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浙江新富凌电气股份有限公司

Zhejiang New Folinn Electric Co.,Ltd

地址：浙江温岭东部新区26街9号

销售热线：400-889-7111　服务热线：400-110-1098

E-mail:fuling@chinafuling.com

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BD612 SERIES

SPECIAL FREQUENCY CONVERTER FOR ENGRAVING MACHINE MANUAL

Preamble

This instruction manual provides users with relevant precautions and guidance on model description, wiring, parameter setting, fault diagnosis and daily maintenance of the inverter. In order to ensure the correct use of the inverter, please read this manual carefully before installing the inverter and keep it properly for future use.

First time use:

For users who use this product for the first time, please read this manual carefully. If you have doubts about some functions and performance, please consult our company's technical support personnel for help.

Precautions:

◆ Before wiring, be sure to turn off the power.

◆ The electronic components inside the inverter are particularly sensitive to static electricity, so do not put foreign objects into the inverter or touch the main circuit board.

◆ After the AC power is cut off, before the indicator light on the display panel of the inverter goes out, it means that there is still high voltage inside the inverter, which is very dangerous. Please do not touch the internal circuit and parts.

◆ Be sure to properly ground the inverter terminals.

◆ Never connect the input power to the output terminals U, V, W of the inverter.

The scope of application of this manual:

This manual is applicable to the BD612 dedicated inverter for engraving machine produced by our company.

Version number: 2022.V1.0

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Chapter I Safety and Precautions

Security definition:

In this manual, safety precautions are divided into the following two categories:

DANGEROUS Serious injury or even death may result from the hazards caused by failure to operate as required.

DANGEROUS Hazards caused by failure to operate as required may result in moderate or minor injuries, as well as equipment damage.

1.1 Safety considerations

1、 Before installation:

DANGEROUS

Do not use damaged or missing inverters. Risk of injury.

2、 During installation:

DANGEROUS

Please install it on flame-retardant objects such as metal; keep away from combustibles. Otherwise it may cause fire!

DANGEROUS

★ When two or more inverters are placed in the same cabinet, please pay attention to the installation position (refer to Chapter 3 Mechanical and Electrical Installation) to ensure the cooling effect.
★ Do not allow wires or screws to fall into the inverter. Otherwise, the inverter will be damaged!

3、 When wiring:

DANGEROUS

★ It should be constructed by professional electrical engineering personnel. Otherwise there is a risk of electric shock!
★ There must be a circuit breaker between the inverter and the power supply. Otherwise a fire may occur!
★ Before wiring, please make sure the power is off. Otherwise there is a risk of electric shock!
★ Please ground according to standard requirements. Otherwise there is a risk of electric shock!

DANGEROUS

★ Do not connect the input power line to the output terminals U, V, W. Otherwise, the inverter will be damaged!
★ Make sure that the wiring meets the EMC requirements and the safety standards of the area. Please use the wire diameter recommended by the reference manual. Otherwise accidents may occur!
★ The braking resistor cannot be directly connected between the (+) (-) terminals of the DC bus. otherwise possible set off a fire alarm!

4、 After power on:

DANGEROUS

★ Do not open the cover after power on. Otherwise there is a risk of electric shock!
★ Do not touch the inverter and its surrounding circuits with wet hands. Otherwise there is a risk of electric shock!
★ Do not touch the inverter terminals. Otherwise there is a risk of electric shock!
★ After power on, the inverter will automatically check the safety of the external strong current circuit. At this time, please do not touch the U, V, W terminals of the inverter or the motor terminals, otherwise there is a danger of electric shock!

5、 In operation:

DANGEROUS

★ When the inverter is running, avoid objects falling into the equipment. Otherwise it will cause equipment damage!
★ Do not use the contactor on-off method to control the start and stop of the inverter. Otherwise it will cause equipment damage!

6、 During maintenance:

DANGEROUS

★ Do not repair and maintain the device with power on. Otherwise there is a risk of electric shock!
★ Make sure that the maintenance and repair of the inverter can only be carried out after the indicator light of the inverter is off. Otherwise, the residual charge on the capacitor will cause harm to people!
★ Do not repair and maintain the inverter without professional training. Otherwise, personal injury or equipment damage will result!

1.2 Precautions:

1. Motor Insulation Inspection

When the motor is used for the first time, before re-use after long-term storage, and during regular inspection, the motor insulation inspection should be done to prevent the inverter from being damaged due to the insulation failure of the motor winding. When checking the insulation, the motor connection must be separated from the inverter. It is recommended to use a 500V voltage type megger to ensure that the measured insulation resistance is not less than 5MΩ.

2. Motor thermal protection

If the selected motor does not match the rated capacity of the inverter, especially when the rated power of the inverter is greater than the rated power of the motor, be sure to adjust the relevant protection parameters of the motor in the inverter or heat the relay in front of the motor to protect the motor.

3. Operation above power frequency

This inverter can provide output frequency of 0~1000Hz. If the customer needs to operate above the rated frequency, please consider the bearing capacity of the mechanical device.

4. About motor heat and noise

Because the output voltage of the inverter is a PWM wave, which contains certain harmonics, the temperature rise, noise and vibration of the motor will increase compared with power frequency operation.

5. When there is a voltage-sensitive device or a capacitor for improving power factor on the output side

The output of the frequency converter is PWM wave, if the output side is equipped with capacitors for improving power factor or varistors for lightning protection, etc., it is easy to cause instantaneous overcurrent of the frequency converter or even damage the frequency converter. Please do not use.

6. Switching devices such as contactors used in the input and output ends of the inverter

If a contactor is installed between the power supply and the input end of the inverter, it is not allowed to use this contactor to control the start and stop of the inverter. When it is necessary to use the contactor to control the start and stop of the inverter, the interval should not be less than one hour. Frequent charging and discharging will easily reduce the service life of the capacitor in the inverter. If there is a switch device such as a contactor between the output terminal and the motor, ensure that the inverter performs on-off operation when there is no output, otherwise it will easily cause damage to the modules in the inverter.

