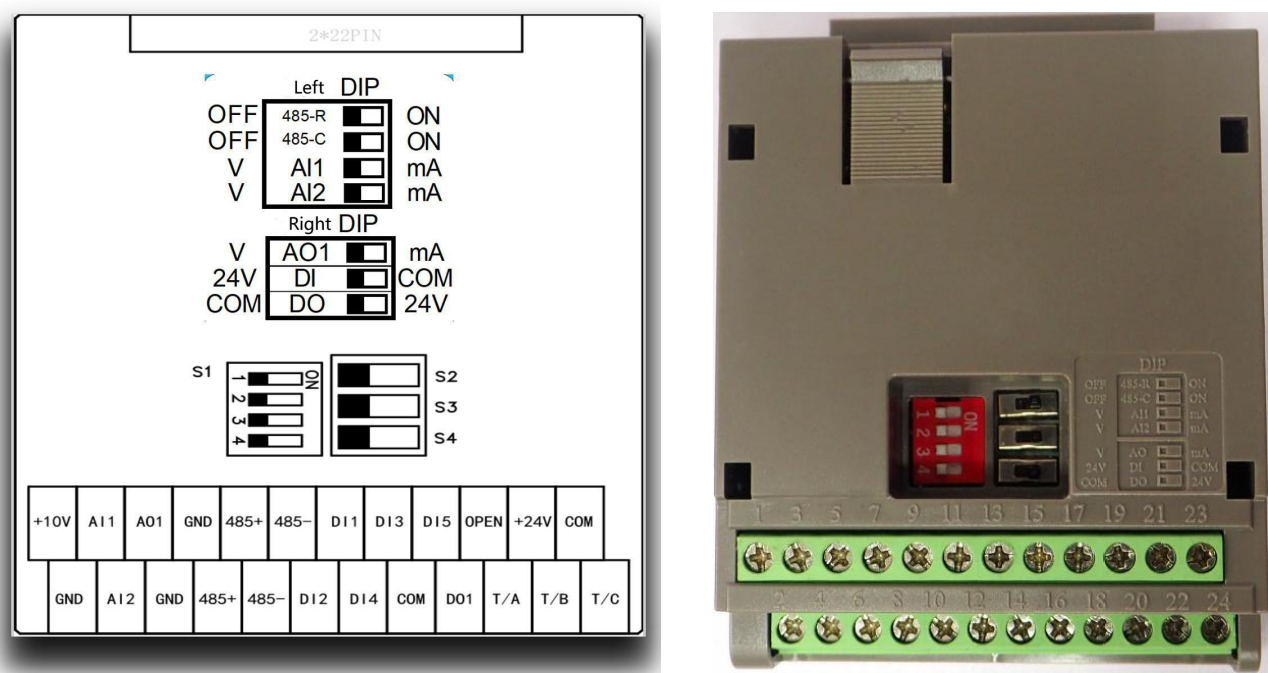


VD60 Series IO Expansion Card Selection Description V3-1

1. V8GT005IO1(Default I/O card) Instruction (Expansion card Order Material number: 02040057)



+10V	AI1	AO1	GND	485+	485-	DI1	DI3	DI5	OPEN	+24V	COM
1	3	5	7	9	11	13	15	17	19	21	23
2	4	6	8	10	12	14	16	18	20	22	24
GND	AI2	GND	485+	485-	DI2	DI4	COM	DO1	T/A	T/B	T/C

IO1 card terminal identification

Function description of IO1 control loop terminals

Type	Terminal Identification	Terminal Name	Function Description
Power Supply	+10V	Analog input reference voltage	1. Provide external 10V power supply. 2. Generally used as an external potentiometer power, the resistance range of the potentiometer is 1k Ω ~10k Ω . 3. The maximum output current is 20mA.
	GND	Analog ground	Internal isolation from COM
	+24V	+24V power supply	1. Provide external +24V power supply, which is generally used as the power supply for digital input output terminals for external sensors. 2. The maximum output current is 200mA.
	COM	+24V ground	Internal isolation from GND
	OPEN	External power input terminal	Connected with +24V or COM by select through the S4 dial switch (DI) on the expansion board: 1)  Connect with +24V (default) 2)  Connect with COM
Analog Input	AI1	Analog input terminal 1	1. Input range: DC 0V~10V or 0/4mA~20mA, select by S1 switch 3 rd gear (AI1) on the expansion board.  1)  It is DC 0V~10V signal (default)  2)  It is 0/4mA~20mA signal 2. Input impedance: 22k Ω for voltage input, 500 Ω for current input.
	AI2	Analog input terminal 2	1. Input range: DC 0V~10V or 0/4mA~20mA, select by the 4 th gear (AI2) of the S1 dial switch on the expansion board.  1)  It is DC 0V~10V signal (default)  2)  It is 0/4mA~20mA signal 2. Input impedance: 22k Ω for voltage input, 500 Ω for current input.
	GND	Analog ground	Internal isolation from COM
Digital Input	DI1	Digital input terminal 1	1. Optocoupler isolation, compatible with bipolar input, internal impedance 3.6k Ω .
	DI2	Digital input terminal 2	2. Multifunctional digital input, set the function through F5-01~F5-05.
	DI3	Digital input terminal 3	3. The factory default of the inverter is to provide +24V power supply internally, and COM is the common terminal.
	DI4	Digital input terminal 4	4. When using an external power supply, the external +24V is connected to the OPEN terminal, and COM is the common terminal (external supply voltage range +24V $\pm$ 10%).
	DI5	Digital input terminal 5	Same as DI1~DI4
	DI5	High speed pulse input terminal (optional)	1. When used as a common digital output terminal, the function is the same as DO1. 2. As a high-speed pulse output terminal, the maximum output frequency is 100kHz. 3. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48k Ω ~ 10k Ω); 4. Output current range: 2mA~50mA;

	COM	+24V ground	Internal isolation from GND
Analog Output	AO1	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S2 dial switch (AO): 1) ☐ It is 0V~10V voltage output (default) 2) ☒ It is 0/4mA~20mA current output
	GND	Analog ground	Internal isolation from COM
Digital Output	DO1	Digital output	1. Optocoupler isolated, bipolar OC (open collector) output; 2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48kΩ~10kΩ); 3. Output current range: 2mA~50mA; 4. The power source can be selected through the S3 dial switch (DO). 1) ☐ To select external power output (external supply voltage+24V±10%). 2) ☒ To select to use the internal power source output.
		High speed pulse output terminal (optional) Please see the order material number in the remarks to purchase in advance	1. It can be combined with the OPEN terminal as a bipolar high speed pulse output terminal, the maximum output frequency is 100kHz. 2. Pull-up voltage range: 5V~24V (pull-up resistance value range is same as above); 3. Output current range: 2mA~50mA;
	COM	+24V ground	Internal isolation from GND
Relay Output	T/A-T/B	Relay T1 normally open terminal	Common terminal is T/B, normally open contact is T/A, normally closed contact is T/C; contact driving capacity: AC250V, 3A; DC30V, 5A.
	T/B-T/C	Relay T1 normally closed terminal	
485 Communication	485+	485 differential signal positive	Standard RS-485 communication terminal, should use twisted pair shielded cables.
	485-	485 differential signal negative	
	GND	485 communication shield grounding	
CAN Communication (Optional)	CANH	CAN bus positive	CAN communication terminal, please use twisted pair shielded cable
	CANL	CAN bus negative	
	CANG	CAN bus reference ground	
Dial Switch	485-R	OFF terminal	When the S1-1 dial code is dialed to the left end, the 120 Ω terminal resistance of the 485 communication is disconnected.
		ON terminal	When the S1-1 dial is dialed to the right end, the 485 communication 120 Ω terminal resistance is connected.
	485-C	OFF terminal	When the S1-2 dial is dialed to the left end, the 485 communication filter capacitor is disconnected.
		ON terminal	When the S1-2 dial is dialed to the right end, the 485 communication filter capacitor is connected.
	AI1	V terminal	When the S1-3 dial code is dialed to the left end, the AI1 terminal selects the input DC 0~10V voltage signal.
		mA terminal	When the S1-3 is dialed to the right end, AI1 terminal selects to input DC 0/4mA~20mA current signal.
	AI2	V terminal	When the S1-4 is dialed to the left end, AI2 terminal selects to input DC 0~10V voltage signal.
		mA terminal	When the S1-4 is dialed to the right end, AI2 terminal

			selects to input DC 0/4mA~20mA current signal.
		AO	V terminal When the S2 dial code is dialed to the left end, the A01 terminal chooses to output DC 0~10V voltage signal.
			mA terminal When the S2 dial code is dialed to the right end, the A01 terminal selects to output a DC 0/4mA ~ 20mA current signal.
		DI	24V terminal When the S3 dial code is dialed to the left end, the OPEN terminal is connected to 24V, and the short-circuit input between DI and COM is valid.
			COM terminal When the S3 dial code is dialed to the right end, the OPEN terminal is connected to COM, and the short-circuit input of DI and 24V is valid.
		DO	COM terminal When the S4 dial is dialed to the left end, the DO output is to select the external power output (external power supply voltage +24V±10%).
			24V terminal When the S4 dial is dialed to the right end, the DO output is the internal power output.
Shield Ground	GND	Shielded cable ground terminal	1. It is used for the shielding grounding of the control cable. When the field environment is disturbed or the control circuit is long, it must be well grounded to reduce the electromagnetic interference to comply with EMC electromagnetic regulations. 2. It is strictly forbidden to connect this terminal with the power PE wire.
Auxiliary Interface	J2	Control board-Expansion card	The socket is the connection port between the main control board and the expansion card. The main control board supplies power to the expansion card and the electrical channel for signal connection between the main control board and the expansion card.

