Novusun CNC

DC brushless driver Suite

NVBDH+/NVBDL+

Manual

Manual of NVBDH+/NVBDL+

Contects

➤➤ Chapter 1. │ Brief Introdution

1.1 Products brief introduction

We design Brushless spindle driver NVBDH+ and NVBDL+ specialized for the ecomomic engraving machine,it matchs 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.

DVBDH is the brushless driver with Hall.

DVBDL is the brushless driver without Hall.

1.2 Specification feature

1) High performance,low prices

2) DSP main control module

3) No current passing when no movement

4) Voltage range 24VDC-60VDC

5) demountable panel

6) Maximum driver power 600W

7) 3 debugging ways:Panel potentiometer、external voltage signal、external PWM signal

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

NVBDH+ product appearance pls see picture 1-1,detached driver pls see picture 1-2,NVBDH with motor see picture 1-3.

NVBDL+ product appearance pls see picture 1-4, detached driver pls see picture 1-5,NVBDH with motor see picture 1-6.
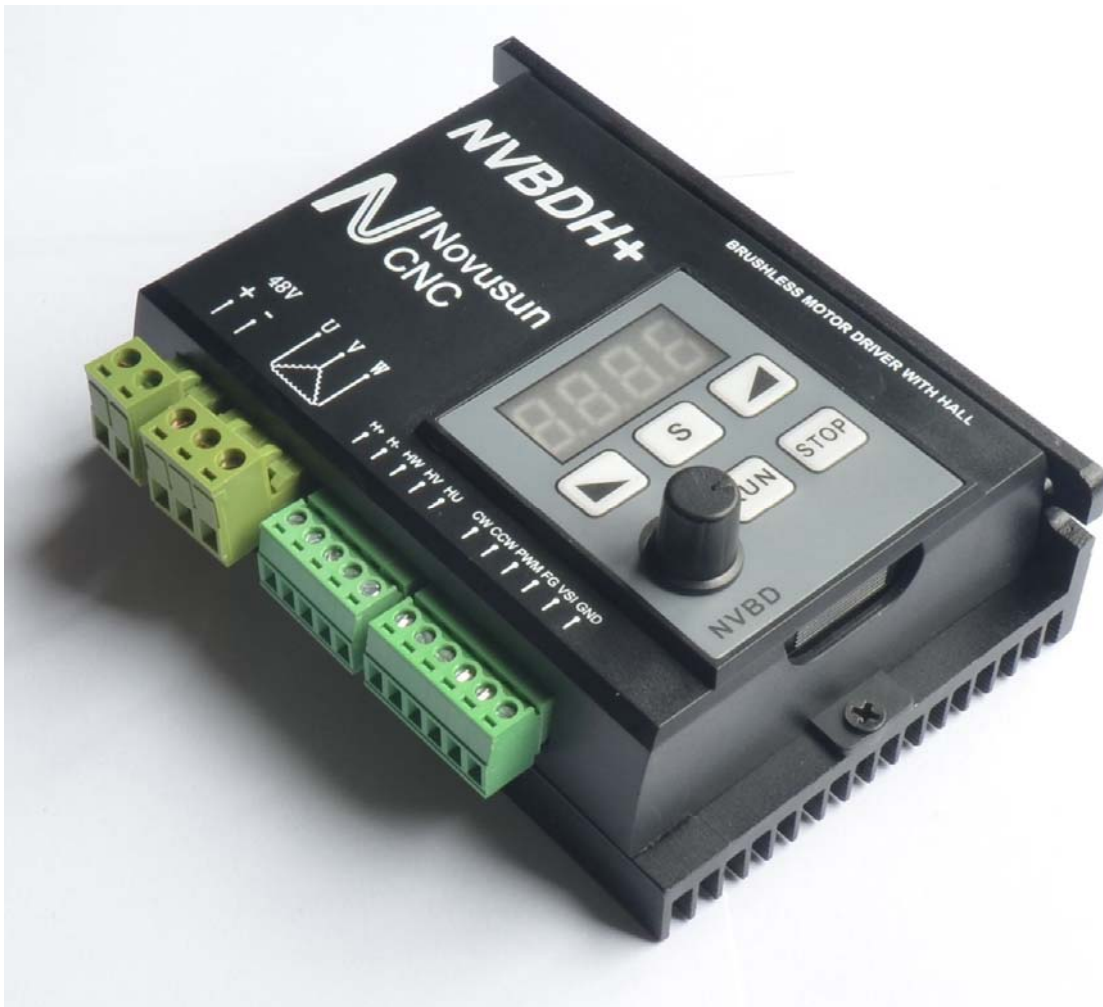

Figure1-1.   NVBDH+ appearance

Figure1-2.　　detached NVBDH+ appearance

Figure1-3.　　NVBDH with brushless spindle motor as one set

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Figure1-4.　　NVBDL+ Product appearance

Figure1-5.　　NVBDL+ detached panel

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Figure1-6.　　NVBDL+ brushless spindle motor as one set