7. Use other than the rated voltage value

It is not suitable to use the BD612 series inverter outside the allowable working voltage range stipulated in the manual, which may easily cause damage to the components in the inverter. If necessary, please use the corresponding step-up or step-down device for voltage transformation.

8. Three-phase input changed to two-phase input

It is not allowed to use single-phase input for inverters that are not marked with single-phase input, otherwise the inverter will be damaged.

9. Altitude and Derating

In areas where the altitude exceeds 1000 meters, the heat dissipation effect of the inverter is deteriorated due to the thin air, so it is necessary to use it with derating. In this case, please contact our company for technical consultation.

10. Attention when scrapping the inverter

The electrolytic capacitor of the main circuit and the electrolytic capacitor on the printed board may explode when burned. Toxic gases are produced when plastic parts are incinerated. Please dispose of it as industrial waste.

11. About the matching motor

The standard matching motor is a squirrel cage asynchronous induction motor. If it is not the motor mentioned above, please select the inverter according to the rated current of the motor. If you need to drive a permanent magnet synchronous motor, please consult our company.

Chapter I Safety and Precautions

2.1 Precautions for Arrival Inspection ·Storage

Before leaving the factory, this product has undergone strict quality inspection and is packed with anti-collision and shock-proof. However, the product may be damaged due to handling or severe impact during transportation. Therefore, after unpacking, please perform the following inspections immediately matter:

● Inspection before unpacking

Check if any damage occurred during transportation.

● Inspection after unpacking

Check the interior, including one BD612 series inverter, one user manual, and one certificate of conformity.

Check the nameplate on the side of the drive to make sure you have the product you ordered.

● Store

This product must be placed in its packing box before installation. If the machine is not in use for the time being, in order to make the product meet the company's warranty conditions and future maintenance, be sure to pay attention to the following items when storing:

1. It must be placed in a dust-free and dry environment.
2. The temperature of the storage environment must be within the range of -20°C to +65°C.
3. The relative humidity of the storage environment must be within the range of 0% to 95% without condensation.
4. Avoid storing in environments containing corrosive gases and liquids.
5. Best packaged properly and stored on a shelf or countertop.

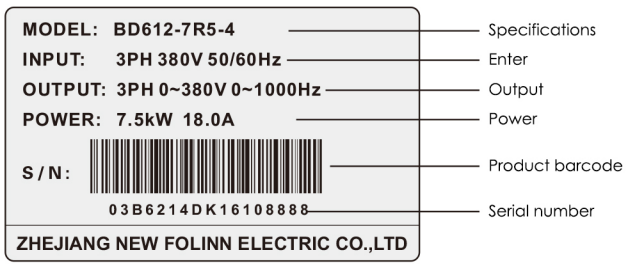
● Transportation

During transportation, the following conditions should be met:

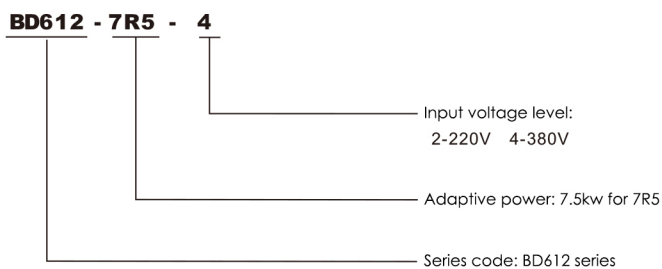
1. The temperature must be within the range of -25°C to +70°C.
2. The relative humidity is within the range of 5% to 95%.
3. Atmospheric pressure must be maintained within the range of 70kPa to 106kPa.

2.2 Inverter nameplate and specifications:

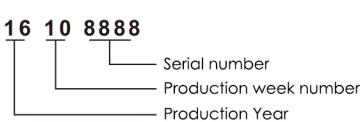
●Inverter nameplate



● Specifications



● Production code



Chapter III Mechanical and Electrical Installation

3.1 Mechanical installation:

1. Installation environment:

1) Ambient temperature: The ambient temperature has a great influence on the life of the inverter, and the operating environment temperature of the inverter is not allowed to exceed the allowable temperature range (-10 degrees to 40 degrees).

2) Install the inverter on the surface of the flame retardant object, and there should be enough space around it for heat dissipation. When the frequency converter is working, it is easy to generate a lot of heat. And install it vertically on the mounting bracket with screws.

3) Please install it in a place that is not easy to vibrate. Vibration should not be greater than 0.6G. Take special care to stay away from equipment such as punch presses.

4) Avoid direct sunlight, humidity, and places with water drops.

5) Avoid installing in places with corrosive, flammable and explosive gases in the air.

6) Avoid installing in places with oil, dust, and metal dust.

2. Tips for installation location:

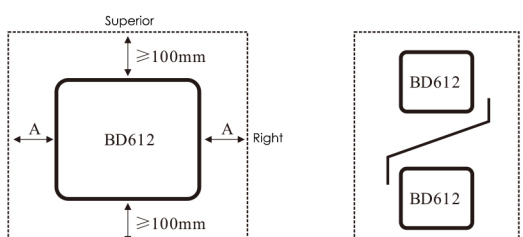


Figure 3-1 Schematic diagram of inverter installation

What needs to be paid attention to in mechanical installation is heat dissipation. So please note the following points:

1) Please install the inverter vertically so that the heat can be dissipated upwards. But not upside down. If there are many inverters in the cabinet, it is best to install them side by side. In the case where up and down installation is required, please refer to the schematic diagram in Figure 3-1 to install the heat insulation deflector.

