Additional Instructions for Closed-loop Vector Control Inverter

I、Incremental PG card terminal description and encoder port wiring description：

1.1 Terminal ordering：

SD6-PG01A（5V\12V optional）

CAN communication, according to the customer demand for choose.

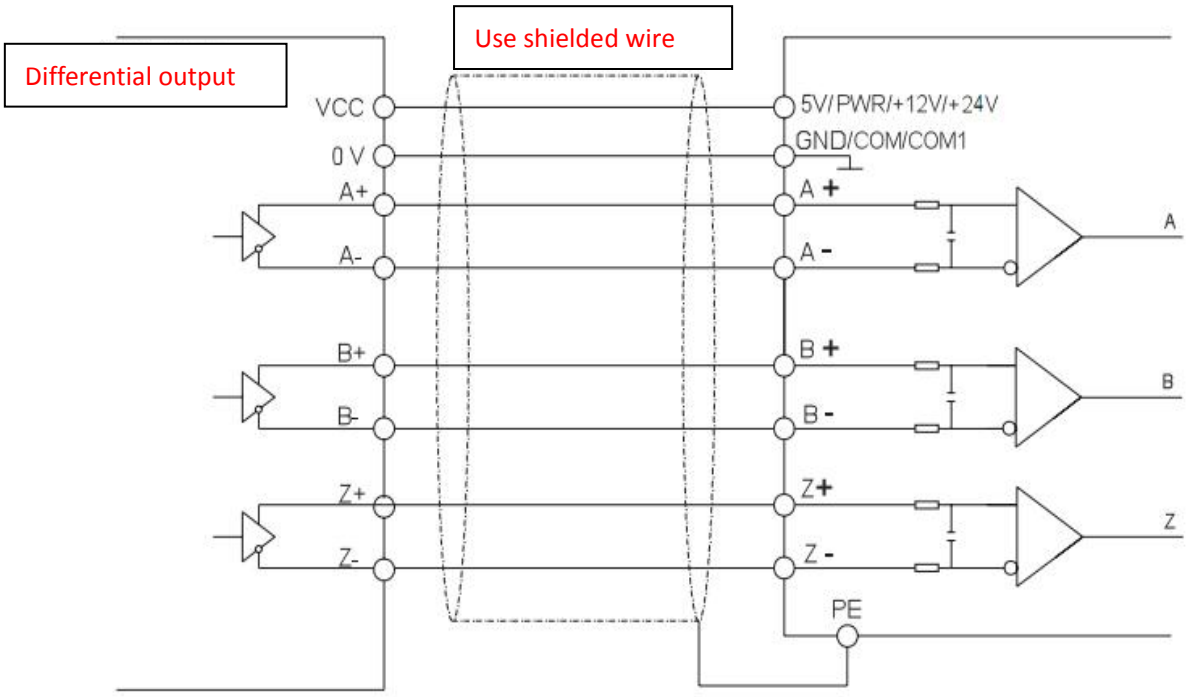
CANH	CANL	GND	Z-	Z+	B-	B+	A-	A+	PWR 5V/12V	COM