NVBDH+ and NVBDL+ mechanical dimensions are the same,here we take NVBDL+

as example.Product outline dimension is 118*76*33mm,as picture 1-7 shows.The two

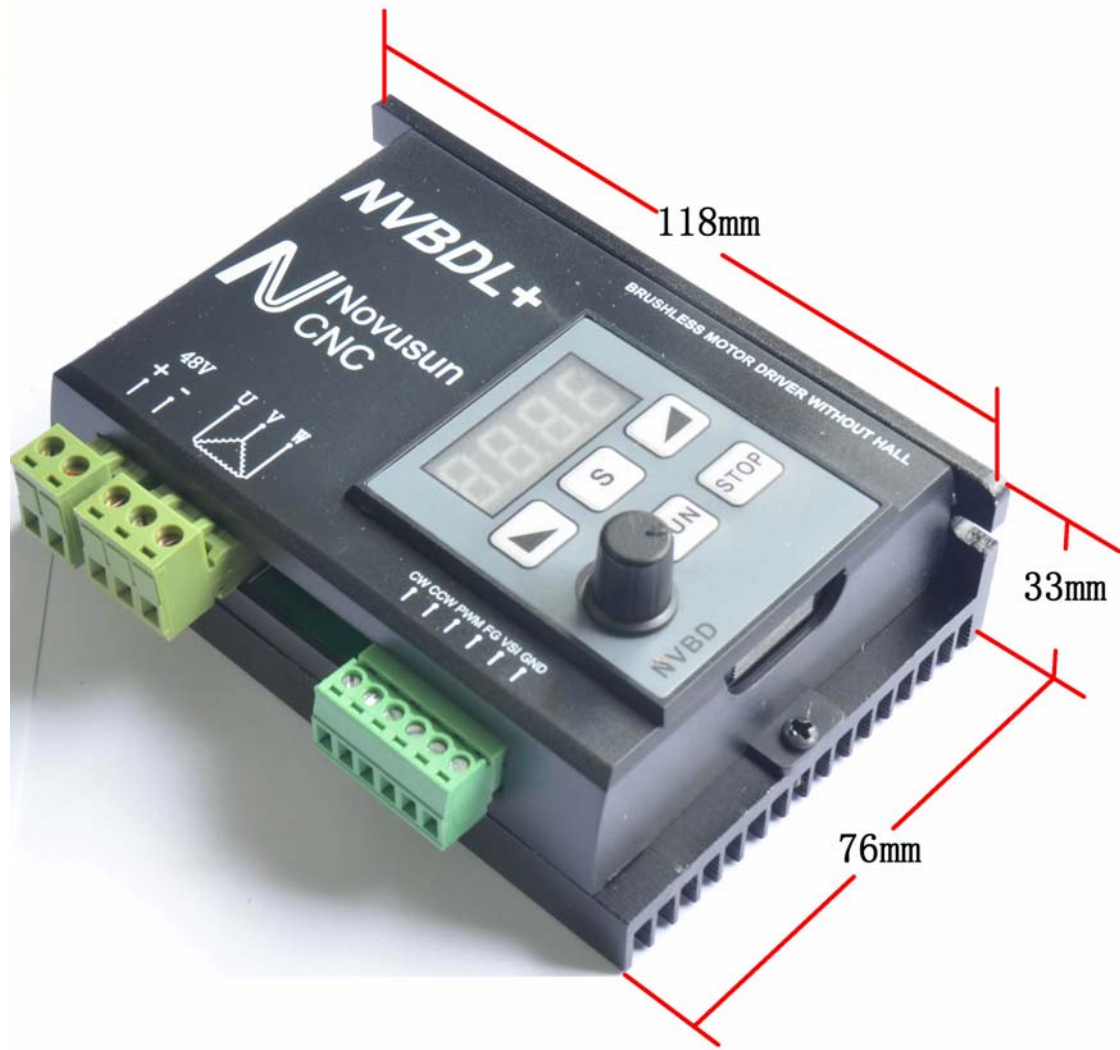installing hole size is 110mm,see picture 1-8.

