frequency.

FC-50 **PLC running time unit**

Address:	0xFC32	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Second (s)

1: Hour (h)

Description

This parameter defines the unit of the PLC running time for each speed.

FC-51 **Multi-reference 0 setting mode**

Address:	0xFC33	Effective mode:	-
Min.:	0	Unit:	-
Max.:	6	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0: FC-00
1: AI1
2: Reserved
3: Reserved
4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
5: PID
6: Preset frequency (F0-08)
Description
Multi-reference 0 can be set through seven ways, including digital setting, analog input, pulse frequency, PID, and preset frequency.
0: FC-00
The frequency of multi-reference 0 is set by FC-00.
1: AI1
The frequency of multi-reference 0 is set by AI1.
2: Reserved
3: Reserved
4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
The frequency of multi-reference 0 is set by pulse frequency.
5: PID
The frequency of multi-reference 0 is set by PID.
6: Preset frequency (F0-08)
The frequency of multi-reference 0 is set by F0-08 (preset frequency).

7.14 FD Communication Baud Rate

FD-00 **Baud rate**

Address:	0xFD00	Effective mode:	-
Min.:	0	Unit:	-
Max.:	6009	Data type:	UInt16
Default mode:	5005	Change mode:	At once

Value range:

Ones: Modbus
0: 300 bit/s
1: 600 bit/s
2: 1200 bit/s
3: 2400 bit/s
4: 4800 bit/s
5: 9600 bit/s
6: 19200 bit/s
7: 38400 bit/s
8: 57600 bit/s
9: 115200 bit/s
Tens: Reserved

Hundreds: Reserved

Thousands: CANlink baud rate
0: 20 kbit/s
1: 50 kbit/s
2: 100 kbit/s
3: 125 kbit/s
4: 250 kbit/s
5: 500 kbit/s

Description

This parameter defines the speed of data transmission between the host controller and the AC drive. The higher the baud rate, the faster the communication speed.

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

FD-01 Modbus data format

Address:	0xFD01	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

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)

Description

This parameter defines the format of Modbus data transmitted between the host controller and the AC drive. Note that the data format of the host controller must be the same as that of the AC drive. Otherwise, communication fails.

FD-02 **Local address**

Address:	0xFD02	Effective mode:	-
Min.:	0	Unit:	-
Max.:	247	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0 to 247

Description

When the local address is set to 0 (broadcast address), the host controller broadcast is enabled.

The local address must be unique in the range of 1 to 247, which is the basis for point-point communication between the AC drive and the host controller.

FD-03 **Modbus response delay**

Address:	0xFD03	Effective mode:	-
Min.:	0	Unit:	ms
Max.:	20	Data type:	UInt16
Default mode:	2	Change mode:	At once

Value range:

0 ms to 20 ms

Description

This parameter defines the interval from the end of data receiving by the AC drive to the start of data transmission to the host controller.

If the response delay is shorter than the system processing time, the system processing time prevails. This means that the system processes data and then sends the data to the host controller. If the response delay is longer than the system processing time, the system processes data and waits for the response delay time. After the time elapses, the system sends the data to the host controller.

FD-04 **Communication timeout time**

Address:	0xFD04	Effective mode:	-

Min.:	0.0	Unit:	s
Max.:	60.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0s–60.0s

Description

When this parameter is set to 0.0s, the Modbus communication timeout time is invalid. Set it to 0.0s under normal circumstances. This parameter can be used to monitor communication status in a system with continuous communication. When it is set to an effective value, if the time interval between the current communication and the next communication exceeds FD-04 (Modbus communication interruption detection time), the system reports a communication fault (Err16).

FD-05 **Data transmission protocol**

Address:	0xFD05	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0 to 1

Description

Ones: Modbus

0: Non-standard Modbus. The number of bytes returned by the slave is one byte more than the byte stipulated in the standard Modbus protocol. Other read/write operations are the same as those stipulated in the standard Modbus protocol.

1: Standard Modbus. Only word-type parameters can be read and written. The reading command is 0x03 and writing command is 0x06. Reading and writing of bytes or bits are not supported.

FD-06 **Current resolution read through communication**

Address:	0xFD06	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: 0.01 A (valid when the power is equal to or lower than 55 kW)
1: 0.1 A

Description

This parameter is used to determine the current unit when the output current is read through communication.

FD-07 **Software tool selection**

Address:	0xFD07	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable
1: Enable

Description

-

7.15 FE User-defined Parameters

FE-00 **User-defined parameter 0**

Address:	0xFE00	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	7017	Change mode:	At once

Value range:

0 to 65535

Description

Group FE consists of user-defined parameters. Users can add commonly used parameters to group FE for convenient check and modification.

FE-01 **User-defined parameter 1**

Address:	0xFE01	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	7016	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-02 **User-defined parameter 2**

Address:	0xFE02	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-03 **User-defined parameter 3**

Address:	0xFE03	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-04 **User-defined parameter 4**

Address:	0xFE04	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-05 User-defined parameter 5

Address:	0xFE05	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-06 User-defined parameter 6

Address:	0xFE06	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-07 User-defined parameter 7

Address:	0xFE07	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-08 User-defined parameter 8

Address:	0xFE08	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-09 User-defined parameter 9

Address:	0xFE09	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-10 User-defined parameter 10

Address:	0xFE0A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-11 User-defined parameter 11

Address:	0xFE0B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-12 **User-defined parameter 12**

Address:	0xFE0C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-13 **User-defined parameter 13**

Address:	0xFE0D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-14 **User-defined parameter 14**

Address:	0xFE0E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-15 **User-defined parameter 15**

Address:	0xFE0F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-16 **User-defined parameter 16**

Address:	0xFE10	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-17 **User-defined parameter 17**

Address:	0xFE11	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-18 **User-defined parameter 18**

Address:	0xFE12	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-19 **User-defined parameter 19**

Address:	0xFE13	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-20 **User-defined parameter 20**

Address:	0xFE14	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	6768	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-21 **User-defined parameter 21**

Address:	0xFE15	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	6769	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-22 **User-defined parameter 22**

Address:	0xFE16	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-23 **User-defined parameter 23**

Address:	0xFE17	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-24 **User-defined parameter 24**

Address:	0xFE18	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-25 **User-defined parameter 25**

Address:	0xFE19	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-26 **User-defined parameter 26**

Address:	0xFE1A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-27 **User-defined parameter 27**

Address:	0xFE1B	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-28 **User-defined parameter 28**

Address:	0xFE1C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

Same as FE-00

FE-29 **User-defined parameter 29**

Address:	0xFE1D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-30 **User-defined parameter 30**

Address:	0xFE1E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

FE-31 **User-defined parameter 31**

Address:	0xFE1F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535
Description
Same as FE-00

7.16 FP Parameter Management

FP-00 **User password**

Address:	0x1F00	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:
0 to 65535

Description

This parameter indicates the user password.

FP-01 **Parameter initialization**

Address:	0x1F01	Effective mode:	-
Min.:	0	Unit:	-
Max.:	501	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: No operation

1: Restore to factory settings (excluding motor parameters)

2: Clear records

4: Back up current user parameters

20: Mechanical movement (conveyor belt) industry

21: Inertia (fan) industry

501: Restore user backup parameters

Description

This parameter sets the action upon parameter initialization of the AC drive.

0: No operation

The AC drive does not perform any operation.

1: Restore to factory settings

Most of the AC drive parameters are restored to factory settings. However, motor parameters, F0-22 (decimal places of frequency reference), fault records, F7-09 (accumulative running time), F7-13 (accumulative power-on time), F7-14 (accumulative power consumption), and F7-07 (IGBT heatsink temperature) are not restored.

2: Clear records

The fault records, F7-09 (accumulative running time), F7-13 (accumulative power-on time), and F7-14 (accumulative power consumption) are cleared.

4: Back up current user parameters

The current parameter settings are backed up.

501: Restore user backup parameters

Parameters backed up by setting FP-01 to 4 are restored.

FP-02 **Parameter group display**

Address:	0x1F02	Effective mode:	-
Min.:	0	Unit:	-
Max.:	11	Data type:	UInt16

Default mode:	11	Change mode:	At stop

Value range:

Ones: Parameter group U display
0: Not displayed
1: Displayed
Tens: Parameter group A display
0: Not displayed
1: Displayed

Description

This parameter is used to determine whether parameters in groups U and A are displayed on the operating panel.

FP-04 **Parameter modification**

Address:	0x1F04	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Enable
1: Disable

Description

This parameter sets whether the parameter can be modified.

7.17 A1 Virtual I/O

A1-07 **Function selection for AI1 used as DI**

Address:	0xA107	Effective mode:	-
Min.:	0	Unit:	-
Max.:	59	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

0: No function
1: Forward run (FWD)
2: Reverse run (REV)
3: Three-wire operation control
4: Forward jog (FJOG)
5: Reverse jog (RJOG)
6: Function as the UP key
7: Function as the DOWN key
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
15: Multi-reference terminal 4
16: Acceleration/deceleration terminal 1
18: Frequency reference switchover
19: Clear information set by UP/DOWN keys
20: Command source switchover terminal 1
21: Acceleration/Deceleration inhibited
22: PID pause
23: Simple PLC state reset
30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models)
32: Immediate DC braking
33: NC input of external fault
34: Frequency modification enable
35: PID operation direction reversal
36: External stop terminal 1
37: Control command switchover terminal 2

38: PID integral pause
39: Switchover between frequency source X and preset frequency
40: Switchover between frequency source Y and preset frequency
43: PID parameter switchover
47: Emergency stop
48: External stop terminal 2
49: Decelerate to DC braking
50: Clear current operating time
51: Two-wire/Three-wire control switchover
52: Reverse running prohibited
53: Reserved
54: Reserved
55: Reserved
56: Reserved
57: Reserved
58: Reserved
59: Reserved

Description

This parameter sets the function of the AI used as the DI. Functions 0 to 52 can be allocated to the AI in the same way as normal DIs. Functions 53 to 59 are reserved.

A1-10 **Active mode for AI used as DI**

Address:	0xA10A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	111	Data type:	UInt16
Default mode:	0	Change mode:	At stop

Value range:

Ones: AI1
0: Active high
1: Active low
Tens: Reserved

Hundreds: Reserved

Description

The ones position of this parameter is used to set the active mode for AI1 used as the DI.
0: Active high
The AI is active when the ones position of A1-10 is set to 0 and inactive when set to 1.

1: Active low

The AI is inactive when the ones position of A1-10 is set to 0 and active when set to 1.

7.18 A5 Control Optimization Parameters

A5-02 **Dead zone compensation mode**

Address:	0xA502	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0: No compensation

1: Compensation mode 1

Description

A dead zone must be reserved for the switch signals of the upper and lower switch transistors on the same bridge arm of the AC drive. Dead zone compensation can improve the current waveform when the motor runs at low frequencies.

A5-03 **Random PWM depth**

Address:	0xA503	Effective mode:	-
Min.:	0	Unit:	-
Max.:	10	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 10

Description

If the motor noise is loud, setting A5-03 to a non-zero value can reduce the motor noise. The higher the value, the better the effect of noise reduction. However, if the value is too high, the motor may be out of control. Therefore, set this parameter to 1 during commissioning and then increase by 1 each time based on the field application.

A5-04 **Pulse-by-pulse current limit**

Address:	0xA504	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	1	Change mode:	At once

Value range:

0: Disable

1: Enable

Description

This parameter is used to minimize the possibility of overcurrent faults, ensuring normal operation of the AC drive.

It is recommended to disable this function in hoist applications such as cranes.

A5-05 **Overmodulation coefficient**

Address:	0xA505	Effective mode:	-
Min.:	100	Unit:	%
Max.:	110	Data type:	UInt16
Default mode:	105	Change mode:	At stop

Value range:

100% to 110%

Description

This parameter defines the maximum output voltage coefficient in percentages. The maximum output voltage coefficient indicates the boost capacity of the maximum output voltage of the AC drive.

Increasing A5-05 will improve the maximum loading capacity in the motor field-weakening range, but will increase motor current ripple and heat. Decreasing A5-05 will weaken the maximum loading capacity in the motor field-weakening range, but will reduce motor current ripple and heat. Generally, this parameter needs no modification.

A5-06 **Undervoltage threshold**

Address:	0xA506	Effective mode:	-
Min.:	210	Unit:	V
Max.:	420	Data type:	UInt16
Default mode:	350	Change mode:	At once

Value range:

210 V to 420 V

Description

When the bus voltage is lower than the value set by A5-06, the AC drive reports E09.00, and E05.00 to E07.00.

A5-08 **Low speed carrier upper limit**

Address:	0xA508	Effective mode:	-
Min.:	0.0	Unit:	kHz
Max.:	8.0	Data type:	UInt16
Default mode:	0.0	Change mode:	At once

Value range:

0.0 kHZ to 8.0 kHZ

Description

The AC drive limits the carrier frequency during operation at low frequencies, causing the actual carrier frequency to be lower than that defined by F0-15. To make the actual carrier frequency the same as that defined by F0-15 during operation at low frequencies, set A5-08 to the same value as F0-15.

A5-09 **Overvoltage threshold**

Address:	0xA509	Effective mode:	-
Min.:	650.0	Unit:	V
Max.:	820.0	Data type:	UInt16
Default mode:	820.0	Change mode:	At stop

Value range:

650.0 V to 820.0 V

Description

When the bus voltage exceeds the setpoint of A5-06/A5-09, the AC drive reports Err09/Err05 to Err07.

7.19 A6 AI Curve Settings

A6-24 **Jump point set by AI1**

Address:	0xA618	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16

Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

This parameter indicates the jump point set by AI1.

A6-25 **Jump amplitude set by AI1**

Address:	0xA619	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.5	Change mode:	At once

Value range:

0.0% to 100.0%

Description

This parameter indicates the jump amplitude set by AI1.

