

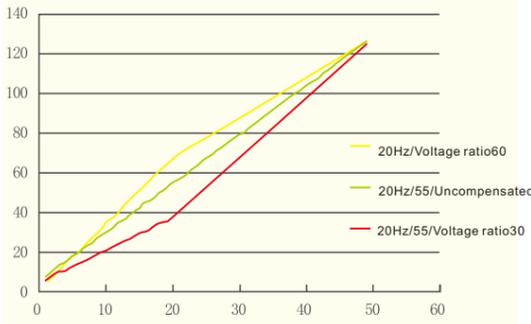
INVERTER

Operation Instructions

Three-phase driver for single-phase 220-volt power supply

28	-2.8-	operation frequency	1.0-99.0Hz	45
29	-2.9-	Undefined (customizable)		
30	-3.0-	current display options	1: percentage	1
31	-3.1-	Undefined (customizable)		
32	-3.2-	braking frequency when stop	00. 0-50.0Hz	0
33	-3.3-	braking time	0.0-5.0s	0
34	-3.4-	brake coefficient	00-30%	0
35	-3.5-	polar logarithm	1-6	2
36	-3.6-	Motor slip rate	0.01-1.00	1
37	-3.7-	motor rated speed	1-9999	1500
38	-3.8-	motor speed 0 set	1.0-99.0Hz	1
39	-9.1-	restore default values	CLE displaying scintillation, press OK key to perform operations	
40	-9.5-	reset MCU	display flickering - 8.88, press OK key to perform the operation	-8.88
41	-9.6-			
42	-9.7-	hardware version number		-X.xx
43	-9.8-	software Version Number		-X.xx

2.2.3 Description of Low Frequency V/F Compensation
According to the load condition, we can set - 0.3, - 0.4, - 0.5 in Table 2 value and linear V/F curve value. In order to raise the motor torque at low frequency, the upper limit frequency of the lifting torque should be selected. The highest compensation frequency voltage ratio should be set at -0.3 and -0.4. The corresponding frequency or similar frequency can be found in Table 2. When higher than this data, the slope of V/F curve will be increased and the torque will be increased. When the value is lower than that, the slope of V/F curve will be reduced and the torque will be reduced.
For example, in - 0.3 - the setting value is 20.0, in - 0.4 - the setting value is 60, 55, 30, and - 0.5 - the default setting is 8. The three curves of V/F are as follows:



2.2.3 Maximum Frequency Limitation Voltage Ratio
When the load is relatively small and the motor runs at the highest speed, the optimal operation effect can be achieved by reducing the set of - 0.6 - option data.

Table 2: Linear Voltage Ratio

Frequency HZ	Voltage ratio	Frequency HZ	Voltage ratio	Frequency HZ	Voltage ratio	Frequency HZ	Voltage ratio	Frequency HZ	Voltage ratio
1	8	11	32	21	57	31	81	41	106
2	10	12	35	22	59	32	84	42	108
3	13	13	37	23	62	33	86	43	111
4	15	14	40	24	64	34	89	44	113
5	18	15	42	25	67	35	91	45	116
6	20	16	45	26	69	36	94	46	118
7	23	17	47	27	72	37	96	47	121
8	25	18	50	28	74	38	99	48	123
9	28	19	52	29	77	39	101	49	126
10	30	20	55	30	79	40	104	50	128

3. Setting up a case

Case 1: Setting motor acceleration time
Turn on the power supply, press (MENU/ESC) key, enter the main menu to display - 0.0 - , press (↑) key, display - 0.1 - , press (RUN/STOP) key, display 01.01: representing that the acceleration time is 5S; 02 representing that the acceleration time is 2.5s. 03 representing that the acceleration time is 1.5s. The acceleration time can be adjusted by using (↑) and (↓) keys. Press the (RUN/STOP) key and return to the main menu - 0.1 - . Then you can continue to set other options. If you do not set other options, please press the (SAVE/LOCK) key to enter the save option, the digital tube displays the flickering SAVE, and then press the (SAVE/LOCK) key to return to the frequency display interface. If you do not want to save the previously modified data, you can press the (MENU/ESC) key, the previously modified data will become invalid.