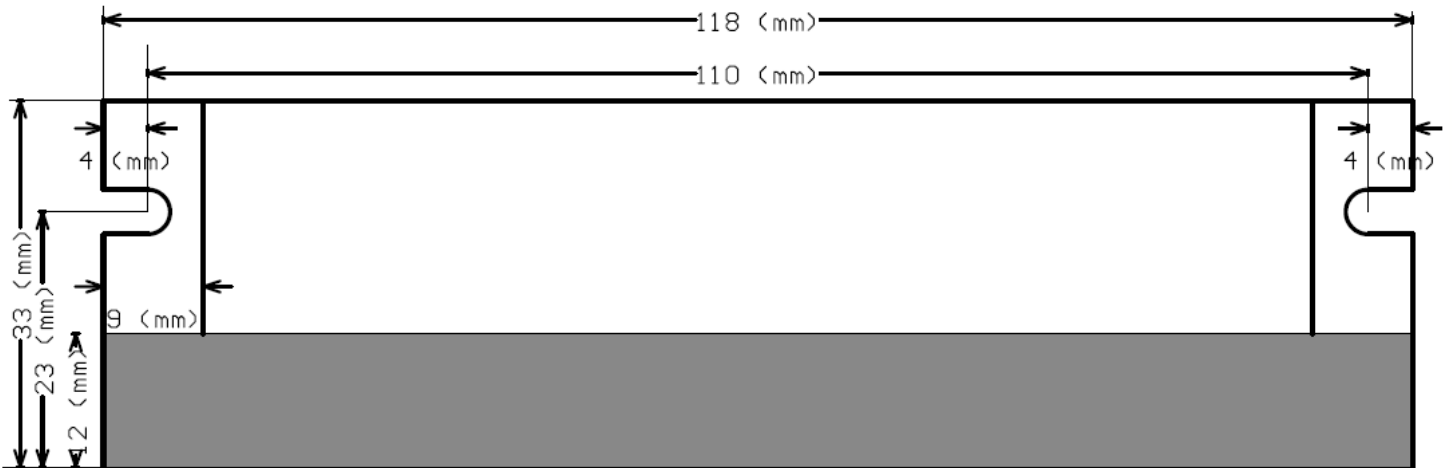Figure1-7.　　NVBDL+ outline dimension

Figure1-8. back side installing hole 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

NVBDL without Hall feedback,other parts are same as NVBDH.

NVBDH+ and NVBDL+ connection table as table 2-1.The green color Hall signal cable

is only for NVBDH+.

Mark	Definition		Type
+	Main power supply+	Input voltage range is 24V-60V,our matched spindle is 48V,so here we marked 48V	NVBDH+/NVBDL+
-	Main power supply Ground		NVBDH+/NVBDL+
U	Brushless motor U phase		NVBDH+/NVBDL+
V	Brushless motor V phase		NVBDH+/NVBDL+
W	Brushless motor W phase		NVBDH+/NVBDL+
H+	Hall power supply+,voltage is 12V		NVBDH+
H-	Hall power supply Ground		NVBDH+
HW	Hall feedback W phase signal cable		NVBDH+
HV	Hall feedback V phase signal cable		NVBDH+
HU	Hall feedback U phase signal cable		NVBDH+
CW	Motor clockwise rotate control signal port		NVBDH+/NVBDL+
CCW	Motor couterclockwise rotate control signal port		NVBDH+/NVBDL+

PWM	PWM speed control input port	NVBDH+/NVBDL+
FG	Motor speed inspection output port	NVBDH+/NVBDL+
VSI	Analog speed control input port	NVBDH+/NVBDL+
GND	Control signal common Ground	NVBDH+/NVBDL+

Chart 2-1 Wiring definition of NVBDH+ and NVBDL+

2.2 NVBDH+ 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 use can define the combination control methods.Here we explain 3 ways

connection mode:Panel button speed control+Panel start/stop control、external analog speed

control+external interface start/stop control、external PWM speed control+external interface

start/stop control.Firstly introduce Hall version NVBDH+:

1、 NVBDH+panel button speed control+ Panel start/stop control

NVBDH+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

NVBDH+ need to connect with signal collection port、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. Cable thin red、thin black、thin green、thin blue on the motor is Hall

power supply+、Hall GND、Hall U、Hall V、Hall W respectively,connect with H+、H-、HV、

HW on the drivers respectively.

