EACON 易控

Professional AC Drive Manufacturer

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EC590 AC Drive

Quick Guide V2.3

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EC590 Catalogue

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1. Preface

Thank you for using the EC590 series general vector control AC drive.

Please carefully read this manual before the installation in order to ensure the correct installation and operation of the AC drive, give full play to its superior performance, and ensure safety. Please keep this guide permanently for future maintenance, service and overhaul.

AC drive is a precise electric and electronic product, thus for the safety of the operators and the equipment, please ensure that the installation and parameters adjustment is done by professional motor engineers and the content marked as "Danger", "Notice", etc in this manual must be read carefully. If you have any questions, please contact with the agents of our company, and our technicians are ready to serve you.

The instructions are subject to change, without notice.

You can contact us with any product questions through the following ways.

E-mail
overseas@eacon.cc

Official website
www.eacon-cn.com

EACON WeChat
Subscription

↯ Dangerous and wrong use may cause casualties

↯ Danger

- The power supply must be turned off when laying the wires.
- When the AC power supply is cut off but the indicator light of the manipulator of AC drive is still on, there is still high voltage in the AC drive which is very dangerous, please do not touch the interior circuit and components.
- Do not check the components and signals on the circuit board during operation.
- The terminal of AC drive must be grounded correctly.
- Do not refit or replace the control board and parts without permission, otherwise, there are risks such as electric shock and explosion.

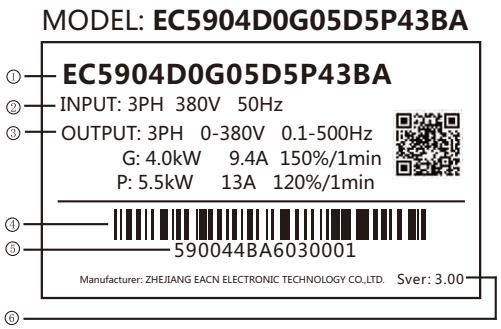
! Wrong use may cause damage to AC drive or mechanical system

! Notice

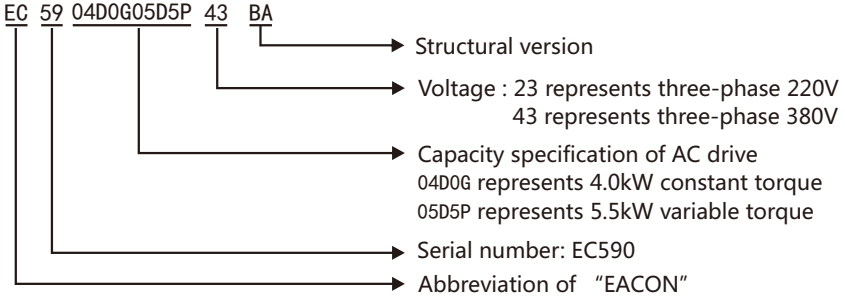
- Please do not test the voltage resistance of the interior components of AC drive, as the semi-conductor of AC drive is easy to be punctured and damaged by high voltage.
- Never connect the main circuit output terminals U, V, and W directly to the AC main circuit power supply.
- The circuit board of the AC drive has CMOS IC which is extremely easy to be damaged by static electricity, thus please do not touch the circuit board with your hand before taking anti-static electricity measures.
- Only the qualified motor professionals can install the driver, lay the wire, repair and maintain the AC drive.
- The scrapping of AC drive shall be treated as industrial waste and burning is strictly prohibited.

2. Description of AC drive

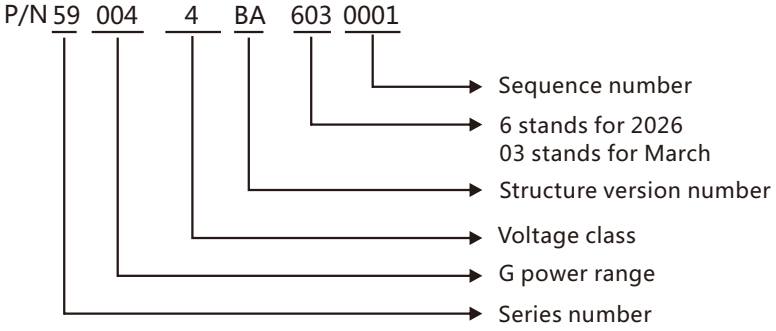
2.1 Description of the label of AC drive



2.2 Description of Model



2.3 Description of Serial number



2.4 Product standard specification

Voltage:220V		Voltage:380V	
Power (kW)	Rated output current (A)	Power (kW)	Rated output current (A)
0.75	4.8	0.75	2.5
1.5	8.0	1.5	4.2
2.2	10.0	2.2	5.6
		4.0	9.4
		5.5	13.0
		7.5	17.0
		11	25.0
		15	32.0
		18.5	38.0
		22	45.0
		30	60.0
		37	75.0
		45	90.0
		55	110.0
		75	150.0
		90	176.0
		110	210.0
		132	253.0
		160	304.0
		185	340.0
		200	380.0
		220	415.0
		250	470.0
		280	510.0
		315	575.0
		355	650.0
		400	725.0
		450	810.0
		500	870.0
		560	990.0

3. Technical Specifications

Item		Specifications
Standard functions	Maximum frequency	0.00 - 500.00 Hz
	Carrier frequency	0.5 - 16 kHz The carrier frequency is automatically adjusted based on the load features.
	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: maximum frequency x 0.025%
	Control mode	Sensorless flux vector control (SVC) Voltage/Frequency (V/F) control
	Startup torque	G type: 0.5 Hz/150% (SVC); P type: 0.5 Hz/100%
	Speed range	1:100 (SVC)
	Speed stability accuracy	±0.5% (SVC)
	Overload capacity	G type: 60s for 150% of the rated current, 3s for 180% of the rated current P type: 60s for 120% of the rated current, 3s for 150% of the rated current
	Torque boost	Customized boost 0.1% - 30.0%
	V/F curve	Straight-line V/F curve;Multi-point V/F curve; N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square)
	V/F separation	Two types: complete separation; half separation
	Acceleration and deceleration mode	Straight-line ramp or S-curve ramp Four groups of acceleration/deceleration time with the range of 0.0 - 6500.0s
	DC braking	DC braking frequency: 0.00 Hz to maximum frequency Braking time: 0.0 - 100.0s Braking action current value: 0.0% - 150.0%
	JOG control	JOG frequency range: 0.00 - maximum frequency JOG acceleration/deceleration time: 0.0 - 6500.0s
	Simple PIC/Multiple preset speeds	It implements up to 16 speeds via the simple PLC function.
	Onboard PID	It realizes process-controlled closed loop control system easily.
	Auto voltage regulation (AVR)	It can keep constant output voltage automatically when the mains voltage changes.
	Overvoltage/ Overcurrent stall control	The current and voltage are limited automatically duringthe running process so as to avoid frequent tripping due to overvoltage/overcurrent.
	High-speed current limiting function	Minimize over-current fault and protect normal operation of AC drive.
	Torque limit and control	It can limit the torque automatically and prevent frequent over current tripping during the running process. Torque control can be implemented in the CLVC mode.

Item		Specifications
Individualized functions	High performance	Control of asynchronous motor and synchronous motor are implemented through the high-performance current vector control technology.
	Power dip ride through	The load feedback energy compensates the voltage reduction so that the AC drive can continue to run for a short time.
	Rapid current limit	It helps to avoid frequent overcurrent faults of the AC drive.
	Timing control	Time range: 0.0 - 6500.0 minutes
	Multiple communication protocols	It supports Modbus.
RUN	Running command source	Operation panel Control terminals Serial communication port You can perform switchover between these sources in various ways.
	Frequency source	There are a total of 10 frequency sources, such as digital setting, analog voltage setting, analog current setting, pulse setting and serial communication port setting. You can perform switchover between these sources in various ways.
	Auxiliary frequency source	There are ten auxiliary frequency sources. It can implement fine tuning of auxiliary frequency and frequency synthesis.
	Input terminal	Standard: 6 digital input (S) terminals, one of which supports up to 100kHz high-speed pulse input 2 analog input (AI) terminals, one of which only supports 0 - 10 V voltage input and the other supports 0 - 10 V voltage input or 0 - 20 mA current input
	Output terminal	Standard 1 high-speed pulse output terminal (open-collector) that supports 0 - 100 kHz square wave signal output 1 digital output (Y) terminal 1 relay output terminal 2 analog output (AO) terminal that supports 0 - 20 mA current output or 0 - 10 V voltage output
Display and operation on the operation panel	LED display	It displays the parameters.
	Key locking and function selection	It can lock the keys partially or completely and define the function range of some keys so as to prevent mis-function.

Item		Specifications
Protection mode	Protection mode	Motor short-circuit detection at power-on, input/output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection and overload protection
Environment	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip or salt.
	Altitude	Lower than 1000m
	Ambient temperature	-10°C to +40°C (de-rated if the ambient temperature is between 40°C and 50°C)
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9m/s (0.6g)
	Storage temperature	-20°C ～ +60°C
	IP level	IP20
	Pollution degree	PD2

4. Mechanical dimension of AC drive

Figure 4-1:

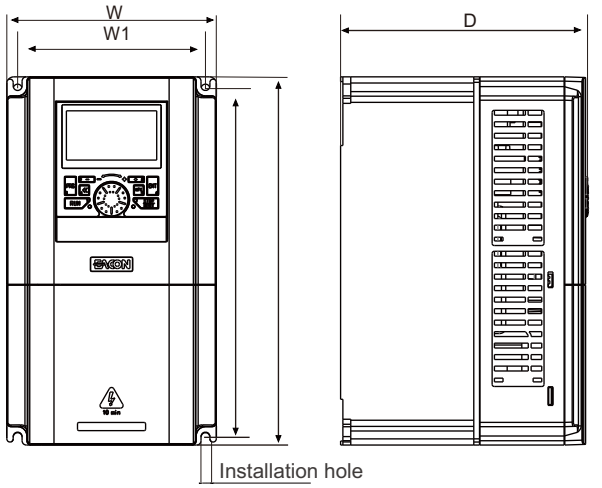
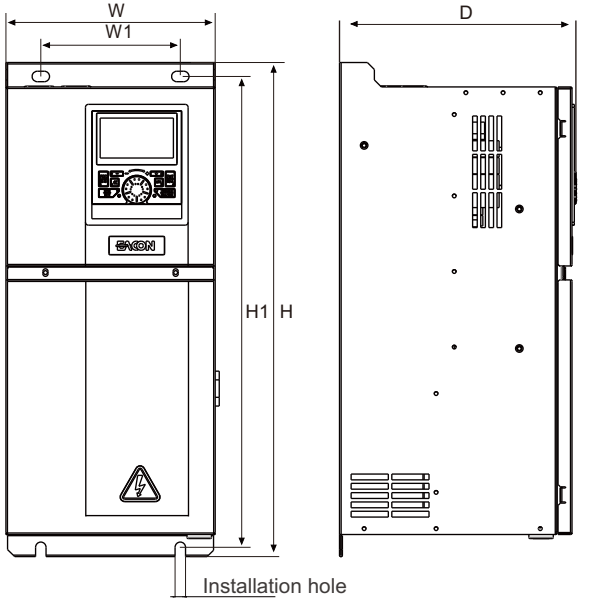


Figure 4-2:



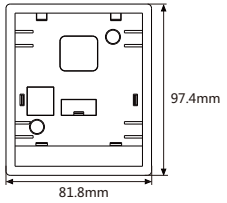
220VClass

Power (kW)	W (mm)	W1	H	H1	D	Installation Hole	Diagram
0.75kW	92	76	171	160	138	Φ4.5	Figure 4-1
1.5kW							
2.2kW							

380V Class

Power (kW)	W (mm)	W1	H	H1	D	Installation Hole	Diagram
0.75kW	126	115	187	175	160	Φ4.6	Figure 4-1
1.5kW							
2.2kW							
4.0kW							
5.5kW							
7.5kW	146	131	257	243	173	Φ5.8	
11kW							
15kW	170	151	320	303	195	Φ5.8	
18.5kW							
22kW							
30kW	180	120	425	405	204	Φ9	Figure 4-2
37kW							
45kW	200	120	510	490	230	Φ9	
55kW							
75kW	270	190	660	630	290	Φ11	
90kW							
110kW	300	210	720	690	290	Φ11	
132kW							
160kW	340	210	800	770	300	Φ11	
185kW							
200kW	393	312	802	777	312	Φ11	
220kW							
250kW	485	400	1023	986	378	Φ16	
280kW							
315kW	570	400	1028	991	428	Φ16	
355kW							
400kW							
450kW	740	520	1248	1211	438	Φ18	
500kW							
560kW							

Installation hole size of pull-out keyboard on operation panel:



Sheet metal installation hole size:
97.4mm*81.8mm

5. Main Circuit Connection Functions

Terminal	Type	Function Description
R/L1 S/L2 T/L3	Main circuit power supply input	Input end of commercial power supply
U/T1 V/T2 W/T3	AC drive output terminal	AC driver output connected with 3-phase induction motor.
PB	External braking resistorconnection	≤37kW with braking component which is connected to terminal ⊕, PB. To improve the brake moment of force, an external braking resistor is needed.
⊕ ⊖	Braking unit or Dc Input connection	1: Machinery≥45kW without built-in braking unit component. To improve braking power, external braking unit and braking resistor is necessary (both are optional accessories). 2: DC input terminal;
⏚	Grounding terminal	For safety and small noise, AC drive's ground terminal EG should be well grounded.

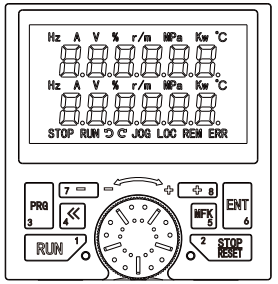
6. AC drive control terminal connections

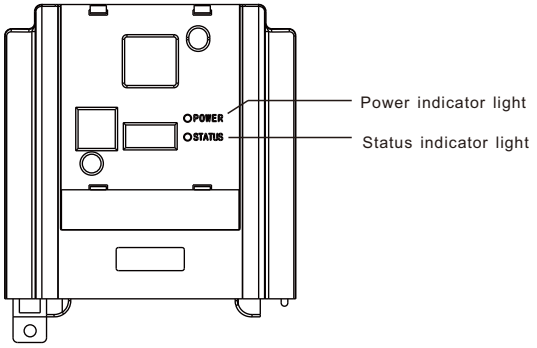
Type	Terminal	Name	Function Description
Power supply	10V-GND	External+10V power supply	Provide +10V power supply for external unit, maximum output current: 10mA Generally, it provides power supply to external potentiometer with resistance range of 1kΩ.～5kΩ.
	24V-COM	External+24V power supply	Provide +24V power supply to external unit, generally, it provides power supply to S/Y terminals and external sensors. Maximum output current: 200mA
	PLC	Input terminal of external power supply	Connect to +24V by default when S1～S6 need to be driven by external signal, PLC needs to be connected to external power supply and be disconnected from +24V power supply terminal.
Analog input	AI1-GND	Analog input termianl 1	1. Input voltage range: DC 0V～10V 2. Impedance: 22kΩ
	AI2-GND	Analog input termianl 2	1. Input range: DC 0V～10V/4mA－20mA, decided by selection of F4-40. 2. Impedance: 22kΩ(voltage input), 500Ω(current input)

Digital input	S1-COM	Digital input 1	1. Optocoupler coupling isolation, compatible with dual polarity input 2. Impedance: 2.4kΩ 3. Voltage range for level input: 9V-30V 4. S5 can be used for high-speed pulse input. Maximum input frequency: 100kHz
	S2-COM	Digital input 2	
	S3-COM	Digital input 3	
	S4-COM	Digital input 4	
	S5-COM	Digital input 5	
	S6-COM	Digital input 6	
Analog output	AO1-GND	Analog output terminal 1	Voltage or current output of AO1 is decided by F5-23. Voltage or current output of AO2 is decided by F5-24. Output voltage range: 0V～10V Output current range: 0mA～20mA
	AO2-GND	Analog output terminal 2	
Digital output	Y3-YC	Trnsistor digital output 3	1. Optocoupler coupling isolation, dual polarity open collector output: 2. Output voltage range: 0～24 V 3. Output current range: 0～50 mA 4. Y4 is limited by F5-00 "HY function enable". As high-speed pulse output, the maximum frequency is 100 kHz. When output as open collector, the specification is the same as Y3. 5. It's disconnected by default at the factory. If you need to connect, you can short-circuit YC and COM by yourself.
	Y4-YC	Trnsistor digital output 4/ High-speed pulse output	
	Y1A/Y1B/ Y1C	Relay digital output 1	Contact driving capacity: 250Vac, 3A, COSØ=0.4. 30Vdc, 1A
	Y2A/Y2B/ Y2C	Relay digital output 2	
Commun-ication	DA, DB	RS485 interface	1. Standard RS485 communication interface;

7. Operation and display

7.1 LED operation panel





7.2 Description of the operation panel indicators

Indicator	Description	Indicator	Description
STOP	Motor stop	RUN	Motor run
↺	Motor reverse rotation	↻	Motor forward rotation
JOG	JOG state	LOC	Control source as panel
REM	Control mode set by the source of F0-02	ERR	AC drive has failure
Hz	Monitoring interface is frequency	A	Monitoring interface is current
V	Monitoring interface is voltage	%	Monitoring interface for percentage display
r/m	Monitoring interface is motor speed	kW	Monitoring interface is power
MPa	Monitoring interface is Mpa under monitor mode setting	℃	Monitoring interface is temperature

7.3 Instruction for local LED indicators

Name	Function Description
Power indicator light	Red light: power on
Status indicator light	Light off: stop status
	Green light on: running
	Yellow light on: fault status

7.4 Description of Keys on the LED operation panel

Key	Name	Function Description
RUN	Running key	In the keyboard operation mode, it is used to run the operation.
STOP/RESET	Stop/Reset	In the running state, press this key to stop; In the fault alarm state, press this key to reset; Its characteristics are constrained by function F7-02.
PRG	Programming key	Level 1 main menu entry or exit.
≪	Shift key	Move the position on the display screen.
ENT	Confirm key	Enter the menu interface step by step; Set parameters.
MFK	Multi functional key	Select function switching according to F7-01, which can be defined as source, or fast direction switching.
−	Incremental key	Increment of data or function code.
+	Decrement key	Decrement of data or function code.
◎	Potentiometer	Increase and decrease of figures.

