INVERTER ZVF11-M/S Series
User's Manual

Foreword

● Thank you for your purchase of the ZVF11-M/S Series inverter
● This manual introduces the installation, operation, function setting, troubleshooting and etc. of the inverter ZVF11-M/S series.
● Incorrect installation or use may result in damage or other accidents. Do read all instructions in detail before installing or operating.
● Please forward this manual to the end user, and keep it handy for quick reference.
● If there are any doubts or questions, please contact the Technical Service Center of the Company.

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Chapter 1 Safety Instructions

1.1 Safety Symbols and Definitions

The safety instructions described in this manual are very important. To avoid any error that may result in damage to equipment, injury to personnel or loss of property, do read and clearly understand all of the safety symbols, symbol definitions and be sure to observe the indicated safety instructions below.

Safety Symbols	Symbol Definitions
HAZARD	This symbol indicates hazardous HIGH VOLTAGE. Any incorrect operation may result in serious damage to the equipment or death to personnel.
WARNING	This symbol indicates that any incorrect operation can result in damage to the equipment or minor to moderate injury to personnel.
CAUTION	This symbol calls your attention to follow the instructions while in operation or in use.
TIP	This symbol calls your attention to some useful messages for the user.

HAZARD

- Do not touch the circuit board or the parts when the power or the charge indicator is still on.
- Do not perform the work of wiring or inspecting the parts or signal of the circuit board unless the power supply is completely off.
- Do not dismount or change the connecting wires, circuits or parts inside the inverter by yourself.
- Do connect the inverter's earth terminal to the ground properly and tightly.

WARNING

- Do not perform withstand voltage test on the internal parts of the inverter because semiconduction parts can be easily damaged by the voltage.
- Do not connect the output terminal U, V or W of the inverter to the terminal L or N of AC power supply.
- Do not touch the main circuit board of the inverter because its CMOS and IC are vulnerable to static damage.

1.2 Cautions for Use

Before power transmission

WARNING

- Be sure the power supply and voltage selected should be equivalent to the input voltage of the inverter.

WARNING

- Be sure to install the inverter on metallic or other inflammable materials to avoid fire.
- Be sure to install a fan if several inverters are put in one cabinet, so that the temperature inside the cabinet is always below 40℃, thus overheat or fire can be prevented.
- Be sure not to dismount or install the operation panel and avoid failure or no display of the panel due to loose contact.

During power transmission

HAZARD

- DO NOT insert or pull the connecting lines of the inverter to avoid damage of the control panel caused by surge that enters the panel.

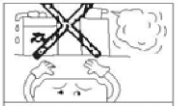
During operation

HAZARD

- DO NOT insert or isolate the motor during operation. Otherwise, it may cause overcurrent protection or even result in burnout of the main circuit of the inverter.
- KEEP CLEAR to avoid danger if self-priming (automatic start) is set which can restart automatically after the motor stops.
- DO NOT remove the terminal cover to prevent possible electric shock and injuries.

1.3 Cautions for Operating Ambient


direct exposure to sunlight

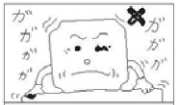

corrosive gas or liquid


oil or gas


Salt


high humidity (>90%) caused by rain or water drop


iron filings or powder


high vibration


extreme cold

Heat


EMI, ultrahigh pressure (i.e., electric welding line)


radioactive substances


inflammable substances

Chapter 2 Introduction to the Product and Installation

2.1 Unpacking and Inspection upon Arrival

This product is guaranteed a high level of quality with strict outgoing inspection, crush proof and shock proof packaging. But this does not preclude damage to the product due to heavy collision or strong extrusion. So it is necessary to unpack the inverter upon arrival and perform these steps:

①Check whether there is a deformed or damaged casing; or any shattered component.

②Check the nameplate of the inverter and make sure it matches the product part number you've ordered.

If there is any problem with the above-mentioned contents, please contact with the supplier or manufacturer immediately.

2.2 Demonstration of the Model

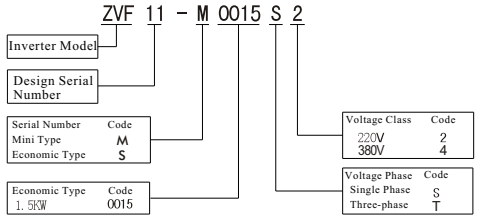


Figure 2-1 Inverter Model Demonstration

2.3 Demonstration of the Nameplate

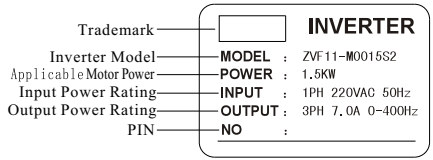


Figure 2-2 Specifications Label

2.4 Specifications and Technical Indications

Input VoltageClass			220V			
ZVF11-M/S_ _ _			0004S2	0075S2	0015S2	0022S2
Applicable Motor Power (KW)			0.4	0.75	1.5	2.2
Output	Output Current(A)		2.3	4.5	7.5	10.0
	Maximum Output Voltage(V)		Corresponding Three-phase Input Voltage			
	Range of Output Frequency(Hz)		0.01～400.00Hz			
Input	Range of Input Voltage		160～240V			
	Range of Input Power Frequency		50±5%Hz			
Control Characteristics	Control Mode		SAPWM Space Vector Control			
	Frequency Resolution		Figure Setting: 0.01Hz Analog Setting: Maximum Frequency*0.1%			
	Torque Characteristics		Adjustable from 0% to20%.			
	Overload Capacity		150% of the rated outputcurrent per minute			
	Acceleration/Deceleration time		Adjustable from 0.1 to999.9.			
	V/F Curve		Linear/ Quadratic			
Running Characteristics	Frequency Setting Signal	Panel Control	Set by the key▲▼ or the potentiometer on thepanel.			
		External Signal	Terminal 0~10V, 4~20mA，0~10KHz，UP/DOWN，485 COM etc.			
	Operation Setting Signal	Panel Control	Set by the keyRUN or STOP.			
		External Signal	External FWD, REV and JOGoperation, PLC operation and COM operation.			
	Multi-function Input Signal		Multi phase speed, counter, programrun, VI/CI shifting and etc.			
	Multi-function Output Signal		Failiure,running,counter arrival,frequency arrival program running			
	Analog Output Signal		Running frequency,output voltage , current,motor rotation			
Other Functions			AVR, overvoltage andcurrent stall prevention, no reversal andetc.			
Protecting Functions			Overvoltage, overcurrent, undervoltage, overload, overheat, short circuit protection and etc.			
Cooling Mode			Forced air cooling			
Ambient	Points of Use		Altitude < 1000m, indoor places without corrosive gas, liquid and etc.)			
	External Environment		Temperature: -10~+45℃; Humidity < 90%RH withoutcondensing			
	Vibration		< 0.5G			

2.5 Installation and Wiring

2.5.1 Operating Environment:

The Inverter mounting ambient have direct effect on the function and lifetime of inverter, So the ambient have to reach the followingsituation:
Altitude: Maximum 1000m above sea level
Ambient Temperature: -10~+45℃ [Bare Machine: -10~+50℃]
Humidity: 20~90% RH(Non-condensing)
Ambient: Indoor places free from direct exposure to sunlight, dust, corrosive gas, flammable gas, oil mist, steam, drip and salt.
Vibration: <0.5G

2.5.2 Installation Space and Direction

To get better cooling effect and for the convenience of maintenance, the inverter shall be installed vertically with enough space left (refer to Fig.2-3). When two or more inverters are fixed in the same cabinet, it is recommended to fix them in parallel and horizontally to reduce heat produced by them (refer to Fig.2-4). When there is a must to fix them up and down, please fix an insulating board between them so that the heat produced by the lower one could not have direct influence on the upper one (refer to Fig.2-5).

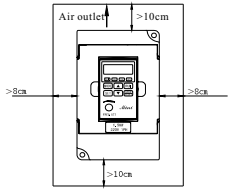


Fig.2-3 Diagram of Installation Space

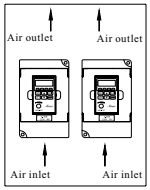


Fig.2-4 Diagram of Multi-piece Parallel Installation

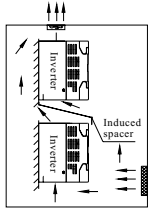


Fig.2-5 Diagram of Multi-piece Vertical Installation

WARNING

- Be sure the main loopterminals should be connected tothe cable tightly.Otherwise, the inverter may be damaged arisingfrom loose connection.
- Be sure the ground terminalsof the inverter and themotor must be properly grounded. Multi-piece inverter should be groundedat one shared point.
- Be sure to install anon-fuse circuit breaker or leakageprotective circuit breaker in the inverter's input port toprevent expanding of accident due to inverter problem.

2.5.3 Inverter's Standard WiringDiagram

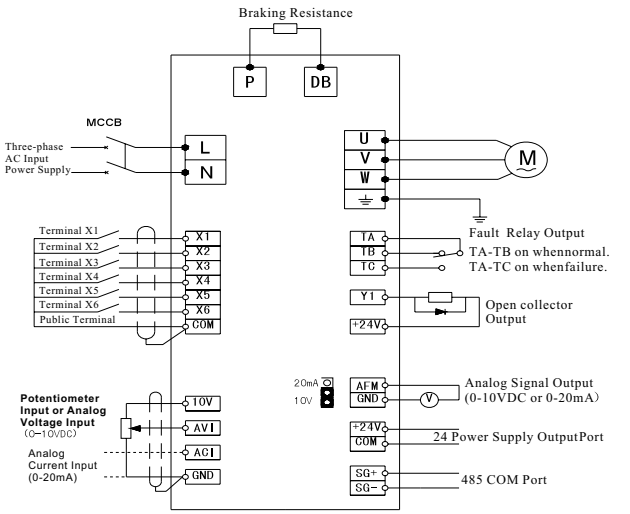


Fig. 2-6 Basic SystemDescription on Wiring

2.5.4 Instructions for Main Circuit Terminals

1、Diagram of Main CircuitTerminals

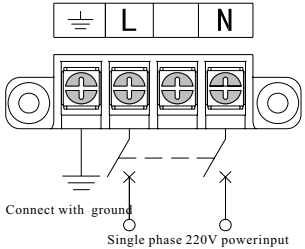


Fig.2-7 Input Terminals

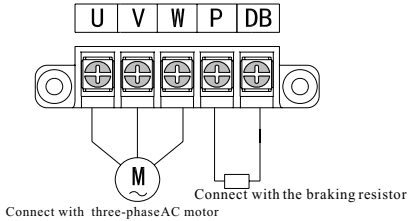


Fig.2-8 Output Terminals

2、Description on Main Circuit Terminals

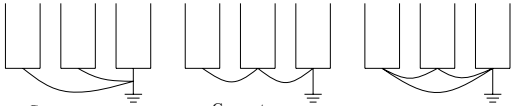
Terminal Symbol	Function Description
L、N	Power input terminals connecting tosingle-phase 220V ACpower supply
U、V、W	Inverter output terminals connectingto three-phase ACmotor
P、DB	External braking resistance terminals connectingto both ends of theexternal braking resistor.
⏚ G	Ground terminal or ground wire.

Tips

• The input power terminals donot differ on phasesequence and can be connectedarbitrarily.
• If the motor counter rotates(reverses) when the output terminalsU, V andW connect to three-phase motor, just exchangetwo phases of U,V and Warbitrarily.

WARNING

• The inverter's ground lead cannot connect to the groundtogether with other heavy current load, but connect tothe ground separately.The shorter of theground line is ,the better is.
• The ground terminal is requiredto have a tight groundcontact to avoid electric shockor fire and reduce noise. Donot form a loop ifseveral inverters connect to theground together. Refer to the figure below



WARNING

• The diameter of the ground line must conform to the state standards.

• Make sure the excellent connection, Please use the terminal with insulating pipe to connect the terminal with lead.
• After wiring is finished, check carefully if there is any foreign matter come into the inverter. Confirm all the connection lines are proper without any missing or wrong connection. Be sure there is no short circuit between terminals and connection lines, or short circuit to earth.

2.5.5 Description of Control Circuit Terminals

1、Diagram of Control Circuit Terminals

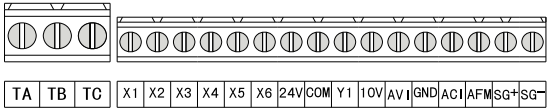


Fig.2-9 Control Terminals

2、Description of Control Circuit Terminals

Types	Terminal Symbols	Function Description	Electrical Specifications
Public Port	COM	Numeral Signal Public Terminal	
Multi-function Input Terminal	X1	Valid only when there is a short-circuit between Xn (n=1, 2, 3, 4,5, 6) and COM. The functions can be set by parameter F3.00~F3.05 separately.	INPUT, 0~24V power level, low level valid, 5mA
	X2		
	X3		
	X4		
	X5		
	X6		
Power Supply	24V	24VDC Power Output(Control Power)	24VCD/100mA
Multi-function Output Terminal	Y1	Multi-function open-collector output is defined as on-off output terminal, whose function is set by the parameter F3.09 with reference of COM	OUTPUT Maximm load current≤50mA
Public Port	GND	Analog Signal Public Terminal	
Analog Input Terminal	10V	External analog preset power supply	OUTPUT，10VDC Voltage
	AVI	Analog voltage signal input, with reference of GND.	INPUT，0∽10VDC Voltage
	ACI	Analog current signal input, with reference of GND	INPUT，0∽20mA DC Current
Analog Output Terminal	AFM	Analog voltage current output with reference of GND.	OUTPUT，0∽10V（0∽20mA）

Types	Terminal Symbols	Function Description	Electrical Specifications
Multi-function Relay Output Terminal	TA	Set by the parameterF3.08. Normal: TA-TB closed Failure: TA-TC closed	Contact capacity: NO 250VAC/5A NC 250VAC/3A
	TB		
	TC		
COM Terminal	SG+	Communication Signal Positive Terminal	
	SG-	Communication Signal Negative Terminal	

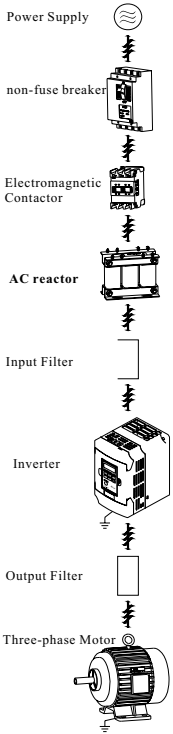
Tips

• The connecting wire of controlcircuit must be STP(shielded twisted pair wire) which should be separated from themain circuit and strong currentcircuit. If the connecting wireof the control circuit had topass through the main circuitand other control wires, theymust intersect at an angle of90o.
• The control circuit is liableto external interferences. So thelength of the wire shouldbe short as possible. Usually, it can not exceed30m. When used foranalog voltage, current or potentiometer input, the wire shouldnot exceed 20m in length.
• To avoid loosecontact, a tight contact isrecommended when taking a jointas input.
• To remove malfunctionof surge voltage onthe inverter's control circuit andperipheral equipment, a surge absorbershould be installed to connecttwo ends of the magneticcoil that has generated surge voltage.
• The diameter of the controlcircuit wire is recommended tobe 0.75mm^2.

