AnyHz

FST-501-0R7ST2

Mini Frequency Inverter User Manual Preface

In order to give full play to the functions of The frequency inverter and ensure the safety of users, please read this operation manual carefully. When you find difficult problems during use, please contact the distributors in various regions or our technical personnel, and our professionals will be happy to serve you.

Mini Frequency Inverter is a sophisticated power electronic product. In order to protect your life and property, there are "danger" in this manual.

Terms and Conditions:

"Attention" and other words are to remind you of the safety precautions that you need to pay attention to when moving, installing, using and checking the frequency inverter, Please cooperate with us.

⚠ Improper handling may result in serious personal injury.

⚠ Improper operation may cause damage to The frequency inverter or the mechanical system.

> After The frequency inverter is powered off, do not touch the circuit board before the indicator light of the digital operator is off;
> Do not perform wiring during power transmission, and do not check the circuit board when The frequency inverter is running;
> Do not disassemble and change the internal connection wires or circuits and parts of The frequency inverter by yourself;

⚠
> Do not carry out withstand voltage test on the international components of The frequency inverter, these semiconductor parts are easily damaged by high voltage.
> Never connect The frequency inverter output terminals U,V,W to the AC power supply;
> The CMOS integrated circuit on the main circuit board of The frequency inverter is easily affected and damaged by static electricity, please do not touch the main circuit board.

1. Display interface

POWER LED

FWD LED

REV LED

POL4 Digital display window WER LED

K1　K2　K3　K4

K5　K6　K7

l ogo　　VR
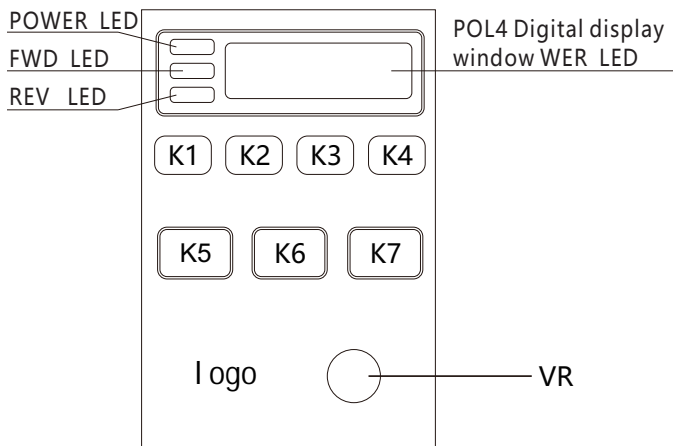
1.1. Display Interface Description:

L1: POWER indicator light, power indicator light, always on.

L1-1 :It is always on when the operation panel is locked, it is off when it is unlocked, and it flickers when it is under communication control.

L2: The forward rotation indicator is green (FWD), always on when running. The LED light flashes when the forward rotation stops.

L3: The reverse indicator light is blue (REV), always on when running. The LED light flashes when the reverse stops.

L4: Four-digit digital tube display, P00.0 is the parameter setting interface. Er00 is the fault code display.

Installation Dimensions:
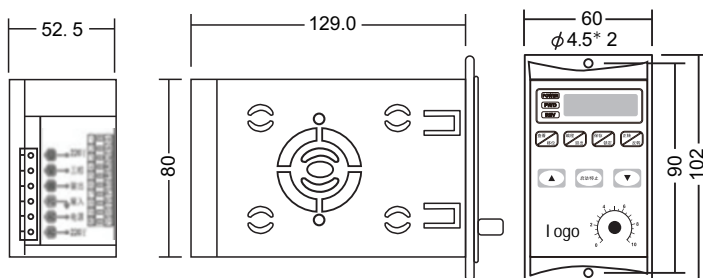
1.2. Button function description:

K1: Shift/query function parameter display key (P-K/SHIFT)

K2: Enter the parameter setting key (MENU/ESC).

K3: Lock/unlock button (SAVE/LOCK). Short press to lock/long press 3S to unlock.

K4: Forward and reverse switch button (FWD/REV)

K5: Speed adjustment minus key/data setting minus ($\downarrow$).

K6: Start/stop/failure recovery/data setting save key (RUN/STOP)

K7: speed control plus key/data setting plus ($\uparrow$).

