

**YTB-S-LT Model Special Frequency  
Converter for Bobbin Winder**

**User's Manual**

**Shanghai Yatai Instrumentation Limited Company**

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## Advising to the Clients

## 1. Security

### Danger!

- ★ Converter will be installed in the place, where the absence of flammable and explosive gas was strictly prohibited, **else may cause to an explosion.**
- ★ Only can the professionals operate the converter in installation, wiring operating and maintenance, **otherwise may be to endanger the property and the personal safety.**
- ★ The converter ground terminal PE() must be reliable grounding (ground impedance must less than 4Ω), **otherwise it may endanger the personal safety.**
- ★ The common terminal (CM) of internal power in the converter is not allowed to short circuit with the zero power line, **otherwise it will damage the converter and the property.**
- ★ Before putting power on the converter, it must be sure that the wiring is correct and the cover board is installed well.
- ★ After the converter is power on, strictly forbid to touch the terminals electrified. **Otherwise it will jeopardize the personal safety.**
- ★ Before wiring and maintenance, must turn off the power supply. **Otherwise it will also jeopardize the personal safety.**
- ★ In the period (10 minutes) of turning off the power on the converter, or when the voltage of the DC bus is larger than 36V, please do not carry out any maintenance operations or touch the internal circuitry and devices, **otherwise it will also jeopardize the personal safety.**

### Warning!

- Before putting power on the converter, must recognize that the input supply voltage of converter is right, **otherwise it will damage the converter, and even to cause fire disaster.**
- Don't drop the screwdriver, screw or other metal objects into the converter. **Otherwise it will damage the converter and may also cause fire disaster.**
- Do not install the converter under the sunlight or close up the cooling holes on the converter. Otherwise, it will reduce output power of the converter.

- Strictly prohibit connecting the input power line to the terminals U、V、W、U1、V1 and W1. Otherwise it will damage the converter and may cause fire disaster.
- The wiring line of control loop should be separated far from the power line each other; otherwise it may affect the normal status of the converter or other devices.



Pay Attention to the Following Items,

- ◆ Before operating of the converter please read this manual carefully.
- ◆ The storage and installation of the converter must avoid the environment with strong vibration, strong corrosion, high dust, high temperature and high humidity.
- ◆ Must carry out regular checks whether or not the input and output wiring of the converter is correct and the other electrical equipments are aging.
- ◆ Electrical insulation strength must be checked before installing and operating the converter.
- ◆ When the motor is frequently used in the operation with low-speed, additional cooling measures must be taken to the motor.
- ◆ Do not connect variable resistors and capacitors to the converter output trying to improve the power factor. If you need to install circuit breaker between the output of the converter and the motor, you have to ensure that the circuit breaker of the converter only acts at the zero output current.
- ◆ The protection level of the YTB-S-LT converter is IP20.
- ◆ After using the converter for 1 to 3 months, cleaning treatment to the internal parts and the radiator is recommended. If the converter is not used for a long time, it is needed to turn power on some time in an interval of certain period (one month is recommended).

## 2. Brief Introductions to the Product

### 2.1 Model and the Nameplate of the Product

The model example of the YTB-S-LT series frequency converter is shown in Figure 2-1, the nameplate example is shown in Figure 2-2 (here, we take the 0.4KW single-phase input converter as the example).

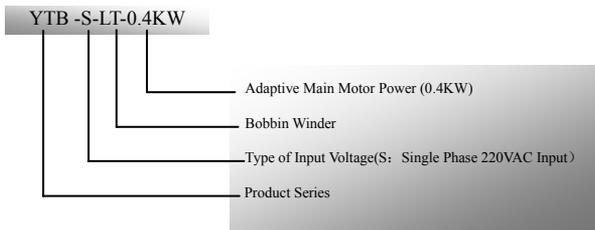


Figure 2-1 Example of the Product Model

名称 name	络筒机专用变频器
型号 model	YTB-S-LT-0.4KW
规格 specify	0~220VAC/0.4KW
编号 Product No.	200812056
检验合格 (Test Pass)	
 上海亚泰仪表有限公司	

Figure 2-2 The Nameplate Example

### 2.2 The List Table of the YTB-S-LT Series Products

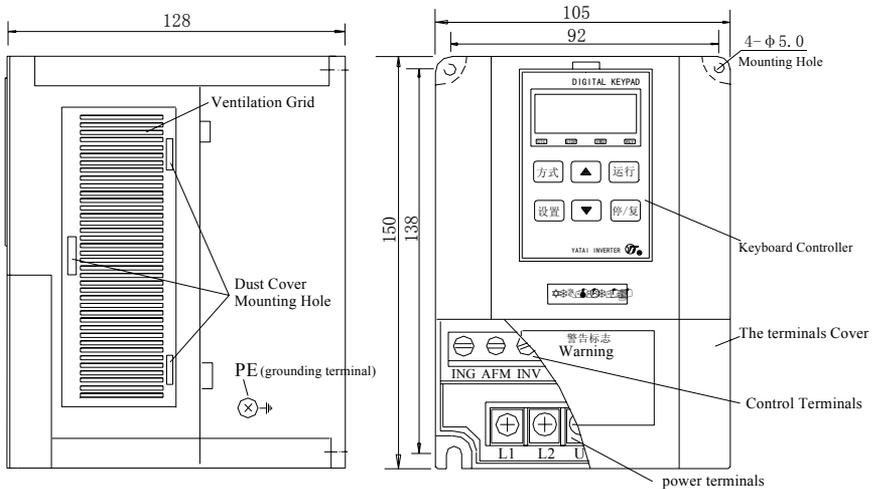
Table 2-1 List Table of the YTB-S-LT Series Products

Model	Winding Motor		Extra-Feeding Motor		Cooling Type
	Power (KW)	Rating Output Current(A)	Power (KW)	Rating Output Current (A)	
YTB-S-LT-0.4KW	0.4	2.5	0.1	0.6	Self-Cooling

YTB-S-LT-0.75K W	0.75	4.5	0.2	1.2	Wind Cooling
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### 2.3 Appearance of the Product

The upper casing of the YTB-S-LT series converter is made of plastic and the lower casing is a structure made by cast aluminum, its appearance is with the characteristics of beautiful shape, high-intensity, toughness and fast cooling and shown in Figure 2-3.



YTB-S-LT-0.4KW外型及操作面板图

Figure 2-3 Structure Chart of the Plastic Shell

### 2.4 Performance Index

Item		Content
Input	Voltage Range	220V±15%
	Frequency Range	50/60Hz (±5%)
Output	Voltage Range	Three Phase 0~220V
	Frequency Range	10.00~150.0Hz (Frequency Resolution 0.01Hz)
	Overload Ability	150% of Rating Output, Overload Time:60 Sec

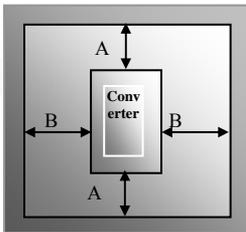
Control Type	Frequency Setting Accuracy		Digital Setting: 0.01Hz
	Modulation Mode		Vector modulation for Optimization of Space
	V/F Curve		18 Compensating Curves
	PI Control		Internal PI Controller to Facilitate the Automatic Control
Operation	Speed Control Mode	Winding Motor	1) Speed Adjusting with Decreasing Frequency 2) PI Speed Adjusting 3) Swing Frequency Speed Adjusting 4) Speed Adjusting with Increasing Frequency
		Extra-feeding Motor	1) Constant Velocity 2) Varied Velocity 3) Velocity Adjusting with Increasing Frequency 4) Velocity Track 5) Varied Velocity 2 6) Velocity Adjusting with Decreasing Frequency
	Start-up		Start-up by Keyboard, Start by Terminals
	Machine Halt		Machine Halt by Keyboard, Machine Halt by Terminals
Memory	Automatic Memory after Power Off (Current Length and Frequency)		
Protection Function	Under-voltage, Over-voltage, Over-current, Converter Overload, Overheat etc.		
Display	LED digitally display the current output frequency (or the current velocity), the current length, the setting length, the type of fault, the parameter of function code and the operating parameters. Four LED indicators indicate immediately the current converter operating status		
Ambient Condition	Environment	No strong corrosion or dust	
	Level Above the Sea	1,000 meters below the sea level	
	Ambient Temperature	-10°C ~+50°C	
	Ambient Humidity	Below 90% (No water condensation phenomenon)	
	Vibration Intensity	Below 0.5g (Acceleration)	
Adaptive Motor Power	0.4~0.75KW		

### 3. Installation and Wiring

#### 3.1 Installation

##### 3.1.1 The Installation Direction and Space

In order to benefit the heat dissipation of the converter, it is needed that installation of the converter must in vertical direction (as shown in Figure 3-1); and must guarantee sufficient ambient ventilation space. The table 3-1 gives out the size of clearance space for installing the converter (recommended value).