8. Faults and solutions

Display	Fault name	Possible causes	Solutions
Err02	Overcurrent during acceleration	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The acceleration time is too short. 4: Manual torque boost or V/F curve is not appropriate. 5: The input voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The AC drive model is of too small power class. 9: Subject to external interference.	1: Eliminate external faults. 2: Perform the motor auto-tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to the normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class. 9: According to the historical fault records, if the current value at the time of fault is far from reaching the over-current point value, it is necessary to find the interference suorce.
Err03	Overcurrent during deceleration	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The deceleration time is too short. 4: The input voltage is too low. 5: A sudden load is added during deceleration. 6: The braking unit and braking resistor are not installed. 7: Subject to external interference.	1: Eliminate external faults. 2: Perform the motor autotuning. 3: Increase the deceleration time. 4: Adjust the voltage to the normal range. 5: Remove the added load. 6: Install the braking unit and braking resistor. 7: According to the historical fault records, if the current value at the time of fault is far from reaching the over-current point value, it is necessary to find the interference suorce.
Err04	Overcurrent at constant speed	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The input voltage is too low. 4: A sudden load is added during operation. 5: The AC drive model is of too small power class. 6: Subject to external interference.	1: Eliminate external faults. 2: Perform the motor autotuning. 3: Adjust the voltage to the normal range. 4: Remove the added load. 5: Select an AC drive of higher power class. 6: According to the historical fault records, if the current value at the time of fault is far from reaching the over-current point value, it is necessary to find the interference suorce.
Err05	Overvoltage during acceleration	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed. 5: Subject to external interference.	1: Adjust the voltage to normal range. 2: Remove the external force or install a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor. 5: According to the historical fault records, if the current value at the time of fault is far from reaching the over-current point value, it is necessary to find the interference suorce.

Err06	Overvoltage during deceleration	1: The input voltage is too high. 2: An external force drives the motor during deceleration. 3: The deceleration time is too short. 4: The braking unit and braking resistor are not installed. 5: Subject to external interference.	1: Adjust the voltage to normal range. 2: Remove the external force or install a braking resistor. 3: Increase the deceleration time. 4: Install the braking unit and braking resistor. 5: According to the historical fault records, if the current value at the time of fault is far from reaching the overcurrent point value, it is necessary to find the interference suorce.
Err07	Overvoltage at constant speed	1: The input voltage is too high. 2: An external force drives the motor during running. 3: Subject to external interference.	1: Adjust the voltage to the normal range. 2: Remove the external force or install the braking resistor. 3: According to the historical fault records, if the current value at the time of fault is far from reaching the overcurrent point value, it is necessary to find the interference suorce.
Err08	Control power supply fault	1: The input voltage is not within the allowable range.	1: Adjust the input voltage to the allowable range.
Err09	Undervoltage	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The DC-Bus voltage is abnormal. 4: The rectifier bridge and buffer resistor are faulty. 5: The drive board is faulty. 6: The main control board is faulty.	1: Reset the fault. 2: Adjust the voltage to the normal range. 3: Contact technical support. 4: Contact technical support. 5: Contact technical support. 6: Contact technical support.
Err10	AC drive overload	1: The load is too heavy or locked rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Err11	Motor overload	1: F9-01 is set improperly. 2: The load is too heavy or locked rotor occurs on the motor. 3: The AC drive model is of too small power class.	1: Set it correctly. 2: Reduce the load and check the motor and the mechanical condition. 3: Select an AC drive of higher power class.
Err12	Power input phase loss	1: The three-phase power input is abnormal. 2: The drive board is faulty. 3: The lightening board is faulty. 4: The main control board is faulty.	1: Eliminate external faults. 2: Seek technical support. 3: Seek technical support. 4: Seek technical support.
Err13	Power output phase loss	1: The cable connecting the AC drive and the motor is faulty. 2: The AC drive's three-phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external faults. 2: Check whether the motor three-phase winding is normal. 3: Seek technical support. 4: Seek technical support.

Err14	Module overheat	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the module is damaged. 5: The inverter module is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the inverter module.
Err15	External equipment fault	1: External fault signal is input via S. 2: Input the signal of external fault through virtual IO function.	1:Reset the operation. 2:Reset the operation.
Err16	Communication fault	1: The host computer is in abnormal state. 2: The communication cable is faulty. 3: Incorrect setting of communication expansion card F0-28. 4: The communication parameters in group PB are set improperly.	1: Check the cabling of host computer. 2: Check the communication cabling. 3: Set the communication expansion cardtypes. 4: Set the communication parameters properly.
Err17	Contactor faul	1: The drive board and power supply are faulty. 2: The contactor is faulty.	1: Replace the faulty drive board or power supply board. 2: Replace the faulty contactor.
Err18	Current detection fault	1: The HALL device is faulty. 2: The drive board is faulty.	1: Replace the faulty HALL device. 2: Replace the faulty drive board.
Err19	Motor auto-tuning fault	1: The motor parameters are not set according to the nameplate. 2: The motor auto-tuning times out.	1: Set the motor parameters according to the nameplate properly. 2: Check the cable connecting the AC drive and the motor.
Err20	Encoder fault	1: The encoder type is incorrect. 2: The cable connection of the encoder is incorrect. 3: The encoder is damaged. 4: The PG card is faulty.	1: Set the encoder type correctly based on the actual situation. 2: Eliminate external faults. 3: Replace the damaged encoder. 4: Replace the faulty PG card.
Err21	EEPROM readwrite fault	1: The EEPROM chip is damaged.	1: Replace the main control panel.
Err22	AC drive hardware fault	1: Overvoltage exists. 2: Overcurrent exists.	1: Handle based on over-voltage. 2: Handle based on over-current.
Err23	Short circuit to ground	1: The motor is short circuited to the ground.	1: Replace the cable or motor.
Err26	Running time reached	1: Accumulative running time reaches setting.	1: Clear the record through the parameter initialization function.
Err27	User-defined fault 1	1: Input the signal of user-defined fault 1 through multi-function terminal S. 2: Input the signal of user-defined fault 1 through the virtual IO function.	1: Reset the operation. 2: Reset the operation.
Err28	User-defined fault 2	1: Input the signal of user-defined fault 2 through multi-function terminal S. 2: Input the signal of user-defined fault 2 through the virtual IO function.	1: Reset the operation. 2: Reset the operation.

Err29	Power-on time reached	1: Accumulative power-ontime reaches the setting.	1: Clear the record through the parameter initialization function.
Err30	Load becoming 0	1: The AC drive running current is lower than F9-64.	1: Check the load is disconnected or F9-64 and F9-65 is correct.
Err31	PID feedback lost during running	1: The PID feedback is lower than the setting of FA-26.	1: Check the PID feedback signal or set FA-26 to a proper value.
Err40	Pulse-by-pulse current limit fault	1: The load is too heavy or lockedrotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select the AC drive of higher power class.
Err41	Switching motor fault during operation	1: During the operation of the AC drive, the current motor selection is changed through the terminal.	1: Switch the motor after shutdown.
Err42	Too large speed deviation	1: The encoder parameters are set incorrectly. 2: The motor auto-tuning is not performed. 3: F9-69 and F9-70 are set incorrectly.	1: Set the encoder parameters properly. 2: Perform the motor autotuning. 3: Set F9-69 and F9-70 correctly based on the actual situation.
Err43	Motor over-speed	1: The encoder parameters are set incorrectly. 2: The motor auto-tuning is not performed. 3: F9-67 and F9-68 are set incorrectly	1: Set the encoder parameters properly. 2: Perform the motor auto-tuning. 3: Set F9-67 and F9-68 correctly based on the actual situation.
Err45	Motor overheat	1: The cabling of the temperature sensor becomes loose. 2: The motor temperature is too high.	1: Check the temperature sensor cabling and eliminate the cabling fault. 2: Lower the carrier frequency or adopt other heat radiation measures.
Err51	Pole position detection failed	1: The deviation between the motor parameters and the actual value is too large.	1: Reconfirm whether the motor parameters are correct, and focus on whether the rated current is set too small.
Err56	Over-pressure protection	Automatically resumes operation when pressure drops below the set point.	-
Err57	Low-pressure warning	Monitor the water level and shut down the equipment manually if necessary.	-
Err58	Dry run protection	Wait for the water level to return to normal before resuming operation.	-

Err64	Back-EMF identification anomaly warning	1. Incorrect motor parameter settings. 2. Incorrect back-EMF setting (parameter F1-20) during static identification . 3. Abnormal back-emf identification during dynamic identification. 4. Motor demagnetization has occurred. 5. The motor's back-EMF is indeed too high or too low.	1. Correctly set the motor parameters, especially the rated frequency and rated speed. 2. Check whether the setting of F1-20 is too high or too low and adjust it accordingly. 3. During dynamic identification, ensure that the motor is completely unloaded and rotates up to 40% of the motor's rated speed. If the motor fails to reach 40% of the rated speed due to an attached load disconnect the load and repeat the identification. 4. Check for motor demagnetization. 5. If the motor's back-EMF is confirmed to be too high or too low, you may press the "STOP" key to reset the warning and proceed with the subsequent operation.

9. Function Code Table

When FP-00 is set to a non-zero value, the parameter protection password is set. In the function parameter mode and user change parameter mode, the parameter menu can only be entered after correctly entering the password. Set FP-00 to 0 to cancel the password.

The parameter menu in user-defined parameter mode is not password protected.

Group F and group A are basic function parameters, and group u is monitoring function parameters.

☆ : It is possible to modify the parameter with the AC drive in the Stop and in the Run status.
★ : It is not possible to modify the parameter with the AC drive in the Run status.
● : The parameter is the actual measured value and cannot be modified.
*: The parameter is a factory parameter and can be set only by the manufacturer.

F0 Standard Parameter group

Function Code	Parameter Name	Setting Range	Default	Change
F0-00	AC drive G/P selection	1: G (constant torque load) 2: P (fan and pump)	1	★
F0-01	Motor 1 control mode	0: SVC 2: V/F	2	★
F0-02	Running command selection	0: Operating panel (LED off) 1: Terminal(LED on) 2: Serial communication(LED flashing)	0	☆
F0-03	Main frequency reference setting channel selection	0: Digital setting (revised value is not cleared after power off) 1: Digital setting (revised value is cleared after power off) 2: AI1 3: AI2 4: Reserved 5: Pulse setting(S5) 6: Multi-reference 7: Simple PLC 8: PID reference 9: Communication setting 10:Reserved	1	★
F0-04	Auxiliary frequency reference setting channel selection	Same as F0-03 (Main frequency reference setting channel selection)	0	★
F0-05	Base value of range of auxiliary frequency reference for main and auxiliary calculation	0: Relative to maximum frequency 1: Relative to main frequency reference	0	☆
F0-06	Range of auxiliary frequency reference for main and auxiliary calculation	0% to 150%	100%	☆
F0-07	Final Frequency reference setting selection	BIT 0: Frequency reference selection 0: Main frequency reference 1: Main and auxiliary calculation (based on tens position) 2: Switchover between main and auxiliary 3: Switchover between main and "main & auxiliary calculation" 4: Switchover between auxiliary and "main & auxiliary calculation" 5.Any non-0 value of the main and auxiliary channel is valid, main channel first. BIT 1: main and auxiliary calculation formula 0: Main + auxiliary 1: Main - auxiliary 2: Max. (main, auxiliary) 3: Min. (main, auxiliary)	00	☆

F0-08	Preset frequency	0.00 Hz to F0-10 (Max. frequency)	50.00 Hz	☆
F0-09	Running direction	0: Run in the default direction 1: Run in the direction reverse to the default direction	0	☆
F0-10	Max. frequency	50.00 Hz to 500.00 Hz	50.00Hz	★
F0-11	Setting channel of frequency upper limit	0: Set by F0-12 1: AI1 2: AI2 3: Reserved 4: PULSE reference (S5) 5: Communication reference	0	★
F0-12	Frequency reference upper limit	0.00 Hz to maximum frequency (F0-10)	50.00Hz	☆
F0-13	Frequency reference upper limit offset	0.00 Hz to F0-10 (Max. frequency)	0.00Hz	☆
F0-14	Frequency reference lower limit	0.00 Hz to F0-12 (Frequency reference upper limit)	0.00Hz	☆
F0-15	Carrier frequency	Model dependent	Model dependent	☆
F0-16	Carrier frequency adjusted with load	0: Disabled 1: Enabled	1	☆
F0-17	Acceleration time 1	0.00s to 650.00s(F0-19 = 2) 0.0s to 6500.0s(F0-19 = 1) 0s to 65000s(F0-19 = 0)	Model dependent	☆
F0-18	Deceleration time 1	0.00s to 650.00s(F0-19 = 2) 0.0s to 6500.0s(F0-19 = 1) 0s to 65000s(F0-19 = 0)	Model dependent	☆
F0-19	Acceleration/ Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
F0-21	Frequency offset of auxiliary frequency setting channel for main and auxiliary calculation	0.00 Hz to F0-10 (Max. frequency)	0.00 Hz	☆
F0-22	Frequency reference resolution	1: 0.1Hz 2: 0.01 Hz	2	★
F0-23	Retentive of digital setting frequency upon stop	0: Not retentive 1: Retentive	1	☆
F0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	0	★
F0-25	Acceleration/ Deceleration time base frequency	0: Maximum frequency (F0-10) 1: Frequency reference 2: 100 Hz	0	★
F0-26	Base frequency for UP/ YWN modification during running	0: Running frequency 1: Frequency reference	0	★
F0-27	Running command + frequency source	BIT 0: operating panel (keypad & display) 0: No function 1: Digital setting 2: AI1 3: AI2 4: Reserved 5: Pulse reference (S5) 6: Multi-reference 7: Simple PLC 8: PID reference 9: Serial communication BIT 1: terminal control + frequency reference setting channel	0000	☆

F0-27	Command source + frequency source	BIT 2: serial communication + frequency reference setting channel BIT 3: automatic operation + frequency reference setting channel	0000	☆
F0-28	Serial port communication protocol	0: Modbus protocol	0	★