2.5.6 Schedule of Matching ElectricalProducts

Model ZVF11	Maximum Applicable Motor (KW)	Main Circuit Diameter mm^2	Circuit Breaker (A)	Contactor (A)
-M/S0004S2	0.4	2.5	10	10
-M/S0007S2	0.75	2.5	10	10
-M/S0015S2	1.5	4.0	16	16
-M/S0022S2	2.2	4.0	20	25

2.5.6 Diagram of Wiringfor Inverter System &Cautions for Wiring



Power Supply:
• Be sure the voltageclass is proper toavoid damage tothe inverter.
• A non-fuse breakermust be installed betweenthe AC power supply and the inverter.

non-fuse breaker
• Be sure to usea non-fuse breaker whichmatches the rated voltage and current ofthe inverter. Itis used as anOn/Off switch between the inverterand the power supply, and a protector for the inverter.
• Do not use thenon-fuse breaker to startor stop the inverter.

Electromagnetic Contactor
• A contactor isnot used generally.But it must be installed when certain functions, i.e., externalcontrol, restart are performed.
• Do not use the electromagneticcontactor to start or stopthe inverter.

AC reactor
• When large capacity power supply (>600KVA) is used, an extra AC reactor can be installed to improve the power.

Input Filter
• An input filter should bemounted if there isinductive load around the inverter.

Inverter
• The power can be connectedto the terminal L or N arbitrarily.
• The output port can beconnected to the terminal U,V and W. If themotor reverses when theinverter forwards, just exchange two phases of U,V and W arbitrarily.
• Do not connect output terminalto AC powersupply. Otherwise, it may cause damageto the inverter.
• The ground terminal should beproperly grounded.

Chapter 3 Instructions for use of the product and specification for parameters

3.1 Specification for Operation Panel

3.1.1 Operation Panel Outlay

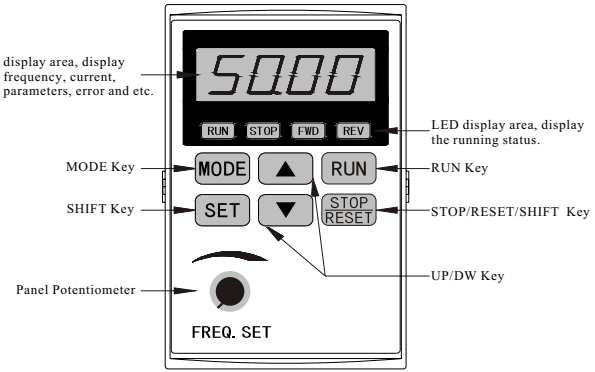


Fig.3-1 Diagram for ZVF11-M/S Operation Panel

3.1.1 Description on Keys

Symbol	Key Name	Function Description
MODE	Mode key.	Press this key to enter intothe function programming mode. Once parameters are modified, press this keyto exit the function programming mode.
SET	Confirm key.	In the state of programming, pressthis key to confirm the functioncode. After parameters are modified, press thiskey to save modified data. Inan operation or hold mode, press thiskey to shift the displaying content,such as output frequency,current ,revolution.
▲	Up key.	In the state of programming, thefunction code and parameter value will go up by pressing this key In an operation or holdmode, press this key to increase the operation frequency.
▼	Down key.	In the state of programming,Pressingthis key, the functioncodes and parameter value will go down. Inan operation or hold mode, pressthis key to decrease the operation frequency
RUN	Run key.	Pressing this key, theinverter begins to run. If "F0.02"is set to "External Terminal Control", then itis invalid to press this key
STOP RESET	Stop/Reset key.	Press this key to stop theinverter. If "F0.02" is setto "External Terminal Control", then it is invalid topress this key. Whenfailure alarm occurs, press this key to reset thesystem. In the state of programming,press this key to realize data traverse.

3.1.2 Description on LED IndicatorLights

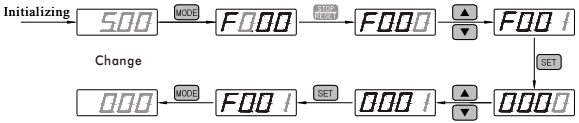
LED Symbol	Name	Description
RUN	Run Indicator	This Light turns ONwhen the inverter runs.
STOP	Stop Indicator	This Light turns ONwhen the inverter stops.
FWD	Forward Indicator	This Light turns ONwhen the inverter forwards.
REV	Reverse Indicator	This Light turns ONwhen the inverter reverses.

Tips

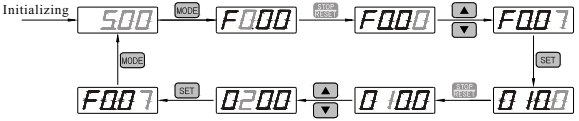
The LED displays -VF-when the inverter isenergized.
• In the operation orhold mode, pressing▲▼, the frequency valuecan be modified when it is set byUp/Down key▲▼ on the panel (F0.01=1).
• In the operation orhold mode, pressing SET ,the display can shiftto the output frequency, current, rotatingspeed and etc
• In the state ofoperation, the stop functionof STOP RESET key is priorto the reset function, i.e., to modifya parameter when theinverter is in operation,pressing this key,the inverter will stop running.(Note: The operation modeis set to "PanelControl".)

3.1.2 Use of the Operation Panel

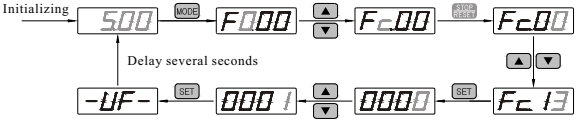
1、Change the frequency set mode from ▲▼ control to external voltage (0~10V) control.



2、Change the acceleration time from 10.0s to 20.0s.



3、Restore all the parameters to Factory Default Settings



Notes

- 0 indicates the data tube flickers; 0 indicates the tube doesn't flicker.
- To modify parameters when the inverter is in operation, the inverter will stop running when pressing the STOP RESET key. (Note: The operation mode is set to "Panel Control".)
- To modify parameters when the inverter is in operation, please pay attention to the modification right because some parameters can not be modified in the operation mode.
- If parameters cannot be modified in the hold mode, please check whether the parameters are locked or not(Fc.12=1).

3.2 List of Function Parameters

F0 series Basic Parameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F0.00	Keyboard setting frequency	0.0～400.0Hz	0.1Hz	5.0Hz	
F0.01	Frequency setting mode	0: Keyboard or terminal settingby pressing UP/DOWN 1: Keyboard potentiometer setting 2: External analog voltage setting 3: External analog current setting 4: Combined multi-stage speed setting 5: External terminal high/low speed setting (AVI) 6: External impulse input setting 7: PID setting 8: 485 COM setting 9: Terminal AVI/ACI setting	1	1	
F0.02	Operation command selection	0: Keyboard control 1: Terminal control 2: Multi-stage speed control 3: External analog voltage input control 4: External analog current input control 5: 485 COM control	1	0	
F0.03	Stop mode	0: Free stop 1: Decelerated stop	1	1	
F0.04	Basic frequency	40.0–400.0Hz	0.1Hz	50.0Hz	
F0.05	upper limiting frequency	0.0–400.0Hz	0.1Hz	50.0Hz	
F0.06	lower limiting frequency	0.0–400.0Hz	0.1Hz	0.0Hz	
F0.07	Acceleration time	0.1–999.9s	0.1s	10.0s	
F0.08	Deceleration time	0.1–999.9s	0.1s	10.0s	
F0.09	Starting frequency	0.0–40.0Hz	0.1Hz	0.5Hz	
F0.10	Starting holding time	0.0–60.0s	0.1s	0.0s	
F0.11	Shutdown frequenc	0.0–40.0Hz	0.1Hz	0.0Hz	
F0.12	Frequency fine tuning	0.00–0.09Hz	0.01Hz	0.00Hz	

F0 series Basic Parameters(Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F0.13	Jog frequency	0.5-400.0Hz	0.1Hz	5.0Hz	
F0.14	Jog acceleration time	0.1-999.9s	0.1s	10.0s	
F0.15	Jog Deceleration time	0.1-999.9s	0.1s	10.0s	

F1 series Control Parameters(Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F1.00	FWD/REV command selection	0: No reversing 1: Keyboard selection 2: External terminal selection 3: 485 COM selection	1	0	
F1.01	Keyboard operating direction	0: Forward 1: Reverse	1	0	
F1.02	FWD/REV shifting time	0.0-60.0s	0.1s	0.0s	
F1.03	V/F curve setting	0: Linear type (constant torqueload) 1: Square type (fan, pump) 2: Polygonal type (F1.04, F1.05)	1	0	
F1.04	IF setting	10.0Hz-40.0Hz (Valid whenF1.03=2)	0.1Hz	30.0Hz	
F1.05	IF output voltage setting	20.0Hz-100.0% (Valid whenF1.03=2)	0.1%	60.0%	
F1.06	Acceleration S curve setting	0-7 (Validwhen acceleration time<10s)	1	0	
F1.07	Deceleration S curve setting	0-7 (Validwhen deceleration time<10s)	1	0	
F1.08	Leap frequency range	0.0-10.0Hz	0.1Hz	0.0Hz	
F1.09	1st leap frequency	0.0-400.0Hz	0.1Hz	0.0Hz	
F1.10	2nd leap frequency	0.0-400.0Hz	0.1Hz	0.0Hz	
F1.11	3rd leap frequency	0.0-400.0Hz	0.1Hz	0.0Hz	
F1.12	Carrier frequency	1000-9999Hz	1Hz	5000Hz	

F1 series Control Parameters(Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F1.13	Torque lifting	0.0-20.0%	0.1%	8.0%	
F1.14	Output voltage regulating	50%-100%	1%	100%	

F2 series Braking andBraking Displaying Parameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F2.00	Starting DC braking time	0.0-100.0s	0.1s	0.0s	
F2.01	Starting DC braking voltage	0-100V	1V	20V	
F2.02	Shutdown DC braking time	0.0-100.0s	0.1s	0.0s	
F2.03	Shutdown DC braking voltage	0-100V	1V	20V	
F2.04	Braking enable	0: Invalid 1: Valid	1	1	
F2.05	Braking inception voltage coefficient	100%-170%	1%	140%	
F2.06	Braking termination retard coefficient	0%-20%	1%	5%	
F2.07	Display mode 1	0: Frequency display 5: Count input value 1: Output current 6: AVI feedback value 2: Input voltage 7: ACI feedback value 3: Output voltage 8: PID setting value 4: Motor rotating speed 9: PID feedback value	1	0	
F2.08	Display mode 2			1	
F2.09	Display mode 3			2	

F3 Series Multi-function portparameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F3.00	Terminal X1 function selection	0: Invalid 1: Combined multi-stage speed 1 2: Combined multi-stage speed 2	1	1	
F3.01	Terminal X2 function selection			2	

F3 Series Multi-function portparameters (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F3.02	Terminal X3 function selection	3: Combined multi-stage speed 3 4: Combined accelerating/decelerating time 1 5: Combined accelerating/decelerating time 2 6: Forward operation (FWD) 7: Reverse operation (REV) 8: RUN 9: Running direction selection (forward or reverse) 10: JOG forward 11: JOG reverse 12: Reset (RST) 13: Counter reset 14: Counter Up input 15: Counter Down input 16: External impulse input 17: Pulse enable 18: Frequency increasing (UP) 19: Frequency decreasing (DOWN) 20: External fault 21: PLC pulse start 22: PLC pulse stop 23: Three-wire FWD control 24: Three-wire REV control 25: Three-wire NO shutdown control 26: Three-wire NC shutdown control 27: External free shutdown input 28: External decelerated shutdown input 29: Analog frequencycommand selection (AVI/ACI) 30: Terminal high/lowspeed selection	1	3	
F3.03	Terminal X4 function selection			6	
F3.04	Terminal X5 function selection			7	
F3.05	Terminal X6 function selection			12	
F3.06	Output target frequency setting	0.2–400.0Hz	0.1Hz	50.0Hz	
F3.07	Frequency detection range	0.0–50.0Hz	0.1Hz	0.0Hz	

F3 Series Multi-function portparameters (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F3.08	Relay function selection	0: Invalid 1: Fault output 2: Targetfrequency arrived 3: Set frequency arrived 4: Operation output 5: Counter arrived 6: upper limiting frequency arrived 7: lower limiting frequency arrived 8: Program operating indication	1	0	
F3.09	Y1 function selection			0	

F4 Series Multi-stage SpeedParameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F4.00	Multi-stage speed 1	0.0–400.0Hz	0.1Hz	10.0Hz	
F4.01	Multi-stage speed 2	0.0–400.0Hz	0.1Hz	20.0Hz	
F4.02	Multi-stage speed 3	0.0–400.0Hz	0.1Hz	30.0Hz	
F4.03	Multi-stage speed 4	0.0–400.0Hz	0.1Hz	40.0Hz	
F4.04	Multi-stage speed 5	0.0–400.0Hz	0.1Hz	50.0Hz	
F4.05	Multi-stage speed 6	0.0–400.0Hz	0.1Hz	60.0Hz	
F4.06	Multi-stage speed 7	0.0–400.0Hz	0.1Hz	70.0Hz	
F4.07	1st accelerating time	0.1–999.0s	0.1s	10.0s	
F4.08	1st decelerating time	0.1–999.0s	0.1s	10.0s	
F4.09	2nd accelerating time	0.1–999.0s	0.1s	10.0s	
F4.10	2nd decelerating time	0.1–999.0s	0.1s	10.0s	
F4.11	3rd accelerating time	0.1–999.0s	0.1s	10.0s	

F4 Series Multi-stage SpeedParameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F4.12	3rd decelerating time	0.1-999.0s	0.1s	10.0s	
F4.13	4th accelerating time	0.1-999.0s	0.1s	10.0s	
F4.14	4th decelerating time	0.1-999.0s	0.1s	10.0s	
F4.15	Acceleration/Deceleration source selection	0: Keyboard setting 1: Terminal selection	1	0	

F5 Series Protection FunctionParameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F5.00	Undervoltage protection	0: Disabled 1: Enabled	1	1	
F5.01	Undervoltage Protection Voltage Proportion	50%-100%	1%	60%	
F5.02	Over-voltage protection Function	0: Disabled 1: Enabled	1	1	
F5.03	Over-voltage protection voltage proportion	100%-150%	1%	135%	
F5.04	Over-voltage stall function	0: Disabled 1: Enabled	1	1	
F5.05	Over-voltage stall voltage proportion	100%-150%	1%	125%	
F5.06	Over-current stall function	0: Disabled 1: Enabled	1	1	
F5.07	Stall current proportion	100%-150%	1%	150%	
F5.08	Overload protection	0: Disabled 1: Enabled	1	1	
F5.09	Overload current proportion	10%-200%	1%	150%	
F5.10	Overload protection time	0-120s	1s	60.0s	
F5.11	Overheat function	0: Disabled 1: Enabled	1	1	
F5.12	OP trip function	0: Disabled 1: Enabled	1	0	

