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40010000177

SINOVO

SP600 SERIES
SOLAR PUMP INVERTER

User Manual



Warranty Agreement

1. The warranty period of the product is 18 months (refer to the bar code on the equipment body). During the warranty period , if the product fails or damaged under the condition of normal use by following the instruction, we will be responsible for free maintenance.

2. Within the warranty period , maintenance will be charged for the damages caused by the following reasons :

The damage caused by improper use or repair/modification without prior permission.

The damage caused by fire , flood , abnormal voltage , other natural disasters and second disaster.

The hardware damage caused by artificial falling or transportation after purchase.

The damage caused by the improper operation.

The damage or failure caused by the trouble out of the equipment (e.g. : External device)

3. If there is any failure or damage to the product, please fill in the information of the Product Warranty Card in details correctly.

4. The maintenance fee is charged according to the newly adjusted Maintenance Price List of our company .

5. In general , the warranty card will not be re-issued. Please keep the card and present it to the maintenance personnel when asking for maintenance .

6. If there is any problem during the service , please contact the agent of our company or our company directly .

7. The company reserves the right to interpret this agreement

Chapter 2 Product Information

2.1 Naming Rules

SP600 - 4T - 11 G

① ② ③ ④

Field	Mark	Explanation	Content
Ac drive series	①	Ac drive series	SP600 series
Voltage Level	②	Voltage Level	2T:Single-phase/Three-phase 220Vac Recommended voltage range （MTTP）250Vdc~350Vdc 4T:Three-phase 380Vac Recommended voltage range （MTTP）450Vdc~600Vdc
Adaptive Power	③	Adaptive Power	0.7KW~200KW
Function Type	④	Function Type	G:General

Figure 2-1 Name Designation Rules

2.2 Nameplate

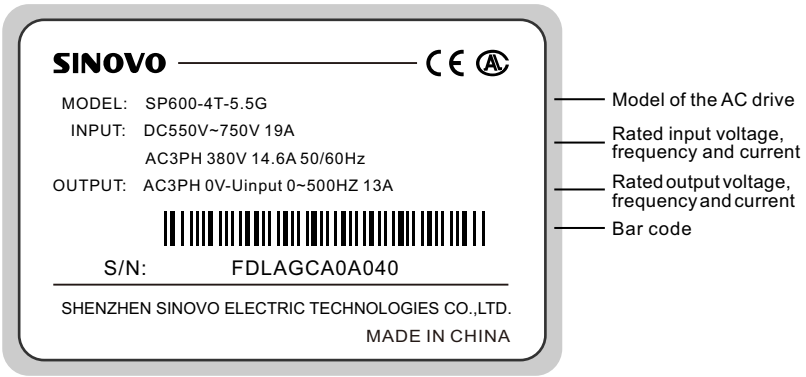


Figure 2-2 Name Designation Rules

2. 3 AC220V Input Specifications

Model	Power Capacity (KVA)	Input Current (A)	Maximum Input DC Current(A)	Output Current (A)	Adaptable Motor (KW)	Recommended main circuit wire (mm^2)
AC Three-phase/Single-phase220V Range:-15%~20% DC 360V~430V						
SP600-2T-0.7G	1.5	5.5	12	4.7	0.75	2.5
SP600-2T-1.5G	3.0	7.7	12	7.5	1.5	4.0
SP600-2T-2.2G	4.0	12.0	12	10.0	2.2	4.0
SP600-2T-4.0G	5.9	14.6	21	13	4.0	4.0
SP600-2T-5.5G	8.9	26	31	25	5.5	6.0
SP600-2T-7.5G	11	35	43	32	7.5	10
SP600-2T-11G	17	46.5	63	45	11	10
SP600-2T-15G	21	62.5	85	60	15	16
SP600-2T-18.5G	24	76	105	75	18.5	25
SP600-2T-22G	30	92	128	91	22	25

Input Specification	
Max. input DC voltage	450VDC
Recommended VOC voltage range	360~430VDC
Recommended MPPT voltage range	250~350VDC
Starting voltage range	160~450VDC（Adjustable parameters）
Grid or Backup Generator Input	
Input AC voltage	2T：Single-phase 220V/Three-phase 220V（-15%~20%）
Output Specification	
Rated output voltage AC	3PH /1PH 220V
Output frequency range	0 ~ 500HZ
Protection	
Built-in protection	Overvoltage, overcurrent, output phase loss, overload, undervoltage, short circuit,overheating, dry running of the pump under load, etc.