A6-26 **Jump point set by external operating panel potentiometer**

Address:	0xA61A	Effective mode:	-
Min.:	-100.0	Unit:	%
Max.:	100.0	Data type:	Int16
Default mode:	0.0	Change mode:	At once

Value range:

-100.0% to +100.0%

Description

This parameter indicates the jump point set by external operating panel potentiometer

A6-27 **Jump amplitude set by external operating panel potentiometer**

Address:	0xA61B	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	100.0	Data type:	UInt16
Default mode:	0.5	Change mode:	At once

Value range:

0.0% to 100.0%

Description

This parameter indicates the jump amplitude set by external operating panel potentiometer

7.20 AA Vector Control Expansion Parameters

AA-05 **SVC speed filter**

Address:	0xAA05	Effective mode:	-
Min.:	5	Unit:	ms
Max.:	32	Data type:	UInt16
Default mode:	15	Change mode:	At once

Value range:

5 ms to 32 ms

Description

-

AA-06 **SVC speed feedback mode**

Address:	0xAA06	Effective mode:	-
Min.:	0	Unit:	-
Max.:	3	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 3

Description

-

AA-07 **SVC magnetic field adjustment bandwidth**

Address:	0xAA07	Effective mode:	-
Min.:	5.0	Unit:	Hz
Max.:	80.0	Data type:	UInt16
Default mode:	40.0	Change mode:	At once

Value range:

5.0 Hz to 80.0 Hz

Description

-

AA-08 **Low-speed current with the SVC magnetic field reference in the open loop control mode**

Address:	0xAA08	Effective mode:	-
Min.:	30	Unit:	%
Max.:	150	Data type:	UInt16
Default mode:	100	Change mode:	At once

Value range:

30% to 150%

Description

-

AA-09 **Switchover frequency in open loop control**

Address:	0xAA09	Effective mode:	-
Min.:	20.0	Unit:	Hz
Max.:	1000.0	Data type:	UInt16
Default mode:	40.0	Change mode:	At once

Value range:

20.0 Hz to 1000.0 Hz

Description

-

AA-10 **Speed fluctuation reduction coefficient in open loop control**

Address:	0xAA0A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	6	Data type:	UInt16
Default mode:	3	Change mode:	At once

Value range:

0 to 6

Description

-

AA-11 **Acceleration/Deceleration time in open loop control**

Address:	0xAA0B	Effective mode:	-
Min.:	1.0	Unit:	s
Max.:	10000.0	Data type:	UInt16

Default mode:	500.0	Change mode:	At once

Value range:

1.0s to 10000.0s

Description

-

AA-12 Resistance auto-tuning upon start

Address:	0xAA0C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	1	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0: Disable auto-tuning upon start

1: Enable auto-tuning upon start

Description

-

AA-13 Auto-tuned stator resistance coefficient 1 before startup

Address:	0xAA0D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

-

AA-14 Auto-tuned stator resistance coefficient 2 before startup

Address:	0xAA0E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	At once

Value range:

0 to 65535

Description

-

AA-15 **Auto-tuned stator resistance coefficient 3 before startup**

Address:	0xAA0F	Effective mode:	-
Min.:	0	Unit:	-
Max.:	-1	Data type:	Int16
Default mode:	0	Change mode:	At once

Value range:

0 to -1

Description

-

7.21 AC AI/AO Correction

AC-00 **Measured voltage 1 over AI1**

Address:	0xAC00	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16
Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is conducted on AI1, a correction curve is obtained based on two points, which corresponds to a measured voltage and a displayed voltage. The measured voltage is the voltage measured using a meter, and the displayed voltage is the AI1 voltage before correction (U0-21).

AC-01 **Displayed voltage 1 over AI1**

Address:	0xAC01	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16
Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is conducted on AI1, a correction curve is obtained based on two points, which corresponds to a measured voltage and a displayed voltage. The measured voltage is the voltage measured using a meter, and the displayed voltage is the AI1 voltage before correction (U0-21).

AC-02 **Measured voltage 2 over AI1**

Address:	0xAC02	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16
Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is conducted on AI1, a correction curve is obtained based on two points, which corresponds to a measured voltage and a displayed voltage. The measured voltage is the voltage measured using a meter, and the displayed voltage is the AI1 voltage before correction (U0-21).

AC-03 **Displayed voltage 2 over AI1**

Address:	0xAC03	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16
Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is conducted on AI1, a correction curve is obtained based on two points, which correspond to a measured voltage and a displayed voltage. The measured voltage is the voltage measured using a meter, and the displayed voltage is the AI1 voltage before correction (U0-21).

AC-12 **Target voltage 1 over AO1**

Address:	0xAC0C	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16

Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is performed on AO1, a correction curve is formed through two points, corresponding to a target voltage and a measured voltage. The target voltage is the expected output voltage, and the measured voltage is the output voltage measured.

AC-13 Measured voltage 1 over AO1

Address:	0xAC0D	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16
Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is performed on AO1, a correction curve is formed through two points, corresponding to a target voltage and a measured voltage. The target voltage is the expected output voltage, and the measured voltage is the output voltage measured.

AC-14 Target voltage 2 over AO1

Address:	0xAC0E	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16
Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is performed on AO1, a correction curve is formed through two points, corresponding to a target voltage and a measured voltage. The target voltage is the expected output voltage, and the measured voltage is the output voltage measured.

AC-15 **Measured voltage 2 over AO1**

Address:	0xAC0F	Effective mode:	-
Min.:	-10.000	Unit:	V
Max.:	10.000	Data type:	Int16
Default mode:	0.000	Change mode:	At once

Value range:

-10.000 V to +10.000 V

Description

When analog voltage correction is performed on AO1, a correction curve is formed through two points, corresponding to a target voltage and a measured voltage. The target voltage is the expected output voltage, and the measured voltage is the output voltage measured.

7.22 U0 Basic Monitoring Parameters

U0-00 **Running frequency (Hz)**

Address:	0x7000	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter indicates the running frequency (Hz) of the AC drive.

U0-01 **Frequency reference (Hz)**

Address:	0x7001	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	500	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 Hz to 500.00 Hz

Description

This parameter indicates the frequency reference (Hz) of the AC drive.

U0-02 **Bus voltage (V)**

Address:	0x7002	Effective mode:	-
Min.:	0.0	Unit:	V
Max.:	3000.0	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0 V to 3000.0 V

Description

This parameter indicates the bus voltage (V) of the AC drive.

U0-03 **Output voltage (V)**

Address:	0x7003	Effective mode:	-
Min.:	0	Unit:	V
Max.:	1140	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 V to 1140 V

Description

This parameter indicates the output voltage (V) of the AC drive.

U0-04 **Output current (A)**

Address:	0x7004	Effective mode:	-
Min.:	0.00	Unit:	A
Max.:	655.35	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 A to 655.35 A

Description

This parameter indicates the output current (A) of the AC drive.

U0-05 **Output power (kW)**

Address:	0x7005	Effective mode:	-
Min.:	0.0	Unit:	kW
Max.:	3276.7	Data type:	Int16

Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0 kW to 3276.7 kW

Description

This parameter indicates the output power (kW) of the AC drive.

U0-06 **Output torque (%)**

Address:	0x7006	Effective mode:	-
Min.:	-200.0	Unit:	%
Max.:	200.0	Data type:	Int16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

-200.0% to +200.0%

Description

This parameter indicates the output torque (%) of the AC drive.

U0-07 **DI state**

Address:	0x7007	Effective mode:	-
Min.:	0	Unit:	-
Max.:	32767	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 32767

Description

This parameter indicates the DI state value. After it is converted to binary data, each bit corresponds to one DI signal. The value 1 indicates that the input is high level. The value 0 indicates that the input is low level.

U0-08 **DO state**

Address:	0x7008	Effective mode:	-
Min.:	0	Unit:	-
Max.:	32767	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 32767

Description

This parameter indicates the DO state value. After it is converted to binary data, every bit corresponds to one DO signal. The value 1 indicates that the output is high level. The value 0 indicates that the output is low level.

U0-09 **AI1 voltage (V)**

Address:	0x7009	Effective mode:	-
Min.:	-10.57	Unit:	V
Max.:	10.57	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

-10.57 V to +10.57 V

Description

This parameter displays the actual input corrected voltage/current. The actual input voltage/current is corrected linearly to reduce the deviation between the analog input sampling voltage/current and the actual input voltage/current. For the analog input sampling voltage/current, see U0-21 and U0-22.

You can select voltage input or current input through J9 jumper cap on the control board.

U0-10 **Reserved**

Address mode:	0x700A	Effective: mode	-
Min.:	-10.57	Unit:	V
Max.:	10.57	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

-10.57 V to +10.57 V

Description

-

U0-11 **Voltage (V) input through external operating panel potentiometer**

Address:	0x700B	Effective mode:	-
Min.:	-10.57	Unit:	V
Max.:	10.57	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

-10.57 V to +10.57 V

Description

This parameter displays the corrected voltage/current input through the external operating panel potentiometer.

U0-12 **Count value (applicable only to single-phase MD200SXX models)**

Address:	0x700C	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

-

U0-13 **Length value (applicable only to single-phase MD200SXX models)**

Address:	0x700D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

-

U0-14 **Load speed display**

Address:	0x700E	Effective mode:	-
Min.:	0	Unit:	RPM
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 RPM to 65535 RPM

Description

This parameter displays the load speed.

U0-15 **PID reference**

Address:	0x700F	Effective mode:	-
Min.:	0	Unit:	%
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0% to 65535%

Description

PID reference = PID reference (percentage) x FA-04 (PID reference feedback range)

U0-16 **PID feedback**

Address:	0x7010	Effective mode:	-
Min.:	0	Unit:	%
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0% to 65535%

Description

PID feedback = PID feedback (percentage) x FA-04 (PID reference feedback range)

U0-17 **PLC stage**

Address:	0x7011	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

A total of 16 stages are available.

U0-18 **Pulse input frequency (kHz)**

Address:	0x7012	Effective mode:	-
Min.:	0.00	Unit:	kHz

Max.:	100.00	Data type:	UInt16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 kHz to 100.00 kHz

Description

This parameter displays the high-speed pulse sampling frequency of DI4, which is applicable to MD200XXX models, or that of DIO, which is applicable to MD200XXX-NC models. The values of U0-18 and U0-27 are the same in different units. The unit of U0-27 is Hz and the unit of U0-18 is kHz.

U0-19 **Feedback speed (Hz)**

Address:	0x7013	Effective mode:	-
Min.:	-5000.0	Unit:	Hz
Max.:	5000.0	Data type:	Int16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

-5000.0 Hz to +5000.0 Hz

Description

When the tens position of F7-12 is set to 1, the number of decimal places of U0-19 is 1 and the display range is -500.0 Hz to +500.0 Hz.

When the tens position of F7-12 is set to 2, the number of decimal places of U0-19 is 2 and the display range is -320.00 Hz to +320.00 Hz.

U0-20 **Remaining running time (min)**

Address:	0x7014	Effective mode:	-
Min.:	0.0	Unit:	Minute
Max.:	6500.0	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0-6500.0 minutes

Description

This parameter displays the remaining running time.

U0-21 **AI1 voltage before correction (V)**

Address:	0x7015	Effective mode:	-
Min.:	-10.570	Unit:	V

Max.:	10.570	Data type:	Int16
Default mode:	0.000	Change mode:	Unchangeable

Value range:

-10.570 V to +10.570 V

Description

This parameter displays the analog input sampling voltage/current. The actual input voltage/current is corrected linearly to reduce the deviation between the analog input sampling voltage/current and the actual input voltage/current. For the actual input corrected voltage/current, see U0-09 and U0-11.

U0-22 External operating panel potentiometer voltage before correction

Address:	0x7016	Effective mode:	-
Min.:	-10.570	Unit:	V
Max.:	10.570	Data type:	Int16
Default mode:	0.000	Change mode:	Unchangeable

Value range:

-10.570 V to +10.570 V

Description

This parameter displays the analog input sampling voltage/current. The actual input voltage/current is corrected linearly to reduce the deviation between the analog input sampling voltage/current and the actual input voltage/current. For the actual input corrected voltage/current, see U0-09 and U0-11.

U0-24 Motor speed (RPM) (applicable only to single-phase MD200SXX models)

Address:	0x7018	Effective mode:	-
Min.:	0	Unit:	RPM
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 RPM to 65535 RPM

Description

This parameter displays the current operating speed of the motor.

U0-25 Current power-on time (min)

Address:	0x7019	Effective mode:	-

Min.:	0	Unit:	Minute
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0-65535 minutes

Description

This parameter displays the current power-on time.

U0-26 **Current running time (min)**

Address:	0x701A	Effective mode:	-
Min.:	0.0	Unit:	Minute
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0-6553.5 minutes

Description

This parameter displays the current running time.

U0-27 **Pulse input frequency (Hz)**

Address:	0x701B	Effective mode:	-
Min.:	0	Unit:	Hz
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 Hz to 65535 Hz

Description

This parameter displays the high-speed pulse sampling frequency of DI4, which is applicable to MD200XXX models, or that of DI/DO, which is applicable to MD200XXX-NC models. The values of U0-27 and U0-18 are the same in different units. The unit of U0-27 is Hz and the unit of U0-18 is kHz.

U0-28 **Communication setting**

Address:	0x701C	Effective mode:	-
Min.:	-100.00	Unit:	%
Max.:	100.00	Data type:	Int16

Default mode:	0.00	Change mode:	Unchangeable

Value range:

-100.00% to +100.00%

Description

This parameter indicates the data written by the communication address 0x1000.

U0-30 Main frequency X display (Hz)

Address:	0x701E	Effective mode:	-
Min.:	-500.00	Unit:	Hz
Max.:	500	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

-500.00 Hz to +500.00 Hz

Description

This parameter displays the main frequency reference.

U0-31 Auxiliary frequency Y display (Hz)

Address:	0x701F	Effective mode:	-
Min.:	-500.00	Unit:	Hz
Max.:	500	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

-500.00 Hz to +500.00 Hz

Description

This parameter displays the auxiliary frequency reference.