Case 2: System restore default value
You can press (MENU/ESC) key, enter the main menu to display - 0.0 - , press (↑) key, display - 0.1 - , press (P-K/SHIFT) shift key, adjust the main menu - x.1 to - 9.1 - , press (RUN/STOP) key, display the flickering CLE press (RUN/STOP) key to restore the factory default value, and return to the frequency display interface. If you don't want to operate, press (MENU/ESC) to return to the frequency display interface.
Attention:
1. Press the MENU/ESC key at any set interface can return to the frequency display interface.
2. During the saving process, the digital tube displays the flashing SAVE. If press (MENU/ESC) key to exit the save, the previously modified data is invalid, and the parameters will automatically restore the parameters before setting.
3. Data adjustment can use (P-K/SHIFT) key and shifting digital tubes to set parameters quickly. All places where data needs to be saved need to press the SAVE/ LOCK key twice to prevent misoperation.

Case 3: Using DC brake
When using DC brake, it is necessary to set - 1.2 - item (stopping mode choosing 2) - 3.2 - item (starting frequency of stopping brake) - 3.3 - item (time of DC brake, 0.1 is the minimum setting time unit) - 3.4 - item to set DC brake voltage. Voltage value needs to increase slowly from small to large.
4. Fault code
When the converter fails, the four-digit digital tube will flicker and display: E-x.x.
The fault code and its solution are as follows:

Number	Fault code	Content	Reason	Remarks
1	E-0.1	Inverter overheating	1. Detecting Line Faults 2. Peripheral overheating or poor ventilation	1. Proceed frequency converter maintenance 2. Improve ventilation conditions
2	E-0.2	Pulse overcurrent	1. Overload 2. Inappropriate V/F mode setting 3. Faults of the detection-frequency converter	1. Proceed frequency converter maintenance 2. Set the appropriate V/F curve
3	E-0.3			
4	E-0.4	Inverter overload	1. overload 2. Inappropriate V/F mode setting	1. Increase the capacity of frequency converter 2. Set the appropriate V/F curve
5	E-0.6	Temperature sensor failure	Temperature sensor open or damaged	1. Check temperature sensor connection 1. Proceed frequency converter maintenance
6	E-0.7	Temperature sensor failure	Short circuit or damage of temperature sensor	1. Check temperature sensor connection 1. Proceed frequency converter maintenance
7	E-0.8	Inverter overload 100%	The output power of the converter exceeds 100% for 6 seconds or more.	1. Replacement of frequency converter with higher power
8	E-0.9	Frequency converter thermal protection	1. Detecting Line Faults 2. Peripheral overheating or fan damage	1. Proceed frequency converter maintenance 2. Improve ventilation conditions
9	E-1.0	Overvoltage protection	Speed of deceleration and shutdown is too fast	Set the acceleration and deceleration value low

5. Notes

- When the fault code is shown as E-0.2, the following points should be noted:
1> If it is because of overload or too short acceleration time, please adjust acceleration time and replace higher power converter.
2> If it is because of motor rated power being too large, please replace motor matching with the frequency converter.
3> If it is because the parameter setting of - 0.3 - , - 0.4 - , - 0.5 - , - 0.6 - is unreasonable. It is suggested that the factory value be restored.
- When the motor is running, there will be strong interference. At this time, the continuous function of manual frequency regulation may fail, but the frequency can still be adjusted by pressing the button. It is suggested to use a single button, or to stop the motor to modify the frequency.
- It is recommended to use keys to adjust speed accurately. Motor speed regulation will cause slight deviation caused by vibration in motor operation or installation system, which will affect the control accuracy.
- When the ambient temperature is too high, enough heat dissipation space is needed.

6. Use environment
Power supply: single-phase AC220V +20%
Temperature: -10-55 degrees Celsius
Humidity: 0%-65%

Preface

In order to give full play to the functions of this frequency converter and ensure the safety of users, please read this operation manual in detail. If you find any abnormal phenomena in use and this operation manual does not enumerate this situation, please contact the distributors or the company's business personnel in various regions, and we will solve the product problems for you in time.

Instructions for Use

In order to ensure that users are always in a safe working state, dangerous notes and other symbols in this manual remind you to check the safety precautions of transducers during handling, installation and operation. Please follow the rules to make the use of transducers safer.
DANGER: Improper operation may result in casualties.
ATTENTION: Improper operation may cause damage to the frequency converter or mechanical system.