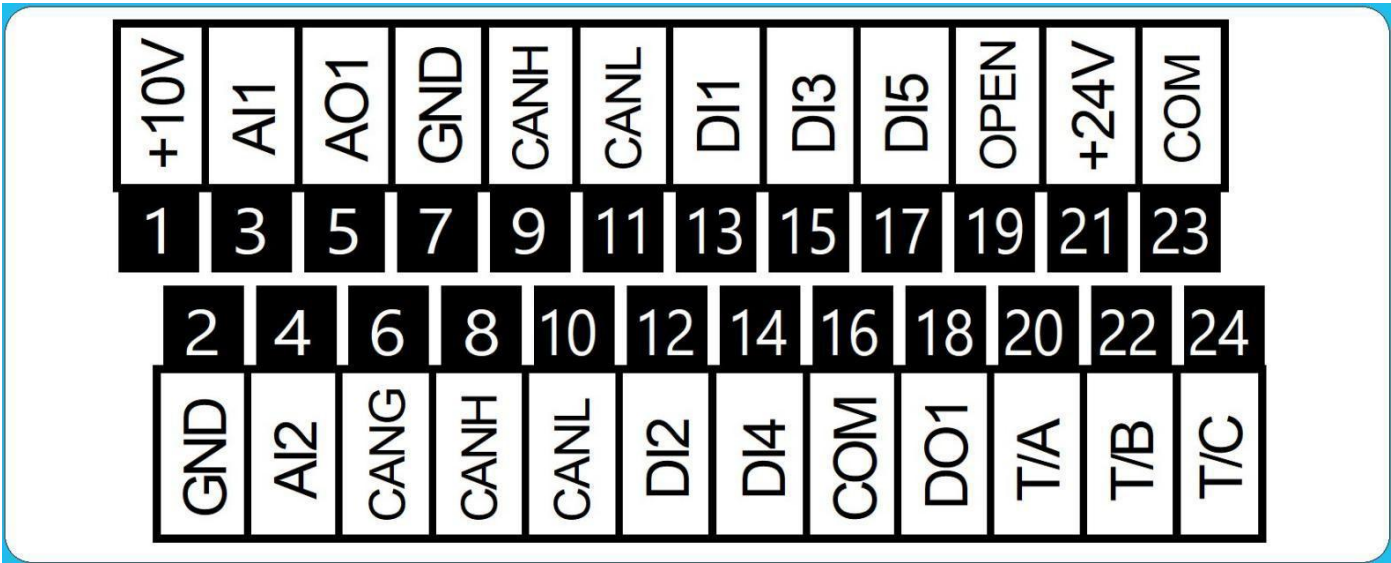
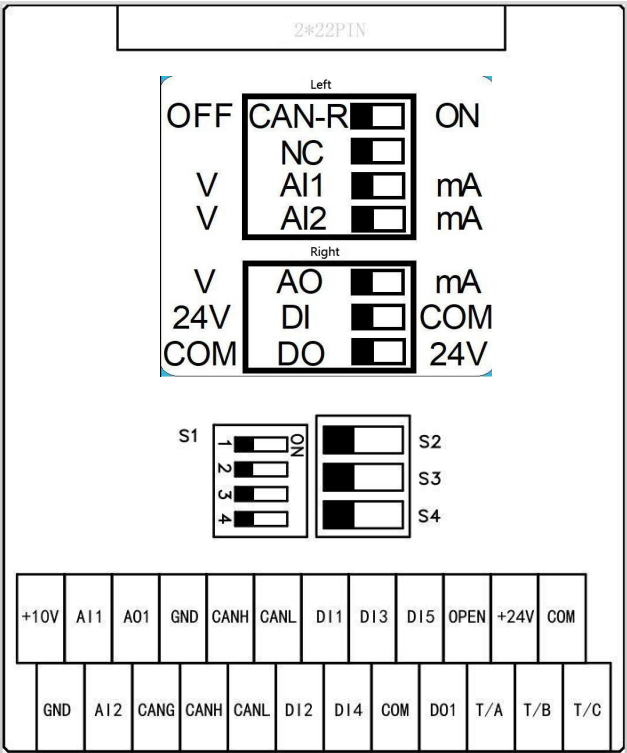
Note: IO1 card default DO is low speed open collector output, DI5 is ordinary low speed switching input, if you need HDO1(high-speed pulse output function) HDI1 (high-speed pulse input function), you need to place a separate order (Expansion card order Material No. : 02040058)

DI5 corresponding HDI5

DO1 corresponding HDO1

+10V	A1	AO1	GND	485+	485-	DI1	DI3	HDI5	OPEN	+24V	COM
1	3	5	7	9	11	13	15	17	19	21	23
2	4	6	8	10	12	14	16	18	20	22	24
GND	A12	GND	485+	485-	DI2	DI4	COM	HDO1	T/A	T/B	T/C

2. V8GT005IO2 -- CAN communication card introduction (Expansion card Order Material No. 02040059)



IO2 card (CAN communication) terminal identification

Function description of IO2 control loop terminals

Type	Terminal Identification	Terminal Name	Function Description
Power Supply	+10V	Analog input reference voltage	1. Provide external 10V power supply. 2. Generally used as an external potentiometer power, the resistance range of the potentiometer is 1kΩ~10kΩ. 3. The maximum output current is 20mA.
	GND	Analog ground	Internal isolation from COM
	+24V	+24V power supply	1. Provide external +24V power supply, which is generally used as the power supply for digital input output terminals for external sensors. 2. The maximum output current is 200mA.
	COM	+24V ground	Internal isolation from GND
	OPEN	External power input terminal	Connected with +24V or COM by select through the S4 dial switch (DI) on the expansion board: 1)  Connect with +24V (default) 2)  Connect with COM
Analog Input	AI1	Analog input terminal 1	1. Input range: DC 0V~10V or 0/4mA~20mA, select by S1 switch 3 rd gear (AI1) on the expansion board.  1)  It is DC 0V~10V signal (default)  2)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	AI2	Analog input terminal 2	1. Input range: DC 0V~10V or 0/4mA~20mA, select by the 4 th gear (AI2) of the S1 dial switch on the expansion board.  1)  It is DC 0V~10V signal (default)  2)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	GND	Analog ground	Internal isolation from COM
Digital Input	DI1	Digital input terminal 1	1. Optocoupler isolation, compatible with bipolar input, internal impedance 3.6kΩ.
	DI2	Digital input terminal 2	2. Multifunctional digital input, set the function through F5-01~F5-05.
	DI3	Digital input terminal 3	3. The factory default of the inverter is to provide +24V power supply internally, and COM is the common terminal.
	DI4	Digital input terminal 4	4. When using an external power supply, the external +24V is connected to the OPEN terminal, and COM is the common terminal (external supply voltage range +24V±10%).
	DI5	Digital input terminal 5	Same as DI1~DI4
		High speed pulse input terminal (optional) Please see the order material number	1. It can be combined with the OPEN terminal as a bipolar high speed pulse input terminal, the maximum input frequency is 100kHz. 2. When using an external powder supply, the input voltage range is +24V±10%.

		in the remarks to purchase in advance	
	COM	+24V ground	Internal isolation from GND
Analog Output	AO1	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S2 dial switch (AO): 1) ☐ It is 0V~10V voltage output (default) 2) ☐ It is 0/4mA~20mA current output
	GND	Analog ground	Internal isolation from COM
Digital Output	DO1	Digital output	1. Optocoupler isolated, bipolar OC (open collector) output; 2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48kΩ~10kΩ); 3. Output current range: 2mA~50mA; 4. The power source can be selected through the S3 dial switch (DO). 1) ☐ To select external power output (external supply voltage+24V±10%). 2) ☐ To select to use the internal power source output.
		High speed pulse output terminal (optional) Please see the order material number in the remarks to purchase in advance	1. It can be combined with the OPEN terminal as a bipolar high speed pulse output terminal, the maximum output frequency is 100kHz. 2. Pull-up voltage range: 5V~24V (pull-up resistance value range is same as above); 3. Output current range: 2mA~50mA;
	COM	+24V ground	Internal isolation from GND
Relay Output	T/A-T/B	Relay T1 normally open terminal	Common terminal is T/B, normally open contact is T/A, normally closed contact is T/C; Contact drive capacity: AC250V, 3A; DC30V, 5A.
	T/B-T/C	Relay T1 normally closed terminal	
CAN Communication (Optional)	CANH	CAN differential signal positive	CAN communication terminal, please use twisted pair shielded cable. Note that CANG is different from GND.
	CANL	CAN differential signal negative	
	CANG	Shield ground for CAN communication	
Dial Switch	CAN-R	OFF terminal	When the S1-1 dial code is dialed to this end, the CAN communication 120Ω terminal resistance is disconnected.
		ON terminal	When the S1-1 dial code is dialed to this end, the CAN communication 120Ω terminal resistance is connected.
	AI1	V terminal	When the S1-3 dial code is dialed to this end, AI1 terminal selects input DC 0~10V voltage signal
		mA terminal	When the S1-3 dial code is dialed to this end, AI1 terminal selects input DC 0/4mA~20mA current signal
	AI2	V terminal	When the S1-4 dial code is dialed to this end, AI2 terminal selects input DC 0~10V voltage signal
		mA terminal	When the S1-4 dial code is dialed to this end, AI2 terminal selects input DC 0/4mA~20mA current signal
	AO	V terminal	When the S2 dial code is dialed to this end, AO1 terminal selects input DC 0~10V voltage signal
		mA terminal	When the S2 dial code is dialed to this end, AO1 terminal selects input DC 0/4mA~20mA current signal

