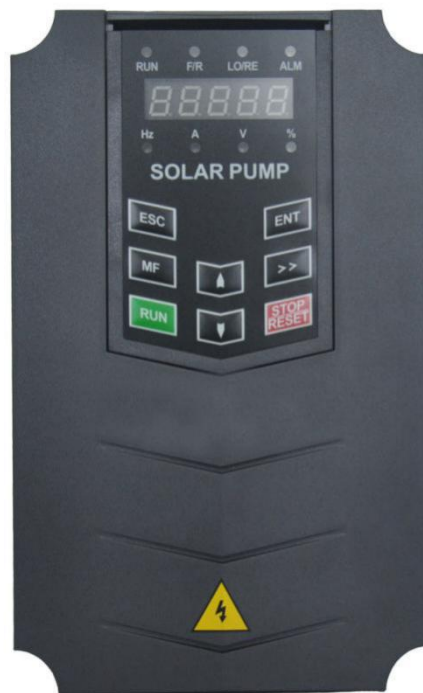# Solar Pumping Inverter
User Manual

Figure 1 Solar pumping inverter

- Thank you for your using our solar pump inverter.
- Please read this manual thoroughly to ensure proper usage, keep this manual at an easily accessible place so that can refer anytime as necessary.

Safety Precautions

Please read this operation manual carefully before installation, operation, maintenance or inspection.

In this manual, the safety precautions were sorted to "WARNING" or "CAUTION".

⚠️ WARNING   Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.

⚠️ CAUTION   Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury and physical damage. This sign is also used for alert of any un-safety operation.

In some cases, the contents of "CAUTION" could cause serious accident. Please follow these important precautions in any situation.

★ NOTE is the necessary step to ensure the proper operation.

Warning Marks were shown on the front keypad of inverters.
Please follow these indications when using the inverter.

WARNING
● **May cause injury or electric shock.**
● **Please follow the instructions in the manual before installation or operation.**
● **Disconnect all power line before opening front cover of unit. Wait at least 5 minute until DC Bus capacitors discharge.**
● **Use proper grounding techniques.**
● **Never connect AC power to output U V W terminals**

Chapter 1   System Introduction

1.1   Brief Introduction

A complete solar pumping system consist of solar array, pump and solar pumping inverter. The inverter can convert DC power from solar PV array to AC power to run pump motors.

Solar array, an aggregation of many solar modules connected in series and parallel,absorbs sunlight radiation and converts it into electrical energy, providing dynamical water for the whole system.

Inverter controls the system operation and adjust the output frequency in real-time according to the variation of sunlight intensity to realize the maximum power point tracking (MPPT).