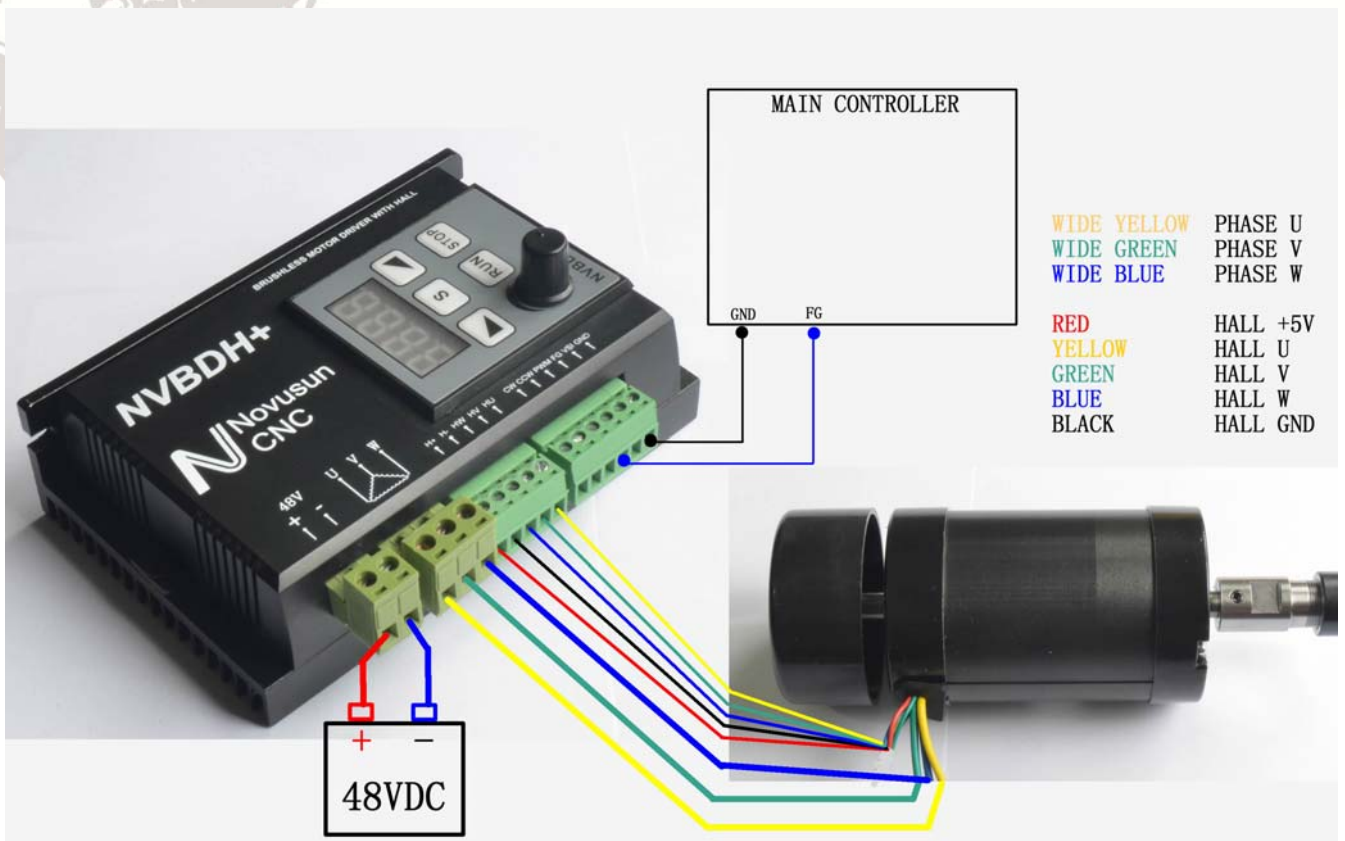|	
WIDE YELLOW	PHASE U
WIDE GREEN	PHASE V
WIDE BLUE	PHASE W
RED	HALL +5V
YELLOW	HALL U
GREEN	HALL V
BLUE	HALL W
BLACK	HALL GND

Figure2-1.　　NVBDH+panel button speed control+ Panel start/stop control

2、NVBDH+ external analog speed control+external interface start/stop control

　　　　NVBDH+ external analog speed control+external interface start/stop control connection

pls see picture 2-2.The VSI is analog speed control interface,connect VSI to controller analog

output;CW and CCW control the motor rotating direction,CW and GND connect with motor CW.

