VFD
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Mini Size Vector AC Drive Model : VFD640

User Manual

Preface

Thanks for purchasing our inverters.

This manual describes how to use this AC Drive properly. Please read it carefully before installation, operation, maintenance and inspection. Besides, please use the product after understanding the safety precautions.

Precautions
● In order to describe the product's details, the drawings presented in this instruction are sometimes shown without covers or protective guards. When using the product, please make sure to install the cover or protective guard as specified firstly, and operate the products in accordance with the instructions. ● Since the drawings in this manual are represented examples, some are subject to differ from delivered products. ● This manual may be modified when necessary, because of improvement of the product, modification or changes in specifications. Such modifications are denoted by a revised manual No. ● If you want to order the manual due to loss or damage, please contact our company agents in each region or our company customer service center directly. ● If there is still any problem during using the products, please contact our company customer service center directly.

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Chapter 1 Installation and wiring of AC Drive

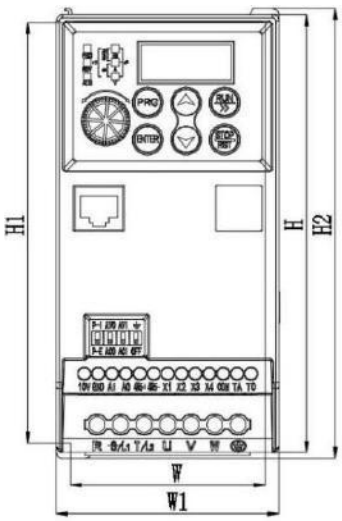
1.1 Installation precautions

 Danger	● Please make sure that the input power has been cut off before wiring. Otherwise there maybe danger of electric shock and fire! ● Only The qualified and trained personnel can perform wiring connection. Otherwise, it may cause equipment and human injuries! ● It should be earthed reliably. Otherwise, there may be danger of electric shock or fire! ● Pls check whether the emergency stop terminal's performance is effective after connected. Otherwise, it may cause risk of Injury! (The user shall be responsible if injury caused without checking.) ● Do not touch the output terminals directly. The output terminal of the AC Drive is directly connected to the motor. Do not short circuit between output terminals. Otherwise, there maybe risk of electric shock and circuit short. ● Be sure to install the cover outside the terminal before powering on. When removing the cover, be sure to disconnect the power supply first. Otherwise, there will be risk of electric shock. ● Please wait for 5 to 8 minutes to discharge the residual power before inspecting and maintaining the motor after cutting off the power supply, otherwise there maybe risk of residual voltage on the electrolytic capacitor. ● Non-professional technicians are not allowed to carry out inspection and maintenance. Otherwise, there will be risk of electric shock.

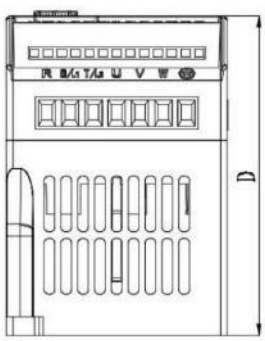
 Danger	● Please make sure that the rated voltage value of the input power is consistent with that of the inverter. Otherwise, it may cause danger of injury and fire. ● Please connect the braking resistor or braking unit according to the wiring diagram. Otherwise, there will be risk of fire! ● It is better to use a screwdriver and wrench with specified torque to fasten the terminal. Otherwise, there will be risk of fire. ● Do not connect the input power supply to the terminals of U.V.W. Otherwise, the voltage input will cause internal damage of the Inverter. ● Do not remove the cover of the front panel. Only remove the cover of the terminal when wiring. Otherwise, It may cause internal damage to the inverter.

1.2 Outlook Drawing

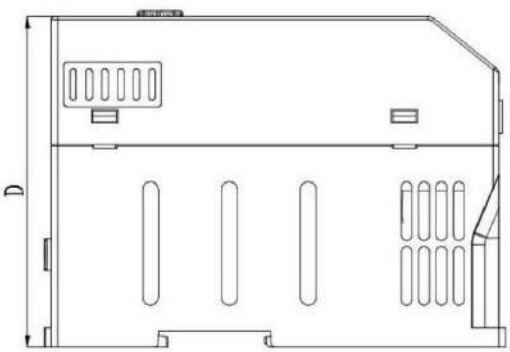
A. outline dimension



Front view



Bottom view

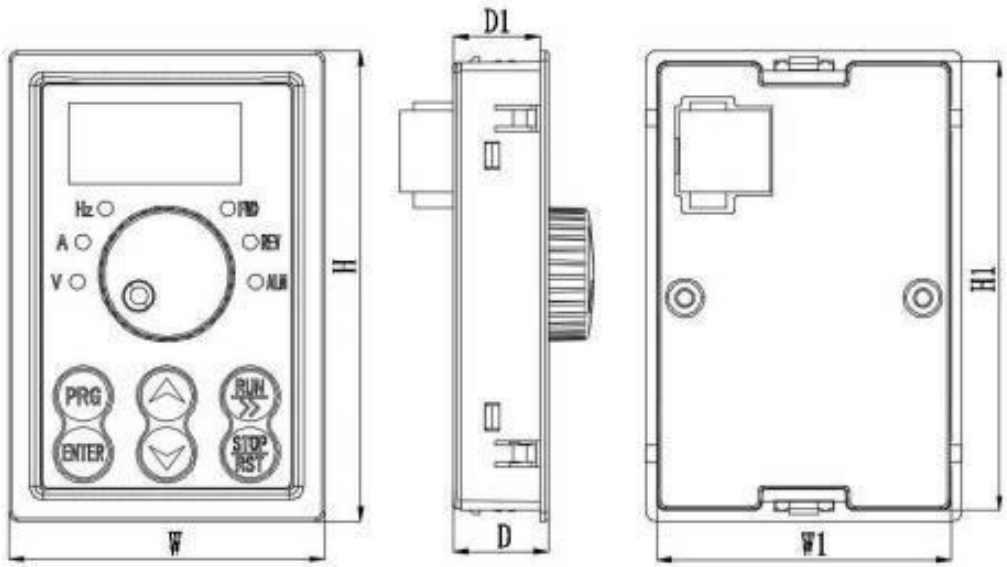


Side view

Inverter outlook dimensions

Model	W (mm)	W1 (mm)	H (mm)	H1 (mm)	H2 (mm)	D (mm)	Installation hole (mm)
	Installation dimensions			Overall dimensions			
0.75~2.2KW	63	72	142	136.5	146	104.5	4
4-5.5KW	78	87	181.5	172.5	181.5	127.5	4

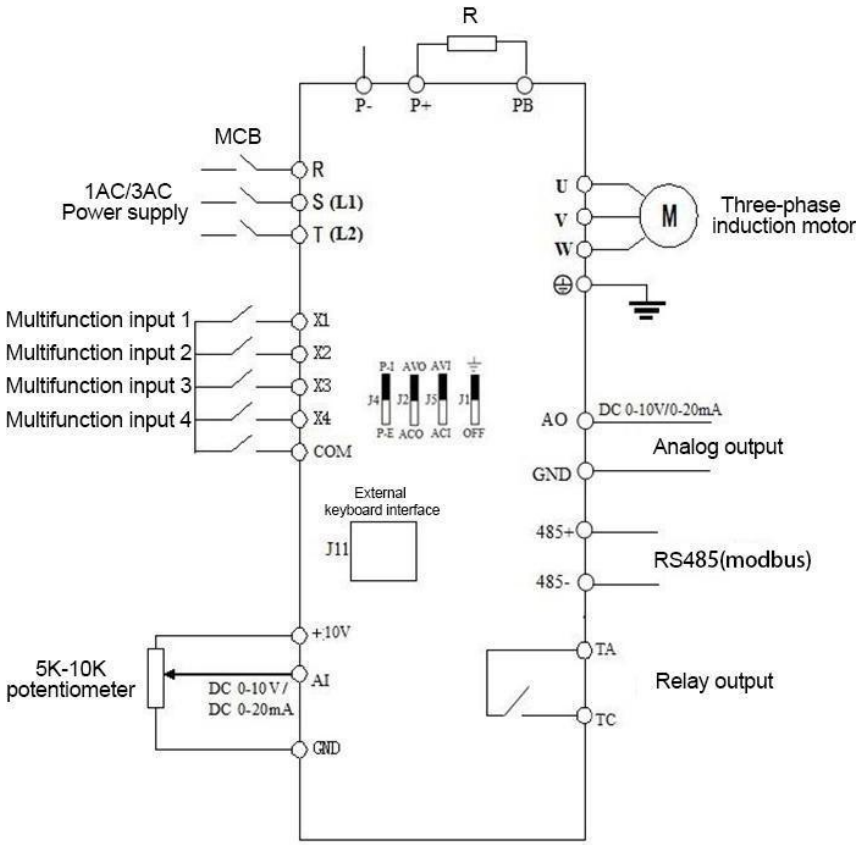
B. Dimensions of external keyboard base



Keyboard base hole size				Keyboard thickness	
W	W1	H	H1	D	D1
53mm	49.4mm	79mm	75.4mm	15.9mm	14.5mm