2.4 AC380V Input Specifications

Model	Power Capacity (KVA)	Input Current (A)	Maximum Input DC Current(A)	Output Current (A)	Adaptable Motor (KW)	Recommended main circuit wire (mm^2)
AC Three-phase 380V Range:-15%~20% DC 550V~750V						
SP600-4T-0.7G	1.5	3.4	9	2.3	0.75	2.5
SP600-4T-1.5G	3.0	5.0	9	3.7	1.5	2.5
SP600-4T-2.2G	4.0	5.8	12	5.1	2.2	2.5
SP600-4T-4.0G	5.9	10.5	12	8.5	4.0	4.0
SP600-4T-5.5G	8.9	14.6	19	13	5.5	4.0
SP600-4T-7.5G	11	20.5	21	17	7.5	6.0
SP600-4T-11G	17	26.0	31	25	11	6.0
SP600-4T-15G	21	35.0	43	32	15	10
SP600-4T-18.5G	24	38.5	53	37	18.5	10
SP600-4T-22G	30	46.5	63	45	22	10
SP600-4T-30G	40	62.5	85	60	30	16
SP600-4T-37G	57	76.0	105	75	37	25
SP600-4T-45G	69	92.0	128	91	45	25
SP600-4T-55G	85	113	157	112	55	50
SP600-4T-75G	114	157	214	150	75	60
SP600-4T-90G	134	180	252	176	90	70
SP600-4T-110G	160	214	308	210	110	120
SP600-4T-132G	192	256	369	253	132	150
SP600-4T-160G	231	307	448	304	160	185
SP600-4T-185G	255	333	517	330	185	185
SP600-4T-200G	287	380	559	377	200	150*2

Input Specification	
Max. input DC voltage	800VDC（900VDC optional）
Recommended VOC voltage range	550~750VDC
Recommended MPPT voltage range	450~600VDC
Starting voltage range	250~800VDC（Adjustable parameters）
Grid or Backup Generator Input	
Input AC voltage	Three-phase 380V Range:-15%~20%

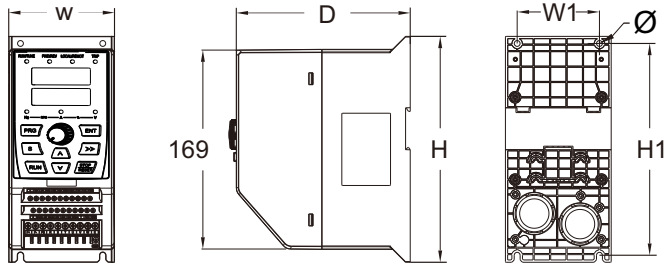
2.4 AC380V Input Specifications

Model	Power Capacity (KVA)	Input Current (A)	Output Current (A)	Adaptable Motor (KW)	Recommended input side main circuit wire (mm^2)	Recommended output side main circuit wire (mm^2)
Output Specification						
Rated output voltage AC			Three-phase380V			
Output frequency range			0~500.00Hz			
Protection						
Built-in protection			Overvoltage, overcurrent, output phase loss, overload, undervoltage, short circuit,overheating, dry running of the pump under load, etc.			