MAIN CONTROLLER

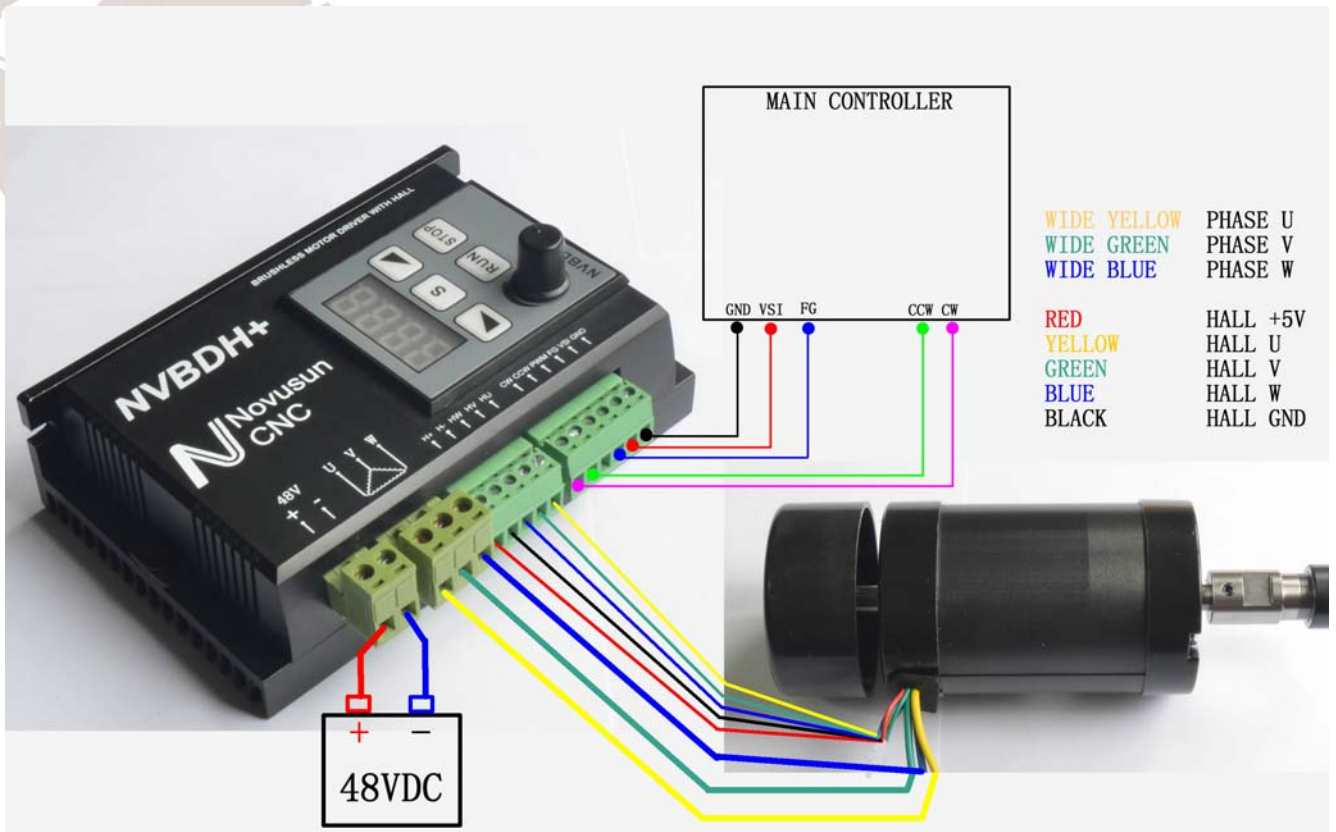| WIDE YELLOW	PHASE U
WIDE GREEN	PHASE V
WIDE BLUE	PHASE W
RED	HALL +5V
YELLOW	HALL U
GREEN	HALL V
BLUE	HALL W
BLACK	HALL GND

Figure2-2.   NVBDH+ external PWM speed control+external interface start/stop control

3、NVBDH+ external PWM speed control+external interface start/stop control

NVBDH+ external PWM speed control+external interface start/stop control connection

pls see the picture 2-3.In the mode of PWM control,connect PWM port on NVBDH+ to PWM
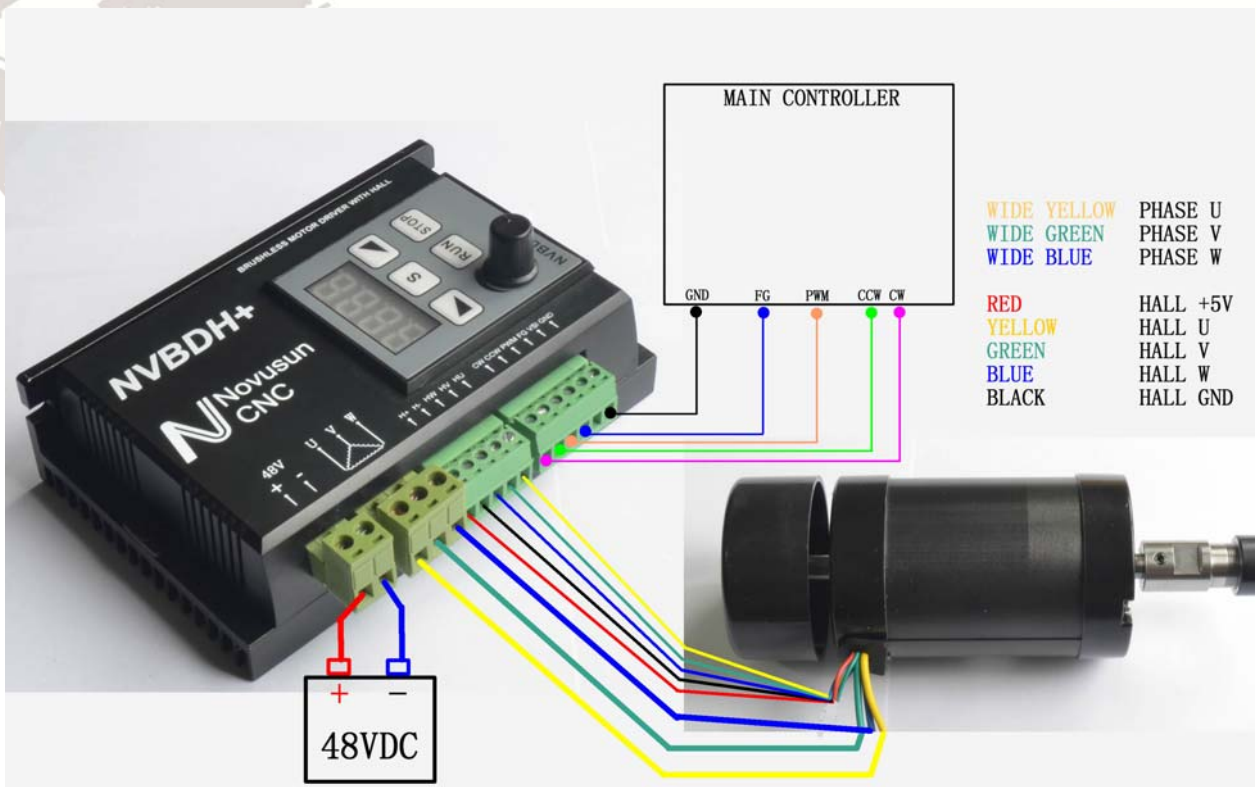
output port on controller.

