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Chapter 1 Safety Information and Precautions

To ensure safety of your health, equipment and property, please read this chapter carefully before using the frequency inverter and act in compliance with the instructions when installing,Debugging, running and overhauling the frequency inverter.

1.1 Safety Definition

Danger: it will cause danger of serious injuries and even death while operating against the rules.

Caution: it will cause danger of light injuries or equipment destruction while operating against the rules.

Note: some information is useful while operating and use frequency inverter.

1.2 Safety Requirements and Cautions

●Before Installation

Danger
Only qualified personnel can operate the equipment. Before operating, be sure to carefully read the manual about safety, installation, operation and maintenance. The safe operation depends on the proper processes of choosing models, carrying, installation, operation and maintenance.

Danger
Don’t use the damaged or incomplete frequency inverters; Otherwise, there is risk of injury.

●Installation

Danger
1) Please install the frequency inverter on metal or other nonflammable material, and keep it away from the combustible material. Otherwise there is danger of fire; 2) No unauthorized modification to the frequency inverter; Otherwise there is danger of damaged. 3) Normal frequency inverter, which is not explosion-proof, can not be installed where with explosive gas or dust; Otherwise there is danger of explosion.

Attention
1) When two frequency inverters are installed in the same control cabinet, please pay attention to the installing place to guarantee the effective heat dissipation.
2) When carrying the frequency inverter, ease support its bottom.

●Wiring

Danger
1) Wire is connected only when the main circuit is cut off, otherwise there is a danger of shock.
2) Wire is connected by professional person only. Otherwise there is a danger of shock.
3) Earth must be reliable. Otherwise there is a danger of shock.
4) AC power supply should not be connected with output ports U, V, W, otherwise there is a danger of damage to inverter.

1.3 Cautions in Using

1) In application of this series frequency inverter, you have to confirm all machine insulation to prevent damage to the equipment. Moreover, when the motor working in tough environment, please periodic inspect the electrical insulation to ensure the safety of the system work.
2) If the motor adapter is not consistent with frequency inverter's rating current (The rating current of the motor is far smaller than that of frequency inverter), please adjust the protective value to ensure safe running.
3) In occasions such as load raises, usually there is negative torque and frequency inverter breaks off for over-current or over-voltage. In this case, you should consider choosing the matching brake unit.
4) Frequency inverter, in a certain output frequency range, can meet the mechanical resonance of the load equipment. To avoid it, you can set up jumping frequency.
5) As output voltage of the inverter is pulse-wave type, if there is capacity which can improve power factor or pressure-sensitive resistance which used for thunder-proof in the voltage output side, the frequency inverter will break off or its parts will be damaged, so it is necessary to dismantle them. Moreover, it is proposed not install switch parts like air switch and contactor (if it is necessary to install switch on output side, please make sure the output electricity of frequency inverter is zero when the switch is working)
6) At over 1,000 meters altitude, the inverter’s heat dissipation function worsened due to the thin air, it is necessary to use less.
7) The inverter output voltage is pulse wave type. If using digital multi-meter measurement, deviation of the reading will be great. And the deviation is different by using different type of digital multi-meter. Under normal circumstances, while RMS 380V, digital multi-meter reading is around 450V.

8) Solar panel can be connected in the series or parallel. For rated voltage 380V controller, we suggest working voltage between 480V and 560V while MPPT. What means the solar panel open circuit voltage should be between 600V and 700V.

1.4 Cautions in Disposal

When you dispose frequency inverter please pay attention to:

1) Electrolytic capacitor: the electrolytic capacitor of main circuit or the printing plant may explode when they are burned.
2) Plastic: plastic incineration may generate toxic gases.
3) Dispose method: please dispose as industrial waste.

Chapter 2 Product Information

2.1 Naming Rules

PV300 - 4T - 7.5G (H)
① ② ③ ④

Field	Identification	Label description
Inverter series	①	PV300 series Solar photovoltaic water pump inverter
Voltage level	②	1T:Input 90-400VDC, 3 Phase 110-230VAC Output,Suitable for AC110V Pumps 2S:Input 150-450VDC,1 Phase150-230VAC Output, Suitable for AC220V Pumps 2T: Input 150-450VDC,3 Phase150-230VAC Output, Suitable for AC220V Pumps 4T:Input 250-800VDC, 3 Phase230-460VAC Output , Suitable for AC380V Pumps
Adaptive motor power	③	0.75:0.75kW 1.5:1.5kW 2.2:2.2kW 4.0:4.0kW 5.5:5.5kW 7.5:7.5kW
Suffix	④	Support up to 900V input

2.2 Nameplate

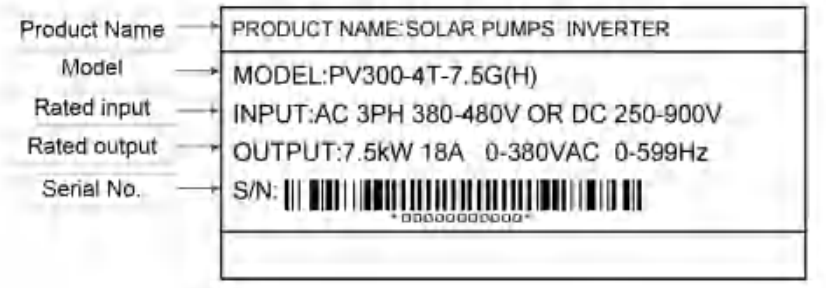


Fig. 2.2-1 Nameplate instructions

2.3 Specification and rated parameters

Solar Pump Inverter Power (kW)	Pump		Max solar power input (kW)	Max DC Input Voltage (V)	Recommend ed Voc voltage (V)	Rated Output Current (A)	Output frequency (Hz)
	Rated Power (kW)	Rated Voltage (V)					
PV300-1T Series:Input 90-400VDC, 3 Phase 110-230VAC Output,Suitable for AC110V Pumps							
0.75	0.75	110	1.0	400	175-380	7.0	0-599.00
1.5	1.5	110	1.95	400	175-380	10.6	0-599.00
PV300-2S Series:Input 150-450VDC,1 Phase150-230VAC Output, Suitable for AC220V Pumps							
0.75	0.75	220	1.0	450	360-430	4.0	0-599.00
1.5	1.5	220	1.95	450	360-430	7.0	0-599.00
2.2	2.2	220	2.86	450	360-430	10.6	0-599.00
4.0	4.0	220	4.81	450	360-430	17	0-599.00
PV300-2T Series:Input 150-450VDC,3 Phase150-230VAC Output, Suitable forAC220V Pumps							
0.75	0.75	220	1.0	450	360-430	4.0	0-599.00
1.5	1.5	220	1.95	450	360-430	7.0	0-599.00
2.2	2.2	220	2.86	450	360-430	10.6	0-599.00
4.0	4.0	220	4.81	450	360-430	17	0-599.00
PV300-4T Series:Input 250-800VDC(With suffix "H" support up to 900V input), 3 Phase 230-460VAC Output ,Suitable for AC380V Pumps							
0.75	0.75	380	1.0	800	620-750	2.5	0-599.00
1.5	1.5	380	2.2	800	620-750	3.8	0-599.00
2.2	2.2	380	3.3	800	620-750	5.1	0-599.00
4.0	4.0	380	5.0	800	620-750	10	0-599.00
5.5	5.5	380	8.0	800	620-750	14	0-599.00
7.5	7.5	380	10.0	800	620-750	18	0-599.00
11	11	380	14.3	800	620-750	26	0-599.00
15	15	380	19.5	800	620-750	33	0-599.00
18.5	18.5	380	23.4	800	620-750	38	0-599.00
22	22	380	28.6	800	620-750	46	0-599.00
30	30	380	39.0	800	620-750	61	0-599.00
37	37	380	48.1	800	620-750	76	0-599.00
PV300-4T Series:Input 350-800VDC(With suffix "H" support up to 900V input), 3 Phase 230-460VAC Output , Suitable for AC380V Pumps							
45	45	380	58.5	800	620-750	92	0-599.00
55	55	380	71.5	800	620-750	113	0-599.00
75	75	380	97.5	800	620-750	151	0-599.00
90	90	380	120.0	800	620-750	177	0-599.00
110	10	380	143.0	800	620-750	211	0-599.00

Solar Pump Inverter Power (kW)	Pump		Max solar power input (kW)	Max DC Input Voltage (V)	Recommend ed Voc voltage (V)	Rated Output Current (A)	Output frequency (Hz)
	Rated Power (kW)	Rated Voltage (V)					
132	32	380	171.6	800	620-750	254	0-599.00
160	60	380	208.0	800	620-750	305	0-599.00
185	185	380	240.5	800	620-750	327	0-599.00
200	200	380	260.0	800	620-750	378	0-599.00

2.4 Technical Specification

Power input	Voltage	1T:90 - 400VDC;1PH/3PH 110VAC 2S/2T:150 - 450VDC;1PH/3PH 220 - 240VAC 4T:250 - 900VDC/350- 900VDC;3PH 380 - 480VAC
	Frequency	50Hz/60Hz, tolerance ±5%
	Voltage range	Voltage out-of-balance rate<3%
	Total Voc range (V) of recommended panels	1T Type:175 - 380VDC 2S/2T Type:360 - 430VDC 4T Type:620 - 750VDC
Power output	Adaptive motor type	Asynchronous motor, permanent magnet synchronous motor
	Output voltage (V)	0%~rated input voltage, error < ±3%
	Output frequency (Hz)	0.00%~599.00Hz; unit:0.01Hz
	Overload capacity	150% rated current/60s, 180% rated current/10s, 200% rated current/0.5s
Basic functions	ACC/DEC time	0.0~650.00s
	Switching frequency	1.0kHz~16kHz
	Frequency setting	Digital setting + control panel，Communication，Analog setting，Terminal pulse setting
	Motor start-up methods	Started from starting frequency，DC brake start-up，Speed tracking start
	Motor stop methods	Ramp to stop，Free stop
Protection function	Solar pump protection function	Dry run,low frequency,low power,dormancy,water full,pump over current protection
	Basic protection function	Inverter unit protection，Overcurrent during acceleration，Overcurrent during deceleration，Over current at constant speed，Overvoltage during acceleration，Overvoltage during deceleration，Overvoltage at constant speed，Undervoltage，Power input phase loss，Power output phase loss,Inverter overload，Motor overload，Current detection fault，Inverter temperature exceeds the limit，Load becoming 0 ，Too large speed deviation，Short circuit to ground，External equipment fault，Fast current limit fault，Communication fault，Master slave control communication disconnection，EEPROM read-write fault，PID feedback lost during running，Data storage fault，Control power supply fault，Motor switchover fault during running,Accumulative running time reached

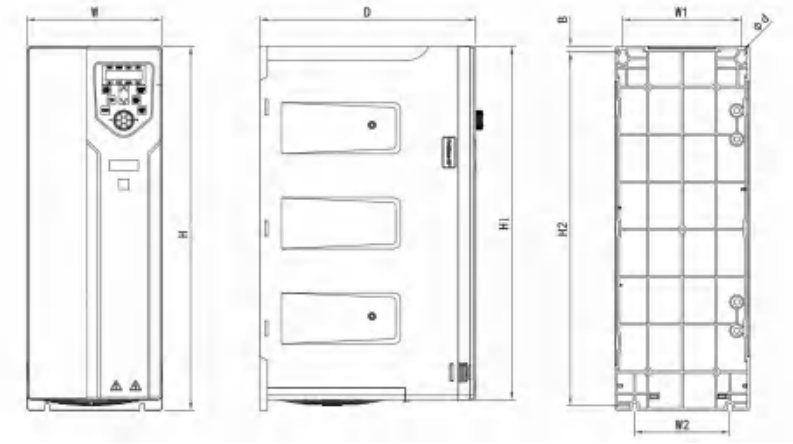
Communication network		Supports 485/Modbus protocol, protibus-DP protocol, CANopen protocol, Profinet protocol, EtherCAT protocol, Modbus TCP protocol and CAN customized protocol.
Featured functions	Parameter copy, parameter backup, common DC bus, various master & auxiliary setting and switchover, flying start, a variety of Accel/Decel curves optional, brake control, 15-step speed control programmable (2-step speed supports flexible frequency command), wobble frequency control,three history faults, over excitation brake, over voltage stall protection, under voltage stall protection, restart on power loss, skip frequency, frequency binding, four kinds of Accel/Decel time, motor thermal protection, flexible fan control, process PID control, simple PLC, multi-functional key programmable, autotuning,field-weakening control, high-precision torque restraint, V/f separated control	
Control Panel	Standard (Internal)	LED control panel
	Optional (External)	Single-line display LED control panel、LCD control panel
Environment	Place of operation	Indoors, no direct sunlight, free from dust, corrosive gases, flammable gases, oil mist, water vapor, water drop or salt, etc.
	Altitude	0~2000m. De-rate 1% for every 100m when the altitude is above 1000 meters
	Ambient temperature	-10℃~50℃, The rated output current should be derated1% for every 1℃ when the ambient is 40℃~50℃
	Relative humidity	0~95%, no condensation
	Vibration	Less than 5.9m/s² (0.6g)
	Storage temperature	-20℃~+60℃
Others	IP grade	IP20
	Cooling method	Forced air cooling

2.5 Appearance, Mounting Dimensions

Plastic housing

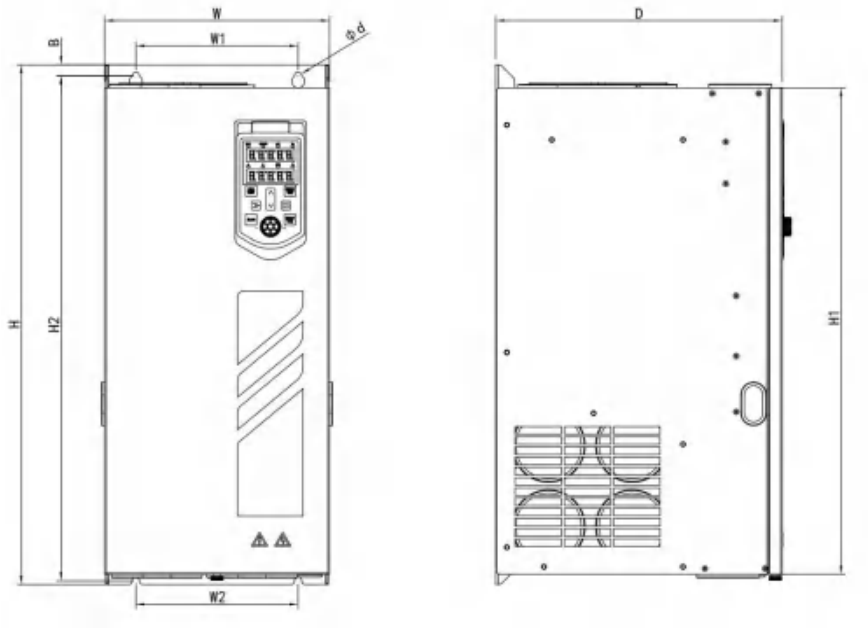
Fig. 2.5-1 Overall dimensions of PV300-1T(0.75kW~1.5kW)、PV300-2S/2T(0.75kW~2.2kW)

PV300-4T(0.75kW~4.0kW)



Plastic housing

Fig. 2.5-2 Overall dimensions of PV300-2S/2T(4.0kW)、PV300-4T(5.5kW~22kW)



Sheet metal housing

Fig. 2.5-3 Overall dimensions of PV300-4T(30kW~200kW)

Table 2.5-1 Appearance, mounting dimensions and weight

Model	External and installation dimensions (mm)									NW	GW
	W	H	H1	D	W1	W2	H2	B	d	(Kg)	(Kg)
PV300-1T											
PV300-1T-0.75G	76	200	193	160	61	62	193	5.5	3-φ5	1.2	1.5
PV300-1T-1.5G											
PV300-2S											
PV300-2S-0.75G	76	200	193	160	61	62	193	5.5	3-φ5	1.2	1.5
PV300-2S-1.5G											
PV300-2S-2.2G											
PV300-2S-4.0G	100	242	232	165	84	85	231	5.5	3-φ5	2.3	2.6

Model	External and installation dimensions (mm)									NW	GW
	W	H	H1	D	W1	W2	H2	B	d	(Kg)	(Kg)
PV300-2T											
PV300-2T-0.75G	76	200	193	160	61	62	193	5.5	3-Φ5	1.2	1.5
PV300-2T-1.5G											
PV300-2T-2.2G											
PV300-2T-4.0G	100	242	232	165	84	85	231	5.5	3-Φ5	2.3	2.6
PV300-4T											
PV300-4T-0.75G(H)	76	200	193	160	61	62	193	5.5	3-Φ5	1.2	1.5
PV300-4T-1.5G(H)											
PV300-4T-2.2G(H)											
PV300-4T-4.0G*											
PV300-4T-4.0G(H)*	100	242	232	165	84	85	231	5.5	3-Φ5	2.3	2.6
PV300-4T-5.5G(H)											
PV300-4T-7.5G(H)											
PV300-4T-11G(H)	116	320	306	185	98	98	307	5	3-Φ5	3.5	5
PV300-4T-15G(H)	142	383	372	227	125	100	372	6	4-Φ6	5.5	7.0
PV300-4T-18.5G(H)											
PV300-4T-22G(H)											
PV300-4T-30G(H)	173	430	408	230	150	150	416	8	4-Φ7	13.3	14.3
PV300-4T-37G(H)											
PV300-4T-45G(H)	242	560	524	310	175	175	544	12	4-Φ8	26.0	27.0
PV300-4T-55G(H)											
PV300-4T-75G(H)											
PV300-4T-90G(H)	270	638	595	350	195	195	615	15	4-Φ8	36.0	40.0
PV300-4T-110G(H)											
PV300-4T-132G(H)	349	738	681	403	220	220	715	13	4-Φ10	65.0	72.0
PV300-4T-160G(H)											
PV300-4T-185G(H)	360	940	851	480	200	200	910	21	4-Φ18	90.0	102.0
PV300-4T-200G(H)											

Note: “*” Models of the same power are different sizes due to DC input differences.

