Preface

Product Introduction

The CM680 is a newly designed series of high-performance general-purpose inverters with a book-shaped industrial appearance, effectively improving the utilization of installation space. The product boasts rich hardware configurations and powerful software performance, supporting various industrial bus communication protocols. It integrates industry-leading vector control technology, delivering excellent drive performance for various types of motors. Additionally, it offers a wide range of industry functions and macros, empowering applications in automation equipment across industries such as metallurgy, lifting, machine tools, printing, wire drawing, glass, food, fans, and pumps.

This manual covers the installation, wiring, commissioning and trial operation procedures, including installation dimensions, mechanical installation, electrical installation, commissioning and trial operation, troubleshooting, and a brief table of function codes.

Additional Information

Document Name	Brief Description
CM680Series General VFDs Quick Installation and Commissioning Manual	Detailed information on product installation, wiring, commissioning, troubleshooting, function codes, and fault codes.
CM680Series General VFDs Hardware Manual	Detailed information on the product's system composition, technical specifications, components, dimensions, optional accessories (installation accessories, cables, peripheral electrical components), expansion cards, as well as daily maintenance and care instructions, compliance certifications, and standards.
CM680Series General VFDs Installation Manual	Detailed information on product installation dimensions, spatial design, detailed installation steps, wiring requirements, cable management requirements, optional accessory installation requirements, and common solutions to EMC issues.
CM680Series General VFDs Software Manual	Detailed information on product applications, communication, fault codes, and function codes.
CM680Series General VFDs Communication Manual	Detailed information on the product's communication expansion card, including overview, composition, dimensions, installation, electrical connections, and communication parameter configuration, fault codes, and more.

Revision History

Revision Date	Release Version	Content of Change
2023–11	1.0	Initial Release

Warranty Statement

If the product fails or is damaged under normal usage conditions, we provide warranty service within the warranty period. Beyond the warranty period, repair fees will be charged.

During the warranty period, repair charges will be incurred for product damage caused by the following situations:

● Damage caused by operating the product contrary to the instructions in the manual.

● Damage caused by fire, flooding, or abnormal voltage.

● Damage caused by using the product for non-intended functions.

● Damage caused by using the product beyond the specified usage range.

● Secondary damage to the product caused by force majeure (natural disasters, earthquakes, lightning strikes).

The charges for relevant services are calculated according to the manufacturer's uniform standards, and an agreement, if any, shall prevail. Please refer to the *Product Warranty Card* for detailed warranty instructions

Safety Precautions

Safety Statement

● This chapter explains the safety precautions that need to be observed for the correct use of this product. Before using this product, please read the product manual and correctly understand the information related to safety precautions. Failure to comply with the safety precautions may result in death, serious injury, or equipment damage.

●The "Danger" and "Cautions" notes in the manual do not represent all the safety precautions that need to be observed but supplement the overall safety precautions.

● This product should be used in an environment that meets the design specifications. Failure to do so may cause malfunctions, and any functional abnormalities or component damage caused by non-compliance with these regulations are not covered by the product warranty.

●Our company will not bear any legal liability for personal safety accidents or property damage caused by non-compliance with the contents of this manual or unauthorized operation of the product.

Definitions of Safety Signs

In this manual, safety precautions are divided into the following two categories:

 DANGER: this sign indicates that failure to operate as required may result in serious injury or even death;

 CAUTION: this sign indicates that failure to operate as required may result in moderate or minor injury or machine damage;

Users shall read this section carefully and be sure to follow the safety precautions given when installing, commissioning, and servicing this system. The Company assumes no responsibility for any injury or damage caused by improper operation.

Stage of Use	Safety Level	Operations
Before installation	 Danger	Do not install the equipment if you find water ingress, missing parts or damaged parts in the control system upon unpacking. Do not install the equipment if the name is different from that given on the packing list.
	 Caution	Handle the equipment with due care. Otherwise there is a risk of equipment damage. Do not use the VFD with damaged drive or missing parts. Otherwise, there is a risk of personal injury. Do not touch the components of the control system with your hands. Otherwise there is a risk of electrostatic damage.
During installation	 Danger	Install the equipment on metal or other flame-retardant objects and keep it away from combustible materials. Otherwise it may cause fire hazards. Do not unscrew the anchor bolts of the components, especially those with red marks.
	 Caution	Do not allow lead ends or screws in the drive, as this may cause damage to the drive. Install the drive in a place free of vibration and do not expose it to direct sunlight. When a cabinet contains two or more VFDs, please pay attention to their installation positions to ensure effective heat dissipation.
During wiring	 Danger	Wiring operations must be performed by professional electrical engineers to avoid unexpected dangers. There must be a circuit breaker to separate the VFD from the power supply to avoid fire hazards. Please make sure that the power supply is in zero energy state before wiring operations to avoid electric shock. Make sure that the VFD is properly grounded according to grounding standards to avoid electric shock.
	 Caution	Do not connect the input power supply to the output terminals (U, V, W) of the VFD. Pay attention to the marks of the terminals and do not connect the wrong wires. Otherwise the drive may damage.

Stage of Use	Safety Level	Operations
		Do not connect the braking resistor directly between (+) and (-) terminals of the DC busbar to avoid fire hazards. For the diameter of the wires used, please refer to the recommendations in the User Manual. Otherwise safety accidents may occur.
Before powering up	 Caution	Please check whether the voltage level of the input power supply is consistent with the rated voltage level of the VFD, whether the connection positions on the power input terminals (R, S, T) and output terminals (U, V, W) are correct, whether there is any short circuit in the peripheral circuits connected to the drive, and whether the connected lines are tightened. Otherwise the drive may damage. Do not conduct the withstand voltage test on any parts of the VFD. This test has been made at the factory. Otherwise, safety accidents may occur.
	 Danger	The VFD must be tightly covered before powering up to avoid electric shock. All peripheral accessories must be wired in accordance with the instructions in the User Manual and be wired correctly using the circuit connection method provided in the User Manual. Otherwise safety accidents may occur.
After powering up	 Danger	Do not open the cover after powering up. Otherwise electric shock may occur. Do not touch any input or output terminals of the VFD. Otherwise electric shock may occur.
	 Caution	Please be aware of the risk of injury from the running motor while identifying parameters to avoid safety accidents. Do not change the factory defaults of the VFD without authorization to avoid equipment damage.
During operation	 Danger	Non-professional technicians should not detect signals while the equipment is operating, as this may cause personal injury or equipment damage. Do not touch the cooling fan and discharge resistor to test the temperature. Otherwise this may cause burns.
		Avoid foreign matters inside while the VFD is operating to avoid equipment damage.

Stage of Use	Safety Level	Operations
	Caution	Do not start or stop the drive by making or breaking the contactor. This will cause equipment damage.
During maintenance	 Danger	Non-professionals without receiving professional training should not repair and maintain the VFD. This will cause personal injury or equipment damage. Do not repair and maintain the equipment with power on. Otherwise there is a risk of electric shock. Make sure that the input power supply of the VFD is disconnected for at least 10 minutes before carrying out maintenance and repair on the drive. Otherwise the residual charge on the capacitors will cause personal injury. All pluggable connectors must be plugged and unplugged with power off. Parameters must be set and checked after the VFD is replaced.

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1.Product Information

1.1 Naming Rules

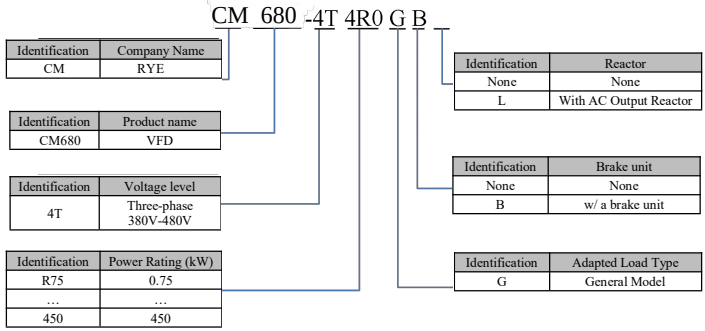
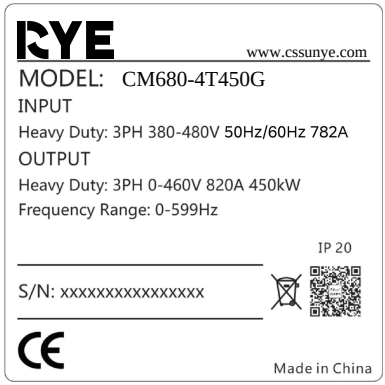


Figure 1-1 Product Model

1.2 Nameplate



Description:

1．For three-phase 380V-480V, models C2-C5 do not support the option of a DC reactor, while models C6 and above come standard with a DC reactor.

2．For three-phase 380V-480V, models C2-C4 come standard with a braking unit, and models C5-C7 have an optional braking unit.

3．(-L) denotes an optional output AC reactor. Models C9-C11 have the option to be equipped with a base for the reactor.

1.3 CM680VFD Series

Table 1-1 CM680VFD Models and Technical Data

Structural Design	VFD model	Input voltage (V)	Input current (A)	Output current (A)	Applicable motor (kW)
C2	CM680-4T4R0GB	Three-phase 380V ~ 480V Range: -15% ~ +10%	11.4	9.0	4.0
	CM680-4T5R5GB		16.7	13.0	5.5
	CM680-4T7R5GB		21	17.0	7.5
C3	CM680-4T011GB		32	25.0	11.0
	CM680-4T015GB		41	32.0	15.0
C4	CM680-4T018GB		47	37.0	18.5
	CM680-4T022GB		56	45.0	22.0
	CM680-4T030GB		72	60.0	30.0
C5	CM680-4T037G(B)		88	75.0	37.0
	CM680-4T045G(B)		110	90.0	45.0
C6	CM680-4T055G(B)		106	110.0	55.0
	CM680-4T075G(B)		139	152.0	75.0
	CM680-4T093G(B)		165	176.0	93.0
C7	CM680-4T110G(B)		190	210.0	110.0
	CM680-4T132G(B)		230	253.0	132.0
C8	CM680-4T160G		276	304.0	160.0
	CM680-4T185G		314	340.0	185.0
C9	CM680-4T200G		346	380.0	200.0
	CM680-4T220G		380	426.0	220.0
	CM680-4T250G		435	465.0	250.0
C10	CM680-4T280G		478	520.0	280.0
	CM680-4T315G		534	585.0	315.0
	CM680-4T355G		598	650.0	355.0
C11	CM680-4T400G		672	725.0	400.0
	CM680-4T450G		742	820.0	450.0

1.4 Technical Specifications

Table 1-2 VFD Technical Specifications

Item		Specification
Main control performance	Maximum output frequency	599.00Hz
	Carrier frequency	7.5kW and below: 2kHz ~ 15kHz 11kW ~ 93kW: 2kHz ~ 10kHz 110kW ~ 450kW: 2kHz ~ 6kHz Automatic carrier frequency adjustment can be done according to the load characteristics
	Input frequency resolution	Digital setting: 0.01 Hz Analog Setting: Maximum Frequency × 0.025%
	Control Mode	Asynchronous motors: V/F, VVC , SVC , and FVC
		Permanent magnet motors: SVC, VVC, and FVC
	Starting torque	SVC: 150%; FVC: 180%
	Speed regulation range	1:200 (SVC) 1:1000 (FVC)
	Speed Stability Accuracy	SVC: ≤±0.5% FVC: ≤±0.02%
	Torque response	Torque step response < 20ms
	Torque accuracy	±10% (SVC) ±5% (FVC)
	Overload capacity	150% rated current 60s
	Torque boost	Automatic and manual torque boost modes are included
	V/F curve	Multi-point V/F curve; 1.5-power V/F curve; square V/F curve
	Acceleration and deceleration curve	Linear or S-curve acceleration/deceleration; four groups of acceleration/deceleration times; acceleration/deceleration time range: 0.00s-600.00s or 0.0s-6000.0s
	DC braking	Start DC braking and shutdown DC braking are included (0.0s-60.0s)
	Jog control	Jog frequency range: 0.00Hz-599.00Hz; Jog acceleration/deceleration time range: 0.00s-600.00s or 0.0s-6000.0s

Item		Specification
	Tension control	Contain four control modes: Tension closed-loop speed mode, linear speed closed-loop speed mode, tension closed-loop torque mode, and tension open-loop torque mode
	Multi-speed running	Up to 16-speed running can be realized through terminals
	Built-in PID	Provides the option of traditional PID or fuzzy PID control, enhancing the parameter adaptability and robustness of the process control system.
Personalized function	Peripheral safety self-test	A safety test is performed on the peripherals to timely identify any problems, such as a grounding problem or a short-circuit, and improve the reliability of the system
	Common DC busbar function	A common DC bus can be shared by multiple VFDs
	JOG key	The JOG key on the operation panel can be used for jog running
	Fast current limiting function	A quick current limiting algorithm is embedded to reduce the probability that an overcurrent fault happens to the VFD
	Motor parameter identification	Automatic motor parameter identification
	Automatic Voltage Regulation	A constant voltage output can be maintained in case of grid voltage variations
Personalized function	Standardized panel extension cable	Customers can extend the panel using standard network cables
	Communication buses	At least five kinds are supported (Profinet、CANopen、Profibus-DP、EtherCAT、Ethernet/IP)
	Expansion function	Various bus communication expansion cards; PG cards (incremental, rotary encoder).
	STO	Safe torque off in case of emergency
Running	Run command channels	Support multiple command signal input methods: operation panel setting, control terminal setting, communication setting, etc.
	Frequency sources	Multiple frequency setting sources: operation panel setting, analog setting, control terminal setting, communication setting, etc.
	Auxiliary frequency sources	Multiple auxiliary frequency sources: operation panel setting, analog setting, control terminal setting, communication setting, etc. Users can

Item		Specification
		flexibly fine tune and combine auxiliary frequency sources.
	Universal terminals	8*DI (including 1 high-speed), 3*DO (including 1 high-speed), 2*Relay output, 3*AI, 2*AO
	Automatic acceleration/deceleration	Automatic acceleration/deceleration time adjustment based on the load torque
Display and panel operation	LCD display	Chinese and English are supported
	LCD parameter copying	Quick parameter copying can be accomplished on the LCD panel
Protections and options	Protection functions	Motor short-circuit detection, input/output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overtemperature protection, overload protection, etc.
	Options	Brake assembly
Environment	Use place	Indoor, free from direct sunlight, dust, corrosive gas, flammable gas, oil mist, water vapour, dripping water or salt, etc.
	Altitude	No derating is required for altitudes below 1000 meters. For altitudes above 1000 meters, derate by 1% for every additional 100 meters or lower the temperature by 0.5°C. The maximum operating altitude is 2000 meters. For altitudes exceeding 2000 meters, please contact the manufacturer.
	Ambient temperature	-10°C to +50°C (For ambient temperatures above 40°C, derate by 2% for each additional 1°C).
	Humidity	< 95％ (RH), w/o water droplets
	Vibration	< 5.9m/s²（0.6g）
	Storage temperature	-20°C ~ ＋60°C
	Pollution degree	2
Product standards	Applied safety standard	IEC61800-5-1:2017
	Applied EMC standard	IEC61800-3:2018

1.5 Optional Accessories

For detailed functions and instructions for use of options, see the relevant option descriptions.

If the following optional accessories are required, please specify when ordering.

Table 1-3 CM680VFD Optional Accessories

Name	Model	Function	Remarks
Brake unit	A model number is ended with "B"	For dynamic braking	Brake unit as standard configuration
	A model number is ended with "(B)"	For dynamic braking	Braking unit as optional configuration
C2-C8 Embedded Installation Bracket	/	Embedded Installation	Optional Configuration
C9-C11 Floor Mounting Brackets	/	Floor Mounting	Optional Configuration
C9-C11 Output Reactor Base	/	Reactor Base Installation	Optional Configuration
C9-C11 Push-in Tooling	/	Mounting the guide rail	Optional Configuration
C2-C4 Sealing Strip	2mm^2 O-ring Seal	Enhancing the sealing capability of the device chamber	Optional Configuration
PG Card1	EMH-PG1	Supports differential ABZ and non-differential ABZ encoders	Optional Configuration
PG Card2	EMH-PG2	Resolver	Optional Configuration
CANopen Bus Card	EMH-OP	Implement CANopen Communication	Optional Configuration
PROFIBUS-DP Bus Card	EMH-DP	Implement PROFIBUS-DP Communication	Optional Configuration
PROFINET Bus Card	EMH-PN	Implement PROFINET Communication	Optional Configuration
EtherNet/IP Bus Card	EMH-EN	Implement EtherNet/IP Communication	Optional Configuration
EtherCAT Bus Card	EMH-EC	Implement EtherCAT Communication	Optional Configuration
For additional function module expansion (such as: PG card, communication bus card, etc.), please choose CM680series VFD and specify the ordered function module card when placing the order.			

2 Mechanical Installation

2.1 C2 ~ C11 Overall Dimensions

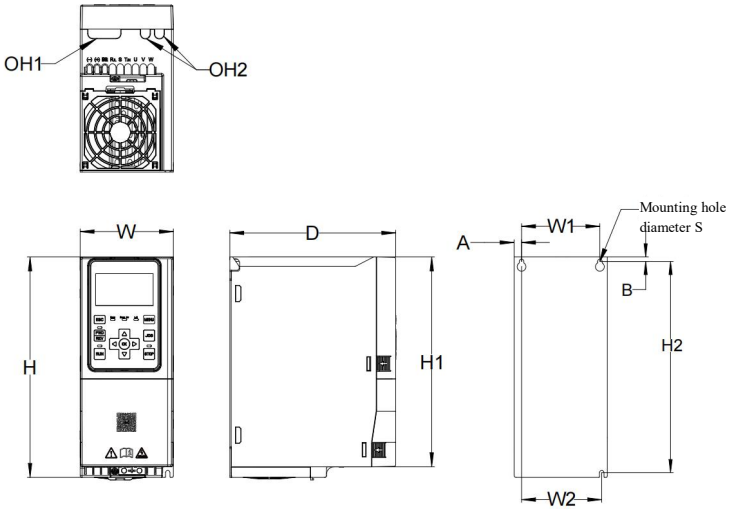


Figure 2-1 (C2~C3) 380V(4T) Under 15kW Plastic External Dimensions and Mounting Dimensions Schematic

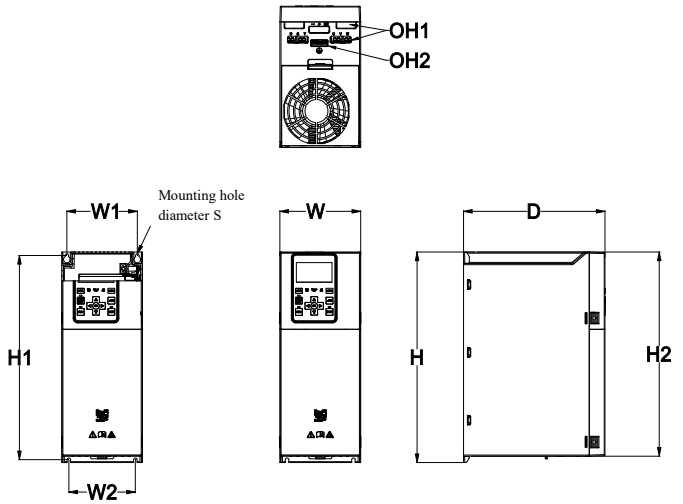


Figure 2-2 (C4) 380V(4T) 18.5 ~ 30kW Under Plastic External Dimensions and Mounting Dimensions Schematic

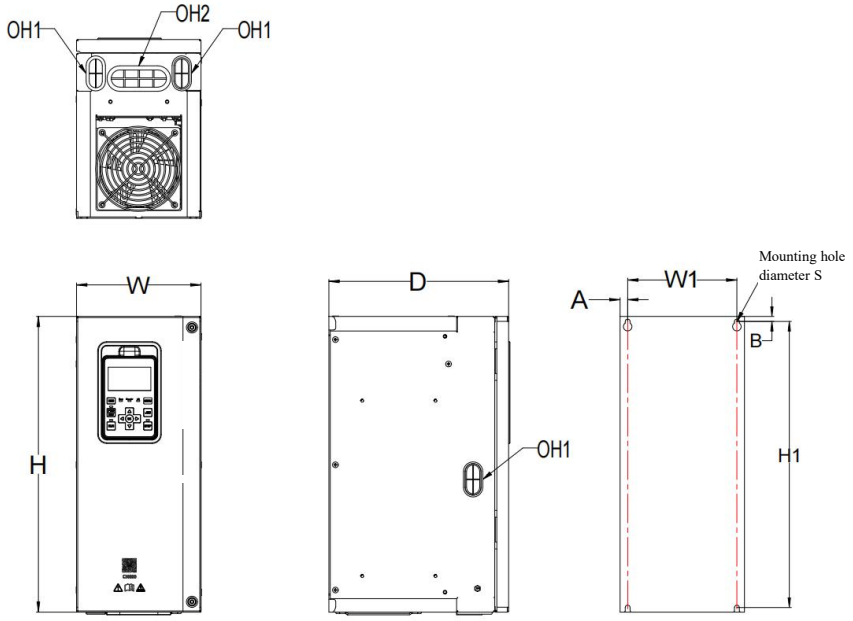


Figure 2-3 (C5) 380V(4T) 37 ~ 45kW Sheet Metal External Dimensions and Mounting Dimensions Schematic

Table 2-1 CM680-C2~C5 External Dimensions and Mounting Hole Sizes

Structural Design	W	W1	W2	H	H1	H2	D	B	Mounting hole diameter S	OH1 (Wiring hole)	OH2 (Wiring hole)	Net weight
C2	100	84	86	235	224	225	178	5	5	35*10	10*10	2kg
C3	118	100	102	320	307	308	200	6	6	35*10	10*10	3.5kg
C4	140	122	115	365	354	354	245	5.5	6	36*12	30*12	6kg
C5	180	158	×	430	416	×	260	7.5	7	46*23	85*30	13kg

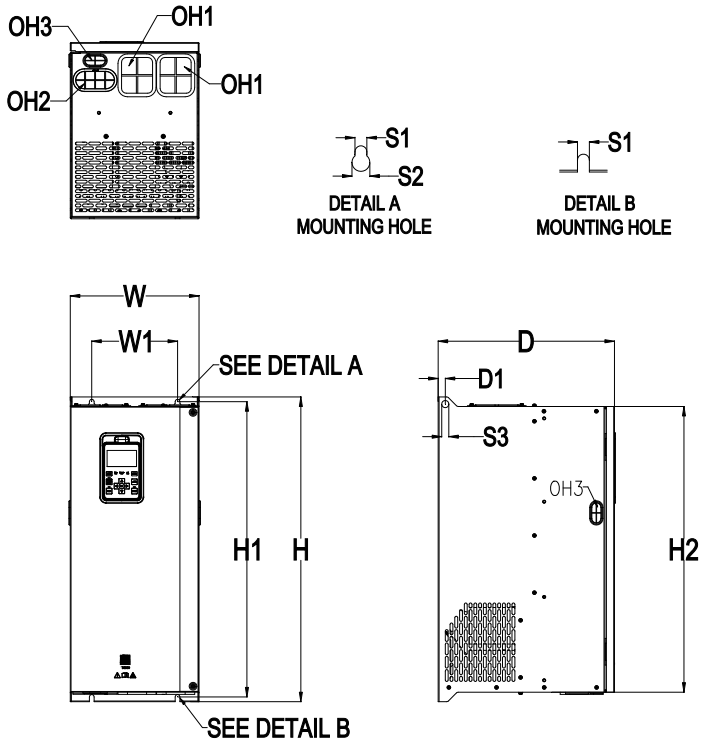


Figure 2-4 (C6~C8) 380V(4T) 55 ~ 185kW VFD External Dimensions and Mounting Dimensions Schematic

Table 2-2 CM680-C6~C8 External Dimensions and Mounting Hole Sizes

Structural Design	W	W1	H	H1	H2	D	D1	Mounting Hole Diameter S1	S2	S3	OH1	OH2	OH3	Net weight
C6	250	170	593	573	553	362	15	9	14	15	70*80	Φ30	46*23	47.5kg
C7	270	180	640	620	600	370	15	10	15	15	70*80	85*38	46*23	49.5kg
C8	290	190	780	764	730	425	17.5	9	14	15	70*80	85*38	46*23	80.5kg

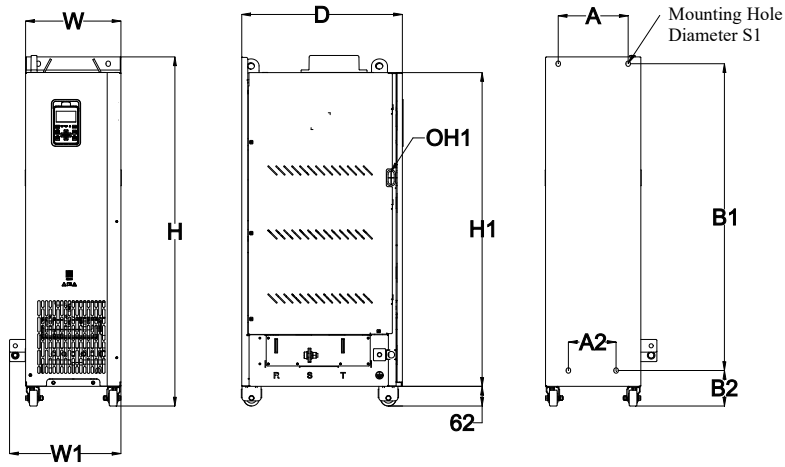


Figure 2-5 (C9~C11) 380V(4T) 200 ~ 450kW VFD External Dimensions and Mounting Dimensions Schematic

Table 2-3 CM680-C9~C11 External Dimensions and Mounting Hole Sizes

Structural Design	W	H	W1	D	H1	A1	B1	B2	A2	OH1	Mounting hole S	Net weight
C9	300	1101	350	506	990	220	968	112	150	46*23	14*17	121.5kg
C10	340	1248	390	545	1135	246	1111	115	147	46*23	17*20	167.5kg
C11	340	1389	400	545	1286	246	1262	115	180	46*23	17*20	207.5kg

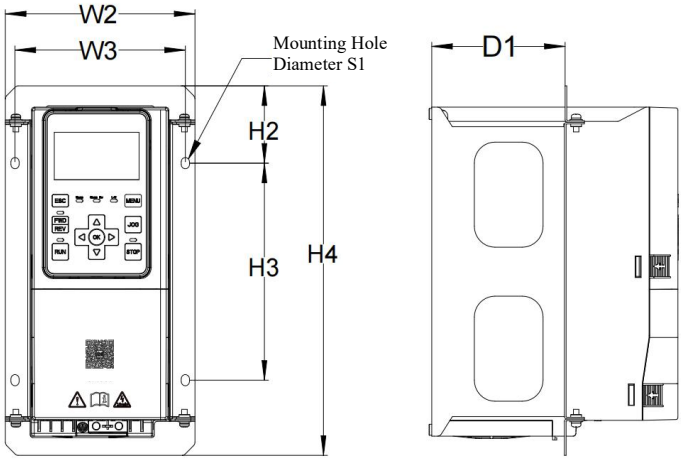


Figure 2-6 (C2~C3) CM680-4T VFD Under 15kW Dimensions Diagram

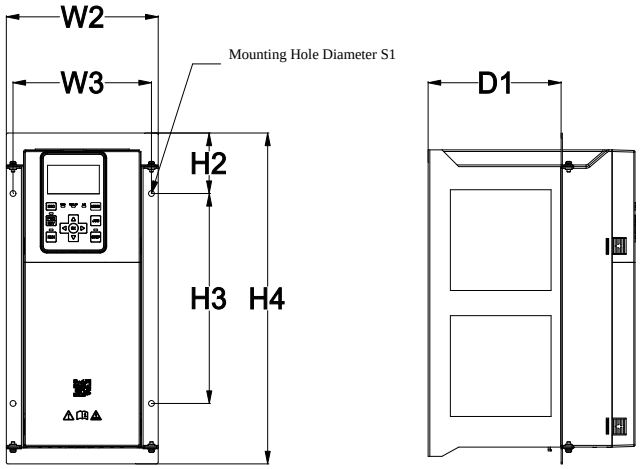


Figure 2-7 (C4) CM680-4T VFD 18.5 ~ 30kW Dimensions Diagram

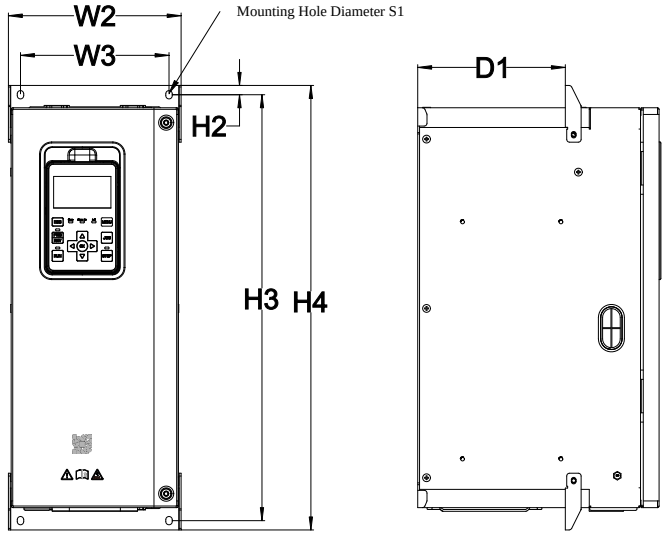


Figure 2-8 (C5) CM680-4T VFD 37 ~ 45kW Dimensions Diagram

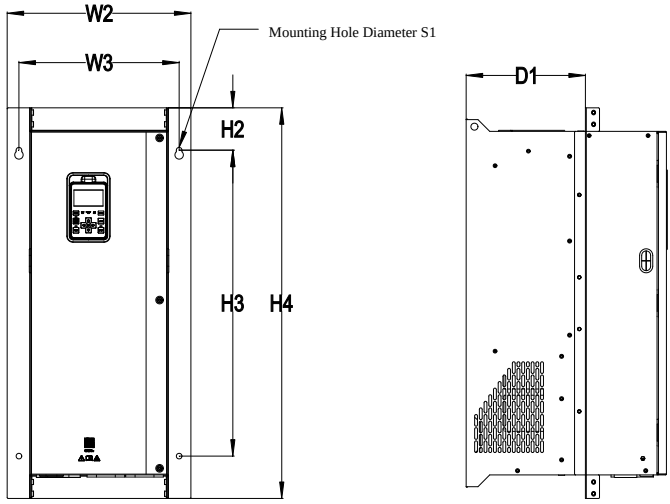


Figure 2-9 (C6~C8) CM680-4T VFD 55 ~ 185kW Dimensions Diagram

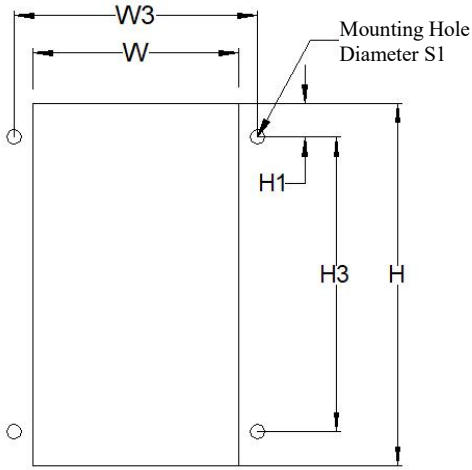


Figure 2-10 Through-Wall Installation Diagram

Table 2-4 CM680VFD Under 185kW Through-Wall Mounting Opening and Mounting Hole Sizes

VFD model	Mounting hole position			Through-wall opening dimensions		Mounting hole diameter S1 (mm)
	W3(mm)	H1(mm)	H3(mm)	H(mm)	W(mm)	
CM680-4T4R0GB	124	41.5	155	241	108	φ5
CM680-4T5R5GB						
CM680-4T7R5GB						
CM680-4T011GB	142	43.5	240	327	126	φ6
CM680-4T015GB						
CM680-4T018GB	165	53.5	250	368	148	φ7
CM680-4T022GB						
CM680-4T030GB						
CM680-4T037G(B)	160	11	458	440	185	φ7
CM680-4T045G(B)						

VFD model	Mounting hole position			Through-wall opening dimensions		Mounting hole diameter S1 (mm)
	W3(mm)	H1(mm)	H3(mm)	H(mm)	W(mm)	
CM680-4T055G(B)	287	22	553	597	254	φ10
CM680-4T075G(B)						
CM680-4T093G(B)						
CM680-4T110G(B)	300	72	500	644	274	φ10
CM680-4T132G(B)						
CM680-4T160G	330	67	650	784	294	φ10
CM680-4T185G						

External Keyboard with Tray Installation Dimensions and Without Tray Installation Diagram

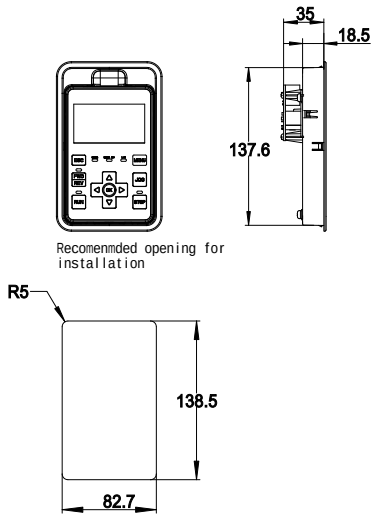


Figure 2-11 External Keyboard with Tray Installation Dimensions Diagram

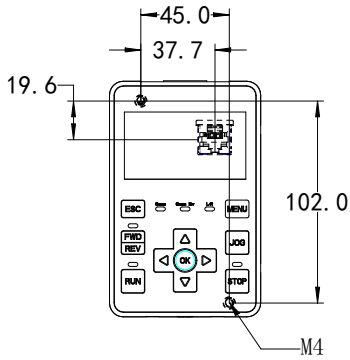


Figure 2-12 External Keyboard without Tray Installation Dimensions Diagram

2.2 Installation Requirements

2.2.1 Installation Environment

1) Ambient temperature: The surrounding ambient temperature greatly affects the lifespan of the VFD, and the operating environment temperature of the VFD should not exceed the allowable temperature range (-10°C to 50°C). When the ambient temperature is between 40-50°C, derating is required.

2) Install the inverter on the surface of a flame-retardant object. There should be enough space around it for heat dissipation. The inverter easily generates a lot of heat when working, and install it vertically on the mounting support with screws.

3) Please install in a place that is not prone to vibration, with vibrations not exceeding 0.6g, especially away from equipment such as punch presses.

4) Avoid installation in places exposed to direct sunlight, humidity, or water droplets.

5) Avoid installation in locations with corrosive, flammable, or explosive gases in the air.