F1 Motor 1 parameters

Function Code	Parameter Name	Setting Range	Default	Change
F1-00	Motor type selection	0: Common asynchronous motor 2: Permanent Magnet synchronous motor	0	★
F1-01	Motor rated power	0.1kW～1000.0kW	Model dependent	★
F1-02	Motor rated voltage	0.1V～2000V	Model dependent	★
F1-03	Motor rated current	0.01～655.35A (AC Drive<=55kW) 0.1～6553.5A (AC Drive>55kW)	Model dependent	★
F1-04	Motor rated frequency	0.01Hz～maximum frequency	Model dependent	★
F1-05	Motor rated rotational speed	1rpm～65535rpm	Model dependent	★
F1-06	Stator resistance (asynchronous motor)	0.001Ω～65.535Ω (AC Drive<=55kW) 0.0001Ω～6.5535Ω(AC Drive>55kW)	Auto-tuning parameter	★
F1-07	Rotor resistance (asynchronous motor)		Auto-tuning parameter	★
F1-08	Leakage inductive reactance (asynchronous motor)	0.01mH～655.35mH (AC Drive<=55kW) 0.001mH～65.535mH (AC Drive>55kW)	Auto-tuning parameter	★
F1-09	Mutual inductive reactance (asynchronous motor)		Auto-tuning parameter	★
F1-10	No-load current (asynchronous motor)	0.01A～F1-04 (AC Drive<=55kW) 0.1A～F1-04 (AC Drive>55kW)	Auto-tuning parameter	★
F1-16	Synchronous motor stator resistance	0.001Ω～65.535Ω (AC Drive<=55kW) 0.0001Ω～6.5535Ω(AC Drive>55kW)	Auto-tuning parameter	★
F1-17	Synchronous motor D-axis inductance	0.01mH～655.35mH (AC Drive<=55kW) 0.001mH～65.535mH (AC Drive>55kW)	Auto-tuning parameter	★
F1-18	Synchronous motor Q-axis inductance	0.01mH～655.35mH (AC Drive<=55kW) 0.001mH～65.535mH (AC Drive>55kW)	Auto-tuning parameter	★
F1-20	Synchronous motor back electromotive force	0.0V～6553.5V	Auto-tuning parameter	★
F1-27	Number of encoder lines	1～65535	1024	★

F1-28	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Rotating Transformer 4: Provincial line mode UVW encoder	0	★
F1-30	ABZ incremental encoder AB phase sequence	0: Forward 1: Reverse	0	★
F1-31	Encoder installation angle	0.0 ～ 359.9°	0.0°	★
F1-32	UVW encoder UVW phase sequence	0: Forward 1: Reverse	1	★
F1-34	Number of pole pairs for rotary transformers	1～65535	1	★
F1-36	Speed feedback PG disconnection detection time	0.0s: No action 0.1s～10.0s	0.0s	★
F1-37	Auto-tuning selection	0: No auto-tuning 1: Asynchronous motor partial static auto-tuning 2: Asynchronous motor dynamic auto-tuning 3: Asynchronous motor complete static auto-tuning 11: Synchronous on load tuning 12: Synchronous machine no-load tuning	0	★

F2 Vector Control Parameters of Motor 1

Function Code	Parameter Name	Setting Range	Default	Change
F2-00	Speed loop proportional gain 1	1～100	30	☆
F2-01	Speed loop integral time 1	0.01～10.00s	0.50s	☆
F2-02	Switchover frequency 1	0.00～F2-05	5.00Hz	☆
F2-03	Speed loop proportional gain 2	1～100	20	☆
F2-04	Speed loop integral time 2	0.01～10.00s	1.00s	☆
F2-05	Switchover frequency 2	F2-02～maximum frequency	10.00Hz	☆
F2-06	Slip compensation factor	50～200%	100%	☆
F2-07	Time constant of SVC speed loop filter	0.000～0.100s	0.015s	☆
F2-09	Torque upper limit source in speed control mode	0: F2-10 function code setting 1: AI1 2: AI2 3: Reserved 4: Pulse setting (S5) 5: Communication setting 6: MIN(AI1,AI2) 7: MAX(AI1,AI2) The full scale of 1-7 corresponds to F2-10.	0	☆
F2-10	Digital setting of torque upper limit	0.0～200.0%	150.0%	☆

F2-11	Torque limit source in speed control (regenerative)	0: F2-10 (electrical or regenerative) 1: AI1 2: AI2 3: Reserved 4: Pulse reference 5: Communication reference 6: MIN(AI1, AI2) 7: MAX(AI1, AI2) 8: F2-12 The full scale of 1-7 corresponds to F2-12.	0	☆
F2-12	Digital setting of torque limit in speed control (regenerative)	0.0%～200.0%	150.0%	☆
F2-13	Excitation adjustment proportional gain	0～60000	2000	☆
F2-14	Excitation adjustment integral gain	0～60000	1300	☆
F2-15	Torque adjustment proportional gain	0～60000	2000	☆
F2-16	Torque adjustment integral gain	0～60000	1300	☆
F2-17	Speed loop integral separation selection	BIT0: Integral separation 0: Disabled 1: Enabled	0	☆
F2-18	Synchronous machine weak magnetic mode	0,1,2	1	★
F2-19	Weak magnetic coefficient of synchronous machine	1～50	5	☆
F2-20	Maximum weak magnetic current	1～300	50	★
F2-21	Max. torque coefficient of field weakening area	50～200%	100%	☆
F2-22	Regenerative power limit selection	0: Disabled 1: Enabled	0	☆
F2-22	Weak magnetic integral multiple	0, 1	0	★
F2-23	Weak magnetic depth	0～50	5	☆
F2-24	Weak magnetic coefficient of synchronous machine	80～180%	120%	☆
F2-25	Whether the initial position detected	0, 1, 2	0	☆
F2-26	Speed loop mode selection	0～1	0	☆
F2-27	Maximum output adjustment coefficient	50～500	100	☆
F2-28	Enable frequency limiting based on bus voltage	0, 1	0	☆
F2-29	Feedforward compensation mode	0～2	0	☆
F2-30	Current loop KP during tuning	0～100	6	☆

F2-31	Current loop KI during tuning	0～100	6	☆
F2-32	Z signal correction enable	0, 1	1	☆
F2-33	Synchronous SVC speed filtering level	10～1000	100	☆
F2-34	Synchronous SVC speed estimation proportional gain	5～200	40	☆
F2-35	Synchronous SVC speed estimation integral gain	5～500	30	☆
F2-36	Synchronous machine SVC initial excitation current limit	0～80	30	☆
F2-37	Synchronous SVC Minimum Carrier Frequency	0.8～100.0	1.5	☆
F2-38	Low frequency operation mode	0～1	0	☆
F2-39	Low frequency effectiveness	0.00～10.00	0	☆
F2-40	Low frequency step size	5.0E-4～1.0000	0.001	☆
F2-41	Synchronous machine inductance detection current	30～120	80	☆
F2-42	Synchronous SVC speed tracking	0～1	0	☆
F2-43	Zero servo enable	0～1	0	☆
F2-44	Switching frequency	0.00～655.35	0.30	☆
F2-45	Zero servo speed loop proportional gain	1～100	10	☆
F2-46	Zero servo speed loop integration time	0.01s～10.00s	0.50s	☆
F2-47	Shutdown prohibited from reversing	0～1	0	☆
F2-48	Shutdown angle	0.0～10.0	0.8	☆
F2-49	Online tuning enabled	0: Close 1: Tune before the first operation after power on 2: Tune before operation	0	☆
F2-50	Online identification of back electromotive	0: Close 1: Open	0	☆
F2-51	Initial position fault angle	0.0～359.9°	0.0°	☆

F3 V/F Control Parameters				
Function Code	Parameter Name	Setting Range	Default	Change
F3-00	V/F curve setting	0: Linear V/F 1: Multi point 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved 10: V/F complete separation 11: V/F half separation	0	★
F3-01	Torque boost	0.0%: Automatic torque boost 0.1% to 30.0%	Model dependent	☆
F3-02	Cut-off frequency of torque boost	0.00 Hz to the maximum frequency	50.00Hz	★
F3-03	Multi-point V/F frequency point 1	0.00～F3-05	0.00Hz	★
F3-04	Multi-point V/F voltage point 1	0.0～100.0%	0.0%	★
F3-05	Multi-point V/F frequency point 2	F3-03～F3-07	0.00Hz	★
F3-06	Multi-point V/F voltage point 2	0.0～100.0%	0.0%	★
F3-07	Multi-point V/F frequency point 3	F3-05～rated frequency (F1-04)	0.00Hz	★
F3-08	Multi-point V/F voltage point 3	0.0～100.0%	0.0%	★
F3-09	VF slip compensation	0～20.0%	0.0%	★
F3-10	V/F over-excitation gain	0～200	64	☆
F3-11	V/F oscillation suppression gain	0～100	40	☆
F3-13	Voltage source for V/F separation	0: Set by F3-14 1: AI1 2: AI2 3: Reserved 4: Pulse reference (S5) 5: Multi-reference 6: Simple PLC 7: PID reference 8: Communication reference Note: 100.0% corresponds to the rated motor voltage	0	☆
F3-14	Digital setting of voltage for V/F separation	0V to rated motor voltage	0V	☆
F3-15	Voltage rise time of V/F separation	0.0s to 1000.0s Note: It is the time used for the voltage increases from 0V to the rated motor voltage.	0.0s	☆
F3-16	Voltage decline time of V/F separation	0.0s to 1000.0s Note: It is the time used for the voltage increases from 0V to the rated motor voltage.	0.0s	☆
F3-17	Stop mode selection for V/F separation	0: Frequency and voltage declining to 0 independently 1: Frequency declining after voltage declines to 0	0	☆
F3-18	Current limit level	50%～200%	150%	★
F3-19	Current limit selection	0: Disabled 1: Enabled	1	★
F3-20	Current limit gain	0～100	20	☆

F3-21	Compensation factor of speed multiplying current limit	50%～200%	50%	★
F3-22	Voltage limit	650.0V～800.0V	770.0V	★
F3-23	Voltage limit selection	0: Disabled 1: Enabled	1	★
F3-24	Frequency gain for voltage limit	0～100	30	☆
F3-25	Voltage gain for voltage limit	0～100	30	☆
F3-26	Frequency rise threshold during voltage limit	0～50Hz	5Hz	★

F4 Input Terminals				
Function Code	Parameter Name	Setting Range	Default	Change
F4-00	S1 terminal function	0: No function 1: Forward RUN (FWD) or running command 2: Reverse RUN (REV) or running direction (Note: F4-11 must be set when F4-00 is set to 1 or 2.) 3: Three-wire control 4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Terminal UP 7: Terminal YWN 8: Coast to stop 9: Fault reset (RESET) 10: RUN pause 11: External fault normally open (NO) input 12: Multi-reference terminal 1 13: Multi-reference terminal 2 14: Multi-reference terminal 3 15: Multi-reference terminal 4 16: Terminal 1 for acceleration/ deceleration time selection 17: Terminal 2 for acceleration/ deceleration time selection 18: Frequency source switchover 19: UP and YWN setting clear (terminal, operating panel) 20: Running command switchover terminal 1 21: Acceleration/Deceleration prohibited 22: PID pause 23: PLC status reset 24: Wobble pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control prohibited 30: Pulse input (enabled only for S5) 31: Reserved 32: Immediate DC injection braking 33: External fault normally closed (NC) input 34: Frequency modification enabled 35: PID action direction reverse 36: External STOP terminal 1 37: Running command switchover terminal 2 38: PID integral disabled 39: Switchover between main frequency source and preset frequency 40: Switchover between auxiliary frequency source and preset frequency 41: Motor terminal selection 42: Reserved 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/Torque control switchover	1	★
F4-01	S2 terminal function		4	★
F4-02	S3 terminal function		9	★
F4-03	S4 terminal function		12	★
F4-04	S5 terminal function		13	★

F4-05	S6 terminal function	48: External STOP terminal 2 49: Deceleration DC injection braking 50: Clear the current running time 51: Two-wire/Three-wire mode switchover 52: Reverse frequency forbidden 53-59: Reserved	0	★
F4-10	S filter time	0.000s to 1.000s	0.010s	☆
F4-11	Terminal control mode	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2	0	★
F4-12	Terminal UP/YWN rate	0.001Hz/s～65.535Hz/s	1.00Hz/s	☆
F4-13	AI curve 1 minimum input	0.00V～F4-15	0.00V	☆
F4-14	AI curve 1 minimum input corresponding setting	-100.0%～+100.0%	0.0%	☆
F4-15	AI curve 1 maximum input	F4-13～+10.00V	10.00V	☆
F4-16	AI curve 1 maximum input corresponding setting	-100.0%～+100.0%	100.0%	☆
F4-17	AI1 filter time	0.00～10.00s	0.10s	☆
F4-18	AI curve 2 minimum input	0.00V～F4-20	0.00V	☆
F4-19	AI curve 2 minimum input corresponding setting	-100.0%～+100.0%	0.0%	☆
F4-20	AI curve 2 maximum input	F4-18～+10.00V	10.00V	☆
F4-21	AI curve 2 maximum input corresponding setting	-100.0%～+100.0%	100.0%	☆
F4-22	AI2 filter time	0.00～10.00s	0.10s	☆
F4-23	Reserved	-	-	☆
F4-24	Reserved	-	-	☆
F4-25	Reserved	-	-	☆
F4-26	Reserved	-	-	☆
F4-27	Reserved	-	-	☆
F4-28	PULSE minimum input	0.00kHz～F4-30	0.00kHz	☆
F4-29	PULSE minimum inputcorresponding setting	-100.0%～+100.0%	0.0%	☆

F4-30	PULSE maximum input	F4-28～100.00kHz	50.00kHz	☆
F4-31	PULSE maximum inputcorresponding setting	-100.0%～+100.0%	100.0%	☆
F4-32	PULSE filter time	0.00s～10.00s	0.10s	☆
F4-33	AI curve selection	BIT0: AI curve selection 1: curve 1 (2 point, check F4-13～F4-16) 2: curve 2 (2 point, check F4-18～F4-21) 3: curve 3 (2 point, check F4-23～F4-26) 4: curve 4 (4 point, check A6-00～A6-07) 5: curve 5 (4 point, check A6-08～A6-15) BIT 1: AI2 curve selection ditto. BIT 2: Reserved	321	☆
F4-34	AI below minimum input setting selection	BIT 0: AI1 below minimum input setting selection 0: Corresponding to te minimum input setting 1: 0.0% BIT 1: AI2 below minimum input setting selection ditto. BIT 2: Reserved	000	☆
F4-35	S1 delay time	0.0s～3600.0s	0.0s	★
F4-36	S2 delay time	0.0s～3600.0s	0.0s	★
F4-37	S3 delay time	0.0s～3600.0s	0.0s	★
F4-38	S terminal valid mode selection 1	0: Active high 1: Active low BIT 0: S1 BIT 1: S2 BIT 2: S3 BIT 3: S4 BIT 4: S5	00000	★
F4-39	S terminal valid mode selection 2	0: Active high 1: Active low BIT 0: S6 BIT 1: S7 BIT 2: S8 BIT 3: S9 BIT 4: S10	00000	★
F4-40	AI2 current voltage switching	0: 0～10 V 1: 0～20mA	0	★

F5 Output Terminals

Function Code	Parameter Name	Setting Range	Default	Change
F5-00	Y4 output terminal mode selection	0: Pulse output (Y4P) 1: Switch output (Y4R)	0	☆
F5-01	Y4R output function selection	0: No output 1: Inverter is running 2: Fault output (fault for free stop) 3: Frequency level detection FDT1 output 4: Frequency reached 5: Running at zero speed (no output when stopped) 6: Motor overload pre-amarm	0	☆