2.6 External Dimensions of Control Panel

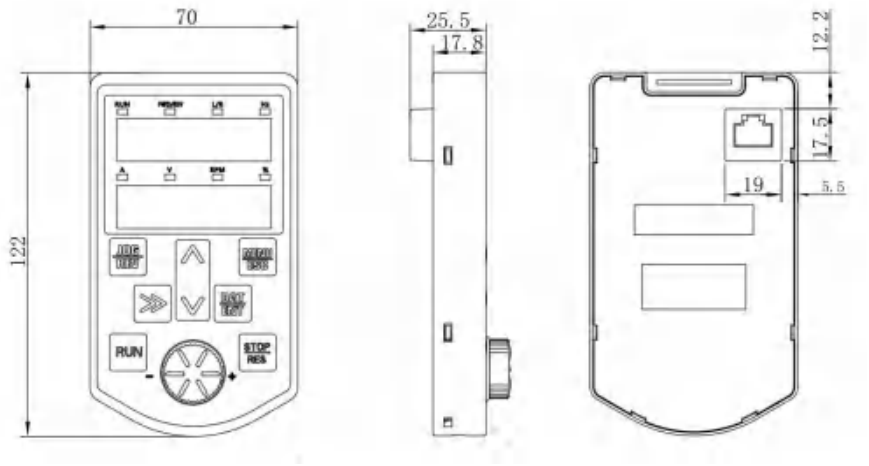


Fig. 2.6-1 External dimensions of Dual-line display LED Control Panel (Standard)

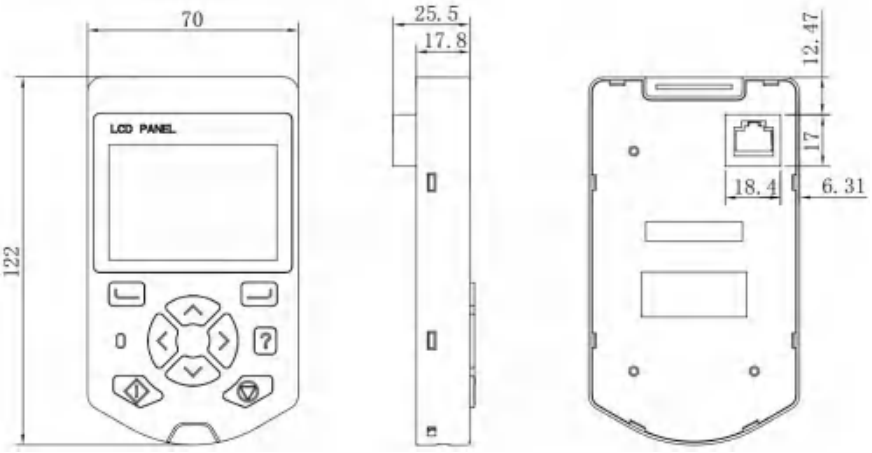


Fig. 2.6-2 External dimensions of LCD Control Panel (Optional)

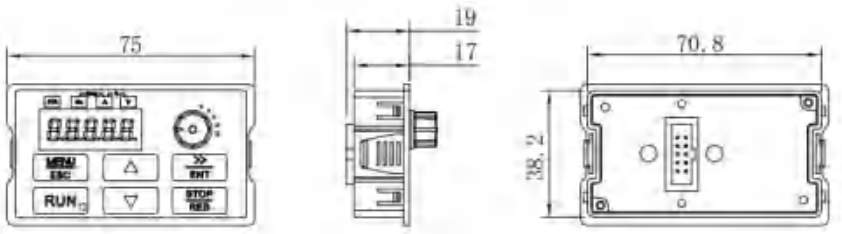


Fig. 2.6-3 External dimensions of Single-line display LED Control Panel (Optional)

2.7 External Dimensions of Control Panel Bracket

2.7.1 External Dimensions of Dual-line display LED/LCD Control Panel Bracket

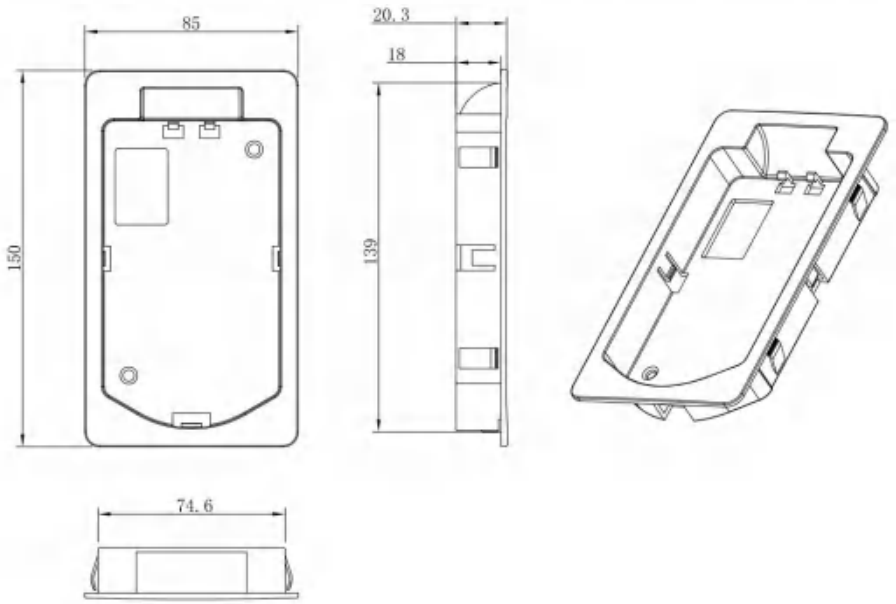


Fig. 2.7-1 External Dimensions of Control Panel Bracket (Optional)

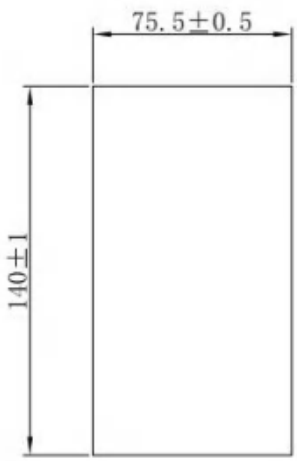


Fig. 2.7-2 Hole dimensions in the cabinet

2.7.2 External Dimensions of Single-line display LED Control Panel

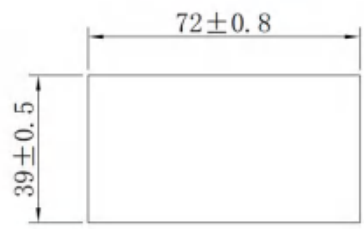


Fig. 2.7-3 Hole dimensions in the cabinet

Chapter 3 Installation and Wiring

3.1 Installation Environment

1) Ambient temperature is in the range of -10℃~ 40℃.
2) Inverter should be installed on surface of flame retardant object, with adequate surrounding space for heat dissipation.
3) Installation should be performed where vibration is less than 5.9m/s² (0.6g).
4) Protect from moisture and direct sunlight.
5) Protect the cooling fan by avoiding oil, dust and metal particles.
6) Do not expose to an atmosphere with flammable gases, corrosive gases, explosive gases or other harmful gases.
7) Prevent drilling residues, wire ends and screws falling into Inverter.
8) Ventilation part of the Inverter should be installed outside from harsh environment (e.g. textile facilities with fiber particles and chemical facilities filled with corrosive gases).

3.2 Minimum Mounting Clearances

To ensure favorable heat dissipation, mount the Inverter upright on a flat, vertical and level surface as per Fig. 3.2-1. For installation inside cabinet, the product shall be mounted side by side to the greatest extent while adequate surrounding space shall be preserved for favorable heat dissipation.

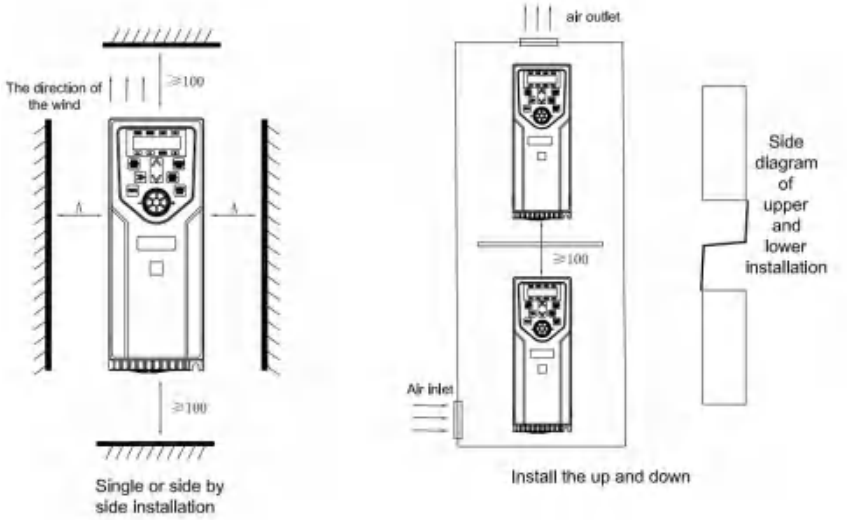


Fig. 3.2-1 Installation of frequency converter

Single installation:when the power of the converter is not greater than 22kW, the size of A can be ignored. When greater than 22kW, A should be greater than 45mm.

Upper and lower installation:When installing the Inverters up and down, please install the Air Guide Plate shown in the figure.

Power level	Mounting dimensions for upper and lower installation	A
≤22kW	≥100mm	≥8mm
30kW~37kW	≥200mm	≥45mm
≥45kW	≥300mm	

3.3 Remove & Mount Control Panel and Cover

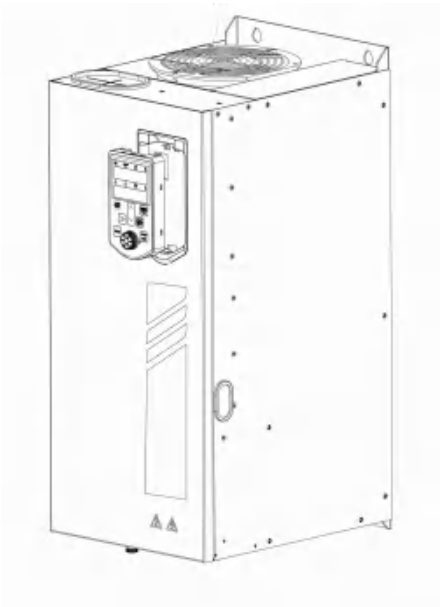


Fig. 3.3-1 Remove and Mount Control Panel

- **Remove control panel:**
  Place your middle finger on the finger insertion hole above the control panel, gently press and hold the top shrapnel and pull outward.
- **Mount control panel:**
  First the bottom of the control panel fixed buckle docking in the operation panel installation slot below the installation claw, with the middle finger press the top of the shrapnel pushed in, in place after the release of the middle finger can be.

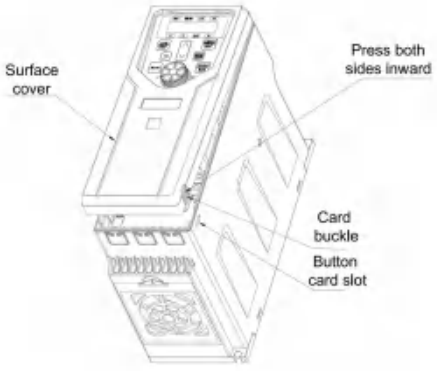


Fig. 3.3-2 Schematic diagram of removal and installation of plastic shell cover plate

- **Removal of plastic shell cover plate:**
  Use a finger or a tool to hook the lower end of the cover plate to the inside.
- **Installation of plastic shell cover plate:**
  First push the upper hook of the cover into the outer box, and then press the lower hook of the cover into the outer box.

Fig. 3.3-3 Schematic diagram of disassembly and installation of sheet metal housing cover plate

Remove and install the sheet metal cover:Use a Phillips screwdriver to remove the four screws shown in ① and remove the cover in the direction shown in ②.

3.4 Wiring Diagram

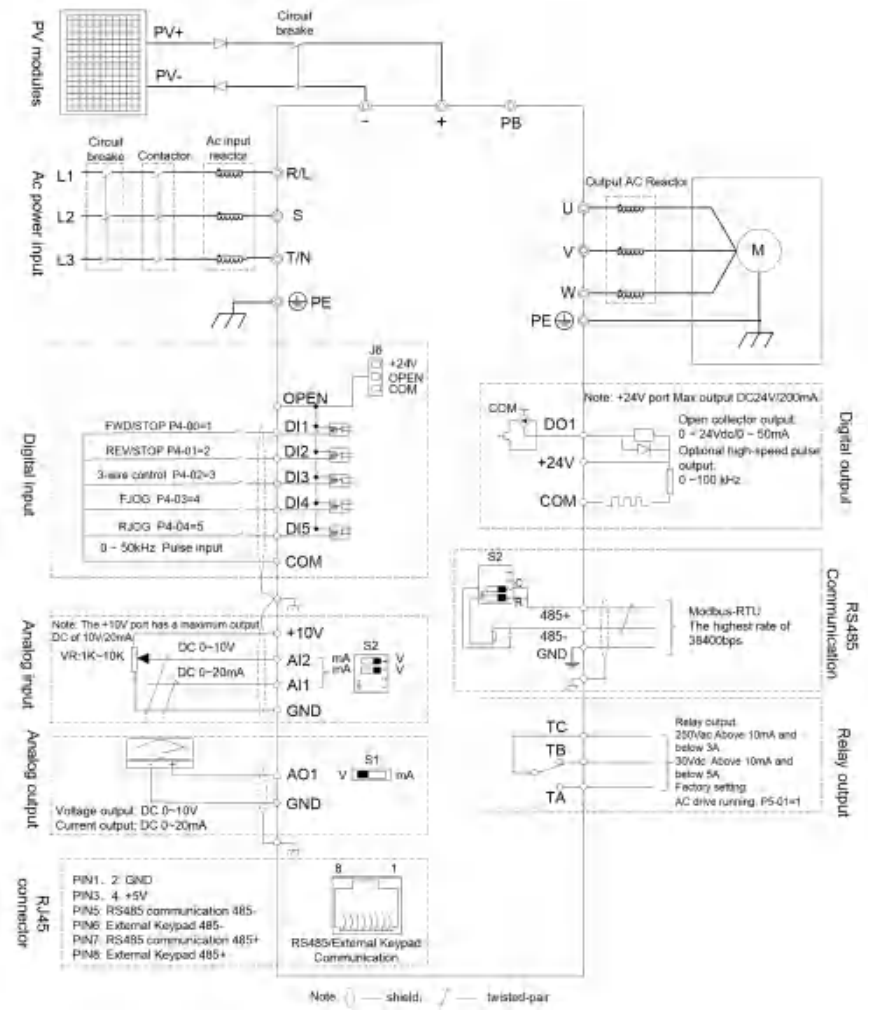


Fig. 3.4-1 Wiring diagram

Notice:

① Terminal ◎ Indicates the main loop terminal, ○ indicates the control loop terminal;

② Signal cables and power cables must be routed separately, and the control cables and power cables should be crossed at a 90-degree Angle as far as possible.The analog signal line reference diagram describes the selection of linear, power cable is the best choice of shielded three core cable;

③ Single-phase 220V model power terminals are L and N;

④ "+" and"-"used to connect DC power supply. "+" terminals must connect positive of DC solar

power and "-" must connect negative of DC solar power supply. Otherwise it will cause inverter damaged seriously;

⑤ This inverter can compatible with connecting DC power supply input and AC grid power supply input at the same time. But please connect a backward diode between PV modules and inverter which use to prevent current forward to solar panels and damaged solar panels;

⑥ When connecting both AC grid and DC solar power together, the inverter drawing power as according to which side power voltage is higher.

3.5 Control Terminal Specification

3.5.1 Schematic diagram of control board layout

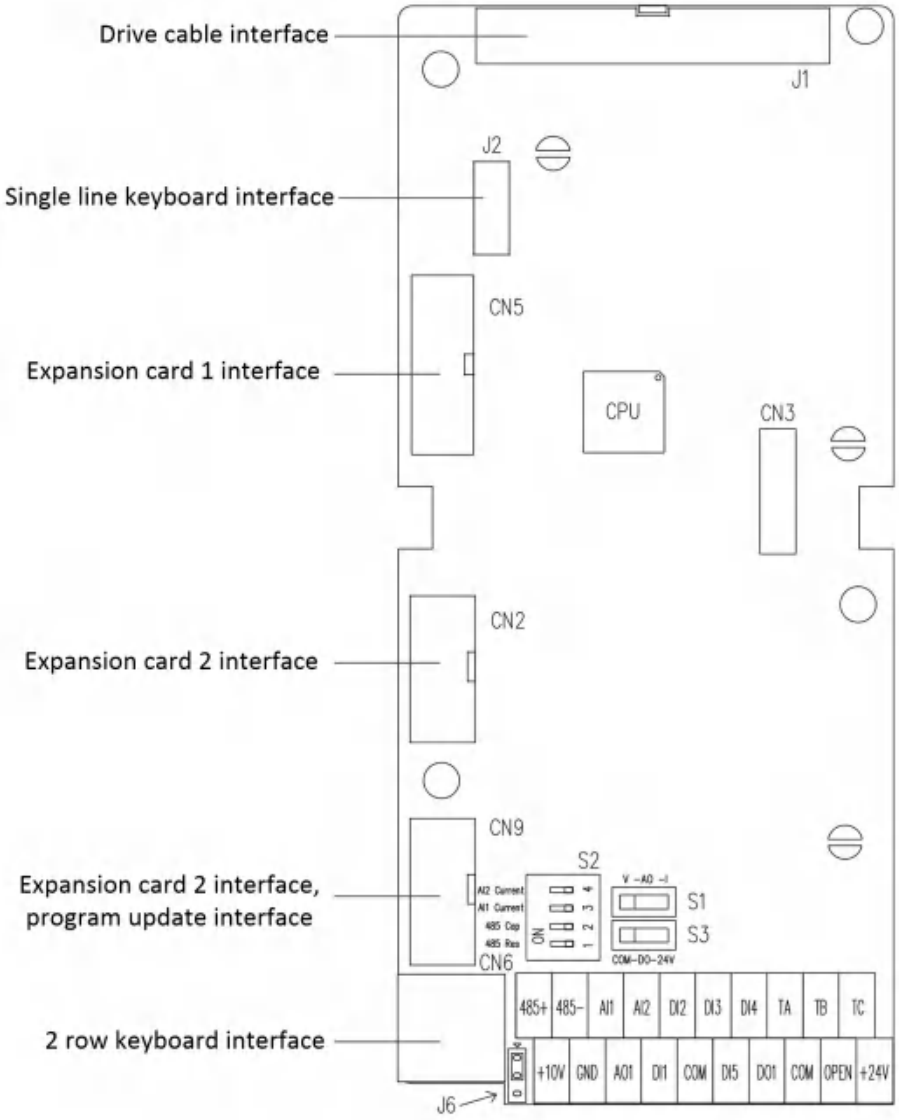


Fig. 3.5-1 Schematic diagram of control board layout

3.5.2 Function description of the control terminals

Table 3.5-1 Functions of control terminals

Category	Terminal	Terminal Name	Function Description
Power source	+10V	Analog input reference voltage	1、Provide +10 V power supply to external unit. 2、it provides power supply to external potentiometer with resistance range of 1kΩ–10kΩ. 3、Maximum output current:20mA.
	GND	Analog ground	Isolated from COM interiorly
	+24V	External +24 V power supply	1、Provide +24 V power supply to external unit. Generally, it provides power supply to DI/DO terminals and external sensors. 2、Maximum output current:200 mA
	COM	+24V ground	Isolated from GND interiorly
	OPEN	External power input terminal	Connect to +24V or COM via the J6 pin (DI) on the control board: 1）  +24V connection (default), external support for NPN input connection type. 2）  With COM connection, external support for PNP input connection type.
Analog input	AI1	Analog input 1	1、Input range:DC 0V~10V or 0/4mA~20mA, through the S2 switch on the control panel to select the third gear (AI1) : 1）  Indicates DC 0V to 10V signals (default). 2）  Indicates a signal from 0/4 mA to 20mA. 2、Input impedance:22 kΩ (voltage input),500 Ω (current input).
	AI2	Analog input 2	1、Input range:DC 0V~10V or 0/4mA~20mA, through the S2 switch on the control panel to select the fourth gear (AI2): 1）  Indicates DC 0V to 10V signals (default). 2）  Indicates a signal from 0/4 mA to 20mA. 2、Input impedance:22 kΩ (voltage input), 500Ω (current input).