Wall Type

Table 3-1 Gap size

Type of Frequency Converter	Gap Size	
Wall Type	A ≥ 150mm	B ≥ 50mm

Figure 3-1 Converter Installation

##### 3.1.2 Installation Environment

- ◆ Without rain, water droplets, steam, dust and oily dust; no corrosive, flammable gas, liquid and no metal particles or metal powder, and so on.
- ◆ Ambient temperature at -10 °C ~ +50 °C.
- ◆ Level above the sea is less than 1,000 meters.
- ◆ Environmental relative humidity must be below 90%, with no water condensation phenomenon.
- ◆ No strong electromagnetic interference
- ◆ Vibration intensity is less than 0.5g (Acceleration)
- ◆ If the frequency converter is installed in the control cabinet, should guarantee that the control cabinet must have the ventilation flow with outside.

#### 3.2 Terminals Explanation

The terminals of YTB-S-LT series converter include the power terminals and the control terminals, following is a description of each terminal respectively.

### 3.2.1 Explanation of the Power Terminals



Figure 3-2 Diagram of the Power Terminals

Table 3-2 Explanation of the Power Terminals

Terminal Name	Terminal Label	Explanation of the Terminal Function
Terminals of Power Input	L1、L2	Terminals for Single Phase 220V Alternative Voltage
Terminals of Converter Output	U、V、W	Terminals for Primary Power Output of the Converter, which is connected to Winding Motor
	U1、V1、W1	Terminals for Secondary Power Output of the Converter, which is connected to Extra-Feeding Motor

Note: Converter ground terminal  is on the right lateral side of the aluminum case.

### 3.2.2 Explanation of the Control Terminals



Figure 3-3 Diagram of the Control Terminals



Notice: The tightening torque moment of the control terminals is 5kgf.cm.

Table 3-3 Brief Introduction to the Control Terminals

Classification	Terminal Name	Factory Function	Function Explanation	Specification
Control Terminals of the Oil-feeding Motor	ING	Ground of the Control Power	Ground of the Control Power of the Oil-feeding Motor	
	AFM	Output Terminal	Control Output Terminal of the Oil-feeding Motor	
	INV	Control Power	Control Power/12V of the Oil-feeding Motor	
Terminal Output	OUT1	Continuous Time Adjustable Output Signal	Used as the signal of Yarn Broken, Machine Halt or Full Yarn Indicating	The Maximum Output Current is 100mA

	OUT2	Operation Indicating Signal	Used to Indicate Operation	
Terminal Input	AD1	Input Terminal	The Signal Input for the Tension Control	Reserved
Power Source	+12V	Control Power	Auxiliary Power for the Output and Input Terminals, the Common Terminal of the Power Source is the CM Terminal	
Common Terminal	CM	Common Terminal	Common Terminal of 12V Power Source and Terminals of OP1 ~ OP4	Not allow to short with the terminal "PE"
Terminal Input	OP1	Operating Terminal	Only this terminal shorts with CM, then the frequency converter can be in running.	
	OP2	Pulse Terminal	This terminal coordinates with and 12V and CM, can be used as an input port for the pulse signal	
	OP3	Machine halt/Reset	the specific function can see 5-08	
	OP4	Yarn broken Measurement	This terminal coordinates with and 12V and CM, can be used as an input port for the yarn broken signal	
Reference Power Source	5V	Voltage Power	5V Reference Power , the reference point is at the GND terminal	DC: 5V <100mA
Control Signal of stepper motor	SCK	Control Terminal of the stepper motor	Voltage Output of Pulse	Maximum Output Voltage: 5V Maximum Output Current: 20mA

### 3.3 System Wiring

#### 3.3.1 Basic Wiring Diagram of the converter

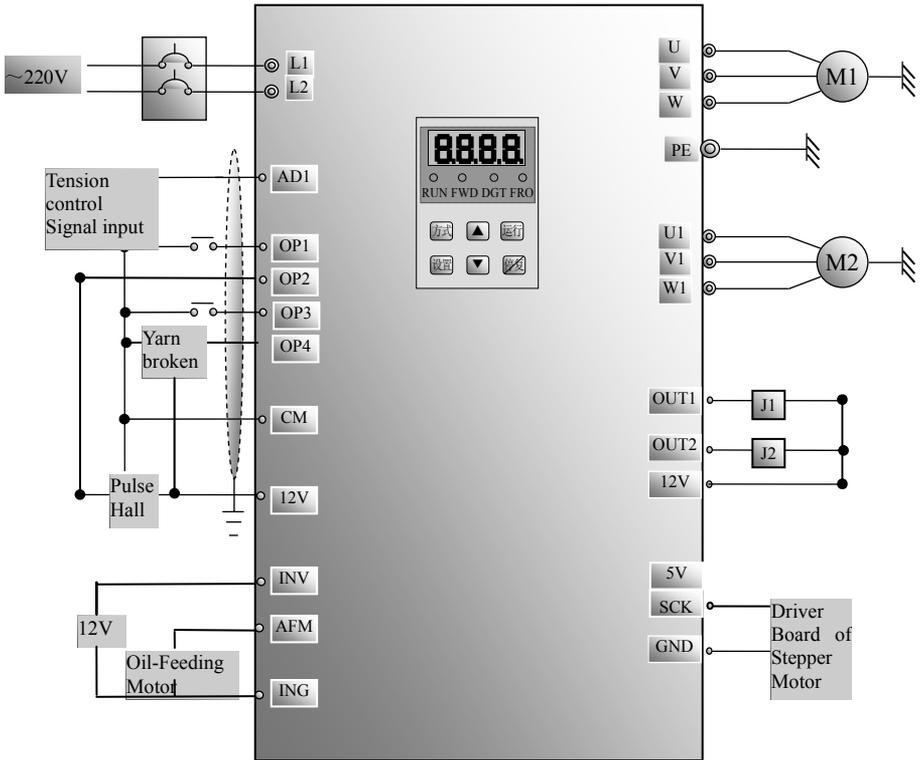


Figure 3-4 Basic Wiring Diagram of the Converter

- Notice: 1. Terminal of Primary Loop    Terminal of Control Loop
2. Control loop is recommended to adopt the shielding line
3. OUT1, OUT2 are connected to indicator or relay externally

### 3.3.2 Reference of the Loop Wiring

Table 3-4 Loop Wiring Reference Table

Converter Model	Input Capacity	Input Current	Primary Output Power	Rating Output Current (A)	Power Circuit Wiring (mm <sup>2</sup> )
YTB-S-LT-0.4KW	Single Phase 220V, 1KVA	5A	0.4KW	2.5	1.5
YTB-S-LT-0.75KW	Single Phase 220V, 2KVA	9A	0.75KW	4.5	2.5

◆The longest distance of input and output lines ought to be within 300 meters in order to ensure the electromagnetic compatibility requirements.

◆ Control circuit wiring and power circuit wiring should be separated from each other, can not be placed in the same cell line pipe in order to avoid possible interference.

◆ Control loop should be selected with the multi-layer shielding cored wire, so as to reduce or avoid the electromagnetic interference.

## 4. Operation and Display

### 4.1 Keyboard Controller

#### 4.1.1 Explanation of the Operating Panel

The size and appearance of the controller keyboard of YTB-S-LT series frequency converter can see the note of Figure 4-1. .

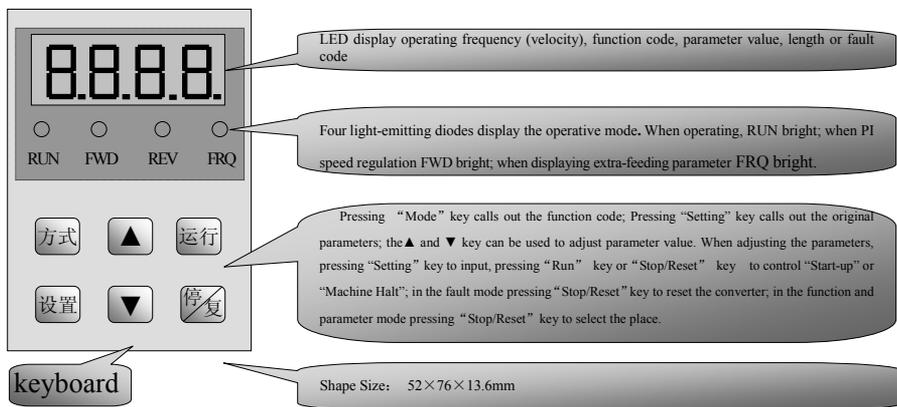


Figure 4-1 Keyboard Controller

方式: Mode; 运行: Run; 设置: Setting; 停/复: Stop/Reset; 操作面板: Operating Panel (keyboard)

#### 4.1.2 Explanation of the keys on the Keyboard

Table 4-1 Explanation of the keys

Key	Name	Explanation
方式	"Mode" Key	In the Mode of Machine Halt or Operating this key can switch the display content, such as the Current Length, Setting Length, Current Frequency(Velocity), Extra-feeding Display and Function Code; Entering "Function Code Edit" display mode; In the parameter modifying status, pushing down this key will return to the display mode of "Function Code Edit" without saving the modified data.