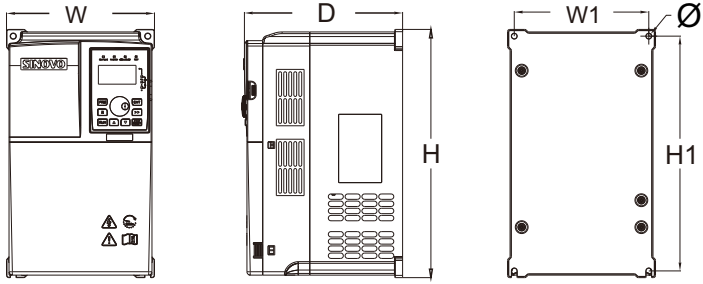
2.5Recommended Battery Module Configuration for Solar Pump Inverter (only some power sections are listed for reference)

Model	Solar Cell Module Open Circuit Voltage Rating			
	37±1V		45±1V	
	Component power ±5WP	Components per string number* strings number	Component power ±5WP	Components per string number* strings number
SP600-4T-2.2G	250	18*1	300	15*1
SP600-4T-4.0G	250	20*1	300	16*1
SP600-4T-5.5G	250	18*2	300	15*2
SP600-4T-7.5G	250	18*2	300	15*2
SP600-4T-11G	250	18*3	300	15*3
SP600-4T-15G	250	18*4	300	15*4
SP600-4T-18.5G	250	18*5	300	15*5
SP600-4T-22G	250	18*6	300	15*6
SP600-4T-30G	250	18*8	300	15*8
SP600-4T-37G	250	18*9	300	15*9
SP600-4T-45G	250	18*11	300	15*11

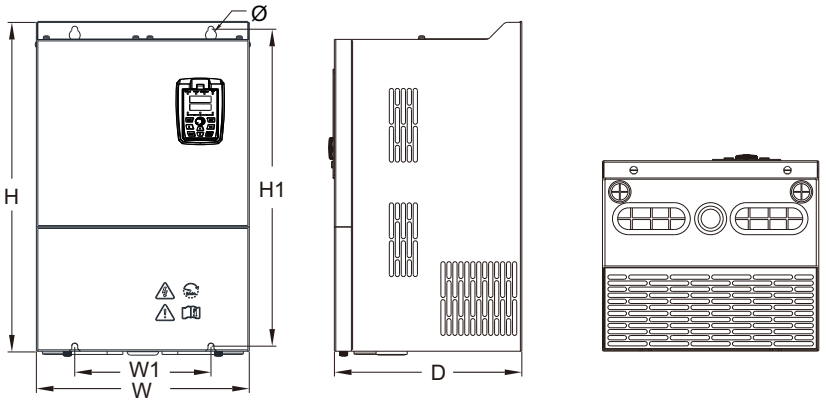
2.6 Product Outline, Installation Hole Size



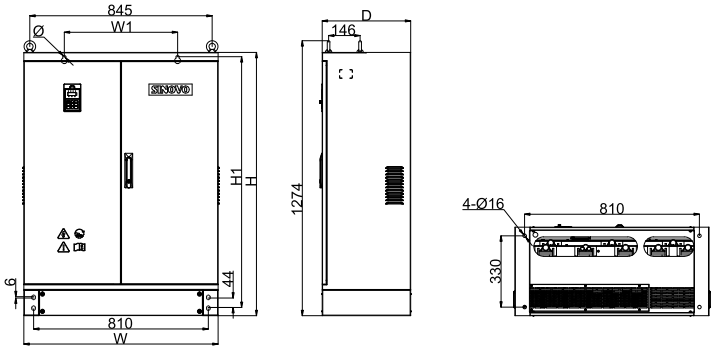
Model	Inverter			Installation			GW(kg)
	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	Diameter (mm)	
600-4T-0.7G	192	90	148	180	70	Ø5	1.6
600-4T-1.5G							
600-4T-2.2G							
600-4T-4.0G							



