



# DC brushless driver Suite

## KL-600BD/KL-600BM

### Manual



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## Chapter 1. | Brief Introduction

### 1.1 Products brief introduction

We design Brushless spindle driver KL-600BD and KL-600BM specialized for the economic engraving machine, it matches with the brushless DC motor. With the updated DSP technology, the driver can drive the motor to output more precise speed and bigger torque comparing with current drivers. We adopt the idea from the inverter, designed independent demountable panel. The users can take down the panel from the main driver and install it on the controller cabinet. By the panel, we can set the parameter, control motor speed and start/stop, very convenient.

### 1.2 Specification feature

- 1) High performance, low prices
- 2) DSP main control module
- 3) No current passing when no movement
- 4) Voltage range 100VAC~120VAC
- 5) External independent panel
- 6) Maximum driver power 600W
- 7) 5 debugging ways: Built in panel potentiometer、External panel potentiometer、external voltage signal、external PWM signal、485 communication.
- 8) Maximum driver motor running speed 12000R/Min

- 9) Speed testing port for user to inspect the real speed.
- 10) Internal over-voltage, over-current and stalling inspection
- 11) Input signal TTL compatible

## 1.3 Product appearance and dimension

KL600 product appearance pls see picture 1-1, Panel pls see picture 1-2, KL600 with motor see picture 1-3.



Figure1-1. Appearance

# Chapter 1 Brief Introduction



Figure1-2. Panel



Figure1-3. KL600 with BLDC kit

# Chapter 1 Brief Introduction



Product outline dimension is 133\*122\*68.8mm,as picture 1-4 shows.The two installing size is 122\*57.8mm,see picture 1-5.Ext panel hole size is 51\*77mm see as picture 1-6. BLDC size see as picture 1-7.