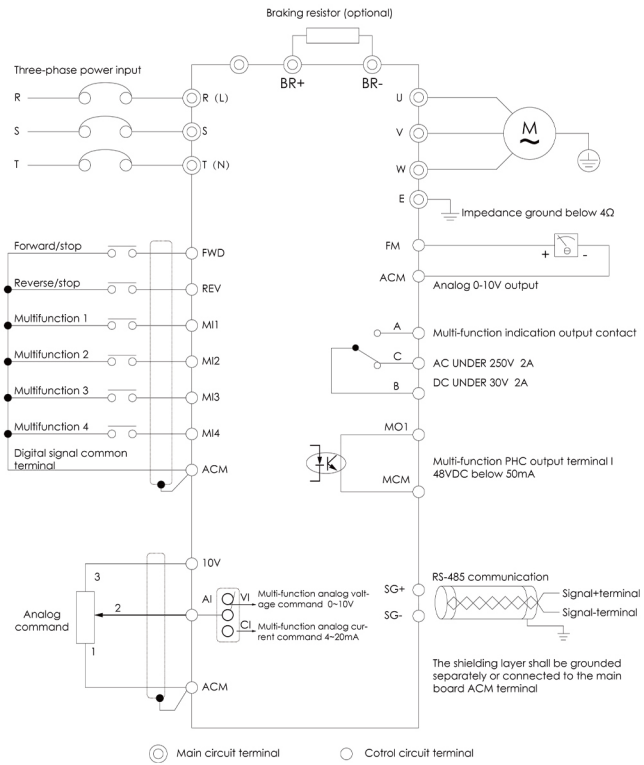
2) The installation space is shown in Figure 3-1. Ensure the heat dissipation space of the inverter. However, please consider the heat dissipation of other components in the cabinet when arranging.

3) The mounting bracket must be made of flame retardant material.

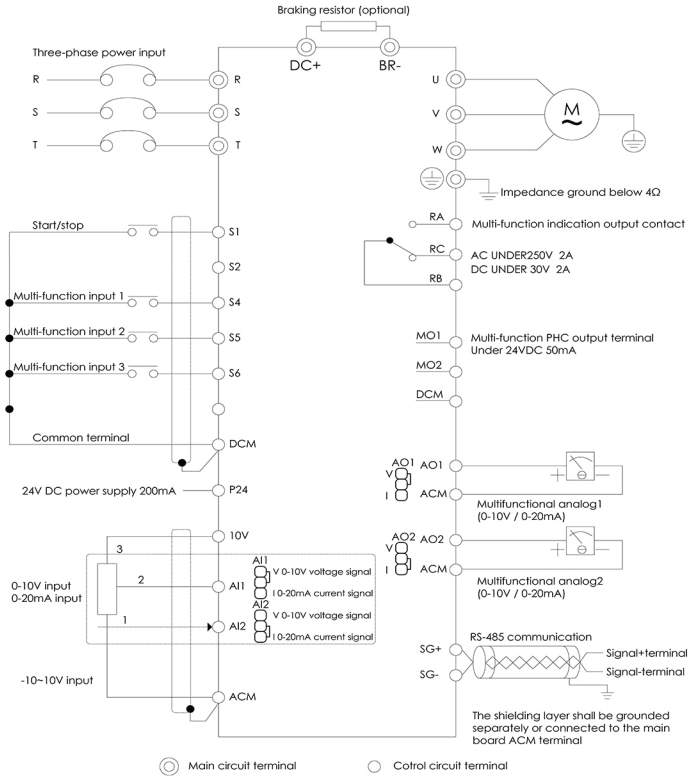
4) For applications with metal dust, it is recommended to install the radiator outside the cabinet. At this time, the space in the fully sealed cabinet should be as large as possible.

3.2 Electrical Installation

●Basic wiring diagram (2.2kw and below power wiring diagram)



●Basic wiring diagram (2.2kw and above power wiring diagram)



Note: The wiring of the engraving machine is divided into two types according to the analog board and the multi-speed board:

The multi-stage speed board generally adopts multi-stage speed control, and the speed signal is given by the control board and connected to the inverter S4, S5, S6 and DCM terminals.

The analog board adopts 0 10V analog voltage signal to adjust the speed, and the speed signal is given by the control board and connected to the inverter AI (AI1) and ACM terminals.

• Main circuit wiring

⚠ DANGEROUS

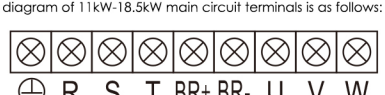
★ Make sure the power switch is in the OFF state before wiring. Otherwise, an electric shock accident may occur!
★ Wiring personnel must be professionally trained personnel. Otherwise, equipment and personal injury may be caused!
★ Must be reliably grounded. Otherwise, there is a danger of electric shock or fire!

★ Confirm that the input power is consistent with the rated value of the inverter. Otherwise the inverter will be damaged!
★ Confirm that the motor and frequency converter are compatible. Otherwise, it may damage the motor or cause inverter protection!
★ Do not connect the power supply to the U.V.W terminal. Otherwise the inverter will be damaged!

1) The schematic diagram of the main circuit terminals of 2.2kW and below is as follows:

2) The schematic diagram of 3.7kW-7.5kW main circuit terminals is as follows:

3) The schematic diagram of 11kW-18.5kW main circuit terminals is as follows:

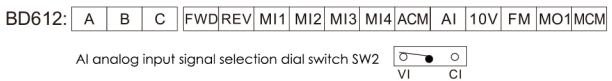


4) The main circuit terminals are described as follows:

Terminal marking	Name	Function description
R.S.T/L.N	Main circuit power input terminal	Connect three-phase power supply (R.S.T)/connect single-phase power supply (L.N)
U.V.W	Inverter output terminal	Connect three-phase motor
BR+(DC+).BR-	Brake terminal	Connect the external braking resistor
⏚ PE	Grounding terminal	Safe grounding of frequency converter

• Control circuit wiring

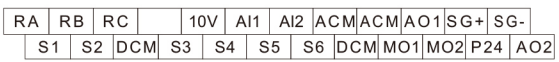
1) The schematic diagram of the control circuit terminals of 2.2kW and below is as follows:



2) The functions of the control circuit terminals of 2.2kW and below are as follows:

Identification	Terminal identification	
A-B	Normally open contact output of multi-function relay	Relay connected to output consult F06.03
B-C	Normally closed contact output of multi-function relay	
MO1-MCM	Multi-function collector open-circuit terminal output 1	
FWD-DCM	Forward/stop	Function setting F05.00~F05.03
REV-DCM	Reverse/stop	
MI1-DCM	Multi-function input port 1	
MI2-DCM	Multi-function input port 2	
MI3-DCM	Multi-function input port 3	
MI4-DCM	Multi-function input port 4	
AI-ACM	0~10V analog signal input	External analog signal input (select the analog input signal through the switch SW2)
	0-20mA analog signal output	
FM-ACM	0-10V analog signal output	
10V-ACM	Power supply for frequency setting of external potentiometer	100mA.max Output