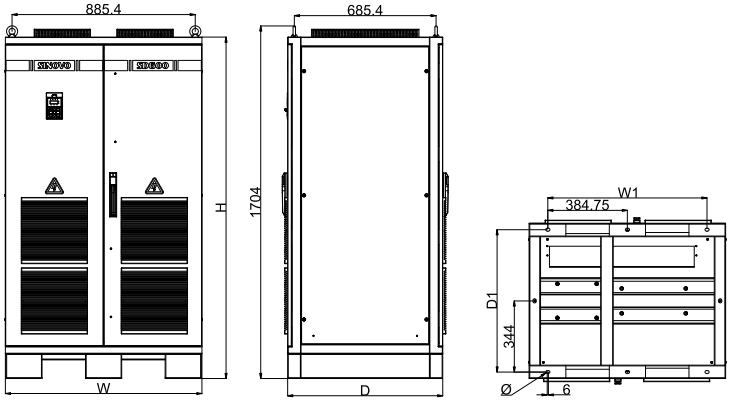
Model	inverter			Installation			GW(kg)
	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	Diameter (mm)	
4T-5.5G	190	110	150	179	98	Ø5	2.3
4T-7.5G	210	130	160	198	118	Ø5	3.3
4T-11G	250	155	176	236	141	Ø5	4.4
4T-15G	295	176	188	279	160	Ø7	6.4
4T-18.5G							
4T-22G	337	245	188	320	228	Ø7	9.5
4T-30G							



Model	inverter			Installation			GW(kg)
	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	Diameter (mm)	
4T-37G	387	250	220	372	150	Ø7	13.5
4T-45G	440	270	256	426	180		20.6
4T-55G							
4T-75G	469	307	263	450	200	Ø10	26.8
4T-90G	590	340	305	565	200		48.1
4T-110G							
4T-132G	740	450	329	715	360	Ø12	103.6
4T-160G							103.9
4T-185G							105
4T-200G	940	500	369	914	400		125.5
4T-220G							136.2
4T-250G							140.6
4T-280G	1045	725	390	1012	600	Ø14	198.2
4T-315G							200
4T-350G							200.2



Model	inverter			Installation			GW(kg)
	H(mm)	W(mm)	D(mm)	H1(mm)	W1(mm)	Diameter (mm)	
4T-400G	1220	900	410	1162	525	Ø14	257. 8
4T-450G							
4T-500G							



Model	inverter			Installation			GW(kg)
	H(mm)	W(mm)	D(mm)	W1(mm)	D1(mm)	Diameter (mm)	
4T-630G	1650	950	750	769.5	688	Ø14	531.4
4T-710G							

Chapter 3 Debugging Guide

3.1 Debugging when solar panels are powered

1.When the solar panel is powered, the SP600 wiring is as follows:

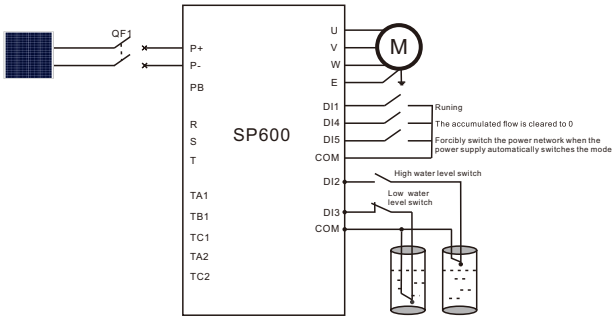


Figure 1 SP600 Wiring Diagram

2.Debugging Step are as Follows

1).Check the inverter model and wiring, and turn on QF1 after confirming that it is correct.

2).Correctly set the motor parameters, and input F05.01~F05.05 according to the motor nameplate; Set the command source F02.00 according to the requirements, SP600 inverter has a power-off memory for the panel commands and communication commands, that is, the command before the power-off is memorized, and the command is still maintained after the power-on.

3).When running the inverter, under normal light, if the running frequency is very low or the water output is very small, it is possible that the connection of the water pump is reversed.

4).F23 group related weak light warning, abnormal water level warning and other special functions can be set according to requirements.

5).If the water pumping is normal, it can work normally.

