MOLLOM

G75 AC Drive

User Manual

For Qucik Setup

Version: 1.02

Preface

Thank you for purchasing the G75 Series AC Drive developed by our company!

It is a gerneral-purpose and high-performace current vector AC drive. It is mainly used for controlling and ajusting the speed and torque of three-phase AC asynchronous, and also compatible for a Three-phase AC synchornous with G75E series. Using high-performace vector control tenchnology. The G75/G75E Series AC drive features high torque output at a low speed, excellent dynamic characteristics and superior overload capability. It provides user-programmable features and backgroud monitoring with built-in Mod-bus communication and Simple PLC function. It can be used to drive multiple kinds of automated production equeipment.

§ Manual and Acquisition

This is a quick setup mannual which contains basic setup instruction, installation and parameter table.

If you need full version of this mannual, please contact your product distributor for a newest PDF version.

If you find any contents are not match to your product, such as: code order, word spelling, Wrong descrptions...etc. Please contact your prduct distributor to comfirm.

§ Revision History

Date	Version	Change Description
Jan.2022	1.0	Orignal Version.

Contents

Safety Information

§ Safety Precautions

1. Please read and follow the safety precautions when installing, operating and maintaining the product.
2. To ensure your safety and prevent damage to equipment, please follow the marks on the product and safety precautions in this manual when installing, operating and maintaining the product.
3. "CAUTION", "WARNING", and "DANGER" items in the manual do not indicate all safety precautions that need to be followed; instead, they just supplement the safety precautions.
4. Use this product in environment meeting the design and specification requirements; otherwise, a fault may occur. Noncompliance-caused malfunction or damage to parts are not covered in product quality warranty.
5. Our company is not legally responsible for any personal safety accident or property losses caused by improper operation of this product.

§ Safety Grade and Definition

The 

"DANGER" indicates the improper operation, which, if not avoided, causes death or serious injury.

The 

"WARNING" indicates the improper operation, which, if not avoided, may cause death or serious injury.

The 

"CAUTION" indicates the improper operation, which, if not avoided, may cause minor injury or equipment damage.

§ Safety Information

Unpacking and Checking
 ◆ Before unpacking, check whether the outer package is intact, damaged, wet, damped, or deformed. ◆ Open the package in sequence. Violent beating is prohibited! ◆ During unpacking, check whether the product and its accessories have any damage, corrosion or bump on the surface. ◆ Check the quantity of the product and its accessories and data completeness according to the packing list.
 ◆ Do not install the product and its accessories when you find that the product and its accessories have any damage or corrosion or they have been used. ◆ Do not install the product when there is water inside the product or any of its parts is missing or damaged. ◆ Do not install the product when the product name is inconsistent with that in the packing list.

During Storage and Transportation

Warning

- Store and transport the product according to its storage and transportation conditions. The storage temperature and humidity shall meet relevant requirements.
- Do not store or transport the product in places with direct sunlight, strong electric field, strong magnetic field or strong vibration or places that are wet by rain or splashing water.
- Do not store the product for over three months. Take stricter prevention measures and perform necessary inspection when the storage time is too long.
- Well pack the product before transportation. The product must be placed in a sealed box for long-distance transportation.
- Do not transport the product together with any equipment or articles that may affect or impair the product.

Caution

- Be sure to use professional loading and unloading equipment to move large or heavy equipment and products!
- When moving the product by hand, grab the product case tightly to avoid dropping the product parts, causing injury!
- Be sure to move the product lightly, pay attention to your step to prevent trip or fall; otherwise, there is the risk of injury or damage to the product!
- When the equipment is lifted by a lifting gear, do not stand or stay in the area below the lifting area.

During Installation

Caution

- Before installation, carefully read the product manual and safety precautions!
- Do not modify the product!
- Do not unscrew the fixing bolts and bolts with red mark of the product parts and components!
- Do not install this product in a place with strong electric field or strong electromagnetic interference!
- When the product is installed in a cabinet or terminal equipment, the cabinet or terminal equipment shall be provided with the corresponding protective devices such as fireproof enclosure, electrical enclosure and mechanical enclosure. The protection grade shall comply with relevant IEC standards and local laws and regulations.

Danger

- Non-professionals are strictly prohibited from product installation, wiring, maintenance, inspection or parts replacement!
- These operations can only be done by professionals trained on electrical equipment and having knowledge of electrical equipment.
- Installers must be familiar with product installation requirements and related technical data.
- When you need to install equipment, such as transformers, having strong electromagnetic interference, install the shield protection device to prevent the product from malfunction!

During Wiring

Danger

- Non-professionals are strictly prohibited from equipment installation, wiring, maintenance, inspection or parts replacement!
- Do not perform wiring when the power is turned on. Failure to comply may result in electric shock.
- Before wiring, cut off the power of all equipment. There is residual voltage in internal capacitor of the equipment after the power is cut off. Wait for at least 10 minutes before wiring and other operations.
- Be sure the equipment and product are properly grounded. Failure to comply may result in electric shock.
- Follow the ESD precautions and wear EDS wrist strap to avoid damage to the equipment or circuit inside the product.

Warning

- It is prohibited to connect the input power to the output terminal of the equipment or product; otherwise, the equipment may be damaged or fire may occur.
- When connecting a driving equipment to the motor, be sure that the phase sequence of the driver and the motor terminal are consistent, so as to avoid reverse rotation of the motor.
- The cables used for wiring must meet relevant diameter and shielding requirements, and the shielding layer of the shielding cables must be reliably grounded at single terminal!
- After wiring is finished, be sure there is no screw or bar cables inside the equipment and product.

During Power-on

Warning

- Before power-on, be sure the equipment and product are installed properly, the wiring is firm and the motor unit is allowed to restart.
- Before power-on, be sure the power supply meets the equipment requirements to avoid damage to the equipment or causing fire!
- During power-on, mechanical devices of the equipment or product may suddenly move. Stay away from the mechanical devices.
- After power-on, do not open the equipment cabinet door or product protection cover; otherwise, there is the danger of electric shock!
- It is prohibited to touch any terminal of the equipment when power is on; otherwise, there is the danger of electric shock!
- It is prohibited to dismantle any device or parts of the equipment and product when the power is on; otherwise, there is the danger of electric shock!

During Running

Danger

- It is prohibited to touch any terminal of the equipment when it is running; otherwise, there is the danger of electric shock!
- It is prohibited to dismantle any device or parts of the equipment and product when the equipment is running; otherwise, there is the danger of electric shock!
- It is prohibited to touch the equipment closure, fan or resistor to check the temperature; otherwise, there is the danger of burn!
- Non-professional technicians are prohibited to detect the signal when the equipment is running; otherwise, there is the danger of personal injury or damage to the equipment!

Warning

- When the equipment is running, do not drop other articles or metals into the equipment; otherwise, the equipment may be damaged!
- Do not start or stop the equipment by turning on or off the connector; otherwise, the equipment may be damaged!

During Maintenance

Danger

- Non-professionals are strictly prohibited from equipment installation, wiring, maintenance, inspection or parts replacement!
- It is prohibited to maintain the equipment when power is on; otherwise, there is the danger of electric shock!
- After the equipment power is cut off, wait for at least 10 minutes before maintaining the equipment or performing other operations.

Warning

- Follow the equipment maintenance and repair requirements for routine and regular inspection and maintenance of the product and equipment, and prepare the maintenance records.

During Repair

Danger

- Non-professionals are strictly prohibited from equipment installation, wiring, maintenance, inspection or parts replacement!
- It is prohibited to repair the equipment when power is on; otherwise, there is the danger of electric shock!
- After the equipment power is cut off, wait for at least 10 minutes before inspecting or repairing the equipment or performing other operations.

Warning

- Repair the equipment according to the product warranty agreement.
- When the equipment has fault or is damaged, troubleshoot and repair the equipment and product follow guidance by professionals, and prepare the repair records.
- Replace the product wearing parts under guidance.
- Do not continue to use damaged machines; otherwise, greater damager may be caused.
- After replacing the equipment, re-check the equipment wiring and parameter settings again.

During Scrapping

Warning

- Scrap the equipment and product according to national regulations and standards to avoid property loss or personal injury!
- Recycle scrapped equipment and product according to industrial waster processing standards to avoid pollution to the environment.

§ Safety Marks

For safe operation and maintenance of the equipment, be sure to observe the safety marks affixed to the equipment and product. Do not damage, destroy or peel off the safety marks. Safety marks are described as follows:

Safety Marks	Description
	◆ Read the user manual before installing and running the equipment; otherwise, there is the danger of electric shock! ◆ Do not dismantle the cover within 10 minutes after the power is turned on or cut off! ◆ After cutting off the power at the input and output terminals, wait for 10 minutes until the power indicator turns off before maintaining, inspecting or wiring the equipment.

2 Product Information

2.1 Technical Specification

- Input and Output
  - Input Voltage : 1PH 220V / 3PH 220V / 3PH 380V
  - Input Frequency: 47~63Hz
  - Output Voltage: 0 ~ rated voltage
  - Output Frequency: 0.00Hz ~ 500.00Hz or 500.00Hz ~ 3000.00Hz to choose.
- Programmable Input Terminals
  - Digital Input (DI): 5 Photocoupler isolated inputs.
  - High Speed Input (HDI): Up to 100kHz pulse input.
  - Analog Input (AI): 3 isoloated channels AI input (0~10V or 0/4~20mA)
  - High Speed Output (HDO): Up to 100kHz pulse output, compatiable with open-collector switch reference.
  - Analog Output (AO): 2 isolated outputs, 0 ~ 20mA or 0 ~ 10V defined by reference.
  - Relay Output : 1 relay channel output, contactor capacity: 250VAC 5A.
  - Open-collector Output: 2 isolated outputs of HDO, can be used as relay extension.
  - Serial Communication: 1 RS485 channel, compatiable with Modbus protocol.
  - Digital Input Mode: Sink or Source type available to select.
  - External Temperature Senor: Compatiable with PT100, NTC sensor input directly, and 0 ~ 5V, 0 ~ 10V and 4 ~ 20mA transmitter.
- Technical specification
  - Control Mode: SVC, FVC, torque control, V/F control.
  - Overload Capicity: Type G: 150% up to 60s, 180% up to 3s.Type P: 120% up to 60s, 150% up to 3s.
  - Start Torque: Type G: SVC 150% of 0.3Hz, FVC 180%. Type P: SVC 100%
  - Speed Ratio: SVC 1:100, FVC 1:1000.
  - Speed Control Accuracy: SVC ±0.5%, FVC ±0.02%.
  - Carrier Frequecy: 0.5kHz ~ 16.0kHz , auto-ajustment frequency is available depend on loads.
- Functions
  - Frequency Setting Mode: Digital input, Analog input, Serial input, Muti-speed, PID input..etc
  - Built-in Simple PLC, PID control Mode.
  - Easy setting for Water pressure control and Temperature connection and control.
  - Muti-speed function: 8-step and 16-step speed control available.
  - Current-limitation function avaliable, keep output current uder a certian level to aviod fault.
  - Muti-Protection function: Shor Circuited, AVR, Current-Limitation, Overheated, Over/Short voltage, Phase-lack detection..etc.

2.2 Nameplate and Model

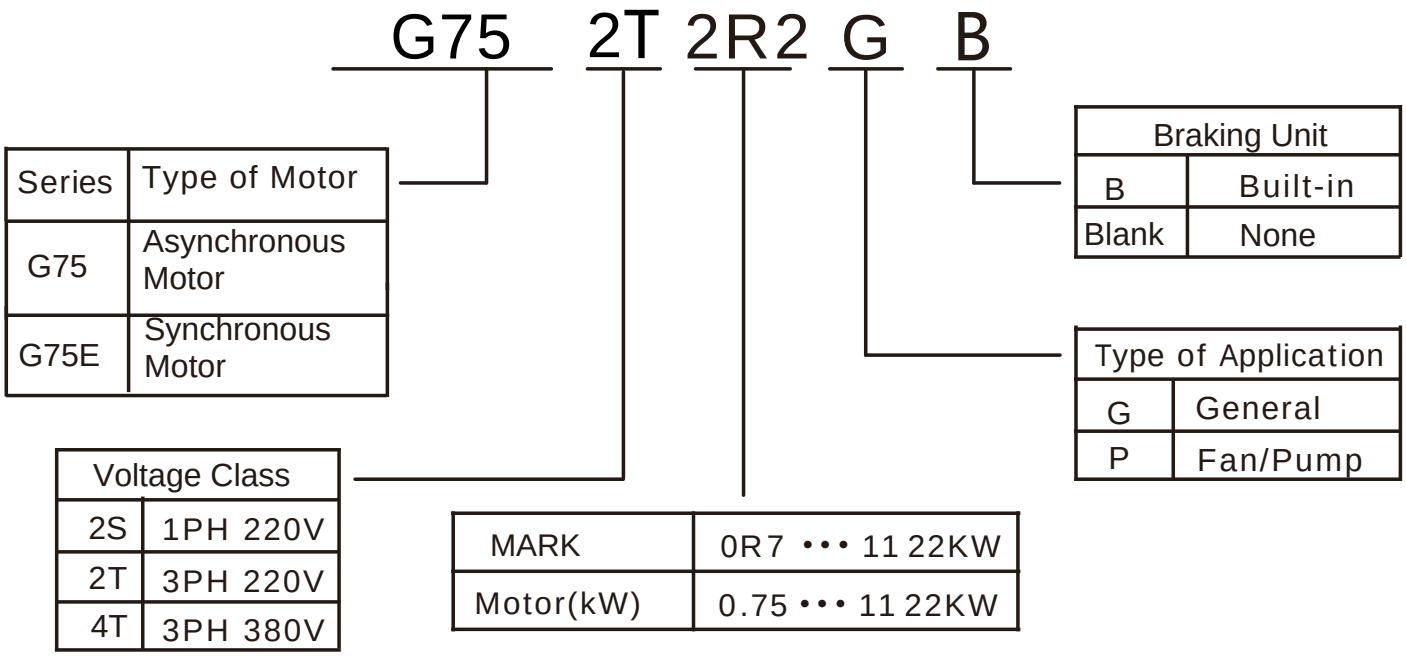


Fig 2-1 Product naming and nameplate

3 Installation and Wiring

3.1 Installation

3.1.1 Installation Environment

1. Ambient temperature: The AC drive service life is greatly influenced by the ambient temperature. Do not run the AC drive under a temperature exceeding the allowed temperature range (-10°C to 50°C).

2. Install the AC drive on the surface of a flame retardant object, and ensure there is sufficient space around the enclosure to allow for efficient heat dissipation. The AC drive generates great heat during working. Use screws to install the AC drive on the mounting support vertically.

3. Install the AC drive without strong vibration. Ensure the mounting location is not affected by levels of vibration that exceeds 0.6 G. Keep the drive away from punch machines.

4. Ensure the mounting location is away from direct sunlight, damp or water drops.

5. Ensure the mounting location is protected against corrosive, combustible or explosive gases and vapors.

6. Ensure the mounting location is free from oil and dust.

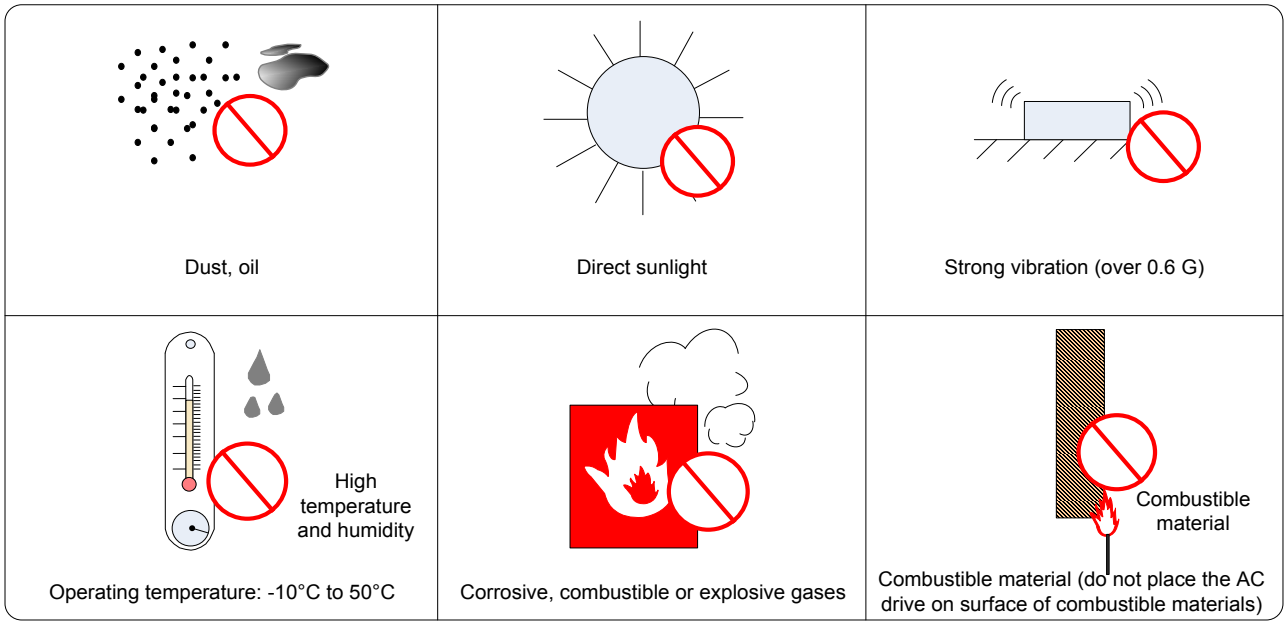


Figure 3-1 Installation environment requirements

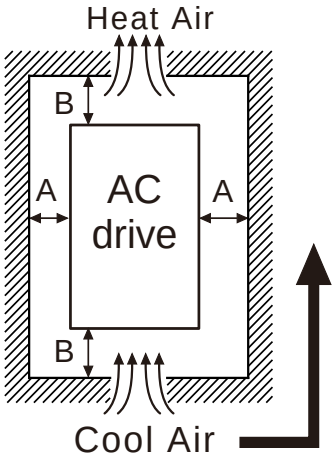
7. The drive units must be installed in a fireproof cabinet with doors that provide effective electrical and mechanical protection. The installation must conform to local and regional laws and regulations, and to relevant IEC requirements.

3.1.2 Mouting Clearance and Orientation

1. Mouting Clearance

1) Single AC drive installation

The mounting clearance varies with the power rating of the AC drive.



Power Rating	Distance Requirement	
0.7 ~ 15KW	A≥50mm	B≥100mm
18.5 ~ 22KW	A≥50mm	B≥200mm
30 ~ 37KW	A≥100mm	B≥200mm
45 ~ 450KW	A≥100mm	B≥300mm

Always mount the AC drive in an upright posistion

Fig.3-1 Mounting clearance of a single drive

2) Multi-drive installation

Where an AC drive is required to be mouted directly above another AC drive, it is recommende d to install an Air Guide Plate to divert exhaust colling air of the bottom unit away from the top unit.