Pump, drive by 3-phase or single phase AC motor, can draw water from the deep wells or rivers and lakes to pour into the storage tank or reservoir, or directly connect to the irrigation system, fountain system, etc.
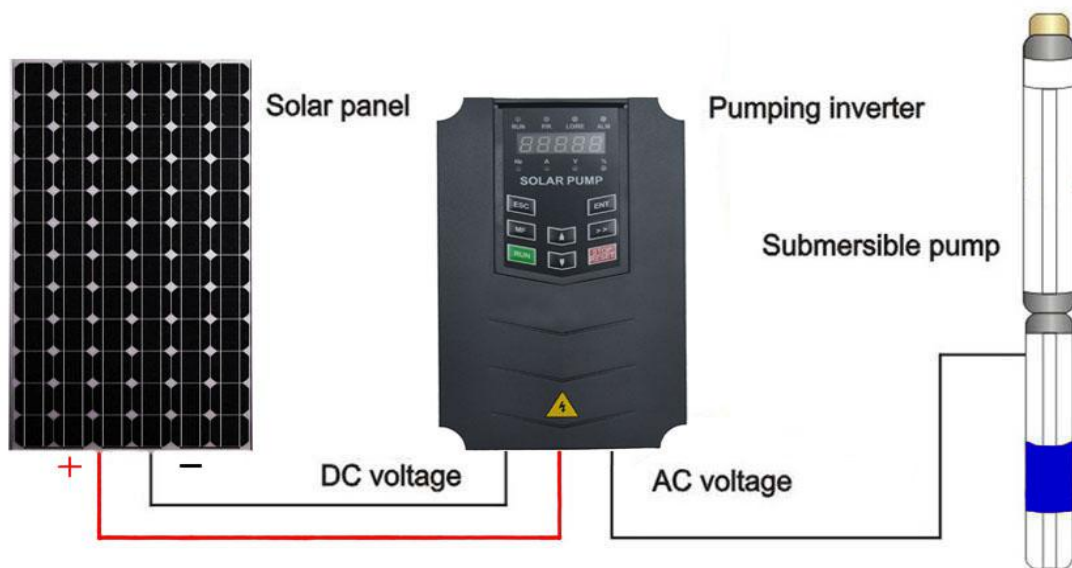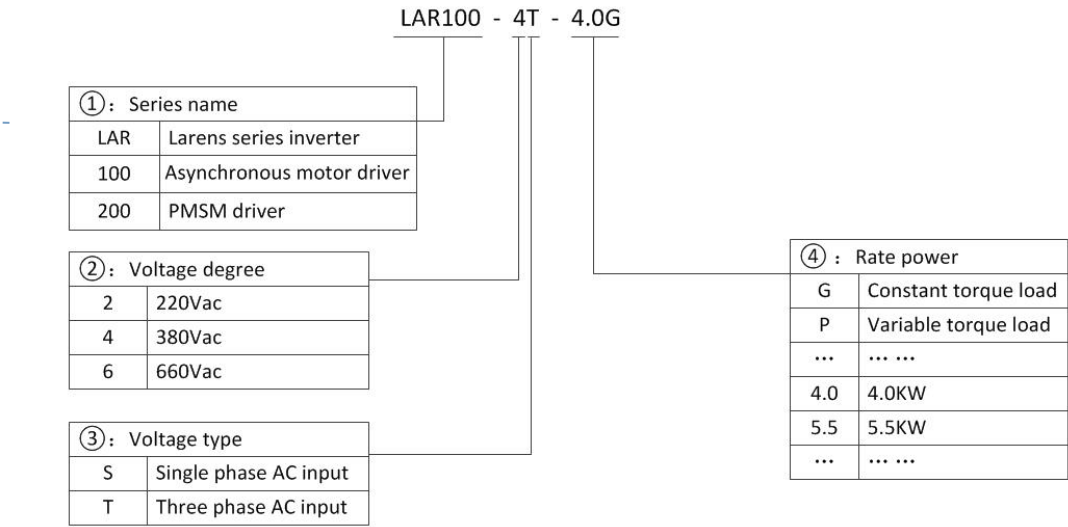
Figure 2 Structure of solar pumping system

Chapter 2   Solar Pumping Inverter

2.1   Inverter Specification

Model Description

Model numbers on name plate consist of numbers, symbols, and letters, to express its respective series, suitable power type, power level and other information.

LAR100 - 4T - 4.0G

①： Series name	
LAR	Larens series inverter
100	Asynchronous motor driver
200	PMSM driver

②： Voltage degree	
2	220Vac
4	380Vac
6	660Vac

③： Voltage type	
S	Single phase AC input
T	Three phase AC input

④ ： Rate power	
G	Constant torque load
P	Variable torque load
…	… …
4.0	4.0KW
5.5	5.5KW
…	… …

2.2   Inverter Features

· Apply to all kinds of single phase or 3 phase AC induction motor .

· With Infineon IGBT .Maximum power point tracking (MPPT) algorithm for dynamic VI, fast response speed.

. Good stability, the efficiency of MPPT 99.99%.

· Both AC and DC input, but do not use DC and AC at the same time.

· Remote control , support RS323/RS485 protocol.

· Outdoor working environment temperature: －10℃~+50℃.

· Start in the morning and stop in the late afternoon full automatically.

· Full protections : overload , over current, over voltage , under voltage ,short circuit , dry pumping etc..

· PV reversed connection protection.