Note: DI2, DI3 abnormal water level input terminals, it can change the positive and negative logic polarity of the terminals through parameter F11.11 to meet the different installation methods of the water level switch.

3.2 Debugging when grid or generator are powered

1.When the solar panel is powered, the SP600 wiring is as follows

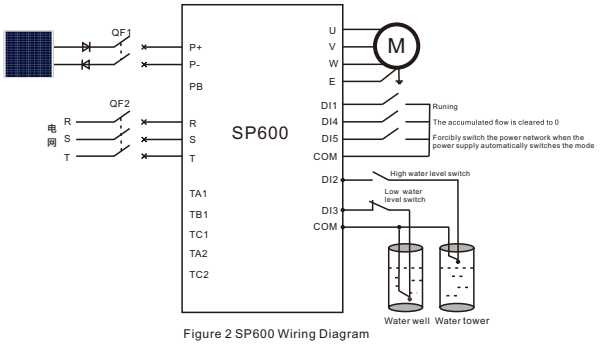


Figure 2 SP600 Wiring Diagram

2.Debugging Step are as Follows

1).Check whether the wiring is correct. When there is no diode protection installed at the input end of the DC bus, it is forbidden to close the solar panel switch QF1 and the grid input switch QF2 at the same time, otherwise the solar panel will be damaged.

2).First disconnect the solar panel switch QF1, and then close the grid switch QF2.

3).Set the motor parameters correctly, and input F05.01～F05.05 according to the motor nameplate;.Set the command source F02.00 according to the requirements, SP600 inverter has a power-off memory for the panel commands and communication commands, that is, the command before the power-off is memorized, and the command is still maintained after the power-on.

4).Set parameter F23.05=2 or close DI5 terminal (switch to grid mode). Note: when F23.05 is not equal to 0, closing the DI5 terminal only participates in the internal algorithm calculation, and does not automatically switch the power relay output operation. If need to convert the power supply to the photovoltaic panel, only need to set F23.05=1 or disconnect the DI5 terminal.

5).F23 group related weak light warning, abnormal water level warning and other special functions can be set according to requirements.

6).If the water pumping is normal, it can work normally.

Note: DI2, DI3 abnormal water level input terminals, it can change the positive and negative logic polarity of the terminals through parameter F11.11 to meet the different installation methods of the water level switch.

3.3 Debugging when Solar Panel is Automatically Switched with Grid or Generator are Powered

1.When the solar panel and the grid power supply are automatically switched, the Sp600 wiring is as follows:

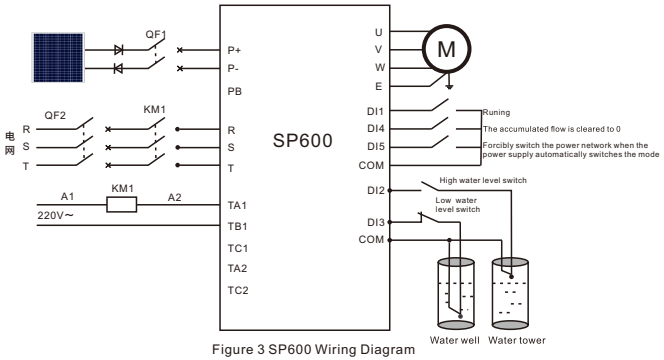


Figure 3 SP600 Wiring Diagram

2.Debugging Step are as

1).Please connect the wires correctly according to the above figure, and close QF1 and QF2 at the same time after making sure that there is no error.

2).Set the motor parameters correctly, and input F05.01～F05.05 according to the motor nameplate;Set the command source F02.00 according to the requirements, SP600 inverter has a power-off memory for the panel commands and communication commands, that is, the command before the power-off is memorized, and the command is still maintained after the power-on

3).Set F23.05=0 (automatically switch the power supply), when the system is powered on, the solar panel will give priority to power supply by default,TA1/TB1 operates,and the power will be switched to the solar panel. After the bus voltage is stable and the conditions are met, it is allowed to run. When it is insufficient, the inverter determines that it is weak light according to its own weak light algorithm, the inverter automatically stops and TA1\TB1 operates, and switches to grid power supply and runs automatically. After the running time reaches F23.06, it switches to solar panel power supply,after F23.07 delay and voltage stable, it will automatically run, and this logic cycle will determine the switching operation.