	DI	24V terminal	When the S3 dial code is dialed to this end, the OPEN terminal is connected to 24V, and the input of DI and COM short-circuit is value.
		COM terminal	When the S3 dial code is dialed to this end, the OPEN terminal is connected to COM, and the input of DI and 24V short-circuit is value.
	DO	COM terminal	When the S4 dial code is dialed to this end, DO output selects external power output (external power supply voltage+24V±10%)
		24V terminal	When the S4 dial code is dialed to this end, the DO output is the internal power output
Shield Ground	GND	Shielded cable ground terminal	1. It is used for the shielding grounding of the control cable. When the field environment is disturbed or the control circuit is long, it must be well grounded to reduce the electromagnetic interference to comply with EMC electromagnetic regulations. 2. It is strictly forbidden to connect this terminal with the power PE wire.
Auxiliary Interface	J2	Control board-Expansion card	The socket is the connection port between the main control board and the expansion card. The main control board supplies power to the expansion card and the electrical channel for signal connection between the main control board and the expansion card.

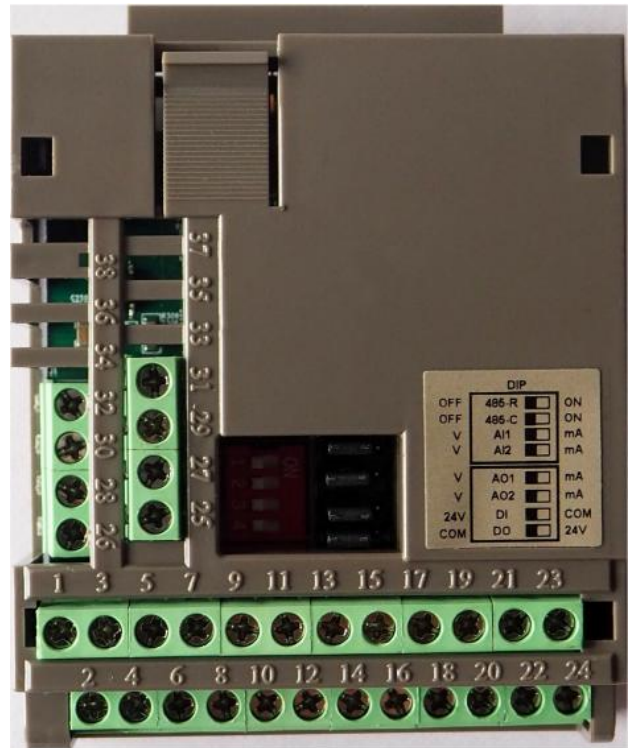
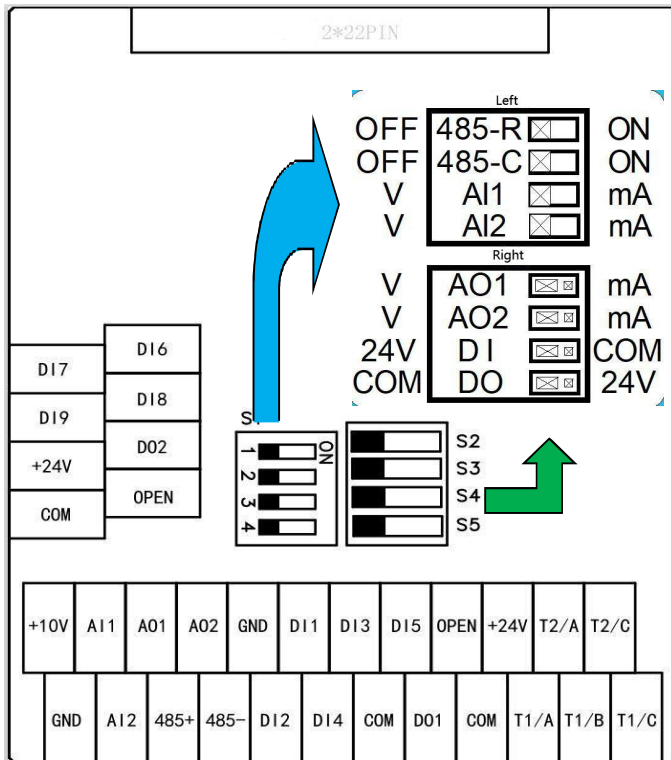
Note: IO2 card is CAN communication card, default DO is low-speed open collector output, DI5 is ordinary low-speed switch input, if you need HDO1(high-speed pulse output function) HDI1(high-speed pulse input function), you need to place a separate order (expansion card order Material No. : 02040060)

DI5 corresponding HDI5

DO1 corresponding HDO1

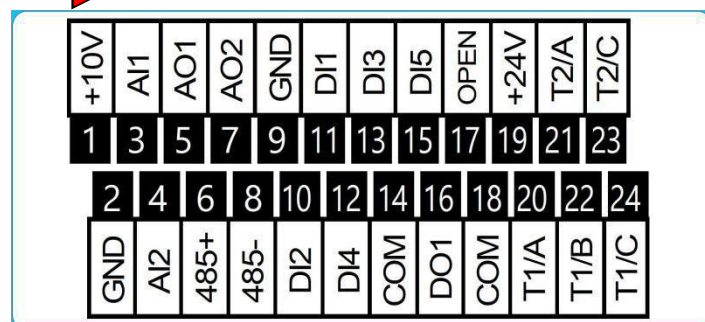
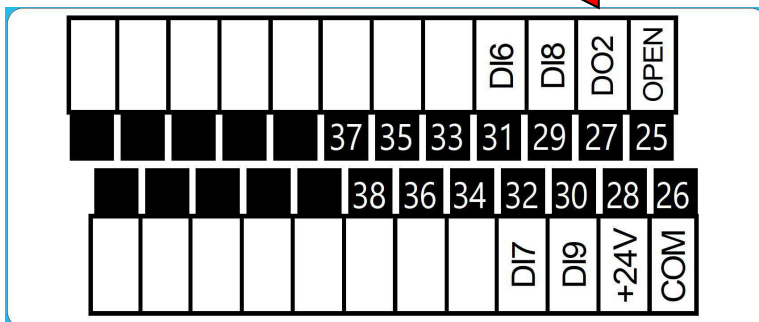
+10V	A1	AO1	GND	CANH	CANL	DI1	DI3	HDI5	OPEN	+24V	COM
1	3	5	7	9	11	13	15	17	19	21	23
2	4	6	8	10	12	14	16	18	20	22	24
GND	A2	CANG	CANH	CANL	DI2	DI4	COM	HDO1	T/A	T/B	T/C

3. V8GT005IO3 Card introduction (Expansion Card Order Material No. : 02040061)



This mark corresponds to the front of the physical IO3

This logo corresponds to the left side of the physical IO3



IO3 Card Terminal Identification

Function description of IO3 control loop terminals

Type	Terminal Identification	Terminal Name	Function Description
Power Supply	+10V	Analog input reference voltage	1. Provide external 10V power supply. 2. Generally used as an external potentiometer power, the resistance range of the potentiometer is 1kΩ~10kΩ. 3. The maximum output current is 20mA.
	GND	Analog ground	Internal isolation from COM
	+24V	+24V power supply	1. Provide external +24V power supply, which is generally used as the power supply for digital input output terminals for external sensors. 2. The maximum output current is 200mA.
	COM	+24V ground	Internal isolation from GND
	OPEN	External power input terminal	Connected with +24V or COM by select through the S4 dial switch (DI) on the expansion board: 1)  Connect with +24V (default) 2)  Connect with COM
Analog Input	AI1	Analog input terminal 1	1. Input range: DC 0V~10V or 0/4mA~20mA, select by S1 switch 3 rd gear (AI1) on the expansion board.  1)  It is DC 0V~10V signal (default) 2)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	AI2	Analog input terminal 2	1. Input range: DC 0V~10V or 0/4mA~20mA, select by the 4 th gear (AI2) of the S1 dial switch on the expansion board.  1)  It is DC 0V~10V signal (default) 2)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	GND	Analog ground	Internal isolation from COM
Digital Input	DI1	Digital input terminal 1	1. Optocoupler isolation, compatible with bipolar input, internal impedance 3.6kΩ. 2. Multifunctional digital input, set the function through F5-01~F5-09. 3. The factory default of the inverter is to provide +24V power supply internally, and COM is the common terminal. 4. When using an external power supply, first remove the S4 jumper cap, connect the external +24V to the OPEN terminal, and COM is the common terminal (external supply voltage range +24V±10%).
	DI2	Digital input terminal 2	
	DI3	Digital input terminal 3	
	DI4	Digital input terminal 4	
	DI6	Digital input terminal 6	
	DI7	Digital input terminal 7	
	DI8	Digital input terminal 8	
	DI9	Digital input terminal 9	