1.2 Terminal instruction：

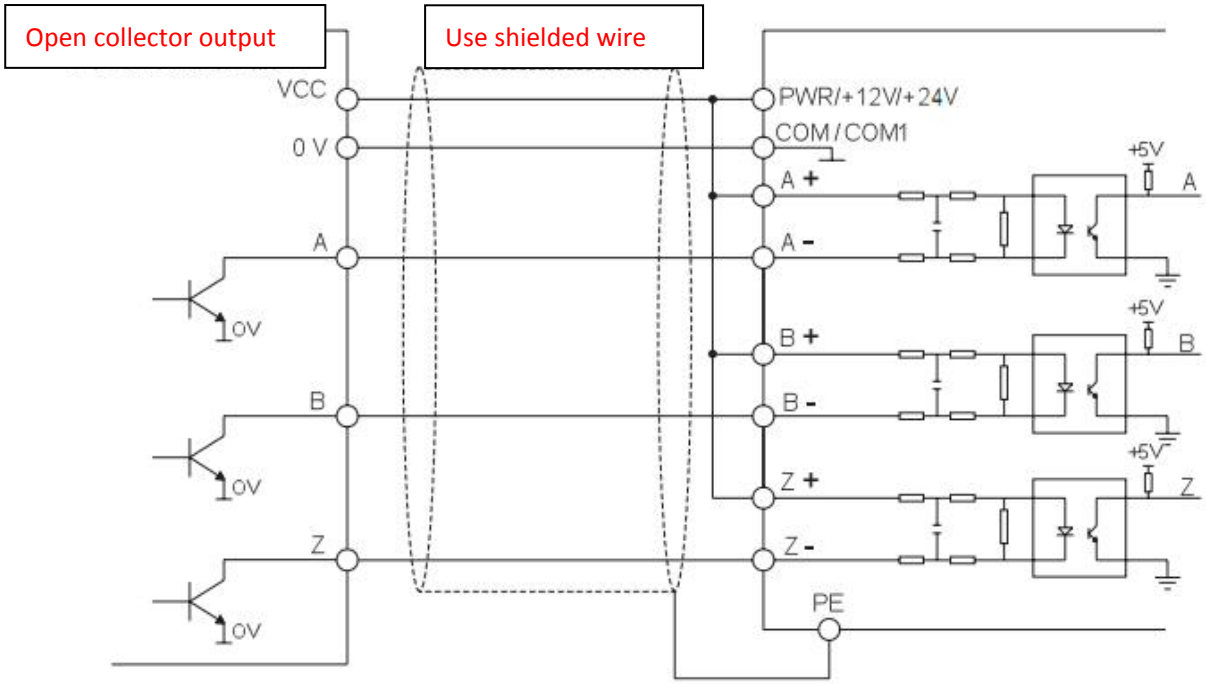
Terminal name	Function	Responding speed
+5V、+12V、PWR、COM	Encoder working power	-
A+、A-	Encoder A signal	0~300kHz
B+、B-	Encoder B signal	0~300kHz
Z+、Z-	Encoder Z signal	0~300kHz
CANH、CANL、GND	CAN communication signal	-

1.3 Encoder port wiring：

1, Differential output method：

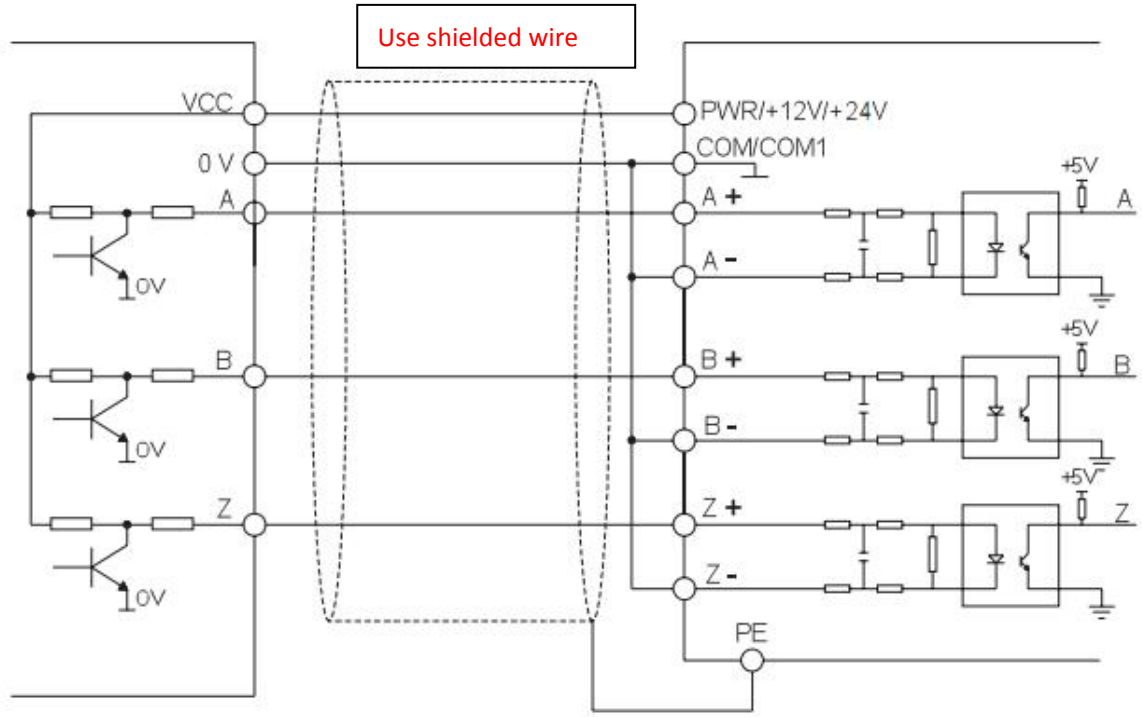


2, Open collector output mode:：



Note: A+, B+, Z+ of the PG card is short-circuited with PWR, and the encoder VCC, 0V, A, B, and Z are connected to the PWR, COM, A-, B-, Z- of the PG card correspondingly.。