3) The schematic diagram of the 2.2kW-7.5kW power control circuit terminals is as follows:



4) The schematic diagram of the power control circuit terminals of 11kW and above is as follows:

RA	RB	RC	10V	AI1	AI2	AI3	ACM	AO1	AO2	ACM	SG+	SG-
TA	TB	TC	S1	S2	DCM	S3	S4	S5	S6	DCM	MO1	P24

5) The functions of the power control circuit terminals above 2.2kW are described as follows:

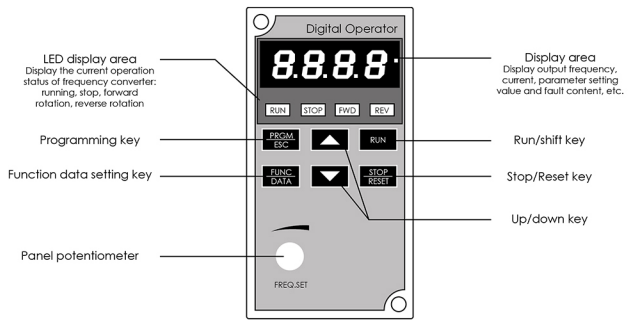
Terminal identification	Terminal function description	
S1-DCM	Multi-function terminal 1	Function setting: F05.00～F05.05
S2-DCM	Multi-function terminal 2	
S3-DCM	Multi-function terminal 3	
S4-DCM	Multi-function terminal 4	
S5-DCM	Multi-function terminal 5	
S6-DCM	Multi-function terminal 6	
P24-DCM	Auxiliary power supply 24VDC 200mA	
10V-ACM	Input input auxiliary power supply 10VDC 20mA	
AI1-DCM	Analog current input port 1: 0-10V or 0-20mA	Function setting: F05.18～F05.32
AI2-ACM	Analog current input port 2: 0-10V or 0-20mA	
AI3-ACM	Analog current input port 3: -10V～10V	
AO1-ACM	Analog output port 1: output 0-10VDC or 0-20mA	Function setting: F06.13～F06.20
AO2-ACM	Analog output port 2: output 0-10VDC or 0-20mA	
SG+ SG-	485 communication port	F13.00～F13.06
RA-RB-RC	Multi-function contact output, the factory value is fault output	Function setting: F06.02～F06.04
MO1-DCM	Multifunctional open collector output 1	
MO2-DCM (TA-TB-TC)	Multifunctional open collector output 2	

Chapter IV Operation and display

4.1.1 Operation panel description (2.2kW and below)

- Button description and function

The operation panel is located above the inverter and can be divided into two parts: display area and key control area. The display area shows the parameter setting mode and different operating states. The button control area is the communication interface between the user and the inverter.

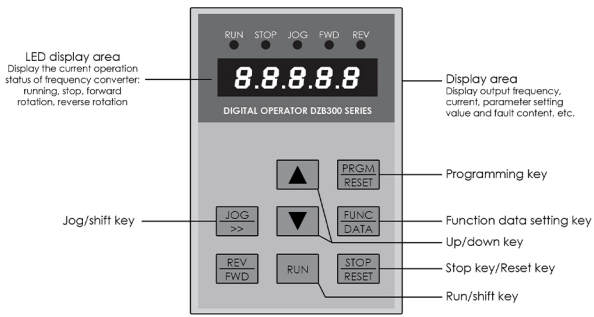


PRGM. ESC	PROGRAM/ESC Entry or exit of primary menu
FUNC. DATA	FUNCTION/DATA Under normal operation mode, press this key to display various status information of the frequency converter, such as frequency command, output frequency and output current; Press this key in the programming mode to display the parameter content, and then press this key to write the changed data into its internal memory.
RUN	RUN Start the operation key (if it is set to external terminal control, pressing this key is invalid). In the parameter operation mode, use the shift key.
STOP RESET	STOP/RESET Stop reset key. If the frequency converter is interrupted due to fault status, press this key to reset after the fault phenomenon has been eliminated.
▲ ▼	UP/DOWN These two keys are used to select parameter items or modify data.

4.1.2 Operation panel description (above 2.2kW)

- Button description and function

The operation panel is located above the inverter and can be divided into two parts: display area and key control area. The display area shows the parameter setting mode and different operating states. The button control area is the communication interface between the user and the inverter.



PRGM RESET	PROGRAM/ESC Entry or exit of primary menu
FUNC DATA	FUNCTION/DATA Under normal operation mode, press this key to display various status information of the frequency converter, such as frequency command, output frequency and output current; Press this key in the programming mode to display the parameter content, and then press this key to write the changed data into its internal memory.
RUN	RUN Start the operation key (if it is set to external terminal control, pressing this key is invalid). In the parameter operation mode, use the shift key.
STOP RESET	STOP/RESET Stop reset key. If the frequency converter is interrupted due to fault status, press this key to reset after the fault phenomenon has been eliminated.
▲ ▼	UP/DOWN These two keys are used to select parameter items or modify data.
JOG >>	JOG/SHIFT KEY It can be used as a function in standby mode and as a shift function key in parameter editing mode.

- Digital display items and instructions

1. In running state

Display code	Show item description	Operation
H	Set frequency	" FUNC DATA "
P	Operating frequency	" FUNC DATA "
C	Output current	" FUNC DATA "
d	The output voltage	" FUNC DATA "
U	Bus voltage	" FUNC DATA "

2. In stop state

Display code	Show item description	Operation
H	Set frequency	" FUNC DATA "
U	Bus voltage	" FUNC DATA "
u	Analog VI value	" FUNC DATA "

4.2 Description of how to view and modify function codes

The operation panel of BD612 dedicated inverter for engraving machine adopts two-level menu structure for parameter setting and other operations.