6) Avoid installation in places with oil pollution, high dust levels, or metal dust.

2.2.2 Installation Method and Steps

For plastic-encased structures, through-wall installation method:

Installation instructions:

1) Remove the front and rear U-shaped brackets of the through-wall support.

2) Secure the VFD and the base of the through-wall support.

3) Reattach the front and rear U-shaped brackets to the support.

4) Insert the embedded panel and secure with screws.

For detailed through-wall installation opening sizes, see Table 2-4.

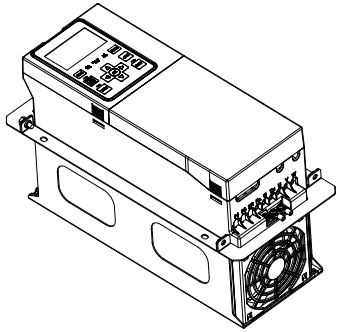


Figure 2-13 Plastic-Encased Structure Through-Wall Bracket

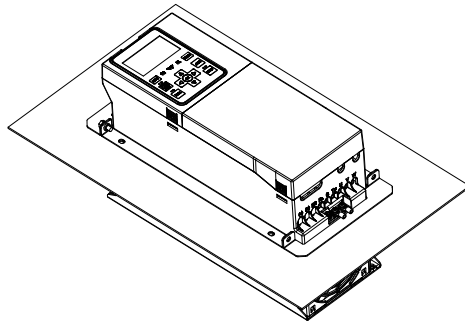


Figure 2-14 Plastic-Encased Structure Through-Wall Installation Method

Sheet Metal Structure Through-Wall Installation Method:

Installation instructions:

1) Fix the through-wall bracket to all four sides of the VFD.

2) Secure the VFD and the through-wall bracket.

3) Install the embedded panel and fix it with screws.

For detailed through-wall installation opening sizes, see Table 2-4.

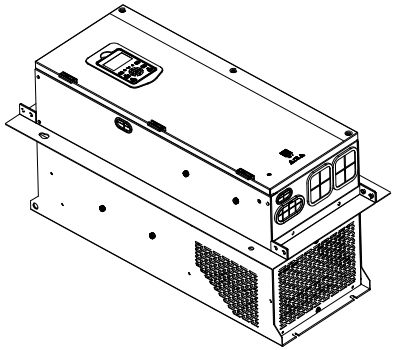


Figure 2-15 Sheet Metal Structure Through-Wall Bracket

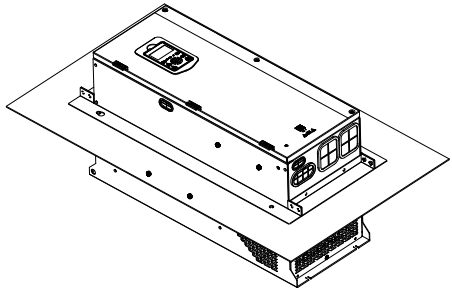


Figure 2-16 Sheet Metal Structure Through-Wall Installation Method

2.2.3 Terminal Cover Removal and Installation

For VFDs with plastic enclosures, see Figure 2-17 for the removal of the plastic enclosure terminal cover, and for those with sheet metal enclosures, see Figure 2-18.

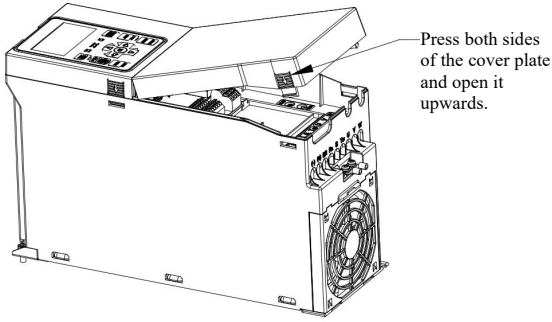


Figure 2-17 Plastic Enclosure Terminal Removal and Installation Diagram

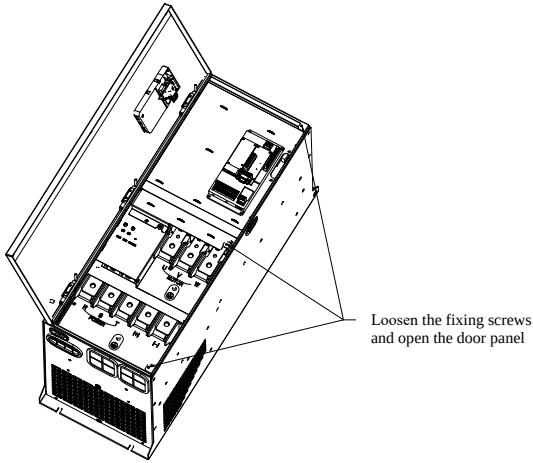


Figure 2-18 Sheet Metal Structure Disassembly Diagram

2.2.4 Wall Mounting Installation

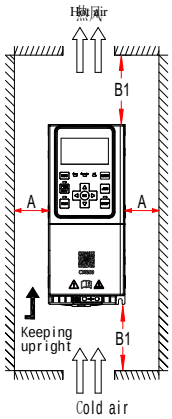


Figure 2-19 Installation Diagram for Models C2~C8

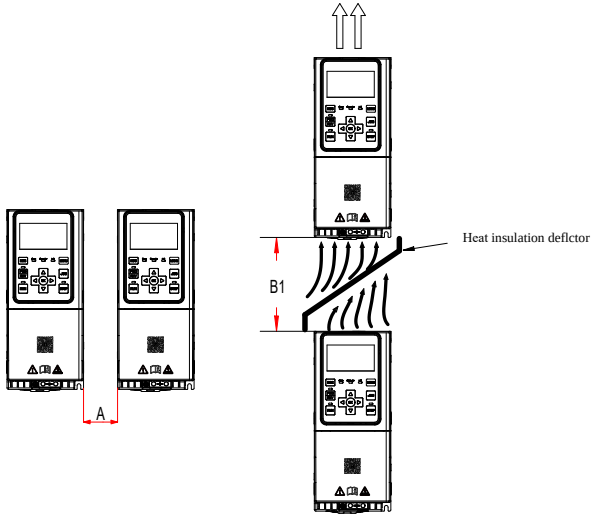


Figure 2-20 Top and Bottom Row Installation Diagram for Models C2~C8

This product is used in situations requiring top and bottom row installations. The heat from devices in the lower row can cause the temperature of devices in the upper row to rise, leading to overheating/overload faults. Therefore, measures such as installing thermal conduction plates should be taken.

Table 2-5 Installation Space Requirements for 4-185kW

Installation Space Requirements		
Power Rating	Dimensional Requirements (mm)	
4kW ~ 15kW	A≥10	B1≥100
18kW ~ 30kW	A≥10	B1≥150
37kW ~ 45kW	A≥30	B1≥200
55kW ~ 185kW	A≥100	B1≥300

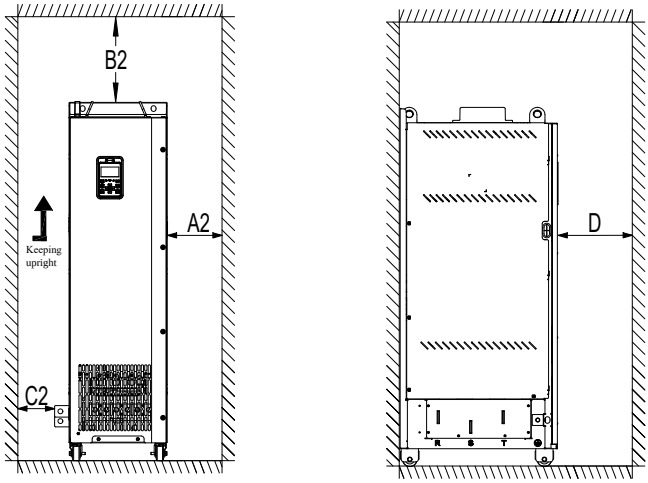


Figure 2-21 Installation Diagram for Models C9~C11

Table 2-6 Installation Space Requirements for 200 ~ 450kW

Installation Space Requirements				
Power Rating	Dimensional Requirements (mm)			
200kW ~ 450kW	A2≥10	B2≥250	C2≥20	D≥20

When installing models, attention should be paid to cooling issues. Note:

1) Please install the VFD vertically to facilitate upward heat dissipation, but it should not be inverted. If there are multiple VFDs in a cabinet, it is best to install them side by side. In cases where top and bottom installations are necessary, refer to the schematic in Figure 2-20 and install a heat dissipation guide plate.

2) Follow the installation space guidelines shown in Figures 2-19 and 2-21 to ensure proper cooling space for the VFD. However, consider the heat dissipation of other devices in the cabinet when arranging.

3) The installation bracket must be made of flame-retardant material.

4) For applications with metal dust, it is recommended to install the radiator outside the cabinet. Therefore, the space inside the fully sealed cabinet should be as large as possible.

2.2.5 Cabinet Installation (C9-C11)

Procedure

1. Bottom Bracket Installation

Use six M6 self-tapping screws to fix the mounting bracket onto the base of the nine-fold profile cabinet frame, as shown in Figure 2-22.

If the cabinet used by the customer is not a nine-fold profile cabinet, then the fixing holes of the mounting bracket need to be drilled and assembled on site.

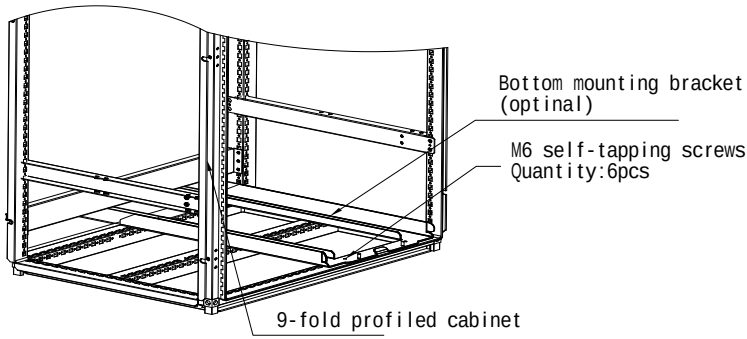


Figure 2-22 Bottom Mounting Bracket Installation Diagram

2. Rail Installation

Align the two round holes at the front of the mounting rail with the mounting holes of the mounting bracket, the rail's slot with the bracket's bent part, and finally secure both with two M6 rivet nuts, as shown in Figure 2-23.

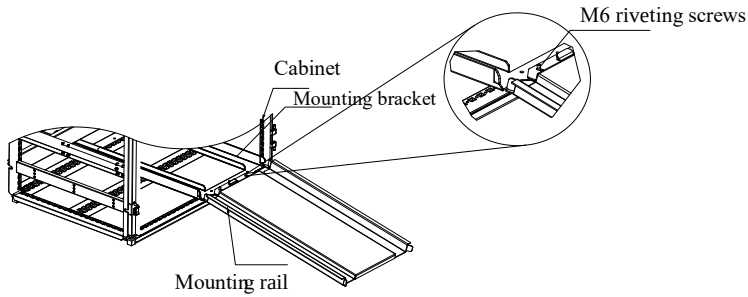


Figure 2-23 Inside Cabinet Rail Installation Diagram

3. VFD Installation

Remove the VFD cover to expose the mounting aid handle on the VFD. Align the casters of the VFD with the mounting rails and slowly push them into the cabinet. Use an iauxiliary strap during installation to avoid the VFD from tipping over during pushing in/out, and it is recommended that two people cooperate in the operation, Finally, tighten the four fixing holes on the back of the VFD with screws to fix the VFD to the fixing beam inside the cabinet and remove the auxiliary strap.

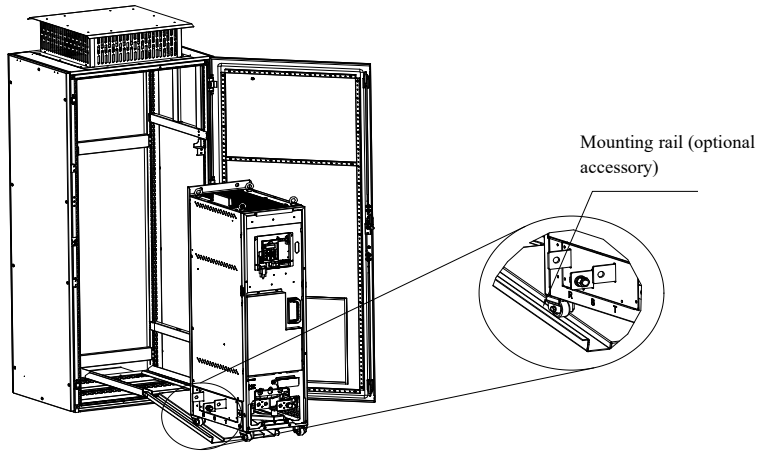


Figure 2-24 Casters Aligned with Mounting Rail Diagram

4. Connecting Power Lines to the VFD

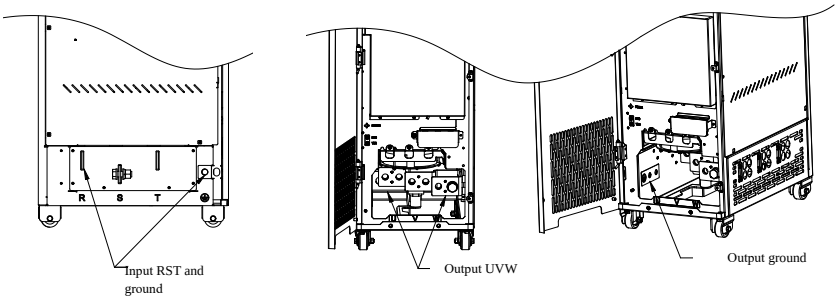


Figure 2-25 VFD Power Connection Diagram

3 Electrical Installation

3.1 Electrical Wiring Diagram

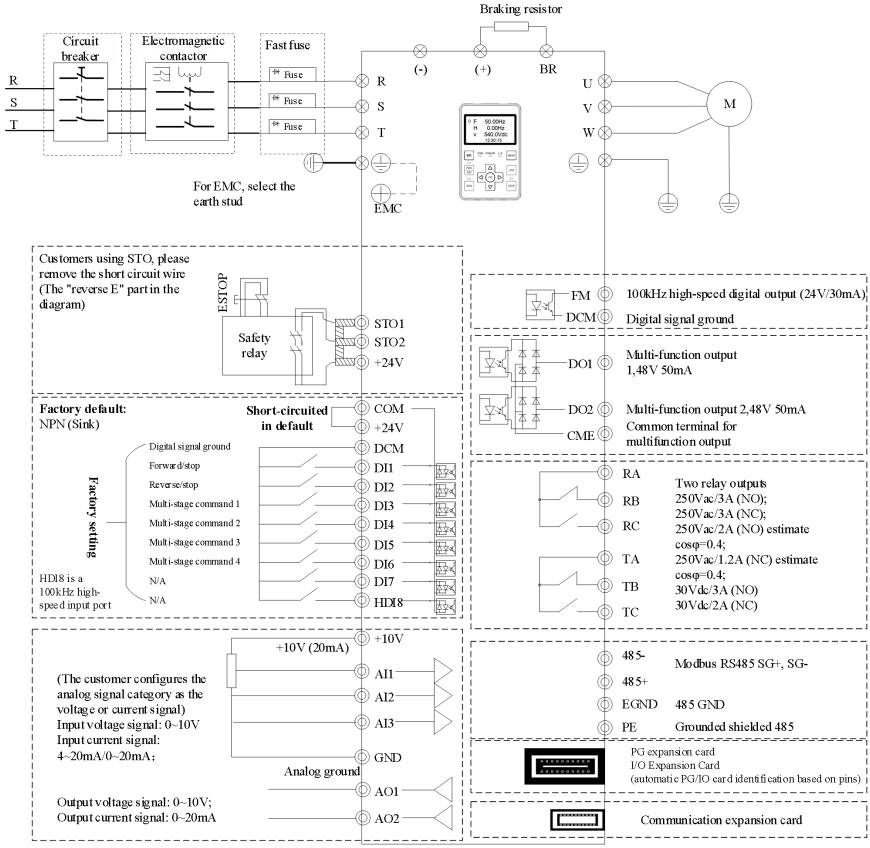


Figure 3-1 4.0 ~ 7.5kW Three-Phase VFD

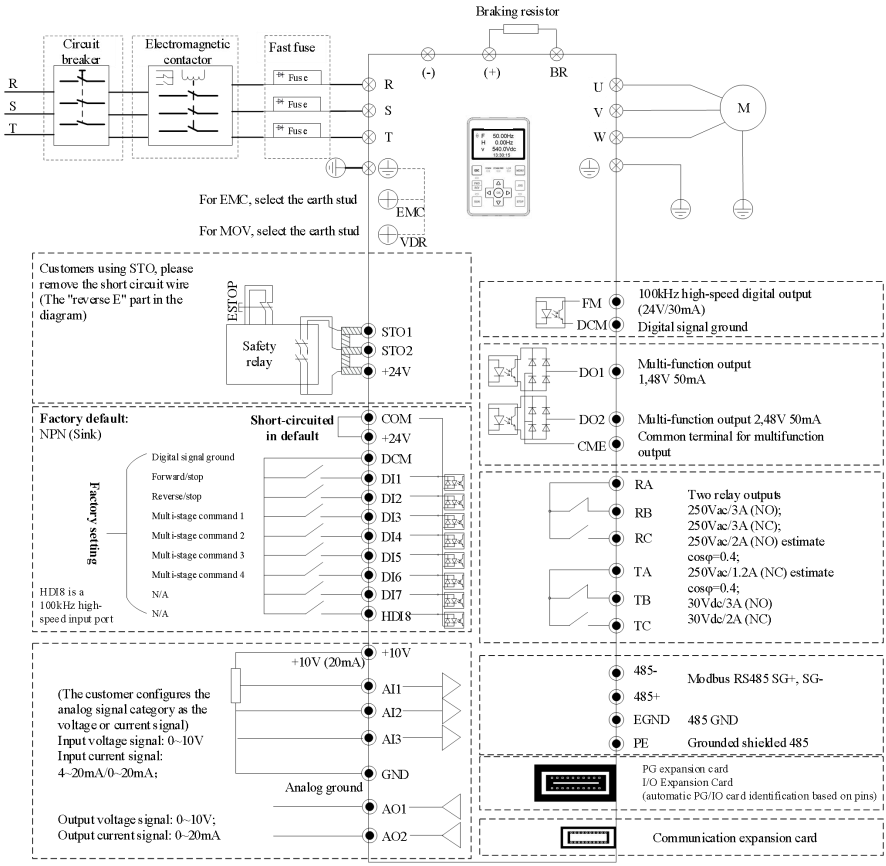


Figure 3-2 11kW ~ 132kW Three-Phase VFD

Note: The CM680series 11 ~ 30kW has an integrated braking unit, while the CM680series 37 ~ 132kW braking unit is an optional feature. Please specify if required when ordering.

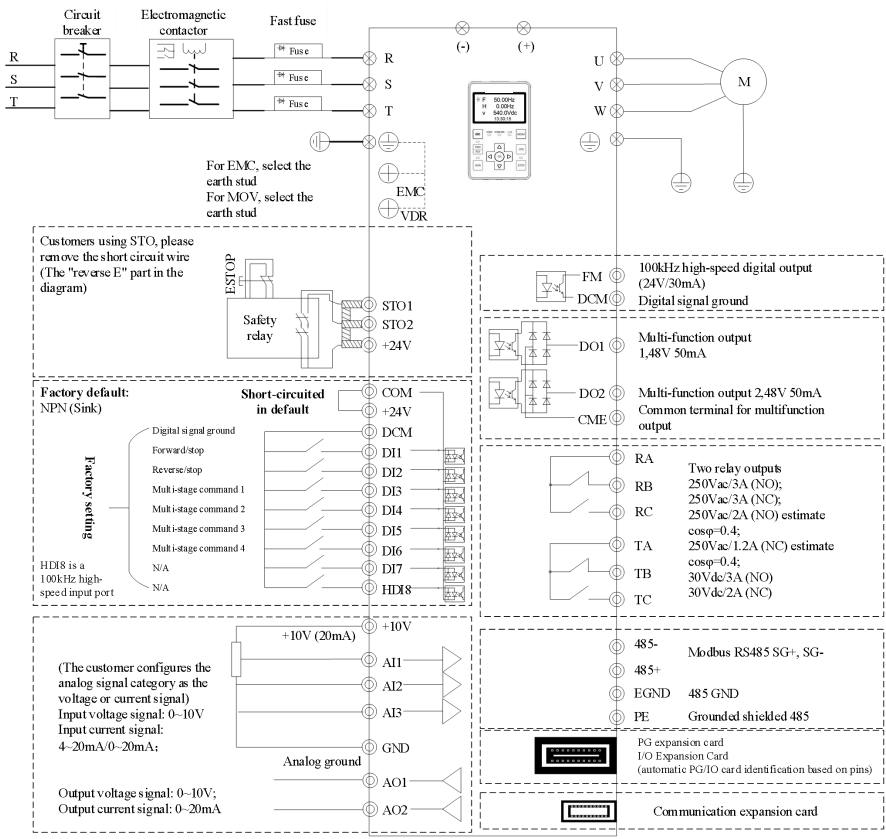


Figure 3-3 CM680series 160kW ~ 450kW Three-Phase VFD

Note: The CM680series 160kW ~ 450kW does not offer a braking function option.

3.2 Main Circuit Terminal Description

Main Circuit Terminals and Wiring

Table 3-1 Main Circuit Terminal Marking Description

Terminal marking	Name	Description
R, S, T	Three-phase power input terminal	AC input three-phase power connection point
(+), (-)	DC busbar positive and negative terminals	Common DC busbar input point
(+)、BR	Braking resistor connection terminals	160kW ~ 450kW no braking option
U, V, W	VFD output terminals	Connect three-phase motor
⏚	Grounding terminal	Grounding terminal

Wiring notes:

DC Bus (+), (-):

Be cautious as the DC bus (+), (-) terminals may retain residual voltage immediately after power off. Wait for the power indicator light on the drive board to go off, and confirm no operation for 10 minutes before wiring to avoid the risk of electric shock.

The wiring length for the braking unit should not exceed 10m, and twisted pairs or tight double-wire parallel wiring should be used.

Do not connect the braking resistor directly to the DC busbar, as this may cause damage to the VFD or even fire.

Braking resistor connection terminal (+), BR:

Select braking resistors based on recommended values and ensure wiring distance is less than 5m to prevent damage to the VFD.

VFD output side U, V, W:

Capacitors or surge protection devices must not be connected to the output side of the VFD, otherwise frequent protection or even damage to the VFD may be caused.

When the motor cable is too long, it is easy to generate electrical resonance due to the influence of the distributed capacitance, which will cause motor insulation damage or generate large leakage current to protect the VFD from overcurrent. Refer to the table below for cable length.

Table 3-2 VFD Cable Length Table

VFD model	Rated output current (A)	Without AC output reactor		With AC output reactor	
		Shielded cable(m)	Unshielded cable(m)	Shielded cable(m)	Unshielded cable(m)
CM680-4T4R0GB	9.0	50	75	75	115
CM680-4T5R5GB	13.0	50	75	75	115
CM680-4T7R5GB	17.0	50	75	75	115
CM680-4T011GB	25.0	100	150	150	225
CM680-4T015GB	32.0	100	150	150	225
CM680-4T018GB	37.0	100	150	150	225
CM680-4T022GB	45.0	100	150	150	225
CM680-4T030GB	60.0	100	150	150	225
CM680-4T037G(B)	75.0	100	150	150	225
CM680-4T045G(B)	90.0	100	150	150	225
CM680-4T055G(B)	110.0	150	225	225	325
CM680-4T075G(B)	152.0	150	225	225	325
CM680-4T093G(B)	176.0	150	225	225	325
CM680-4T110G(B)	210.0	150	225	225	325
CM680-4T132G(B)	253.0	150	225	225	325
CM680-4T160G	304.0	150	225	225	325
CM680-4T185G	340.0	150	225	225	325
CM680-4T200G	380.0	150	225	225	325
CM680-4T220G	426.0	150	225	225	325
CM680-4T250G	465.0	150	225	225	325
CM680-4T280G	520.0	150	225	225	325
CM680-4T315G	585.0	150	225	225	325
CM680-4T355G	650.0	150	225	225	325
CM680-4T400G	725.0	150	225	225	325
CM680-4T450G	820.0	150	225	225	325

Grounding terminal ⏚:

The terminal must be reliably grounded to avoid abnormal operation or damage to the equipment.

The grounding terminals ⏚ must not be shared with the power supply neutral wire N terminal.

3.3 Control Circuit Terminal Description

The arrangement of the control circuit terminals is as follows:

Figure 3-4 Control Circuit Terminal Layout

Functional Description of Control Terminals:

Table 3-3 CM680VFD Control Terminal Function Description

Category	Terminal symbol	Terminal name	Function Description
Power supply	+24V-DCM	+24V power supply	+24V power supply generally used for digital input and output terminals and an external sensor Maximum output current: 200mA
AI	AI1-GND	Analog input terminal 1	1. Input Range: DC 0 ~ 10V / 0 ~ 20mA / 4 ~ 20mA, user-configurable. 2. Input Impedance: 10kΩ for voltage input, 500Ω for current input.
	AI2-GND	Analog input terminal 2	
	AI3-GND	Analog input terminal 3	
Digital input	DI1-DCM	Digital input 1	1. Opto-coupler isolation, compatible with bipolar input 2. Input impedance: 3kΩ 3. Voltage range for DI1-DI7 level input: 9 ~ 30V; Voltage range for HDI8 level input: 15 ~ 30V; 4. HDI8 can be used as a high-speed input port. Default built-in power supply, NPN type (Sink)
	DI2-DCM	Digital input 2	
	DI3-DCM	Digital input 3	
	DI4-DCM	Digital input 4	
	DI5-DCM	Digital input 5	
	DI6-DCM	Digital input 6	
	DI7-DCM	Digital input 7	

Category	Terminal symbol	Terminal name	Function Description
	HDI8-DCM	Digital input 8	

Category	Terminal symbol	Terminal name	Function Description
AO	AO1-GND	Analog output 1	Software-configurable current output or voltage output Output voltage range: 0 ~ 10V Output current range: 0 ~ 20mA
	AO2-GND	Analog output 2	
DO	DO1-CME	Digital output 1	Opto-isolated, bipolar open-collector output Output voltage range: 0 ~ 48V Output current range：0 ~ 50mA
	DO2-CME	Digital output 2	
High speed digital output	FM-DCM	High speed digital output	Opto-coupled isolated output Output voltage range: 0 ~ 24V Output current range: 0 ~ 30mA Maximum output frequency: 100KHz
Functional safety	STO1	STO1	S1-DCM / S2-DCM Rated input voltage: +24 VDC ± 10 %; Maximum input voltage: +30 VDC Rated input current: 6.8mA ± 10% Note: When the STO function is not used, it can be disabled by short-circuiting S1 and S2 with +24V.
	STO2	STO2	
Communication interface	485+ and 485-	Modbus communication interface	Modbus communication interface
	EGND	485GND	485GND
PE	PE	PE	Signal cable shield grounding terminal
Relay output 1	TA-TB	Normally closed terminal	Single relay output capability: 250Vac/3A (NO); 250Vac/3A (NC); 250Vac/2A (NO) estimate cosφ=0.4; 250Vac/1.2A (NC) estimate cosφ=0.4; 30Vdc/3A (NO) 30Vdc/2A (NC)
	TA-TC	Normally open terminal	
Relay output 2	RA-RB	Normally closed terminal	
	RA-RC	Normally open terminal	
Interface for panel extension cable	J6	Interface for external operating panel	External keyboard or parameter copy keyboard interface (the standard network cable can be used for keyboard cable extension).

3.4 Guidance on Selecting Peripheral Electrical Components

Table 3-4 CM680VFD Guidance on Selecting Peripheral Electrical Components

VFD model	Miniature circuit breaker (MCCB) (A)	Contactor (A)	Recommended wires and cable lugs for RST/UVW		Control circuit conductor (mm^2)	Recommended wires and cable lugs for grounding	
			Wire (mm^2)	Cable lug model		Wire	Cable lug model
CM680-4T4R0GB	25	26	2.5	TNR2-4M	1.5	2.5	TNR2-4M
CM680-4T5R5GB	32	26	2.5	TNR2-4M	1.5	2.5	TNR2-4M
CM680-4T7R5GB	50	38	4	RNB5.5-4S	1.5	4	RNB5.5-4S
CM680-4T011GB	63	50	6	TNR5.5-5	1.5	6	TNR5.5-5
CM680-4T015GB	63	50	10	GTNR8-5	1.5	10	GTNR8-5
CM680-4T018GB	80	65	10	GTNR10-6	1.5	10	GTNR10-6
CM680-4T022GB	80	80	16	GTNR16-6	1.5	16	GTNR16-6
CM680-4T030GB	100	80	16	GTNR16-6	1.5	16	GTNR16-6
CM680-4T037G(B)	160	95	25	GTNR25-6	1.5	25	GTNR25-6
CM680-4T045G(B)	160	115	35	GTNR35-8	1.5	25	GTNR25-6
CM680-4T055G(B)	250	150	50	GTNR50-8	1.5	25	GTNR25-6
CM680-4T075G(B)	250	170	70	GTNR70-12	1.5	35	GTNR35-8
CM680-4T093G(B)	250	205	95	GTNR95-12	1.5	50	GTNR50-8
CM680-4T110G(B)	400	245	120	GTNR120-12	1.5	70	GTNR70-12
CM680-4T132G(B)	400	300	150	GTNR150-12	1.5	95	GTNR95-12
CM680-4T160G	400	400	185	GTNR185-12	1.5	95	GTNR95-12
CM680-4T185G	630	475	185	GTNR185-12	1.5	95	GTNR95-12

VFD model	Miniature circuit breaker (MCCB) (A)	Contactor (A)	Recommended wires and cable lugs for RST/UVW		Control circuit conductor (mm²)	Recommended wires and cable lugs for grounding	
			Wire (mm²)	Cable lug model		Wire	Cable lug model
CM680-4T200G	630	475	2×120	GTNR120-12	1.5	120	GTNR120-12
CM680-4T220G	800	620	2×150	GTNR150-12	1.5	150	GTNR150-12
CM680-4T250G	800	620	2×150	GTNR150-12	1.5	150	GTNR150-12
CM680-4T280G	800	620	2×150	GTNR150-12	1.5	150	GTNR150-12
CM680-4T315G	1000	800	2×150	GTNR150-12	1.5	185	GTNR185-12
CM680-4T355G	1000	800	2×185	GTNR185-12	1.5	185	GTNR185-12
CM680-4T400G	1250	800	2×240	GTNR240-16	1.5	240	GTNR240-16
CM680-4T450G	1250	1000	2×240	GTNR240-16	1.5	240	GTNR240-16

Table 3-5 Recommended Braking Resistor Selection Table

Structural Design	VFD model	Brake unit	125% Braking Torque (10%, maximum 10s)	Minimum Braking Resistor (Ω)
			Equivalent Braking Resistor	
C2	CM680-4T4R0GB	Built-in brake unit	1000W/75Ω	54.3
	CM680-4T5R5GB		1100W/75Ω	54.3
	CM680-4T7R5GB		1100W/75Ω	47.5
C3	CM680-4T011GB		1500W/43Ω	42.2
	CM680-4T015GB		2000W/32Ω	26.2
C4	CM680-4T018GB		2000W/32Ω	23
	CM680-4T022GB		3000W/26Ω	23
	CM680-4T030GB		4000W/16Ω	14.1

Structural Design	VFD model	Brake unit	125% Braking Torque (10%, maximum 10s)	Minimum Braking Resistor (Ω)
			Equivalent Braking Resistor	
C5	CM680-4T037G(B)	Optional braking unit	4800W/15Ω	12.7
	CM680-4T045G(B)		6000W/13Ω	12.7
C6	CM680-4T055G(B)		8000W/10.2Ω	9.5
	CM680-4T075G(B)		9600W/7.5Ω	6.3
	CM680-4T093G(B)		12000W/6.5Ω	6.3
C7	CM680-4T110G(B)		12000W/6Ω	6
	CM680-4T132G(B)		18000W/4Ω	4
C8	CM680-4T160G	No braking option	/	
	CM680-4T185G			
C9	CM680-4T200G			
	CM680-4T220G			
	CM680-4T250G			
C10	CM680-4T280G			
	CM680-4T315G			
	CM680-4T355G			
C11	CM680-4T400G			
	CM680-4T450G			

3.5 Wiring Method

Signal input terminal wiring description:

AI terminal:

Due to the susceptibility of weak analog voltage signals to external interference, shielded cables are generally required, and the wiring distance should be as short as possible, not exceeding 20m, as shown

in Figure 3-5. Where some analog signals are subjected to serious interference, a filter capacitor or a ferrite core needs to be used on the analog signal source side.

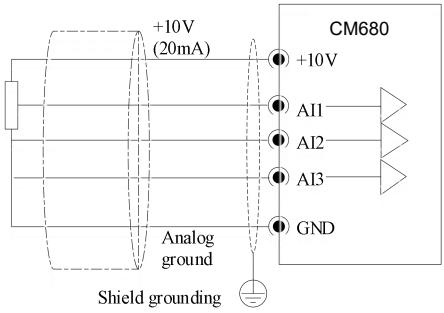


Figure 3-5 Analog Input Terminal Wiring Diagram

DO digital output terminal:

When the digital output terminal is required to drive the relay, snubber diodes should be installed on both sides of the relay coil, and the driving capacity should not be greater than 50mA. Otherwise, the DC 24V power supply is easily damaged.

Note: Ensure the correct installation of the diode's polarity to absorb surges, as shown in Figure 3-6, otherwise the DC 24V power supply will be immediately damaged when the digital output terminal is active.