U0-32 Memory address view

Address:	0x7020	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter is used to view any memory address.

U0-35 Target torque (%) (applicable only to single-phase MD200SXX models)

Address:	0x7023	Effective mode:	-
Min.:	-200.0	Unit:	%
Max.:	200.0	Data type:	Int16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

-200.0% to +200.0%

Description

-

U0-37 Power factor angle

Address:	0x7025	Effective mode:	-
Min.:	0.0	Unit:	°
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0° to 6553.5°

Description

This parameter displays the power factor angle.

U0-39 Target voltage upon V/f separation

Address:	0x7027	Effective mode:	-
Min.:	0	Unit:	V
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 V to 65535 V

Description

This parameter displays the target output voltage in the V/f separation status.

U0-40 Output voltage upon V/f separation

Address:	0x7028	Effective mode:	-

Min.:	0	Unit:	V
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 V to 65535 V

Description

This parameter displays the actual output voltage in the V/f separation status.

U0-41 **DI state display**

Address:	0x7029	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter displays the DI state. When the terminal indicator is on, it indicates high level; when the terminal indicator is off, it indicates low level.

U0-42 **DO state display**

Address:	0x702A	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter displays the DO state. When the terminal indicator is on, it indicates high level; when the terminal indicator is off, it indicates low level.

U0-45 **Fault information**

Address:	0x702D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter displays the fault code of the drive part.

U0-59 Frequency reference percentage (%)

Address:	0x703B	Effective mode:	-
Min.:	-100.00	Unit:	%
Max.:	100.00	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

-100.00% to +100.00%

Description

This parameter displays the frequency reference percentage. The parameter value equals to the value of frequency reference/F0-10 (maximum frequency).

U0-60 Running frequency percentage (%)

Address:	0x703C	Effective mode:	-
Min.:	-100.00	Unit:	%
Max.:	100.00	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

-100.00% to +100.00%

Description

This parameter displays the running frequency percentage. The parameter value equals to the value of running frequency/F0-10 (maximum frequency).

U0-61 AC drive state

Address:	0x703D	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0 to 65535

Description

This parameter displays the monitoring state of bit 0 to bit 4.

When bit 1 and bit 0 are monitored, 0 indicates "stop", 1 indicates "forward running", and 2 indicates "reverse running".
When bit 2 and bit 3 are monitored, 0 indicates "constant speed, 1 indicates "acceleration", and 2 indicates "deceleration".
When bit 4 is monitored, 0 indicates "bus voltage normal" and 1 indicates "undervoltage".

U0-62 **Current fault code**

Address:	0x703E	Effective mode:	-
Min.:	0	Unit:	-
Max.:	99	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:
0 to 99
Description
This parameter displays the current fault code. For example, 2 represents Err02.

U0-63 **Reserved**

Address:	0x703F	Effective mode:	-
Min.:	0.0	Unit:	%
Max.:	6553.5	Data type:	Int16
Default mode:	0.0	Change mode:	Unchangeable

Value range:
0.0% to 6553.5%
Description
-

U0-64 **Number of slaves in master/slave control**

Address:	0x7040	Effective mode:	-
Min.:	0	Unit:	-
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:
0 to 65535
Description
This parameter displays the number of slaves that can be viewed on the master.

U0-65 Torque upper limit (%) (applicable only to single-phase MD200SXX models)

Address:	0x7041	Effective mode:	-
Min.:	-200.0	Unit:	%
Max.:	200.0	Data type:	Int16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

-200.0% to +200.0%

Description

-

U0-69 Motor rotation frequency

Address:	0x7045	Effective mode:	-
Min.:	0.00	Unit:	Hz
Max.:	655.35	Data type:	Int16
Default mode:	0.00	Change mode:	Unchangeable

Value range:

0.00 Hz to 655.35 Hz

Description

-

U0-70 Motor speed

Address:	0x7046	Effective mode:	-
Min.:	-32767	Unit:	RPM
Max.:	32767	Data type:	Int16
Default mode:	0	Change mode:	Unchangeable

Value range:

-32767 RPM to +32767 RPM

Description

-

U0-71 Current display (A) specific to communication card

Address:	0x7047	Effective mode:	-
Min.:	0.0	Unit:	A
Max.:	6553.5	Data type:	UInt16
Default mode:	0.0	Change mode:	Unchangeable

Value range:

0.0 A to 6553.5 A

Description

This parameter displays the current dedicated for the communication card.

U0-78 **Line speed (applicable only to single-phase MD200SXX models)**

Address:	0x704E	Effective mode:	-
Min.:	0	Unit:	m/min
Max.:	65535	Data type:	UInt16
Default mode:	0	Change mode:	Unchangeable

Value range:

0–65535 m/min

Description

-

8 Parameter List

8.1 Parameter List

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F0-01	0xF001	Motor 1 control mode	0: Sensorless vector control (SVC, applicable only to three-phase MD200TXX models) 1: Reserved 2: V/f control	0	-	At stop	" F0-01" on page 97
F0-02	0xF002	Command source	0: Operation panel (indicator OFF) 1: Terminal (indicator ON) 2: Communication (indicator blinking)	0	-	At once	" F0-02" on page 97
F0-03	0xF003	Main frequency source X selection	0: Digital setting (non-retentive at power failure) 1: Digital setting (retentive at power failure) 2: AI1 3: External operating panel potentiometer 4: Reserved 5: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication	0	-	At stop	" F0-03" on page 98
F0-04	0xF004	Auxiliary frequency source Y selection	0: Digital setting (non-retentive at power failure) 1: Digital setting (retentive at power failure) 2: AI1 3: External operating panel potentiometer 4: Reserved 5: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 6: Multi-reference 7: Simple PLC 8: PID 9: Communication	0	-	At stop	" F0-04" on page 100

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F0-05	0xF005	Auxiliary frequency at superposition	0: Relative to the maximum frequency 1: Relative to the main frequency source X	0	-	At once	" F0-05" on page 101
F0-06	0xF006	Value of auxiliary frequency source Y at superposition	0% to 150%	100	%	At once	" F0-06" on page 102
F0-07	0xF007	Frequency source superposition selection	Ones: Frequency reference selection 0: Main frequency source X 1: Main and auxiliary operation result (based on tens position) 2: Switchover between the main frequency source X and the auxiliary frequency source Y 3: Switchover between the main frequency source X and the main and auxiliary operation result 4: Switchover between the auxiliary frequency source Y and the main and auxiliary operation result Tens: Main and auxiliary operation of the frequency reference 0: Main + Auxiliary 1: Main – Auxiliary 2: Max. (main, auxiliary) 3: Min. (main, auxiliary)	0	-	At once	" F0-07" on page 102
F0-08	0xF008	Preset frequency	0.00 Hz to 500.00 Hz	50.00	Hz	At once	" F0-08" on page 104
F0-09	0xF009	Running direction selection	0: Default direction 1: Opposite to the default direction	0	-	At once	" F0-09" on page 104
F0-10	0xF00A	Max. frequency	50.00 Hz to 500.00 Hz	50.00	Hz	At stop	" F0-10" on page 104

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F0-11	0xF00B	Source of the frequency upper limit	0: F0-12 (frequency upper limit) 1: AI1 2: Reserved 3: Reserved 4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 5: Communication	0	-	At stop	" F0-11" on page 105
F0-12	0xF00C	Frequency upper limit	0.00 Hz to 500.00 Hz	50.00	Hz	At once	" F0-12" on page 105
F0-14	0xF00E	Frequency lower limit	0.00 Hz to 500.00 Hz	0.00	Hz	At once	" F0-14" on page 106
F0-15	0xF00F	Carrier frequency	0.5 kHz to 16.0 kHz	6.0	kHz	At once	" F0-15" on page 106
F0-16	0xF010	Carrier frequency change with temperature	0: Disable 1: Enable	1	-	At once	" F0-16" on page 107
F0-17	0xF011	Acceleration time 1	0.0s to 6500.0s	0.0	s	At once	" F0-17" on page 107
F0-18	0xF012	Deceleration time 1	0.0s to 6500.0s	0.0	s	At once	" F0-18" on page 107
F0-19	0xF013	Acceleration/ Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	-	At stop	" F0-19" on page 108
F0-23	0xF017	Retentive selection of frequency set by digit	0: Non-retentive 1: Retentive	0	-	At once	" F0-23" on page 108
F0-25	0xF019	Acceleration/ Deceleration time base frequency	0: Maximum frequency (F0-10) 1: Frequency reference 2: 100 Hz	0	-	At stop	" F0-25" on page 109
F0-26	0xF01A	Base of frequency adjusted by UP/ DOWN keys during running	0: Running frequency 1: Frequency reference	0	-	At stop	" F0-26" on page 109
F1-01	0xF101	Rated motor power	0.1 KW to 1000.0 KW	3.7	kW	At stop	" F1-01" on page 109
F1-02	0xF102	Rated motor voltage	1 V to 2000 V	380	V	At stop	" F1-02" on page 110
F1-03	0xF103	Rated motor current	0.1 A to 6553.5 A	9.0	A	At stop	" F1-03" on page 110

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F1-04	0xF104	Rated motor frequency	0.01 Hz to 500.00 Hz	50.00	Hz	At stop	" F1-04" on page 110
F1-05	0xF105	Rated motor speed	1 RPM to 65535 RPM	1460	RPM	At stop	" F1-05" on page 111
F1-06	0xF106	Asynchronous motor stator resistance	0.001 Ω to 65.535 Ω	1.204	Ω	At stop	" F1-06" on page 111
F1-07	0xF107	Asynchronous motor rotor resistance	0.001 Ω to 65.535 Ω	0.908	Ω	At stop	" F1-07" on page 111
F1-08	0xF108	Asynchronous motor leakage inductance	0.01 mH to 655.35 mH	5.28	mH	At stop	" F1-08" on page 112
F1-09	0xF109	Asynchronous motor mutual inductance	0.01 mH to 655.35 mH	156.80	mH	At stop	" F1-09" on page 112
F1-10	0xF10A	Asynchronous motor no-load current	0.1 A to 6553.5 A	4.2	A	At stop	" F1-10" on page 113
F1-37	0xF125	Auto-tuning selection	0: No operation 1: Static auto-tuning on partial parameters of asynchronous motors 2: Dynamic auto-tuning on all parameters of asynchronous motors (applicable only to three-phase MD200TXX models)	0	-	At stop	" F1-37" on page 113
F2-00	0xF200	Speed loop proportional gain 1	1 to 100	30	-	At once	" F2-00" on page 114
F2-01	0xF201	Speed loop integral time 1	0.01s to 10.00s	0.50	s	At once	" F2-01" on page 114
F2-02	0xF202	Switchover frequency 1	0.00 Hz to 500.00 Hz	5.00	Hz	At once	" F2-02 " on page 115
F2-03	0xF203	Speed loop proportional gain 2	1 to 100	20	-	At once	" F2-03" on page 115
F2-04	0xF204	Speed loop integral time 2	0.01s to 10.00s	1.00	s	At once	" F2-04" on page 116
F2-05	0xF205	Switchover frequency 2	0.00 Hz to 500.00 Hz	10.00	Hz	At once	" F2-05" on page 116
F2-06	0xF206	Slip gain in vector control mode	50% to 200%	100	%	At once	" F2-06" on page 117

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F2-08	0xF208	Over-excitation gain in vector control mode	0 to 200	64	-	At once	" F2-08" on page 117
F2-09	0xF209	Torque upper limit source in speed control mode	0: F2-10 1: AI1 2: External operating panel potentiometer 3: Reserved 4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 5: Communication 6: Min. (AI1, external operating panel potentiometer) 7: Max. (AI1, external operating panel potentiometer)	0	-	At once	" F2-09 " on page 117
F2-10	0xF20A	Digital setting of torque limit in speed control mode	0.0% to 200.0%	150.0	%	At once	" F2-10" on page 118
F2-11	0xF20B	(Regenerative) torque upper limit settings in speed control mode	0: F2-10 1: AI1 2: External operating panel potentiometer 3: Reserved 4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 5: Communication 6: Min. (AI1, external operating panel potentiometer) 7: Max. (AI1, external operating panel potentiometer) 8: F2-12	0	-	At once	" F2-11 " on page 119
F2-12	0xF20C	Digital setting of (regenerative) torque upper limit	0.0% to 200.0%	150.0	%	At once	" F2-12" on page 120
F2-13	0xF20D	Excitation adjustment proportional gain	0 to 60000	2000	-	At once	" F2-13" on page 120

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F2-14	0xF20E	Excitation adjustment integral gain	0 to 60000	1300	-	At once	" F2-14" on page 121
F2-15	0xF20F	Torque adjustment proportional gain	0 to 60000	2000	-	At once	" F2-15" on page 121
F2-16	0xF210	Torque adjustment integral gain	0 to 60000	1300	-	At once	" F2-16" on page 121
F2-17	0xF211	Speed loop integral attribute	0: Disable 1: Enable	0	-	At once	" F2-17" on page 122
F2-19	0xF213	Torque feedforward filter time	1 to 50	5	-	Unchangeable	" F2-19" on page 122
F2-21	0xF215	Maximum torque coefficient in field weakening area	50 to 200	100	-	At once	" F2-21" on page 122
F2-22	0xF216	Generating power upper limit (applicable only to single-phase MD200SXX models)	0.0% to 2000.0%	0.0	%	At once	" F2-22" on page 123
F3-00	0xF300	V/f curve setting	0: Linear V/f curve 1: Multi-point V/f curve 2-9: Reserved 10: V/f complete separation mode 11: V/f half-separation mode	0	-	At stop	" F3-00" on page 123
F3-01	0xF301	Torque boost	0.0% to 30.0%	0.0	%	At once	" F3-01" on page 124
F3-02	0xF302	Cutoff frequency of torque boost	0.00 Hz to 500.00 Hz	50.00	Hz	At stop	" F3-02" on page 124
F3-03	0xF303	Frequency 1 on multi-point V/f curve	0.00 Hz to 500.00 Hz	0.00	Hz	At stop	" F3-03" on page 125
F3-04	0xF304	Voltage 1 on multi-point V/f curve	0.0% to 100.0%	0.0	%	At stop	" F3-04" on page 125