WIDE YELLOW   PHASE U
WIDE GREEN   PHASE V
WIDE BLUE   PHASE W

RED   HALL +5V
YELLOW   HALL U
GREEN   HALL V
BLUE   HALL W
BLACK   HALL GND

Figure2-3.   NVBDH+   external PWM speed control+external interface start/stop control

2.3 NVBDL+ connection

NVBDL+ is the driver without Hall feedback,so the connection is easier than NVBDH+.Here we also introduce 3 control modes.

1、NVBDL+ panel button speed control+ Panel start/stop control

NVBDL+ panel button speed control+ Panel start/stop control connection pls see the picture 2-4. In this mode,if the control system need to collect motor speed data,then FG、GND port on NVBDH+ need to connect with signal collection port、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.No hall connection.

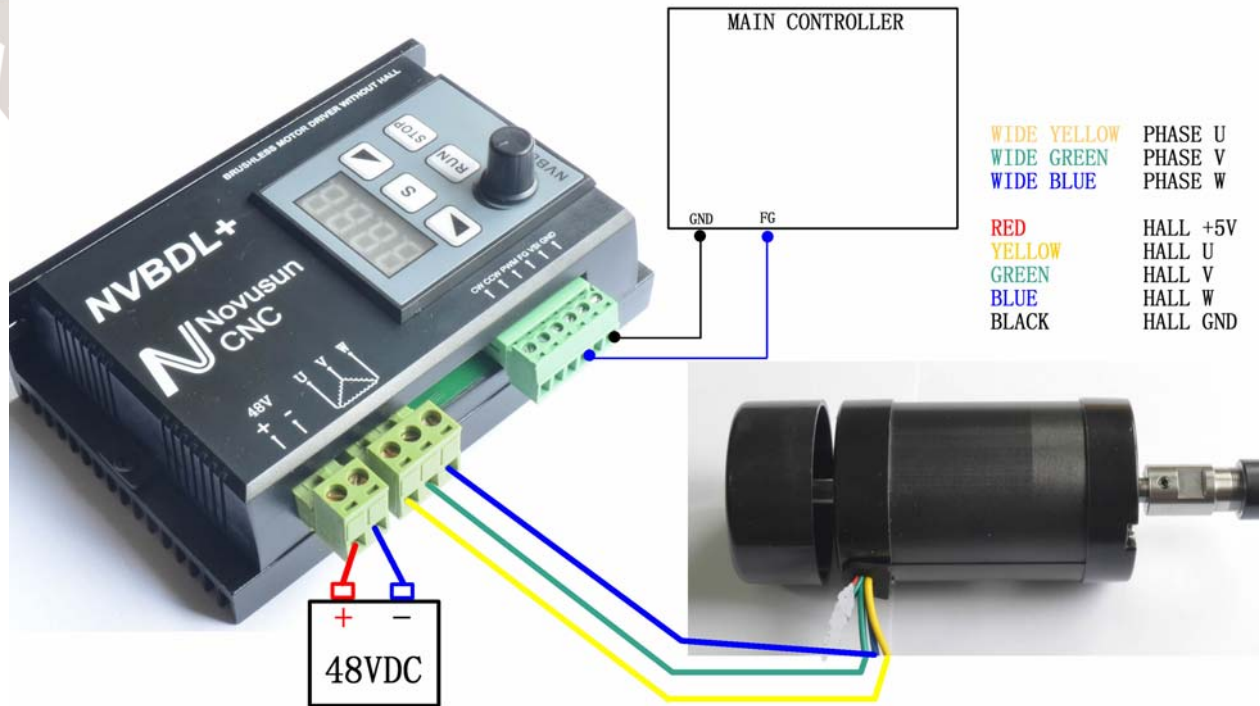| WIDE YELLOW | PHASE U |
WIDE GREEN	PHASE V
WIDE BLUE	PHASE W
RED	HALL +5V
YELLOW	HALL U
GREEN	HALL V
BLUE	HALL W
BLACK	HALL GND

Figure2-4. NVBDL+ panel button speed control+ Panel start/stop control connection