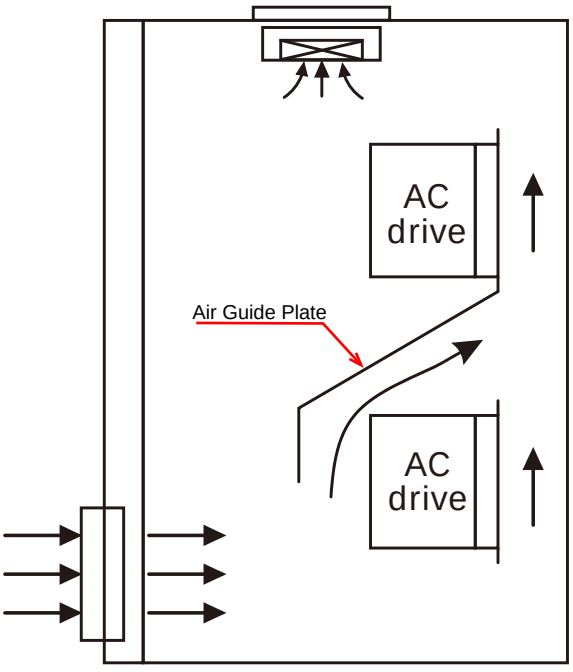


Fig.3-2 Multi-drive installation with an air guide plate

3.2 G75 System Connection3.2.1

External Parts Connection Diagram

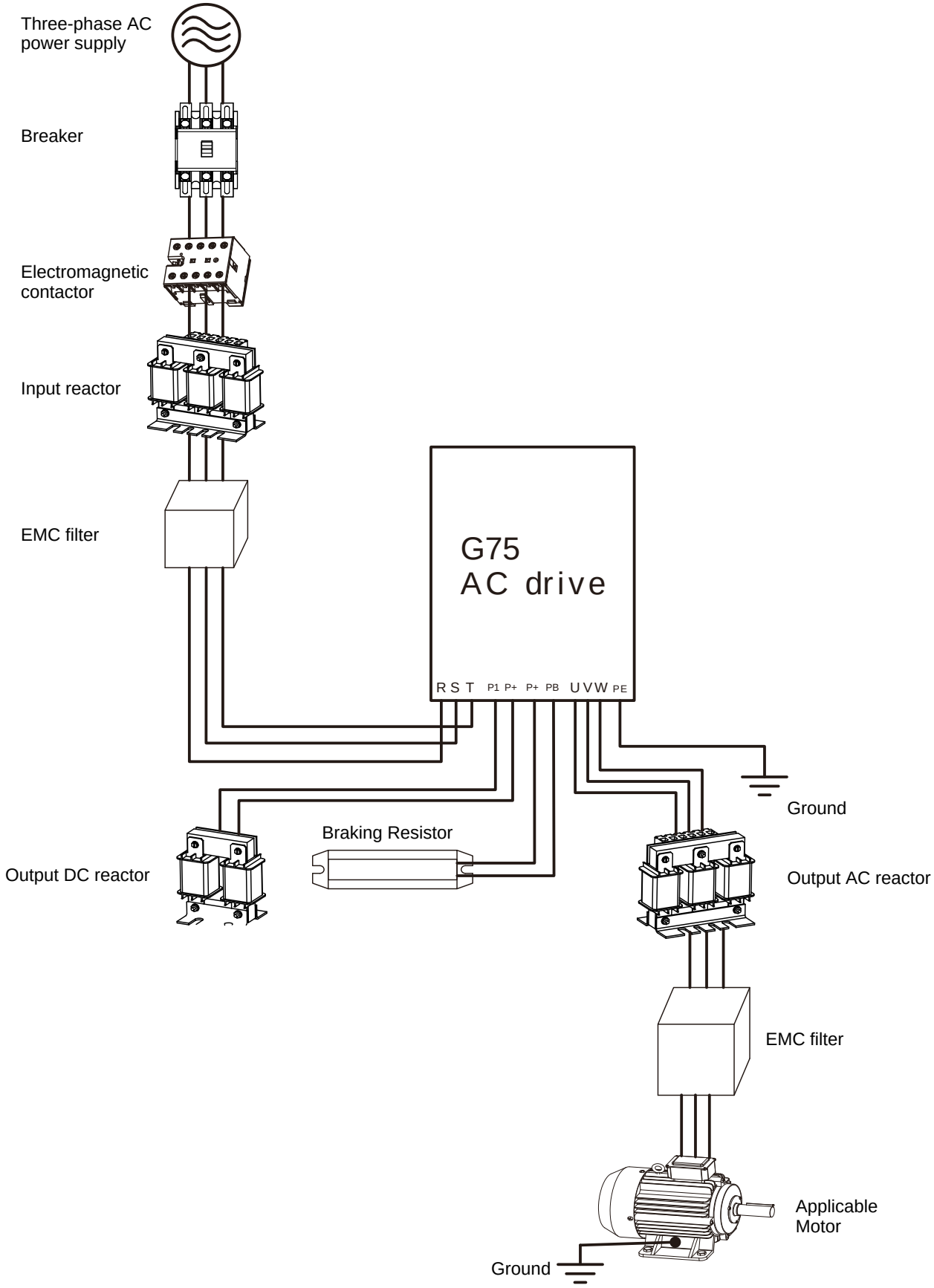


Fig. 3-3 G75 Serial System composition

3.2.2 Description of Terminals

Terminal	Description
L、N	Single-Phase supply input
R、S、T	Three-Phase supply input
U、V、W	Three-Phase output to motor
P+,PB	Breaking resistor connection
P1,P+ or [+]	DC reactor output connection
P+、P- or [+]、[-]	External Breaking unit connection
⏚	Grounding

3.2.3 Control Circuit Terminal Function

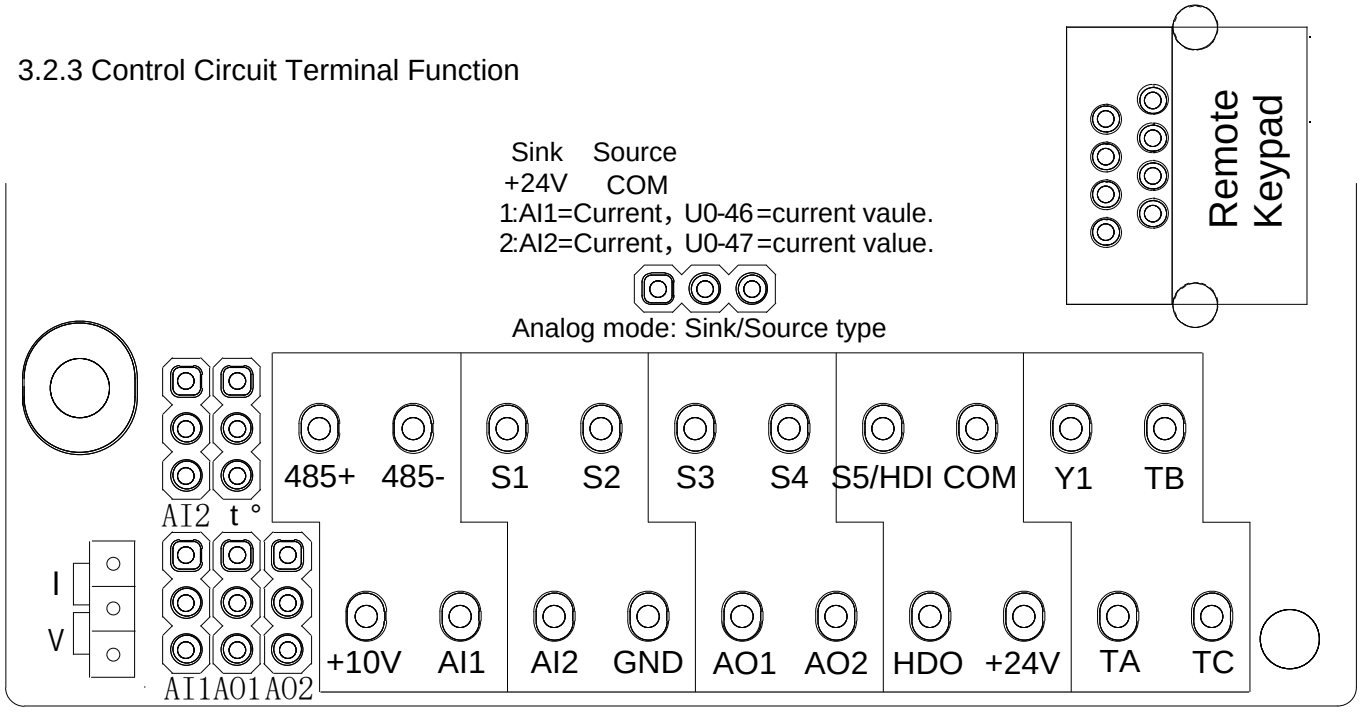


Fig. 3-4 G75 Conrol circuit terminal and jumper arrangement

Name	Terminal	Function Description
Power Supply	+10V - GND	+10V power supply to an external unit, Max input: 50mA
	+24V - COM	+24V power supply to an external unit, Max input: 200mA
	Note: power of +10V-GND and +24V-COM are internally isolated.	
Digital Inputs(DI)	S1 - COM/+24V	Photocoupler isolated input, compatible with dual-polarity input(sink or source type). HDI/S5 can also be used for high speed pulse inputs. Max. input: 100kHz Input impendance: 1.03kΩ Note: Sink type- DI termial and +24V are circuited.(default) Source type- DI terminal and COM are circuited.
	S2 - COM/+24V	
	S3 - COM/+24V	
	S4 - COM/+24V	
	S5/HDI - COM/+24V	
Digital outputs(DO)	HDO - +24V	High speed pulse output with 100kHz max. Function parameter is changable to a open-collector output. Note: HDO is driven by +24V output to a external loads, cirucited with COM after the output is activited.

Name	Terminal	Function Description
Analog inputs(AI)	AI1 - GND	Either a voltage(0~10V) or a current(4~20mA) with single-polarity input. Current resistor impendence: 160Ω
	AI2 - GND	Either a voltage(0~10V) or a current(4~20mA) with dual-polarity input. Also compatiable with PT100, NTC sensor input, defined by F9-56. Note: AI2 can measured voltage of 2.4V with suspened input. Current resistor impendence: 160Ω
	AI3	Keypad potentiometer channel only
Analog outputs(AO)	AO1 - GND	Swithover voltage and current output by Jumper. Voltage: 0~10V Current: 0/4~20mA
	AO - GND	
Relay outputs	TA - TC (NO)	1 Normally-Open(NO) contactor,and 1 Normally-Close(NC) contactor output. Contactor capacity：250VAC-3A, 30VDC-5A.
	TA - TB (NC)	

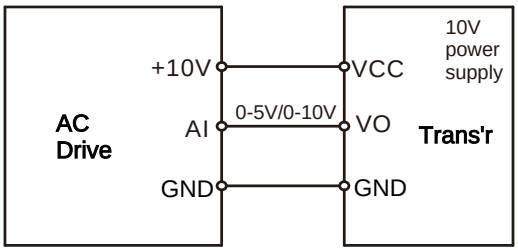
Note: default factory setting of AI1,AI2 defined as voltage inputs. AO1,AO2 defined as voltage output. DI termianls defined as Sink mode, HDO defined as pulse output.

3.2.4 Analog Input Reference and Wiring Analog

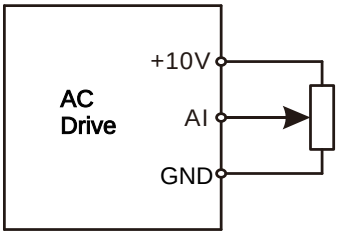
Input reference table

AI1 common input reference			AI2 common input reference		
0~5V	0~10V(default)	4~20mA	±0~5V	±0~10V(default)	4~20mA
F4-13=0.00V F4-15=5.00V	F4-13= 0.00V F4-15=10.00V	F4-13= 2.00V F4-15=10.00V	F4-18=-5.00V F4-19=-100.00% F4-20=5.00V	F4-18=-10.00V F4-19=-100.00% F4-20=10.00V	F4-18= 200V F4-19= 0.00% F4-20=10.00V

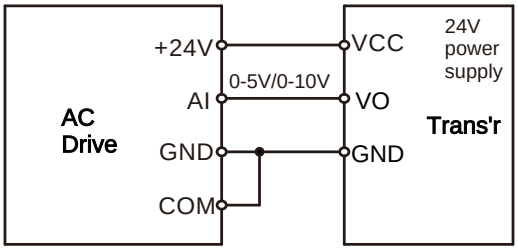
AI1 Wiring with Common Transmitter:



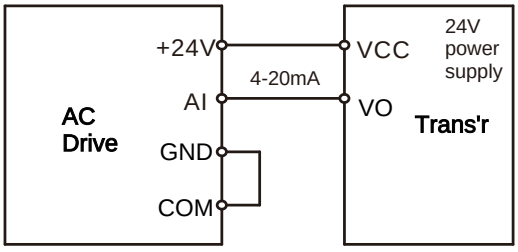
Voltage Transmitter connection 1



External Potentiometer connection



Voltage Transmitter connection 2



Current Transmitter connection

*AI renference need define current input

Fig.3-5 AI input connection diagram

3.2.5 Sink/Source Switchover of DI Ternminal Connection

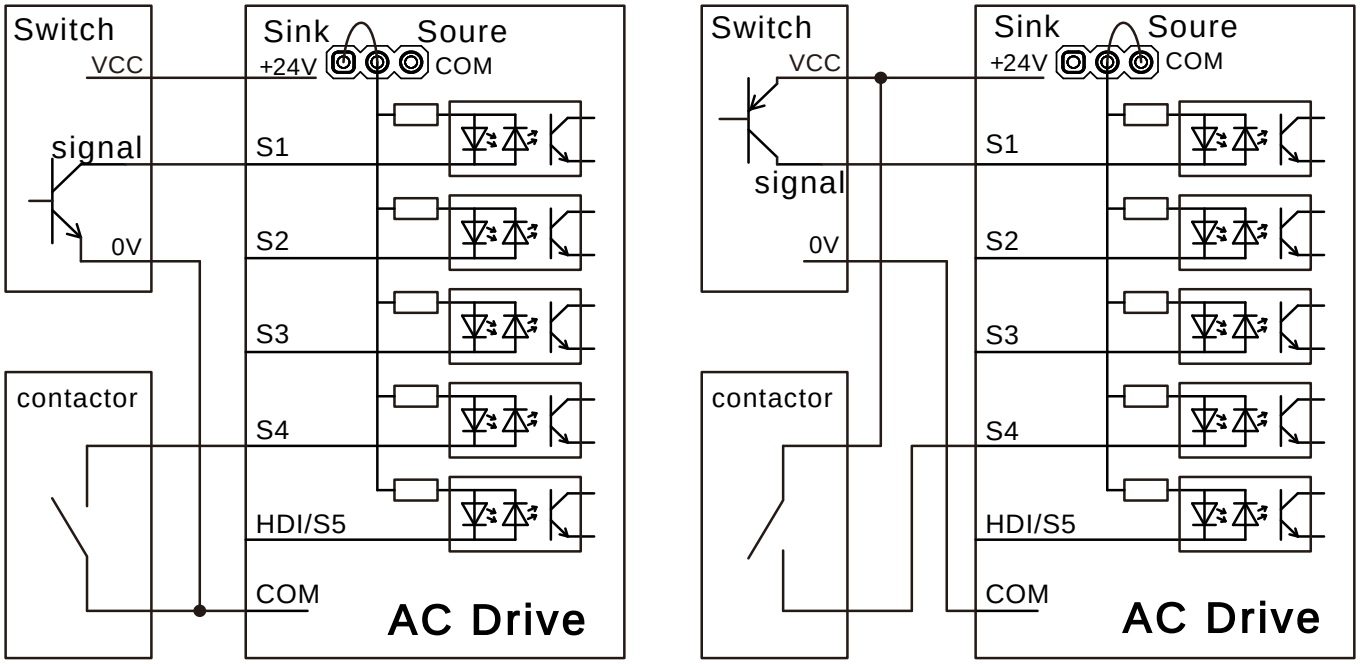


Fig.3-6 Sink/Source Switchover of DI Ternminal Connection

3.2.6 Braking Unit and Braking Resistor Installation

1) Selection of Resistance of Braking Resistor

The AC drive transfers regenerative energy generated during braking of motor to external braking resistor. According to formula U x U/R=Pb:
- U refers to braking voltage at system stable braking. (Its value varies with the system. The default braking voltage of G75 Series is 760V. You can set F9-07 to change the value)

2)Slection of Power of Braking Resistor

In theory, power of braking resistor is the same as braking power. But in consideration of de-rating, power of braking resistor is calculated from the fllowing formula: K x Pr= Pb x D
-K is about 50%.
- Pr refers to power of braking resistor.
- D refers to braking frequency (% of regenerative process to whole deceleration).
The following two formula can be obtained:

$$K \times Pr = Pb \times D = (U \times U)/(R \times D)$$
$$Pr = (U \times U \times D)/(R \times K)$$

The user can caluclate braking resistor power.
K is de-rating coefficient of braking resistor. Low K value can ensure that braking resistor does not get overheated. the K value can be increased appropriately on the condition of good disspipation and should not exceed 50%. Failure to comply may result in a fire due to overheating of braking resistor

Braking Frequency (D) is determined by application. Typical value of braking frequency in different applications are listed in the Table bleow:

Application	Elevator	Winding & Unwinding	Centrifuge	Occasional	Gerneral application
Breaking Freq.	20%~30%	20~30%	50%~60%	5%	10%

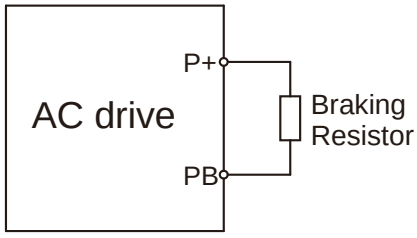
AC Drive Power(KW)	Breaking Resistor Power (W)	Breaking Resistor Power (W)
Single Phase 220V		
0.75	80W	≥150Ω
1.5	100W	≥100Ω
2.2	100W	≥70Ω
Three Phase 220V		
0.75	150W	≥110Ω
1.5	250W	≥100Ω
2.2	300W	≥65Ω
3.7	400W	≥45Ω
5.5	800W	≥22Ω
7.5	1000W	≥16Ω
11	1500W	≥11Ω
15	2500W	≥8Ω
18.5	3.7KW	≥6.7Ω
22	4.5KW	≥6.7Ω
30	5.5KW	≥5Ω
37	7.5KW	≥3.3Ω
45	4.5KW×2	≥5Ω×2
55	5.5KW×2	≥5Ω×2
75	16KW	≥3.3Ω×2
Three Phase 380V		
0.75	150W	≥300Ω
1.5	150W	≥220Ω
2.2	250W	≥200Ω
3.7	300W	≥130Ω
5.5	400W	≥90Ω
7.5	500W	≥65Ω
11	800W	≥43Ω
15	1000W	≥32Ω
18.5	1300W	≥25Ω
22	1500W	≥22Ω
30	2500W	≥16Ω
37	3.7KW	≥12.6Ω
45	4.5KW	≥9.4Ω
55	5.5KW	≥9.4Ω
75	7.5KW	≥6.3Ω
90	4.5KW×2	≥9.4Ω×2
110	5.5KW×2	≥9.4Ω×2
132	6.5KW×2	≥6.3Ω×2

AC Drive Power(KW)	Breaking Resistor Power (W)	Reistor Value of Resistance(Ω)
160	16KW	≥6.3Ω×2
200	20KW	≥2.5Ω
220	22KW	≥2.5Ω
250	12.5KW×2	≥2.5Ω×2
280	14KW×2	≥2.5Ω×2
315	16KW×2	≥2.5Ω×2
355	17KW×2	≥2.5Ω×2
400	14KW×3	≥2.5Ω×3
450	15KW×3	≥2.5Ω×3

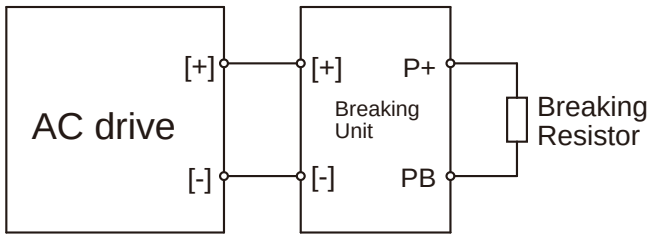
Note: "x2" means 2 Breaking Units parallel both with resistor, "x3" means 3 Breaking Units parallel.