	“Setting” key	From “Function Code Edit” display mode to the display mode of “Function Code Parameter Modifying”, then in the “Function Code Parameter Modifying” display mode, this key is used for data storage and returning to the “Function Code Edit” mode.
	“Raising” key	In the “Function Code Edit” display mode and “Function Code Parameter Modifying” display mode, this key is used to increase data progressively.
	“Drop” key	In the “Function Code Edit” display mode and “Function Code Parameter Modifying” display mode, this key is used to decrease data progressively.
	“Run” key	Start-up the operation of the converter.
	“Stop/Reset” key	This key is a multiplex key: 1): Reset in the protection mode; 2): In the “Function Code Edit” display mode and parameter setting, this key is used to select the data’s place; 3): In the Machine Halted state, press this key 3 second successively can forcible reset and clear the length.

## 4.2 Setting of the Function Parameters

User can change the parameters of the function code to carry out different applications. After power on again, if user needs to set the parameters, he must input firstly the user’s password (the factory setting value or restoring the factory setting value, the password is 8) in the display number 0-00. Only after inputting the accurate password then can modify new password again.

Table 4-2 Steps to set the parameters

Step	Key	Operation	Display
1		Pushing the “Mode” key to display the function code.	
2		Pushing the “Stop/Reset” key to select the data place, the selected place is displayed with twinkle to show that this place is able to be edited. If choose 0-00 and push the “▲/▼”key, than can select the function code district. If choose 0-00 or choose 0-00 and push “▲/▼”key, then can address the needed modified function code.	
3	 or 	Push the “▲/▼”key to select the needed function code.	
4		Push the “Setting” key to read the setting data in the function code. At this time, the default selected edited place is twinkle.	
5		Push the “Stop/Reset” key to select the needed edited place and the selected data place is displayed with twinkle to show that this place is able to be edited.。	

6	▲ or ▼	Push the “▲/▼”key to modify the selected data place.	2000
7	设置 or 方式	Push the “Setting” key to store the setting data and return to the current function code. Push the “Mode”key to display function code, but the changed value is invalid.	0-05

Operations in Table 4-2 are indicated in Figure 4-2:

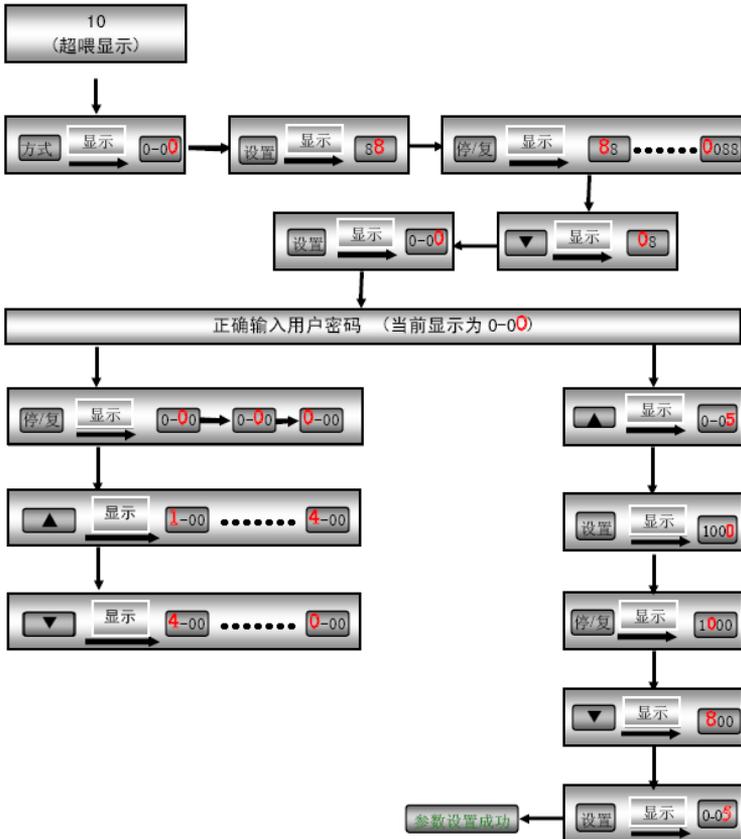


Figure 4-2 The Diagram of steps in setting parameters

超喂显示 Extra-feeding Display    设置 Setting    显示 Display    停/复位 Stop/Reset  
 正确输入用户密码 Input the User's Password Accurately (Current Display is 0-00)

参数设置成功 Success of parameter setting

### 4.3 Illustration of the Display Items

Table 4-3 List of the display Items

Display Item	Illustration
-YT-	Process of the power on to reset, after reset the value of length is displayed.
60.00	Current operating frequency, parameter's setting value and so on.
1000	Display the current length of the spinning yarn.
0-00	Function code
OVER	Prompt of the spindle full, need to replace the spindle
□	Prompt of the yarn broken, need to connect yarn again.
OC	Over-current protection instruction for the primary winding motor, the output current is too large (Fault)
OC1	Over-current protection instruction for Extra-feeding motor, the output current is too large (Fault)
OE	Over-voltage protection instruction, voltage at DC side is too high (Fault)
PO	Under-voltage protection instruction, voltage at DC side is too low (Fault)
OL	Overload protection instruction, the load is over weight.
Err1	Prompt the error of the incorrect password that the user entered.
Err2	Have no detected the Hall pulse of machine halt instruction when operated time is passed the setting value of 4-02 or in the PI control the velocity is too low.
Err3	Communication Breakdown
Err4	External Storage Breakdown
dT...	The Factory Values are being restored and display of dT...expresses that the data are in communication.
rSt	Prompt of the forcible reset

Sequence of the keyboard controller's display: Current Length—Setting Length—Current Frequency—

Extra-feeding Display—Function Code—Current Length.

PI Control: Current Length—Setting Length—Current Velocity—Extra-feeding Display—Function Code—Current Length.

When display the Extra-feeding parameters, the indicator FRT on panel is bright.

**Notice:** When the Fault information is emerged, it is needed firstly to analyze and examine the cause of the Fault, please don't run the "Reset" operation immediately.

**Matters Needed to Attention:**

- ◆ In setting of the function parameters, beside that the parameters in the extra-feeding parameters district can be modified in on-line operating, the other parameters must be modified in the Machine Halt state and after the parameters are modified it is needed to forcible reset at first then can operate the machine normally.
- ◆ The steps of modifying the password is the same as modifying parameters. After the password is modified please safekeeping it properly.
- ◆ The setting steps of other parameters can refer to the illustrations above.
- ◆ Please don't try to modify the parameters that are unwanted to alter.
- ◆ In operating, please take notice of that the start-up and machine halt of the extra-feeding motor and the winding motor must keep synchronous basically. That is to say, the difference between the acceleration time and the deceleration time of the winding motor and them of the extra-feeding motor cannot be too large. So it is needed to debug their operation synchronously by function code 5-03 and 5-04. When machine halt, must wait the two motors both stop firmly and the operating indicator has turned off, and then the machine can be started-up again.
- ◆ When breaking the extra-feeding, the braking time is not suitable to set too long in order to avoid injuring the motors.
- ◆ If do not intend to employ the extra-feeding motor, please set the 5-00 to 0.
- ◆ When employ the Swing Frequency, please adopt the internal counting, and don't adopt the terminal's counting.

## 5. Parameters and Function Codes

YTB-S-LT Series specific winding converter provides users with the following function parameters. By modifying the value of these parameters, the frequency converter can meet various requirements of users.