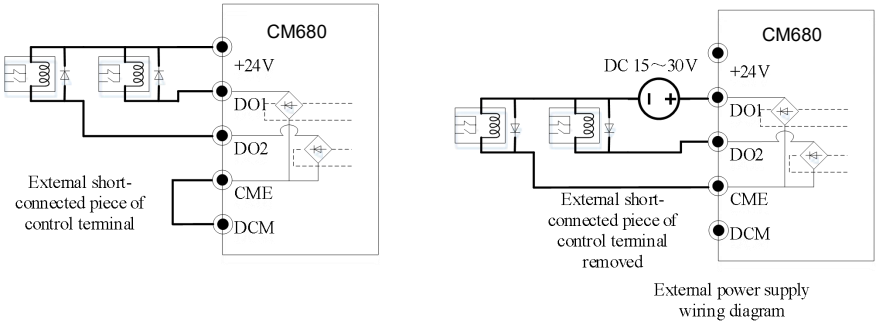


Figure 3-6 Digital Output Terminal DO Wiring Diagram

DI terminal:

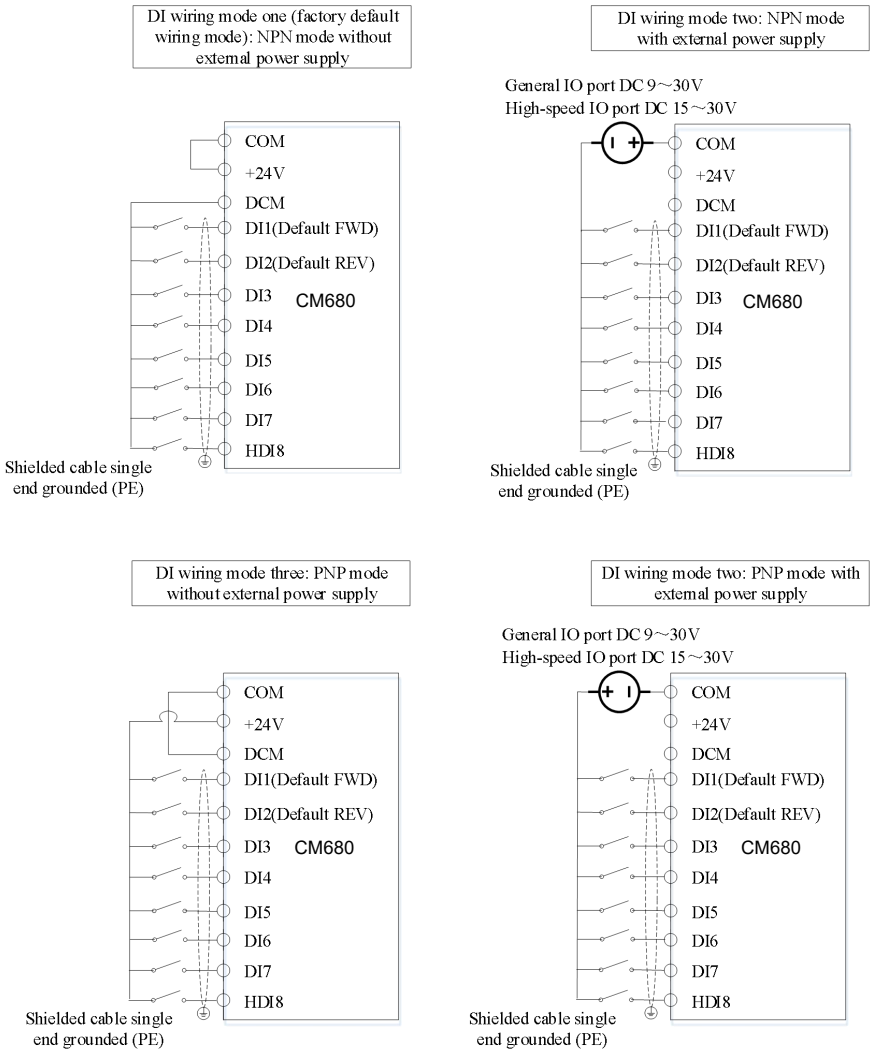


Figure 3-7 Wiring Diagram of Digital Input Terminals in Four Different Modes

Note: When using an external power supply, the normal IO ports (DI1-DI7) require an external power supply range of 9 ~ 30V, and the high-speed IO port (HDI8) requires an external power supply range of 15 ~ 30V.

Generally, a shielded cable needs to be used and its length shall be as short as no more than 20m.

When the active drive mode is selected, it is necessary to take a necessary filtering measure for the crosstalks of the power supply.

The contact control mode is recommended.

4 Commissioning Instructions

Before starting the VFD, some necessary steps, including installation, wiring, and basic checks, need to be completed to ensure the drive meets the starting conditions. The commissioning steps differ for different control methods; this section introduces the commissioning steps for VF, VVC, and SVC.

4.1 Asynchronous Motor VF and VVC Control Commissioning Method

Both VF control and VVC control can drive asynchronous motors, and their commissioning methods are almost identical. This section will introduce them together. The relevant parameters for commissioning asynchronous motors with VF and VVC are listed in Table 4-1.

Table 4-1 List of Parameters Related to Asynchronous Motor VF and VVC Commissioning

Parameter Number	Parameter Name
F4-03	M1 rated frequency
F4-04	M1 rated voltage
F2-04	M1 multi-point VF frequency point 1
F2-05	M1 multi-point VF voltage point 1
F2-06	M1 multi-point VF frequency point 2
F2-07	M1 multi-point VF voltage point 2
F2-08	M1 multi-point VF frequency point 3
F2-09	M1 multi-point VF voltage point 3
F2-10	Slip filter time
F2-11	Slip compensation gain
F2-14	Vibration compensation gain
F3-29	Torque filter time
F7-37	Automatic voltage regulation

4.1.1 Basic Settings

The basic settings for commissioning asynchronous motors with VF and VVC primarily include setting the motor nameplate parameters. Generally, motor parameter identification is not needed. The setting process is illustrated in Figure 4-1.

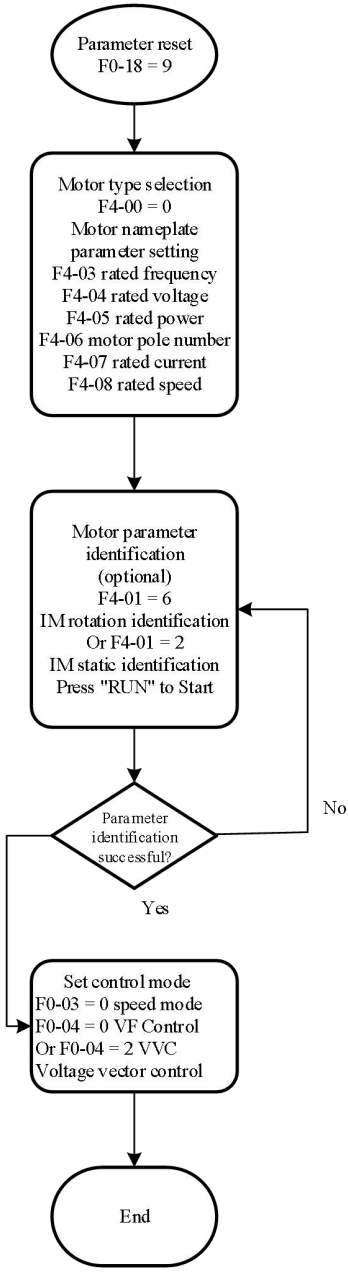


Figure 4-1 Basic Settings for commissioning Asynchronous Motors with VF and VVC

Basic setting steps for VF and VVC are as follows:

(1) Parameter reset; by setting parameter F0-18 to 9, the VFD parameters can be restored to factory settings.

(2) Set motor nameplate parameters; according to the parameters shown in Table 4-2 based on the motor's nameplate:

Table 4-2 Motor Nameplate Parameters

Parameter Number	Parameter Name
F4-00	IM/PM motor selection
F4-03	IM1 rated frequency
F4-04	IM1 rated voltage
F4-05	IM1 rated power
F4-06	IM1 number of poles
F4-07	IM1 rated current
F4-08	IM1 rated speed

(3) Perform motor parameter identification (optional, generally not required); set parameter F4-01 to 6 (IM rotation identification) or 2 (IM static identification), start the identification by pressing the run button, and after completion, the motor parameters shown in Table 4-3 will automatically update.

Table 4-3 Motor Parameters After Identification

Parameter Number	Parameter Name
F4-10	IM1 no-load current
F4-11	IM1 stator resistance
F4-12	IM1 rotor resistance
F4-13	IM1 mutual inductance
F4-14	IM1 leakage inductance

(4) Set the control mode to VF or VVC; set F0-03 to 0 for speed mode, and setting F0-04 to 0 will set the control mode to VF control. If F0-04 is set to 2, it will be VVC for an asynchronous motor.

4.1.2 No-load Commissioning

After completing the basic settings, no-load debugging can be performed. Control the motor to run at different frequencies, and if the motor vibrates, increase F2-14 "Oscillation Suppression Gain".

4.1.3 Full-load Commissioning

After no-load commissioning, proceed with load commissioning. If the motor's load capacity is insufficient, try increasing F2-01 "torque compensation gain". Under full load, if the actual motor speed is lower than the set speed, try increasing F2-11 "Slip Compensation Gain". Conversely, if the actual motor speed is higher than the set speed, try reducing F2-11 "Slip Compensation Gain".

4.2 Permanent Magnet Motor VVC Commissioning Method

PMVVC is a sensorless vector control method for permanent magnet synchronous motors. The parameters needed for debugging are shown in Table 4-4:

Table 4-4 List of Parameters Related to Permanent Magnet Motor VVC Commissioning

Parameter Number	Parameter Name
F1-01	Initial position identification method
F1-36	PM voltage pulse width
F1-37	PM high frequency injection frequency
F1-38	PM high frequency injection amplitude
F2-01	Torque compensation gain
F3-23	I/F mode current command
F3-24	IF switching frequency 1
F3-25	IF switching frequency 2
F3-29	Torque filter time
F3-41	VVC frequency compensation high pass
F3-42	VVC frequency compensation gain

4.2.1 Basic Settings

The basic settings for PMVVC commissioning include setting the motor nameplate parameters and motor parameter identification. The setting process is illustrated in Figure 4-2.

PMVVC basic setting steps are as follows:

(1) Parameter reset; by setting parameter F0-18 to 9, the VFD parameters can be restored to factory settings.

(2) Set motor nameplate parameters; according to the parameters shown in Table 4-5 based on the motor's nameplate:

Table 4-5 Motor Nameplate Parameters

Parameter Number	Parameter Name
F4-00	Motor type selection
F4-03	M1 rated frequency
F4-04	M1 rated voltage
F4-15	PM rated power
F4-16	PM number of poles
F4-17	PM rated current
F4-18	PM rated speed

(3) Perform motor parameter identification; set parameter F4-01 to 5 (PM rotation identification) or 13 (PM static identification), start the identification by pressing the run button, and after completion, the motor parameters shown in Table 4-6 will automatically update.

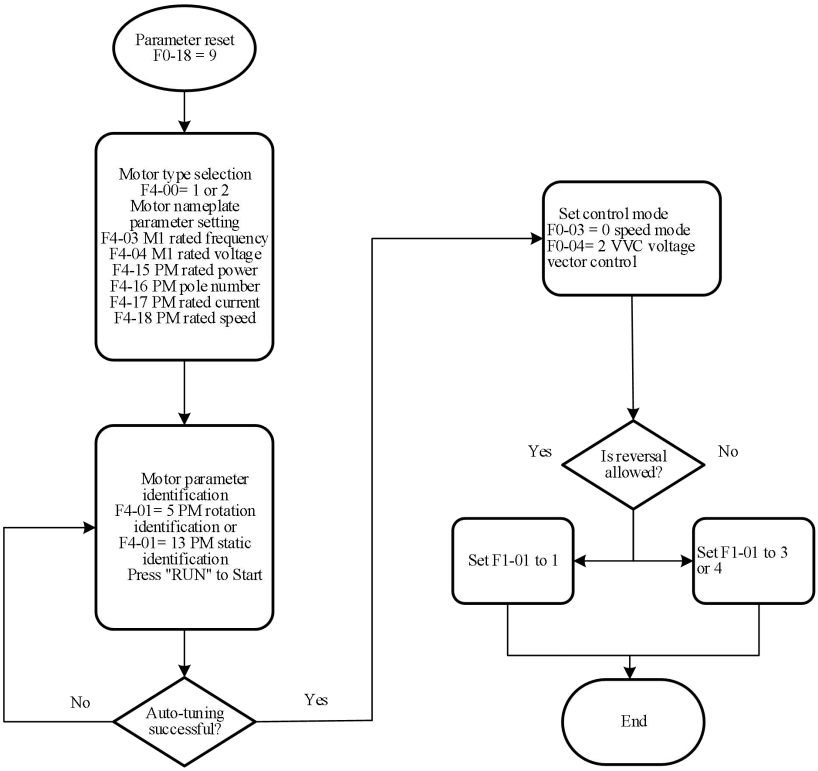


Figure 4-2 Basic Settings for Permanent Magnet Motor VVC Commissioning

Table 4-6 Motor Parameters After Identification

Parameter Number	Parameter Name
F4-20	PM stator resistance
F4-21	PM D-axis inductance
F4-22	PM Q-axis inductance
F4-23	PM Ke parameters

Table 4-6 indicates that the Ke parameter refers to the effective value of the back electromotive force at 1000 rpm. A true Ke value can be obtained during rotation identification, while during static identification, Ke will be estimated based on motor parameters.

If an error occurs during identification, or if the identification results are not within a reasonable range, identification must be redone. The table below details possible identification errors, and when an error occurs, you can follow the descriptions in Table 4-7 to troubleshoot.

Table 4-7 Identification Related Errors

Fault Code	Fault Description
E040 Motor parameter identification error	Motor parameter identification error
E142 No feedback current during motor parameter identification	No feedback current during identification
E143 Motor phase loss during motor parameter identification	Motor phase loss during identification

(4) Set the control mode to PMVVC; set F0-03 to 0 speed mode, and setting F0-04 to 2 will configure the control mode to PMVVC.

(5) Initial Angle Identification Method Selection; choose the initial angle identification method through parameter F1-01 as shown in Table 4-8.

Table 4-8 Initial Position Identification Method

F1-01	Description
0	No initial angle identification
1	Attraction method
3	Pulse injection method 1
4	Pulse injection method 2

If reverse starting is not allowed, prefer options 3 or 4. If reverse starting is permitted or if 3 and 4 are not effective, the attraction method may be attempted.

4.2.2 No-load Commissioning

After completing the basic settings, no-load commissing can be performed. The no-load commissioning process for a permanent magnet motor with VVC is shown in Figure 4-3.

The steps for no-load commissioning of permanent magnet motor with VVC are as follows:

(1) Start the motor and run it up to 1/2 of its rated speed. If overcurrent occurs during startup, handle according to the setting of F1-01: if F1-01=1, reduce the current loop bandwidth; if F1-01=3 or 4, decrease F1-36 "PM Voltage Pulse Width". If reverse starting is not permitted and the motor reverses,

increase F1-36 "PM Voltage Pulse Width". If the no-load current is too high (exceeding 60% of the rated current), "F2-01 Torque Compensation Gain" can be increased.

(2) Control the motor to run at its rated speed.

If the motor exhibits periodic low-frequency fluctuations, try increasing F3-42 "VVC Frequency Compensation Gain" or raising F3-41 "VVC Frequency Compensation High Pass". If the motor experiences severe vibration, attempt to decrease F3-42 "VVC Frequency Compensation Gain" or lower F3-41 "VVC Frequency Compensation High Pass".

(3) Control the motor to run at its maximum speed.

If loss of control occurs during acceleration, try increasing F3-42 "VVC Frequency Compensation Gain", or increase the carrier frequency (parameter F0-15, where the carrier frequency generally needs to be more than 10 times the highest output frequency).

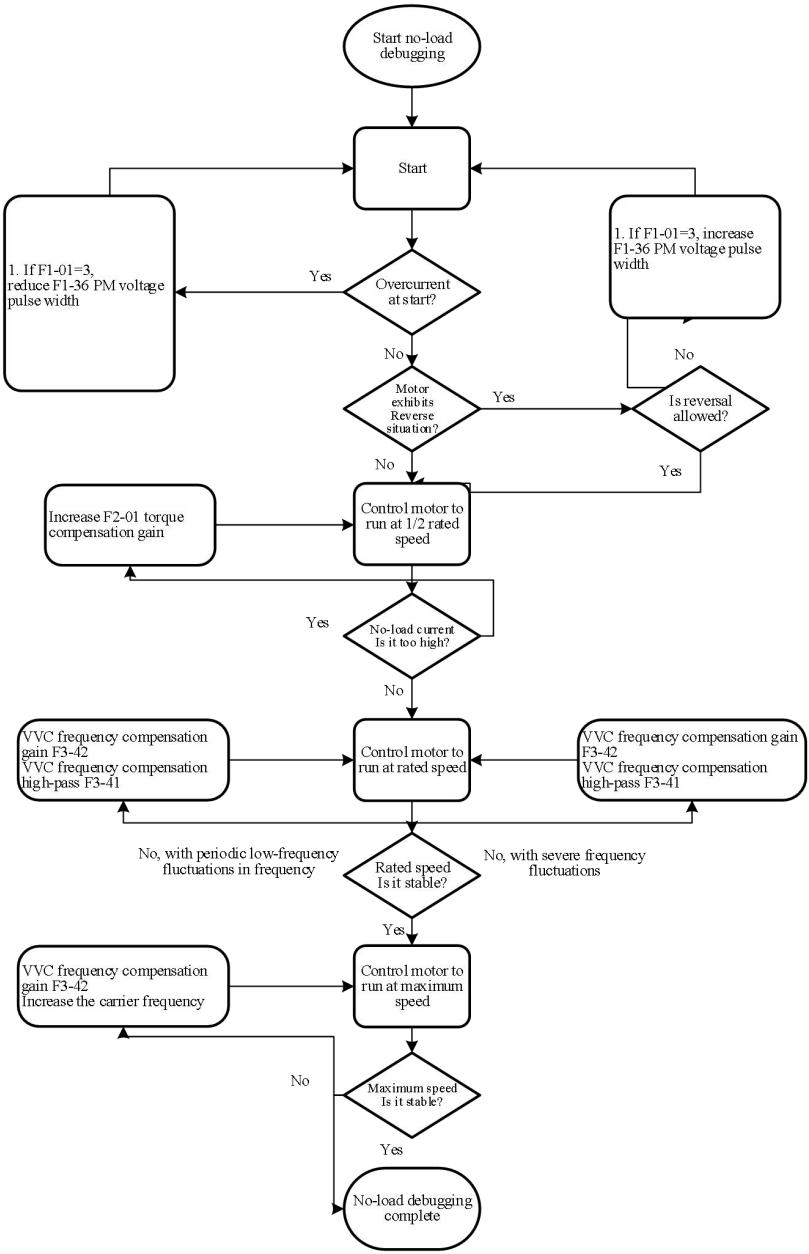


Figure 4-3 Flowchart of No-load Debugging Process for Permanent Magnet Motor with VVC

4.2.3 Full Load Commissioning

After the no-load commissioning is completed, load commissioning can be performed. The load commissioning process for the permanent magnet motor VVC is shown in Figure 4-4.

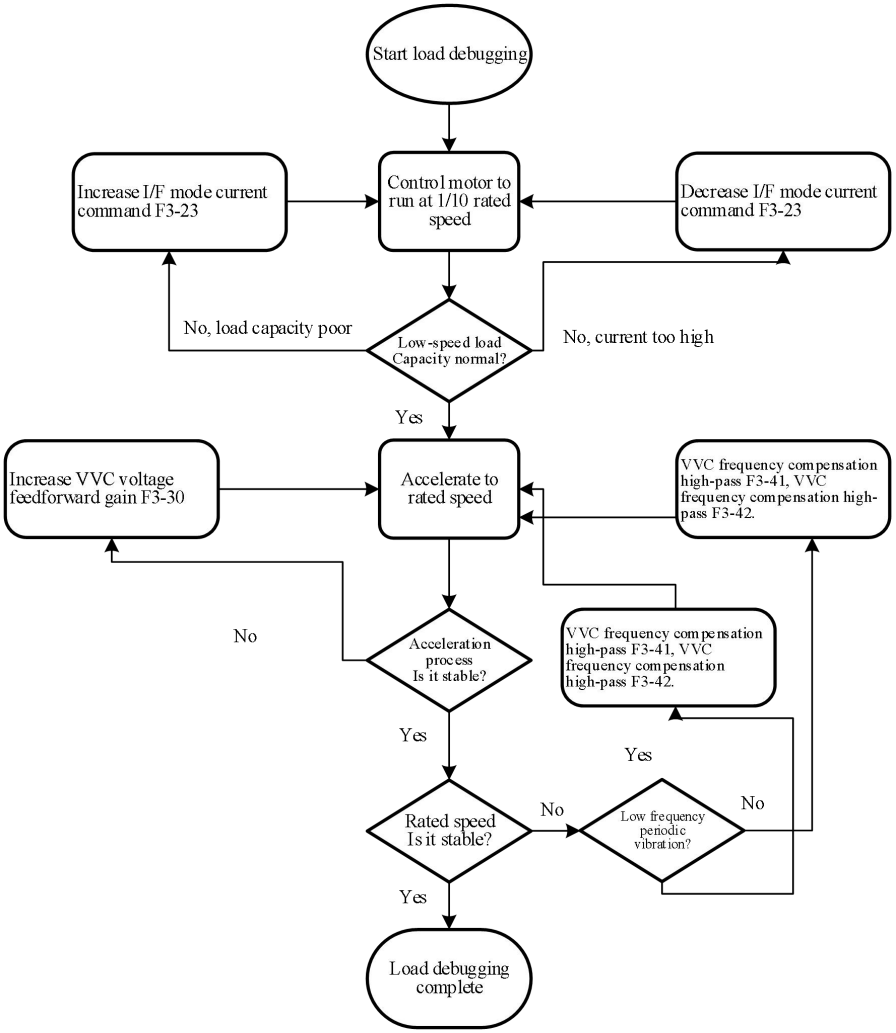


Figure 4-4 Load Commissioning Process Flow Chart for Permanent Magnet Motor VVC

By default, I/F control is applied at 1/10 of the rated speed. If I/F control is not used, F3-25 can be set to zero.

The steps for full-load commissioning are as follows:

(1) Low-speed load capacity commissioning: Run the motor at 1/10 of the rated speed. If the load capacity of the motor is insufficient, increase the "I/F Mode Current Command" F3-23. If the low-frequency current is too high, reduce the "I/F Mode Current Command" F3-23.

(2) Load test during acceleration; Accelerate from 1/10 of the rated speed to the rated speed. If instability occurs, try increasing "VVC Voltage Feedforward Gain" F3-30.

(3) Rated speed load test: If the motor exhibits periodic low-frequency fluctuations, try increasing "VVC Frequency Compensation Highpass" F3-41 or "VVC Frequency Compensation Gain" F3-42. If the motor experiences severe vibrations, attempt to reduce "VVC Frequency Compensation Highpass" F3-41 or "VVC Frequency Compensation Gain" F3-42.

4.3 Commissioning Methods for Asynchronous and Permanent Magnet Motors SVC

4.3.1 Introduction to SVC

SVC is a sensorless vector control method that can perform speed or torque control for asynchronous motors, synchronous motors, and synchronous reluctance motors. The parameters related to SVC commissioning are shown in Table 4-9.

Table 4-9 Parameters Related to SVC Commissioning

Parameter Number	Parameter Name
F3-00	Speed loop PI parameter automatic calculation function enable bit (bit 0 of F3-00, set to 1 to enable)
F3-01	ASR1/2 switching frequency
F3-02	Zero speed bandwidth
F3-03	ASR1 low-speed bandwidth
F3-04	ASR2 high-speed bandwidth
F3-05	ASR zero-speed gain
F3-06	ASR zero-speed integral
F3-07	ASR1 low speed gain
F3-08	ASR1 low-speed integral time
F3-09	ASR2 high-speed gain

Parameter Number	Parameter Name
F3-10	ASR2 high-speed integral time
F3-14	ASR output filtering time
F3-23	I/F mode current command
F3-26	Field weakening proportional coefficient
F3-27	Field weakening integral coefficient
F4-09	Inertia per unit value
L2-09	Dead zone compensation slope 4

4.3.2 Basic Settings

The basic settings for an induction motor SVC include setting the motor nameplate parameters and motor parameter identification. The setup process is shown in Figure 4-5.

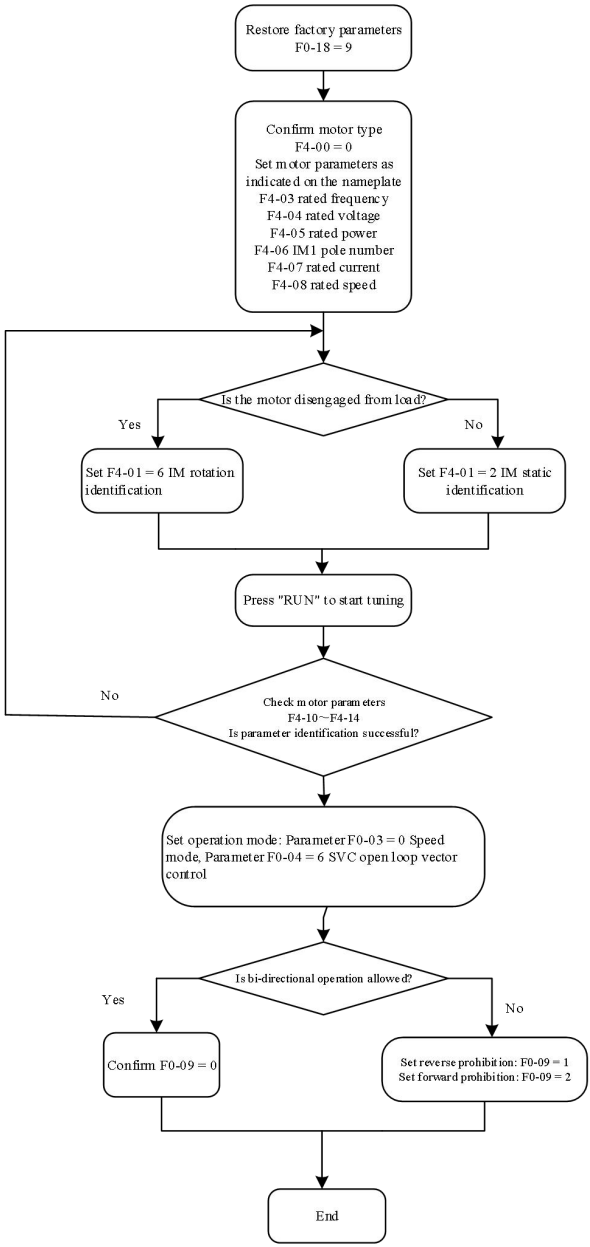


Figure 4-5 Basic Setup Process Flow Chart for Induction Motor SVC

(1) Parameter Reset

Set parameter F0-18 to 9 will restore the VFD parameters to factory settings.

(2) Motor Type Selection

Setting parameter F4-00 = 0 is for induction motors.

(3) Set the motor parameters according to the actual motor nameplate parameters as shown in Table 4-10.

Table 4-10 Motor Nameplate Parameters

Parameter Number	Parameter Name
F4-03	IM1 rated frequency
F4-04	IM1 rated voltage
F4-05	IM1 rated power
F4-06	IM1 number of poles
F4-07	IM1 rated current
F4-08	IM1 rated speed

(4) Perform Motor Parameter Identification

Check whether the motor is disengaged from the load. In the case of disengagement, it is recommended to set F4-01 = 6 for rotation parameter identification; if disengagement is not possible, set F4-01 = 2 for stationary parameter identification. Press the "RUN" button to start the identification process. After the motor parameter identification is completed, the motor parameters shown in Table 4-11 will be automatically updated.

Table 4-11 Motor Parameters after Identification

Parameter Number	Parameter Name
F4-10	IM1 no-load current
F4-11	IM1 stator resistance
F4-12	IM1 rotor resistance
F4-13	IM1 mutual inductance
F4-14	IM1 leakage inductance

The above parameters refer to the per-phase parameter values. If an error occurs during identification, or if the identification results are not within a reasonable range, identification must be redone.

The basic settings for a permanent magnet motor SVC include setting the motor nameplate parameters and motor parameter identification. The setup process is shown in Figure 4-6.

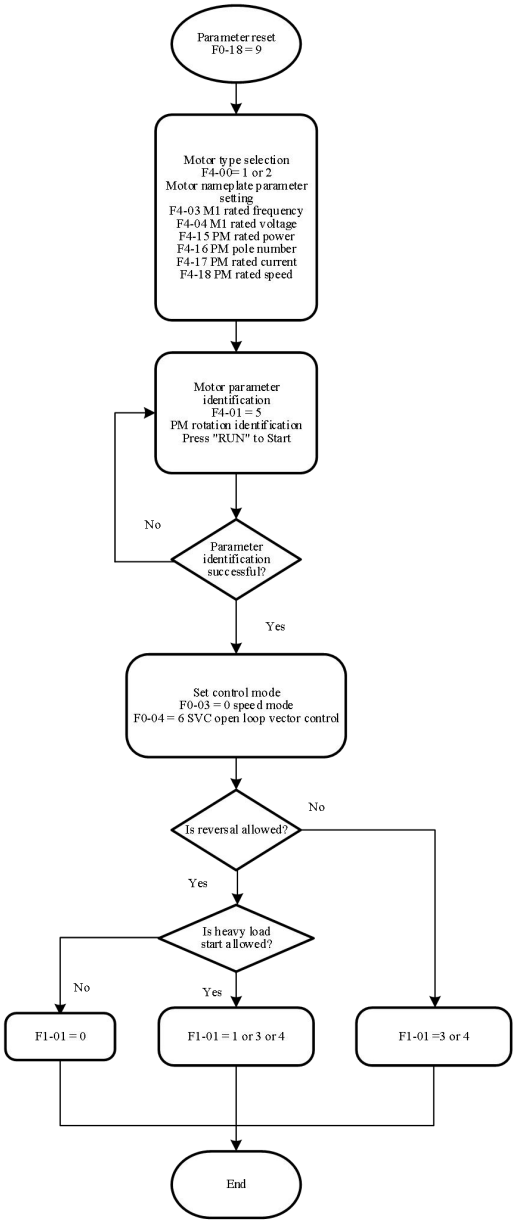


Figure 4-6 Basic Setup Process Flow Chart for Permanent Magnet Motor SVC

(1) Parameter Reset

Set parameter F0-18 to 9 will restore the VFD parameters to factory settings.

(2) Motor Type Selection

Setting parameter F4-00 = 1 corresponds to a surface-mounted synchronous motor, with Ld = Lq; setting F4-00 = 2 corresponds to an interior permanent magnet synchronous motor, with Ld ≠ Lq.

(3) Set the motor nameplate parameters according to Table 4-12:

Table 4-12 Motor Nameplate Parameters

Parameter Number	Parameter Name
F4-03	M1 rated frequency
F4-04	M1 rated voltage
F4-15	PM rated power
F4-16	PM number of poles
F4-17	PM rated current
F4-18	PM rated speed

(4) Perform Motor Parameter Identification

Check whether the motor is disengaged from the load. In the case of disengagement, it is recommended to set F4-01 = 5 for rotational parameter identification. Press the "RUN" button to start the identification process. After the motor parameter identification is completed, the motor parameters shown in Table 4-13 will be automatically updated.

Table 4-13 Motor Parameters after Identification

Parameter Number	Parameter Name
F4-20	PM stator resistance
F4-21	PM D-axis inductance
F4-22	PM Q-axis inductance
F4-23	PM Ke parameters (V/krpm)
F4-26	PM magnetic pole angle (degrees)

4.3.3 No-load Commissioning

After completing the basic settings, no-load commissioning can be performed. The SVC no-load commissioning process is shown in Figure 4-7.

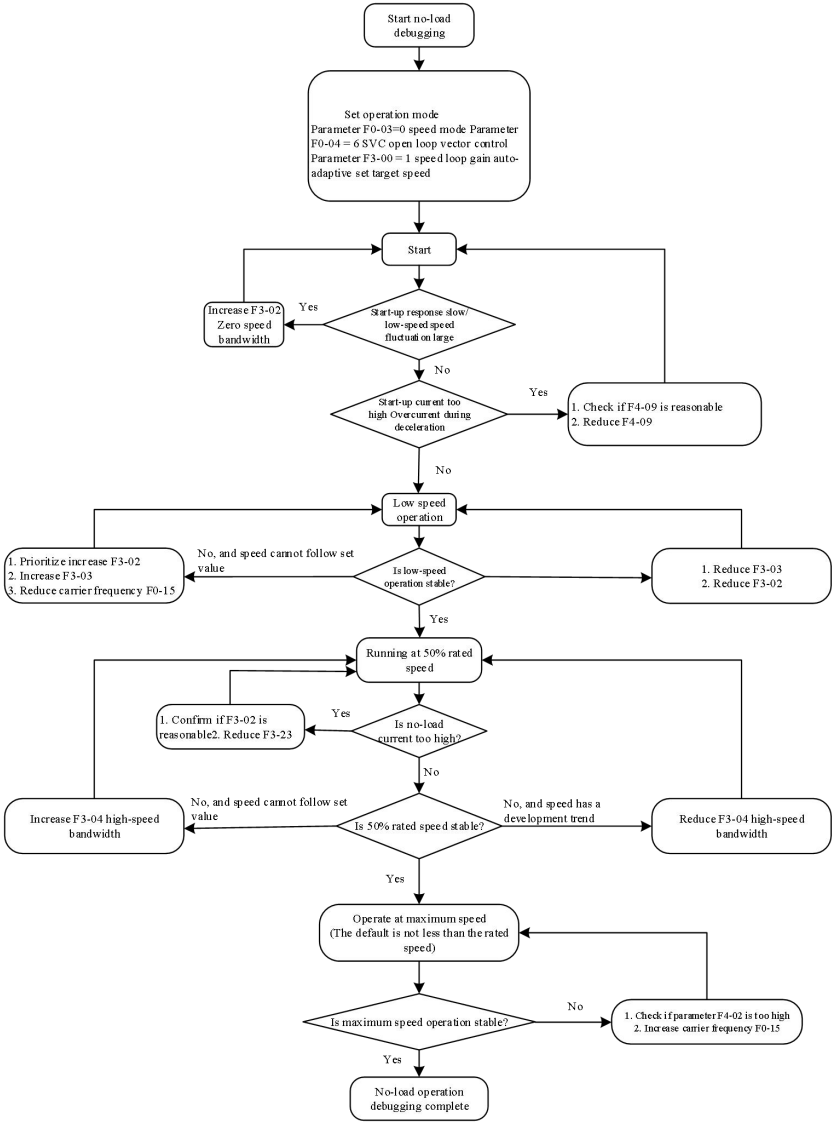


Figure 4-7 SVC No-Load Commissioning Process Flow Chart

4.3.4 Load Commissioning

After completing the no-load commissioning, load commissioning can be performed. The SVC load commissioning process is shown in Figure 4-8.