2)Brake Resistor/DC Breaking Unit Connection

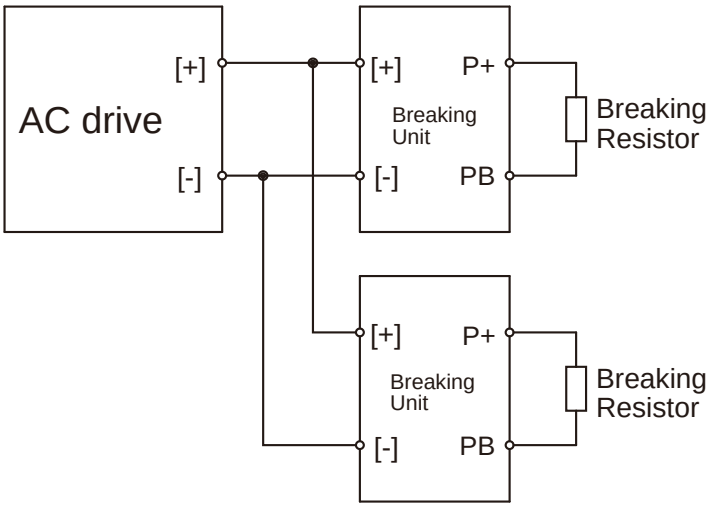
Braking resisitor and Braking Unit Wiring:



Internal Breaking Unit Connection



External Breaking Unit Connection



External Breaking Unit Parallel Connection

Fig.3-7 Breaking Resistor and Breaking Unit Connection

3.2.7 Wring Diagram

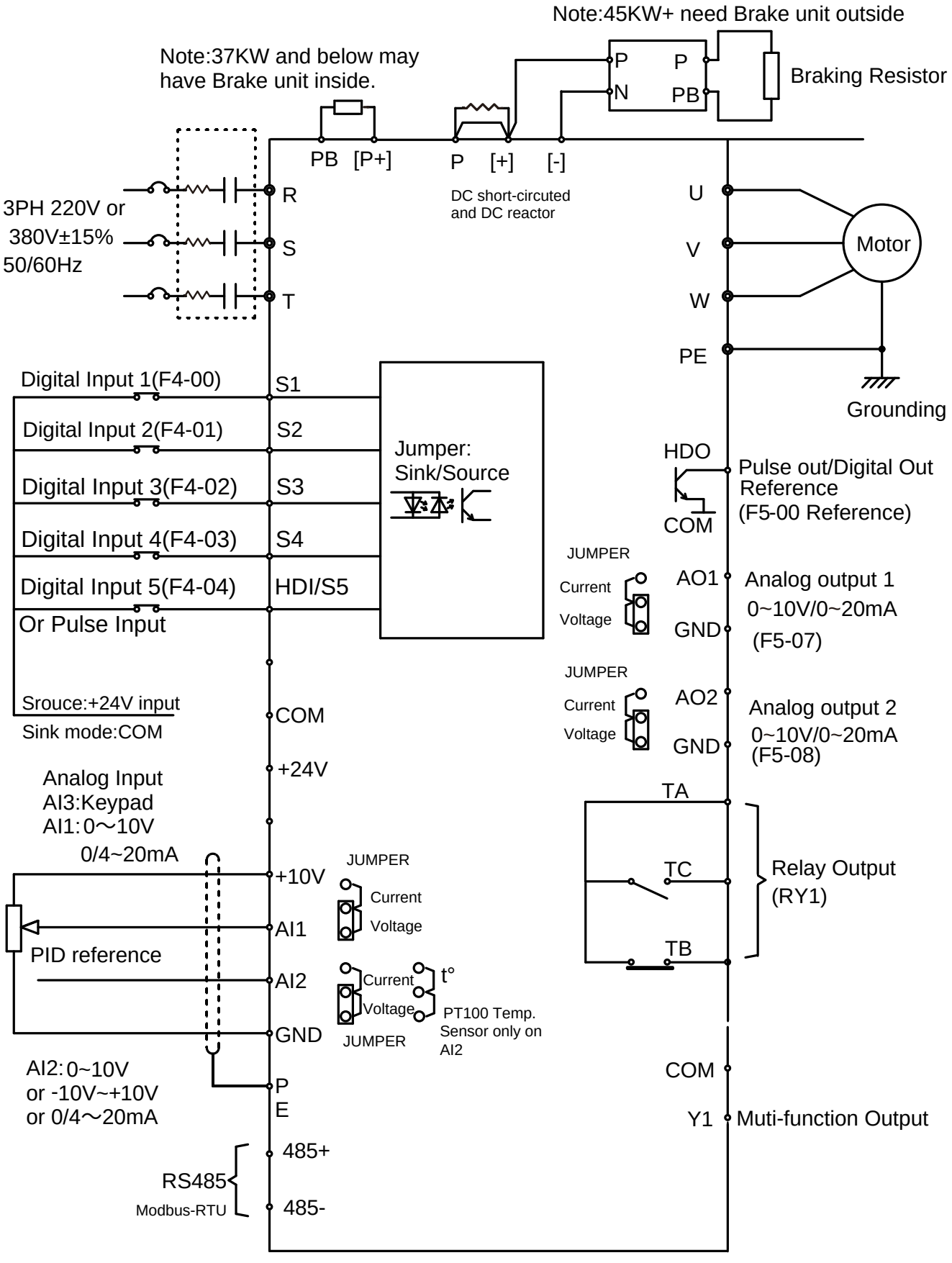
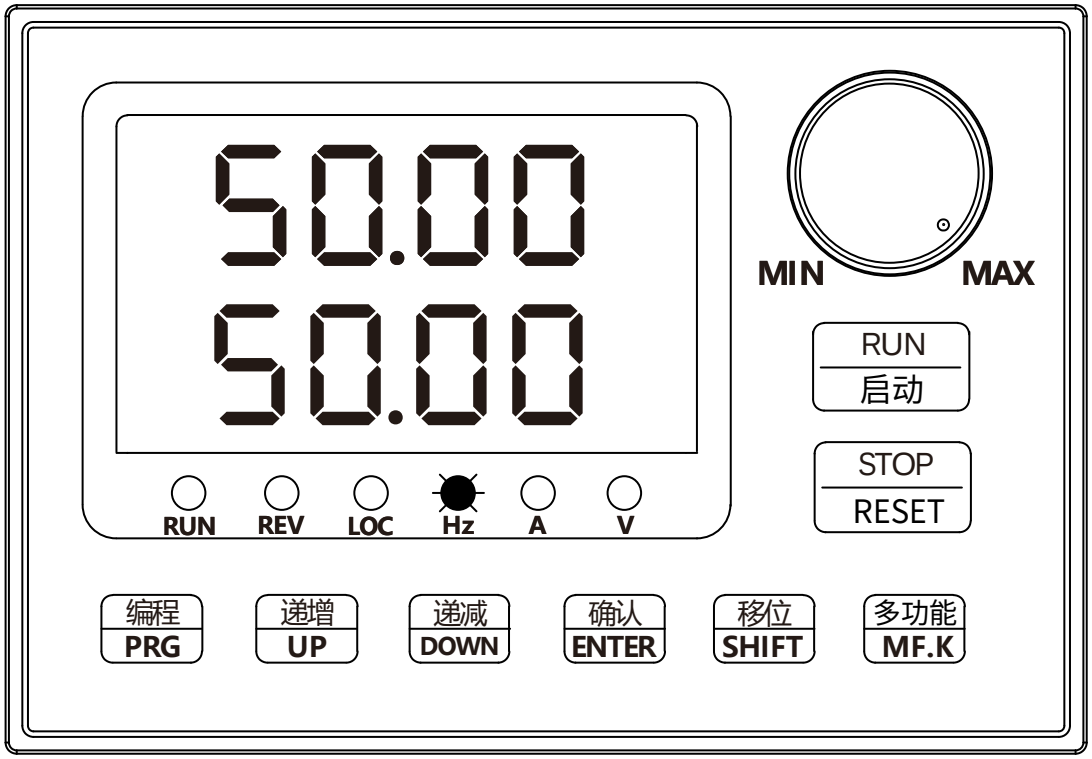


Fig. 3-8 Terminals Wiring Diagram

4 Panel Operation

4.1 Panel(Keypad) Instruction

4.1.1 LED and LCD Panel(Keypad) Diagram



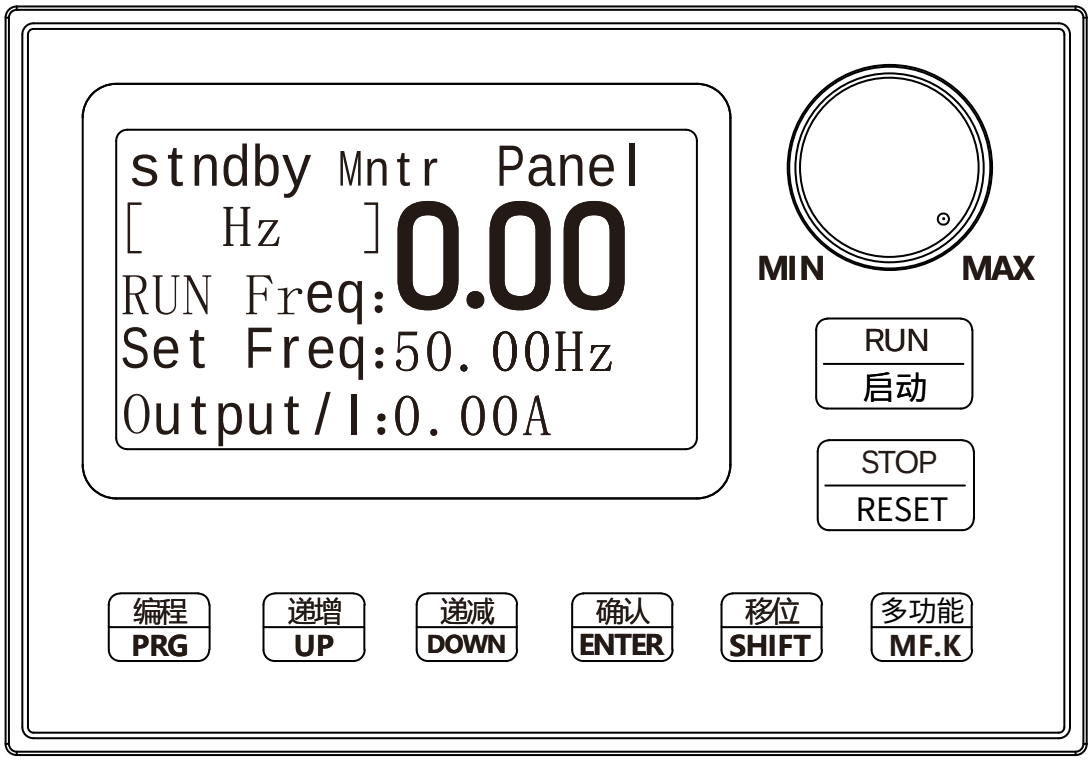


Fig. 4-1 LED/LCD Panel Outfit Type 1

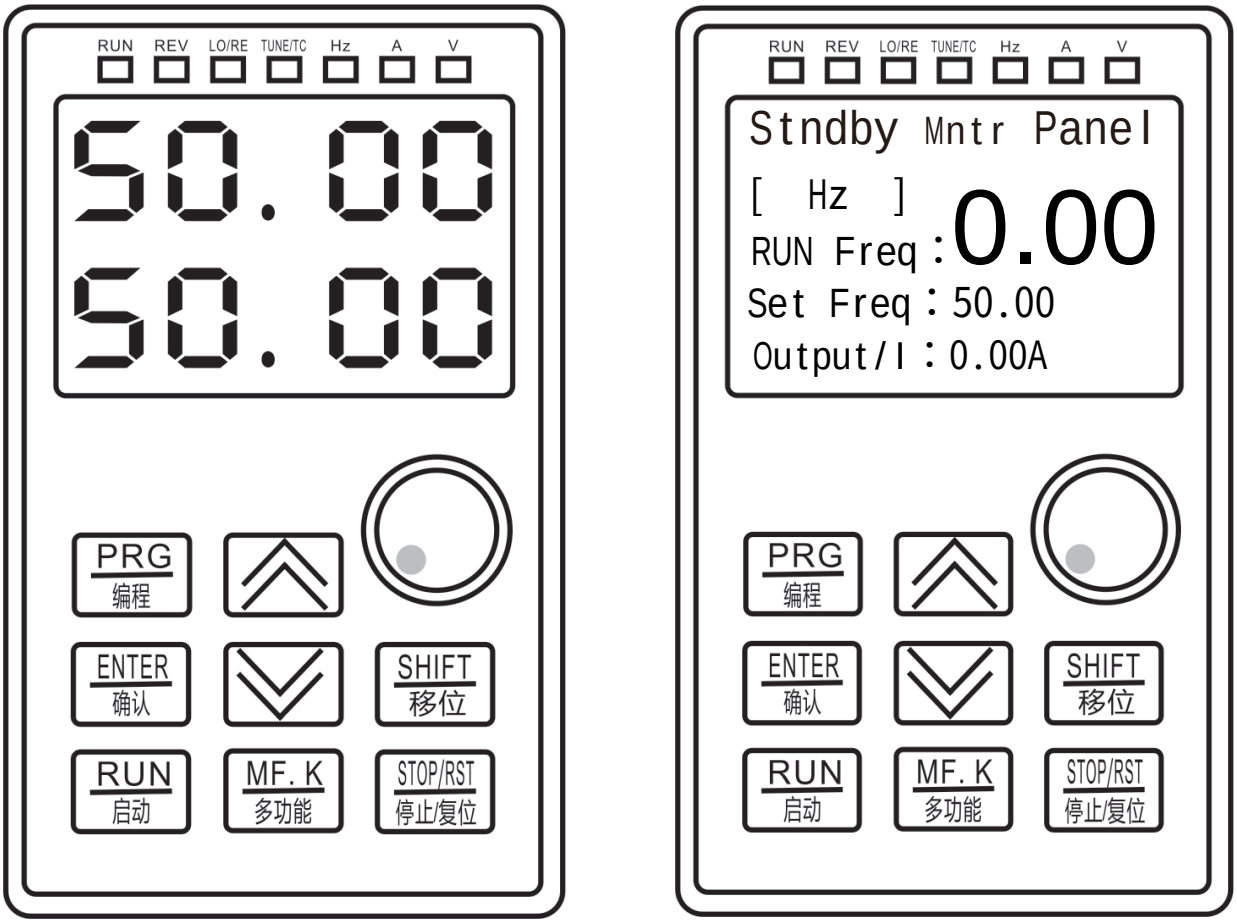
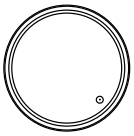


Fig. 4-2 LED/LCD Panel Outfit Type 2

4.1.2: Operation Panel Key

Key	Key Name	Function Description
编程 PRG	Programming	Enter or exit Level or Menu.
递增 UP	Increment	When editing a parameter value, it increase the dispalyed value.
递减 DOWN	Decrement	When editing a parameter value, it decrease the displayed value.
确认 ENTER	Confirm	Enter each level of menu interface and confirm displayed parameter setting.

Key	Key Name	Function Description
移位 SHIFT	Shift	Select the displayed parameter in the STOP or RUNNING status. Select the parameter code or value digit place under setting.
多功能 MF.K	Multi-Function key	Perform a function switchover as defined by the setting of F7 -01. Factory defalut fucntion is JOG
启动 RUN	RUN	Start the AC drive when using the operating panel control mode. *Emergency STOP function will be activited if press the 'RUN' and 'STOP' key on the same time. This function only cut off power output of AC drive, the motor will be coast to stop.
停止 STOP	STOP /RESET	Stop the AC drive at operating. The function of this key can be restricted refer to F7-02. Perform a reset operation when the drive is in the FAult status.
	Multi-func Potentiometer or Encoder	Potentiometer: For operate frequency, torque value, PID and pressure control, etc. (Default) Encoder: For digital frequency, increase or decrease pressure function or reference setting, etc.
Emergency STOP key		See '*' on RUN key description.
Main/AUX display switchover		Press and hold ENTER key, then press SHIFT key to switch display.

4.1.3 Panel Indicators

NAME	Function Discription
RUN	OFF indicates the STOP status. ON indicates the RUNNING status. Flashing indicates hibernate status
REV	ON indicates Running reverse. OFF indicates Running forward.
LO/RE	OFF indicates Panel control. ON indicates Terminal control. FLASH indicates Communication control.
TUNE/TC	ON indicates Torque control. SLOW FLASH indicates Auto-tunning status. FAST FLASH indicates AC drive fault.
Hz	Running frequency Under RUNNING.Reference frequency Under STOP.
A	A for Current.
V	V for Voltage.
Hz、A	RPM for motor speed.
A、V	ON indicates %. FLASH indicates PID reference value. Note: MPa/Kg in Pressure control mode. ℃ in Temperature control mode.

4.2 View and Modify Function Parameter

4.2.1 Modify Instruction

This AC drive contains parameter from Group F0 to FP,A0 to A6 and U0. Use 'UP' or 'DOWN' key to choose one of these parameter group. There are two grades of the menu: grade 1 is parameter code, and grade 2 is setting value. Under grade 2 menu, use 'PRG' key can return back to 1 grade without save the change value , or use 'ENTER' key to confirm the setting value and turn to the following parameter number .