Figure1-4. Outline dimension

# Chapter 1 Brief Introduction

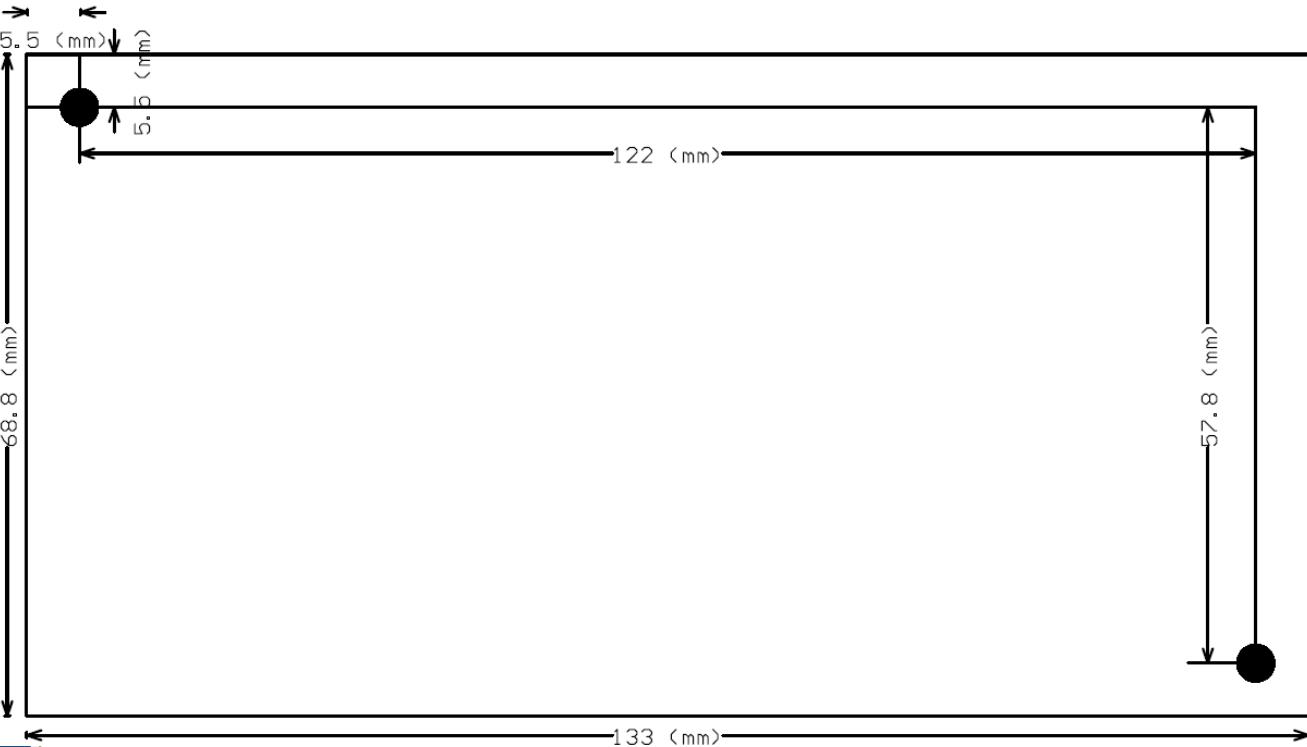


Figure 1-5. KL600 outline and installing dimension

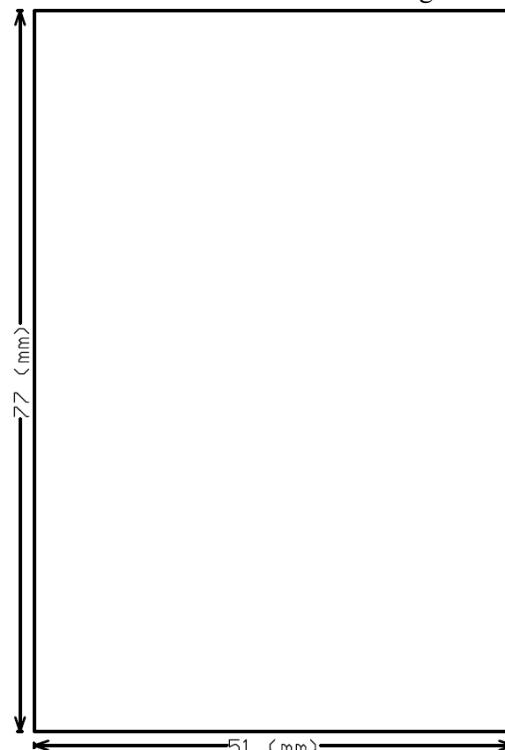


Figure 1-6. External panel installing hole dimension

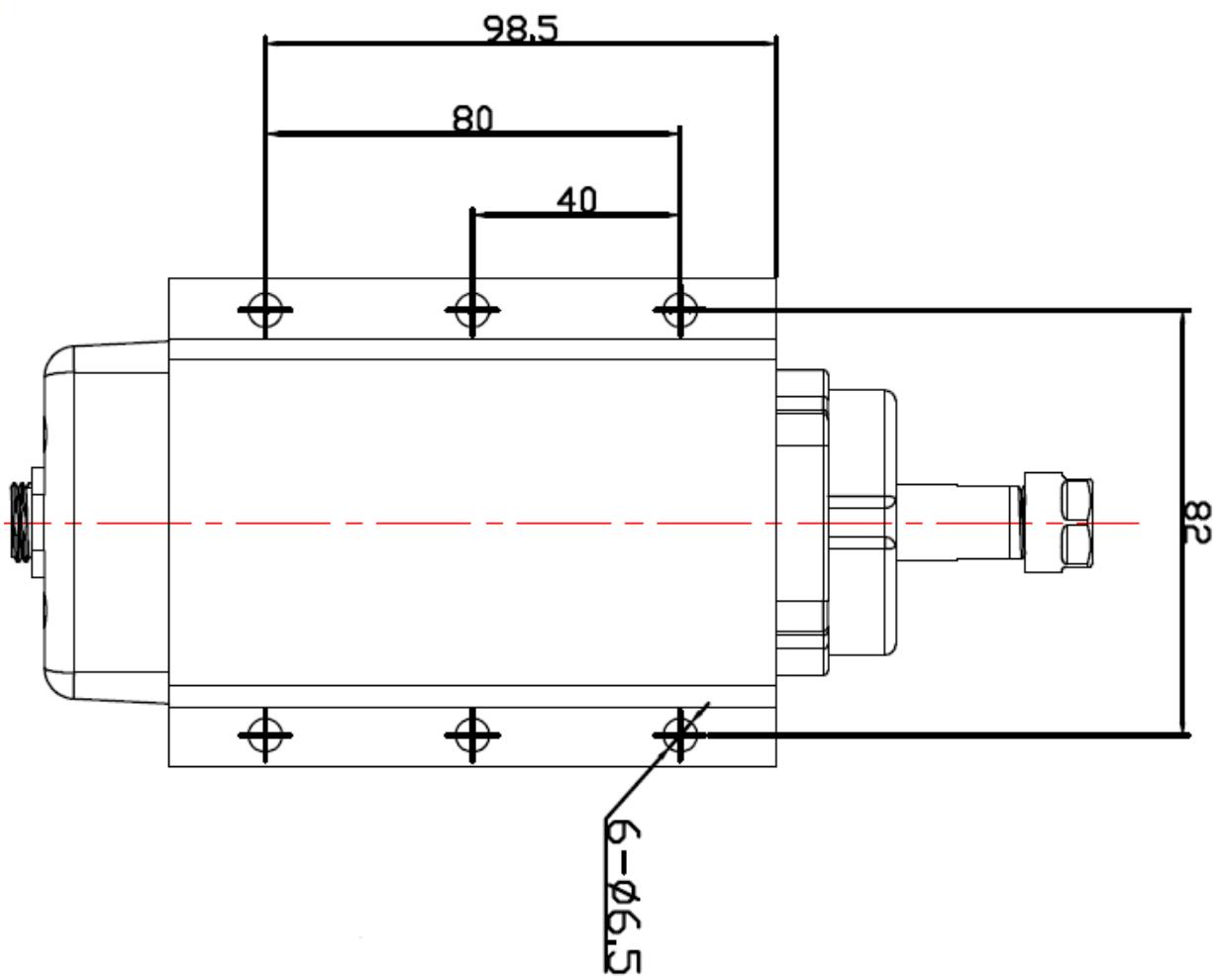


Figure1-7. BLDC installing dimension

## 1.4 Notice and Waring



Prohibit staying in the rain, it will cause short-circuit..