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F3-05	0xF305	Frequency 2 on multi-point V/f curve	0.00 Hz to 500.00 Hz	0.00	Hz	At stop	" F3-05" on page 125
F3-06	0xF306	Voltage 2 on multi-point V/f curve	0.0% to 100.0%	0.0	%	At stop	" F3-06" on page 126
F3-07	0xF307	Frequency 3 on multi-point V/f curve	0.00 Hz to 500.00 Hz	0.00	Hz	At stop	" F3-07" on page 126
F3-08	0xF308	Voltage 3 on multi-point V/f curve	0.0% to 100.0%	0.0	%	At stop	" F3-08" on page 126
F3-10	0xF30A	V/f over-excitation gain	0 to 200	64	-	At once	" F3-10" on page 126
F3-11	0xF30B	V/f oscillation suppression gain	0 to 100	40	-	At once	" F3-11" on page 127
F3-13	0xF30D	Voltage source for V/f separation	0: Digital setting (F3-14) 1: AI1 2: Reserved 3: Reserved 4: Pulse setting (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 5: Multi-reference 6: Simple PLC 7: PID 8: Communication setting	0	-	At once	" F3-13" on page 127
F3-14	0xF30E	Voltage source digital setting for V/f separation	0 V to 2000 V	0	V	At once	" F3-14" on page 128
F3-15	0xF30F	Voltage rise time of V/F separation	0.0s to 1000.0s	0.0	s	At once	" F3-15" on page 129
F3-16	0xF310	Voltage decline time of V/f separation	0.0s to 1000.0s	0.0	s	At once	" F3-16" on page 129
F3-17	0xF311	Stop mode for V/f separation	0: Frequency and voltage decline to 0. 1: Frequency declines after voltage declines to 0.	0	-	At stop	" F3-17" on page 129
F3-18	0xF312	Overcurrent stall action current	50% to 200%	150	%	At stop	" F3-18" on page 130

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F3-19	0xF313	Overcurrent stall suppression	0: Disable 1: Enable	1	-	At stop	" F3-19" on page 130
F3-20	0xF314	Overcurrent stall suppression gain	0 to 100	20	-	At once	" F3-20" on page 130
F3-21	0xF315	Compensation coefficient for overcurrent stall action current at multiplied rated frequency	50% to 200%	50	%	At stop	" F3-21" on page 131
F3-22	0xF316	Overvoltage stall action voltage	650.0 V to 800.0 V	770.0	V	At stop	" F3-22" on page 131
F3-23	0xF317	Overvoltage stall suppression	0: Disable 1: Enable	1	-	At stop	" F3-23" on page 131
F3-24	0xF318	Frequency gain during overvoltage stall suppression	0 to 100	30	-	At once	" F3-24" on page 132
F3-25	0xF319	Voltage gain during overvoltage stall suppression	0 to 100	30	-	At once	" F3-25" on page 132
F3-26	0xF31A	Frequency rise threshold during overvoltage stall suppression	0 Hz to 50 Hz	5	Hz	At stop	" F3-26" on page 133
F3-27	0xF31B	Slip compensation time constant	0.1 to 10.0	0.5	-	Unchangeable	" F3-27" on page 133

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F4-00	0xF400	DI1 function selection	0: No function 1: Forward run (FWD) 2: Reverse run (REV) 3: Three-wire operation control 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as the UP key 7: Function as the DOWN key 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 15: Multi-reference terminal 4 16: Acceleration/deceleration terminal 1 18: Frequency reference switchover 19: Clear information set by UP/DOWN keys	1	-	At stop	*" F4-00" on page 133*
Continued	Continued	Continued	20: Command source switchover terminal 1 21: Acceleration/Deceleration inhibited 22: PID pause 23: Simple PLC state reset 30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 32: Immediate DC braking 33: NC input of external fault 34: Frequency modification enable 35: PID operation direction reversal 36: External stop terminal 1 37: Control command switchover terminal 2 38: PID integral pause 39: Switchover between frequency source X and preset frequency	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	40: Switchover between frequency source Y and preset frequency 43: PID parameter switchover 47: Emergency stop 48: External stop terminal 2 49: Decelerate to DC braking 50: Clear current operating time 51: Two-wire/Three-wire control switchover 52: Reverse running prohibited 53: Reserved 54: Reserved 55: Reserved 56: Reserved 57: Reserved 58: Reserved 59: Reserved	Continued	Continued	Continued	Continued
F4-01	0xF401	DI2 function selection	0: No function 1: Forward run (FWD) 2: Reverse run (REV) 3: Three-wire operation control 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as the UP key 7: Function as the DOWN key 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 15: Multi-reference terminal 4 16: Acceleration/deceleration terminal 1 18: Frequency reference switchover 19: Clear information set by UP/DOWN keys	4	-	At stop	*" F4-01" on page 139*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	20: Command source switchover terminal 1 21: Acceleration/Deceleration inhibited 22: PID pause 23: Simple PLC state reset 30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 32: Immediate DC braking 33: NC input of external fault 34: Frequency modification enable 35: PID operation direction reversal 36: External stop terminal 1 37: Control command switchover terminal 2 38: PID integral pause	Continued	Continued	Continued	Continued
Continued	Continued	Continued	39: Switchover between frequency source X and preset frequency 40: Switchover between frequency source Y and preset frequency 43: PID parameter switchover 47: Emergency stop 48: External stop terminal 2 49: Decelerate to DC braking 50: Clear current operating time 51: Two-wire/Three-wire control switchover 52: Reverse running prohibited 53: Reserved 54: Reserved 55: Reserved 56: Reserved 57: Reserved 58: Reserved 59: Reserved	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F4-02	0xF402	DI3 function selection	0: No function 1: Forward run (FWD) 2: Reverse run (REV) 3: Three-wire operation control 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as the UP key 7: Function as the DOWN key 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 15: Multi-reference terminal 4 16: Acceleration/deceleration terminal 1 18: Frequency reference switchover 19: Clear information set by UP/DOWN keys	9	-	At stop	" F4-02" on page 141
Continued	Continued	Continued	20: Command source switchover terminal 1 21: Acceleration/Deceleration inhibited 22: PID pause 23: Simple PLC state reset 30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 32: Immediate DC braking 33: NC input of external fault 34: Frequency modification enable 35: PID operation direction reversal 36: External stop terminal 1 37: Control command switchover terminal 2 38: PID integral pause	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	39: Switchover between frequency source X and preset frequency 40: Switchover between frequency source Y and preset frequency 43: PID parameter switchover 47: Emergency stop 48: External stop terminal 2 49: Decelerate to DC braking 50: Clear current operating time 51: Two-wire/Three-wire control switchover 52: Reverse running prohibited 53: Reserved 54: Reserved 55: Reserved 56: Reserved 57: Reserved 58: Reserved 59: Reserved	Continued	Continued	Continued	Continued
F4-03	0xF403	DI4 function selection	0: No function 1: Forward run (FWD) 2: Reverse run (REV) 3: Three-wire operation control 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as the UP key 7: Function as the DOWN key 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 15: Multi-reference terminal 4 16: Acceleration/deceleration terminal 1 18: Frequency reference switchover	12	-	At stop	*" F4-03" on page 142*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	19: Clear information set by UP/DOWN keys 20: Command source switchover terminal 1 21: Acceleration/Deceleration inhibited 22: PID pause 23: Simple PLC state reset 30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 32: Immediate DC braking 33: NC input of external fault 34: Frequency modification enable 35: PID operation direction reversal 36: External stop terminal 1 37: Control command switchover terminal 2 38: PID integral pause	Continued	Continued	Continued	Continued
Continued	Continued	Continued	39: Switchover between frequency source X and preset frequency 40: Switchover between frequency source Y and preset frequency 43: PID parameter switchover 47: Emergency stop 48: External stop terminal 2 49: Decelerate to DC braking 50: Clear current operating time 51: Two-wire/Three-wire control switchover 52: Reverse running prohibited 53: Reserved 54: Reserved 55: Reserved 56: Reserved 57: Reserved 58: Reserved 59: Reserved	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F4-04	0xF404	DI/DO input function selection (applicable only to MD200XXX-NC models)	0: No function 1: Forward run (FWD) 2: Reverse run (REV) 3: Three-wire operation control 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as the UP key 7: Function as the DOWN key 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 15: Multi-reference terminal 4 16: Acceleration/deceleration terminal 1 18: Frequency reference switchover 19: Clear information set by UP/DOWN keys	13	-	At stop	*" F4-04" on page 144*
Continued	Continued	Continued	20: Command source switchover terminal 1 21: Acceleration/Deceleration inhibited 22: PID pause 23: Simple PLC state reset 30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 32: Immediate DC braking 33: NC input of external fault 34: Frequency modification enable 35: PID operation direction reversal 36: External stop terminal 1 37: Control command switchover terminal 2 38: PID integral pause 39: Switchover between frequency source X and preset frequency	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	40: Switchover between frequency source Y and preset frequency 43: PID parameter switchover 47: Emergency stop 48: External stop terminal 2 49: Decelerate to DC braking 50: Clear current operating time 51: Two-wire/Three-wire control switchover 52: Reverse running prohibited 53: Reserved 54: Reserved 55: Reserved 56: Reserved 57: Reserved 58: Reserved 59: Reserved	Continued	Continued	Continued	Continued
F4-10	0xF40A	DI filter time	0.000s to 1.000s	0.010	s	At once	*" F4-10" on page 146*
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	*" F4-11 " on page 146*
F4-12	0xF40C	Step of adjustment through terminal functioning as UP/DOWN keys	0.001–65.535 Hz/s	1.000	Hz/s	At once	*" F4-12 " on page 147*
F4-13	0xF40D	Minimum input of AI curve 1	0.00 V to 10.00 V	0.00	V	At once	*" F4-13 " on page 148*
F4-14	0xF40E	Percentage corresponding to minimum input of AI curve 1	-100.0% to +100.0%	0.0	%	At once	*" F4-14" on page 148*
F4-15	0xF40F	Maximum input of AI curve 1	0.00 V to 10.00 V	10.00	V	At once	*" F4-15" on page 148*
F4-16	0xF410	Percentage corresponding to maximum input of AI curve 1	-100.0% to +100.0%	100.0	%	At once	*" F4-16" on page 149*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F4-17	0xF411	AI1 fitter time	0.00s to 10.00s	0.10	s	At once	" F4-17 " on page 149
F4-28	0xF41C	Pulse minimum input	0.00 kHz to 100.00 kHz	0.00	kHz	At once	" F4-28" on page 150
F4-29	0xF41D	Settings corresponding to pulse minimum input	-100.0% to +100.0%	0.0	%	At once	" F4-29" on page 150
F4-30	0xF41E	Pulse maximum input	0.00 kHz to 100.00 kHz	50.00	kHz	At once	" F4-30" on page 150
F4-31	0xF41F	Settings corresponding to pulse maximum input	-100.0% to +100.0%	100.0	%	At once	" F4-31" on page 151
F4-32	0xF420	Pulse filter time	0.00s to 10.00s	0.10	s	At once	" F4-32" on page 151

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F4-33	0xF421	AI curve selection	Ones: AI1 curve selection 1: Curve 1 (2 points, see F4-13 to F4-16) 2: Curve 2 (2 points, see F4-18 to F4-21) 3: Curve 3 (2 points, see F4-23 to F4-26) 4: Curve 4 (4 points, see A6-00 to A6-07) 5: Curve 5 (4 points, see A6-08 to A6-15) Tens: Curve selection for the external operating panel potentiometer 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: Reserved 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)	321	-	At once	*" F4-33" on page 151*
F4-34	0xF422	Selection when AI < min. input (applicable only to single-phase MD200SXX models)	Ones: 0: Minimum input value 1: 0.0% Tens: Selection when external operating panel potentiometer value < min. input value. The tens position values are the same as the ones position values.	0	-	At once	*" F4-34" on page 152*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F4-35	0xF423	DI1 delay (applicable only to single-phase MD200SXX models)	0.0s to 3600.0s	0.0	s	At stop	" F4-35" on page 153
F4-36	0xF424	DI2 delay (applicable only to single-phase MD200SXX models)	0.0s to 3600.0s	0.0	s	At stop	" F4-36" on page 153
F4-37	0xF425	DI3 delay (applicable only to single-phase MD200SXX models)	0.0s to 3600.0s	0.0	s	At stop	" F4-37" on page 153
F4-38	0xF426	DI active mode selection 1	Ones: DI1 0: Active high 1: Active low Tens: DI2 0: Active high 1: Active low Hundreds: DI3 0: Active high 1: Active low Thousands: DI4 0: Active high 1: Active low Ten thousands: DI/DO (applicable only to MD200XXX-NC models) 0: Active high 1: Active low	0	-	At stop	" F4-38" on page 153
F4-41	0xF429	DI/DO type (applicable only to MD200XXX-NC models)	Ones: 0: DI/PULSE 1: DO	0	-	At stop	" F4-41" on page 154