Category	Terminal	Terminal Name	Function Description
	GND	Analog ground	Isolated from COM interiorly
Digital input	DI1	Digital input Terminals 1~4	1、Optical coupling isolation, compatible with bipolar input, internal impedance 3.6 kΩ . 2、Multi-function digital input, through P4-00 to P4-04 to set the function. 3、Driver default for the internal supply of +24V power, COM for the common end. 4、When the external power supply is used, the cable connection mode see Figure 3.5-4 and 3.5-5. The voltage range of the external power supply is +24V±10%.
	DI2		
	DI3		
	DI4		
	DI5	Digital input Terminals 5	Same as DI1 to DI4
		High-speed pulse input terminal	1、Can be combined with the OPEN terminal as a bipolar high-speed pulse input terminal, the highest input frequency is 50kHz. 2、When using external power supply, the input voltage range is +24V±10%.
	COM	+24V ground	Isolated from GND interiorly
Analog output	AO1	Analog output	Supports 0V to 10V voltage or 0/4mA to 20mA current output, selected by S1 dip switch (AO) : 1）  0V to 10V output (default). 2）  Indicates the current output from 0/4 mA to 20mA.
	GND	Analog ground	Isolated from COM interiorly
Digital output	DO1	Digital output	1、Optical coupling isolation, bipolar OC (open collector) output. 2、Pull up voltage range: 5V~24V (pull up resistance range: 0.48 kΩ~10 kΩ). 3、Output current range: 2mA~50mA. 4、Can select the power supply by using the DIP switch (DO) of S3: 1）  Choose the internal power supply NPN connection type. 2）  Choose the internal power supply PNP connection type.
		High-speed pulse output terminal (optional)	1、The highest output frequency is 100kHz. 2、Pull-up voltage range: 5V to 24V (pull-up resistance range is the same as above). 3、Output current range: 2mA to 50mA.
	COM	+24V ground	Isolated from GND interiorly
Relay output	TC-TA	Relay T1 normally open terminal	Contact drive capability:AC250V,3A；DC30V,5A.

Category	Terminal	Terminal Name	Function Description
	TC-TB	Relay T1 normally closed terminal	
485 Communication interface	485+	485 differential signal +	Use a twisted-pair shielded cable for the standard RS-485 communication terminal.
	485-	485 differential signal -	
	GND	485 communication shield grounding	
Dial switches	485-R	OFF the port	When dialed to this port, the 485 communication 120 Ω terminal resistance is disconnected.
		ON the port	When dialed to the port 485 communication 120 Ω terminal resistance is connected.
	485-C	OFF the port	When the terminal is dialed, the 485 communication filter capacitor is disconnected.
		ON the port	When dialed to the port, 485 communication filter capacitor is connected.
	AI1	V the port	When the AI1 terminal is switched to this terminal, select the input DC 0 to 10V voltage signal.
		mA the port	When the terminal is switched to this terminal, select the input DC 0/4 mA to 20mA current signal for the AI1 terminal.
	AI2	V the port	When the AI2 terminal is switched to this terminal, select the input DC 0 to 10V voltage signal.
		mA the port	When the terminal is switched to this terminal, select the input DC 0/4 mA to 20mA current signal for the AI2 terminal.
	AO	V the port	When the terminal is switched to this terminal, the AO1 terminal outputs DC 0 to 10V voltage signals.
		mA the port	When the terminal is switched to this port, the AO1 terminal outputs DC 0/4 mA to 20mA current signals.
	DI	24V the port	When the OPEN terminal is connected to 24V, the DI and COM short input are valid. Can also use the NPN input type.
		COM the port	When you dial this end, the OPEN terminal is connected to COM. In this case, the DI and 24V short input are valid. PNP input type is also supported.
	DO	COM the port	When dialed to this end, the DO output is selected as the internal power NPN connection type output.
		24V the port	When dialed to this end, DO output is selected internal power PNP connection type output.
Shielding earthing	GND	Shielded cable grounding	1、It is used for shielding and grounding of control cables. When the field interference is large or the control line is long, it must be well grounded to reduce the electromagnetic interference to comply with EMC specifications. 2、Do not connect this terminal to the PE cable of the power supply.

3.5.3 Cable Connections to Main control board terminals

3.5.3.1 Digital input terminal

Multifunctional digital input terminals support NPN or PNP connection type. DI1 to DI5 terminals are flexibly connected to external devices. You can select the NPN or PNP mode through the jump cap at J6 on the control board (the factory default mode is NPN). Figure 3.5-2 to 3.5-2 shows the jumping caps and cabling modes of the multi-function digital input terminals in different modes.

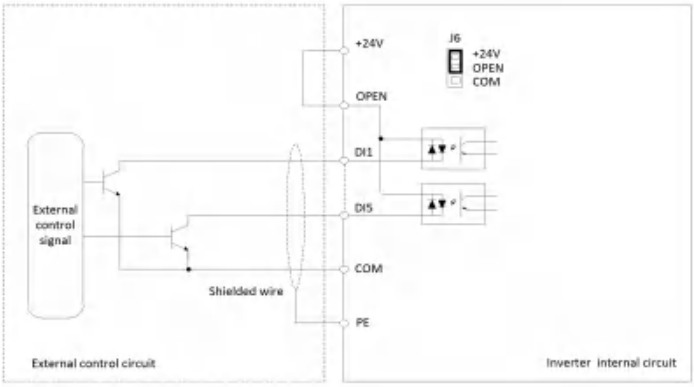


Fig. 3.5-2 NPN mode Uses the internal power supply

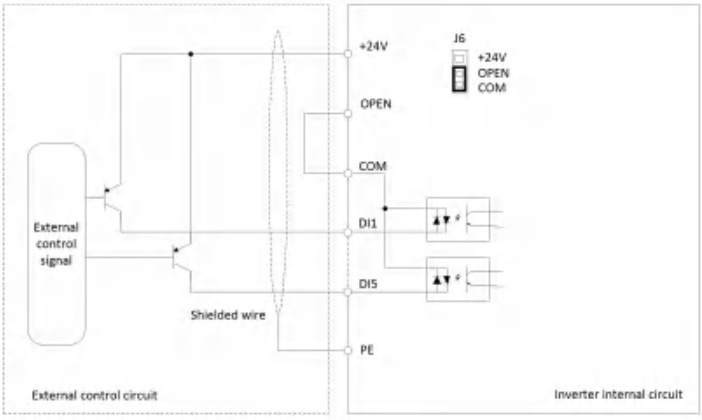


Fig. 3.5-3 PNP mode uses an internal power supply

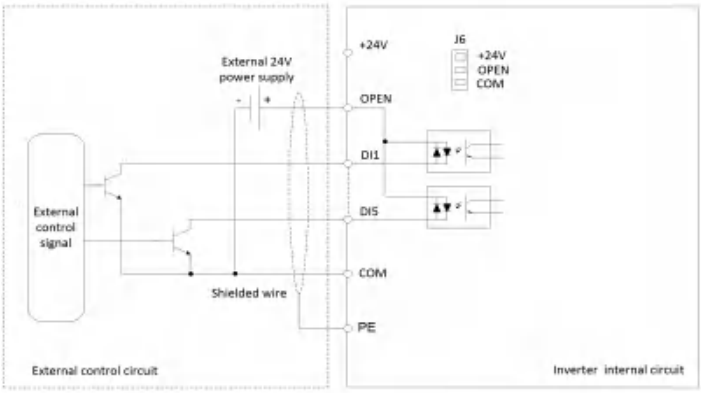


Fig. 3.5-4 NPN mode Uses external power supplies

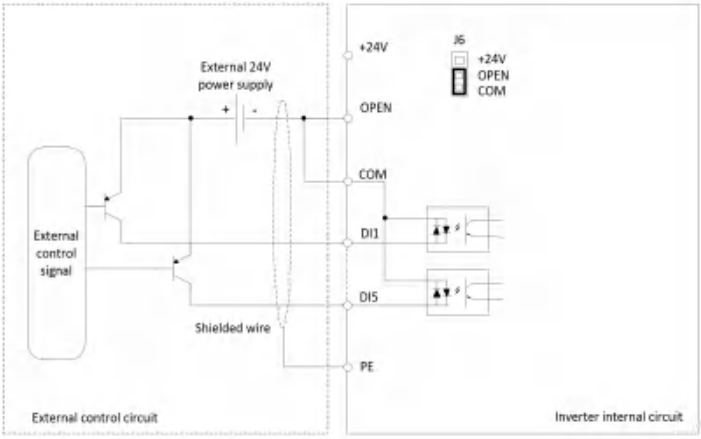


Fig. 3.5-5 PNP mode uses an external power supply

Precautions:

If the external power supply is connected in NPN mode, remove the jump cap in position J6.

3.5.3.2 Analog input terminal

Because weak analog voltage signal is particularly vulnerable to external interference, it is generally necessary to use shielded twisted-pair cable, and the wiring distance is as short as possible, not more than 20m, according to different analog signal input types can be adjusted by adjusting the S2 dip switch inside the Inverter third (AI1) and fourth (AI2) to select the corresponding input signal type. Figure 3.5-6 and 3.5-7 show dip switches and cabling methods. When some analog signals are seriously interfered, filter capacitors or ferrite magnetic rings need to be added to the source side of the analog signal, as shown in Fig. 3.5-8.

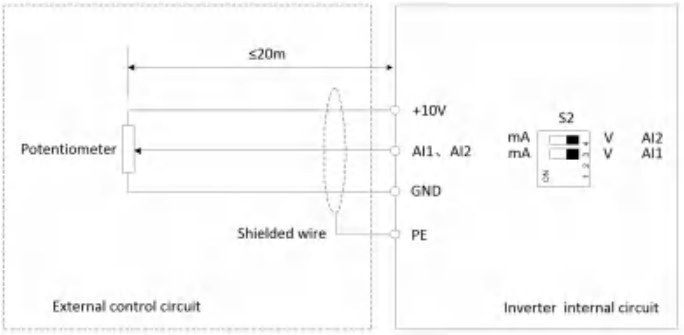


Fig. 3.5-6 Analog input terminal input voltage signal wiring diagram

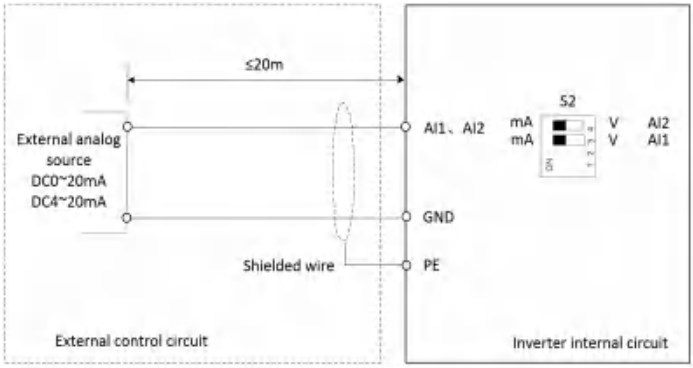


Fig. 3.5-7 Analog input terminal Input current signal wiring diagram

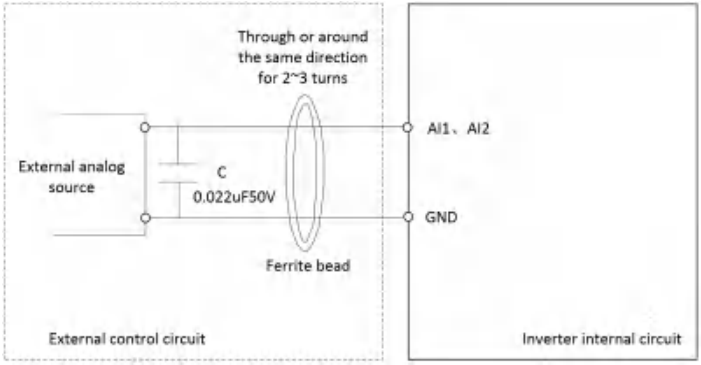


Fig. 3.5-8 Analog input terminal cable coat ferrite magnetic ring wiring diagram

3.5.3.3 Digital Output terminal

When the digital output terminal DO1 needs to drive the relay, the absorption diode should be installed on both sides of the relay coil, otherwise it may cause damage to DC +24V power supply,

and the driving capacity of DO1 is not greater than 50mA. The DO1 output can choose the wiring mode of NPN and PNP by adjusting the dip switch S3. Figure 3.5-9 and 3.5-10 show dip switches and cable distribution modes.

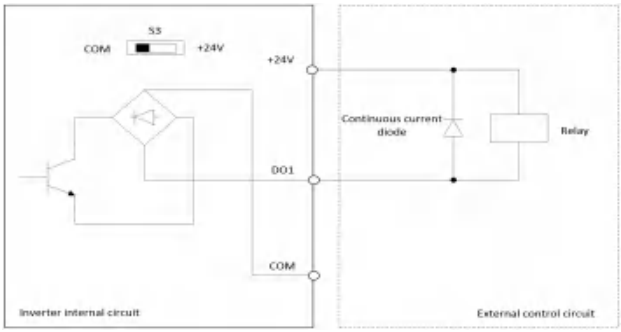


Fig. 3.5-9 Digital output terminal using the driver internal power NPN mode wiring diagram

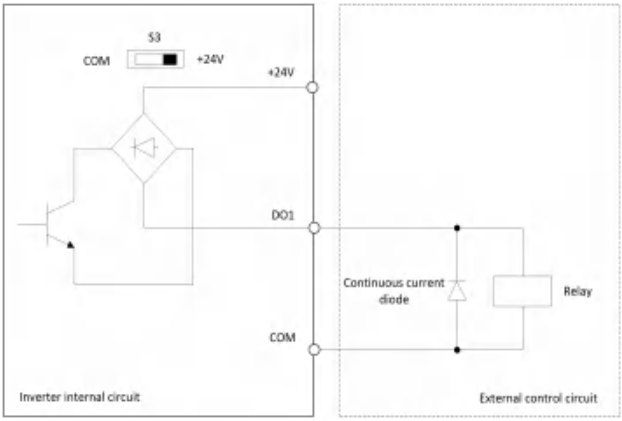


Fig. 3.5-10 Digital output terminal using the driver internal power PNP mode wiring diagram

3.5.3.4 Analog output terminal

The analog output terminal AO1 external analog quantity can represent a variety of physical quantities. You can select the output current (0/4 ~ 20mA) or (0 ~ 10V) through DIP S1. Figure 3.5-11 and 3.5-12 show dip switches and terminal wiring methods.