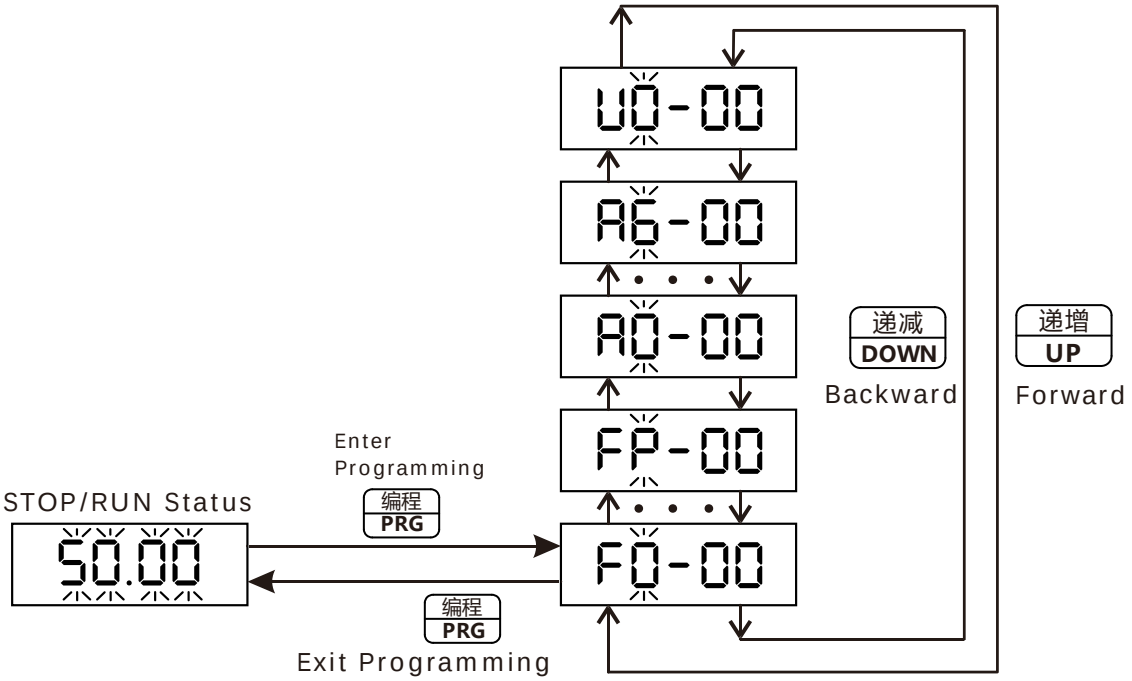


Fig. 4-3 Operation Procedure of the Menu

4.2.2 Operation Example

Following example shows how to modify F0-03 from 50.00Hz to 30.00Hz:

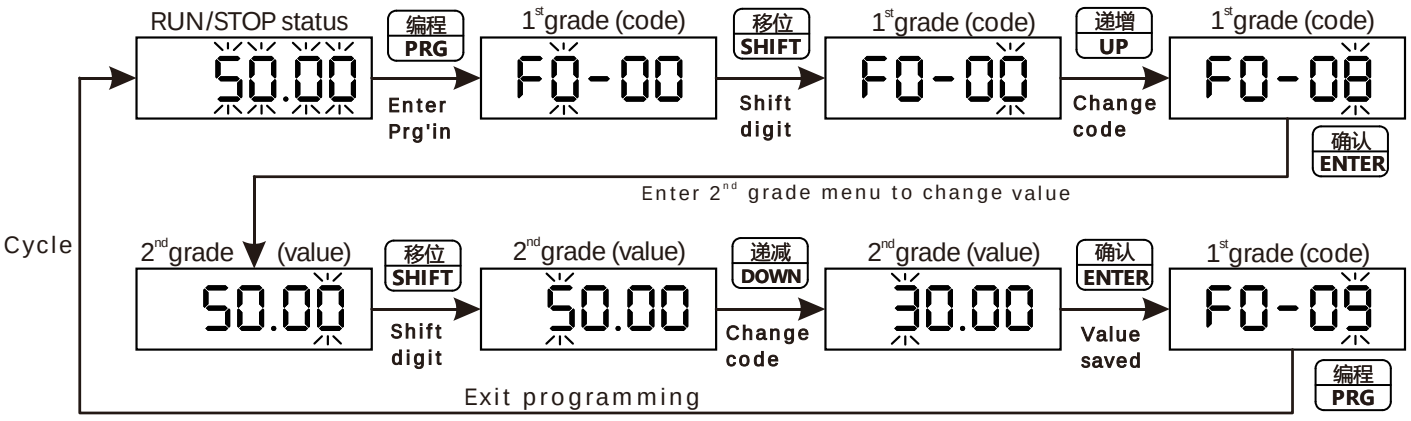


Fig. 4-4 Expamle for Panel Operation

5 Parameter Code and Instruction

Sorry!

This chapter of parameter instruction pages (p.24 to p.101) are not printed.

You can find a quick Parameter Table on **page 102.**

If you need the Full Version Manual, please ask your distributor for a latest PDF copy.

Thank you for helping us to save paper and the global enviroment change.

6 Parameter Table

Password protection is not applicable to user-defined parameters. Group P include standard function parameters and monitoring parameters.

The symbols in the parameter table are described as follows:

◇: It is possible to modify the parameter with the drive in the Stop and in the Run Status.

☐: It is not possible to modify the parameter with the drive in the Run Status.

■: The parameter is the actual monitored value and cannot be modified;

*: The parameter is a factory parameter and can be set only by the manufacturer.

Para.No.	Name	Description	Default	Modify
Group F0: Basic Function				
F0-00	Type G/P Display	1: G (Constant torque loads) 2: P (Fan and pump)	1	☐
F0-01	Motor 1 control mode	0: SVC 1: FVC 2: V/F	2	☐
F0-02	Command source selection	0: Operating Panel 1: Terminal 2: Serial Communication	0	☐
F0-03	Main frequency reference setting channel selection	0: Digital Setting (Revised value is cleared after power off). 1: Digital Setting (Revised value is not cleared after power off). 2: AI1 3: AI2 4: AI3(Panel Potentiometer) 5: PULSE setting (DI5) 6: Multi Reference 7: Simple PLC 8: PID 9: Communication setting	4	☐
F0-04	Auxiliary frequency reference setting channel selection		0	☐
F0-05	Base value of range of auxiliary frequency reference for mail 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	Units: 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 + AUX calculation” 4: Switchover between Auxiliary and “main + AUX calculation”	00	◇

Parameter Table

Para.No.	Name	Description		Default	Modify
F0-07	Final frequency reference setting selection	Tens	Main and Auxiliary calculation formula. 0: Main+AUX 1: Main-AUX 2: Max. Of Main and AUX 3: Min. Of Main and AUX 4: Main*AUX(Max. Freq. only)		
F0-08	Preset frequency	0.00Hz to Max. Freq. (P01.10)		50.00Hz	◇
F0-09	Running direction	0: Run in the default direction.(FWD/REV indicator off) 1: Run in the direction reverse to the default direction(FWD/REV indicator on)		0	◇
F0-10	Max. Frequency	500.0Hz to 3000.0Hz (F0-22 = 1) 0.00Hz to 500.00Hz (F0-22 = 2)		50.00Hz	□
F0-11	Setting channel of frequency upper limit	0: Set by P01.12 1: AI1 2: AI2 3: AI3 4: PULSE reference 5: Communication reference		0	□
F0-12	Frequency upper limit	Freq. Lower limit (P01.14) to Max. Freq. (P01.10)		50.00Hz	◇
F0-13	Frequency reference upper limit offset	0.00Hz to MAX. Freq. (P01.10)		0.00Hz	◇
F0-14	Frequency reference lower limit	0.00Hz to Freq. Upper limit (P01.12)		0.00Hz	◇
F0-15	Carrier Frequency	0.5kHz to 16.0kHz		Model default	◇
F0-16	Carrier Frequency adjusted with temperature	0: Disable 1: Enable		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 default	◇
F0-18	Deceleration time1	0.00s to 650.00s (F0-19 = 2) 0.0s to 6500.0s (F0-19 = 1) 0s to 65000s (F0-19 = 0)		Model default	◇
F0-19	Acceleration/Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s		1	□
F0-20	Operation delay time after power on	0.0s to 3600.0s			
F0-21	Frequency offset of Auxiliary frequency setting channel for main and auxiliary calculation	0.00Hz to Max. Freq. (F0-10)		0.00Hz	◇
F0-22	Max. Frequency range selection	1: 500.0Hz to 3000.0Hz 2: 0.00Hz to 500.00Hz		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	□

Parameter Table

Para.No.	Name	Description	Default	Modify
F0-25	Acceleration/Deceleration time base frequency	0:Max. Freq. (P01.10) 1:Frequency reference. 2:100Hz	0	□
F0-26	Base frequency for UP/DOWN Modification during running	0:Running frequency 1:Frequency reference	0	□
F0-27	Command source + Frequency Source	Units:Operation panel + Frequency reference setting channel Tens:Terminal I/O control + frequency reference setting channel. Hundreds: Serial communication + frequency reference setting channel. Thousands:Auto start + frequency reference setting channel. 0: No function 1: Digital Setting 2: AI1 3: AI2 4: AI3 5: PULSE reference (DI5) 6: Multi-reference 7: Simple PLC 8: PID 9: Serial communication		
F1-00	Motor type selection	0:Standard asynchronous Motor 1:Variable Frequency asynchronous Motor 2:Permanent magnet synchronous motor	0	□
F1-01	Rated motor power	0.1KW to 1000.0KW	Model default	□
F1-02	Rated motor voltage	1V to 2000V	Model default	□
F1-03	Rated motor current	0.01A to 655.35A (AC drive power ≤55KW) 0.1A to 6553.5A(AC drive power ≥55KW)	Model default	□
F1-04	Rated motor frequency	0.01 Hz to max. frequency	Model default	□
F1-05	Rated motor speed	1 to 65535 RPM	Model default	□
F1-06	Stator resistance of asynchronous motor	0.001Ω to 65.535Ω (AC drive power≤55KW) 0.0001Ω to 6.5535Ω(AC drive power>55KW)	Tuning Reference	□
F1-07	Rotor resistance of asynchronous motor	0.001Ω to 65.535Ω(AC drive power≤55KW) 0.0001Ω to 6.5535Ω(AC drive power>55KW)	Tuning Reference	□
F1-08	Leakage inductance of asynchronous motor	0.01mH to 655.35mH(AC drive power≤55KW) 0.001mH to 65.535mH (AC drive power>55KW)	Tuning Reference	□
F1-09	Mutual inductance of asynchronous motor	0.1mH to 6553.5mH(AC drive power≤55KW) 0.01mH to 655.35mH (AC drive power>55KW)	Tuning Reference	□
F1-10	No-load current of asynchronous motor	0.01A to F1-03(AC drive power≤55KW) 0.1A to F1-03(AC drive power>55KW)	Tuning Reference	□
F1-16	Stator resistance of synchronous motor	0.001Ω to 65.535Ω(AC drive power≤55KW) 0.0001Ω to 6.5535Ω(AC drive power>55KW)	Tuning Reference	□
F1-17	D-axis inductance of synchronous motor	0.01mH to 655.35mH(AC drive power≤55KW) 0.001mH to 65.535mH(AC drive power>55KW)	Tuning Reference	□

Parameter Table

Para.No.	Name	Description	Default	Modify
F1-18	Q-axis inductance of synchronous motor	0.01mH to 655.35mH(AC drive power≤55KW) 0.001mH to 65.535mH(AC drive power>55KW)	Tuning Reference	□
F1-20	Counter electromotive force of synchronous motor	0.0V to 6553.5V	Tuning Reference	□
F1-27	Encoder pulses per revolution	1 to 65535	1024	□
F1-28	Encoder type	0:ABZ incremental encoder 1:UVW incremental encoder 2:Resolver 3:正余弦编码器 Sine-cosine encoder 4:Wire-Saving UVW encoder	0	□
F1-29	Encoder connection terminal selection	0: QEP1 1: QEP2 2: HDI/S5 Pulse	0	□
F1-30	A/B phase sequence of ABZ incremental encoder	0:Forward 1:Reverse	0	□
F1-31	Encoder installation angle	0.0 to 359.9°	0.0°	□
F1-32	Number of pole pairs of resolver	1 to 65535	0	□
F1-33	A/B phase sequence of ABZ incremental encoder	0:Forward 1:Reverse	0.0°	□
F1-34	Encoder installation angle	0.0 to 359.9°	1	□
F1-36	Encoder wire-break fault detection time	0.0s:No detection 0.1s to 10.0s	0.0s	□
F1-37	Auto-tuning selection	0:No tuning 1: Asynchronous Still-learning mode 2: Asynchronous Motive-learning mode 3: Asynchronous completed Still-learning mode 11:Synchronous auto-tuning with load 12:synchronous auto-tuning with no load	0	□
Group F2:Vector Control Parameters of Motor 1				
F2-00	Speed loop proportional gain 1	1 to 100	30	◇
F2-01	Speed loop integral time 1	0.01s to 10.00s	0.2s	◇
F2-02	Switchover frequency 1	0.00 to F2-05	5.00Hz	◇
F2-03	Speed loop proportional gain 2	1 to 100	20	◇
F2-04	Speed loop integral time 2	0.01s to 10.00s	1.00s	◇
F2-05	Switchover frequency 2	F2-02 to F0-10(Max. Freq.)	10.00Hz	◇
F2-06	Running slip compensation	50% to 200%	100%	◇
F2-07	Speed loop filter time coefficient	0.000s to 0.100s	0.000s	◇
F2-08	Over-excitation gain	0 to 200	64	◇
F2-09	Torque limit source in speed control	0: refer to P03.10 1: AI1 2: AI2 3: AI3 4: PULSE reference 5: Serial Communication reference 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) Full scale of 1-7 corresponds to F2-10	0	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
F2-10	Digital setting of torque limit in speed control (regenerative)	0.0% to 200.0%	150.0%	◇
F2-11	Torque limit source in speed control(regenerative)	0: Refer to P03.12 (electrical or regenerative) 1: AI1 2: AI2 3: AI3 4: PULSE reference 5: Serial Communication reference 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) Full scale of 1-7 corresponds to F2-12	0	◇
F2-12	Digital setting of torque limit in speed control (regenerative)	0.0% to 200.0%	150.0%	
F2-13	Excitation adjustment proportional gain	0 to 60000	2000	◇
F2-14	Excitation adjustment proportional gain	0 to 60000	1300	◇
F2-15	Torque adjustment proportional gain	0 to 60000	2000	◇
F2-16	Torque adjustment integral gain	0 to 60000	1300	◇
F2-17	Speed loop integral separation	0: Disable 1: Enable	0	◇
F2-18	Regenerative power limit selection	0: No function 1: always 2: enable on constant speed 3: enable on deceleration	0	□
F2-19	Regenerative power limit	0.0% to 200%	机型设置	◇
F2-20	Overvoltage adjustment coefficient	100% to 110%	105%	□
F2-21	Torque coefficient of weak magnet zone	50% to 200%	100%	◇
F2-25	Initial position angle detection of synchronous motor	50% to 180%	80%	◇
F2-26	Salient-pole rate adjustment gain of synchronous motor	0: Always 1: No function 2: Only on first time after power on	0	◇
F2-27	Speed loop selection	0: Default 1: With Zero speed	0	□
F2-28	Salient-pole rate adjustment gain of synchronous motor	50 to 500	100	◇
F2-29	Max. Torque lift current proportion control	0: Disable 1: Enable	0	◇
F2-31	Tuning adjustment of current loop index Kp	1 to 100	6	◇
F2-32	Tuning adjustment of current loop index Ki	1 to 100	6	◇
F2-33	Z signal correction	0: Disable 1: Enable	1	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
F2-34	SVC speed estimate filter coefficient of synchronous motor	10 to 1000	Model default	◇
F2-37	SVC initial excitation current of synchronous motor	0% to 100%(Motor rated current)	50%	◇
F2-38	Min. Initial SVC carrier frequency for synchronous motor	0.8KHz to F0-15(Carrier)	1.5KHz	◇
F2-39	SVC low speed braking function	0: Disable 1: Enable	0	◇
F2-40	SVC low speed braking frequency	0.00Hz to 10.00Hz	2.00Hz	◇
F2-41	SVC low speed braking frequency rate	0.0005Hz to 1.0000Hz	0.0010Hz	◇
F2-42	SVC low speed braking current	0% to 80% (Motor rated current)	50%	◇
F2-44	Zero servo function	0: Disable 1: Enable	0	◇
F2-45	Zero servo switchover frequency	0.00Hz to F2-02 (switchover Freq. 1)	0.30Hz	◇
F2-46	Zero servo speed loop proportional gain	1 to 100	10	◇
F2-47	Zero servo speed loop integral time	0.01s to 10.00s	0.50s	◇
F2-48	No reverse when stopping enabling	0: Disable 1: Enable	0	◇
F2-49	Stopping angle	0.0° to 10.0°	0.8°	◇
Group F3: V/F Control Parameter				
F3-00	V/F Curve setting	0: Liner V/F 1: Multi-point V/F 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 10: V/F separation 11: V/F half-separation	0	□
F3-01	Torque boost	0.1% to 30.0% 0.0%: Auto boost	Model default	◇
F3-02	Cut-off frequency of torque boost	0.00Hz to F0-10 (Max. Freq.)	50.00Hz	□
F3-03	Multi-point V/F frequency 1	0.00Hz to F3-05	0.00Hz	□
F3-04	Multi-point V/F voltage 1	0.0% to 100.0%	0.0%	□
F3-05	Multi-point V/F frequency 2	F3-03 to F3-07	0.00Hz	□
F3-06	Multi-point V/F voltage 2	0.0% to 100.0%	0.0%	□
F3-07	Multi-point V/F frequency 3	F3-05 to F1-04(电机额定频率)	0.00Hz	□
F3-08	Multi-point V/F voltage 3	0.0% to 100.0%	0.0%	□
F3-09	V/F slip compensation	0.0% to 200.0%	0.0%	◇

F3-10	V/F over-excitation gain	0 to 200	64	◇
Para.No.	Name	Description	Default	Modify
F3-11	V/F oscillation suppression gain	0 to 100	Model default	◇
F3-13	Voltage source for V/F separation	0: Refer to F3-14 1: AI1 2: AI2 3: AI3(Keypad Control) 4: Pulse reference (HDI/S5) 5: Multi-reference 6: Simple PLC 7: PID 8: Serial communications. PS: 100.0% corresponds to the rated motor voltage(F1-02、A2-02)	0	◇
F3-14	Digital setting of voltage V/F separation	0V to rated motor voltage	0V	◇
F3-15	Voltage rise time of V/F separation	0.0s to 1000.0s	10.0s	◇
F3-16	Voltage decline time of V/F Separation	0.0s to 1000.0s	10.0s	◇
F3-17	Stop mode selection for V/F separation	0: Frequency and voltage declining to 0 separately 1: Frequency declines after voltage declined to 0	0	◇
F3-18 To F3-33	Reserved	-	1	□
Group F4: Input Terminals				

Parameter Table

Group F4: Input Terminals				
Para.No.	Name	Description	Default	Modify
F4-00	S1 function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) Note: F4-00 only available when F4-11 is set) 3: Three-wrie control 4: JOG forward (F JOG) 5: JOG reverse (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop 9: Fault reset (RESET) 10: RUN pause 11: External fault opened-relay (TA) 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 Acc/Dec time selection 17: Terminal 2 for Acc/Dec time selection 18: Frequency source switchover 19: UP and DOWN setting clear (Terminals, Keypad) 20: Running command switchover terminal 1 21: Acc/Dec function prohibited 22: PID Pause 23: PLC status reset 24: Swing frequency pause 25: Counter input 26: Counter reset 27: Length count input 28: Length count reset 29: Torque control pause 30: Pulse input (HDI/S5 only) 31: Reserved 32: DC braking	1	☐
F4-01	S2 function selection		2	☐
F4-02	S3 function selection	33: External fault closed-relay (TA) input 34: Frequency modification enabled 35: PID action direction reverse 36: External STOP command terminal 1 37: Running command switchover terminal 2 (Terminal and Serial Comm.) 38: PID integral disable 39: Switchover between main frequency source and preset frequency. 40: Switchover between auxiliary frequency source and preset frequency 41: Motor selection terminal 1 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed/Torque control switchover 47: Emergency stop 48: External Stop terminal 2 (refer to F8-08) 49: Deceleration by DC barking 50: Clear the current operating time 51: Two-wire and Three-wire mode switchover 52: AI input and terminal 1 switchover 53: AI input and terminal 2 switchover 54: Reverse prohibited Note: S1 to S4, HDI/S5 can not define the same.	9	☐
F4-03	S4 function selection		12	☐