Pls use proper voltage power supply and motor.



Note the power supply connection. Prohibit reverse connection of power supply

and Hall.



## Chapter 2. Connection

### 2.1 Connection interface definition

KL-600BD connection table as table 2-1.

Mark	Definition	
L	Live line	Supply 110VAC
N	Neutral line	
G	Connect to the earth	
U	Brushless motor U phase	
V	Brushless motor V phase	
W	Brushless motor W phase	
GND	Control signal common Ground	
IN	Analog speed control input port	
FG	Motor speed inspection output port	
PWM	PWM speed control input port	
RE	Motor couterclockwise rotate control signal port	
F0	Motor clockwise rotate control signal port	
X1	Multistage speed control port1	
X2	Multistage speed control port2	
X3	Multistage speed control port3	
A	communication control 485-A	
B	communication control 485-B	

Chart 2-1 Wiring definition of KL-600BD

## 2.2 KL600 connection

Thought parameter setting, the speed control mode can be adjusted by external analog, external PWM and panel potentiometer. Start/Stop also can be controlled by external interface or panel keys, the user can define the combination control methods. Here we explain 5 ways connection mode: Built in panel button speed control and panel start/stop control、External panel control、external analog speed control and external interface start/stop control、external PWM speed control and external interface start/stop control、485 communication control.

### 1、Built in panel button speed control and panel start/stop control

Built in panel button speed control+ Panel start/stop control connection pls see picture 2-1. In this mode, if the control system need to collect motor speed data, then FG、GND port on NBD600 connect with signal collection port if need、GND port on controller. Cable thick yellow、thick green and thick blue is the U\V\W phase of the motor, they connect with UVW port on the drivers respectively.