V R: Potentiometer: panel speed potentiometer button (invalid when external port. RS485 given frequency).

2. Function description

2.1. Brief description of inverte

The frequency inverter is single-phase AC220V input, drives three-phase AC220V motor, and the frequency output is 0HZ--130.0HZ. In order to increase the output voltage, this product uses SVPWM modulation method, and the carrier frequency is 8.0KHZ. Suitable for 750W motors, the maximum output power is 1100W. The frequency inverter can change the V/F curve arbitrarily by setting the V/F compensation frequency and the voltage ratio at this frequency. By setting the highest value of the V/F curve, according to the load conditions, it can maximize the use efficiency of electric energy, reduce the heating of the motor, and prolong the service life of the motor and The frequency inverter

2.2. Internal parameter setting

2.2.1 Operation Interface Description

1.Parameters that can be queried by K1 query key

A. F50.0: Displayed as the running frequency value. (F flashing is the set frequency)

B. U310: Displayed as DC bus voltage value.

C. T020: Displayed as IPM module temperature value.

D. U01.0: Displayed as the current current value.

E. D 0: Displayed as DI input status.

F. o 0: Displayed as DO input status.

G.Er0.2: Indicates a fault, refer to the fault code to determine the cause of the fault.

2.L1:The power indicator light is red.

The yellow light of L1-1 is on, the keypad is locked (press K3 lightly, the keypad is locked, and the yellow light is on. Press and hold K3 to unlock. The yellow light is off). The yellow light is flashing, RS485 communication is in progress.

3.The running indicator light L2 rotates FWD (green) LED forward, and L2 flashes to indicate that the forward rotation stops.

4.The running indicator light L3 reverses the REV (blue) LED, and L3 flashes to indicate that the reverse rotation stops.

5.External terminal control wiring diagram
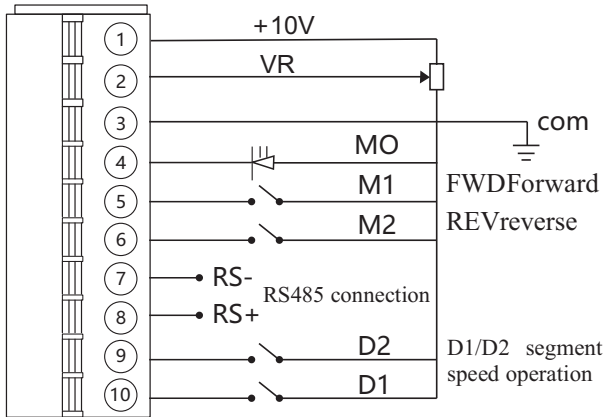
External terminal control wiring diagram: COM is not allowed to be connected to external earth and neutral wire

Serial number	Represent	Function
①	+10V	+10V power output port（external potentiometer power supply）
②	VR	Analog（potentiometer）input port
③	COM	public port
④	MO	M0 function（fault）output port
⑤	M1	MI（forward）function
⑥	M2/D3	MI（reverse）function/Segment speed port 3
⑦	RS485-	RS485 communication port -
⑧	RS485+	RS485 communication port +
⑨	D2	Segment speed port 2
⑩	D1	Segment speed port 1

Segment speed corresponding graph:

segment speed	D1	D2	D3
0	1	1	1
1	0	1	1
2	1	0	1
3	0	0	1
4	1	1	0
5	0	1	0
6	1	0	0
7	0	0	0

2.2.2 Setting Interface Description

When you press the MENU key to enter the parameter setting, the interface displays P00.0, and the jumping value indicates the number of digits that have been selected and can be set. You can use the data shift key (P-K/SHIFT) and the addition and subtraction keys (↑) (↓) Adjust the data to be set (the function is as shown in the figure below), set the corresponding parent item code according to the required function, press the confirmation key (RUN/STOP/OK) to enter the sub-item code selection, press the confirmation key (RUN/STOP/OK) Save the set sub-item code, return to the parent item code parameter interface, press the MENU key to exit the parameter setting, and return to the frequency display interface.