### 5.1 Zoom Table of the Parameters and Function Codes

Table 5-1 Table of the Parameters and Functions Codes

Function Code	Illustration of Function	Setting Range	Unit	Factory Value	Change	
District Of Basic Winding Parameter	0-00	User Password	0~9999	Non	8	×
	0-01	Acceleration Time	0.1~300.0	Second	3.0	×
	0-02	Deceleration Time	0.1~300.0	Second	3.0	×
	0-03	Carrier Frequency	2~10	KHz	3	×
	0-04	Compensation Torque Curve	1~18	Non	4	×
	0-05	Setting of the Length	100~9999	Non	1000	×
	0-06	Type of Frequency Adjusting	0:Frequency decrease progressively Control 1:PI Control 2:Frequency Sway Control 3:Frequency increase progressively Control 4: Constant Tension	Non	0	×
	0-07	Restore the Factory Values	0: No 1: Yes	Non	0	×
	0-08	Preservation		Non	0	×
	0-09	Display Selection of the Extra-feeding Parameter	0: Display Velocity 1: Display Operating Frequency	Non	0	×

	0-10	Preservation		Non	0	×
District of the Constant Velocity PI Control	1-00	PI Control Coefficient	1~20	Non	5	×
	1-01	PI Control Time	0.1~10.0	Second	0.1	×
	1-02	Target Velocity	80~1200	Meter/Minute	300	×
	1-03	Roller Diameter	10.0~50.0	mm	22.0	×
	1-04	Bobbin Diameter	30.0~200.0	mm	40.0	×
	1-05	Unit for Displaying length of the Yarn	0: Yarn Length=Setting of the length 1: Yarn Length=Setting of the length *10 2: Yarn Length=Setting of the length *100	Meter	0	×

Function Code	Function Illustration	Setting Range	Unit	Factory Value	Change	
Frequency-controlled District	2-00	Starting Frequency	Ending Frequency-150.0	Hz	60.00	×
	2-01	Ending Frequency	10.00-Starting Frequency	Hz	40.00	×
	2-02	Double Length Coefficient	2~1500	Non	15	×
	2-03	Swing Standard Frequency	0.50~100.0	Hz	30.00	×
	2-04	Amplitude of Swing Frequency	0~10.00	Hz	5.00	×
	2-05	Swing Cycle Number of times in one minute	0~30	R/min	15	×
	2-06	Rotate Speed Coefficient	0~200	Non	100	×

## Function Code 3 District is Invalid

District of the synthesis parameters	4-00	Time for Beginning Detect the time of Yarn broken	0.0~20.0	Sec	3.0	×
	4-01	Is or not Machine Halt for no pulse?	0:Yes 1:No 2:Internal Counting	Non	0	×
	4-02	Delay Machine Halt-Time of no pulse	0.0~10.0	Non	5.0	×
	4-03	OUT1 Selection of Output Terminal Function	0:Machine Halt, Indication of Yarn broken Output 1: Indication of Spindle full 2: Indication of Adjustable Machine Halt Output	Non	0	×
	4-04	OUT1 Output Lasting Time	0.0~10.0	Sec	5.0	×
	4-05	OUT2 Selection of Output Terminal Function	0: Indication of Operating 1: Indication of Machine Halt	Non	0	×
	4-06	Maximum Frequency Output of OUT1 at Machine Halt	0.00~20.00	Hz	0.00	×
	4-07	Preservation		Non	0	×
	4-08	Preservation		Non	0	×
	4-09	Selection of Yarn	0:Clear the Yarn broken Mark	Non	0	×

broken

with pushing Reset

1:Control Yarn broken Mark

			with the Yarn broken Signal			
4-10	Delay Time for Beginning of the PI Control	0.1~300.0	Sec	10.0	×	
4-11	Protected Value for the PI Control	20~100	m/min	50	×	
4-12	Type of Outputting Analog Voltage	0: No Voltage Output 1: Output Fixed Value 2: Output directly proportional to Winding Frequency	non	0	×	
4-13	Output Ratio Coefficient	0~100	%	0	×	
4-14	Output Modify Coefficient	1~200	%	100	×	

Function Code		Function Illustration	Setting Range	Unit	Factory Value	Change
Extra-feeding Parameter District	5-00	Setting of the operating Mode of the Extra-feeding Motor	0:Extra-feeding invalid 1:Constant Velocity 2:Varied Velocity 3:Frequency Increase 4: Varied velocity Track 5:Varied Velocity2 6:Extra-frequency decrease progressively	Non	0	×
	5-01	Target velocity of the Extra-feeding motor	80~1500	m/min	600	×
	5-02		30.0~100.0	mm	72.5	×

Extra-feeding

	wheel Diameter				
5-03	Extra-feeding Acceleration Time	0.1~300.0	Sec	3.0	√
5-04	Extra-feeding Deceleration Time	0.1~300.0	Sec	3.0	√
5-05	Extra-feeding Carrier Frequency	2~10	kHz	3	×
5-06	Extra-feeding Torque Compensation	1~18	Non	6	×
5-07	Selection of the Extra-feeding Motor Operation in the Yarn broken	0: Machine Halt with Deceleration 1: Machine Halt with high speed 2: Machine Halt with Direct Current Brake	Non	0	√
5-08	OP3 Function Selection	0: Machine Halt, Reset 1: Reset, Quick Halt of the Extra-feeding 2: Reset, Brake of the Extra-feeding	Non	0	√
5-09	Extra-Feeding Starting Frequency	5-14~120.00	Hz	50.00	√
5-10	Extra-feeding Stop	5-09~120.00	Hz	60.00	√

		Frequency				
5-11	Increment of the winding length	1~200	m	100	√	
5-12	Value of the Extra-feeding increased velocity	0.0~8.0	m/min	1.0	√	
5-13	Velocity Track Coefficient	1.00~4.00	Non	1.20	√	
5-14	Extra-feeding Start-up frequency	0.00~25.00	Hz	0.00	×	
5-15	Extra-feeding Brake voltage	0~60	V	40	√	
5-16	Extra-feeding Brake Time	0.0~10.0	Sec	0.5	√	
5-17	Starting Frequency of the Extra-feeding Brake	0.00-10.00	Hz	5.00	√	

√ Can modify in the states both operating and machine halt.

× Can modify only in the machine halt state but cannot modify in the operating state and can modify the parameters on debug probation. After finishing the process of debug, please do not modify again the parameters to the greatest extent. If it is in the state of displaying the function code in operating state, cannot halt the machine with the keyboard.

## 5.2 Detailed Explanation for the Function Codes

### Function Distract 0

0-00 Setting of the User Password	Setting Range: 1~9999	Factory Value: 8
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In order to prevent the converter parameters have been changed arbitrarily by other personals, a password function is set up for operating this converter. Only the user inputs the accurate password, the parameters then can be

modified. The Factory Value of the password is 8; the user can set it with another number by his desire. After modifying, please save valid password properly.

0-01 Acceleration Time	Setting Range: 0.1~300.0S	Factory Value: 3.0
------------------------	---------------------------	--------------------

Acceleration time is the time of the period from 0Hz to 50 Hz in beginning operation of the converter. This parameter is inappropriate to set too short, if that it is easy to jump to “OC” protection.

0-02 Deceleration Time	Setting Range: 0.1~300.0S	Factory Value: 3.0
------------------------	---------------------------	--------------------

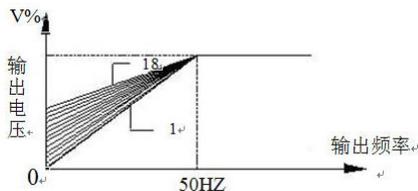
Deceleration Time is the period from 50Hz to 0Hz of the converter operating frequency in deceleration process. This parameter is inappropriate to set too short, if that it is easy to jump to “OE” protection.

0-03 Carrier Frequency	Setting Range: 2~10 KHZ	Factory Value: 3
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Carrier Frequency is namely the chopper frequency, which means the pulse frequency of PWM waves of the converter output. The higher the Carrier Frequency, the lower the electromagnetic noise of the motor; but the wear and tear of the switch would increase and the temperature rise also will be raised. So with the power of the converter increasing, ought to decrease the Carrier Frequency.

0-04 Selection of the Torque Compensation Curve	Setting Range: 1~18	Factory Value: 4
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In order to compensate the torque characteristics of the motor at lower frequency, the converter set up the following torque compensation curve (V / F curve), which should be used in accordance with the specific circumstance, in general circumstance do not have to be adjusted again.



输出频率 Output Frequency: 输出电压 Output Voltage

0-05 Length Setting	Setting Range: 100~9999	Factory Value: 1000
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This parameter refers to the length of spinning yarn, used together with 1-05 and 2-02, can set different spinning length, see the function introduction of 0-05 and 2-05 for details.

0-06 Frequency Adjusting Mode	0: Frequency Decrease Progressively Control 1: PI Control 2: Frequency Swing Control 3: Frequency Increase Progressively Control	Factory Value: 0
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When 0-06=0, selecting frequency decrease progressively mode to operate, its detailed function code setting can be seen in the introduction of frequency control district(District of Function Code 2).

When 0-06=1, selecting constant velocity mode to operate, its detailed function code setting can be seen in the introduction of constant velocity district(District of Function Code 1).

When 0-06=2, selecting frequency swing control mode to operate, its detailed function code setting can be seen in the introduction to the frequency control district(District of the Function Code 2).

When 0-06=3, selecting frequency increase progressively mode to operate, its detailed function code setting can be seen in the introduction to frequency control district(District of the Function Code 2).