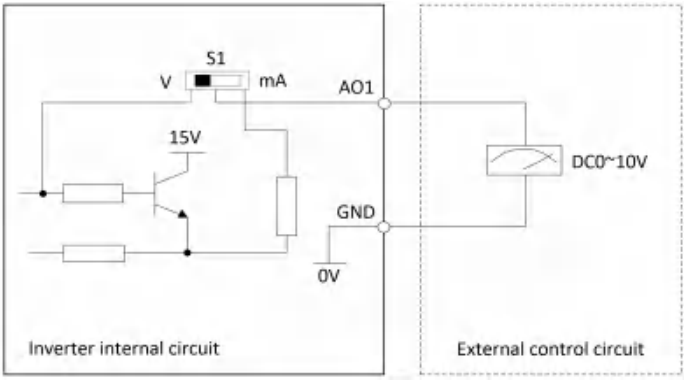


Fig. 3.5-11 Analog output terminal output voltage signal wiring diagram

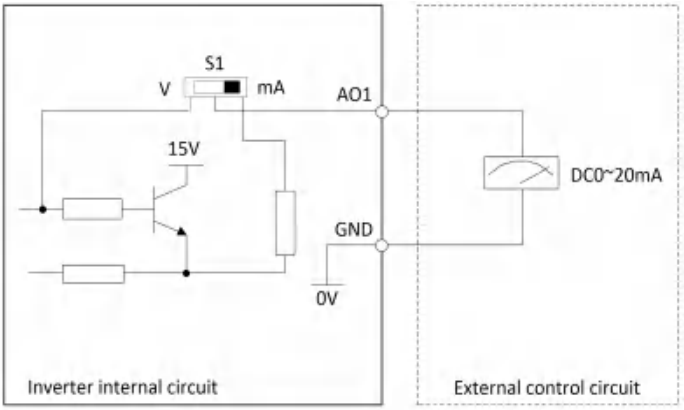
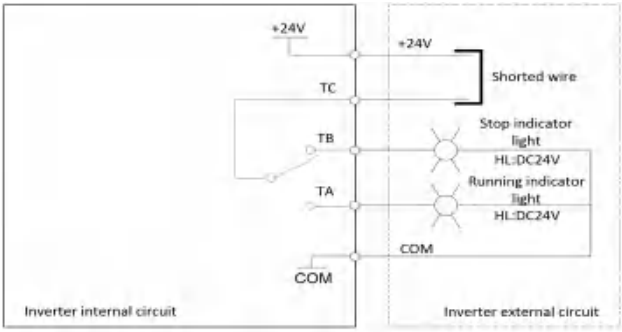


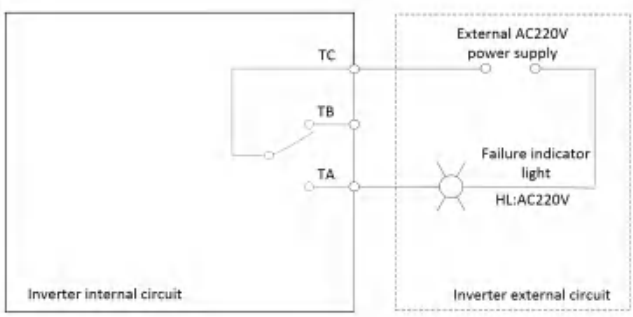
Fig. 3.5-12 Analog output terminal output current signal wiring diagram

3.5.3.5 Relay Output terminal

The wiring of relay output terminals is shown in Fig. 3.5-13, where TC is the common end of relay contacts, TB is the normally closed terminal, TA is the normally open terminal, and the driving load of relay does not exceed AC 250V3A and DC 30V 5A.



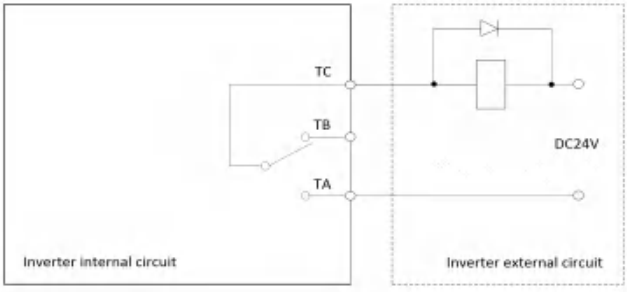
Use internal DC24V power supply



Use external AC220V power supply

Fig. 3.5-13 Wiring diagram of relay output terminal

When the relay output is connected to the inductive load (such as relay, contactor or motor), voltage peak will be caused when the current is cut off. Therefore, it is better to add varistor to the relay contact for protection, and install absorbent circuit, such as varistor, RC absorbent circuit or diode, on the inductive load to ensure the minimum interference during shutdown. For details, see Fig. 3.5-14:



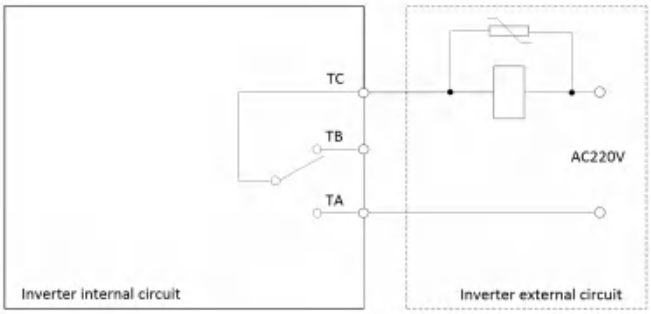


Fig. 3.5-14 Relay output terminal anti-interference processing

3.5.3.6 RS485 Communication Terminal

Communication terminals 485+ and 485- are the RS485 communication interfaces of the Driver. 485+ is connected to the positive end of the communication of the host computer, and 485- is connected to the negative end of the host computer, realizing the networking control between the host computer (PC or PLC controller) and the Driver. The connection between RS485 and the Driver is shown in Fig. 3.5-15 below:

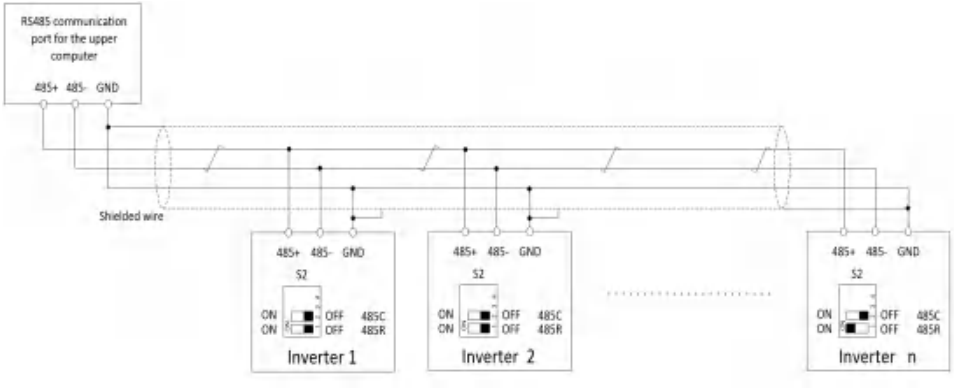


Fig. 3.5-15 RS485 communication terminal wiring diagram of one or multiple drive

Precautions:

RS485 communication should use twisted-pair shielded wires as far as possible, and short-connect all communication GND. In multi-machine communication, switch the first gear of dip switch of the most terminal drive S2 to ON (connect the terminal resistor).

Chapter 4 Operation and Run Instructions

4.1 Operation of Control Panel

As a human-machine interface, control panel is the main part for the drive to receive command and display parameters.

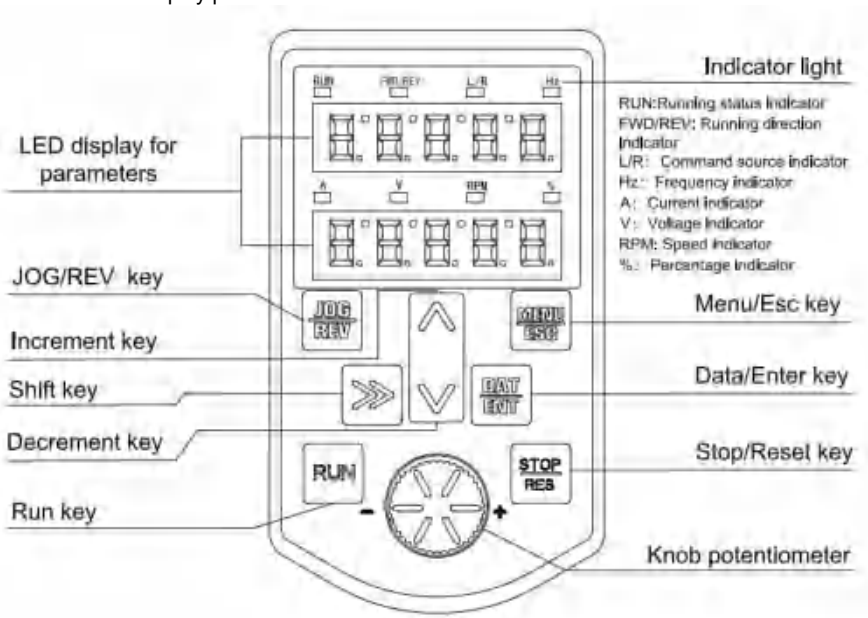


Fig.4.1-1 Control panel

4.1.1 Key Functions on Control Panel

Symbol	Key name	Meaning
	JOG/REV	P7-00 setting 2 is for JOG RUN, P7-00 setting 1 is for Reverse RUN.
	MENU/ESC	1) Enter or exit Level 1 menu. 2) Return to the previous menu.
	Increment	1) When navigating a menu, it moves the selection up through the screens available. 2) When editing a parameter value, it increases the displayed value. 3) When the Inverter is in RUN mode, it increases the speed.

	Decrement	1) When navigating a menu, it moves the selection down through the screens available. 2) When editing a parameter value, it decreases the displayed value. 3) When the Inverter is in RUNNING mode, it decreases the speed.
	Shift	1) Select the displayed parameter in the STOP or RUNNING status. 2) Select the digit to be modified when modifying a parameter value.
	DAT/ENT	1) Enter each level of menu interface. 2) Confirm displayed parameter setting.
	Potentiometer	Clockwise rotation increases the operation value, and counterclockwise rotation decreases the operation value.
	RUN	Start the Inverter when using the operating panel control mode. It is inactive when using the terminal or communication control mode.
	STOP/RES	1) Stop the Inverter when the drive is in the RUNNING status. 2) Perform a reset operation when the drive is in the FAULT status.

4.1.2 Status Indicators

Status Indicators	Indication
RUN	ON indicates the RUNNING status. OFF indicates the STOP status.
FWD/REV	ON indicates forward motor rotation. OFF indicates reverse motor rotation.
L/R	ON indicates under terminal control OFF indicates under operating panel control. FLASHING indicates under serial communication control
Hz	Hz for frequency
A	A for current
V	V for voltage
RPM	RPM for motor speed
%	Percentage

Chapter 5 List of Parameters

The symbols in the function code table are described as follows:

"☆":The parameter can be modified when the Inverter is in either stop or running state

"★":The parameter cannot be modified when the Inverter is in the running state

"○":The parameter is the actually measured value and cannot be modified

"●":The parameter is factory parameter and can be set only by the manufacturer

5.1 Fundamental group of parameters

Function Code	Parameter Name	Setting Range	Default	Property
Group P0:Basic Function Parameters				
P0-00	G/P type select	0:G type 1:P type	0	★
P0-01	Control mode selection	Asynchronous motor control method: 2:VF control-AM Synchronous motor control method: 4:Sensorless vector control (SVC)-PM	2	★
P0-02	Running command source selection	0:Operation Keyboard control 1:Terminal control 2:Communication control	0	★
P0-03	Main frequency source X selection	0:Digital Setting 1:Keyboard potentiometer setting 2:AI1 3:AI2 4:AI3 5:Multi-segment setting 6:PLC setting 7:PID 8:Communication setting 9:Pulse setting by DI5 10:Terminal UP/ DOWN setting	0	☆
P0-04	Auxiliary frequency source Y selection		0	☆
P0-05	Auxiliary frequency source Y range selectionY	0:Relative to maximum frequency 1:Relative to main frequency X	0	☆
P0-06	Coefficient of auxiliary frequency Y	0~10.000	1.000	☆
P0-07	Frequency source selection	0:Main frequency source X 1:Auxiliary frequency source Y 2:Main frequency source X+Auxiliary frequency source Y 3:Main frequency source X-Auxiliary frequency source Y 4:Max(X,Y) 5:Min(X,Y)	0	☆
P0-08	Digital frequency	0.00~Frequency upper limit(P0-12)	50.00Hz	☆

P0-09	Rotation direction	Unit's digit :Motor direction selection 0:Same direction 1:Reverse direction Ten's digit:Running direction prohibited 0:Invalid 1:Reverse prohibited 2:Forward prohibited Hundred's digit: Frequency control direction command 0:Invalid 1:Valid Thousand's:Torque control direction command 0:Invalid 1:Valid	1100	★
P0-10	Maximum frequency	0.00~599.00Hz	50.00Hz	★
P0-11	Forward Frequency source upper limit	0:Digital Setting 1:Keyboard potentiometer setting 2:AI1 3:AI2 4:AI3 5:Communication setting 6: Pulse setting by DI5	0	☆
P0-12	Forward Frequency upper limit	Frequency lower limit (P0-14)~Frequency max limit (P0-10)	50.00Hz	☆
P0-13	Reverse Frequency upper limit	Frequency lower limit (P0-14)~Frequency max limit (P0-10)	50.00Hz	☆
P0-14	Frequency lower limit	0.00Hz~Frequency upper limit P0-10	0.00Hz	☆
P0-15	Carrier frequency setting	1.0~16.0kHz	Model dependent	☆
P0-16	PWM control mode 1	Unit's digit:Carrier-Temperature Correlation 0:Unrelated 1:Related Ten's digit:Carrier to output frequency correlation 0:Unrelated 1:Related Hundred's digit:Random PWM enable 0:Unrelated 1:Related Thousand's digit:PWM modulation 0:Three phase modulation 1:Automatic switching	1011	☆
P0-17	PWM control mode 2	Unit's digit: overmodulation enable 1:enable 0:disable Ten's digit:double modulation enable 1:enable 0:disable Hundred's digit:deadband compensation enable 1:enable 0:disable Thousand's digit:Reserved	1101	☆
P0-18	Reserved			
P0-19	Acceleration time 1	0.01~650.00s	Model dependent	☆

P0-20	Deceleration time 1	0.01~650.00s	Model dependent	☆
P0-21	Acceleration time 2	0.01~650.00s	Model dependent	☆
P0-22	Deceleration time 2	0.01~650.00s	Model dependent	☆
P0-23	Acceleration time 3	0.01~650.00s	Model dependent	☆
P0-24	Deceleration time 3	0.01~650.00s	Model dependent	☆
P0-25	Acceleration time 4	0.01~650.00s	Model dependent	☆
P0-26	Deceleration time 4	0.01~650.00s	Model dependent	☆
P0-27	UP/DOWN button function selection	Unit's digit:UP/DOWN key modifying function selection 0:Invalid 1:Modify frequency setting in P0-08 2:Modify PID setting in PA-01 Ten's digit:Storage selection after modification by UP/DOWN key 0:No storage when power off 1:Stored after power-off Hundred's:UP/DOWN key resolution selection 0:0.01Hz 1:0.10Hz 2:0.50Hz 3:1.00Hz 4:2.00Hz 5:5.00Hz 6:8.00Hz 7:10.00Hz Thousand's digit:Reserved	0011	★
P0-28	Motor Selection	1:Motor 1 2:Motor 2	1	
P0-29	Acceleration/Deceleration time base frequency	0:Maximum frequency (P0-10) 1:Fixed frequency 50.00Hz 2:Set frequency	0	★
P0-30	Reserved			

P0-31	Command source binding select	Unit's digit:Binding operation Keyboard command to frequency source Ten's digit:Binding operation terminal command to frequency source Hundred's digit:Binding operation communication command to frequency source 0:No Binding 1:Digital setting 2:Keyboard potentiometer setting 3:AI1 4:AI2 5:AI3 6:Multi -peed setting 7:PLC setting 8: PID setting 9:Communication setting A:Pulse setting by DI5 B:Terminal UP/DW setting	0000	☆
P0-32	Initialization parameters	0:No operation 1:Restore factory parameters(except motor parameters） 2:Restore factory parameters (Includes motor parameters） 3:Clear the record information 067:Parameter upload 087:Parameters download	0	★
Group P1: Motor 1 parameter group				
P1-00	Motor 1 rated power	0.1~1000.0kW	Model dependent	★
P1-01	Motor 1 rated voltatge	0~1500V	Model dependent	★
P1-02	Motor 1 rated current	0.1~2000.0A	Model dependent	★
P1-03	Motor 1 rated frequency	0.01~Max frequency(P0-10)	Model dependent	★
P1-04	Motor 1 rated rpm	1~65000rpm	Model dependent	★
P1-05	Motor 1 poles	2~98	Model dependent	•
P1-06	Asynchronous motor stator resistance	0.01~50.00%	Model dependent	★
P1-07	Asynchronous motor rotor resistance	0.01~50.00%	Model dependent	★
P1-08	Asynchronous motor mutual inductance	0.01~50.00%	Model dependent	★
P1-09	Asynchronous motor leakage inductance	0.1~2000.0%	Model dependent	★
P1-10	Asynchronous motor no-load current	0.1~650.0A	Model dependent	★

P1-11	Synchronous motor stator resistance	0.01~50.00%	Model dependent	★
P1-12	Synchronous motor D-axis inductance	0.01~200.00%	Model dependent	★
P1-13	Synchronous motor Q-axis inductance	0.01~200.00%	Model dependent	★
P1-14	Synchronous motor back electromotive force	1~1500V	Model dependent	★
P1-15	Installation angle of synchronous motor encoder	0.0°~360.0°	0.0°	★
P1-16	Initial magnetic pole identification pulse of synchronous motor	1000~9090	Model dependent	★
P1-17	Selection of initial magnetic pole identification for synchronous motors	Unit's digit:Closed loop vector 0:Disable 1:Enable 2:On at the first startup Ten's digit: Open loop vector 0:Disable 1:Enable 2:On at the first startup	0012	★
P1-18 ~ P1-24	Reserved			
P1-25	Encoder type selection	Unit's digit:Encoder type 0:ABZ 1:Resolver Ten's digit:Encoder direction 0:Same direction 1:Reverse direction Hundred's digit:Wire loss detection 0:Disable 1:Enable Thousand's digit: Reserved	0000	★
P1-26	Number of encoder pulses (before 4th harmonic)	1~10000	1024	★
P1-27	Resolver poles	2~128	2	★
P1-28	Encoder disconnection detection time	0.100~60.000s	2.000s	☆
P1-29	Encoder transmission ratio numerator	1~32767	1	☆
P1-30	Encoder transmission ratio denominator	1~32767	1	☆
P1-31	Encoder speed measurement filtering	0.0~100.0ms	1.0ms	☆
P1-32~ P1-35	Reserved			