1.3 Basic Wiring Diagram

The wiring of AC Drive is divided into main circuit and control circuit. The user can lift the cover of the output/input terminal, and then the main circuit terminal and control circuit terminal can be seen. The user must correctly connect the wiring circuit according to the following diagram.



1.4 Control circuit terminals

10V	GND	AI	AO	485+	485−	X1	X2	X3	X4	COM	TA	TC

1.5 0.75KW-2.2KW Main circuit terminals

R	S/L1	T/L2	U	V	W	⏚

4KW-5.5KW Main circuit terminals

R	S	T	P+	PB	U	V	W	⏚

1.6 Description of jumpers on control board

J1	
⏚	Main control board grounding
OFF	Main control board grounding is disconnected
J2	
AVO	Analog AO output voltage signal: 0-10V
ACO	Analog AO output current signal: 0-20mA
J4	
P-I	The selection of built-in keyboard potentiometer

P-E	The selection of external keyboard potentiometer
J5	
AVI	Analog AI input voltage signa: 0-10V
ACI	Analog AI input current signal: 0-20mA

1.7 Wiring precautions

(1) When replacing the motor, the input power of the AC Drive must be cut off.

(2) The motor or the power supply of the power frequency only can be switched when the inverter stops output.

(3) In order to minimize the impact of electromagnetic interference, when the electromagnetic contactor and electric relay used are close to the AC Drive, the surge absorption device should be installed.

(4) Do not connect the AC input power to the inverter output terminals U, V, W.

(5) The external control line of AC Drive shall be equipped with isolation device or shielded wire.

(6) In addition to shielding, the input command signal wiring should also be routed separately, preferably away from the main circuit wiring.

(7) When the carrier frequency is less than 4KHz, the maximum distance between the AC Drive and the motor should be within 50 meters. When the carrier frequency is greater than 4KHz, the distance should be appropriately reduced. The wiring should preferably be laid in a metal tube.

(8) When the AC Drive is equipped with peripheral equipment (filter, reactor, etc.), the insulation resistance to the ground shall be measured with a 1000V megohmmeter first to ensure that it is not lower than 4 megohm.

(9) It is not allowed to install phase capacitance or resistance capacitance absorption device at the U, V and W output terminals of the converter

(10) If the AC Drive needs to be started frequently, do not turn off the power supply. You must use the COM/RUN of the control terminal for start and stop operation to avoid damaging the rectifier bridge.

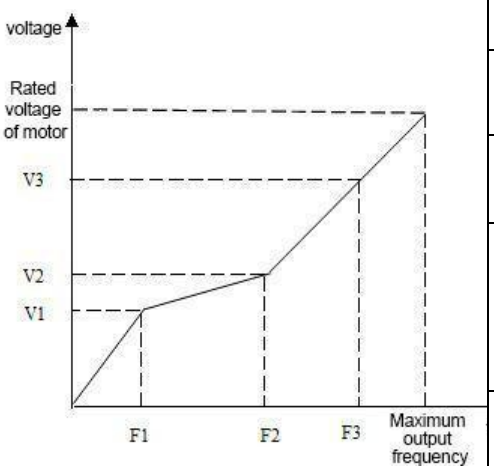
(11) In order to prevent accidents, the grounding terminal G must be reliably grounded (the grounding impedance should be below 100 Ω), otherwise there will be electricity leakage.

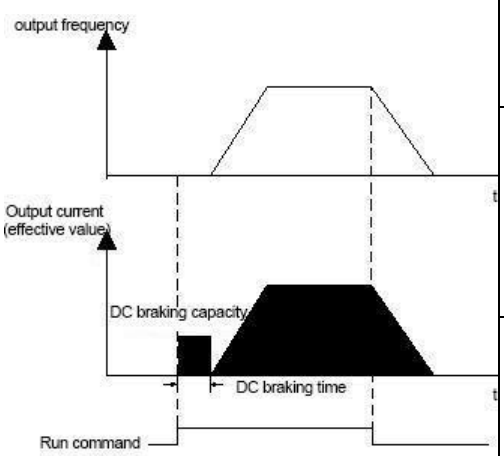
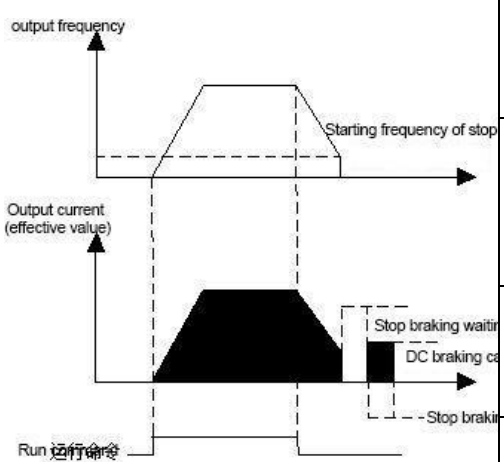
(12) When wiring the main circuit, please select the wire diameter and specification according to the relevant provisions of the national electrical regulations.

Chapter 2 Product Information

○ —Parameters that can be modified in any state ×—Parameters that cannot be modified in operation ◆ —Actual detection parameters cannot be modified ◇ —Manufacturer parameters are only modified by the manufacturer. Users are not allowed to modify					
F0 group - Basic operating parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
F0.00	Function macro definition	0：Common mode 1：Single pump constant pressure water supply 2～3：Reserved 4： Engraving machine mode 5～10：Reserved	0～10	0	×
F0.01	Motor control mode	0：VF control 1： Advanced VF control 2： Simple vector control 3：Advanced Vector Control 4：Torque control	0～4	0	×
F0.02	Run command channel selection	0：Panel operation command channel 1： Terminal operation command channel 2： Communication operation command channel	0～2	0	○
F0.03	Frequency setting selection	0：Panel potentiometer 1：Digital setting 1, operation panel ▲, ▼ key adjustment 2：Digital setting 2, terminal UP/DOWN adjustment 3:AI analog setting (0 ～ 10V/0 ～ 20mA) 4：Combined given 5：Reserved 6： Communication given 7 ：Reserved Note: Select the combination setting time, and the combination setting method is selected in F1.15	0～7	0	○
F0.04	Maximum output frequency	The maximum output frequency is the maximum frequency allowed by the	F0.05～999.9Hz	50.0Hz	×

