Preface

Thank you for choosing SINEE's EM730 series inverter.

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The EM730 series inverter is a high-reliable and small-sized universal inverter launched by SINEE. EM730 supports three-phase AC asynchronous motors and permanent magnet synchronous motors(EM730 non-standard). They support a variety of drive control technologies, such as the vector VF (VVF) control and speed sensorless vector control (SVC); speed output and torque output; and Wi-Fi access and background software debugging.

Features of the EM730 series inverter:

- Support debugging by the mobile phone APP or monitoring of the inverter status;
- Support Wi-Fi module or serial port access;
- Rich and convenient PC background software functions;
- No need for derating at the ambient temperature of 50 ℃;
- Support "one-key shuttle" for fast and accurate speed adjustment;
- Perfect protections: Protections against the short circuit, overcurrent, overvoltage, overload, overheating, etc.

Before using the EM730 series inverter, please read this manual carefully and keep it properly.

While connecting the inverter to motor for the first time, please select the motor type (asynchronous or synchronous) correctly and set the motor nameplate parameters: rated power, rated voltage, rated current, rated frequency, rated speed, motor connection, rated power factor, etc.

Since we are committed to continuously improving our products and product data, the data provided by us may be modified without prior notice.

For the latest changes and contents, please visit www.sineedrive.com.

Safety precautions

Safety definition: Safety precautions are divided into the following two categories in this Guide:

Danger: The dangers caused by nonconforming operations may include serious injuries and even deaths.

Warning: The danger caused by nonconforming operations, including moderate or minor injuries and equipment damage.

During the installation, commissioning and maintenance, please read this chapter carefully, and follow the safety precautions herein. Our company will not be liable for any injury or loss arising from nonconforming operations.

Precautions

Before installation:

Danger
1. Do not install the product in the case of water in the package or missing or damaged components found in unpacking! 2. Do not install the product in the case of inconsistency between the actual product name and identification on the outer package.

Warning
1. Handle the controller with care; otherwise, it may be damaged! 2. Never use the inverter damaged or with some parts missing; otherwise, injuries may be caused! 3. Do not touch the components of the control system with your hands; otherwise, there is a danger of static damage!

During installation:

Danger

1. Please install the inverter on a metal retardant object (e.g. metal) and keep it away from combustibles; otherwise, a fire may be caused!
2. Do not loosen the fixing bolts of components, especially those with red marks!

Warning

1. Never make wire connectors or screws fall into the inverter; otherwise, the inverter may be damaged!
2. Install the inverter in a place with little vibration and exposure to direct sunlight.
3. When the inverter is installed a relatively closed cabinet or space, pay attention to the installation gap to ensure the effects of heat dissipation.

During wiring:

Danger

1. Follow the instructions in this guide, and appoint professional and electrical engineering personnel to complete wiring; otherwise, unexpected dangers may be caused!
2. The inverter and power supply must be separated by a circuit breaker (recommendation: greater than or equal to and closest to twice the rated current); otherwise, a fire may be caused!
3. Before wiring, make sure that the power supply is in the zero energy status; otherwise, electric shock may be caused!
4. Never connect the input power supply to the output terminals (U, V, W) of the inverter. Pay attention to the marks of wiring terminals, and connect wires correctly! Otherwise, the inverter may be damaged!
5. Make the inverter grounded correctly and reliably according to the standards; otherwise, electric shock and fire may be caused!

Warning

1. Make sure that the lines meet the EMC requirements and local safety standards. For wire diameters, refer to the recommendations. Otherwise, an accident may occur!
2. Never connect the braking resistor directly between the DC bus + and − terminal. Otherwise, a fire may be caused!
3. Tighten the terminals with a screwdriver of specified torque; otherwise, there is a risk of fire.

4. Never connect the phase-shifting capacitor and LC/RC noise filter to the output circuit.
5. Do not connect the electromagnetic switch and electromagnetic contactor to the output circuit. Otherwise, the overcurrent protection circuit of the inverter will be enabled. In severe cases, the inverter may be subject to internal damage.
6. Do not dismantle the connecting cable inside the inverter; otherwise, internal damage may be caused to the inverter.

Before power-on:

Danger

1. Make sure that the voltage level of the input power supply is consistent with the rated voltage of the inverter; and the input terminals (R, S, T) and output terminals (U, V, W) of the power supply are connected correctly. Check whether there is short circuit in the peripheral circuits connected to the inverter and whether all connecting lines are tightened; otherwise, the inverter may be damaged!
2. The withstand voltage test has been performed to all parts of the inverter, so it is not necessary to carry it out again. Otherwise, an accident may be caused!

Warning

1. The inverter must not be powered on until it is properly covered; otherwise, electric shock may be caused!
2. The wiring of all peripheral accessories must be in line with the instructions in this manual. All wires should be connected correctly according to the circuit connections in this manual. Otherwise, an accident may occur!

After power-on:

Danger

1. Never touch the inverter and surrounding circuits with wet hands; otherwise, electric shock may occur!
2. If the indicator is not ON and the keyboard has no response after power-on, immediately turn off the power supply. Never touch the inverter terminals (R, S, T) and the terminals on the terminal block with your hands or screwdriver; otherwise, electric shock may be caused. Upon turning off the power supply, contact our customer service personnel.
3. At the beginning of power-on, the inverter automatically performs a safety test to external strong current circuits. Do not touch the inverter terminals (U, V, W) or motor terminals; otherwise, electric shock may be caused!
4. Do not disassemble any parts of the inverter while it is powered on.

Warning

1. When parameter identification is required, please pay attention to the danger of injury during motor rotation; otherwise, an accident may occur!
2. Do not change the parameters set by the inverter manufacturer without permission; otherwise, the inverter may be damaged!

During operation:

Danger

1. Do not touch the cooling fan, radiator and discharge resistor to feel the temperature; otherwise, burns may be caused!
2. Non-professional technicians must not test signals when the controller is in operation; otherwise, personal injury or equipment damage may be caused!

Warning

1. Prevent any object from falling into the inverter in operation; otherwise, the inverter may be damaged!
2. Do not start or stop the inverter by turning on or off the contactor; otherwise, the inverter may be damaged!

During maintenance:

Danger

1. Never carry out repair and maintenance in the live state; otherwise, electric shock may be caused!
2. Maintenance of the inverter must be carried out 10 min after the main circuit is powered off and the display interface of the keyboard is disabled; otherwise, the residual charge in the capacitor will do harm to the human body!
3. Personnel without professional training are not allowed to repair and maintain the inverter; otherwise, personal injury or inverter damage may be caused!
4. The parameters must be set after the inverter is replaced. Plugs in all interfaces must be operated in the power-off status!
5. The synchronous motor generates electricity while rotating. Inverter maintenance and repair must be performed 10 min after the power supply is turned off and the motor stops running; otherwise, electric shock may be caused!

Precautions

Motor insulation inspection

When the motor is used for the first time or after long-term storage or subject to regular inspection, its insulation should be checked to prevent the inverter from damage caused by

failure of the motor winding insulation. During the insulation inspection, the motor must be disconnected from the inverter. It is recommended to use a 500V megohmmeter. The measured insulation resistance must not be less than 5 MΩ.

Thermal protection of motor

If the motor used does not match the rated capacity of the inverter, especially when the rated power of the inverter is greater than that of the motor, the motor must be protected by adjusting the motor protection parameters of the inverter or installing a thermal relay in front of the motor.

Operation above power frequency

This inverter can provide the output frequency of 0.00Hz to 600.00Hz/0.0Hz to 3000.0Hz. When the motor needs to operate above the rated frequency, please consider the capacity of the mechanical device.

About motor heat and noise

Since the inverter outputs PWM waves, containing some harmonics, the temperature rise, noise and vibration of the motor will be slightly more than those in operation at the power frequency.

Presence of voltage-dependent device increasing the power factor on output side

The inverter outputs PWM waves. If there is a capacitor increasing the power factor or voltage-dependent resistor for lightning protection on the output side, the inverter may be subjected to instantaneous overcurrent and even damage. Do not use these devices.

Use beyond rated voltage

The EM730 series open-loop vector inverter should not be used beyond the allowable working voltage range specified in this manual; otherwise, the components inside the inverter are prone to damage. If necessary, use the appropriate step-up or step-down device for voltage transformation.

Lightning impulse protection

The inverter of this series is equipped with a lightning overcurrent protector, which has certain capabilities in self-protection against induced lightning. Where lightning strikes occur frequently, a protective device should be added in front of the inverter.

Altitude and derating

In areas with an altitude of more than 1,000 m, where heat dissipation of the inverter is poor due to thin air, derating is required (derating by 1% per 100 m altitude increase to maximum 3,000 m; for ambient temperature above 50℃, derating by 1.5% per 1℃ temperature rise to maximum 60℃). Contact us for technical advice.

Precautions for scrapping of inverter

Burning of the electrolytic capacitors of the main circuit and printed circuit board may result in explosion, and burning of plastic parts may generate toxic gases. Please dispose of the controller as a kind of industrial waste.

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Chapter 1 Overview

1.1 Model and Specification of EM730 Series Inverter

- Rated voltage of power supply:

  Three-phase AC 340-460V, three-phase/single-phase AC 200V-240V;

- Applicable motor: Three-phase AC asynchronous motor (EM730) and permanent magnet synchronous motor (EM730 non-standard).

The model and rated output current of EM730 series inverter are as shown in Table 1-1.

Table 1-1 EM730 Series Inverter

Rated voltage of power supply	Model	Applicable motor power (kW)	Heavy-duty rated output current (A)	Light-duty rated output current (A)
Single-phase/three-phase AC 200V～240V	EM730-0R4-2B	0.4	2.8	3.2
	EM730-0R7-2B	0.75	4.8	5.0
	EM730-1R5-2B	1.5	8	8.5
	EM730-2R2-2B	2.2	10	11.5
Three-phase AC 340～460V	EM730-0R7-3B	0.75	2.5	3
	EM730-1R5-3B	1.5	4.2	4.6
	EM730-2R2-3B	2.2	5.6	6.5
	EM730-4R0-3B	4.0	9.4	10.5
	EM730-5R5-3B	5.5	13	15.7
	EM730-7R5-3B	7.5	17	20.5
	EM730-011-3B	11	25	28
	EM730-015-3B	15	32	36
	EM730-018-3B	18.5	38	41.5
	EM730-022-3B	22	45	49
	EM730-030-3/3B	30	60	70
	EM730-037-3/3B	37	75	85
	EM730-045-3	45	90	105
	EM730-055-3	55	110	134
	EM730-075-3	75	150	168
	EM730-090-3	90	176	200
	EM730-110-3	110	210	235
	EM730-132-3	132	253	290
	EM730-160-3	160	304	340

★ Correct selection of the inverter: The rated output current of the inverter is greater than or equal to the rated current of the motor, taking into account the overload capacity.

★ The difference between the rated power of the inverter and that of the motor is usually recommended not to exceed two power segments.

★ When a high-power inverter is provided with a low-power motor, the motor parameters must be entered accurately to prevent the motor from damage as a result of overload.

The technical specifications of the EM730 series inverter are shown in Table 1-2.

Table 1-2 Technical Specifications of EM730 Series Inverter

Item		Specification
Power supply	Rated voltage of power supply	Three-phase 340V-10% to 460V+10%, Single-phase/three-phase 200V-10% to 240V+10%; 50-60Hz ±5%; voltage unbalance rate: <3%
Output	Maximum output voltage	The maximum output voltage is the same as the input power voltage.
	Rated output current	Continuous output of 100% rated current
	Maximum overload current	150% heavy-duty rated current: 60s; 180% heavy-duty rated current: 10s; 200% heavy-duty rated current: 2s 120% light-duty rated current: 60s; 150% light-duty rated current: 10s; 180% light-duty rated current: 2s
Basic control functions	Drive mode	V/F control (VVF); speed sensorless vector control (SVC)
	Input mode	Frequency (speed) input, torque input
	Start and stop control mode	Keyboard, control terminal (two-line control and three-line control), communication
	Frequency control range	0.00~600.00Hz/0.0~3000.0HZ
	Input frequency resolution	Digital input: 0.01Hz/0.1Hz Analog input: 0.1% of maximum frequency
	Speed control range	1:50 (VVF), 1:200 (SVC)
	Speed control accuracy	Rated synchronous speed ±0.2%

	Acceleration and deceleration time	0.01 s to 600.00 s / 0.1 s to 6,000.0 s / 1 s to 60,000 s
	Voltage/frequency characteristics	Rated output voltage: 20% to 100%, adjustable Reference frequency: 1Hz to 600Hz/3,000Hz
	Torque boost	Fixed torque boost curve Any V/F curve is acceptable.
	Starting torque	150%/1Hz (VVF) 150%/0.25Hz (SVC)
	Torque control accuracy	±5% rated torque (SVC)
	Self-adjustment of output voltage	When the input voltage changes, the output voltage will basically remain unchanged.
	Automatic current limit	Output current is automatically limited to avoid frequent overcurrent trips.
	DC braking	Braking frequency: 0.01 to maximum frequency Braking time: 0～30S Braking current: 0% to 150% rated current
	Signal input source	Communication, multi-speed, analog, etc.
Input and output function	Reference power supply	10V/20mA
	Terminal control power	24V/100mA
	Digital input terminal	5-channel digital multi-function input: X1~X5 X5 can be used as the high-speed pulse input (max. 100kHZ).
	Analog input terminal	2-channel analog inputs: One (AI1) voltage source: -10 to 10V input; One channel (AI2): 0 to 10V input voltage or 0 to 20mA input current optional;
	Digital output	Multi-function output of one open collector and one relay

	terminal	Maximum output current of the collector: 50 mA; Relay contact capacity: 250VAC/3A or 30VDC/1A, EA-EC: normally open; EB-EC: normally closed
	Analog output terminal	One multi-function analog terminal output M1: 0-10V/0-20mA multi-function analog output terminal
Keyboard	LED display	The LED digital tube displays relevant information about the inverter.
Protection	Protective Function	Short circuit, overcurrent, overvoltage, undervoltage, phase loss, overload, overheat, load loss, external protection, etc.
Use conditions	Location	Indoor, at an altitude of less than 1 km, free of dust, corrosive gases and direct sunlight. When the altitude is higher than 1km, it is derated by 1% per 100m. The maximum allowable altitude is 3km.
	Applicable environment	-10℃ to +50℃, 5% to 95%RH (no condensation). When the ambient temperature exceeds 50 ℃, it needs to be derated by 3% per 1 ℃ temperature rise. The maximum allowable ambient temperature is 60 ℃.
	Vibration	Less than 0.5g
	Storage environment	-40℃～+70℃
	Installation method	Wall-mounted or installed in the cabinet
Levels of protection		IP20/IP21 (with plastic baffle)
Cooling method		Forced air cooling

Chapter 2 Installation

2.1 Product check

Danger
● **Never install the inverter damaged or with some parts missing.** Otherwise, injuries may be caused.

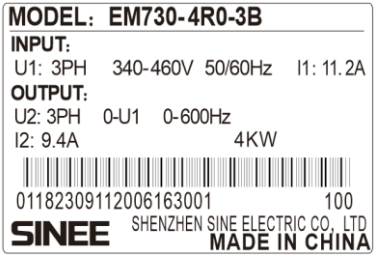
When you get the product, please check it according to Table 2-1.

Table2-1 Check Items

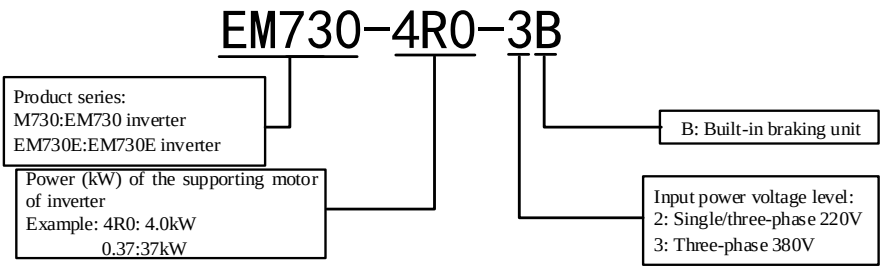
Item to be confirmed	Confirming methods
Check whether the product is consistent with the order.	Check the nameplate on the side face of the inverter.
Check whether any part is damaged.	Check the overall appearance for damage caused in transportation.
Check whether the fastened parts (e.g. screws) are loose.	If necessary, check the product with a screwdriver.

In the case of any defect, contact the agent or our Marketing Department.

- **Nameplate**

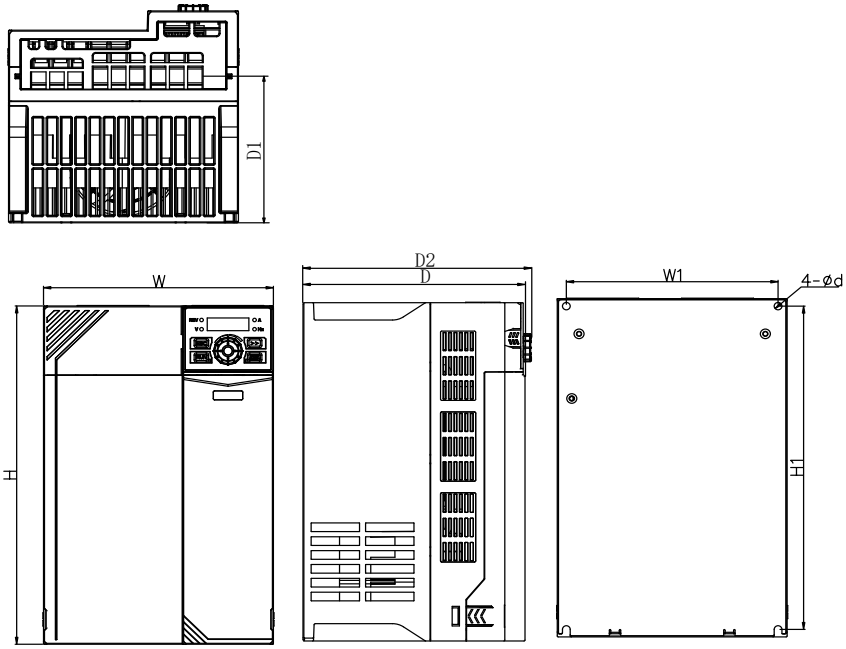


- **Description of inverter model**

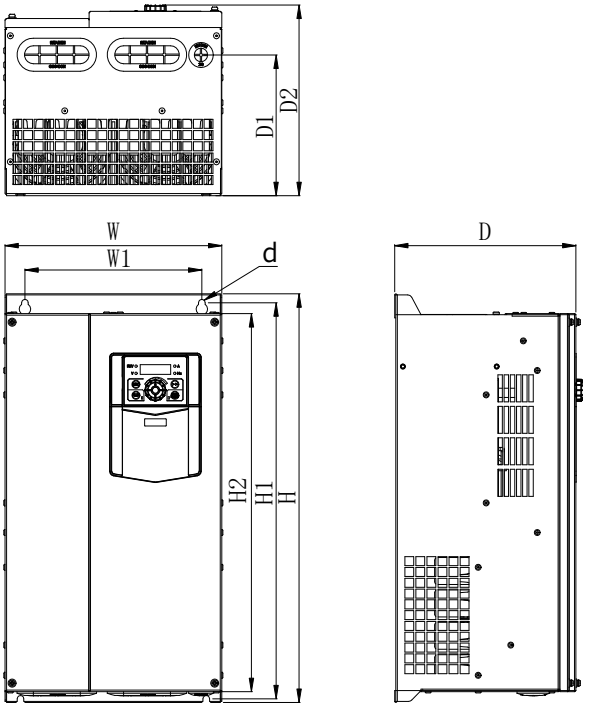


2.2 Outline dimensions and installation dimensions

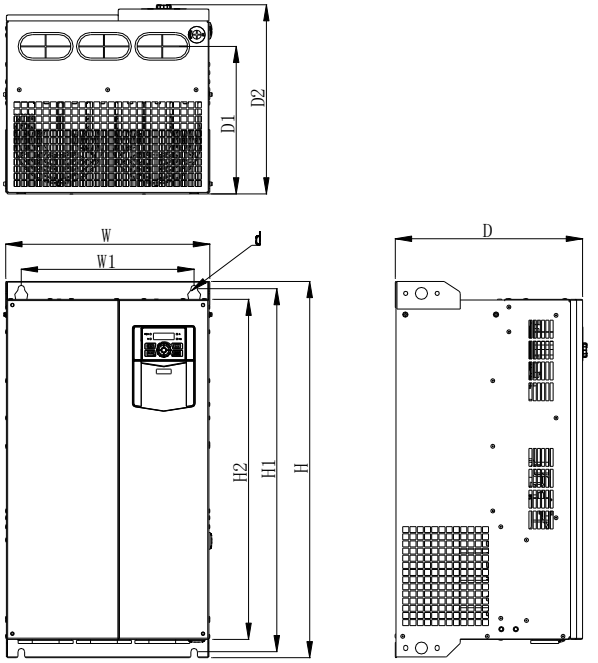
EM730 series inverters involve 25 specifications, two types of appearance and ten installation sizes, as shown in Fig. 2-1 and Table 2-2.