# Chapter 2 Connection

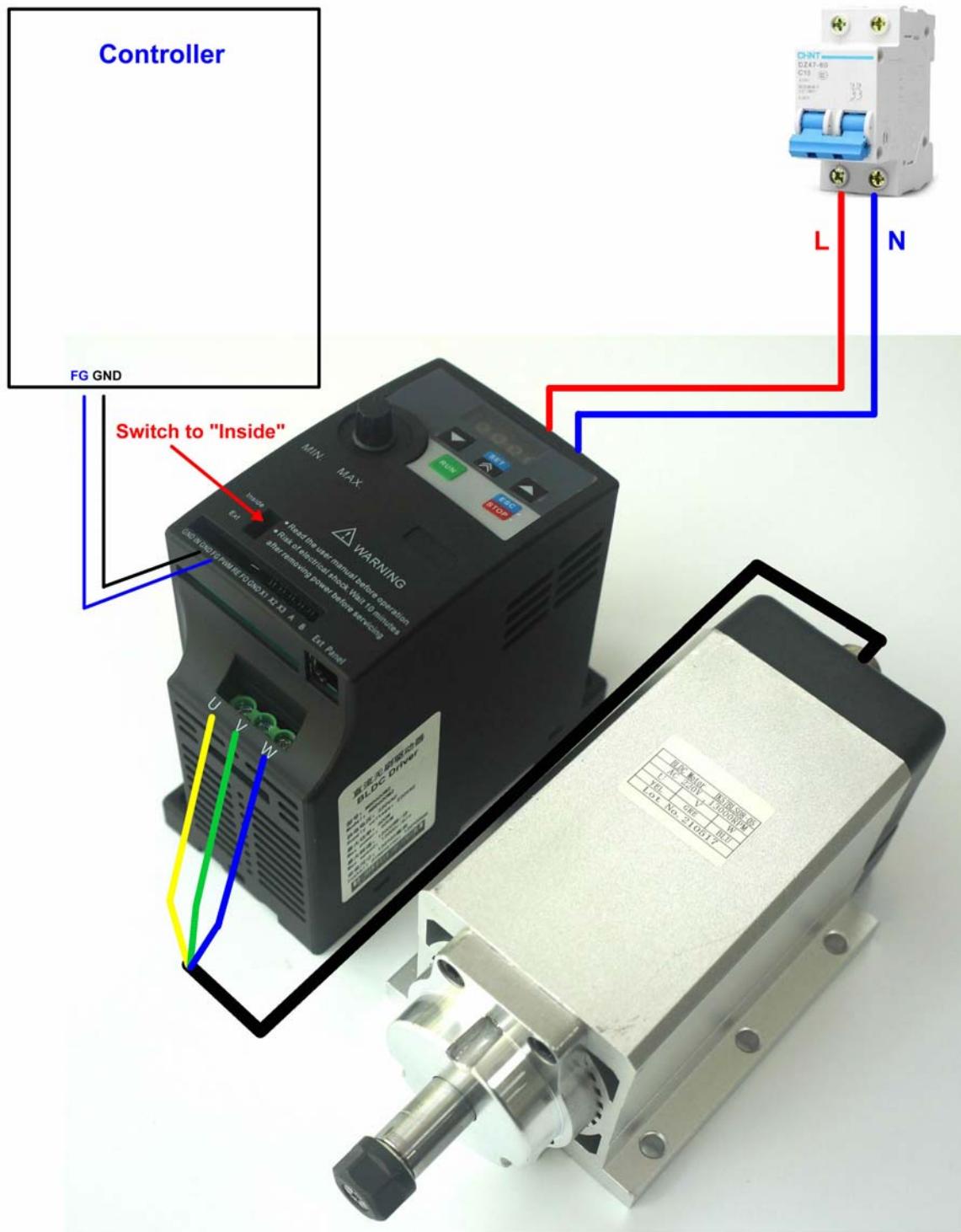


Figure2-1. Built in panel button speed control and panel start/stop control

## 2、External panel button speed control and panel start/stop control

External panel button speed control+ Panel start/stop control connection pls see picture

2-2.In this mode,if the control system need to collect motor speed data,then FG、GND port on KL600 connect with signal collection port if need、GND port on controller. Cable thick yellow、thick green and thick blue is the U\V\W phase of the motor,they connect with UVW port on the drivers respectively.

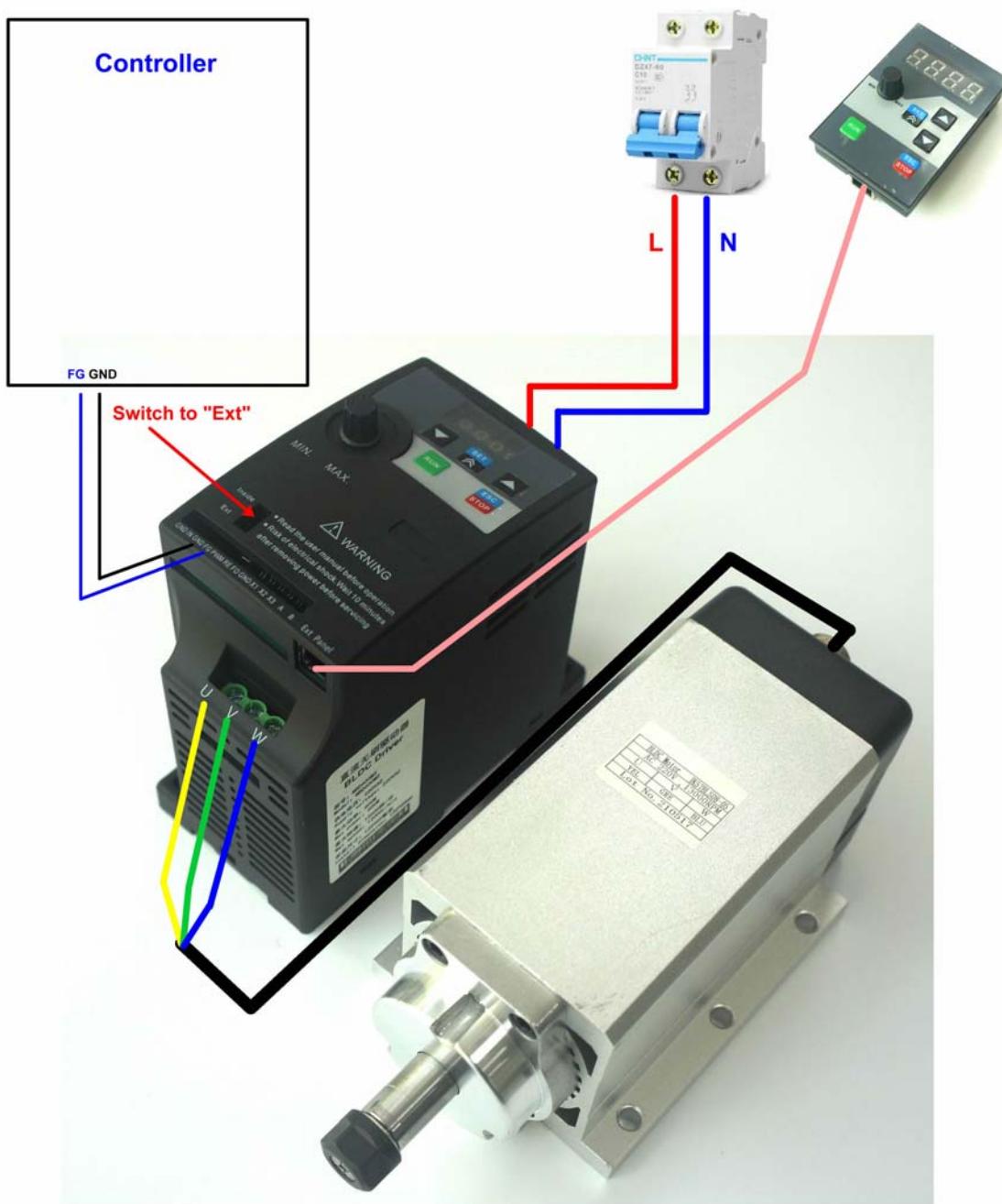


Figure2-2. External panel button speed control and panel start/stop control

## 3、External analog speed control+external interface start/stop control

KL600 external analog speed control+external interface start/stop control connection pls see picture 2-3.The IN is analog speed control interface,connect IN to controller analog output; FO and RE control the motor rotating direction; Controller get the motor speed from FG.