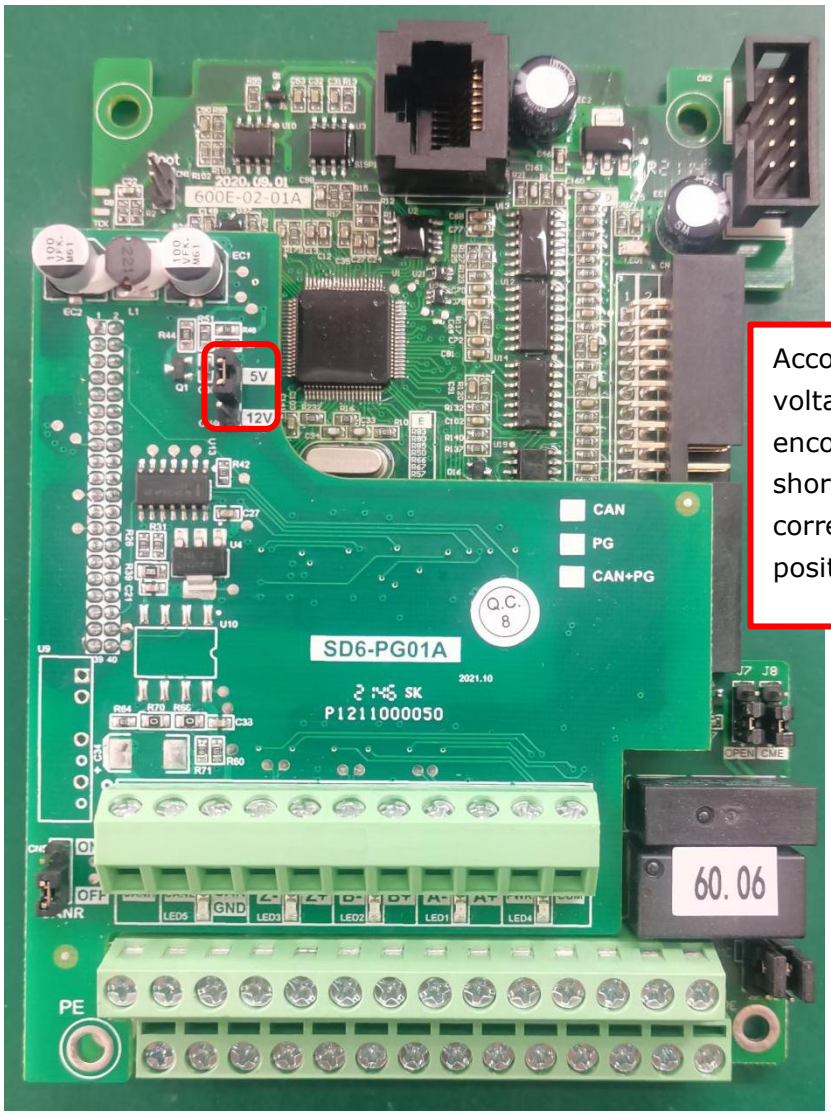
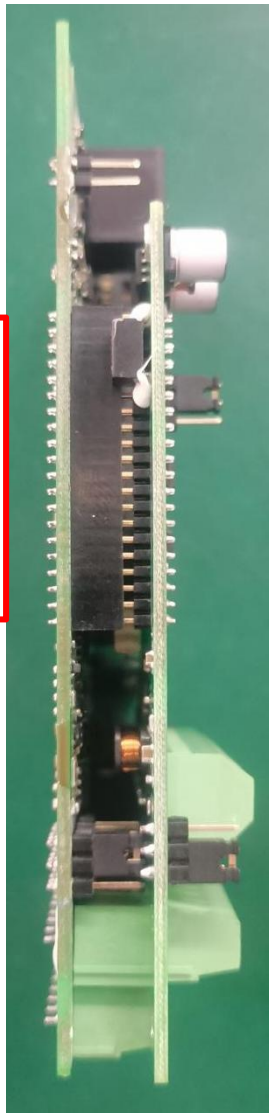
III、Voltage output method：



Note: A-, B-, Z- of the PG card are short-circuited with COM, and the encoder VCC, 0V, A, B, and Z are connected to the PWR, COM, A+, B+, Z+ of the PG card correspondingly.