Parameter Table

Para.No.	Name	Description		Default	Modify
F4-04	HDI/S5 function selection				
F4-10	Digital Input filter time	0.000s to 1.000s		0.010s	◇
F4-11	Terminal I/O 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/DOWN rate	0.001Hz/s to 65.535Hz/s		1.00Hz/s	◇
F4-13	AI curve 1 Min. input	-10.00V to F4-15		0.00V	◇
F4-14	Corresponding % of AI curve 1 Min. input	-100.0% to 100.0%		0.0%	◇
F4-15	AI curve 1 Max. input	F4-13 to 10.00V		10.00V	◇
F4-16	Corresponding % of AI curve 1 Max. input	-100.0% to 100.0%		100.0%	◇
F4-17	AI1 filter time	0.00s to 10.00s		0.05s	◇
F4-18	AI Curve 2 Min. input	-10.00V to F4-20		-10.00V	◇
F4-19	Corresponding % of AI curve 2 Min. input	-100.0% to 100.0%		-100.0%	◇
F4-20	AI Curve 2 Max. input	F4-18 to 10.00V		10.00V	◇
F4-21	Corresponding % of AI curve 2 Max. input	-100.0% to 100.0%		100.0%	◇
F4-22	AI2 filter time	0.00s to 10.00s		0.05s	◇
F4-23	AI curve 3 Min. input	-10.00V to F4-25		0.00V	◇
F4-24	Corresponding % of AI curve 3 Min. input	-100.0% to 100.0%		0.0%	◇
F4-25	AI curve 1 Max. input	F4-23 to 10.00V		10.00V	◇
F4-26	Corresponding % of AI curve 3 Max. input	-100.0% to 100.0%		100.0%	◇
F4-27	AI3 filter time	0.00s to 10.00s		0.06s	◇
F4-28	HDI/S5 Min. Input	0.00KHz to F4-30		0.00KHz	◇
F4-29	Corresponding % of HDI/S5 Min. input	-100.0% to 100.0%		0.0%	◇
F4-30	HDI/S5 Max. Input	F4-28 to 100.00KHz		50.00HKz	◇
F4-31	Corresponding % of HDI/S5 Max. input	-100.0% to 100.0%		100.0%	◇
F4-32	HDI/S5 filter time	0.00s to 10.00s		0.10s	◇
F4-33	AI curve selection	Units: AI1 Tens: AI2 Hundreds: AI3	1: AI Curve 1 2: AI Curve 2 3: AI Curve 3 4: AI Curve 4 5: AI Curve 5	0x321	◇
F4-34	Setting selection when AI less than Min. input	Units: AI1 Tens: AI2 Hundreds: AI3	0: Corresponding % of Min input 1: 0.0%	000	◇
F4-35	S1 delay	0.0s to 3600.0s		0.0s	□
F4-36	S2 delay	0.0s to 3600.0s		0.0s	□
F4-37	S3 delay	0.0s to 3600.0s		0.0s	□
F4-38	S Terminals active mode selection	Units: S1 Tens: S2	0: High level active 1: Low level active	00000	□

		Hundreds: S3			
		Thousands: S4			
		Ten Thousands: HDI/S5			
Para.No.	Name	Description		Default	Modify
Group F5: Output Terminals					
F5-00	HDO output terminal mode	0: Pulse output (HDOP) 1: Digital output (HDOR)		0	◇
F5-01	HDOR function	0: No Output 1: AC drive operating 2: Fault output (Coast to stop fault) 3: Frequency detective threshold 1(FDT1) output 4: Frequency reached 5: Zero speed running(no output at stop) 6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Count value reached 9: Designated count value reached 10: Length reached 11: PLC cycle finished 12: Total operating time finished 13: Frequency limited 14: Torque limited 15: Ready to RUN 16: AI1>AI2 17: Frequency upper limit reached 18: Frequency lower limit reached (no output at stop) 19: Under-voltage status output 20: Serial communication setting 21: Reserved 22: Reserved 23: Zero speed running 2(no output at stop) 24: Total power-on time reached 25: FDT 2 output 26: Frequency 1 reached 27: Frequency 2 reached 28: Current 1 reached 29: Current 2 reached 30: Time duration reached 31: AI1 input limit exceeded 32: Load lost 33: Reverse running 34: Zero current status 35: IGBT temperature limit reached 36: Output current limit exceeded 37: Frequency lower limit reached(keep output at stop) 38: Fault output(all faults) 39: Motor overheat warning 40: Current operating time reached 41: Fault output (exclude under-voltage)		0	◇
F5-02	Control board relay function selection (TA-TB-TC)			1	◇
F5-03	Y1 function selection			2	◇
F5-04	DO1 function selection			0	◇
F5-05	DO2 function selection			0	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
F5-06	HDOP setting	0: Run frequency 1: Set frequency 2: Output current 3: Output torque(absolute value of proportion to motor torque) 4: Output power 5: Output voltage 6: HDI/S5 input (100.00% = 100.0KHz) 7: AI1 8: AI2 9: AI3 (keypad) 10: Length 11: Count value 12: Serial Comm. setting 13: Motor speed 14: Output current(100.0% = 1000.0A) 15: Output voltage(100.0% = 1000.0V) 16: Output torque(actual value of proportion to motor torque)	0	◇
F5-07	AO1 setting		0	◇
F5-08	AO2 setting		1	◇
F5-09	Max. HDO frequency	0.01KHz to 100.00KHz	50.00KHz	◇
F5-10	AO1 zero offset coefficient	-100.0% to 100.0%	0.0%	◇
F5-11	AO1 gain	-10.00 to 10.00	1.00	◇
F5-12	AO2 zero offset coefficient	-100.0% to 100.0%	0.0%	◇
F5-13	AO2 gain	-10.00 to 10.00	1.00	◇
F5-17	HDOR delay	0.0s to 3600.0s	0.0s	◇
F5-18	Relay output delay	0.0s to 3600.0s	0.0s	◇
F5-19	Y1 output delay	0.0s to 3600.0s	0.0s	◇
F5-20	DO1 delay	0.0s to 3600.0s	0.0s	◇
F5-21	DO2 delay	0.0s to 3600.0s	0.0s	◇
F5-22	Active mode of DO terminals	Units: HDOR Tens: Relay Hundreds: Y1 Thousands: DO1 Ten thousands: DO2 0: High level active 1: Low level active	00000	◇
Group F6: Start/Stop Control				
F6-00	Start mode	0: Direct start 1: start after speed tracking 2: start after pre-excitation(synchronous motor)	0	◇
F6-01	Speed tracking mode	0: Start from stop frequency 1: Start from zero speed 2: Start from Max. frequency	0	□
F6-02	Speed tracking rate	1 to 100	20	◇
F6-03	Start frequency	0.00Hz to 15.00Hz	0.00Hz	◇
F6-04	Start frequency holding time	0.0s to 100.0s	0.0s	□
F6-05	Start after DC braking or pre-excitation current	0% to 100%	0%	□
F6-06	Start after DC braking or pre-excitation holding time	0.0s to 100.0s	0.0s	□

Parameter Table

Para.No.	Name	Description	Default	Modify
F6-07	Acceleration/Deceleration mode	0: Linear Acc/Dec 1: Static S-curve Acc/Dec 2: Dynamic S-curve Acc/Dec	0	□
F6-08	Time proportion of S-curve start segment	0.0% to (100.0% - F6-09)	30%	□
F6-09	Time proportion of S-curve end segment	0.0% to (100.0% - F6-08)	30%	□
F6-10	Stop mode	0: Decelerate to stop 1: Coast to stop(AC drive no output)	0	◇
F6-11	DC braking start frequency	0.00Hz to MAX.Freq. (F0-10)	0.00Hz	◇
F6-12	DC braking holding time	0.0s to 100.0s	0.0s	◇
F6-13	DC braking current	0% to 100%	0%	◇
F6-14	DC braking duration	0.0s to 100.0s	0.0s	◇
F6-15	DC braking output ratio	0% to 100%	100%	◇
F6-16	DC braking unit activation time	0s to 3600s Note: 0=disable	0s	◇
Group F7: Keypad and Display				
F7-01	Muti-function Key (MF.K) selection	0: MF.K disable 1: Switchover from remote (terminals or communication) to keypad control 2: Forward / Reverse switchover 3: Forward jogging 4: Reverse jogging	3	◇
F7-02	STOP/RST Key function	0: enabled only in keypad control mode 1: enabled in any operation mode	1	◇
F7-03	LED display running parameters 1	0x0000 to 0xFFFF (Hexadecimal) BIT0: Running frequency (Hz indicator ON) # BIT1: Bus voltage(V indicator ON) # BIT2: Output voltage(V indicator ON) # BIT3: Output current(A indicator ON) # BIT4: Output frequency BIT5: Output torque (V and A indicator ON) BIT6: Digital input terminal state BIT7: Digital output terminal state BIT8: AI1 voltage (V indicator ON) BIT9: AI2 voltage(V indicator ON) BIT10: AI3 voltage(V indicator ON) BIT11: Count value BIT12: Length value BIT13: Running speed(Hz & A indicator ON) # BIT14: PID reference (V & A indicator flash) # BIT15: PID feedback(V & A indicator ON) # Note: # means default to display	0xE00F	◇

F7-04	LED display running parameters 2	0x0000 to 0xFFFF(Hexadecimal) BIT0: PLC Stage BIT1: V/F set voltage(V indicator ON) BIT2: V/F output voltage(V indicator ON) BIT3: AC drive heatsink temperature # BIT4: Detective sensor temperature BIT5: HDI/S5 pulse reference(KHz) BIT6: Linear speed BIT7: Load speed Next page continues...	0x0008	◇
Para.No.	Name	Description	Default	Modify
F7-04	LED display running parameters 2	BIT8: Encoder feedback frequency('Hz' ON) BIT9: Motor feedback frequency('Hz' ON) BIT10: Main frequency display('Hz' ON) BIT11: Auxiliary frequency display('Hz' ON) BIT12: Serial communication reference BIT13: Current power-on time(Hrs) BIT14: Current running time(Mins.) BIT15: Remained running time(Mins) Note: # means default to display	0x0008	◇
F7-05	LED display stop parameters	0x0000 to 0xFFFF(Hexadecimal) BIT0: Frequency reference('Hz' flash) # BIT1: Bus voltage('V' ON) # BIT2: Digital input terminal state BIT3: Digital output terminal state BIT4: AI1 voltage ('V' ON)) # BIT5: AI2 voltage ('V' ON)) # BIT6: AI3 voltage ('V' ON) BIT7: Count value BIT8: Length value BIT9: PID reference('V'&'A' flash) # BIT10: PID feedback('V'&'A' ON) # BIT11: PLC stage BIT12: HDI/S5 pulse input (KHz) BIT13: Remained running time (Mins) BIT14: AC drive heatsink temperature # BIT15: Detective sensor temperature Note: # means default to display	0x4633	◇
F7-06	Load speed coefficient	0.0001 to 6.5000	1.0000	◇
F7-07	Load speed decimal	0 to 3	1	◇
F7-08	AC drive heatsink temperature	-20.0℃ to 100.0℃	-	■
F7-09	Product number	-	-	■
F7-10	Software version	-	-	■
F7-12	Total running time	0 to 65535 hrs	-	■
F7-13	Total power-on time	0 to 65535 hrs	-	■
F7-14	Total power used	0 to 65535 kWh	-	■
F7-15	Auxiliary reference index	0 to 67 Note: 0 to 67 = U0-00 to U0-67	4	◇
Group F8: Auxiliary Function				

Parameter Table

Para.No.	Name	Description	Default	Modify
F8-00	Jogging frequency	0.00Hz to Max. Freq. (F0-10)	2.00Hz	◇
F8-01	Jog acceleration time	0.00s to 650.00s (F0-19 = 2) 0.0s to 6500.0s (F0-19 = 1) 0s to 65000s (F0-19 = 0)	20.0s	◇
F8-02	Jog deceleration time		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 default	◇
F8-04	deceleration time 2		Model default	◇
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 default	◇
F8-06	deceleration time 3		Model default	◇
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)	Model default	◇
F8-08	deceleration time 4		Model default	◇
F8-09	Frequency Jump 1	0.00Hz to F0-10(Max. Freq.)	0.00Hz	◇
F8-10	Frequency Jump 2	0.00Hz to F0-10(Max. Freq.)	0.00Hz	◇
F8-11	Frequency Jump band	0.00Hz to F0-10(Max. Freq.)	0.00Hz	◇
F8-12	FWD/REV switchover dead-zone time	0.0s to 3000.0s	0.0s	◇
F8-13	Reverse control	0: Enable 1: Disable	0	◇
F8-14	Running mode when lower than frequency lower limit	0: Run as frequency lower limit reference 1: Stop 2: Run at zero speed	0	◇
F8-15	Droop rate	0.00Hz to 10.00Hz	0.00Hz	◇
F8-16	Total power-on time threshold	0 to 65000 hrs	0 小时	◇
F8-17	Total running time threshold	0 to 65000 hrs	0 小时	◇
F8-18	Startup protection selection	0: Disable 1: Enable Caution: AC drive will run straight after RUN command detected, when the function is disabled. It may cause incident.	1	◇
F8-19	Freq. Detective Threshold (FDT1)	0.00Hz to Max. Freq (F0-10)	50.00Hz	◇
F8-20	FDT1 hysteresis	0.0% to 100.0%(FDT1 Level)	5.0%	◇
F8-21	Detection width of target frequency reached	0.0% to 100.0%(Max. Freq.)	0.0%	◇
F8-22	Jump Frequency function	0: Disable 1: Enable	0	◇
F8-25	Switchover frequency of Acc. Time 1 and Acc. Time 2	0.00Hz to F0-10(Max. Freq.)	0.00Hz	◇
F8-26	Switchover frequency of Dec. Time 1 and Dec. Time 2	0.00Hz to F0-10(Max. Freq.)	0.00Hz	◇
F8-27	Terminal Jog priority	0: Disable 1: Enable	0	◇
F8-28	Freq. Detective Threshold (FDT2)	0.00Hz to Max. Freq (F0-10)	50.00Hz	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
F8-29	FDT2 hysteresis	0.0% to 100.0%(FDT2 level)	5.0%	◇
F8-30	Detection level of frequency 1	0.00Hz to F0-10(Max. Freq.)	50.00Hz	◇
F8-31	Detection width of frequency 1	0.0% to 100.0%(Max. Freq.)	0.0%	◇
F8-32	Detection level of frequency 2	0.00Hz to F0-10(Max. Freq.)	50.00Hz	◇
F8-33	Detection width of frequency 2	0.0% to 100.0%(Max. Freq.)	0.0%	◇
F8-34	Zero current detection	0.0% to 300.0% (rated motor current)	5.0%	◇
F8-35	Zero current detection delay	0.01s to 600.00s	0.10s	◇
F8-36	Output overcurrent threshold	0.1% to 300.0% (rated motor current) 0.0% (disable)	200.0%	◇
F8-37	Output overcurrent detection delay	0.00s to 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: Disable 1: Enable	0	◇
F8-43	Running time setting channel	0: F8-44 reference 1: AI1 2: AI2 3: AI3 (keypad) Note: 100% of analog input corresponds to F8-44 reference	0	◇
F8-44	Running time	0.0 to 6500.0 Mins	0.0 Min	◇
F8-45	AI1 input voltage lower limit protection	0.00V to F8-46	3.10V	◇
F8-46	AI1 nput voltage upper limit protection	F8-45 to 10.00V	6.80V	◇
F8-47	IGBT Temp. threshold	-20.0℃ to 100.0℃	75.0℃	◇
F8-48	Cooling fan working mode	0: Working during drive operating 1: Working during power-on	0	◇
F8-49	Wakeup frequency	F8-51(Hibernating) to F0-10(Max.Freq)	0.00Hz	◇
F8-50	Wakeup delay	0.0s to 6500.0s	0.0s	◇
F8-51	Hibernating frequency	0.00Hz to F8-49(Wakeup Freq.)	0.00Hz	◇
F8-52	Hibernating delay	0.0s to 6500.0s	0.0s	◇
F8-53	Operating time threshold	0.0 to 6500.0 Mins	0.0 Min	◇
F8-54	Output power correction coefficient	0.0% to 200.0%	100.0%	◇
F8-55	Auto RUN function	Units: Run with muti-speed Tens: Run after power on (0: Disable, 1: Enable) Note: This function may cause incident injury, please make sure all setting is fully understand and checked.	00	□
Group F9: Fault and Protection				

Parameter Table

Para.No.	Name	Description		Default	Modify
F9-00	Motor overload protection	0: Disable 1: Enable		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	650 to 800v		Model default	◇
F9-05	Overcurrent protection	0: Disable 1: Enable		1	□
F9-06	Overcurrent protection gain	50% to 200% (AC drive rated output current)		150%	◇
F9-07	DC braking start voltage	650 to 800v		Model default	□
F9-08	Detection of short-circuit to ground upon power-on	0: Disable 1: Enable		1	◇
F9-09	Auto reset times	0 to 20		0	◇
F9-10	Selection of DO action during auto reset	0: Disable 1: Enable		0	◇
F9-11	Delay of auto reset	0.1s to 100.0s		1.0s	◇
F9-12	Input phase loss or power loss protection	Units: Input phase loss Tens: Power loss	0: Disable 1: Enable	11	◇
F9-13	Output phase loss protection	0: Disable 1: Enable		1	◇
F9-14	1st fault type	Please check on Chapter 8.2 for Fault and Solution		-	■
F9-15	2nd fault type				
F9-16	3rd (latest) fault type				
F9-17	Frequency upon 3rd fault	-		-	■
F9-18	Current upon 3rd fault	-		-	■
F9-19	Bus voltage upon 3rd fault	-		-	■
F9-20	DI state upon 3rd fault	-		-	■
F9-21	DO state upon 3rd fault	-		-	■
F9-22	AC drive state upon 3rd fault	-		-	■
F9-23	Power on time upon 3rd fault	-		-	■
F9-24	Running time upon 3rd fault	-		-	■
F9-25	AC drive sink temperature upon 3rd fault	-		-	■
F9-27	Frequency upon 2nd fault	-		-	■
F9-28	Current upon 2nd fault	-		-	■
F9-29	Bus voltage upon 2nd fault	-		-	■
F9-30	DI state upon 2nd fault	-		-	■
F9-31	DO state upon 2nd fault	-		-	■
F9-32	AC drive state upon 2nd fault	-		-	■
F9-33	Power on time upon 2nd fault	-		-	■

Parameter Table

Para.No.	Name	Description		Default	Modify
F9-34	Running time upon 2nd fault	-		-	■
F9-35	AC drive sink temperature upon 2nd fault	-		-	■
F9-37	Frequency upon 1st fault	-		-	■
F9-38	Current upon 1st fault	-		-	■
F9-39	Bus voltage upon 1st fault	-		-	■
F9-40	DI state upon 1st fault	-		-	■
F9-41	DO state upon 1st fault	-		-	■
F9-42	AC drive state upon 1st	-		-	■
F9-43	Power on time upon 1st	-		-	■
F9-44	Running time upon 1st fault	-		-	■
F9-45	AC drive sink temperature upon 1st fault	-		-	■
F9-47	Fault protection action 1	Units: Motor Overload(Err11)	0: Coast to stop 1: According to stop mode 2: keep running	00000	◇
		Tens: input phase loss (Err12)			
		Hundreds: Output phase loss (Err13)			
		Thousands: External fault (Err15)			
		Ten Thousands: Communication fault (Err16)			
F9-48	Fault protection action 2	Units: Encoder fault(Err20)	0: Coast to stop. 1: switch to stop mode with V/F. 2: Keep running with V/F mode.	00000	◇
		Tens: EEPROM R/W fault (Err21)	0: Coast to stop 1: According to stop mode 2: Keep running		
		Hundreds: Reserved			
		Thousands: Reserved			
		Ten Thousands: Running time is up (Err26)			
F9-49	Fault protection action 3	Units: User-defined fault 1 (Err27)	0: Coast to stop 1: According to stop mode 2: Keep running	00000	◇
		Tens: User-defined fault 2 (Err28)			
		Hundreds: Power-on time is up (Err29)			
		Ten Thousands: PID feedback loss (Err31)			
		Thousands: Load loss (Err30)	0: Coast to stop 1: Deceleration 2: Continue to run at 7% of rated motor frequency and restore to the frequency reference if the load recovers		