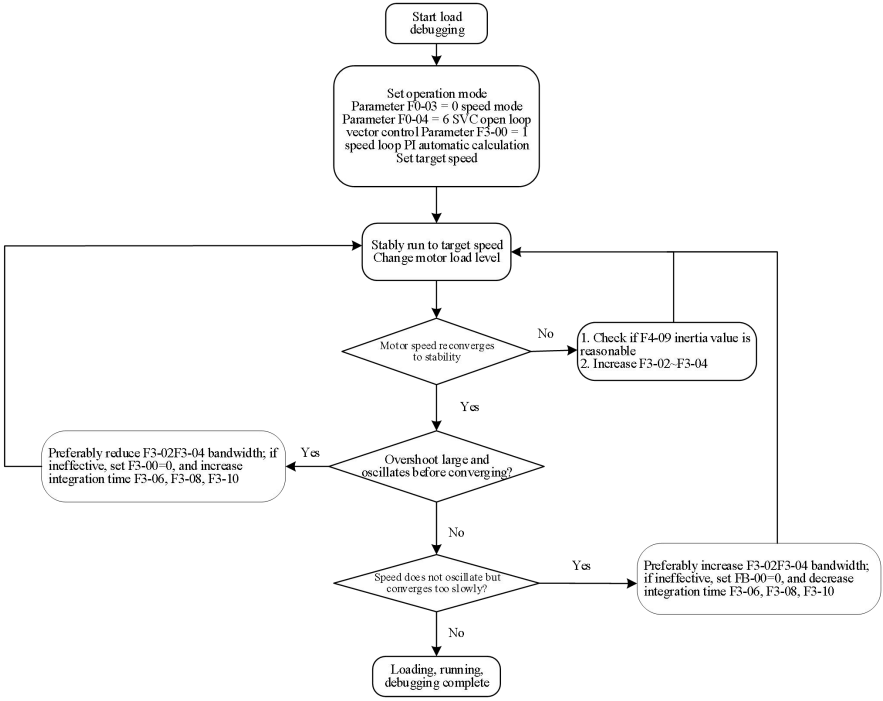


Figure 4-8 SVC Load Commissioning Process Flow Chart

5 Operation and Display

5.1 Introduction to the Operation and Display Panel

The keyboard allows for modification of VFD function parameters, monitoring of VFD working status, and control of VFD operation (start, stop), etc. The keyboard layout is shown in Figure 5-1, with detailed function descriptions in Table 5-1, and keyboard indicator explanations in Table 5-2.

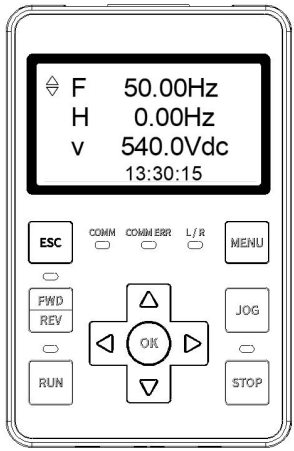


Figure 5-1 Keyboard Layout

Table 5-1 Keyboard Functions and Detailed Descriptions

Serial Number	Function	Detailed Description
1	Main display area	Interfaces for various menu levels, such as the main menu interface, parameter setting, quick and easy setting, language setting, etc., including 11 submenu selection interfaces
2	Status Display	Status LED indicators for Modbus communication connection (COMM), communication failure (COMM ERR), local/remote control (L/R), forward/reverse (F/R), running (RUN), stopping (STOP), etc.
3	Exit	Return to the previous menu or cancel execution

Serial Number	Function	Detailed Description
4	Up/Down/Left/Right keys	1. In value setting mode, use left/right keys to move the digit position, and up/down keys to increase or decrease the value. 2. In menu option mode, use the up/down keys to move through options.
5	Direction switching	1. VFD forward/reverse selection, FWD for forward and REV for reverse. 2. When the VFD is set to forward, the corresponding status LED (green) lights up; when set to reverse, the corresponding red LED lights up.
6	Run command	1. This key is only effective when the VFD operation command source is set to digital operator, press to start running. 2. When the VFD starts running, the corresponding status LED (green) lights up.
7	Stop command	1. This key is only effective when the VFD operation command source is set to digital operator, press to stop output. 2. In stop mode, the corresponding status LED (red) lights up. 3. In the event of a fault, press this key to reset the VFD.
8	Jog Mode Command	VFD jog operation
9	Confirm	Confirm parameter settings or enter the next level of the selected menu option.
10	Menu	Press this key from any interface to directly enter the main menu interface.

Note: The default values for frequency command and operation command source are both the digital operator keypad.

Table 5-2 Description of Keyboard Indicator Lights

Serial Number	Function	Detailed Description
	VFD direction LED indicators	1. Steady green: Forward running state. 2. Steady red: Reverse running state. 3. Blinking every 200ms: Currently switching direction.
	Running LED indicators	1. Steady light: VFD is running. 2. Blinking every 200ms: VFD is in the process of stopping (in this case, the stop LED is steady).
	Stop LED indicators	Steady light: VFD is in the stop state. Light off: VFD is in the running state.
COMM (green)	Communication connection LED indicators	Steady light: Good communication connection between the VFD and the keypad Modbus. Light off: Abnormal communication connection between the VFD and the keypad Modbus.
COMMERR (red)	Fault or warning LED indicators	Steady light: VFD is in a fault or warning state (e.g., overcurrent during acceleration/deceleration...). Light off: No fault or warning in the VFD. Note: When the VFD triggers an alarm, in addition to the COMM ERR indicator on the keypad panel being constantly lit, pressing any key before the set LCD backlight time reaches, the LCD backlight will remain on for the first 3 seconds after the fault occurs; thereafter, the backlight will blink at a frequency of 1 second. After the fault is cleared, the LCD will operate normally according to the backlight time setting.
L/R(green)	Local or remote control LED indicator	1. Steady light: The VFD is controlled remotely by another device, such as an upper-level computer Modbus. 2. Light off: The VFD is controlled by the digital operator keypad. 3. Blinking every 200ms: The VFD is controlled by an external terminal input.

5.2 Function Description

5.2.1 Keyboard Menu Interface Hierarchy

The keyboard menu hierarchy interface is shown in Figure 5-2:

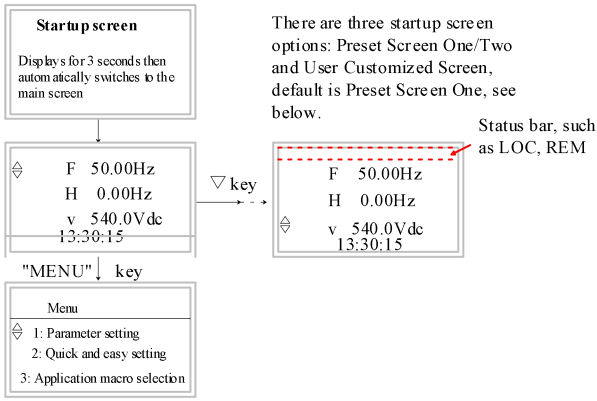


Figure 5-2 Keyboard Menu Hierarchy Interface

Main menu options:

1: Parameter setting 2: Quick and easy setting

3: Application macro selection 4: Modified parameters record

5: Parameter copy 6:Fault record

7: Language setting 8: Time setting

9: Keyboard lock 10:Screen display settings

11:Startup screen setting

Note: 1. After power on, the startup screen is displayed first, followed by the main screen. The main screen displays the set frequency, output frequency, user-customized display, output current, etc. (i.e., F/H/U/A physical quantities) in sequence according to the VFD parameter F7-20. The user-customized display can be switched to other physical quantities through the "◁" and "▷" keys based on the function code parameter F7-21 page display selection.

2. Interface symbol description:

◉ indicates the current default setting value (such as the startup screen setting option indicator)

◁ content from the previous page on the current line, viewable by pressing the "◁" key.

▷ There is more content not yet displayed on this line, viewable by pressing the "▷" key.

△ Upper option, viewable by pressing the "△" key.

▽ Lower option, viewable by pressing the "▽" key.

5.2.2 Parameter Setting

Under the main menu interface, select "1: Parameter Setting" to enter the second-level menu interface for parameter setting as shown in Figure 5-3.

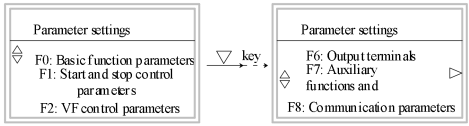


Figure 5-3 Second-level Menu Interface for Parameter Setting

5.2.3 Quick and Easy Setting

Under the main menu interface, select "2: Quick and Easy Settings" to enter the second-level menu interface:

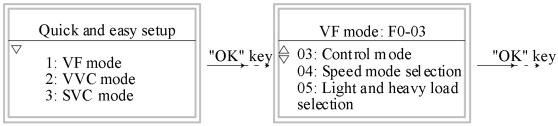


Figure 5-4 Second-level Menu Interface for Quick and Easy Setting

All mode options in this menu are as follows:

1: VF mode 2: VVC mode 3: SVC mode

4: FVC mode 5: TQCPG mode 6: Custom-setting mode

Example: Operating steps for VF control speed mode

5.2.4 Application Macro Selection

Under the main menu interface, select "3: Application Macro Selection" to enter the second-level menu interface for application macro selection as shown in Figure 5-5, press "△" to increase to 3, and enter the "User Custom" application macro.

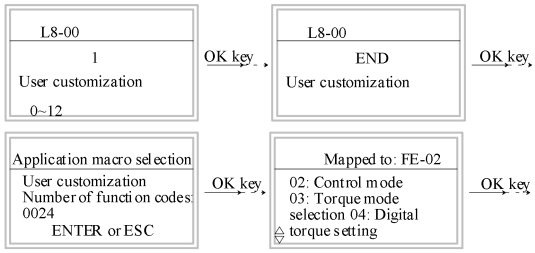


Figure 5-5 Second-level Menu Interface for Application Macro Selection

5.2.5 Modified Parameters Record

Under the main menu interface, select "4: Modified Parameters Record" to enter the second-level menu interface for modified parameters record as shown in Figure 5-6.

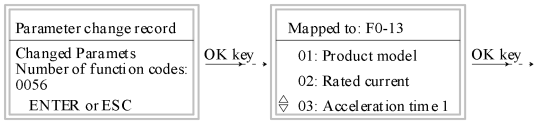


Figure 5-6 Second-level Menu Interface for Modified Parameters Record

5.2.6 Parameter Copying

Under the main menu interface, select "5: Parameter Copying" to enter the second-level menu interface for parameter copying. The steps to download keyboard parameters to the VFD are shown in Figure 5-7.

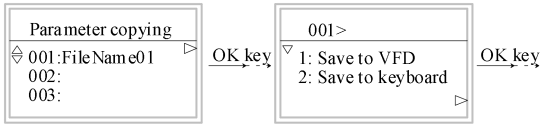


Figure 5-7 Steps for Downloading Keyboard Parameters to the VFD

Steps for uploading VFD parameters to the keyboard:

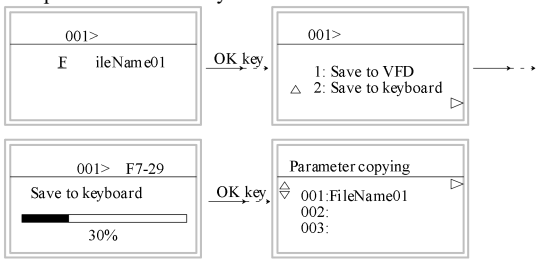


Figure 5-8 Steps for Uploading VFD Parameters to the Keyboard

The steps for uploading VFD parameters to the keyboard are shown in Figure 5-8. When all the parameters from the keyboard have been downloaded to the VFD (when the download progress bar shows 100%), the keypad will automatically return to the parameter copying interface. When uploading VFD parameters to the keyboard, users can move the cursor with the left and right keys and select a custom file name with the up and down keys. After the parameter upload is completed, it will also automatically return to the parameter copying interface.

5.2.7 Fault Record

Under the main menu interface, select "6: Fault Record" to enter the second-level menu interface for fault records as shown in Figure 5-9.

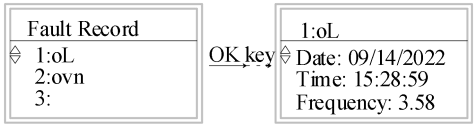


Figure 5-9 Second-level Menu Interface for Fault Records

The menu records the most recent 30 fault codes. Press the "OK" key to view detailed records of faults, such as the date, time, frequency, current, voltage, Bus voltage, and other variables at the moment of the fault.

5.2.8 Language Setting

Under the main menu interface, select "7: Language Settings" to enter the second-level menu interface for language setting as shown in Figure 5-10, supporting two types: Simplified Chinese and English.

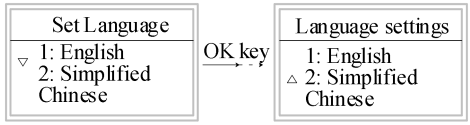


Figure 5-10 Second-level Menu Interface for Language Setting

5.2.9 Time Setting

Under the main menu interface, select "8: Time Setting" to enter the second-level menu interface. Use the left and right keys "◁,▷ " to move the cursor, and select the year, month, day, hour, minute and second to set. Use the up and down keys "△, ▽" to increase or decrease the values. The "day of the week" parameter is automatically determined by the system based on the set year, month, and day, and does not require user setting.

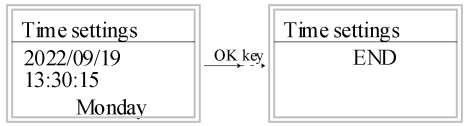


Figure 5-11 Second-level Menu Interface for Time Setting

5.2.10 Keyboard Lock

Under the main menu interface, select "9: Keyboard Lock" to enter the second-level menu interface for keyboard lock setting. The steps for keyboard lock are shown in Figure 5-12. When the keyboard is locked, only the main screen is in an unlocked state. At this time, pressing any key will pop up the prompt "Press ESC key for 3 seconds to unlock the keyboard", and the same applies after power off. The steps for unlocking the keyboard are shown in Figure 5-13. After pressing the ESC key for 3 seconds to unlock the keyboard, it will jump back to the main screen.

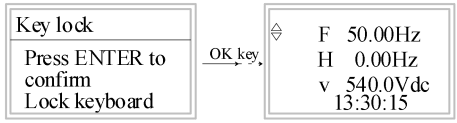


Figure 5-12 Steps for Keyboard Lock

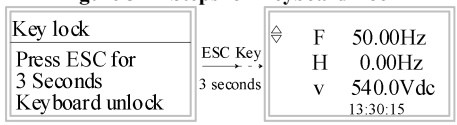


Figure 5-13 Steps for Keyboard Unlock

5.2.11 Screen Display Setting

Under the main menu interface, select "10: Screen Display Settings" to enter the second-level menu interface for screen display setting as shown in Figure 5-14. In the "Contrast Adjustment" option, use the up and down keys "△, ▽" to increase or decrease the value, which will add or subtract the set offset value from the default contrast baseline value of 12. A positive offset gradually darkens the font, while a negative offset gradually fades the font. In the "Backlight Time" option, the setting value is in minutes. The LCD backlight remains on until the set time is reached; after the set time, the backlight turns off. When set to 0, the backlight remains constantly on. In the "Text Color" option, there are choices for white and black text. The default LCD setting is white background with black text; if the parameter is set to 1, then it is black background with white text. After setting the above three options, it will jump back to the upper-level menu "Screen Display Setting" screen.

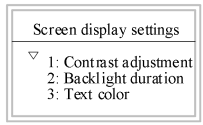


Figure 5-14 Second-level Menu Interface for Screen Display Setting

5.3 VFD Function Codes

The function code groups of the CM680VFD and their corresponding descriptions are shown in Table 5-3.

Table 5-3 Function Code Groups and Their Descriptions

Function Code Group	Function Description	Function Code Group	Function Description
F0	Basic function parameters	U0	Fault record parameters
F1	Start and stop control parameters	U1	Status monitoring parameters
F2	VF control parameters	H0	Other motor parameters
F3	Vector control parameters	H1	Other motor VF control
F4	First motor parameters	H2	Other motor vector control parameters
F5	Input terminals	H3	Other motor fault parameters
F6	Output terminals	L0	System control parameters
F7	Auxiliary functions and keyboard display	L1	User custom function codes
F8	Communication parameters	L2	Optimization control parameters
F9	Fault and protection parameters	L3	Master-slave control parameters
FA	PID function	L4	Holding brake function parameters
FB	Tension control parameters	L5	Sleep wake function parameters
FC	Position control parameters	L6	Oscillation, fixed length, and technique parameters
FD	Multi-stage speed and simple PID function	L7	AI multi-point curve setting
FE	Torque control parameters	L8	Application macro parameters
FF	Manufacturer parameters		

The function code parameters of the CM680VFD are structured in a three-level menu, which can be viewed and modified via the operation panel. The three-level menu consists of Function Code Group Selection (Level I Menu) → Function Code Number Selection (Level II Menu) → Function Code Value Setting (Level III Menu). During the operation of the three-level menu, pressing either the ESC key or the OK key will return to the second-level menu. Pressing the OK key will save the current parameter modifications and move to the next function code, whereas pressing the ESC key will discard the current modifications. In the third-level menu, if the parameter is not blinking, it indicates that the function code parameter value cannot be modified, and the specific reason can be found in the function code attribute description.

6 Fault Diagnosis

6.1 Fault Handling

If a fault occurs during the operation of the system, the VFD will immediately stop outputting to protect the motor from further damage. Simultaneously, the VFD will trigger the corresponding fault relay contact and display the fault code on the control panel for rapid problem diagnosis. Corresponding to each fault code, there are respective fault types and common solutions, which can be found in Table 6-1. Please note that the information listed in the table is for reference only and should not be altered arbitrarily. If you are unable to resolve the problem, please contact our technical support or product agent for assistance.

Table 6-1 Fault Codes and Fault Handling

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E001	Overcurrent during acceleration	During acceleration, the output current exceeds the VFD's overcurrent threshold. When E001 occurs, the VFD immediately stops output, and the motor will coast to a stop.	1. The set acceleration time is too short. 2. Check if poor insulation in the motor wiring is causing a short circuit in the output. 3. Inspect the motor for burnout or insulation aging. 4. The torque compensation amount is too large. 5. The load is too heavy. 6. The V/F curve setting is abnormal. 7. Hardware failure.	Manual reset; it can be reset only after 5 seconds once the condition has cleared.
E002	Overcurrent during deceleration	During deceleration or stopping, the output current exceeds the VFD's overcurrent threshold. When E002 occurs, the VFD immediately stops output, and the motor will coast to a stop.	Same as above	Manual reset; it can be reset only after 5 seconds once the condition has cleared.
E003	Overcurrent during constant speed	During the constant speed operation, the output current exceeds the VFD's overcurrent threshold. When E003 occurs, the VFD immediately stops output, and the motor will coast to a stop.	Same as above	Manual reset; it can be reset only after 5 seconds once the condition has cleared.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E004	Grounding Short circuit	The VFD detects a ground short circuit at the output end (U / V / W), immediately stops output, and the motor will coast to a stop.	1. The motor is burned out or has insulation aging. 2. Ground short circuit occurs due to cable damage, and the stray capacitance between the cable and terminals is large, causing misoperation, hardware failure.	Manual reset; it can be reset only after 5 seconds once the condition has cleared.
E005	IGBT upper and lower bridge short circuit	The VFD detects a short circuit between the upper and lower bridges of the IGBT module.	1. IGBT failure 2. Short circuit between the upper and lower bridges of IGBT	Manual reset; it can be reset only after 5 seconds once the condition has cleared.
E006	Overcurrent during stopping	Overcurrent or hardware circuit anomaly occurs during stopping. After E006 occurs, power off and then power on. If there is a hardware issue, E033, E034, or E035 will appear.	1. Misoperation due to interference 2. Hardware failure	Manual reset; it can be reset only after 5 seconds once the condition has cleared.
E007	Overvoltage during acceleration	During acceleration, the VFD detects excessive bus voltage. When E007 occurs, the VFD immediately stops output, and the motor will coast to a stop.	1. The acceleration is too low (e.g., when accelerating with a lifting load downwards); 2. Check if the stall prevention action setting is less than the no-load current; 3. The power supply voltage is too high. 4. There is an operation of leading phase capacitors within the same power supply system. 5. The motor is in a power generation state; 6. The acceleration time is too short; 7. The motor experiences a ground short circuit; 8. Incorrect wiring of the braking resistor or braking unit; 9. Misoperation due to interference.	Manual reset; it can be reset only when the bus voltage drops below approximately 90% of the overvoltage threshold (810V).
E008	Overvoltage during deceleration	During deceleration, the VFD detects excessive bus voltage. When E008 occurs, the VFD immediately stops output, and the motor will coast to a stop.	1. The deceleration time is too short, causing excessive regenerative energy from the load; 2. Same as above	Manual reset; it can be reset only when the bus voltage drops below approximately 90% of the overvoltage threshold (810V).
E009	Overvoltage during constant speed	During constant speed operation, the VFD detects excessive bus voltage. When E009 occurs, the VFD immediately stops output, and the motor will coast to a stop.	1. Rapid load changes; 2. Same as above	Manual reset; it can be reset only when the bus voltage drops below approximately 90% of the overvoltage threshold (810V).

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E010	Overvoltage during stopping	Overvoltage occurs when the VFD is stopping.	1. Power supply voltage too high; 2. Operation of leading phase capacitors within the same power supply system; 3. Incorrect wiring of the braking resistor or braking unit; 4. Hardware failure (voltage sampling circuit anomaly); 5. The motor experiences a ground short circuit.	Manual reset; it can be reset only when the bus voltage drops below approximately 90% of the overvoltage threshold (810V).
E011	Undervoltage during acceleration	During acceleration, the VFD detects the bus voltage is lower than the value set in parameter L2-18.	1. Power outage occurred; 2. Power supply voltage fluctuated; 3. Check if there is a large capacity motor starting; 4. Excessive load; 5. Shared DC bus; 6. Check if a DC reactor has been added.	Manual reset; it can be reset only when the bus voltage is higher than parameter L2-18 + 60 V.
E012	Undervoltage during deceleration	During deceleration, the VFD detects the bus voltage is lower than the value set in parameter L2-18.	Same as above	Same as above
E013	Undervoltage during constant speed	During constant speed, the VFD detects the bus voltage is lower than the value set in parameter L2-18.	Same as above	Same as above
E014	Undervoltage during stopping	1. During stopping, the VFD detects the bus voltage is lower than the value set in parameter L2-18.	Same as above	Same as above
E015	Input phase loss protection	Power supply input phase loss protection.	1. Input power phase loss occurred; 2. Single-phase power input in a three-phase machine type; 3. Power supply voltage fluctuations; 4. Loose terminals of the input power supply; 5. Check if the input cables of the three-phase power supply have been cut; 6. Unbalanced three-phase input power supply.	Manual reset
E016	IGBT overtemperature	The VFD detects an excessively high IGBT temperature, exceeding 95°C.	1. Check if the on-site environment or temperature inside the control cabinet is too high, or if the ventilation holes of the cabinet are blocked; 2. Check for foreign objects on the heatsink, and whether the fan is rotating; 3. Insufficient ventilation space for the VFD; 4. Check if the load matches the VFD; 5. Operating for a long time at	Manual reset; it can only be reset after the IGBT temperature drops below 85°C.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
			100% or more than 100% of the rated output.	
E017	Too high ambient temperature	The VFD detects an excessively high temperature of internal critical components, exceeding 55°C.	Too high ambient temperature	Manual reset; it can only be reset after the ambient temperature sensor temperature reads below 45°C.
E021	VFD overload	The output current exceeds the VFD's current capacity, rated at 150% for 1 minute.	1. Excessive load; 2. Acceleration/deceleration time and duty cycle time too short; 3. Voltage too high in V/F control; 4. VFD capacity too small; 5. Overload occurring during low-speed operation; 6. Torque compensation amount too large; 7. Check if the stall prevention action setting is correct; 8. Output phase loss; 9. Speed tracking function parameter setting is inappropriate.	Manual reset; it can be reset only after the error has cleared for 5 seconds.
E022	Motor 1 overload protection	Motor 1 overload protection is activated, after which, the motor will coast to a stop.	1. Excessive load; 2. Acceleration/deceleration time and duty cycle time too short; 3. When using a motor specifically designed for VFDs, set parameter F9-01 motor 1 overload protection to 0 for constant torque output motor. 4. Incorrect action value for motor overload; 5. The set value for the maximum motor frequency is too low; 6. Driving multiple motors with one VFD; 7. Check if the stall prevention action setting is correct; 8. Torque compensation amount too large; 9. Motor fan not operating normally; 10. Three-phase impedance imbalance in the motor.	Manual reset; it can be reset only after the error has cleared for 5 seconds.
E023	Motor 2 overload protection	Motor 2 overload protection is activated, after which, the motor will coast to a stop.	1. When using a motor specifically designed for VFDs, set parameter H3-03 motor 2 overload protection to 0 for constant torque output motor. 2. Same as items 1-2 and 4-10 above.	Same as above

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E024 E024	Motor overheating Motor overheating	Motor PTC over-temperature warning. When the motor is installed with PTC and this function is activated (parameter F5-21/27/33=6 thermistor PTC input), if the PTC input is higher than the set value in parameter F9-49, it will be handled according to the setting in parameter F9-48.	1. Motor jam; 2. Excessive load; 3. High ambient temperature; 4. The motor's cooling system/fan is malfunctioning; 5. Frequent use in low-speed operation; 6. Acceleration/deceleration time and duty cycle time too short; 7. Voltage too high in V/F control; 8. Check if the setting of the motor's rated current matches the motor nameplate; 9. Check if the PTC-related settings and wiring are appropriate; 10. Check if the stall prevention action setting is correct; 11. Three-phase impedance imbalance in the motor; 12. Excessive harmonic components.	Parameter F9-48 0: Warning and continue running 1: Fault and decelerate to stop 2: Fault and coast to stop 3: No warning When parameter F9-48=0, it's a warning and auto resets; when Parameter F9-48=1 or 2, it's a fault and requires manual reset. Can be reset immediately.
E026	Over torque 1	When the output current exceeds the torque detection value F9-37, and it lasts longer than the over-torque detection time set in parameter F9-38, E026 will be displayed if parameter F9-36 is set to 2 or 4.	1. Incorrect parameter setting; 2. Fault on the mechanical side; 3. Excessive load; 4. Acceleration/deceleration time or duty cycle time too short; 5. Voltage too high in V/F control; 6. Motor capacity too small; 7. Overload during low-speed operation; 8. Torque compensation amount too large; 9. Inappropriate setting of speed tracking function parameters (including situations of instant power-off restart and abnormal restart).	Parameter F9-36 0: Detection disabled 1: Over-torque detection during constant speed operation, continue running; 2: Over-torque detection during constant speed operation and stop running; 3: Over-torque detection during operation, continue running; 4: Over-torque detection during operation and stop running; Reset Method: For Parameter F9-36=1 or 3, it will automatically clear when the output current is less than Parameter F9-36. When parameter F9-36=2 or 4, manual reset is required. Reset conditions: Can be reset immediately.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E027	Over torque 2	Error E027 is displayed when the output current exceeds the torque detection threshold (H3-01) and lasts longer than the over torque detection time (H3-02), provided that parameter H3-00 is set to either 2 or 4.	1. Incorrect parameter setting; 2. Fault on the mechanical side; 3. Excessive load; 4. Acceleration/deceleration time or duty cycle time too short; 5. Voltage too high in V/F control; 6. Motor capacity too small; 7. Overload during low-speed operation; 8. Torque compensation amount too large; 9. Inappropriate setting of speed tracking function parameters (including situations of instant power-off restart and abnormal restart).	Parameter H3-00 0: No detection; 1: Over-torque detection during constant speed operation, continue running; 2: Over-torque detection during constant speed operation and stop running; 3: Over-torque detection during operation, continue running; 4: Over-torque detection during operation, stop operation; Reset mode: Automatic reset occurs when the output current falls below parameter H3-00, for settings 1 or 3. For settings 2 or 4 of parameter H3-00, a manual reset is required. Reset conditions: Can be reset immediately.
E028	Low current	Detection of low current condition	1. Motor cable disconnection; 2. Inappropriate setting of the low current protection function; 3. Excessively low load.	Parameter F9-24 0: No function. 1: Error and free stop; 2: Error with stop based on the second deceleration time; 3: Warning and continue operation. Parameter F9-24 set to 3 indicates a "warning". The warning is automatically cleared when the output current exceeds parameter F9-22 + 0.1 A; For settings 1 or 2 of parameter F9-24, indicating a "fault", a manual reset is required and can be done immediately.
E029	Limit reached	In non-PG vector control mode, when the VFD operates in speed mode, this fault is reported after the action of the reverse running prohibition limit or forward running prohibition limit at the DI terminal.	1. Home position mode: If not set to use forward or reverse limit as home, and set to report fault upon reaching the limit, and when input terminal function is set to PL forward limit or NL reverse limit, and the status of that terminal is active, a limit reached fault is reported. 2. Non-home position mode: If input terminal function is set to PL forward limit or NL reverse limit and the status of that terminal is active, a limit reached fault is reported.	When the limit reached terminal status is invalid, manual reset is required.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E031	Memory readout anomaly	Abnormal EEPROM data readout from memory	Abnormal EEPROM data readout from memory	Manual reset required; Can be reset immediately.
E033	U phase current detection error	At power-on, the VFD's U-phase current detection circuit is abnormal.	Hardware fault	Power-off required
E034	V-phase current detection error	At power-on, the VFD's V-phase current detection circuit is abnormal.	Hardware fault	Power-off required
E035	W-phase current detection error	At power-on, the VFD's W-phase current detection circuit is abnormal.	Hardware fault	Power-off required
E036	cc hardware circuit anomaly	At power-on, the VFD's cc hardware protection circuit is abnormal.	Hardware fault	Power-off required
E037	oc hardware circuit anomaly	At power-on, the VFD's oc hardware protection circuit is abnormal.	Hardware fault	Power-off required
E038	ov hardware circuit anomaly	At power-on, the VFD's ov hardware protection circuit is abnormal.	Hardware fault	Power-off required
E040	Motor parameter identification error	Motor parameter identification error	1. The STOP button was pressed during self-learning; 2. Incorrect motor capacity (too large or too small) and parameter settings; 3. Incorrect motor wiring; 4. Motor jammed; 5. Use of output contactor, but the output contactor did not engage; 7. Overload; 8. Acceleration/deceleration time too short.	Manual reset required; Can be reset immediately.
E041	PID disconnection	PID feedback error	1. Check if the analog feedback value is abnormal; 2. Verify if the negative feedback type is set correctly; 3. PID deviation threshold set too low, causing false alarms.	FA-50 feedback signal disconnection handling: 0: Warn and continue running 1: Fault and decelerate to stop 2: Fault and free stop 3: Warning and running at the frequency before disconnection.
E042	PG feedback setting error	The actual running direction of the motor is opposite to the frequency command direction.	1. Encoder parameter setting incorrect; 2. Check for disconnection in encoder wiring; 3. Damage to PG card or PG encoder; 4. Misoperation due to interference.	Parameter FA-50 0: Warning and continue running 1: Fault and decelerate to stop 2: Fault and free stop Manual reset required; Can be reset immediately.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E043	PG feedback disconnection	In PG mode, if parameters F4-27 and F4-29 are not set, pressing RUN will result in error E043.	1. Encoder parameter setting incorrect; 2. Incorrect control mode selection.	Manual reset required; Can be reset immediately.
E044	PG feedback overspeed	In PG mode, when the motor frequency value exceeds the encoder's stall threshold (parameter F9-30) for a certain duration, and the error duration exceeds the encoder timeout detection time (parameter F9-31), error E044 occurs.	1. Encoder parameter setting incorrect; 2. Parameter F4-02 set too low; 3. Speed loop parameters and acceleration/deceleration settings are inappropriate; 4. PG feedback timeout protection function parameter settings are inappropriate.	Parameter F9-32 0: Warning and continue running 1: Fault and decelerate to stop 2: Fault and free stop Manual reset required; Can be reset immediately.
E045	PG slip anomaly	In PG mode, when the difference between the output frequency and the motor frequency exceeds the encoder deviation range (parameter F9-33) for a certain duration, and the error duration exceeds the encoder deviation detection time (parameter F9-34), fault E045 occurs.	1. Improper setting of PG feedback deviation anomaly function parameters; 2. Speed loop parameters and acceleration/deceleration settings are inappropriate; 3. Encoder parameter settings are incorrect; 4. Acceleration/deceleration time too short; 5. Torque limit related parameter settings are incorrect; 6. Motor jammed; 7. Mechanical brake not released.	Parameter F9-35: 0: Warning and continue running 1: Fault and decelerate to stop 3: Fault and free stop When parameter F9-35 is set to 0, it indicates a warning, which is automatically cleared when the difference between the output frequency and the motor frequency is less than the encoder deviation threshold. When parameter F9-35 is set to 1 or 2, it indicates a "fault", and a manual reset is required. Can be reset immediately.
E048	AI current signal disconnection	When the 4-20mA disconnection action (parameter F5-42) is set to 3, and any one of the AI1, AI2, or AI1 analog input terminals is of the 4-20mA current signal type, with the analog input function set to non-zero, if the input current signal at that terminal falls below the 4-20mA disconnection threshold (parameter F5-43), fault E048 is reported.	Analog input current signal is disconnection	Reset method: Manual reset; Reset condition: Manual reset is possible when disconnection fault conditions are not met.
E048	AI current signal disconnection		Analog input current signal is disconnection	Reset method: Manual reset; Reset condition: Manual reset is possible when disconnection fault conditions are not met.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E049	External faults	External fault, the VFD decelerates according to the setting of parameter F1-23.	DI terminal function = 10 "External fault", and the signal is valid	Parameter F1-23 0: Stop with free run; 1: According to the first deceleration time; 2: According to the second deceleration time; 3: According to the third deceleration time; 4: According to the fourth deceleration time; 5: System deceleration (according to the original deceleration time) 6: Automatic deceleration Manual reset required; Manual reset is possible only after the external fault has cleared.
E050	External terminal emergency stop	When the DI terminal function is set to "external fault free stop", if the terminal signal is valid, the VFD immediately stops output, and the motor comes to a free stop.	DI terminal function = 28 "External fault free stop", and the signal is valid	Manual reset; manual reset is possible only after the "External Fault Free Stop" signal has cleared.
E051	External interrupt	When the DI terminal function is set to "Gate Block", the VFD immediately stops output, and the motor comes to a free stop.	DI terminal function = 11 "Gate Block", and the signal is valid.	Fault is automatically cleared after the "Gate Block signal" disappears.
E052	Password entered incorrectly three times	Password decoding failed three consecutive times	Parameter F7-33 password entry error	Manual reset required; Reset condition require power-off.
E054	Illegal communication command	Illegal communication command	1. Communication command sent by the host computer is incorrect; 2. Misoperation due to interference; 3. Communication conditions differ from those of the host machine; 4. Communication cable is disconnected or poorly connected.	F8-05 communication error handling method 0: Warning and continue running 1: Error and decelerate to stop 2: Error and free stop 3: No warning and continue operation Reset method: Manual reset; Reset conditions: Can be reset immediately.
E055	Illegal communication address	Illegal communication data address	Same as above	Reset method: Manual reset; Reset conditions: Can be reset immediately.
E056	Communication data error	Illegal communication data value	Same as above	Reset method: Manual reset; Reset conditions: Can be reset immediately.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E057	Communication writing to read-only address	Writing data to a read-only address	Same as above	Reset method: Manual reset; Reset conditions: Can be reset immediately.
E058	Modbus transmission timeout	Modbus transmission timeout	1. The host computer failed to transmit the communication command within the time set by parameter F8-04; 2. Misoperation due to interference; 3. Communication conditions differ from those of the host machine; 4. Communication cable is disconnected or poorly connected.	Parameter F8-05 error handling method 0: Warning and continue running 1: Error and decelerate to stop 2: Error and free stop 3: No warning and continue operation Reset method: Manual reset; Reset conditions: Can be reset immediately.
E062	Deceleration regenerative braking action	As long as parameter F1-34 is not zero, and a power glitch or outage causes the bus voltage to drop below the deceleration regenerative braking action threshold, the deceleration regenerative braking function activates, initiating motor deceleration and stopping, during which fault E062 is displayed.	1. Unstable power supply or power outage; 2. Other large loads starting in the power system.	Reset conditions: Automatic: If parameter F1-34 is set to 2, the fault is automatically cleared after power is restored; Manual: If parameter F1-34 is set to 1, after the VFD decelerates to 0 Hz, it can be manually reset.
E063	Excessive slip	Slip anomaly, using the maximum slip (parameter F2-13) as a reference. When the VFD's output is steady, and the deviation between the given speed and actual speed exceeds the set value of parameter F9-25, and this deviation lasts longer than the set time of parameter F9-26, fault E063 occurs. Fault E063 only occurs when driving an induction motor.	1. Verify if the motor parameters are correct; 2. Excessive load; 3. Check if the set values of parameters F9-25, F9-26, and F2-13 are appropriate.	Parameter F9-27 0: Warning and continue running 1: Error and decelerate to stop 2: Warning and free stop 3: No warning Automatic: When parameter F9-27 is set to 0 for "warning," and when the VFD's output is steady, and the deviation between the given speed and actual speed no longer exceeds the set value of parameter F9-25, the warning is automatically cleared. Manual: When parameter F9-27 is set to 1 or 2 for "fault", a manual reset is required.
E064	Please reset the machine type code	Machine type code is incorrectly set	Machine type code is incorrectly set	Set the product signal F0-00 according to the VFD specification sheet