F6 series Communication andFault Parameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F6.00	485 COM Mode	0: 8-N-1, 8-bit data, 1 bit stop, no parity RTU 1: 8-E-1, 8-bit data, 1 bit stop, even parity RTU 2: 8-0-1, 8-bit data, 1 bit stop, odd parity RTU 3: 8-N-2, 8-bit data, 2-bit stop, no parity, RTU 4: 8-E-2, 8-bit data, 2-bit stop, even parity, RTU 5: 8-0-1, 8-bit data, 2-bits stop, odd parity, RTU 6: 7-N-1, 8-bit data, 1-bit stop, no parity, ASCII 7: 7-E-1, 8-bit data, 1-bit stop, even parity, ASCII 8: 7-0-1, 8-bit data, 1-bit stop, odd parity, ASCII 9: 7-N-2, 8-bit data, 2-bit stop, no parity, ASCII 10: 7-E-2, 8-bit data, 2-bit stop, even parity, ASCII 11: 7-0-2, 8-bit data, 2-bit stop, odd parity, ASCII 12: 8-N-1, 8-bit data, 1-bit stop, no parity, ASCII 13: 8-E-1, 8-bit data, 1-bit stop, even parity, ASCII 14: 8-0-1, 8-bit data, 1-bit stop, odd parity, ASCII 15: 8-N-2, 8-bit data, 2-bit stop, no parity, ASCII 16: 8-E-2, 8-bit data, 2-bit stop, even parity, ASCII 17: 8-0-2, 8-bit data, 2-bit stop, odd parity, ASCII	1	0	

F6 series Communication andFault Parameters (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F6.01	485 COM baud rate selection	0: 1200bps 3: 9600bps 1: 2400bps 4: 19200bps 2: 4800bps 5: 38400bps	1	0	
F6.02	485 COM local address	1-127	1	1	
F6.03	Communication error report	0: Disabled 1: Enabled	1	0	
F6.04	Error-recoverable times	0-5	1	0	
F6.05	Error recovering time	5-600s	1s	60s	
F6.06	Last error type	0-14	1	For search	
F6.07	Next-to-last error type	0-14	1	For search	
F6.08	Antepenultimate error type	0-14	1	For search	

F7 Series PID FunctionParameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F7.00	PID setting source selection	0: Keyboard set, AVI feedback 1: Keyboard set, ACIfeedback 2: Keyboard potentiometer set, AVI feedback 3: Keyboard potentiometer set, ACI feedback 4: AVIset, ACI feedback 5: ACI set, AVI feedback	1	0	
F7.01	PID digital set	00.0-100.0	0.1	50.0	
F7.02	PID upper limiting frequency	10.0-400.0	0.1Hz	50.0Hz	
F7.03	PID lower limiting frequency	10.0-400.0	0.1Hz	10.0Hz	

F7 Series PID FunctionParameters (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F7.04	PID feedback selection	0: Positive feedback 1: Negative feedback	1	0	
F7.05	Proportional gain Kp	00.0-100.0	0.1	1.0	
F7.06	Integral time Ki	0.0-100.0s	0.1s	0.0s	
F7.07	Differential time Kd	0.0-100.0s	0.1s	0.0s	
F7.08	PID tolerance range	0.0-20.0%	0.1%	1.0%	
F7.09	PID detection time	0.1-60.0s	0.1s	1.0s	
F7.10	Sleep time	0.0-60.0s	0.1s	0.0s	
F7.11	Frequency wake-up threshold	1.0-100.0Hz	0.1Hz	10.0Hz	
F7.12	Encoder speed setting	1-9999	1	2400	
F7.13	Encoder impulse times per week	1-2000	1	1024	
F7.14	Reserved function				

F8 Series Analog Input/Output Parameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F8.00	Maximum voltage value for analog voltage input	0.0-10.0V	0.1V	10.0V	
F8.01	Minimal voltage value for analog voltage input	0.0-10.0V	0.1V	0.5V	
F8.02	Frequency that corresponds to the maximum voltage for analog input	0.0-400.0Hz	0.1Hz	50.0Hz	
F8.03	Frequency that corresponds to the minimal voltage for analog input	0.0-400.0Hz	0.1Hz	0.0Hz	
F8.04	Maximum current value for analog current input	0.0-20.0mA	0.1mA	20.0mA	
F8.05	Minimal current value for analog current input	0.0-20.0mA	0.1mA	4.0mA	

F8 Series AnalogInput/Output Parameters (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F8.06	Frequency that corresponds to the maximum current for analog input	0.0–400.0Hz	0.1Hz	50.0Hz	
F8.07	Frequency that corresponds to the minimal current for analog input	0.0–400.0Hz	0.1Hz	0.0Hz	
F8.08	Maximum value for external impulse input	0.0–10.0KHz	0.1KHz	5.0KHz	
F8.09	Minimal value for external impulse input	0.0–10.0KHz	0.1KHz	0.1KHz	
F8.10	Frequency that corresponds to the maximum value for impulse input	0.0–400.0Hz	0.1Hz	50.0Hz	
F8.11	Frequency that corresponds to the minimal value for impulse input	0.0–400.0Hz	0.1Hz	0.0Hz	
F8.12	Analog output enable	0: Disabled 1: Enabled	1	1	
F8.13	Analog output content selection	0: Operating frequency 3: Motor rotating speed 1: Output voltage 4: PID set value 2: Output current 5: PID feedback value	0	0	
F8.14	Analog output correction coefficient	80%–120%	1%	100%	
F8.15	Frequency that corresponds to the maximum value for analog output	10.0–400.0Hz	0.1Hz	50.0Hz	

F9 series PLC FunctionParameters 1

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F9.00	PLC operating frequency stage 1	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.01	PLC operating frequency stage 2	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.02	PLC operating frequency stage 3	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.03	PLC operating frequency stage 4	0.0–400.0Hz	0.1Hz	5.0Hz	

F9 series PLC FunctionParameters 1 (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
F9.04	PLC operating frequency stage 5	0.0 400.0Hz	0.1Hz	5.0Hz	
F9.05	PLC operating frequency stage 6	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.06	PLC operating frequency stage 7	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.07	PLC operating frequency stage 8	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.08	PLC operating frequency stage 9	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.09	PLC operating frequency stage 10	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.10	PLC operating frequency stage 11	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.11	PLC operating frequency stage 12	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.12	PLC operating frequency stage 13	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.13	PLC operating frequency stage 14	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.14	PLC operating frequency stage 15	0.0–400.0Hz	0.1Hz	5.0Hz	
F9.15	PLC operating frequency stage 16	0.0–400.0Hz	0.1Hz	5.0Hz	

FAseries PLC Function Parameters2

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
FA.00	PLC operating time stage 1	0–9000s	1s	0s	
FA.01	PLC operating time stage 2	0–9000s	1s	0s	
FA.02	PLC operating time stage 3	0–9000s	1s	0s	

FA series PLC Function Parameters2 (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
FA. 03	PLC operating time stage 4	0-9000s	1s	0s	
FA. 04	PLC operating time stage 5	0-9000s	1s	0s	
FA. 05	PLC operating time stage 6	0-9000s	1s	0s	
FA. 06	PLC operating time stage 7	0-9000s	1s	0s	
FA. 07	PLC operating time stage 8	0-9000s	1s	0s	
FA. 08	PLC operating time stage 9	0-9000s	1s	0s	
FA. 09	PLC operating time stage 10	0-9000s	1s	0s	
FA. 10	PLC operating time stage 11	0-9000s	1s	0s	
FA. 11	PLC operating time stage 12	0-9000s	1s	0s	
FA. 12	PLC operating time stage 13	0-9000s	1s	0s	
FA. 13	PLC operating time stage 14	0-9000s	1s	0s	
FA. 14	PLC operating time stage 15	0-9000s	1s	0s	
FA. 15	PLC operating time stage 16	0-9000s	1s	0s	

Fb series PLC Function Parameters 3

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
Fb. 00	PLC operating control stage 1	000-144	1	000	
Fb. 01	PLC operating control stage 2	000-144	1	000	

Fb series PLC Function Parameters 3 (Continued)

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
Fb. 02	PLC operating control stage 3	000-144	1	000	
Fb. 03	PLC operating control stage 4	000-144	1	000	
Fb. 04	PLC operating control stage 5	000-144	1	000	
Fb. 05	PLC operating control stage 6	000-144	1	000	
Fb. 06	PLC operating control stage 7	000-144	1	000	
Fb. 07	PLC operating control stage 8	000-144	1	000	
Fb. 08	PLC operating control stage 9	000-144	1	000	
Fb. 09	PLC operating control stage 10	000-144	1	000	
Fb. 10	PLC operating control stage 11	000-144	1	000	
Fb. 11	PLC operating control stage 12	000-144	1	000	
Fb. 12	PLC operating control stage 13	000-144	1	000	
Fb. 13	PLC operating control stage 14	000-144	1	000	
Fb. 14	PLC operating control stage 15	000-144	1	000	
Fb. 15	PLC operating control stage 16	000-144	1	000	

Fc series AuxiliaryControl Parameters

Function Code	Name	Range of setting	Minimum Unit	Factory Default Setting	Note
Fc. 00	PLC function setting	0: Non operation 1: Single cycling 2：Continuous Cycling 3；Retaining the final value after single cycling	1	0	
Fc. 01	AVI/ACI filter time	0.01—60.00s	0.01s	1.00s	
Fc. 02	Speed correction	50—100%	0.1%	100%	
Fc. 03	Remain				
Fc. 04	ACI fine tuning	0—1000	1	0	
Fc. 05	Digital frequency control	0: Keep memory after powerfailure; hold after shutdown. 1：Keep memory after power failure; don't hold after shutdown. 2: Don't keep memory after powerfailure; hold after shutdown. 3：Don't keep memory after power failure; don't hold after shutdown.	1	0	
Fc. 06	Digital frequency range	0.1—50.0Hz	0.1Hz	1.0Hz	
Fc. 07	Standby time	0.0—60.0s	0.1s	0.0s	
Fc. 08	Motor poles	2—20	2	4	
Fc. 09	Counter target value	1—9999	1	100	
Fc. 10	Counter arrival motion time	0.01—60.00s	0.01s	1.00s	
Fc. 11	Output voltage auto compensation	0: Disabled 1: Enabled	1	1	
Fc. 12	Parameter lock	0: Parameter modification allowed 1: Parameter modification not allowed	1	0	
Fc. 13	Parameter Initializing	0: Invalid 1: Parameter restores tothe default value.	1	0	

3.3 Function Parameters Description

F0 Series Operating Parameters Description
F0.00 Keyboard setting frequency Rangeof setting: 0.0~400.0Hz Factory DefaultValue: 5.0Hz

F0.01 Frequency setting mode Rangeof setting: 0~9 Factory DefaultValue: 0
0: Keyboard or terminal UP/DOWNsetting:
To set thefrequency by pressing ▲▼ on the keyboard or UP/DWNkey of the terminal (ifthe port is valid).
1: Keyboard potentiometer setting:
To set thefrequency according to the resistancevalue of potentiometer on thekeyboard.
2: External analog voltage setting:
To set thefrequency according to the externalanalog voltage input value. F8.00and F8.01 are used toset the range for analog input. F8.02and F8.03 are used toset the frequency that correspondsto the maximum or minimal analog input.
3: External analog current setting:
To set thefrequency according to the externalanalog current input value. F8.04and F8.05 are used toset the range for analog input. F8.06and F8.07 are used toset the frequency that correspondsto the maximum or minimal analog input.
4: Combined multi-stage speed setting:
External terminals reserve the functionof 7-stage speed setting. Sofrequency can be set accordingto the state of external terminals. F4.00~F4.06 are frequencyparameters that correspond to everymulti stages.
5: External terminal high/low speedsetting (AVI):
To set thefrequency by analog voltage inputif there is input forthe terminal. If there isno input, then refer tothe frequency set by F8.03.
6: External impulse input setting:
To set thefrequency according to the externalpulse input value. F8.08~F8.09 areused to set the rangefor pulse input. F8.10~F8.11 refer tothe frequency that corresponds tothe maximum or minimal impulse.
7: PID setting: This indicatesPID's self-motion regulation function isenabled.
8: 485 COM setting: To realize frequency setting throughcommunication.
9: External TerminalAVI/ACIsetting:
When the external terminal isset to have two kindsof selections of analog frequencycommand AVI or ACI, its frequency can be set byexternal voltage or external current.

F0.02 Operation command selection Rangeof setting:0-5 Factory Default value:0-5
0: Keyboard control:
To switch on bypressing RUN key and switchoff by pressing STOPkey on the keyboard.
1: Terminal control:
To switch on oroff according to the stateof external terminals.
2: Multi-stage speed control
If external terminals are setto have the function of7-stage speed function, it isconsidered to perform the stop command over the machine whenthree ports of the terminalsare disabled; to perform thestart command when the ports are enabled.
3: External analog voltage inputcontrol:
To set "on-off"by external analog input voltage.The state of "ON" or"OFF" is decided by analogvoltage. When the analog voltage rises andexceeds DC1V,the machine switches on; whenthe analog voltage falls toDC1V, the machine switches off.
4: External analog current inputcontrol:
To set "on-off"by external analog input current.The state of "ON" or"OFF" is decided by analogcurrent. When the analog voltage rises andexceeds DC2mA, the machine switcheson; when the analog voltagefalls to DC2mA, the machine switches off.
5: 485 COM control
To set "on-off"by 485 COM.

F0.03 Stop mode Range ofsetting: 0~1 Factory default value:1
0: Free stop
Once the stop command isreceived, the inverter will blockPWM output with a freestop of the load dueto inertia.
1: Decelerated stop
Once the stop command isreceived, the inverter will decelerateits frequency gradually till afull stop according to the deceleration time.
Deceleration + DC braking:
If F0.03=1, parameter F2.02 (shutdownDC braking time) and F2.03(shutdown DC

braking level) ≠ 0, the inverter will decelerate its output frequency during theperiod of deceleration after the stop command is received. Oncethis value reaches the stopfrequency (parameter F0.11), theinverter will start its DC braking and thenstop.

F0.04 Basic frequency Range ofsetting: 40.0~400.0Hz Factory default value:50.0Hz
This refers to the minimaloutput frequency that corresponds tothe rated output voltage. Itis used as a reference for frequency regulation.
Note: The rated frequency ofthe motor is generally takenas the set value forbasic frequency, which can be reset according to therequirements in some special occasions.But attention must be paidto V/F characteristic of the load motorand output of the motor.

F0.05 Upper limiting frequency Rangeof setting: 0.2~400.0Hz Factory defaultvalue: 50.0Hz
This is used to setthe upper limit of frequency.

F0.06 Lower limiting frequency Rangeof setting: 0.0~400.0Hz Factory defaultvalue: 0.0Hz
This is used to setthe lower limit of frequency.