		AC Drive, and is the benchmark for acceleration and deceleration setting.			
F0.05	Upper limit frequency	The operating frequency cannot exceed this frequency	F0.06～F0.04	50.0Hz	×
F0.06	Lower frequency	The operating frequency cannot be lower than this frequency	0.0～Upper limit frequency	0.0Hz	×
F0.07	Lower frequency arrival processing	0：Zero speed operation 1：Run at lower frequency 2：halt	0～2	0	×
F0.08	Digital setting of shutdown operation frequency	The set value is the given initial value of frequency number	0.0～Upper limit frequency	10.0Hz	○
F0.09	Digital frequency control	Unit bit: Power-down storage 0：Store 1：Do not store Tens bit: shutdown hold 0：Reserved 1：Do not Reserved Hundreds bit: UP/DOWN negative frequency regulation 0：of no avail 1：effective Thousand bit：PID, PLC frequency superposition selection 0：of no avail 1：F0.03+PID 2：F0.03+PLC	0000～2111	0000	○
F0.10	Acceleration time	Time required for converter to accelerate from zero frequency to maximum output frequency	0.1～999.9S 0.4～4.0KW 7.5S 5.5～7.5KW 15.0S	Model setting	○
F0.11	Deceleration time	Time required for converter to decelerate from maximum output frequency to zero frequency			
F0.12	Running direction setting	0：Forward 1：Reverse 2：Reverse prohibited	0～2	0	○
F0.13	V/F Curve setting	0：Linear curve 1：Square curve 2：Multi-point VF curve	0～2	0	×

F0.14	Torque increase	Manual torque increase, which is a percentage of the rated voltage of the motor	0.0～30.0%	Model setting	○
F0.15	Torque lifting cut-off frequency	This setting is the lifting cut-off frequency point for manual torque lifting	0.0～50.0Hz	15.0Hz	×
F0.16	Carrier frequency setting	For the occasions requiring silent operation, the carrier frequency can be appropriately increased to meet the requirements, but increasing the carrier frequency will increase the heat output of the converter.	2.0～16.0KHz 0.4～3.0KW 4.0KHz 4.0～7.5KW 3.0KHz	Model setting	×
F0.17	F1		0.1～F2	12.5Hz	×
F0.18	V1		0.0～V2	25.0%	×
F0.19	F2		F1 ～ F3	25.0Hz	×
F0.20	V2		V1 ～ V3	50.0%	×
F0.21	F3		F2~rated frequency of motor [F4.03]	37.5Hz	×
F0.22	V3		V2~100.0 % * (motor rated voltage [F4.00])	75.0%	×
F0.23	User Password	To set any non-zero number, it takes 3 minutes or power off to take effect.	0～9999	0	○
F0.24	Frequency display resolution selection	0：0.1Hz 1：1Hz Note: When setting this parameter, you must check the maximum output frequency (F0.04), upper frequency limit (F0.05), motor rated frequency (F4.03) and other frequency-related parameters.	0～1	0	○
F1 group - Auxiliary operation parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**

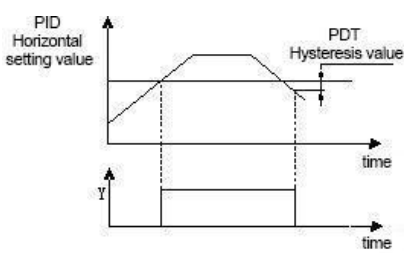
F1.00	Starting mode	LED Single digit：Starting mode 0：Start from starting frequency 1：DC braking first and then starting from starting frequency 2：Reserved LED Tens digit：Power failure or abnormal restart mode 0：Of no avail 1：Start from starting frequency LED hundreds digit：Reserved LED thousands digit：Reserved	0000 ～ 0012	00	×
F1.01	Starting frequency		0.0 ～ 50.0Hz	1.0Hz	○
F1.02	Starting DC braking voltage		0.0～ 50.0% ×Rated voltage of motor	0.0%	○
F1.03	Start DC braking time		0.0～30.0s	0.0s	○
F1.04	Shutdown mode	0：Deceleration shutdown 1：Free stop	0～1	0	×
F1.05	Starting frequency of DC braking during shutdown		0.0～ Upper limit frequency	0.0Hz	○
F1.06	Shutdown DC brake voltage		0.0～ 50.0%×Rated voltage of motor	0.0%	○
F1.07	Shutdown DC braking time		0.0～30.0s	0.0s	×
F1.08	DC braking waiting time of shutdown		0.00～ 99.99s	0.00s	×
F1.09	Forward jog frequency setting	Set point dynamic positive and negative frequency	0.0 ～ 50.0Hz	10.0Hz	○

F1.10	Reverse jog frequency setting	Set point dynamic positive and negative frequency	0.0 ～ 50.0Hz	10.0Hz	○
F1.11	Jog acceleration time	Set inching acceleration and deceleration time	0.1～ 999.9S 0.4～ 4.0KW 10.0S 5.5～ 7.5KW 15.0S	Model setting	○
F1.12	Jog deceleration time				
F1.13	Skip frequency	By setting the skip frequency and range, the AC Drive can avoid the mechanical resonance point of the load.	0.0 ～ Upper limit frequency	0.0Hz	○
F1.14	Jump range		0.0 ～ 10.0Hz	0.0Hz	○
F1.15	Frequency combination setting mode	0：Potentiometer+digital frequency 1 1：Potentiometer+digital frequency 2 2：Potentiometer+AI 3：Digital frequency 1+AI 4：Digital frequency 2+AI 5：Digital frequency 1+multi-speed 6：Digital frequency 2+multi-speed 7：Potentiometer+multi-step speed 8：AI+PLC (stacking in the same direction) 9：Reserved	0～9	0	×
F1.16	Programmable operation control (simple PLC operation)	LED single digit： PLC enable control 0：Of no avail 1：Effective LED Tens digit： Operation mode selection 0：Single cycle 1：Continuous cycle 2：Maintain final value after single cycle LED hundreds digit：Starting mode 0：Restart from the first section 1：Start from the stage at the time of shutdown (fault) 2：Start from the stage and frequency at the time of shutdown (fault) LED thousands digit：Power down storage selection 0：Do not store 1：Store	0000 ～ 1221	0000	×
F1.17	Multi-step speed frequency 1	Set step 1 frequency	-Upper limit frequency~ upper limit frequency	5.0Hz	○
F1.18	Multi-step speed frequency 2	Set step 2 frequency.	-Upper limit frequency~ upper limit frequency	10.0Hz	○
F1.19	Multi-step speed frequency 3	Set step 3 frequency	-Upper limit frequency~ upper limit frequency	15.0Hz	○

F1.20	Multi-step speed frequency 4	Set step 4 frequency	-Upper limit frequency~ upper limit frequency	20.0Hz	○
F1.21	Multi-step speed frequency 5	Set step 5 frequency	-Upper limit frequency~ upper limit frequency	25.0Hz	○
F1.22	Multi-step speed frequency 6	Set step 6 frequency	-Upper limit frequency~ upper limit frequency	37.5Hz	○
F1.23	Multi-step speed frequency 7	Set step 7 frequency	-Upper limit frequency~ upper limit frequency	50.0Hz	○
F1.24	Step 1 run time	Set the running time of segment speed 1 (the unit is selected by [F1.35], and the default is seconds)	0.0 ～ 999.9s	10.0s	○
F1.25	Step 2 run time	Set the running time of segment speed 2 (the unit is selected by [F1.35], and the default is seconds)	0.0 ～ 999.9s	10.0s	○
F1.26	Step 3 run time	Set the running time of segment speed 3 (the unit is selected by [F1.35], and the default is seconds))	0.0 ～ 999.9s	10.0s	○
F1.27	Step 4 run time	Set the running time of segment speed 4 (the unit is selected by [F1.35], and the default is seconds)	0.0 ～ 999.9s	10.0s	○
F1.28	Step 5 run time	Set the running time of segment speed 5 (the unit is selected by [F1.35], and the default is seconds)	0.0 ～ 999.9s	10.0s	○
F1.29	Step 6 run time	Set the running time of segment speed 6 (the unit is selected by [F1.35], and the default is seconds)	0.0 ～ 999.9s	10.0s	○
F1.30	Step 7 run time	Set the running time of segment speed 7 (the unit is selected by [F1.35], and the default is seconds)	0.0 ～ 999.9s	10.0s	○
F1.31	Multi-step acceleration and deceleration time selection 1	Unit bit：Acceleration and deceleration time of phase 1 0～1 Tens bit：Acceleration and deceleration time of stage 2 0～1 Hundreds bit：Acceleration and deceleration time of stage 3 0～1 Thousands bit：Acceleration and deceleration time of stage 4 0～1	0000 ～ 1111	0000	○
F1.32	Multi-step acceleration and deceleration time selection 2	Unit bit: Acceleration and deceleration time of stage 5 0～1 Tens bit：Acceleration and deceleration time of stage 6 0～1 Hundreds bit：Acceleration and deceleration	000～111	000	○