Because the Starting Frequency must be larger than the Stopping Frequency, then when frequency increase progressively, the frequency is increased from the Stopping Frequency to the Starting Frequency. If the Stopping Frequency is equal to the Starting Frequency then the frequency converter is operated according to the Starting Frequency.

0-07 Restore the Factory Values	0: Do not restore all the Factory Values 1: Restore all the Factory Values	Factory Value: 0
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This parameter can clear all the settings and restore all the parameters of the converter to their Factory

Values, that is to say, if choosing its value as 1, then pushing the setting key can make all the parameters restore to their Factory Values. During the process of restoring the Factory Values, the “dT...” is displayed to express the data are in transferring: “data transferring”.

Function District 1 (When 0-06 is set as 1, this parameter district is valid.)

1-00	PI Control Coefficient	Setting Range: 1~20	Factory Value: 5
1-01	PI Control Time	Setting Rang: 0.1~10.0 S	Factory Value:0.1
1-02	Velocity	Setting Rang: 80~1200 m/min	Factory Value: 300

Parameter 1-02 is used to set the target velocity, namely the reference velocity of PI control; the parameters 1-00 and 1-01 are mainly used to control the response speed and control amplitude. If the user requires the rapid response for the change, he can set the parameter 1-01 to a smaller value; otherwise he should set it larger. If the user requires the extent by control every time with larger than the last one, he can set the parameter 1-00 as a slight large value (but inappropriate too large, if that it is easy to produce oscillation), else should set it smaller. Users can set these two parameters according to the actual situation, until to its suitable state.

1-03 Roller Diameter	Setting Range:10.0~50.0 mm	Factory Value:22.0
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This parameter is used to count the length of the spinning yarn and the velocity. By the sensor mounted on the converter, sampling the pulses which are passing through the OP2 Port on the terminal and sending to the CPU, then make the count of the length. As an instance: if 1-03 is set to 22.0 mm, 10 pulses every minute then the velocity is  $22.0 \times 3.14 \times 60 \div 1000 = 41.1$  m/min. Every 14.5 pulses ( $1000 \div 22.0 \div 3.14 = 14.5$ ) the length is increased by 1m.

1-04 Yarn Bobbin Diameter	Setting Range: 30.0~200.0 mm	Factory Value: 40.0
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This parameter is valid only for the empty spindle. It is mainly set up for estimating the operating velocity in the empty spindle state to make it convenient to operate immediately with near the setting velocity at the

beginning time, and then PI control the velocity. For instance: if 1-04 is set up to 40.0 mm, 1-02 is set up to 300m/min, then if 1 Hz is estimated according to 30 R/min, the target frequency for beginning operating is  $300 \times 1000 / 40.0 / 30 / 3.14 = 79.62\text{Hz}$ . When the target frequency setting up is above 150 Hz, for the purpose of protecting the machine equipment, the converter still operates according to 150 Hz.

1-05 Unit for Displaying the Yarn Length	Setting Range 0: Yarn Length=Length Setting 1: Yarn Length=Length Setting*10 2: Yarn Length=Length Setting*100	Factory Value: 0
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In the mode of constant velocity, this parameter is used to select the display accuracy of the digital display indicator, which is coordinately used with the function code of 0-05 to complete counting of the different length. For instance: if 0-05 is set up as 1000 and 1-05 is set up as 0 then the length of the spinning yarn is with the maximum value of 1000m and the display length is with the minimum value is 1 m; otherwise if the 1-05 is set up as 1, then the length of the spinning yarn is with the maximum value of 10000m and the display length is with the minimum value of 10m; else if the 1-05 is set up as 2 then the length of the spinning yarn is with the maximum value of 100000m and the display length is with the minimum value of 100m. The users can set up them according to the actual situation.

Function 2 (Only the 0-06 is set up as no "1", the parameters in this data district are valid.)

2-00 Starting Frequency	Setting Range: Lower Limit Frequency~150.0Hz	Factory Value: 60.00
2-01 Stopping Frequency	Setting Range: 10.00Hz~Upper Limit Frequency	Factory Value: 40.00

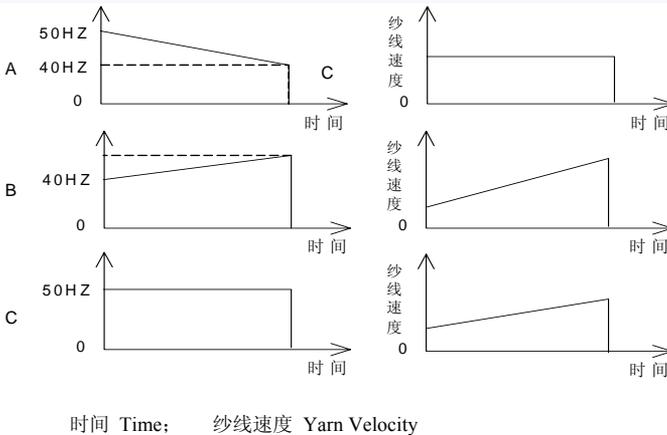
The Parameter 2-00 together with 2-01 can satisfy different spinning requirements.

When control with frequency decreasing progressively, the Starting Frequency refers to the target frequency

of the converter at the beginning of spinning (Spindle Empty). Along with the changing of the spinning length, the frequency is also decreasing as well. If the machine halts without full yarn, then the target frequency at operation of the next time is just the frequency at the time of machine halt. The Stopping Frequency refers to the frequency of the spindle full, as shown in Figure A.

When control with frequency increasing progressively, the Stopping Frequency refers to the target frequency of the converter at the beginning of spinning (Spindle Empty). Along with the changing of the spinning length, the frequency is also increasing as well. If the machine halts without full yarn, then the target frequency at operation of the next time is just the frequency at the time of machine halt. The Starting Frequency refers to the frequency of the spindle full, as shown in Figure B.

For instance, if the Starting Frequency is 60Hz and the Stopping Frequency is 40Hz, then along with the changing of the spinning length (this moment the radius of spindles also gradually increase and the velocity of the spindle is also increasing; if operating with a fixed frequency then it is possible to form the spindle in the inner loose and outer tight state), the relation between the operating frequency and the yarn velocity is shown as Figure A; if the starting frequency is 50Hz and the Stopping Frequency is also 50Hz, the relation between the operating frequency and the yarn velocity is shown as Figure C.



From **Figure A** it can be seen that if operating is in decreasing progressively from the Starting Frequency to the Stopping Frequency, the velocity of the yarn is intended to stable. From **Figure C** it can be seen that the

operating will be according to a general constant frequency and together with the diameter increasing of yarn bobbin, the velocity of the yarn also gradually increases as well. However the **Figure B** adopts the operating mode of increasing progressively from the Stopping Frequency to the Starting Frequency, it can increase the velocity of the yarn effectively and make the efficiency of spinning able to be improved obviously.

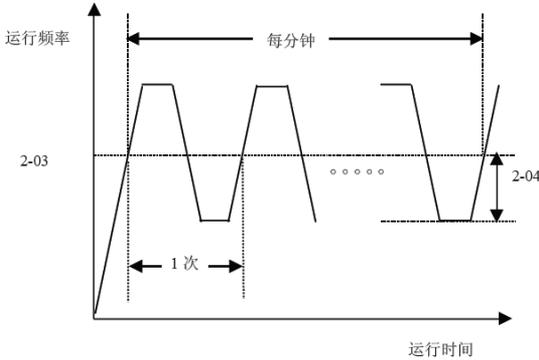
2-02 Double length Coefficient	Setting Range: 2~1500	Factory: 15
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This parameter refers to the needed pulse's number when the length counting increasing one unit. This parameter must be used together with the 0-05 function code to accomplish the counting for different length. For instance: If the parameter 0-05 is set up to 1000 and the parameter 2-02 is set up to 20, which expresses the motor revolving 20 circles(the length counting pulse sensor send out 20 long pulses ) the length value increases one unit. If the parameter 2-02 is set up to 200, then when inputting 200 pulses then can increase the length value increasing one unit. Therefore, by expansion of this double length coefficient it can increase the counting length; user can set up it according to the specific situation.