Note: The upper limiting frequencyrefers to the allowable maximumworking frequency of the inverter, and the tower limiting frequency refersto the allowable minimal outputfrequency of the inverter.To set theupper and lower limit of frequencymay ensure a moderate outputfrequency automatically, neither higherthan the upper limiting frequency nor lowerthan the lower limiting frequency So the motor canalways work in the allowable frequency range to avoidmechanical or inverter accident dueerror operation. This function isespecially applicable to super high/low speedprevention.

F0.07 Acceleration time Rangeof setting: 0.1~999.9s Factory defaultvalue: 10.0s
This refers to the time during which the output frequencyof the inverter is acceleratedfrom 0Hz to 100Hz. It is used togetherwith the parameter F4.15. I.e.,if F4.15=0, the keyboard willkeep the control over frequency velocity accelerated from 0Hzto 100Hz according to theset value for this parameter.

F0.08 Deceleration time Range ofsetting: 0.1~999.9s Factory default value:10.0s
This refers to the periodduring which the output frequencyof the inverter is deceleratedfrom 100Hz to 0.0Hz. It is used togetherwith the parameter F4.15. I.e.,if F4.15=0, the keyboard shallkeep the control over frequency velocity decelerated from 100Hzto 0.0Hz according to theset value for this parameter.

F0.09 Starting frequency Range ofsetting: 0~40.0Hz Factory default value:0.5Hz
This refers to the inceptionfrequency of the inverter whenit is started. This isused to adjust the inception synchronous speed of the motorand overcome the maximum staticfriction force. Shifting from idleto start, the motor runs at thestarting frequency at first, thenenters into the stage ofholding (set by F0.10) andfinally it runs at the targetfrequency set by the user.

F0.10 Starting holding time Rangeof setting: 0~60.0s Factory defaultvalue: 10.0s
This refers to the holdingtime of starting frequency.

F0.11 Shutdown frequency Rangeof setting: 0~40.0Hz Factory defaultvalue: 0.0Hz
When the inverter is deceleratedto stop, its output frequencycan be set. Once thevalue reaches the shutdown frequency, the inverterwill close output.
Note: The inverter doesn't enterinto the stage of shutdownDC braking until its operatingfrequency reaches the stop frequency.

F0.12 Frequency fine tuning Rangeof setting: 0.00~0.09Hz Factory defaultvalue: 0.00Hz
The user can regulate theoperating frequency of the currentmotor by setting this parameter, which can be set up to an accuracyof 0.01Hz.

F0.13 Jog frequency Rangeof setting: 0.5~400.0Hz Factorydefault value: 5.0Hz
The inverter will runat the jog frequency(F0.13) automatically when itis in the stateof jog operation, and the frequencyvelocity will be decidedby the jog accelerationtime (F0.14) and the jog deceleration time (F0.15)when accelerating or decelerating.

F0.14 Jog acceleration time Range of setting: 0.1~999.9s Factory default value: 10.0s
This refers to theperiod during which thefrequency is accelerated from0Hz to 100Hz. The frequency velocity is determinedby this parameter whilethe machine is inthe state of jog operation.

F0.15 Jog Deceleration time Range of setting: 0.1~999.9s Factory default value: 10.0s
Parameter description: This refersto the period duringwhich the frequency isdecelerated from 100Hz to 0Hz.The frequency velocity isdetermined by this parameterwhile the machine is in the state ofjog operation.

F1 Series Control Parameters Description

F1.00 FWD/REV command selection Range of setting: 0~3 Factory default value: 0
0: No reversing:
The machine always forwardswhatever the input signalis, forward or reverse.
1: Keyboard selection: Theoperating direction is determinedby the keyboard.
2: External terminal selection:The operating direction isdetermined by external terminals.
3: 485 COM selection: The operation direction isdetermined by 485 COM.

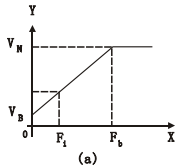
F1.01 Keyboard operating direction Range of setting: 0~1 Factory default value: 0
Combined with the parameterF1.00, this is usedto set the operatingdirection of the motor. If F1.00=1, the keyboardcan determine whether themotor forwards or reversesaccording to the set value for thisparameter.
0：Forward
1：Reverse

F1.02 FWD/REV shifting waiting time Range of setting:0~60.0s Factory default value:0.0s
Once the operating directionof the motor changes,the inverter enters intothe stage of FWD/REV shifting (if permitted)when the operation frequencyfalls to the stopfrequency (see the detail for F0.11).Wait tillthe set shifting timeis passed and themotor will counter rotate.
Using this function canavoid overcurrent protection causedby large inertia ofthe motor during FWD/REV shifting.
Please set proper FWD/REVshifting time according tothe actual inertia ofthe motor.
During the course ofshifting, the inverter hasno output and themotor decelerates freely according to its owninertia and load.

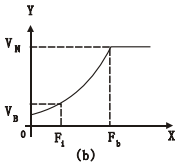
F1.03 V/F curve setting Range of setting: 0~2 Factory default value: 0
There are three kindsV/F curve setting:
0: Linear type, applicableto constant torque load;
1: Square type, applicableto fan, pump andsimilar loads;
2：Polygonal type, combined withthe parameter F1.04 andF1.05.

F1.04 Intermediate frequency (IF)setting Range of setting: 10~40.0Hz Factory default value: 30.0Hz
Intermediate frequency (IF) refersto the output frequencyat the turning pointof V/F curve if V/F curve is adopted.

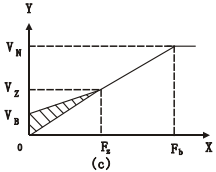
F1.05 IF output voltage setting Range of setting: 20%~100% Factory default value: 30.0Hz
Intermediate voltage refers to the output voltage at the turning point of V/F curve if V/F curve is adopted.



(a)



(b)

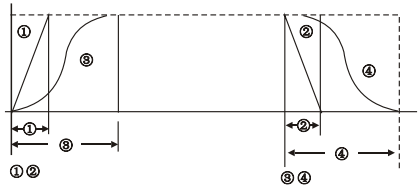


(c)

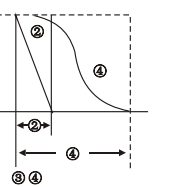
V_B – torque lifting
V_N – rated voltage
V_Z intermediate voltage
X – output frequency
Y – output voltage
F_i starting frequency
F_b basic frequency
F_z intermediate frequency

F1.06 Acceleration S curve setting Range of setting: 0~7 Factory default value: 0

F1.07 Deceleration S curve setting Range of setting: 0~7 Factory default value: 0
This is used in the occasion that has critical requirement for motor's acceleration/deceleration. If this parameter=0, then frequency velocity will be worked out according to the currently selected acceleration/deceleration time. If this parameter≠0, then the currently selected acceleration/deceleration time is for reference only. If the acceleration/deceleration time remains the same, the larger the parameter is, the longer the transformation period is. The acceleration curve is valid only when the set time for acceleration/deceleration is less than 10.0s.



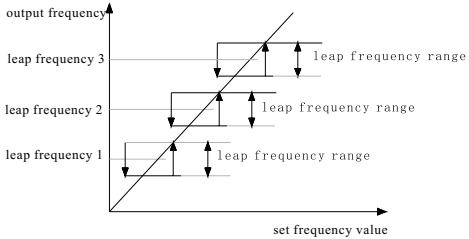
Acceleration/deceleration performance when S curve is not enabled.



Acceleration/deceleration performance when S curve is enabled.

F1.08 Leap frequency range Range of setting: 0.0~10.0Hz Factory default value: 0.0Hz
F1.09 1st leap frequency Range of setting: 0.0~400.0Hz Factory default value: 0.0Hz
F1.10 2nd leap frequency Range of setting: 0.0~400.0Hz Factory default value: 0.0Hz
F1.11 3rd leap frequency Range of setting: 0.0~400.0Hz Factory default value: 0.0Hz

To avoid point of resonant frequency of mechanical load, the inverter's set frequency may perform leap operation near some frequency points. The working frequency that corresponds to resonant frequency is called leap frequency. This inverter can set three leap frequency points whose ranges are not allowed to be overlaid or inlaid.
If the leap frequency range = 0.0Hz, then the function of leap frequency is disabled.
When the range of setting leap frequency is half lower than the leap frequency, The leap frequency function is invalid.
When the frequency is set within the range of the Xth leap frequency, the inverter will output the upper limiting value for the Xth leap frequency if the set frequency is larger than the Xth leap frequency, and output the lower limiting value for the Xth leap frequency if the set frequency is smaller than the Xth leap frequency.
Eg. If set F1.08=10.0Hz, F1.09=40.0Hz, then the frequency 35.0~45.0Hz is the range for the 1st leap frequency.



F1.12 Carrier frequency Range of setting: 1000~9999 Factory default value: 5000
Changing the value for carrier frequency may reduce noise of the motor and avoid mechanical resonant.
Note: To change carrier frequency when the inverter is in operation, the newly set parameter value will be effective only when the inverter restarts after stop.

F1.13 Torque lifting Range of setting: 0.0~20.0% Factory default value: 5.0%
The value stands for the set value for voltage when frequency = 0. It is used to regulate the output torque of the motor. The smaller the parameter is, the lower the output voltage is if other parameters remain the same.
Note: If output frequency >basic frequency, then the output voltage is not influenced by this parameter.

F1.14 Output voltage regulation Range of setting: 50%~100% Factory default value: 100%
This is used to regulate the percentage of output voltage to rated voltage. If it is set to be 100%, then the output voltage corresponds to the rated voltage.

Type F2 Braking Parameters Description

F2.00 Start DC braking time Range of setting:0~100.0s Factory default value:0.0s

Three manners can be selected to start the inverter: 1) Accelerate to the target frequency directly; 2) Perform inception frequency for a period of time, then accelerate to the target frequency; 3) Perform DC braking first, then perform incepting frequency for a period of time, and finally accelerate to the target frequency. E.g.

1) Accelerate to the target frequency directly:
Set F0.10 (start holding time) = 0, F2.00(starting DC braking time)= 0.

2) Perform inception frequency for a period of time, then accelerate to the target frequency:
Set F0.10 (start holding time) ≠0, F2.00 (starting DC braking time) = 0.

3) Perform DC braking first, then perform incepting frequency for a period of time, and finally accelerate to the target frequency:
Set F0.10 (start holding time) ≠0, F2.00 (starting DC braking time) ≠ 0, F2.01 (start braking voltage) ≠ 0.

F2.01 Start DC braking voltage Range of setting: 0~100V Factory default value:20V

If set this parameter when the motor needs DC braking before starting, the system will proceed braking over the motor. This parameter indicates the ratio of output voltage when performing braking to the output voltage when starting frequency is in a normal operation. The bigger the figure, the stronger the braking force.

F2.02 Shutdown DC braking time Range of setting: 0~100.0s Factory default value: 0.0s

DC braking is used if output frequency of the inverter is smaller than stop frequency when there is a decelerated stop or FWD/REV shift.

F2.03 Shutdown DC braking voltage Range of setting: 0~100V Factory default value: 20V

If set this parameter when the inverter stops running and the motor needs DC braking, the system will proceed braking over the motor. This parameter indicates the ratio of output voltage for braking to the output voltage when stop frequency is in a normal operation. The bigger the figure, the stronger the braking force.

F2.04 Braking enable Range of setting: 0~1 Factory default value: 1

This function is used to control the output of braking signal.

0：Disabled 1: Enabled

F2.05 Braking inception voltage coefficient Range of setting:100~170%

Factory default value: 140%

If detected voltage is higher than the product of rated voltage and this parameter, the braking signal will be output.

F2.06 Braking termination retard coefficient Range of setting: 0~20%

Factory default value: 5%

If detected voltage is lower than the product of braking inception voltage and this parameter, the braking signal will be terminated.

F2.07 Display mode 1 Range of setting: 0~9 Factory default value: 0

F2.08 Display mode 2 Range of setting: 0~9 Factory default value: 1

F2.09 Display mode 3 Range of setting: 0~9 Factory default value: 2

This is used to set the display contents of the inverter when it is in the mode of operation or holding.

0：Frequency display 5: Count input value
1: Output current 6：AVI feedback value
2：Input voltage 7：ACI feedback value
3：Output voltage 8：PID setting value
4: Motor rotating speed 9: PID feedback value

Note: The inverter's digital tube will display three types of data, which can be shifted by pressing the "SET" key. If Mode 1 is selected, the digital tube will display the data when the inverter is energized; If Mode 2 or Mode 3 is selected, the tube will display the data when the inverter is in the mode of shifting.

F3 Series Multi-function Port Parameters Description

F3.00 Terminal X1 function selection Range of setting: 0~30 Factory default value: 1
F3.01 Terminal X2 function selection Range of setting: 0~30 Factory default value: 2
F3.02 Terminal X3 function selection Range of setting: 0~30 Factory default value: 3
F3.03 Terminal X4 function selection Range of setting: 0~30 Factory default value: 6
F3.04 Terminal X5 function selection Range of setting: 0~30 Factory default value: 7
F3.05 Terminal X6 function selection Range of setting: 0~30 Factory default value: 12

Setting Value	Function Content	Function of TerminalX
0	Invalid	Invalid
1	Combined multi-stage speed 1	ON; OFF
2	Combined multi-stage speed 2	ON; OFF
3	Combined multi-stage speed 3	ON; OFF
4	Combined accelerating/decelerating period 1	ON; OFF
5	Combined accelerating/decelerating period 2	ON; OFF
6	Forward operation (FWD)	ON: Forward; OFF: Shutdown
7	Reverse operation (REV)	ON: Reverse; OFF: Shutdown
8	RUN	ON: Run OFF: Shutdown
9	Running direction(F/R)	ON: Reverse OFF: Forward
10	JOG forward	ON: Terminal jog forwards. OFF: Shutdown
11	JOG reverse	ON: Terminal jog reverses. OFF: Shutdown
12	Reset (RST)	ON: Chip resets; OFF: Chip doesn't reset.
13	Counter reset	ON: Counter resets; OFF: Counter doesn't reset.
14	Counter Up input	1 count per input of impulse
15	Counter Down input	1 count per input of impulse
16	External pulse input	Pulse input enabled.
17	Pulse enable	Pulse input enabled.
18	Frequency increasing (UP)	Impulse
19	Frequency decreasing (DOWN)	Impulse
20	External fault	Shutdown without reservation
21	PLC pulse enable	Impulse

Setting Value	Function Content	Function of TerminalX
22	PLC pulse stop	Impulse
23	Three-wire FWD control	ON: Forward
24	Three-wire REV control	ON: Reverse
25	Three-wire NO shutdown control	OFF: Stop
26	Three-wire NC shutdown control	ON: Stop
27	External free shutdown input	ON: Free shutdown
28	External decelerated shutdown input	ON: Decelerated shutdown
29	Analog frequency command selection(AVI/ACI)	ON: ACI enabled. OFF:AVIenabled.
30	Terminal high/low speedselection	ON: Frequency of VI input OFF: Minimal frequency of VIinput

Refer to parameter descriptionin the clause F3.00~F3.06for the use ofcombined multistage speed. Refer to parameterdescription in the clauseF3.07~F3.14 for the usageof combined acceleration/deceleration time.
When the terminal isset to have high/lowspeed function, just adoptthe frequency set byanalog input AVI if the terminalis ON and adoptthe frequency set bythe parameter F8.03.
When the terminal's settingfrequency rises or falls,each impulse is equivalentto one MOP and the impulse time mustnot be less than10ms.
Terminal's ON/OFF mustbe set for theinverter before performing thehigh/low speed function. An impulse lasts morethan 10ms can beregarded as an ON/OFFsignal. To avoiderror operation, different terminals can notbe set to performthe same function (butthey can be setto "0").