		time of stage 6 0 ～1 thousands bit：Reserved			
F1.33	Acceleration time 2	Set acceleration and deceleration time 2	0.1～999.9s 0.4～4.0KW 10.0s 5.5～7.5KW 15.0s	10.0s	○
F1.34	Deceleration time 2				
F1.35	Time unit selection	LED Single digit：Process PID time unit LED Tens digit：Simple PLC time unit LED hundreds digit：Conventional acceleration and deceleration time unit LED thousands digit：Reserved 0：Unit: 1 second 1：Unit: 1 point 2：Unit: 0.1 second	000～211	000	×
F1.36	Dead time of positive and negative rotation	The transition time waiting at the output zero frequency during the transition of the converter from forward operation to reverse operation or from reverse operation to forward operation.	0.0～999.9s	0.0	○
F2 group - Analog and digital input and output parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
F2.00	AI input lower limit voltage	Set AI upper and lower voltage	0.00～F2.01	0.00V	○
F2.01	AI input upper limit voltage		F2.01～10.00V	10.00V	○
F2.02	AI lower limit corresponding setting	Set the AI upper and lower limit corresponding setting, which corresponds to the percentage of the upper limit frequency [F0.05]。	-100.0%～100.0%	0.0%	○
F2.03	Corresponding setting of AI upper limit			100.0%	○
F2.04～F2.07	Reserved	-	-	0	◆
F2.08	Analog input signal filtering time constant	This parameter is used for filtering the input signal of AI and panel potentiometer to eliminate the influence of interference	0.1～5.0s	0.1s	○
F2.09	Analog input anti-shaking deviation limit	When the analog input signal fluctuates frequently near the given value, the frequency fluctuation caused by this fluctuation can be suppressed by setting F2.09.	0.00～0.10V	0.00V	○

F2.10	AO analog output terminal function selection	0：output frequency 1：Output current 2 ：motor speed 3： output voltage 4：AI 5：Reserved	0～5	0	○
F2.11	AO output lower limit	Set AO output upper and lower limits	0.00 ～ 10.00V/ 0.00 ～ 20.00mA	0.00V	○
F2.12	AO Output upper limit			10.00V	○
F2.13	Input terminal X1 function	0：Control terminal idle 1： Forward inching control 2： Reverse jog control 3： Forward control (FWD) 4： Reverse control (REV) 5： Three-wire operation control 6 ：Free stop control 7： External stop signal input (STOP) 8： External reset signal input (RST) 9： External fault normally open input 10： Frequency increase command (UP) 11： Frequency decrement instruction (DOWN) 13：Multi-stage speed selection S1 14： Multi-stage speed selection S2 15：Multi-stage speed selection S3 16：Operation command channel is forced to be terminal 17：The running command channel is forced to communicate 18: Stop DC braking command 19: Frequency switch to AI 20：Frequency switch to digital frequency 1 21：Frequency switch to digital frequency 2 22 ：Reserved 23：Counter clear signal 24 ：Counter trigger signal 25： Timer reset signal 26：Timer trigger signal 27：Acceleration and deceleration time selection 28：Swing frequency pause (stop at the current frequency) 29：Swing frequency reset (return to center frequency) 30：External stop/reset signal input (STOP/RST) 40：Run Pause	0～30	3	×
F2.14	Input terminal X2 function		0～30	4	×
F2.15	Input terminal X3 function		0～30	0	×
F2.16	Input terminal X4 function		0～30	0	×
F2.17	Reserved		-	0	×
F2.18	FWD/REV terminal control mode	0：Two-wire control mode 1 1：Two-wire control mode 2 2：Three-wire control mode 1 3：Three-wire control mode 2 4：Three-wire control mode 3 5：Reserved	0～5	0	×

F2.19	Terminal function detection selection during power-on	0： Terminal operation command is invalid when power-on 1：Terminal operation command is valid when power-on	0～1	0	×
F2.20	R Output setting	0：leave unused 1: AC Drive is ready for operation 2：Converter in operation 3：The AC Drive is running at zero speed 4：External fault shutdown 5：Inverter fault 6：Frequency/speed arrival signal(FAR) 7：Frequency/speed level detection signal(FDT) 8：Output frequency reaches the upper limit 9：Output frequency reaches the lower limit 10：AC Drive overload pre-alarm 11：Timer overflow signal 12：Counter detection signal 13：Counter reset signal 14 ：Auxiliary motor 15：Forward 16：Reverse 17：Output indication signal when output frequency drops to speed detection level	0～17	5	○
F2.21	Reserved		-	0	○
F2.22	R Closing delay	Delay from relay R state change to output change	0.0 ～ 255.0s	0.0s	×
F2.23	R Disconnection delay				
F2.24	Frequency reaches FAR detection amplitude	The output frequency is within the positive and negative detection width of the set frequency, and the terminal outputs effective signal (low level)	0.0Hz～ 15.0Hz	5.0Hz	○
F2.25	FDT Horizontal setting value		0.0Hz～ Upper limit frequency	10.0Hz	○
F2.26	FDT Hysteresis value		0.0～ 30.0Hz	1.0Hz	○
F2.27	UP/DOWN Terminal modification rate	This function code is used to set the frequency modification rate when the UP/DOWN terminal sets the frequency, that	0.1Hz ～ 99.9Hz/s	1.0Hz/s	○

		is, the amount of frequency change when the UP/DOWN terminal is shorted to the COM terminal for one second.			
F2.28	Input terminal pulse trigger mode setting(X1～X4)	0：Indicates the level triggering mode 1：Indicates pulse triggering mode Note: X1 ～ X4 correspond to 1H, 2H, 4H and 8H in hexadecimal order.	0～FH	0	○
F2.29	Valid logic setting of input terminal(X1～X4)	0 ： Indicates positive logic, that is, the connection between Xi terminal and common terminal is valid, and the disconnection is invalid 1：Indicates anti-logic, that is, the connection between Xi terminal and common terminal is invalid, and the disconnection is valid Note: X1 ～ X4 correspond to 1H, 2H, 4H and 8H in hexadecimal order.	0～FH	0	○
F2.30	X1 Filter coefficient	Used to set the sensitivity of the input terminal. If the digital input terminal is vulnerable to interference and causes mis-operation, increase this parameter, and the anti-interference ability will be enhanced, but if the setting is too large, the sensitivity of the input terminal will be reduced. 1：Represents 2MS scanning time unit	0～9999	5	○
F2.31	X2 Filter coefficient		0～9999	5	○
F2.32	X3 Filter coefficient		0～9999	5	○
F2.33	X4 Filter coefficient		0～9999	5	○
F2.34	Reserved		-	0	○
F2.35	X1 Access delay time	Used to set input terminal access delay time	0.00~655.00s		○
F2.36	X2 Access delay time		0.00~655.00s		○
F2.37	X3 Access delay time		0.00~655.00s		○
F2.38	X4 Access delay time		0.00~655.00s		○
F2.39	Reserved		-		○
F2.40	X1 Disconnect delay time	Used to set the input terminal disconnection delay time	0.00~655.00s	5	○
F2.41	X2 Disconnect delay time		0.00~655.00s	5	○
F2.42	X3 Disconnect delay time		0.00~655.00s	5	○
F2.43	X4 Disconnect delay time		0.00~655.00s	5	○
F2.44	Reserved		-	0	○