P1-36	Motor tuning method	0:No operation 1:Static self-learning 2:Rotating self-learning 3:Static integrity self-learning	0	★
Group P2:Motor 1 Vector Control Parameters				
P2-00	Speed loop switchover frequency 1	0.00~[P2-04]	0.00Hz	☆
P2-01	Speed loop proportional gain at low frequency	0.01~100.00	10.00	☆
P2-02	Speed loop integral time at low frequency	0.000~6.000s	0.200s	☆
P2-03	Low frequency feedback filtering time	0.0~100.0ms	0.0ms	☆
P2-04	Speed loop switchover frequency 2	[P2-00]~Frequency upper limit	0.00Hz	☆
P2-05	Speed loop proportional gain at high frequency	0.01~100.00	10.00	☆
P2-06	Speed loop integral time at high frequency	0.000~6.000s	0.200s	☆
P2-07	High frequency feedback filtering time	0.0~100.0ms	0.0ms	☆
P2-08	D-axis current proportional gain	0.001~4.000	1.000	☆
P2-09	D-axis current integration time	0.001~4.000	1.000	☆
P2-10	Q-axis current proportional gain	0.001~4.000	1.000	☆
P2-11	Q-axis current integration time	0.001~4.000	1.000	☆
P2-12	Electric torque limit source	0:Digital Setting by P2-13 1:Keyboard potentiometer 2:AI1 3:AI2 4:AI3 5:PULSE pulse given 6:Communication given	0	☆
P2-13	Electric torque limit	0.0~400.0%	150.0%	☆
P2-14	Power generating torque limit source	0:Digital Setting by P2-15 1:Keyboard potentiometer 2:AI1 3:AI2 4:AI3 5:PULSE pulse given 6:Communication given	0	☆

P2-15	Power generating torque limit	0.0~400.0%	150.0%	☆
P2-16	Overexcitation braking gain	0.0~500.0%	100.0%	☆
P2-17	Overexcitation braking limit	0.0~250.0%	100.0%	☆
P2-18	Output power limitation	0.0~400.0%	150.0%	☆
P2-19	Motor field weakening current upper limit	0.0~250.0%	60.0%	☆
P2-20	Motor field weakening feedforward gain	0.0~200.0%	10.0%	☆
P2-21	Motor field weakening gain	0.0~500.0%	10.0%	☆
P2-22	Field weakening voltage coefficient	0.0~120.0%	97.0%	☆
P2-23	Vector electric driving slip compensation	0.0~250.0%	100.0%	☆
P2-24~ P2-26	Reserved			
P2-27	Synchronous machine pull-in current at low frequency	0.0~50.0%	10.0%	☆
P2-28	Synchronous machine pull-in current at high frequency	0.0~50.0%	10.0%	☆
P2-29	Synchronous machine pull-in current frequency	0.0~100.0%	10.0%	☆
P2-30	Vector control energy saving function	0:Disable 1:Enable	0	☆
P2-31	Energy saving control gain	0.0~80.0%	50.0%	☆
P2-32	Energy saving control low pass filter	0.000~6.000s	0.010s	☆
P2-33	Reserved			
P2-34	MTPA gain	0.0~400.0%	100.0%	☆
P2-35	MTPA filter time	0.0~100.0ms	1.0ms	☆
GroupP3:Motor 1 V/F Control Parameters				
P3-00	V/F curve setting	0:Linear V/F； 1~9:1.1-power ~1.9-power V/F； 10:Square V/F； 11:Multi-point V/F(P3-17~P3-26)；	0	★

P3-01	Torque boost	0.0~30.0%	Model dependent	☆
P3-02	Cut-off frequency of torque boost	0.0~100.0%	50.0%	☆
P3-03	VF slip compensation gain	0.0~200.0%	100.0%	☆
P3-04	VF slip compensation limit	0.0~300.0%	100.0%	☆
P3-05	VF slip compensation filter	0.000~6.000s	0.200s	☆
P3-06	Reserved			
P3-07	VF flux braking gain	1~128	64	★
P3-08	Reserved			
P3-09	VF oscillation suppression gain	0.0~900.0%	100.0%	☆
P3-10	VF oscillation suppression filter time	0.0~100.0s	1.0s	☆
P3-11	VF output voltage percentage	25.0~120.0%	100.0%	★
P3-12	Output voltage source for voltage and frequency separation	0:Digital Setting by P3-13 1:Keyboard potentiometer setting 2:AI1 3:AI2 4:AI3 5:PID output setting 6:Communication setting 7:Pulse setting by DI5	0	☆
P3-13	Voltage digital setting for V/F separation	0.0% - 100.0%	0.0%	☆
P3-14	Voltage rise time of V/F separation	0.00-100.00sec	10.00s	☆
P3-15	Voltage decline time of V/F separation	0.00-100.00sec	10.00s	☆
P3-16	Stop mode selection upon V/F separation	0:Frequency and voltage rising and declining independently 1:Frequency declining after voltage declines to 0	0	☆
P3-17	VF voltage point V1	0.0~100.0%	3.0%	★
P3-18	VF frequency point F1	0.00~maximum frequency	1.00Hz	★
P3-19	VF voltage point V2	0.0~100.0%	28.0%	★
P3-20	VF frequency point F2	0.00~maximum frequency	10.00Hz	★

P3-21	VF voltage point V3	0.0~100.0%	55.0%	★
P3-22	VF frequency point F3	0.00~maximum frequency	25.00Hz	★
P3-23	VF voltage point V4	0.0~100.0%	78.0%	★
P3-24	VF frequency point F4	0.00~maximum frequency	37.50Hz	★
P3-25	VF voltage point V5	0.0~100.0%	100.0%	★
P3-26	VF frequency point F5	0.00~maximum frequency	50.00Hz	★
P3-27	VF automatic energy saving control	0:Off 1:On	0	★
P3-28	Frequency lower limit of energy saving and voltage reduciotn	0.0~50.00Hz	15.00Hz	★
P3-29	Voltage lower limit of energy saving and voltage reduciotn	20.0~100.0%	50.0%	★
P3-30	Voltage reducing rate of energy saving and voltage reduction rate	0.000~0.200V/ms	0.010V/ms	☆
P3-31	Voltage recovering rate of energy saving and voltage reduction rate	0.000~2.000V/ms	0.200V/ms	☆
Group P4:Input terminal parameter group				
P4-00	DI1 terminal function selection	See 5.2 DI terminal function selection	1	★
P4-01	DI2 terminal function selection		2	★
P4-02	DI3 terminal function selection		3	★
P4-03	DI4 terminal function selection		4	★
P4-04	DI5 terminal function selection		5	★
P4-05~ P4-09	Reserved			
P4-10	DI terminal filter time	0.000s~1.000s	0.010s	☆
P4-11	Terminal control operation mode	0:Two-wire control mode 1 1:Two-wire control mode 2 2:Three-wire control mode 1 3:Three-wire control mode 2	0	☆
P4-12	UP/DOWN terminal adjusting speed	0.01~50.00Hz/s	0.50Hz/s	☆

P4-13	AI1 voltage lower limit value	0.00~10.00V	0.00V	☆
P4-14	AI1 voltage lower limit corresponding setting	-100.0~100.0%	0.0%	☆
P4-15	AI1 voltage upper limit value	0.00~10.00V	10.00V	☆
P4-16	AI1 voltage upper limit corresponding setting	-100.0~100.0%	100.0%	☆
P4-17	AI1 voltage filter time	0.000~6.000s	0.010s	☆
P4-18	AI2 voltage lower limit value	0.00~10.00V	0.00V	☆
P4-19	AI2 voltage lower limit corresponding setting	-100.0~100.0%	0.0%	☆
P4-20	AI2 voltage upper limit value	0.00~10.00V	10.00V	☆
P4-21	AI2 voltage upper limit corresponding setting	-100.0~100.0%	100.0%	☆
P4-22	AI2 voltage filter time	0.000~6.000s	0.010s	☆
P4-23	AI3 voltage lower limit value	0.00~10.00V	0.00V	☆
P4-24	AI3 voltage lower limit corresponding setting	-100.0~100.0%	0.0%	☆
P4-25	AI3 voltage upper limit value	0.00~10.00V	10.00V	☆
P4-26	AI3 voltage upper limit corresponding setting	-100.0~100.0%	100.0%	☆
P4-27	AI3 voltage filter time	0.000~6.000s	0.010s	☆
P4-28	HDI input minimum frequency	0.00~50.00kHz	0.00kHz	☆
P4-29	HDI input minimum frequency corresponding setting	0.00~100.00%	0.00%	☆
P4-30	HDI input maximum frequency	0.00~50.00kHz	50.00kHz	☆
P4-31	HDI input maximum frequency corresponding setting	0.00~100.00%	100.00%	☆
P4-32	HDI filter time	0.000~9.000s	0.100s	☆
P4-33	HDI cutoff frequency	0.000～1.000kHz	0.010kHz	☆

P4-34	AI curve selection	0:Line 1:Curve 1 2:Curve 2 Unit's digit:AI1 Ten's digit:AI2 Hundred's digit:AI3 Thousand's digit: Reserved	0000	☆
P4-35	Reserved			
P4-36	DI1 On delay time	0.000~6.000s	0.010s	☆
P4-37	DI1 Off delay time	0.000~6.000s	0.010s	☆
P4-38	DI2 On delay time	0.000~6.000s	0.010s	☆
P4-39	DI2 Off delay time	0.000~6.000s	0.010s	☆
P4-40	DI3 On delay time	0.000~6.000s	0.010s	☆
P4-41	DI3 Off delay time	0.000~6.000s	0.010s	☆
P4-42	DI4 On delay time	0.000~6.000s	0.010s	☆
P4-43	DI4 Off delay time	0.000~6.000s	0.010s	☆
P4-44	DI5 On delay time	0.000~6.000s	0.010s	☆
P4-45	DI5 Off delay time	0.000~6.000s	0.010s	☆
P4-46 ~ P4-55	Reserved			
P4-56	DI1~DI4 terminal effective mode selection	0:Close Enable 1:Disconnect Enable Unit's:DI1 Ten's:DI2 Hundred's:DI3 Kilobit:DI4	0000	☆
P4-57	DI5 terminal effective mode selection	0:Close Enable 1:Disconnect Enable Unit's:DI5 Ten's:Reserved Hundred's:Reserved Kilobit:Reserved	0000	☆
P4-58	Reserved			
Group P5: Input terminal parameter group				
P5-00	Output signal selection	Unit's digit:AO1 0:0~10V 1:4~20mA 2:0~20mA Ten's digit: AO2 0:0~10V 1:4~20mA 2:0~20mA Hundred's digit: DO1 0:Switching signals 1:Pulse signal Thousand's: Reserved	0000	☆
P5-01	Relay T1 function selection	See 5.3 DO terminal function selection	1	☆
P5-02	Relay T2 function selection		1	☆

P5-03	Relay T3 function selection		1	☆
P5-04	DO1 function selection		1	☆
P5-05	DO2 function selection		1	☆
P5-06	AO1 output function selection	See 5.4 AO & HDO terminal function selection	0	☆
P5-07	AO2 output function selection		1	☆
P5-08	HDO1 output function selection		0	☆
P5-09	HDO1 output frequency lower limit	0.00~100.00kHz	0.20KHz	☆
P5-10	HDO1 output frequency upper limit	0.00~100.00kHz	50.00KHz	☆
P5-11	AO1 output gain	25.0~200.0%	100.0%	☆
P5-12	AO1 output signal bias	-10.0~10.0%	0.0%	☆
P5-13	AO1 output filter	0.010~6.000s	0.010s	☆
P5-14	AO2 output gain	25.0~200.0%	100.0%	☆
P5-15	AO2 output signal bias	-10.0~10.0%	0.0%	☆
P5-16	AO2 output filter	0.010~6.000s	0.010s	☆
P5-17	Relay T1 on delay	0.000~6.000s	0.010s	☆
P5-18	Relay T1 off delay	0.000~6.000s	0.010s	☆
P5-19	Relay T2 on delay	0.000~6.000s	0.010s	☆
P5-20	Relay T2 off delay	0.000~6.000s	0.010s	☆
P5-21	Relay T3 on delay	0.000~6.000s	0.010s	☆
P5-22	Relay T3 off delay	0.000~6.000s	0.010s	☆
P5-23	DO1 on delay	0.000~6.000s	0.010s	☆
P5-24	DO1 off delay	0.000~6.000s	0.010s	☆
P5-25	DO2 on delay	0.000~6.000s	0.010s	☆
P5-26	DO2 off delay	0.000~6.000s	0.010s	☆
P5-27	Output terminal effective logic selection 1	0:High level 1:Low level Unit's digit: T1 Ten's digit: T2 Hundred's digit: T3 Thousand's digit: DO1	0000	☆

P5-28	Output terminal effective logic selection 2	0:High level 1:Low level Unit's digit:DO2 Ten's digit:Reserved Hundred's digit:Reserved Thousand's digit:Reserved	0000	☆
Group P6:Start/ Stop control parameter group				
P6-00	Start mode	0:Direct start 1:Rotational speed tracking restart 2: Start after DC current injection	0	★
P6-01~ P6-02	Reserved			
P6-03	Startup frequency	0.00~60.00Hz	0.50Hz	★
P6-04	Startup frequency holding time	0.0~50.0s	0.0s	★
P6-05	Startup DC braking current/ Pre-excited current	0.0~150.0%	60.0%	★
P6-06	Startup DC braking time/ Pre-excited time	0.0~60.0s	0.0s	★
P6-07	Acceleration/Deceleration mode	0:Linear Acceleration/Deceleration mode 1:S-curve Acceleration/Deceleration mode	0	★
P6-08	Acceleration time proportion of S-curve start segment	0.01~650.00s	Model dependent	☆
P6-09	Acceleration time proportion of S-curve end segment	0.01~650.00s	Model dependent	☆
P6-10	Deceleration time proportion of S-curve start segment	0.01~650.00s	Model dependent	☆
P6-11	Deceleration time proportion of S-curve end segment	0.01~650.00s	Model dependent	☆
P6-12	Stop mode	0:Decelerate to stop 1:Free stop	0	☆
P6-13	Initial frequency of stop DC braking	0.00~50.00Hz	1.00Hz	★
P6-14	DC braking waiting time when stop	0.0~60.0s	0.0s	★
P6-15	DC braking current when stop	0.0~150.0%	60.0%	★
P6-16	DC braking time when stop	0.0~60.0s	0.0s	★
P6-17	Stop frequency	0.00 Hz to maximum frequency(P0-10)	0.50Hz	☆

P6-18	Rotational speed tracking mode	Unit's digit:Software frequency tracking selection 0:Search from maximum frequency 1:Search from stop frequency Ten's digit:Software frequency tracking selection 0:Bidirectional search 1:Unidirectional search	0010	★
P6-19	Reserved			
P6-20	RPM tracking speed	0.00~60.00s	0.50s	★
P6-21	RPM tracking stop delay	0.00~60.00s	1.00s	★
Group P7: Keyboard display parameter group				
P7-00	JOG/REV button function selection	0: No function 1: Reverse running 2: JOG(JOG direction is determined by the P0-09 bits) 3: Reserved 4:Forward and Reverse switching 5:Local and remote control command switching	0	★
P7-01	STOP/RES function	0:Non-keyboard control, invalid 1:Non-keyboard control, stop according to stop mode 2:Non-keyboard control, stop in free mode	1	★
P7-02	LED first line display parameter 1 when running	Unit's,ten's digit: the first group shows 00~45 Hundred's,thousand's digit:the second group shows 00~45	0400	☆
P7-03	LED first line display parameter 2 when running		0302	☆
P7-04	LED first line display parameter 1 when stop		0001	☆
P7-05	LED first line display parameter 2 when stop		1002	☆
P7-06	LED second line display parameter 1 when running		0304	☆
P7-07	LED second line display parameter 2 when running		0509	☆
P7-08	LED second line display parameter 1 when stop		0402	☆
P7-09	LED second line display parameter 2 when stop		0611	☆
P7-10 ~ P7-14	Reserved			
P7-15	Performance software version	*****	Model dependent	•

P7-16	Function software version	*****	Model dependent	●
P7-17	Keyboard Version Display	*****	Model dependent	●
Group P8: Auxiliary Functions				
P8-00	User Password	0~65535	0	☆
P8-01	JOG running frequency	0.00 Hz ~ maximum frequency(P0-10)	5.00Hz	☆
P8-02	JOG acceleration time	0.01~650.00s	10.00s	☆
P8-03	JOG deceleration time	0.01~650.00s	10.00s	☆
P8-04	JOG preferred Mode	0:Linear Acceleration/Deceleration mode 1:S-curve Acceleration/Deceleration mode	0	★
P8-05	Jump frequency during acceleration and deceleration	0:Disable 1:Enable	0	★
P8-06	Jump frequency 1	0.00 Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P8-07	Jump frequency 1 amplitude.	0.00 Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P8-08	Jump frequency 2	0.00 Hz ~ maximum frequency (P0-10)	0.00Hz	☆
P8-09	Jump frequency 2 amplitude.	0.00 Hz to maximum frequency (P0-10)	0.00Hz	☆
P8-10	Forward and reverse running dead time	0.0~120.0s	0.0s	★
P8-11	Reserved			
P8-12	Lower limit frequency operation mode selection	0:Stop output 1:Operate at lower limit frequency	0	★
P8-13	Restart selection after power down	0:Invalid 1:Valid	0	★
P8-14	Restart waiting time after power down	0.00~60.00s	0.50s	★
P8-15	Output frequency detection value 1 (FDT1)	0.00~maximum frequency	30.00Hz	☆
P8-16	FDT1 hysteresis	0.00~maximum frequency	1.00Hz	☆
P8-17	Setting frequency to reach detection amplitude	0.00~maximum frequency	2.00Hz	☆
P8-18	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00 Hz ~ maximum frequency(P0-10)	0.00Hz	☆