The second-level menus are: function code (first-level menu) → function code setting value (second-level menu). Operating procedures

As shown in Figure 4-3:

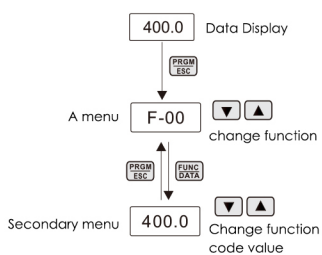


Figure 4-3 Secondary menu operation flow chart

Example: Example of changing function code F-10 from 400.0Hz to 300.0Hz. (Bold font indicates flashing bit)

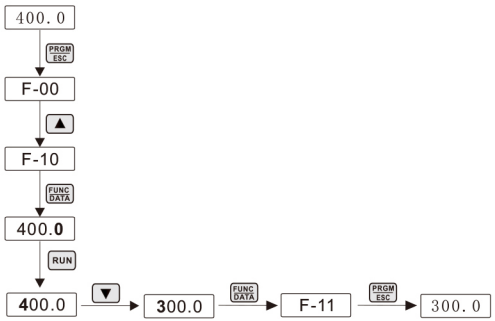


Figure 4-4 Example of parameter editing operation

In the second-level menu state, if the parameter does not have a flashing bit, it means that the code cannot be modified, and the possible reasons are as follows:

1) This function code is an unchangeable parameter. Such as actual detection parameters, operation record parameters, etc.

2) This function code cannot be modified under the condition of running state, and it needs to be modified after shutdown;

4.3 How to view status parameters:

In the stop or running state, various state parameters of the inverter can be displayed by the LED digital tube.

Through the DATA key, the status parameters in the stop or running state can be cyclically switched and displayed.

Chapter V Function·Parameter Summary

function code	Name	Predetermined area	Factory default	Change
F00 basic function group				
F00.00	Speed control mode	0: No PG vector control (SVC) 1: With PG vector control (FVC) 2: V/F control	2	●
F00.01	Run command channel	0: keyboard control 1: terminal control 2: 485 communication control	1	※
F00.03	Output frequency	50.00Hz～600.00Hz	300.0Hz	●
F00.04	Frequency cap	F00.05～F00.03 (maximum frequency)	300.0Hz	※
F00.06	A frequency command selection	0: keyboard setting, and the inverter will not be memorized when power off 1: Keyboard setting, and inverter power-off memory 2: Analog AI1 setting 3: Analog AI2 setting 4: Analog AI3 setting 5:PULSE pulse setting (HDI) 6: Multi-speed operation setting 7: Simple PLC setting 8: PID control setting 9:485 Communication Settings 10: Panel potentiometer setting	6	●
F00.10	Keyboard setting frequency	0.00Hz～F00.03 (maximum frequency)	300.0Hz	※
F00.12	Acceleration time 1	0.00s～6500.0s	2. 00s	※
F00.13	Deceleration time 1	0.00s～6500.0s	1.50s	※

function code	Name	Predetermined area	Factory default	Change
F01 Start and stop control				
F01.09	Parking brake start frequency	0.00Hz～F00.03 (maximum frequency)	5.0Hz	※
F01.11	Stop DC brake current	0%～100%	30%	※
F01.12	Stop DC braking time	0.0s～100.0s	0.5s	※
F02 Motor parameter groupgroup				
F02.02	Asynchronous motor 1 rated frequency	0.00Hz～F00.03 (maximum frequency)	300. 00Hz	●
F02.03	Rated speed of asynchronous motor 1	1rpm～65535rpm	18000rpm	●
F02.04	Asynchronous motor 1 rated voltage	1V～2000V	380V	●
F04 V/F control parameter group				
F04.01	Motor torque boost	0.0%: (automatic torque boost) 0.1%～30.0%	1.0%	※
F05 input terminal parameter group				
F05.00	S1 terminal function selection	0: no function 1: Forward running 2: reverse operation 3: Three-wire operation control 4: Forward rotation inching 5: reverse inching 6: Free parking 7: Fault reset (RESET) 8: External fault normally open input 12: Multi-speed terminal 1 13: Multi-speed terminal 2 14: Multi-speed terminal 3 15: Multi-speed terminal 4	1	●
F05.01	S2 terminal function selection		2	●
F05.02	S3 terminal function selection		12	●
F05.03	S4 terminal function selection		13	●
F05.04	S5 terminal function selection		14	●
F05.05	S6 terminal function selection		4	●

function code	Name	Predetermined area	Factory default	Change
F09 Fault and Protection Group				
F09.05	Overvoltage stall gain	0～100	10	※
F09.06	Overvoltage stall protection voltage	200.0V～2000.0V	770V	※
F09.27	Current fault type	0: no fault 1: Acceleration overcurrent (E004) 2: Deceleration overcurrent (E005) 3: Constant speed overcurrent (E006) 4: Acceleration overvoltage (E002) 5: Deceleration overvoltage (E00A) 6: Constant speed overvoltage (E003) 7: Undervoltage fault (E001) 8: Motor overload (E007) 9: Inverter overload (E008) 10: Input side phase loss (E012) 11: Output side phase loss (E013) 12: The inverter module is overheated (E00E) 13: Snubber resistor overload (E014) 14: The contactor pulls in abnormally (E017) 15: External fault (E00d) 16: Communication failure (E018) 17: Current detection fault (E015) 18: Motor self-learning fault (E016) 19: Running time arrives (E020) 20: EEPROM failure (E00F) 21: Motor to ground short circuit fault (E023) 22: PID feedback lost during runtime (E02E) 23: Encoder/PG card abnormal (E026) 24: Inverter hardware abnormality (E033) 25: Power-on time arrives (E029)	–	●
F09.28	Type of previous failure		–	●
F09.29	The first two failure types		–	●

function code	Name	Predetermined area	Factory default	Change
		26: Load drop (E030) 27: Fast current limit timeout (E032) 28: The speed deviation is too large (E034) 29:Switch the motor during operation (E038) 30: Motor overspeed (E035) 31: Motor overtemperature (E036) 32: Initial position error (E037)		
F12 Multi-stage speed control				
F12.02	Multi-speed 0	−100. 0%～100. 0%	0.0%	※
F12.03	Multi-speed 1	−100. 0%～100.0%	25.0%	※
F12.04	Multi-speed 2	−100. 0%～100. 0%	37.5%	※
F12.05	Multi-speed 3	−100. 0%～100. 0%	50.0%	※
F12.06	Multi-speed 4	−100. 0%～100. 0%	62.5%	※
F12.07	Multi-speed 5	−100. 0%～100. 0%	75. 0%	※
F12.08	Multi-speed 6	−100. 0%～100. 0%	87.5%	※
F12.09	Multi-speed 7	−100. 0%～100. 0%	100.0%	※
F12. 51	Multi-stage speed 0 given mode		1	※