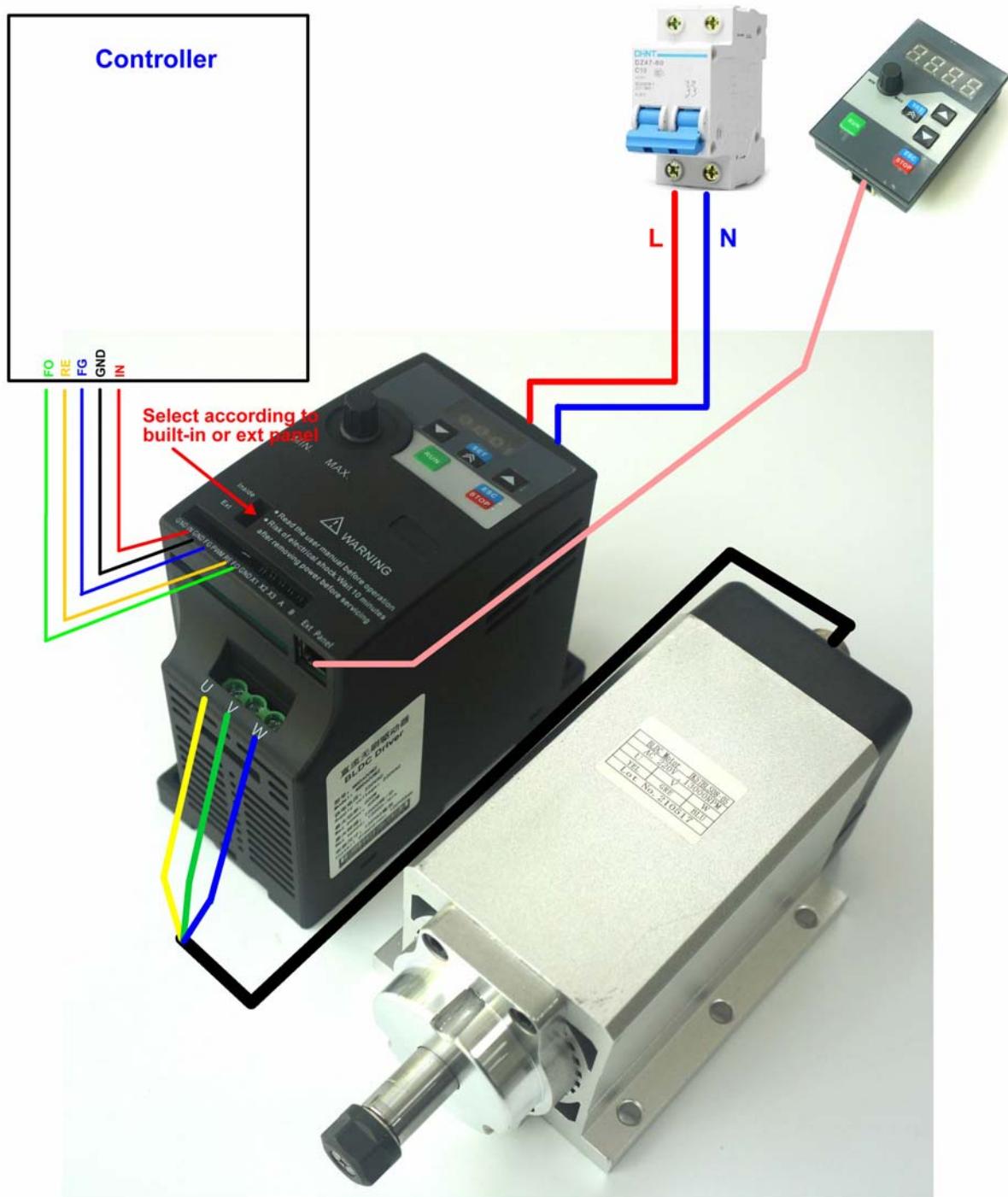


Figure2-3. External analog speed control+external interface start/stop control

## 4、External PWM speed control+external interface start/stop control

KL600 external PWM speed control+external interface start/stop control connection pls see the picture 2-4.In the mode of PWM control, The PWM is PWM speed control interface,connect PWM to controller PWM output;FO and RE control the motor rotating direction;Controller get the motor speed from FG.