II、SD600 closed-loop vector debugging steps are as follows：

Step 1: Connect the inverter to the main power cable (off power), connect the motor cable, connect the expansion card of the control board to the suitable PG card, and connect the encoder cable to the terminal of the PG card, as show follow picture.

<table>
<tr>
<td> 
</td>
<td>According to the voltage of the encoder, jump the shorting cap to the corresponding position (5V/12V)</td>
<td>  </td>
</tr>
<tr>
<td>front</td>
<td></td>
<td>side</td>
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</table>

Step 2: Power on the inverter. If there is no fault on display, the inverter is normal. First, set the nameplate parameters related to the motor, as shown in the following table F05 group motor parameters.

Parameter	Description	Setting
F05.01	Motor 1 rated power	Correctly set according to the motor nameplate parameters
F05.02	Motor 1 rated voltage	
F05.03	Motor 1 rated current	
F05.04	Motor 1 rated frequency	
F05.05	Motor 1 rated speed	

Step 3: Set the encoder parameters of the closed-loop vector, such as the encoder parameters in the F02 group in the following table.

Parameter	Description	设定
F05.16	Encoder type	Set according to the encoder nameplate
F05.17	AB encoder pulse number	
F05.18	ABZ pulse phase sequence	Available through motor self-learning
F05.19	Number of pole pairs of resolver	According to the actual setting

Step 4: Set the control mode to have speed sensor vector control（F00.01=2）

Step 5： Set F05.26=1, the keypad will be display “TUNE” and press “RUN” key to dynamic self-learning on the motor parameters, when it finished, it will stop and get the motor self-learning parameters.

Parameter	Description	Setting
F05.06	Motor 1 stator resistance	Obtained through motor parameter self-learning
F05.07	Motor 1 rotor resistance	
F05.08	Motor 1 leakage inductance	
F05.09	Motor 1 mutual inductance	
F05.10	Motor 1 no-load current	

Step 6: According to the actual specific application effect, the user can optimize the control performance of the closed-loop vector, and the relevant optimization parameters are shown in the following table.

Parameter	Description	Setting
Group F03：Vector control parameter group		
F06.00	Speed loop low speed proportional gain 1	1. The motor has medium and low frequency oscillations. On the basis of the factory value, the proportional coefficient of the speed loop can be appropriately reduced and the integral time can be increased; or the proportional and integral coefficient of the current loop can be reduced. 2. If the motor has a slow response at medium and low frequency, and the speed drops greatly during sudden load, on the basis of the factory value, appropriately increase the proportional gain of the speed loop and reduce the integral time; or increase the proportional and integral coefficient of the current loop.
F06.01	Speed loop low speed integration time 1	
F06.02	switching frequency 1	
F06.03	Speed loop high speed proportional gain 2	
F06.04	Speed loop high-speed integration time 2	
F06.05	switching frequency 2	
F06.06	ASR feedback input filter time	
F06.07	Current loop proportional gain1	
F06.08	Current loop integral gain1	
F06.09	Current loop proportional gain2	
F06.10	Current loop integral gain2	

Precautions:

When dynamic self-learning is selected, the AB pulse phase sequence (F05.18) can be obtained through self-learning, and the user does not need to set it manually.

When static self-learning is selected, the AB pulse phase sequence (F05.18) cannot be obtained through self-learning. If the closed-loop vector does not work normally after startup, the user can manually modify the AB pulse phase sequence setting.

Attached:

Verify that the encoder is installed and set correctly: when F00.01 is 0 (in V/F mode), when run the inverter to check the measured frequency value of the encoder, the parameters are F99.32, the value is positive and It is not much different from the running frequency, which indicates that the encoder is installed correctly and the parameters are set correctly. If the parameter value is negative, please exchange any two phases between U, V and W to make them positive.