Chapter VI Fault Diagnosis and Countermeasures

6.1 Fault alarm and countermeasures

The BD612 inverter has a total of 21 warning messages and protection functions. Once a fault occurs, the protection function will act, the inverter will stop output, the inverter fault relay contact will act, and the fault code will be displayed on the display panel of the inverter. Before seeking service, users can conduct self-examination according to the prompts in this section, analyze the cause of the fault, and find out the solution. If it belongs to the reasons mentioned in the dotted line box, please seek service, contact the agent of the frequency converter you purchased or contact our company directly.

Panel display	Fault name	Troubleshooting	Troubleshooting
E001	Bus undervoltage fault	1. Momentary power failure 2. The voltage at the input terminal of the inverter is not within the range required by the specification 3. The inverter hardware is damaged	1. Reset fault 2. Adjust the voltage to the normal range 3. Seek technical support
E002	accelerated overvoltage	1. The input voltage is too high 2. During the acceleration process, there is an external force to drive the motor to run 3. Acceleration time is too short 4. No braking unit and braking resistor installed	1. Adjust the voltage to the normal range 2. Cancel the external power or install braking resistor 3. Increase the acceleration time 4. Install brake unit and resistor
E003	Constant speed overvoltage	1. The input voltage is too high 2. There is an external force to drive the motor during operation	1. Adjust the voltage to the normal range 2. Cancel the external power or install braking resistor
E004	Acceleration overcurrent	1. There is grounding or short circuit in the output circuit of the inverter 2. The acceleration time is too short 3. Manual torque boost or V/F curve is inappropriate 4. Low voltage 5. Start the rotating motor 6. Sudden load increase during acceleration 7. The selection of frequency converter is too small	1. Eliminate peripheral faults 2. Increase the acceleration time 3. Adjust manual lifting torque or V/F curve 4. Adjust the voltage to the normal range 5. Select speed tracking start or start after the motor stops 6. Cancel sudden load 7. Choose a frequency converter with a higher power level

Panel display	Fault name	Troubleshooting	Troubleshooting
E005	Deceleration overcurrent	1. There is grounding or short circuit in the output circuit of the inverter 2. The deceleration time is too short 3. Low voltage 4. Sudden load increase during deceleration	1. Eliminate peripheral faults 2. Increase the deceleration time 3. Adjust the voltage to the normal range 4. Cancel the sudden load
E006	Constant speed overcurrent	1. There is grounding or short circuit in the output circuit of the inverter 2. Low voltage 3. Whether there is a sudden load during operation 4. The selection of frequency converter is too small	1. Eliminate peripheral faults 2. Adjust the voltage to the normal range 3. Cancel the sudden load 4. Choose a frequency converter with a higher power level
E007	Motor 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 a higher power level
E008	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 a higher power level
E00A	Deceleration overvoltage	1. The input voltage is too high 2. During the deceleration process, there is an external force to drive the motor to run 3. The deceleration time is too short 4. No braking unit and braking resistor installed	1. Adjust the voltage to the normal range 2. Cancel the external power or install braking resistor 3. Increase the deceleration time 4. Install brake unit and resistor
E00d	External failure	Input external fault signal through multi-function terminal S	Reset operation

Panel display	Fault name	Troubleshooting	Troubleshooting
E00E	Inverter module overheat fault	1. The ambient temperature is too high 2. The air duct is blocked 3. The fan is damaged	1. Reduce the ambient temperature 2. Clean the air duct 3. Replace the fan
E00F	EEPROM failure	EEPROM Chip Damage Troubleshooting Countermeasures	Replace the main control
E013	Output side phase loss	1. The lead wire from the inverter to the motor is abnormal 2. The three-phase output of the inverter is unbalanced when the motor is running 3. The driver board is abnormal	1. Eliminate peripheral faults 2. Check whether the three-phase winding of the motor is normal and troubleshoot 3. Seek technical support
E015	Current sense failure	1. The driver board is abnormal	1. Replace the driver board
E018	Communication fail	1. The upper computer is not working properly 2. The communication line is abnormal 3. The setting of communication parameter F13 group is incorrect	1. Check the wiring of the host computer 2. Check the communication cable 3. Correctly set the communication parameters
E020	Cumulative running time reached fault	The cumulative running time reaches the set value	Use the parameter initialization function to clear the record information
E029	Cumulative power-on time reached fault	Accumulated power-on time reaches the set value	Use the parameter initialization function to clear the record information
E030	load drop fault	The running current of the inverter is less than F09.13	Confirm whether the load is disengaged or whether the parameter settings of F09.14 and F09.14 conform to the actual operating conditions
E033	Inverter hardware abnormality	1. There is overvoltage 2. There is an overcurrent	1. Handle according to overvoltage fault 2. Handle according to overcurrent fault

Panel display	Fault name	Troubleshooting	Troubleshooting
E036	Motor over temperature fault	1. The wiring of the temperature sensor is loose 2. The temperature of the motor is too high	1. Check the wiring of the temperature sensor and troubleshoot 2. Reduce the carrier frequency or take other heat dissipation measures to dissipate heat from the motor
E038	Switching motor failure while running	Change the current motor selection through the terminals during the operation of the inverter	Perform motor switching operation after the inverter stops

6.2 Common faults and their solutions

The following fault conditions may be encountered during the use of the inverter, please refer to the following methods for simple fault analysis:

Table 6-1 Common faults and their solutions

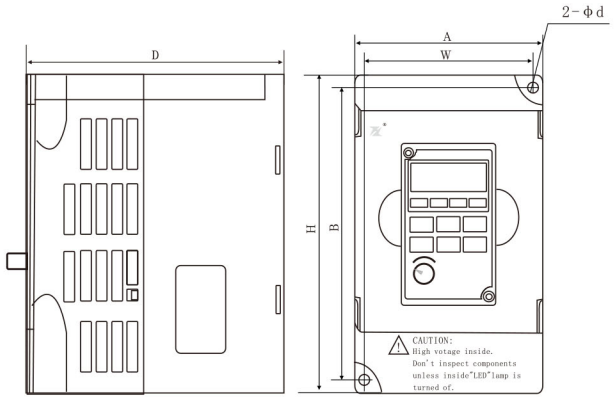
Panel display	Fault name	Troubleshooting	Troubleshooting
1	No display after power on	The grid voltage is not available or is too low; The switching power supply on the inverter drive board is faulty; The rectifier bridge is damaged; The buffer resistance of the inverter is damaged; Control board, keyboard failure; The connection between the control board, the driver board and the keyboard is broken;	Check the input power; Check bus voltage; Re-insert the 34-core cable; Seek manufacturer services;
2	No display after power on	Poor connection between the driver board and the control board; Related components on the control board are damaged; There is a short circuit to the ground of the motor or the motor line; Hall failure; Grid voltage is too low;	Pull out the ferrule cable again; Seek manufacturer services;

Appendix B: Dimensions

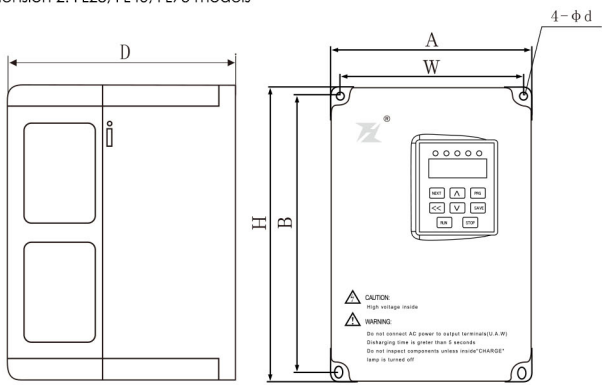
● Adaptive power and dimensions

Model	Specifications	Adaptive power (kw)	Size （mm）					
			A	B	H	W	D	d
FL22	BD612-0R7-2-DK	0.75	100	141	151	89	117	5
	BD612-1R5-2-DK	1.5						
FL28	BD612-2R2-2-DK	2.2	125	159	170	113	142	5
	BD612-1R5-4-DK	1.5						
	BD612-2R2-4-DK	2.2						
FL40	BD612-3R7-2-DK	3.7	154	238	250	142	155	5
	BD612-5R5-2-DK	5.5						
	BD612-7R5-2-DK	7.5						
	BD612-3R7-4-DK	3.7						
	BD612-5R5-4-DK	5.5						
	BD612-7R5-4-DK	7.5						
FL75	BD612-011-2-DK	11	205	300	322	190	193	6.5
	BD612-015-2-DK	15						
	BD612-011-4-DK	11						
	BD612-015-4-DK	15						
	BD612-018-4-DK	18.5						

1. Dimension 1: FL22 model



2. Dimension 2: FL28, FL40, FL75 models



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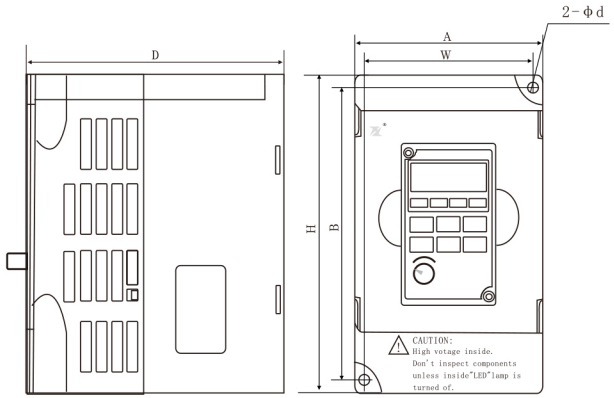
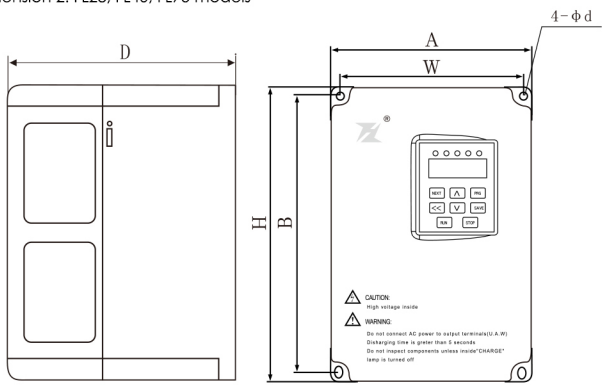
	BD612-5R5-2-DK	5.5						
	BD612-7R5-2-DK	7.5						
	BD612-3R7-4-DK	3.7						
	BD612-5R5-4-DK	5.5						
	BD612-7R5-4-DK	7.5						
FL75	BD612-011-2-DK	11	205	300	322	190	193	6.5
	BD612-015-2-DK	15						
	BD612-011-4-DK	11						
	BD612-015-4-DK	15						
	BD612-018-4-DK	18.5						

1. Dimension 1: FL22 model



2. Dimension 2: FL28, FL40, FL75 models



Appendix C: Selection of Accessories

1. Selection of braking unit and its braking resistor

Voltage level	Inverter power	Braking resistor			Braking torque (10%UD)
		Power W/ resistance (Ω)		Quantity	
220V	1. 5kW	300	68	1	100%
	2. 2kW	300	68	1	
	3. 7kW	400	30	1	
	5. 5kW	400	30	1	
	7. 5kW	400	30	1	
380V	0. 75kW	200	300	1	
	1. 5kW	200	200	1	
	2. 2kW	400	150	1	
	3. 7kW	400	100	1	
	5. 5kW	750	75	1	
	7. 5kW	1000	60	1	
	11kW	1500	40	1	
	15kW	2500	30	1	

Precautions:

1. Please choose the wattage and resistance value recommended by our company.
2. The power and resistance value recommended in the above table are calculated based on 100% of the braking torque and 10% of the operating frequency. In the case of meeting the load requirements and system reliability, the resistance power and resistance value can be appropriately increased or decreased; if required When the braking torque is increased or the frequency of use is high, the power and resistance value of the braking resistor should be appropriately changed, or consult our company.
3. When installing the braking resistor, please be sure to consider the safety and flammability of the surrounding environment.