parent item code	name	Subitem code	Factory	Unit/Remarks	MODBUS address
P00.0	acceleration time	0~999.9	1	S	0
P00.1	Deceleration time	0~999.9	1	S	1
P00.2	freqMultipoint VF uency point F1	0.00HZ~Parameter 0.4	2.0	HZ	2
P00.3	freqMultipoint VF voltage point V1	0.0% ~100.0%	15.%		3
P00.4	freqMultipoint VF frequency point F2	Parameter 0.4 to Parameter 0.6	25.0	HZ	4
P00.5	freqMultipoint VF voltage point V2	0.0% ~100.0%	50.0%		5
P00.6	freqMultipoint VF frequency point F3	Parameter 0.4 to motor rated frequency	50.0	HZ	6
P00.7	freqMultipoint VF voltage point V3	0.0% ~100.0%	100.0%		7
P00.8	485 communication baud rate	0 : 1200 1 : 2400 2: 4800 3 : 9600	3	bps	8
P00.9	Data Format	0 :no parity (8~N~2) 1 :even parity (8~E~1) 2 :Odd parity (8~O~1) 3 :no parity (8~N~1)	3	bps	9
P01.0	local address	0~255	1		10
P01.1	communication timeout	0.0~100.0	0.0	S	11

P01.2	Main frequency source X selection	0 : Panel addition and subtraction keys to adjust speed 1 : panel potentiometer 2 : Communication setting 3 : External AI input 4 : Multi-stage speed	1		12
P01.3	command source selection	0 : panel control 1 : terminal control 2 : Communication control 3 : forward rotation after power on 4 : Power-on reverse	0		13
P01.4	preset frequency	0.0 - frequency cap	50.00	HZ	14

P01.5	MI function selection	0 : M1 forward/stop
		    M2 reverse/stop
		1 : M1 running
		    M2 running direction switching
		2 : M1 Forward rotation
		    M2 Reverse rotation
		    D1 and
		    D2 stage speed
			0		15

P01.6	MO function selection	0 : no function 1 : running 2 : failure 3 : reserved 4 : The frequency reaches the set frequency 5 : Running at zero speed 6 : reserved	0		16

P01.7	Overload protection enable	0: no protection 1: protection	1		17
P01.8	frequency cap	0.0~130	50.00	HZ	18
P01.9	frequency lower limit	0.0~ frequency cap	0.00	HZ	19
P02.0	Motor rated power	0.01~1.00	0.75	KW	20
P02.1	Motor rated voltage	1~500	220	V	21
P02.2	Motor rated current	0.01~10.00	4.00	A	22
P02.3	Motor rated frequency	0.1~ frequency cap	50.0	HZ	23
P02.4	Motor rated	1~65535	1430	rpm	24
P02.5	Multi~segment speed 0	0% ~100.0% of upper frequency	0.0		25
P02.6	Multi~segment speed 1	0% ~100.0% of upper frequency	0.0		26
P02.7	Multi~segment speed 2	0% ~100.0% of upper frequency	0.0		27
P02.8	Multi~segment speed 3	0% ~100.0% of upper frequency	0.0		28
P02.9	Multi~segment speed 4	0% ~100.0% of upper frequency	0.0		29
P03.0	Multi~segment speed 5	0% ~100.0% of upper frequency	0.0		30
P03.1	Multi~segment speed 6	0% ~100.0% of upper frequency	0.0		31
P03.2	Multi~segment speed 7	0% ~100.0% of upper frequency	0.0		32

P03.3	Shutdown display selection	0: Set frequency 1: Bus voltage 2: IPM module temperature 3: AI voltage 4: DI input state 5: DO output status	0		33
P03.4	Run display selection	0 : Run frequency 1 : Bus voltage 2 : set frequency 3 : Motor speed 4: Input current 5: IPM module temperature 6: AI voltage 7 : DI input state 8: DO output state	0		34
P03.5	Starting DC braking current percentage	0-100	0		35
P03.6	Start DC braking time	0.0-100.0	0.0	S	36
P03.7	Start frequency of DC braking at stop	0.0-frequency cap	0.0	HZ	37
P03.8	Stop DC braking current percentage	0-100	0		38
P03.9	Stop DC braking time	0.0-100.0	0.0	S	39
P04.0	Shutdown mode	0: Deceleration stop 1: Free stop	0		40