F3.06 Output target frequencysetting Range of setting:0.2~400.0Hz
Factory default value: 50.0Hz
Refer to the secondclause for the parameterF3.09.

F3.07 Frequency detection range Range of setting: 0.0~50.0Hz Factory default value: 0.0Hz
This refers to theminimal creepingrange of frequency when frequency output isselected.

F3.08 Relay output selection Range of setting: 0~5 Factory default value: 0
Used to set conditionsfor relay action.

F3.09 Y1 output selection Range of setting: 0~5 Factory default value: 0

Setting Value	Function Conten	Conditions for Relay Actuation
0	Invalid	The relay is failure toactuate.
1	Fault output	When the inverter is inan abnormal state.
2	Target frequency arrival	If output frequency > outputtarget frequency (set by F3.06),retard frequency (F3.07) can be set to prevent continuous shifting of frequency fluctuation when there is analog control frequency.
3	Setting frequency arrival	Output after the user presettarget frequency is reached.

Setting Value	Function Conten	Conditions for Relay Actuation
4	Operating Indication	When the inverter is inthe state of operation.
5	Counter arrival	If counting function is set,the number of the impulse input reaches thecounting value.
6	upper limiting frequency arrival	Output when the operation frequencyreaches the upper limit.
7	ower limiting frequency arrival	Output when the operation frequencyreaches the lower limit.
8	Program in-operating indication	Out put when PLC functionis started and actuated.

F4 Series Multi-stage SpeedParameters Description

F4.00 Multi-stage speed 1 Range of setting: 0.0~400.0Hz Default value: 10.0Hz

F4.01 Multi-stage speed 2 Range of setting: 0.0~400.0Hz Default value: 20.0Hz

F4.02 Multi-stage speed 3 Range of setting: 0.0~400.0Hz Default value: 30.0Hz

F4.03 Multi-stage speed 4 Range of setting: 0.0~400.0Hz Default value: 40.0Hz

F4.04 Multi-stage speed 5 Range of setting: 0.0~400.0Hz Default value: 50.0Hz

F4.05 Multi-stage speed 6 Range of setting: 0.0~400.0Hz Default value: 60.0Hz

F4.06 Multi-stage speed 7 Range of setting: 0.0~400.0Hz Default value: 70.0Hz

Multi-stage speed combination			Output frequency
Terminal X1	Terminal X1	Terminal X1	
OFF	OFF	OFF	No multi-stage speed
ON	OFF	OFF	Multi-stage speed 1 10Hz
OFF	ON	OFF	Multi-stage speed 2 20Hz
ON	ON	OFF	Multi-stage speed 3 30Hz
OFF	OFF	ON	Multi-stage speed 4 40Hz
ON	OFF	ON	Multi-stage speed 5 50Hz
OFF	ON	ON	Multi-stage speed 6 60Hz
ON	ON	ON	Multi-stage speed 7 70Hz

Parameter Description:
If the connecting terminalswith multi-stage speed areOFF, the motorwill begin to runwithout performing operation.
If multi-stage speed terminalsare ON during operation,the motor will runat corresponding multi- stage speed frequency.

F4.07 1st accelerating period Range of setting: 0.1~999.9s Default value: 10.0s
F4.08 1st decelerating period Range of setting: 0.1~999.9s Default value: 10.0s
F4.09 2nd accelerating period Range of setting: 0.1~999.9s Default value: 10.0s
F4.10 2nd decelerating period Range of setting: 0.1~999.9s Default value: 10.0s
F4.11 3rd accelerating period Range of setting: 0.1~999.9s Default value: 10.0s
F4.12 3rd decelerating period Range of setting: 0.1~999.9s Default value: 10.0s
F4.13 4th accelerating period Range of setting: 0.1~999.9s Default value: 10.0s
F4.14 4th decelerating period Range of setting: 0.1~999.9s Default value: 10.0s

Accelerating period refers to the time when frequency is accelerated from 0.0Hz to 100.0Hz.
Decelerating period refers to the time when frequency is decelerated from 100.0Hz to 0.0Hz.

Terminal X4	Terminal X5	Frequency Accelerating/Decelerating Period
OFF	OFF	Accelerate during accelerating period 1 anddecelerate during decelerating period 1.
ON	OFF	Accelerate during accelerating period 2 anddecelerate during decelerating period 2.
OFF	ON	Accelerate during accelerating period 3 anddecelerate during decelerating period 3.
ON	ON	Accelerate during accelerating period 4 anddecelerate during decelerating period 4.

If no terminal isset to acceleration/deceleration selectionparameter 1 or 2,then acceleration will be performed according to thedefault acceleration time F4.07and deceleration will beperformed according the deceleration timeF4.08.

F4.15 Acceleration/Deceleration source Range of setting: 0~1 Default value: 0
Frequency acceleration/deceleration can berealized by setting acceleration/decelerationtime, which refers to the time when the frequencychanges from 0.0Hz to100.0Hz or 100.0Hz to 0.0Hz.
0: Set by thekeyboard 1: Set bythe terminal

F5 Series Protecting FunctionParameters Description
F5.00 Undervoltage protection selection Range of setting: 0~1 Default value: 1
0: Disabled 1: Enabled
This function can beenabled or disabled accordingto user's selection.
Undervoltage protection can bejudged only when theinverter is in themode of operation.

F5.01 Undervoltage Protection Voltage Proportion Range ofsetting: 50%~100%
Default value: 60%
Undervoltage protection can bereported only when powervoltage is detected tobe lower than the product of thisparameter and rated voltage.

F5.02 Over-voltage protection Function Range of setting: 0~1 Default value: 2
0: Disabled 1: Enabled
Over-voltage protection will bereported by the systemwhen power voltage isdetected to be higher than the valuefor over-voltage protection ifthis parameter is setto 1.

F5.03 Over-voltage protection voltageproportion Range of setting:100%~150%
Default value: 135%
Over-voltage protection will occurand over-voltage protection isreported if the voltageis detected to be higherthan the product ofrated voltage and thisparameter.

F5.04 Over-voltage stall function Range of setting: 0~1 Defaultvalue: 1
0: Disabled 1: Enabled
If this parameter is setto 1 and the decelerationtime is set to beshorter than the necessary time for load inertia,then deceleration can bedelayed and over-voltage trippingcan be avoided.

F5.05 Over-voltage stall voltageproportion Range of setting: 100%~150% Default value: 125%
If capacitor voltage is detectedto be higher than theproduct of capacitor voltage and this parameter, over-voltage stallwill occur and frequencywill stop falling.

F5.06 Over-current stallfunction Rangeof setting: 0~1 Default value:1
0: Disabled 1: Enabled
If this parameter is setto 1 and the acceleration time is set tobe shorter than the necessary time for load inertia,then acceleration can bedelayed and over-current trippingcan be avoided.

F5.07 Stall current coefficient Range of setting: 10%~200% Defaultvalue: 150%
If the current is detectedto be higher than theproduct of rated current (Fd.04)and this parameter, over-current stallwill occur and frequencywill stop rising.

F5.08 Overload protection function Rangeof setting: 0~1 Default value:1
0: Disabled 1: Enabled
If this parameter is setto 1 and the currentis detected to be larger than the current valuefor overload protection (F5.09) and theduration is longer than overloadprotection time (F5.10), then overload protection willoccur.

F5.09 Overload current proportion Rangeof setting: 10%~200% Default value:150%
Parameter description:
If the current is detectedto be higher than theproduct of rated current (FD.04)and this parameter, it is regarded as overload.If the duration reaches theoverload protection time, then overload protection will be reported.

F5.10 Overload protection time Rangeof setting: 60~120s Default value:60s

F5.11 Overheat protection Rangeof setting: 0~1 Default value:1
This parameter is usedto enable or disable overheatprotection for module.

F5.12 OP trip function Range of setting: 0~1 Defaultvalue: 0
0: OP trip disabled; 1: OP trip enabled.

OP trip protection willbe reported if this functionis set to "1" andexternal terminals are setto be in the mode of operationat the moment of powerup,which means operation command before power failure hasn't been clearedoff after the poweris off. Tripprotection will not be reportedif no terminal is set tobe in the mode ofoperation while being energizedor this parameter is setto "0", but be sure toconfirm if the terminal modeis normal before powerup.

F6 series Communication and Fault Parameters Description

F6.00 Selection of COM mode Range of setting: 0~17 Defaultvalue: 4
Mode 1: 8-bit data, 1-bitstop, no parity, RTU transfer
Mode 2: 8-bit data, 1-bitstop, even parity, 8-bitRTU transfer
Mode 3: 8-bit data, 1-bitstop, odd parity, 8-bitRTU transfer
Mode 4: 8-bit data, 2-bitstop, no parity, 8-bitRTU transfer
Mode 5: 8-bit data, 2-bitstop, even parity, 8-bitRTU transfer
Mode 6: 8-bit data, 2-bitstop, odd parity, 8-bitRTU transfer
Mode 7: 8-bit data, 1-bitstop, no parity, 7-bitASCII transfer
Mode 8: 8-bit data, 1-bitstop, even parity, 7-bitASCII transfer
Mode 9: 8-bit data, 1-bitstop, odd parity, 7-bitASCII transfer
Mode 10: 8-bit data, 2-bitstop, no parity, 7-bitASCII transfer
Mode 11: 8-bit data,2-bit stop, even parity,7-bit ASCII transfer
Mode 12: 8-bit data, 2-bitstop, odd parity, 7-bitASCII transfer
Mode 13: 8-bit data, 1-bitstop, no parity, 8-bitASCII transfer
Mode 14: 8-bit data, 1-bitstop, even parity, 8-bitASCII transfer
Mode 15: 8-bit data, 1-bitstop, odd parity, 8-bitASCII transfer
Mode 16: 8-bit data, 2-bitstop, no parity, 8-bitASCII transfer
Mode 17: 8-bit data, 2-bitstop, even parity, 8-bitASCII transfer
Mode 18: 8-bit data, 2-bitstop, odd parity, 8-bitASCII transfer

F6.01 485 COM baud rateselection Range of setting: 0~5 Default value: 0
0: Transfer at thespeed of 1200pbs 3: Transfer at the speed of9600pbs
1: Transfer at thespeed of 2400pbs 4: Transfer at the speed of19200pbs
2: Transfer at thespeed of 4800pbs 5: Transfer at the speed of38400pbs

F6.02 485 COM local address selection Range of setting: 1~127 Defaultvalue: 1
Refer to instructions for 485COM in the attached pagesfor detail.

F6.03 Communication error report Rangeof setting: 0~1 Default value:0
Communication error refers to thefault that the inverter cannothave a normal communication with upper machine. When usingcommunication function, the upper machineneedn't keep continuous communication with the inverterto cancel the use ofcommunication fault to avoid the inverter's report of communication error

F6.04 Error-recoverable times Range ofsetting: 0~5 Default value: 0
If the number of faultsis higher than this parameterafter the inverter is poweredon, then the faults will always maintain and cannotbe restored. Tosay in detail, if thenumber is "0", the faultscan not be restored, if thenumber is "1", the faultwill be restored for 1time. E.g., if setting this parameter to "1" and overvoltageprotection occurs, the system willremove faults and reset after the voltage is restored toa normal value kept fora period of time whichcan be set by theparameter F6.05. If faults occur again,then the system will alwaysmaintain faults and will notrecover by itself.

F6.05 Error recovery time Rangeof setting: 5~600s Default value:30s

F6.06 Last error type Rangeof setting: 0~14 Default value:0

F6.07 Next-to-last (penultimate) error type Range of setting: 0~14 Defaultvalue: 0

F6.08 Antepenultimate error type Range of setting: 0~14 Defaultvalue: 0
The above parameters are setby the system and canbe referred by the userwhen faults occur. It is suggested not tomodify them. Parameter =0 indicatesno fault.

Data	Type of Error		Data	Type of Error
0	No error		8	485 COM error: ErCE
1	Short circuit protection: ErSC		9	Open-phase protection: ErLP
2	Over-voltage protection: ErOU		10	Fuse error: ErFS
3	Overheat protection: ErOH		11	Braking unit error: Erbr
4	Overload protection: ErOL		12	Current zero error: ErCO
5	Under-voltage protection: ErLU		13	External error: ErEF
6	EPROM failure: ErEP		14	Over-current Protection: ErOC
7	OP trip protection: ErOP			

F7 Series PID Function ParametersDescription
F7.00 PID setting source selection Range of setting: 0~6 Defaultvalue: 3
0: Keyboard setting (VI feedback):Keyboard setting -- target,VI -- feedback input;
1: Keyboard setting (CI feedback):Keyboard setting -- target,CI --feedback input;
2: Keyboard potentiometer setting (VIfeedback):
Keyboard potentiometer setting-- target,VI -- feedback input;
3: Keyboard potentiometer setting (CIfeedback):
Keyboard potentiometer setting-- target,CI -- feedback input;
4: VI setting (CIfeedback):VI target, CI feedbackinput;
5: CI setting (VIfeedback): CI target, VI feedback input.

F7.01 PID digital setting Rangeof setting: 0~100.0 Default value:50.0
This refers to setPID value by keyboard. Itwill be valid if F7.00(PID setting source selection) = 0.1.

F7.02 PID upper limiting frequency Range of setting: 10.0~400.0Hz Defaultvalue: 50.0Hz
This refers to themaximum operation frequency of theinverter when PID regulation is carried on.

F7.03 PID lower limiting frequency Range of setting: 10.0~400.0Hz Defaultvalue: 0Hz
This refers to theminimal allowable operation frequency ofthe inverter when PID regulationis carried on.

F7.04 PID Positive/Negative feedback selection Range of setting: 0~1 Defaultvalue: 0
0：Positive feedback: If the feedbackvalue is larger thanthe set value, the frequencywill fall; if the feedback value is smallerthan the set value, thefrequency will rise.
1：Negative feedback: If the feedbackvalue is larger thanthe set value, the frequencywill rise; if the feedback value is smallerthan the set value, thefrequency will fall.

F7.05 Proportional gain Kp Rangeof setting: 0~100.0 Default value:0.0
Influence of proportional gain Kpon system performance: This aparameter that decides deviation response of action "p".Big value for proportional gainwill enable the system tooperate flexibly and its influence willspeed up. Excessivevalue for "P" will bring out moreoscillation and longer regulation time. Too big "p" value willlead to instability of thesystem. Too small"p" value will cause instability andslow response of the system.