(a) Appearance of EM730-0R7-3B to EM730-022-3B inverters

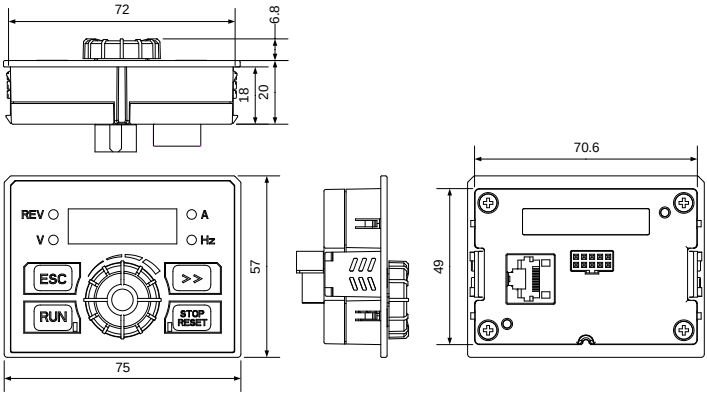


(b) Appearance of EM730-030-3B to EM730-075-3 inverters



(c)

Appearance of EM730-090-3 to EM730-160-3 inverters



(d) EM730 keyboard appearance

Fig.2-1 Outline Dimensions of EM730 Series Inverter and Keyboard

Table 2-2 Outline and Installation Dimensions of EM730 Series Inverter

Specifications	W	W1	H	H1	H2	D	D1	D2	d
EM730-0R4-2B	75	65	142	132		146	67	152	4.5
EM730-0R7-2B									
EM730-1R5-2B	93	82	172	163		136	85	141	4.7
EM730-2R2-2B									
EM730-0R7-3B	75	65	142	132		146	67	152	4.5
EM730-1R5-3B									
EM730-2R2-3B	93	82	172	163		136	85	141	4.7
EM730-4R0-3B									
EM730-5R5-3B	109	98	207	196		154	103	160	5.5
EM730-7R5-3B									
EM730-011-3B	136	125	250	240		169	115	174	5.5
EM730-015-3B									
EM730-018-3B	190	175	293	280		184	145	189	6.5
EM730-022-3B									
EM730-030-3	245	200	454	440	420	205	156	212	7.5
EM730-030-3B									
EM730-037-3									
EM730-037-3B									
EM730-045-3	300	266	524	508	480	229	174	236	9
EM730-055-3									
EM730-075-3	335	286	580	563	536	228	177	235	9
EM730-090-3	335	286	630	608	570	310	247	317	11
EM730-110-3									
EM730-132-3	430	330	770	747	710	311	248	319	13
EM730-160-3									

2.3 Installation Site Requirements and Management

2.3.1 Installation site

The installation site should meet the following conditions:

1. The room is well ventilated.
2. The ambient temperature should be -10°C to 50°C. When the plastic case is used at the ambient temperature above 40℃, remove the top baffle.
3. The controller should be free from high temperature and humidity (less than 90% RH) or rainwater and other liquid droplets.
4. Please install the inverter on a fire-retardant object (e.g. metal). Never install it on flammable objects (e.g. wood).
5. No direct sunlight.
6. There should be no flammable or corrosive gas and liquid.
7. There should be no dust, oily dust, floating fibers or metal particles.
8. The installation foundation should be secured and vibration-free.

2.3.2 Preventive measures

Take protective measures to the inverter during installation to prevent metal fragments or dust generated in drilling and other processes from falling into the inverter. Remove the protection after installation.

2.4 Installation Direction and Space

The EM730-1R5-3B inverters and above are equipped with the cooling fan for forced air cooling. To ensure good cyclic cooling effects, the inverter must be installed in a vertical direction, and sufficient spaces must be reserved between the inverter and adjacent objects or baffles (walls). Refer to Fig. 2-2.

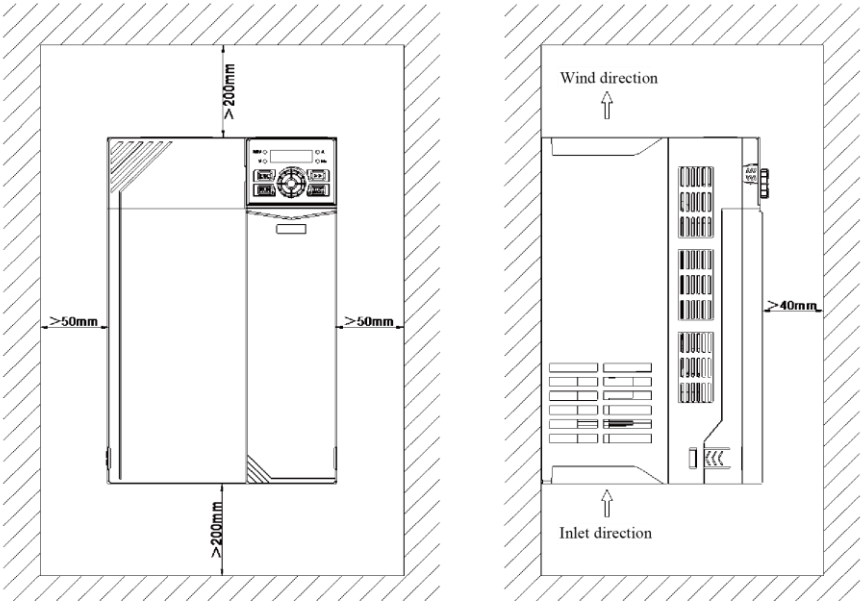


Fig.2-2 Inverter Installation Direction and Space

Chapter 3 Wiring

3.1 Connection of Peripheral Device

The standard connection between the EM730 series inverter and peripheral devices is shown in Fig.3-1.

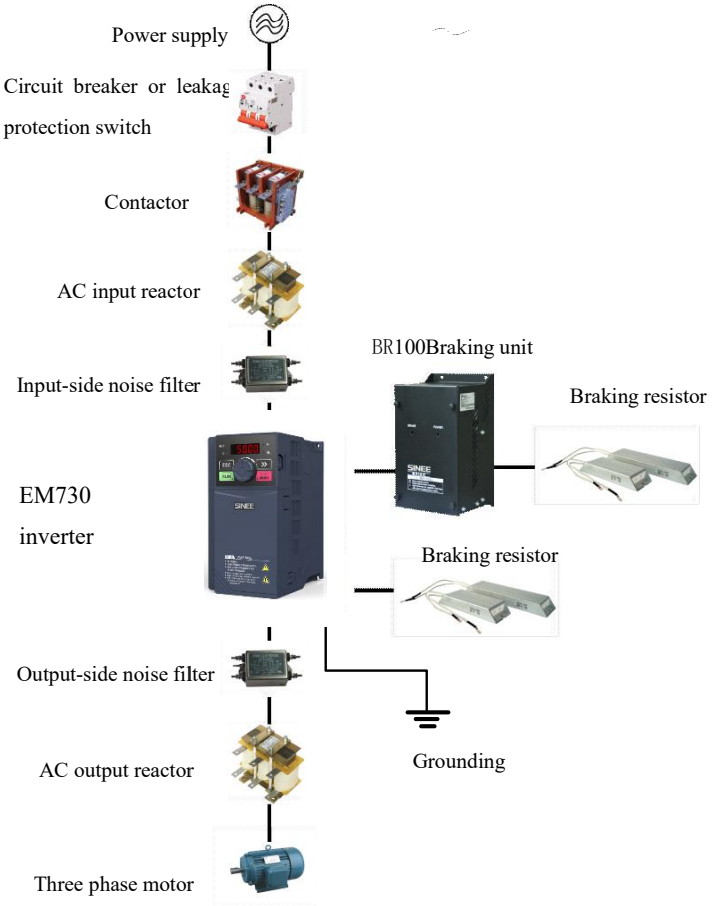
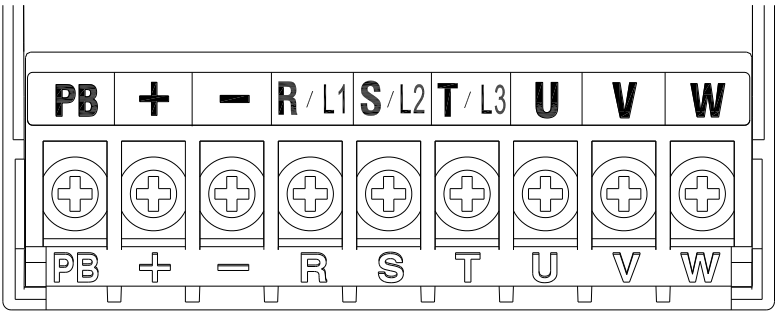


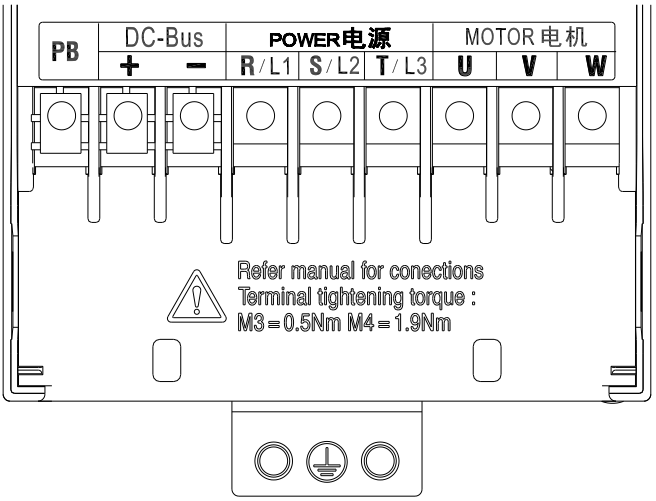
Fig.3-1 Connection of Inverter and Peripheral Devices

3.2 Wiring of Main Circuit Terminal

3.2.1 Composition of main circuit terminal



a) Schematic Diagram of Terminals (380V, 0.75kW-1.5kW)



b) Schematic Diagram of Terminals (380V, 2.2kW-4.0kW)

Note 1: The 45-160kw inverter has no PB terminal

Note 2: The 132-160kW inverter has a P terminal for external DC reactor

3.2.2 Functions of main circuit terminals

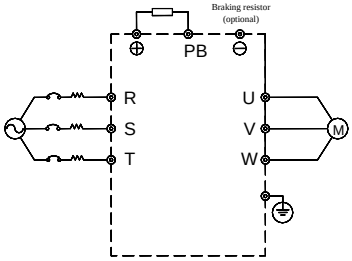
The functions of the main circuit terminals of the EM730 series inverter are shown in the following table. Please connect wires correctly according to the corresponding functions.

Terminal label	Function description
R/L1, S/L2, T/L3	AC power input terminal, connected to three-phase AC power supply (the single-phase power input terminal can be connected with any two terminals)
U, V, W	AC output terminal of the inverter, connected to three-phase AC motor
⊕⊖	Positive and negative terminals of the internal DC bus, connected to external braking unit
⊕, PB	Braking resistor terminal, with one end of the braking resistor connected to⊕ and the other end to PB
P,⊕	DC reactor terminal, for the external DC reactor of EM730/EM730E-090-3 and above
⏚	Grounding terminal, connected to earth

3.2.3 Standard wiring diagram of main circuit

The standard wiring diagram of the main circuit of the EM730 series inverter is shown in Fig. 3-3.

● Wiring of built-in brake unit



● Wiring of external brake unit

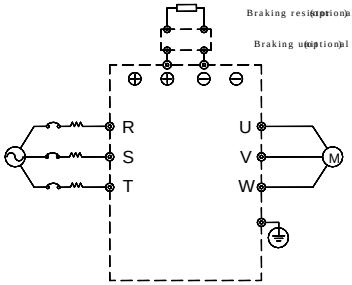


Fig.3-3 Standard Wiring of Main Circuit

3.2.4 Input side wiring of main circuit

The input cable, output cable and inverter itself generates RF interference, which can be reduced by installing noise filters on the input and output sides and shielding the inverter body with an iron box, as shown in Fig. 3-4.

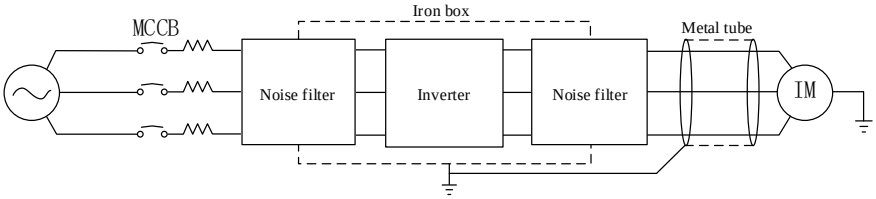


Fig.3-4Solution to RF Interference

3.2.5 Cable and screw dimensions of main circuit

The cable and screw dimensions of the main circuit are shown in EM730 User manual.

3.2.6 Installation and wiring of braking resistor and braking unit

Refer to Chapter 8 for the selection and wiring of the braking resistor and braking unit.

For the inverter with a built-in braking unit, connect the braking resistor between the inverter terminal (+) and PB terminal. For the inverter with no built-in braking unit, connect the terminals (+ and -) of the braking unit to those (+ and -) of the DC bus of the inverter, and the braking resistor to the PB+ and PB- terminals of the braking unit.

3.3 Wiring of Control Circuit Terminal

3.3.1 Composition of control circuit terminal

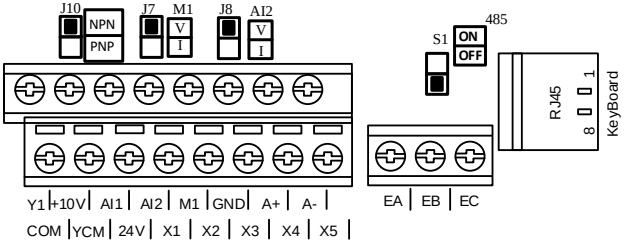


Fig.3-11 Layout of Control Circuit Terminals 1

Note: YCM is the common end of Y1 terminal. If Y1 terminal is not used, the connection plate between YCM and COM may not be connected

3.3.2 Functions and wiring of control circuit terminals

Category	Terminal label	Terminal name	Function description
Power supply	24V	External power	Supply 24V power to external devices, with

		supply	the maximum output current of 100mA.
	COM	Power grounding terminal	Power grounding terminal of the external power supply, and common side of the digital input terminal
Analog input	10V	Analog terminal power supply	Supply 10V power to external devices. Maximum output current: 10.5±0.5V/20mA, usually as the power supply of the external potentiometer
	GND	Analog power grounding terminal	Grounding terminal of analog input and output
	AI1	Analog voltage input	-10V to 10V, 50kΩ input impedance, bipolar analog voltage input
	AI2	Analog current/voltage input	Current or voltage type Input range: 0/4-20mA or 0-10V
Analog output	M1	Analog voltage/current output	0-10V/0-20mA; output accuracy: ±2%
Digital input port	X1	Multi-function input terminal	Program the corresponding terminals by setting function codes, to realize the input control of the set functions. The input terminal supports PNP and NPN input modes, and the default mode is the NPN input mode. X5 can also be used as the high-frequency pulse input, with the input frequency up to 100kHz.
	X2		
	X3		
	X4		
	X5		
Multi-function digital output	Y1	Open collector output terminal	It can be programmed as the multi-function output terminal.
	YCM	Common side of Y	The common side YCM of Y terminal and the

		terminal	common side COM of the digital input terminal are independent of each other.
Communication	A+	RS485 communication terminal	positive terminal of RS485 differential signal
	A-		negative terminal of RS485 differential signal
Relay output	EA	Relay output terminal	EA-EC: Normally open EB-EC: Normally closed
	EB		
	EC		
External keyboard port	RJ45	External keyboard terminal	For the external operation panel The upper computer can also be connected through this port for background software debugging.

3.3.3 Wiring of analog input terminal

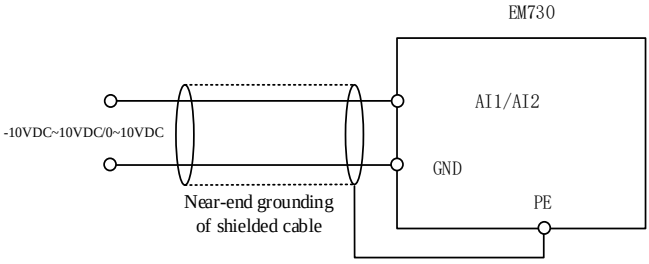
Wiring of AI1 and AI2 terminals with analog voltage signal:

When the AI2 terminal is in the mode of analog voltage signal input, the switch J8 on the control panel is set to the voltage mode, as shown in Fig. 3-12

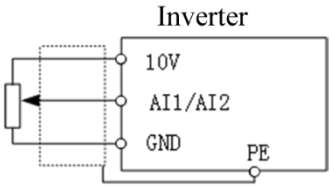
When the analog voltage input signal is powered by an external power supply, the wiring of terminals AI1 and AI2 is shown in Fig. 3-12-a.

When the analog voltage input signal is sent by a potentiometer, the terminals AI1 and AI2 are connected as shown in Fig. 3-12-b.

In addition, F02.62 (AI1 input type) and F02.63 (AI2 input type) should be set according to actual needs (0: 0-10V; 1: 4-20mA; 2: 0-20mA; 4: 0-5V).



(a)



(b)

Fig.3-12 AI1/AI2 Terminal Wiring Diagram

Wiring of the input analog current signal of AI2 terminal:

When the AI2 terminal is in the mode of analog current signal input, the switch J8 on the terminal block is set to the current mode.