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
E065	PG card hardware error	PG card hardware error	1. Wiring error; 2. Encoder parameter selection error; 3. Incorrect selection of PG card.	Reset method: Manual reset; Reset conditions: The error can be reset only by re-powering.
E069	Feedback speed divergence	Feedback speed exceeds the set value: maximum speed value * parameter F9-30.	1. Encoder parameter setting error; 2. Incorrect motor parameters; 3. Motor parameter identification not performed;	Manual reset
E070	Excessive feedback speed deviation	Feedback speed difference is too large, estimated value command deviates by ±F9-33.	1. Encoder parameter setting error; 2. Incorrect setting of motor parameters; 3. Motor parameter identification not performed.	Manual reset
E072	STO1 fault	Anomaly diagnosed in the internal circuit between S1 and +24V	The short circuit line between S1 and +24V is not connected Hardware fault	Reset method: Hardware error, cannot be reset, re-power after power-off; Reset conditions: None
E076	STO	Safe torque output stop function activated	Switching action of S1 / +24V, S2 / +24V	Reset method: Automatic: Can be automatically reset after the STO state disappears when parameter F9-54 is set to 1; Manual: Can be manually reset after the STO state disappears when parameter 06-44 is set to 0; Reset conditions: Can be reset only after the STO state disappears.
E077	STO2 fault	Anomaly diagnosed in the internal circuit between S2 and +24V	The short circuit line between S2 and +24V is not connected Hardware fault	Reset method: Hardware error, cannot be reset, re-power after power-off; Reset conditions: None
E079	U phase overcurrent	U-phase short circuit detected before VFD operation	1. Incorrect motor wiring; 2. Output short circuit caused by poor insulation of motor wiring; 3. Inspect the motor for burnout or insulation aging. 4. Misoperation due to interference 5. Longer motor cable wiring length; 6. Hardware fault.	Reset method: Manual reset; Reset conditions: Can be reset only 5 seconds after the condition has cleared.
E080	V phase overcurrent	V-phase short circuit detected before VFD operation	Same as above	Same as above
E081	W phase overcurrent	W-phase short circuit detected before VFD operation	Same as above	Same as above
E082	U-phase output phase loss	U-phase output phase loss	1. Imbalance in the three-phase impedance of the motor; 2. Issues with wiring; 3. The motor is a single-phase motor; 4. Fault in the current sensor; 5. VFD capacity significantly exceeds motor capacity.	Parameter F9-15 0: Warning and continue running 1: Error and decelerate to stop 2: Error and free stop 3: No warning Reset method: Manual reset;

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
				Reset conditions: Can be reset immediately.
E083	V phase output phase loss	V phase output phase loss	Same as above	Same as above
E084	W phase output phase loss	W phase output phase loss	Same as above	Same as above
E087	Low frequency overload protection	Load close to the limit of the power module	Power module overload	Reset method: Manual reset; Reset conditions: Can be reset immediately.
E101	CANopen disconnection	CANopen software disconnection 1	1. Communication timeout time set too short; 2. Misoperation due to interference; 3. Communication cable disconnected or poorly connected.	Reset method: Manual reset; Reset condition: Cleared by a reset signal sent from the host.
E102	CANopen disconnection	CANopen software disconnection 2	1. Communication timeout time set too short; 2. Misoperation due to interference; 3. Communication cable disconnected or poorly connected.	Reset method: Manual reset; Reset condition: Cleared by a reset signal sent from the host.
E104	CANopen hardware disconnection	CANopen hardware disconnection	1. Confirm whether the CANopen card is installed; 2. Confirm whether the communication format is correct; 3. Misoperation due to interference; 4. Communication cable disconnected or poorly connected;	Reset method: Manual reset; Reset conditions: Power off and then power on again.
E105	CANopen index error	CANopen communication index error	Incorrect setting of communication index	Reset method: Manual reset; Reset condition: Cleared by a reset signal sent from the host.
E106	CANopen node ID error	CANopen communication node ID error (only support 1~127)	Incorrect setting of communication node ID	Reset method: Manual reset (parameter F0-18＝7); Reset conditions: None
E107	CANopen memory error	CANopen memory error	CANopen internal memory error	Reset method: Manual reset; Reset condition: parameter F0-18=7.
E120	EMS overcurrent	Output current exceeds the VFD's overcurrent threshold. When EMS overcurrent fault occurs, the VFD immediately stops output, and the motor comes to a free stop.	1. The set acceleration time is too short. 2. Check if poor insulation in the motor wiring is causing a short circuit in the output. 3. Inspect the motor for burnout or insulation aging. 4. The torque compensation amount is too large. 5. The load is too heavy. 6. The V/F curve setting is abnormal. 7. Hardware failure.	Manual reset; can be reset only 5 seconds after the condition has cleared;
E128	Over torque 3	Error E128 occurs when the output current exceeds the torque detection value H3-06, and lasts	1. Incorrect parameter setting; 2. Fault on the mechanical side; 3. Excessive load; 4. Acceleration/deceleration time or duty cycle time too short;	Parameter H3-05 0: Detection disabled 1: Over-torque detection during constant speed operation, continue running;

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
		longer than the over torque detection time H3-07, provided that parameter H3-05 is set to either 2 or 4.	5. Voltage too high in V/F control; 6. Motor capacity too small; 7. Overload during low-speed operation; 8. Torque compensation amount too large; 9. Inappropriate setting of speed tracking function parameters (including situations of instant power-off restart and abnormal restart).	2: Over-torque detection during constant speed operation and stop running; 3: Over-torque detection during operation, continue running; 4: Over-torque detection during operation, stop operation; Reset method: When parameter H3-05 is set to 1 or 3 for "warning", the warning is automatically cleared when the output current falls below parameter H3-06. When parameter H3-05 is set to 2 or 4 for "fault", a manual reset is required. Reset conditions: Can be reset immediately.
E129	Over torque 4	Error E129 occurs when the output current exceeds the torque detection value H3-11, and lasts longer than the over torque detection time H3-12, provided that parameter H3-10 is set to either 2 or 4.	Same as above	Parameter H3-10 0: No detection; 1: Over-torque detection during constant speed operation, continue running; 2: Over-torque detection during constant speed operation and stop running; 3: Over-torque detection during operation, continue running; 4: Over-torque detection during operation, stop operation; Reset method: When parameter H3-10 is set to 1 or 3 for "warning", the warning is automatically cleared when the output current falls below parameter H3-11. When parameter H3-10 is set to 2 or 4 for "fault", a manual reset is required. Reset conditions: Can be reset immediately
E134	Motor 3 overload protection	Motor 3 overload protection action, after the action, free stop.	1. Excessive load; 2. Acceleration/deceleration time and duty cycle time too short; 3. When using a VFD-dedicated motor, parameter H3-08 Motor 3 overload protection selection = 0 constant torque output motor. 4. Incorrect action value for motor overload; 5. The set value for the maximum motor frequency is too low;	Reset method: Manual reset; Reset condition: Can be reset only 5 seconds after the fault has cleared.

Fault Number	Fault name	Fault Description	Possible Causes	Reset Method and Conditions
			6. Driving multiple motors with one VFD; 7. Check if the stall prevention action setting is correct; 8. Torque compensation amount too large; 9. Motor fan not operating normally; 10. Three-phase impedance imbalance in the motor.	
E135	Motor 4 overload protection	Motor 4 overload protection action, after action, free stop.	1. When using a VFD-dedicated motor, parameter H3-13 Motor 4 overload protection selection = 0 constant torque output motor; 2. The same as above 1～2 and 4～10.	Same as above
E141	Pre-operation grounding fault	Ground short circuit detected during output wiring detection before VFD operation.	1. Incorrect motor wiring; 2. Motor wiring may cause output short circuit due to poor insulation. 3. Inspect the motor for burnout or insulation aging.	Reset method: Manual reset; Reset conditions: Can be reset only 5 seconds after the condition has cleared.
E142	Parameter identification error 1	Motor parameter identification with no feedback current error	1. Motor not wired; 2. On the VFD output side (U / V / W); 3. Electromagnetic contactor used as open circuit.	Reset method: Manual reset. Reset conditions: Can be reset immediately.
E143	Parameter identification error 2	Motor parameter identification phase loss error during motor identification	1. Incorrect motor wiring; 2. Motor fault; 3. Electromagnetic contactor used as open circuit on the VFD output side (U / V / W); 4. Anomaly in the motor U/V/W lines.	Same as above
E144	Tension break	Tension break identified by speed detection	1. Check if the analog feedback value is abnormal; 2. Check if the negative feedback type is set correctly.	Reset method: Manual reset.
E147	Excessive tension PID deviation	Tension feedback value deviates significantly from the set value	1. Check if the analog feedback value is abnormal; 2. Improper setting of tension control PID parameters;	FB-50 tension error handling: 0: Warn and continue running 1: Warning and free stop 2: Warning and decelerate to stop.

6.2 Warning handling

For some errors that have a minor impact on the system, the VFD only issues a warning and continues to operate, while displaying the warning name and corresponding warning code on the LCD panel. Once the warning reset conditions are met, the warning is automatically cleared, and the motor operates normally. Warning codes and corresponding warning handling are shown in Table 6-2.

Table 6-2 Warning Codes and Warning Handling

Warning code	Warning name	Fault Description	Possible Causes	Reset Method and Conditions
A001	Communication command error	RS-485Modbus, illegal communication command	1. Communication command sent by the host computer is incorrect; 2. Misoperation due to interference and differing communication conditions with the host machine; 3. Communication cable disconnected or poorly connected.	When parameter F8-05 is set to 0 for "warning" and continues to operate, the warning is automatically reset after receiving the correct communication command.
A002	Communication address error	RS-485 Modbus, illegal communication data address	Same as above	Same as above
A003	Communication data error	RS-485 Modbus, illegal communication data value	Same as above	Same as above
A004	VFD unable to handle	RS-485 Modbus, writing data to a read-only address	Same as above	Same as above
A005	Communication transmission timeout	RS-485Modbus, transmission timeout	1. The host did not send the communication command within the time set by parameter F8-04; 2. Misoperation due to interference; 3. Communication conditions differ from those of the host machine; 4. Communication cable is disconnected or poorly connected.	When parameter F8-05 is set to 0 for "warning" and continues operation, it's considered a "warning", which is automatically reset after receiving the next communication packet.
A006	Parameter copy error	Keypad to Drive COPY function error warning 1	1. Communication anomaly; 2. Panel anomaly; 3. Control panel anomaly.	Manual reset
A007	Parameter copy error	Keypad to Drive COPY function error warning 2	1. Check if new parameters have been added to the VFD software; 2. Misoperation due to interference.	Manual reset
A009	IGBT overheating Warning	The VFD detects IGBT temperature too high, exceeding the IGBT overheating warning set point	1. Check if the on-site environment or temperature inside the control cabinet is too high, or if the ventilation holes of the cabinet are blocked;	Automatic reset; the IGBT temperature automatically resets after dropping below 85°C.

Warning code	Warning name	Fault Description	Possible Causes	Reset Method and Conditions
		(parameter F9-41, above which no IGBT overheating warning will be issued, instead, an IGBT temperature too high fault will occur directly).	2. Check for foreign objects on the heatsink, and whether the fan is rotating; 3. Insufficient ventilation space for the VFD; 4. Check if the load matches the VFD; 5. Long time operation at 100% or more than 100% rated output.	
A010	Environmental overheating warning	The VFD detects internal key component temperatures too high, exceeding the protection set point.	Same as above	Manual reset; it can only be reset after the ambient temperature sensor temperature reads below 45°C.
A011	PID feedback signal warning	PID feedback signal loss warning (applicable to analog feedback signals, requires PID function to be enabled)	1. PID feedback wiring loose or disconnected; 2. Feedback device fault; 3. Hardware fault.	Automatic: When parameter FA-50 is set to 0 or 3, it's considered a "warning". Warning is automatically cleared when the feedback signal exceeds 4 mA. Manual: When parameter FA-50 is set to 1 or 2, it's considered a "fault" and requires manual reset.
A012	AI current signal disconnection	Warning A012 is issued, when 4-20mA disconnection action (parameter F5-42) is set to 1 or 2, any one of the analog input terminals AI1, AI2, or AI1 is of the 4-20mA current signal type, and the analog input function is non-zero, the input current signal at that terminal falls below the 4-20mA disconnection threshold (parameter F5-43).	Analog input current signal is disconnection	Warning is automatically cleared when disconnection warning conditions are not met.
A015	PG feedback error	PG Feedback error warning	1. Encoder parameter setting incorrect; 2. Disconnection in encoder wiring;	This warning is automatically cleared and reset after the machine is stopped.

Warning code	Warning name	Fault Description	Possible Causes	Reset Method and Conditions
			3. Damage to PG card or PG encoder; 4. Misoperation due to interference.	
A017	Overspeed warning	Excessive speed warning	1. In open-loop control, parameter F3-36 speed observer bandwidth is improperly set; 2. Bandwidth setting of ASR speed controller is inappropriate; 3. Incorrect setting of motor parameters; 4. Misoperation due to interference.	This warning is automatically cleared after stopping.
A018	Excessive speed deviation	Large speed deviation warning	1. Inappropriate setting of feedback deviation anomaly function parameters; 2. Inappropriate setting of ASR-related parameters and acceleration/deceleration; 3. Acceleration/deceleration time too short; 4. Motor jammed; 5. Mechanical brake not released; 6. Incorrect setting of torque limit related parameters, causing misoperation due to interference.	This warning is automatically cleared after stopping.
A019	Input phase loss	VFD input phase loss	1. Input power phase loss occurred 2. Single-phase power input in a three-phase machine type; 3. Power supply voltage fluctuated; 4. Loose terminals of the input power supply; 5. Check if the input cables of the three-phase power supply have been cut; 6. Unbalanced three-phase input power supply.	This warning is automatically cleared after stopping.
A020	Over-torque	Over-torque 1 warning	1. Incorrect parameter setting; 2. Fault on the mechanical side; 3. Excessive load;	A020 warning is automatically cleared when the output current is less than the set value of parameter F9-37.

Warning code	Warning name	Fault Description	Possible Causes	Reset Method and Conditions
			4. Acceleration/deceleration and duty cycle time too short; 5. Voltage too high in V/F control; 6. Motor capacity too small; 7. Overload during low-speed operation; 8. Torque compensation amount too large; 9. Inappropriate setting of speed tracking function parameters (including situations of instant power-off restart and abnormal restart).	
A021	Over-torque	Over-torque 2 warning	Same as above	A021 warning is automatically cleared when the output current is less than the set value of parameter H3-01.
A022	Motor Overheating	Motor overheating	1. Motor jam; 2. Excessive load; 3. High ambient temperature; 4. The motor's cooling system/fan is malfunctioning; 5. Frequent use in low-speed operation; 6. Acceleration/ deceleration time and duty cycle time too short; 7. Voltage too high in V/F control; 8. Check if the motor's rated current setting matches the motor nameplate 9. Check if the PTC-related settings and wiring are appropriate; 10. Check if the stall prevention action setting is correct; 11. Imbalance in motor three-phase impedance 12. Excessive harmonic components.	When parameter F9-48 is set to 0 for "warning", A022 warning is automatically cleared when the temperature is less than or equal to the set value of parameter F9-49.
A024	Excessive slip	Using the maximum slip (parameter F2-13) as a baseline, when the VFD's output is steady, and either F > H or	1. Verify if the motor parameters are correct; 2. Excessive load; 3. Check if the set values of parameters F9-25, F9-26, and F2-13 are appropriate.	When parameter F9-27 is set to 0 for "warning", the A024 warning is automatically cleared when the VFD's output is steady, and the deviation between the setting speed and actual speed no longer exceeds the set value of parameter F9-25.

Warning code	Warning name	Fault Description	Possible Causes	Reset Method and Conditions
		F < H exceeds the threshold of parameter F9-25 and lasts longer than the set time of parameter F9-26, A024 warning occurs.		
A025	Parameter identification in progress	Automatic parameter identification in progress. When performing automatic parameter measurement, the panel displays warning A025.	The VFD is performing motor parameter identification.	Parameter identification is completed without errors, this warning is automatically cleared.
A028	Output phase loss warning	VFD output phase loss	1. Imbalance in the three-phase impedance of the motor; 2. Issues with wiring; 3. The motor is a single-phase motor; 4. Fault in the current sensor; 5. VFD capacity significantly exceeds motor capacity.	If parameter F9-15 is set to 0, the A028 warning is automatically cleared after the VFD stops.
A030	Different model parameter copy error	Keypad to Drive COPY function error warning 3	Copying parameters to an VFD of a different model.	Manual reset
A031	Over-torque	Over-torque 3 warning	1. Incorrect parameter setting; 2. Mechanical side failure (e.g., over torque, mechanical lock-up, etc.); 3. Excessive load; 4. Acceleration/ deceleration time or duty cycle time too short; 5. Voltage too high in V/F control; 6. Motor capacity too small; 7. Overload during low-speed operation; 8. Torque compensation amount too large; 9. Improper setting of speed tracking function parameters; 10. (Including situations of	A031 warning is automatically cleared when the output current is less than the set value of parameter H3-06.

Warning code	Warning name	Fault Description	Possible Causes	Reset Method and Conditions
			momentary power outage restart and abnormal restart).	
A032	Over-torque	Over-torque 4 warning	Same as above	A032 warning is automatically cleared when the output current is less than the set value of parameter H3-11.
A036	CANopen software disconnection	CANopen software disconnection 1	1. Communication timeout duration set too short; 2. Misoperation due to interference.	Manual reset, cleared by a reset signal sent from the host.
A037	CANopen software disconnection	CANopen software disconnection 2	1. Communication timeout duration set too short; 2. Misoperation due to interference; 3. Communication cable disconnected or poorly connected.	Manual reset, cleared by a reset signal sent from the host.
A039	CANopen hardware disconnection	CAN BUS hardware disconnection	1. Verify if the communication format is correct; 2. Misoperation due to interference; 3. Communication cable disconnected or poorly connected.	Manual reset, power off and then power on again
A040	CANopen index error	CANopen communication index error	Incorrect setting of communication index	Manual reset, cleared by a reset signal sent from the host
A041	CANopen node ID error	CANopen node ID error (only supports 1–127)	Incorrect setting of communication node ID	Manual reset, parameter F0-18=7
A042 CANopen memory error	CANopen memory error	CANopen memory error	CANopen internal memory error	Manual reset, parameter F0-18=7
A043	CANopen SDO transmission timeout	SDO transmission timeout (warning occurs only at the master station)	1. Slave station not connected; 2. Sync cycle set too short; 3. Misoperation due to interference; 4. Communication cable is disconnected or poorly connected.	Warning is automatically cleared when the master station re-sends an SDO and gets a response.
A044	CANopen SDO reception overflow	CANopen internal stack buffer overflow	Host sends too many SDOs at once	Manual reset, cleared by a reset signal sent from the host.
A045	CANopen startup error	CANopen startup error warning	1. Severe hardware interference; 2. Communication speed set incorrectly;	Turn off CANopen, power off and then power on again.

Warning code	Warning name	Fault Description	Possible Causes	Reset Method and Conditions
			3. Communication card not connected or loosely connected.	
A046	CANopen format error	CANopen protocol error	Host sends incorrect communication packets.	Manual reset, cleared by a reset signal sent from the host.

Appendix A Modbus Communicatio

1. Communication Introduction

The CM680series of VFDs use an RS485 communication interface to connect to a PC/PLC for communication, forming a PC/PLC communication network with one master and multiple slaves. Each communication slave must have a unique slave address. The range for setting slave addresses is 1–254, with 0 being the broadcast communication address. Users can centrally control the slaves (VFDs) through the master (usually a PC or PLC), using the Modbus communication protocol to implement functions such as setting inverter operation commands, modifying and reading parameters, and reading inverter operating status and fault information.

The CM680series VFDs support Modbus-ASCII and Modbus-RTU slave communication protocols. This communication protocol is a serial communication protocol that defines the content of information transmitted in serial communication and the format used. If the slave encounters an error when receiving information or cannot execute the command issued by the master, the slave will feed back a fault message to the master.

2. RS485 Connection Topology

The RS485 bus typically adopts a daisy chain topology structure. The wiring method involves sequentially connecting the 485+ interface of the master to multiple slaves, and the 485- interface does the same. The daisy chain form of the RS485 bus topology is shown in Figure 1. The daisy chain topology structure has the advantages of low signal reflection, high communication success rate, and no need for additional equipment. To reduce the impact of interference on the output signal, it is recommended to use shielded twisted pair transmission for the RS485 bus.

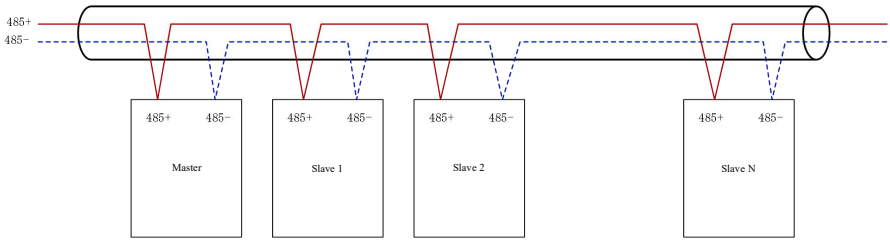


Figure 1 Daisy Chain RS485 Bus Topology

3. Communication Transmission Mode

The RS485 communication protocol can support half-duplex and full-duplex modes. Usually, we use half-duplex mode, where at any given moment, only one of the master and slave can send data while the other can only receive data. The RS485 communication transmission mode is shown in Figure 3. Data is transmitted in the message format stipulated in the Modbus-RTU protocol, sending one frame of data at a time. When the idle time on the communication data line exceeds the transmission time of 3.5Bytes, it signifies the start of a new communication frame.

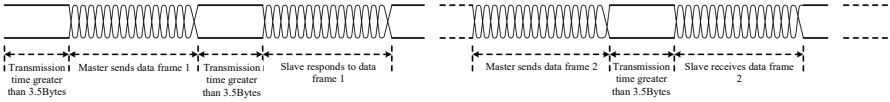


Figure 2 RS485 communication transmission method

CM680series VFDs are equipped with built-in Modbus-RTU and Modbus-ASCII communication protocols, allowing users to select their preferred communication protocol. In the network, only one device (master) can establish the protocol, i.e., send "query/command". Other devices (slaves) can only respond to the master's "query/command" and provide data or perform operations as directed by the master. The master can be a PC, PLC, etc., while the slave refers to the VFD. The master can communicate independently with a particular slave or broadcast information to all slaves. When the master sends a "query/command", slaves need to return information (respond), but if the master sends broadcast information, slaves do not need to provide feedback.

4. Communication Data Frame Structure

The communication data format for the Modbus-RTU protocol is as shown in Figure 4; the VFD only supports reading or writing Word-type parameters. The corresponding communication read operation command is 03; write operation command is 06, and multiple write operation command is 10. Reading or writing of bytes or bits is not supported.

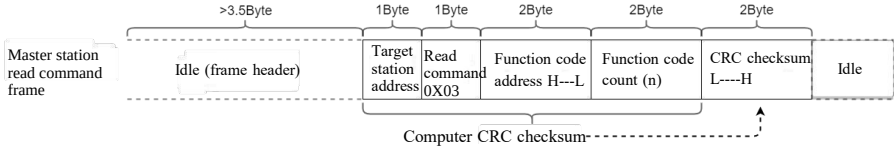


Figure 3(a) Master station read command frame

CN	EN
主站读命令帧	Master station read command frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
读命令0x03	Read command 0x03
功能码地址H---L	Function code address H---L
功能码个数（n）	Function code count (n)
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

Note: Theoretically, the host can read multiple consecutive parameters at once (where n can be up to 12), but it should be noted that it should not exceed the last parameter of this parameter group, otherwise, it will respond with an error.

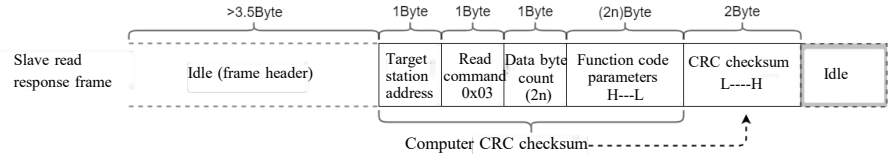


Figure 3(b) Slave read response frame

CN	EN
从站读应答帧	Slave read response frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
读命令0x03	Read command 0x03
数据字节数（2n）	Data byte count (2n)
功能码参数H---L	Function code parameters H---L
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

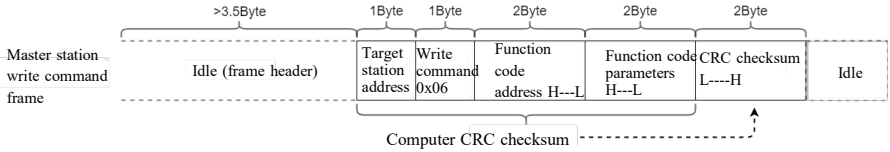


Figure 3(c) Master station write command frame

CN	EN
主站写命令帧	Master station write command frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
写命令0x06	Write command 0x06
功能码地址H---L	Function code address H---L
功能码参数H---L	Function code parameters H---L
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

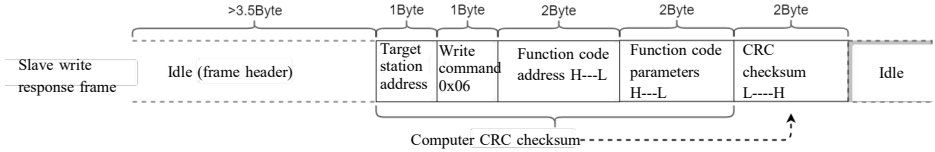


Figure 3(d) Slave write response frame

CN	EN
从站写应答帧	Slave write response frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
写命令0x06	Write command 0x06
功能码地址H---L	Function code address H---L
功能码参数H---L	Function code parameters H---L
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

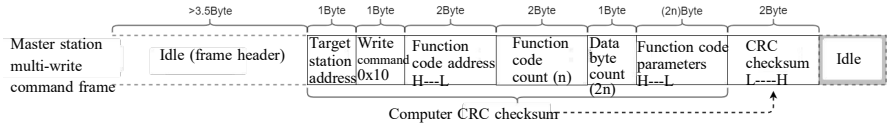


Figure 3(e) Master station multi-write command frame

CN	EN
主站多写命令帧	Master station multi-write command frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
写命令0x10	Write command 0x10
功能码地址H---L	Function code address H---L
功能码个数（n）	Function code count (n)
数据字节数（2n）	Data byte count (2n)
功能码参数H---L	Function code parameters H---L
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

Note: Like multi-read, multi-write can only operate a maximum of 12 parameters.

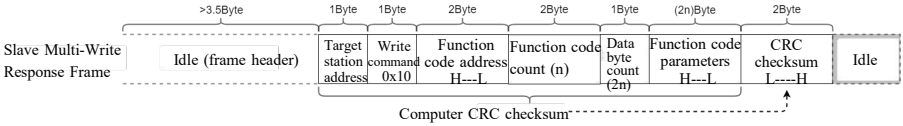


Figure 3(f) Slave multi-write response frame

CN	EN
从站多写应答帧	Slave Multi-Write Response Frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
写命令0x10	Write command 0x10
功能码地址H---L	Function code address H---L

功能码个数（n）	Function code count (n)
数据字节数（2n）	Data byte count (2n)
功能码参数H---L	Function code parameters H---L
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

The slave's read response error command is 0x83, write response error command is 0x86, multi-write response error command is 0x90, and there will be no response for CRC verification errors. In addition, among the error types, 0x01 represents command code error, 0x02 represents address error, 0x03 represents data error, and 0x04 represents the command cannot be processed.

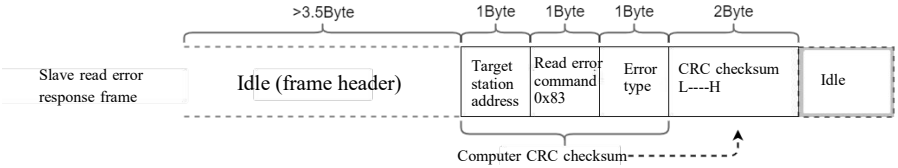


Figure 3(g) Slave read error response frame

CN	EN
从站读错误应答帧	Slave read error response frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
读错误命令0x83	Read error command 0x83
错误类型	Error type
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

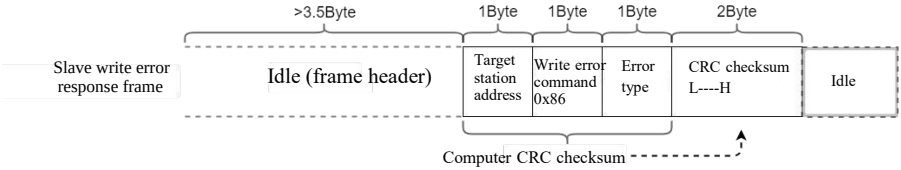


Figure 3(h) Slave write error response frame

CN	EN
从站写错误应答帧	Slave write error response frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
写错误命令0x86	Write error command 0x86
错误类型	Error type
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

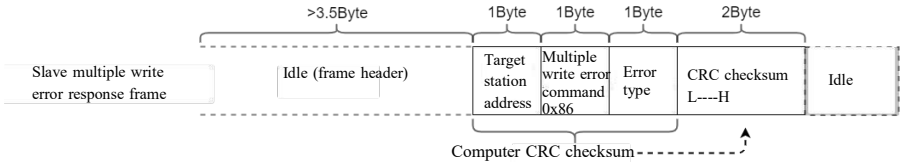


Figure 3(i) Slave multiple write error response frame

CN	EN
从站多写错误应答帧	Slave multiple write error response frame
空闲（帧头）	Idle (frame header)
目标站地址	Target station address
多写错误命令0x86	Multiple write error command 0x86
错误类型	Error type
CRC校验和L---H	CRC checksum L----H
空闲	Idle
计算机CRC校验和	Computer CRC checksum

5. Related parameters

Function Code	Name	Contents	Default value	Parameter Descriptions
F8-00	Baud rate setting	4.8～115.2 kb/s	115.2	Used to set the data transmission rate between the host computer and the VFD. The higher the baud rate, the faster the communication. Note: The baud rate set for the host computer and the VFD must be the consistent, otherwise communication cannot be conducted.
F8-01	Communication data format	1：7,N,2 for ASCII 2：7,E,1 for ASCII 3：7,O,1 for ASCII 4：7,E,2 for ASCII 5：7,O,2 for ASCII 6：8,N,1 for ASCII 7：8,N,2 for ASCII 8：8,E,1 for ASCII 9：8,O,1 for ASCII 10：8,E,2 for ASCII 11：8,O,2 for ASCII 12：8,N,1 for RTU 13：8,N,2 for RTU 14：8,E,1 for RTU	12	The data format set by the host computer and the VFD must be consistent, otherwise communication cannot be conducted.

Function Code	Name	Contents	Default value	Parameter Descriptions
F8-01	Communication data format	15：8,O,1 for RTU 16：8,E,2 for RTU 17：8,O,2 for RTU	12	The data format set by the host computer and the VFD must be consistent, otherwise communication cannot be conducted.
F8-02	Communication address	1～254	1	Used to set the local communication address of the VFD.
F8-03	Response delay	0.0～200.0ms	2.0	The time interval between the end of data reception by the VFD and sending data to the host computer. If the response delay is less than the system processing time, the response delay is based on the system processing time; If the response delay time is greater than the system processing time, the system will wait after processing the data until the response delay time is reached before sending data to the host computer.
F8-04	Communication timeout time	0.0～100.0s	0.0	When this parameter is set to a non-zero value, if the interval between one communication and the next exceeds the communication timeout duration, the system will report a Modbus transmission timeout (E058) fault. It is usually set to zero, which means it is ineffective.

6. Communication Parameter Address

This part contains the contents of the communication used to control the operation, status, and related parameter settings of the VFD. R indicates read-only, RW indicates read-write.

Parameter address presentation rules based on function code group number and code number:

High byte: F0–FF group as 0x00–0x0F, U0–U1 as 0x10–0x11, H1–H3 as 0x12–0x15, L0–L8 as 0x16–0x1E.