F5-01	Y4R output function selection	7: Inverter overload pre-amarm 8: Set count value reached 9: The specified count value reached 10: Length arrives 11: PLC cycle completed 12: Accumulated running time reached 13: Frequency limit 14: Torque limit 15: Ready to run 16: AI1>AI2 17: Upper limit frequency reached 18: Lower limit frequency reached (operation related) 19: Brown-out status output 20: Communication settings 21: Positioning complete (reserved) 22: Positioning close (reserved) 23: Running at zero speed 2 (output also when stopped) 24: The cumulative power-on time arrives 25: Frequency detection level FDT2 output 26: Frequency 1 arrives at the output 27: Frequency 2 arrives at the output 28: Current 1 reaches the output 29: Current 1 reaches the output 30: Timed arrival output 31: AI1 input timeout 32: Downloading 33: Running in reverse 34: Zero current state 35: Module temperature reached 36:The output current exceeds the limit 37: The lower limit frequency is reached (it is also output when stopped) 38: Alarm output (all faults) 39: Motor over temperature pre-alarm 40: The running time has arrived 41: Fault output (it is a free stop fault and does not output under voltage)	0	☆
F5-02	Y1 relay function selection		2	☆
F5-03	Y2 relay function selection		0	☆
F5-04	Y3 output function selection		1	☆
F5-06	Y4P output function selection	0: Operating frequency 1: Set frequency 2: Output current 3: Output torque(torque absolute value) 4: Output power 5: Output voltage 6: PULSE input(100.0% correspond 100.0kHz) 7: AI1 8:AI2 9: Reserved 10: Length 11:Count value 12: Communication setting 13: Motor speed 14: Output current (100.0% correspond 1000.0A) 15: Output voltage (100.0% correspond 1000.0V) 16: Output torque (actual torque value)	0	☆
F5-07	AO1 output function selection		0	☆
F5-08	AO2 output function selection		1	☆
F5-09	Y4P output maximum frequency	0.01kHz～100.00kHz	50.00kHz	☆

F5-10	AO1 zero bias coefficient	-100.0%～+100.0%	0.0%	☆
F5-11	AO1 gain	-10.0～+10.0	1.00	☆
F5-12	AO2 zero bias coefficient	-100.0%～+100.0%	0.0%	☆
F5-13	AO1 gain	-10.0～+10.0	1.00	☆
F5-17	Y4R output delay time	0.0s～3600.0s	0.0s	☆
F5-18	Y1 output delay time	0.0s～3600.0s	0.0s	☆
F5-20	Y3 output delay time	0.0s～3600.0s	0.0s	☆
F5-21	Y4 output delay time	0.0s～3600.0s	0.0s	☆
F5-22	Y output terminal valid state selection	0: Positive logic 1: Inverse logic BIT 0: Y4R BIT 1: Y1 BIT 2: - BIT 3: Y3 BIT 4: Y4	00000	☆
F5-23	AO1 current and voltage output switching	0: 0 to 10V 1: 0 to 20mA	0	★
F5-24	AO2 current and voltage output switching	0: 0 to 10V 1: 0 to 20mA	0	★

F6 Start-stop control

Function Code	Parameter Name	Setting Range	Default	Change
F6-00	Start run mode	0: Start and stop directly 1: Speed tracking restart 2: Pre-excitation start(AC asynchronous motor)	0	☆
F6-01	Speed tracking method	0: Start with stop frequency 1: Start from zero speed 2: Start from maximum frequency	0	★
F6-02	Speed tracking speed	1～100	20	☆
F6-03	Start frequency	0.00Hz～10.00Hz	0.00Hz	☆
F6-04	Start frequency hold time	0.0s～100.0s	0.0s	★
F6-05	Start DC braking current/pre-excitation current	0%～100%	0%	★
F6-06	Start DC braking time/pre-excitation time	0.0s～100.0s	0.0s	★

F6-07	Acceleration and deceleration method	0:Linear acceleration time 1、2:Dynamic S-curve acceleration and deceleration	0	★
F6-08	The time ratio of the beginning of the S-curve	0.0%～(100.0%-F6-09)	30%	★
F6-09	The time proportion of the end of the S-curve	0.0%～(100.0%-F6-08)	30%	★
F6-10	Stop mode	0:Decelerate to stop 1:Coast to stop	0	☆
F6-11	DC injection braking start frequency	0.00Hz to the maximum frequency	0.00Hz	☆
F6-12	DC injection braking delay time	0.0s to 100.0s	0.0s	☆
F6-13	DC injection braking level	0% to 100%	0%	☆
F6-14	DC injection braking active time	0.0s to 100.0s	0.0s	☆
F6-15	Braking use ratio	0% to 100%	100%	☆
F6-18	Catching a spinning motor current limit	30% to 200%	Model dependent	★
F6-21	Demagnetization time (effective for SVC)	0.00s to 5.00s	Model dependent	☆

F7 Operating panel and display

Function Code	Parameter Name	Setting Range	Default	Change
F7-00	Reserved	-	-	☆
F7-01	MF.K key function selection	0: MF.K key disabled 1: Switchover from remote control (terminal or communication)to operating panel control 2: Switchover between forward rotation and reverse rotation 3: Forward jog 4: Reverse jog	0	★
F7-02	STOP/RESET key function	0: STOP/RESET key enabled only in operating panel control 1: STOP/RESET key enabled in any operation mode	1	☆
F7-03	LED display running parameters 1	0000 to FFFF BIT 0:Running frequency 1(Hz) BIT 1:Set frequency(Hz) BIT 2:Bus voltage(V) BIT 3:Output voltage(V) BIT 4:Output current(A)	1F	☆

F7-03	LED display running parameters 1	BIT 5: Output power(kW) BIT 6: Output torque 1(%) BIT 7: S state BIT 8: Y state BIT 9: AI1 voltage(V) BIT 10: AI2 voltage(V) BIT 11: Reserved BIT 12: Count value BIT 13: Length value BIT 14: Load speed display BIT 15: PID reference	1F	☆
F7-04	LED display running parameters 2	0000 to FFFF BIT 0: PID feedback BIT 1: PLC stage BIT 2: Pulse reference(kHz) BIT 3: Running frequency 2(Hz) BIT 4: Remaining running time BIT 5: AI1 voltage before correction(V) BIT 6: AI2 voltage before correction(V) BIT 7: Reserved BIT 8: Linear speed BIT 9: Currentpower-on time(h) BIT 10: Currentpower running time(Min) BIT 11: Pulse reference(Hz) BIT 12: Communication reference BIT 13: Enceder feedback speed(Hz) BIT 14: Main frequency X display(Hz) BIT 15: Auxiliary frequency Y display(Hz)	0	☆
F7-05	Display stop parameter	0000 to FFFF BIT 0: Frequency reference(Hz) BIT 1: Bus voltage BIT 2: S state BIT 3: Y state BIT 4: AI1 voltage(V) BIT 5: AI2 voltage(V) BIT 6: Reserved BIT 7: Count value BIT 8: Length value BIT 9: PLC stage BIT 10: Load speed BIT 11: PID reference BIT 12: Pulse reference (kHz)	33	☆
F7-06	Load speed display coefficient	0.0001 to 6.5000	1.0000	☆
F7-07	Inverter module heat sink temperature	-20℃ to 120℃	-	●
F7-08	Product number	-	-	●
F7-09	Accumulative running time	0h to 65535h	-	●
F7-10	Performance software version	-	-	●

F7-11	Function software version	-	-	●
F7-12	Number of decimal places for load speed display	BIT 0: Number of decimal places for U0-14 0: No decimal places 1: One decimal places 2: Two decimal places BIT1: Number of decimal places for U0-19/U0-29 1:One decimal places 2:Two decimal places	20	☆
F7-13	Accumulative power on time	0 to 65535h	-	●
F7-14	Accumulative power consumption	0 to 65535kWh	-	●

F8 Auxiliary Functions

Function Code	Parameter Name	Setting Range	Default	Change
F8-00	Jog frequency refence	0.00Hz to the maximum frequency	2.00Hz	☆
F8-01	Jog acceleration time	0.0s to 6500.0s	20.0s	☆
F8-02	Jog deceleration time	0.0s to 6500.0s	20.0s	☆
F8-03	Acceleration time 2	0.00s to 650.00s (F0-19=2) 0.0s to 6500.0s (F0-19=1) 0s to 65000s (F0-19=0)	Model dependent	☆
F8-04	Deceleration time 2	0.00s to 650.00s (F0-19=2) 0.0s to 6500.0s (F0-19=1) 0s to 65000s (F0-19=0)	Model dependent	☆
F8-05	Acceleration time 3	0.00s to 650.00s (F0-19=2) 0.0s to 6500.0s (F0-19=1) 0s to 65000s (F0-19=0)	Model dependent	☆
F8-06	Deceleration time 3	0.00s to 650.00s (F0-19=2) 0.0s to 6500.0s (F0-19=1) 0s to 65000s (F0-19=0)	Model dependent	☆
F8-07	Acceleration time 4	0.00s to 650.00s (F0-19=2) 0.0s to 6500.0s (F0-19=1) 0s to 65000s (F0-19=0)	0.0s	☆
F8-08	Deceleration time 4	0.00s to 650.00s (F0-19=2) 0.0s to 6500.0s (F0-19=1) 0s to 65000s (F0-19=0)	0.0s	☆
F8-09	Frequency jump 1	0.00Hz to the maximum frequency	0.00Hz	☆
F8-10	Frequency jump 2	0.00Hz to the maximum frequency	0.00Hz	☆
F8-11	Frequency jump band	0.00Hz to the maximum frequency	0.00Hz	☆
F8-12	Forward/Reverse run switch over dead-zone time	0.0s to 3000.0s	0.0s	☆

F8-13	Reverse RUN selection	0: Disable 1: Enable	0	☆
F8-14	Running mode when frequency lower than frequency lower limit	0: Run at frequency reference lower limit 1: Stop 2: Run at zero speed	1	☆
F8-15	Droop rate	0.00% to 100.00%	0.00%	☆
F8-16	Accumulative running time threshold	0 to 65000h	0h	☆
F8-17	Accumulative running time threshold	0 to 65000h	0h	☆
F8-18	Startup protection selection	0: Disabled 1: Enabled	0	☆
F8-19	Frequency detection value 1	0.00Hz to the maximum frequency	50.00Hz	☆
F8-20	Frequency detection hystersis 1	0.0% to 100.0%(FDTI level)	5.0%	☆
F8-21	Detection width of target frequency reached	0.0% to 100.0%(maximum frequency)	0.0%	☆
F8-22	Jump frequency function	0: Disabled 1: Enabled	0	☆
F8-25	Switch over frequency of acceleration time 1 and acceleration time 2	0.00Hz to the maximum frequency	0.00Hz	☆
F8-26	Switch over frequency of deceleration time 1 and deceleration time 2	0.00Hz to the maximum frequency	0.00Hz	☆
F8-27	Set highest priority to terminal JOG function	0: Disabled 1: Enabled	1	☆
F8-28	Frequency detection value (FDT2)	0.00Hz to the maximum frequency	50.00Hz	☆
F8-29	Frequency detection hysteresis (FDT2)	0.0% to 100.0%(FDT2 level)	5.0%	☆
F8-30	Detection of frequency 1	0.00Hz to the maximum frequency	50.00Hz	☆
F8-31	Detection width of frequency 1	0.0% to 100.0%(maximum frequency)	0.0%	☆
F8-32	Detection of frequency 2	0.00Hz to the maximum frequency	50.00Hz	☆
F8-33	Detection width of frequency 2	0.0% to 100.0%(maximum frequency)	0.0%	☆
F8-34	Zero current detection level	0.0% to 300.0% 100% corresponds to the rated motor current	5.0%	☆
F8-35	Zero current detection delay	0.01s～600.00s	0.10s	☆

F8-36	Output over current threshold	0.0%(no detection) 0.1% to 300.00% (rated motor current)	200.0%	☆
F8-37	Output over current detection delay	0.00s～600.00s	0.00s	☆
F8-38	Detection level of current 1	0.0% to 300.0% (rated motor current)	100.0%	☆
F8-39	Detection width of current 1	0.0% to 300.0% (rated motor current)	0.0%	☆
F8-40	Detection level of current 2	0.0% to 300.0% (rated motor current)	100.0%	☆
F8-41	Detection width of current 2	0.0% to 300.0% (rated motor current)	0.0%	☆
F8-42	Timing function	0: Disabled 1: Enabled	0	★
F8-43	Running time setting channel	0: Set by F8-44(running time) 1: AI1 2: AI2 3: Reserved (100% of analog input corresponds to the value of F8-44)	0	★
F8-44	Running time	0.0Min to 6500.0Min	0.0Min	★
F8-45	AI1 input voltage lower limit	0.00V to F8-46	3.10V	☆
F8-46	AI1 input voltage upper limit	F8-45 to 10.00V	6.80V	☆
F8-47	IGBT temperature	0℃ to 100℃	75℃	☆
F8-48	Cooling fan working mode	0: Working during running 1: Working continuously	0	☆
F8-49	Wake up frequency	F8-51(hibernating frequency)to F0-10(maximum frequency)	0.00Hz	☆
F8-50	Wake up delay time	0.0s to 6500.0s	0.0s	☆
F8-51	Hibernating frequency	0.00Hz to F8-49(wake up frequency)	0.00Hz	☆
F8-52	Hibernating delay time	0.0s to 6500.0s	0.0s	☆
F8-53	Running time threshold this time	0.0 to 6500.0Min	0Min	☆
F8-54	Output power correction coefficient	0.00% to 200.0%	100.0%	☆

F9 Fault and protection

Function Code	Parameter Name	Setting Range	Default	Change
F9-00	Motor overload protection	0: Disabled 1: Enabled	1	☆
F9-01	Motor overload protection gain	0.20 to 10.00	1.00	☆

F9-02	Motor overload pre-warning coefficient	50% to 100%	80%	☆
F9-03	Overvoltage protection gain	0 to 100	30	☆
F9-04	Overvoltage protection voltage	650V to 680V	770V	☆
F9-05	Over current stall gain	0 ～ 100	100	☆
F9-06	Over current stall protection current	0% ～ 1%	0	☆
F9-07	Detection of short-circuit to ground	BIT 0: Detection of short-circuit to ground upon power on 0: Disabled 1: Enabled BIT1: Detection of short-circuit to ground before running 0: Disabled 1: Enabled	01	☆
F9-08	Braking unit applied voltage	650V to 800V	760V	☆
F9-09	Auto reset times	0 to 20	0	☆
F9-10	Selection of Y action during auto reset	0: Not act 1: Act	0	☆
F9-11	Delay of auto reset	0.1s to 100.0s	1.0s	☆
F9-12	Input phase loss/Contactor protection	BIT0: Input phase loss protection 0: Disabled 1: Enabled BIT1: Contactor closing protection selection 0: Disabled 1: Enabled	11	☆
F9-13	Output phase loss protection	BIT0: Output phase loss protection 0: Disabled 1: Enabled BIT1: Contactor protection before running 0: Disabled 1: Enabled	01	☆
F9-14	1st fault type	0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during deceleration 4: Overcurrent at constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed 8: Pre-charge power fault 9: Undervoltage 10: AC drive overload 11: Motor overload 12: Input phase loss 13: Output phase loss 14: IGBT overheat 15: External fault 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto-tuning fault	-	●
F9-15	2nd fault type		-	●

F9-16	3rd (latest) fault type	20: Encoder/PG card fault 21: Parameter read and write fault 22: AC drive hardware fault 23: Motor short circuited to ground 24: Reserved 25: Reserved 26: Accumulative running time reached 27: User-defined fault 1 28: User-defined fault 2 29: Accumulative power-on time reached 30: Load lost 31: PID feedback lost during running 40: Fast current limit timeout 41: Motor switchover error during running 42: Too large speed deviation 43: Motor over-speed 45: Motor overheat 51: Initial position error 55: Slave error in master-slave control	-	●
F9-17	Frequency upon 3rd (latest) fault	-	-	●
F9-18	Current upon 3rd (latest) fault	-	-	●
F9-19	Bus voltage upon 3rd (latest) fault	-	-	●
F9-20	S state upon 3rd (latest) fault	-	-	●
F9-21	Y state upon 3rd (latest) fault	-	-	●
F9-22	AC drive state upon 3rd (latest) fault	-	-	●
F9-23	Power-on time upon 3rd (latest) fault	-	-	●
F9-24	Running time upon 3rd (latest) fault	-	-	●
F9-27	Frequency upon 2nd fault	-	-	●
F9-28	Current upon 2nd fault	-	-	●
F9-29	Bus voltage upon 2nd fault	-	-	●
F9-30	S state upon 2nd fault	-	-	●
F9-31	Y state upon 2nd fault	-	-	●