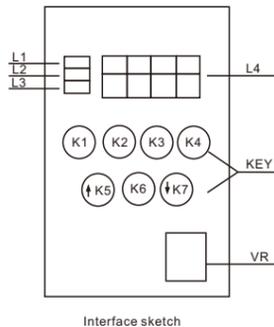
DANGER

- Do not touch the circuit board until the red charging indicator on the mainboard is turned off after the frequency converter is powered off.
- No wiring is allowed in the process of power transmission. Do not check the circuit board when the frequency converter is in operation.
- Do not disassemble, assemble, and change the internal connection, wiring, or parts of the frequency converter by yourself.
- The ground terminal of the frequency converter must be grounded correctly — the third grounding of 220V class and the exceptional grounding of 400V class.
- Sales of this product must be by EN61800-3. When used in the home, this product may cause electromagnetic interference. In this case, users may have to take appropriate measurements.
- After the frequency converter is installed in the large power supply system above 600KW, when the phase-leading capacitor is installed on the power side, it may cause the maximum peak current to pass through the power supply to the input, leading to its failure. In order to prevent this happening, it is suggested to install AC reactor at the input end of the power supply of the dry converter to restrain the sudden current protection converter, which can also improve the power factor of the power supply end.

ATTENTION

- Do not test the voltage withstanding of the components inside the frequency converter. Semiconductor parts are vulnerable to high voltage breakdown.
- Converter output terminals T1 (U), T2 (V), T3 (W) must not be connected to AC power supply.
- Converter primary circuit board CMOS integrated circuit is vulnerable to electrostatic influence and damage, do not touch the main circuit board.

1. Display interface



1.1 Display interface description

- L1: POWER indicator is light, and power indicator light is always on. The red LED flashing button is locked.
- L2: The positive turn indicator is green (FWD) and is always on when running. The LED lights flicker when the forward turn stops.
- L3: Reverse indicator is blue (REV) which is always bright when running. LED lights flicker when reversal stops.
- L4: Four-digit tube display.

1.2 Key Function Interpretation

- K1: Functional parameter display button (P-K/SHIFT). P-K button can query IPM module temperature, bus current, bus voltage, motor speed, motor frequency. Shift keys can be set for shift selection.
- K2: Set the Entry Key (MENU/ESC). The MENU key is the function entry key. ESC key is exit key.
- K3: Save/Lock key (SAVE/LOCK) SAVE: Save LOCK. Long press lock or unlock K2, K3, K4 keys, run 3 minutes interface without operation, it will be locked automatically.
- K4: Forward and reverse switching button (FWD/REV).
- K5: Speed regulation plus keys/data setting plus (↑).
- K6: Start/stop key/data setting confirmation key (RUN/STOP/OK).
- K7: Speed-adjusting key/data setting subtraction (↓).
- VR: Panel speed regulator potentiometer. When operating, the keys, external ports, RS485 are invalid.

2. Functional description

2.1 Brief description of frequency converter
The converter is a single-phase 220V voltage input driving three-phase motor (must be converted into a triangular connection). Frequency output is 1.0-99.0HZ, in order to improve the output voltage, the product uses SVPWM modulation mode, carrier frequency should be 8.0KHZ. It is suitable for motor under 750W with maximum output power of 1100W. The frequency converter can be compensated by setting V/F frequency. The V/F curve can be changed arbitrarily by setting the voltage ratio at this frequency. By setting the maximum value of V/F curve, according to the load situation, it can maximize the use efficiency of electric energy, reduce the heat of the generator, and prolong the service life of the motor and frequency converter.

2.2 Internal parameter setting

2.2.1 Running Interface Description

Functional parameters are shown as follows:

- Items that the K1 key can query
A. T-xx: displays the radiator temperature value.
B. Cx.xx: displays the current value.
C. xxx.x: displays the value of DC bus voltage.
D. xxxx: displays the speed of the motor.
E. Fxx.x: displays the running frequency value.
- E-xx represents a fault and refer to the fault code to determine the cause of the failure.
3. The power indicator flashes when the interface is set, and the startup is started, which indicates that the communication between the machine and the external RS485 is successful.
The button has not been operated for 3 minutes, and the power lamp flickers. At this time, k2, k3 and k4 are locked.
- Run indicator light FWD (green) LED, REV (blue), flicker stands for stop, bright for a long time stands for running in this mode.