Low byte: 0x00 to 0xFF

For example, address F0-11 is represented as 0x000B

Note:
FF group: neither readable nor changeable parameters;
U group: readable yet unchangeable parameters.
Some parameters cannot be changed while the VFD is running; others cannot be changed regardless of the VFD's status; when changing function code parameters, be mindful of the parameter range, unit, and related descriptions.

Function code group number	Communication access address
F0 ~ FE	0x0000～0x0FFF
U0～U1 group	0x1000～0x11FF
H1～H3 group	0x1200～0x15FF
L0～L8 group	0x1600～0x1EFF

Address	Parameter Description	Address	Parameter Description
2102H	Set Frequency (Unit: 0.01 Hz)	2210H	DI Switch Status
2103H	Output Frequency (Unit: 0.01 Hz), Read-Only	2211H	DO Switch Status
2200H	Output current (unit: A), read-only	2211H	DO switch status, read-only
2201H	Count value, read-only	2212H	Multi-stage speed, read-only
2202H	Actual motor speed (unit: rpm), read-only	2213H	DI CPU pin status, read-only
2203H	Bus voltage (unit: V), read-only	2214H	DO CPU pin status, read-only
2204H	Output voltage (unit: V), read-only	2215H	PG1 encoder pulse count, read-only
2205H	Power factor angle (unit: deg), read-only	2216H	Pulse input frequency (unit: Hz), read-only
2206H	Output power (unit: kW) , read-only	2217H	Pulse input position, read-only
2207H	Actual feedback speed (unit: rpm) , read-only	221AH	GFF detection percentage (unit: %)
2208H	Output torque (unit: Nm) , read-only	221EH	User-defined display

2209H	PG position, read-only	2223H	Speed mode, read-only
220AH	PID feedback value, read-only	2224H	Carrier frequency (unit: Hz), read-only
220BH	AI1, read-only	222CH	PG1 pulse low word (unit:1Hz), read-only
220CH	AI2, read-only	222DH	PG1 pulse high word (unit: 0.01Hz), read-only
220DH	AI3, read-only	222EH	PID setting, read-only
220EH	IGBT temperature (unit: ℃), read-only	222FH	PID compensation, read-only
220FH	Bus capacitor temperature (unit: ℃), read-only	2230H	PID output frequency (unit: Hz), read-only
2210H	DI switch status, read-only		

Stop/run parameters:

Type	Command address	Command content
Control command input (Write-only)	2000H	xx12: Forward running, xx22: Reverse running, xx13: Forward jog xx23: Reverse jog, xxx1: Stop running
Setting frequency (read-write)	2001H	Setting frequency (unit: 0.01Hz)
External signal (read-write)	2002H	0001: External fault signal 0002: Fault reset signal 0004: Base fault signal
VFD fault Address (read-only)	2100H	xx01: Overcurrent during acceleration xx33: External interruption xx02: Overcurrent during deceleration xx34: Three consecutive wrong password entries xx03: Overcurrent during constant speed xx36:Illegal communication command xx04: Grounding protection xx37: Illegal communication address xx05: IGBT upper and lower bridge short circuit xx38: Communication data error xx06: Overcurrent during stopping xx39: Communication writing to read-only address

Type	Command address	Command content
VFD fault address (read-only)	2100H	xx07: Overvoltage during acceleration xx3A: Modbus transmission timeout xx08: Overvoltage during deceleration xx3E: Deceleration regenerative braking action xx09: Overvoltage during constant speed xx3F: Excessive slip xx0A: Overvoltage during stopping xx40: Please reset the machine type code xx0B: Undervoltage during acceleration xx41: PG card hardware error xx0C: Undervoltage during deceleration xx45: Feedback speed divergence xx0D: Undervoltage during constant speed xx46: Excessive feedback speed deviation xx0E: Undervoltage during stopping xx48: STO1 fault xx0F: Input phase loss protection xx4C: STO xx10: IGBT overtemperature xx4D: STO2 fault xx11: Too high ambient temperature xx4F: U phase overcurrent xx15: VFD overload xx50: V phase overcurrent xx16: Motor 1 overload protection xx51 W phase overcurrent xx17: Motor 2 overload protection xx52: U-phase output-phase xx18: Motor overheat PTC xx53: V-phase output under-phase xx1A: Over torque 1 xx54: W-phase output under-phase xx1B: Over torque 2 xx57: Low frequency overload protection xx1C: Low current xx65: CANopen disconnection xx1D: Limit reached xx66: CANopen disconnection xx1F: Memory readout anomaly xx68: CANopen hardware disconnection xx21: U phase current detection error xx69: CANopen index error xx22: V-phase current detection error xx6A:CANopen station number error xx23: W-phase current detection error xx6B: CANopen memory error xx24: cc hardware circuit anomaly xx78: EMS overcurrent xx25: oc hardware circuit anomaly xx80: Over torque 3 xx26: ov hardware circuit anomaly xx81: Over torque 4 xx28: Motor parameter identification error xx86: Motor 3 overload protection

Type	Command address	Command content
		xx29: PID disconnection AI2 xx87: Motor 4 overload protection xx2A: PG feedback setting error xx8D: Ground fault before operation xx2B: PG feedback disconnection xx8E: Parameter identification error 1 xx2C: PG feedback stall xx8F: Parameter identification error 2 xx2D: PG slip anomaly xx92: Belt break detection xx31: External terminal abnormality xx93: Tension PID feedback error detection xx32: External terminal emergency stop
		01xx: Communication command error 16xx: Motor overheating 02xx: Communication address error 18xx: Excessive slip 03xx: Communication data error 19xx: Parameter identification in progress 04xx: VFD unable to process 1Cxx: Output phase loss warning 05xx: Communication transmission timeout 1Exx: Different model copy error 07xx: Parameter copy error 1Fxx: Over torque 3 08xx: Parameter copy error 20xx: Over torque 4 09xx: IGBT overheat warning 24xx: CANopen software disconnection 0Axx: Environmental overheating warning 25xx: CANopen software disconnection 0Bxx: PID feedback signal warning 27xx: CANopen hardware disconnection 0Dxx: Low current warning 28xx: CANopen index error 0Fxx: PG feedback error 29xx: CANopen node ID error 11xx: Overspeed warning 2Axx: CANopen memory error 12xx: Excessive speed deviation 2Bxx: CANopen SDO transmission timeout 13xx: Input phase loss 2Cxx: CANopen SDO reception overflow 14xx: Over torque 1 2Dxx: CANopen startup error 15xx: Over torque 2 2Exx: CANopen format error

Appendix B Function Parameter Table

The function code symbols are described as follows:

"☆": indicates that the VFD parameters can be modified during both stop and operation processes.

"★": indicates that the VFD cannot be modified while in operation.

"○": Indicates that the parameter is a factory parameter and cannot be changed by the user.

"●": Indicates the VFD's actual detected value or manufacturer's fixed value, which cannot be changed.

Communication addresses in the function parameter table are written in hexadecimal.

Function Code	Name	Contents	Default value	Change-ability	Communication address
Group F0 - Basic Function Group					
F0-00	Product model	Product model: Input voltage, power, number of input voltage phases.	Machine type determination	●	0000
F0-01	Light and heavy load selection	1: Heavy load	1	★	0001
F0-02	Rated current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	Machine type determination	●	0002
F0-03	Control mode	0: Speed mode 1: Point-to-point mode 2: Torque mode 3: Home return mode	0	★	0003
F0-04	Speed mode selection	0: VF control 2: VVC voltage vector control 3: Closed-loop control for induction motors 4: Closed-loop control for permanent magnet motors 6: SVC open-loop vector control	0	★	0004
F0-05	Run command source selection	0: Digital operator 1: External terminal input 2: RS485 communication input 3: CANopen input 4: Reserved 5: Communication card input	0	★	0005
F0-06	Frequency source selection	0: Digital operator 1: RS485 communication 2: Analog input 3: External Up/Down input 4: Pulse input without	0	★	0006

Function Code	Name	Contents	Default value	Change-ability	Communication address
		direction 5: Pulse input with direction 6: CANopen input 7. Reserved 8: Communication card input 9：PID 10: Digital terminal multispeed			
F0-07	Auxiliary frequency sources	0: Disable 1: Digital operator 2: RS485 communication 3: Analog input 4: External Up/Down input 5: Pulse input 6: CANopen input 7. Reserved 8: Communication card input	0	★	0007
F0-08	Selection of frequency source combination	0: Main + Auxiliary frequency 1: Main frequency - Auxiliary frequency 2: Auxiliary frequency - main frequency 3: Main frequency + Auxiliary frequency 2	0	★	0008
F0-09	Forward/reverse disable selection	0：Forward and reverse enabled 1: Reverse disabled 2: Forward disabled	0	★	0009
F0-10	Maximum frequency	0.00Hz～599.00Hz	599.00Hz	☆	000A
F0-11	Minimum frequency	0.00Hz～599.00Hz	0.00Hz	☆	000B
F0-12	Speed curve time unit	0: Acceleration and deceleration unit is 0.01s 1: Acceleration and deceleration unit is 0.1s	0	★	000C
F0-13	Acceleration time 1	0.00s～600.00s	Machine type determination	☆	000D
F0-14	Deceleration time 1	0.00s～600.00s	Machine type determination	☆	000E
F0-15	Carrier frequency	2kHz～15kHz	6kHz	★	000F
F0-16	Carrier reduction mode	0: Reduce carrier based on current temperature 1: Fixed carrier and limit current 2: Same as setting 0	0	☆	0010
F0-17	High speed mode	0～65535	0	★	0011
F0-18	Parameter management setting	0: No function 1: Parameter write protection	0	★	0012

Function Code	Name	Contents	Default value	Change-ability	Communication address
		5: kWH display reset 7: Reset CAN slave 9: Reset to factory value of 50Hz			
F0-19	Keyboard frequency command	0.00～599.00Hz	50.00Hz	☆	0013
F1 group - start/stop control parameters					
F1-00	Start speed tracking	0: No action 1: Track from maximum frequency 2: Track frequency at start-up 3: Track from the minimum frequency	0	☆	0100
F1-01	Initial position identification method	0： No initial angle identification 1： Attraction method 3： Pulse injection method 1 4： Pulse injection method 2	0	☆	0101
F1-02	Abnormal restart mode	0: Stop running 1: Track current speed 2: Track minimum frequency	0	☆	0102
F1-03	Maximum current for speed tracking	20%～200%	100%	☆	0103
F1-04	Voltage increase rate	1%～200%	100%	☆	0104
F1-05	Start frequency	0.00Hz～599.00Hz	0.50Hz	★	0105
F1-06	Start-up hold time	0.00s～600.00s	0.00s	☆	0106
F1-07	Startup hold frequency	0.00Hz～599.00Hz	0.00Hz	☆	0107
F1-08	Braking current size	0% to 100%	0%	☆	0108
F1-09	Start-up braking time	0.0s～60.0s	0.0s	☆	0109
F1-10	DC braking proportion coefficient	0～65535	2000	☆	010A
F1-11	DC brake integral coefficient	0～65535	100	☆	010B
F1-12	Stopping method	0: Deceleration stop 1: Free stop	0	☆	010C
F1-13	Deceleration method	0: Deceleration method 0 1: Deceleration method 1 2: Deceleration method 2	0	★	010D
F1-14	Maximum current for flux braking	0～26214	10485	☆	010E
F1-15	1-4 segment acceleration/deceleration switching	0.00Hz～599.00Hz	0.00Hz	☆	010F

Function Code	Name	Contents	Default value	Change-ability	Communication address
	point				
F1-16	S acceleration time1	0.00s～25.00s	0.20s	☆	0110
F1-17	S acceleration time 2	0.00s～25.00s	0.20s	☆	0111
F1-18	S deceleration time 1	0.00s～25.00s	0.20s	☆	0112
F1-19	S deceleration time2	0.00s～25.00s	0.20s	☆	0113
F1-20	Automatic acceleration and deceleration selection	0: Linear acceleration and deceleration 1: Automatic acceleration linear deceleration 2: Linear acceleration auto deceleration 3: Automatic acceleration and deceleration 4: Auto acceleration deceleration suppression	0	☆	0114
F1-21	Auto acceleration and deceleration Kp	0～65535	20	☆	0115
F1-22	Auto acceleration and deceleration Ki	0.000～65.535	0.400	☆	0116
F1-23	Abnormal stop mode	0: Free stop 1: According to the first deceleration time 2: According to the second deceleration time 3: According to the third deceleration time 4: According to the fourth deceleration time 5: According to the system deceleration time 6: Automatic deceleration	0	☆	0117
F1-24	Stop braking time	0.0s～60.0s	0.0s	☆	0118
F1-25	Braking start frequency	0.00Hz～599.00Hz	0.00Hz	☆	0119
F1-26	Stop hold time	0.00s～600.00s	0.00s	☆	011A
F1-27	Stop hold frequency	0.00Hz～599.00Hz	0.00Hz	☆	011B
F1-28	Speed tracking demagnetization time	0～65535	50	☆	011C
F1-29	Instantaneous power failure start mode	0: Stop running 1: Track current speed 2: Track minimum frequency	0	☆	011D
F1-30	Allowed power-off time	0.0s～20.0s	2.0s	☆	011E
F1-31	Base block	0.0s～5.0s	0.5s	☆	011F

Function Code	Name	Contents	Default value	Change-ability	Communication address
	interruption time				
F1-32	dEb recovery threshold	0.0～200.0	40.0	☆	0120
F1-33	dEb action bias threshold	0.0～200.0	40.0	☆	0121
F1-34	dEb deceleration selection	0: No action 1: Enabled, not recoverable 2: Enabled, recoverable	0	☆	0122
F1-35	dEb recovery time	0.0s～25.0s	3.0s	☆	0123
F1-36	PM voltage pulse width	0.0ms～3.0ms	1.0ms	☆	0124
F1-37	Reserved	0～65535	0	●	0125
F1-38	Reserved	0～65535	0	●	0126
F1-39	Reserved	0～65535	0	●	0127
F1-40	Reserved	0～65535	0	●	0128
F1-41	Reserved	0～65535	0	●	0129
F1-42	Stopping Frequency Mode	0: According to current frequency command 1: Frequency command cleared 2: According to initial stopping frequency	0	☆	012A
F1-43	Initial Stopping Frequency	0.00～599.00Hz	50.00Hz	☆	012B
Group F2 V/F Control Parameters					
F2-00	V/F voltage selection	0: General V/F curve 1: 1.5 power V/F curve 2: 2 power V/F curve	0	★	0200
F2-01	Torque compensation gain	0～10	1	☆	0201
F2-02	Torque filter time	0.001s～10.000s	0.500s	☆	0202
F2-03	Reserved	0～65535	0	●	0203
F2-04	M1 multi-point VF frequency point 1	0.00Hz～599.00Hz	0.50Hz	★	0204
F2-05	M1 multi-point VF voltage point 1	0.0V～480.0V	2.0V	★	0205
F2-06	M1 multi-point VF frequency point 2	0.00Hz～599.00Hz	1.50Hz	★	0206
F2-07	M1 multi-point VF voltage point 2	0.0V～480.0V	10.0V	★	0207
F2-08	M1 multi-point VF frequency point 3	0.00Hz～599.00Hz	3.00Hz	★	0208
F2-09	M1 multi-point VF voltage point 3	0.0V～480.0V	22.0V	★	0209

Function Code	Name	Contents	Default value	Change-ability	Communication address
F2-10	Slip filter time	0.001s～10.000s	0.100s	☆	020A
F2-11	Slip compensation gain	0.00～10.00	0.00	☆	020B
F2-12	Generating torque compensation gain	0.00～1.00	1.00	☆	020C
F2-13	Maximum slip limit value	0.00Hz～200.00Hz	20.00Hz	☆	020D
F2-14	Oscillation suppression gain	0～10000	1000	☆	020E
F2-15	Reserved	0～65535	0	●	020F
F2-16	Reserved	0～65535	0	●	0210
F2-17	Reserved	0～65535	0	●	0211
F2-18	Reserved	0～65535	0	●	0212
F2-19	Reserved	0～65535	0	●	0213
F2-20	Reserved	0～65535	0	●	0214
F3 group - vector control parameters					
F3-00	System control	0～65535	0	★	0300
F3-01	ASR1/2 switching frequency	5.00Hz～599.00Hz	7.00Hz	☆	0301
F3-02	Zero speed bandwidth	1Hz～40Hz	10Hz	☆	0302
F3-03	ASR1 low-speed bandwidth	1Hz～40Hz	10Hz	☆	0303
F3-04	ASR2 high-speed bandwidth	1Hz～40Hz	10Hz	☆	0304
F3-05	ASR zero-speed gain	0Hz～40Hz	10Hz	☆	0305
F3-06	ASR zero-speed integral	0.000s～10.000s	0.100s	☆	0306
F3-07	ASR1 low speed gain	0Hz～40Hz	10Hz	☆	0307
F3-08	ASR1 low-speed integral time	0.000s～10.000s	0.100s	☆	0308
F3-09	ASR2 high-speed gain	0Hz～40Hz	10Hz	☆	0309
F3-10	ASR2 high-speed integral time	0.000s～10.000s	0.100s	☆	030A
F3-11	ASR speed feedforward	0%～200%	0%	☆	030B
F3-12	PDFF coefficient	0～200	30	☆	030C
F3-13	DOB compensation gain	0Hz～5000Hz	0Hz	☆	030D
F3-14	ASR output filtering time	0.000s～0.350s	0.008s	☆	030E

Function Code	Name	Contents	Default value	Change-ability	Communication address
F3-15	Notch filter depth	0dB～20dB	0dB	☆	030F
F3-16	Notch filter frequency	0.00Hz～200.00Hz	0.00Hz	☆	0310
F3-17	Speed limit selection	0: Parameters FE-03 & FE-04 1: Frequency source 2: Absolute value of frequency source 3: Tension control line speed	0	★	0311
F3-18	Current loop bandwidth	0Hz～65535Hz	290Hz	☆	0312
F3-19	Iq current loop proportional gain	0%～65535%	100%	☆	0313
F3-20	Iq current loop integral time	0s～65535s	100s	☆	0314
F3-21	Id current loop proportional gain	0%～65535%	100s	☆	0315
F3-22	Id current loop integral time	0s～65535s	100s	☆	0316
F3-23	I/F mode current command	0%～250%	40%	☆	0317
F3-24	IF switching frequency 1	0.00Hz～599.00Hz	20.00Hz	☆	0318
F3-25	IF switching frequency 2	0.00Hz～599.00Hz	20.00Hz	☆	0319
F3-26	Field weakening proportional coefficient	0.00～3.00	1.00	☆	031A
F3-27	Field weakening integral coefficient	0.00～3.00	0.20	☆	031B
F3-28	Output voltage limit value	0～115	100	☆	031C
F3-29	Torque filter time	0.001～10.000	0.500	☆	031D
F3-30	VVC voltage feedforward gain	0.00～2.00	1.00	☆	031E
F3-31	VVC compensation low pass	0.00s～600.00s	0.05s	☆	031F
F3-32	Forward motoring torque upper limit	0%～500%	500%	☆	0320
F3-33	Forward braking torque upper limit	0%～500%	500%	☆	0321
F3-34	Reverse motoring torque upper limit	0%～500%	500%	☆	0322
F3-35	Reverse braking torque upper limit	0%～500%	500%	☆	0323
F3-36	FLUXBEMF bandwidth	20.0Hz～100.0Hz	40.0Hz	☆	0324
F3-37	PM weak magnetic	0～65535	32	☆	0325

Function Code	Name	Contents	Default value	Change-ability	Communication address
	Ki				
F3-39	Flux observer filter	1ms～1000ms	50ms	☆	0327
F3-40	Flux rise time	33%～100%	100%	☆	0328
F3-41	VVC compensation high pass	0.00s～600.00s	5.00s	☆	0329
F3-42	VVC compensation gain	0.00 to 655.35	1.00	☆	032A
F3-43	PM sensorless control bit	0～65535	0	☆	032B
F3-44	Id filter time	0.0s～6.0s	0.2s	☆	032C
F3-45	IDBST filter coefficient	0～1000	10	☆	032D
F3-46	M1 weak magnetic curve	0～200	90	☆	032E
F3-47	M2 weak magnetic curve	0～200	90	☆	032F
F3-48	Weak magnetic speed response	0～150	65	☆	0330
F3-49	Weak magnetic ASR proportional coefficient	0%～65535%	7618%	☆	0331
F3-50	Weak magnetic ASR integral coefficient	0s～65535s	30s	☆	0332
F3-51	I maximum value	0～250	150	★	0333
F3-52	Torque limit value	0～500	200	☆	0334
F3-53	Weak magnetic current	0～65535	100	☆	0335
F3-54	Frequency filter coefficient	0～1000	10	★	0336
F3-55	Us maximum value	0～100	100	★	0337
F3-56	Id weak magnetic bandwidth	0～546	273	☆	0338
F3-57	MTPA weak magnetic limit voltage	0.0%～12.0%	10.5%	☆	0339
F4 group - first motor's parameters					
F4-00	Motor type selection	0: Induction motor 1: Surface-mounted permanent magnet synchronous motor 2: Interior permanent magnet synchronous motor 3: Synchronous reluctance motor	0	★	0400
F4-01	Motor parameter identification	0: No function 1: IM advanced rotation identification	0	★	0401

Function Code	Name	Contents	Default value	Change-ability	Communication address
		2: IM static identification 4: PM motor pole identification 5: PM rotation identification 6: IM rotation identification 12: Inertia identification 13: PM static identification			
F4-02	M1 maximum frequency	0.00Hz～599.00Hz	50.00Hz	★	0402
F4-03	M1 rated frequency	0.00Hz～599.00Hz	50.00Hz	★	0403
F4-04	M1 rated voltage	0.0V～510.0V	380.0V	★	0404
F4-05	IM1 rated power	0.00kW～655.35kW	Machine type determination	★	0405
F4-06	IM1 number of poles	2～20	Machine type determination	★	0406
F4-07	IM1 rated current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	Confirmation of F4-05	★	0407
F4-08	IM1 rated speed	0rpm～65535rpm	Confirmation of F4-05	★	0408
F4-09	Inertia per unit value	1pu～65535pu	Machine type determination	★	0409
F4-10	IM1 no-load current	0.00A～F4-07	Machine type determination	★	040A
F4-11	IM1 stator resistance	0.000Ω～65.535Ω	Machine type determination	★	040B
F4-12	IM1 rotor resistance	0.000Ω～65.535Ω	Machine type determination	★	040C
F4-13	IM1 mutual inductance	0.0mH～6553.5mH	Machine type determination	★	040D
F4-14	IM1 leakage inductance	0.00mH～655.35mH	Machine type determination	★	040E
F4-15	PM rated power	0.00kW～655.35kW	Machine type determination	★	040F
F4-16	PM number of poles	0～65535	Machine type determination	★	0410
F4-17	PM rated current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	Confirmation of F4-15	★	0411
F4-18	PM rated speed	0rpm～65535rpm	Confirmation of F4-15	★	0412
F4-19	PM motor inertia	0.0kgm2～6553.5kgm2	Machine type determination	★	0413
F4-20	PM stator resistance	0.000Ω～65.535Ω	Machine type determination	★	0414

Function Code	Name	Contents	Default value	Change-ability	Communication address
F4-21	PM D-axis inductance	0.00mH～655.35mH	Machine type determination	★	0415
F4-22	PM Q-axis inductance	0.00mH～655.35mH	Machine type determination	★	0416
F4-23	PM Ke parameters	0V～65535V	Machine type determination	★	0417
F4-24	PM back electromotive force coefficient	0.0～6553.5	Machine type determination	★	0418
F4-25	PM identification current threshold	0.00%～100.00%	Machine type determination	☆	0419
F4-26	PM pole angle	0.0DEG～360.0DEG	Machine type determination	★	041A
F4-27	Encoder type selection	0: No PG card 1: ABZ encoder 2: Reserved 3: Resolver	0	★	041B
F4-28	Encoder pulse count	6ppr～20000ppr	600ppr	★	041C
F4-29	Pulse input type	0: No function 1: Phase A leading Phase B indicates forward rotation 2: Phase B leading Phase A indicates forward rotation 3: Phase A pulse, Phase B direction HL 4: Phase A pulse, Phase B direction LH 5: Single-phase input	0	★	041D
F4-30	Reference pulse input type	0: No function 1: Phase A leading Phase B indicates forward rotation 2: Phase B leading Phase A indicates forward rotation 3: Phase A pulse, Phase B direction HL 4: Phase A pulse, Phase B direction LH 5: Single-phase input	0	★	041E
F4-31	Reserved	Reserved	0	☆	041F
F4-32	Rotary encoder's number of pole pairs	1～50	0	★	0420
F4-33	Reserved	Reserved	0	★	0421
F4-34	PG feedback filter	0Hz～2000Hz	100	☆	0422
F4-35	PG feedback zero-speed filter	0Hz～2000Hz	50	☆	0423
F4-36	Load side gear A1	1～65535	100	☆	0424
F4-37	Load side gear B1	1～65535	100	☆	0425

Function Code	Name	Contents	Default value	Change-ability	Communication address
F4-38	Load side gear A2	1～65535	100	☆	0426
F4-39	Load side gear B2	1～65535	100	☆	0427
F4-40	Electronic gear A	1～65535	100	☆	0428
F4-41	Electronic gear B	1～65535	100	☆	0429
F4-42	No-load current of synchronous reluctance	0.00A ~ 655.35A(≤93kW) 0.0A ~ 6553.5A(≥110kW)	Machine type determination	★	042A
Group F5 - input terminals					
F5-00	DI1 terminal function selection	0: No function 1: Multi-stage/multi-point position 1 2: Multi-stage/multi-point position 2 3: Multi-stage/multi-point position 3 4: Multi-stage/multi-point position 4 5: Fault reset 6: Jogging 7: Speed pause 8: 1-2 stage acceleration/deceleration switching 9: 3-4 stage acceleration/deceleration switching 10：External fault 11: Gate blocking 12: Stop output 13: Automatic acceleration and deceleration disabled 15: AI1 input frequency command 16: AI2 input frequency command 17: AI3 input frequency command 18: Deceleration stop 19: External command for frequency rise 20: External command for frequency drop 21: PID function disable 22: Clear counter 23: Input counter 24: External forward jogging 25:External reverse jogging	0	★	0500
F5-01	DI2 terminal function selection		0	★	0501
F5-02	DI3 terminal function selection		1	★	0502
F5-03	DI4 terminal function selection		2	★	0503
F5-04	DI5 terminal function selection		3	★	0504
F5-05	DI6 terminal function selection		4	★	0505
F5-06	DI7 terminal function selection		0	★	0506
F5-07	HDI8 terminal function selection		0	★	0507

Function Code	Name	Contents	Default value	Change-ability	Communication address
		26: Torque/speed mode switching 27: Speed loop 1/2 switch 28: External fault free stop 31: High torque compensation 32: Medium torque compensation 33: Low torque compensation 34: Multi-stage speed/position switch 35: Internal positioning enable 36: Multi-point position input 37: Pulse input position control 39: Torque command direction switch 40: Motor free stop 41: Manual mode enable 42: Automatic mode enable 44: NL reverse limit 45: PL forward limit 46: ORG homing point 47: Home action enable 48: Mechanical gear ratio switch 49: VFD enable 50: Slave dEb execution 53: CANopen quick stop 56: LOC/REM switch 70: Auxiliary frequency disable 71: PID disable, zero output 72: PID disable, maintain output 73: PID I gain zero 74: PID feedback reverse 83: Motor switch Bit0 84: Motor switch Bit1			
F5-08	Terminal command mode	0: No function 1: 2-wire mode 1 2: 2-wire mode 2 3: 3-wire mode 4: 2-wire mode 1/quick start 5: 2-wire mode 2/quick start 6: 3-wire quick start	1	★	0508
F5-09	UP/DOWN mode selection	0: System acceleration and deceleration time 1: Fixed acceleration/deceleration	0	☆	0509

Function Code	Name	Contents	Default value	Change-ability	Communication address
		F5-10 2: Pulse signal F5-10 3: External Up/Down input 4: External Up/Down input 1			
F5-10	UP/DOWN rate of change	0.001Hzms～1.000Hzms	0.001Hzms	☆	050A
F5-15	DI terminal effective logic	0～65535	0	☆	050F
F5-16	DI terminal response time	0.000s～30.000s	0.005s	☆	0510
F5-17	Virtual/real DI terminal selection	0～65535	0	☆	0511
F5-18	Virtual terminal status setting	0～65535	0	☆	0512
F5-19	External runnning selection	0: Invalid 1: Run if there is a run command	0	☆	0513
F5-20	AI1 signal type selection	0: 0-10V input selection 1: 0-20mA input selection	0	☆	0514
F5-21	AI1 function selection	0: No function 1: Frequency setting 2: Torque setting 3: Torque compensation setting 4: PID target value 5: PID feedback value 6: Thermistor PTC input 7: Forward torque limit 8: Reverse torque limit 9: Regenerative torque limit 10: Forward/reverse torque limit 11: Thermistor PT100 value 12: Auxiliary frequency setting 13: PID offset 14: Tension PID feedback value 15: Line speed feedback 16: Reel diameter feedback 17: Tension PID setting 18: Tension setting value 19: Zero speed tension setting 20: Tension taper setting	1	☆	0515
F5-22	AI1 input offset voltage	-100.0%～100.0%	0.0%	☆	0516
F5-23	AI1 offset mode selection	0: No offset 1: Below offset = offset 2: Above offset = offset	0	☆	0517

Function Code	Name	Contents	Default value	Change-ability	Communication address
		3: Absolute value offset centered 4: Offset centered			
F5-24	AI1 gain	-500.0%～500.0%	100.0%	☆	0518
F5-25	AI1 filter time	0.00s～20.00s	0.01s	☆	0519
F5-26	AI2 signal type selection	0: 0-10V input selection 1: 0-20mA input selection	0	☆	051A
F5-27	AI2 function selection	0: No function 1: Frequency setting 2: Torque setting 3: Torque compensation setting 4: PID target value 5: PID feedback value 6: Thermistor PTC input 7: Forward torque limit 8: Reverse torque limit 9: Regenerative torque limit 10: Forward/reverse torque limit 11: Thermistor PT100 value 12: Auxiliary frequency setting 13: PID offset 14: Tension PID feedback value 15: Line speed feedback 16: Reel diameter feedback 17: Tension PID setting 18: Tension setting value 19: Zero speed tension setting 20: Tension taper setting	0	☆	051B
F5-28	AI2 input offset voltage	-100.0%～100.0%	0.0%	☆	051C
F5-29	AI2 offset mode selection	0: No offset 1: Below offset = offset 2: Above offset = offset 3: Absolute value offset centered 4: Offset centered	0	☆	051D
F5-30	AI2 gain	-500.0%～500.0%	100.0%	☆	051E
F5-31	AI2 filter time	0.00s～20.00s	0.01s	☆	051F
F5-32	AI3 signal type selection	0: 0-10V input selection 1: 0-20mA input selection	0	☆	0520
F5-33	AI3 function selection	0: No function 1: Frequency setting 2: Torque setting 3: Torque compensation setting	0	☆	0521

Function Code	Name	Contents	Default value	Change-ability	Communication address
		4: PID target value 5: PID feedback value 6: Thermistor PTC input 7: Forward torque limit 8: Reverse torque limit 9: Regenerative torque limit 10: Forward/reverse torque limit 11: Thermistor PT100 value 12: Auxiliary frequency setting 13: PID offset 14: Tension PID feedback value 15: Line speed feedback 16: Reel diameter feedback 17: Tension PID setting 18: Tension setting value 19: Zero speed tension setting 20: Tension taper setting			
F5-34	AI3 input offset voltage	-100.0%～100.0%	0.0%	☆	0522
F5-35	AI3 offset mode selection	0: No offset 1: Below offset = offset 2: Above offset = offset 3: Absolute value offset centered 4: Offset centered	0	☆	0523
F5-36	AI3 positive gain	-500.0%～500.0%	100.0%	☆	0524
F5-37	AI3 filter time	0.00s～20.00s	0.01s	☆	0525
F5-38	Analog frequency negative value inversion	0: Forward/reverse determined by operation source 1: Forward/reverse determined by offset	0	☆	0526
F5-39	Analog input addition enable	0: Disable 1: Enable	0	☆	0527
F5-40	Reserved	0～65535	0	●	0528
F5-41	Reserved	0～65535	0	●	0529
F5-42	4-20mA wire break action	0: No wire break detection 1: Maintain frequency before wire break 2: Decelerate to 0Hz 3: Immediate fault stop	0	☆	052A
F5-43	4-20mA wire break threshold	0.00mA～4.00mA	2.00mA	☆	052B
Group F6 - Output Terminals					
F6-00	RLY1 terminal	0: No function	11	☆	0600

Function Code	Name	Contents	Default value	Change-ability	Communication address
	function selection	1: VFD running 2: Reached set speed 3: Reached frequency 1 4: Reached frequency 2 5: Zero speed command running 6: Zero speed command 7: Over-torque threshold 1 8: Over torque threshold 2 9: VFD ready complete 10: Low voltage warning 11: Fault indication 12: Brake release 13: Overheat warning 14: Braking unit action 15: PID deviation warning 16: Excessive slip 17: Set count value reached 18: Final count value reached 19: Base block 20: Warning Indicator 21: Over voltage 22: Over current stall prevention 23: Overvoltage stall prevention 24: Operation source other than operator 25: Forward command 26: Reverse command 29: Above F6-08 speed value 30: Below F6-08 speed value 31: Motor Y connection command output 32: Motor D connection command output 33: Zero operating output frequency 34: Zero output frequency 35: Fault option 1 36: Fault option 2 37: Fault option 3 38: Fault option 4 39: Positioning complete 40: Reached set frequency STP 41: Multi-point position positioning complete 42: Trolley gate opening			
F6-01	RLY2 terminal function selection		1	☆	0601
F6-02	DO1 terminal function selection		0	☆	0602
F6-03	DO2 terminal function selection		0	☆	0603

Function Code	Name	Contents	Default value	Change-ability	Communication address
		output 43: Above F6-09 speed 44: Low current output 45: UVW electromagnetic switch enable 46: dEb action output 47: No function 48: No function 49: Home action completion 50: CANopen control output 51: RS485 control output 52: Communication card control output 66: STO action output A 67: Analog setpoint reached output 68: STO action output B 73: Over-torque threshold 3 74: Over-torque threshold 4 75: Forward running status 76: Reverse rotation running status			
F6-04	DO terminal valid logic	0～65535	0	☆	0604
F6-05	DO output AI source	0: AI1 1: AI2 2: AI3	0	☆	0605
F6-06	DO output AI upper limit value	-100.00%～100.00%	50.00%	☆	0606
F6-07	DO output AI lower limit value	-100.00%～100.00%	10.00%	☆	0607
F6-08	DO action frequency	0.00Hz～599.00Hz	0.00Hz	☆	0608
F6-09	Motor zero speed judgment threshold	0rpm～65535rpm	0rpm	☆	0609
F6-13	AO1 signal type selection	0: 0-10V output selection 1: 0-20mA output selection	0	☆	060D
F6-14	AO1 output function selection	0: Output frequency 1: Frequency command 2: Motor running frequency 3: Output current 4: Output voltage 5: DC bus voltage 6: Power factor 7: Power 8: Output torque 9: AI1 percentage 10: AI2 percentage	0	☆	060E