P8-19	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00 Hz ~ maximum frequency(P0-10)	0.00Hz	☆
P8-20	Output frequency detection value 2 (FDT2)	0.00~maximum frequency	50.00Hz	☆
P8-21	FDT2 hysteresis	0.00~maximum frequency	1.00Hz	☆
P8-22	Frequency reaches detection value1	0.00Hz~P0-10	50.00Hz	☆
P8-23	Frequency reach detection 1 amplitude	0.0%~100.0%	0.0%	☆
P8-24	Frequency reaches detection value 2	0.00Hz~maximum frequency(P0-10）	50.00Hz	☆
P8-25	Frequency reach detection 2 amplitude	0.0%~100.0%	0.0%	☆
P8-26	Light load detection current value	0.0%~300.0%	10.0%	☆
P8-27	Light load detection delay time	0.00s～600.00s	1.00s	☆
P8-28	Current reaches detection value 1	0.0%~300.0%	100.0%	☆
P8-29	Current detection value 1 arrival amplitude	0.0%~P8-28	0.0%	☆
P8-30	Current reaches detection value 2	20.0%~300.0%	100.0%	☆
P8-31	Current detection value 2 arrival amplitude	0.0%~P8-30	0.0%	☆
P8-32	Timer time unit	0:Sec 1:Min 2:Hour	0	☆
P8-33	Timer Setting Value	0~65000	0	☆
P8-34	Module Temperature Reaches	0.0℃~100.0℃	75.0℃	☆
P8-35	Fan running control	0:The fan runs after the Inverter is powered on. 1:The fan is stopped related to temperature, it runs when inverter starts. 2:The fan is stopped when the inverter is stopped, it is running ralated to the temperature	1	☆
P8-36	Sleep function selection	0:Disable 1:Enable	0	☆
P8-37	Sleep frequency	0.00~50.00Hz	30.00Hz	☆
P8-38	Sleep delay	0.0~3600.0s	3.0s	☆
P8-39	Wake-up bias	0.0~50.0%	5.0s	☆

P8-40	Wake-up delay	0.0~60.0s	0.0s	☆
Group P9:Protection Parameter				
P9-00	Motor overload protection coefficient	0.0~250.0%	100.0%	☆
P9-01	Bus overvoltage suppression gain	0.0 ~ 500.0%	200.0%	☆
P9-02	Bus overvoltage suppression value	1T、2T: 40.0V~450.0V 4T:650.0V~900.0V	Model dependent	★
P9-03	Overcurrent suppression gain	0.0 ~ 500.0%	100.0%	☆
P9-04	Overcurrent suppression value	0.0~300.0%	160.0%	☆
P9-05	Short circuit to ground detection selection after power-on	0:Disable 1:Enable Unit's digit: short circuit to ground fault Ten's digit: Reserved	0001	★
P9-06	Fault self-recovery times setting	0~5	0	★
P9-07	Fault relay action selection during automatic fault reset	0: No action 1:Action	0	★
P9-08	Failure self-recovery interval setting	0.1~100.0s	1.0s	★
P9-09	Phase loss protection selection	Unit's digit: Output phase loss protection 0:Disable 1:Enable Ten's digit: Input phase loss protection 0:Disable 1:Turn on the Alarm 2:Turn on the Fault Hundred's, thousand's: Reserved	0011	☆
P9-10	Type of last fault	See 5.5 Fault Code Table	——	●
P9-11	Frequency at last fault	0.00~Max Frequency	0.00Hz	●
P9-12	Output voltage at last fault	0~1500V	0.0V	●
P9-13	Current at last fault	0.1~2000.0A	0.0A	●
P9-14	DC voltage at last fault	0~3000V	0.0V	●
P9-15	Temp at last fault	0~100℃	0.0℃	●
P9-16	status at last fault	Uint: running direction 0:FWD 1:REV Ten:Running status 0:Stop 1:Constant speed 2:Acceleration 3:Deceleration Hundred's, thousand's: Reserved	0000	●

P9-17	DI status at last fault	See 5.2 DI terminal function table	nnnnn	●
P9-18	DO status at last fault	See 5.3 DO terminal function table	nnnnn	●
P9-19	Type of previous fault	See 5.5 Fault Code Table	0	●
P9-20	Frequency at previous fault	0.00~Max Frequency	0.00Hz	●
P9-21	Output voltage at previous fault	0~1500V	0.0V	●
P9-22	Current at previous fault	0.1~2000.0A	0.0A	●
P9-23	DCvoltage at previous fault	0~3000V	0.0V	●
P9-24	Temp at previous fault	0~100℃	0.0℃	●
P9-25	status at previous fault	Uint: running direction 0:FWD 1:REV Ten: running status 0:Stop 1:Constant speed 2:Acceleration 3:Deceleration Hundred's, thousand's: Reserved	0000	●
P9-26	DI status at previous fault	See 5.2 DI terminal function table	nnnnn	●
P9-27	DO status at previous fault	See 5.3 DO terminal function table	nnnnn	●
P9-28	First two failure types	See 5.5 Fault Code Table	0	
P9-29	First three failure types	See 5.5 Fault Code Table	0	
P9-30	Fault diagnosis information		0	
P9-31	Motor temperature sensor type selection	Unit's digit:Motor Temperature sensor type 0:Disable 1:PT100 2:PT1000 3:KTY84 Ten's digit:Motor overheating protection options 0:Disable 1:Turn on the overheat alarm only 2:Turn on the overheat fault only 3:Enable overheat alarm and overheat fault	0000	★
P9-32	Motor overheat protection temperature value	0℃~180℃	120.0℃	☆
P9-33	Motor overheating warning temperature value	0℃~P9-32	110.0℃	☆

P9-34	Overspeed protection action	Unit's digit: Detection selection 0:Do not detect 1:Only detected at constant speed 2:Always detect Ten's digit: Alarm selection 0:Free stop and report fault 1:Report Alarm and continue running Hundred's, thousand's digit: Reserved	0000	★
P9-35	Overspeed detection threshold	0.0~150.0%	110.0%	★
P9-36	Over speed detection time	0.000~2.000s	0.010s	★
P9-37	Excessive speed deviation detection threshold	0.0~60.0%	10.0%	★
P9-38	Excessive speed deviation detection time	0.0~60.0s	2.0s	★
P9-39	Undervoltage setting	2S、2T:160.0V～240.0V 4T: 200.0V～400.0V	Model dependent	★
P9-40	Braking setting	2S、2T:350.0V～390.0V 4T:650.0V～880.0V	Model dependent	☆
Group PA:PID Function parameter group				
PA-00	PID reference setting channel	0:Digital setting by PA-01 1:Keyboard potentiometer setting 2:AI1 3:AI2 4:AI3 5:Pulse setting by DI5 6:Communication setting 7:Terminal selection	0	☆
PA-01	PID value digital setting	0.00~100.0%	50.0%	☆
PA-02	PID feedback source	0:Digital setting by PA-25 1:Keyboard potentiometer setting 2:AI1 3:AI2 4:AI3 5:Pulse setting by DI5 6:Communication setting 7:Terminal selection	2	☆

PA-03	PID control selection	Unit's digit: feedback characteristics selection 0:Positive 1:Negative Ten's digit: Closed-loop bypass holding output 0:Output cleared during closed loop bypass 1:Output maintained during closed loop bypass Hundred's place: Alignment selection 0:Non-center aligned 1:Center aligned Thousand's: Differential adjustment characteristics 0:Differentiate the deviation 1:Differentiate the feedback	0100	☆
PA-04	Proportional gain P1	0.000~8.000	0.100	☆
PA-05	Integration time I1	0.0~600.0s	1.0s	☆
PA-06	Differential gain D1	0.000~6.000s	0.000s	☆
PA-07	Proportional gain P2	0.000~8.000	0.100	☆
PA-08	Integration time I2	0.0~600.0s	1.0s	☆
PA-09	Differential gain D2	0.000~6.000s	0.000s	☆
PA-10	PID deviation limit	0.0%~100.0%	0.0%	☆
PA-11	PID differential limit	0.0~100.0%	5.0%	☆
PA-12	PID setting acceleration and deceleration time	0.00~60.00s	1.00s	☆
PA-13	PID feedback filter time	0.000~6.000s	0.010s	☆
PA-14	PID output filter time	0.000~6.000s	0.000s	☆
PA-15	PID parameter switching condition	0:No switching 1:Switched by DI terminal 2:Switch by the deviation	0	☆
PA-16	PID parameter switching low value	0.0~100.0%	20.0%	☆
PA-17	PID parameter switching high value	0.0~100.0%	80.0%	☆
PA-18	PID setting initial value	0.0%~100.0%	0.0%	☆
PA-19	PID setting initial value holding time	0.0s~650.0s	0.0s	☆

PA-20	PID Integral Properties	Unit's digit:Integral Separation 0:Invalid 1:Valid Ten's digit: output to the limit value, whether to stop integration 0:Continue to integrate 1:Stop integrating	0000	☆
PA-21	PID disconnection action selection	0:Continue running without reporting a fault 1:Stop and report a fault 2:Continue running and output alarm 3:Run at the current frequency and alarm	0000	☆
PA-22	PID disconnection detection time	0.0~120.0s	1.0s	☆
PA-23	PID disconnection alarm upper limit value	0.0~100.0%	100.0%	☆
PA-24	PID disconnection alarm lower limit value	0.0~100.0%	0.0%	☆
Group PB :AI/AO Correction parameter group				
Pb-00	AI1 displayed voltage 1	0.000V~10.000V	3.000V	★
Pb-01	AI1 measured voltage 1	0.000V~10.000V	3.000V	★
Pb-02	AI1 displayed voltage 2	0.000V~10.000V	8.000V	★
Pb-03	AI1 measured voltage 2	0.000V~10.000V	8.000V	★
Pb-04	AI2 displayed voltage 1	0.000V~10.000V	3.000V	★
Pb-05	AI2 measured voltage 1	0.000V~10.000V	3.000V	★
Pb-06	AI2 displayed voltage 2	0.000V~10.000V	8.000V	★
Pb-07	AI2 measured voltage 2	0.000V~10.000V	8.000V	★
Pb-08	AI3 displayed voltage 1	0.000V~10.000V	3.000V	★
Pb-09	AI3 measured voltage 1	0.000V~10.000V	3.000V	★
Pb-10	AI3 displayed voltage 2	0.000V~10.000V	8.000V	★
Pb-11	AI3 measured voltage 2	0.000V~10.000V	8.000V	★
Pb-12	AO1 target voltage 1	0.000V~10.000V	3.000V	★
Pb-13	AO1 measured voltage 1	0.000V~10.000V	3.000V	★
Pb-14	AO1 target voltage 2	0.000V~10.000V	8.000V	★
Pb-15	AO1 measured voltage 2	0.000V~10.000V	8.000V	★
Pb-16	AO2 target voltage 1	0.000V~10.000V	3.000V	★
Pb-17	AO2 measured voltage 1	0.000V~10.000V	3.000V	★
Pb-18	AO2 target voltage 2	0.000V~10.000V	8.000V	★

Pb-19	AO2 measured voltage 2	0.000V~10.000V	8.000V	★
Pb-20	AI1 displayed current 1	0.000mA~20.000mA	6.000mA	★
Pb-21	AI1 measured current 1	0.000mA~20.000mA	6.000mA	★
Pb-22	AI1 displayed current 2	0.000mA~20.000mA	16.000mA	★
Pb-23	AI1 measured current 2	0.000mA~20.000mA	16.000mA	★
Pb-24	AI2 displayed current 1	0.000mA~20.000mA	6.000mA	★
Pb-25	AI2 measured current 1	0.000mA~20.000mA	6.000mA	★
Pb-26	AI2 displayed current 2	0.000mA~20.000mA	16.000mA	★
Pb-27	AI2 measured current 2	0.000mA~20.000mA	16.000mA	★
Pb-28	AI3 displayed current 1	0.000mA~20.000mA	6.000mA	★
Pb-29	AI3 measured current 1	0.000mA~20.000mA	6.000mA	★
Pb-30	AI3 displayed current 2	0.000mA~20.000mA	16.000mA	★
Pb-31	AI3 measured current 2	0.000mA~20.000mA	16.000mA	★
Pb-32	AO1 target current 1	0.000mA~20.000mA	6.000mA	★
Pb-33	AO1 measured current 1	0.000mA~20.000mA	6.000mA	★
Pb-34	AO1 target current 2	0.000mA~20.000mA	16.000mA	★
Pb-35	AO1 measured current 2	0.000mA~20.000mA	16.000mA	★
Pb-36	AO2 target current 1	0.000mA~20.000mA	6.000mA	★
Pb-37	AO2 measured current 1	0.000mA~20.000mA	6.000mA	★
Pb-38	AO2 target current 2	0.000mA~20.000mA	16.000mA	★
Pb-39	AO2 measured current 2	0.000mA~20.000mA	16.000mA	★
Group PC: Multi-segment and simple PLC function parameter				
PC-00	Multi-segment frequency 1	0.00~maximum frequency	0.00Hz	☆
PC-01	Multi-segment frequency 2	0.00~maximum frequency	0.00Hz	☆
PC-02	Multi-segment frequency 3	0.00~maximum frequency	0.00Hz	☆
PC-03	Multi-segment frequency 4	0.00~maximum frequency	0.00Hz	☆
PC-04	Multi-segment frequency 5	0.00~maximum frequency	0.00Hz	☆
PC-05	Multi-segment frequency 6	0.00~maximum frequency	0.00Hz	☆
PC-06	Multi-segment frequency 7	0.00~maximum frequency	0.00Hz	☆
PC-07	Multi-segment frequency 8	0.00~maximum frequency	0.00Hz	☆
PC-08	Multi-segment frequency 9	0.00~maximum frequency	0.00Hz	☆

PC-09	Multi-segment frequency 10	0.00~maximum frequency	0.00Hz	☆
PC-10	Multi-segment frequency 11	0.00~maximum frequency	0.00Hz	☆
PC-11	Multi-segment frequency 12	0.00~maximum frequency	0.00Hz	☆
PC-12	Multi-segment frequency 13	0.00~maximum frequency	0.00Hz	☆
PC-13	Multi-segment frequency 14	0.00~maximum frequency	0.00Hz	☆
PC-14	Multi-segment frequency 15	0.00~maximum frequency	0.00Hz	☆
PC-15	Multi-segment operation mode selection	Unit‘s digit: circular mode 0:Single cycle 1:Continuous cycle 2:Keep the final value after a single cycle Ten’s digit: timing unit 0:Seconds 1:Minutes 2:Hours Hundred's digit: power-off storage method 0:Do not store 1:Store Thousand's digit: startup mode 0:Rerun from the first stage 1:Restart from the stage of downtime 2:Continue operation with the remaining time of the shutdown stage	0000	☆
PC-16	Running time of PLC reference 1	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-17	Acceleration/deceleration time of PLC reference 1	Unit's digit: running direction of this stage 0:Forward 1:Reverse Ten's digit: acceleration and deceleration time of this stage 0:Acceleration and deceleration time 0 1:Acceleration and deceleration time 1 2:Acceleration and deceleration time 2 3:Acceleration and deceleration time 3 Hundred's, thousand's: Reserved	0000	☆
PC-18	Running time of PLC reference 2	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-19	Acceleration/deceleration time of PLC reference 2	the same as PC-17	0000	☆
PC-20	Running time of PLC reference 3	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-21	Acceleration/deceleration time of PLC reference 3	the same as PC-17	0000	☆
PC-22	Running time of PLC reference 4	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆

PC-23	Acceleration/deceleration time of PLC reference 4	the same as PC-17	0000	☆
PC-24	Running time of PLC reference 5	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-25	Acceleration/deceleration time of PLC reference 5	the same as PC-17	0000	☆
PC-26	Running time of PLC reference 6	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-27	Acceleration/deceleration time of PLC reference 6	the same as PC-17	0000	☆
PC-28	Running time of PLC reference 7	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-29	Acceleration/deceleration time of PLC reference 7	the same as PC-17	0000	☆
PC-30	Running time of PLC reference 8	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-31	Acceleration/deceleration time of PLC reference 8	the same as PC-17	0000	☆
PC-32	Running time of PLC reference 9	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-33	Acceleration/deceleration time of PLC reference 9	the same as PC-17	0000	☆
PC-34	Running time of PLC reference 10	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-35	Acceleration/deceleration time of PLC reference 10	the same as PC-17	0000	☆
PC-36	Running time of PLC reference 11	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-37	Acceleration/deceleration time of PLC reference 11	the same as PC-17	0000	☆
PC-38	Running time of PLC reference 12	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-39	Acceleration/deceleration time of PLC reference 12	the same as PC-17	0000	☆
PC-40	Running time of PLC reference 13	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-41	Acceleration/deceleration time of PLC reference 13	the same as PC-17	0000	☆
PC-42	Running time of PLC reference 14	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-43	Acceleration/deceleration time of PLC reference 14	the same as PC-17	0000	☆

PC-44	Running time of PLC reference 15	0.0~6500.0(s/m/h)	0.0(s/m/h)	☆
PC-45	Acceleration/deceleration time of PLC reference 15	the same as PC-17	0000	☆
Group Pd:Communication parameter group				
Pd-00	Baud rate	Unit's digit: Modbus baud rate 0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps	0023	★
Pd-01	Modbus data format	0:(N，8，1) 1:(E，8，1) 2:(O，8，1) 3:(N，8，2) 4:(E，8，2) 5:(O，8，2)	0	★
Pd-02	Local address	1~247	1	★
Pd-03	Response delay	0~500ms	0ms	☆
Pd-04	Communication response timeout	0~500ms	1.0ms	☆
Pd-05	Communication failure action selection	0:Do not detect 1:Free stop and report fault 2:Report alarm and continue running 3:Forced shutdown	0	☆
Group PE: Photovoltaic Parameter group				
PE-00	Photovoltaic water pumping model	0:Variable frequency control mode 1:CVT mode for solar 2:MPPT mode	2	★
PE-01	Pump operation status	0:Stop 1:Run 2:Sleep mode 3:Low frequency protection 4:Dry run protection active 5:Overcurrent protection active 6:Low power protection active	0	•
PE-02	CVT target voltage	20.0% ~ 200.0%	81.0%	★
PE-03	VOC voltage	0.0V ~ 999.9V	0.0V	★
PE-04	Frequency Adjustment Gain	10.0% ~ 500.0%	10.0%	☆
PE-05	Fast down conversion Gain	0~20	2	☆
PE-06	Frequency Adjustment Filter Time	0.001s ~ 9.999s	0.002s	☆
PE-07	DC Bus voltage bias value	0.00 ~ 99.99A	0.00A	☆
PE-08	DC Bus current correction factor	0.0 ~ 999.9%	100.0%	☆
PE-09	Reserved			