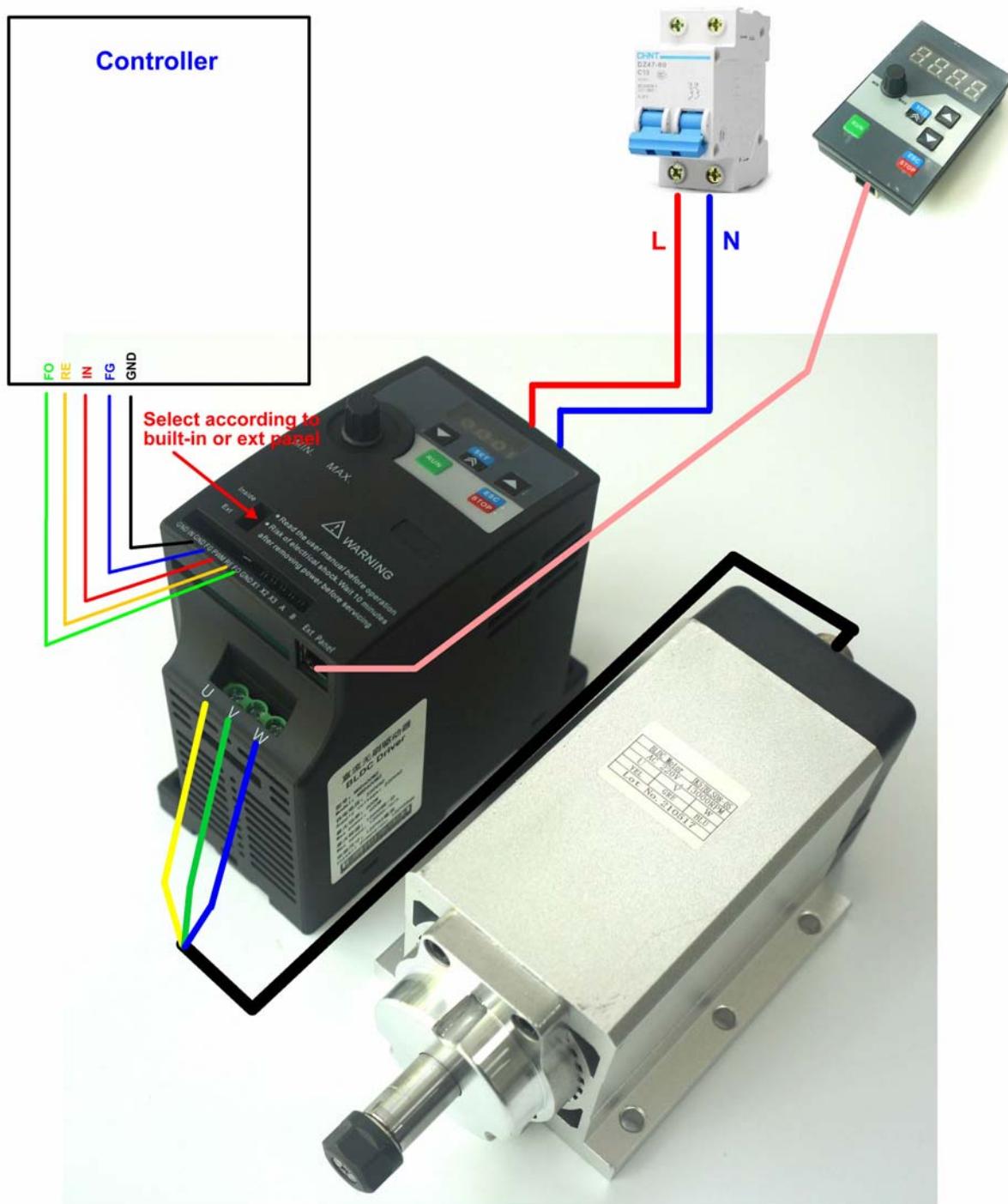


Figure2-4. KL600 external PWM speed control+external interface start/stop control

## 5. Multistage control

Multistage control connection pls see the picture 2-5.Multistage control mainly means that the speed is controlled by 3 switch signals. In the mode of Multistage control, 8 spindle speeds can be set by x1x2x3 8 arrangements;FO and RE control the motor rotating direction;Controller get the motor speed from FG.