F7.06 Integral time Ki Rangeof setting: 0~100.0s Default value:0.0s
Influence of integral action onsystem performance:
Integral time decides the effect of integral action. Ifthe integral time is long,the response will be slow and the control overexternal agitation will be weakened.If the integral time isshort, the response will be fast, buttoo short integral time willresult in oscillation. Integral actionmay decrease the stability of thesystem. If "i" is small,the integral action will bestrong which will cause instability of the system,but can remove the steadystate error and improve thecontrol precision of the system.

F7.07 Differential time Kd Rangeof setting: 0~100.0s Default value:0.0s
Influence of differential control onsystem performance:
Differential time parameter decides theeffect of differential action.If the differential timeis long, oscillation caused by p actionwill soon be reduced andregulation time will be shortwhen deviation occurs, but too large "d" may cause oscillation.If the differential timeis short, the attenuation effect will besmall and the regulation timewill be longer when deviationoccurs. The regulation time can be reducedonly when there is aproper "d".

F7.08 PID tolerance error range Range of setting: 0.0%~20.0% Defaultvalue: 1.0%
This refers to the maximumdeviation ratio of the outputvalue of the system tothe given value for closed-loop, which is used tocontrol PID action. If theD-value between feedback and setpoint is lower than PID deviation tolerance,PID controller will pause andthe inverter will maintain present output.

F7.09 PID detection time Rangeof setting: 0~60.0s Default value:0.0s
PID detection time refers tothe cycle during which PIDregulation is performedover feedback sampling cycle.

F7.10 PID Sleep time Rangeof setting: 0.0~60.0s Default value:0.0s
If output frequency = F7.03(lower limiting frequency) with holdingtime > PID sleep timewhen PID regulation is enabled, theinverter will enter into thestate of sleep without operationof the motor. If it isset to "0", there willbe no sleep function.

F7.11 PID Frequency wake-upthreshold Range of setting: 1.0~100.0Hz Default value: 10.0Hz
If command frequency > (F7.03+F7.11) after the inverter entersinto sleep mode, the inverterwill wake up rapidly,start and begin to runthe motor.

F7.12 Encoder speed setting Rangeof setting: 1~9999 Default value:2400

F7.13 Encoder impulse timesper cycle Range of setting: 1~2000 Defaultvalue: 1024

F8 Series Analog Input/Output Parameters Description

F8.00 Maximum voltage valuefor analog voltage input Range of setting: 0.0~10.0V
Default value: 10.0V
F8.01 Minimal voltage valuefor analog voltage input Range of setting: 0.0~10.0V
Default value: 0.5V
F8.02 Frequency that correspondsto the maximum voltagefor analog input Rangeof setting: 0.0~400.0Hz Default value: 50.0Hz
F8.03 Frequency that correspondsto the minimal voltagefor analog input Rangeof setting: 0.0~400.0Hz Default value: 0.0Hz
F8.04 Maximum current valuefor analog current input Range of setting: 0~20mA
Default value: 20mA
F8.05 Minimal current valuefor analog current input Range of setting: 0~20mA Default value: 4.0mA
F8.06 Frequency that correspondsto the maximum currentfor analog input Range of setting: 0.0~400.0Hz Default value: 50.0Hz
F8.07 Frequency that correspondsto the minimal currentfor analog input
Range of setting: 0.0~400.0Hz Default value: 0.0Hz

Analog input can eitherbe voltage input orcurrent input. Both inputsare equivalent on hardware, but cannot be inputsimultaneously. If voltageinput is activated,AVI ofthe terminal will beused to input; if currentinput is enabled, CIwill be used toinput.

It is required thatF8.00 or F8.04 mustlarger than F8.01 orF8.05, and F8.02 orF8.06 must larger than F8.03 or F8.07.If analog input voltage(or current) is higherthan F8.00 or F8.04,then the target frequency will bethe set value forF8.02 or F8.06.

If analog input voltage(or current) is lowerthan F8.01 or F8.05,then the target frequencywill be the set valuefor F8.03 or F8.07.

If analog input voltage(or current) is lowerthan F8.02 or F8.06,and lower than theset value for F8.00 or F8.04, thetarget frequency will alinear result between theset value for F8.02or F8.06 and F8.03 or F8.07.

F8.08 Maximum value forexternal impulse input Rangeof setting: 0.0~10.0KHz Default value: 5.0KHz
F8.09 Minimal value forexternal impulse input Rangeof setting: 0.0~10.0KHz Default value: 0.1KHz
F8.10 Frequency that correspondsto the maximum valuefor impulse input Rangeof setting: 0.0~400.0Hz Default value: 50.0Hz
F8.11 Frequency that corresponds to the minimalvalue for impulse input Range of setting: 0.0~400.0Hz Default value: 0.0Hz
It is required thatF8.08 must larger thanF8.09, and F8.10 mustlarger than F8.11.If external impulse is higher thanF8.08, the target frequencywill be the setvalue for F8.10.
If external impulse islower than F8.09, thetarget frequency will bethe set value forF8.11.
If external impulse ishigher than the setvalue for F8.09 andlower than the setvalue for F8.08, the target frequency willa linear result betweenthe set value forF8.10 and F8.11.

F8.12 Analog output function Range ofsetting: 0~1 Default value: 1

0: Disabled 1: Enabled

F8.13 Analog output content selection Rangeof setting: 0~5 Default value: 0

0: Operating frequency 3: Motor rotating speed

1: Output voltage 4: PID setvalue

2: Output current 5: PID feedback value

F8.14 Analog output correction coefficient Range of setting: 80~120% Default value: 100%

This parameter is used to adjustthe output voltage if the setanalog output voltage is not proper

F8.15 Frequency that corresponds to the maximumvalue for analog output

Range of setting: 10.0~400.0Hz Default value: 50Hz

When the out put frequency of inverter is higher than the parameter setting value, The analog output voltage send the maximum value, while the output frequency inverter is lower than the parameter setting value. The analog output voltage depends on the frequency linear output.

F9 series PLC Function Parameters Description 1

F9.00 PLC operating frequency stage 1 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.01 PLC operating frequency stage 2 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.02 PLC operating frequency stage 3 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.03 PLC operating frequency stage 4 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.04 PLC operating frequency stage 5 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.05 PLC operating frequency stage 6 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.06 PLC operating frequency stage 7 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.07 PLC operating frequency stage 8 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.08 PLC operating frequency stage 9 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.09 PLC operating frequency stage 10 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.10 PLC operating frequency stage 11 Range of setting: 0.0~400.0Hz Default value: 5.0Hz

F9.11 PLC operating frequency stage 12 Range of setting: 0.0~400.0Hz Default value: 5.0Hz

F9.12 PLC operating frequency stage 13 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.13 PLC operating frequency stage 14 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.14 PLC operating frequency stage 15 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

F9.15 PLC operating frequency stage 16 Rangeof setting: 0.0~400.0Hz Default value: 5.0Hz

FA series PLC Function Parameters Description 2

FA.00 PLC operating timestage 1 Range of setting: 0~9000s Defaultvalue: 0s

FA.01 PLC operating timestage 2 Range of setting: 0~9000s Defaultvalue: 0s

FA.02 PLC operating timestage 3 Range of setting: 0~9000s Defaultvalue: 0s

FA.03 PLC operating timestage 4 Range of setting: 0~9000s Defaultvalue: 0s

FA.04 PLC operating timestage 5 Range of setting: 0~9000s Defaultvalue: 0s

FA.05 PLC operatingtime stage 6 Rangeof setting: 0~9000s Default value: 0s

FA.06 PLC operatingtime stage 7 Rangeof setting: 0~9000s Default value: 0s

FA.07 PLC operatingtime stage 8 Rangeof setting: 0~9000s Default value: 0s

FA.08 PLC operatingtime stage 9 Rangeof setting: 0~9000s Default value: 0s

FA.09 PLC operatingtime stage 10 Rangeof setting: 0~9000s Defaultvalue: 0s

FA.10 PLC operatingtime stage 11 Rangeof setting: 0~9000s Defaultvalue: 0s

FA.11 PLCoperating time stage 12 Range of setting: 0~9000s Default value: 0s

FA.12 PLC operatingtime stage 13 Rangeof setting: 0~9000s Defaultvalue: 0s

FA.13 PLC operatingtime stage 14 Rangeof setting: 0~9000s Defaultvalue: 0s

FA.14 PLC operatingtime stage 15 Rangeof setting: 0~9000s Defaultvalue: 0s

FA.15 PLC operatingtime stage 16 Rangeof setting: 0~9000s Defaultvalue: 0s

Fb series PLC FunctionParameters Description 3

Fb.00 PLC operating control stage1 Range of setting: 0~144 Default value: 0

Fb.01 PLC operating control stage2 Range of setting: 0~144 Default value: 0

Fb.02 PLC operating control stage3 Range of setting: 0~144 Default value: 0

Fb.03 PLC operating control stage4 Range of setting: 0~144 Default value: 0

Fb.04 PLC operating control stage5 Range of setting: 0~144 Default value: 0

Fb.05 PLC operating control stage6 Range of setting: 0~144 Default value: 0

Fb.06 PLC operating control stage7 Range of setting: 0~144 Default value: 0

Fb.07 PLC operating control stage8 Range of setting: 0~144 Default value: 0

Fb.08 PLC operating control stage9 Range of setting: 0~144 Default value: 0

Fb.09 PLC operating control stage10 Range of setting: 0~144 Default value: 0

Fb.10 PLC operating control stage11 Range of setting: 0~144 Default value: 0

Fb.11 PLC operating controlstage 12 Range of setting: 0~144 Default value: 0

Fb.12 PLC operating control stage13 Range of setting: 0~144 Default value: 0

Fb.13 PLC operating control stage14 Range of setting: 0~144 Default value: 0

Fb.14 PLC operating control stage15 Range of setting: 0~144 Default value: 0

Fb.15 PLC operating control stage16 Range of setting: 0~144 Default value: 0

0	0	0	0
Invalid	FWD/REV	Acceleration Time	Deceleration Time
Invalid	Forward Reserve	0：F0.06 1：F4.07 2：F4.09 3：F4.11 4：F4.13	0：F0.07 1：F4.08 2：F4.10 3：F4.12 4：F4.14

Fc series Auxiliary Control Parameters Description

Fc.00 PLC function setting Range of setting: 0~3 Default value: 0
PLC function means the inverter proceeds auto running according to the preset frequency, FRD/REV, acceleration and deceleration time in the designated sectors divided into 16 sectors.
0: Non operation: There is no PLC function.
1: Single cycling: PLC runs from sector 1 to sector 16 and shut down after the operation is completed.
2: Continuous Cycling: PLC runs from sector 1 to sector 16 and proceeds repeated operation.
3: Retaining the final value after single cycling: PLC retains the speed in sector 16 and runs at this speed after it runs from sector 1 to sector 16.

Fc.01 AVI/ACI filter time Range of setting: 0.01~60.00s Default value: 0.1s

Fc.02 Speed correction Range of setting: 50~100% Default value: 100%
The actual revolution is equivalent to the multiple of theoretic rotary and speed correction value.
Fc.03 Remain Range of setting: -- Default value: --
Fc.04 CI fine tuning Range of setting: 0~1000 Default value: 0
This refers to the corrected value for of analog current input.
Fc.05 Digital frequency control Range of setting: 0~3 Default value: 0
This is used to control the power-failure memory and shutdown memory of digital frequency.
0: Keep memory after power failure; holding after shutdown.
1: Keep memory after power failure; not holding after shutdown.
2: No memory after power failure; holding after shutdown.
3: No memory after power failure; no holding after shutdown.

Fc.06 MOP function Range of setting: 0.1~50.0Hz Default value: 1.0Hz
When there is a MOP operation, frequency variation value will be set by pressing ▲▼ (or external UP/DOWN input). The user can modify the setting frequency by MOP function.
Fc.07 Standby time Range of setting: 1~1000s Default value: 0s
This is used to set the standing time from this shutdown to next power up. It is applicable to the occasion that frequent start of the inverter is not allowed.
Fc.08 Motor poles Range of setting: 1~20 Default value: 4
Fc.09 Counter target value Range of setting: 1~9999 Default value: 100
This refers to the value compared with the impulse input of X4 if the terminal X4 is set to have counter function.
Fc.10 Counter arrival motion time Range of setting: 0.01~60.0s Default value: 1.0s
If the relay is set to counter output and the input impulse of terminal X4 matches with the set value for FC.09, then the output time of the relay is equal to the set value for this parameter.

Fc.11 Output voltage auto compensation Range of setting: 0~1 Default value: 1
If this parameter is set to "1", the output voltage of the inverter will not fluctuate with input power voltage and its internal self-regulating system will start to work.

Fc.12 Parameter lock Range of setting: 0~1 Default value: 0
This function is used to protect the data set in the inverter so that the data cannot be changed. To avoid error operation or improper modification of others, the user may set this parameter to "1" and all the parameters will be locked till this parameter is reset to "0" which indicates parameters can be modified. The default value is "0", which means there is no parameter is locked.

Fc.13 Parameter Initializing Range of setting: 0~1 Default value: 0
This parameter is used to set initializing of the system. If it is set to non-zero, the system begins initializing.
Note: If this function is selected, parameter initializing will proceed only when the system is in the mode of shutdown.

Attached: 485 COM Description

The inverter ZVF11/M/S adopts MOBUS communication protocol on the aspect of 485 communication control. Before using 485COM, the address of the inverter, communication baud rate and data format must be set by hand, and do not modify these parameters during communication.

Two encoding formats are used under MODBUS communication protocol: ASCII (American Standard Code for Information Interchange) and RTU (Remote Terminal Unit). ASCII encoding means data to be delivered will convert to corresponding ASCII codes before transfer, while RTU encoding means data will be transferred directly without conversion.

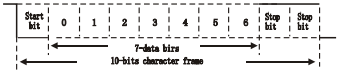
In ASCII format, each BYTE data is made up of 2 ASCII codes. E.g. 0x1F can be described as '1F' in ASCII format, which is made up of '1'(31Hex) and 'F'(46Hex). The following are ASCII codes for 0 - 9 and A - F.