F9-32	AC drive state upon 2nd fault	-	-	●
F9-33	Power-on time upon 2nd fault	-	-	●
F9-34	Running time upon 2nd fault	-	-	●
F9-37	Frequency upon 1st fault	-	-	●
F9-38	Current upon 1st fault	-	-	●
F9-39	Bus voltage upon 1st fault	-	-	●
F9-40	S state upon 1st fault	-	-	●
F9-41	Y state upon 1st fault	-	-	●
F9-42	AC drive state upon 1st fault	-	-	●
F9-43	Power-on time upon 1st fault	-	-	●
F9-44	Running time upon 1st fault	-	-	●
F9-47	Fault protection action selection 1	BIT0: Motor overload (Err11) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run BIT1: Input phase loss (Err12) BIT2: Output phase loss (Err13) BIT3: Thousands: External fault (Err15) BIT4: Communication fault (Err16)	00000	☆
F9-48	Fault protection action selection 2	BIT0: Encoder fault (Err20) 0: Coast to stop BIT1: EEPROM read-write fault (Err21) 0: Coast to stop 1: Stop according to the stop mode BIT2: Reserve BIT3: Motor overheat (Err45) BIT4: Accumulative running time reached(Err26)	00000	☆
F9-49	Fault protection action selection 3	BIT0: User-defined fault 1 (Err27) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run BIT1: User-defined fault 2 (Err28) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run BIT2: Accumulative power-on time reached (Err29) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run	00000	☆

F9-49	Fault protection action selection 3	BIT3: Load lost (Err30) 0: Coast to stop 1: Deceleration to stop 2: Continue to run at 7% of rated motor frequency and restore to the frequency reference if the load recovers BIT4: PID feedback lost during running (Err31) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run	00000	☆
F9-50	Fault protection action selection 4	BIT0: Too large speed feedback error(Err42) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run BIT1: Motor overspeed (Err43) BIT2: Initial position fault(Err51)	0000	☆
F9-54	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Frequency reference 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon abnormality	0	☆
F9-55	Backup frequency upon fault	0.0% to 100.0% (100.0% corresponds to F0-10.)	100.0%	☆
F9-56	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	0	☆
F9-57	Motor overheat protection threshold	0℃ to 200℃	110℃	☆
F9-58	Motor overheat pro-warning threshold	0℃ to 200℃	90℃	☆
F9-59	Power dip ride-through function selection	0: Disabled 1: Bus voltage constant control 2: Decelerate to stop	0	☆
F9-60	Threshold of power dip ride-through function disabled	80% to 100%	85.0%	☆
F9-61	Judging time of bus voltage recovering from power dip	0.0 to 100.0s	0.50s	☆
F9-62	Threshold of power dip ride-through function enabled	60% to 100%	80.0%	☆
F9-63	Load lost protection	0: Disabled 1: Enabled	0	☆
F9-64	Load lost detection level	0.0 to 100.0%	10.0%	☆
F9-65	Load lost detection time	0.0 to 60.0s	1.0s	☆
F9-67	Overspeed detection level	0.0% to 50.0% (maximum frequency)	20.0%	☆

F9-68	Overspeed detection time	0.0s: Not detected 0.1 to 60.0s	1.0s	☆
F9-69	Detection level of speed error	0.0% to 50.0% (maximum frequency)	20.0%	☆
F9-70	Detection time of speed error	0.0s: Not detected 0.1 to 60.0s	5.0s	☆
F9-71	Power dip ride-through gain Kp	0 to 100	40	☆
F9-72	Power dip ride-through integral coefficient Ki	0 to 100	30	☆
F9-73	Deceleration time of power dip ride-through	0 to 300.0s	20.0s	★
F9-74	UVW encoder malfunction enable	0 to 1	1	☆
F9-75	Initial position fault enable	BIT0: Initial position fault enable 0: Close 1: Open BIT1: Enable zero point position angle tuning fault with load 0: Close 1: Open	11	☆

FA PID Function

Function Code	Parameter Name	Setting Range	Default	Change
FA-00	PID reference setting channel	0: Set by FA-01 (PID digital setting) 1: AI1 2: AI2 3: Reserved 4: Pulse reference (S5) 5: Communication reference 6: Multi-reference	0	☆
FA-01	Set pressure	0 to FA-04	0.300	☆
FA-02	PID feedback setting channel	0:AI1 1:AI2 2:Reserved 3:AI1-AI2 4:Pulse reference (S5) 5: Communication reference 6: AI1 + AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|)	0	☆
FA-03	PID operation direction	0: Forward 1: Reverse	0	☆
FA-04	Set pressure range	0 to 65.535	1.000	☆
FA-05	Proportional gain Kp1	0.0 to 100.0	20.0	☆
FA-06	Integral time TI1	0.01s to 10.00s	2.00s	☆

FA-07	Differential time TD1	0.000s to 10.000s	0.000s	☆
FA-08	PID output limit in reverse direction	0.00 Hz to the maximum frequency	0.00Hz	☆
FA-09	PID error limit	0.0% to 100.0%	0.0%	☆
FA-10	PID differential limit	0.00% to 100.00%	0.10%	☆
FA-11	PID reference change time	0.00 to 650.00s	0.00s	☆
FA-12	PID feedback filter time	0.00 to 60.00s	0.00s	☆
FA-13	PID output filter time	0.00 to 60.00s	0.00s	☆
FA-14	Reserved	-	-	☆
FA-15	Proportional gain Kp2	0.0 to 100.0	20.0	☆
FA-16	Integral time Ti2	0.01s to 10.00s	2.00s	☆
FA-17	Differential time Td2	0.000s to 10.000s	0.000s	☆
FA-18	PID parameter switchover condition	0: No switchover 1: Switchover using S 2: Auto switchover based on PID error 3: Auto switchover based on running frequency	0	☆
FA-19	PID error 1 for auto switchover	0.0% to FA-20 (PID error 2 for auto switchover)	20.0%	☆
FA-20	PID error 2 for auto switchover	FA-19 (PID error 1 for auto switchover) to 100.0%	80.0%	☆
FA-21	PID initial value	0.0% to 100.0%	0.0%	☆
FA-22	PID initial value active time	0.00 to 650.00s	0.00s	☆
FA-23	Reserved	-	-	☆
FA-24	Reserved	-	-	☆
FA-25	PID integral property	BIT 0: Integral separation 0: Disabled 1: Enabled BIT 1: Whether to stop integral operation when the PID output reaches the limit 0: Continue integral operation 1: Stop integral operation	00	☆
FA-26	Detection level of PID feedback loss	0.0%: No detection 0.1% to 100.0%	0.0%	☆
FA-27	Detection time of PID feedback loss	0.0s to 20.0s	0.0s	☆
FA-28	Selection of PID operation at stop	0: Stop and do not operate 1: Compute shutdown	0	☆

FB Fixed Length and Count

Function Code	Parameter Name	Setting Range	Default	Change
FB-05	Set length	0 m to 65535 m	1000m	☆
FB-06	Actual length	0 m to 65535 m	0m	☆
FB-07	Number of pulses permeter	0.1 to 6553.5	100.0	☆
FB-08	Set count value	1 to 65535	1000	☆
FB-09	Designated count value	1 to 65535	1000	☆

FC Multi-Reference and Simple PLC Function

Function Code	Parameter Name	Setting Range	Default	Change
FC-00	Multi-Reference 0	-100.0% to 100.0%	0.0%	☆
FC-01	Multi-Reference 1	-100.0% to 100.0%	0.0%	☆
FC-02	Multi-Reference 2	-100.0% to 100.0%	0.0%	☆
FC-03	Multi-Reference 3	-100.0% to 100.0%	0.0%	☆
FC-04	Multi-Reference 4	-100.0% to 100.0%	0.0%	☆
FC-05	Multi-Reference 5	-100.0% to 100.0%	0.0%	☆
FC-06	Multi-Reference 6	-100.0% to 100.0%	0.0%	☆
FC-07	Multi-Reference 7	-100.0% to 100.0%	0.0%	☆
FC-08	Multi-Reference 8	-100.0% to 100.0%	0.0%	☆
FC-09	Multi-Reference 9	-100.0% to 100.0%	0.0%	☆
FC-10	Multi-Reference 10	-100.0% to 100.0%	0.0%	☆
FC-11	Multi-Reference 11	-100.0% to 100.0%	0.0%	☆
FC-12	Multi-Reference 12	-100.0% to 100.0%	0.0%	☆
FC-13	Multi-Reference 13	-100.0% to 100.0%	0.0%	☆
FC-14	Multi-Reference 14	-100.0% to 100.0%	0.0%	☆
FC-15	Multi-Reference 15	-100.0% to 100.0%	0.0%	☆
FC-16	Simple PLC running mode	0: Stop after running one cycle 1: Keep final values after running one cycle 2: Repeat after running one cycle	0	☆
FC-17	Simple PLC retentive selection	BIT0: Retentive at power down 0: Not retentive 1: Retentive BIT1: Retentive at stop 0: Not retentive at stop 1: Retentive at stop	00	☆
FC-18	Running time of simple PLC reference 0	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-19	Acceleration/ Deceleration time of simple PLC reference 0	0 to 3	0	☆

FC-20	Running time of simple PLC reference 1	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-21	Acceleration/ Deceleration time of simple PLC reference 1	0 to 3	0	☆
FC-22	Running time of simple PLC reference 2	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-23	Acceleration/ Deceleration time of simple PLC reference 2	0 to 3	0	☆
FC-24	Running time of simple PLC reference 3	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-25	Acceleration/ Deceleration time of simple PLC reference 3	0 to 3	0	☆
FC-26	Running time of simple PLC reference 4	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-27	Acceleration/ Deceleration time of simple PLC reference 4	0 to 3	0	☆
FC-28	Running time of simple PLC reference 5	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-29	Acceleration/ Deceleration time of simple PLC reference 5	0 to 3	0	☆
FC-30	Running time of simple PLC reference 6	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-31	Acceleration/ Deceleration time of simple PLC reference 6	0 to 3	0	☆
FC-32	Running time of simple PLC reference 7	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-33	Acceleration/ Deceleration time of simple PLC reference 7	0 to 3	0	☆
FC-34	Running time of simple PLC reference 8	0.0s (h) to 6553.5s (h)	0.0s(h)	☆

FC-35	Acceleration/ Deceleration time of simple PLC reference 8	0 to 3	0	☆
FC-36	Running time of simple PLC reference 9	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-37	Acceleration/ Deceleration time of simple PLC reference 9	0 to 3	0	☆
FC-38	Running time of simple PLC reference 10	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-39	Acceleration/ Deceleration time of simple PLC reference 10	0 to 3	0	☆
FC-40	Running time of simple PLC reference 11	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-41	Acceleration/ Deceleration time of simple PLC reference 11	0 to 3	0	☆
FC-42	Running time of simple PLC reference 12	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-43	Acceleration/ Deceleration time of simple PLC reference 12	0 to 3	0	☆
FC-44	Running time of simple PLC reference 13	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-45	Acceleration/ Deceleration time of simple PLC reference 13	0 to 3	0	☆
FC-46	Running time of simple PLC reference 14	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-47	Acceleration/ Deceleration time of simple PLC reference 14	0 to 3	0	☆
FC-48	Running time of simple PLC reference 15	0.0s (h) to 6553.5s (h)	0.0s(h)	☆
FC-49	Acceleration/ Deceleration time of simple PLC reference 15	0 to 3	0	☆

FC-50	Time unit of simple PLC running	0: s 1: h	0	☆
FC-51	Reference 0 source	0: Set by FC-00 (Reference 0) 1: AI1 2: AI2 3: Reserved 4: Pulse reference 5: PID 6: Set by preset frequency (F0-08), modifiedusing terminal UP/YWN	0	☆

FD Communication

Function Code	Parameter Name	Setting Range	Default	Change
FD-00	Baud rate	BIT0: MODBUS 0: 300 bps 1: 600 bps 2: 1200 bps 3: 2400 bps 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps 8: 57600 bps 9: 115200 bps BIT1: Reserved BIT2: Reserved BIT3: Reserved	5005	☆
FD-01	Modbus data format symbol	0: No check (8,N,2) 1: Even parity check (8,E,1) 2: Odd parity check (8,O,1) 3: No check, data format (8,N,1) (Valid for Modbus)	0	☆
FD-02	Local address	0: Broadcast address; 1 to 247 (Valid for Modbus)	1	☆
FD-03	Modbus response delay	0 to 20 ms (Valid for Modbus)	2	☆
FD-04	Serial port communication timeout	0.0: Disabled 0.1 to 60.0s (Valid for Modbus)	0.0	☆
FD-05	Modbus communication data format	BIT0:Modbus 0: Non-standard Modbus protocol 1: Standard Modbus protocol BIT1:Reserved	31	☆
FD-06	Current resolution read by communication	0: 0.01 A (valid when ≤ 55 kW)	0	☆
FD-08	Reserved	-	-	☆

FE Custom function code (Application macro)

Function Code	Parameter Name	Setting Range	Default	Change
FE-01	Wake-up pressure set value	0.00～100.00%	70.00%	★
FE-02	Wake-up waiting time	0.0～6553.5s	3.0s	☆
FE-03	Sleep pressure set value	0.00～100.00%	100.00%	★
FE-04	Sleep delay time	0.0～6553.5s	15.0s	☆
FE-05	Over water pressure protection set value	0.000～65.000	0.700	★
FE-06	Over water pressure protection delay time	0.0～6553.5s	1.0s	★
FE-07	Low water pressure warning set value	0.000～65.000	0.000	★
FE-08	Low water pressure warning delay time	0.0～6553.5s	60.0s	☆
FE-09	Water shortage protection set value	0.000～65.000	0.000	★
FE-10	Water shortage protection detection frequency	0.00～maximum frequency	50.00Hz	☆
FE-11	Water shortage protection delay time	0.0～6553.5s	40.0s	☆

FP Parameter Management

Function Code	Parameter Name	Setting Range	Default	Change
FP-00	User password	0 to 65535	0	☆
FP-01	Parameter Initialization	0: No operation 01: Restore factory parameters except motor parameters 02: Clear records 10: Constant pressure water supply macro 12: Machine tool special purpose macro 04: Back up current user parameters 501: Restore user backup parameters	0	☆
FP-02	Parameter display property	BIT0: Group U 0: Not displayed 1: Displayed BIT1: Group A 0: Not displayed 1: Displayed	11	☆
FP-03	Selection of individualized parameter display	BIT 0: Selection of user-defined parameter display 0: Not displayed 1: Displayed BIT 1: Selection of user-modified 0: Not displayed 1: Displayed	00	☆
FP-04	Selection of parameter modification	0: Disabled 1: Enabled	0	☆

A0 Torque Control and Limit

Function Code	Parameter Name	Setting Range	Default	Change
A0-00	Speed/Torque control selection	0: Speed control 1: Torque control	0	★
A0-01	Torque reference source in torque control	0: Set by A0-03 (Torque digital setting in torque control) 1: AI1 2: AI2 3: Reserved 4: Pulse reference 5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) The full scale of 1-7 corresponds to A0-03.	0	★
A0-03	Torque digital setting in torque control	-200.0% to 200.0%	150.0%	☆
A0-05	Forward max. frequency in torque control	0.00 Hz to the maximum frequency	50.00Hz	☆
A0-06	Reverse max. frequency in torque control	0.00 Hz to the maximum frequency	50.00Hz	☆
A0-07	Acceleration time in torque control	0.00s to 650.00s	0.00s	☆
A0-08	Deceleration time in torque control	0.00s to 650.00s	0.00s	☆

A1 Virtual IO

Function Code	Parameter Name	Setting Range	Default	Change
A1-00	VS1 function selection	0 to 59	0	★
A1-01	VS2 function selection	0 to 59	0	★
A1-02	VS3 function selection	0 to 59	0	★
A1-03	VS4 function selection	0 to 59	0	★
A1-04	VS5 function selection	0 to 59	0	★
A1-05	VS active state setting mode	0: Decided by state of VYx 1: Decided by A1-06 BIT 0: VS1 BIT 1: VS2 BIT 2: VS3 BIT 3: VS4 BIT 4: VS5	00000	★
A1-06	Selection of VS active state	0: Disabled 1:Enabled BIT 0: VS1 BIT 1: VS2 BIT 2: VS3 BIT 3: VS4 BIT 4: VS5	00000	★