Function Code	Name	Contents	Default value	Change-ability	Communication address
		11: AI3 percentage 12: Iq current command 13: Iq current feedback 14: Id current command 15: Id current feedback 16: Vq voltage command 17: Vd voltage command 18: Torque command 19: PG2 frequency command 20: CANopen analog output 21: RS485 analog output 22: Communication card analog output 23: Fixed voltage output			
F6-15	AO1 output gain	0.0%～500.0%	100.0%	☆	060F
F6-16	AO1 reverse enable	0: Absolute value output 1: Negative value output as 0V 2: 5V as center point	0	☆	0610
F6-17	AO1 output offset	-100.00%～100.00%	0.00%	☆	0611
F6-18	AO1 output fixed value	0.00%～100.00%	0.00%	☆	0612
F6-19	AO1 filter time	0.00s～20.00s	0.01s	☆	0613
F6-20	AO2 signal type selection	0: 0-10V output selection 1: 0-20mA output selection	0	☆	0614
F6-21	AO2 output function selection	0: Output frequency 1: Frequency command 2: Motor running frequency 3: Output current 4: Output voltage 5: DC bus voltage 6: Power factor 7: Power 8: Output torque 9: AI1 percentage 10: AI2 percentage 11: AI3 percentage 12: Iq current command 13: Iq current feedback 14: Id current command 15: Id current feedback 16: Vq voltage command 17: Vd voltage command 18: Torque command 19: PG2 frequency command 20: CANopen analog output 21: RS485 analog output 22: Communication card analog output	0	☆	0615

Function Code	Name	Contents	Default value	Change-ability	Communication address
		23: Fixed voltage output			
F6-22	AO2 output gain	0.0%～500.0%	100.0%	☆	0616
F6-23	AO2 reverse enable	0: Absolute value output 1: Negative value output as 0V 2: 5V as center point	0	☆	0617
F6-24	AO2 output offset	-100.00%～100.00%	0.00%	☆	0618
F6-25	AO2 output fixed value	0.00%～100.00%	0.00%	☆	0619
F6-26	AO2 filter time	0.00s～20.00s	0.01s	☆	061A
F6-27	Frequency reach 1 detection value	0.00Hz～599.00Hz	50.00Hz	☆	061B
F6-28	Frequency reach 1 amplitude	0.00Hz～599.00Hz	2.00Hz	☆	061C
F6-29	Frequency reach 2 detection value	0.00Hz～599.00Hz	50.00Hz	☆	061D
F6-30	Frequency reach 2 amplitude	0.00Hz～599.00Hz	2.00Hz	☆	061E
Group F7 - Auxiliary Functions and Keypad Display					
F7-00	JOG frequency setting	0.00Hz～599.00Hz	6.00Hz	☆	0700
F7-01	JOG acceleration time	0.00s～600.00s	10.00s	☆	0701
F7-02	JOG deceleration time	0.00s～600.00s	10.00s	☆	0702
F7-03	Acceleration time 2	0.00s～600.00s	Machine type determination	☆	0703
F7-04	Deceleration time 2	0.00s～600.00s	Machine type determination	☆	0704
F7-05	Acceleration time 3	0.00s～600.00s	Machine type determination	☆	0705
F7-06	Deceleration time 3	0.00s～600.00s	Machine type determination	☆	0706
F7-07	Acceleration time 4	0.00s～600.00s	Machine type determination	☆	0707
F7-08	Deceleration time 4	0.00s～600.00s	Machine type determination	☆	0708
F7-09	Skip frequency 1 upper limit	0.00Hz～599.00Hz	0.00Hz	☆	0709
F7-10	Skip frequency 1 lower limit	0.00Hz～599.00Hz	0.00Hz	☆	070A
F7-11	Skip frequency 2 upper limit	0.00Hz～599.00Hz	0.00Hz	☆	070B
F7-12	Skip frequency 2 lower limit	0.00Hz～599.00Hz	0.00Hz	☆	070C
F7-13	Skip frequency 3 upper limit	0.00Hz～599.00Hz	0.00Hz	☆	070D
F7-14	Skip frequency 3	0.00Hz～599.00Hz	0.00Hz	☆	070E

Function Code	Name	Contents	Default value	Change-ability	Communication address
	lower limit				
F7-15	Skip frequency 4 upper limit	0.00Hz～599.00Hz	0.00Hz	☆	070F
F7-16	Skip frequency 4 lower limit	0.00Hz～599.00Hz	0.00Hz	☆	0710
F7-17	Fan control method	0: Continuous fan operation 1: 1 minute stop after shutdown 2: Stops with the VFD 3: Starts at 50°C temperature 4: Stop below 50°C when off	4	☆	0711
F7-18	Reserved	0% to 100%	60%	☆	0712
F7-19	Keyboard STOP key enable	0: Disable 1: Enable	0	☆	0713
F7-20	Startup screen selection	0: Setting frequency display 1: Output frequency display 2: User-defined display 3: Output current display	0	☆	0714
F7-21	Page display selection	0: Output current 1: PG card feedback frequency 2: Actual motor running frequency 3: DC bus voltage 4: Output voltage 5: Power factor 6: Output power 7: Actual motor running speed 8: Output torque % 9: PG feedback value 10: PID feedback value % 11: AI1 % 12: AI2 % 13: AI3 % 14: IGBT temperature 15: Ambient temperature 16: Digital input terminal status 17: Digital output terminal status 18: Multi-speed status 19: CPU input terminal status 20: CPU output terminal status 21: Actual motor position 22: Pulse input frequency value 23: Pulse input position 24: Position tracking error 25: Overload count value 26: Ground short-circuit current threshold	3	☆	0715

Function Code	Name	Contents	Default value	Change-ability	Communication address
		27: Bus voltage fluctuation value 29: PM motor magnetic pole sector 30: User physical quantity 31: H-page value multiplied by coefficient K 32: Encoder Z phase count 33: Motor pulse count 34: Reserved 35: Speed/torque mode 36: Current carrier frequency 37: Reserved 38: VFD status 39: Output torque Nt-m 40: Torque command 41: kWh 42: PID target value 43: PID compensation 44: PID output frequency 45: Reserved 46: Auxiliary frequency 47: Main frequency 48: Set frequency display 49: Reserved 50: Reserved 51: PMVVC torque compensation amount 52: AI10 % 53: AI11 % 54: Reserved 55: Current coil diameter 56: Current line speed 57: Tension reference value 58: MI6 count value 59: U phase current AD value 60: V-phase current AD value 61 : W phase current AD value			
F7-22	H page display gain	0.00～160.00	0.00	☆	0716
F7-23	FM terminal function selection	0: Operating frequency 1: Setting frequency 2: Output current 3: Output voltage 4: Output power 5: AI1 value 6: AI2 value 7: AI3 value 8: Output torque absolute value 9:Motor speed 10:Bus Voltage	0	☆	0717
F7-24	FMP Output Maximum Frequency	1.00% to 100.00	1	☆	0718
F7-25	IGBT temperature offset	0.0℃～6553.5℃	0.0℃	☆	0719

Function Code	Name	Contents	Default value	Change-ability	Communication address
F7-26	Cumulative power-on count	0～65535	0	●	071A
F7-27	Cumulative power-on days	0～65535	0	●	071B
F7-28	Cumulative power-on minutes	0～1439	0	●	071C
F7-29	Cumulative running days	0～65535	0	●	071D
F7-30	Cumulative running minutes	0～65535	0	●	071E
F7-31	Motor running time	0min～1439min	0min	☆	071F
F7-32	Motor running days	0～65535	0	☆	0720
F7-33	Password entry	0～65535	0	☆	0721
F7-34	Password setting	0～65535	0	☆	0722
F7-35	Automatic energy saving setting	0: Disable 1: Enable	0	☆	0723
F7-36	Energy saving gain	10～1000	100	☆	0724
F7-37	Automatic voltage regulation	0: Activate AVR function 1: Cancel AVR function 2: Cancel AVR during deceleration	0	☆	0725
F7-38	Current display filter	0.001s～65.535s	0.100s	☆	0726
F7-39	Display filter time	0.001s～65.535s	0.100s	☆	0727
F7-40	Soft start switch delay time	0～65535	7000	☆	0728
F7-41	Running frequency deviation dead zone	0.00～599.00	0.00	☆	0729
F7-42	Output phase sequence switching	0: Output phase sequence switching 1: Output phase sequence switching	0	☆	072A
F7-43	User-defined attribute	0～65535	0	☆	072B
F7-44	User-defined maximum value	0～65535	0	☆	072C
F7-45	User-defined content value	0	0	★	072D
F7-46	CANOpen quick stop time	0.00s～600.00s	1.00s	☆	072E
F7-47	Y-D switching frequency	0.00Hz～599.00Hz	60.00Hz	☆	072F
F7-48	Y-D switching enable	0: Disable 1: Enable	0	☆	0730
F7-49	Y-D switching time	0.000s～60.000s	0.200s	☆	0731
F7-50	ICT test exclusive	0～65535	0	☆	0732

Function Code	Name	Contents	Default value	Change-ability	Communication address
F7-51	Electromagnetic switch check value	0～65535	200	☆	0733
F7-52	W-sec low byte	0.0～6553.5	0.0	●	0734
F7-53	W-sec high byte	0.0～6553.5	0.0	●	0735
F7-54	W-hrs	0.0～6553.5	0.0	●	0736
F7-55	KWh low byte	0.0～6553.5	0.0	●	0737
F7-56	KWh high byte	0.0～6553.5	0.0	●	0738
F7-57	Software version (H)	0.00 to 655.35	\	●	0739
F7-58	Software version (L)	0.00 to 655.35	\	●	073A
F7-59	Software release date	0～65535	\	●	073B
F7-60	PG card software version	0.00 to 655.35	0.00	●	073C
F7-61	Enhanced parameter display selection	0～1	1	☆	073D
F7-62	Top four digits of serial number code	0～65535	\	●	073E
F7-63	Bottom three digits of serial number code	0～65535	\	●	073F
F8 group - Communication parameters					
F8-00	Baud rate setting	4.8kbps～115.2kbps	115.2kbps	☆	0800
F8-01	Communication data format	0：7,N,1 for ASCII 1：7,N,2 for ASCII 2：7,E,1 for ASCII 3：7,O,1 for ASCII 4：7,E,2 for ASCII 5：7,O,2 for ASCII 6：8,N,1 for ASCII 7：8,N,2 for ASCII 8：8,E,1 for ASCII 9：8,O,1 for ASCII 10：8,E,2 for ASCII 11：8,O,2 for ASCII 12：8,N,1 for RTU 13：8,N,2 for RTU 14：8,E,1 for RTU 15：8,O,1 for RTU 16：8,E,2 for RTU 17：8,O,2 for RTU	12	☆	0801

Function Code	Name	Contents	Default value	Change-ability	Communication address
F8-02	Communication address	1～254	1	☆	0802
F8-03	Response delay	0.0ms～200.0ms	2.0ms	☆	0803
F8-04	Communication timeout time	0.0s to 100.0s	0.0s	☆	0804
F8-05	Communication error handling	0: Warning and continue running 1: Warn and decelerate to stop 2: Warn and free stop 3: No warning	3	☆	0805
F8-06	Communication set frequency	0.00Hz～599.00Hz	50.00Hz	●	0806
F8-07	Communication decoding method	0: Use 20XX 1: Use 60XX	1	★	0807
F8-08	Communication format	0: Modbus 485 1: Internal communication_slave 1 2: Internal communication_slave 2 3: Internal communication_slave 3 4: Internal communication_slave 4 5: Internal_communication_slave 5 6: Internal_communication_slave 6 7: Internal_communication_slave 7 8: Internal_communication_slave 8 9: Reserved 10: Internal_communication_master 11: Reserved	0	★	0808
F8-09	Communication card type	0: No communication card 1: DeviceNet 2: Profibus-DP 3: CANopen 4: Modbus-TCP 5: EtherNet/IP 6: EtherCAT 7: LonWorks	0	●	0809

Function Code	Name	Contents	Default value	Change-ability	Communication address
		8: BACNet 9: Reserved 10: 24V Power Supply 11: DMCnet 12: PROFINET			
F8-10	Communication card version	0～65535	0	●	080A
F8-11	Communication card address	0～65535	0	●	080B
F8-12	Communication card rate	0～65535	0	☆	080C
F8-13	Rate enable setting	0～65535	0	☆	080D
F8-14	CANopen node address	0～127	0	★	080E
F8-15	CAN bus communication rate	0：1Mbps 1：500kbps 2：250kbps 3：125kbps 4：100kbps 5：50kbps	0	★	080F
F8-16	Reserved	0～65535	2	★	0810
F8-17	Reserved	0.00～2.00	1.00	☆	0811
F8-18	CANopen warning log	0～65535	0	●	0812
F8-19	CiA402 protocol selection	0: Disable 1: Enable	0	☆	0813
F8-20	CANopen communication status	0: Node reset status 1: Communication reset status 2: Reset complete status 3: Pre-operational status 4: Operational status 5: Stopped status	0	●	0814
F8-21	CiA402 operating status	0: Start-up not yet complete status 1: Run disabled status 2: Pre-excitation status 3: Excitation status 4: Operation enabled status 5: No function 6: No function 7: Quick stop action status 8: No function 9: No function 10: No function 11:No function 12:No function	0	●	0815

Function Code	Name	Contents	Default value	Change-ability	Communication address
		13:Trigger error action status 14: Already in error status			
F8-22	CANopen index reset	0～65535	65535	★	0816
F8-23	CANopen fault status	0～65535	0	●	0817
F8-24	Product code	0～65535	0	●	0818
F8-25	Error code	0～65535	0	●	0819
F8-26	Communication card DHCP enable	0～1	0	☆	081A
F8-27	Communication card IP 1	0～255	0	☆	081B
F8-28	Communication card IP 2	0～255	0	☆	081C
F8-29	Communication card IP 3	0～255	0	☆	081D
F8-30	Communication card IP 4	0～255	0	☆	081E
F8-31	Communication card mask 1	0～255	0	☆	081F
F8-32	Communication card mask 2	0～255	0	☆	0820
F8-33	Communication card mask 3	0～255	0	☆	0821
F8-34	Communication card mask 4	0～255	0	☆	0822
F8-35	Communication card gateway 1	0～255	0	☆	0823
F8-36	Communication card gateway 2	0～255	0	☆	0824
F8-37	Communication card gateway 3	0～255	0	☆	0825
F8-38	Communication card gateway 4	0～255	0	☆	0826
F8-39	Communication card low byte password	0～99	0	☆	0827
F8-40	Communication card upper byte password	0～99	0	☆	0828
F8-41	Communication card reset	0～65535	0	☆	0829
F8-42	Communication card setting	0～65535	0	☆	082A
F8-43	Communication card status	0～65535	0	●	082B

Function Code	Name	Contents	Default value	Change-ability	Communication address
F8-44	Reserved	0: Disable 1: Enable	0	☆	082C
F8-45	Reserved	0～127	100	☆	082D
F8-46	Reserved	0～65535	0	●	082E
F8-47	Reserved	0～65535	1	☆	082F
F8-48	Communication card commissioning parameters	0～65535	0	☆	0830
F9 group - faults and protection					
F9-00	Protection control bit	0～65535	0	☆	0900
F9-01	Motor 1 overload selection	0: Constant torque output motor 1: Variable torque output motor 2: No motor overload protection	2	☆	0901
F9-02	Motor 1 overload time	30.0s～600.0s	60.0s	☆	0902
F9-03	Overvoltage stall mode	0: Overvoltage stall mode 0 1: Overvoltage stall mode 1	1	☆	0903
F9-04	Overvoltage stall threshold	0.0V～900.0V	760.0V	☆	0904
F9-05	Overvoltage stall deceleration time	0.00s～655.35s	600.00s	☆	0905
F9-06	Undervoltage fault auto clear	0: Disable 1: Enable	0	☆	0906
F9-07	Maximum current limit	0%～250%	150%	☆	0907
F9-08	OC stall threshold during acceleration	0%～200%	180%	☆	0908
F9-09	Overcurrent stall limit threshold	0% to 100%	100%	☆	0909
F9-10	OC stall threshold during operation	0%～200%	180%	☆	090A
F9-11	Constant speed OC acceleration and deceleration selection	0: System acceleration and deceleration time 1: First acceleration and deceleration time 2: Second acceleration and deceleration time 3: Third acceleration and deceleration time 4: Fourth acceleration and deceleration time 5: Automatic acceleration and deceleration time	0	☆	090B

Function Code	Name	Contents	Default value	Change-ability	Communication address
F9-12	Input phase loss action selection	0: Warning and decelerate to stop 1: Warning and coast to stop	0	☆	090C
F9-13	Input phase loss filter time	0.00s～600.00s	0.20s	☆	090D
F9-14	Input phase loss voltage threshold	0.0V～320.0V	60.0V	☆	090E
F9-15	Output phase loss action selection	0: Warning and continue running 1: Warn and decelerate to stop 2: Warn and free stop 3: No warning	3	☆	090F
F9-16	Output phase loss detection time	0.000s～65.535s	0.500s	☆	0910
F9-17	Output phase loss current threshold	0.00%～100.00%	2.00%	☆	0911
F9-18	Output phase loss braking time	0.000s～65.535s	0.000s	☆	0912
F9-19	Ground fault test count	1～20	10	☆	0913
F9-20	Ground fault current threshold	0.0%～6553.5%	60.0%	☆	0914
F9-21	Ground fault filtering time	0.00s～655.35s	0.10s	☆	0915
F9-22	Low current setting threshold	0.0%～100.0%	0.0%	☆	0916
F9-23	Low current detection time	0.00s～360.00s	0.00s	☆	0917
F9-24	Low current action mode	0: No function 1: Alarm and coast to stop 2: Alarm and second deceleration to stop 3: Alarm and continue operation	0	☆	0918
F9-25	Excessive slip detection value	0.0%～100.0%	0.0%	☆	0919
F9-26	Excessive slip detection time	0.0s～10.0s	1.0s	☆	091A
F9-27	Excessive slip action selection	0: Warning and continue running 1: Warn and decelerate to stop 2: Warn and free stop 3: No warning	0	☆	091B
F9-28	PG feedback error action	0: Warn and continue running 1: Warning and decelerate to stop 2: Warning and free stop	2	☆	091C
F9-29	PG feedback error	0.0s～10.0s	1.0s	☆	091D

Function Code	Name	Contents	Default value	Change-ability	Communication address
	time				
F9-30	PG feedback overspeed threshold	0%～120%	115%	☆	091E
F9-31	PG feedback overspeed time	0.0s～2.0s	0.1s	☆	091F
F9-32	PG feedback overspeed action	0: Warn and continue running 1: Warning and decelerate to stop 2: Warning and free stop	2	☆	0920
F9-33	PG feedback deviation range	0%～50%	50%	☆	0921
F9-34	PG feedback deviation time	0.0s～10.0s	0.5s	☆	0922
F9-35	PG feedback deviation action	0: Warn and continue running 1: Warning and decelerate to stop 2: Warning and free stop	2	☆	0923
F9-36	Over-torque selection 1	0: Detection disabled 1: Constant speed detection continues operation 2: Constant speed detection stop operation 3: Running detection continue operation 4: Operation detection stop operation	0	☆	0924
F9-37	Over-torque threshold 1	10%～250%	120%	☆	0925
F9-38	Over-torque time 1	0.1s～60.0s	0.1s	☆	0926
F9-39	Reserved	0～65535	0	●	0927
F9-40	Reserved	0～65535	0	●	0928
F9-41	Reserved	0～65535	0	●	0929
F9-42	Reserved	0～65535	0	●	092A
F9-43	Reserved	0～65535	0	●	092B
F9-44	Reserved	0～65535	0	●	092C
F9-45	Reserved	0～65535	0	●	092D
F9-46	Abnormal start count	0～10	0	☆	092E
F9-47	Abnormal restart reset time	0.0s～6000.0s	60.0s	☆	092F
F9-48	PTC action selection	0: Warn and continue running 1: Warn and decelerate to stop 2: Warn and free stop	0	☆	0930

Function Code	Name	Contents	Default value	Change-ability	Communication address
		3: No warning			
F9-49	PTC threshold	0.0%～100.0%	50.0%	☆	0931
F9-50	PT detection threshold 1	0.000V～10.000V	5.000V	☆	0932
F9-51	PT detection threshold 2	0.000V～10.000V	7.000V	☆	0933
F9-52	PT protection frequency	0.00Hz～599.00Hz	0.00Hz	☆	0934
F9-53	PT action delay time	0s～6000s	60s	☆	0935
F9-54	STO lock function	0: Locked 1: Unlocked	0	☆	0936
F9-55	Reserved	0～65535	40	☆	0937
F9-56	Reserved	0～65535	0	●	0938
F9-57	Output phase loss threshold 2	0.00%～100.00%	2.00%	☆	0939
F9-58	Overvoltage stall recovery threshold	0.0V～900.0V	630.0V	☆	093A
Group FA - PID functions					
FA-00	PID feedback type selection	0: No function 1: Negative feedback analog input 2: Negative feedback pulse non-directional 3: Negative feedback pulse directional 4: Positive feedback pulse input 5: Positive feedback pulse non-directional 6: Positive feedback pulse directional 7: Negative feedback communication input 8: Positive feedback communication input	0	☆	0A00
FA-01	PID setpoint source selection	0: Frequency command 1: Parameter FA-02 2: RS485 communication 3: Analog input 4：CANopen 5: Reserved 6: Communication card	0	☆	0A01
FA-02	PID setting value	-100.00%～100.00%	50.00%	☆	0A02
FA-03	PID setting change time	0.00s～655.35s	0.00s	☆	0A03
FA-04	PID feedback filter time	0.1s～300.0s	5.0s	☆	0A04

Function Code	Name	Contents	Default value	Change-ability	Communication address
FA-05	Proportional coefficient 1	0.00%～100.00%	88.00%	☆	0A05
FA-06	Integral time 1	0.00s～100.00s	0.05s	☆	0A06
FA-07	Derivative time 1	0.00s～1.00s	0.00s	☆	0A07
FA-08	Proportional coefficient 2	0.00 to 100.00	100.00	☆	0A08
FA-09	Integral time 2	0.00s～100.00s	0.08s	☆	0A09
FA-10	Derivative time 2	0.00s～1.00s	0.00s	☆	0A0A
FA-11	PID series-parallel selection	0：Kp，Kp*Ki，Kp*Kd 1：Kp，Ki，Kd	1	☆	0A0B
FA-12	PID control execution cycle	0～1	0	☆	0A0C
FA-13	PID parameter switching condition	0: No function 1: Switch based on output frequency 2: Switch based on PID deviation	0	☆	0A0D
FA-14	PID parameter switch err1	0.00%～100.00%	10.00%	☆	0A0E
FA-15	PID parameter switch err2	0.00%～100.00%	40.00%	☆	0A0F
FA-16	Allowable PID reversal delay	0.0s～6553.5s	0.0s	☆	0A10
FA-17	PID direction change selection	0: Disable 1: Enable	0	☆	0A11
FA-18	Feedback inhibition deviation rate	0%～65535%	10%	☆	0A12
FA-19	Feedback inhibition gain	0～1000	800	☆	0A13
FA-20	PID compensation selection	0: Parameter setting 1: Analog input	0	☆	0A14
FA-21	PID compensation value	-100.0～100.0	0.0	☆	0A15
FA-22	PID dead zone limit	0.00%～100.00%	0.06%	☆	0A16
FA-23	PID control deviation limit	0.00%～100.00%	0.00%	☆	0A17
FA-24	Integral separation level	0.00%～100.00%	0.00%	☆	0A18
FA-25	Integral upper limit	0.00%～100.00%	100.0%	☆	0A19
FA-26	Wake-up integral limit	0.0%～200.0%	50.0%	☆	0A1A
FA-27	Main-auxiliary inversion cut-off frequency	0.00%～100.00%	10.0%	☆	0A1B
FA-28	PID output forward limit	0.00%～100.00%	100.0%	☆	0A1C

Function Code	Name	Contents	Default value	Change-ability	Communication address
FA-29	PID output reverse limit	0.00%～100.00%	100.0%	☆	0A1D
FA-30	PID output frequency reference	0～1	0	☆	0A1E
FA-31	PID output filtering time	0.0s～2.5s	0.0s	☆	0A1F
FA-32	Soft start-PID switching value	0.00%～100.00%	5.00%	☆	0A20
FA-33	Soft start frequency	0.00Hz～599.00Hz	0.00Hz	☆	0A21
FA-34	Soft start acceleration time	0.00s～600.00s	3.00s	☆	0A22
FA-35	No-load current	0.00A～655.35A	0.00A	☆	0A23
FA-36	Soft start acceleration step	0.00s～600.00s	0.10s	☆	0A24
FA-37	Fuzzy PID tuning enable	0: Fuzzy PID tuning disable 1: Fuzzy PID tuning enable	1	☆	0A25
FA-38	Deviation fuzzy domain-NB	0.00 to 100.00	5.00	☆	0A26
FA-39	Deviation fuzzy domain-NS	0.00 to 100.00	2.00	☆	0A27
FA-40	Deviation fuzzy domain-PS	0.00 to 100.00	2.00	☆	0A28
FA-41	Deviation fuzzy domain-PB	0.00 to 100.00	5.00	☆	0A29
FA-42	Deviation rate fuzzy domain-NB	0.00 to 100.00	10.00	☆	0A2A
FA-43	Deviation rate fuzzy domain-NS	0.00 to 100.00	5.00	☆	0A2B
FA-44	Deviation rate fuzzy domain-PS	0.00 to 100.00	5.00	☆	0A2C
FA-45	Deviation rate fuzzy domain-PB	0.00 to 100.00	10.00	☆	0A2D
FA-46	Fuzzy PID inference rules	0～3	2	☆	0A2E
FA-47	Fuzzy rule midpoint value KP	0～100	50	☆	0A2F
FA-48	Fuzzy rule midpoint value KI	0～100	50	☆	0A30
FA-49	Feedback anomaly detection time	0.0s to 3600.0s	0.0s	☆	0A31
FA-50	Feedback disconnection action selection	0: Warn and continue running 1: Warning and decelerate to stop 2: Warning and free stop 3: Operate at the frequency before disconnection	0	☆	0A32
FA-51	PID feedback	1.0%～50.0%	10.0%	☆	0A33

Function Code	Name	Contents	Default value	Change-ability	Communication address
	abnormal deviation				
FA-52	Deviation anomaly detection time	0.1s～300.0s	5.0s	☆	0A34
FA-53	PID control flag	0～65535	2	☆	0A35
FB group - tension control parameters					
FB-00	Tension control mode selection	0～4	0	☆	0B00
FB-01	Curling mode	0～1	0	☆	0B01
FB-02	Load-side mechanical gear A	1～65535	100	☆	0B02
FB-03	Load-side mechanical gear B	1～65535	100	☆	0B03
FB-04	PID setpoint source selection	0～2	0	☆	0B04
FB-05	PID target setpoint	0.0%～100.0%	50.0%	☆	0B05
FB-06	PID feedback source selection	0～1	0	☆	0B06
FB-07	PID parameter adjustment basis	0～3	0	★	0B07
FB-08	PID proportional coefficient 1	0.0～1000.0	50.0	☆	0B08
FB-09	PID integration time 1	0.00s～500.00s	1.00s	☆	0B09
FB-10	PID proportional coefficient 2	0.0～1000.0	50.0	☆	0B0A
FB-11	PID integration time 2	0.00s～500.00s	1.00s	☆	0B0B
FB-12	PID output positive and negative selection	0～1	0	★	0B0C
FB-13	PID output forward limit	0.00%～100.00%	20.00%	★	0B0D
FB-14	PID output reverse limit	0.00%～100.00%	20.00%	★	0B0E
FB-15	PID feedback upper limit value	0.0%～100.0%	100.0%	★	0B0F
FB-16	PID feedback lower limit value	0.0%～100.0%	0.0%	★	0B10
FB-17	Line speed input source	0～5	0	★	0B11
FB-18	Maximum line speed	0.0～6500.0	1000.0	★	0B12
FB-19	Minimum line speed	0.0～6500.0	0.0	★	0B13
FB-20	Pulses per meter	0.0～6500.0	0.0	★	0B14
FB-21	Current line speed	0.0～6500.0	0.0	★	0B15
FB-22	Line speed filtering	0.00s～100.00s	0.10s	☆	0B16

Function Code	Name	Contents	Default value	Change-ability	Communication address
	time				
FB-23	Line speed acceleration time	0.00s～655.35s	0.00s	☆	0B17
FB-24	Line speed deceleration time	0.00s～655.35s	0.00s	☆	0B18
FB-25	Roll diameter calculation method selection	0～5	0	☆	0B19
FB-26	Maximum roll diameter	1.0mm～6000.0mm	500.0mm	☆	0B1A
FB-27	Empty roll diameter	1.0mm～6000.0mm	100.0mm	☆	0B1B
FB-28	Initial roll diameter selection	0～1	0	★	0B1C
FB-29	Initial roll diameter 0	0.0mm～6000.0mm	100.0mm	★	0B1D
FB-30	Initial roll diameter 1	0.0mm～6000.0mm	100.0mm	★	0B1E
FB-31	Initial roll diameter 2	0.0mm～6000.0mm	100.0mm	★	0B1F
FB-32	Pulses per revolution	1ppr～60000ppr	1ppr	★	0B20
FB-33	Layers per revolution	1～10000	1	★	0B21
FB-34	Material thickness	0.001～65.000	0.001	★	0B22
FB-35	Roll diameter filtering time	0.00s～100.00s	1.00s	☆	0B23
FB-36	Roll diameter compensation enable	0～1	0	★	0B24
FB-37	Roll diameter calculation delay time	0.0s～6553.5s	0.0s	☆	0B25
FB-38	Current roll diameter	1.0～6553.5	100.0	●	0B26
FB-39	Minimum frequency for roll diameter calculation	0.00Hz～599.00Hz	1.00Hz	☆	0B27
FB-40	Pre-drive mode selection	0～2	0	★	0B28
FB-41	Pre-drive/PID switching point	0.0%～100.0%	15.0%	★	0B29
FB-42	Soft start frequency	0.00Hz～599.00Hz	2.00Hz	★	0B2A
FB-43	Soft start acceleration time	0.00s～600.00s	3.00s	☆	0B2B
FB-44	Band break detection selection	0～1	0	☆	0B2C
FB-45	Minimum line speed	0.0～3000.0	0.0	★	0B2D

Function Code	Name	Contents	Default value	Change-ability	Communication address
	for band break detection				
FB-46	Roll diameter change for band break detection	1.0mm～6000.0mm	100.0mm	★	0B2E
FB-47	Band break detection time	0.00s～100.00s	1.00s	★	0B2F
FB-48	Tension feedback precision level	0% to 100%	100%	★	0B30
FB-49	Tension error detection time	0.0s～10.0s	0.5s	★	0B31
FB-50	Tension error abnormal handling	0～2	0	★	0B32
FB-51	PID output gain	0.0～200.0	100.0	★	0B33
FB-52	Tension setpoint source selection	0～1	0	★	0B34
FB-53	Maximum tension value	0～65535	0	★	0B35
FB-54	Tension setpoint	0～65535	0	☆	0B36
FB-55	Zero speed tension setpoint source	0～2	0	★	0B37
FB-56	Zero-speed tension setpoint	0～65535	0	☆	0B38
FB-57	Zero speed tension precision level	0.00%～100.00%	5.00%	☆	0B39
FB-58	Sliding friction compensation tension	0.0%～100.0%	0.0%	☆	0B3A
FB-59	Material inertia compensation coefficient	0～30000	0	☆	0B3B
FB-60	Acceleration inertia compensation gain	0.0%～1000.0%	0.0%	☆	0B3C
FB-61	Inertia compensation filtering time	0.00 to 100.00	5.00	☆	0B3D
FB-62	Deceleration inertia compensation gain	0.0%～1000.0%	0.0%	★	0B3E
FB-63	Tension taper curve selection	0～4	0	★	0B3F
FB-64	Tension taper setpoint source	0～1	0	★	0B40
FB-65	Taper setpoint value	0% to 100%	0%	☆	0B41
FB-66	Taper curve compensation value	0.0～6000.0	0.0	★	0B42
FB-67	Roll diameter 1 for taper calculation	1.0～6000.0	6000.0	★	0B43

Function Code	Name	Contents	Default value	Change-ability	Communication address
FB-68	Roll diameter 2 for taper calculation	1.0～6000.0	6000.0	★	0B44
FB-69	Multi-stage taper value 1	0～100	0	☆	0B45
FB-70	Multi-stage taper value 2	0～100	0	☆	0B46
FB-71	Pre-drive frequency gain	-50.0%～50.0%	0.0%	☆	0B47
FB-72	Pre-drive acceleration time	0.00s～655.35s	0.00s	☆	0B48
FB-73	Pre-drive deceleration time	0.00s～655.35s	0.00s	☆	0B49
FB-74	Speed limit gain	0.0s～6553.5s	100.0s	☆	0B4A
FB-75	Soft start/PI switching LSErr	0～100	5	★	0B4B
FB-76	Soft start/PI switching LS1	0.0%～10.0%	0.4%	★	0B4C
FB-77	Soft start/PI switching LS2	0.0%～10.0%	0.7%	★	0B4D
FB-78	Soft start/PI switching 1 setting	0.0～40.0	2.0	★	0B4E
FB-79	Unwind soft start PI switching point	0.0～40.0	5.0	★	0B4F
FB-80	Tension control flag bit	0～65535	0	☆	0B50
FC group-position control parameters					
FC-00	P2P position mode	0: Relative P2P position control 1: Absolute P2P position control	0	★	0C00
FC-01	Homing mode selection	0～65535	0	☆	0C01
FC-02	Position control command source	0: External terminal input 1: Reserved 2: RS485 communication 3: CANopen 4: Reserved 5: Communication expansion card	0	☆	0C02
FC-03	First stage homing speed	0.00Hz～599.00Hz	8.00Hz	☆	0C03
FC-04	Second stage homing speed	0.00Hz～599.00Hz	2.00Hz	☆	0C04
FC-05	Home offset position	-32767CNT～32767CNT	0CNT	☆	0C05
FC-06	Z-point search error amount	0～65535	1	☆	0C06