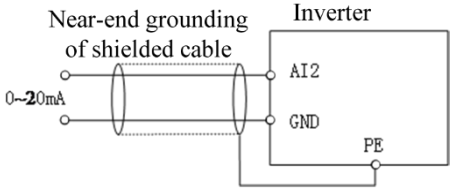
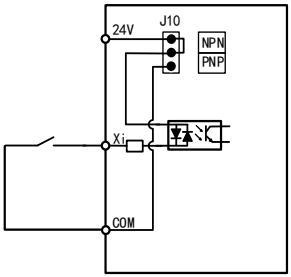
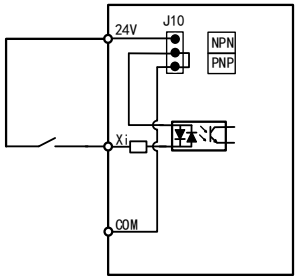


Fig.3-13 Wiring Diagram of External Current Source and AI2 Terminal

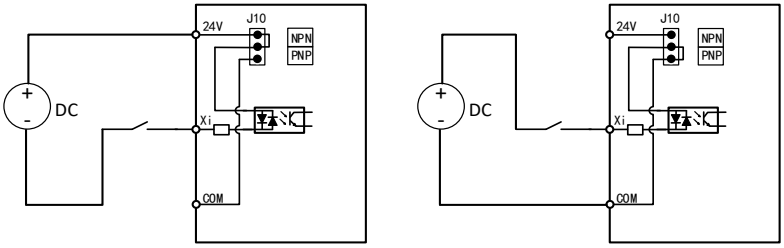
3.3.4 Wiring of multi-function input terminal

The multi-function input terminals of EM730 series inverters support the access in the NPN or PNP mode. The terminals X1-X5 can be flexibly connected with external devices. The NPN or PNP mode (NPN by default) can be selected via the jumper cap J10 on the control panel. The wiring of the multi-function input terminal in different modes is shown below:





a: Use of internal power supply in NPN mode b: Use of internal power supply in PNP mode

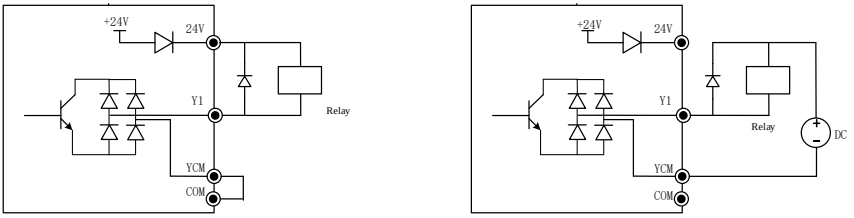


c: Use of external power supply in NPN mode d: Use of external power supply in PNP mode

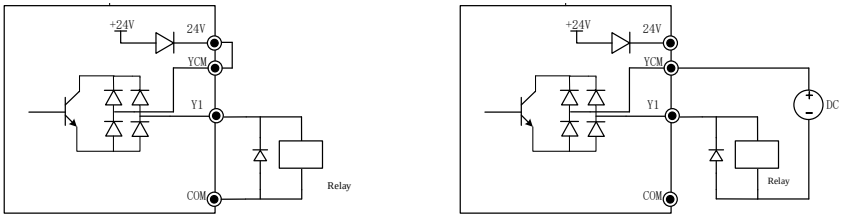
Fig. 3-14 Wiring Diagram of Multi-function Input Terminals

3.3.5 Wiring of multi-function output terminals

The multi-function output terminal Y1 is powered on by the internal 24V power supply of the inverter or an external power supply, as shown in Fig. 3-15:



a: Use of internal power supply NPN b: Use of external power supply NPN



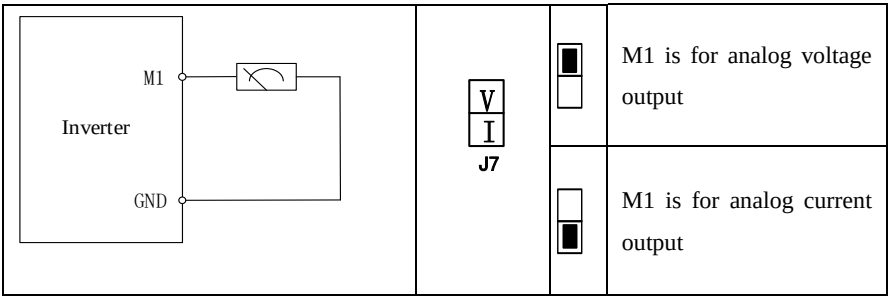
a: Use of internal power supply PNP b: Use of external power supply PNP

Fig.3-15 Wiring of Multi-function Output Terminals

Note: (1) An anti-parallel diode must be included in the relay wire package. The absorption circuit components should be installed at both ends of the coil of the relay or contactor.

3.3.6 Wiring of analog output terminals

The external analog meter connected to the analog output terminal M1 indicates a variety of physical quantities. Choose the output current (0-20mA) or (0-10V) via the jumper cap, M1 corresponding to J7. Set F03.34 as needed (0: 0-10V; 1: 4-20mA; 2: 0-20mA). The jumper cap and terminal wiring is as follows.



3.3.7 Wiring of 485 communication terminals

The communication terminals A+ and A- are the RS485 communication interfaces of the inverter. The online control of the host (PC or PLC controller) and inverter is performed through the connection and communication with the host. The connection of the RS485 and RS485/RS232 adapters to EM730 series inverter is shown in Fig. 3-16, Fig. 3-17 and Fig. 3-18.

- Direct connection of the RS485 terminal of a single inverter to the host for communication:

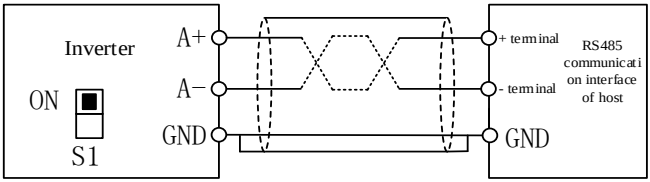


Fig.3-16 Communication Terminal Wiring of Single Inverter

- Connection of the RS485 terminals of multiple inverters to host for communication:

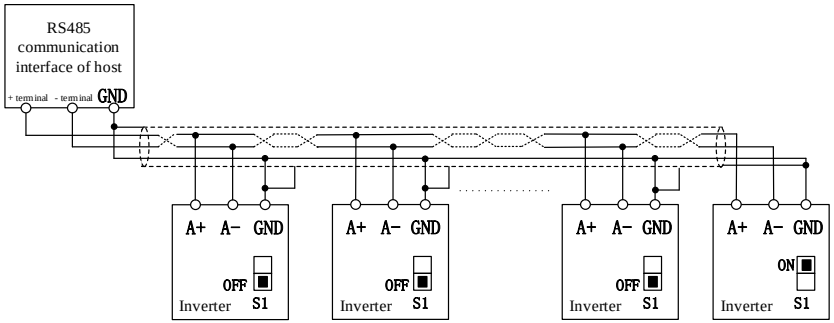


Fig. 3-17 Wiring of Communication Terminals of Multiple Inverters

- Connection to the host via RS485/RS232 adapter for communication:

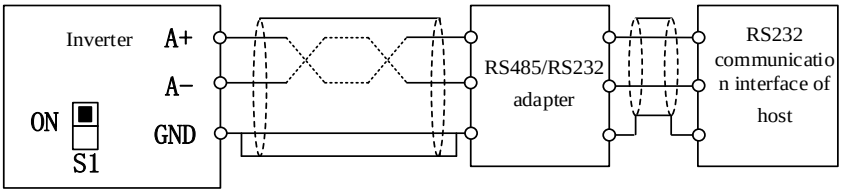


Fig. 3-18 Communication Terminal Wiring

3.3.8 Precautions for control circuit wiring

- Connect the control circuit connection wires and other wires separately.
- Connect the control circuit terminals EA, EB, EC, and Y1 separately from other control circuit terminals.
- In order to avoid malfunction caused by interference, use the twisted shielded cables in the control circuit. The wiring distance should be less than 50 m.
- Prevent the shield screen from contact with other signal lines and enclosures. The exposed shield screen can be wrapped with insulating tapes.
- It is prohibited to touch the ports and components of the control panel without static electricity protection measures.

3.3.9 Standard Wiring Diagram of Control Circuit

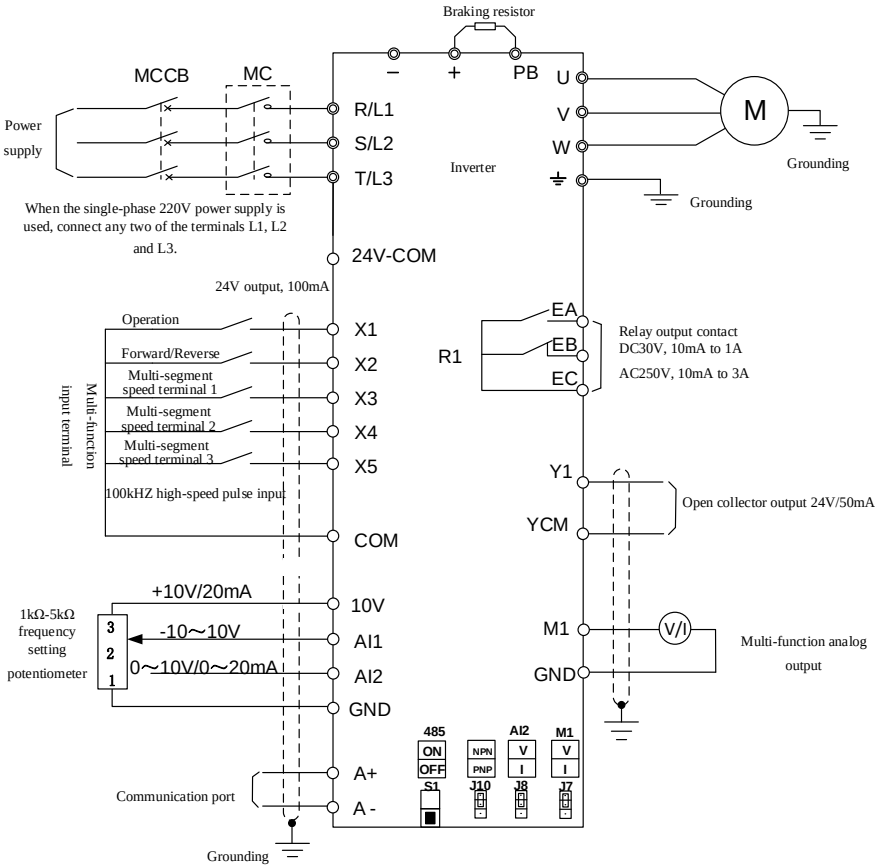


Fig. 3-19 Standard Wiring Diagram of Control Circuit

- It is recommended to use the wires with a diameter of 0.5-1mm^2 in the control circuit.
- Install the control circuit terminals with the PH0 Phillips screwdriver. The tightening torque should be 0.5N.m.

3.4 Extension wiring of keyboard

1) The external keyboard needs to be ordered separately.
2) The external keyboard is connected to the RJ45 port via an ordinary network cable (plug:

meeting the EIA/TIA568B standards) prepared by the customer.

3) Connect the RJ45 port of the keyboard to that of the control panel via a network cable. The keyboard extension cable should be no longer than 3m. Then extension cable may be 10m long in the presence of Cat5E wires and good electromagnetic environments.

Chapter 4 KEYBOARD OPERATIONS

4.1 Keyboard Functions

4.1.1 Structure of LED keyboard

The control panel of EM730 series inverter is a pluggable LED keyboard The LED keyboard has one five-digit LED digital display, four operation buttons, one digital potentiometer, and six status and unit indicators. Users can perform parameter setting, status monitoring and start/stop of the inverter via the keyboard.

Fig. 4-1 LED Keyboard

4.1.2 Functions of keys and indicators on LED keyboard

Key/Indicator	Name	Function
	Right	Select the group number and function number of the currently modified function code. Change the monitoring parameters.
	Back	Go back to the previous menu. Cancel the current parameter modification when the menu mode selection level is enabled from the monitoring level.
	Run	When the keyboard control is enabled, press this key to start the inverter.
	Stop/Reset	When the keyboard control is enabled, press this key to stop the inverter. Reset the protection in use.
	Potentiometer/Confirm key	Turn it clockwise to select the function code and menu group or increase the parameter value. Increase the currently valid reference digital input data.
		Turn it counterclockwise to select the function code and menu group or decrease the parameter value. Decrease the currently valid reference digital input data.
		Click it to enter the lower-level menu. Confirm and save the parameter modification, and

		enable the function code following the current function code.
	Unit indicator	It is ON when the frequency, current, and voltage are displayed.
	Running direction indicator	This indicator is ON during reverse running. It is OFF during forward running. It is ON when a certain frequency is being monitored or displayed.
 (Green)	Running indicator	It is ON when the inverter is running, flickering when the inverter is being stopped, and OFF after the inverter is stopped.
 (Red)	Protection indicator	When the inverter is in the protection status, this indicator will be ON in red.

( and  below means that the potentiometer rotates clockwise and counterclockwise.)

4.2 Operation Mode of Keyboard with Digital Tube Display

The LED keyboard menu is divided into the monitoring level (Level 0), menu mode selection level (Level 1), function code selection level (Level 2) and parameter level (Level 3) from low to high. The menu levels mentioned below are represent by numbers.

There are five parameter display modes: menu mode (--A--), used to display all function codes; user-defined mode (--U--), used to display only function codes selected by the user based on the F11 group; non-default mode (--C--), used to display only the function codes that differ from the default settings;

Protection information display mode (--E--): display the current protection information; version information mode (--P--): display software and product serial numbers.

When the keyboard is powered on, the first monitoring parameter of Level 0 is displayed by default. Press the ESC key  to open the Level 1 menu. Users can turn the potentiometer indicator  in the keyboard to select different menu modes. The process of menu mode selection is shown in Fig. 4-2.

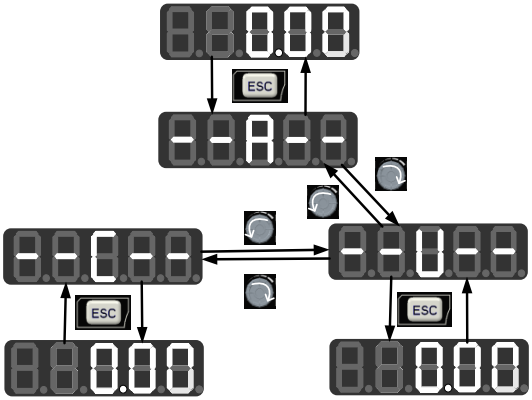


Fig. 4-2 Flowchart of Menu Mode Selection

4.2.1 Full menu mode (--A--)

In the full menu mode, press the ENTER key to enter the Level 2 menu and select any function code. Then press the ENTER key to enter the Level 3 menu and view or modify the function code. Except for a few special ones, the function codes needed by general users can be modified.

The entire process from the initial status of power-on to change of the value of the function code F03.28 to 5.28 in the full menu mode is shown in Fig. 4-3.

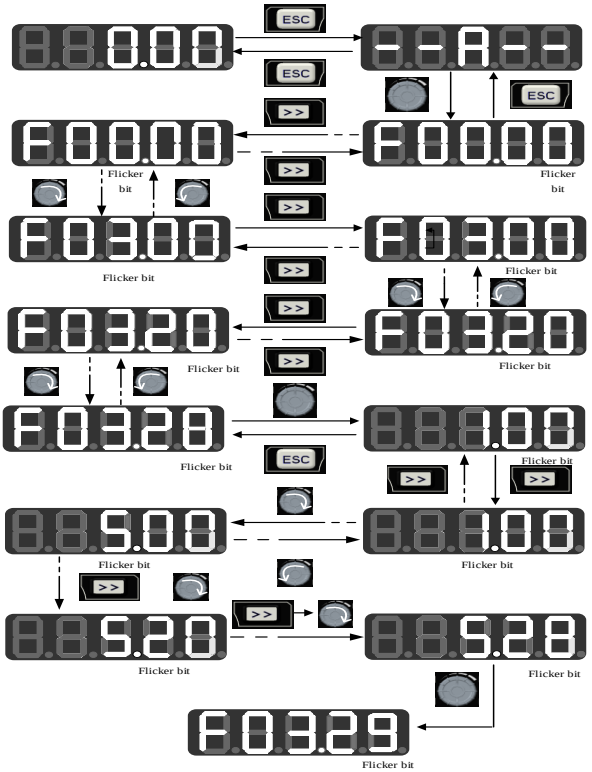


Fig. 4-3 Flowchart from Power-on to F03.28=5.28 Setting

In all menu modes, the user needs to press the ENTER key to save parameter modifications. Differences after parameter saving are as follows: In the full menu mode, enter the function code following the function code that has been successfully modified. In the non-default mode, enter the non-default function code following the non-default function code that has been successfully modified. In the Level 3 menu, press the ESC key ESC to abandon parameter modifications.

4.2.2 Non-default mode (--C--)

In the non-default mode, press the ENTER key to enter the Level 2 menu. The first parameter different from the default settings of the inverter will be displayed, starting from F00.00. When the right shift key >> is pressed in the Level 2 menu, the cursor will not shift.

If the increment or decrement key on the keyboard is pressed, the function group and function code will not be modified, and the non-default function code following and in front of the current function code will be displayed respectively. If the displayed function code is modifiable currently in the Level 3 menu, the lowest bit indicated by the cursor will flicker. In this case, parameters can be modified in the Level 3 menu under the full menu mode. After modification, press the ENTER key to confirm and save the parameters and enable next non-default parameter.

For example, change F00.03 to 1 and F00.07 to 40.00 in the full menu mode, which are not default values. Then enable the non-default mode. F00.03 will be displayed first. When the potentiometer key on the keyboard is turned clockwise, F00.07 will be displayed; and when the potentiometer key on the keyboard is turned counterclockwise, F00.03 will be returned, as shown below:

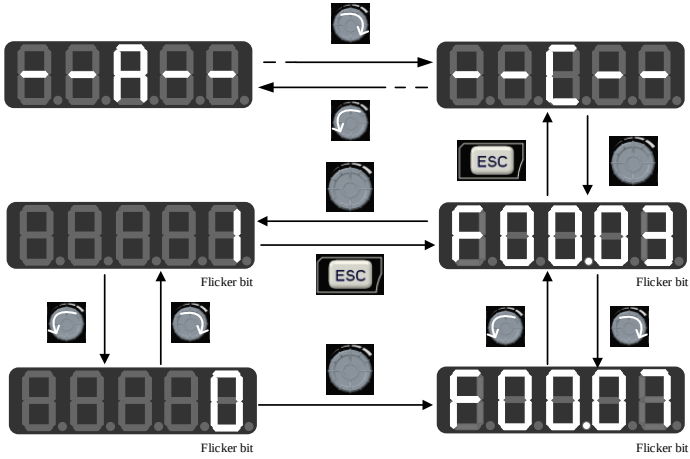


Fig. 4-4 Function Code Modification in Non-default Mode

4.3 Protection Monitoring

When the inverter is in the protection status, you can directly press the right shift key >> to switch the current protection type and the output frequency, output current, output voltage, running status and working time during the protection.

4.4 Operation Monitoring

4.4.1 Normal monitoring

In the monitoring status mode 1 of EM730, you can set any function code to be viewed between F12.33 and F12.37. When F12.32=1, the monitoring mode 1 will be enabled. If the Level 0 monitoring menu appears, you can press the right shift key >> to switch the monitoring parameters according to the order set for each function code between F12.33 and F12.37. When the inverter changes from the stop status to running status, the monitoring parameter will automatically change from the current value to that indicated by F12.33. When the inverter changes from the running status to stop status, the monitoring parameter will automatically change from the current value to that indicated by F12.34.

4.4.2 Editing Mode

Quick change in the monitoring mode:

When F00.04 is set to "0: digital frequency setting F00.07", turn the potentiometer key to directly change the offset;

When F00.04 is set to "8: digital potentiometer", turn the potentiometer key to change the set frequency of F12.42 digital potentiometer. In this case, turn the potentiometer key to enter the editing mode. The value will change from the second digit of the digital tube by default. The digital tube corresponding to the changed digit will flash. Press the right shift key >> to move to next digit on the right. Press the ESC key ESC to cancel change and return to the original value. Or, press the ENTER key to confirm the change and exit the editing mode. The indicator will not be flicker. Press the right shift key >> to enable the normal monitoring mode: switch to next monitoring parameter. Fig. 4-6 shows the editing status in the monitoring mode.

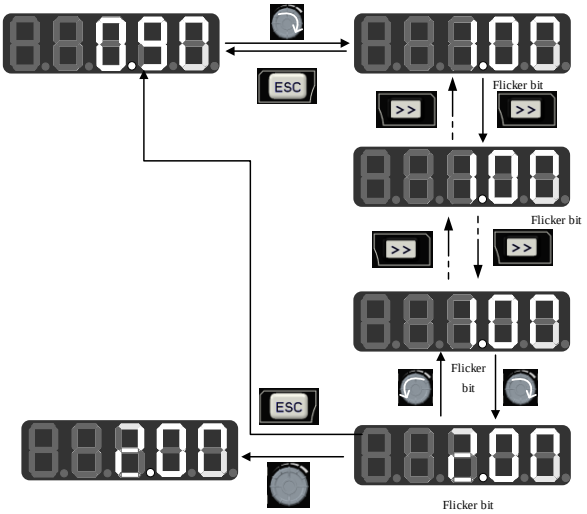


Fig. 4-6 Editing Status in the Monitoring Mode

4.5 Run/Stop

After setting the parameters, press the RUN key RUN to enable the normal operation of the inverter, and the STOP/RESET key STOP RESET to stop the inverter.

4.6 Other Warning Prompts

4.6.1 P.-ON prompt

The P.-ON prompt will be displayed after power-on initialization.

4.6.2 P.-OFF prompt

When the voltage drops to 250V (with the soft start disconnected), P-OFF will be displayed, and the keyboard can be operated freely to exit the P.-OFF display and display normal information. In case of no keyboard operation within 5s, P-OFF will be displayed again. After the voltage is restored and the soft start is engaged, P.-ON will be displayed again.

4.6.3 SOFT.E warning

If the soft start is not engaged and the inverter is started, the SOFT.E warning will appear. After the voltage is restore and the soft start is engaged, normal operation will be enabled.