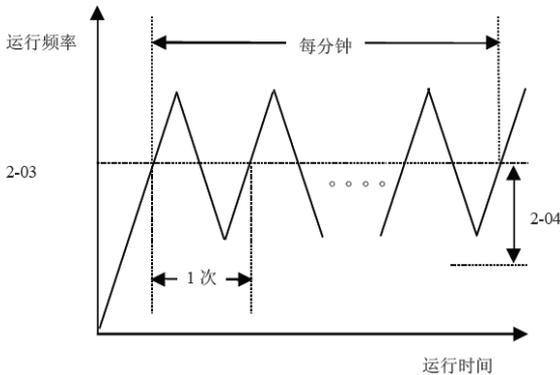
2-03Swing Standard Frequency	Setting Range: 0.50~100.0Hz	Factory Value: 30.00
2-04Swing Frequency Amplitude	Setting Range: 0~10.00Hz	Factory Value: 5.00
2-05 Swing Cycle Times	Setting Range: 0~30 times/min	Factory Value: 15
2-06 Speed Coefficient	Setting Range: 0~200	Factory Value: 100

When selecting the swing frequency, namely, set up 0-06=2 and 4-01=2, the converter will take the frequency set up by the parameter 2-03 as the center to sway up and down and the amplitude of the swing is the setting value of 2-04. The 2-05 is point to the times of period in one minute, which takes the standard frequency as the center to sway up and down. The 2-06, the speed coefficient refers to the compensation for the internal counting (4-01=2) ; its Factory Value is 100 without compensation. If the length counting speed is too high, then can decrease this value, else if the length counting speed is too low can increase this value to compensate it till the length counting can reflect its actual value. When adopting the swing

frequency, the operation process is shown in the Figure below.



Setting up the 2-03 and 2-04 must ensure  $(2-03) - (2-04) > 0.50\text{Hz}$ , otherwise the lowest operating frequency is 0.50Hz and bring about the cycle period inaccurate. While setting up the parameters, the acceleration and deceleration time are easy to be too long. If the acceleration and deceleration time are too long, then the amplitude of the operating frequency is unable to achieve the setting value  $(2-03 + 2-04, 2-03 - 2-04)$ , namely diminish the swing amplitude. As shown in the following figure:



运行频率 Operating Frequency;运行时间 Operating Time;每分钟 Every Minute;1次Each Time

### Function Code 3 District

The parameters in this district are in preservation; please do not set up casually.

## Function Code 4 District

4-00 Delay Detect the Yarn broken Time	Setting Range: 1.0~20.0 S	Factory Value: 3.0
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Because at the beginning of the converter's operation the yarn is still up on the spindle, the sensor for yarn broken would account the yarn has been break, this parameter must be set up to make the converter not treat the signal of yarn broken in this period of time.

4-01 Is machine halt or not if without pulse	Setting Range: 0: Yes 1: No 2: Internal Counting	Factory Value: 0
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When 4-01=0 and 1, please see 4-02 for detailed introduction.

The 4-01=2 is the special function when the converter is in using of the swing frequency and is an internal counting function. The details can be seen in the introduction of the swing frequency function in the district of the function code 2.

4-02 Delay Machine Halt Time without Pulse	Setting Range: 1.0~10.0 S	Factory Value: 5.0
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In operating of the converter, the spinning length is counted. When 4-01 is set up to "0" and without pulse input in the time which is set up by the parameter 4-02 continuously, the converter will stop its operation and display the err information (Err2). But if 4-01 is set up to "1" and without pulse input then besides the operation will stop in the PI control constant velocity mode, the converter will be running as usual in other control modes.

4-03 OUT1 Selection of Output Terminal Function	0: Machine Halt, Indication of Yarn broken Output 1: Indication of Spindle full 2: Indication of Adjustable Machine Halt Output	Factory Value: 0
4-04 OUT1 Output Lasting Time	Setting Range: 0.0~10.0 S	Factory Value: 5.0
4-06 Maximum Frequency Output of OUT1 at Machine Halt	Setting Range: 0.00~20.00	Factory Value: 0.00

4-03 is set up to “0”, then when machine halt or yarn broken, between OUT1 and 12V there are several seconds output; if 4-03 is set up to “1”, there are several seconds output when yarn is full. The output time is set up by 4-04. If 4-03 is set up to “2”, then the starting time point and the lasting time will be adjustable. During the system halt process, when the driving frequency of winding motor is lower than the value set by 4-06, OUT1 begins to output, and will last for the time set by 4-04, then stop output automatically.

4-05 OUT2 Function Selection of the output terminals	Setting Range: 0: Indication of Operating 1: Indication of Machine Halt	Factory Value: 0
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OUT2 as the output indication of the converter, when the 4-05=0, between OUT2 and 12V, there are 12V to output and vanish after machine halt; when 4-05=1, only in the machine halt mode between OUT2 and 12V, there are 12V to output.

4-09 Selection of the Yarn broken	Setting Range: 0: Clear the Mark of Yarn broken by pushing the Reset Key 1: Control the Yarn broken Mark by the Yarn broken Signal	Factory Value: 0
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When 4-09=0, after yarn broken the converter can display the signal of yarn broken immediately, only push the “Reset” key then can clear the mark of yarn broken.

When the 4-09=1, after yarn broken the converter can display the signal of the yarn broken and the yarn broken signal will be clear automatically. If before halting the machine the yarn broken signal has been cleared, then the mark of yarn broken will be cleared automatically after 5 seconds displayed with its display mark.

4-10 Delay Beginning PI Control Time	Setting Range: 0.1~300.0 S	Factory Value: 10.0
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The Function Code 4-10 refers to that when the converter operates to its target velocity and goes through the time delay set by the parameter 4-10, then the PI control begins to act. Its Factory Value is 10Sec. User

can adjust it according to his requirements.

4-11 Protection Value of PI Control	Setting Range: 20~100 m/min	Factory Value: 50
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The Function Code 4-11 means that when the difference between the target velocity and the actual velocity exceeds the setting value of 4-11, the converter will jump to the protection of Err2. As an example, if user adopts PI control but the contact being bad between the compression roller and yarn bobbin, it will cause the rotation of the compression roller with lower speed, and then causes further the larger difference between the target velocity and the actual velocity, and therefore to prompt the machine jumping to Err2 protection. In such situation the user should set up the value of this function code appropriately larger but not suitable over too. The Factory Value is 50. User can adjust it by his need.

Function Code 5 District, the setting District of the Extra-feeding parameters

5-00 Setting of the Extra-feeding Motor Operating Mode	Setting Range: 0: Extra-feeding is invalid 1: Constant Velocity 2: Variable Velocity 3: Frequency Increase 4: Velocity Tracking 5: Variable Velocity 2 6: Extra-feeding Frequency Decrease Progressively	Factory Value: 0
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5-00=0, Extra-feeding Motor Invalid: U1, V1 and W1 have no voltage output.

5-00=1, Constant Velocity: The velocity of Extra-feeding is constant; the value of the velocity is determined by the Function Codes of 5-01 and 5-02.

5-00=2, Variable Velocity: The Extra-feeding motor increases continuously on the basis of the setting velocity of 5-01 and according to the setting values of 5-11 and 5-12.

5-00=3, Frequency increase: This function together with the setting length and along with the increase of the winding length can make the frequency increase progressively from the Extra-feeding Starting

Frequency (Function code 5-09) until to the Extra-feeding Stopping Frequency (Function Code 5-10) and the yarn bobbin is in spindle full.

5-00=4, Velocity Tracking: The machine operates with the Extra-feeding velocity directly proportional to the winding velocity and the proportional coefficient is determined by the Function Code 5-13.

5-00 = 5, Variable Velocity 2: The Extra-feeding motor decreases continuously on the basis of the setting velocity of 5-01 and according to the setting values of 5-11 and 5-12.

Interrelated Function Code: 5-00=5, 5-01 is the target velocity of the Extra-feeding, 5-11 is the winding length increment and 5-12 is the Extra-feeding velocity increasing value.

5-00 =6, Frequency Decrease Progressively: This function together with the setting length and along with the increasing of the winding length can make the frequency decrease progressively from the Stopping Frequency (Function code 5-10) until to the Extra-feeding Starting Frequency (Function Code 5-09) and the yarn bobbin is in spindle full.

Interrelated Function Code: 5-00=6, 5-09, 5-10 and 2-02.

The relation between the Extra-feeding velocity and the rolling speed:  $\text{Velocity} = \text{Diameter of the Extra-feeding} \times 3.14 \times 3.14 \times \text{Speed}$ .

No matter what mode the Extra-feeding Motor operates in, please set reasonably the diameter of the compression roller (Function Code 1-02) .

5-01 Setting of the Extra-feeding Velocity	Setting Range : 80 ~ 1200 m/min	Factory Value: 600
5-02 Diameter of Extra-feeding Wheel	Setting Range: 30.0~100.0 mm	Factory Value: 72.5

Computing Formula of the Extra-feeding velocity:  $\text{Extra-feeding velocity} = \text{Diameter of Extra-feeding} \times 3.14 \times \text{Speed}$ . Owing to the maximum speed of the Extra-feeding Motor is 4200 R/min, when setting the velocity, must consider whether the diameter of the Extra-feeding wheel can meet the user's needs. For instance: If the diameter of the Extra-feeding wheel is 72.5mm and the speed of the Extra-feeding motor is 2800 R/min, then the Extra-feeding velocity= $0.0725 \times 3.14 \times 2800 = 637$  m/min.