P04.1	Forward and reverse dead time	0.0s ~ 3000.0	0.0	S	41
P04.2	Reversal prohibited	0：invalid 1：valid	0		42
P04.3	reset	0： Invalid 1：Restore factory settings	0		43
P04.4	Boot Protection Selection	0： no protection 1： protection	0		44
P04.5	Terminal and panel control automatic switching	0：off 1：Run command source terminal and panel switch automatically	1		45
P04.6	reserve				46
P04.7	Panel control running direction	0： Forward rotation 1： Reverse rotation	0		47
P04.8	AI maximum input voltage	0.00−10.00	5.00	V	48
P04.9	Cooling fan on temperature	Cooling fan off temperature −80	65	℃	49
P05.0	cooling fan off temperature	30− Cooling fan opening temperature	55	℃	50
P05.1	carrier frequency	4−12	8	K	
P05.2	panel lock time	0−1000S is not locked when it is set to 0	0	S	

Instruction	
1000	: Set frequency 0‒500 corresponds to 0‒50HZ
1001	: When it is 1, it runs forward, when it is 2, it reverses, when it is 3, it stops/fault reset
Read	
2000	: Operating frequency
2001	: Operating status
2002	: Bus voltage
2003	: Phase current
2004	: Module temperature
2005	:Motor speed
2006	: Error code

2.2.3 Parameter description

1. Parameter 2.0‒2.4 Motor rated parameter setting. Set the rated motor parameters according to the nameplate of the controlled motor. The factory rated current will change according to the rated power. The rated current of the motor is an important parameter for the triggering of overload protection.

2. When using multi‒stage speed, set 1.2 to 4: multi‒stage speed, set 1.3 to 1: terminal control, and set 1.5MI function to 2: M1 forward rotation, M2 reverse rotation, D1 and D2 are multi‒stage speed.

3.4.5 Terminal and panel control automatic switching function, that is, the panel is on and the panel is off; the port is on and the port is off.

2.2.4 V/F control deascription

The six parameters of parameters 0.2-0.7 define the multi-segment V/F curve. The multi-point V/F curve should be set according to the load characteristics of the motor. It should be noted that the relationship between the three voltage points and frequency points must satisfy: V1< V2<V3, F1<F2<F3. If the voltage is set too high at low frequency, it may cause the motor to overheat or even burn out, and the frequency converter may suffer from overcurrent stall or overcurrent protection.

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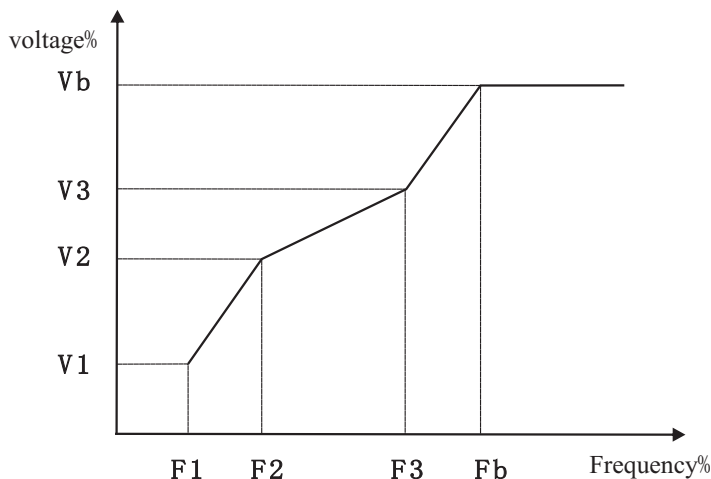
V1–V3 : Multi–speed V/F 1st–3rd stage voltage percentage

F1–F3 : Multi–speed VF first–third frequency percentage

Vb : Motor rated voltage   Fb : Motor rated operating frequency

2.2.4. The relationship between voltage ratio and voltage output Output voltage = power supply voltage * (voltage ratio) / 128;