2、NVBDL+ external analog speed control+external interface start/stop control

NVBDL+ external analog speed control+external interface start/stop control connection see the picture 2-5. The VSI is analog speed control interface,connect VSI to controller analog output;CW and CCW control the motor rotating direction,CW and GND connect with motor CW.
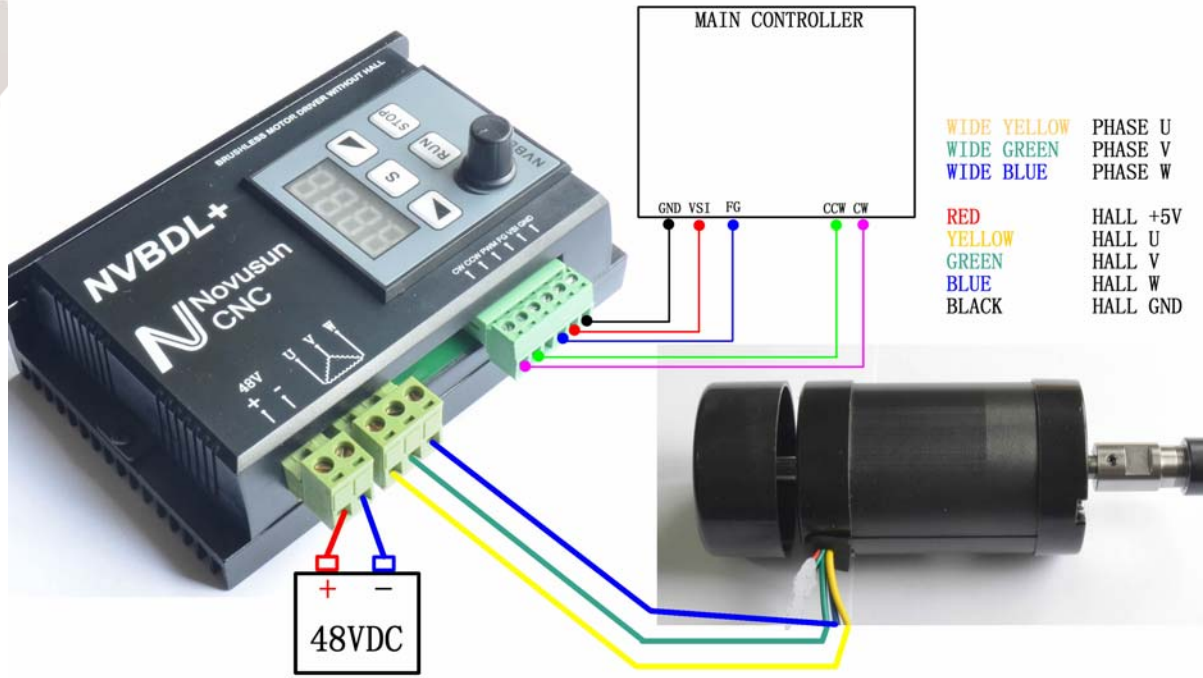
Figure2-5.   NVBDL+ external PWM speed control+external interface start/stop control

3、NVBDL+ external PWM speed control+external interface start/stop control

NVBDL+ external PWM speed control+external interface start/stop control connection

pls see the picture 2-6.In the mode of PWM control,connect PWM port on NVBDL+ to PWM
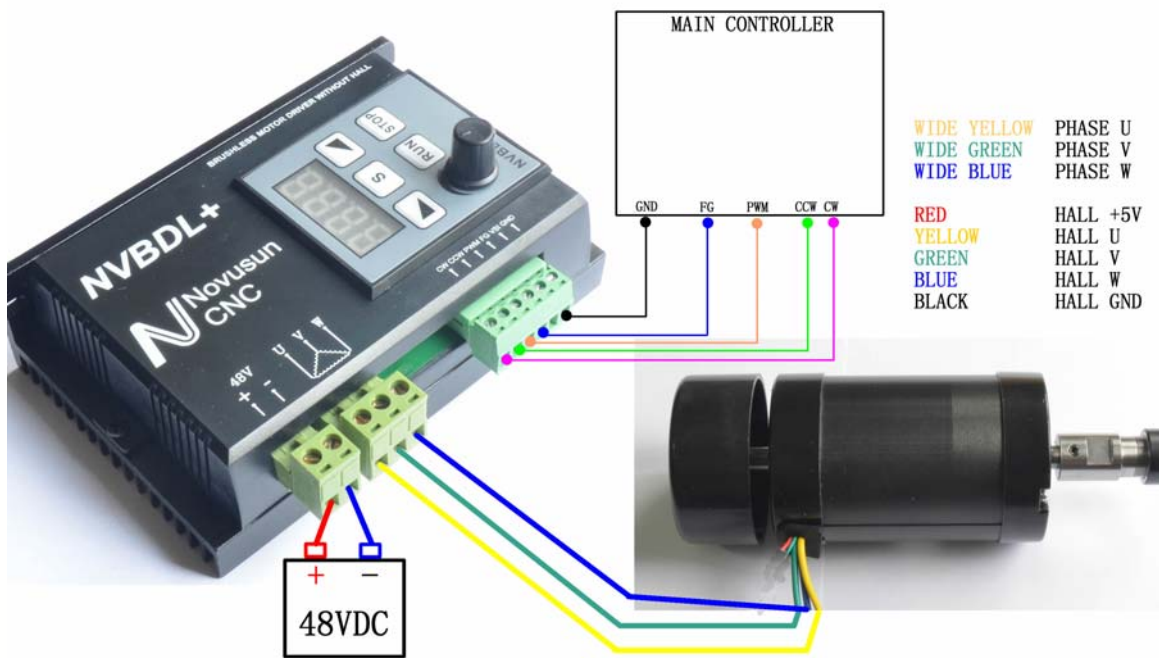
output port on controller.