F3 group - PID parameter					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
F3.00	PID function setting	LED Single digit：PID Regulation characteristics 0：of no avail 1： Positive action When the feedback signal is greater than the given quantity of PID, the output frequency of AC Drive is required to decrease (that is, reduce the feedback signal) 2：Negative effect When the feedback signal is greater than the given quantity of PID, the output frequency of AC Drive is required to rise (that is, reduce the feedback signal)。 LED Tens digit：PID Quantitative input channel 0： Keyboard potentiometer PID dosing is given by potentiometer on the operation panel 1：Number given PID dosing is given by numbers and set by function code F3.01. 2：Pressure setting (Mpa, Kg) Set the pressure given by F3.01 and F3.18 LED hundreds digit：PID feedback input channel 0：AI 1：Reserved LED thousands digit：PID sleep selection 0：of no avail 1：Normal sleep This method needs to set specific parameters such as F3.10~F3.13 2： Disturbance dormancy It is the same as the parameter setting when the sleep mode is 0. If the PID feedback value is within the range of F3.14 setting value, the disturbance sleep will be entered after the sleep delay time is maintained. When the feedback value is less	0000 ～ 2122	1010	×

		than the awakening threshold (PID polarity is positive), it will wake up immediately.			
F3.01	Setting of quantitative number	Use the operation keyboard to set the given quantity of PID control. This function is effective only when the PID given channel is selected as a digital given channel (F3.00 ten digits are 1 or 2). If the tenth digit of F3.00 is 2, it is used as a pressure setting, and this parameter is consistent with the unit of F3.18.	0.0 ～ 100.0%	0.0%	○
F3.02	Feedback channel gain	When the feedback channel is inconsistent with the set channel level, this function can be used to adjust the gain of the feedback channel signal.	0.01 ～ 10.00	1.00	○
F3.03	Proportional gain P	The speed of PID regulation is set by the two parameters of proportional gain and integration time. It is required to increase the proportional gain and reduce the integration time when the regulation speed is fast, and to decrease the proportional gain and increase the integration time when the regulation speed is slow. Generally, the differential time is not set.	0.01～5.00	2.00	○
F3.04	Integral time Ti		0.1～50.0s	1.0s	○
F3.05	Differential time Td		0.1～10.0s	0.0s	○
F3.06	Sampling period T	The larger the sampling period is, the slower the response is, but the better the suppression effect of interference signal is. Generally, it is not necessary to set.	0.1～10.0s	0.0s	○
F3.07	Deviation limit	The deviation limit is the ratio of the absolute value of the deviation between the system feedback quantity and the given quantity to the given quantity. When the feedback quantity is within the deviation limit, the PID regulation will not act.	0.0 ～ 20.0%	0.0%	○
F3.08	Close-loop preset frequency	Frequency and operation time of AC Drive before PID is put into operation	0.0～ Upper limit frequency	0.0Hz	○
F3.09	Preset		0.0 ～	0.0s	×

	frequency holding time		999.9s		
F3.10	Wake-up threshold coefficient	If the actual feedback value is greater than the set value, and the frequency output by the AC Drive reaches the lower limit frequency, the AC Drive will enter the sleep state after the delay waiting time defined in F3.12 (i.e., running at zero speed); This value is a percentage of the PID setpoint.	0.0 ～ 150.0%	100.0%	○
F3.11	Awakening threshold coefficient	If the actual feedback value is less than the set value, the converter will leave the sleep state and start working after the delay waiting time defined in F3.13; This value is a percentage of the PID setpoint.	0.0 ～ 150.0%	90.0%	○
F3.12	Sleep delay time	Set sleep delay time	0.0 ～ 999.9s	100.0s	○
F3.13	Wake up delay time	Set awakening delay time	0.0 ～ 999.9s	1.0s	○
F3.14	Deviation between feedback and set pressure when entering sleep	This function parameter is only valid for disturbance sleep mode	0.0 ～ 10.0%	0.5%	○
F3.15	Tube burst detection delay time	Set the delay time of tube burst detection	0.0 ～ 130.0s	0.0s	○
F3.16	High pressure detection threshold	When the feedback pressure is greater than or equal to this set value, the tube burst fault "EPA0" will be reported after the tube burst delay of F3.15. When the feedback pressure is less than this set value, the tube burst fault "EPA0" will automatically reset; This threshold is a percentage of the given pressure.	0.0 ～ 200.0%	150.0%	○
F3.17	Low pressure detection threshold	When the feedback pressure is less than this set value, the tube burst fault "EPA0" will be reported after the tube burst delay of F3.15. When the feedback pressure is greater than or equal to this set value, the tube burst fault "EPA0" will automatically reset; This threshold is a percentage of the given	0.0 ～ 200.0%	50.0%	○

		pressure.			
F3.18	Sensor range	Set the maximum range of the sensor	0.00 ～ 99.99 (MPa, Kg)	10.00MPa	○
F4 group - Advanced function parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
F4.00	Rated power of motor	Motor parameter setting	0.0~2000.0 KW	Model depend	×
F4.01	Rated voltage of motor		0～500V：380V 0～250V：220V	Model depend	×
F4.02	Rated current of motor		0.1～ 999.9A	Model depend	×
F4.03	Rated frequency of motor		1.0～ 999.9Hz	50.0Hz	×
F4.04	Rated speed of motor		0~9999RPM	Model depend	×
F4.05	No-load Cur	Set motor no-load current	0.1～F4.01	Model depend	×
F4.06	AVR function	0：of no avail 1：Effective throughout 2：Invalid only when decelerating	0～2	0	×
F4.07	Cooling fan control	0：Automatic control mode 1：Keep running during power-on	0～1	0	○
F4.08	Number of fault automatic reset	When the number of reset times is set to 0, there is no automatic reset function, and only manual reset is allowed. 10 means that the number of times is unlimited, that is, countless times.	0～10	0	×
F4.09	Fault automatic reset interval	Set the automatic reset interval of fault	0.5～25.0s	3.0s	×
F4.10	Starting voltage of energy consumption braking	If the internal DC side voltage of the converter is higher than the starting voltage of energy consumption braking, the built-in braking unit acts. If a braking resistor is connected at this time, the rising voltage energy in the converter will be released through the braking resistor, so that the DC voltage will fall back。	330 ～ 380/660 ～ 800V	350/780V	○
F4.11	Energy consumption braking action ratio		10～100%	100%	○
F4.12	Overmodulation function selection	0：of no avail 1：effective	0～1	0	×
F4.13	PWM model	0：Full frequency seven-band 1：Full frequency five-band 2：Seven sections to five sections	0～2	0	×
F4.14	Slip compensation coefficient	The speed of the asynchronous motor will drop after it is loaded. The slip compensation can make the motor speed close to its synchronous speed, thus making the motor	0～200%	100%	×

		speed control accuracy higher. This coefficient is only valid for ordinary V/F and simple vectors.			
F4.15	Slip compensation mode	0：of no avail 1：Low frequency compensation Note: This parameter is only valid for advanced V/F	0～1	0	×
F4.16	Motor parameter self-learning	0：of no avail 1：Static self-learning (Start to display STAR immediately, and end to display END for 1s)	0～1	0	×
F4.17	Rated power of motor	After changing the rated power of the motor F4.17, F4.01, F4.02, F4.04, F4.05, F4.18~F4.20 are automatically updated to the default parameters of the corresponding power of the motor.	0.0～2000.0KW	Model depend	○
F4.18	Motor rotor resistance		0.00～200.00Ω	Model depend	○
F4.19	Motor stator and rotor inductance		0.00～200.00mH	Model depend	○
F4.20	Motor stator and rotor mutual inductance		0.00～200.00mH	Model depend	○
F4.21	Speed loop (ASR1) proportional gain	Function codes F4.21~F4.26 are valid in vector control mode. The speed response characteristic of vector control is changed by setting the proportional gain P and the integral time I.	1～100	30	×
F4.22	Speed loop (ASR1) integration time		0.01～10.00s	0.50	○
F4.23	Switching low frequency		0.0～10.0Hz	5.0	×
F4.24	Speed loop (ASR2) proportional gain		1～100	20	○
F4.25	Speed loop (ASR2) integration time		0.01～10.00s	1.00	○
F4.26	Switch high frequency		F4.23～320.0Hz	10.0	×
F4.27	Vector slip compensation	In the vector control mode, this parameter is used to adjust the speed stability accuracy of the motor. When the motor is overloaded and the speed is low, increase this parameter, otherwise reduce this parameter	50%～200%	100	○
F4.28	Speed loop filtering time constant	Set the speed loop filtering time constant	0.000～1.000S	0.010	○
F4.29	Reserved	-	-	0	◆