Chapter 5 Trial run

5.1 Inverter Commissioning Process

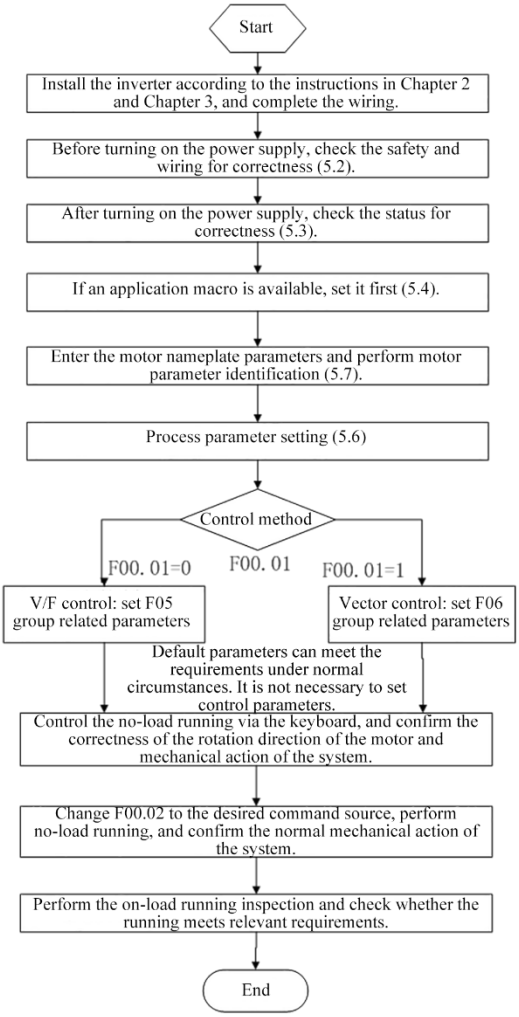


Fig. 5-1 Inverter Commissioning Flowchart

5.2 Confirmation before Power-on

Please confirm the following items before turning on the power supply:

Item to be confirmed	Confirmation content
Power wiring confirmation	Check whether the input power voltage is consistent with the voltage of the inverter.
	Confirm that the circuit breaker has been connected to the power supply circuit, and the power cables are correctly connected to the input terminals (R, S, T) of the inverter.
	Make sure that the inverter and motor are properly grounded.
Motor wiring confirmation	Confirm that the motor is correctly connected to the output terminals (U, V, W) of the inverter, and the motor wiring is secured.
Confirmation of braking unit and braking resistor	Make sure that the braking resistor and braking unit are connected as shown in Fig. 3-3 (use the dynamic braking resistor if necessary during operation).
Control terminal wiring confirmation	Check whether the control terminals of the inverter are correctly and reliably connected to other controls.
Control terminal status confirmation	Make sure that the control terminal circuit of the inverter is disconnected to prevent operation upon powering on.
Mechanical load confirmation	Confirm that the machinery is in the no-load state and free of danger in operation.

5.3 Inverter Status Confirmation after Power-on

After the power supply is turned on, the control panel (keyboard) of the inverter displays the following information in the normal status.

Status	Display	Note
During normal operation	0.00	The digital setting 0.00Hz is displayed by default.
Protection	Protection code in character or Exx format	The protection code is displayed in the protection status. See the protection measures in Chapter 6.

5.4 Precautions for Application Macro Setting

F16.00 is an industry application macro option. Select the application macro according to the specific application, and press the Enter key to automatically restore default settings. See EM730 User manual for details on application macros.

5.5 Start and Stop Control

Function code	Function code name	Parameter description	Default setting	Attribute
F00.02	Options of command source	0: keyboard control 1: Terminal control 2: Communication control	0	○

F00.02=0: keyboard control

The start and stop of the inverter are controlled by the RUN key, STOP key on the keyboard. In the case of no trip protection, press the RUN key to enter the running status. If the green LED indicator above the RUN key is normally ON, it indicates that the inverter is running. If this indicator is flickering, it indicates that the inverter is in the status of deceleration to stop.

F00.02=1: terminal control

The inverter start and stop are controlled by the start and stop control terminals defined by the function code F02.00 to F02.04. Terminal control is dependent on F00.03.

F00.02=2: communication control

The inverter start and stop are controlled by the host through the RS485 communication port.

Function code	Function code name	Parameter description	Default setting	Attribute
F04.00	Start-up method	0: direct start 1: start of speed tracking	0	○

F04.00=0: direct start

The inverter is started at the starting frequency, following the DC braking (not suitable when F04.04=0) and pre-excitation (not suitable when F04.07=0). The starting frequency will change to the set frequency after the holding time.

F04.00=1: start with speed tracking

The inverter is smoothly started at the current rotating frequency of the motor, following the speed tracking.

Function code	Function code name	Parameter description	Default setting	Attribute
F04.19	Stop mode	0: Slow down to stop 1: Free stop	0	○

F04.19=0: deceleration to stop

The motor decelerates to stop according to the set deceleration time [default setting: based on F00.15 (deceleration time 1)].

F04.19=1: free stop

When there is a valid stop command, the inverter will stop output immediately, and the motor will freely coast to stop. The stop time depends on the inertia of the motor and load.

5.5.1 Terminal control of start and stop

Function code	Function code name	Parameter description	Default setting	Attribute
F00.03	Options of terminal control mode	0: terminal RUN (running) and F/R (forward/reverse) 1: terminal RUN (forward) and F/R (reverse) 2: terminal RUN (forward), Xi (stop) and F/R (reverse) 3: terminal RUN (running), Xi (stop) and F/R (forward/reverse)	0	○

Terminal RUN: Xi terminal is set to "1: terminal RUN"

Terminal F/R: Xi terminal is set to "2: running direction F/R"

Terminal control can be divided into two types: two-line control and three-line control.

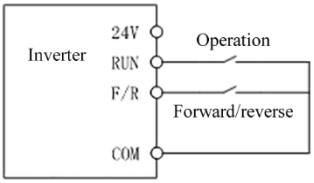
Two-line control:

F00.03=0: the terminal RUN is enabled and the terminal F/R controls forward/reverse running.

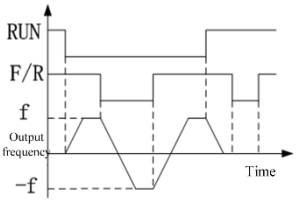
Enable/Disable the terminal RUN to control the start and stop of the inverter, and the terminal F/R to control the forward/reverse running. If F00.21 is set to 1 and reverse running is disabled, the F/R terminal will not be available. When the mode of deceleration to stop is selected, the logic diagram is as shown in Fig. 5-2 (b).

F00.03=1: the terminal RUN controls forward running, and the terminal F/R is in the reverse mode.

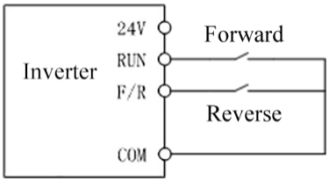
Enable/Disable the terminal RUN to control the forward running and stop of the inverter, and the terminal F/R to control the reverse running and stop. When the terminals RUN and F/R are enabled simultaneously, the inverter will be stopped. If reverse running is disabled, the terminal F/R will not be available. When the mode of deceleration to stop is selected, the logic of forward/reverse running is as shown in Fig. 5-2 (d);



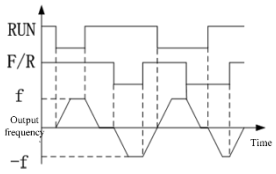
(a) Wiring diagram of two-line control (F00.03=0)



(b) F04.19=0, F00.03=0, run the forward/reverse logic.



(c) F00.03=1 two-line control wiring



(d) F04.19=0, F00.03=1: forward/reverse running logic

Fig. 5-2 Two-line Control

When the start/stop value of F00.03 is set to 0 or 1, even if the terminal RUN is available, the inverter can be stopped by pressing the STOP key STOP RESET or sending an external stop command to the terminal. In this case, the inverter will not be in the running status until the terminal RUN is disabled and then enabled.

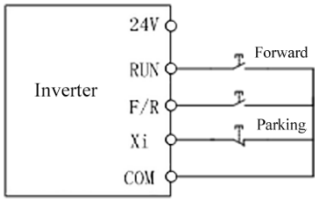
Three-line control:

F00.03=2: the terminal RUN controls forward running, the terminal Xi is for stop, and the terminal F/R is in the reverse status.

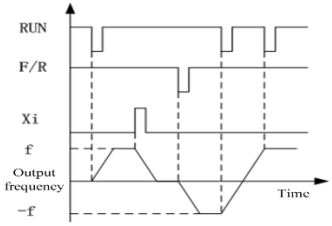
The terminal RUN is normally ON for forward running, and the terminal F/R is normally ON for reverse running, with valid pulse edges. The terminal Xi is normally closed for stop, with the valid level. When the inverter is in the running status, press Xi to stop it. In the case of deceleration to stop (F04.19=0), the logic diagram is as shown in Fig. 5-3 **错误!未找到引用源。**(b). The terminal Xi is for "three-line running and stop control" as defined by F02.00 to F02.04.

F00.03=3: the terminal RUN is for running, Xi for stop and F/R for forward/reverse control.

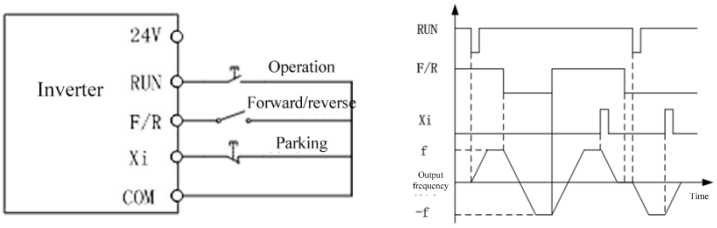
The terminal RUN is normally ON for running, with the valid pulse edge, F/R for forward/reverse switching (forward in the OFF status and reverse in the ON status), and Xi is normally OFF for stop, with the valid level. In the case of deceleration to stop (F04.19=0), the logic diagram is as shown in Fig. 5-3(d).



(a) Wiring diagram of three-line control (F00.03=2)



(b) Forward/reverse control logic (F04.19=0, F00.03=2)



(b) Wiring diagram of three-line control (F00.03=3) (d) Forward/reverse running logic (F04.19=0, F00.03=3)

Fig. 5-3 Three-line Control

The three-line control logic of the EM730 series inverter is consistent with the conventional electrical control. The keys and knob switches should be used correctly as shown in the schematic diagram. Otherwise, operation errors may be caused.

5.6 Common Process Parameters of Inverter

Function code	Function code name	Parameter description	Unit	Default setting	Attribute
F00.01	Drive control mode of motor 1	0: V/F control (VVF) 1: Speed sensorless vector control (SVC)		0	○
F00.04	Options of main frequency source A	0: digital frequency setting F00.07 1：AI1 2：AI2 5: high frequency pulse input (X5) 6: Percentage setting of main frequency communication 7: Direct setting of main frequency communication 8: digital potentiometer setting		0	○
F00.07	Digital frequency setting	0.00 to maximum frequency F00.16	Hz	0.00	●
F00.14	Acceleration time 1	0.00～650.00（F15.13=0）	s	15.00	●
F00.15	Deceleration time 1	0.00～650.00（F15.13=0）	s	15.00	●
F00.16	Maximum frequency	1.00～600.00	Hz	50.00	○
F00.18	Upper frequency limit	Lower frequency limit F00.19 to maximum frequency F00.16	Hz	50.00	●
F00.19	Lower frequency limit	0.00 to upper frequency limit F00.18	Hz	0.00	●
F00.21	Reverse control	0: Allow forward/reverse running 1: Prohibit reversing		0	○

Note: Common process parameters may also include the input and output terminal function

settings. Refer to the F02 and F03 groups in the function table.

5.7 Motor Parameter Identification

For the better control performance, motor parameters must be identified.

Identification Method	Application	Identification Effect
F01.34=01 Static self-learning of asynchronous motor	It is applied where the motor and load cannot be separated easily and rotary self-learning is not allowed.	General
F01.34=11 Static self-learning of synchronous motor		
F01.34=02 Rotary self-learning of asynchronous motor	It is applied when the motor and load can be separated easily. Before operation, the motor shaft should be separated from the load. The motor under load must not be put into rotary self-learning.	Optimal
F01.34=12 Rotary self-learning of synchronous motor		

- Prior to self-identification, make sure that the motor is stopped; otherwise, self-identification cannot be performed properly.

5.7.1 Parameter identification steps

- Where the motor and load can be separated, the mechanical load and motor should be completely separated in the power-off status.
- After the power-on, set the command source of the inverter to keyboard control (F00.02=0).
- Enter the nameplate parameters of the motor accurately.

Motor	Corresponding Parameter
Motor 1	F01.00 Motor type F01.01 Rated power of electric motor F01.02 Rated voltage of motor F01.03 Rated current of motor F01.04 Rated frequency of motor F01.05 Rated speed F01.06: Motor winding connection
Motor 2	F14.00 Motor type F14.01 Rated power of electric motor F14.02 Rated voltage of motor F14.03 Rated current of motor F14.04 Rated frequency of motor F14.05 Rated speed F14.06: Motor winding connection

- For the asynchronous motor:

Set F01.34=1 for confirmation and press the RUN key. The inverter will start the static self-identification of the motor.

Or, set F01.34=2 and press the RUN key. The inverter will start the rotary self-identification of the motor.

- For the synchronous motor:

Set F01.34=11 and press the RUN key. The inverter will start the static self-identification of the motor.

Or, set F01.34=12 and press the RUN key. The inverter will start the rotary self-identification of the motor.

- It takes about two minutes to complete the self-identification of the motor. Then the system will return to the initial power-on status from the “tune” interface.
- If multiple motors are used in parallel, the rated power and rated current input of the motors should be the sum of power and current of these motors.

If two motors are used alternately, the parameters of the motor 2 in the F14 group need to be set separately, and identified based on F14.34.

Chapter 6 Protection/Warning Solutions

6.1 Protection content

When the inverter is in the abnormal status, the digital tube display will show the corresponding protection code and its parameters, the protection relay and protection output terminal will work, and the inverter will stop the output. In case of protection, the motor will stop rotating normally or slow down until it is stopped. The protection contents and solutions of the EM730 series inverter are shown in Table.

Protection code	Protection Type	Protection Cause	Protection Solution
E01	Short circuit protection	1. Short circuit to the ground. 2. Inter-phase short circuit 3. Short circuit of the external braking resistor. 4. The acceleration and deceleration time is too short. 5. The inverter module is damaged. 6. There is excessive on-site interference.	1. Check the wiring for short circuits. 2. Properly increase the acceleration and deceleration time. 3. Investigate the cause and reset the controller after implementing the corresponding solutions. 4. Seek technical support.
E02	Instantaneous overcurrent	1. The acceleration and deceleration time is too short. 2. In the V/F drive mode, the V/F curve setting is unreasonable. 3. The motor is running during startup. 4. The motor used is beyond the capacity of the inverter or the load is too heavy. 5. Motor parameters are not suitable and need to be identified. 6. The phases on the output side of the inverter are short-circuited. 7. The inverter is damaged.	1. Increase the acceleration and deceleration time. 2. Reasonably set the V/F curve. 3. Enable speed tracking or start DC braking. 4. Use the appropriate motor or inverter. 5. Identify the motor parameters. 6. Check the wiring for short circuits. 7. Seek technical support.
E04	Steady-state overcurrent	The same as E02	The same as E02
E05	Overvoltage	1. The deceleration time is too	1. Increase the deceleration time.

		short, and the motor has too much regenerated energy. 2. The braking unit or braking resistor forms an open circuit. 3. The braking unit or braking resistor does not match. 4. The power voltage is too high. 5. The energy consumption braking function is not enabled	2. Check the wiring of the braking unit and braking resistor. 3. Use a suitable braking unit/braking resistor. 4. Reduce the power voltage to the specified range. 5. For the model of the built-in braking unit, set F15.30 to 1, and enable the energy consumption braking.
E06	Undervoltage	1. The input power supply is subject to phase loss. 2. The terminals of the input power supply are loose. 3. The voltage of the input power supply drops too much. 4. The switch contacts of the input power supply are aging.	1. Check the input power supply and wiring. 2. Tighten the screws of input terminals. 3. Check the air circuit breaker and contactor.
E07	Input phase loss	1. The input power supply is subject to phase loss. 2. The input power supply fluctuates greatly.	1. Check the input power supply. 2. Check the wiring of the input power supply. 3. Check whether the terminal is loose 4. Use a voltage regulator on the input side.
E08	Output phase loss	1. The output terminals U, V and W have phase losses.	1. Check the connection between the inverter and motor. 2. Check whether the output terminal is loose. 3. Check whether the motor winding is disconnected.
E09	Inverter overload	1. The acceleration and deceleration time is too short. 2. In the V/F drive mode, the V/F curve setting is unreasonable. 3. The load is too heavy. 4. The braking time is too long, the braking intensity is too high, or DC braking is enabled repeatedly.	1. Increase the acceleration and deceleration time. 2. Reasonably set the V/F curve. 3. Use the inverter that matches the load. 4. Reduce the braking time and braking intensity. Do not enable DC braking repeatedly.
E10	Inverter overheat	1. The ambient temperature is too high. 2. The inverter is subject to poor	1. The operating environment of the inverter should meet the specifications.

		ventilation. 3. The cooling fan fails.	2. Improve the ventilation environment and check whether the air duct is blocked. 3. Replace the cooling fan.
E11	Parameter setting conflict	1. There is a logic conflict in parameter settings.	1. Check whether parameters set is illogical before the protection.
E13	Motor overload	1. The acceleration and deceleration time is too short. 2. In the V/F drive mode, the V/F curve setting is unreasonable. 3. The load is too heavy.	1. Increase the acceleration and deceleration time. 2. Reasonably set the V/F curve. 3. Use a motor matching the load.
E14	External protection	1. The protection terminal of the external device acts.	1. Check the external device.
E15	Inverter memory protection	1. Interference results in memory reading and writing errors. 2. The internal memory of the controller is read and written repeatedly, causing damage to the memory.	1. Press the STOP/RESET key to reset the controller and try again. 2. For the parameters (e.g. frequency setting) to be modified frequently, set F10.56 to 11 after debugging.
E16	Communication error	1. Communication timeout is enabled in the discontinuous communication system. 2. Communication is disconnected.	1. F10.03 is set to 0.0 in the discontinuous communication system. 2. Adjust the F10.03 communication timeout. 3. Check whether the communication cable is disconnected.
E17	Abnormality of inverter temperature sensor	The inverter temperature sensor is disconnected or short-circuited.	1. Check whether the inverter temperature sensor is connected properly. 2. Seek technical support.
E18	The soft start relay is not engaged.	1. The power supply fails during operation. 2. The input power supply is subject to phase loss. 3. The terminals of the input power supply are loose. 4. The voltage of the input power supply drops too much. 5. The switch contacts of the input power supply are aging.	1. Stop the inverter before power-off, or directly reset the protection. 2. Check the input power supply and wiring. 3. Tighten the screws of input terminals. 4. Check the air circuit breaker and contactor.
E19	Error of current detection circuit	The detection circuit of the drive board or control board is damaged.	1. Seek technical support.

E20	Stall protection	1. The deceleration time is too short. 2. Error of dynamic brake for deceleration. 3. The load is too heavy.	1. Increase the deceleration time. 2. Check the dynamic brake. 3. Check whether the motor cannot be stopped as it is driven by another load.
E21	PID feedback disconnection	1. The PID feedback is greater than the upper limit (F09.24) or less than the lower limit (F09.25), depending on the type of the feedback sensor.	1. Check whether the feedback line falls off. 2. Check whether the sensor is working abnormally. 3. Adjust the detection value of feedback disconnection to a reasonable level.
E24	Self-identification error	1. Press the STOP/RESET key during parameter identification. 2. The external terminal stops working (FRS = ON) properly during parameter identification. 3. The motor is not connected. 4. The rotary self-learning motor is not disconnected from the load. 5. The motor fails.	1. Press the STOP/RESET key to reset. 2. The external terminal should not be operated during parameter identification. 3. Check the connection between the inverter and motor. 4. Disconnect the rotary self-learning motor from the load. 5. Check the motor.
E26	Load loss protection	1. The motor is not connected or does not match the load. 2. Load loss occurs. 3. The parameters of load loss protection are not set reasonably.	1、Check the wiring and use the appropriate motor 2、Check the equipment. 3、Change the off-load detection level F07.22 and detection time F07.23.
E27	Up to cumulative power-on time	1. The inverter maintenance time is up.	1. Please contact the dealer for technical support.
E28	Up to cumulative running time	1. The inverter maintenance time is up.	1. Please contact the dealer for technical support.
E44	Wiring protection	1. The valid time of the wiring detection terminal is too long. 2. The invalid time of the wiring detection terminal is too long.	1. Check whether the sensor can work normally. 2. Check whether the terminal is capable of properly judging the closing and opening.
E57	Overpressure in pipeline network	1. The feedback pressure in the water supply application is too high.	1. Check whether the sensor is in the abnormal status. 2. Check the analog terminal for normal detection of analog input.