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F5-02	0xF502	Control board relay output function selection	0: No output 1: AC drive running 2: Fault output (coast to stop) 3: Frequency level detection FDT1 output 4: Frequency reach 5: Zero-speed running (no output at stop) 6: Motor overload warning 7: AC drive overload warning 11: Simple PLC cycle completed 12: Accumulative running time reach 13: Frequency limited 15: Ready to run 17: Frequency upper limit reach 18: Frequency lower limit reach (no output at stop) 19: Undervoltage output 20: Communication 24: Accumulative power-on time reach 26: Output upon frequency 1 reach 28: Output upon current 1 reach 30: Output upon expiration of scheduled time 31: AI1 input limit exceeded 32: Load loss 33: Reverse running 34: Zero current state 36: Output current limit exceeded 37: Frequency lower limit reach (output at stop) 38: Fault output (all faults) 40: Present running time reach 41: Fault (excluding undervoltage) output	2	-	At once	*" F5-02" on page 155*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F5-04	0xF504	DI/DO output function selection (applicable only to MD200XXX-NC models)	0: No output 1: AC drive running 2: Fault output (coast to stop) 3: Frequency level detection FDT1 output 4: Frequency reach 5: Zero-speed running (no output at stop) 6: Motor overload warning 7: AC drive overload warning 11: Simple PLC cycle completed 12: Accumulative running time reach 13: Frequency limited 15: Ready to run 17: Frequency upper limit reach 18: Frequency lower limit reach (no output at stop) 19: Undervoltage output 20: Communication 24: Accumulative power-on time reach 26: Output upon frequency 1 reach 28: Output upon current 1 reach 30: Output upon expiration of scheduled time 31: AI1 input limit exceeded 32: Load loss 33: Reverse running 34: Zero current state 36: Output current limit exceeded 37: Frequency lower limit reach (output at stop) 38: Fault output (all faults) 40: Present running time reach 41: Fault (excluding undervoltage) output	1	-	At once	*" F5-04" on page 158*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F5-07	0xF507	AO1 function selection	0: Running frequency 1: Frequency reference 2: Output current (0 to two times the rated motor current) 3: Output torque (absolute value) 4: Output power 5: Output voltage 6: Pulse input 7: AI1 12: Communication settings 13: Motor speed 14: Output current (0.0-1000.0 A) 15: Bus voltage	0	-	At once	*" F5-07" on page 159*
F5-10	0xF50A	AO1 zero offset coefficient	-100.0% to +100.0%	0.0	%	At once	*" F5-10" on page 160*
F5-11	0xF50B	AO1 gain	-10.00 to +10.00	1.00	-	At once	*" F5-11" on page 160*
F5-18	0xF512	Relay 1 output delay	0.0 to 3600.0	0.0	-	At once	*" F5-18" on page 161*
F5-20	0xF514	DI/DO output delay (applicable only to MD200XXX-NC models)	0.0 to 3600.0	0.0	-	At once	*" F5-20" on page 161*
F5-22	0xF516	DO active mode settings	Ones: Reserved 0: Positive logic 1: Negative logic Tens: Relay 1 0: Positive logic 1: Negative logic Hundreds: Reserved 0: Positive logic 1: Negative logic Thousands: DIO 0: Positive logic 1: Negative logic Ten thousands: Reserved 0: Positive logic 1: Negative logic	0	-	At once	*" F5-22" on page 162*
F6-00	0xF600	Start mode	0: Direct start 1: Flying start	0	-	At once	*" F6-00" on page 162*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F6-01	0xF601	Flying start mode	0: From the stop frequency 1: From the mains frequency 2: From the maximum frequency	0	-	At once	" F6-01" on page 163
F6-03	0xF603	Startup frequency	0.00 Hz to 10.00 Hz	0.00	Hz	At once	" F6-03" on page 164
F6-04	0xF604	Startup frequency hold time	0.0s to 100.0s	0.0	s	At stop	" F6-04" on page 164
F6-07	0xF607	Acceleration/ Deceleration mode	0: Linear acceleration/ deceleration 1: Static S-curve acceleration/ deceleration 2: Dynamic S-curve acceleration/deceleration	0	-	At stop	" F6-07" on page 164
F6-08	0xF608	Time proportion of S-curve start segment	0.0% to 100.0%	30.0	%	At stop	" F6-08" on page 165
F6-09	0xF609	Time proportion of S-curve end segment	0.0% to 100.0%	30.0	%	At stop	" F6-09" on page 165
F6-10	0xF60A	Stop mode	0: Decelerate to stop 1: Coast to stop	0	-	At once	" F6-10" on page 165
F6-11	0xF60B	Start frequency of DC braking at stop	0.00 Hz to 500.00 Hz	0.00	Hz	At once	" F6-11" on page 166
F6-12	0xF60C	Waiting time of DC braking at stop	0.0s to 100.0s	0.0	s	At once	" F6-12" on page 166
F6-13	0xF60D	DC braking current at stop	0% to 100%	50	%	At once	" F6-13" on page 166
F6-14	0xF60E	DC braking time at stop	0.0s to 100.0s	0.0	s	At once	" F6-14" on page 167
F6-21	0xF615	Demagnetization time (valid in SVC mode)	0.00s to 5.00s	0.50	s	At once	" F6-21" on page 167
F6-22	0xF616	Min. output frequency	0 to 65535	0	-	At once	" F6-22" on page 167
F7-00	0xF700	LED default display check	0 to 1	0	-	At once	" F7-00" on page 168

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F7-01	0xF701	MF.K key function selection	0: MF.K key unavailable 1: Switchover between the operating panel control mode and remote command control mode 2: Switchover between forward run and reverse run 3: Forward jog (long press MF.K to start jog and release the key to end) 4: Reverse jog (long press MF.K to start jog and release the key to end) 5: Reserved	0	-	At stop	" F7-01" on page 168
F7-02	0xF702	STOP/RESET key availability	0: STOP/RESET key available only in keypad control mode 1: STOP/RESET key available in any operation mode	1	-	At once	" F7-02" on page 169
F7-03	0xF703	Parameter 1 display on LED during operation	Bit 0: Running frequency (Hz) Bit 1: Frequency reference (Hz) Bit 2: Bus voltage (V) Bit 3: Output voltage (V) Bit 4: Output current (A) Bit 5: Output power (kW) Bit 6: Output torque (%) Bit 7: DI status Bit 8: DO status Bit 9: AI1 voltage (V) Bit 10: Reserved Bit 11: Voltage of external operating panel potentiometer (V) Bit 12: Count value Bit 13: Length value Bit 14: Load speed display Bit 15: PID reference	31	-	At once	" F7-03" on page 169

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F7-04	0xF704	Parameter 2 display on LED during operation	Bit 0: PID feedback Bit 1: PLC stage Bit 2: Pulse input frequency (kHz) Bit 3: Running frequency 2 (Hz) Bit 4: Remaining running time Bit 5: AI1 voltage before correction (V) Bit 6: Voltage of external operating panel potentiometer before correction (V) Bit 7: Reserved Bit 8: Motor speed (applicable only to single-phase MD200SXX models) Bit 9: Current power-on time (hour) Bit 10: Current running time (min.) Bit 11: Pulse input frequency (Hz) Bit 12: Communication setting value Bit 13: Reserved Bit 14: Main frequency X display Bit 15: Auxiliary frequency Y display	0	-	At once	*" F7-04" on page 170*
F7-05	0xF705	Parameter display on LED upon stop	Bit 0: Frequency reference (Hz) Bit 1: Bus voltage (V) Bit 2: DI state Bit 3: DO state Bit 4: AI1 voltage (V) Bit 5: Reserved Bit 6: Voltage (V) of external operating panel potentiometer Bit 7: Count value Bit 8: Length value Bit 9: PLC stage Bit 10: Load speed display Bit 11: PID reference Bit 12: Pulse input frequency (kHz)	51	-	At once	*" F7-05" on page 171*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F7-06	0xF706	Load transmission ratio	0.001 to 65.000	1.000	-	At once	" F7-06" on page 172
F7-07	0xF707	Drive unit heatsink temperature	0°C to 999°C	0	°C	Unchangeable	" F7-07" on page 172
F7-08	0xF708	Product No.	0.00 to 655.35	0.00	-	Unchangeable	" F7-08" on page 173
F7-09	0xF709	Accumulative running time	0 h to 65535 h	0	h	Unchangeable	" F7-09" on page 173
F7-10	0xF70A	Performance software version	0.00 to 655.35	0.00	-	Unchangeable	" F7-10" on page 173
F7-11	0xF70B	Function software version	0.00 to 655.35	0.00	-	Unchangeable	" F7-11" on page 174
F7-12	0xF70C	Number of decimal places for load speed display	Ones: Number of decimal places for U0-14 0: 0 decimal place 1: 1 decimal place 2: 2 decimal places Tens: Number of decimal places for U0-19 0: 0 decimal place 1: 1 decimal place 2: 2 decimal places	20	-	At once	" F7-12" on page 174
F7-13	0xF70D	Accumulative power-on time	0 h to 65535 h	0	h	Unchangeable	" F7-13" on page 175
F7-14	0xF70E	Accumulative power consumption	0-65535 kW h	0	kW h	Unchangeable	" F7-14" on page 175
F7-15	0xF70F	Temporary performance software version	0.00 to 655.35	0.00	-	Unchangeable	" F7-15" on page 175
F7-16	0xF710	Temporary function software version	0.00 to 655.35	0.00	-	Unchangeable	" F7-16" on page 175
F8-00	0xF800	Jog frequency	0.00 Hz to 500.00 Hz	2.00	Hz	At once	" F8-00" on page 176
F8-01	0xF801	Jog acceleration time	0.0s to 6500.0s	20.0	s	At once	" F8-01" on page 176

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F8-02	0xF802	Jog deceleration time	0.0s to 6500.0s	20.0	s	At once	" F8-02" on page 176
F8-03	0xF803	Acceleration time 2	0.0s to 6500.0s	0.0	s	At once	" F8-03" on page 177
F8-04	0xF804	Deceleration time 2	0.0s to 6500.0s	0.0	s	At once	" F8-04" on page 177
F8-07	0xF807	Acceleration time 4 (applicable only to single-phase MD200SXX models)	0.0s to 6500.0s	0.0	s	At once	" F8-07" on page 177
F8-08	0xF808	Deceleration time 4 (applicable only to single-phase MD200SXX models)	0.0s to 6500.0s	0.0	s	At once	" F8-08" on page 178
F8-12	0xF80C	Dead-zone time of forward/ reverse run	0.0s to 3000.0s	0.0	s	At once	" F8-12" on page 178
F8-13	0xF80D	Reverse running prohibition	0: Disable 1: Enable	0	-	At once	" F8-13" on page 178
F8-14	0xF80E	Running mode when running frequency is below the frequency lower limit	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	0	-	At once	" F8-14" on page 179
F8-16	0xF810	Accumulative power-on time threshold	0 h to 65000 h	0	h	At once	" F8-16" on page 179
F8-17	0xF811	Accumulative running time threshold	0 h to 65000 h	0	h	At once	" F8-17" on page 180
F8-18	0xF812	Protection upon start	0: Disable 1: Enable	0	-	At once	" F8-18" on page 180
F8-19	0xF813	Frequency detection value (FDT1)	0.00 Hz to 500.00 Hz	50.00	Hz	At once	" F8-19" on page 180
F8-20	0xF814	Frequency detection hysteresis (FDT1)	0.0% to 100.0%	5.0	%	At once	" F8-20" on page 181

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F8-21	0xF815	Detection frequency amplitude	0.0% to 100.0%	0.0	%	At once	" F8-21 " on page 181
F8-25	0xF819	Switchover frequency between acceleration time 1 and acceleration time 2	0.00 Hz to 500.00 Hz	0.00	Hz	At once	" F8-25" on page 181
F8-26	0xF81A	Switchover frequency between deceleration time 1 and deceleration time 2	0.00 Hz to 500.00 Hz	0.00	Hz	At once	" F8-26" on page 182
F8-27	0xF81B	Priority setting of jog through terminal	0: Disable 1: Enable	0	-	At once	" F8-27" on page 182
F8-30	0xF81E	Detection frequency 1	0.00 Hz to 500.00 Hz	50.00	Hz	At once	" F8-30" on page 183
F8-31	0xF81F	Detection frequency amplitude 1	0.0% to 100.0%	0.0	%	At once	" F8-31" on page 183
F8-34	0xF822	Zero current detection value	0.0% to 300.0%	5.0	%	At once	" F8-34" on page 183
F8-35	0xF823	Zero current detection delay	0.01s to 600.00s	0.10	s	At once	" F8-35" on page 184
F8-36	0xF824	Output overcurrent threshold	0.0% to 300.0%	200.0	%	At once	" F8-36" on page 184
F8-37	0xF825	Output overcurrent detection delay	0.00s to 600.00s	0.00	s	At once	" F8-37" on page 184
F8-38	0xF826	Detection current 1	0.0% to 300.0%	100.0	%	At once	" F8-38" on page 185
F8-39	0xF827	Detection current amplitude 1	0.0% to 300.0%	0.0	%	At once	" F8-39" on page 185
F8-42	0xF82A	Timing function	0: Disable 1: Enable	0	-	At stop	" F8-42" on page 185

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F8-43	0xF82B	Scheduled running time setting	0: F8-44 1: AI1 2: Reserved 3: Reserved	0	-	At stop	" F8-43" on page 186
F8-44	0xF82C	Scheduled running time	0.0-6500.0 minutes	0.0	Minute	At stop	" F8-44" on page 186
F8-45	0xF82D	Lower limit of AI1 input voltage	0.00 V to 11.00 V	3.10	V	At once	" F8-45" on page 186
F8-46	0xF82E	Upper limit of AI1 input voltage	0.00 V to 11.00 V	6.80	V	At once	" F8-46" on page 187
F8-48	0xF830	Fan working mode	0: Fan working during AC drive operation 1: Fan working continuously 2: Fan working at specified temperature	0	-	At stop	" F8-48" on page 187
F8-49	0xF831	Wakeup frequency (applicable only to single-phase MD200SXX models)	0.00 Hz to 500.00 Hz	0.00	Hz	At once	" F8-49" on page 188
F8-50	0xF832	Wakeup delay (applicable only to single-phase MD200SXX models)	0.0s to 6500.0s	0.0	s	At once	" F8-50" on page 188
F8-51	0xF833	Hibernation frequency (applicable only to single-phase MD200SXX models)	0.00 Hz to 500.00 Hz	0.00	Hz	At once	" F8-51" on page 188
F8-52	0xF834	Hibernation delay (applicable only to single-phase MD200SXX models)	0.0s to 6500.0s	0.0	s	At once	" F8-52" on page 189
F8-53	0xF835	Present running time reach settings	0.0-6500.0 minutes	0.0	Minute	At stop	" F8-53" on page 189
F8-54	0xF836	Output power correction coefficient	0.0% to 200.0%	100.0	%	At once	" F8-54" on page 189