Bit	'0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'
ASCII code	30H	31H	32H	33H	34H	35H	36H	37H
Bit	'8'	'9'	'A'	'B'	'C'	'D'	'E'	'F'
ASCII code	38H	38H	41H	42H	43H	44H	45H	46H

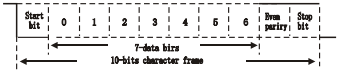
The following is thecharacter box

10.bit (For ASCII)

(Data Format7, N, 2)



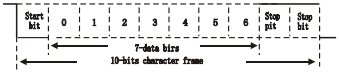
(Data Format7, E, 1)



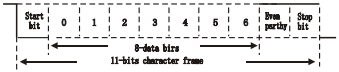
(Data Format7, O, 1)

11-bit (For RTU)

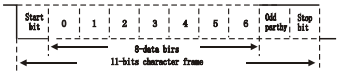
(Data Format8, N, 2)



(Data Format8, E, 1)



(Data Format8, O, 1)



The following is thestructure for each unitof data:

ASCII Mode

START	Initial character ’ :’ (0x3A)
ADDR Hi	Secondary address: 8-bit datais made up of 2 ASCIIcodes.
ADDR Lo	
FUNCTION Hi	Function Code: 8-bit datais made up of 2 ASCII codes.
FUNCTION Li	
DATA(n-1)	Content 1) n*8-bit: The contentis made up of 2n ASCII codes; 2)n≤12, 24 ASCIIcodes maximally
……	
DATA0	
LRC CHK Hi	LRC checksum
LRC CHK Lo	
END1	End code 1 “CR” (0x0D
END2	End code 2 “LF” (0x0A)

RTU Mode

START	No signal. Input > 10ms
ADDR	Secondary Machine Address
FUNTION	Function code
DATA(n-1)	Content n*8-bit Content: n≤2
……	
DATA0	
CRC CHK Hi	CRC checksum
CRC CHK Lo	
END	>10m, no signal input

Communication address
00H： Broadcasting to all inverters
Secondary machine does notrespond to broadcast address
01H： Corresponds to the inverter atthe location 01
OFH： Corresponds to the inverter atthe location 15
10H： Correspond to the inverter atthe location 16. Therest can be done inthe same manner till at the maximum of 254(FEH).
Function Codes and Contents
03H： Read out the contents inthe inverter register.
Note: Only 1 piece ofthe content is readable atone time to read theset parameter register of the inverter. Several (<=12)are readable at one timeto read the register ifthe inverter is in themode of operation.

06H： To write 1WORD to the inverterregister
08H： Loop Detection
21H： Manufacturer reserved for the useof liquid-crystal display panel, unavailableto the user.

Function code 03H: Readout the contents in the inverter register.
E.g. If the driveris at 01H, thecontents read out in2 continuous registers withinitial address of 21002 are listed asfollows:

ASCII Mode

Inquiry message string format

STX	':'
Address	'0'
	'1'
Function	'0'
	'3'
Starting address	'2'
	'1'
	'0'
	'2'
Number of data (count by word)	'0'
	'0'
	'2'
LRC Check	'D'
	'7'
END	CR
	LF

Response message string format

STX	':'
Address	'0'
	'1'
Function	'0'
	'3'
Number of data (count by word)	'0'
	'4'
Conlent fo Starting address 2102H	'1'
	'7'
	'7'
	'0'
Conlent of address 2103H	'0'
	'0'
	'0'
LRC Check	'7'
	'1'
END	CR
	LF

RTU Mode

Inquiry message format

Address	01H
Function	03H
Starting data address	21H
	02H
Number of data (count by world)	00H
	02H
CRC CHK Low	6FH
CRC CHK High	F7H

Response message format

Address	01H
Function	03H
Number of data (count by byte)	04H
Content of data address 8102H	17H
	70H
Content of data address 8103H	00H
	00H
CRC CHK Low	FEH
CRC CHK High	5CH

Note: If inquiry functionis performed, when theupper machine sends messageto the lower, the number of bytes(beginning at the initialaddress) to be inquiredis described as 1WORD. When the lower machineresponds to it, theinitial address will notbe responded and the number of bytes isresponded in BYTE.

Function code 06H:
Write contents to theinverter register, only onecontent can be written inat one time.
E.g. 6000(1770H) should bewritten to the internalof the driver toset the parameter 0100Hif the inverter is atthe location of 01H.

ASCII Mode

Inquiry message string format

STX	':'
Address	'0'
	'1'
Function	'0'
	'6'
Data address	'0'
	'1'
	'0'
	'0'
Data content	'1'
	'7'
	'7'
	'0'
LRC Check	'7'
	'1'
END	CR
	LF

Response message string format

STX	':'
Address	'0'
	'1'
Function	'0'
	'6'
Data address	'0'
	'1'
	'0'
	'0'
Data content	'1'
	'7'
	'7'
	'0'
LRC Check	'7'
	'1'
END	CR
	LF

RTU Mode

Inquiry message format

Address	01H
Function	06H
Data address	01H
	00H
Data content	17H
	70H
CRC CHK Low	86H
CRC CHK High	22H

Response message format

Address	01H
Function	06H
Data address	01H
	00H
Data content	17H
	70H
CRC CHK Low	86H
CRC CHK High	22H

Function Code 08: Loop DetectionFunction
Under this function, if thefunction address is 00, messagesthat the secondary inverter responds to the upper will bethe same as it hasreceived.

ASCII Mode

Inquiry message string format

STX	':'
Address	'0'
	'1'
Function	'0'
	'8'
Sub-Function Hi	'0'
	'0'
Sub-Function LO	'0'
	'0'
Data content Hi (Any Data)	'1'
	'2'
Data content Lo (Any Data)	'A'
	'B'
LRC Check	'3'
	'A'
END	CR
	LF

Response message string format

STX	':'
Address	'0'
	'1'
Function	'0'
	'8'
Sub-Function Hi	'0'
	'0'
Sub-Function LO	'0'
	'0'
Data content Hi (Any Data)	'1'
	'2'
Data content Lo (Any Data)	'A'
	'B'
LRC Check	'3'
	'A'
END	CR
	LF

RTU Mode

Inquiry message format

Address	01H
Function	08H
Sub-function Hi	00H
Sub-function Lo	00H
Data content	12H
	ABH
CRC CHK Low	ADH
CRC CHK High	14H

Response message format

Address	01H
Function	08H
Sub-function Hi	00H
Sub-function Lo	00H
Data content	17H
	70H
CRC CHK Low	ADH
CRC CHK High	14H

Check code inASCII format (LRC):
In this format, checksum isthe value added up fromAddress to Data Content.E.g. Checksum for the above-mentioned 03 searchedinfo is: 01H +03H +21H + 02H +00H +02H=29H, then take the complement with respectto 2, that is,equal toD7H

Check code in RTU format (CRC):
In this format, checksum isthe value added up fromAddress to Data Content.The operational rule is listed below:
Step 1: Set 16-bit register(CRC register) = FFFFH.
Step 2: Exclusive OR whichmeans command for the first8-bit byte and the lowbit 16-bit CRC register is taken as anExclusive.OR: Store the result inCRC register.
Step 3: Move 1 bit right to CRC register andfil 0 in the highbit.
Step 4: Check the valuefor right shift. If itis 0,, restore the newvalue in step 3 toCRC register. Otherwise, Exclusive ORA001H and CRC registerwill store the result inCRC register.
Step 5: Repeat step 3to step 4 till all8-bit bytes are completed operation..
Step 6: Repeat step 2to step 5 and takeone 8-bit command till allthe info commands are done.
Finally, the valuefor CRC register (CRC checksum)will turn out. It isnotable that the CRC check must be exchanged andput into the checksum ofthe info command.
The following is an exampleof CRC check in Clanguage.

```
unsigned char* data
unsigned char length
unsigned int crc_chk(unsigned char* data, unsigned char length)
{
 int j;
 unsigned int reg_crc=0Xffff;
 while(length--){
 reg_crc ^= *data++;
 for(j=0;j<8;j++){
 if(reg_crc & 0x01){ /* LSB(b0)=1 */
 reg_crc=(reg_crc>>1) ^ 0Xa001;
 }else{
 reg_crc=reg_crc >>1;
       }
    }
 }
 return reg_crc;
```

Finally , Passback CRC register value.

Definition for Parameter Address that can be used by COM

Definition	Parameter Address	Function Description	
Setting parameters inside the inverter	XXH	E.g. The address of parameter P0-3: 13(0DH) The address of parameter Pn-m: n*16+m (nmH) Note: It is allowed to be read and overwritten, but only one parameter can be read or overwritten.	
Order to inverter	2000H	Bit0~1	00: Invalid
			01: Shutdown
			10: Start-up
			11: JOG+RUN
		Bit2~3	Remain
		Bit4~5	00B: Invalid
			01B: Positive direction command
			10B: Negative direction command
			11B: Command given to change direction
		Bit6~15	Remain
	2001	Frequency order	
	2002	Bit0	Remain
		Bit1	RESET
		Bit2—15	Remain
Monitor the inverter state	2100	Error code:	
		0	No error
		1	Module
		2	Over-voltage
		3	Overheat
		4	Overload
		5	Low voltage
		6	Parameter register fault
		7	OP trip
		8	Communication
		9	Default phase
		10	Remain
	2101	Remain	
	2102	Current setting frequency	
	2103	Current operating frequency	
	2104	Output current (XXX.X)	
	2105	DC voltage value (XXXV)	
	2106	Output voltage (XXXV)	

	2107	Multi-stage speed value
	2108	Remain
	2109	Remain
	210A	Counter value
	210B	Input AC voltage value (XXXX)
	210C	Module temperature
	210D	Motor rotating speed
	210E	Remain
	210F	Remain
	2110	Remain
	2111	Remain
	2112	Remain
	2113	Remain
	2114	Remain

Error Response

The inverter will not respond if the data received is incomplete or the data failed to pass the proof. Error response will bring out if the function code or address is incorrect though the data received has passed proof. E.g.
Respond to inquiry command of the host

ASCII Mode

STX	':'
Address	'0'
	'1'
Function	'8'
	'6'
Exception code	'0'
	'2'
LRC CHK	'7'
	'7'
END	CR
	LF

RTU Mode

Address	01H
Function	86H
Exception code	02H
CRC CHK Low	C3H
CRC CHK High	A1H

Put the function codes received from the upper machine to a high bit 1, then error codes will be followed. See detail instructions on error codes below:

Error Code	Description
1	Invalid command
2	Invalid address
3	Invalid data
4	The inverter can not perform the requested operation of the user.

Chapter 4 Trouble Indication and Troubleshooting

4.1 Trouble Displayand Causes

Code	Content	Causes for anomalies	Solution
ErLU	Under-voltage during operation	1)The input power andvoltage are too low. 2)There's a momentary outageof power; 3)There's a loose contactof relay DC loop.	1)Check power and voltage. 2)Check the main circuit orseek service.
ErOC	Over-current	1)The accelerating period istoo short. 2)The load inertia istoo large. The inverter has a smallpower supply.	1)Extend accelerating or decelerating time . 2)Reduce load inertia. 3)Use an inverter with largerpower supply.
ErOL	Overload	1)Over torque lifting 2)Excessively short acceleration time 3)Overload 4)Power grid voltage below level.	1)Reduce torque lifting value . 2)Extend acceleration time. 3)Replace an inverter with higher power level. 4)Check power grid voltage.
ErOH	Overheat	1)The ambient temperature istoo high. 2)The fan is damaged. 3)There's air binding to the exhaust.	1)Lower the ambient temperature. 2)Change the fan. 3)Clear up the exhaust and improve ventilation.
ErSC	Short Circuit	1)Short circuit occurs at theoutput port. 2)There is short circuit amongphases of the inverter or error grounding. 3)There is a momentary over-currentof the inverter. 4)The control panel is abnormal.	1)Check the output wireor the motor. 2)Seek Service.
ErOP	OP Trip	The starting signal is closedbefore it is energized.	1)Disconnect the starting signal. 2)Cancel OP protection function.
ErEF	External Faults	The input terminals are closedbecause of external equipment error.	Disconnect the input terminal impacted by external equipment failure and clear failure.
ErEP	Register Failure	There is failure inside the invertet	Seek Service.
ErCE	Communication Error	1)The baud rate is improperlyset. 2)Communication error occurs at the serial port due to interference. 3)There is no communication signalin the upper machine.	1)Adjust the baud rate. 2)Check the communication cable and take more measures to prevent interference. 3)Check if the upper machineruns normally; the communication cable is disconnected.
ErOU	Over-voltage	1)The input voltage is abnormal; 2)The decelerating period is too short. 3)There is energy feedbackload. 4)The voltage detection is abnormal.	1)Check the power supply. 2)Extent the decelerating period. 3)Choose proper braking units. 4)Seek service.
ErCO	Current Detection Error	1)Hoare is damaged orcircuit is error. 2)DC auxiliary current error occurs.	Seek service.

4.2 Common Troubleshoot

Anomalies	Key points to be checked	Solutions
Motor doesn't rotate.	Check if there isinput of power and the control panel indicatoris ON.	• Disconnect the power supplyand restart again. • Confirm the grade of powervoltage. • The terminal screw is tightly fastened.
	Check if the output terminalU, V or W has output ofvoltage.	• Disconnect the power supply andrestart again.
	Check if there isoverload which leads to jamming of themotor.	• Reduce loads to enable themotor to run.
	Check if the inverter isnormal or not.	• Refer to troubleshooting.
	Check if RWD/REVcommand has been carried out.	
	Check if the frequencysetting signal has been sent out.	• Make the frequency input wiring proper • Set the frequency input voltage properly
	Check if the operation modeis set properly.	• Select the mode by operationpanel.
Motor counter rotates.	Check if the outputU, V andW are correctly wired; FRD/REV signalis right or not.	• Change two ends. • Check the wiring and correct it.
Motor couldn't change speed.	Check if the frequency settingsignal for input is correct ornot; the operation mode is properly setor not; the load is too heavyor not.	• Check the wiring and correct it. • Run the motor by operation panel. • Reduce loads.
Motor runs too fast or too slow.	Check if the motorspecifications (i.e. polarity, voltage) isproper; the gear ratio is proper ornot; the value forthe maximum output frequency is proper.	• Check the specifications of themotor. • Confirm the gear ratio. • Confirm the value for themaximum output frequency.
The speed is abnormal when the motor rotates.	Check if the loadis too heavy; the load fluctuation is toolarge; the input power is stable.	• Reduce loads. • Reduce load fluctuation. • Increase the inverter andthe motor capacity. • Install an ACreactor at inlet side of input power supply.

Chapter 5 Inverter Inspection and Maintenance

5.1 Inspection and Maintenance

The following influences may leadto latent failure of theinverter such as ambient temperature, humidity, dust, vibration,as well as device ageing,wear and other causes ofthe inverter itself during long-period operation onindustrial occasions. So itis necessary to performdaily and periodic inspections and maintenance onthe inverter.