			3. Check the external device.
E58	Under-pressure in pipeline network	1. The feedback pressure in the water supply application is too low.	1. Check whether the sensor is in the abnormal status. 2. Check the analog terminal for normal detection of analog input. 3. Check the external device.
E76	Short circuit to the ground	1. The output is short-circuited to ground. 2. The inverter module is damaged.	1. Check whether the output cable is broken or whether the motor shell is broken down. 2. Investigate the cause and reset the controller after implementing the corresponding solutions. 3. Seek technical support.

When the inverter is subject to the aforesaid protection, press the STOP/RESET key 

to reset/clear protection or use the protection resetting terminal to exit the protection status. If the protection has been eliminated, the inverter will return to the function setting status; otherwise, the digital tube will continue to display the current protection information.

The protection number corresponds to the digit behind the letter “E”. For example, the digit corresponding to “EXX” is “XX”.

For example, E01 corresponds to 1, and E10 corresponds to 10.

The prompt codes and description of inverter operation are as follows:

Prompt Code	Description
P.-ON	The inverter is in the power-on status.
P.-OFF	The inverter is in the power-off status.
SoFt.E	If the soft starter is not engaged, the inverter will show the SOFT.E prompt after startup. When the voltage is restored and the soft starter is engaged, the inverter will work normally.

6.2 Protection analysis

If the motor does not work as expected due to errors in function setting and external control terminal connection after the inverter is powered on, refer to the analysis in this section for the corresponding solutions. If a protection code is displayed, see the solutions in **错误!未找到引用源。**.

6.2.1 Failure in parameter setting of function codes

- The displayed parameters remain unchanged during the forward or reverse spinning of the digital potentiometer.

When the inverter is in the running status, some code parameters cannot be modified without stopping the inverter.

- The displayed parameters can be modified but cannot be stored during the forward or reverse spinning of the digital potentiometer.

Some function codes are locked and cannot be modified.

When F12.02 is set to 1 or 2, parameter changes are restricted. Please set F12.02 to 0. Or, this occurs after the user password is set.

6.2.2 Abnormality of motor rotation

- When the RUN key 

on the keyboard is pressed, the motor does not rotate.
  - Terminal control of the start and stop: Check the setting of the function code F00.02.
  - The free stop terminal FRS and COM are closed: Disconnect the free stop terminal FRS from COM.
  - Switching of the running command to terminal is valid. In this case, the running command is only subject to terminal control. This will be invalid if modified.
  - The status combination of the running command channel is terminal control: Change it to keyboard control.
  - The reference input frequency is set to 0: Increase the reference input frequency.
  - The input power supply is abnormal or the control circuit fails.
- The control terminals RUN and F/R are ON, and the motor does not rotate.
  - Enabling of the stop function by the external terminal is invalid: Check the setting of function code F00.02.
  - Free stop terminal FRS=ON: Change the free stop terminal to FRS=OFF.
  - Control switch failure: Check the control switch.
  - The reference input frequency is set to 0: Increase the reference input frequency.
- The motor can only rotate in one direction.

Reverse running is prohibited: When the reverse running prohibition code F00.21 is set to 1, the inverter is not allowed for reverse running.

- The motor rotates in the opposite direction.

The output phase sequence of the inverter is inconsistent with the input phase sequence of the motor: Exchange any two of the motor wires in the power-off status to change the rotation direction of the motor.

6.2.3 Too long acceleration time of motor

- The current limit level is too low.

When the overcurrent limit setting is valid, and the output current of the inverter reaches the set current limit, the output frequency will remain unchanged during acceleration, until the output current is less than the limit. Then the output frequency will continue to rise. This makes the acceleration time of the motor longer than the set time. Check whether the set current limit of the inverter is too low.

- The set acceleration time is too long. Please check the acceleration time code.

6.2.4 Too long deceleration time of motor

- When energy consumption braking is valid:
  - The resistance of the braking resistor is too high, and the energy consumption braking power is too low, which extends the deceleration time.
  - The set value of braking rate (F15.32) is too small, which extends the deceleration time. Increase the set value of braking rate.
  - The set deceleration time is too long. Check the deceleration time code.
- When the stall protection is valid:
  - When the overvoltage stall protection is enabled, and the DC bus voltage exceeds the voltage of overvoltage stall (F07.07), the output frequency will remains unchanged; and when the DC bus voltage is lower than F07.07, the output frequency will continue to drop, which extends the deceleration time.
  - The set deceleration time is too long. Check the deceleration time code.

6.2.5 Electromagnetic interference and RF interference

- Since the inverter works in the high-frequency switching status, electromagnetic interference and RF interference will be generate to the control device. The following measures can be taken.
  - Reduce the carrier frequency (F00.23) of the inverter.
  - Install a noise filter on the input side of the inverter.

- Install a noise filter on the output side of the inverter.
- Install a metal tube outside the cables. Install the inverter in a metal casing.
- Make the inverter and motor grounded reliably.
- Connect the main circuit and control circuit separately. Use the shielded cables in the control circuit, and connect them according to the wiring method in Chapter 3.

6.2.6 Action of leakage circuit breaker

- When the inverter is running, the leakage circuit breaker works.

Since the inverter outputs high-frequency PWM signals, a high-frequency leakage current will be generated. Please use the dedicated leakage circuit breaker with the current sensitivity above 30 mA. If an ordinary leakage circuit breaker is used, use a leakage circuit breaker with the current sensitivity above 200 mA and action time of more than 0.1 s.

6.2.7 mechanical vibration

- The inherent frequency of the mechanical system resonates with the carrier frequency of the inverter.

The motor is not faulty, but the mechanical system produces sharp resonant sounds. This is caused by the resonation between the inherent frequency of the mechanical system and carrier frequency of the inverter. Please adjust the carrier frequency (F00.23) to avoid resonation.

- The inherent frequency of the mechanical system resonates with the output frequency of the inverter.

Resonation between the inherent frequency of the mechanical system and output frequency of the inverter will lead to mechanical noise. Please use the vibration suppression function (F05.13), or install the anti-vibration rubber or take other anti-vibration measures on the motor base.

- PID control oscillation

The adjustment parameters P, Ti and Td of the PID controller are not set correctly. Please set the PID parameters again.

6.2.8 Motor rotation in the absence of inverter output

- Insufficient DC braking for stop
  - The DC braking torque for stop is too small. Please increase the set value of the DC braking current for stop (F04.21).

- The DC braking time for stop is short. Please increase the set value of the DC braking time for stop (F04.22). Under normal circumstances, please give priority to increase in the DC braking current for stop.

6.2.9 Inconsistency between output frequency and set frequency

- The set frequency exceeds the upper frequency limit.

When the set frequency exceeds the set value of the upper frequency limit, the output frequency will be the upper frequency limit. Set the frequency again within the upper frequency limit range; or check whether F00.16, F00.17 and F00.18 are appropriate.

Chapter 7 Maintenance

7.1 Daily Maintenance of Inverter

Depending on the usage, the user needs to check the inverter on a regular basis to eliminate faults and safety hazards. Prior to the inspection, turn off the power supply and wait until the LED indicator of the keyboard is OFF, and then wait for 10min. The check content is shown in Table7-1

Table 7-1 Content of Regular Inspection

Check Item	Check Content	Solution
Screws of main circuit terminals and control circuit terminals	Check whether the screws are loose.	Tighten the screws with a screwdriver.
Cooling fins PCB (printed circuit board)	Check whether there is dust or foreign objects.	Purge them with dry compressed air (pressure: 4-6 kg/cm^2).
Cooling fan	Check it for abnormal noise and vibration. Check whether the cumulative running time is up to 20,000 hours.	Replace the cooling fan
Power components	Check whether there is dust.	Purge them with dry compressed air (pressure: 4-6 kg/cm^2).
Electrolytic capacitor	Check it for color changes, odor and bubbles.	Replace the electrolytic capacitor.

In order to make the inverter work properly in a long time, regular maintenance and replacement must be performed regularly based on the service life of its internal components.

Table 7-2 Replacement Intervals of Inverter Components

Name of Part	Standard Replacement Interval (Year)
Cooling fan	2-3 years
Electrolytic capacitor	4-5 years
Printed circuit board	5-8 years

The operating conditions for replacement of the inverter components listed in the above table are as follows:

Ambient temperature: Annual average 30℃.

Load factor: Less than 80%.

Operating time: less than 12 hours per day.

7.2 Instructions for Inverter Warranty

Our company will provide warranty services for the inverter in the following cases.

The warranty applies to the inverter body only. Our company is responsible for the warranty of the inverter that fails or is damaged within 18 months during normal operation, and will charge reasonable maintenance fees after 18 months.

Certain maintenance fees will also be charged within one year in the following cases:

- The inverter is damaged due to noncompliance with the instructions in this manual during operation;
- The inverter is damaged due to flood, fire, abnormal voltage, etc.;
- The inverter is damaged as a result of incorrect wiring;
- The inverter is damaged due to unauthorized modification.

Relevant service fees will be calculated based on the actual costs.

If any, the additional agreement shall prevail.

Chapter 8 Select accessories

8.1 Braking Resistor

If the braking performance does not meet the customer requirements, an external braking resistor is needed to release energy in a timely manner.

The power of the braking resistor can be calculated by the following formula:

Resistor power Pb = inverter power P × braking frequency D

D - Braking frequency. This is an estimated value, depending on the load conditions. Under normal circumstances, D is as follows:

D=10% under ordinary loads

D=5% for occasional braking loads

D = 10% to 15% for elevators

D = 5% to 20% for centrifuges

D = 10% to 20% for oilfield kowtow machines

D = 50% to 60% for unwinding and winding. It should be calculated based on the system design indicators.

D = 50% to 60% for lifting equipment with a lowering height over 100m

The recommended power and resistance for the braking resistor of the EM730 series inverter are given in the table below. The recommended resistor power is calculated based on the braking rate (10% to 20%). It is for reference only. If the inverter is used in the case of frequent acceleration/deceleration or continuous braking, the power of the braking resistor needs to be increased. The user can change the value according to the load conditions, but within the specified range.

Inverter Model	Motor (kW)	Resistance (Ω)	Resistor Power (W)	Wire (mm^2) Connected to Resistor
EM730-0R4-2B	0.4	≧360	≧200	1
EM730-0R7-2B	0.75	≧180	≧400	1.5
EM730-1R5-2B	1.5	≧180	≧400	1.5
EM730-2R2-2B	2.2	≧90	≧800	2.5
EM730-0R7-3B	0.75	≧360	≧200	1
EM730-1R5-3B	1.5	≧180	≧400	1.5
EM730-2R2-3B	2.2	≧180	≧400	1.5
EM730-4R0-3B	4	≧90	≧800	2.5
EM730-5R5-3B	5.5	≧60	≧1000	4
EM730-7R5-3B	7.5	≧60	≧1000	4
EM730-011-3B	11	≧30	≧2000	6
EM730-015-3B	15	≧30	≧2000	6
EM730-018-3B	18.5	≧30	≧2000	6
EM730-022-3B	22	≧15	≧4000	6
EM730-030-3B	30	≧10	≧4000	6
EM730-037-3B	37	≧10	≧6000	6

8.2 Braking unit

For the EM730 series inverters (EM730-045-3 and above), use our BR100 series braking units (power range: 18.5-160kW). The models of our braking units are as follows.

Model and specification	Application	Minimum Resistance (Ω)	Average Braking Current I_{av}(A)	Peak Current I_{max}(A)	Applicable Inverter Power (kW)
BR100-045	Energy consumption braking	10	45	75	18.5 - 45
BR100-160	Energy consumption braking	6	75	150	55 - 160

★ When BR100-160 works with the minimum resistance, the braking unit can work continuously at the braking frequency D=33%.

In the case of D>33%, intermittent operation will be performed; otherwise, the over-temperature protection will be enabled.

8.2.1 Selection of Connecting Wires

Since all braking units and braking resistors work at high voltage (>400VDC) and in the

discontinuous status, please select appropriate wires. See Chapter 3 for the wiring specifications of the main circuit. Use the cables with the conforming insulation levels and cross-sections.

Specification and model	Average Braking Current I_{av}(A)	Peak Braking Current I_{max}(A)	Cross-section (mm^2) of Copper-core Cable
BR100-045	45	75	10
BR100-160	75	150	16
BR100-315	120	300	25

Flexible cables have higher flexibility. Because cables may be in contact with high-temperature devices, it is recommended to use copper-core and heat-resistant flexible cables or flame-retardant cables. The braking unit should be close to the inverter as much as possible and no more than 2m far away from the inverter. Otherwise, the DC-side cables should be twisted and used with magnetic rings to reduce radiation and inductance.

6.3 Wi-Fi module

Applicable Wi-Fi module and model for EM730 series inverters: EM730-WIFI. The inverter can be controlled by the mobile phone APP, PC background software and the like for quick parameter setting, parameter copying and status monitoring of the inverter.

Installation of the Wi-Fi module: First unplug the keyboard from the inverter and then install the Wi-Fi module to the original keyboard position.

The external schematic diagram of the Wi-Fi module is as follows.

Chapter 9 Function Code Table

9.1 Description of Function Code Table

The function codes of the EM730 series inverter (hereinafter referred to as the "function codes") are divided into 21 groups, and each group contains several function codes. Among them, the F18 group is a monitoring parameter group used to view the inverter status; the F19 group is a protection record group used to view the details of the last three protections; and other groups are parameter setting groups to meet different functional requirements.

F00	Basic function parameter group	P61	F01	Parameter group of motor 1	P64
F02	Input terminal function group	P65	F03	Output terminal function group	P69
F04	Start/stop control parameter group	P71	F05	V/F control parameter group	P73
F06	Vector control parameter group	P75	F07	Protection function setting group	P80
F08	Multi-segment speed and simple PLC	P83	F09	PID function group	P88
F10	Communication function group	P90	F11	User-selected parameter group	P92
F12	Keyboard and display function group	P92	F13	Torque control parameter group	P95
F14	Parameter group of motor 2	P96	F15	Auxiliary function group	P96
F16	Customization function group	P100	F17	Virtual I/O function group	P101
F18	Monitoring parameter group	P101	F19	Protection record group	P103
F27	Winding/unwinding application macro parameter group	P105			

★ Some parameters of the current series are reserved, and their readings are 0. Some options of parameters are reserved and settable, but this may result in abnormal operation of the inverter. Please avoid misuse of such parameters.

9.2 Table of functional parameters

Function code	Function code name	Parameter description	Unit	Default setting	Attribute
F00	**Basic function parameter group**				
F00.00	Reserved				
F00.01	Drive control mode of motor 1	0: V/F control (VVF) 1: Speed sensorless vector control (SVC)		0	○
F00.02	Options of command source	0: keyboard control (LOC/REM indicator: ON) 1: terminal control (LOC/REM indicator: OFF) 2: communication control (LOC/REM indicator: flicker)		0	○
F00.03	Options of terminal control mode	0: terminal RUN (running) and F/R (forward/reverse) 1: terminal RUN (forward) and F/R (reverse) 2: terminal RUN (forward), Xi (stop) and F/R (reverse) 3: terminal RUN (running), Xi (stop) and F/R (forward/reverse)		0	○
F00.04	Options of main frequency source A	0: digital frequency setting F00.07 1：AI1 2：AI2 3: retention 4: retention 5: high frequency pulse input (X5) 6: main frequency communication setting (percentage) 7: main frequency communication setting (direct frequency) 8: digital potentiometer setting		8	○
F00.05	Options of auxiliary frequency source B	0: digital frequency setting F00.07 1：AI1 2：AI2 3: retention 4: retention 5: high frequency pulse input (X5) 6: auxiliary frequency communication setting (percentage) 7: auxiliary frequency communication setting (direct frequency) 8: digital potentiometer setting 9: retention 10: process PID 11: simple PLC		0	○
F00.06	Options of frequency source	0: main frequency source A		0	○

		1: auxiliary frequency source B 2: main and auxiliary operation results 3: switching between main frequency source A and auxiliary frequency source B 4: switching between main frequency source A and main and auxiliary operation results 5: switching between auxiliary frequency source B and main and auxiliary operation results 6: Auxiliary frequency source B + feedforward calculation (winding application)			
F00.07	Digital frequency setting	0.00 to maximum frequency F00.16	Hz	50.00	●
F00.08	Options of main and auxiliary operation	0: main frequency source A + auxiliary frequency source B 1: main frequency source A - auxiliary frequency source B 2: larger value of main and auxiliary frequency sources 3: smaller value of main and auxiliary frequency sources		0	○
F00.09	Reference options of auxiliary frequency source B in main and auxiliary operation	0: relative to he maximum frequency 1: Relative to main frequency source A		0	○
F00.10	Gain of main frequency source	0.0～300.0	%	100.0	●
F00.11	Gain of auxiliary frequency source	0.0～300.0	%	100.0	●
F00.12	Synthetic gain of main and auxiliary frequency sources	0.0～300.0	%	100.0	●
F00.13	Analog adjustment of synthetic frequency	0: synthetic frequency of main and auxiliary channels 1: AI1 * synthetic frequency of main and auxiliary channels 2: AI2 * synthetic frequency of main and auxiliary channels 3: retention 4: retention 5: High frequency pulse (PULSE) * synthetic frequency of main and auxiliary channels		0	○
F00.14	Acceleration time 1	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	15.00	●
F00.15	Deceleration time 1	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	15.00	●
F00.16	Maximum frequency	1.00~600.00/1.0~3000.0	Hz	50.00	○
F00.17	Options of upper frequency limit	0: set by F00.18		0	○

	control	1：AI1 2：AI2 3: retention 4: retention 5: high frequency pulse input (X5) 6: Communication setting (percentage) 7: Communication setting (direct frequency)			
F00.18	Upper frequency limit	Lower frequency limit F00.19 to maximum frequency F00.16	Hz	50.00	●
F00.19	Lower frequency limit	0.00 to upper frequency limit F00.18	Hz	0.00	●
F00.20	Running direction	0: consistent direction 1: opposite direction		0	●
F00.21	Reverse control	0: Allow forward/reverse running 1: Prohibit reversing		0	○
F00.22	Duration of forward and reverse dead zone	0.00～650.00	s	0.00	●
F00.23	Carrier frequency	1.0-16.0 (rated power of the inverter: 0.75-4.00kW) 1.0-10.0 (rated power of the inverter: 5.50-7.50kW) 1.0 - 8.0 (rated power of inverter 11.00 - 45.00kW) 1.0 - 4.0 (rated power of inverter 55.00 - 90.00kW) 1.0-3.0 (rated power of inverter: 110.00 and above)	kHz	4.0 (0.75 and below) /2.0	●
F00.24	Automatic adjustment of carrier frequency	0: Invalid 1: valid 1 2: Valid 2		1	○
F00.25	Noise suppression of carrier frequency	0: Invalid 1: valid		0	○
F00.26	Noise suppression tone	20～200	Hz	40	●
F00.27	Noise suppression intensity	10～150	Hz	100	●
F00.28	Options of motor parameter group	0: parameter group of motor 1 1: parameter group of motor 2		0	○
F00.29	User password	0 - 65535		0	○
F00.31	Frequency resolution	0：0.01Hz 1: 0.1Hz (speed unit: 10rpm)		0	○
F00.35	Power supply voltage selection	0: 380V 1: 440V		0	○
F01	**Parameter group of motor 1**				
F01.00	Motor type	0: ordinary asynchronous motor 1: variable-frequency asynchronous motor 2: permanent magnet synchronous motor		0	○
F01.01	Rated power of electric motor	0.10～650.00	kW	Depending on the motor type	○
F01.02	Rated voltage of motor	50～2000	V	Depending	○

				on the motor type	
F01.03	Rated current of motor	0.01 to 600.00 (rated power of motor: ≤ 75 kW) 0.1 to 6000.0 (rated power of motor: > 75 kW)	A	Depending on the motor type	○
F01.04	Rated frequency of motor	0.01～600.00	Hz	Depending on the motor type	○
F01.05	Rated speed	1～60000	rpm	Depending on the motor type	○
F01.06	Motor winding connection	0:Y 1:Δ		Depending on the motor type	○
F01.07	Rated power factor of motor	0.600～1.000		Depending on the motor type	○
F01.08	Motor efficiency	30.0～100.0	%	Depending on the motor type	○
F01.09	Stator resistance of asynchronous motor	1-60000 (rated power of motor: ≤ 75 kW) 0.1-6000.0 (rated power of motor: > 75kW)	mΩ	Depending on the motor type	○
F01.10	Rotor resistance of asynchronous motor	1-60000 (rated power of motor: ≤ 75 kW) 0.1-6000.0 (rated power of motor: > 75kW)	mΩ	Depending on the motor type	○
F01.11	Leakage inductance of asynchronous motor	0.01 to 600.00 (rated power of motor: ≤ 75 kW) 0.001 to 60.000 (rated power of motor: > 75 kW)	mH	Depending on the motor type	○
F01.12	Mutual inductance of asynchronous motor	0.1 to 6000.0 (rated power of motor: ≤ 75 kW) 0.01 to 600.00 (rated power of motor: > 75 kW)	mH	Depending on the motor type	○
F01.13	No-load excitation current of asynchronous motor	0.01 to 600.00 (rated power of motor: ≤ 75 kW) 0.1 to 6000.0 (rated power of motor: > 75 kW)	A	Depending on the motor type	○
F01.14	Flux weakening coefficient 1 of asynchronous motor	10.00 - 100.00	%	87.00	○
F01.15	Flux weakening coefficient 2 of asynchronous motor	10.00 - 100.00	%	80.00	○
F01.16	Flux weakening coefficient 3 f asynchronous motor	10.00 - 100.00	%	75.00	○
F01.17	Flux weakening coefficient 4 f asynchronous motor	10.00 - 100.00	%	72.00	○