A1-07	Function selection for AI1 used as S	0 to 59	0	★
A1-08	Function selection for AI2 used as S	0 to 59	0	★
A1-09	Reserved	-	-	★
A1-10	Active state selection for AI used as S	0: High level active 1: Low level active BIT0: AI1 BIT1: AI2 BIT2: Reserved	000	★
A1-11	VY1 function selection	0: Short with physical Sx internally 1 to 41: See physical Y selection in group F5	0	☆
A1-12	VY2 function selection		0	☆
A1-13	VY3 function selection		0	☆
A1-14	VY4 function selection		0	☆
A1-15	VY5 function selection		0	☆
A1-16	VY1 output delay	0.0s to 3600.0s	0.0s	☆
A1-17	VY2 output delay	0.0s to 3600.0s	0.0s	☆
A1-18	VY3 output delay	0.0s to 3600.0s	0.0s	☆
A1-19	VY4 output delay	0.0s to 3600.0s	0.0s	☆
A1-20	VY5 output delay	0.0s to 3600.0s	0.0s	☆
A1-21	VY active mode selection	0: Positive logic active 1: Negative logic active BIT0:VY1 BIT1:VY2 BIT2:VY3 BIT3:VY4 BIT4:VY5	00000	☆

A2 Motor 2 Parameters

Function Code	Parameter Name	Setting Range	Default	Change
A2-00	Motor type selection	0: Common asynchronous motor 2: Permanent Magnet synchronous motor	0	★
A2-01	Rated motor power	0.1 kW to 1000.0 kW	Model dependent	★
A2-02	Rated motor voltage	1 V to 2000 V	Model dependent	★
A2-03	Rated motor current	0.01 A to 655.35 A (AC drive power ≤ 55 kW) 0.1 A to 6553.5 A (AC drive power > 55 kW)	Model dependent	★
A2-04	Rated motor frequency	0.01 Hz to the maximum frequency	Model dependent	★
A2-05	Rated motor speed	1 rpm to 65535 rpm	Model dependent	★
A2-06	Stator resistance	0.001 Ω to 65.535 Ω (AC drive power ≤ 55 kW) 0.0001 Ω to 6.5535 Ω (AC drive power > 55 kW)	Model dependent	★

A2-07	Rotor resistance	0.001 Ω to 65.535 Ω (AC drive power ≤ 55 kW) 0.0001 Ω to 6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A2-08	Leakage inductive reactance	0.01 mH to 655.35 mH (AC drive power ≤ 55 kW) 0.001 mH to 65.535 mH (AC drive power > 55 kW)	Model dependent	★
A2-09	Mutual inductive reactance	0.1 mH to 6553.5 mH (AC drive power ≤ 55 kW) 0.01 mH to 655.35 mH (AC drive power > 55 kW)	Model dependent	★
A2-10	No-load current	0.01 A to A2-03 (AC drive power ≤ 55 kW) 0.1 A to A2-03 (AC drive power > 55 kW)	Model dependent	★
A2-27	Encoder pulses per revolution	1 to 65535	1024	★
A2-28	Encoder type	0: ABZ incremental encoder 2: Resolver	0	★
A2-29	Speed feedback channel selection	0: Local PG card 1: Extension PG card 2: Pulse input (S5)	0	★
A2-30	A/B phase sequence of ABZ incremental encoder	0: Forward 1: Reverse	0	★
A2-31	Encoder installation angle	0.0 to 359.9°	0.0°	★
A2-34	Number of pole pairs of resolver	1 to 65535	1	★
A2-36	Encoder wire-break fault detection time	0.0s: No detection 0.1s to 10.0s	0.0s	★
A2-37	Auto-tuning selection	0: No auto-tuning 1: Asynchronous motor partial static auto-tuning 2: Asynchronous complete dynamic auto-tuning 3: Asynchronous complete static auto-tuning 11: Synchronous on load tuning 12: Synchronous machine no-load tuning	0	★
A2-38	Speed loop proportional gain 1	1 to 100	30	☆
A2-39	Speed loop integral time 1	0.01s to 10.00s	0.50s	☆
A2-40	Switchover frequency 1	0.00 to A2-43	5.00Hz	☆
A2-41	Speed loop proportional gain 2	1 to 100	20	☆
A2-42	Speed loop integral time 2	0.01s to 10.00s	1.00	☆
A2-43	Switchover frequency 2	A2-40to the maximum frequency	10.00Hz	☆
A2-44	Vector control slip compensation gain	50% to 200%	100%	☆
A2-45	SVC torque filter constant	0.000s to 0.100s	0.000s	☆
A2-47	Torque limit source in speed control	0: Set by A2-48 1: AI1 2: AI2 3: Reserved 4: Pulse reference 5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) The full scale of 1-7 corresponds to A2-48.	0	☆
A2-48	Digital setting of torque limit in speed control	0.0% to 200.0%	150.0%	☆

A2-50	Digital setting of torque limit in speed control (regenerative)	0.0% to 200.0%	150.0%	☆
A2-51	Excitation adjustment proportional gain	0 to 20000	2000	☆
A2-52	Excitation adjustment integral gain	0 to 20000	1300	☆
A2-53	Torque adjustment proportional gain	0 to 20000	2000	☆
A2-54	Torque adjustment integral gain	0 to 20000	1300	☆
A2-55	Speed loop integral separation selection	BIT0: Integral separation 0: Disabled 1:Enabled	0	☆
A2-59	Max. torque coefficient of field weakening area	50% to 200%	100%	☆
A2-60	Regenerative power limit selection	0: Disabled 1:Enabled	0	☆
A2-61	Motor 2 control mode	0: SVC 1: FVC 2: V/F control	0	★
A2-62	Motor 2 acceleration/deceleration time selection	0: Same to Motor 1 1: Acceleration/Deceleration time 1 2: Acceleration/Deceleration time 2 3: Acceleration/Deceleration time 3 4: Acceleration/Deceleration time 4	0	☆
A2-63	Motor 2 torque boost	0.0%: Automatic torque boost 0.1% to 30.0%	Model dependent	☆
A2-65	Motor 2 oscillation suppression gain	0 to 100	40	☆

A5 Control Optimization

Function Code	Parameter Name	Setting Range	Default	Change
A5-00	DPWM switchover frequency upper limit	5.00 Hz to the maximum frequency	8.00Hz	☆
A5-01	PWM modulation pattern	0: Asynchronous modulation 1: Synchronous modulation	0	☆
A5-02	Dead zone compensation mode selection	0: Disabled 1: Enabled (compensation mode 1)	1	☆
A5-03	Random PWM depth	0: Random PWM invalid 1 to 10: Random PWM	0	☆
A5-04	Overcurrent fast prevention	0: Disabled 1: Enabled	1	☆
A5-05	Voltage over modulation coefficient	100 to 110	105	★

A5-06	Undervoltage threshold	210 to 420V	350V	☆
A5-08	Dead-zone time adjustment	100% to 200%	150%	★
A5-09	Overvoltage threshold	200.0V to 2500.0V	Model dependent	★

A6 AI Curve Setting

Function Code	Parameter Name	Setting Range	Default	Change
A6-00	AI curve 4 min. Input	-10.00 V to A6-02	0.00V	☆
A6-01	Corresponding percentage of AI curve 4 min. Input	-100.0% to +100.0%	0.0%	☆
A6-02	AI curve 4 inflection 1 input	A6-00 to A6-04	3.00V	☆
A6-03	Corresponding percentage of AI curve 4 inflection 1 input	-100.0% to +100.0%	30.0%	☆
A6-04	AI curve 4 inflection 2 input	A6-02 to A6-06	6.00V	☆
A6-05	Corresponding percentage of AI curve 4 inflection 2 input	-100.0% to +100.0%	60.0%	☆
A6-06	AI curve 4 max. Input	A6-04 to +10.00V	10.00V	☆
A6-07	Corresponding percentage of AI curve 4 max. Input	-100.0% to +100.0%	100.0%	☆
A6-08	AI curve 5 min. Input	-10.00V to A6-10	-10.00V	☆
A6-09	Corresponding percentage of AI curve 5 min. Input	-100.0% to +100.0%	-100.0%	☆
A6-10	AI curve 5 inflection 1 input	A6-08 to A6-12	-3.00V	☆
A6-11	Corresponding percentage of AI curve 5 inflection 1 input	-100.0% to +100.0%	-30.0%	☆
A6-12	AI curve 5 inflection 2 input	A6-10 to A6-14	3.00V	☆
A6-13	Corresponding percentage of AI curve 5 inflection 2 input	-100.0% to +100.0%	30.0%	☆
A6-14	AI curve 5 max. Input	A6-12 to +10.00V	10.00V	☆
A6-15	Corresponding percentage of AI curve 5 max. Input	-100.0% to +100.0%	100.0%	☆
A6-16	Reserved	-	-	☆
A6-17	Reserved	-	-	☆

A6-18	Reserved	-	-	☆
A6-19	Corresponding setting of maximum input of keyboard potentiometer	-100.0% to +100.0%	100.0%	☆
A6-24	Jump point of AI1 input corresponding setting	-100.0% to +100.0%	0.0%	☆
A6-25	Jump amplitude of AI1 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-26	Jump point of AI2 input corresponding setting	-100.0% to +100.0%	0.0%	☆
A6-27	Jump amplitude of AI2 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-28	Reserved	-	0.0%	☆
A6-29	Reserved	-	0.5%	☆

AC AI/AO Correction

Function Code	Parameter Name	Setting Range	Default	Change
AC-00	AI1 measured voltage 1	-10.00 V to 10.000 V	Factory corrected	☆
AC-01	AI1 displayed voltage 1	-10.00 V to 10.000 V	Factory corrected	☆
AC-02	AI1 measured voltage 2	-10.00 V to 10.000 V	Factory corrected	☆
AC-03	AI1 displayed voltage 2	-10.00 V to 10.000 V	Factory corrected	☆
AC-04	AI2 measured voltage 1	-10.00 V to 10.000 V	Factory corrected	☆
AC-05	AI2 displayed voltage 1	-10.00 V to 10.000 V	Factory corrected	☆
AC-06	AI2 measured voltage 2	-10.00 V to 10.000 V	Factory corrected	☆
AC-07	AI2 displayed voltage 2	-10.00 V to 10.000 V	Factory corrected	☆
AC-08	Reserved	-	-	☆
AC-09	Reserved	-	-	☆
AC-10	Reserved	-	-	☆
AC-11	Reserved	-	-	☆
AC-12	AO1 target voltage 1	-10.00 V to 10.000 V	Factory corrected	☆
AC-13	AO1 measured voltage 1	-10.00 V to 10.000 V	Factory corrected	☆

AC-14	AO1 target voltage 2	-10.00 V to 10.000 V	Factory corrected	☆
AC-15	AO1 measured voltage 2	-10.00 V to 10.000 V	Factory corrected	☆
AC-16	AO2 target voltage 1	-10.00 V to 10.000 V	Factory corrected	☆
AC-17	AO2 measured voltage 1	-10.00 V to 10.000 V	Factory corrected	☆
AC-18	AO2 target voltage 2	-10.00 V to 10.000 V	Factory corrected	☆
AC-19	AO2 measured voltage 2	-10.00 V to 10.000 V	Factory corrected	☆

U0 Monitoring Parameters			
Function Code	Parameter Name	Minimum Unit	Change
U0-00	Running frequency	0.01Hz	7000H
U0-01	Frequency reference	0.01Hz	7001H
U0-02	Bus voltage	0.1V	7002H
U0-03	Output voltage	1V	7003H
U0-04	Output current	0.01A	7004H
U0-05	Output power	0.1kW	7005H
U0-06	Output torque	0.1%	7006H
U0-07	S state	1	7007H
U0-08	Y state	1	7008H
U0-09	AI1 voltage	0.01V	7009H
U0-10	AI2 voltage (V)/current (mA)	0.01V/0.01mA	700AH
U0-11	Reserved	-	700BH
U0-12	Count value	1	700CH
U0-13	Length value	1	700DH
U0-14	Load speed display	Determined by F7-12 bit0	700EH
U0-15	PID reference	1	700FH
U0-16	PID feedback	1	7010H
U0-17	PLC stage	1	7011H
U0-18	Pulse reference	0.01kHz	7012H
U0-19	Feedback speed	0.01Hz	7013H
U0-20	Remaining running time	0.1Min	7014H
U0-21	AI1 voltage before correction	0.001V	7015H
U0-22	AI2 voltage (V)/current (mA) before correction	0.001V/0.01mA	7016H
U0-23	Reserved	0.001V	7017H
U0-24	Motor speed	1RPM	7018H
U0-25	Current power-on time	1Min	7019H
U0-26	Current running time	0.1Min	701AH
U0-27	Pulse reference	1Hz	701BH
U0-28	Communication reference	0.01%	701CH
U0-29	Encoder feedback speed	0.01Hz	701DH
U0-30	Main frequency reference X display	0.01Hz	701EH
U0-31	Auxiliary frequency reference Y display	0.01Hz	701FH
U0-32	Viewing any register address value	1	7020H
U0-34	Motor temperature	1℃	7022H
U0-35	Target torque	0.1%	7023H
U0-36	Resolver position	1	7024H
U0-37	Power factor angle	0.1°	7025H
U0-38	ABZ position	1	7026H

U0-39	Target voltage upon V/F separation	1V	7027H
U0-40	Output voltage upon V/F separation	1V	7028H
U0-41	S state display	1	7029H
U0-42	Y state display	1	702AH
U0-43	S set for function state display 1 (function 01-40)	1	702BH
U0-44	S set for function state display 2 (function 41-80)	1	702CH
U0-45	Fault information	1	702DH
U0-58	Phase Z counting	1	703AH
U0-59	Rated frequency	0.01%	703BH
U0-60	Running frequency	0.01%	703CH
U0-61	AC drive state	1	703DH
U0-62	Current fault code	1	703EH
U0-63	Sending torque value of point-to-point communication	0.01%	703FH
U0-64	Number of slaves	1	7040H
U0-65	Torque upper limit	0.1%	7041H
U0-66	Reserved	-	7042H
U0-67	Communication extension card version	Display range	-
U0-68	AC drive state on DP card	BIT0: AC drive running status BIT1: Running direction BIT2: Whether the AC drive has a fault BIT3: Target frequency reached BIT4 to BIT7: Reserved BIT8 to BIT15: Fault code	7043H
U0-69	Speed of transmitting DP/0.01 Hz	0.00Hz to Max.frequency	7044H
U0-70	Motor speed of transmitting DP/RMP	0 to rated motor speed	7045H
U0-71	Communication card current display	Display range	-
U0-72	Communication card faulty state	Display range	-
U0-73	Motor SN	0: Motor 1 1: Motor 2	7046H
U0-74	AC drive output torque	0.1%	7047H

10. RS485 card and RS485 communication protocol

This part is the content of communication, which is used to control the operation of the inverter, the status of the inverter and the setting of related parameters. Read and write function code parameters (some function codes cannot be changed, only for manufacturers to use or monitor). Function code parameter address marking rules.

The rules are represented by the function code group number and label as the parameter address:

High byte: F0~FF (group F), A0~AF (group A), 70~7F (group U) low byte: 00~FF

For example: F0-16, the communication address is F010H; among them, F0H represents the parmeters of the F0 group, and 10H represents the value of the serial number 16 in the function group converted to hexadecimal;

Note: Group F: neither can read parameters nor change parameters; Group U: can only read, can not change parameters.

Some parameters cannot be changed when the inverter is in the running state; some parameters cannot be changed regardless of the state of the inverter; when changing the function code parameters, pay attention to the range, unit, and related instructions of the parameters.

Parameter group NO.	Communication access adress	Communication to modify the parameter address in RAM
F0 ~ FE	0xF000 ~ 0xFEFF	0x0000 ~ 0x0EFF
A0 ~ AC	0xA000 ~ 0xACFF	0x4000 ~ 0x4CFF
U	0x7000 ~ 0x70FF	-

Note, since the EEPROM is frequently stored, the service life of the EEPROM will be reduced. Therefore, some parameters do not need to be stored in the communication mode, just change the value in the RAM.

If it is a parameter of group F, to realize this function, just change the high-order F of the parameter address to 0. If it is a group A parameter, to realize this function, just change the high-order A of the parameter address to 4. The corresponding parameter address are expressed as follows:

High byte: 00 ~ 0F (group F), 40 ~ 4F (group A) low byte: 00 ~ FF such as parameter F3-12 is not stored in EEPROM, and the address is 030C parameter A0-05 is not stored in EEPROM, and the address is 4005; this address can only be used for writing to ARM, but not for reading, when reading, it is invalid address.