5-03 Extra-feeding Acceleration Time	Setting Range: 0.1~300.0 S	Factory Value: 3.0
5-04 Extra-feeding Deceleration Time	Setting Range: 0.1~300.0 S	Factory Value: 3.0

For the purpose of synchronous operation of the Extra-feeding and the Winding, please debug on-site the acceleration and deceleration time of the Extra-feeding motor to make both of them synchronous reliably. Because the acceleration and deceleration setting time is the needed time that the frequency of the converter operates from 0 Hz to 50Hz or from 50Hz to 0Hz, and that the target frequencies operated of the winding and extra-feeding motors are frequently different, when debugging the winding motor operating in mode of frequency decrease progressively, constant velocity and swing frequency, the user should suitably set the acceleration and deceleration time to guarantee that while the winding motor operates to its target frequency, the extra-feeding motor can achieve its target frequency at the same time and while the winding motor decreases to 0 Hz, the extra-feeding motor also decreases to 0Hz simultaneously.

5-05 Extra-feeding Carrier Wave Frequency	Setting Range: 2~10 KHz	Factory Value: 3
5-06 Extra-feeding Torque Compensation	Setting Range: 1~18	Factory Value: 6

Carrier wave frequency is the pulse frequency of the converter's output PWM wave. The higher the carrier wave frequency, the lower the electromagnetic noise of the motors; but the wear of converter's switch and the temperature rise will increase. The Torque Compensation is mainly to increase the output torque of the converter at low frequency. The larger the compensation, the larger the torque at start-up, but it will increase attack to the motors. Therefore the user may set up 5-06 according to the actual situation.

5-07 Selection of the Extra-feeding Motor's Operation when Yarn broken	Setting Range: 0: Speed decrease and Machine Halt 1: Fast Machine Halt 2: DC Braking Machine Halt	Factory Value: 0
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5-07=0: After yarn broken, the Extra-feeding motor stops its operation according to its original deceleration time. It is applicable to the situation without requirement to the Extra-feeding during yarn

broken.

5-07=1: After yarn broken, the Extra-feeding motor stops its operation in the mode of fast machine halt. It is applicable to the situation with the requirement to stop the Extra-feeding motor rapidly.

5-07=2: After yarn broken, the Extra-feeding motor stops its operation in the mode of fast machine halt with braking; the braking voltage and braking time are determined by the function code of 5-15 and 5-16. It is applicable to the situation that the fast machine halt can not satisfy the user's requirement.

5-08 Selection of the Function OP3	Setting Range:  0: Machine Halt, Reset and Forcible Reset  1: Reset and Extra-feeding Fast Stop 2: Reset and Extra-Feeding Braking	Factory Value: 0
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5-08=0: Shorting circuit the terminals of OP3 and CM, the winding motor and the extra-feeding motor both stop and will reset when machine fault, short-circuit 3 seconds will start up the mandatory reset.

5-08=1: Shorting circuit the terminals of OP3 and CM, the winding motor stops and the extra-feeding motor is in fast stop and will reset when machine fault, short-circuit 3 seconds will start up the mandatory reset.

5-08=2: Shorting circuit the terminals of OP3 and CM, the winding motor stops and the extra-feeding motor is in fast stop with braking. The braking voltage and the braking time are determined by the function codes of 5-15 and 5-16 and will reset when machine fault, short-circuit 3 seconds will start up the mandatory reset.

5-09 Extra-feeding Starting Frequency	Setting Range: 5-14~5-10	Factory Value: 50.00
5-10 Extra-feeding Stopping Frequency	Setting Range: 5-10~75.00Hz	Factory Value: 60.00

When 5-00=3, it is similar to increase progressively frequency control mode in the main winding. It is applicable to the situation of the winding motor with constant frequency and the extra-feeding motor with

increasing frequency. It is commonly applicable to the situation of smaller textile yarn bobbin and then able to increase the spinning velocity in the allowable range of the extra-feeding velocity. As an example, if the setting length is 1000 m, 5-09=50Hz and 5-10=60Hz, then while the winding length increases from 0m to 1000m the operating frequency of the extra-feeding increases from 5-09 to 5-10.

When the 5-00=6, it is similar to decrease progressively frequency control mode in the main winding that in the range of the setting length the extra-feeding frequency decreases progressively with a constant speed.

In the function of the progressive decrease of the extra-feeding frequency the parameter 5-09 is the Stopping Frequency and the 5-10 is the Starting Frequency. The Extra-feeding frequency will decrease progressively from 5-10 to 5-09. When the winding adopts the constant velocity, and extra-feeding adopts the frequency increase or decrease progressively, must pay attention to that the double-length coefficient should be consistent with the unit of 1-05 (namely the representative units of length should be same each other).

5-11 The Increase Value of the Winding Length	Setting Range: 1~200 m	Factory Value: 100
5-12 The Velocity Increase Value of the Extra-feeding	Setting Range: 0.0~8.0 m/min	Factory Value: 1.0

When the 5-00=2, the setting parameters of the 5-11 and 5-12 are valid. After the winding and the extra-feeding come into stable operation, when the winding length increases the setting value of 5-11 once, the extra-feeding will base on the setting value of 5-01, to increase the setting value of 5-12. As an example, if 5-01=500m/min, 5-11=80m and 5-12=4 m/min, then in operation, when the velocity of the extra-feeding achieves 500m/min, then to begin the accumulation of the winding length and the extra-feeding velocity will increase 4m/min while the actual value of winding length increase 80m once.

When 5-00=5, after the winding and the extra-feeding come into stable operation, when the winding length increases the setting value of 5-11 once, the extra-feeding will base on the setting value of 5-01, to decrease progressively the setting value of 5-12.

5-13 Tracking Coefficient of the Velocity	Setting Range: 1.00~4.00	Factory Value: 1.20
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When the 5-00=4, this parameter is valid. The operating velocity of the extra-feeding motor is proportional to the velocity of the winding motor, so for various yarn the user should set the different and appropriate proportional coefficient to meet the sufficient extra-feeding amount. For instance, in this mode firstly need to preset the velocity of the extra-feeding motor, otherwise would cause the yarn broken. If the velocity of winding is predict 500m/min after completing the start-up process and the Tracking Coefficient 5-13=1.20, then the setting value of 5-01= $500 \times 1.2 = 600$ m/min. In order to make the pressure roll reflect the velocity better, it is needed to begin its control after delay automatically a period of time (about 10 seconds).

5-14 The Star-up Frequency of the Extra-feeding Motor	Setting Range: 0.00~25.00Hz	Factory Value: 0.00
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This parameter is used to increase the initial operating frequency, convenient for the start-up of the Extra-feeding motor. It is applicable to the situation with difficult start-up of Extra-feeding motor.

5-15 Extra-feeding Braking Voltage	Setting Range: 0~60 V	Factory Value: 40
5-16 Extra-feeding Braking Time	Setting Range: 0.0~10.0 Sec	Factory Value: 0.5
5-17 Extra-feeding Braking Starting Frequency	Setting Range: 0.00~10.00 Hz	Factory Value: 5.00

When needing the braking, such three parameters are valid. The Braking Voltage and the Braking time are not suitable too large so as to avoid damaging the extra-feeding motor.

The Matching Table for the operation of the Winding and Extra-feeding Motors:

The Operating Mode of the Winding Motor		The Operating Mode of the Extra-feeding Motor	
0-06=0	Frequency Decrease Progressively	5-00=0	Without the Extra-feeding Motor
		5-00=1	Constant Velocity
		5-00=2	Variable Velocity
		5-00=3	Frequency Increase
		5-00=4	Tracking of the Velocity
0-06=1	Constant Velocity PI	5-00=0	Without the Extra-feeding Motor
		5-00=1	Constant Velocity
		5-00=2	Variable Velocity
		5-00=4	Tracking of the Velocity
		5-00=5	Variable Velocity 2
0-06=2	Swing Frequency	5-00=0	Without the Extra-feeding Motor
		5-00=1	Constant Velocity
0-06=3	Frequency Increase	5-00=0	Without the Extra-feeding Motor
		5-00=3	Frequency Increase
		5-00=4	Tracking of the Velocity

## 6. Debugging and Application

Before the products manufactured by our company are delivered out from factory, all have inspected comprehensively. However the process of loading, discharging and transportation, all may bring harmful effect to the products. For that reason, after you get the products, you should test them all-round in accordance with the following specific steps firstly:

### 6.1 Debugging Operating

#### 6.1.1 Debugging Wiring

Power Supply through the air switch connects the power input terminals L1 and L2, the ground wire connects to PE and put the output terminals U,V and W to the winding motor and U1,V1 and W1 to the Extra-feeding motor.