3. Set the case

Case 1: Setting the acceleration and deceleration time of The frequency inverter General Manual of I M P U L S E – 5 0 1 Mini Frequency Inverter Turn on the power, press (MENU/ESC) key, enter the main menu display P00.0, press (RUN/STOP) key, enter the submenu display 000.1 (S), set the required acceleration time, press (RUN/ STOP) key to return to the main menu P00.1, press the (RUN/STOP) key to enter the submenu display 000.1 (S), set the required deceleration time, press the enter key (RUN/STOP) to confirm (ie save) the parameter Exit the parent menu interface, if you do not want to save, press the (MENU/ESC) key, the previously set data is invalid

Case 2: The frequency inverter restores the factory default value

Press the (MENU/ESC) key to enter the main menu and display P00.0, select the parameter P04.3 through the plus and minus keys and the shift key, press the (RUN/STOP) key to enter the submenu and display 0, change 0 to 1, Press the (RUN/STOP) key, the digital tube will flicker slightly and then return to the frequency display interface, and the factory settings are restored successfully.

Case 3: Setting the DC brake

To use the DC braking function, first confirm that the parameter 4.0 Stop mode is 0: decelerate to stop, and then set the three parameters 3.7, 3.8 and 3.9. When the three parameters are not 0, the DC braking at stop will take effect. Set 3.7 DC according to the load of the motor. Braking current percentage, it is recommended to start with a small value, and then increase the braking current percentage according to the braking effect.

Case 4: Fault code

When the frequency inverter fails, the four-digit digital tube will flicker and display：Erx.x

serial number	Fault code	content	Abnormal	Trouble shooting
1	Er01	overcurrent	1. The frequency Inverter output circuit Is short-circuited	1. Eliminate peripheral faults
2	Er02	overvoltage		2. Adjust the voltage to the normal range
3	Er03	Undervoltage	2.The input voltage is too high/low 3.Acceleration and deceleration time is too short 4.Sudden load during use 5. V/F curve setting is not appropriate	3. Increase the acceleration and deceleration time 4. Cancel the sudden load 5. Adjust the V/F curve setting
4	Er04	Output phaseloss	1. The lead wire from The frequency inverter to the motor is abnormal 2. The three-phase output of The frequency inverter is unbalanced 3. Inverter failure	1. Eliminate peripheral faults 2. Measure whether the three-phase winding of the motor is flat balance 3.Seek technical support
5	Er05	Current Detection Fault	1. Hardware failure	1. Seek technical support

6	Er 10	Inverter overload	1. Whether the load is too large or the motor is blocked 2. The selection of frequency converter is too small	1. Reduce the load and check the motor and mechanical condition 2. Choose a frequency converter with higher power
7	Er 11	Motor overload	1. Whether the rated current setting of the motor is appropriate 2. Whether the load is too large or the motor is blocked 3. The selection of frequency converter is too small	1. Normally set the rated current of the motor 2. Reduce the load and check the motor and its mechanical condition 3. Choose a frequency converter with higher power
8	Er 12	communication fail	1. The communication parameter setting is incorrect 2. The upper computer Is not working properly 3. The communication line is abnormal	1. Correctly set the communication parameters 2. Check the upper computer wiring 3. Check the communication cable
9	Er 13	Module overheating	1. The ambient temperature is too high 2. The fan is blocked or damaged 3. The frequency inverter module is abnormal	1. Reduce the ambient temperature 2. Clean the air duct or replace the fan 3. Seek technical support

5. Use environment

Power supply：single‐phase AC220V±20%

Temperature：−10℃ ˜55℃

Humidity：0% ˜ 65%

5.2.1. Maintenance and peripheral components
5.2.1.1. Maintenance Inspection

Frequency converter does not need regular inspection and maintenance

In order to maintain good operating characteristics for a long time, please conduct regular inspections according to the following points. When checking, be sure to turn off the power supply, and start after the power indicator light goes out, because the internal large‐capacity capacitor will have residual voltage.

⑴ Clean up the dirty deposits inside.

⑵ Check whether the terminal screws and component fixing screws are loose, and lock them tightly if the loose screws are loose.

⑶ Dielectric insulation test.

⒜ When doing the insulation withstand voltage test of the external circuit, all the wires connecting The frequency inverter and the outside should be removed.

Operate when powered on.

⒝ When doing the insulation withstand voltage test inside The frequency inverter, it is only necessary to test the main circuit of The frequency inverter, and use Use DC file.

500V megger Insulation resistance must be above 100M