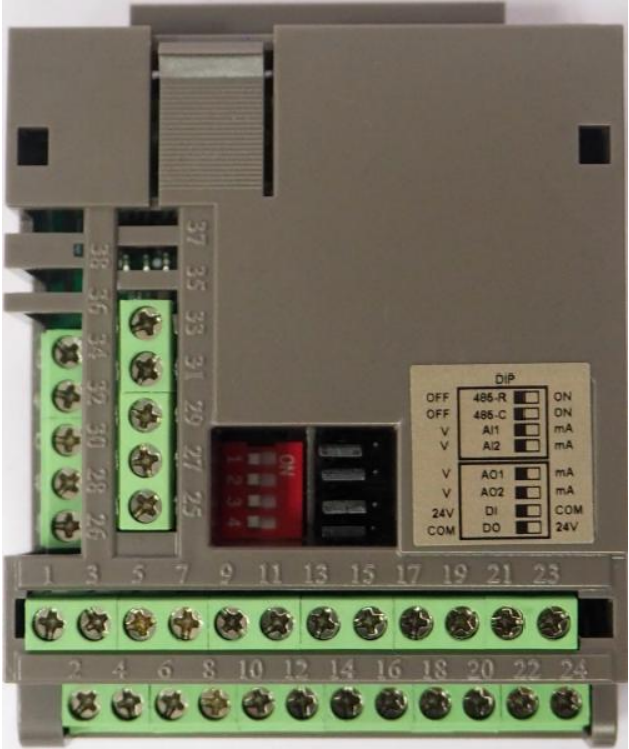
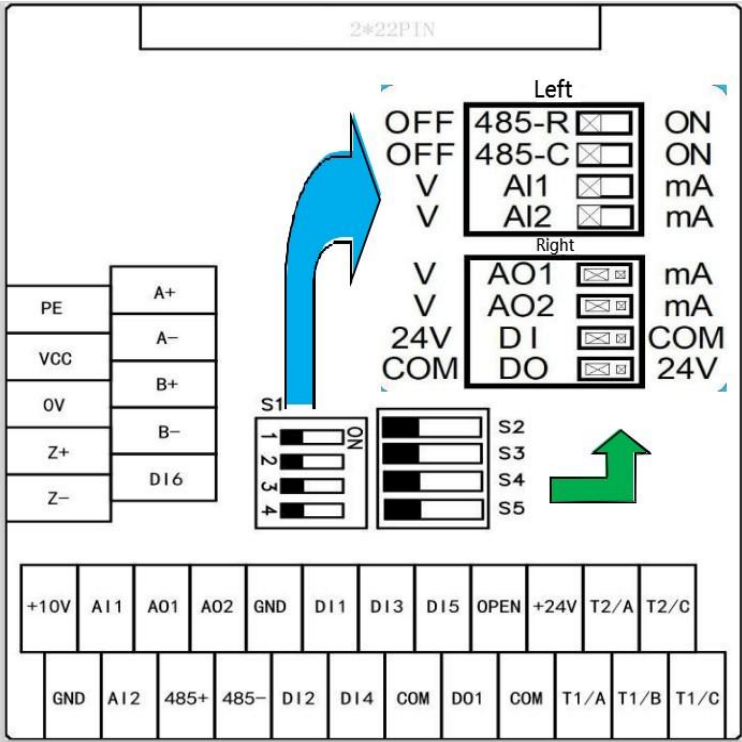
		Digital input terminal 5	Same as DI1~DI9
		DI5 High speed pulse input terminal	1. It can be combined with the OPEN terminal as a bipolar high speed pulse input terminal, the maximum input frequency is 100kHz. 2. When using an external power supply, the input voltage range is +24V±10%.
		COM +24V ground	Internal isolation from GND
Analog Output	AO1	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S2 jumper cap (AO): 1) ☐ It is 0V~10V voltage output (default) 2) ☐ It is 0/4mA~20mA signal
	AO2	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S3 jumper cap (AO): 1) ☐ It is 0V~10V voltage output (default) 2) ☐ It is 0/4mA~20mA signal
	GND	Analog ground	Internal isolation from COM
Digital Output	DO1	Digital output terminal	1. Optocoupler isolated, bipolar OC (open collector) output; 2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48kΩ~10kΩ); 3. Output current range: 2mA~50mA; 4. The power source can be selected through the S5 jumper cap (DO).
	DO2	High speed pulse output terminal (optional)	1) ☐ To select external power output (external supply voltage+24V±10%). 2) ☐ To select to use the internal power source output. 5. Can be combined with OPEN terminal as bipolar high-speed pulse output terminal, the highest output frequency is 100kHz. 6. Pull-up voltage range: 5V~24V (the range of pull-up resistance is the same as above). 7. Output current range: 2mA~50mA.
	COM	+24V ground	Internal isolation from GND
Relay Output	T1/A-T1/B	Relay T1 normally open terminal	Common terminal is T1/B, normally open contact is T1/A, normally closed contact is T1/C; Contact drive capacity: AC250V, 3A; DC30V, 5A.
	T1/B-T1/C	Relay T1 normally closed terminal	
	T2/A-T2/C	Relay T2 normally open terminal	The common terminal is T2/A, the normally open contact is T2/C; the contact drive capacity is AC250V, 3A; DC30V, 5A.
485 Communication	485+	485 differential signal positive	Standard RS-485 communication terminal, should use twisted pair shielded cables.
	485-	485 differential signal negative	
Dial Switch	485-R	OFF terminal	When the S1-1 dial code is dialed to this side, the 485 communication 120Ω terminal resistance is disconnected.
		ON terminal	When the S1-1 dial code is dialed to this side, the 485 communication 120Ω terminal resistance is connected.
	485-C	OFF terminal	When the S1-2 dial code is dialed to this side, the 485 communication filter capacitor is disconnected.
		ON terminal	When the S1-2 dial code is dialed to this side, the 485 communication filter capacitor is connected.
	AI1	V terminal	When the S1-3 dial code is dialed to this side, AI1

				terminal selects input DC 0~10V voltage signal
			mA terminal	When the S1-3 dial code is dialed to this side, AI1 terminal selects input DC 0/4mA~20mA current signal
		AI2	V terminal	When the S1-4 dial code is dialed to this side, AI2 terminal selects input DC 0~10V voltage signal
			mA terminal	When the S1-4 dial code is dialed to this side, AI2 terminal selects input DC 0/4mA~20mA current signal
		AO1	V terminal	When the S2 jumper cap is dialed to this side, the AO1 terminal selects to output a DC 0~10V voltage signal.
			mA terminal	When the S2 jumper cap is dialed to this side, AO1 terminal selects input DC 0/4mA~20mA current signal
		AO2	V terminal	When the S3 jumper cap is dialed to this side, the AO1 terminal selects to output a DC 0~10V voltage signal.
			mA terminal	When the S3 jumper cap is dialed to this side, AO1 terminal selects input DC 0/4mA~20mA current signal
		DI	24V terminal	When the S4 jumper cap is dialed to this side, the OPEN terminal is connected to 24V, and the input of DI and COM short-circuit is value.
			COM terminal	When the S4 jumper cap is dialed to this side, the OPEN terminal is connected to COM, and the input of DI and 24V short-circuit is value.
		DO	COM terminal	When the S5 jumper cap is dialed to this side, DO output selects external power output (external power supply voltage+24V±10%)
			24V terminal	When the S5 jumper cap is dialed to this side, the DO output is the internal power output
	Shield Ground	GND	Shielded cable ground terminal	1. It is used for the shielding grounding of the control cable. When the field environment is disturbed or the control circuit is long, it must be well grounded to reduce the electromagnetic interference to comply with EMC electromagnetic regulations. 2. It is strictly forbidden to connect this terminal with the power PE wire.
	Auxiliary Interface	J2	Control board-Expansion card	The socket is the connection port between the main control board and the expansion card. The main control board supplies power to the expansion card and the electrical channel for signal connection between the main control board and the expansion card.