PE-10	MPPT voltage upper limit	20.0% ~ 200.0%	100.0%	☆
PE-11	MPPT voltage lower limit	20.0% ~ 200.0%	50.0%	☆
PE-12	MPPT Gain	0~9999	100	☆
PE-13	MPPT search interval	0.1 ~ 30.0	1.0s	☆
PE-14	Water full protection detection time	0.0s~3000.0s	10.0s	☆
PE-15	Water fulling level protection exit relay time	0.0s~3000.0s	10.0s	☆
PE-16	Sleep voltage threshold	0 ~ 1000V	0V	☆
PE-17	Wake-up voltage	0 ~ 1000V	400V	☆
PE-18	Sleep mode delay time	0.0s~3000.0s	10.0s	☆
PE-19	Low frequency protection detection frequency	0.00Hz ~300.00Hz	0.00Hz	☆
PE-20	Low frequency protection detection time	0.0s~3000.0s	10.0s	☆
PE-21	Low frequency protection auto-recovery time	0.0s~3000.0s	10.0s	☆
PE-22	Dry run protection current threshold	0.0 ~ 999.9A	0.0A	☆
PE-23	Dry run protection detection time	0.0s~3000.0s	10.0s	☆
PE-24	Dry run protection auto-recovery time	0.0s~3000.0s	10.0s	☆
PE-25	Overcurrent protection detection current	0.0 ~ 999.9A	0.0A	☆
PE-26	Overcurrent protection detection time	0.0s~3000.0s	10.0s	☆
PE-27	Overcurrent protection auto-recovery time	0.0s~3000.0s	10.0s	☆
PE-28	Minimum power protection value	0.00kw ~ 650.00kw	0.00kw	☆
PE-29	Minimum power protection detection time	0.0s~3000.0s	10.0s	☆
PE-30	Minimum power protection auto-recovery time	0.0s~3000.0s	10.0s	☆

PE-31	Alarm recovery mode	0:Automatic recovery 1:Manual recovery Unit's digit:Low frequency protection Ten's digit:Dry run protection Hundred's digit:Overcurrent and Overload protection Thousand's digit:Minimum power protection	0000	☆
PE-32 ~37	Reserved			
PE-38	Power point 0 of PQ Current	0.00kw ~ 99.99kw	0.50kw	☆
PE-39	Power point 1 of PQ Current	0.00kw ~ 99.99kw	1.00kw	☆
PE-40	Power point 2 of PQ Current	0.00kw ~ 99.99kw	1.50kw	☆
PE-41	Power point 3 of PQ Current	0.00kw ~ 99.99kw	2.00kw	☆
PE-42	Power point 4 of PQ Current	0.00kw ~ 99.99kw	2.50kw	☆
PE-43	Flow point 0 of PQ curve	0.0 ~ 999.9m^3/h	0.0 m^3/h	☆
PE-44	Flow point 1 of PQ curve	0.0 ~ 999.9m^3/h	5.0 m^3/h	☆
PE-45	Flow point 2 of PQ curve	0.0 ~ 999.9m^3/h	10.0m^3/h	☆
PE-46	Flow point 3 of PQ curve	0.0 ~ 999.9m^3/h	15.0m^3/h	☆
PE-47	Flow point 4 of PQ curve	0.0 ~ 999.9m^3/h	20.0m^3/h	☆
PE-48	Flow calculation calibration bias	0.0m^3 ~ 999.9^3	0.0m^3	☆
PE-49	Flow calculation correction gain	0.1% ~ 999.9%	100.0%	☆
PE-50	Daily flow/Daily power zero cycle	0.1 ~ 24.0Hr	7.0Hr	☆

Function Code	Parameter Name	Unit	Property
Group U0:Monitoring parameters			
U0-00	Running frequency(Hz）	0.01Hz	●
U0-01	Setting frequency(Hz）	0.01Hz	●
U0-02	Bus voltage(V）	0.1V	●
U0-03	Output voltage(V）	0.1V	●
U0-04	Output current(A）	0.1A	●
U0-05	Output power(kW）	0.1kW	●
U0-06	Reserved		
U0-07	DI input status, hexadecimal	nnnnn	●
U0-08	DO output status, hexadecimal	nnnnn	●
U0-09~ U0-13	Reserved		
U0-14	AI1 voltage after correction	0.01V	●
U0-15	AI2 voltage after correction	0.01V	●
U0-16	AI3 voltage after correction	0.01V	●
U0-17	PID setting	0.0%	●
U0-18	PID feedback	0.0%	●
U0-19	Count value	0	●
U0-20	Motor speed	rpm	●
U0-21	Feedback speed	0.01Hz	●
U0-22	PLC stage	0	●
U0-23	Communication setting value	0.01Hz	●
U0-24	Main frequency X	0.1Hz	●
U0-25	Auxiliary frequency Y	0.1Hz	●
U0-26	Input pulse frequency	0.01KHz	●
U0-27	AI1 voltage before correction	0.001V	●
U0-28	AI2 voltage before correction	0.001V	●
U0-29	AI3 voltage before correction	0.001V	●
U0-30	AO1 target voltage	0.01V	●
U0-31	AO2 target voltage	0.01V	●
U0-32	HDO target frequency	0.01KHz	●

U0-33	Reserved		
U0-34	Inverter operation status (Bit0 0: :Stop 1: Run Bit1 0: non-accelerated state 1:accelerated state Bit2 0: non-deceleration state 1:deceleration state Bit3 0: Forward operation 1:Reverse operation)	——	●
U0-35	Inverter current fault	——	●
U0-36	Running time of this power-up	0.1hour	●
U0-37	PLC current stage remaining time1	1	●
U0-38	PLC current stage remaining time2	1	●
U0-39	Accumulative running time 1(Hour)	1hour	●
U0-40	Accumulative running time 2 (Min)	1min	●
U0-41	Reserved	0.1℃	●
U0-42	Temperature of Inverter module	0.1℃	●
U0-43	Reserved		
U0-44	Target torque	0.0%	●
U0-45	Output torque	0.0%	●

5.2 DI terminal function selection

DI Setting Value	Function	DI Setting Value	Function	DI Setting Value	Function
0	No function	21	Frequency DW	42	Swing reset
1	Forward RUN (FWD)	22	Frequency UP/DW/reset	43	Speed control/Torque control switchover
2	Reverse RUN (REV)	23	Command channel switches to keyboard	44	Pulse Input
3	3-wire control (DI)	24	Changeover of the command channel to terminal	45	Timer trigger terminal
4	Forward JOG (FJOG)	25	Changeover of the command channel to communication	46	Timer Zero Terminal
5	Reverse JOG (RJOG)	26	Changeover of the command channel to Control Word	47	Counter clock input terminal
6	Free stop	27	Program run (PLC) pause	48	Counter Zero Terminal
7	Emergency stop	28	Program run (PLC) restart	49	DC brake command
8	Fault reset	29	PID control cancel	50	Pre-excitation command terminal
9	External fault input	30	PID control pause	51	Run prohibited
10	Multi-reference terminal 1	31	PID characteristic switching	52	Forward run prohibited
11	Multi-reference terminal 2	32	PID gain switching	53	Reverse run prohibited
12	Multi-reference terminal 3	33	PID Integral Pause	54	RUN pause
13	Multi-reference terminal 4	34	PID given switching 1	55	Switching between motor 1 and motor 2
14	Terminal 1 for acceleration/deceleration time selection	35	PID given switching 2	56	External fault 2
15	Terminal 2 for acceleration/deceleration time selection	36	PID given switching 3	57	External fault 3
16	acceleration/deceleration pause	37	PID feedback switching 1	64	AC source input
17	Frequency source X switches to frequency source Y	38	PID feedback switching 2	65	Water Full Input1
18	Frequency channel switches to X	39	PID feedback switching 3	66	Water Full Input2
19	Frequency channel switches to Y	40	Swing input		
20	Frequency UP	41	Swing pause		

5.3 DO terminal function selection

DO Setting Value	Function	DO Setting Value	Function
0	No output.	19	Light load output
1	Inverter running	20	Load pre-alarm output 1
2	Inverter forward running	21	Load pre-alarm output 2
3	Inverter reverse running	22	PID feedback sensor wire broken
4	Fault trip alert 1 (alert during fault self-recovery)	23	PID feedback upper limit reached
5	Fault trip alert 2 (no alert during fault self-recovery)	24	PID feedback lower limit unreached
6	External fault stop(All external fault outputs)	25	PLC cycle period completed
7	Inverter undervoltage	26	PLC run phase completed
8	Inverter running preparation completed	27	RS485 Communication given
9	Set frequency reached	28	Timer's set time reached
10	Frequency reached 1	29	Counter's setting value reached
11	Frequency reached 2	30	Counter's maximum reached
12	Output frequency detection test 1 (FDT1)	31	Dynamic braking
13	Output frequency detection test 2 (FDT2)	32	Emergency stopping
14	Zero-speed running	33	PG card feedback disconnected
15	Upper frequency limit reached	34	Brake control output
16	Lower frequency limit reached	35	Module temperature reached
17	Current reached 1	36	Motor temperature reached
18	Current reached 2		

5.4 AO & HDO terminal function selection

Terminal Setting Value	Function	Terminal Setting Value	Function
0	Output frequency	9	Given torque
1	Given frequency	10	Mechanical speed
2	Output current	11	PID given value
3	Output power	12	PID feedback value
4	Output voltage	13	Pulses input value DI5
5	AI1 input value	14	Bus voltage
6	AI2 input value	15	Input voltage (0~10V corresponds to 0~1.5 times the nominal voltage)
7	485 communication given	16	Inverter temperature (0~10V corresponds to 0~100.0°C)
8	Output torque	17	Motor temperature (0~10V corresponds to 0~200.0°C)

5.5 Fault Code Table

Keyboard display	Communication code	Fault type	Keyboard display	Communication code	Fault type
E.SC	1	VCE Overcurrent protection	E.OC1	2	Acceleration overcurrent
E.OC2	3	Deceleration overcurrent	E.OC3	4	Constant speed overcurrent
E.rSv	5	Reserved	E.rSv	6	Reserved
E.oU1	7	Stopping over voltage	E.oU2	8	Acceleration over voltage
E.oU3	9	Deceleration Over voltage	E.oU4	10	Constant speed over voltage
E.LU2	11	Undervoltage fault	E.ILF	12	Input phase loss
E.oLF	13	Output phase loss	E.oL1	14	Inverter overload
E.oL2	15	Motor overload	E.HAL	16	Current detection fault
E.oH1	17	Inverter over temperature	E.dEv	19	Speed deviation over limit
E.GNd	20	Short circuit to ground	E.EF1	21	External fault 1
E.CE1	23	Communication fault	E.EEP	25	EEprom parameters communication fault
E.PId	26	PID feedback loss fault	E.ATr	27	Agent setting time reached
E.AT1	32	Auto-tunning over time	E.SPd	33	Motor over speed
E.Ld1	34	Load detection protection 1	E.Ld2	35	Load detection protection 2
E.PG	36	Encoder fault	E.IAE	37	Synchronous motor position detection fault
E.oH2	38	Motor over temperature	E.PST	39	Synchronous motor out of step
E.EF2	46	External fault 2	E.EF3	47	External fault 3
E.AL1	48	AI1 input disconnection	E.AL2	49	AI2 input disconnection
E.AL3	50	AI3 input disconnection	E.PAd	/	Keyboard communication fault
E.CPE	/	Keyboard parameters number download fault	E.PEE	/	Keyboard EEPROM fault
A.LU1	64	Main contactor disconnect alarm	A.IEF	65	Input phase loss alarm
A.PId	66	PID feedback loss alarm	A.Ld1	67	Load detection protection 1 alarm
A.Ld2	68	Load detection protection 2 alarm	A.EEP	69	Parameters save alarm
A.dEv	70	Speed deviation over limit alarm	A.SPd	71	Motor speed over limit alarm
A.ATr	72	Agent setting time reached	A.CE1	74	Communication disconnection alarm

A.oH2	78	Motor over temperature alarm	A.AL1	80	AI1 input disconnection alarm
A.AL2	81	AI2 input disconnection alarm	A.AL3	82	AI3 input disconnection alarm
A.LPr	83	Minimum power alarm	A.FuL	85	Water full alarm

5.6 Input and output terminal status diagram

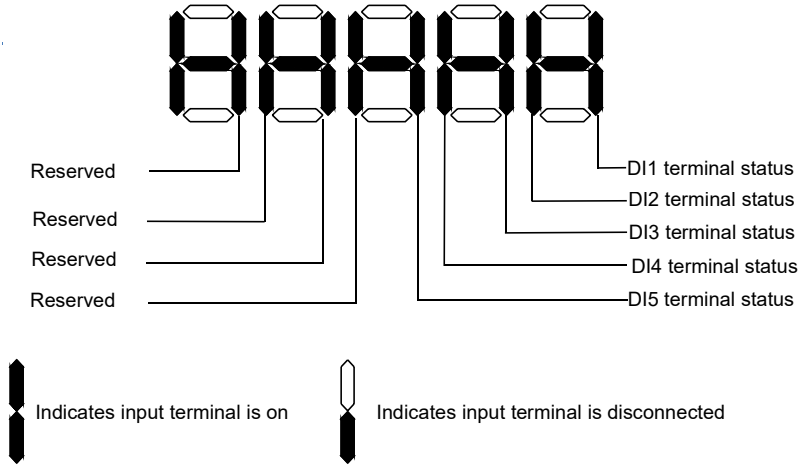


Fig. 5.6-1 Input terminal ON/OFF status diagram

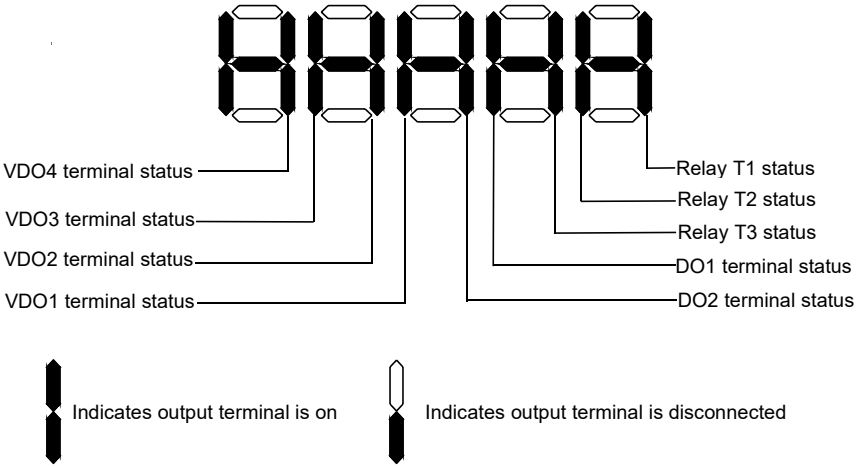


Fig. 5.6-2 Output terminal ON/OFF status diagram

Chapter 6 Trouble Shooting

If a fault occurs during the system operation, the Inverter will immediately protect the motor to stop the output, and the corresponding Inverter fault relay contact will act. The Inverter panel displays the fault code. The fault type and common solution corresponding to the fault code are shown in the following table. The list in the table is for reference only, please do not repair or modify it without authorization. If the fault cannot be eliminated, please seek technical support from our company or the product agent.

6.1 Faults and Solutions

Communication code	Display	Fault Name	Possible Causes	Solutions
1	E.SC	VCE Overcurrent protection	1:Whether the motor connection terminals U, V, W have short-circuit or straight-through between phases or to ground 2:Whether the module is overheating 3:Whether the internal wiring of the Inverter is loose 4:Whether the main control board, driver board or module is normal	1:Check motor wiring and output impedance to ground 2:Check whether the fan and air duct are normal 3:Connect all loose wires 4:Seek technical support
2	E.OC1	Acceleration overcurrent	1:The output circuit is grounded or short circuited 2:Motor parameter is not right 3:The acceleration time is too short 4:Manual torque boost or V/F curve is not appropriate 5:The voltage is too low 6:The startup operation is performed on the rotating motor 7:A sudden load is added during acceleration 8:The Inverter model is of too small	1:Eliminate external faults 2:Perform the motor auto-tuning 3:Increase the acceleration time 4:Correctly set the V/f curve 5:Check grid input power 6:Select rotational speed tracking restart or start the motor after it stops 7:Remove the added load 8:Select an Inverter of higher power class
3	E.OC2	Deceleration overcurrent	1:The output circuit is grounded or short circuited 2:Motor parameter is not right 3:The deceleration time is too short 4:The voltage is too low 5:A sudden load is added during deceleration 6:The inertia of the load is too large 7:The magnetic flux braking gain is too large	1:Eliminate external faults 2:Perform the motor auto-tuning 3:Increase the deceleration time 4:Adjust the voltage to normal range 5:Remove the added load 6:Install the braking unit and braking resistor 7:decrease the over-excitation gain

4	E.OC3	Constant speed overcurrent	1:The output circuit is grounded or short circuited 2:Motor parameter is not right. 3:The voltage is too low 4:A sudden load is added during operation 5:The Inverter model is of too small	1:Eliminate external faults 2:Perform the motor auto-tuning 3:Adjust the voltage to normal range 4:Remove the added load 5:Select an Inverter of higher power class
8	E.oU2	Acceleration over voltage	1:The input voltage is too high 2:An external force drives the motor during acceleration 3:The acceleration time is too short 4:The inertia of the load is too large 5:Motor parameter is not right	1:Adjust the voltage to normal range 2:Cancel the external force or install a braking resistor 3:Extend the acceleration time 4:Use energy consumption braking 5:Auto-tune the parameters of the motor
9	E.oU3	Deceleration Over voltage	1:The input voltage is too high 2:An external force drives the motor during deceleration 3:The deceleration time is too short. 4:The inertia of the load is too large	1:Adjust the voltage to normal range 2:Cancel the external force or install a braking resistor 3:Increase the deceleration time 4:Install the braking unit and braking resistor
10	E.oU4	Constant speed over voltage	1:The input voltage is too high 2:An external force drives the motor during acceleration 3:When the vector control is running, the parameters of the regulator are not set properly 4:The load fluctuates too much	1:Adjust the voltage to normal range 2:Cancel the external force or install a braking resistor 3:Correctly set the regulator parameters 4:Check the load
11	E.LU2	Undervoltage fault	1:Instantaneous power failure occurs 2:The input voltage exceeds the allowed range 3:The DC bus voltage is too low 4:The rectifier bridge and buffer resistor are faulty 5:The drive board is faulty 6:The control board is faulty	1:Reset the fault 2:Adjust the input voltage to within the allowed range 3:Seek for maintenance
12	E.ILF	Input phase loss	1:The three-phase power input is abnormal 2:The drive board is faulty 3:The lightening board is faulty 4:The main control board is faulty	1:Eliminate external faults 2:Seek for maintenance