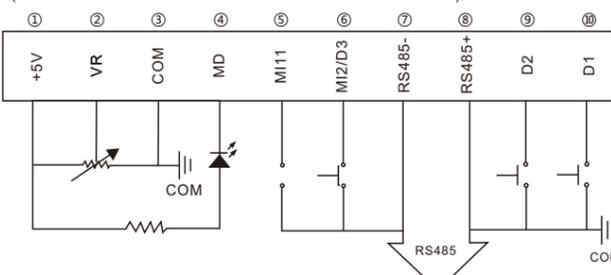
External terminal control chart

No.	Representation	Function
①	+5V ↔	The output of External Regulating Power Supply
②	VR	External potentiometer input
③	GND	COM Common Port
④	MO	Indicator Setting Port
⑤	MI1	MI Functional Port
⑥	↔ MI2/D3	MI functional port/segment speed D3
⑦	↔ RS485-	Communication RS485 Interface (to be determined)
⑧	RS485+	Communication RS485 Interface (to be determined)
⑨	↔ D2 ↔ ↔	Section Quick Interface
⑩	D1 ↔	Section Quick Interface

Note: don behalf of the period of speed

External terminal control wiring diagram

("COM" is not allowed to connect with the earth and zero lines)



The section velocity maps are as follows:

No.	D3	D2	D1
0	1	1	1
1	1	1	0
2	1	0	1
3	1	0	0
4	0	1	1
5	0	1	0
6	0	0	1
7	0	0	0

Note: M1, M2, D1, D2, D3 are a high level when they are not connected to anything, so low level is sufficient. D1, D2, D3 are all high level indicating the lowest speed.

2.2.2 Setting Interface Description

When pressing the K2 (MENU) key, the digital tube flickers - 0.0 - through the digital setting add and subtract button (↑) and (↓), adjust and select the setting main-item code to enter, as shown in Table 1. In the setting process, the shift key (K1) and the subtraction key (↓) and (↑) can be adjusted to the code to be set. After the code being set, press the confirmation key (K6) to enter the sub-item code selection. After the sub-item code is selected, the key K6 returns to the parent code interface, displays the flickering -x.x- , choose the next main-item code, and then key K6 to enter the word code selection. When all the settings are completed, press the data setting save key K3 (SAVE) to confirm the save, and save the data after the interface stops flickering. Starting the frequency converter can operate according to the set data, without power failure and power on. When you don't want to save data, you can set the exit key (MENU/ESC) according to the menu, without affecting the parameters previously set, or after 20 seconds of keyless operation, return to the running interface automatically.

Table 1

No.	Main-item code	content	Sub-item code	Original system defaults
1	-0.1-	Set start-up time	Setting range: 1-15 (corresponding time 5s-0.1s)	7
2	-0.2-	Set start-up time	Setting range: 1-15 (corresponding time 5s-0.1s)	7
3	-0.3-	Minimum Frequency Compensation	Setting range: 5-15	8
4	-0.4-	Setting the maximum compensation frequency	Setting range: 5-30Hz	20
5	-0.5-	Setting the Maximum Frequency Voltage Ratio for Compensation	Setting range: 25-85	55
6	-0.6-	Maximum Frequency Limited Voltage Ratio	Setting range: 80-128	128
7	-0.7-	To be determined		
8	-0.8-	To be determined		
9	-0.9-	To be determined		
10	-1.0-	Working frequency source	0: Panel keyboard control 1 Panel potentiometer control 2: External analog signal input (output voltage 0-5v) or external potentiometer 3: RS485 4: Section Speed Input	1
11	-1.1-	Start/Stop Control Source	0: Panel keyboard control 1. Set arrival instructions 2. corotate when power is on 3. Reverse when power is on 4. External ports	0
12	-1.2-	Stop mode	0. Inertial stop 1. Deceleration stop 2. Brake stop	1
13	-1.3-	MI Function Selection	0. MI1 forward/stop, MI2 reverse/stop 1: MI1 runs/stops, MI2 reverses/forwards 2: MI1 run/stop, MI2 speed	0
14	-1.4-	M0 Function Selection	0. Operating instructions 0. Operating instructions 2. Fault indication 3. Undefined (customizable)	0
15	-1.5-	Overload Protection Selection	undefined	
16	-1.6-	Selection of Overtemperature Protection	40°C-100°C	90°C
17	-1.7-	Maximum frequency setting	1-99Hz	50
18	-1.8-	Minimum frequency setting	1-30Hz	1
19	-1.9-	working frequency	1-99Hz	50
20	-2.0-	Output Maximum Voltage for Frequency	35-99Hz	50
21	-2.1-	Section Speed 1 Setting	1-99Hz	5
22	-2.2-	Section Speed 2 Setting	1-99Hz	10
23	-2.3-	Section Speed 3 Setting	1-99Hz	20
24	-2.4-	Section Speed 4 Setting	1-99Hz	25
25	-2.5-	Section Speed 5 Setting	1-99Hz	35
26	-2.6-	Section Speed 6 Setting	1-99Hz	40
27	-2.7-	Section Speed 7 Setting	1-99Hz	45