							D16	D18	DO2	OPEN	
					37	35	33	31	29	27	25
					38	36	34	32	30	28	26
								D17	D19	+24V	COM

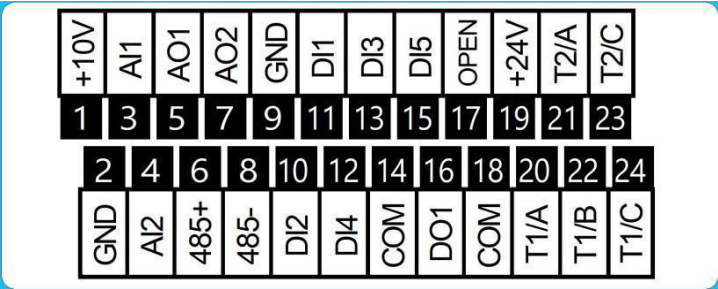
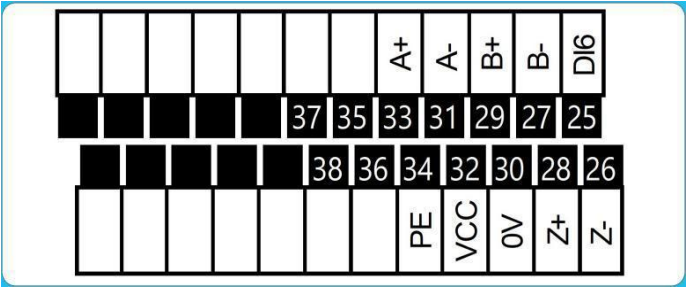
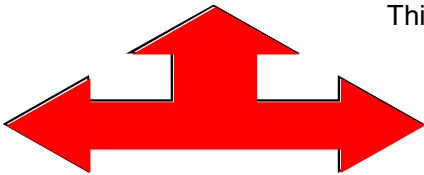
+10V	A1	AO1	AO2	GND	DI1	DI3	HDI5	OPEN	+24V	T2/A	T2/C
1	3	5	7	9	11	13	15	17	19	21	23
2	4	6	8	10	12	14	16	18	20	22	24
GND	A2	485+	485-	DI2	DI4	COM	HDO1	COM	T1/A	T1/B	T1/C

4. Introduce V8GT005PG3 card (PG card order Material No. : 02040065 (12V encoder), 02040063 (5V encoder))



This logo corresponds to the left side of the physical PG3

This logo corresponds to the front of the physical PG3



Type	Terminal Identification	Terminal Name	Function Description
Power Supply	+10V	Analog input reference voltage	1. Provide external 10V power supply. 2. Generally used as an external potentiometer power, the resistance range of the potentiometer is 1kΩ~10kΩ. 3. The maximum output current is 20mA.
	GND	Analog ground	Internal isolation from COM
	+24V	+24V power supply	1. Provide external +24V power supply, which is generally used as the power supply for digital input output terminals for external sensors. 2. The maximum output current is 200mA.

	COM	+24V ground	Internal isolation from GND
	OPEN	External power input terminal	Connected with +24V or COM by select through the S4 dial switch (DI) on the expansion board: 1)  Connect with +24V (default) 2)  Connect with COM
Analog Input	AI1	Analog input terminal 1	1. Input range: DC 0V~10V or 0/4mA~20mA, select by S1 switch 3 rd gear (AI1) on the expansion board.  It is DC 0V~10V signal (default)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	AI2	Analog input terminal 2	1. Input range: DC 0V~10V or 0/4mA~20mA, select by the 4 th gear (AI2) of the S1 dial switch on the expansion board.  It is DC 0V~10V signal (default)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	GND	Analog ground	Internal isolation from COM
Digital Input	DI1	Digital input terminal 1	1. Optocoupler isolation, compatible with bipolar input, internal impedance 3.6kΩ. 2. Multifunctional digital input, set the function through F5-01~F5-06. 3. The factory default of the inverter is to provide +24V power supply internally, and COM is the common terminal. 4. When using an external power supply, first remove the S4 jumper cap, connect the external +24V to the OPEN terminal, and COM is the common terminal (external supply voltage range +24V±10%).
	DI2	Digital input terminal 2	
	DI3	Digital input terminal 3	
	DI4	Digital input terminal 4	
	DI5	Digital input terminal 5	
	DI6	Digital input terminal 6	
	COM	+24V ground	Internal isolation from GND
Analog Output	AO1 AO2	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S2 and S3 jumper cap (AO1, AO2): 1)  It is 0V~10V voltage output (default) 2)  It is 0/4mA~20mA signal
	GND	Analog ground	Internal isolation from COM
Digital Output	DO1	Digital output terminal (Optional high-speed pulse output)	1. Optocoupler isolated, bipolar OC (open collector) output; 2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48kΩ~10kΩ); 3. Output current range: 2mA~50mA; 4. The power source can be selected through the S5 jumper cap (DO). 1)  To select internal power output. 2)  To select to use the external power source output (external supply voltage +24V±10%).

	COM	+24V ground	Internal isolation from GND
Relay Output	T1/A-T1/B	Relay T1 normally open terminal	Common terminal is T1/B, normally open contact is T1/A, normally closed contact is T1/C; Contact drive capacity: AC250V, 3A; DC30V, 5A.
	T1/B-T1/C	Relay T1 normally closed terminal	
	T2/A-T2/C	Relay T2 normally open terminal	The common terminal is T2/A, the normally open contact is T2/C; the contact drive capacity is AC250V, 3A; DC30V, 5A.
485 Communication	485+	485 differential signal positive	Standard RS-485 communication terminal, should use twisted pair shielded cables.
	485-	485 differential signal negative	
	GND	485 communication shield grounding	
Encoder Signal Input and Power	A+	Encoder A Phase differential input	A+, A- are a group of differential input signals (compatible with differential, push-pull and relay output, etc.), and the signals of group A and group B are orthogonal.
	A-		
	B+	Encoder B Phase differential input	B+ and B- are a group of differential input signals (compatible with differential, push-pull and relay outputs, etc.), and the signals of group B and group A are orthogonal.
	B-		
	Z+	Encoder Z phase differential input	Z+ and Z- are a set of zero position signals, that is, the pulse signal output by the encoder every one rotation. The input is compatible with differential, push-pull and relay output signals.
	Z-		
	VCC	Encoder power supply	+5V/+12V power supply (power supply needs to place an order note), the interior is isolated from other power supplies, the output voltage is selected according to the type of expansion card, and the output power is 3W
	0V	Encoder power supply ground	+5V/+12V power reference ground, internally isolated from GND and COM.
Dial Switch	485-R	OFF terminal	When the S1-1 dial code is dialed to this end, the 485 communication 120Ω terminal resistance is disconnected.
		ON terminal	When the S1-1 dial code is dialed to this end, the 485 communication 120Ω terminal resistance is connected.
	485-C	OFF terminal	When the S1-2 dial code is dialed to this end, the 485 communication filter capacitor is disconnected.
		ON terminal	When the S1-2 dial code is dialed to this end, the 485 communication filter capacitor is connected.
	AI1, AI2	V terminal	When the S1-3, S1-4 dial code is dialed to this end, AI1, AI2 terminal selects input DC 0~10V voltage signal
		mA terminal	When the S1-3, S1-4 dial code is dialed to this end, AI1, AI2 terminal selects input DC 0/4mA~20mA current signal
	AO1, AO2	V terminal	When the S2, S3 dial code is dialed to this end, the AO1, AO2 terminal selects to output a DC 0~10V voltage signal.
		mA terminal	When the S2, S3 dial code is dialed to this end, the AO1, AO2 terminal selects input DC 0/4mA~20mA current signal.
	DI	24V terminal	When the S4 jumper cap is dialed to this side, the OPEN terminal is connected to 24V, and the input of DI and

			COM short-circuit is value.
		COM terminal	When the S4 jumper cap is dialed to this side, the OPEN terminal is connected to COM, and the input of DI and 24V short-circuit is value.
	DO	24V terminal	When the S5 jumper cap is dialed to this side, the DO output is to select the external power output (external power supply voltage +24V±10%)
		COM terminal	When the S5 jumper cap is dialed to this side, the DO output is the internal power output.
Auxiliary Interface	J2	Control board-Expansion card	The socket is the connection port between the main control board and the expansion card. The main control board supplies power to the expansion card and the electrical channel for signal connection between the main control board and the expansion card.