Figure2-6.   NVBDL+ external PWM speed control+external interface start/stop control

►► Chapter 3. Configuration methods

3.1 Panel definition

The parameters on NVBDH+ and NVBDL+ are the same, so here just describe only
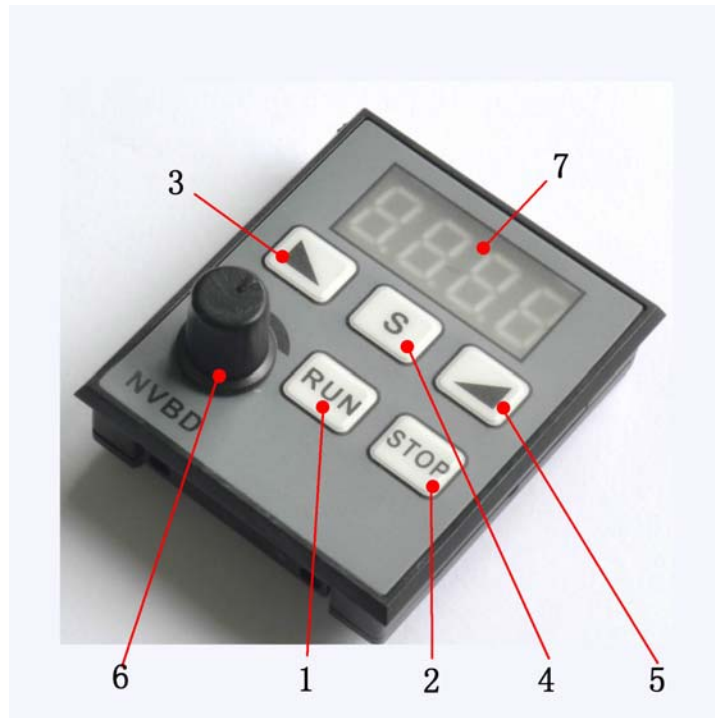
one.Panel definition reference image just see picture 3-1.

Figure3-1.   control panel structure image

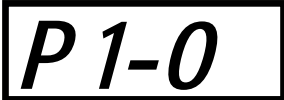| No.	Mark	Definition	Description
1	RUN	Start	Press this button motor run
2	STOP	Stop	Press this button motor stop working
3	◣	reduce parameter	parameter downpage or reduce parameter
4	S	selection	press once the button and enter into parameter term,keep pressing button,exit from current parameter term.
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.

<center>Chart 3-1 Control panel definition</center>

3.2 Parameter setting and LED display

1、When power on buzzer "DI--"rings one time,and LED lights up, driver standby.
$$\boxed{\ .\quad.\quad.\quad.\ }$$

2、At the status of Standby,keep pressing S button and enter into parameter setting page,kilobit displayed P,hundreds place is flashing,then press ◢ or ◣ to increase or reduce your parameter. The adjustable range is from P0 to P5,and Po is exit.
$$\boxed{P\ 1}$$

3、When selected the parameter,keep pressing S button and enter into parameter setting,then kilobit on the page displayed P, hundreds place is flashing,decade displayed "-",the unit flashing and shows the value.
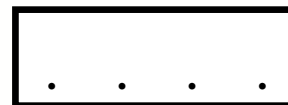$$\boxed{P\ 1\text{-}0}$$

4、After parameter setting,keep pressing S button and confirm the setting,page go to last menu.

$$\boxed{P\ 1}$$

5、When all the parameter setting finished,at the first menu,press ◢ or ◣ to select Po,

$$\boxed{Po}$$

And keep pressing S,Then exit this page,into standby status.
$$\boxed{\ .\quad.\quad.\quad.\ }$$

6、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.

7、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		

2、Start control mode P1

Mark	P1	start control mode	default =0
value	remark		
0	panel button start		
1	CW/CCW start		

3、External voltage control range P2

Mark	P1	external voltage control range	default =1
value	remark		
0	0-5V		
1	0-10V		

4、PWM   effective voltage P3

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	P1	Panel start motor direction default =0
value	remark	
0	CW	
1	CCW	

6、Speed signal feedback frequency multiplication P5

Mark	P1	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	