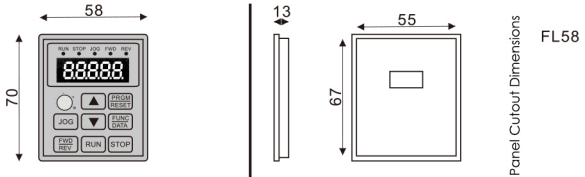
2. Panel lead wire specifications

FL — WX 0100

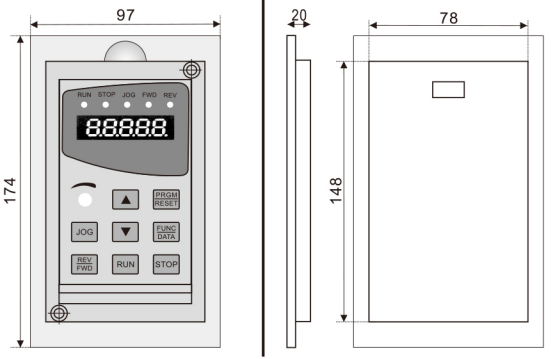
Model	Length
0100	1.0M
0150	1.5M
0200	2.0M
0250	2.5M
0300	3.0M

3. Dimensions of the panel:

1) Five-digit display panel 1 (FL58):

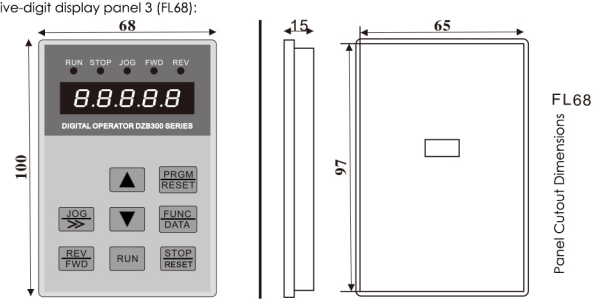


2) Five-digit display panel 2 (FL75):



Note: FL75 panel installation must be installed with a panel box. The above picture shows the external dimensions and opening dimensions of the panel box.

3) Five-digit display panel 3 (FL68):



Product Warranty Agreement

1. The warranty period of this product is 12 months from the date of shipment (subject to the production date of the barcode on the product body). During the warranty period, if the product fails or is damaged under normal use according to the user manual, our company will provide free maintenance .

2. Specific terms of quality assurance that are indeed the responsibility of the manufacturer:

a. Return, replacement and warranty within one month after shipment

b. Replacement and warranty within three months after shipment

c. Warranty within twelve months after shipment

3. No matter when and where you use the company's products, you will enjoy life-long paid services.

4. The company's offices, sales and agents all over the country can provide after-sales service for this product, and the service conditions are as follows:

a. "Level 3" inspection services (including troubleshooting) at the location of the unit

b. It is necessary to follow the responsibility standards for after-sales service in the content of the contract signed between the company and the distribution agent

c. You can seek after-sales service (whether warranty or not) from the company's distribution agencies for a fee

5. If the fault is caused by the following reasons, even within the warranty period, it is also a paid repair:

a. Problems caused by incorrect operation (according to the instruction manual) or self-repair or modification without permission;

b. Problems caused by the use of frequency converters beyond standard specifications;

c. Human factors such as falling or improper handling after purchase;

d. Device aging or failure caused by bad environment;

e. Damage caused by earthquake, fire, wind and water disaster, lightning strike, fault voltage or other natural disasters or accompanying causes of disasters;

f. Due to damage during transportation (Note: The transportation method is specified by the customer, and the company handles it on its behalf);

g. When the brand, trademark serial number, nameplate, etc. marked by the manufacturer are damaged or unrecognizable;

h. Failing to pay off the payment in accordance with the purchase agreement;

i. The installation, wiring, operation, maintenance or other usage conditions cannot be objectively and realistically described to the service unit of the company;

j. For the service of refund, replacement and warranty, the goods need to be returned to the company, and the responsibility can only be returned or repaired after the attribution of responsibility is confirmed.

5. The final interpretation right of this warranty agreement belongs to Zhejiang Xinfuling Electric Co., Ltd. suoyou

A card inverter warranty

User units:	
Address:	
post code:	Contact person:
Telephone:	Fax:
Model No.:	
Power:	
Contract No:	Purchase date:
Service Units:	
Contact person:	Telephone:
Maintenance staff:	Telephone:
Maintenance date:	
User comments on service quality: ☐good ☐ better ☐generally ☐ Poor evaluation Other comments: user signature: Year Month Day	
Customer service center return visit record: ☐ Telephone interviews ☐ Letter return visit Other: Signature of technical support engineer: Year Month Day	

B card inverter warranty

Model:	Bill number:
Serial number:	Purchase date:

Dear Customer:

Welcome to choose Fuling frequency converter.

1. From the date of purchase, you will enjoy our company's "three guarantees service". Due to product quality problems, you can get: one month refund from the date of delivery; three months replacement, twelve months free warranty Serve. For maintenance services after twelve months, the company will charge the normal material cost.
2. Please keep card B after purchase and return card A within 10 days, otherwise the company will only provide paid warranty.
3. Please indicate the serial number of the product and the ticket number when repairing.
4. The company only provides paid services for failures caused by natural and human factors, or improper repairs, wrong use beyond the scope of use, etc.