F4.30	Speed loop torque limit	This setting is a percentage of the rated current of the motor	0.0%～200.0%	150.0	○
F4.31	Torque command selection	0：Keyboard number setting 1：AI 2：Reserved	0～2	0	×
F4.32	Torque digital setting	This setting is a percentage of the rated current of the motor	0.0%～200.0%* Motor rated current	150.0	○
F4.33	Torque control forward maximum frequency	It is used to set the maximum forward or reverse operating frequency of the converter under the torque control mode.	0.0～3200.0Hz	50.0	○
F4.34	Torque control reverse maximum frequency		0.0～3200.0Hz	50.0	○
F4.35	Torque rise time	The torque rise/fall time defines the time when the torque rises from 0 to the maximum value or decreases from the maximum value to 0.	0.00～1.00s	0.00	○
F4.36	Torque drop time		0.00～1.00s	0.00	○

F5 group - Protection function parameters

Function code	Name	Description	Set range	Default	Change
F5.00	Protection settings	LED Single digit：Motor overload protection selection 0：of no avail 1：effective LED Tens digit：PID Feedback disconnection protection 0：of no avail 1：Protection action and free shutdown LED hundreds digit：485 communication failure handling 0：Protection action and free shutdown 1：Alarm but maintain current operation 2：Alarm and shut down according to the set mode LED thousands digit：Shock suppression selection 0：of no avail 1：effective	0000 ～ 1211	0001	×
F5.01	Motor overload protection factor	The motor overload protection factor is the percentage of the rated current of the motor to the rated output current of the AC Drive.	30% ～ 110%	100%	×
F5.02	Undervoltage protection level	This function code specifies the allowable lower limit voltage of DC bus when the AC Drive works normally	50 ～ 280/50 ～ 480V	180/360V	×

F5.03	Deceleration voltage limit factor	This parameter is used to adjust the ability of the inverter to suppress overvoltage during deceleration.	0：close，1～255	1	×
F5.04	Overvoltage limit level	The overvoltage limit level defines the action voltage during overvoltage stall protection	350 ～ 400/660 ～ 850V	375/700V	×
F5.05	Acceleration current limiting factor	This parameter is used to adjust the ability of the converter to suppress overcurrent during acceleration	0：close，1～99	10	×
F5.06	Constant speed current limiting factor	This parameter is used to adjust the ability of the converter to suppress overcurrent during the constant speed process	0：close，1～10	0	×
F5.07	Current limiting level	The current limiting level defines the current threshold of the automatic current limiting action, and its setting value is the percentage of the rated current of the AC Drive	50% ～ 200%	160%	×
F5.08	Feedback disconnection detection value	This value is the percentage of PID given quantity. When the feedback value of PID is continuously less than the feedback disconnection detection value, the AC Drive will make corresponding protection actions according to the setting of F5.00. When F5.08=0%, it is invalid.	0.0 ～ 100.0%	0.0%	×
F5.09	Feedback disconnection detection time	The delay time before the protection action after the feedback disconnection occurs.	0.1 ～ 999.9S	10.0s	×
F5.10	Frequency converter overload pre-alarm level	The set value of the current threshold of the overload pre-alarm action of the AC Drive is the percentage of the rated current of the AC Drive.	0～150%	120%	○
F5.11	AC Drive overload pre-alarm delay	The delay time between the output current of the converter from continuously greater than the amplitude of the overload pre-alarm level (F5.10) to the output of the overload pre-alarm signal.	0.0～15.0s	5.0s	×
F5.12	Jog priority enable	0：of no avail 1：When the AC Drive is running, inching priority is the highest	0～1	0	×
F5.13	Oscillation suppression coefficient	In case of motor vibration, set F5.00 thousand bits to be effective, turn on the vibration suppression function, and then adjust it by setting the vibration suppression coefficient. Generally, the vibration amplitude is large, and increase the vibration suppression coefficient F5.13, F5.14~F5.16 do not need to be set; In case of special occasions, F5.13~F5.16 should be used together.	0～200	30	○
F5.14	Amplitude suppression factor		0～12	5	○
F5.15	Lower limit frequency of oscillation suppression		0.0～F5.16	5.0Hz	○
F5.16	Upper limit frequency of oscillation suppression		F5.15～F0.05	45.0Hz	○

F5.17	Wave-by-wave current limiting selection	LED Single digit：Select in acceleration 0：of no avail 1：effective LED Tens digit：Select in deceleration 0：of no avail 1：effective LED hundreds digit：Select at constant speed 0：of no avail 1：effective LED thousands digit：Reserved	000～111	011	×
F5.18	Detection coefficient of output phase loss protection	When the ratio of the maximum value to the minimum value of the three-phase output current is greater than this factor and the duration exceeds 6 seconds, the converter reports the output current unbalance fault EPLI; When F5.18=0.00, the output phase loss protection is invalid	0.00～20.00	2.00	○
F5.19	Instantaneous power-off frequency reduction coefficient	Set the instantaneous power-off frequency reduction factor	0：Instantaneous stop function is invalid 1～9999	0	○
F5.20	Instantaneous power-off frequency reduction point	Set the frequency reduction point of instant power failure	220V:180～330V 250V 380V:300～550V 450V	Model setting	×
F6 group - Communication parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
F6.00	Local address	Set the local address, 0 is the broadcast address	0～247	1	×
F6.01	MODBUSC communication configuration	Unit bit：Baud rate selection0：9600BPS 1：19200BPS 2：38400BPS Tens bit：data format 0：No verification 1：even parity check 2：Odd check Hundreds bit：Communication response mode 0：Normal response 1：Only respond to slave address 2：No response 3：The slave does not respond to the free stop command of the host in broadcast mode Thousands bit：Reserved	0000～0322	0000	×

F6.02	Communication timeout detection time	If the machine does not receive the correct data signal within the time interval defined by this function code, the machine thinks that the communication has failed, and the AC Drive will determine whether to protect or maintain the current operation according to the setting of the communication failure action mode; When this value is set to 0.0, RS485 communication timeout detection is not performed.	0.1～ 100.0s	0.0s	×
F6.03	Local response delay	This function code defines the intermediate time interval between receiving the converter data frame and sending the response data frame to the upper computer. If the response time is less than the system processing time, the system processing time shall prevail.	0～200ms	5ms	×
F6.04	Proportional linkage coefficient	This function code is used to set the weight coefficient of the frequency command received by the slave through the RS485 interface. The actual operating frequency of the slave is equal to the value of this function code multiplied by the value of the frequency setting command received through the RS485 interface. In the linkage control, this function code can set the proportion of operating frequency of multiple inverters.	0.01～ 10.00	1.00	○
F6.05	Reserved	-	-	0	×
F7 group - Supplementary function parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
F7.00	Counting and timing mode	LED Single digit：Count arrival processing 0：One-week counting, stop output 1： One-week count, continue to output 2： Cycle count, stop output 3：Cycle count, continue output LED Tens digit：Reserved LED hundreds digit：Timed arrival processing 0：One-cycle timing, stop output 1：One-cycle timing, continue to output 2： Cycle timing, stop output 3：Cycle timing, continue output LED thousands digit：Reserved	000～303	103	×
F7.01	Counter reset value setting	Set counter reset value	F7.02～ 9999	1	○
F7.02	Counter detection value setting	Set counter detection value	0～F7.01	1	○
F7.03	Timing time setting	Set timing time	0～9999s	0s	○