F01.18	Flux weakening coefficient 5 f asynchronous motor	10.00 - 100.00	%	70.00	○
F01.19	Stator resistance of synchronous motor	1-60000 (rated power of motor: ≤75kW) 0.1 to 6000.0 (rated power of motor: > 75 kW)	mΩ	Depending on the motor type	○
F01.20	d-axis inductance of synchronous motor	0.01 to 600.00 rated power of motor: ≤ 75 kW) 0.001 to 60.000 (rated power of motor: > 75 kW)	mH	Depending on the motor type	○
F01.21	q-axis inductance of synchronous motor	0.01~600.00 (rated power of motor: ≤ 75 kW) 0.001~60.000 (rated power of motor: > 75kW)	mH	Depending on the motor type	○
F01.22	Counter electromotive force of synchronous motor	10.0-2000.0 (counter electromotive force of rated speed)	V	Depending on the motor type	○
F01.23	Initial electrical angle of synchronous motor	0.0-359.9 (valid for synchronous motor)			○
F01.34	Motor parameter self-learning	00: No operation 01: static self-learning of asynchronous motor 02: rotation self-learning of asynchronous motor 03: inertia self-learning of asynchronous motor 11: static self-learning of synchronous motor 12: rotary self-learning of synchronous motor 13: encoder self-learning of synchronous motor		00	○
F02	**Input terminal function group**				
F02.00	Options of X1 digital input function	0: no function 1: terminal running (RUN) 2: running direction (F/R) 11: multi-segment speed terminal 1 12: multi-segment speed terminal 2 13: multi-segment speed terminal 3 14: multi-segment speed terminal 4 15: multi-segment PID terminal 1 16: multi-segment PID terminal 2 17: multi-segment torque terminal 1 18: multi-segment torque terminal 2 19: acceleration and deceleration time terminal 1 20: acceleration and deceleration time terminal 2 21: Acceleration and deceleration prohibition 22: operation pause 23: External protection input 24: Switching of RUN command to keyboard 25: switching of RUN command to communication 26: Frequency source switching		1	○
F02.01	Options of X2 digital input function			2	○
F02.02	Options of X3 digital input function			11	○
F02.03	Options of X4 digital input function			12	○
F02.04	Options of X5 digital input function			13	○
F02.07	Options of AI1 digital input function			0	○
F02.08	Options of AI2 digital input function			0	○

		27: clearing of regular running time 28: speed control/torque control switching 29: torque control prohibition 30: motor 1/motor 2 switching 31: resetting of simple PLC status (running from the first segment, with the running time cleared) 32: simple PLC time pause (keep running at current segment) 33: retention 34: counter input (≤250Hz) 35: high-speed count input (≤100kHz, only valid for X5) 36: count clearing 37: length counter input (≤250Hz) 38: High-speed length counting input (≤100kHz, only valid for X5) 39: Reset length (clear by meter) 40: Pulse input (≤100kHz, only valid for X5) 41: process PID pause 42: process PID integral pause 43: PID parameter switching 44: PID positive/negative switching 45: stop and DC braking 46: DC braking at stop 47: immediate DC braking 48: fastest deceleration to stop 49: retention 50: external stop 51: switching of main frequency source to digital frequency setting 52: switching of main frequency source to AI1 53: Switching of main frequency source to AI2 54: retention 55: Switching of main frequency source to high-frequency pulse input 56: switching of main frequency source to communication setting 57: inverter enabling 68: Disable reversal 69: prohibit reversing 121: External material cutoff signal 122: Wiring detection signal 123: Brake reset terminal			

F02.15	Positive/negative logic 1 of digital input terminal	D7	D6	D5	D4	D3	D2	D1	D0		00000	○
		*	*	*	X5	X4	X3	X2	X1			
		0: positive logic, valid in the closed state/invalid in the open state 1: Negative logic, invalid in the closed state/valid in the open state										
F02.16	Positive/negative logic 2 of digital input terminal	D7	D6	D5	D4	D3	D2	D1	D0		00	○
		*	*	*	*	*	*	AI2	AI1			
		0: positive logic, valid in the closed state/invalid in the open state 1: Negative logic, invalid in the closed state/valid in the open state										
F02.17	Filtering times of digital input terminal	0-100, 0: no filtering; n: sampling every n ms									2	○
F02.18	X1 valid delay time	0.000-30.000								s	0.000	●
F02.19	X1 invalid delay time	0.000-30.000								s	0.000	●
F02.20	X2 valid delay time	0.000-30.000								s	0.000	●
F02.21	X2 invalid delay time	0.000-30.000								s	0.000	●
F02.22	X3 valid delay time	0.000-30.000								s	0.000	●
F02.23	X3 invalid delay time	0.000-30.000								s	0.000	●
F02.24	X4 valid delay time	0.000-30.000								s	0.000	●
F02.25	X4 invalid delay time	0.000-30.000								s	0.000	●
F02.26	Minimum input pulse frequency	0.00 to maximum input pulse frequency F02.28								kHz	0.00	●
F02.27	Minimum input setting	–100.0 - +100.0								%	0.0	●
F02.28	Maximum input pulse frequency	0.01~100.00								kHz	50.00	●
F02.29	Maximum input setting	–100.0 - +100.0								%	100.0	●
F02.30	Pulse input filtering time	0.00 - 10.00								s	0.10	●
F02.31	Options of analog input function	Ones place: AI1 0: analog input 1: digital input (0 below 1V, 1 above 3V, the same as last time under 1-3V) Tens place: AI2 0: analog input 1: digital input (the same as above)									00B	○

F02.32	Options of analog input curve	Ones place: Options of AI1 curve 0: curve 1 1: curve 2 2: curve 3 3: curve 4 Tens place: AI2 curve selection 0: curve 1 1: curve 2 2: curve 3 3: curve 4		10D	○
F02.33	Minimum input of curve 1	0.00 - F02.35	V	0.10	●
F02.34	Minimum input setting of curve 1	–100.0 - +100.0	%	0.0	●
F02.35	Maximum input of curve 1	F02.33~10.00V	V	9.90	●
F02.36	Maximum input setting of curve 1	–100.0 - +100.0	%	100.0	●
F02.37	Minimum input of curve 2	-10.00V~F02.39	V	0.10	●
F02.38	Minimum input setting of curve 2	–100.0 - +100.0	%	0.0	●
F02.39	Maximum input of curve 2	F02.37~10.00V	V	9.90	●
F02.40	Maximum input setting of curve 2	–100.0 - +100.0	%	100.0	●
F02.41	Minimum input of curve 3	0.00V - F02.43	V	0.10	●
F02.42	Minimum input setting of curve 3	–100.0 - +100.0	%	0.0	●
F02.43	Input of inflection point 1 of curve 3	F02.41 - F02.45	V	2.50	●
F02.44	Input setting of inflection point 1 of curve 3	–100.0 - +100.0	%	25.0	●
F02.45	Input of inflection point 2 of curve 3	F02.43 - F02.47	V	7.50	●
F02.46	Input setting of inflection point 2 of curve 3	–100.0 - +100.0	%	75.0	●
F02.47	Maximum input of curve 3	F02.45 - 10.00	V	9.90	●
F02.48	Maximum input setting of curve 3	–100.0 - +100.0	%	100.0	●
F02.49	Minimum input of curve 4	-10.00 - F02.51	V	-9.90	●
F02.50	Minimum input setting of curve 4	–100.0 - +100.0	%	-100.0	●
F02.51	Input of inflection point 1 of curve 4	F02.49 - F02.53	V	-5.00	●
F02.52	Input setting of inflection point 1 of curve 4	–100.0 - +100.0	%	-50.0	●
F02.53	Input of inflection point 2 of curve 4	F02.51 - F02.55	V	5.00	●
F02.54	Input setting of inflection point 2 of curve 4	–100.0 - +100.0	%	50.0	●
F02.55	Maximum input of curve 4	F02.53 - 10.00	V	9.90	●
F02.56	Maximum input setting of curve 4	–100.0 - +100.0	%	100.0	●

F02.57	AI1 filtering time	0.00 - 10.00	s	0.10	●
F02.58	AI2 filtering time	0.00 - 10.00	s	0.10	●
F02.61	AD hysteresis code	2 - 50		2	○
F02.62	Selection of analog input AI1 type	0: 0~10V 3: -10~10V 4: 0~5V		0	○
F02.63	Selection of analog input AI2 type	0: 0~10V 1: 4~20mA 2: 0~20mA 4: 0~5V		0	
F02.66	Selection of AI2 current input impedance	0: 500Ω 1: 250Ω		0	○
F03	**Output terminal function group**				
F03.00	Options of Y1 output function	0: no output		1	○
F03.02	Options of R1 output function (EA-EB-EC)	1: inverter running (RUN) 2: up to output frequency (FAR) 3: output frequency detection FDT1 4: output frequency detection FDT2 5: reverse running (REV) 6: jog 7: inverter protection 8: inverter ready to run (READY) 9: reach the upper frequency limit 10: reach the lower frequency limit 11: valid current limit 12: valid overvoltage stall 13: complete simple PLC cycle 14: reach the set count value 15: reach the specified count value 16: Length reached (in meters) 17: motor overload pre-alarm 18: inverter overheat pre-alarm 19: reach the upper limit of PID feedback 20: reach the lower limit of PID feedback 21: analog level detection ADT1 22: analog level detection ADT2 24: undervoltage state 26: up to the set time 27: zero-speed running 38: off-load 47: PLC output 67: Brake control 68: Material cutoff detection output		7	○

<table>
<tr><td></td><td></td><td>69: FDT1 lower limit (pulse)
70: FDT2 lower limit (pulse)
71: FDT1 lower limit (pulse, invalid in JOG)
72: FDT2 lower limit (pulse, invalid in JOG)
73: output overcurrent</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">F03.05</td><td rowspan="2">Options of output signal type</td><td><table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>R1</td><td>*</td><td>Y1</td></tr></table></td><td></td><td>0*0</td><td>○</td></tr>
<tr><td>0: level
1: single pulse</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">F03.06</td><td rowspan="2">Positive/negative logic of digital output</td><td><table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>R1</td><td>*</td><td>Y1</td></tr></table></td><td></td><td>0*0</td><td>○</td></tr>
<tr><td>0: positive logic, valid in the closed state/invalid in the open state
1: Negative logic, invalid in the closed state/valid in the open state</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">F03.08</td><td rowspan="2">Output status control in jog</td><td><table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>*</td><td>*</td><td>*</td><td>REV</td><td>FDT2</td><td>FDT 1</td><td>FAR</td><td>RUN</td></tr></table></td><td></td><td>00000</td><td>○</td></tr>
<tr><td>0: valid in jogging
1: invalid in jogging</td><td></td><td></td><td></td></tr>
<tr><td>F03.09</td><td>Y1 valid delay time</td><td>0.000～30.000</td><td>s</td><td>0.000</td><td>●</td></tr>
<tr><td>F03.10</td><td>Y1 invalid delay time</td><td>0.000～30.000</td><td>s</td><td>0.000</td><td>●</td></tr>
<tr><td>F03.13</td><td>R1 valid delay time</td><td>0.000～30.000</td><td>s</td><td>0.000</td><td>●</td></tr>
<tr><td>F03.14</td><td>R1 invalid delay time</td><td>0.000～30.000</td><td>s</td><td>0.000</td><td>●</td></tr>
<tr><td>F03.17</td><td>Single pulse time of Y1 output</td><td>0.001～30.000</td><td>s</td><td>0.250</td><td>●</td></tr>
<tr><td>F03.19</td><td>Single pulse time of R1 output</td><td>0.001～30.000</td><td>s</td><td>0.250</td><td>●</td></tr>
<tr><td>F03.21</td><td>Options of analog output M1</td><td>0: running frequency (absolute value)
1: set frequency (absolute value)
2: output torque (absolute value)
3: set torque (absolute value)
4: output current
5: Output voltage
6: bus voltage
7: output power
8：AI1
9：AI2
12: High-frequency pulse input (with 100%</td><td></td><td>0</td><td>○</td></tr>
</table>

		corresponding to 100.00kHz) 13: Communication setting 1 14: count value 15: length value 16: PID output 18: PID feedback 19: PID setting 30: Communication setting 2			
F03.27	M1 output bias	-100.0～100.0	%	0.0	●
F03.28	M1 output gain	-10.000～10.000		1.000	●
F03.31	Control logic options of PLC output terminal	D7 D6 D5 D4 D3 D2 D1 D0 * * * * * R1 * Y1		0*0	○
		0: Output 1: no output			
F03.34	Selection of analog output M1 type	0: 0~10V 1: 4~20mA 2: 0~20mA		0	○

F04	**Start/stop control parameter group**				
F04.00	Start-up method	0: direct start 1: start of speed tracking		0	○
F04.01	Start frequency	0.00 - 10.00	Hz	0.00	○
F04.02	Start frequency hold time	0.00-60.00, 0.00 is invalid	s	0.00	○
F04.03	Starting current of DC braking	0.0～100.0 (100.0 = Rated current of motor)	%	100.0	○
F04.04	Starting time of DC braking	0.00～30.00 0.00: invalid	s	0.00	○
F04.06	Pre-excitation current	50.0-500.0 (100.0 = no-load current)	%	100.0	○
F04.07	Pre-excitation time	0.00 - 10.00	s	0.10	○
F04.08	Speed tracking mode	Ones place: Tracking start frequency 0: maximum frequency 1: stop frequency 2: power frequency Tens place: Selection of search direction 0: search only in command direction		0	○

		1: Search in the opposite direction if the speed cannot be found in the command direction			
F04.10	Deceleration time of speed tracking	0.1 - 20.0	s	2.0	○
F04.11	Speed tracking current	30.0-150.0 (100.0 = rated current of inverter)	%	50.0	○
F04.12	Speed tracking compensation gain	0.00 - 10.00		1.00	○
F04.14	Acceleration and deceleration mode	0: linear acceleration and deceleration 1: acceleration and deceleration of continuous S curve 2: acceleration and deceleration of intermittent S curve		0	○
F04.15	Starting time of S curve in acceleration	0.00~30.00(F15.13=0) 0.0~300.0(F15.13=1) 0~3000(F15.13=2)	s	1.00	●
F04.16	Ending time of S curve in acceleration	0.00~30.00(F15.13=0) 0.0~300.0(F15.13=1) 0~3000(F15.13=2)	s	1.00	●
F04.17	Starting time of S curve in deceleration	0.00~30.00(F15.13=0) 0.0~300.0(F15.13=1) 0~3000(F15.13=2)	s	1.00	●
F04.18	Ending time of S curve in deceleration	0.00~30.00(F15.13=0) 0.0~300.0(F15.13=1) 0~3000(F15.13=2)	s	1.00	●
F04.19	Stop mode	0: slow down to stop 1: free stop		0	○
F04.20	Starting frequency of DC braking in stop	0.00Hz to maximum frequency F00.16	Hz	0.00	○
F04.21	DC braking current in stop	0.0～100.0 (100.0 = Rated current of motor)	%	50.0%	○
F04.22	DC braking time in stop	0.00～30.00 0.00: invalid	s	0.00	○
F04.23	Demagnetization time for DC braking in stop	0.00 - 30.00	s	0.50	○

F04.24	Flux braking gain	100-150 (100: no flux braking)		100	○
F04.26	Start mode after protection/free stop	0: start according to F04.00 setting mode 1: start of speed tracking		0	○
F04.27	Second confirmation of terminal start command	0: Not required for confirmation 1: to be confirmed		0	○
F04.29	Zero speed check frequency	0.00 - 5.00	Hz	0.25	●
F04.30	Initial magnetic pole search mode of synchronous motor	0: Invalid 1: Mode 1		0	●
F05	**V/F control parameter group**				
F05.00	V/F curve setting	0: straight line V/F 1: multi-point broken line V/F 2: 1.3-power V/F 3: 1.7-power V/F 4: square V/F 5: VF complete separation mode (Ud = 0, Uq = K * t = voltage of separation voltage source) 6: VF semi-separation mode (Ud = 0, Uq = K * t = F/Fe * 2 * voltage of separation voltage source)		0	○
F05.01	Frequency point F1 of multi-point VF	0.00 - F05.03	Hz	0.50	●
F05.02	Voltage point V1 of multi-point VF	0.0～100.0 (100.0 = Rated voltage)	%	1.0	●
F05.03	Frequency point F2 of multi-point VF	F05.01～F05.05	Hz	2.00	●
F05.04	Voltage point V2 of multi-point VF	0.0-100.0	%	4.0	●
F05.05	Frequency	F05.03 to rated frequency of motor (reference frequency)	Hz	5.00	●

	point F3 of multi-point VF				
F05.06	Voltage point V3 of multi-point VF	0.0-100.0	%	10.0	●
F05.07	Voltage source of VF separation mode	0: digital setting of VF separation voltage 1：AI1 2：AI2 4: High-frequency pulse (X5) 5：PID 6: Communication setting Note: 100% is the rated voltage of the motor.		0	○
F05.08	Digital setting of VF separation voltage	0.0-100.0 (100.0 = rated voltage of motor)	%	0.0	●
F05.09	Rise time of VF separation voltage	0.00 - 60.00	s	2.00	●
F05.10	Compensation gain of V/F stator voltage drop	0.00 - 200.00	%	100.00	●
F05.11	V/F slip compensation gain	0.00 - 200.00	%	100.00	●
F05.12	V/F slip filtering time	0.00 - 10.00	s	1.00	●
F05.13	Oscillation suppression gain	0 - 10000		100	●
F05.14	Oscillation suppression cutoff frequency	0.00-600.00	Hz	55.00	●
F05.15	Droop control frequency	0.00 - 10.00	Hz	0.00	●
F05.16	Energy saving rate	0.00 - 50.00	%	0.00	●
F05.17	Energy saving action time	1.00 - 60.00	s	5.00	●
F05.18	Flux compensation	0.00~500.00	%	0.00	●