#### 6.1.2 Inspection before Power On

- ◆ Whether or not the converter is installed in the environmental requirements
- ◆ Whether or not the wiring of converter is correct and the sectional area of the power circuit is satisfactory.
- ◆ Whether or not the rating input voltage and the rating input power can match to the AC power source.
- ◆ When finished the wiring, it is to be sure that inside the converter and on the field must put in order.
- ◆ The converter must be operated by the specially trained technicians.

#### 6.1.3 Debugging with Power on

1. After convinced that the connection is right and every preparation is ready, then can put on the power to the converter. After the power supply is put on, the keyboard controller displays "--YT-", about after 5 seconds, the converter enters its normal standby mode and displays the length of last time of the machine operating.
2. Entering into the parameter's setting mode, its concrete steps please refer to the "Operation Illustration of the Keyboard."
3. After finishing the parameter's setting, pushing the operating key can make the converter run and can employ the electromagnetic or electro-dynamics multi-meter to measure and test the output voltage of the converter. It must be sure that the three phase voltage of the terminals U, V, W and U1, V1, W1 ought to balance, namely each voltage between every two phase must be equal by each other. When the operating frequency attains 50Hz, the output voltage by measuring should be equal to 220V and the three voltages of the three phases ought to be equal.

## 6.2 Normal Operating

1. According to the site specific requirements, connect the pulse sensor for counting the length of yarn and the sensor for yarn broken.
2. In accordance with the spinning requirement, other parameters can be set up.
3. Commissioning operation with motor: Examining the rotation direction of winding motor is or isn't identical to the requirement. If not, the user must change two random output line of U, V and W; and it is also needed to examine the rotation direction of the Extra-feeding is or isn't consistent with the requirement, if not, the user must also change two random output line of U1,V1 and W1. (Notice: when wiring again, must cut off the power supply!)
4. Observing the operating status of the yarn spindle: Analyze the degree of tightness and mellowness of the yarn spindle and refer to the parameter's setting explanation in detail to find out the improper parameters and alter them carefully till they can satisfy the requirements of your spinning.
5. Configure the trained professionals to operate such as the actions of handling the yarn broken, spindle changing and other matters and to treat some simple machine faults. ( Detailed can be seen in Chapter7-Recovery Processing and Routine Maintenance ) .
6. If still have some problems that cannot resolve, please according to the communication method to contact us for resolving. At the same time we welcome you to send information back the insufficiency of this converter to us. We will strive for improving.

## 7. Recovery Processing and Routine Maintenance

In the actual use of the converter, due to be reflected by environment and working condition, it is possible to take place some error protection and abnormal phenomena. This chapter has given the processing method of some common faults.

### 7.1 Abnormal Information and its Treatment

This machine is provided with the protection functions of over current, over voltage and overload. Once the fault occurred, the converter immediately stops its output and displays the corresponding fault type. Table 7-1 lists the common faults and their simple measures to deal with.

Table 7-1 Common Faults Phenomena and Their Measures to Deal with

Fault Display	Illustration	Cause	Measures to Deal With
OC(Winding) OC1 (Extra-feeding)	Over Current	*Too short Increase Time  *Short Circuit on the output side  * Motor blocked * VF Compensation improper	* Increase the acceleration time  *Whether the motor cable is damaged.  *Examine whether or not the motor is overload. *Decrease the V/F compensation value
OE	DC Over voltage	* Too high the Power Voltage  *Too large the Load Inertia * Too short the speed decrease time	*Check whether or not input the rating voltage *Increase the speed decrease time
OL	Overload	*Too high the Load	*Decrease the Load *Augment the converter
Err1	Input Error	*Setting Parameters without breaking open the password	*Re-input the accurate password
Err2	Without Pulse Signal	* Without the Hall Signal * Pressure Roller without contact well	*Inspect the connecting line of Hall Element * Inspect whether or not the pressure roller is contacted well
Err3	Communication Breakdown		

Err4	External Storage Breakdown		
OT	System Over Temperature		
<input type="checkbox"/>	Yarn broken	<ul style="list-style-type: none"> <li>* Yarn has Broken</li> <li>* Damage of the yarn probing device</li> </ul>	<ul style="list-style-type: none"> <li>*Inspect whether or not the yarn is broken</li> <li>*Inspect whether or not the Yarn Probing Device is damaged</li> </ul>
Motor not Rotation		<ul style="list-style-type: none"> <li>*Wiring Error</li> <li>*Setting Error</li> <li>*Load is too high</li> </ul>	<ul style="list-style-type: none"> <li>*Inspect the power and control lines</li> <li>*Inspect the Parameter's setting</li> <li>*Increase the output capability of the converter</li> </ul>
Tripping Operation of the Power Supply	Too large the circuit current	<ul style="list-style-type: none"> <li>*Short Circuit on the input side</li> <li>*Too low capability of the Air Switch</li> <li>*Overload the Motor</li> </ul>	<ul style="list-style-type: none"> <li>*Inspect the Input Lines</li> <li>*Inspect the capability of the air switch</li> <li>*Decrease the load</li> </ul>

## 7.2 Motor Faults and Its Corrective Measures

Table 7-2 Motor Faults and Its Corrective Measures

Fault	Inspection Item	Corrective Measures
Motor not Rotation	Whether or not the power voltage is normal?	Put on power supply; Inspect the wiring
	Whether or not the three phase output is normal?	Cut off power supply and put on it again
	Whether or not the motor is blocked?	Decrease the load
Motor Rotation Direction Error	Wiring of U、V、W is or isn't accurate?	Correct the wiring
Rotation of Motor is not stable	Whether or not the load is over?	Decrease the load

	Whether or not the variation of the load is over?	Decrease the variation of the load; Increase the capability of converter.
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Notice: If above treatments are invalid, please contact our factory to resolve it, don't dismantle and repair by yourself.

### 7.3 The Routine Maintenance

In order to make the converter service for you better, it is needed to guarantee the converter operating in a good and safe working atmosphere and please do well the following routine maintenance and servicing.

- ◆ Keep clear the use atmosphere of the converter, without dust and with good ventilation and cooling.
- ◆ Clear the cooling fan and inspect whether or not the operation of the converter is normal.
- ◆ Clear the dust and other sundries in the cooling plates at regular intervals.
- ◆ Inspect whether or not the wiring bolts on the terminals and the fixed screws is tightening at regular intervals.
- ◆ Replace the rapid ware devices which are connected to the converter at regular intervals. Such as the relays and contactors, etc.
- ◆ Inspect whether or not the input and output wiring lines is damaged, ageing at regular intervals and replace it in time.
- ◆ If the converter is not used for a long time, must guarantee to charge the converter with a fixed interval (don't exceed one month) so as to ensure that the internal devices in the converter will not ageing for the long time of no use!

## Advising to the Clients

Thank you for your choice of our product. In order to ensure you can get the best after-sales service from our company, please read the following terms and do good jobs of related issues as below:

### 1. Product Inspection at Out of the Box

- 1 To confirm whether or not the product is damaged during transport.
- 2 Check the nameplate to determine the frequency converter in the hands is by your ordering goods.
- 3 Check whether or not that the box includes a converter body, a user manual, a factory certificate and the other purchasing goods.

### 2. Warranty and after-sales service

1. The scope of warranty is only for the converter body and only for the failure in the normal use according to employing request.
2. Converter used in the normal warranty is twelve months beginning from the date of purchasing the invoice (according to the date of purchasing invoice or the release date). If the product malfunctions or damages in the warranty under the normal use, our company will carry out the free repair. More than this warranty, our Company will give out the paid maintenance.
3. Even in the warranty, if the affairs as following are occurred, a certain amount of maintenance costs will be collected:
  - ▲ Operating not according to the requirement of the user manual to cause the mechanical failure or damage;
  - ▲ After purchase, the damage occurred as a result of the product falling or in transport;
  - ▲ The mechanical failure or damage caused by earthquakes, fires, floods, lightning and other natural disasters or the abnormal voltage of power supply;
  - ▲ The damage is due to that the converter is used in its non-normal function. As well as the damage is caused for selfishly demolition, modification and repair without permission.
4. Within 30 days from the date of purchase, and the damage is really due to the product quality issues (not belong to the above-mentioned four affairs) and the appearance without evident deface, our Company can replace the product with the same specifications.
5. The on-site service charge of users, counted based on actual costs, is borne by the users. If having another contract, the contract is a priority basis.
6. Please be sure to retain your warranty card, and bring forth to the maintenance unit at the warranty time.  
If you have problems, please contact with the nearby office of our Company or the agents, it is able also to be directly related to the company headquarters

*This manual is only for reference, and without notice for its further improvement!*

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