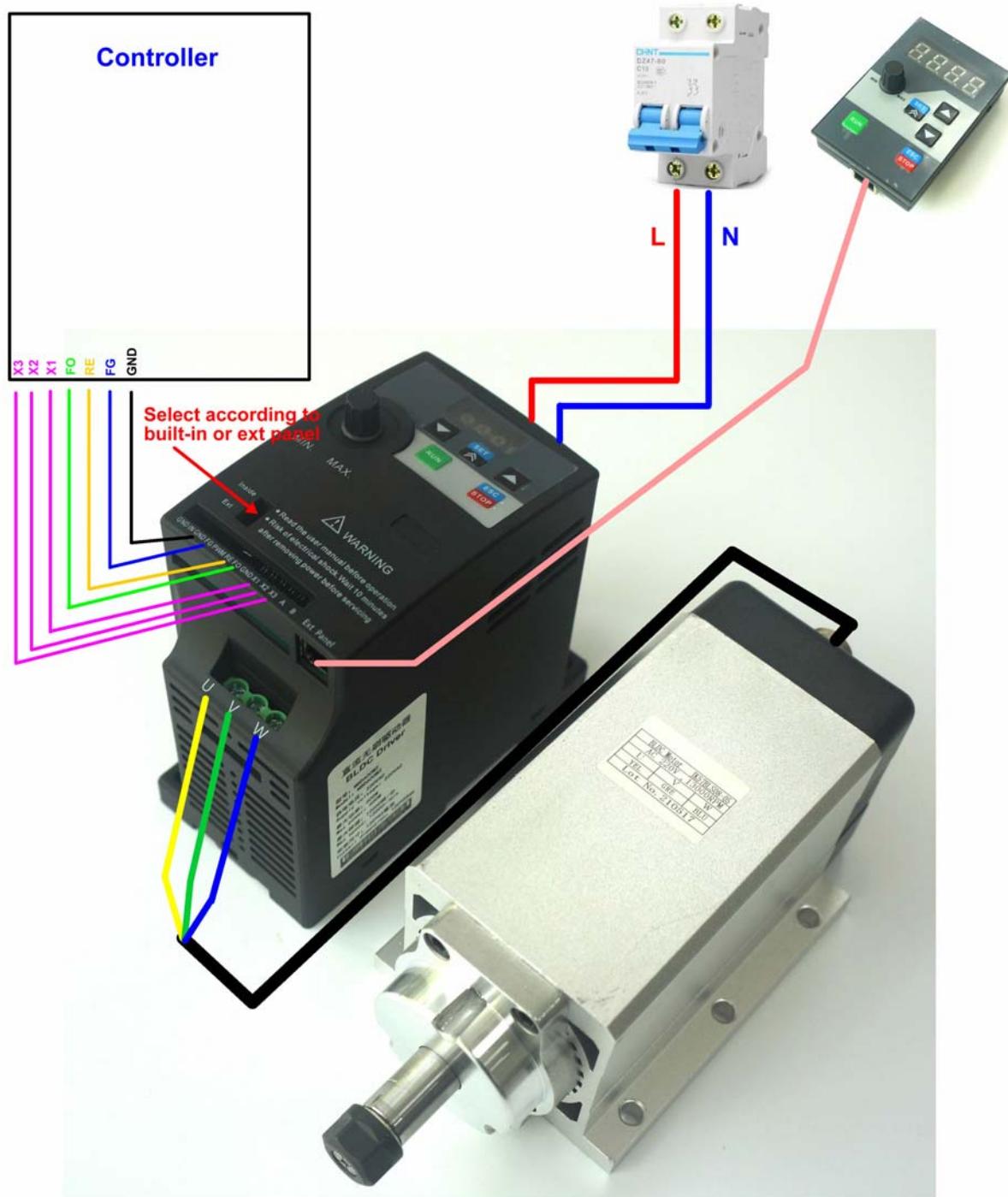


Figure 2-5. Multistage control

# Chapter 2 Connection

## 6、485 communication control

485 communication control connection pls see the picture 2-5.In the mode of 485 communication control, port A and port B connected to 485-a and 485-b of controller.