F7.04～F7.07	Reserved	-	-	0	○
F7.08	Swing control	0：forbid 1：effective	0～1	0	×
F7.09	Swing control	0：Fixed amplitude The reference value of swing is the maximum output frequency (F0.04) 1：Variable amplitude The swing reference value is the given channel frequency	0～1	0	×
F7.10	Swing frequency shutdown and start mode selection	0：Start according to the state memorized before shutdown 1：Restart	0～1	0	×
F7.11	Swing amplitude	The swing amplitude is a percentage corresponding to the maximum output frequency (F0.04).	0.0～100.0%	0.0%	○
F7.12	Jump frequency	This function code refers to the amplitude of rapid decline after the frequency reaches the upper limit of the frequency during the frequency swing, and also refers to the amplitude of rapid rise after the frequency reaches the lower limit of the frequency swing. This value is the percentage relative to the amplitude of swing frequency (F7.11). If it is set to 0.0%, there will be no sudden jump frequency.	0.0～50.0%	0.0%	○
F7.13	Swing rise time	The running time from the lower frequency of swing to the upper frequency of swing.	0.1～3600.0s	5.0	○
F7.14	Swing down time	The running time from the upper limit frequency to the lower limit frequency.	0.1～3600.0s	5.0	○
F7.15	Upper limit of swing frequency delay	Set the upper and lower frequency delay of swing frequency.	0.1～3600.0s	5.0	○
F7.16	Lower limit frequency delay of swing frequency		0.1～3600.0s	5.0	○
F8 Group - Manage and display parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**

F8.00	Selection of main parameters of Operation Monitoring	For example, F8.00=2, that is, select the output voltage (d-02), then the default display item of the main monitoring interface is the current output voltage value	0～31	0	○
F8.01	Selection of main parameters for Shutdown monitoring	For example, F8.01=3, that is, select the bus voltage (d-03), then the default display item of the main monitoring interface is the current bus voltage value.	0～31	1	○
F8.02	Run auxiliary display (only valid for dual display)	For example, F8.02=4, that is, select the output current (d-02), then the default display item of the main monitoring interface is the current output voltage value.	0～31	4	○
F8.03	Shutdown Auxiliary Display(only valid for dual display)	For example, F8.03=3, that is, select the bus voltage (d-03), then the default display item of the main monitoring interface is the current bus voltage value.	0～31	3	○
F8.04	Motor speed display coefficient	It is used to correct the speed scale display error and has no effect on the actual speed.	0.01～ 99.99	1.00	○
F8.05	Parameter Initialization	0: No action The AC Drive is in normal parameter reading and writing state. Function code setting value. Whether it can be changed depends on the setting state of the user password and the current working state of the converter. 1: Restore factory settings All user parameters are restored to the factory settings according to the model. 2: Clear the fault record Clear the contents of fault records (d-19~d-24). After the operation is completed, this function code will be cleared automatically.	0～2	0	×
F8.06	Reserved	-	0	0	×

F9 Group - Factory Parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
F9.00	Factory password	1～9999	1	****	◇

D Group - Monitoring parameters					
Function code	**Name**	**Description**	**Set range**	**Default**	**Change**
d-00	Output Frequency (Hz)	0.0～999.9Hz	0.1Hz	0.0Hz	◆

d-01	Frequency set (Hz)	0.0～999.9Hz	0.1Hz	0.0Hz	◆
d-02	Output Voltage(V)	0～999V	1V	0V	◆
d-03	Bus voltage(V)	0～999V	1V	0V	◆
d-04	Output Current(A)	0.0～999.9A	0.1A	0.0A	◆
d-05	Motor Speed(rpm)	0～60000rpm	1rpm	Model setting	◆
d-06	Analog Input AI(V/mA)	0.00～10.00V/0.00～20.00mA	0.01V/0.01mA	0.00V/mA	◆
d-07	Reserve	-	0	0	◆
d-08	Analog Output AO(V/mA)	0.00～10.00V/0.00～20.00mA	0.01V/0.01mA	0.00V/mA	◆
d-09	Reserved	-	-	0	◆
d-10	PID Pressure setpoint	0.00～10.00V/0.00～99.99 (MPa, Kg)	0.01V/(MPa, Kg)	0.00V (MPa, Kg)	◆
d-11	PID Pressure feedback value	0.00～10.00V/0.00～99.99 (MPa, Kg)	0.01V/(MPa, Kg)	0.00V/ (MPa, Kg)	◆
d-12	Current count value	0～9999s	1s	0s	◆
d-13	Current timing value(s)	0～9999s	1s	0s	◆
d-14	Input terminals status(X1-X4)	0～FH	1H	0H	◆
d-15	Output status(R)	0～1H	1H	0H	◆
d-16	Module temperature(℃)	0.0～132.3℃	0.1℃	0.0	◆
d-17	Software upgrade date(year)	2010～2026	1	2023	◆
d-18	Software upgrade date (Month, day)	0～1231	1	0109	◆
d-19	Second fault code	0～19	1	0	◆
d-20	Last fault code	0～19	1	0	◆
d-21	Output frequency at the last fault (Hz)	0.0～999.9Hz	0.1Hz	0.0Hz	◆
d-22	Output current at the last fault(A)	0.0～999.9A	0.1A	0.0V	◆
d-23	Bus voltage at the last fault(V)	0～999V	1V	0V	◆
d-24	Module temperature at the last fault(℃)	0.0～132.3℃	0.1℃	0.0℃	◆
d-25	Accumulated operation time of the AC Drive(h)	0～9999h	1h	0h	◆

d-26	Inverter status	0～FFFFH BIT0: operation/shutdown BIT1: reverse/forward rotation BIT2: Jog BIT3: DC braking BIT4: Reserved BIT5: overvoltage limit BIT6: Constant speed frequency reduction BIT7: overcurrent limit BIT8~9:00 - zero speed/01 - acceleration/10 - deceleration/11 - constant speed BIT10: overload pre-alarm BIT11: Reserved BIT12~13 running command channel: 00-panel/01-terminal/10-reserved BIT14~15 bus voltage status: 00 - normal/01 - low voltage protection/10 - overvoltage protection	1H	0H	◆
d-27	Software version	1.00～99.99	0.01	2.00	◆
d-28	Power model	0.10～99.9KW	0.01KW	Model setting	◆
d-29	Estimated frequency of motor	0.0~maximum output frequency [F0.04] Note: motor operating frequency converted from estimated motor speed	0.1Hz	0.0Hz	◆
d-30	Output torque	-200～+200%	1%	0%	◆
d-31	Input voltage(V)	0～999V	1V	0V	◆

E group-Error code

Error Code	Description	Possible causes of failure	Trouble shooting	
E0C1	Overcurrent during accelerated operation	The acceleration time is too short	Expand the acceleration time	1
		Low power of inverter	Choose higher power grade inverter	
		Improper setting of the V/F curve or torque rise	Adjust the V/F curve or torque increase	
E0C2	Overcurrent during the decelerated operation	The deceleration time is too short	Expand the deceleration time	2
		Lower Power of inverter	Choose higher power grade inverter	
E0C3	Overcurrent during the constant speed operation	Low grid voltage	Check input power	3
		Sudden or abnormal load	Check the load or reduce the sudden change of load	
		Low power of inverter	Choose higher grade power inverter	
EHU1	Overvoltage during accelerated operation	Abnormal input voltage	Check input power supply	4
		Restart the rotating motor	Set to start after DC braking	
EHU2	Overvoltage	The deceleration time is too short	Extend the deceleration time	5