	gain of synchronous motor				
F05.19	Filtering time constant of flux compensation of synchronous motor	0.00 - 10.00	s	0.50	●
F05.20	Change rate of VF separate power supply setting	-500.0~+500.0	%	0.0	●
F06	**Vector control parameter group**				
F06.00	Speed proportional gain ASR_P1	0.00-100.00		12.00	●
F06.01	Speed integral time constant ASR_T1	0.000-30.000 0.000: no integral	s	0.200	●
F06.02	Speed proportional gain ASR_P2	0.00-100.00		8.00	●
F06.03	Speed integral time constant ASR_T2	0.000-30.000 0.000: no integral	s	0.300	●
F06.04	Switching frequency 1	0.00 to switching frequency 2	Hz	5.00	●
F06.05	Switching frequency 2	Switching frequency 1 to maximum frequency F00.16	Hz	10.00	●
F06.06	No-load current gain	50.0~300.0	%	100.0	●
F06.07	Filtering time constant of speed loop output	0.000 - 0.100	s	0.001	●
F06.08	Vector control slip gain	50.00-200.00	%	100.00	●
F06.09	Upper limit source selection of	0: set by F06.10 and F06.11 1: AI1 2: AI2		0	○

	speed control torque	3: retention 4: retention 5: Communication setting (percentage) 6: the larger of AI1 and AI2 7: The smaller of AI1 and AI2			
F06.10	Upper limit of speed control motor torque	0.0 - 250.0	%	165.0	●
F06.11	Upper limit of speed control brake torque	0.0 - 250.0	%	165.0	●
F06.12	Excitation current proportional gain ACR-P1	0.00-100.00		0.50	●
F06.13	Excitation current integral time constant ACR-T1	0.00-600.00 0.00: no integral	ms	10.00	●
F06.14	Torque current proportional gain ACR-P2	0.00-100.00		0.50	●
F06.15	Torque current integral time constant ACR-T2	0.00-600.00 0.00: no integral	ms	10.00	●
F06.17	SVC zero-frequency processing	0: braking 1: not processed 2: seal the tube		2	○
F06.18	SVC zero-frequency braking current	50.0-400.0 (100.0 is the no-load current of the motor)	%	100.0	○
F06.20	Voltage feedforward gain	0 - 100	%	0	●
F06.21	Flux weakening control options	0: Invalid 1: direct calculation 2: automatic adjustment		2	○
F06.22	Flux	70.00-100.00	%	95.00	●

	weakening voltage				
F06.23	Maximum field weakening current of synchronous motor	0.0-150.0 (100.0 is the rated current of the motor)	%	100.0	●
F06.24	Proportional gain of flux weakening regulator	0.00 - 10.00		0.50	●
F06.25	Integral time of flux weakening regulator	0.01 - 60.00	s	2.00	●
F06.26	MTPA control option of synchronous motor	0: Invalid 1: valid		1	○
F06.27	Self-learning gain at initial position	0 - 200	%	100	●
F06.28	Frequency of low frequency band of injection current	0.00-100.00 (100.00 is the rated frequency of the motor)	%	10.00	●
F06.29	Injection current of low frequency band	0.0-60.0 (100.0 is the rated current of the motor)	%	20.0 40.0-(F16.00=2)	●
F06.30	Regulator gain of low frequency band of injection current	0.00 - 10.00		0.50	●
F06.31	Regulator integral time of low frequency band of injection current	0.00 - 300.00	ms	10.00	●
F06.32	Frequency of	0.00-100.00 (100.00 is the rated frequency of the motor)	%	20.00	●

	high frequency band of injection current				
F06.33	Injection current of high frequency band	0.0-30.0 (100.0 is the rated current of the motor)	%	8.0	●
F06.34	Regulator gain of high frequency band of injection current	0.00 - 10.00		0.50	●
F06.35	Regulator integral time of high frequency band of injection current	0.00 - 300.00	ms	10.00	●
F06.36	Magnetic saturation coefficient of synchronous motor	0.00~1.00		0.75	○
F06.37	Stiffness coefficient of speed loop	0~20		12	●
F06.38	Gain coefficient of sliding mode of synchronous motor	1.00~3.70		3.50	○
F06.39	Error width of sliding mode of synchronous motor	0.005~0.100		0.100	○
F06.40	Amplitude of injected reactive current of synchronous motor	0.0~20.0	%	10.0	○
F06.41	Open-loop low-frequency	0: VF 1: IF		0	○

	processing of synchronous motor	2: IF in start and VF in stop			
F06.42	Open-loop low-frequency processing range of synchronous motor	0.0 - 50.0	%	8.0	○
F06.43	IF injection current	0.0 - 600.0	%	50.0	○
F06.44	Time constant of pull-in current of magnetic pole	0.0 - 6000.0	ms	1.0	○
F06.45	Initial lead angle of magnetic pole	0.0~359.9	°	30.0	○
F06.46	Speed tracking proportional gain of synchronous motor	0.00 - 10.00		1.00	○
F06.47	Speed tracking integral gain of synchronous motor	0.00 - 10.00		1.00	○
F06.48	Filtering time constant of speed tracking of synchronous motor	0.00 - 10.00	ms	0.40	○
F06.49	Speed tracking control intensity of synchronous motor	1.0 - 100.0		5.0	○
F06.50	Speed tracking control threshold of synchronous motor	0.00 - 10.00		0.20	○
F06.51	Rise time of	0.010 - 1.000	s	0.020	○

	injected active current of synchronous motor				
F06.76	Low-speed correction factor of stator resistor of asynchronous motor	10.0~500.0	%	100.0	●
F06.77	Low speed correction factor of rotor resistor of asynchronous motor	10.0~500.0	%	100.0	●
F06.78	Slip gain switching frequency of asynchronous motor	0.10~Fmax	Hz	5.00	○
F07	**Protection function setting group**				
F07.00	Protection shield	E20 * E13 E06 * E04 E07 E08 0: valid protection 1: shielded protection		0*0 0*000	○
F07.01	Motor overload protection gain	0.20 - 10.00		1.00	●
F07.02	Motor overload pre-alarm coefficient	50 - 100	%	80	●
F07.06	Bus voltage control options	Ones place: Instantaneous stop/no-stop function options 0: Invalid 1: deceleration 2: deceleration to stop Tens place: Overvoltage stall function options 0: Invalid 1: valid		10	○
F07.07	Voltage of overvoltage stall control	110.0 - 150.0 (380V, 100.0=537V)	%	131.0(703V)	○
F07.08	Instantaneous	60.0 to instantaneous stop/no-stop recovery voltage (100.0	%	76.0	○

	stop/no-stop operating voltage	= standard bus voltage)			
F07.09	Instantaneous stop/no-stop recovery voltage	Instantaneous stop/no-stop operating voltage to 100.0	%	86.0	●
F07.10	Check time for instantaneous stop/no-stop recovery voltage	0.00-100.00	s	0.50	●
F07.11	Current limit control	0: Invalid 1: limit mode 1 2: limit mode 2		2	○
F07.12	Current limit level	20.0-180.0(100.0 = the rated current of inverter)	%	150.0	●
F07.13	Quick current limit options	0: Invalid 1: valid		0	○
F07.14	Protection retries	0-20; 0: Disable protection retry		0	○
F07.15	Options of digital output action in protection retries	0: no action 1: action		0	○
F07.16	Interval of protection retries	0.01 - 30.00	s	0.50	●
F07.17	Restoration time of protection retries	0.01 - 30.00	s	10.00	●
F07.18	Action option of protection	E08 * E07 * E02 E06 E05 E04 0: allow protection retry 1: disable protection retry		0 *0 *0000	○
F07.19	Action option 1 of protection	E21 E16 E15 E14 E13 * E08 E07 0: free stop 1: stop according to stop mode		000 00*00	○
F07.20	Action option 2 of protection	E28 E27 * E23 0: free stop 1: stop according to stop mode		00*0	○

F07.21	Options of load loss protection	0: Invalid 1: valid		0	●
F07.22	Load loss detection level	0.0-100.0	%	20.0	●
F07.23	Load loss detection time	0.0 - 60.0	s	1.0	●
F07.24	Options of load loss protection action	0: trip protection, free stop 1: trip protection, stop according to stop mode 2: Continue to run, with DO status output		1	○
F07.25	Motor overspeed detection level	0.0-50.0 (reference: maximum frequency F00.16)	%	20.0	●
F07.26	Motor overspeed detection time	0.0-60.0, 0.0: disable motor overspeed protection	s	1.0	●
F07.27	AVR function	0: Invalid 1: valid 2: automatic		1	○
F07.28	Stall protection detection time	0.0-6000.0(0.0: no stallprotection detection)	s	0.0	○
F07.29	Stall control intensity	0 - 100	%	20	○
F07.30	Instantaneous stop/no-stop deceleration time	0.00 - 300.00	s	20.00	○
F07.32	Action option 2 of protection	E10 E13 E15 E16 * E19 E20 * 0: allow protection retry 1: disable protection retry		000 00000	○
F07.34	Action option 3 of protection	* * * * * * E09 E17 0: allow protection retry 1: disable protection retry		*****00	○
F08	**Multi-segment speed and simple PLC**				
F08.00	Multi-segment speed 1	0.00 to maximum frequency F00.16	Hz	0.00	●
F08.01	Multi-segment speed 2	0.00 to maximum frequency F00.16	Hz	5.00	●
F08.02	Multi-segment speed 3	0.00 to maximum frequency F00.16	Hz	10.00	●
F08.03	Multi-segment	0.00 to maximum frequency F00.16	Hz	15.00	●

	speed 4				
F08.04	Multi-segment speed 5	0.00 to maximum frequency F00.16	Hz	20.00	●
F08.05	Multi-segment speed 6	0.00 to maximum frequency F00.16	Hz	25.00	●
F08.06	Multi-segment speed 7	0.00 to maximum frequency F00.16	Hz	30.00	●
F08.07	Multi-segment speed 8	0.00 to maximum frequency F00.16	Hz	35.00	●
F08.08	Multi-segment speed 9	0.00 to maximum frequency F00.16	Hz	40.00	●
F08.09	Multi- speed 10	0.00 to maximum frequency F00.16	Hz	45.00	●
F08.10	Multi-segment speed 11	0.00 to maximum frequency F00.16	Hz	50.00	●
F08.11	Multi-segment speed 12	0.00 to maximum frequency F00.16	Hz	50.00	●
F08.12	Multi-segment speed 13	0.00 to maximum frequency F00.16	Hz	50.00	●
F08.13	Multi-segment speed 14	0.00 to maximum frequency F00.16	Hz	50.00	●
F08.14	Multi-segment speed 15	0.00 to maximum frequency F00.16	Hz	50.00	●
F08.15	Simple PLC running mode	0: stop after a single run 1: stop after a limited number of cycles 2: run at the last segment after a limited number of cycles 3: continuous cycles		0	●
F08.16	Limited number of cycles	1 - 10000		1	●
F08.17	Simple PLC memory options	Ones place: Stop memory options 0: no memory (from the first segment) 1: memory (from the moment of stop) Tens place: Power-down memory options 0: no memory (from the first segment) 1: Memory (from the power-down moment)		0	●
F08.18	Simple PLC time unit	0: s (second) 1: min (minute)		0	●
F08.19	Setting of the first segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1		0	●

		1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4			
F08.20	Running time of the first segment	0.0 - 6000.0	s/min	5.0	●
F08.21	Setting of the second segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.22	Running time of the second segment	0.0 - 6000.0	s/min	5.0	●
F08.23	Setting of the third segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.24	Running time of the third segment	0.0 - 6000.0	s/min	5.0	●
F08.25	Setting of the fourth segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.26	Running time of the fourth segment	0.0 - 6000.0	s/min	5.0	●
F08.27	Setting of the fifth segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options		0	●

		0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4			
F08.28	Running time of the fifth segment	0.0 - 6000.0	s/min	5.0	●
F08.29	Setting of the sixth segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.30	Running time of the sixth segment	0.0 - 6000.0	s/min	5.0	●
F08.31	Setting of the seventh segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.32	Running time of the seventh segment	0.0 - 6000.0	s/min	5.0	●
F08.33	Setting of the eighth segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.34	Running time of the eighth segment	0.0 - 6000.0	s/min	5.0	●
F08.35	Setting of the nineth segment	Ones place: Running direction options 0: forward 1: reverse		0	●

		Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4			
F08.36	Running time of the ninth segment	0.0 - 6000.0	s/min	5.0	●
F08.37	Setting of the tenth segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.38	Running time of the tenth segment	0.0 - 6000.0	s/min	5.0	●
F08.39	Setting of the eleventh segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.40	Running time of the eleventh segment	0.0 - 6000.0	s/min	5.0	●
F08.41	Setting of the twelve segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.42	Running time of the twelfth segment	0.0 - 6000.0	s/min	5.0	●
F08.43	Setting of the thirteenth	Ones place: Running direction options 0: forward		0	●

	segment	1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4			
F08.44	Running time of the thirteenth segment	0.0 - 6000.0	s/min	5.0	●
F08.45	Setting of the fourteenth segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.46	Running time of the fourteenth segment	0.0 - 6000.0	s/min	5.0	●
F08.47	Setting of the fifteenth segment	Ones place: Running direction options 0: forward 1: reverse Tens place: Acceleration and deceleration time options 0: acceleration and deceleration time 1 1: acceleration and deceleration time 2 2: acceleration and deceleration time 3 3: acceleration and deceleration time 4		0	●
F08.48	Running time of the fifteenth segment	0.0 - 6000.0	s/min	5.0	●
F09	**PID function group**				
F09.00	PID setting source	0: digital PID setting 1: AI1 2: AI2 3: Reserved 4: retention 5: PULSE, high-frequency pulse (X5) 6: Communication setting		0	○
F09.01	Digital PID setting	0.0 to PID setting feedback range F09.03		0.0	●

F09.02	PID feedback source	1: AI1 2: AI2 3: Reserved 4: retention 5: PULSE, high-frequency pulse (X5) 6: Communication setting		1	○
F09.03	PID setting feedback range	0.1 - 6000.0		100.0	●
F09.04	PID positive and negative action selection	0: positive 1: negative		0	○
F09.05	Proportional gain 1	0.00-100.00		0.40	●
F09.06	Integral time 1	0.000 - 30.000, 0.000: no integral	s	2.000	●
F09.07	Differential time 1	0.000-30.000	ms	0.000	●
F09.08	Proportional gain 2	0.00-100.00		0.40	●
F09.09	Integral time 2	0.000 - 30.000, 0.000: no integral	s	2.000	●
F09.10	Differential time 2	0.000-30.000	ms	0.000	●
F09.11	PID parameter switching conditions	0: no switching 1: switching via digital input terminal 2: automatic switching according to deviation 3: Automatic switching by frequency		0	●
F09.12	PID parameter switching deviation 1	0.00 - F09.13	%	20.00	●
F09.13	PID parameter switching deviation 2	F09.12 - 100.00	%	80.00	●
F09.14	Initial PID value	0.00-100.00	%	0.00	●
F09.15	PID initial value holding time	0.00～650.00	s	0.00	●
F09.16	Upper limit of PID output	F9.17~+100.0	%	100.0	●
F09.17	Lower limit of PID output	–100.0~F9.16	%	0.0	●
F09.18	PID deviation	0.00-100.00 (0.00: invalid)	%	0.00	●

	limit				
F09.19	PID differential limit	0.00-100.00	%	5.00	●
F09.20	PID integral separation threshold	0.00-100.00 (100.00% = invalid integral separation)	%	100.00	●
F09.21	PID setting change time	0.000-30.000	s	0.000	●
F09.22	PID feedback filtering time	0.000-30.000	s	0.000	●
F09.23	PID output filtering time	0.000-30.000	s	0.000	●
F09.24	Upper limit detection value of PID feedback disconnection	0.00-100.00; 100.00 = invalid feedback disconnection	%	100.00	●
F09.25	Lower limit detection value of PID feedback disconnection	0.00-100.00; 0.00 = invalid feedback disconnection	%	0.00	●
F09.26	Detection time of PID feedback disconnection	0.000-30.000	s	0.000	●
F09.27	PID sleep control options	0: Invalid 1: sleep at zero speed 2: sleep at lower frequency limit 3: sleep with tube sealed		0	●
F09.28	Sleep action point	0.00-100.00 (100.00 corresponds to the PID setting feedback range)	%	100.00	●
F09.29	Sleep delay time	0.0 - 6500.0	s	0.0	●
F09.30	Wake-up action point	0.00-100.00 (100.00 corresponds to the PID setting feedback range)	%	0.00	●
F09.31	Wake-up delay time	0.0 - 6500.0	s	0.0	●
F09.32	Multi-segment PID setting 1	0.0 to PID setting feedback range F09.03		0.0	●
F09.33	Multi-segment PID setting 2	0.0 to PID setting feedback range F09.03		0.0	●

F09.34	Multi-segment PID setting 3	0.0 to PID setting feedback range F09.03		0.0	●
F09.35	Upper limit of feedback voltage	Lower limit of feedback voltage to 10.00	V	10.00	●
F09.36	Lower limit of feedback voltage	0.00 to upper limit of feedback voltage	V	0.00	●
F09.37	Integral action option within set PID change time	0: Always calculate the integral term 1: Calculate the integral term after the F09.21 set time is reached 2: Calculate the integral term when the error is less than F09.38		0 Straight-2	●
F09.38	Integral within set PID change time Input deviation	0.00-100.00	%	0	●
F09.39	Wake-up option	0: target pressure F09.01* coefficient of wake-up action point 1: Wake-up action point (F09.30)		0	○
F09.40	Coefficient of wake-up action point	0.0-100.0 (100% corresponds to PID setting)	%	90.0	●
F09.41	Pipeline network alarm overpressure	0.0 to pressure sensor range F09.03	%	90.0	●
F09.42	Overpressure protection time	0-3600 (0: invalid)	bar	6	●
F09.43	PID reverse limit	0: no limit 1: limit		1	○
F10	**Communication function group**				
F10.00	Local Modbus communication address	1-247; 0: broadcast address		1	○
F10.01	Baud rate of Modbus communication	0:4800 1:9600 2:19200 3:38400 4:57600 5:115200		1	○
F10.02	Modbus data	0: 1-8-N-1 (1 start bit + 8 data bits + 1 stop bit)		0	○

	format	1: 1-8-E-1 (1 start bit + 8 data bits + 1 even parity check bit + 1 stop bit) 2: 1-8-O-1 (1 start bit + 8 data bits + 1 odd parity check bit + 1 stop bit) 3: 1-8-N-2 (1 start bit + 8 data bits + 2 stop bits) 4: 1-8-E-2 (1 start bit + 8 data bits + 1 even parity check bit + 2 stop bits) 5: 1-8-O-2 (1 start bit + 8 data bits + 1 odd parity check bit + 2 stop bits)			
F10.03	485 communicatio n timeout	0.0s-60.0s; 0.0: invalid (valid for the master-slave mode)	s	0.0	●
F10.04	Modbus response delay	1 - 20	ms	2	●
F10.05	Options of master-slave communicatio n function	0: Invalid 1: valid		0	○
F10.06	Master-slave options	0: slave 1: host (Modbus protocol broadcast transmission)		0	○
F10.07	Data sent by host	0: output frequency 1: set frequency 2: output torque 3: set torque 4: PID setting 5: output current		1	○
F10.08	Proportional factor of slave reception	0.00-10.00 (multiple)		1.00	●
F10.09	Host sending interval	0.000-30.000	s	0.200	●
F10.10	Communicatio n protocol option	0: Modbus-RTU protocol		0	×
F10.56	Options of 485 EEPROM writing	0-10: default operation (for commissioning) 11: writing not triggered (available after commissioning)		0	○
F10.57	Enabling of SCI sending timeout resetting	0:invalid resetting 1: valid resetting		1	●
F10.58	Delay time of	110~10000	ms	150	●