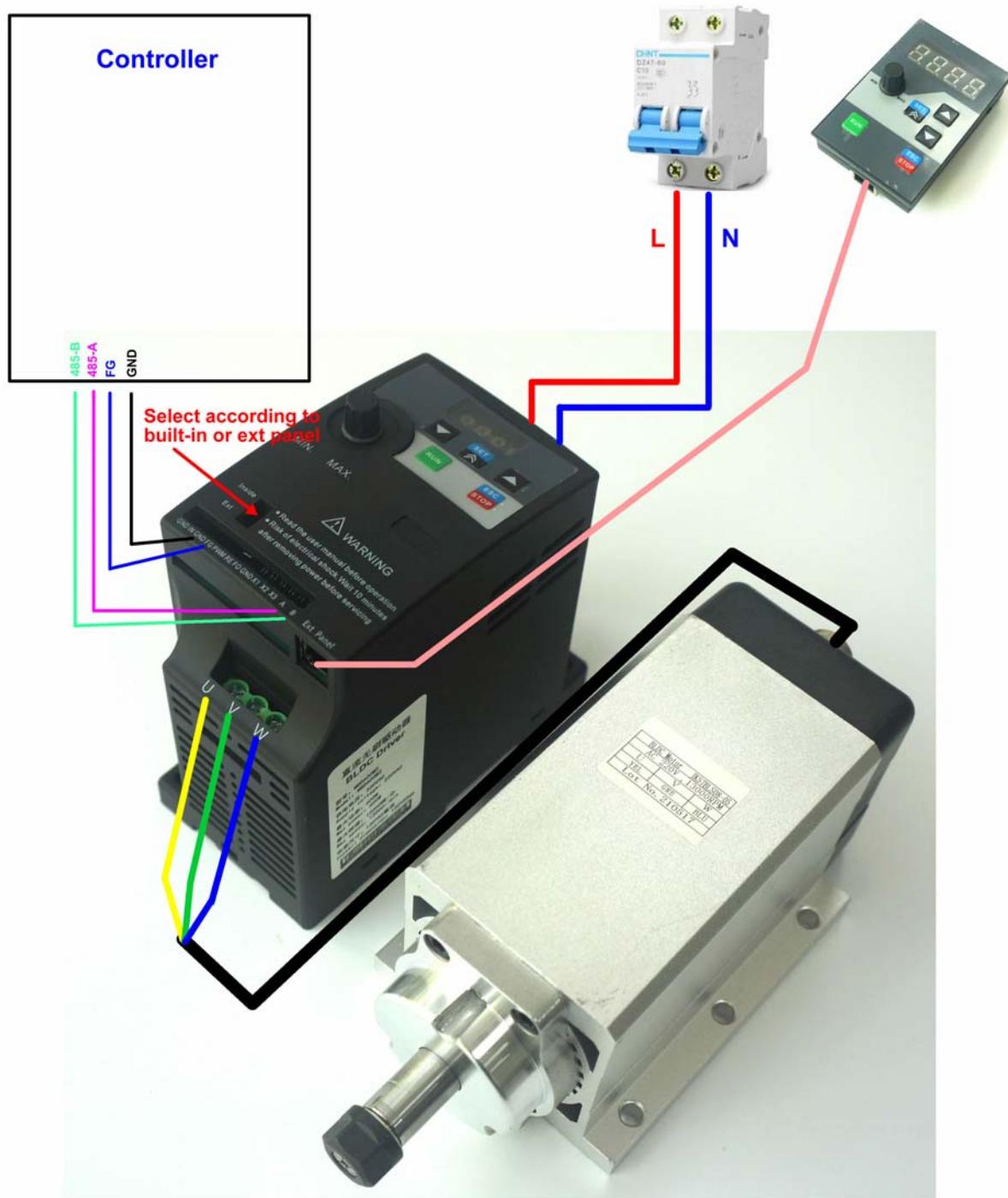


Figure2-6. 485 communication control



## Chapter 3. Configuration methods

### 3.1 Panel definition

Panel definition reference image just see picture 3-1.



Figure3-1. control panel structure image

No.	Mark	Definition	Description
1	RUN	Start	Press this button motor run
2	ESC/STOP	Stop	Press this button motor stop working/or Exit parameter setting
3	↓	reduce parameter	parameter downpage or reduce parameter
4	SET	selection	press once the button and enter into parameter

			term,keep pressing button,exit from current parameter term.
5	↑	increase parameter	parameter uppage or increase parameter
6		speed control potentiometer	Motor speed adjust,CW increase speed,CCW reduce speed.
7		LED display	display parameter or motor running speed.

Chart 3-1 Control panel definition

## 3.2 Parameter setting and LED display

1、When power on buzzer “DI--”rings one time, and LED lights up, driver standby.

2、At the status of Standby, Press SET button and enter into parameter setting page, In the configuration page, press the set key to cycle to switch parameters. From P0 to \*.

3、In the configuration page, press ↑ to increase the parameter value and press ↓ to decrease the parameter value. For example at

**P 1-0**

Press ↑ it will be

changed to

**P 1-1**

4、After parameter setting, press ESC button to esc the setting .

5、At the first setting menu or the second setting menu, if without any operation over 15 seconds, system will exit from the setting display, and enter into standby status.

6、At the standby page, press START button motor start to run, LED display the motor speed, real speed=display speed\*10. For example, when LED display 1020, then the motor speed is 10200 R/Min. The LED 4 radixpoints take turns to flash, shows the motor run properly.

## 3.3 parameter description

1、Speed control mode P0

Mark	P0	Speed control mode	default=0
value	remark		
0	panel potentiometer speed control		
1	external PWM speed control		
2	external analog speed control		
3	Multistage control		
4	485 communion speed control		

2、Run & stop control mode P1

Mark	P1	Run & stop control mode	default =0
value	remark		
0	panel button start		
1	CW/CCW start		
2	485 communion run & stop control		

3、External voltage control range P2

Mark	P2	external voltage control range	default =1
value	remark		
0	0-5V		
1	0-10V		

4、PWM effective voltage P3

# Chapter 3 Configuration methods

Mark	P3	PWM effective voltage	default =1
value	remark		
0	Low level is effective, output 0V		
1	High level is effective, output DC5V		

5、Panel start motor direction P4

Mark	P4	Panel start motor direction	default =0
value	remark		
0	CW		
1	CCW		

6、Speed signal feedback frequency multiplication P5

Mark	P5	Speed signal feedback frequency multiplication	default =1
value	remark		
1	one revolution output 1 pulse		
2	one revolution output 2 pulse		
3	one revolution output 3 pulse		
4	one revolution output 4 pulse		

7、485 baud rate setting P6

Mark	P6	Speed signal feedback frequency multiplication	default =1
value	remark		
0	4800 bit/s		
1	9600bit/s		
2	19200bit/s		

# Chapter 3 Configuration methods

8、Address of 485 communication equipment A

Mark	A	Speed signal feedback frequency multiplication default =1
value	Range	
A	1-255	

9、Speed signal feedback frequency multiplication \*

Mark	*	Speed signal feedback frequency multiplication default =1
value	Range	
*	22-255, Actual speed=S/255*12000,S=(22-255), If setting is 1-21, speed is the same as setting 22.	