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F8-55	0xF837	Deceleration time for emergency stop	0.0s to 6553.5s	0.0	s	At once	" F8-55" on page 190
F8-57	0xF839	Speed proportional synchronous control	0: Disable 1: Enable	0.0	s	At once	" F8-57" on page 190
F8-58	0xF83A	Master/Slave selection in synchronous control	0: Master 1: Slave	0.0	s	At once	" F8-58" on page 190
F9-00	0xF900	Motor overload protection	0: Disable 1: Enable	1	-	At once	" F9-00" on page 191
F9-01	0xF901	Motor overload protection gain	0.20 to 10.00	1.00	-	At once	" F9-01" on page 191
F9-02	0xF902	Motor overload warning coefficient	50% to 100%	80	%	At once	" F9-02" on page 191
F9-07	0xF907	Protection against short circuit to ground	Ones: Protection against short circuit to ground upon power-on 0: Inactive 1: Active Tens: Protection against short circuit to ground before operation 0: Inactive 1: Active	1	-	At once	" F9-07" on page 192
F9-08	0xF908	Braking unit action start voltage	650 V to 800 V	760	V	At stop	" F9-08" on page 192
F9-09	0xF909	Number of automatic reset times	0 to 20	0	-	At once	" F9-09" on page 193
F9-10	0xF90A	Relay action selection upon automatic reset	0: Disable 1: Enable	0	-	At once	" F9-10" on page 193
F9-11	0xF90B	Fault automatic reset interval	0.1s to 100.0s	1.0	s	At once	" F9-11" on page 194
F9-12	0xF90C	Input phase loss protection (applicable only to single-phase MD200TXX models)	0 to 1	1	-	At once	" F9-12" on page 194

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-13	0xF90D	Output phase loss protection	0 to 11	1	-	At once	" F9-13" on page 194
F9-14	0xF90E	Type of the 1st fault	0: No fault 1: Reserved 2: Overcurrent during acceleration (Err02) 3: Overcurrent during deceleration (Err03) 4: Overcurrent at constant speed (Err04) 5: Overvoltage during acceleration (Err05) 6: Overcurrent during deceleration (Err06) 7: Overvoltage at constant speed (Err07) 8: Pre-charge resistor overload (Err08) 9: Undervoltage (Err09) 10: AC drive overload (Err10) 11: Motor overload (Err11) 12: Input phase loss (Err12) 13: Output phase loss (Err13) 14: Module overheat (Err14) 15: External fault (Err15)	0	-	Unchangeable	" F9-14" on page 195

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	16: Communication error (Err16) 17: Reserved (Err17) 18: Current detection error (Err18) 19: Motor auto-tuning error (Err19) 20: Reserved (Err20) 21: Parameter read/write error (Err21) 22: Reserved (Err22) 23: Motor short-circuited to ground (Err23) 24: Reserved (Err24) 25: Reserved (Err25) 26: Running time reached (Err26) 27: User-defined fault 1 28: User-defined fault 2 29: Power-on time reached (Err29) 30: Load loss (Err30) 31: PID feedback loss during running (Err31) 32: Reserved (Err32) 33: Reserved (Err33) 34: Reserved (Err34)	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	35: Reserved (Err35) 36: Reserved (Err36) 37: Reserved (Err37) 38: Reserved (Err38) 39: Reserved (Err39) 40: Fast current limit timeout (Err40) 41: Reserved (Err41) 42: Excessive speed deviation (Err42) 43: Reserved (Err43) 44: Reserved (Err44) 45: Reserved (Err45) 46: Reserved (Err46) 47: Reserved (Err47) 48: Reserved (Err48) 49: Reserved (Err49) 50: Reserved (Err50) 51: Reserved (Err51) 52: Reserved (Err52) 53: Reserved (Err53) 55: Slave fault under master/ slave control (Err55)	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-15	0xF90F	Type of the 2nd fault	0: No fault 1: Reserved 2: Overcurrent during acceleration (Err02) 3: Overcurrent during deceleration (Err03) 4: Overcurrent at constant speed (Err04) 5: Overvoltage during acceleration (Err05) 6: Overcurrent during deceleration (Err06) 7: Overvoltage at constant speed (Err07) 8: Pre-charge resistor overload (Err08) 9: Undervoltage (Err09) 10: AC drive overload (Err10) 11: Motor overload (Err11) 12: Input phase loss (Err12) 13: Output phase loss (Err13) 14: Module overheat (Err14) 15: External fault (Err15) 16: Communication error (Err16) 17: Reserved (Err17)	0	-	Unchangeable	*" F9-15" on page 197*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	18: Current detection error (Err18) 19: Motor auto-tuning error (Err19) 20: Reserved (Err20) 21: Parameter read/write error (Err21) 22: Reserved (Err22) 23: Motor short-circuited to ground (Err23) 24: Reserved (Err24) 25: Reserved (Err25) 26: Running time reached (Err26) 27: User-defined fault 1 28: User-defined fault 2 29: Power-on time reached (Err29) 30: Load loss (Err30) 31: PID feedback loss during running (Err31) 32: Reserved (Err32) 33: Reserved (Err33) 34: Reserved (Err34)	Continued	Continued	Continued	Continued
Continued	Continued	Continued	35: Reserved (Err35) 36: Reserved (Err36) 37: Reserved (Err37) 38: Reserved (Err38) 39: Reserved (Err39) 40: Fast current limit timeout (Err40) 41: Reserved (Err41) 42: Excessive speed deviation (Err42) 43: Reserved (Err43) 44: Reserved (Err44) 45: Reserved (Err45) 46: Reserved (Err46) 47: Reserved (Err47) 48: Reserved (Err48) 49: Reserved (Err49) 50: Reserved (Err50) 51: Reserved (Err51) 52: Reserved (Err52) 53: Reserved (Err53) 55: Slave fault under master/ slave control (Err55)	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-16	0xF910	Type of the 3rd (latest) fault	0: No fault 1: Reserved 2: Overcurrent during acceleration (Err02) 3: Overcurrent during deceleration (Err03) 4: Overcurrent at constant speed (Err04) 5: Overvoltage during acceleration (Err05) 6: Overcurrent during deceleration (Err06) 7: Overvoltage at constant speed (Err07) 8: Pre-charge resistor overload (Err08) 9: Undervoltage (Err09) 10: AC drive overload (Err10) 11: Motor overload (Err11) 12: Input phase loss (Err12) 13: Output phase loss (Err13) 14: Module overheat (Err14) 15: External fault (Err15)	0	-	Unchangeable	" F9-16" on page 199

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	16: Communication error (Err16) 17: Reserved (Err17) 18: Current detection error (Err18) 19: Motor auto-tuning error (Err19) 20: Reserved (Err20) 21: Parameter read/write error (Err21) 22: Reserved (Err22) 23: Motor short-circuited to ground (Err23) 24: Reserved (Err24) 25: Reserved (Err25) 26: Running time reached (Err26) 27: User-defined fault 1 28: User-defined fault 2 29: Power-on time reached (Err29) 30: Load loss (Err30) 31: PID feedback loss during running (Err31) 32: Reserved (Err32) 33: Reserved (Err33)	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	34: Reserved (Err34) 35: Reserved (Err35) 36: Reserved (Err36) 37: Reserved (Err37) 38: Reserved (Err38) 39: Reserved (Err39) 40: Fast current limit timeout (Err40) 41: Reserved (Err41) 42: Excessive speed deviation (Err42) 43: Reserved (Err43) 44: Reserved (Err44) 45: Reserved (Err45) 46: Reserved (Err46) 47: Reserved (Err47) 48: Reserved (Err48) 49: Reserved (Err49) 50: Reserved (Err50) 51: Reserved (Err51) 52: Reserved (Err52) 53: Reserved (Err53) 55: Slave fault under master/ slave control (Err55)	Continued	Continued	Continued	Continued
F9-17	0xF911	Frequency upon the latest fault	0.00 Hz to 655.35 Hz	0.00	Hz	Unchangeable	" F9-17" on page 201
F9-18	0xF912	Current upon the latest fault	0.00 A to 655.35 A	0.00	A	Unchangeable	" F9-18" on page 201
F9-19	0xF913	Bus voltage upon the latest fault	0.0 V to 6553.5 V	0.0	V	Unchangeable	" F9-19" on page 201
F9-20	0xF914	DI state upon the latest fault	0 to 9999	0	-	Unchangeable	" F9-20" on page 202
F9-21	0xF915	DO state upon the latest fault	0 to 9999	0	-	Unchangeable	" F9-21" on page 202
F9-22	0xF916	AC drive state upon the latest fault	0 to 65535	0	-	Unchangeable	" F9-22" on page 202
F9-23	0xF917	Power-on time upon the latest fault	0-65535 minutes	0	Minute	Unchangeable	" F9-23" on page 202
F9-24	0xF918	Running time upon the latest fault	0.0-6553.5 minutes	0.0	Minute	Unchangeable	" F9-24" on page 203

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-27	0xF91B	Frequency upon the 2nd fault	0.00 Hz to 655.35 Hz	0.00	Hz	Unchangeable	" F9-27" on page 203
F9-28	0xF91C	Current upon the 2nd fault	0.00 A to 655.35 A	0.00	A	Unchangeable	" F9-28" on page 203
F9-29	0xF91D	Bus voltage upon the 2nd fault	0.0 V to 6553.5 V	0.0	V	Unchangeable	" F9-29" on page 204
F9-30	0xF91E	Input terminal state upon 2nd fault	0 to 9999	0	-	Unchangeable	" F9-30" on page 204
F9-31	0xF91F	Output terminal state upon 2nd fault	0 to 9999	0	-	Unchangeable	" F9-31" on page 204
F9-32	0xF920	AC drive state upon 2nd fault	0 to 65535	0	-	Unchangeable	" F9-32" on page 205
F9-33	0xF921	Power-on time upon the 2nd fault	0-65535 minutes	0	Minute	Unchangeable	" F9-33" on page 205
F9-34	0xF922	Running time upon the 2nd fault	0-65535 minutes	0	Minute	Unchangeable	" F9-34" on page 205
F9-37	0xF925	Frequency upon the 1st fault	0.00 Hz to 655.35 Hz	0.00	Hz	Unchangeable	" F9-37" on page 205
F9-38	0xF926	Current upon the 1st fault	0.00 A to 655.35 A	0.00	A	Unchangeable	" F9-38" on page 206
F9-39	0xF927	Bus voltage upon the 1st fault	0.0 V to 6553.5 V	0.0	V	Unchangeable	" F9-39" on page 206
F9-40	0xF928	Input terminal state upon the 1st fault	0 to 9999	0	-	Unchangeable	" F9-40" on page 206
F9-41	0xF929	Output terminal state upon 1st fault	0 to 9999	0	-	Unchangeable	" F9-41" on page 207
F9-42	0xF92A	Drive state upon the 1st fault	0 to 65535	0	-	Unchangeable	" F9-42" on page 207
F9-43	0xF92B	Power-on time upon the 1st fault	0-65535 minutes	0	Minute	Unchangeable	" F9-43" on page 207
F9-44	0xF92C	Running time upon the 1st fault	0-65535 minutes	0	Minute	Unchangeable	" F9-44" on page 208

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-47	0xF92F	Fault protection action selection 1	Ones: Motor overload (Err11) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Tens: Input phase loss (Err12) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Hundreds: Output phase loss (Err13) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Thousands: External fault (Err15) 0: Coast to Stop 1: Stop according to the stop mode 2: Continue to run Ten thousands: Communication error (Err16) 0: Coast to Stop 1: Stop according to the stop mode 2: Continue to run	0	-	At once	*" F9-47" on page 208*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-48	0xF930	Fault protection action selection 2	Ones: Reserved 0: Coast to stop Tens: Parameter read/write abnormal (Err21) 0: Coast to stop 1: Stop according to the stop mode Hundreds: Reserved 0: Coast to stop 1: Stop according to the stop mode Thousands: Reserved 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Ten thousands: Running time reach (Err26) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run	0	-	At once	*" F9-48" on page 209*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-49	0xF931	Fault protection action selection 3	Ones: User-defined fault 1 (Err27) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Tens: User-defined fault 2 (Err28) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Hundreds: Power-on time reach (Err29) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Thousands: Load loss (Err30) 0: Coast to stop 1: Decelerate to stop 2: Continue to run at 7% of the rated motor frequency after deceleration and resume to the set frequency if the load recovers Ten thousands: PID loss during running (Err31) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run	0	-	At once	" F9-49" on page 210
F9-54	0xF936	Frequency for continuing to run upon fault	0: Current running frequency 1: Frequency reference 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon fault	0	-	At once	" F9-54" on page 210
F9-55	0xF937	Backup frequency upon fault	0.0% to 100.0%	100.0	%	At once	" F9-55" on page 211
F9-59	0xF93B	Power dip ride-through function	0: Disable 1: Bus voltage constant control 2: Decelerate to stop	0	-	At stop	" F9-59" on page 211

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
F9-60	0xF93C	Threshold for recovery from power dip ride-through	80% to 100%	85	%	At stop	" F9-60" on page 212
F9-61	0xF93D	Duration for judging voltage recovery from power dip ride-through	0.0s to 100.0s	0.5	s	At stop	" F9-61" on page 212
F9-62	0xF93E	Threshold for enabling power dip ride-through	60% to 100%	80	%	At stop	" F9-62" on page 213
F9-63	0xF93F	Protection against load loss	0: Disable 1: Enable	0	-	At once	" F9-63" on page 213
F9-64	0xF940	Load loss detection value	0.0% to 100.0%	10.0	%	At once	" F9-64" on page 214
F9-65	0xF941	Load loss detection time	0.0s–60.0s	1.0	s	At once	" F9-65" on page 214
F9-71	0xF947	Power dip ride-through gain Kp	0 to 100	40	-	At once	" F9-71" on page 214
F9-72	0xF948	Power dip ride-through integral coefficient Ki	0 to 100	30	-	At once	" F9-72" on page 215
F9-73	0xF949	Deceleration time of power dip ride-through	0.0s to 300.0s	20.0	s	At once	" F9-73" on page 215
FA-00	0xFA00	PID reference source	0: FA-01 1: AI1 External operating panel potentiometer 3: Reserved 4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 5: Communication 6: Multi-reference	0	-	At once	" FA-00" on page 215
FA-01	0xFA01	PID digital reference	0.0% to 100.0%	50.0	%	At once	" FA-01" on page 216