	SCI sending timeout resetting				
F10.59	SCI response option	0: Reply to both read and write commands 1: Reply to write commands only 2: No reply to both read and write commands		0	○
F11	**User-selected parameter group (Detail in EM730 User Manual)**				
F12	**Keyboard and display function group**				
F12.00	M.K multi-function key options	0: no function 1: forward jog 2: reverse jog 3: forward/reverse switching 4: quick stop 5: free stop 6. Cursor left		1	○
F12.01	Options of stop function of STOP key	0: valid only in keyboard control 1: with all command channels valid		1	○
F12.02	Parameter locking	0: do not lock 1: reference input not locked 2: all locked, except for this function code		0	●
F12.03	Parameter copying	0: No operation 1: parameter upload to keyboard 2: Download parameters to inverter		0	○
F12.09	Load speed display coefficient	0.01～600.00		30.00	●
F12.10	UP/DOWN acceleration and deceleration rate	0.00: automatic rate 0.05~500.00Hz/s		5.00Hz/s	○
F12.11	Options of UP/DOWN offset clearing	0: Not clear (clear changes in main frequency setting) 1: clear in non-running state 2: Clear by releasing the UP/DOWN button		0	○
F12.12	Options of UP/DOWN power-down saving of offset	0: do not save 1: save (valid after the offset is modified)		1	○
F12.13	Power meter resetting	0: do not clear 1: clear		0	●
F12.14	Restoration of factory defaults	0: No operation 1: restoration of factory defaults (excluding the motor parameters, inverter parameters, manufacturer parameters, running and power-on time record)		0	○
F12.15	Cumulative	0~65535	h	XXX	×

	power-on time (h)				
F12.16	Cumulative power-on time (min)	0 - 59	min	XXX	×
F12.17	Cumulative running time (h)	0~65535	h	XXX	×
F12.18	Cumulative running time (min)	0 - 59	min	XXX	×
F12.19	Rated power of inverter	0.40 - 650.00	kW	Depending on the motor type	×
F12.20	Rated voltage of inverter	60 - 690	V	Depending on the motor type	×
F12.21	Rated current of inverter	0.1 - 1500.0	A	Depending on the motor type	×
F12.22	Performance software S/N 1	XXX.XX		XXX.XX	×
F12.23	Performance software S/N2	XX.XXX		XX.XXX	×
F12.24	Functional software S/N 1	XXX.XX		XXX.XX	×
F12.25	Functional software S/N 2	XX.XXX		XX.XXX	×
F12.26	Keyboard software serial number 1	XXX.XX		XXX.XX	×
F12.27	Keyboard software serial number 2	XX.XXX		XX.XXX	×
F12.28	Serial No. 1	XX.XXX		XX.XXX	×
F12.29	Serial No. 2	XXXX.X		XXXX.X	×
F12.30	Serial No. 3	XXXXX		XXXXX	×
F12.31	LCD language options	0: Chinese 1: English 2: retention		0	●
F12.33	Running status display parameter 1 of Mode 1 (LED stop	0.00 - 99.99		18.00	●

	status display parameter 5)				
F12.34	Running status display parameter 2 of Mode 1 (LED stop status display parameter 1)	0.00 - 99.99		18.01	●
F12.35	Running status display parameter 3 of Mode 1 (LED stop status display parameter 2)	0.00 - 99.99		18.06	●
F12.36	Running status display parameter 4 of Mode 1 (LED stop status display parameter 3)	0.00 - 99.99		18.08	●
F12.37	Running status display parameter 5 of Mode 1 (LED stop status display parameter 4)	0.00 - 99.99		18.09	●
F12.38	LCD large-line display parameter 1	0.00 - 99.99		18.00	●
F12.39	LCD large-line display parameter 2	0.00 - 99.99		18.06	●
F12.40	LCD large-line display parameter 3	0.00 - 99.99		18.09	●
F12.41	Options of UP/DOWN zero crossing	0: Invalid 1: valid		0	○

F12.42	Frequency setting of digital potentiometer	0.00 to maximum frequency F00.16					Hz	0.00	×
F12.43	Digital potentiometer torque setting	0.00-|Digital torque setting F13.02|					%	0.0	×
F12.45	UP/DOWN function options of keyboard	Communication	High-speed pulse	Analog quantity	Digital frequency	Multi-segment speed		00000	○
		0	0	0	0	0			
		0: Invalid 1: valid							
F13	**Torque control parameter group**								
F13.00	Speed/torque control options	0: Speed control 1: Torque control						0	○
F13.01	Options of torque setting source	0: digital torque setting F13.02 1: AI1 2: AI2 3: retention 4: retention 5: high frequency pulse input (X5) 6: Communication setting 7: retention 8: digital potentiometer setting (Full range of the items 1-6, corresponding to F13.02 digital torque setting)						0	○
F13.02	Digital torque setting	-200.0 - 200.0					%	100.0	●
F13.03	Multi-segment torque 1	-200.0 - 200.0					%	0.0	●
F13.04	Multi-segment torque 2	-200.0 - 200.0					%	0.0	●
F13.05	Multi-segment torque 3	-200.0 - 200.0					%	0.0	●
F13.06	Torque control acceleration and deceleration time	0.00 - 120.00					s	0.00	●
F13.08	Upper frequency limit options of	0: set by F13.09 1: AI1 2: AI2						0	○

	torque control	3: retention 4: retention 5: high frequency pulse input (X5) 6: Communication setting (percentage) 7: Communication setting (direct frequency)			
F13.09	Positive upper limit of torque control frequency	0.50to maximum frequency F00.16	Hz	50.00	●
F13.10	Upper frequency limit offset	0.00 to maximum frequency F00.16	Hz	0.00	●
F13.11	Static friction torque compensation	0.0-100.0	%	0.0	●
F13.12	Frequency range of static friction compensation	0.00 - 50.00	Hz	1.00	●
F13.13	Dynamic friction torque compensation	0.0-100.0	%	0.0	●
F13.18	Reverse speed limit options	0 - 100	%	100	●
F13.19	Reverse torque control options	0-1		0	●
F14	**Parameter group of motor 2 (Detail in EM730 User Manual)**				
F15	**Auxiliary function group**				
F15.00	Jog frequency	0.00 to maximum frequency F00.16	Hz	5.00	●
F15.01	Jog acceleration time	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	5.00	●
F15.02	Jog deceleration time	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	5.00	●
F15.03	Acceleration time 2	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	15.00	●
F15.04	Deceleration time 2	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	15.00	●
F15.05	Acceleration time 3	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1)	s	15.00	●

		0 - 65000 (F15.13=2)			
F15.06	Deceleration time 3	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	15.00	●
F15.07	Acceleration time 4	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	15.00	●
F15.08	Deceleration time 4	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	15.00	●
F15.09	Fundamental frequency of acceleration and deceleration time	0: maximum frequency F00.16 1: 50.00Hz 2: set frequency		0	○
F15.10	Automatic switching of acceleration and deceleration time	0: Invalid 1: valid		0	○
F15.11	Switching frequency of acceleration time 1 and 2	0.00 to maximum frequency F00.16	Hz	0.00	●
F15.12	Switching frequency of deceleration time 1 and 2	0.00 to maximum frequency F00.16	Hz	0.00	●
F15.13	Acceleration and deceleration time unit	0:0.01s 1:0.1s 2:1s		0	○
F15.14	Frequency hopping point 1	0.00-600.00	Hz	600.00	●
F15.15	Hopping range 1	0.00-20.00, 0.00 is invalid	Hz	0.00	●
F15.16	Frequency hopping point 2	0.00-600.00	Hz	600.00	●
F15.17	Hopping range	0.00-20.00, 0.00 is invalid	Hz	0.00	●

	2				
F15.18	Frequency hopping point 3	0.00-600.00	Hz	600.00	●
F15.19	Hopping range 3	0.00-20.00, 0.00 is invalid	Hz	0.00	●
F15.20	Detection width of output frequency arrival (FAR)	0.00 - 50.00	Hz	2.50	○
F15.21	Output frequency detection FDT1	0.00 to maximum frequency F00.16	Hz	30.00	○
F15.22	FDT1 hysteresis	-(Fmax-F15.21)～F15.21	Hz	2.00	○
F15.23	Output frequency detection FDT2	0.00 to maximum frequency F00.16	Hz	20.00	○
F15.24	FDT2 hysteresis	-(Fmax-F15.23)～F15.23	Hz	2.00	○
F15.25	Options of analog level detection ADT	0:AI1 1：AI2		0	○
F15.26	Analog level detection ADT1	0.00-100.00	%	20.00	●
F15.27	ADT1 hysteresis	0.00 to F15.26 (valid down in one direction)	%	5.00	●
F15.28	Analog level detection ADT2	0.00-100.00	%	50.00	●
F15.29	ADT2 hysteresis	0.00 to F15.28 (valid down in one direction)	%	5.00	●
F15.30	Options of energy consumption braking function	0: Invalid 1: valid		0	○
F15.31	Energy consumption braking voltage	110.0-140.0 (380V, 100.0 = 537V)	%	125.0	○
F15.32	Braking rate	20-100 (100 means that duty ratio is 1)	%	100	●
F15.33	Operating	0: running at the lower frequency limit		0	○

	mode with set frequency less than lower frequency limit	1: Shutdown 2: zero-speed running			
F15.34	Fan control	0: running after power-on 1: running at startup 2: intelligent operation, subject to temperature control		1	○
F15.35	Overmodulation intensity	1.00 - 1.10		1.05	●
F15.36	Switching options of PWM modulation mode	0: invalid (7-segment PWM modulation) 1: valid (5-segment PWM modulation)		0	○
F15.37	Switching frequency of PWM modulation mode	0.00 to maximum frequency F00.16	Hz	15.00	●
F15.38	Options of dead zone compensation mode	0: no compensation 1: compensation mode 1 2: compensation mode 2		1	○
F15.39	Terminal jog priority	0: Invalid 1: valid		0	○
F15.40	Deceleration time for quick stop	0.00 - 650.00 (F15.13=0) 0.0 - 6500.0 (F15.13=1) 0 - 65000 (F15.13=2)	s	1.00	●
F15.66	Overcurrent detection level	0.1-300.0 (0.0: no detection; 100.0%: corresponding to the rated current of motor)	%	200.0	●
F15.67	Overcurrent detection delay time	0.00-600.00	s	0.00	●
F15.68	Market price	0.00-100.00		1.00	○
F15.69	Power-frequency load factor	30.0-200.0	%	90.0	○
F16	**Customization function group**				
F16.00	Industry application	0: Universal model 1: Water supply application 2: Air compressor application 3: Winding application 4: fan application		0	○

		5: Spindle application of machine tool 6: Extruder application 7: High-speed motor application			
F16.01	Set length	1 - 65535 (F16.13=0) 0.1 - 6553.5 (F16.13=1) 0.01 - 655.35 (F16.13=2) 0.001 - 65.535 (F16.13=3)	m	1000	●
F16.02	Pulses per meter	0.1 - 6553.5		100.0	●
F16.03	Set count value	F16.04 - 65535		1000	●
F16.04	Specified count value	1 - F16.03		1000	●
F16.05	Set time of regular running	0.0-6500.0, 0.0 is invalid	min	0.0	●
F16.06	Agent password	0~65535		0	●
F16.07	Setting of cumulative power-on arrival time	0-65535; 0: disable the protection when the power-on time is up	h	0	●
F16.08	Setting of cumulative running arrival time	0-65535; 0: disable the protection when the running time is up	h	0	●
F16.09	Factory password	0~65535		XXXX	●
F16.10	Analog output percentage corresponding to the count value 0	0.00-100.00	%	0.00	○
F16.11	Analog output percentage corresponding to the set count value	0.00-100.00	%	100.00	○
F16.13	Set length resolution	0:1m 1:0.1m 2:0.01 m 3:0.001m		0	○

F17	Virtual I/O function group (Detail in EM730 User Manual)								
F18	Monitoring parameter group								
F18.00	Output frequency	0.00 to upper frequency limit					Hz	XXX	×
F18.01	Set frequency	0.00 to maximum frequency F00.16					Hz	XXX	×
F18.03	Estimate feedback frequency	0.00 to upper frequency limit					Hz	XXX	×
F18.04	Output torque	-200.0 - 200.0					%	XXX	×
F18.05	Torque setting	-200.0 - 200.0					%	XXX	×
F18.06	Output current	0.00 to 650.00 (rated power of motor: ≤ 75 kW) 0.0 to 6500.0 (rated power of motor: > 75 kW)					A	XXX	×
F18.07	Output current percentage	0.0-300.0 (100.0 = the rated current of inverter)					%	0	×
F18.08	Output voltage	0.0 - 690.0					V	XXX	×
F18.09	DC bus voltage	0 - 1200					V	XXX	×
F18.10	Simple PLC running times	0 - 10000						XXX	×
F18.11	Simple PLC operation stage	1 - 15						XXX	×
F18.12	PLC running time at the current stage	0.0 - 6000.0						XXX	×
F18.14	Load rate	0~65535					rpm	XXX	×
F18.15	UP/DOWN offset frequency	0.00 to 2 * Maximum frequency F00.16					Hz	XXX	×
F18.16	PID setting	0.0 to PID maximum range						XXX	×
F18.17	PID feedback	0.0 to PID maximum range						XXX	×
F18.18	Power meter: MWh	0~65535					MWh	XXX	×
F18.19	Watt-hour meter: kWh	0.0 - 999.9					kWh	XXX	×
F18.20	Output power	-650.00~650.00					kW	XXX	×
F18.21	Output power factor	-1.000 - 1.000						XXX	×
F18.22	Digital input terminal status 1	X5	X4	X3	X2	X1		XXX	×
		0/1	0/1	0/1	0/1	0/1			
F18.23	Digital input terminal status	*	AI2	AI1	*	*		XXX	×
		*	0/1	0/1	*	0/1			

	2								
F18.25	Output terminal state	*	*	R1	*	Y1		XXX	×
		*	*	0/1	*	0/1			
F18.26	AI1	0.0-100.0					%	XXX	×
F18.27	AI2	0.0-100.0					%	XXX	×
F18.31	High-frequency pulse input frequency: kHz	0.00-100.00					kHz	XXX	×
F18.32	High-frequency pulse input frequency: Hz	0~65535					Hz	XXX	×
F18.33	Count value	0~65535						XXX	×
F18.34	Actual length	0~65535					m	XXX	×
F18.35	Remaining time of regular running	0.0 - 6500.0					min	XXX	×
F18.36	Rotor position of synchronous motor	0.0~359.9 °						XXX	×
F18.39	VF separation target voltage	0 - 690					V	XXX	×
F18.40	VF separation output voltage	0 - 690					V	XXX	×
F18.51	PID output	-100.0 - 100.0					%		×
F18.60	Inverter temperature	-40 to 200					℃	0	×
F18.67	Saved electric energy (MWH)	Cumulative energy saving MWH					0～65535	MWh	×
F18.68	Saved electric energy (KWH)	Cumulative energy saving KWH					0.0～999.9	kWh	×
F18.69	Saved electric charge (1,000 yuan)	High cumulative cost saving (*1000)					0～65535		×
F18.70	Saved electric charge (yuan)	Low cumulative cost saving					0.0～999.9		×
F18.71	Power-frequency power consumption MWh	Power-frequency power consumption MWH					0～65535	MWh	×
F18.72	Power-frequen	Power-frequency power consumption KWH					0.0～	kWh	×

	cy power consumption KWh		999.9		
F19	**Protection record group**				
F19.00	Category of last protection	0: No protection E01: output short circuit protection E02: instantaneous overcurrent E04: steady-state overcurrent E05: Overvoltage E06: Undervoltage E07: input phase loss E08: output phase loss E09: inverter overload E10: inverter overheat protection E11: Parameter setting conflict E13: motor overload E14: External protection E15: inverter memory protection E16: communication abnormality E17: Temperature sensor abnormality E18: Abnormal disconnection of soft start relay E19: current detection circuit abnormality E20: Stall protection E21: PID feedback disconnection E22: retention E24: parameter identification abnormality E25: retention E26: Load loss protection E27: up to the cumulative power-on time E28: up to the cumulative running time E43: Material cutoff protection E44: Cable protection E57: Overpressure in pipeline network E58: Under-pressure in pipeline network E76: Short-circuit protection to ground		0	×
F19.01	Output frequency in protection	0.00 to upper frequency limit	Hz	0.00	×
F19.02	Output current in protection	0.00 to 650.00 (rated power of motor: ≤ 75 kW) 0.0 to 6500.0 (rated power of motor: > 75 kW)	A	0.00	×
F19.03	Bus voltage in protection	0 - 1200	V	0	×
F19.04	Operating	0: not running		0	×

	status in protection	1: forward acceleration 2: reverse acceleration 3: forward deceleration 4: reverse deceleration 5: constant speed in forward running 6: reverse constant speed in reverse running			
F19.05	Working time in protection		h	0	×
F19.06	Category of previous protection	Same as F19.00 parameter description		0	×
F19.07	Output frequency in protection		Hz	0.00	×
F19.08	Output current in protection		A	0.00	×
F19.09	Bus voltage in protection		V	0	×
F19.10	Operating status in protection	Same as F19.04 parameter description		0	×
F19.11	Working time in protection		h	0	×
F19.12	Category of two previous protections	Same as F19.00 parameter description		0	×
F19.13	Output frequency in protection		Hz	0.00	×
F19.14	Output current in protection		A	0.00	×
F19.15	Bus voltage in protection		V	0	×
F19.16	Operating status in protection	Same as F19.04 parameter description		0	×
F19.17	Working time in protection		h	0	×
F27	**Winding/unwinding application macro parameter group**				
F27.00	Application macro	0: Winding mode 1: Unwinding mode 2: Wire drawing mode 3: Straight wire drawing machine mode		0	○

F27.01	Feedforward gain action channel	0: feedforward gain * set source B 1: Feedforward gain * set source A 2: Feedforward gain * 10V		1	○
F27.02	Feedforward gain input mode	0: No change in feedforward gain 1: 0.00 to upper limit of feedforward gain 2: - upper limit of feedforward gain to + upper limit of feedforward gain		1	○
F27.03	Feedforward control	Ones place: Feedforward reset option 0: Automatic reset 1: Terminal reset Tens place: Feedforward power-off stop option 0: Save after power failure 1: Not save after power failure Hundreds place: Options of continuous feedforward calculation 0: Not calculate 1: Calculate		10	○
F27.04	Upper limit of feedforward gain	0.00~500.00	%	500.00	○
F27.05	Initial feedforward gain	0.00~500.00	%	50.00	●
F27.06	Feedforward gain filter time	0~1000	ms	0	●
F27.07	Feedforward range 0	0.00 to feedforward range 1	%	4.00	●
F27.08	Feedforward range 1	Feedforward range 0 to feedforward range 2	%	12.00	●
F27.09	Feedforward range 2	Feedforward range 1 to feedforward range 3	%	23.00	●
F27.10	Feedforward range 3	Feedforward range 2 to feedforward range 4	%	37.00	●
F27.11	Feedforward range 4	Feedforward range 3 to feedforward range 5	%	52.00	●
F27.12	Feedforward range 5	Feedforward range 4 to 100.00	%	72.00	●
F27.13	Soft start increment	0.00 - 50.00	%/S	0.60	●
F27.14	Feedforward increment 1	0.00 - 50.00	%/S	0.11	●
F27.15	Feedforward increment 2	0.00 - 50.00	%/S	0.30	●

F27.16	Feedforward increment 3	0.00 - 50.00	%/S	0.75	●
F27.17	Feedforward increment 4	0.00 - 50.00	%/S	1.55	●
F27.18	Feedforward increment 5	0.00 - 50.00	%/S	4.00	●
F27.19	Feedforward increment 6	0.00 - 50.00	%/S	11.00	●
F27.20	Material cutoff control mode	Ones place: Disconnection detection mode 0: Automatic detection 1: External signal Tens place: Material cutoff detection control 0: Detect when the output is greater than the lower limit of material cutoff detection 1: no detection Hundreds place: Material cutoff handling mode 0: Protection of terminal action only 1: Delayed stop and trip protection 2: Material cutoff protection 3: Automatic reset after protection shutdown 4: Material cutoff detection terminal output only (straight wire drawing machine) 5: Automatic reset of cutoff detection terminal (straight wire drawing machine) Thousands place: Brake mode 0: mode 0 1: mode 1 Myriabit: Reverse unwinding mode 0: No speed limit 1: Reverse speed limit by F27.24		01201	○
F27.21	Material cutoff detection delay	0.0~10.0	S	6.0	●
F27.22	Lower limit of material cutoff detection after parking	0.00 - 60.00	Hz	5.00	●
F27.23	Time of continuous running after material cutoff	0.0 - 60.0	S	10.0	●
F27.24	Frequency of continuous	0.00~Fmax	Hz	5.00	●

	running after material cutoff				
F27.25	Brake signal output frequency	0.00~FUP	Hz	2.50	●
F27.26	Braking signal duration	0.0-100.0	S	5.0	●
F27.27	Minimum frequency of wiring detection	0.00~20.00	Hz	10.00	●
F27.28	Judgment time for invalid cable signal	0.1 - 20.0	S	10.0	●
F27.29	Judgment time for valid cable signal	0.1 - 20.0	S	2.0	●
F27.30	Filtering time for material cutoff detection	1~100	ms	5	●
F27.36	Current value of feedforward gain	-500.0~500.0	%		×