F9-50	Fault protection action 4	Units: Speed feedback at big difference (Err42) Tens: Motor overspeed (Err43) Hundreds: Initial position fault (Err51) Thousands: Speed feedback fault (Err52) Ten Thousands: Reserved	0: Coast to stop 1: According to stop mode 2: Keep running	00000	◇
F9-54	Keep running frequency upon fault	0: Current running frequency 1: Frequency reference 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency (F9-55)		0	◇
F9-55	Backup frequency upon fault	0.0% to 100.0% (Max.Freq.F0-10)		100.0%	◇
F9-56	Type of temperature sensor selection	0: Disable 1: Two or Three-wire PT100 2: 5KΩ B3950K NTC sensor 3: Temperature transmitter Note: please check wiring chapter for instruction.		0	□
F9-57	Sensor overheat threshold	0.0℃ to 2000.0℃		110.0℃	◇
F9-58	Sensor overheat pre-warning threshold	0.0℃ to 2000.0℃		90.0℃	◇
F9-59	Sensor correction coefficient	50.00% to 150.00%		100.00%	◇
F9-60	Sensor underheat threshold	-50℃ to 0℃		0℃	□
F9-61	Sensor upper limit threshold	10℃ to 2000℃		200℃	□
F9-62	Sensor feedback terminal	0: AI1 1: AI2		0	□
F9-63	Power interruption action	0: Disable 1: Coast to stop 2: Decelerate to stop		0	◇
F9-64	Power recovery voltage threshold after interruption	80.0% to 100.0%		90.0%	◇
F9-65	Power recovery time check threshold after interruption	0.00s to 100.00s		0.50s	◇
F9-66	Voltage of Power interruption action	60.0% to 100.0%(Bus voltage)		80.0%	◇
F9-67	Load loss protection	0: Disable 1: Enable		0	◇
F9-68	Load loss detection ratio	0.0% to 100.0%		10.0%	◇
F9-69	Load loss detection time delay	0.0s to 60.0s		1.0s	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
F9-70	Overspeed threshold	0.0% to 50.0%(Max. Freq.)	20.0%	◇
F9-71	Overspeed detection duration	0.1 to 60.0s 0.0s: disable	1.0s	◇
F9-72	Speed error threshold	0.0% to 50.0%(Max. Freq.)	20.0%	◇
F9-73	Speed error detection duration	0.1 to 60.0s 0.0s: disable	5.0s	◇
Group FA: PID Function				
FA-00	PID reference setting	0: FA-01 or FE-01 reference(Fan and pump) 1: AI1 2: AI2 3: AI3(Keypad) 4: HDI/S5 Pulse reference 5: Serial Communication 6: Multi-reference	0	◇
FA-01	PID digital setting	0.0% to 100.0%	50.0%	◇
FA-02	PID Feedback Source	0: AI1 1: AI2 2: AI3(Keypad) 3: AI1-AI2 4: HDI/S5 Pulse reference 5: Serial Communication 6: AI1+AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|)	0	◇
FA-03	PID running direction	0: Forward 1: Reverse	0	◇
FA-04	PID feedback range	0 to 65535	10000	◇
FA-05	Proportion gain Kp1	0.0 to 100.0	20.0	◇
FA-06	Integral Ti1	0.01s to 10.00s	1.00s	◇
FA-07	Differential Td1	0.000s to 10.000s	0.000s	◇
FA-08	PID output limit in reverse	0.00Hz to F0-10(Max. Freq.)	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 duration	0.00s to 650.00s	0.00s	◇
FA-12	PID feedback filter duration	0.00s to 60.00s	0.00s	◇
FA-13	PID output filter duration	0.00s to 60.00s	0.00s	◇
FA-14	Reserved		0.00s	◇
FA-15	Proportional gain Kp2	0.0 to 100.0	20.0	◇
FA-16	Integral Ti2	0.01s to 10.00s	1.00s	◇
FA-17	Differential Td2	0.000s to 10.000s	0.000s	◇
FA-18	PID switchover condition	0: Disable 1: Switchover through terminal S 2: Auto switchover base on PID error	0	◇
FA-19	PID error 1 for auto switchover	0.0% to FA-20	20.0%	◇
FA-20	PID error 2 for auto switchover	FA-19 to 100.0%	80.0%	◇
FA-21	PID initial value	0.0% to 100.0%	0.0%	◇
FA-22	PID initial value duration	0.00s to 650.00s	0.00s	◇

Parameter Table

Para.No.	Name	Description		Default	Modify
FA-23	Positive difference of the last two output	0.00% to 100.00%		1.00%	◇
FA-24	Negative difference of the last two output	0.00% to 100.00%		1.00%	◇
FA-25	PID integral property	Units: Integral separation	0: Disable 1: Enable	00	◇
		Tens: Integral separation operation after PID output limit reaches	0: Continues 1: Stop		
FA-26	Detection level of PID feedback loss	0.1% to 100.0% 0.0%: No detection		0.0%	◇
FA-27	Detection duration of PID feedback loss	0.0s to 20.0s		0.0s	◇
FA-28	PID operation at stop	0: Disable 1: Enable		1	◇
Group Fb: Wobble, Length and Count Function					
Fb-00	Wobble setting mode	0: Relative to central frequency 1: Relative to the Max. Freq.		0	◇
Fb-01	Wobble amplitude	0.0% to 100.0%		0.0%	◇
Fb-02	Wobble stepping	0.0% to 50.0%		0.0%	◇
Fb-03	Wobble cycle	0.1s to 3000.0s		10.0s	◇
Fb-04	Triangular wave rising time coefficient	0.1% to 100.0%		50.0%	◇
Fb-05	Length setting	0m to 65535m		1000m	◇
Fb-06	Actual length	0m to 65535m		0m	◇
Fb-07	Pulse rate per meter	0.1 to 6553.5		100.0	◇
Fb-08	Count value setting	1 to 65535		1000	◇
Fb-09	Designated count value	1 to 65535		1000	◇
Group FC: Muti-step Speed Reference and Simple PLC					
FC-00	Multi-step speed Reference 0	-100.0% to 100.0%		0.0%	◇
FC-01	Reference 1	-100.0% to 100.0%		0.0%	◇
FC-02	Reference 2	-100.0% to 100.0%		0.0%	◇
FC-03	Reference 3	-100.0% to 100.0%		0.0%	◇
FC-04	Reference 4	-100.0% to 100.0%		0.0%	◇
FC-05	Reference 5	-100.0% to 100.0%		0.0%	◇
FC-06	Reference 6	-100.0% to 100.0%		0.0%	◇
FC-07	Reference 7	-100.0% to 100.0%		0.0%	◇
FC-08	Reference 8	-100.0% to 100.0%		0.0%	◇
FC-09	Reference 9	-100.0% to 100.0%		0.0%	◇
FC-10	Reference 10	-100.0% to 100.0%		0.0%	◇
FC-11	Reference 11	-100.0% to 100.0%		0.0%	◇
FC-12	Reference 12	-100.0% to 100.0%		0.0%	◇
FC-13	Reference 13	-100.0% to 100.0%		0.0%	◇
FC-14	Reference 14	-100.0% to 100.0%		0.0%	◇

Parameter Table

Para.No.	Name	Description		Default	Modify
FC-15	Reference 15	-100.0% to 100.0%		0.0%	◇
FC-16	Simple PLC function	0: Stop after one cycle end. 1: keep running after one cycle end 2: keep cycling		0	◇
FC-17	Simple PLC retentive	Units: Power down	0: Not retentive 1: Retentive	00	◇
		Tens: Operation stop	0: Not retentive 1: Retentive		
FC-18	PLC running time stage 0	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-19	PLC Acc/Dec time stage 0	0 to 3		0	◇
FC-20	PLC running time stage 1	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-21	PLC Acc/Dec time stage 1	0 to 3		0	◇
FC-22	PLC running time stage 2	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-23	PLC Acc/Dec time stage 2	0 to 3		0	◇
FC-24	PLC running time stage 3	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-25	PLC Acc/Dec time stage 3	0 to 3		0	◇
FC-26	PLC running time stage 4	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-27	PLC Acc/Dec time stage 4	0 to 3		0	◇
FC-28	PLC running time stage 5	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-29	PLC Acc/Dec time stage 5	0 to 3		0	◇
FC-30	PLC running time stage 6	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-31	PLC Acc/Dec time stage 6	0 to 3		0	◇
FC-32	PLC running time stage 7	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-33	PLC Acc/Dec time stage 7	0 to 3		0	◇
FC-34	PLC running time stage 8	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-35	PLC Acc/Dec time stage 8	0 to 3		0	◇
FC-36	PLC running time stage 9	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-37	PLC Acc/Dec time stage 9	0 to 3		0	◇
FC-38	PLC running time stage 10	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-39	PLC Acc/Dec time stage 10	0 to 3		0	◇
FC-40	PLC running time stage 11	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-41	PLC Acc/Dec time stage 11	0 to 3		0	◇
FC-42	PLC running time stage 12	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-43	PLC Acc/Dec time stage 12	0 to 3		0	◇
FC-44	PLC running time stage 13	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-45	PLC Acc/Dec time stage 13	0 to 3		0	◇
FC-46	PLC running time stage 14	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-47	PLC Acc/Dec time stage 14	0 to 3		0	◇
FC-48	PLC running time stage 15	0.0s(h) to 6553.5s(h)		0.0s(h)	◇
FC-49	PLC Acc/Dec time stage 15	0 to 3		0	◇
FC-50	Time unit of simple PLC	0: s (Second) 1: h (Hour)		0	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
FC-51	Reference 0 source	0: refer to FC-00 1: AI1 2: AI2 3: AI3 (Keypad) 4: HDI/S5 Pulse reference 5: PID 6: Refer to F0-08(Preset Freq.), Modified by UP/DOWN terminal.	0	◇
Group Fd: Serial Communication				
Fd-00	Local address	1 to 249 (Valid for Modbus, Profibus)	1	◇
Fd-01	Baud rate	0: 300bps 1: 600bps 2: 1200bps 3: 2400bps 4: 4800bps 5: 9600bps 6: 19200bps 7: 38400bps 8: 57600bps 9: 115200bps		
Fd-02	Modbus data format	0: No check, <8,N,2> 1: Even check, <8,E,1> 2: Odd check, <8,O,1> 3: No check, <8,N,1>	0	◇
Fd-03	Modbus response delay	0 to 20mS	2mS	◇
Fd-04	Communication timeout	0.0 to 60.0s 0.0: Disable	0.0s	◇
Fd-05	Modbus data frame	0: Non-standard Modbus protocol 1: Standard Modbus protocol	1	◇
Fd-06	Communication current resolution	0: 0.01A 1: 0.1A	0	◇
Group FE: Advance Solution Application				
FE-00	Application quick set	0: Disable 1: Constant pressure control 2: Constant temperature control 3 to 99: Reserved	0	□
FE-01	Pressure or Temp. reference	0.01 to 200.00(MPa or ℃)	0.40	◇
FE-02	Pressure or Temp. wakeup reference	0.01 to 200.00(MPa or ℃)	0.10	◇
FE-03	FE-02 wakeup setting	0: refer to diffential= (FE-01)-(FE-02) 1: refer to reference= FE-02	1	◇
FE-04	Pressure or Temp. Hibernating setting	0: No hibernating 1: Hibernate when reaches FE-01	1	◇
FE-05	Hibernating delay	0.0s to 6500.0s	30.0s	◇
FE-06	Reserved		0	□
FE-07	Pressure transmitter property setting	0.60MPa to 100.00MPa	1.0MPa	□
FE-08	Pressure transmitter type	0: AI curve 1: 0V to 10V signal type 2: 0V to 5V signal type 3: 4mA to 20mA signal type	0	□
FE-09	Pressure feedback correction coefficient	80.0% to 120.0%	100.0%	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
FE-10	LED display mode on Pump pressure application	0: Combination: Reference pressure and feedback pressure(Kg) 1: Solo: Only show one value (MPa) 2: Solo: Only show one value (Kg) Note: Check FE-10 for detail.	0	◇
FE-11	Under-pressure detection level	0.0% to 100.0% Note: refer to % of FE-07.	10.0%	◇
FE-12	Under-pressure detection time delay	0.0s to 6500.0s 0: disable	600.0s	◇
FE-13	Detection frequency on water use.	0.00Hz to F0-10(Max. Freq) Note: This setting is to avoid if reach hibernation pressure limit when use water.	50.00Hz	◇
Group FP: User Management				
FP-00	User password	0 to 65535 (0.0.0.0.0 on display) 0: Disable	0	◇
FP-01	Parameter initialization	0: No operation 1: Clear fault records 2: Restore factory set (expcet motor property) 10: Pressure Transmitter (Two-wire, 0 to 10V) 11: Pressure Transmitter (Two-wire, 0 to 5V) 12: Pressure Transmitter (Two-wire, 4 to 20mA) 13: Pressure Transmitter (Three-wire,0 to 10V) 14: Pressure Transmitter (Three-wire, 0 to 5V) 15: Pressure Transmitter (Three-wire,4 to 20mA) 16: Pressure Transmitter(Keypad control, 0 to 10V) 17: Pressure Transmitter(Keypad control,0 to 5V) 18: Pressure Transmitter(Keypad control,4 to 20mA)	0	□
FP-02	Selection of parameter modification	0: Enable 1: Disable	0	◇
FP-04	Trail use time setting (Authorized set needs)	0 to 65535 Hrs 0: Disable	0	◇
Group:AO: Torque Control and Limit				
A0-00	Speed/torque control	0: Speed control 1: Torque control	0	□
A0-01	Torque reference source	0: Refer to A0-03 1: AI1 2: AI2 3: AI3(Keypad) 4: HDI/S5 Pulse reference 5: Communication 6: Max. (|AI1|, |AI2|) 7: Min. (|AI1|, |AI2|) Note: Upper limit value of 1 to 7 refer to A0-03.	0	□
A0-03	Torque range setting	-200.0% to 200.0%	150.0%	◇
A0-05	Torque forward frequency	0.00Hz to F0-10(Max. Freq.)	50.00Hz	◇

Parameter Table

Para.No.	Name	Description		Default	Modify
A0-06	Torque reverse frequency	0.00Hz to F0-10(Max. Freq.)		50.00Hz	◇
A0-07	Torque acceleration time	0.00s to 650.00s		10.00s	◇
A0-08	Torque deceleration time	0.00s to 650.00s		10.00s	◇
Group A1: Virtual DI/DO					
A1-00	VDI1 function	0 to 59		0	□
A1-01	VDI2 function	0 to 59		0	□
A1-02	VDI3 function	0 to 59		0	□
A1-03	VDI4 function	0 to 59		0	□
A1-04	VDI5 function	0 to 59		0	□
A1-05	VDI function reference	Units: VDI1	0: refer to VDOx 1: refer to A1-06	00000	□
		Tens: VDI2			
		Hundreds: VDI3			
		Thousands: VDI4			
		Ten Thousands: VDI5			
A1-06	VDI active state	Units: VDI1	0: Disable 1: Enable	00000	□
		Tens: VDI2			
		Hundreds: VDI3			
		Thousands: VDI4			
		Ten Thousands: VDI5			
A1-07	Function for AI1 used as S terminal	0 to 59		0	□
A1-08	Function for AI2 used as S terminal	0 to 59		0	□
A1-09	Function for AI3 used as S terminal	0 to 59		0	□
A1-10	Active condition for AI used as S terminal	Units: AI1	0: High level active 1: Low level active	000	□
		Tens: AI2			
		Hundreds: AI3			
A1-11	VDO 1 Function	0: short with S1 terminal internally 1 to 40		0	◇
A1-12	VDO 2 Function	0: short with S2 terminal internally 1 to 40		0	◇
A1-13	VDO 3 Function	0: short with S3 terminal internally 1 to 40		0	◇
A1-14	VDO 4 Function	0: short with S4 terminal internally 1 to 40		0	◇
A1-15	VDO 5 Function	0: short with S5 terminal internally 1 to 40		0	◇
A1-16	VDO1 Output delay	0.0s to 3600.0s		0.0s	◇
A1-17	VDO2 Output delay	0.0s to 3600.0s		0.0s	◇
A1-18	VDO3 Output delay	0.0s to 3600.0s		0.0s	◇
A1-19	VDO4 Output delay	0.0s to 3600.0s		0.0s	◇
A1-20	VDO5 Output delay	0.0s to 3600.0s		0.0s	◇
A1-21	VDI function reference	Units: VDO1	0: High level active 1: Low level active	00000	◇
		Tens: VDO2			
		Hundreds: VDO3			
		Thousands: VDO4			
		Ten Thousands: VDO5			

Parameter Table

Para.No.	Name	Description	Default	Modify
Group A2: Motor 2 Parameters				
A2-00	Motor type selection	0:Standard asynchronous Motor 1:Variable Frequency asynchronous Motor 2:Permanent magnet synchronous motor	0	□
A2-01	Rated motor power	0.1KW to 1000.0KW	Model default	□
A2-02	Rated motor voltage	1V to 2000V	Model default	□
A2-03	Rated motor current	0.01A to 655.35A (AC drive power ≤55KW) 0.1A to 6553.5A(AC drive power ≥55KW)	Model default	□
A2-04	Rated motor frequency	0.01 Hz to max. frequency	Model default	□
A2-05	Rated motor speed	1 to 65535 RPM	Model default	□
A2-06	Stator resistance of asynchronous motor	0.001Ω to 65.535Ω (AC drive power≤55KW) 0.0001Ω to 6.5535Ω(AC drive power>55KW)	Tuning Reference	□
A2-07	Rotor resistance of asynchronous motor	0.001Ω to 65.535Ω(AC drive power≤55KW) 0.0001Ω to 6.5535Ω(AC drive power>55KW)	Tuning Reference	□
A2-08	Leakage inductance of asynchronous motor	0.01mH to 655.35mH(AC drive power≤55KW) 0.001mH to 65.535mH (AC drive power>55KW)	Tuning Reference	□
A2-09	Mutual inductance of asynchronous motor	0.1mH to 6553.5mH(AC drive power≤55KW) 0.01mH to 655.35mH (AC drive power>55KW)	Tuning Reference	□
A2-10	No-load current of asynchronous motor	0.01A to F1-03(AC drive power≤55KW) 0.1A to F1-03(AC drive power>55KW)	Tuning Reference	□
A2-16	Stator resistance of synchronous motor	0.001Ω to 65.535Ω(AC drive power≤55KW) 0.0001Ω to 6.5535Ω(AC drive power>55KW)	Tuning Reference	□
A2-17	D-axis inductance of synchronous motor	0.01mH to 655.35mH(AC drive power≤55KW) 0.001mH to 65.535mH(AC drive power>55KW)	Tuning Reference	□
A2-18	Q-axis inductance of synchronous motor	0.01mH to 655.35mH(AC drive power≤55KW) 0.001mH to 65.535mH(AC drive power>55KW)	Tuning Reference	□
A2-20	Counter electromotive force of synchronous motor	0.0V to 6553.5V	Tuning Reference	□
A2-27	Number of pole pairs of resolver	1 to 65535	1024	□
A2-28	Encoder type	0:ABZ incremental encoder 1:UVW incremental encoder 2:Resolver 3:Sine-cosine encoder 4:Wire-Saving UVW encoder	0	□
A2-29	Encoder connection terminal selection	0: QEP1 1: QEP2 2: HDI/S5 Pulse	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°	□
A2-32	Number of pole pairs of resolver	1 to 65535	0	□