Note:
This card

supports optical encoder, differential signal input (A+A-B+B-Z+Z-VCCGND), also supports open collector signal input (ABZ VCCGND), when the open collector signal input, please connect (A-,B-, Z-VCC,GND)

5. PG1A Rotary card terminal description

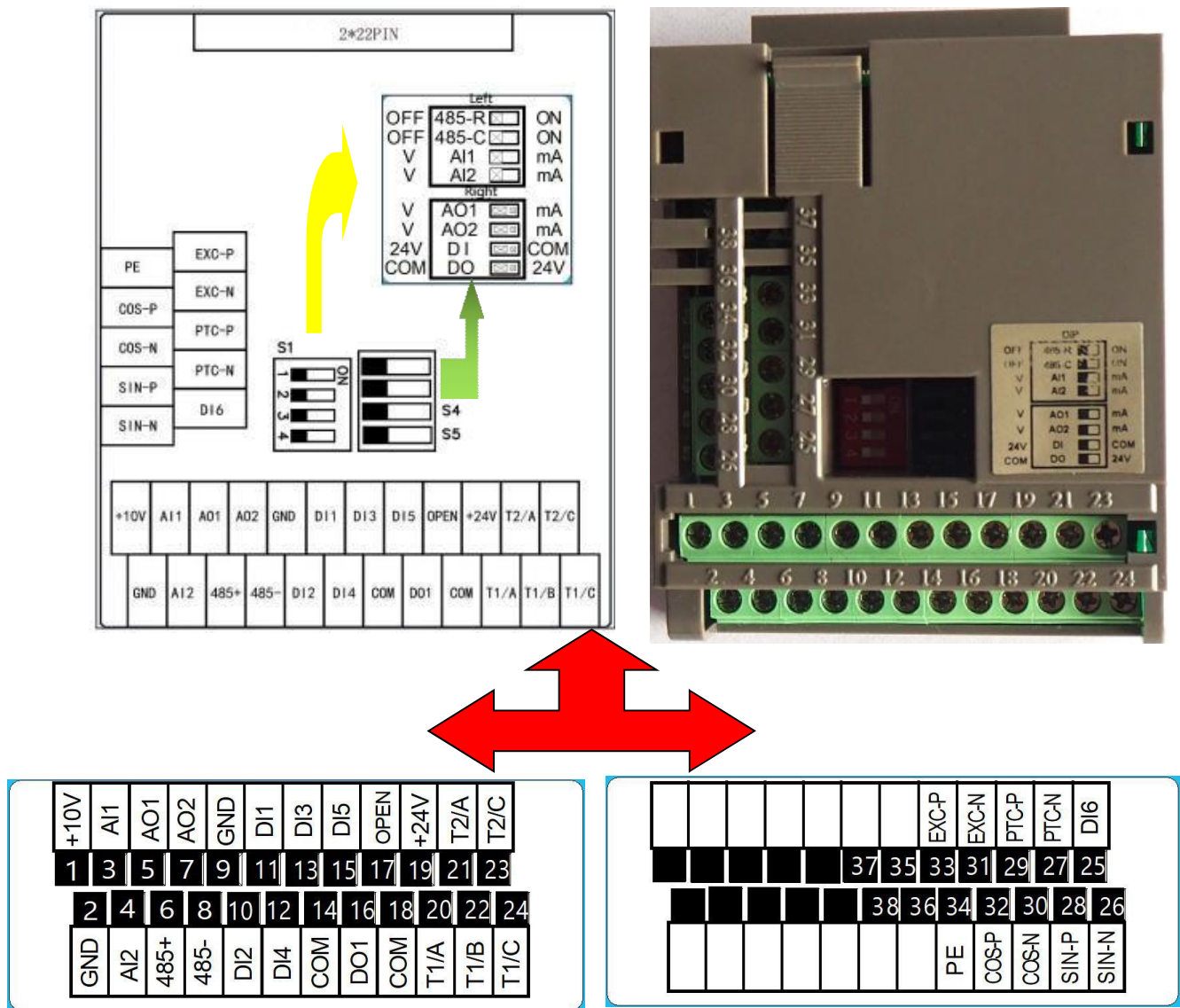


Figure B5-1 PG1A rotary card terminal identification

PG1A Rotary card terminal function description

Type	Terminal Identification	Terminal Name	Function Description
Power Supply	+10V	Analog input reference voltage	1. Provide external 10V power supply. 2. Generally used as an external potentiometer power, the resistance range of the potentiometer is 1kΩ~10kΩ. 3. The maximum output current is 20mA.
	GND	Analog ground	Internal isolation from COM
	+24V	+24V power supply	1. Provide external +24V power supply, which is generally used as the power supply for digital input output terminals for external sensors. 2. The maximum output current is 200mA.
	COM	+24V ground	Internal isolation from GND

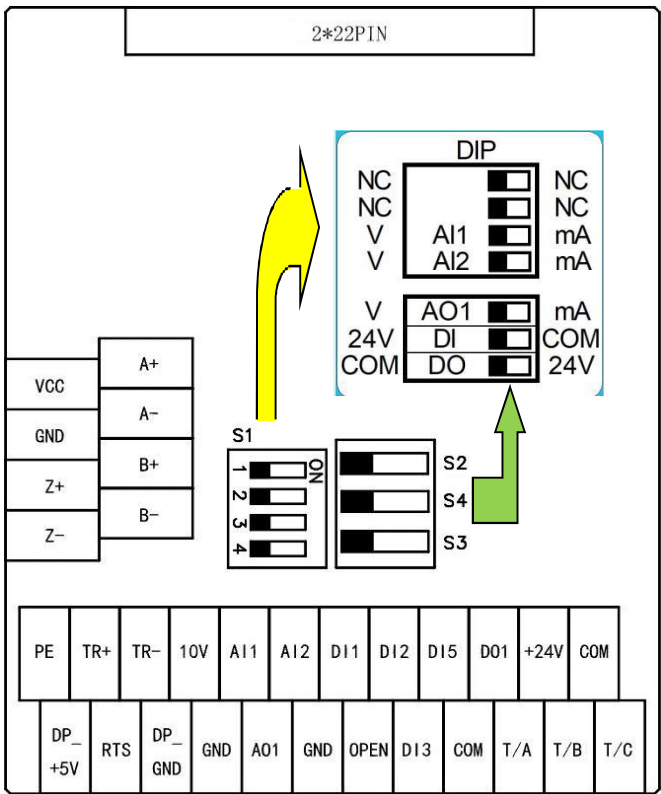
	OPEN	External power input terminal	Connected with +24V or COM by select through the S4 dial switch (DI) on the expansion board: 1)  Connect with +24V (default) 2)  Connect with COM
Analog Input	AI1	Analog input terminal 1	1. Input range: DC 0V~10V or 0/4mA~20mA, select by S1 switch 3rd gear (AI1) on the expansion board.  1)  It is DC 0V~10V signal (default)  2)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	AI2	Analog input terminal 2	1. Input range: DC 0V~10V or 0/4mA~20mA, select by the 4th gear (AI2) of the S1 dial switch on the expansion board.  1)  It is DC 0V~10V signal (default)  2)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	GND	Analog ground	Internal isolation from COM
Digital Input	DI1	Digital input terminal 1	1. Optocoupler isolation, compatible with bipolar input, internal impedance 3.6kΩ. 2. Multifunctional digital input, set the function through F5-01~F5-06. 3. The factory default of the inverter is to provide +24V power supply internally, and COM is the common terminal (jumper cap S4 default position). 4. When using an external power supply, first remove the S4 jumper cap, connect the external +24V to the OPEN terminal. 5. COM is the common terminal (external supply voltage range +24V±10%).
	DI2	Digital input terminal 2	
	DI3	Digital input terminal 3	
	DI4	Digital input terminal 4	
	DI6	Digital input terminal 6	
	DI5	Digital input terminal 5	
		High speed pulse input terminal	1. It can be combined with the OPEN terminal as a bipolar high-speed pulse input terminal, and the maximum input frequency is 100kHz. 2. When using an external power supply, the input voltage range is +24V±10%.
	COM	+24V ground	Internal isolation from GND
Analog Output	AO1 AO2	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S2 and S3 jumper cap (AO1, AO2): 1)  It is 0V~10V voltage output (default) 2)  It is 0/4mA~20mA signal
	GND	Analog ground	Internal isolation from COM

Digital Output	DO1	Digital output	1. Optocoupler isolated, bipolar OC (open collector) output; 2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48k Ω ~10k Ω); 3. Output current range: 2mA~50mA; 4. The power source can be selected through the S5 jumper cap (DO). 1)  To select to use the external power source output (external supply voltage+24V $\pm$ 10%). 2)  To select internal power output.
		High speed pulse output terminal	1. When used as a common digital output terminal, the function is the same as DO1. 2. As a high-speed pulse output terminal, the maximum output frequency is 100kHz. 3. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48k Ω ~10k Ω). 4. Output current range: 2mA~50mA.
	COM	+24V ground	Internal isolation from GND
	T1/A-T1/B	Relay T1 normally open terminal	Common terminal is T1/B, normally open contact is T1/A, normally closed contact is T1/C; Contact drive capacity: AC250V, 3A; DC30V, 5A.
Relay Output	T1/B-T1/C	Relay T1 normally closed terminal	
	T2/A-T2/C	Relay T2 normally open terminal	The contact drive capacity is AC250V, 3A; DC30V, 5A.
485 Communication	485+	485 differential signal positive	Standard RS-485 communication terminal, should use twisted pair shielded cables.
	485-	485 differential signal negative	
	GND	485 communication shield grounding	
Encoder Signal Input and Power Supply	SIN-P	Encoder sine positive and negative	Frequency inverter sine signal, the impedance is generally between 55 and 60 ohms
	SIN-N		
	COS-P	Encoder cosine positive and negative	Frequency inverter cosine signal, the impedance is between 55 and 60 ohms.
	COS-N		
	EXC-P	Encoder excitation power positive and negative	Frequency inverter excitation power signal, the impedance is generally between 30 and 40 ohms
	EXC-N		
Dial Switch	485-R	OFF terminal	When the dial code is dialed to this end, the 485 communication 120 Ω terminal resistance is disconnected.
		ON terminal	When the dial code is dialed to this end, the 485 communication 120 Ω terminal resistance is connected.
	485-C	OFF terminal	When the dial code is dialed to this end, the 485 communication filter capacitor is disconnected.
		ON terminal	When the dial code is dialed to this end, the 485 communication filter capacitor is connected.
	AI1	V terminal	When the dial code is dialed to this end, AI1 terminal selects input DC 0~10V voltage signal
		mA terminal	When the dial code is dialed to this end, AI1 terminal selects input DC 0/4mA~20mA current signal