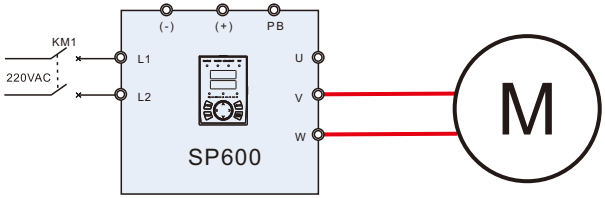
4).F23 group related weak light warning, abnormal water level warning and other special functions can be set according to requirements.

Note: DI2, DI3 abnormal water level input terminals, it can change the positive and negative logic polarity of the terminals through parameter F11.11 to meet the different installation methods of the water level switch.

⚠	● The DC circuit breaker QF1 must be installed as a protection switch for the PV DC input ● When components are connected in parallel should be used PV special combiner box. ● When the distance between the PV cell module and the inverter exceeds 10 meters, the DC input end needs to be equipped with a Type II surge arrester. ● When the pump is more than 50 meters away from the inverter, it is recommended to select an output reactor.

3.4 Single Phase Motor Wiring

SP600 with Single-phase motor wiring diagram is as follows:

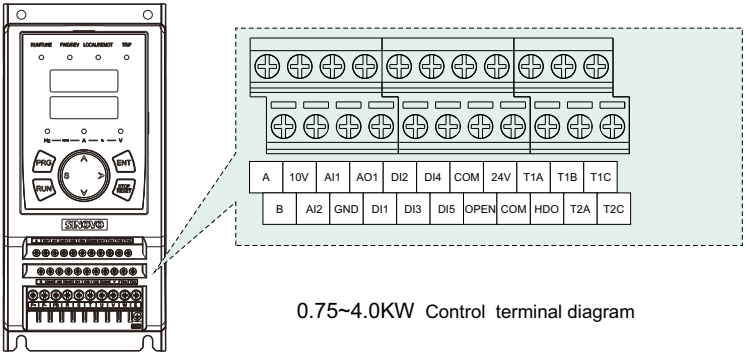


Note: After the wiring is completed, set F22.16=1.

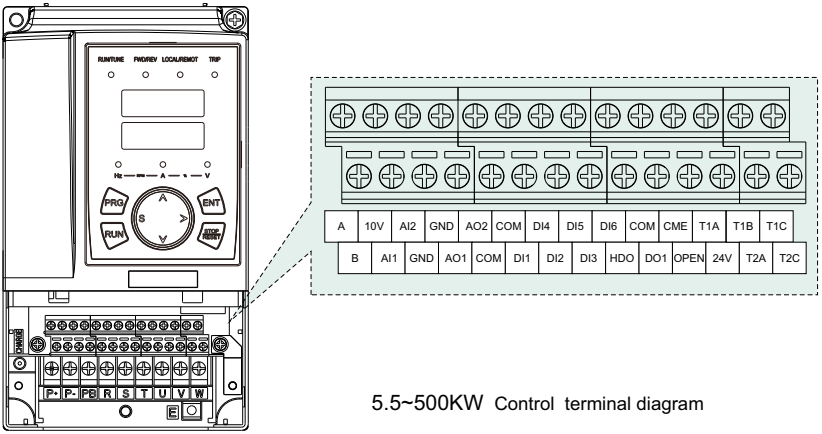
3.5 Main Circuit Terminal Description

Terminal Identity	Terminal Name	Terminal Function Description
R、S、T	AC Input	Three-phase AC input terminal,connected to the grid
P+、P-	PV DC Input	Solar panel input terminal
U、V、W	Inverter Output	Three-phase AC output terminal, connected to the pump motor
PE	Safety grounding	Safety protection grounding terminal, each inverter must be grounded reliably