Parameter adress	Description	Parameter adress	Description
1000H	Communication setting value (decimal) -10000 ~ 10000	1010H	PID reference
1001H	Running frequency	1011H	PID feedback
1002H	Bus voltage	1012H	PLC process
1003H	Output voltage	1013H	Pulse input frequency, unit: 0.01 kHz
1004H	Output current	1014H	Feedback speed, unit 0.1Hz
1005H	Output power	1015H	Remaining running time
1006H	Output torque	1016H	AI1 voltage before correction
1007H	Running speed	1017H	AI2 voltage before correction
1008H	S input indication	1018H	Keyboard potentiometer voltage before correction
1009H	Y output indication	1019H	Linear speed
100AH	AI1 voltage	101AH	Current power-on time
100BH	AI2 voltage	101BH	Current running time
100CH	Keyboard potentiometer voltage	101CH	Pulse input frequency, unit 1Hz
100DH	Counting value input	101DH	AI1 voltage before correction
100EH	Length value input	101EH	AI2 voltage before correction
100FH	Load speed	101FH	Main frequency reference display
-	-	1020H	Auxiliary frequency reference display

Note:

- Communication setting value indicates percentage: 10000 corresponds to 100.00%, and -10000 corresponds to -100.00%.
- With regard to frequency, communication reference is a percentage of F0-10 (max. frequency).
- With regard to torque, communication reference is a percentage of F2-10 and A2-48 (corresponding to motor 1 and motor 2, respectively).

Control command input to AC drive (write-only):

Command Word Address	Command Word Function
2000H	0001: Forward run
	0002: Reverse run
	0003: Forward jog
	0004: Reverse jog
	0005: Coast to stop
	0006: Decelerate to stop
	0007: Fault reset

Read AC drive state (read-only):

Command Word Address	Command Word Function
3000H	0001: Forward run
	0002: Reverse run
	0003: Stop

Parameter lock password verification: if the actual password value is returned, it means that the password verification is passed.(If there is no password, that is the password is 0, the check returns 0000H)

Password Address	Password Content
1F00H	*****

Y terminal control (write-only)

Command Address	Command Content
2001H	BIT0: Y3 output control BIT1: Extended DO output control BIT2: Y1 output control BIT3: Y2 output control BIT4: Y4 output control BIT5: VY1 BIT6: VY2 BIT7: VY3 BIT8: VY4 BIT9: VY5

AO1 control (write-only)

Command Address	Command Content
2002H	0 to 7FFF indicates 0% to 100%.

AO2 control (write-only)

Command Address	Command Content
2003H	0 to 7FFF indicates 0% to 100%.

Pulse output control (write-only)

Command Address	Command Content
2004H	0 to 7FFF indicates 0% to 100%.

AC drive fault description

AC Drive Fault Address	AC Drive Fault Information	
8000H	0000: No fault 0001: Reserved 0002: Overcurrent during acceleration 0003: Overcurrent during deceleration 0004: Overcurrent at constant speed 0005: Overvoltage during acceleration 0006: Overvoltage during deceleration 0007: Overvoltage at constant speed 0008: Buffer resistor overload 0009: Undervoltage 000A: AC drive overload 000B: Motor overload 000C: Power input phase loss 000D: Power output phase loss 000E: IGBT overheat 000F: External fault 0010: Communication fault 0011: Contactor fault 0012: Current detection fault 0013: Motor auto-tuning fault 0014: Encoder/PG card fault 0015: Parameter read and write fault 0016: AC drive hardware fault 0017: Motor short circuited to ground	0018: Reserved 0019: Reserved 001A: Accumulative running time reached 001B: User-defined fault 1 001C: User-defined fault 2 001D: Accumulative power-on time reached 001E: Load lost 001F: PID feedback lost during running 0028: Fast current limit timeout 0029: Motor switchover error during running 002A: Too large speed deviation 002B: Motor over-speed 002D: Motor overheat 005A: Incorrect setting of PPR of the encoder 005B: Not connecting the encoder 005C: Initial position error 005E: Speed feedback error

11. Setting the main frequency via multi-stage commands.

Set parameter F0-03=6 to select multi-stage commands as the main frequency source. This is suitable for applications. Where there is no need to continuously adjust the inverter's specific frequency values are required.

The EC590 allows setting up to 16 stages of operating frequencies, which can be selected using a combination of signals from four S terminals. It also permits scenarios with fewer then four S terminals for multi-stage frequency setting; in such cases, the missing setting bits are always considered to be in state 0.

The correspondence between the number of multi-speed stages and the number of multi-speed stages and the number of S terminals are as follows:

2 speed stages: one S terminal (K1);
3-4 speed stages: two S terminal (K1, K2);
5-8 speed stages: three S terminal (K1, K2, K3);
9-16 speed stages: four S terminal (K1, K2, K3, K4)

The required multi-stage frequencies are set using the multi-stage frequency table in FC group, with the parameters as follows:

Function Code	Parameter Name	Setting Range	Default
FC-00	Multi-Reference 0	-100.00% to 100.0%	0.0%
FC-01	Multi-Reference 1	-100.00% to 100.0%	0.0%
FC-02	Multi-Reference 2	-100.00% to 100.0%	0.0%
FC-03	Multi-Reference 3	-100.00% to 100.0%	0.0%
FC-04	Multi-Reference 4	-100.00% to 100.0%	0.0%
FC-05	Multi-Reference 5	-100.00% to 100.0%	0.0%
FC-06	Multi-Reference 6	-100.00% to 100.0%	0.0%
FC-07	Multi-Reference 7	-100.00% to 100.0%	0.0%
FC-08	Multi-Reference 8	-100.00% to 100.0%	0.0%
FC-09	Multi-Reference 9	-100.00% to 100.0%	0.0%
FC-10	Multi-Reference 10	-100.00% to 100.0%	0.0%
FC-11	Multi-Reference 11	-100.00% to 100.0%	0.0%
FC-12	Multi-Reference 12	-100.00% to 100.0%	0.0%
FC-13	Multi-Reference 13	-100.00% to 100.0%	0.0%
FC-14	Multi-Reference 14	-100.00% to 100.0%	0.0%
FC-15	Multi-Reference 15	-100.00% to 100.0%	0.0%

K4	K3	K2	K1	Reference Setting	Corresponding Pr.
OFF	OFF	OFF	OFF	Reference 0	FC-00
OFF	OFF	OFF	ON	Reference 1	FC-01
OFF	OFF	ON	OFF	Reference 2	FC-02
OFF	OFF	ON	ON	Reference 3	FC-03
OFF	ON	OFF	OFF	Reference 4	FC-04
OFF	ON	OFF	ON	Reference 5	FC-05
OFF	ON	ON	OFF	Reference 6	FC-06
OFF	ON	ON	ON	Reference 7	FC-07
ON	OFF	OFF	OFF	Reference 8	FC-08
ON	OFF	OFF	ON	Reference 9	FC-09
ON	OFF	ON	OFF	Reference 10	FC-10
ON	OFF	ON	ON	Reference 11	FC-11
ON	ON	OFF	OFF	Reference 12	FC-12
ON	ON	OFF	ON	Reference 13	FC-13
ON	ON	ON	OFF	Reference 14	FC-14
ON	ON	ON	ON	Reference 15	FC-15

When the frequency source is selected as multi-speed, 100% of the function code FC-00~FC-15 corresponds to the maximum frequency F0-10.
Besides multi-speed function, the multi-reference can be also used as PID reference source or voltage source for V/F separation.

12. Terminal Control

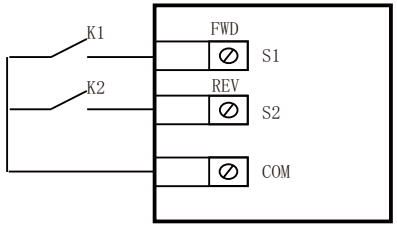
Function Code	Parameter Name	Setting Range	Default
F4-11	Terminal control mode	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2	0

This parameter defines four different modes for controlling the inverter operation via external terminals. For the convenience of explanation, three terminals, namely S1, S2, and the keypad potentiometer, are arbitrarily selected from the multi-function input terminals S1 to S6 as the external terminals. That is, by setting the values of F4-00 to F4-02, the functions of terminals S1, S2, and the reserved terminal are selected. For detailed function definitions, refer to the setting range of F4-00 to F4-05.

0: Two-wire mode 1
This mode is the most commonly used two-wire mode. The forward and reverse rotation of the motor is determined by terminals S1 and S2. The parameters are set as follows:

Function Code	Parameter Name	Value	Function Description
F4-11	Terminal control mode	0	Two-wire control mode 1
F4-00	S1 function selection	1	Forward RUN (FWD)
F4-01	S2 function selection	2	Reverse RUN (REV)

K1	K2	Running Command
1	0	Forward
0	1	Reverse
1	1	Stop
0	0	Stop



Two-wire 1 sequence wiring diagram

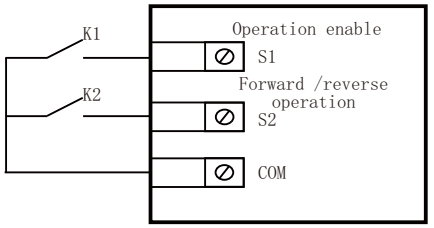
As shown in the figure above, in this control mode, when K1 is closed, the inverter runs in forward rotation. When K2 is closed, it runs in reverse rotation. If K1 and K2 are closed simultaneously or both are open, the inverter stops.

1: Two-wire mode 2

In this mode, the S1 terminal functions as the operation enable terminal, while the S2 terminal determines the running direction. The parameters are set as follows:

Function Code	Parameter Name	Value	Function Description
F4-11	Terminal control mode	1	Two-wire control mode 2
F4-00	S1 function selection	1	Operation enable
F4-01	S2 function selection	2	Reverse RUN (REV)

K1	K2	Running Command
1	0	Forward
1	1	Reverse
0	0	Stop
0	1	Stop



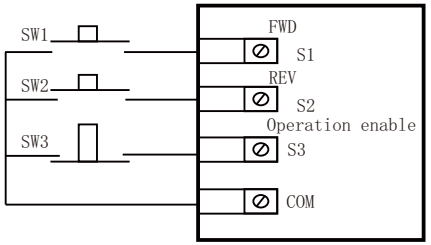
Two-wire 2 sequence wiring diagram

As shown in the figure above, in this control mode, when K1 is closed and K2 is open, the inverter runs in forward rotation; when K1 is closed and K2 is closed, the inverter runs in reverse rotation. When K1 is open, the inverter stops.

2: Three-wire control mode 1

In this mode, S3 serves as the enable terminal, and the direction is controlled by S1 and S2 respectively. The parameters are set as follows:

Function Code	Parameter Name	Value	Function Description
F4-11	Terminal control mode	2	Three-wire control mode 1
F4-00	S1 function selection	1	Forward RUN (FWD)
F4-01	S2 function selection	2	Reverse RUN (REV)
F4-02	S3 function selection	3	Three wire control



Three-wire 1 sequence wiring diagram

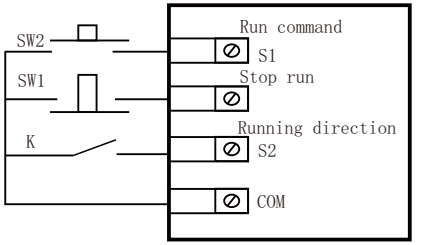
As shown in the figure above, in this control mode, when the SW3 button is held closed, pressing the SW1 button causes the inverter to run in forward rotation, and pressing the SW2 button causes the inverter to run in reverse rotation. The inverter stops the moment the SW3 button is opened. During normal startup and operation, the SW3 button must remain closed. The commands from the SW1 and SW2 buttons take effect on the closing edge, and the operating state of the inverter prevails based on the last button action among these three buttons.

3: Three-wire control mode 2

In this mode, S3 serves as the enable terminal. The operation command is given by S1, and the direction is determined by the state of S2. The parameters are set as follows:

Function Code	Parameter Name	Value	Function Description
F4-11	Terminal control mode	3	Three-wire control mode 2
F4-00	S1 function selection	1	Forward RUN (FWD)
F4-01	S2 function selection	2	Reverse RUN (REV)
F4-02	S3 function selection	3	Three wire control

K	Running direction
0	Forward
1	Reverse



Three-wire 2 sequence wiring diagram

As shown in the figure above, in this control mode, with the SW1 button held closed, pressing the SW2 button starts the inverter. When K is open, the inverter runs in forward rotation; when K is closed, the inverter runs in reverse rotation. The inverter stops the moment the SW1 button is opened. During normal startup and operation, the SW1 button must remain closed, and the command from the SW2 button takes effect on the closing edge.

13. Analog input and output

Function Code	Parameter Name	Value	Setting Range	Function Description
F5-10	AO1 zero bias coefficient	0.0%	-100.0%~+100.0%	Ao1 zero bias coefficient:100% corresponds to 10V or 20mA. Zero bias = zero bias coefficient * 10V(or 20mA)
F5-11	Ao1 gain	1.00	-10.00~+10.00	-
F5-12	AO2 zero bias coefficient	0.0%	-100.0%~+100.0%	AO2 zero bias coefficient:100% corresponds to 10V or 20mA.
F5-13	AO2 gain	1.00	-10.00~+10.00	-

AO (analog output) 0-10V corresponds to 0%-100%. When the Ao2 output function is set to 1 (frequency setting),if the inverter's set frequency is 50% of the maximum frequency, the output voltage of AO2 is 50% x 10V = 5V. Y4(pulse output) 0-100kHz corresponds to 0%-100%. When the Y4 output function is set inverter's set frequency is 50% of the maximum frequency and F5-09 is set to 100kHz, the output frequency at terminal Y4 is 50% x 100 kHz=50kHz.

AO1 analog output parameter:

Function Code	Parameter Name	Value	Output current
F5-23	AO1 current and voltage output switching	1	0-20mA

Function Code	Parameter Name	Value	Output current
F5-23	AO1 current and voltage output switching	1	4-20mA
F5-10	AO1 zero bias coefficient	20	
F5-11	AO1 gain	0.78	

AO2 analog output parameter:

Function Code	Parameter Name	Value	Output current
F5-24	AO2 current and voltage output switching	1	0-20mA

Function Code	Parameter Name	Value	Output current
F5-24	AO2 current and voltage output switching	1	4-20mA
F5-12	AO2 bias coefficient	20	
F5-13	AO2 gain	0.79	

AI2 analog input parameter:

Function Code	Parameter Name	Value	Input current
F0-03	Main frequency reference setting channel selection	3	0-20mA
F4-40	AI2 current voltage switching	1	
F4-20	AI curve 2 maximum input	9.2	

Function Code	Parameter Name	Value	Input current
F0-03	Main frequency reference setting channel selection	3	0-20mA
F4-40	AI2 current voltage switching	1	
F4-18	AI curve 2 minimum input	1.82	
F4-20	AI curve 2 maximum input	9.2	

14. Self-Learning

Methods for enabling the inverter to obtain the internal electrical parameters of the controlled motor include: dynamic tuning, static tuning 1, static tuning 2, manual input of motor parameters, etc.

Tuning Method	Applicable Situations	Tuning Effect
No-load dynamic tuning F1-37 = 2	Occasions where the motor can be easily disconnected from the application system.	Best
On-load dynamic tuning F1-37 = 2	Occasions where the motor cannot be easily disconnected from the application system, but can run with the load. The load friction is small, and constant speed operation is close to no-load.	The smaller the friction, the better the effect
Static tuning 1 F1-37 = 1	Occasions where the motor and load are difficult to separate and dynamic tuning operation is not permitted.	Average
Static tuning 2 F1-37 = 3	Occasions where the motor and load are difficult to separate and dynamic tuning operation is not permitted. This mode is recommended for static tuning, the tuning time is longer compared to static tuning 1.	Good
Manual input of parameters	Occasions where the motor and application system are difficult to separate. Copy the motor parameters of the same model that were successfully tuned by the inverter previously and input them into the corresponding parameters F1-00 ~ F1-10.	Good

The procedure for motor parameter auto-tuning is as follows: the tuning method for the default motor 1 is used as an example for explanation. The tuning method for motor 2 is the same, except that the parameter numbers need to be changed accordingly.

step 1: If the motor can be completely disconnected from the load, mechanically separate the motor from the load part while the power is off, allowing the motor to rotate freely with no load.