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FA-02	0xFA02	PID feedback source	0: AI1 1: External operating panel potentiometer 2: Reserved 3: Reserved 4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 5: Communication 6: Reserved 7: Reserved 8: Reserved	0	-	At once	" FA-02" on page 217
FA-03	0xFA03	PID action direction	0: Positive effect 1: Negative effect	0	-	At once	" FA-03" on page 217
FA-04	0xFA04	PID reference and feedback range	0 to 65535	1000	-	At once	" FA-04" on page 218
FA-05	0xFA05	Proportional gain Kp1	0.0 to 1000.0	20.0	-	At once	" FA-05" on page 218
FA-06	0xFA06	Integral time Ti1	0.01s to 10.00s	2.00	s	At once	" FA-06" on page 218
FA-07	0xFA07	Differential time Td1	0.000s to 10.000s	0.000	s	At once	" FA-07" on page 219
FA-08	0xFA08	PID reverse cut-off frequency	0.00 Hz to 500.00 Hz	0.00	Hz	At once	" FA-08" on page 219
FA-09	0xFA09	PID deviation limit	0.0% to 100.0%	0.0	%	At once	" FA-09" on page 219
FA-10	0xFA0A	PID differential limit	0.00% to 100.00%	0.10	%	At once	" FA-10" on page 220
FA-11	0xFA0B	PID reference change time	0.00s to 650.00s	0.00	s	At once	" FA-11" on page 220
FA-12	0xFA0C	PID feedback filter time	0.00s to 60.00s	0.00	s	At once	" FA-12" on page 220
FA-13	0xFA0D	PID output filter time	0.00s to 60.00s	0.00	s	At once	" FA-13" on page 221
FA-15	0xFA0F	Proportional gain Kp2	0.0 to 1000.0	20.0	-	At once	" FA-15" on page 221
FA-16	0xFA10	Integral time Ti2	0.01s to 10.00s	2.00	s	At once	" FA-16" on page 221
FA-17	0xFA11	Differential time Td2	0.000s to 10.000s	0.000	s	At once	" FA-17" on page 222

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FA-18	0xFA12	PID parameter switchover condition	0: Disable switchover 1: Switchover by DI 2: Automatic switchover based on deviation 3: Automatic switchover based on operating frequency	0	-	At once	" FA-18" on page 222
FA-19	0xFA13	PID parameter switchover deviation 1	0.0% to 100.0%	20.0	%	At once	" FA-19" on page 223
FA-20	0xFA14	PID parameter switchover deviation 2	0.0% to 100.0%	80.0	%	At once	" FA-20" on page 223
FA-21	0xFA15	PID initial value	0.0% to 100.0%	0.0	%	At once	" FA-21" on page 224
FA-22	0xFA16	PID initial value active time	0.00s to 650.00s	0.00	s	At once	" FA-22" on page 224
FA-23	0xFA17	Max. error between two outputs	0.00% to 100.00%	1.00	%	At once	" FA-23" on page 224
FA-24	0xFA18	Min. error between two outputs	0.00% to 100.00%	1.00	%	At once	" FA-24" on page 225
FA-25	0xFA19	PID integral	Ones: Integral separation 0: Inactive 1: Active Tens: Whether integral operations stop when the output reaches the limit 0: Continue integral operation 1: Stop integral operation	0	-	At once	" FA-25" on page 225
FA-26	0xFA1A	Detection value of PID feedback loss	0.0% to 100.0%	0.0	%	At once	" FA-26" on page 226
FA-27	0xFA1B	Detection time of PID feedback loss	0.0s to 20.0s	0.0	s	At once	" FA-27" on page 226
FA-28	0xFA1C	Selection of PID operation at stop	0: Disable 1: Enable	0	-	At once	" FA-28" on page 226
FB-00	0xFB00	Wobble setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0	-	Unchangeable	" FB-00" on page 227
FB-01	0xFB01	Wobble amplitude	0.0% to 100.0%	0.0	%	Unchangeable	" FB-01" on page 227

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FB-02	0xFB02	Jump frequency amplitude	0.0% to 50.0%	0.0	%	Unchangeable	" FB-02" on page 227
FB-03	0xFB03	Wobble cycle	0.1s to 3000.0s	10.0	s	Unchangeable	" FB-03" on page 228
FB-04	0xFB04	Triangular wave rising time coefficient	0.1% to 100.0%	50.0	%	Unchangeable	" FB-04" on page 228
FB-05	0xFB05	Reference length	0 m to 65535 m	1000	(m)	At once	" FB-05" on page 228
FB-06	0xFB06	Actual length	0 m to 65535 m	0	(m)	At once	" FB-06" on page 229
FB-07	0xFB07	Number of pulses per meter	0.1 to 6553.5	100.0	-	At once	" FB-07" on page 229
FB-08	0xFB08	Set count value	1 to 65535	1000	-	At once	" FB-08" on page 229
FB-09	0xFB09	Designated count value	1 to 65535	1000	-	At once	" FB-09" on page 230
FC-00	0xFC00	Multi-reference 0	-100.0% to +100.0%	0.0	%	At once	" FC-00" on page 230
FC-01	0xFC01	Multi-reference 1	-100.0% to +100.0%	0.0	%	At once	" FC-01" on page 231
FC-02	0xFC02	Multi-reference 2	-100.0% to +100.0%	0.0	%	At once	" FC-02" on page 231
FC-03	0xFC03	Multi-reference 3	-100.0% to +100.0%	0.0	%	At once	" FC-03" on page 231
FC-04	0xFC04	Multi-reference 4	-100.0% to +100.0%	0.0	%	At once	" FC-04" on page 232
FC-05	0xFC05	Multi-reference 5	-100.0% to +100.0%	0.0	%	At once	" FC-05" on page 232
FC-06	0xFC06	Multi-reference 6	-100.0% to +100.0%	0.0	%	At once	" FC-06" on page 232
FC-07	0xFC07	Multi-reference 7	-100.0% to +100.0%	0.0	%	At once	" FC-07" on page 232
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	-	At once	" FC-16" on page 233

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FC-17	0xFC11	Simple PLC retention selection upon power failure	Ones: Retentive upon power failure 0: No 1: Yes Tens: Retentive upon stop 0: No 1: Yes	0	-	At once	" FC-17" on page 233
FC-18	0xFC12	Running time of speed reference 0 by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-18" on page 234
FC-19	0xFC13	Acceleration/ deceleration time of speed reference 0 set by simple PLC	0 to 3	0	-	At once	" FC-19" on page 234
FC-20	0xFC14	Running time of speed reference 1 by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-20" on page 235
FC-21	0xFC15	Acceleration/ deceleration time of speed reference 1 set by simple PLC	0 to 3	0	-	At once	" FC-21" on page 235
FC-22	0xFC16	Running time of speed reference 2 by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-22" on page 236
FC-23	0xFC17	Acceleration/ deceleration time of speed reference 2 set by simple PLC	0 to 3	0	-	At once	" FC-23" on page 236
FC-24	0xFC18	Running time of speed reference 3 by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-24" on page 236
FC-25	0xFC19	Acceleration/ deceleration time of speed reference 3 set by simple PLC	0 to 3	0	-	At once	" FC-25" on page 237
FC-26	0xFC1A	Running time of speed reference 4 by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-26" on page 237

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FC-27	0xFC1B	Acceleration/ deceleration time of speed reference 4 set by simple PLC	0 to 3	0	-	At once	" FC-27" on page 237
FC-28	0xFC1C	Running time of speed reference 5 by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-28" on page 238
FC-29	0xFC1D	Acceleration/ deceleration time of speed reference 5 set by simple PLC	0 to 3	0	-	At once	" FC-29" on page 238
FC-30	0xFC1E	Running time of speed reference 6 by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-30" on page 239
FC-31	0xFC1F	Acceleration/ deceleration time of speed reference 6 set by simple PLC	0 to 3	0	-	At once	" FC-31" on page 239
FC-32	0xFC20	Running time of speed reference 7 set by simple PLC	0.0s (h) to 6500.0s (h)	0.0	s (h)	At once	" FC-32" on page 239
FC-33	0xFC21	Acceleration/ deceleration time of speed reference 7 set by simple PLC	0 to 3	0	-	At once	" FC-33" on page 240
FC-50	0xFC32	PLC running time unit	0: Second (s) 1: Hour (h)	0	-	At once	" FC-50" on page 240
FC-51	0xFC33	Multi-reference 0 setting mode	0: FC-00 1: AI1 2: Reserved 3: Reserved 4: Pulse (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 5: PID 6: Preset frequency (F0-08)	0	-	At once	" FC-51" on page 240

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FD-00	0xFD00	Baud rate	Ones: Modbus 0: 300 bit/s 1: 600 bit/s 2: 1200 bit/s 3: 2400 bit/s 4: 4800 bit/s 5: 9600 bit/s 6: 19200 bit/s 7: 38400 bit/s 8: 57600 bit/s 9: 115200 bit/s Tens: Reserved Hundreds: Reserved Thousands: CANlink baud rate 0: 20 kbit/s 1: 50 kbit/s 2: 100 kbit/s 3: 125 kbit/s 4: 250 kbit/s 5: 500 kbit/s	5005	-	At once	*" FD-00" on page 241*
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	-	At once	*" FD-01" on page 242*
FD-02	0xFD02	Local address	0 to 247	1	-	At once	*" FD-02" on page 243*
FD-03	0xFD03	Modbus response delay	0 ms to 20 ms	2	ms	At once	*" FD-03" on page 243*
FD-04	0xFD04	Communication timeout time	0.0s–60.0s	0.0	s	At once	*" FD-04" on page 243*
FD-05	0xFD05	Data transmission protocol	0 to 1	1	-	At once	*" FD-05" on page 244*
FD-06	0xFD06	Current resolution read through communication	0: 0.01 A (valid when the power is equal to or lower than 55 kW) 1: 0.1 A	0	-	At once	*" FD-06" on page 244*
FD-07	0xFD07	Software tool selection	0: Disable 1: Enable	0	-	At once	*" FD-07" on page 245*
FE-00	0xFE00	User-defined parameter 0	0 to 65535	7017	-	At once	*" FE-00" on page 245*
FE-01	0xFE01	User-defined parameter 1	0 to 65535	7016	-	At once	*" FE-01" on page 245*

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FE-02	0xFE02	User-defined parameter 2	0 to 65535	0	-	At once	" FE-02" on page 246
FE-03	0xFE03	User-defined parameter 3	0 to 65535	0	-	At once	" FE-03" on page 246
FE-04	0xFE04	User-defined parameter 4	0 to 65535	0	-	At once	" FE-04" on page 246
FE-05	0xFE05	User-defined parameter 5	0 to 65535	0	-	At once	" FE-05" on page 247
FE-06	0xFE06	User-defined parameter 6	0 to 65535	0	-	At once	" FE-06" on page 247
FE-07	0xFE07	User-defined parameter 7	0 to 65535	0	-	At once	" FE-07" on page 247
FE-08	0xFE08	User-defined parameter 8	0 to 65535	0	-	At once	" FE-08" on page 247
FE-09	0xFE09	User-defined parameter 9	0 to 65535	0	-	At once	" FE-09" on page 248
FE-10	0xFE0A	User-defined parameter 10	0 to 65535	0	-	At once	" FE-10" on page 248
FE-11	0xFE0B	User-defined parameter 11	0 to 65535	0	-	At once	" FE-11" on page 248
FE-12	0xFE0C	User-defined parameter 12	0 to 65535	0	-	At once	" FE-12" on page 249
FE-13	0xFE0D	User-defined parameter 13	0 to 65535	0	-	At once	" FE-13" on page 249
FE-14	0xFE0E	User-defined parameter 14	0 to 65535	0	-	At once	" FE-14" on page 249
FE-15	0xFE0F	User-defined parameter 15	0 to 65535	0	-	At once	" FE-15" on page 249
FE-16	0xFE10	User-defined parameter 16	0 to 65535	0	-	At once	" FE-16" on page 250
FE-17	0xFE11	User-defined parameter 17	0 to 65535	0	-	At once	" FE-17" on page 250
FE-18	0xFE12	User-defined parameter 18	0 to 65535	0	-	At once	" FE-18" on page 250
FE-19	0xFE13	User-defined parameter 19	0 to 65535	0	-	At once	" FE-19" on page 251
FE-20	0xFE14	User-defined parameter 20	0 to 65535	6768	-	At once	" FE-20" on page 251
FE-21	0xFE15	User-defined parameter 21	0 to 65535	6769	-	At once	" FE-21" on page 251
FE-22	0xFE16	User-defined parameter 22	0 to 65535	0	-	At once	" FE-22" on page 251