	AO	V terminal	When the dial code is dialed to this end, AO1 terminal selects input DC 0~10V voltage signal
		mA terminal	When the dial code is dialed to this end, AO1 terminal selects input DC 0/4mA~20mA current signal
	DI	24V terminal	When the dial code is dialed to this end, the OPEN terminal is connected to 24V, and the input of DI and COM short-circuit is value.
		COM terminal	When the dial code is dialed to this end, the OPEN terminal is connected to COM, and the input of DI and 24V short-circuit is value.
	DO	COM terminal	When the dial code is dialed to this end, the DO output is to select the external power output (external power supply voltage +24V±10%)
		24V terminal	When the dial code is dialed to this end, the DO output is the internal power output.
Auxiliary Interface	J2	Control board-Expansion card	The socket is the connection port between the main control board and the expansion card. The main control board supplies power to the expansion card and the electrical channel for signal connection between the main control board and the expansion card.

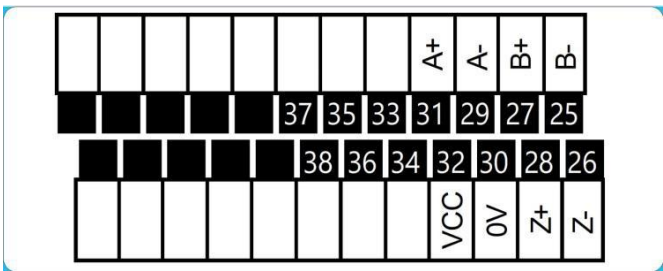
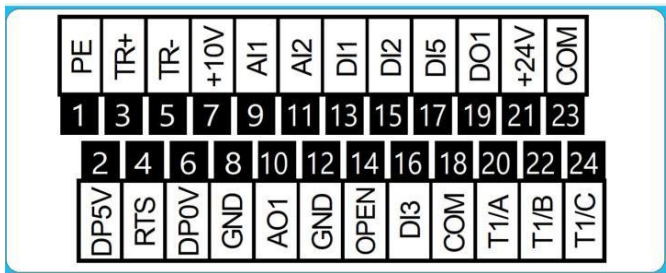
Supplementary notes: V8GT005PG1A Rotary card Order Material No.:02040072 (commonly used rotary card, low speed DIDO, no motor temperature detection), 02040073 (high speed DI,DO, without motor temperature detection), 02040075 (high speed DI,DO, including PT100 temperature detection).

6. Introduction of V8GT005PGDP1 card (DP card order Material Number: 02040068 (5V encoder), 02040070 (12V encoder))



This label corresponds to the positive end of the wiring terminal of the physical DP card

This label corresponds to the left of the wiring terminal of the physical DP card



Type	Terminal Identification	Terminal Name	Function Description
Power Supply	OPEN	External power input terminal	Connected with +24V or COM by select through the S4 dial switch (DI) on the expansion board: 1)  Connect with +24V (default) 2)  Connect with COM
Analog Input	AI1, AI2	Analog input terminal	1. Input range: DC 0V~10V or 0/4mA~20mA, select by S1 switch 3 rd gear (AI1) on the expansion board.  1)  It is DC 0V~10V signal (default)  2)  It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	GND	Analog ground	Internal isolation from COM
Digital Input	DI1	Digital input terminal 1	1. Optocoupler isolation, compatible with bipolar input, internal impedance 3.6kΩ.
	DI2	Digital input terminal 2	2. Multifunctional digital input, set the function through F5-01~F5-06.
	DI3	Digital input terminal 3	3. The factory default of the inverter is to provide +24V power supply internally, and COM is the common terminal (jumper cap S4 default position).
	DI4	Digital input terminal 4	4. When using an external power supply, first remove the S4 jumper cap, connect the external +24V to the OPEN terminal, and COM is the common terminal (external supply voltage range +24V±10%).
	DI5	Digital input terminal 5	
	COM	+24V ground	Internal isolation from GND
Analog Output	AO1	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S2 jumper cap (AO1): 1)  It is 0V~10V voltage output (default) 2)  It is 0/4mA~20mA signal
	GND	Analog ground	Internal isolation from COM
Digital Output	DO1	Digital output (high speed pulse output is optional)	1. Optocoupler isolated, bipolar OC (open collector) output; 2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48kΩ~10kΩ); 3. Output current range: 2mA~50mA; 4. The power source can be selected through the S5 jumper cap (DO). 1)  To select internal power output. 2)  To select to use the external power source output (external supply voltage+24V±10%).
	COM	+24V ground	Internal isolation from GND
Relay Output	T1/A-T1/B	Relay T1 normally open terminal	Common terminal is T1/B, normally open contact is T1/A, normally closed contact is T1/C; contact drive capacity: AC250V, 3A; DC30V, 5A.
	T1/B-T1/C	Relay T1 normally closed terminal	
	T2/A-T2/C	Relay T2 normally open terminal	Common terminal is T2/A, normally open contact is T2/C, normally closed contact is T1/C; contact drive capacity: AC250V, 3A; DC30V, 5A.
DP	TR+	DP signal is	Profibus-DP signal is positive, Profibus-DP signal is

Communication		positive	negative, it is recommended to use standard signal line with shielding layer, shielding layer, please connect PE
	TR-	DP signal is negative	
	RTS	DP reset signal	
	DP0V	DP power GND	
	DP5V	DP5V power	
	PE	Shield grounding for DP communication	
Encoder Signal Input and Power Supply	A+	Encoder A Phase differential input	A+, A- are a group of differential input signals (compatible with differential, push-pull and relay output, etc.), and the signals of group A and group B are orthogonal.
	A-		
	B+	Encoder B Phase differential input	B+ and B- are a group of differential input signals (compatible with differential, push-pull and relay outputs, etc.), and the signals of group B and group A are orthogonal.
	B-		
	Z+	Encoder Z phase differential input	Z+ and Z- are a set of zero position signals, that is, the pulse signal output by the encoder every one rotation. The input is compatible with differential, push-pull and relay output signals.
	Z-		
	VCC	Encoder power supply	+5V/+12V power supply (power supply needs to place an order note), the interior is isolated from other power supplies, the output voltage is selected according to the type of expansion card, and the output power is 3W
	0V	Encoder power supply ground	+5V/+12V power reference ground, internally isolated from GND and COM.
Dial Switch	485-R	OFF terminal	When the S1-1 dial code is dialed to this side, the 485 communication 120Ω terminal resistance is disconnected.
		ON terminal	When the S1-1 dial code is dialed to this side, the 485 communication 120Ω terminal resistance is connected.
	485-C	OFF terminal	When the S1-2 dial code is dialed to this side, the 485 communication filter capacitor is disconnected.
		ON terminal	When the S1-2 dial code is dialed to this side, the 485 communication filter capacitor is connected.
	AI1, AI2	V terminal	When the S1-3 S1-4 dial code is dialed to this side, AI1, AI2 terminal selects input DC 0~10V voltage signal
		mA terminal	When the S1-3 S1-4 dial code is dialed to this side, AI1, AI2 terminal selects input DC 0/4mA~20mA current signal
	AO1	V terminal	When the S2 dial code is dialed to this side, AO1 terminal selects input DC 0~10V voltage signal
		mA terminal	When the S2 dial code is dialed to this side, AO1 terminal selects input DC 0/4mA~20mA current signal
	DI	24V terminal	When the S4 dial code is dialed to this side, the OPEN terminal is connected to 24V, and the input of DI and COM short-circuit is value.
		COM terminal	When the S4 dial code is dialed to this side, the OPEN terminal is connected to COM, and the input of DI and 24V short-circuit is value.
	DO	COM terminal	When the S5 dial code is dialed to this side, the DO output is to select the external power output (external power supply voltage +24V±10%)

		24V terminal	When the S5 dial code is dialed to this side, the DO output is the internal power output.
Auxiliary Interface	J2	Control board-Expansion card	The socket is the connection port between the main control board and the expansion card. The main control board supplies power to the expansion card and the electrical channel for signal connection between the main control board and the expansion card.