Parameter Table

Para.No.	Name	Description	Default	Modify
A2-54	Torque adjustment integral gain	0 to 20000	1300	◇
A2-55	Speed loop integral separation	0: Enable 1: Disable	0	◇
A2-56	Regenerative power limit selection	0: No function 1: always 2: enable on constant speed 3: enable on deceleration	0	□
A2-57	Regenerative power limit	0.0% to 200%	Model default	◇
A2-58	Overvoltage adjustment coefficient	100% to 110%	105%	□
A2-59	Torque coefficient of weak magnet zone	50% to 200%	100%	◇
A2-62	Motor 2 control mode	0: SVC 1: FVC 2: V/F	2	□
A2-63	Motor 2 Acc/Dec time	0: Same as Motor 1 1: Acc/Dec time 1 2: Acc/Dec time 2 3: Acc/Dec time 3 4: Acc/Dec time 4	0	◇
A2-64	Motor 2 torque boost	0.1% to 30.0% 0.0%: Auto boost	Model default	◇
A2-66	Motor 2 oscillation reduction gain	0 to 100	Model default	◇
A2-68	Initial position angle detection of synchronous motor	50% to 180%	80%	◇
A2-69	Salient-pole rate adjustment gain of synchronous motor	0: Always 1: No function 2: Only on first time after power on	0	◇
A2-70	Speed loop selection	0: Default 1: With Zero speed	0	□
A2-71	Salient-pole rate adjustment gain of synchronous motor	50 to 500	100	◇
A2-72	Max. Torque lift current proportion control	0: Disable 1: Enable	0	◇
A2-74	Tuning adjustment of current loop index Kp	1 to 100	6	◇
A2-75	Tuning adjustment of current loop index Ki	1 to 100	6	◇
A2-76	Z signal correction	0: Disable 1: Enable	1	◇
A2-77	SVC speed estimate filter coefficient of synchronous motor	10 to 1000	Model default	◇
A2-80	SVC initial excitation current of synchronous motor	0% to 100%(Motor rated current)	50%	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
A2-33	A/B phase sequence of ABZ incremental encoder	0:Forward 1:Reverse	0.0°	□
A2-34	Encoder installation angle	0.0 to 359.9°	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 tuning 1: Asynchronous Still-learning mode 2: Asynchronous Motive-learning mode 3: Asynchronous completed Still-learning mode 11:Synchronous auto-tuning with load 12:synchronous auto-tuning with no load	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 F2-05	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	1.00s	◇
A2-43	Switchover frequency 2	F2-02 to F0-10(Max. Freq.)	10.00Hz	◇
A2-44	Running slip gain	50% to 200%	100%	◇
A2-45	Speed loop filter time coefficent	0.000s to 0.100s	0.000s	◇
A2-46	Over-excitation gain	0 to 200	64	◇
A2-47	Torque limit source in speed control	0: refer to P03.10 1: AI1 2: AI2 3: AI3 4: PULSE reference 5: Serial Communication reference 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) Full scale of 1-7 corresponds to A2-48	0	◇
A2-48	Digital setting of torque limit in speed control (regenerative)	0.0% to 200.0%	150.0%	◇
A2-49	Torque limit source in speed control (regenerative)	0: Refer to P03.12 (electrical or regenerative) 1: AI1 2: AI2 3: AI3 4: PULSE reference 5: Serial Communication reference 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) Full scale of 1-7 corresponds to F2-12	0	◇
A2-50	Digital setting of torque limit in speed control	0.0% to 200.0%	150.0%	◇
A2-51	Excitation adjustment proportional gain	0 to 20000	2000	◇
A2-52	Excitation adjustment proportional gain	0 to 20000	1300	◇
A2-53	Torque adjustment proportional gain	0 to 20000	2000	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
A2-81	SVC initial carrier of synchronous motor	0.8KHz to F0-15(Carrier Freq.)	1.5KHz	◇
A2-82	SVC low speed braking function	0: Disable 1: Enable	0	◇
A2-83	SVC low speed braking frequency	0.00Hz to 10.00Hz	2.00Hz	◇
A2-84	SVC low speed braking frequency rate	0.0005Hz to 1.0000Hz	0.0010Hz	◇
A2-85	SVC low speed braking current	0% to 80% (Motor rated current)	50%	◇
A2-87	Zero servo function	0: Disable 1: Enable	0	◇
A2-88	Zero servo switchover frequency	0.00Hz to F2-02 (switchover Freq. 1)	0.30Hz	◇
A2-89	Zero servo speed loop proportional gain	1 to 100	10	◇
A2-90	Zero servo speed loop integral time	0.01s to 10.00s	0.50s	◇
A2-91	No reverse when stopping enabling	0: Disable 1: Enable	0	◇
A2-92	Stopping angle	0.0° to 10.0°	0.8°	◇
Group A5: Control Optimization				
A5-00	DPWM Switchover frequency upper limit	0.00Hz to 15.00Hz	12.00Hz	◇
A5-01	PWM modulation pattern	0: Asynchronous modulation 1: Synchronous modulation	0	◇
A5-02	Dead zone compensation	0: Disable 1: Compensation mode 1 2: Compensation mode 2	1	◇
A5-03	Random PWM depth	1 to 10 0: Disable	0	◇
A5-04	Fast overcurrent-limiting	0: Disable 1: Enable	1	◇
A5-05	Current compensation coefficient	0 to 100	5	◇
A5-06	Undervoltage threshold	Model default	Model default	◇
A5-07	SVC Optimization	0: Disable 1: Optimization mode 1 2: Optimization mode 2	1	◇
A5-08	Dead-zone time adjustment	100% to 200% Note: Only available under 1140V class.	150%	◇
A5-09	Overvoltage threshold	Model default	Model default	□
A5-10	PWM Output at 0Hz	0: Disable 1: Enable	1	□
Group A6: AI Curve Setting				
A6-00	AI curve 4 Min. voltage input	-10.00V to A6-02	0.00V	◇
A6-01	Corresponding % of AI curve 4 Min. input	-100.0% to 100.0%	0.0%	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
A6-02	AI curve 4 inflexion 1 input	A6-00 to A6-04	3.00V	◇
A6-03	Corresponding % of AI curve 4 inflexion 1	-100.0% to 100.0%	30.0%	◇
A6-04	AI curve 4 inflexion 2 input	A6-02 to A6-06	6.00V	◇
A6-05	Corresponding % of AI curve 4 inflexion 2	-100.0% to 100.0%	60.0%	◇
A6-06	AI curve 4 Max. voltage input	A6-06 to 10.00V	10.00V	◇
A6-07	Corresponding % of AI curve 4 Max. input	-100.0% to 100.0%	100.0%	◇
A6-08	AI curve 5 Min. voltage input	-10.00V to A6-10	-10.00V	◇
A6-09	Corresponding % of AI curve 5 Min. input	-100.0% to 100.0%	-100.0%	◇
A6-10	AI curve 5 inflexion 1 input	A6-08 to A6-12	-3.00V	◇
A6-11	Corresponding % of AI curve 5 inflexion 1	-100.0% to 100.0%	-30.0%	◇
A6-12	AI curve 5 inflexion 2 input	A6-10 to A6-14	3.00V	◇
A6-13	Corresponding % of AI curve 5 inflexion 2	-100.0% to 100.0%	30.0%	◇
A6-14	AI curve 5 Max. voltage input	A6-12 to 10.00V	10.00V	◇
A6-15	Corresponding % of AI curve 5 Max. input	-100.0% to 100.0%	100.0%	◇
A6-24	Jump point of AI1 input Correspond %	-100.0% to 100.0%	0.0%	◇
A6-25	Jump amplitude of AI1 input Correspond %	0.0% to 100.0%	0.5%	◇
A6-26	Jump point of AI2 input Correspond %	-100.0% to 100.0%	0.0%	◇
A6-27	Jump amplitude of AI2 input Correspond %	0.0% to 100.0%	0.5%	◇
A6-28	Jump point of AI3 input Correspond %	-100.0% to 100.0%	0.0%	◇
A6-29	Jump amplitude of AI3 input Correspond %	0.0% to 100.0%	0.5%	◇
Group AC: AI/AO Correction				
AC-00	AI1 measured voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-01	AI1 displayed voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-02	AI1 measured voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-03	AI1 displayed voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-04	AI2 measured voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-05	AI2 displayed voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-06	AI2 measured voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-07	AI2 displayed voltage 2	-10.00V to 10.000V	Factory Modified	◇

Parameter Table

Para.No.	Name	Description	Default	Modify
AC-08	AI3 measured voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-09	AI3 displayed voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-10	AI3 measured voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-11	AI3 displayed voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-12	AO1 target voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-13	A01 measured voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-14	A01 target voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-15	AO1 measured voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-16	AO2 target voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-17	A02 measured voltage 1	-10.00V to 10.000V	Factory Modified	◇
AC-18	A02 target voltage 2	-10.00V to 10.000V	Factory Modified	◇
AC-19	AO2 measured voltage 2	-10.00V to 10.000V	Factory Modified	◇

Group U0: Monitoring Parameter (Serial Communication)
Group U0 is for monitoring the operating statues of AC drive. You can check the statues via Display Panel, or via host controllor with serial communication following the address of 0x7000 to 0x7043

Para.No.	Name	Min.Value and Unit	Comm.Addr,
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	Digital input state	1	7007H
U0-08	Digital output state	1	7008H
U0-09	AI1 voltage	0.01V	7009H
U0-10	AI2 voltage	0.01V	700AH
U0-11	AI3 voltage	0.01V	700BH
U0-12	Count value	1	700CH
U0-13	Length value	1	700DH
U0-14	Load speed value	1	700EH
U0-15	PID reference	0.01	700FH
U0-16	PID feedback	0.01	7010H
U0-17	PLC stage	1	7011H
U0-18	HDI/S5 pulse reference	0.01KHz	7012H
U0-19	Feedback frequency	0.01Hz	7013H
U0-20	Remaining running time	0.1Min	7014H
U0-21	AI1 voltage before correction	0.001V	7015H

Parameter Table

Para.No.	Name	Min.Value	Comm.Addr,
U0-22	AI2 voltage before correction	0.001V	7016H
U0-23	AI3 voltage before correction	0.001V	7017H
U0-24	Length Speed	1m/Min	7018H
U0-25	Current power on time	1Min	7019H
U0-26	Current running time	0.1Min	701AH
U0-28	Communication reference	0.01%	701CH
U0-29	Encoder feedback speed	0.01Hz	701DH
U0-30	Main frequency reference	0.01Hz	701EH
U0-31	Auxiliary frequency reference	0.01Hz	701FH
U0-33	Rotor position of synchronous motor	0.1°	7021H
U0-34	Motor Speed	1rpm	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	Digital input state display	1	7029H
U0-42	Digital output state display	1	702AH
U0-43	Digital input function state display	1	702BH
U0-44	Digital output function state display	1	702CH
U0-45	Fault information	1	702DH
U0-46	AI1 current value	0.01mA	702EH
U0-47	AI2 current value	0.01mA	702FH
U0-48	AC drive sink temperature	0.1℃	7030H
U0-49	External sensor feedback	0.1℃	7031H
U0-58	Phase Z counting	1	703AH
U0-59	Reference 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	Communication sent value	0.01%	703FH
U0-64	Communication received value	0.01%	7040H
U0-65	AI1 reference (0～32767)	1	7041H
U0-66	AI2 reference (0～32767)	1	7042H
U0-67	AI3 reference (0～32767)	1	7043H

7 Definition of Communication Data Address and Modbus-RTU Communication Protocol

The drive supports Modbus-RTU communication protocol. The host controller can implement control such as monitoring and parameter viewing and modification on the AC drive through their protocols.
The drive's communication data is classified into parameter data and non-parameter data. The non-parameter data includes running commands, running status, running parameters and alarm information.

7.1.1 Parameter Data

The parameter data provides important parameters of the AC drive. In addition to function parameter group F of BN660, G75, G75E provides the function parameter group A.
The parameter data is described as below:

BN660, G75 Parameter Data	Group F (read-write)	F0, F1, F2, F3, F4, F5, F6, F7, F8, F9, FA, FB, FC, FD, FE, and FF
	Group A (read-write)	A0, A5, A6, AC

Communication addresses of parameter data are defined as follows:
1. Read parameters by communication

For groups F0 to FF and A0 to AF, the high 16 bits of the communication address indicate the group number and the low 16 bits indicate the parameter number in the group.
Example: Communication address of F0-16 is F010H, where F0H represents group F0 and 10H is the hexadecimal data format of serial number 16 in the group.
Communication address of AC-08 is AC08H, where ACH represents group AC and 08H is the hexadecimal data format of serial number 8 in the group.

2.Write parameters by communication

For groups F0 to FF, whether the high 16 bits in communication address are 00 to 0F or F0 to FF is decided by whether the high 16 bits are written to EEPROM. The low 16 bits indicate parameter number in the group.
Example:
F0-16:If it needs not be written to EEPROM, communication address is 0010H. If it needs to be written to EEPROM, communication address is F010H.
For groups A0 to AF, whether the high 16 bits in communication address are 40 to 0F or A0 to AF is decided by whether the high 16 bits are written to EEPROM. The low 16 bits indicate parameter number in the group. Example:
AC-08:If it needs not be written to EEPROM, communication address is 4C08H. If it needs to be written to EEPROM, communication address is AC08H.

7.1.2 Non-parameter Data

BN660,G75 Non- parameter Data	Status data (read-only)	Group U (monitoring parameters), AC drive fault information and AC drive running status
	Control parameters (write-only)	Control commands, communication setting values, DO control, AO1 control, AO2 control, high-speed pulse (FMP) output control and parameter initialization

1.Status Data

Status data includes group U (monitoring parameters), AC drive fault description and AC drive running status. Group U (monitoring parameters):

For details about Group U, see Appendix C of this user guide. The communication address is as follows:
The high 16 bits in communication address of U0 to UF is 70 to 7F and the low 16 bits indicate the parameter number in the group. For example, the communication address of U0-11 is 700BH.
AC drive fault description:
Communication address of the drive fault information is 8000H. You can obtain current fault codes by using host controller to read the address. For fault codes, see definition of F9-14 in Appendix C of this user guide
AC drive running status:
When the drive running status is read through communication, the communication address is 3000H. You can obtain current running status information of the AC drive by reading the address. The running status is defined in the following table.

Running Status Communication Address	Status Definition
3000H	1: Forward run
	2: Reverse run
	3: Stop

2.Control Parameters

The control parameters include control command, communication setting values, DO control, AO1 control, AO2 control, high-speed pulse (FMP) output control and parameter initialization.

- Control commands

When F0-02 (command source selection) is set to 2 (communication control), you can implement control such as start/stop of the AC drive by using communication address. The control commands are defined in the following table.

Control Command Communication Address	Status Definition
2000H	1: Forward run
	2: Reverse run
	3: Forward jog
	4: Reverse jog
	5: Coast to stop
	6: Decelerate to stop
	7: Fault reset

- Communication reference

Communication setting values include data set through communication such as frequency reference, torque limit, V/F separation voltage, PID reference and PID feedback. Communication address is 1000H. When the communication address is set in the host controller, the data range is -10000−10000 and corresponding relative set value range is -100.00% to 100.00%.

- DO control

When a DO terminal is set for function 20 (communication control), host controller can implement control on DO terminals of the drive through the communication address. Control on DO terminals of the drive is defined as follows:

Communication Address of Drive Running Status	Command Content	
2001H	BIT0: DO1 output control BIT1: DO2 output control BIT2: Relay1 output control BIT3: Relay2 output control BIT4: FMR output control	BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

■ Analog output AO1, AO2, high-speed pulse (FMP) output control

When AO1, AO2 and FMP are set to function 12 (communication control), host controller can implement control on AO and high-speed pulse outputs by means of communication addresses. The definition is provided in the following table.

Communication Address of AO1, AO2 and FMP Output		Command Content
AO1	2002H	0 to 7FFF indicates 0% to 100%.
AO2	2003H	
FMP	2004H	

■ Parameter initialization

This function is required when you need to perform parameter initialization on the drive by using the host controller.

If FP-00 (User password) is set to a non-zero value, pass password verification first. The host controller performs parameter initialization within 30s after password verification is successful.

Communication address of password verification through communication is 1F00H. Directly write correct user password to this address to perform password verification.

Communication address of parameter initialization by means of communication is 1F01H, defined in the following table.

Communication Address of Parameter Initialization	Status Definition
1F01H	1: Restore default settings
	2: Clear records
	4: Restore user backup parameters
	501: Back up current user parameters

7.2 Modbus Communication Protocol

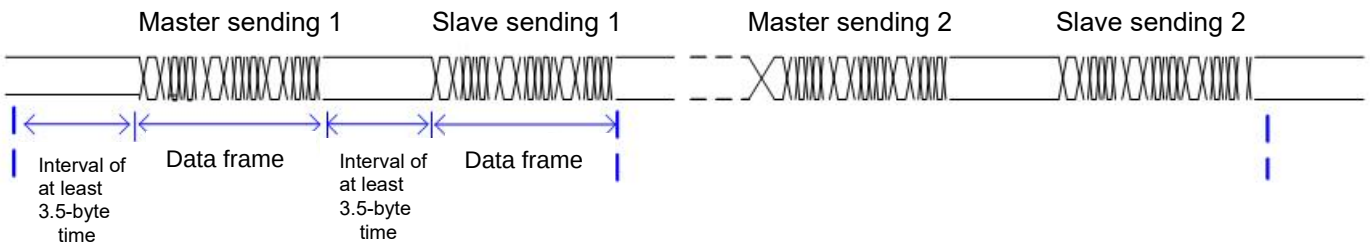
The drive provides RS485 communication interface and supports Modbus-RTU slave communication protocol so that the user can implement centralized control, such as setting running commands and parameters, and reading running status and fault information of the AC drive, by using a PC or PLC.

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

7.2.1 Application

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

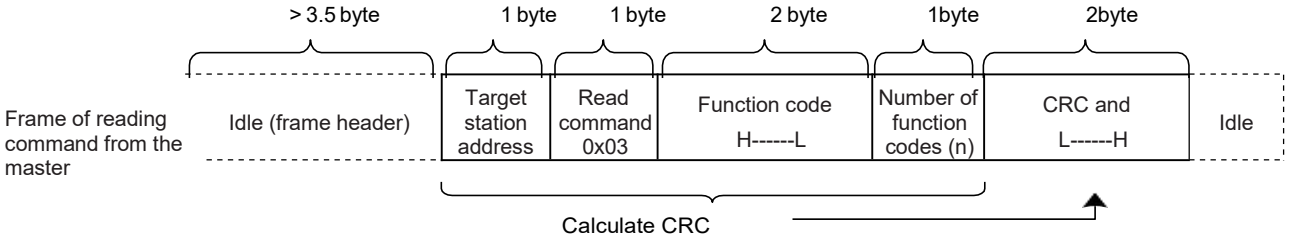
1.Transmission mode



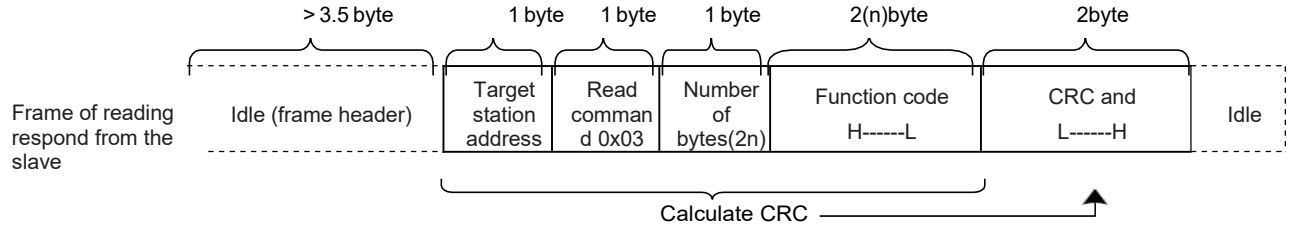
The communication protocol used by the drive is the Modbus-RTU slave communication protocol, which allows the drive to provide data to respond to "query/command" from the master or execute the action according to "query/command" from the master.