3.6 Control Panel Terminals



0.75~4.0KW Control terminal diagram

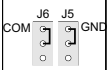


5.5~500KW Control terminal diagram

Control Panel Terminal Function Instructions(continued)

Type	Terminal	Terminal name	Specification
Analog input	+10V	Analog input reference voltage	10.5V(+3%) Maximum output current 25mA/ the potentiometer resistance range is more than 4KΩ.
	GND	Analog ground	Internal isolated with COM
	AI1	Analog Input 1	0~20mA: Input resistance 500Ω, max input current is 25mA 0~10V: Input resistance 100KΩ, max input voltage 12.5V Input range: 0–10VDC/0–20 mA, switched by jumper J9 on the control board and factory defaulted as voltage input.
	AI2	Analog Input 2	
Analog output	AO1	Analog output 1	0~20mA:Input resistance 200Ω~500Ω 0~10V: Input resistance >10KΩ Input range: 0–10 VDC/4–20 mA, switched by jumper J3 or J4 on the control board and factory defaulted as voltage input.
	AO2	Analog output 2	
	GND	Analog ground	Internal isolated with COM
	+24V	+24V	24V±10%: Internal isolated with GND
Digital input	OPEN	Digital input terminal common	It is used for switching between high and low level of input. By default, OPEN is short-connected with +24V through jumper J7, that is, the switch input is low effective. If the enable level needs to be modified, the connection position of the jumper needs to be changed
	COM	+24V	Internal isolated with GND
	DI1~DI5	Digital input 1-5	Input specification: 24VDC/5mA Frequency range: 0~200Hz Voltage range: 10V~30V NOTE: DI5 supports 0~100KHZ high speed pulse input
Digital output	DO1	Open collector output	Voltage range: 0~24V Current range: 0~50mA
	HDO	High-speed pulse output	Pulse output: 0~50KHz
	CME	DO1/HDO1 Digital output public ground	0~20mA: Input impedance: 500Ω, Max input current: 25mA
			When leaving the factory, CME and COM have been short -connected through jumper J8 (DO1 defaults to +24V driver). When DO1 wants to be driven by an external power source, CME and COM must be disconnected.
Relay output	T1A、T1B、T1C	Relay 1 output	T1A-T1B:NC T1A-T1C:NO Contact capacity: 250VAC/5A/30VDC/5A
	T2A、T2C	Relay 2 output	T2A-T2C:NO Contact capacity: 250VAC/3A/30VDC/3A
Rs485 commun -ication	A	485 differential signal +	Speed rate1200/2400/4800/9600/19200/38400 Use twisted pair or shielded cable, the longest distance:300m Internal isolated with COM
	B	485 differential signal -	
	GND	Analog ground	

Switching Dial Code Switch Function Description

Name	Jumpers Figure	Function	Factory setting
485		Rs485 communication terminating resistor selection ON: 120Ω termination resistor connection is valid OFF: Without termination resistor connection	OFF
AI1		I is the current input: 0~20mA. V is voltage input: 0~10V.	0~10V
AI2		I is the current input: 0~20mA. V is voltage input: 0~10V.	0~10V
AO1		I is current output: 0~20mA. V is voltage output: 0~10V.	0~10V
AO2		I is current output: 0~20mA. V is voltage output: 0~10V.	0~10V
J7		OPEN:OPEN is connected with 24V (DI low level valid) NULL: OPEN is disconnected from 24V (user selects according to demand)	OPEN
J8		CME: CME is connected with COM (DO1 defaults to 24V drivers) NULL: CME is disconnected from COM (Use external power to drive).	CME
J5,J6		Choose whether connect PE with GND/COM. Occcasions with interference, Connect PE with GND/COM can improve the ablility to resist the interference.	Connection (Jumper is UP)

Note:

The jumper wire of 0.75~ 4.0kW control board shall be arranged horizontally.