Note: This card supports optical encoder, differential signal input (A+A-B+B-Z+Z-VCCGND), **also supports open collector signal input (ABZ VCCGND), when the open collector signal input, please connect A-,B-, Z-VCC,GND).**

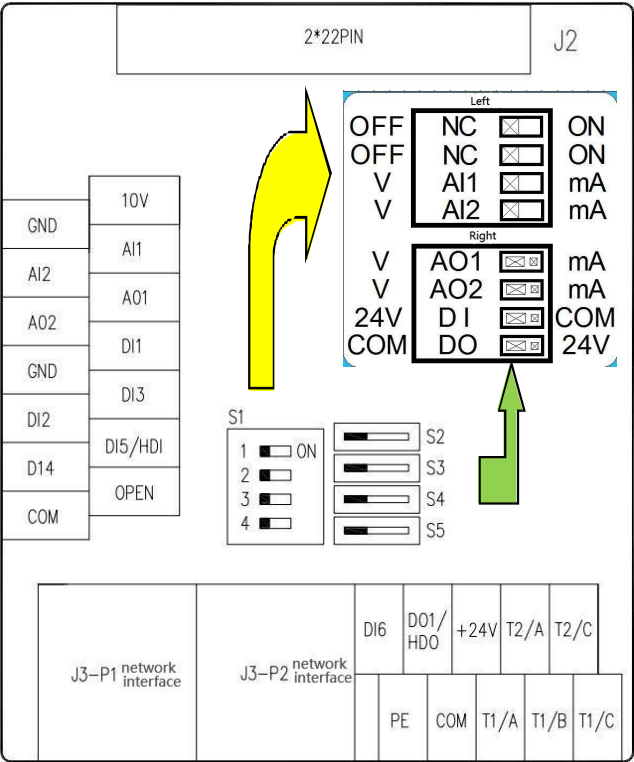
The following are the four configuration information of DP card and the MATERIAL code of the order:

02040068 (5V encoder) low speed DI DO; 02040070 (12V encoder) low speed DI DO;

02040055 (5V encoder) high-speed DI DO; 02040069 (12V encoder) High speed DI DO

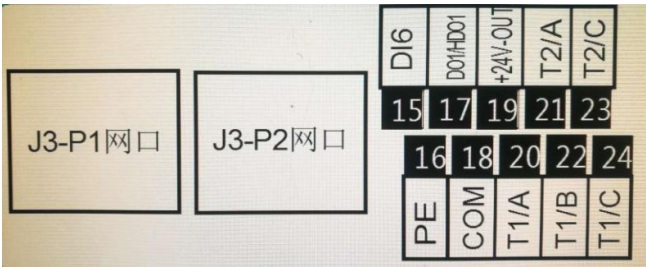
7. Profinet communication card introduction

Control terminal wiring description:

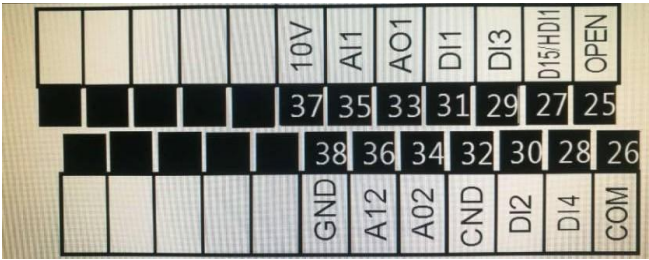


This picture is a schematic diagram of PN card

This picture is the actual picture of the PN card



This label is directly below the PN card



This label is on the left side of the PN card

PN card details:

Type	Terminal Identification	Terminal Name	Function Description
Power Supply	10V	Analog input reference voltage	1. Provide external 10V power supply. 2. Generally used as an external potentiometer power, the resistance range of the potentiometer is 1kΩ~10kΩ. 3. The maximum output current is 20mA.
	GND	Analog ground	Internal isolation from COM

	24V-OUT	+24V power supply	1. Provide external +24V power supply, which is generally used as the power supply for digital input output terminals for external sensors. 2. The maximum output current is 200mA.
	COM	+24V ground	Internal isolation from GND
	OPEN	External power input terminal	Select to connect to +24V or to COM through the S4 jumper (DI) on the expansion board: 1)  Connect with +24V (default) 2)  Connect with COM
Analog Input	AI1	Analog input terminal 1	1. Input range: DC 0V~10V or 0/4mA~20mA, select by S1 switch 3 rd gear (AI1) on the expansion board.  1) It is DC 0V~10V signal (default)  2) It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	AI2	Analog input terminal 2	1. Input range: DC 0V~10V or 0/4mA~20mA, select by the 4 th gear (AI2) of the S1 dial switch on the expansion board.  1) It is DC 0V~10V signal (default)  2) It is 0/4mA~20mA signal 2. Input impedance: 22kΩ for voltage input, 500Ω for current input.
	GND	Analog ground	Internal isolation from COM
Digital Input	DI1	Digital input terminal 1	1. Optocoupler isolation, compatible with bipolar input, internal impedance 3.6kΩ.
	DI2	Digital input terminal 2	2. Multifunctional digital input, set the function through F5-01~F5-06.
	DI3	Digital input terminal 3	3. The factory default of the inverter is to provide +24V power supply internally, and COM is the common terminal.
	DI4	Digital input terminal 4	4. When using an external power supply, the external +24V is connected to the OPEN terminal, and COM is the common terminal (external supply voltage range +24V±10%).
	DI6	Digital input terminal 6	Same as DI1~DI9
	DI5	High speed pulse input terminal	1. It can be combined with the OPEN terminal as a bipolar high-speed pulse input terminal, and the maximum input frequency is 100kHz. 2. When using an external power supply, the input voltage range is +24V±10%.
	COM	+24V ground	Internal isolation from GND
Analog Output	AO1	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S2 jumper cap (AO): 1)  It is 0V~10V voltage output (default) 2)  It is 0/4mA~20mA signal

	AO2	Analog output terminal	Support 0V~10V voltage or 0/4mA~20mA current output, selected by S3 jumper cap (AO): 1) ☐ It is 0V~10V voltage output (default) 2) ☐ It is 0/4mA~20mA signal
	GND	Analog ground	Internal isolation from COM
Digital Output	DO1	Digital output / High speed pulse output terminal	1. Optocoupler isolated, bipolar OC (open collector) output; 2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48kΩ~10kΩ); 3. Output current range: 2mA~50mA; 4. The power source can be selected through the S5 jumper cap (DO). 1) ☐ To select to use the external power source output (external supply voltage+24V±10%). 2) ☐ To select internal power output. 5. Can be combined with OPEN terminal as bipolar high-speed pulse output terminal, the maximum output frequency is 100kHz. 6. Pull-up voltage range: 5V~24V (the range of pull-up resistance is the same as above). 7. Output current range: 2mA~50mA.
	COM	+24V ground	Internal isolation from GND
Relay Output	T1/A-T1/B	Relay T1 normally open terminal	Common terminal is T1/B, normally open contact is T1/A, normally closed contact is T1/C; contact drive capacity: AC250V, 3A; DC30V, 5A.
	T1/B-T1/C	Relay T1 normally closed terminal	
	T2/A-T2/C	Relay T2 normally open terminal	Common terminal is T2/A, normally open contact is T2/C; contact drive capacity: AC250V, 3A; DC30V, 5A.
	AI1	V terminal	When the dial code is dialed to this end, AI1 terminal selects input DC 0~10V voltage signal
		mA terminal	When the dial code is dialed to this end, AI1 terminal selects input DC 0/4mA~20mA current signal
	AI2	V terminal	When the dial code is dialed to this end, AI2 terminal selects input DC 0~10V voltage signal
		mA terminal	When the dial code is dialed to this end, AI2 terminal selects input DC 0/4mA~20mA current signal
	AO1	V terminal	When the dial code is dialed to this end, AO1 terminal selects input DC 0~10V voltage signal
		mA terminal	When the dial code is dialed to this end, AO1 terminal selects input DC 0/4mA~20mA current signal
	AO2	V terminal	When the dial code is dialed to this end, AO2 terminal selects input DC 0~10V voltage signal
		mA terminal	When the dial code is dialed to this end, AO2 terminal selects input DC 0/4mA~20mA current signal
	DI	24V terminal	When the jumper cap is dialed to this end, the OPEN terminal is connected to 24V, and the input of DI and COM short-circuit is value. When the jumper cap is unplugged, connect it to the OPEN terminal through an external power supply, and the external power supply will start and stop.
		COM terminal	When the jumper cap is dialed to this end, the OPEN terminal is connected to COM, and the input of DI and 24V short-circuit is value. When the jumper cap is

	DO		unplugged, connect it to the OPEN terminal through an external power supply, and the external power supply will start and stop.
		COM terminal	When the the jumper cap is dialed to this end, the DO output is to select the external power output (external power supply voltage $+24V \pm 10\%$).
		24V terminal	When the the jumper cap is dialed to this end, the DO output is the internal power output.
Shield Ground	GND	Shielded cable ground terminal	1. It is used for the shielding grounding of the control cable. when the field environment is disturbed or the control circuit is long, it must be well grounded to reduce the electromagnetic interference to comply with EMC electromagnetic regulations. 2. It is strictly forbidden to connect this terminal with the power PE wire.
Auxiliary Interface	J2	Control board-Expansion card	The socket is the connection port between the main control board and the expansion card. The main control board supplies power to the expansion card and the electrical channel for signal connection between the main control board and the expansion card.
Network Interface	1	J3-P1 network interface	Profinet interface 1
	2	J3-P2 network interface	Profinet interface 2