13	E.oLF	Output phase loss	1:The cable connecting the Inverter and the motor is faulty 2:The Inverter's three-phase outputs are unbalanced when the motor is running 3:The drive board is faulty 4:The module is faulty	1:Eliminate external faults 2:Check the motor or replace the motor 3:Seek for maintenance
14	E.oL1	Inverter overload	1:The torque boost value is too large during V/f control 2:The starting frequency is too high 3:The acceleration and deceleration time is too short 4:Improper setting of motor parameters 5:Overload 6:The V/f curve is not suitable for V/f control 7:Restart the rotating motor 8:Output phase-to-phase short-circuit or short-circuit to ground	1:Reduce the torque boost value 2:Reduce the starting frequency value 3:Extend the acceleration and deceleration time 4:Correctly set according to the motor nameplate 5:Lighten the load 6:Correctly set the V/f curve 7:Reduce the current limit value or start by speed search 8:Check the motor wiring and output impedance to ground
15	E.oL2	Motor overload	1:Whether the setting of motor protection parameter P9-00 is appropriate 2:Whether the load is too large or the motor is blocked 3:Inverter selection is too small 4:The torque boost value is too large during V/f control 5:The V/f curve is not suitable for V/f control 6:Improper setting of motor parameters 7:Improper setting of motor overload protection time 8:Motor stall or load sudden change is too large	1:Set this parameter correctly 2:Reduce the load and check the motor and mechanical condition 3:Choose Inverterr with larger power level 4:reduce the torque to increase the value 5:Set V/ F curve correctly 6:Set correctly according to the motor nameplate 7:Set the motor overload protection time correctly 8:Check the cause of motor blocking or check the load
16	E.HAL	Current detection fault	1:The internal connections become loose 2:Confirm whether the current detection device is normal 3:The control or drive board is faulty	1:Connect all cables properly. 2:Seek for maintenance

17	E.oH1	Inverter over temperature	1:The ambient temperature is too high 2:The air filter is blocked 3:The cooling fan is damaged 4:The thermally sensitive resistor of the module is damaged 5:The inverter module is damaged. 6:The temperature sensor is improperly connected	1:Lower the ambient temperature 2:Clean the air filter 3:Replace the damaged fan 4:Replace the damaged thermally sensitive resistor 5:Replace the inverter module 6:Seek service
19	E.dEv	Speed deviation over limit	1:The load is too heavy and the acceleration time is too short 2:P9-28 and P9-29 are set incorrectly 3:The set value of the deviation between the motor speed and the set speed is too small 4:The load fluctuates too much 5:The control parameter setting of vector control is unreasonable	1:Increase the acceleration and deceleration time 2:Set P9-28 and P9-29 correctly based on the actual situation 3:Correctly set the speed deviation point 4:Stable load 5:Correct settings
20	E.GNd	Short circuit to ground	1:The motor is short circuited to the ground 2:The output wiring is short-circuited to ground 3:Abnormal motor insulation 4:The inverter module is abnormal 5:The output leakage current to the ground is too large	1:Replace the cable or motor 2:Check the motor wiring and output impedance to ground 3:Check the motor 4:Seek service
21	E.EF1	External fault	External fault normally closed or normally open signal is input via DI	Reset the fault
23	E.CE1	Communication fault	1:The host computer is in abnormal state 2:The communication cable is faulty 3:The communication parameters in group Fd are set improperly	1:Check cabling of the host computer 2:Check the communication cabling 3:Check Fd group parameters
25	E.EEP	EEPROM parameters communication fault	The EEPROM chip is damaged	Replace the main control board

26	E.PId	PID feedback lost during running	1:The PID feedback is lower than the setting of PA-08 2:The PID feedback channel is abnormal 3:PID parameter setting is unreasonable	1:Check the PID feedback signal or set PA-08 to a proper value 2:Check the feedback channel 3:Correct settings
32	E.AT1	Motor auto-tuning fault	1:Motor parameters are not set according to the nameplate 2:Parameter identification process timeout 3:Encoder abnormality	1:According to the motor nameplate parameter setting 2:Check the Inverter and motor wiring 3:Check whether the encoder parameter setting is correct or not.
33	E.SPd	Motor overspeed	1:Is the encoder parameter setting correct 2:Is the parameter identification 3:Fault detection parameters P9-31, P9-32 set unreasonable	1:Correctly set the encoder parameters 2:Motor parameter identification 3:Reasonable setting of fault detection parameters
36	E.PG	Encoder Failure	1:Mismatch of encoder model 2:Encoder connection error 3:PG card or encoder abnormality	1:Correctly set the encoder type according to the actual 2:Test PG card power supply and phase sequence 3:Replace the PG card or encoder
38	E.oH2	Motor Over Temperature Failure	Motor temperatureU0-42 >P9-32 set value	Reset the fault
46	E.EF2	External fault 2	The user-defined fault 1 signal is input via DI	Reset the fault
47	E.EF3	External fault 3	The user-defined fault 2 signal is input via DI	Reset the fault

6.2 Common Symptoms and Diagnostics

The following fault conditions may be encountered during the use of the Inverter, please refer to the following methods for simple fault analysis.

NO.	Fault Name	Possible Causes	Solutions
1	There is no display at power-on.	1:There is no power supply or the power supply is too low 2:The switching power supply on the Inverter board is faulty 3:The rectifier bridge is damaged 4:The buffer resistor of the Inverter is damaged 5:The control board or the keypad is faulty 6:The cable between the control board and the drive board or keypad breaks	1:Check the power supply 2:Check the bus voltage 3:Re-connect the keypad and core cables 4:Seek service
2	"E.GNd" is displayed at power-on	1:The motor or the motor output cable is short-circuited to the ground 2:The Inverter is damage	1:Measure the insulation of the motor and the output cable with a megger. 2:Seek service
3	Inverter over temperature	1:The setting of carrier frequency is too high 2:The cooling fan is damaged, or the air filter is blocked 3:Components inside the Inverter are damaged (thermal coupler or others)	1:Reduce the carrier frequency 2:Replace the fan and clean the air filter 3:Seek service
4	The motor does not rotate after the Inverter runs.	1:Check the motor and the motor cables 2:The Inverter parameters are set improperly (motor parameters) 3:The cable between the drive board and the control board is in poor contact 4:The drive board is faulty	1:Ensure the cable between the Inverter and the motor is normal 2:Replace the motor or clear mechanical faults 3:Check and re-set motor parameters
5	The DI terminals are disabled.	1:The parameters are set incorrectly 2:The external signal is incorrect 3:The DI DIP switch is in the wrong position 4:The control board is faulty	1:Check and reset the parameters in group P4 2:Re-connect the external signal cables 3:Re-confirm whether the position of the DI DIP switch is consistent with the wiring method 4:Seek service
6	The Inverter reports over-current and over-voltage frequently	1:The motor parameters are set improperly 2:The acceleration/deceleration time is improper 3:The load fluctuates	1:Re-set motor parameters or re-perform the motor auto-tuning 2:Set proper acceleration/ deceleration time 3:Seek service

Chapter 7 Maintenance

Affected by the ambient temperature, humidity, dust, vibration and the aging of the internal components of the Inverter, some potential problems may occur during the operation of the Inverter. The frequency converter conducts daily inspections and periodic inspections. Depending on the external environment of the Inverter, regular maintenance must be carried out every 3 to 6 months, so as to discover and deal with the problems that are difficult to find in the routine inspection process in time.

7.1 Daily inspection

To avoid damage to the Inverter and shorten its service life, please check the following items daily.

Inspection items	Check the content	Measures
Motor	● Whether the motor has abnormal vibration and abnormal sound	● Confirm whether the mechanical connection is abnormal ● Confirm whether the motor is out of phase ● Confirm that the motor fixing screws are secure
Fan	● Abnormal use of Inverter and motor cooling fan	● Confirm whether the cooling fan of the Inverter is running ● Confirm whether the cooling fan on the motor side is abnormal ● Confirm whether the ventilation channel is blocked ● Check that the ambient temperature is within the allowable range
Installation Environment	● Whether the electrical cabinet and cable trough are abnormal	● Check whether the insulation of the cables entering or leaving the Inverter is damaged ● Determine whether there is vibration on the mounting bracket ● Check whether the copper bars and connecting cable terminals are loose and corroded
Load	● Whether the Inverter running current exceeds the Inverter rating and motor rating for a certain period of time	● Confirm whether the motor parameters are set correctly ● Confirm whether the motor is overloaded ● Confirm whether the mechanical vibration is too large (normal condition <0.6g)
Power supply	● Whether the input voltage meets the requirements and whether there is a lack of phase power supply	● Confirm whether the voltage between any two phases of the input voltage is within the allowable range indicated on the nameplate ● Check if there is a large load around to start

7.2 Regular Maintenance

Under normal circumstances, it is advisable to conduct regular inspections every 3 months to 6 months, but in actual cases, please determine the actual inspection cycle based on the usage and working environment of each machine.

Inspection items	Check the content	Measures
Complete machine	● Whether there is garbage, dirt, dust accumulation on the surface	● Confirm whether the Inverter cabinet is powered off ● Use a vacuum cleaner to remove rubbish or dust to avoid touching the parts ● When the surface dirt cannot be removed, can use alcohol to wipe it and wait for it to dry and evaporate completely
Air duct vent	● Whether the air duct and heat sink are blocked ● Whether the fan is damaged	● Clean the air duct ● Replace the fan
Electrical connections	● Whether there is discoloration of wires and connection parts, and whether the insulation layer is damaged, cracked, discolored and aging ● Whether the connecting terminals are worn, damaged or loose ● Ground check	● Replace damaged cables ● Tighten loose terminals and replace damaged terminals ● Measure the grounding resistance and fasten the corresponding grounding terminal
Magnetic contactor periphery	● Whether the suction is not firm or makes abnormal noise during action ● Whether there are short-circuited, water-stained, swollen, or ruptured peripheral devices	● Replace defective components
Motor	● Whether the motor has abnormal vibration and abnormal noise	● Tighten mechanical and electrical connections and lubricate motor shaft
Electrolytic capacitor	● Whether the electrolytic capacitor has leakage、discoloration、cracks, and whether the safety valve leaks, expands, or ruptures	● Replace defective components
Circuit board	● Whether there is peculiar smell, discoloration, serious rust, and whether the connector connection is correct and reliable	● Fastener connection ● Clean the circuit board ● Replace damaged circuit board
Keyboard	● Whether the keyboard is damaged and the display is incomplete	● Replace damaged circuit board

ATTENTION

Do not perform related operations when the power is turned on, otherwise there is a danger of electric shock and death.Please make sure power supply of the Inverter has been cut off, and DC bus voltage has been discharged to 0V prior to maintenance.Never leave screws, gaskets, conductors, tools and other metal articles inside the Inverter. Failure to comply may result in equipment damage. Never modify the interior components of the Inverter in any condition. Failure to comply may result in equipment damage.

7.3 Replacement of Vulnerable Parts

Vulnerable parts of Inverter include cooling fan, electrolytic capacitor.The service lives of these parts are subject to environment and working conditions. To maintain a favorable operating environment is conducive to improving the service life of parts and components; routine inspection and maintenance also contributes to effective improvement of parts' service life. To prolong the service life of entire Inverter, the cooling fan, electrolytic capacitor or other vulnerable parts should be subjected to routine inspection according to the table below. Please replace the abnormal parts (if any) in time.

ATTENTION

- Normally, the cooling fan of the Inverter should be replaced every 2 to 3 years;
- Under normal circumstances, the large-capacity electrolytic capacitor of the Inverter should be replaced every 4 to 5 years;

7.4 Storage

When the inverter is not used temporarily or stored for a long time after purchase, the following matters should be paid attention to:

ATTENTION

- Avoid storing the Inverter in a place with high temperature, humidity or vibration and metal dust, and ensure that the storage place is well ventilated;
- If the Inverter has not been put into use for a long time, the internal filter capacitor characteristics will decline;
- If the Inverter is not used for a long time, it should be powered on once every two years to restore the characteristics of the large-capacity filter capacitor, and the function of the Inverter should be checked at the same time. When energized, the voltage should be gradually increased through an autotransformer, and the energization time should not be less than 5 hours.

Appendix: Modbus Communication Protocol

PV300series of frequency converters can provide RS232/RS485 communication interface, and use MODBUS communication protocol. The user can realize the central control through computer or PLC. Also it can set the running commands, modify or read the function code parameter, read the working status and fault information of the frequency converter according to the protocol.

RTU frame format:

Frame Header START	3.5 characters time
Slave Address ADR	Contact address:0~247
The command code CMD	03:Read the parameter of the slave machine 06:Write the parameters of the slave machine
The content of the data DATA(N-1)	The content of the DATA: The address of function code parameters; The quantity of function code parameters; The value of function code parameters;
The content of the data DATA(N-2)	
…….	
The content of the data DATA0	
CRC CHK Low order	detection value:CRC16 verified value. low byte is sent previous than High byte.
CRC CHK High order	
End	3.5-characters time

1. The Definition of Communication Parameter Address

This part is the content about communication, which used for controlling the running and working status of the frequency convert, and set relevant parameter.

Parameter of read and write function code (some function code can't be changed, only for supplier and monitor usage)

Labeling rule of function code address:
Use the group number and mark number of the function code as parameter address rule:
The high bytes:F0~:FE (group P)、70~7F (group U)　the low byte:00~FF
For example:P0-11,the address indicated as F00B;

Attention:
Group PE:The parameter can neither be read nor be altered.
Group U:The parameter can only be read, but not be altered.

Some parameter can't be changed when the frequency convert is on running status; some parameter can't be changed regardless of any status of the frequency convert; please pay attention to the range, unit and relevant instruction when changing the function code parameter.

Group number of function code	access address of communication	Function code address of communication revise the RAM
Group P0~PE	0xF000~0xFEFF	0x0000~0x0EFF
Group U0	0x70000~0x70FF	

Pay attention that if the EEPROM is stored continuously, the service life will be reduced. So there is no need to store some function code on the communication mode, just need to change the value in RAM.
If it's group P of the parameter to realize this function, just need to change high byte from F to 0 on the function code address.
The relevant function code address indicated as below:High byte: 00~0F (group P) the low byte: 00~FF.
For example: function code P0-11 doesn't store in EEPROM, the address indicated as 000B; this address means that it only can write RAM, but can't use the read action, if it's being read, the address is ineffective.

Communication Control Parameter Group Address Description

Parameter Address (HEX)	Parameter Description	Data description	Property
0x1000	Communication frequency setting	0~1000 Correspondence 0~100.0%	R/W
0x1001	Running frequency	Unit:0.01hz	R
0x1002	Bus voltage	Unit:0.1V	R
0x1003	Output voltage	Unit:0.1V	R
0x1004	Output current	Unit:0.1A	R
0x1005	Output power	Unit:0.1kW	R
0x1006	Output torque	Unit:0.1%	R
0x1007	Motor speed	Unit:1rpm	R
0x1008	Communication command setting	0000H:No order 0001H:Forward operation 0002H:Reverse operation 0003H:Forward jog 0004H:Reverse jog 0005H:Slow-down stop 0006H:Free stop 0007H:Fault reset 0008H:Run the prohibit command 0009H:Run the permit command	R/W
0x1009	Inverter operation status	Bit0 0:Stop 1:Run Bit1 0:non-accelerated state 1:accelerated state	R

		Bit2 0:non-deceleration state 1:deceleration state Bit3 0:Forward operation 1:Reverse operation Bit4 0:True 1:False	
0x100A	Inverter Error Codes	Inverter Current Error Codes	R
0x100B	Upper limit frequency communication given	0~32000 corresponds to 0~320.00hz	R/W
0x100C	VF Separate output voltage communication given	0~32000 corresponds to 0~320.00hz	R/W
0x100D	PID setting communication setting	0~1000 Correspondence 0~100.0%	R/W
0x100E	PID feedback communication settings	0~1000 Correspondence 0~100.0%	R/W
0x100F	Target torque communication given	0~1000 Correspondence 0~100.0%	R/W
0x1010	Torque control forward maximum frequency communication given	0~1000 Correspondence 0~100.0%	R/W
0x1011	Torque Control Reverse Maximum Frequency Communication Given	0~1000 Correspondence 0~100.0%	R/W
0x1012	Output terminal status	Bit0 0:T1 False 1:T1 True Bit1 0:T2 False 1:T2 True Bit2 0:T3 False 1:T3 True Bit3 0:DO1 False 1:DO1 True Bit4 0:DO2 False 1:DO2 True	R/W
0x1013	AO1 output given	0~1000 Correspondence 0~10.00V	R/W
0x1014	AO2 output given	0~1000 Correspondence 0~10.00V	R/W
0x1015	HDO output given	0~1000 Correspondence 0~100.0%	R/W
0x1016	Motor 1 electric torque upper limit given	0~1000 Correspondence 0~100.0%	R/W
0x1017	Motor 1 generating torque upper limit given	0~1000 Correspondence 0~100.0%	R/W
0x1018	Motor 2 electric torque upper limit given	0~1000 Correspondence 0~100.0%	R/W
0x1019	Motor 2 generating torque upper limit given	0~1000 Correspondence 0~100.0%	R/W

Example 1:read the run frequency of the first machine: 0x01 0x03 0x10 0x01 0x00 0x01 0x21 0x0A 0x10 0x01 (1001) run frequency address, 0x00 0x01 (0001) one data 0x21 0x0A (0A21) CRC verified value.

Example 2:read the busbar voltage, output voltage, output current of the first machine at the same time: 0x01 0x03 0x10 0x02 0x00 0x03 CRC verified value, the meaning of the data is similar to example 1.