Function Code	Name	Contents	Default value	Change-ability	Communication address
FC-07	Position control acceleration time	0.00s～655.35s	1.00s	☆	0C07
FC-08	Position control deceleration time	0.00s～655.35s	3.00s	☆	0C08
FC-09	APR first deceleration frequency	0.00Hz～655.35Hz	5.00Hz	☆	0C09
FC-10	APR second deceleration frequency	0.00Hz～655.35Hz	1.00Hz	☆	0C0A
FC-11	PG disconnection counter	0～65535	0	☆	0C0B
FC-12	Low resolution detection gain	0～65535	30	☆	0C0C
FC-13	PG digital filter value	0～65535	111	★	0C0D
FC-14	PG low-speed filtering	0Hz～2000Hz	1Hz	☆	0C0E
FC-15	Positioning checkpoint 1 REV	-30000～30000	0	☆	0C0F
FC-16	Position checkpoint 1 CNT	-32767～32767	0	☆	0C10
FC-17	Position checkpoint 2 REV	-30000～30000	0	☆	0C11
FC-18	Position checkpoint 2 CNT	-32767～32767	0	☆	0C12
FC-19	Position control error	0～65535	65535	☆	0C13
FC-20	Internal positioning position command	-32767～32767	0	☆	0C14
FC-21	Feedback position arrival error	0～65535	10	☆	0C15
FC-22	Pulse input filtering	0.000～65.535	0.100	☆	0C16
FC-23	Pulse speed mode	0: Electrical frequency 1: Mechanical frequency (pole pair number)	0	★	0C17
FC-24	Position loop proportional coefficient	0.00～40.00	10.00	☆	0C18
FC-25	Position loop feed-forward coefficient	0～100	30	☆	0C19
FC-26	Position curve time	0.00s～655.35s	3.00s	☆	0C1A
FC-27	P2P highest frequency	0.00Hz～599.00Hz	10.00Hz	☆	0C1B
FC-28	Multi-stage position 1 (revs)	-30000～30000	0	☆	0C1C

Function Code	Name	Contents	Default value	Change-ability	Communication address
FC-29	Multi-stage position 1 (pulse)	-32767～32767	0	☆	0C1D
FC-30	Multi-stage position 2 (revs)	-30000～30000	0	☆	0C1E
FC-31	Multi-stage position 2 (pulse)	-32767～32767	0	☆	0C1F
FC-32	Multi-stage position 3 (revs)	-30000～30000	0	☆	0C20
FC-33	Multi-stage position 3 (pulse)	-32767～32767	0	☆	0C21
FC-34	Multi-stage position 4 (revs)	-30000～30000	0	☆	0C22
FC-35	Multi-stage position 4 (pulse)	-32767～32767	0	☆	0C23
FC-36	Multi-stage position 5 (revs)	-30000～30000	0	☆	0C24
FC-37	Multi-stage position 5 (pulse)	-32767～32767	0	☆	0C25
FC-38	Multi-stage position 6 (revs)	-30000～30000	0	☆	0C26
FC-39	Multi-stage position 6 (pulse)	-32767～32767	0	☆	0C27
FC-40	Multi-stage position 7 (revs)	-30000～30000	0	☆	0C28
FC-41	Multi-stage position 7 (pulse)	-32767～32767	0	☆	0C29
FC-42	Multi-stage position 8 (revs)	-30000～30000	0	☆	0C2A
FC-43	Multi-stage position 8 (pulse)	-32767～32767	0	☆	0C2B
FC-44	Multi-stage position 9 (revs)	-30000～30000	0	☆	0C2C
FC-45	Multi-stage position 9 (pulse)	-32767～32767	0	☆	0C2D
FC-46	Multi-stage position 10 (revs)	-30000～30000	0	☆	0C2E
FC-47	Multi-stage position 10 (pulse)	-32767～32767	0	☆	0C2F
FC-48	Multi-stage position 11 (revs)	-30000～30000	0	☆	0C30
FC-49	Multi-stage position 11 (pulse)	-32767～32767	0	☆	0C31
FC-50	Multi-stage position 12 (revs)	-30000～30000	0	☆	0C32
FC-51	Multi-stage position 12 (pulse)	-32767～32767	0	☆	0C33
FC-52	Multi-stage position 13 (revs)	-30000～30000	0	☆	0C34

Function Code	Name	Contents	Default value	Change-ability	Communication address
FC-53	Multi-stage position 13 (pulse)	-32767～32767	0	☆	0C35
FC-54	Multi-stage position 14 (revs)	-30000～30000	0	☆	0C36
FC-55	Multi-stage position 14 (pulse)	-32767～32767	0	☆	0C37
FC-56	Multi-stage position 15 (revs)	-30000～30000	0	☆	0C38
FC-57	Multi-stage position 15 (pulse)	-32767～32767	0	☆	0C39
FD group - Multi-speed and simple PLC function					
FD-00	Multi-speed 0	0.00Hz～599.00Hz	0.00Hz	☆	0D00
FD-01	Multi-speed 1	0.00Hz～599.00Hz	0.00Hz	☆	0D01
FD-02	Multi-speed 2	0.00Hz～599.00Hz	0.00Hz	☆	0D02
FD-03	Multi-speed 3	0.00Hz～599.00Hz	0.00Hz	☆	0D03
FD-04	Multi-speed 4	0.00Hz～599.00Hz	0.00Hz	☆	0D04
FD-05	Multi-speed 5	0.00Hz～599.00Hz	0.00Hz	☆	0D05
FD-06	Multi-speed 6	0.00Hz～599.00Hz	0.00Hz	☆	0D06
FD-07	Multi-speed 7	0.00Hz～599.00Hz	0.00Hz	☆	0D07
FD-08	Multi-speed 8	0.00Hz～599.00Hz	0.00Hz	☆	0D08
FD-09	Multi-speed 9	0.00Hz～599.00Hz	0.00Hz	☆	0D09
FD-10	Multi-speed 10	0.00Hz～599.00Hz	0.00Hz	☆	0D0A
FD-11	Multi-speed 11	0.00Hz～599.00Hz	0.00Hz	☆	0D0B
FD-12	Multi-speed 12	0.00Hz～599.00Hz	0.00Hz	☆	0D0C
FD-13	Multi-speed 13	0.00Hz～599.00Hz	0.00Hz	☆	0D0D
FD-14	Multi-speed 14	0.00Hz～599.00Hz	0.00Hz	☆	0D0E
FD-15	Multi-speed 15	0.00Hz～599.00Hz	0.00Hz	☆	0D0F
FE Group-Torque Control Parameters					
FE-00	Torque mode selection	0: TQCPG torque control IM 1: TQCPG torque control PM 2: IM open-loop torque control 3: SVC open-loop torque control	0	★	0E00
FE-01	Torque command source selection	0: Digital operator 1: RS485 communication 2: Analog signal input 3: CANopen 4: Reserved 5: Communication expansion card	0	☆	0E01
FE-02	Torque digital setting	-100.0%～100.0%	0.0%	☆	0E02
FE-03	Torque forward frequency limit	0%～120%	110%	☆	0E03
FE-04	Torque reversal	0%～120%	110%	☆	0E04

Function Code	Name	Contents	Default value	Change-ability	Communication address
	frequency limit				
FE-05	Torque bias selection	0: No function 1: Analog input 2: Input from parameter FE-06 3: External terminal control	0	☆	0E05
FE-06	Torque bias value	-100.0%～100.0%	0.0%	☆	0E06
FE-07	High torque compensation	-100.0%～100.0%	30.0%	☆	0E07
FE-08	Medium torque compensation	-100.0%～100.0%	20.0%	☆	0E08
FE-09	Low torque compensation	-100.0%～100.0%	10.0%	☆	0E09
FE-10	Maximum torque command	0～500	100	☆	0E0A
FE-11	Forward motoring torque upper limit	0～500	500	☆	0E0B
FE-12	Forward braking torque upper limit	0～500	500	☆	0E0C
FE-13	Reverse motoring torque upper limit	0～500	500	☆	0E0D
FE-14	Reverse braking torque upper limit	0～500	500	☆	0E0E
FE-15	Torque filter time	0.000s～1.000s	0.000s	☆	0E0F
FE-16	Torque output filtering gain	0.000s～65.535s	0.200s	☆	0E10
FE-17	Zero torque mode selection	0: Torque mode 1: Speed mode	0	★	0E11
Group FF - Manufacturer's Parameters					
FF-00	Reserved	0～65535	0	○	0F00
Group U0 - fault logging parameters					
U0-00	Fault record 1	0～65535	0	●	1000
U0-01	Fault record 2	0～65535	0	●	1001
U0-02	Fault record 3	0～65535	0	●	1002
U0-03	Fault record 4	0～65535	0	●	1003
U0-04	Fault record 5	0～65535	0	●	1004
U0-05	Fault record 6	0～65535	0	●	1005
U0-06	Fault record 7	0～65535	0	●	1006
U0-07	Fault record 8	0～65535	0	●	1007
U0-08	Fault record 9	0～65535	0	●	1008
U0-09	Fault record 10	0～65535	0	●	1009
U0-10	Fault output 1	0～65535	0	☆	100A

Function Code	Name	Contents	Default value	Change-ability	Communication address
U0-11	Fault output 2	0～65535	0	☆	100B
U0-12	Fault output 3	0～65535	0	☆	100C
U0-13	Fault output 4	0～65535	0	☆	100D
U0-14	Fault 1-Motor speed	-32767rpm～32767rpm	0rpm	●	100E
U0-15	Fault 1-Torque command	-3276.7～3276.7	0.0	●	100F
U0-16	Fault 1-Input terminal	0～65535	0	●	1010
U0-17	Fault 1-Output terminal	0～65535	0	●	1011
U0-18	Fault 1-VFD status	0～65535	0	●	1012
U0-19	Fault 1-Frequency command Hz	0.00Hz～655.35Hz	0.00Hz	●	1013
U0-20	Fault 1-Output frequency	0.00Hz～599.00Hz	0.00Hz	●	1014
U0-21	Fault 1-Output voltage	0.0V～6553.5V	0.0V	●	1015
U0-22	Fault 1-DC voltage	0.0V～6553.5V	0.0V	●	1016
U0-23	Fault 1-Output current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	0.00A or 0.0A	●	1017
U0-24	Fault 1-IGBT temperature	-3276.7℃～3276.7℃	0.0℃	●	1018
U0-25	Fault 1-Capacitor temperature	-3276.7℃～3276.7℃	0.0℃	●	1019
U0-26	Fault 2-Output frequency	0.00Hz～599.00Hz	0.00Hz	●	101A
U0-27	Fault 2-DC voltage	0.0V～6553.5V	0.0V	●	101B
U0-28	Fault 2-Output current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	0.00A or 0.0A	●	101C
U0-29	Fault 2-IGBT temperature	-3276.7℃～3276.7℃	0.0℃	●	101D
U0-30	Fault 3-Output frequency	0.00Hz～599.00Hz	0.00Hz	●	101E
U0-31	Fault 3 - DC voltage	0.0V～6553.5V	0.0V	●	101F
U0-32	Fault 3-Output current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	0.00A or 0.0A	●	1020
U0-33	Fault 3-IGBT	-3276.7℃～3276.7℃	0.0℃	●	1021

Function Code	Name	Contents	Default value	Change-ability	Communication address
	temperature				
U0-34	Fault 4-Output frequency	0.00Hz～599.00Hz	0.00Hz	●	1022
U0-35	Fault 4-DC voltage	0.0V～6553.5V	0.0V	●	1023
U0-36	Fault 4-Output current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	0.00A or 0.0A	●	1024
U0-37	Fault 4-IGBT temperature	-3276.7℃～3276.7℃	0.0℃	●	1025
U0-38	Fault 5-Output frequency	0.00Hz～599.00Hz	0.00Hz	●	1026
U0-39	Fault 5-DC voltage	0.0V～6553.5V	0.0V	●	1027
U0-40	Fault 5-Output current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	0.00A or 0.0A	●	1028
U0-41	Fault 5-IGBT temperature	-3276.7℃～3276.7℃	0.0℃	●	1029
U0-42	Fault 6-Output frequency	0.00Hz～599.00Hz	0.00Hz	●	102A
U0-43	Fault 6-DC voltage	0.0V～6553.5V	0.0V	●	102B
U0-44	Fault 6-Output current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	0.00A or 0.0A	●	102C
U0-45	Fault 6-IGBT temperature	-3276.7℃～3276.7℃	0.0℃	●	102D
U0-46	Days since Fault 1 occurred	0～65535	0	●	102E
U0-47	Minutes since Fault 1 occurred	0～1439	0	●	102F
U0-48	Days since Fault 2 occurred	0～65535	0	●	1030
U0-49	Minutes since Fault 2 occurred	0～1439	0	●	1031
U0-50	Days since Fault 3 occurred	0～65535	0	●	1032
U0-51	Minutes since Fault 3 occurred	0～1439	0	●	1033
U0-52	Days since Fault 4 occurred	0～65535	0	●	1034
U0-53	Minutes since Fault 4 occurred	0～1439	0	●	1035
U0-54	Days since Fault 5	0～65535	0	●	1036

Function Code	Name	Contents	Default value	Change-ability	Communication address
	occurred				
U0-55	Minutes since Fault 5 occurred	0～1439	0	●	1037
U0-56	Days since Fault 6 occurred	0～65535	0	●	1038
U0-57	Minutes since Fault 6 occurred	0～1439	0	●	1039
U1 group - Status monitoring parameters					
U1-00	DI terminal status	0～65535	0	●	1100
U1-01	DO terminal status	0～65535	0	●	1101
U1-02	Frequency command	0.00Hz～599.00Hz	50.00Hz	●	1102
U1-03	External frequency record	0.00Hz～599.00Hz	60.00Hz	●	1103
U1-04	PID feedback value	-200.00～200.00	0.00	●	1104
U1-05	KP gain monitoring value	0.00%～100.00%	88.00%	●	1105
U1-06	KI gain monitoring value	0.00s～100.00s	0.05s	●	1106
U1-07	KD gain monitoring value	0.00～1.00	0.00	●	1107
U1-08	Machine change record	0～65535	0	☆	1108
U1-09	IO card ID	0～13	0	●	1109
H0 group - Additional motor parameters					
H0-00	IM motor selection	1: Induction motor 1 2: Induction motor 2 3: Induction motor 3 4: Induction motor 4	1	★	1200
H0-01	M2 maximum frequency	0.00Hz～599.00Hz	50.00Hz	★	1201
H0-02	M2 rated frequency	0.00Hz～599.00Hz	50.00Hz	★	1202
H0-03	M2 rated voltage	0.0～510.0V	380.0	★	1203
H0-04	IM2 rated power	0.00kW～655.35kW	Machine type determination	★	1204
H0-05	Number of IM2 poles	2～20	Machine type determination	●	1205
H0-06	IM2 rated current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	H0-04 confirmation	★	1206
H0-07	IM2 rated speed	0rpm～65535rpm	H0-04 confirmation	★	1207
H0-08	IM2 no-load current	0.00A～H0-06	Machine type	★	1208

Function Code	Name	Contents	Default value	Change-ability	Communication address
			determination		
H0-09	IM2 stator resistance	0.000Ω～65.535Ω	Machine type determination	★	1209
H0-10	IM2 rotor resistance	0.000Ω～65.535Ω	Machine type determination	★	120A
H0-11	IM2 mutual inductance	0.0mH～6553.5mH	Machine type determination	★	120B
H0-12	IM2 leakage inductance	0.00mH～655.35mH	Machine type determination	★	120C
H0-13	M3 maximum frequency	0.00Hz～599.00Hz	50.00Hz	★	120D
H0-14	M3 rated frequency	0.00Hz～599.00Hz	50.00Hz	★	120E
H0-15	M3 rated voltage	0.0V～510.0V	380.0V	★	120F
H0-16	IM3 rated power	0.00kW～655.35kW	Machine type determination	★	1210
H0-17	Number of IM3 poles	2～20	Machine type determination	●	1211
H0-18	IM3 rated current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	H0-16 confirmation	★	1212
H0-19	IM3 rated speed	0rpm～65535rpm	H0-16 confirmation	★	1213
H0-20	IM3 no-load current	0.00A～H0-18	Machine type determination	★	1214
H0-21	IM3 stator resistance	0.000Ω～65.535Ω	Machine type determination	★	1215
H0-22	M4 maximum frequency	0.00Hz～599.00Hz	50.00Hz	★	1216
H0-23	M4 rated frequency	0.00Hz～599.00Hz	50.00Hz	★	1217
H0-24	M4 rated voltage	0.0V～510.0V	380.0V	★	1218
H0-25	IM4 rated power	0.00kW～655.35kW	Machine type determination	★	1219
H0-26	Number of IM4 poles	2～20	Machine type determination	●	121A
H0-27	IM4 rated current	0.00A～655.35A (93kW and below) 0.0A～6553.5A (110kW and above)	H0-25 confirmation	★	121B
H0-28	IM4 rated speed	0rpm～65535rpm	H0-25 confirmation	★	121C
H0-29	IM4 no-load current	0.00A～H0-27	Machine type determination	★	121D
H0-30	IM4 stator resistance	0.000Ω～65.535Ω	Machine type determination	★	121E
H1 group - other motor VF control					

Function Code	Name	Contents	Default value	Change-ability	Communication address
H1-00	M2 multi-point VF frequency point 1	0.00Hz～599.00Hz	0.50Hz	★	1300
H1-01	M2 multi-point VF voltage point 1	0.0V～480.0V	2.0V	☆	1301
H1-02	M2 multi-point VF frequency point 2	0.00Hz～599.00Hz	1.50Hz	★	1302
H1-03	M2 multi-point VF voltage point 2	0.0V～480.0V	10.0V	☆	1303
H1-04	M2 multi-point VF frequency point 3	0.00Hz～599.00Hz	3.00Hz	★	1304
H1-05	M2 multi-point VF voltage point 3	0.0V～480.0V	22.0V	☆	1305
H1-06	M2 torque compensation gain	0～10	1	☆	1306
H1-07	M2 slip compensation gain	0.00～10.00	0.00	☆	1307
H1-08	M3 multi-point VF frequency point 1	0.00Hz～599.00Hz	0.50Hz	★	1308
H1-09	M3 multi-point VF voltage point 1	0.0V～480.0V	2.0V	☆	1309
H1-10	M3 multi-point VF frequency point 2	0.00Hz～599.00Hz	1.50Hz	★	130A
H1-11	M3 multi-point VF voltage point 2	0.0V～480.0V	10.0V	☆	130B
H1-12	M3 multi-point VF frequency point 3	0.00Hz～599.00Hz	3.00Hz	★	130C
H1-13	M3 multi-point VF voltage point 3	0.0V～480.0V	22.0V	☆	130D
H1-14	M3 torque compensation gain	0～10	1	☆	130E
H1-15	M3 slip compensation gain	0.00～10.00	0.00	☆	130F
H1-16	M4 multi-point VF frequency point 1	0.00Hz～599.00Hz	0.50Hz	★	1310
H1-17	M4 multi-point VF voltage point 1	0.0V～480.0V	2.0V	☆	1311
H1-18	M4 multi-point VF frequency point 2	0.00Hz～599.00Hz	1.50Hz	★	1312
H1-19	M4 multi-point VF voltage point 2	0.0V～480.0V	10.0V	☆	1313
H1-20	M4 multi-point VF frequency point 3	0.00Hz～599.00Hz	3.00Hz	★	1314
H1-21	M4 multi-point VF voltage point 3	0.0V～480.0V	22.0V	☆	1315
H1-22	M4 torque compensation gain	0～10	1	☆	1316
H1-23	M4 slip	0.00～10.00	0.00	☆	1317

Function Code	Name	Contents	Default value	Change-ability	Communication address
	compensation gain				
H2 group - other motor vector control parameters					
H2-00	Reserved	0～65535	0	●	1400
H3 group - other motor fault parameters					
H3-00	Over torque selection 2	0: Detection disabled 1: Constant speed detection continues operation 2: Constant speed detection stop operation 3: Running detection continue operation 4: Operation detection stop operation	0	☆	1500
H3-01	Over torque threshold 2	10%～250%	120%	☆	1501
H3-02	Over torque time 2	0.1s～60.0s	0.1s	☆	1502
H3-03	Motor 2 overload selection	0: Constant torque output motor 1: Variable torque output motor 2: No motor overload protection	2	☆	1503
H3-04	Motor 2 overload time	30.0s～600.0s	60.0s	☆	1504
H3-05	Over torque selection 3	0: Detection disabled 1: Constant speed detection continues operation 2: Constant speed detection stop operation 3: Running detection continue operation 4: Operation detection stop operation	0	☆	1505
H3-06	Over torque threshold 3	10%～250%	120%	☆	1506
H3-07	Over torque time 3	0.1s～60.0s	0.1s	☆	1507
H3-08	Motor 3 overload selection	0: Constant torque output motor 1: Variable torque output motor 2: No motor overload protection	2	☆	1508
H3-09	Motor 3 overload time	30.0s～600.0s	60.0s	☆	1509
H3-10	Over torque selection 4	0: Detection disabled 1: Constant speed detection continues operation	0	☆	150A

Function Code	Name	Contents	Default value	Change-ability	Communication address
		2: Constant speed detection stop operation 3: Running detection continue operation 4: Operation detection stop operation			
H3-11	Over torque threshold 4	10%～250%	120%	☆	150B
H3-12	Over torque time 4	30.0s～600.0s	0.1s	☆	150C
H3-13	Motor 4 overload selection	0: Constant torque output motor 1: Variable torque output motor 2: No motor overload protection	2	☆	150D
H3-14	Motor 4 overload time	30.0s～600.0s	60.0s	☆	150E
L0 group - System control parameters					
L0-00	APP MACRO	0～65535	0	☆	1600
L0-01	System control flag	0～65535	0	☆	1601
L0-02	Debug flag	0～65535	0	☆	1602
L0-03	Debug flag 1	0～65535	40	☆	1603
L0-04	Reserved	0～65535	0	☆	1604
L0-05	System control parameters	0～65535	0	☆	1605
L0-06	Special control flag	0～65535	0	☆	1606
L0-07	Reserved	0～65535	0	☆	1607
L0-08	Reserved	0～65535	0	☆	1608
L0-09	KPD auto refresh enable	0～1	0	☆	1609
L0-10	KPD refresh time setting	0.00s～6.00s	0.15s	☆	160A
L0-11	Low speed debug bit	0～65535	1	☆	160B
Group L1 - user function code customization					
L1-00	Frequency source selection (HAND)	0: Digital operator 1: RS485 communication 2: Analog input 3: External Up/Down input 4: Pulse input without direction 5: Pulse input with direction 6: CANopen input 7. Reserved 8: Communication card input 9：PID	0	★	1700

Function Code	Name	Contents	Default value	Change-ability	Communication address
L1-01	Run command source (HAND)	0: Digital operator 1: External terminal input 2: RS485 communication input 3: CANopen input 4: Reserved 5: Communication card input	0	★	1701
L1-02	LOC/REM action selection	0: Standard HOA operation 1: L/R do not maintain state 2: Maintain REM state 3: Maintain LOC state 4: Maintain REM/LOC state	0	★	1702
Group L2 - optimization control parameters					
L2-00	PWM mode selection	0: DPWM modulation mode 1: Reserved 2: SVPWM modulation mode	2	★	1800
L2-01	PWM seven/five segment switching point	0.00Hz～655.35Hz	15.00Hz	☆	1801
L2-02	PWM mode selection	0：SVPWM 66% DPWM 1 1：SVPWM 100% 2：SVPWM 66% 3：SPWM-DPWM 100% 4：SVPWM-DPWM 100% 5：SPWM 100% 6：SVPWM 66%-100%	0	★	1802
L2-03	PWM dead time value	0～666	133	☆	1803
L2-04	PWM narrow pulse width	0～333	66	☆	1804
L2-05	Reserved	0～1440	180	☆	1805
L2-06	Dead time compensation mode	0～65535	4	☆	1806
L2-07	Dead time compensation value	0～65535	180	☆	1807
L2-08	Tube voltage drop compensation value	0～65535	5	☆	1808
L2-09	Dead zone compensation slope 4	0～65535	200	☆	1809
L2-10	Dead time compensation slope 5	0～65535	5000	☆	180A
L2-11	Dead time compensation offset value	-100.0%～100.0%	0.0%	☆	180B
L2-12	Dead time compensation width	0～65535	512	☆	180C

Function Code	Name	Contents	Default value	Change-ability	Communication address
L2-13	Dead time compensation switching point	0.00Hz～599.00Hz	0.00Hz	☆	180D
L2-14	Dead time compensation filter	0～65535	50000	☆	180E
L2-15	Dead time compensation identification Id	2000pu～65535pu	8000pu	☆	180F
L2-16	Dead time compensation identification	0～1	0	★	1810
L2-17	Braking resistor activation voltage	330.0V～900.0V	740.0V	☆	1811
L2-18	Under voltage protection value	250.0V～440.0V	360.0V	☆	1812
L2-19	Zero speed operation selection	0: Await output 1: Zero speed position control output 2: Output at minimum frequency	0	★	1813
L2-20	Ld Recognition Frequency	0～65535	300	★	1814
L2-21	Ld Recognition Frequency	0～65535	300	★	1815
L2-22	Reserved	0～65535	0	●	1816
L2-23	Overmodulation gain	80～120	100	☆	1817
L3 Group-Master/slave control parameters					
L3-00	Reserved	0～65535	0	●	1900
L4 group-Brake function parameters					
L4-00	Braking frequency	0.00～599.00Hz	0.00	☆	1A00
L5 group-Sleep/Wake function parameters					
L5-00	Sleep mode reference selection	0: PID command reached 1: PID feedback reached	0	★	1B00
L5-01	Sleep threshold	0.00Hz～599.00Hz	0.00Hz	☆	1B01
L5-02	Wake threshold	0.00Hz～599.00Hz	0.00Hz	☆	1B02
L5-03	Sleep delay	0.0s～6000.0s	0.0s	☆	1B03
L5-04	Wake delay	0.00s～600.00s	0.00s	☆	1B04
L6 group - Swing frequency, fixed length, and counting					
L6-00	Final count value setting	0～65500	0	☆	1C00
L6-01	Intermediate count value setting	0～65500	0	☆	1C01
L6-02	Count reached E.F enable	0: Count arrival, no EF 1: Count arrival, EF	0	☆	1C02

Function Code	Name	Contents	Default value	Change-ability	Communication address
L7 group-AI multi-point curve setting					
L7-00	AI curve selection	0: General curve 1: AI1 three-point curve 2: AI2 three-point curve 3: AI1&AI2 three-point curve 4: AI3 three-point curve 5: AI1&AI3 three-point curve 6: AI2&AI3 three-point curve 7: AI123 three-point curve	0	☆	1D00
L7-01	AI1 lowest input value	0.00～20.00	0.00	☆	1D01
L7-02	AI1 lowest percentage	0.00%～100.00%	0.00%	☆	1D02
L7-03	AI1 mid-point input value	0.00～20.00	5.00	☆	1D03
L7-04	AI1 mid-point percentage	0.00%～100.00%	50.00%	☆	1D04
L7-05	AI1 highest input value	0.00～20.00	10.00	☆	1D05
L7-06	AI1 highest percentage	0.00%～100.00%	100.00%	☆	1D06
L7-07	AI2 lowest input value	0.00～20.00	0.00	☆	1D07
L7-08	AI2 lowest percentage	0.00%～100.00%	0.00%	☆	1D08
L7-09	AI2 mid-point input value	0.00～20.00	5.00	☆	1D09
L7-10	AI2 mid-point percentage	0.00%～100.00%	50.00%	☆	1D0A
L7-11	AI2 highest input value	0.00～20.00	10.00	☆	1D0B
L7-12	AI2 highest percentage	0.00%～100.00%	100.00%	☆	1D0C
L7-13	AI3 lowest input value	0.00～20.00	0.00	☆	1D0D
L7-14	AI3 lowest percentage	0.00%～100.00%	0.00%	☆	1D0E
L7-15	AI3 mid-point input value	0.00～20.00	5.00	☆	1D0F
L7-16	AI3 mid-point percentage	0.00%～100.00%	50.00%	☆	1D10
L7-17	AI3 highest input value	0.00～20.00	10.00	☆	1D11
L7-18	AI3 highest percentage	0.00%～100.00%	100.00%	☆	1D12
L8 group - application macro parameters					
L8-00	Industry application macro selection	0: No function 1: Custom user	0	★	1E00

Function Code	Name	Contents	Default value	Change-ability	Communication address
		2: Air compressor 3: Fan 4: Water pump 5: Conveyor belt 6: Machine tool application 7: Packaging 8: Textile application 9: High-speed drill application 10: Production test only 11: PID 12: PID + auxiliary frequency			
L8-01	Application macro parameter 1	0.00～29.00	0.00	☆	1E01
L8-02	Application macro parameter 2	0.00～29.00	0.00	☆	1E02
L8-03	Application macro parameter 3	0.00～29.00	0.00	☆	1E03
L8-04	Application macro parameter 4	0.00～29.00	0.00	☆	1E04
L8-05	Application macro parameter 5	0.00～29.00	0.00	☆	1E05
L8-06	Application macro parameter 6	0.00～29.00	0.00	☆	1E06
L8-07	Application macro parameter 7	0.00～29.00	0.00	☆	1E07
L8-08	Application macro parameter 8	0.00～29.00	0.00	☆	1E08
L8-09	Application macro parameter 9	0.00～29.00	0.00	☆	1E09
L8-10	Application macro parameter 10	0.00～29.00	0.00	☆	1E0A
L8-11	Application macro parameter 11	0.00～29.00	0.00	☆	1E0B
L8-12	Application macro parameter 12	0.00～29.00	0.00	☆	1E0C
L8-13	Application macro parameter 13	0.00～29.00	0.00	☆	1E0D
L8-14	Application macro parameter 14	0.00～29.00	0.00	☆	1E0E
L8-15	Application macro parameter 15	0.00～29.00	0.00	☆	1E0F
L8-16	Application macro parameter 16	0.00～29.00	0.00	☆	1E10
L8-17	Application macro parameter 17	0.00～29.00	0.00	☆	1E11
L8-18	Application macro parameter 18	0.00～29.00	0.00	☆	1E12

Function Code	Name	Contents	Default value	Change-ability	Communication address
L8-19	Application macro parameter 19	0.00～29.00	0.00	☆	1E13
L8-20	Application macro parameter 20	0.00～29.00	0.00	☆	1E14
L8-21	Application macro parameter 21	0.00～29.00	0.00	☆	1E15
L8-22	Application macro parameter 22	0.00～29.00	0.00	☆	1E16
L8-23	Application macro parameter 23	0.00～29.00	0.00	☆	1E17
L8-24	Application macro parameter 24	0.00～29.00	0.00	☆	1E18
L8-25	Application macro parameter 25	0.00～29.00	0.00	☆	1E19
L8-26	Application macro parameter 26	0.00～29.00	0.00	☆	1E1A
L8-27	Application macro parameter 27	0.00～29.00	0.00	☆	1E1B
L8-28	Application macro parameter 28	0.00～29.00	0.00	☆	1E1C
L8-29	Application macro parameter 29	0.00～29.00	0.00	☆	1E1D
L8-30	Application macro parameter 30	0.00～29.00	0.00	☆	1E1E
L8-31	Application macro parameter 31	0.00～29.00	0.00	☆	1E1F
L8-32	Application macro parameter 32	0.00～29.00	0.00	☆	1E20
L8-33	Application macro parameter 33	0.00～29.00	0.00	☆	1E21
L8-34	Application macro parameter 34	0.00～29.00	0.00	☆	1E22
L8-35	Application macro parameter 35	0.00～29.00	0.00	☆	1E23
L8-36	Application macro parameter 36	0.00～29.00	0.00	☆	1E24
L8-37	Application macro parameter 37	0.00～29.00	0.00	☆	1E25
L8-38	Application macro parameter 38	0.00～29.00	0.00	☆	1E26
L8-39	Application macro parameter 39	0.00～29.00	0.00	☆	1E27
L8-40	Application macro parameter 40	0.00～29.00	0.00	☆	1E28
L8-41	Application macro parameter 41	0.00～29.00	0.00	☆	1E29
L8-42	Application macro parameter 42	0.00～29.00	0.00	☆	1E2A

Function Code	Name	Contents	Default value	Change-ability	Communication address
L8-43	Application macro parameter 43	0.00～29.00	0.00	☆	1E2B
L8-44	Application macro parameter 44	0.00～29.00	0.00	☆	1E2C
L8-45	Application macro parameter 45	0.00～29.00	0.00	☆	1E2D
L8-46	Application macro parameter 46	0.00～29.00	0.00	☆	1E2E
L8-47	Application macro parameter 47	0.00～29.00	0.00	☆	1E2F
L8-48	Application macro parameter 48	0.00～29.00	0.00	☆	1E30
L8-49	Application macro parameter 49	0.00～29.00	0.00	☆	1E31
L8-50	Application macro parameter 50	0.00～29.00	0.00	☆	1E32

Warranty Policies

The Company solemnly promises that, from the date of purchase from the Company (hereinafter referred to as the Manufacturer), the Customer enjoys the following product after-sales services.

1. This product comes with a 15-month free warranty (excluding exports to foreign countries/non-standard machinery products) from the date of purchase from the manufacturer, based on the barcode on the machine body. A warranty of 18 months is provided.
2. For any quality problems within one month from the date of purchase, the refund, exchange, and repair policies shall apply.
3. For any quality problems within three months from the date of purchase, the exchange and repair policies shall apply.
4. This product, when sold in non-China, enjoys a 6-month free-of-charge warranty from your local vendor, from the date of purchase.
5. This product enjoys paid lifetime services, from the date of purchase.
6. Disclaimer: Product failures caused by the following reasons are not covered by the Manufacturer's 15-month free-of-charge warranty:

(1) Failure to follow the operation procedure as given in the User Manual.
(2) Product failure caused by unauthorized repair or modification by the Customer without communication with the Manufacturer.
(3) Product failure caused by using the product for unintended purposes.
(4) Ageing or failure of product components due to poor environment conditions.
(5) Product damage caused by force majeure such as earthquake, fire hazards, wind and water disasters, lightning strikes, abnormal voltage or other natural disasters.

7. The Manufacturer reserves the right to refuse the warranty service, at its sole discretion, in the following cases:

(1) The warranty is void if the brand, trademark, serial number, nameplate, or other identifiers marked by the manufacturer are damaged or unrecognizable.
(2) The Customer fails to pay in full in accordance with the Purchases and Sales Contract signed by both parties.
(3) The Customer intentionally conceals the improper use of the product during installation, connection, operation, maintenance or other processes against the after-sales service provider of the Manufacturer.

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