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
FE-23	0xFE17	User-defined parameter 23	0 to 65535	0	-	At once	" FE-23" on page 252
FE-24	0xFE18	User-defined parameter 24	0 to 65535	0	-	At once	" FE-24" on page 252
FE-25	0xFE19	User-defined parameter 25	0 to 65535	0	-	At once	" FE-25" on page 252
FE-26	0xFE1A	User-defined parameter 26	0 to 65535	0	-	At once	" FE-26" on page 253
FE-27	0xFE1B	User-defined parameter 27	0 to 65535	0	-	At once	" FE-27" on page 253
FE-28	0xFE1C	User-defined parameter 28	0 to 65535	0	-	At once	" FE-28" on page 253
FE-29	0xFE1D	User-defined parameter 29	0 to 65535	0	-	At once	" FE-29" on page 253
FE-30	0xFE1E	User-defined parameter 30	0 to 65535	0	-	At once	" FE-30" on page 254
FE-31	0xFE1F	User-defined parameter 31	0 to 65535	0	-	At once	" FE-31" on page 254
FP-00	0x1F00	User password	0 to 65535	0	-	At once	" FP-00" on page 254
FP-01	0x1F01	Parameter initialization	0: No operation 1: Restore to factory settings (excluding motor parameters) 2: Clear records 4: Back up current user parameters 20: Mechanical movement (conveyor belt) industry 21: Inertia (fan) industry 501: Restore user backup parameters	0	-	At stop	" FP-01" on page 255
FP-02	0x1F02	Parameter group display	Ones: Parameter group U display 0: Disable 1: Enable Tens: Group A display 0: Disable 1: Enable	11	-	At stop	" FP-02" on page 255
FP-04	0x1F04	Parameter modification property	0: Enable 1: Disable	0	-	At once	" FP-04" on page 256

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
A1-07	0xA107	Function selection for AI1 used as DI	0: No function 1: Forward run (FWD) 2: Reverse run (REV) 3: Three-wire operation control 4: Forward jog (FJOG) 5: Reverse jog (RJOG) 6: Function as the UP key 7: Function as the DOWN key 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 15: Multi-reference terminal 4 16: Acceleration/deceleration terminal 1	0	-	At stop	"A1-07" on page 256
Continued	Continued	Continued	18: Frequency reference switchover 19: Clear information set by UP/DOWN keys 20: Command source switchover terminal 1 21: Acceleration/Deceleration inhibited 22: PID pause 23: Simple PLC state reset 30: Pulse frequency input (DI4 for MD200XXX models and DI/DO for MD200XXX-NC models) 32: Immediate DC braking 33: NC input of external fault 34: Frequency modification enable 35: PID operation direction reversal 36: External stop terminal 1 37: Control command switchover terminal 2	Continued	Continued	Continued	Continued

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
Continued	Continued	Continued	38: PID integral pause 39: Switchover between frequency source X and preset frequency 40: Switchover between frequency source Y and preset frequency 43: PID parameter switchover 47: Emergency stop 48: External stop terminal 2 49: Decelerate to DC braking 50: Clear current operating time 51: Two-wire/Three-wire control switchover 52: Reverse running prohibited 53: Reserved 54: Reserved 55: Reserved 56: Reserved 57: Reserved 58: Reserved 59: Reserved	Continued	Continued	Continued	Continued
A1-10	0xA10A	Active mode for AI used as DI	Ones: AI1 0: Active high 1: Active low Tens: Reserved Hundreds: Reserved	0	-	At stop	" A1-10 " on page 258
A5-02	0xA502	Dead zone compensation mode	0: No compensation 1: Compensation mode 1	1	-	At once	" A5-02" on page 259
A5-03	0xA503	Random PWM depth	0 to 10	0	-	At once	" A5-03" on page 259
A5-04	0xA504	Pulse-by-pulse current limit	0: Disable 1: Enable	1	-	At once	" A5-04" on page 260
A5-05	0xA505	Overmodulation coefficient	100% to 110%	105	%	At stop	" A5-05" on page 260
A5-06	0xA506	Undervoltage threshold	210 V to 420 V	350	V	At once	" A5-06" on page 260
A5-08	0xA508	Low speed carrier upper limit	0.0 kHZ to 8.0 kHZ	0.0	kHz	At once	" A5-08" on page 261
A5-09	0xA509	Overvoltage threshold	650.0 V to 820.0 V	820.0	V	At stop	" A5-09" on page 261

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
A6-24	0xA618	Jump point set by AI1	-100.0% to +100.0%	0.0	%	At once	"A6-24" on page 261
A6-25	0xA619	Jump amplitude set by AI1	0.0% to 100.0%	0.5	%	At once	"A6-25" on page 262
A6-26	0xA61A	Jump point set by external operating panel potentiometer	-100.0% to +100.0%	0.0	%	At once	"A6-26" on page 262
A6-27	0xA61B	Jump amplitude set by external operating panel potentiometer	0.0% to 100.0%	0.5	%	At once	"A6-27" on page 262
AA-05	0xAA05	SVC speed filter	5 ms to 32 ms	15	ms	At once	"AA-05" on page 263
AA-06	0xAA06	SVC speed feedback mode	0 to 3	0	-	At once	"AA-06" on page 263
AA-07	0xAA07	SVC magnetic field adjustment bandwidth	5.0 Hz to 80.0 Hz	40.0	Hz	At once	"AA-07" on page 263
AA-08	0xAA08	Low-speed current with the SVC magnetic field reference in the open loop control mode	30% to 150%	100	%	At once	"AA-08" on page 264
AA-09	0xAA09	Switchover frequency in open loop control	20.0 Hz to 1000.0 Hz	40.0	Hz	At once	"AA-09" on page 264
AA-10	0xAA0A	Speed fluctuation reduction coefficient in open loop control	0 to 6	3	-	At once	"AA-10" on page 264
AA-11	0xAA0B	Acceleration/ Deceleration time in open loop control	1.0s to 10000.0s	500.0	s	At once	"AA-11" on page 264

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
AA-12	0xAA0C	Resistor auto-tuning upon start	0: Disable auto-tuning upon start 1: Enable auto-tuning upon start	0	-	At once	" AA-12" on page 265
AA-13	0xAA0D	Auto-tuned stator resistance coefficient 1 before startup	0 to 65535	0	-	At once	" AA-13" on page 265
AA-14	0xAA0E	Auto-tuned stator resistance coefficient 2 before startup	0 to 65535	0	-	At once	" AA-14" on page 265
AA-15	0xAA0F	Auto-tuned stator resistance coefficient 3 before startup	0 to -1	0	-	At once	" AA-15" on page 266
AC-00	0xAC00	Measured voltage 1 over AI1	-10.000 V to +10.000 V	0.000	V	At once	" AC-00" on page 266
AC-01	0xAC01	Displayed voltage 1 over AI1	-10.000 V to +10.000 V	0.000	V	At once	" AC-01" on page 266
AC-02	0xAC02	Measured voltage 2 over AI1	-10.000 V to +10.000 V	0.000	V	At once	" AC-02" on page 267
AC-03	0xAC03	Displayed voltage 2 over AI1	-10.000 V to +10.000 V	0.000	V	At once	" AC-03" on page 267
AC-12	0xAC0C	Target voltage 1 over AO1	-10.000 V to +10.000 V	0.000	V	At once	" AC-12" on page 267
AC-13	0xAC0D	Measured voltage 1 over AO1	-10.000 V to +10.000 V	0.000	V	At once	" AC-13" on page 268
AC-14	0xAC0E	Target voltage 2 over AO1	-10.000 V to +10.000 V	0.000	V	At once	" AC-14" on page 268
AC-15	0xAC0F	Measured voltage 2 over AO1	-10.000 V to +10.000 V	0.000	V	At once	" AC-15" on page 269
U0-00	0x7000	Running frequency (Hz)	0.00 Hz to 500.00 Hz	0.00	Hz	Unchangeable	" U0-00" on page 269
U0-01	0x7001	Frequency reference (Hz)	0.00 Hz to 500.00 Hz	0.00	Hz	Unchangeable	" U0-01" on page 269

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
U0-02	0x7002	Bus voltage (V)	0.0 V to 3000.0 V	0.0	V	Unchangeable	" U0-02" on page 270
U0-03	0x7003	Output voltage (V)	0 V to 1140 V	0	V	Unchangeable	" U0-03" on page 270
U0-04	0x7004	Output current (A)	0.00 A to 655.35 A	0.00	A	Unchangeable	" U0-04" on page 270
U0-05	0x7005	Output power (kW)	0.0 kW to 3276.7 kW	0.0	kW	Unchangeable	" U0-05" on page 270
U0-06	0x7006	Output torque (%)	-200.0% to +200.0%	0.0	%	Unchangeable	" U0-06" on page 271
U0-07	0x7007	DI state	0 to 32767	0	-	Unchangeable	" U0-07" on page 271
U0-08	0x7008	DO state	0 to 32767	0	-	Unchangeable	" U0-08" on page 271
U0-09	0x7009	AI1 voltage (V)	-10.57 V to +10.57 V	0.00	V	Unchangeable	" U0-09" on page 272
U0-10	0x700A	Reserved	-10.57 V to +10.57 V	0.00	V	Unchangeable	" U0-10" on page 272
U0-11	0x700B	Voltage (V) input through external operating panel potentiometer	-10.57 V to +10.57 V	0.00	V	Unchangeable	" U0-11" on page 272
U0-12	0x700C	Count value (applicable only to single-phase MD200SXX models)	0 to 65535	0	-	Unchangeable	" U0-12" on page 273
U0-13	0x700D	Length value (applicable only to single-phase MD200SXX models)	0 to 65535	0	-	Unchangeable	" U0-13" on page 273
U0-14	0x700E	Load speed display	0 RPM to 65535 RPM	0	RPM	Unchangeable	" U0-14" on page 273
U0-15	0x700F	PID reference	0% to 65535%	0	%	Unchangeable	" U0-15" on page 274
U0-16	0x7010	PID feedback	0% to 65535%	0	%	Unchangeable	" U0-16" on page 274
U0-17	0x7011	PLC stage	0 to 65535	0	-	Unchangeable	" U0-17" on page 274
U0-18	0x7012	Pulse input frequency (kHz)	0.00 kHz to 100.00 kHz	0.00	kHz	Unchangeable	" U0-18" on page 274

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
U0-19	0x7013	Feedback speed (Hz)	-5000.0 Hz to +5000.0 Hz	0.0	Hz	Unchangeable	" U0-19" on page 275
U0-20	0x7014	Remaining running time (min)	0.0-6500.0 minutes	0.0	Minute	Unchangeable	" U0-20" on page 275
U0-21	0x7015	AI1 voltage before correction (V)	-10.570 V to +10.570 V	0.000	V	Unchangeable	" U0-21" on page 275
U0-22	0x7016	External operating panel potentiometer voltage before correction	-10.570 V to +10.570 V	0.000	V	Unchangeable	" U0-22" on page 276
U0-24	0x7018	Motor speed (RPM) (applicable only to single-phase MD200SXX models)	0 RPM to 65535 RPM	0	RPM	Unchangeable	" U0-24" on page 276
U0-25	0x7019	Current power-on time (min)	0-65535 minutes	0	Minute	Unchangeable	" U0-25" on page 276
U0-26	0x701A	Current running time (min)	0.0-6553.5 minutes	0.0	Minute	Unchangeable	" U0-26" on page 277
U0-27	0x701B	Pulse input frequency (Hz)	0 Hz to 65535 Hz	0	Hz	Unchangeable	" U0-27" on page 277
U0-28	0x701C	Communication setting	-100.00% to +100.00%	0.00	%	Unchangeable	" U0-28" on page 277
U0-30	0x701E	Main frequency X display (Hz)	-500.00 Hz to +500.00 Hz	0.00	Hz	Unchangeable	" U0-30" on page 278
U0-31	0x701F	Auxiliary frequency Y display (Hz)	-500.00 Hz to +500.00 Hz	0.00	Hz	Unchangeable	" U0-31" on page 278
U0-32	0x7020	Memory address view	0 to 65535	0	-	Unchangeable	" U0-32" on page 278
U0-35	0x7023	Target torque (%) (applicable only to single-phase MD200SXX models)	-200.0% to +200.0%	0.0	%	Unchangeable	" U0-35" on page 279
U0-37	0x7025	Power factor angle	0.0° to 6553.5°	0.0	°	Unchangeable	" U0-37" on page 279
U0-39	0x7027	Target voltage upon V/f separation	0 V to 65535 V	0	V	Unchangeable	" U0-39" on page 279

Parameter Code	Communication Address	Parameter Name	Value	Default	Unit	Change mode:	Page
U0-40	0x7028	Output voltage upon V/f separation	0 V to 65535 V	0	V	Unchangeable	" U0-40" on page 279
U0-41	0x7029	DI state display	0 to 65535	0	-	Unchangeable	" U0-41" on page 280
U0-42	0x702A	DO state display	0 to 65535	0	-	Unchangeable	" U0-42" on page 280
U0-45	0x702D	Fault information	0 to 65535	0	-	Unchangeable	" U0-45" on page 280
U0-59	0x703B	Frequency reference percentage (%)	-100.00% to +100.00%	0.00	%	Unchangeable	" U0-59" on page 281
U0-60	0x703C	Running frequency percentage (%)	-100.00% to +100.00%	0.00	%	Unchangeable	" U0-60" on page 281
U0-61	0x703D	AC drive state	0 to 65535	0	-	Unchangeable	" U0-61" on page 281
U0-62	0x703E	Current fault code	0 to 99	0	-	Unchangeable	" U0-62" on page 282
U0-63	0x703F	Reserved	0.0% to 6553.5%	0.0	%	Unchangeable	" U0-63" on page 282
U0-64	0x7040	Number of slaves in master/slave control	0 to 65535	0	-	Unchangeable	" U0-64" on page 282
U0-65	0x7041	Torque upper limit (%) (applicable only to single-phase MD200SXX models)	-200.0% to +200.0%	0.0	%	Unchangeable	" U0-65" on page 283
U0-69	0x7045	Motor rotation frequency	0.00 Hz to 655.35 Hz	0.00	Hz	Unchangeable	" U0-69" on page 283
U0-70	0x7046	Motor speed	-32767 RPM to +32767 RPM	0	RPM	Unchangeable	" U0-70" on page 283
U0-71	0x7047	Current display (A) specific to communication card	0.0 A to 6553.5 A	0.0	A	Unchangeable	" U0-71" on page 283
U0-78	0x704E	Line speed (applicable only to single-phase MD200SXX models)	0–65535 m/min	0	m/min	Unchangeable	" U0-78" on page 284

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