Step 2: After powering on, first set the inverter command source (F0-02) to the operation panel command channel.

Step 3: Accurately input the motor nameplate parameters (e.g., F1-00 ~ F1-05). Enter the following parameters according to the actual motor parameters (select based on the current motor):

Motor Selection	Parameters
Motor 1	F1-00: Motor type selection F1-01: Motor rated power F1-02: Motor rated voltage F1-03: Motor rated current F1-04: Motor rated frequency F1-05: Motor rated speed
Motor 2	A2-00 ~ A2-05: Same definitions as above

If an encoder is used, input the encoder parameters (F1-27, F1-28, F1-30).

Step 4: For an asynchronous motor, set F1-37 (Tuning selection, for Motor 2, set the corresponding parameter A2-37) to 2 (Complete tuning for asynchronous motor), then press the ENTER key to confirm. At this point, the keypad will display "TUNE", as shown in the figure below:

Then press the RUN key on the keypad. The inverter will drive the motor to accelerate, decelerate, and run forward/reverse, and the operation indicator will light up. The tuning operation lasts approximately 2 minutes. When the display information disappears and the screen returns to the normal parameter display state, this indicates that the tuning is complete.

Through this complete tuning, the inverter will automatically calculate the following parameters of the motor:

Motor Selection	Parameters
Motor 1	F1-06: Asynchronous motor stator resistance F1-07: Asynchronous motor rotor resistance F1-08: Asynchronous motor leakage inductance F1-09: Asynchronous motor mutual inductance F1-10: Asynchronous motor no-load current
Motor 2	A2-06 ~A2-10: Same definitions as above

If the motor cannot be completely disconnected from the load, set F1-37 (for Motor 2, set A2-37) to 3 (Static tuning 2 for asynchronous motor), then press the RUN key on the keypad to start the motor parameter tuning operation.

15. Constant pressure water supply parameters

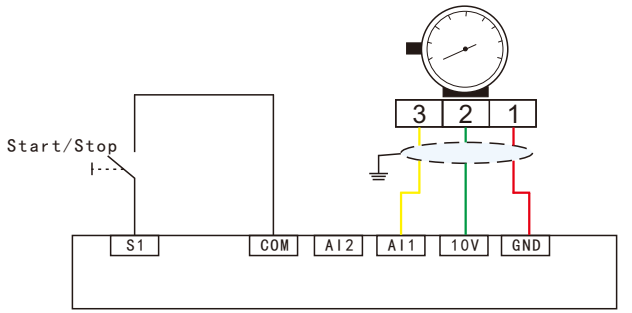
"☆": Indicates that the setting value of this parameter can be modified whether the inverter is in stop or running status;
"★": Indicates that the setting value of this parameter cannot be modified when the inverter is in running state.

Basic operation parameter group				
Function Code	Parameter Name	Setting Range	Default	Change
F0-00	AC drive G/P selection	1: G (constant torque load) 2: P (fan and pump)	2	★
F0-02	Running command selection	0: Operating panel (LED off) 1: Terminal(LED on) 2: Serial communication(LED flashing)	0	☆
F0-03	Main frequency reference setting channel selection	0: Digital setting (revised value is not cleared after power off) 1: Digital setting (revised value is cleared after power off) 2: AI1 3: AI2 4: Reserved 5: Pulse setting(S5) 6: Multi-reference 7: Simple PLC 8: PID reference 9: Communication setting 10:Reserved	8	★
F7-04	LED display running parameters 2	0000 to FFFF BIT 0: PID feedback BIT 1: PLC stage BIT 2: Pulse reference(kHz) BIT 3: Running frequency 2(Hz) BIT 4: Remaining running time BIT 5: AI1 voltage before correction(V) BIT 6: AI2 voltage before correction(V) BIT 7: Reserved BIT 8: Linear speed BIT 9: Currentpower-on time(h) BIT 10: Currentpower running time(Min) BIT 11: Pulse reference(Hz) BIT 12: Communication reference BIT 13: Enceder feedback speed(Hz) BIT 14: Main frequency X display(Hz) BIT 15: Auxiliary frequency Y display(Hz)	1	☆
F8-14	Running mode when frequency lower than frequency lower limit	0: Run at frequency reference lower limit 1: Stop 2: Run at zero speed	1	☆
FA-00	PID reference setting channel	0: Set by FA-01 (PID digital setting) 1: AI1 2: AI2 3: Reserved 4: Pulse reference (S5) 5: Communication reference 6: Multi-reference	0	☆
FA-01	Set pressure	0 to FA-04	0.300	☆

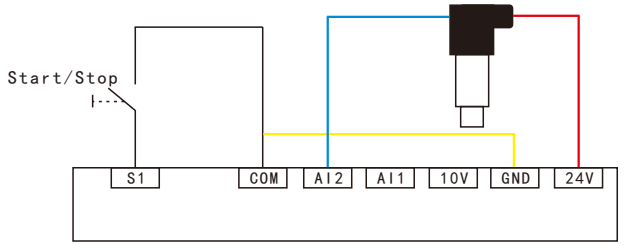
FA-02	PID feedback setting channel	0:AI1 1:AI2 2:Reserved 3:AI1-AI2 4:Pulse reference (S5) 5: Communication reference 6: AI1 + AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|)	0	☆
FA-04	Set pressure range	0 to 65.535	1.000	☆
FA-05	Proportional gain Kp1	0.0 to 100.0	20.0	☆
FA-06	Integral time TI1	0.01s to 10.00s	0.5s	☆
FA-08	PID output limit in reverse direction	0.00 Hz to the maximum frequency	0.00Hz	☆
FA-14	Pressure control specific mode	0: Function enable 1: Function disable	1	★
Sleep function parameter group				
FE-01	Wake-up pressure set value	0.00～100.00%	70.00%	★
FE-02	Wake-up waiting time	0.0～6553.5s	3.0s	☆
FE-03	Sleep pressure set value	0.00～100.00%	100.00%	★
FE-04	Sleep delay time	0.0～6553.5s	15.0s	☆
Water pressure protection function parameter group				
FE-05	Over water pressure protection set value	0.000～65.000	0.700	★
FE-06	Over water pressure protection delay time	0.0～6553.5s	1.0s	★
FE-07	Low water pressure warning set value	0.000～65.000	0.000	★
FE-08	Low water pressure warning delay time	0.0～6553.5s	60.0s	☆
FE-09	Water shortage protection set value	0.000～65.000	0.000	★
FE-10	Water shortage protection detection frequency	0.00～maximum frequency	50.00Hz	☆
FE-11	Water shortage protection delay time	0.0～6553.5s	40.0s	☆
Alarm message annotations				
Err56	Over-pressure protection	Automatically resumes operation when pressure drops below the set point.		

Err57	Low-pressure warning	Monitor the water level and shutdown the equipment manually if necessary.
Err58	Dry run protection	Wait for the water level to return to normal before resuming operation.

Constant pressure water supply wiring diagram



Remote pressure gauge wiring diagram



Pressure transmitter wiring diagram

16. CNC machine tool dedicated parameters

"☆": Indicates that the setting value of this parameter can be modified whether the inverter is in stop or running status;
"★": Indicates that the setting value of this parameter cannot be modified when the inverter is in running state.

CNC machine tool dedicated parameter group				
Function Code	Parameter Name	Setting Range	Default	Change
F0-02	Running command selection	0: Operating panel (LED off) 1: Terminal(LED on) 2: Serial communication(LED flashing)	1	☆
F0-03	Main frequency reference setting channel selection	0: Digital setting (revised value is not cleared after power off) 1: Digital setting (revised value is cleared after power off) 2: AI1 3: AI2 4: Reserved 5: Pulse setting(S5) 6: Multi-reference 7: Simple PLC 8: PID reference 9: Communication setting 10:Reserved	2	★
F0-10	Max. frequency	50.00 Hz to 500.00 Hz	120.00Hz	★
F0-12	Frequency reference upper limit	0.00 Hz to maximum frequency (F0-10)	120.00Hz	☆
F0-17	Acceleration time 1	0.00s to 650.00s(F0-19 = 2) 0.0s to 6500.0s(F0-19 = 1) 0s to 65000s(F0-19 = 0)	3s	☆
F0-18	Deceleration time 1	0.00s to 650.00s(F0-19 = 2) 0.0s to 6500.0s(F0-19 = 1) 0s to 65000s(F0-19 = 0)	3s	☆
F4-01	S2 terminal function	0: No function 1: Forward RUN (FWD) or running command 2: Reverse RUN (REV) or running direction	2	★
F6-11	DC injection braking start frequency	0.00Hz to the maximum frequency	1Hz	☆
F6-13	DC injection braking level	0% to 100%	80%	☆
F6-14	DC injection braking active time	0.0s to 100.0s	0.5s	☆

17. Braking resistor

- Frequency of braking in common application

Application	Elevator	Winding &rewinding	Centrifuge	Accidental braking load	General occasion
Braking frequency	20%～30%	20%～30%	50%～ 60%	5%	10%

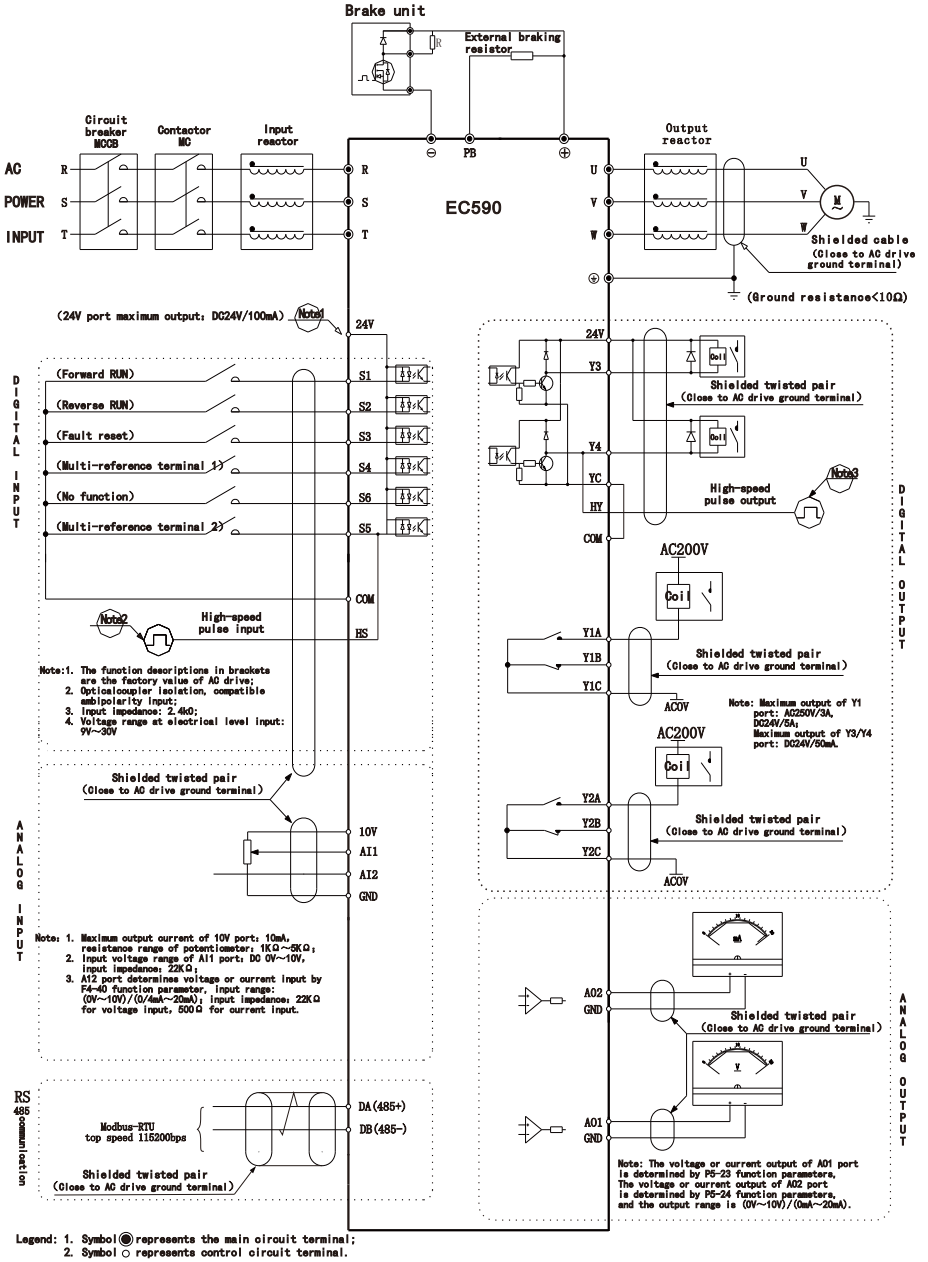
AC Drive Model	Adapter motor (kW)	Brake unit (quantity)	125% braking torque (10% ED, max. 10s)		Min. Resistance of Braking Resistor (Ω)
			Braking Resistor	Quantity	
EC590D75G02D2P43	0.75	Built-in	80W 1450Ω	1	96
EC5901D5G02D2P43	1.5		300W 380Ω	1	64
EC5902D2G03D0P43	2.2		440W 260Ω	1	64
EC5904D0G05D5P43	4.0		740W 150Ω	1	32
EC5905D5G07D5P43	5.5		1100W 100Ω	1	32
EC5907D5G0011P43	7.5		1500W 75Ω	1	32
EC590011G0015P43	11		2200W 50Ω	1	20
EC590015G18D5P43	15		3000W 38Ω	1	20
EC5918D5G0022P43	18.5		4000W 32Ω	1	24
EC590022G0030P43	22		4500W 27Ω	1	24
EC590030G0037P43	30		6000W 20Ω	1	19.2
EC590037G0045P43	37		7000W 16Ω	1	14.8
EC590045G0055P43	45	1	9000W 13Ω	1	12.8
EC590055G0075P43	55	1	11000W 10.5Ω	1	9.6
EC590075G0090P43	75	1	15000W 7.7Ω	1	6.8
EC590090G0110P43	90	2	9000W 10.0Ω	2	9.3×2
EC590110G0132P43	110	2	11000W 9.4Ω	2	9.3×2
EC590132G0160P43	132	2	13000W 6.8Ω	2	6.2×2

EC590160G0185P43	160	2	16000W 6.3Ω	2	6.2×2
EC590200G0220P43	200	2	19000W 4.5Ω	2	2.5×2
EC590220G0250P43	220	2	21000W 4.1Ω	2	2.5×2
EC590250G0280P43	250	2	24000W 3.6Ω	2	2.5×2
EC590280G0315P43	280	2	27000W 3.2Ω	2	2.5×2
EC590315G0355P43	315	3	20000W 4.3Ω	3	2.5×3
EC590355G0400P43	355	3	23000W 3.8Ω	3	2.5×3
EC590400G0450P43	400	3	26000W 3.4Ω	3	2.5×3

Note!

1. If the AC drive of 400V class, ≥45kW or above, to achieve rapid braking, a brake unit must be installed.
2. Select the resistance value and frequency of use established by our company.
3. The company does not bear any responsibility for the damage to the AC drive or other equipment caused by the use of braking resistors and braking modules not provided by our company.
4. The installation of the braking resistor must consider the safety and flammability of the environment.
5. To change the resistance and power number, please contact your local dealer.
6. The braking resistor and braking module need to be ordered separately. For details, please contact your local dealer.

18. Standard wiring diagram



Note:

1. There is no PB terminal for 45kW and above;
2. The S5 port is constrained by the functional parameter F4-04 and can be used as a high-speed pulse input channel, with a maximum input frequency of 50KHz;
3. The Y4 port is constrained by the functional parameter F5-00, and can be used as a high-speed pulse output channel with a maximum output frequency of 50KHz; when used as an open-collector output, Same specification as Y3 terminal.

14. Warranty Service

EACON

Manufacturer of high quality inverter

Warranty Card

User Name			
User Address			
User Contact		Tel	
Specification		Number	
Distributor			
Contacts		Date of delivery	

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