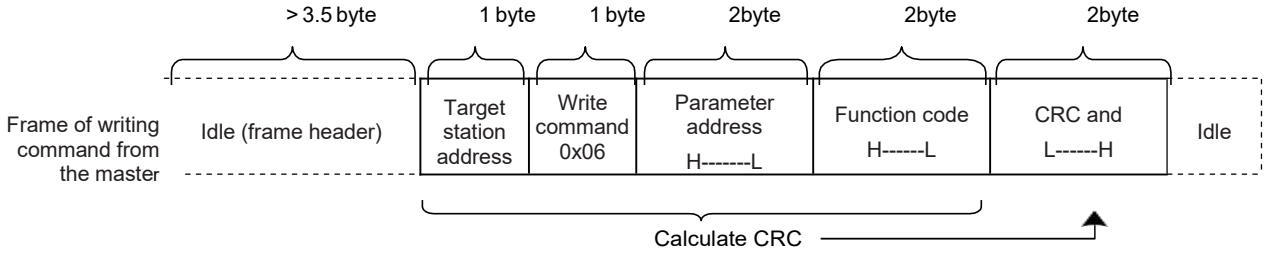
The master can be a PC, an industrial device, or a PLC. The master can communicate with a single slave or send

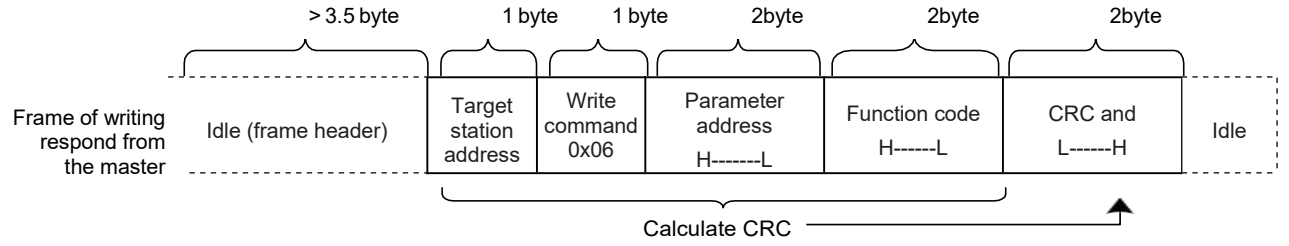
broadcast messages to all slaves. When the master communicates with a single slave, the slave needs to return a message (response) to "query/command" from the master. For a broadcast message sent by the master, the slaves need not return a response.



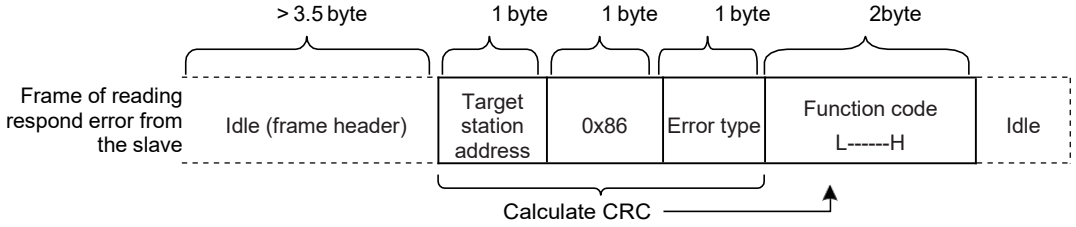
In theory, the host controller can read several consecutive parameters (n can reach up to 12) but the last parameter it reads must not jump to the next parameter group. Otherwise, an error occurs on response.

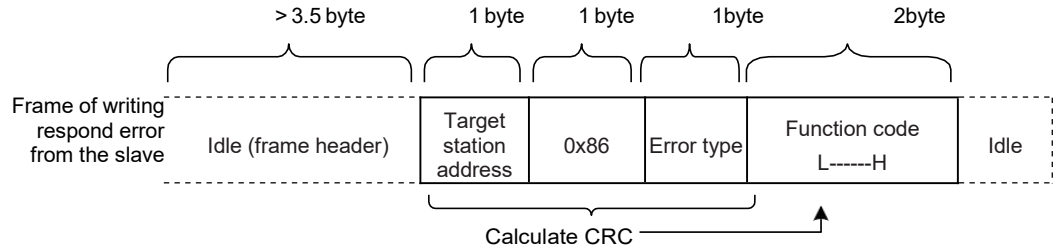






detects reading/writing failure caused by a communication frame error or by other reasons, an error frame will be returned.





Error type:
01: Command code error
02: Address error
03: Data error
04: command cannot be handled

The frame format is described in the following table.

Frame header (START)	Greater than the 3.5-byte transmission idle time
Slave address (ADR)	Communication address: 1 to 247 0: Broadcast address
Command code (CMD)	03: Read slave parameters; 06: Write slave parameters
Parameter address (H)	It is the internal parameter address of the AC drive, expressed in hexadecimal format. The parameters include functional parameters and non-functional parameters (running status and running command). During transmission, low-order bytes follow the high-order bytes.
Parameter address (L)	
Number of parameters (H)	It is the number of parameters read by this frame. If it is 1, it indicates that one parameter is read. During transmission, low-order bytes follow the high-order bytes. In the present protocol, only one parameter is read once, and this field is unavailable.
Number of parameters (L)	
Data (H)	It is the response data or data to be written. During transmission, low-order bytes follow the high-order bytes.
Data (L)	
CRC CHK low bytes	Detection value: CRC16 verification value During transmission, low-order bytes follow the high-order bytes. For calculation method, see CRC Check.
CRC CHK high bytes	
END	It is 3.5-byte transmission time.

CRC Check

In Modbus-RTU mode, a message includes a CRC-based error-check field. The CRC field checks content of the entire message. The CRC field is two bytes, containing a 16-bit binary value. The CRC field is calculated by the transmitting device, and then added to message. The receiving device recalculates a CRC value after receiving the message, and compares the calculated value with the CRC value in the received CRC field. The CRC is first stored to 0xFFFF. Then a procedure is invoked to process the successive 8-bit byte in the message and the value in the register. Only the eight bits in each character are used for the CRC. The start bit, stop bit and the parity bit do not apply to the CRC.During generation of the CRC, each eight-bit character is in exclusive-OR (XOR) with the content in the register. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register then performs XOR with a preset value. If the LSB was a 0, no XOR is performed. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is in XOR with the register's current value, and the process repeats for eight more shifts as described above. The final value of the register, after all the bytes of the message have been applied, is the CRC value. The CRC is added to the message from the low-order byte followed by the high-order byte. The CRC simple function is as follows:

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

Definition of Communication Parameter Addresses

Function parameters can be read and written (except those which cannot be changed because they are only for the factory use or for monitoring).

8 Routine Maintenance and Diagnostics

8.1 Routine Inspection

Safety Information	
Danger	◆ Do not connect or disconnect wiring while the power is on. ◆ Before the inspection, disconnect all power supply. After disconnect the power of the drive, as there is residual voltage in the DC capacitor in the drive, wait for several minutes until the the power indicator is off. Before powering on the drive again for operation, wait for an interval specified by the drive. ◆ Do not modify or disconnect wiring, remove optional extension card or replace the cooling fan while the power is on. ◆ Make sure to connect the motor-side grounding terminal. Failure to comply may result in electric shock due to touching motor housing. ◆ Do not allow unqualified personnel to do the repair & maintenance work. ◆ Installation, wiring, commissioning, repair & maintenance, and component replacement must be performed only by qualified technicians.
Warning	◆ Do not run the AC drive with front cover removed. ◆ Drawings in the user guide are sometimes shown without covers or protective guards to display the details. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with instructions. ◆ Tighten all terminal screws based on specified tightening torque. ◆ Ensure that input voltage is within permissible range. Incorrect input voltage of main circuit may result in abnormal running. ◆ Keep combustible materials far away from the AC drive or mount the AC drive on incombustible surfaces such as a metal wall.
Caution	◆ Replace the cooling fan in correct ways as specified in this chapter. Ensure correct air outlet direction of the fan. Incorrect air direction will diminish the cooling effects. ◆ Do not connect or disconnect motor while the drive is running. Failure to comply may result in electric shock and damage to the AC drive. ◆ Use shielded cables for control circuit wiring. ◆ Meanwhile, ground the shield to the grounding terminal reliably. ◆ Do not modify the drive circuitry. Failure to comply will damage the AC drive. ◆ Make sure to connect the output terminals of the AC drive and the motor terminals correctly. ◆ If it is necessary to change the motor rotation direction, exchange any two of UVW cables of the AC drive. ◆ Do not operate the AC drive that has been damaged. This is to prevent further damage to external equipments.

8.1.1 Routine Inspection Items

Influence of ambient temperature, humidity, dust and vibration will cause aging of components in the AC drive, which may cause potential faults or reduce the product life. Therefore, it is necessary to carry out routine and periodic maintenance. More frequent inspection will be required if it is used in harsh environments, such as:

High ambient temperature;

Frequent starting and stopping;

Fluctuations in the AC power supply or load;

Excessive vibrations or shock loading;

Dust, metal dust, salt, sulfuric acid, chlorine atmospheres;

Poor storage conditions.

Check the following items routine to avoid deterioration in performance or product. Copy this checklist and sign the "Checked" column after each inspection.

Inspection Item	Inspection Points	Solutions	Checked
Motor	Inspect whether abnormal oscillation or noise exists.	● Check mechanical connections. ● Check power phases of the motor. ● Tighten all loose screws.	
Fan	Inspect whether the cooling fan of the AC drive and the motor works abnormally.	● Check running of the drive-side cooling fan. ● Check running of the motor-side cooling fan. ● Check whether the cooling fan is clogged or dirty. ● Check whether ambient temperature is within the permissible range.	
Installation environment	Inspect whether the cabinet and cable duct are abnormal.	● Check for input and output cables with insulation damaged. ● Check for vibration of hanging bracket. ● Check whether copper ground bars and terminals become loose or get corroded.	
Load	Inspect whether the drive output current exceeds the drive or motor rating for an extended period of time.	● Check for setting of motor parameters. ● Check for excessive load. ● Check for mechanical vibration (< 0.6 g on normal condition).	
Input voltage	Check main power supply and control voltage.	● Adjust the input voltage to the permissible range. ● Check whether start of heavy load exists.	

8.2 Periodic Inspection

8.2.1 Periodical Inspection Items

Always keep the AC drive clean. Clear away dusts especially metal powder on the surface of the AC drive, to prevent dust from entering the drive. Clear oil dirt from the cooling fan of the AC drive.

Danger	◆ Do not perform inspection work while the power is on. ◆ Before the inspection, disconnect all power supply and wait for 10 minutes to avoid risk caused by the residual voltage in the capacitor of the drive.

Inspection Item	Inspection Points	Inspection Points	Checked
General	Inspect for wastes, dirt and dust on the surface of the AC drive.	● Check whether the AC drive is powered off. ● Use a vacuum cleaner to suck up wastes and dust to prevent direct touching. ● Wipe surface dirt gently with a soft cloth immersed in neutral detergent.	
Cables	Inspect power cables and connections for discoloration. Inspect wiring insulation for aging or wear.	● Replace cracked cable. ● Replace damaged terminals.	
Peripheral devices such as relay and contactor	Inspect contactors and relays for excessive noise during operation. Inspect coils for signs of overheating such as melted or cracked insulation. Check whether the coil voltage is normal.	● Replace abnormal peripheral device.	
Ventilation	Inspect whether ventilation and heatsink are clogged. Check whether the fan is damaged.	● Clean ventilation. ● Replace the fan.	
Control circuit	Inspect for control components in poor contact. Inspect for loose terminal screws. Inspect for control cables with cracked insulation.	● Clear away foreign matters on the surface of control cables and terminals. ● Replace damaged or corroded control cables.	

8.3 Faults and Diagnostics.

Troubleshoot and faults occurring during operating the drive as follows:

Display Code	Falut Name	Possible Cause	Possible Solution
Err01	IGBT Protected	1. Groud fault or short circuited in output. 2. Accleration time is too short or overloaded. 3. Mistake action inferenced by EMC. 4. Cable to Motor may too long. 5. IGBT Failure.	1. Check on external equipment wiring cable. 2. Increase acceleration time or less loads. 3. Check on external inference source. 4. Connect a AC reactor. 5. Please contact your distributor for factory help.
Err02	Overcurrent during acceleration	1. Accleration time is too short. 2. Groud fault or short circuited in output. 3. Bus voltage is low. 4. Start AC drive when motor is still spinning. 5. Havey load added during acceleration. 6. Run as SVC or FVC mode without auto-tunning performed. 7. Customized torque boost or inapporiate V/F curve. 8. The power of AC drive is insufficient.	1. Increase acceleration time 2. Check on external equipment wiring cable. 3. Fix the bus voltage for need. 4. Enable the speed tracking function or restart after fully stop. 5. Decrease the load. 6. To perform a auto-tunning function again. 7. Modify customized torque boost or change V/F curve. 8. Use a higher power AC drive.
Err03	Overcurrent during deceleration	1. Deceleration time is too short. 2. Groud fault or short circuited in output. 3. Bus voltage is low. 4.Havey load added during decelration. 5. No braking unit or braking resistor connected.	1. Increas 2. Check on external equipment wiring cable. 3. Fix the bus voltage for need. 4. Decrese the load. 5. Add braking unit or barking resistor.
Err04	Overcurrent at constant speed	1. Groud fault or short circuited in output. 2. Run as SVC or FVC mode without auto-tunning performed. 3. Bus voltage is too low. 4. Havey load added during constant running. 5. The power of AC drive is insufficient.	1. Check on external equipment wiring cable. 2. To perform a auto-tunning function again. 3. Fix the bus voltage for need. 4. Decrese the load. 5. Use a higher power AC drive.
Err05	Overvoltage during acceleration	1. Bus voltage is too high. 2. Acceleration time is too short. 3. Cable to Motor may too long. 4. An external froce drives motor during accleration. 5. No braking unit or braking resistor connected.	1. Fix the bus voltage for need. 2. Increase accleration time. 3. Connect a AC reactor. 4. Remove external force or add a braking unit. 5. Add a braking unit or braking resistor.
Err06	Overvoltage during deceleration	1. Bus voltage is too high. 2. Dceleration time is too short. 3. Cable to Motor may too long. 4. An external froce drives motor during decleration. 5. No braking unit or braking resistor connected .	1. Fix the bus voltage for need. 2. Increase accleration time. 3. Connect a AC reactor. 4. Remove external force or add a braking unit. 5. Add a braking unit or braking resistor.
Err07	Overvoltage at constant speed	1. Bus voltage is too high. 2. An external froce drives motor during accleration.	1. Fix the bus voltage for need. 2. Remove external force or add a braking unit.
Err08	Buffer resistor overheated	1. Power on and off too often. 2. Bulit-in power relay failure.	1. Wait 5 to 10 minutes discharge time before restart. 2. Contact your distributor for factory help.

Display Code	Falut Name	Possible Cause	Possible Solution
Err09	Undervoltage	1. Input power may failure. 2. Input voltage is low. 3. AC drive hardware failure. 4. The bus voltage input abnormal.	1. Try to restart AC drive. 2. Fix the input voltage for need. 3. Contact your distributor. 4. Contact your power supplier.
Err 10	AC drive overload	1. Acceleration time is short. 2. Loads too heavy. 3. Auto-tunning is not performed under SVC. 4. Insufficient AC drive power.	1. Extend accelration time. 2. Lower loads or check motor is functional 3. Perform auto-tunning under SVC mode. 4. Choose a higher power AC drive.
Err 11	Motor overload	1. F9-01 setting is inproperly. 2. Heavy loads or motor stuck. 3. Insufficient AC drive power.	1. Check F9-01 is setting properly. 2. Lower loads or check motor is functional. 3. Choose a higher power AC drive.
Err 12	Input phase loss	1. Input phase loss may occurs. 2. Others.	1. Check input power is functional. 2. Contact your distributor.
Err 13	Output phase loss	1. Cable problem connection with motor. 2. Motor is not functional. 3. AC drive hardware failure.	1. Make sure the cable is right. 2. Check phase loss of motor may ocurred. 3. Contact your distributor.
Err 14	IGBT overheated	1. The ambient temperature is too high. 2. Heatsink may blocked. 3. Temp. senor of IGBT may failure. 4. IGBT failure.	1. Lower the ambient temp. 2. Clean heatsink or change ventilation fan. 3. Contact your distributor. 4. Contact your distributor.
Err 15	External Fault	1. External input signal failure.	1. Reset and restart AC drive.
Err 16	Communication Fault	1. Connection cable is not functional. 2. Host controller is not working well.	1. Check or replace the cable. 2. Check the host controller equipment.
Err 18	Current detection fault	1. The current hall sensor failure. 2. AC dirve power unit failure.	1. Contact your distributor.
Err 19	Auto-tunning fault	1. Auto-tunning overtime. 2. Motor reference setting is incorrect.	1. Check the connection cable. 2. Correct setting based on motor nameplate.
Err20	Encoder fault	1. Encoder connection failure. 2. Encoder hardware failure. 3. Others.	1. Check the connection is functional. 2. Change the encoder. 3. Check circuited. 4. Contact your distributor.
Err21	EEPROM fault	1. Interfered with external equipment. 2. EEPROM chip may damaged.	1. Try reset and restart. 2. Contact your distributor.
Err22	AC drive hardware fault	1. Overvoltage may occured. 2. Overcurrent may occured.	1. Check the error code of overvoltage. 2. Check the error code of overcurrent.
Err23	Short Circuit to ground	1. Motor is circuit shorted to the ground.	1. Change the connection cable or motor.
Err26	Total operation time is up	1. Total operation time is runing out.	1. Check setting of reference F8-17.
Err27	User-defined fault 1	1. Input through terminals failure.	1. Reset and restart.
Err28	User-defined Fault 2		

Display Code	Falut Name	Possible Cause	Possible Solution
Err29	Total power on time is up	1. Total power on time reference is set.	1. Clear the setting or extend time refer to F8-16
Err30	Load loss	1. The output current is smaller than F9-65.	1. Check F9-65 setting value is match the actual operation condition.
Err31	PID feedback lost during operation	1. External feedback input is not working properly. 2. Setting value of FA-26 is too low.	1. Check the connection with external input. 2. Setting a proporiate detection threshold.
Err32 End	Trail time is up	1. Time is running out for trail use.	1. Contact your distributor to solve out.
Err34	Waterpresure control failure	1. No water supply or pipe busted. 2. The impeller may running reverse. 3. Transmitter failure or disconnected. 4. Reference is inapproporiate to the application.	1. Please check the water supply and pipe. 2. Make sure the pump impeller running forward.. 3. Check transmitter is functional. 4. Check the reference of FE-11,FE-12.
Err35	Reserved		
Err40	Current limitation overtime	1. Overload or motor is stuck. 2. AC drive power is insufficient.	1. Decrase load or check motor 2. Use a higher power AC drive.
Err41	Switch mortor during operation	1. Modify motor reference during operation.	1. Modify after AC drive stop opeartion.
Err42	Speed error	1. Encoder parameters are set improperly. 2. Motor auto-tuning is not performed. 3. Output cable to motor problem. 4. F9-69, F9-70 setting incorrect.	1. Set encoder parameter properly. 2. Perform motor auto-tunning. 3. Check on the cable and motor connection. 4.set F9-69, F9-70 correctly based on actual condition.
Err43	Motor overspeed	1. Encoder parameters are set improperly. 2. Motor auto-tuning is not performed. 3. F9-67,F9-70 setting incorrect.	1. Set encoder parameter properly. 2. Perform motor auto-tunning. 3.set F9-67, F9-70 correctly based on actual condition.
Err45	Motor overtemperature	1. Worng detection threshold of F9-57 2. Transmitter or cable connection error.	1. Set a aproporiate value of F9-57 2. Transmitter and connection is functional
Err51	Initail Position angle fault	1. Motor inductance is too large. 2. Only sychronous motor meet this code.	1. Check the motor reference is correct. 2. Wrong type of motor connected.
Err61	Breaking unit overload	1. setting of F6-16 is not correct.	1. Set a approporiate threshold time.
Po.OFF	AC drive power off	1. It is normal to display when power off. 2. Display all the time when power on.	1. Working fine. 2. Check the input voltage is enough and no phase lack.

Note: If you find any code not in this table, please contact your distributor for help.