5.1.1 Daily Inspection Items

Target of Inspection	Check for...	Inspection Cycle	Inspection Method	Criteria	Measuring Instrument
Operating ambient	• Ambient temperature; • Humidity, dust, corrosive gas, oil mist and etc.	Daily	• Thermometer • Scent; • Visual.	• Ambient temperature between -10 to 40℃, no-condensing; • Humidity between 20 to 90%，no dew or special odor.	• Thermometer • Hygrometer
Inverter	• Vibration • Heat • Noise	Daily	• Touch the housing; • Aural.	**• Stable vibration** **• Normal temperature** **• No abnormal noise**	
Motor	• Vibration • Heat • Noise	Daily	• Touch the housing; • Aural.	**• Stable vibration** **• Normal temperature** **• No abnormal noise**	
Electric Parameter	• Input voltage • Output voltage • Output current	Daily	• Thermometer	• Each electric parameter is within the rated value.	• Moving-iron voltmeter; • Rectifier voltmeter; • Clip-on ammeter

WARNING

• Make sure that only qualifiedpersonnel will perform maintenance, inspectionand part replacement.
• Wait at least10 minutes after turning OFFthe input power supply beforeperforming maintenance or an inspection. Otherwise,there is the danger ofelectric shock.
• Make sure to open thefront panel only after theindicator on the control keypadturns OFF and verify the charge indicatorat the right side ofmain loop terminal is OFFafter the panel is opened.
• Do use an insulated appliancewhile performing check and donot operate the equipment with wet hand(s) to avoid unexpectedaccidents.
• Always keep the equipment cleanso that dust and otherforeign matter does not enterthe inverter.
• Keep electronic equipment away frommoisture and oil. Dust, steelfilings and other foreign matter can damage the inverter, causing unexpected accidents, sodo take special care.

5.1.2 Periodic Inspection Items

Table 5-2 PeriodicInspection Items

Target of Inspection	Inspection Items	Check for...	Inspection Cycle	Inspection Method	Criteria
Main circuit	Overall	• Check if there is any loose connector or terminal. • Check if there is any device burnt.	Regular	Visual	• No loose connector or loose terminal. • No burnt device.
	Main power module	• Check if it is damaged or not.	Regular	Visual	• No sign of damage.
	Filter capacitance	• Check if there is any leakage. • Check if there is any inflation.	Regular	Visual	• No leakage; • No inflation.
	Contactor	• Check if there is any abnormal sound of actuation. • Check if dust has been cleaned.	Regular	Aural Visual	• Normal sound; • Clean.
	Resistor	• Check if there is any big crack. • Check if the color is abnormal.	Regular	Visual	• No crack. • Normal color.
	Fan	• Check if there is any abnormal noise or vibration.	Regular	Aural Visual	• Normal sound and stable vibration.
	PCB	• Check if dust has been cleaned.	Regular	Visual	• Neat and clean.
Control circuit	FPC strand socket	• Check if it is loose.	Regular	Visual	• No loose connection.
	Overall	• Check there is any special odor or discoloring. • Check if there is any crack	Regular	Scent or audio	• No odor and discoloring; • No crack, smooth surface.
Keyboard	LED	• Check if the LED display is normal.	Regular	Visual	• Normal and clear.
	Connecting cable strand	• Check if there is any scratch. • Check if it is connected tightly.	Regular	Visual	• No scratched surface. • No loose connection.

> **WARNING**
>
> • Do not remove or shake the device arbitrarily, nor pull out the connector during inspection. Otherwise, this may result in inverter failure or damage.
> • Do not leave any inspection tool (i.e., a screwdriver...) in the machine after periodic check. Otherwise, there is the danger of damage to the inverter.

5.2 Replacement of Wearing Parts

The wearing parts of inverter mainly include cooling fan and filter electrolytic capacitor. Usually, a cooling fan's service life is 20,000~30,000 hours and a electrolytic capacitor's service life is 40,000~50,000 hours. User can decide when to replace these parts according to the corresponding operation time.

1、Cooling Fan

It is advisory to replace the fan when abnormal noise or even vibration occurred to the fan due to bearing wear and fan blade aging. The standard replacement age is 2~3 years.

2、Filter Electrolytic Capacitor

The performance of filter electrolytic capacitor is subject to the pulsating current of main circuit. High ambient temperature or frequent load jump may cause damage to the filter electrolytic capacitor. Generally, every 10℃ rise in temperature may lead to reduction of the capacitor's service life by half (as shown in Fig.8-1). If there is any electrolytic leakage or safety valve emission, just replace it at once. The standard replacement age for electrolytic capacitor is 4~5 years.

3、The above replacement duration for inverter's wearing parts is applied to the following conditions:

• Ambient Temperature: 30℃ averagely all year round;
• Load Proportion: <85%;
• Operation Time: ≤12h/day.

If used beyond the above mentioned range, the service life of the inverter's wearing parts will minimize.

5.3 Storage of Inverter

Please pay attention to the following points if an inverter is set aside or stored for a short/long period:

> **CAUTION**
>
> • DO not keep the inverter in a place with high temperature, humidity, heavy dust, metal shavings, corrosive gas and vibration, and ensure a good ventilation.
> • Long-term idle of the inverter may cause decreasing in filter characteristic of the electrolytic capacitor. So it should be recharged within 2 years and the recharging period should be at least 5 hours. DO raise the voltage gradually by using a voltage regulator to some rated value before it is recharged. At the same time, check whether the inverter's function is normal or not, whether there is a short circuit caused by some problems. In case the above problems occur, just remove or seek service as soon as possible.

Chapter 6 Outline Dimension & Mounting Dimension

6.1 Inverter Outline Dimensions & Mounting Dimensions

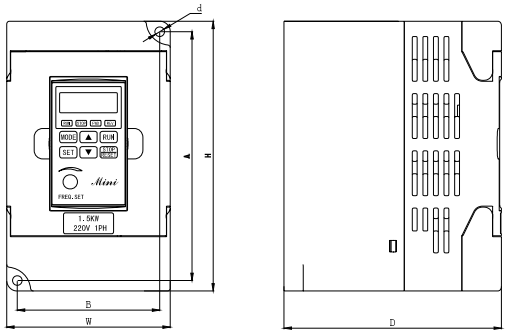


Fig.6-1 Inverter Outline Dimensional Drawings

Inverter Models	Power (KW)	Dimension					
		H	W	A	B	D	d
ZVF11-M0004S2	0.4	141.5	85.0	130.5	74.0	113.0	5
ZVF11-M0007S2	0.75	141.5	85.0	130.5	74.0	113.0	5
ZVF11-M0015S2	1.5	151.0	100.0	140.0	89.5	116.5	5
ZVF11-M0022S2	2.2	151.0	100.0	140.0	89.5	116.5	5

6.2 Operation Panel Outline Dimension

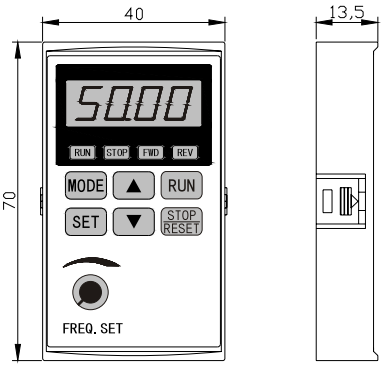


Fig.6-2 Display Panel Dimension

Appendix 1 Quality Warranty

1. Warranty Period under Normal Conditions
• We provide guarantees for repair, replacement and return of the purchase in 1 month from the date of use.
• We provide guarantees for repair and replacement in 3 months from the date of use.
• We provide guarantee for repair in 12 months from the date of use.
2. If the date of use can not be verified, then the warranty period shall be 18 months from the date of manufacture. Service exceeding the warranty periods shall be charged to the purchaser. The purchaser enjoys life-long paid service whenever and wherever he uses an inverter made in our company.
3. Service in the following cases, even within the warranty period, shall be charged to the purchaser:
• Damage caused by mal-operation in violation of this manual;
• Damage caused by improper use of an inverter that is off technical standard and requirement;
• Malfunction or damage caused by fire, earthquake, flood, abnormal input voltage or other natural disasters;
• Artificial damage caused by unauthorized repair or renovation;
• Induced failure or aging of the device due to poor ambient;
• Delayed or unsatisfied payment in violation of purchase appointment;
• Unidentifiable nameplate, mark and date of manufacture;
• Malfunction or damage caused by improper transit or storage after purchase;
• Fail to give an objective description on the use of installation, wiring, operation, maintenance or else;
• Defective products should be sent to us for repair, replacement and return, which can be proceeded only after verifying the burden of liability.
4. In case there is any quality problem or accident, we merely promise to bear the above-mentioned responsibilities. If a user needs more guarantees for liabilities, please assure on the insurance company voluntarily.

Appendix 2 Optional Parts

All the optional partscan be ordered forwith us if needed.

1. Brake Assembly

The brake assembly consists oftwo parts: braking unit andbraking resistor. Itis necessary to install a brake assemblyon the occasion thatquick stop is requiredthough there is aheavy potential load (e.g., elevator)or inertia load.

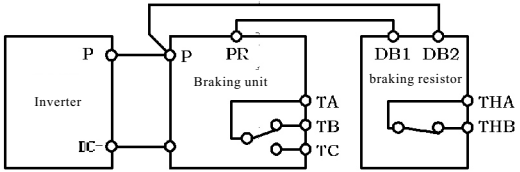


Fig. Appendix 1-1Brake Assembly Wiring Diagram

TIPS

• When installing a brakeassembly, DO takeinto consideration of the safetyof the surrounding ambient.

• For detailed parameters and introductionto the function, please referto **Brake Assembly User's Manual.**

Table Appendix 1-1 Recommended BrakeAssembly Matching Specifications

Inverter		Braking unit	Braking resistor		
Voltage	Motor(kW)		Recommended resistance value	Resistor specification	Quantity
220V	0.4	Built-in	80W250Ω	80W250Ω	1
	0.75	Built-in	80W200Ω	80W200Ω	1
	1.5	Built-in	160W100Ω	160W100Ω	1
	2.2	Built-in	300W70Ω	300W70Ω	1

2、Remote-operated adapter and extendedcable

There are two selectionsavailable for remote operationon the inverter ZVF11-M/Sseries. If it is operated at shortrange（≤15m）, just extend the shieldingcable directly and connect it to the operator panel.The company can provide arange of extended shielding cableswith different specifications such as1m, 1.5m, 2m, 5m and10m. If there isany special requirement on cable length, justplace an order withthe company.

3、Serial Communication (COM)

The standard machine typeof the inverter ZVF11-M/Sseries does not provide RS232and RS485 communication function. User shallmark out the functionat the time oforder. The control terminals of standard RS232and RS485 communication interface mayconnect to RS232 or RS485 communication cableto realize network control orratio interlocking control.

RS232 and RS485 serial communicationprotocol for the inverterZVF11-M/S series can be operated under Windows98/2000.The monitoring software forthis series, featured by friendly man-machine operation interface,can easily realize networkingoperation and perform monitoring and otherfunctions of the inverter. Please contact theservice center of our company or our agents if it isneeded.

Appendix 3 User's Parameter Amendment Record

Table Appendix3-1

Function Code	Setting Value	Function Code	Setting Value	Function Code	Setting Value
F0. 00		F1. 00		F2. 00	
F0. 01		F1. 01		F2. 01	
F0. 02		F1. 02		F2. 02	
F0. 03		F1. 03		F2. 03	
F0. 04		F1. 04		F2. 04	
F0. 05		F1. 05		F2. 05	
F0. 06		F1. 06		F2. 06	
F0. 07		F1. 07		F2. 07	
F0. 08		F1. 08		F2. 08	
F0. 09		F1. 09		F2. 09	
F0. 10		F1. 10		F2. 10	
F0. 11		F1. 11		F2. 11	
F0. 12		F1. 12		F2. 12	
F0. 13		F1. 13		F2. 13	
F0. 14		F1. 14		F2. 14	
F0. 15		F1. 15		F2. 15	

Function Code	Setting Value	Function Code	Setting Value	Function Code	Setting Value
F3. 00		F4. 00		F5. 00	
F3. 01		F4. 01		F5. 01	
F3. 02		F4. 02		F5. 02	
F3. 03		F4. 03		F5. 03	
F3. 04		F4. 04		F5. 04	
F3. 05		F4. 05		F5. 05	
F3. 06		F4. 06		F5. 06	
F3. 07		F4. 07		F5. 07	
F3. 08		F4. 08		F5. 08	

Function Code	Setting Value	Function Code	Setting Value	Function Code	Setting Value
F3. 09		F4. 09		F5. 09	
F3. 10		F4. 10		F5. 10	
F3. 11		F4. 11		F5. 11	
F3. 12		F4. 12		F5. 12	
F3. 13		F4. 13		F5. 13	
F3. 14		F4. 14		F5. 14	
F3. 15		F4. 15		F5. 15	

Function Code	Setting Value	Function Code	Setting Value	Function Code	Setting Value
F6. 00		F7. 00		F8. 00	
F6. 01		F7. 01		F8. 01	
F6. 02		F7. 02		F8. 02	
F6. 03		F7. 03		F8. 03	
F6. 04		F7. 04		F8. 04	
F6. 05		F7. 05		F8. 05	
F6. 06		F7. 06		F8. 06	
F6. 07		F7. 07		F8. 07	
F6. 08		F7. 08		F8. 08	
F6. 09		F7. 09		F8. 09	
F6. 10		F7. 10		F8. 10	
F6. 11		F7. 11		F8. 11	
F6. 12		F7. 12		F8. 12	
F6. 13		F7. 13		F8. 13	
F6. 14		F7. 14		F8. 14	
F6. 15		F7. 15		F8. 15	

Function Code	Setting Value	Function Code	Setting Value	Function Code	Setting Value
F9. 00		FA. 00		Fb. 00	
F9. 01		FA. 01		Fb. 01	
F9. 02		FA. 02		Fb. 02	
F9. 03		FA. 03		Fb. 03	
F9. 04		FA. 04		Fb. 04	
F9. 05		FA. 05		Fb. 05	
F9. 06		FA. 06		Fb. 06	
F9. 07		FA. 07		Fb. 07	
F9. 08		FA. 08		Fb. 08	
F9. 09		FA. 09		Fb. 09	
F9. 10		FA. 10		Fb. 10	
F9. 11		FA. 11		Fb. 11	
F9. 12		FA. 12		Fb. 12	
F9. 13		FA. 13		Fb. 13	
F9. 14		FA. 14		Fb. 14	
F9. 15		FA. 15		Fb. 15	

Function Code	Setting Value	Function Code	Setting Value	Function Code	Setting Value
Fc. 00		Fc. 06		Fc. 12	
Fc. 01		Fc. 07		Fc. 13	
Fc. 02		Fc. 08		Fc. 14	
Fc. 03		Fc. 09		Fc. 15	
Fc. 04		Fc. 10		Fc. 16	
Fc. 05		Fc. 11			

User's Warranty

User's Details

Name of Distributor		Date of Purchase	
Inverter Model(s)		Identification Number	
Name of Equipment		Power Capability of the Motor	
Date of Installation		Date of Use	

Maintenance Record

Failure Cause
Settlement
Date of Maintenance Serviceman Signature

Failure Cause
Settlement
Date of Maintenance Serviceman Signature

TIP

• This copy is for theholder (user) only.

Inverter User's Warranty

User's company		Tel	
Add		Post Code	
Contact Person		Department	

Name of Distributor		Add/Tel	
Date of Purchase		Invoice Number	

Inverter Model(s)		Identification Number	
Name of Equipment		Power Capability of the Motor	
Date of Installation		Date of Use	

Description of Use
Description of ParameterAmendment

TIP

• User shall fill itout based on thefacts with care andreturn it to usas soon as possible,so that we could serveyou better service toavoid inconvenience or losscaused by your improper installation or error use.