	during deceleration operation	Abnormal input voltage	Check input power supply	
EHU3	Over voltage during constant speed operation	Abnormal input voltage	Check input power supply	6
EHU4	Over voltage during shutdown	Abnormal input voltage	Check input power supply	7
ELU0	Under voltage during operation	The input voltage is abnormal or the relay is not closed	Check the voltage of power supply voltage or ask service from the manufacturer	8
ESC1	Power Module Fault	Inverter's output short circuit or grounding	Check motor wiring	9
		Converter instantaneous overcurrent	Refer to overcurrent countermeasures	
		Abnormal control board or serious interference	Ask the manufacturer for service	
		Power device damage	Ask the manufacturer for service	
E-OH	Heatsink over temperature	Ambient temperature is too high	Lower the ambient temperature	10
		Fan damage	Change the fan	
		Air duct blocked	Dredge air duct	
EOL1	Inverter overload	Improper setting of V/F curve or torque rise	Adjust the V/F curve and torque rise	11
		The grit voltage is too low	Check the grid voltage	
		The acceleration time is too short	Extend the Acceleration time	
		Motor Overload	Select higher power converter	
EOL2	Motor Overload	Improper setting of V/F curve or torque rise	Adjust the V/F curve and torque increase	12
		Grid voltage is too low	Check the grid voltage	
		The motor is locked or too large sudden change of the load	Check load	
		Improper setting of the overload protection factor	Correctly set the motor overload protection factor	
E-EF	External equipment failure	External equipment fault input terminal closed	Disconnect the fault input terminal of external equipment and clear the fault (pay more attention to check the cause)	13
EPOF	Double CPU communication failure	CPU communication failure	Ask the manufacturer for service	14
EPID	PID feedback disconnection	PID feedback line is loose	Check feedback wiring	15
		The feedback quantity is less than the detection value of disconnection	Adjust the detection input threshold	
E485	RS485 communication failure	Not match the baud rate of the upper computer	Adjust the baud rate	16
		RS485 Channel interference	Check whether the communication wiring is shielded and whether the wiring is reasonable. If necessary, consider connecting the filter capacitor in parallel	
		Communication timeout	retry	

ETUN	Motor Tuning fault	Motor parameter setting error	Rest the motor parameters	17
ECCF	Current detection fault	Current sampling circuit fault	Ask the manufacturer for service	18
		Auxiliary power failure		
EEEP	EEPROM read and write error	EEPROM fault	Ask the manufacturer for service	19
EPLI	Output phase loss protection	Output U, V, W have phase loss	Check output wiring	20
EPAO	Tube failure	Voltage feedback is less than low voltage detection threshold or greater than or equal to high voltage detection threshold	Check the feedback wiring or adjust the high and low voltage threshold	22

Chapter 3 Communication protocol

1. RTU mode and format

When the controller communicates on the Modbus bus in RTU mode, every 8-bit byte in the message is divided into two 4-bit hexadecimal characters. The main advantage of this mode is that the density of the characters transmitted is higher than ASCII mode at the same baud rate, and each message must be transmitted continuously.

(1) Format of each byte in RTU mode

Program system: 8-bit binary, hexadecimal 0-9, A-F

Data bit: 1-bit start bit, 8-bit data (low bit sent first), stop bit occupies 1 bit, parity bit can be selected.

(Refer to RTU data frame as sequence diagram)

Error check area: cyclic redundancy check (CRC).

(2) RTU Data frame sequence diagram

With Parity Check

Start	1	2	3	4	5	6	7	8	Par	Stop

No Parity Check

Start	1	2	3	4	5	6	7	8	Stop

2. Description of reading and writing

Function Code	Function Description
03	Read Register
06	Write Register

3. Address of the Register

Function of the register	Address
Control Command Input	2000H
Monitoring parameter reading(d-00～d-31)	1000H～001FH
Communication frequency setting	2001H
User parameter setting(F0.00～F8.06)	0000H～0806H
Factory parameter setting(F9.00～F9.10)	0900H～090AH

4. Address description of communication protocol Parameter:

Function description	Address definition	Description of data significance	R/W
Communication control command	2000H	0001H：halt	W
		0012H：normal operation	
		0013H：Normal jog operation	
		0022H：Reverse operation	
		0023H：reverse jog operation	
Communication setting frequency address	2001H	The communication setting frequency range is -10000~10000. Note: The communication set frequency is a percentage of the maximum frequency, and its range is - 100.00%~100.00%).	W
Communication control command	2002H	0001H：External fault input	W
Read operation/shutdown parameter description	2102H	Set frequency (two decimal places)	R
	2103H	Output frequency (two decimal places)	R
	2104H	Output current (one decimal place)	R
	2105H	Bus voltage (one decimal place)	R
	2106H	Output voltage (one decimal place)	R
	2107H	Analog input AI(two decimal places)	R
	2108H	Reserved	R
	2109H	Current Count Value	R
	210AH	Motor Speed	R
	210BH	Analog Output AO (two decimal places)	R
	210CH	Reserved	R
	210DH	Temperature of the Inverter(one decimal place)	R
	210EH	PID feedback value(two decimal places)	R
	210FH	PID set point (two decimal places)	R
	2110H	Reserved	R
	2111H	pulse input frequency	R
	2112H	Current fault	R
	2113H	Current timing value	R
	2114H	Input terminal status	R
	2115H	Output terminal status	R

	2116H	BIT0: operation/shutdown BIT1: forward/reverse BIT2: Jog BIT3: DC braking BIT4: Reserved BIT5: overvoltage limit BIT6: Constant speed frequency reduction BIT7: overcurrent limit BIT8~9:00 - zero speed/01 - acceleration/10 - deceleration/11 - constant speed BIT10: overload pre-alarm BIT11: Reserved BIT12~13 operation command channel: 00-panel/01-terminal/10-communication BIT14~15 bus voltage status: 00 - normal/01 - low voltage protection/10 - overvoltage protection	R
	2101H	Bit0: running Bit1: shutdown Bit2: Jog Bit3: forward rotation Bit4: Reverse Bit5 ～ Bit7: reserved Bit8: Communication given Bit9: analog signal input Bit10: communication operation command channel Bit11: parameter locking Bit12: running Bit13: jog command Bit14 ～ Bit15: R reserved	R
Read fault code description	2100H	00: No abnormality 01: Module fault 02: Overvoltage 03: Temperature fault 04: Inverter overload 05: Motor overload 06: External fault 07~09: Reserved 10: Overcurrent during acceleration 11: Overcurrent during deceleration 12: Overcurrent at constant speed 13: Reserved 14: Under voltage 15: Reserved 16: RS485 communication failure 17: Tube explosion fault 18: Reserved 19: Dual CPU communication failure 20: Reserved 21: Reserved	R

		22: Current detection fault 23: Reserved 24: Reserved 25: Output phase loss	

5. 03 Reading function mode:

Inquiry information frame format:

Address	01H
Function	03H
Starting data address	21H
	02H
Data(2Byte)	00H
	02H
CRC CHK Low	6FH
CRC CHK High	F7H

Data Analysis:

01H address of the inverter
03H reading function code
2102H starting address
0002H numbers of the reading address, and 2102H & 2103H
F76FH 16bit CRC check code

Response information frame format:

Address	01H
Function	03H
DataNum*2	04H
Data1[2Byte]	17H
	70H
Data2[2Byte]	00H
	00H
CRC CHK Low	FEH
CRC CHK High	5CH

Data Analysis:

01H address of the inverter
03H Read Function Code
04H Product of Read Items x2
1770H Data of reading 2102H(set frequency)
0000H Data of reading 2103H (output frequency)
5CFEH 16-bit CRC check code

6. 06H Writing Function Mode:

Inquiry information frame format:

Address	01H
Function	06H
Starting data address	20H
	00H
Data(2Byte)	00H
	01H
CRC CHK Low	43H
CRC CHK High	CAH

Data Analysis：

01H address of the inverter

06H writing function code

2000H address of control order

0001H stop command

43CAH 16-bit CRC check code

Response information frame format

Address	01H
Function	06H
Starting data address	20H
	00H
Number of Data(Byte)	00H
	01H
CRC CHK Low	43H
CRC CHK High	CAH

Data Analysis： If the setting is correct, the same input data is returned.

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