2.3 Parameters :

Solar Pump Inverter							
Model	Rated Power (KW)	DC Input VOC Voltage(V)	Recommend VOC Voltage (V)	Recommend MPPT Voltage(V)	Max. DC Input Current (A)	Rated Output Current(A)	Rated output Voltage (V)	Output Frequency (Hz)
LAR100-2S-0.7G	0.75	300~450	388~450	320~370	8.5	7.0	Single PH 220	0-50/60
LAR100-2S-1.5G	1.5	300~450	388~450	320~370	14	9.6	Single PH 220	0-50/60
LAR100-2S-2.2G	2.2	300~450	388~450	320~370	23	17	Single PH 220	0-50/60
LAR100-2S-4.0G	4	300~450	388~450	320~370	35	25	Single PH 220	0-50/60
LAR100-2T-0.7G	0.75	200~450	388~450	320~370	8.5	4.0	3PH220	0-50/60
LAR100-2T-1.5G	1.5	200~450	388~450	320~370	14	7.0	3PH220	0-50/60
LAR100-2T-2.2G	2.2	200~450	388~450	320~370	23	9.6	3PH220	0-50/60
LAR100-2T-4.0G	4	200~450	388~450	320~370	35	17	3PH220	0-50/60
LAR100-2T-5.5G	5.5	200~450	388~450	320~370	50	25	3PH220	0-50/60
LAR100-4T-0.7G	0.75	300~780	670~780	540~630	8.5	2.5	3PH380	0-50/60
LAR100-4T-1.5G	1.5	300~780	670~780	540~630	8.5	3.8	3PH380	0-50/60
LAR100-4T-2.2G	2.2	300~780	670~780	540~630	14	5.1	3PH380	0-50/60
LAR100-4T-4.0G	4.0	300~780	670~780	540~630	23	9.0	3PH380	0-50/60
LAR100-4T-5.5G	5.5	300~780	670~780	540~630	23	13.0	3PH380	0-50/60
LAR100-4T-7.5G	7.5	300~780	670~780	540~630	35	17.0	3PH380	0-50/60
LAR100-4T-11G	11	300~780	670~780	540~630	35	25.0	3PH380	0-50/60
LAR100-4T-15G	15	300~780	670~780	540~630	50	32.0	3PH380	0-50/60
LAR100-4T-18.5G	18.5	300~780	670~780	540~630	50	37.0	3PH380	0-50/60
LAR100-4T-22G	22	300~780	670~780	540~630	75	45.0	3PH380	0-50/60
LAR100-4T-30G	30	300~780	670~780	540~630	75	60.0	3PH380	0-50/60
LAR100-4T-37G	37	300~780	670~780	540~630	100	75.0	3PH380	0-50/60
LAR100-4T-45G	45	300~780	670~780	540~630	100	91.0	3PH380	0-50/60
LAR100-4T-55G	55	300~780	670~780	540~630	150	112.0	3PH380	0-50/60
LAR100-4T-75G	75	300~780	670~780	540~630	225	150.0	3PH380	0-50/60
LAR100-4T-90G	90	300~780	670~780	540~630	300	176.0	3PH380	0-50/60
LAR100-4T-110G	110	300~780	670~780	540~630	375	210.0	3PH380	0-50/60
LAR100-4T-132G	132	300~780	670~780	540~630	450	253.0	3PH380	0-50/60

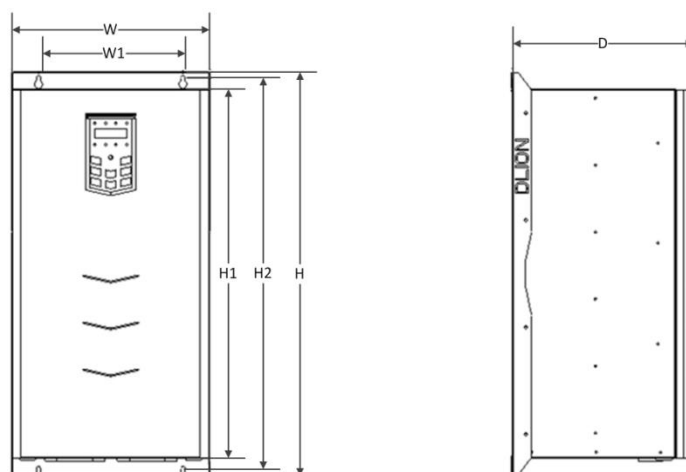## 2.4 External Dimension
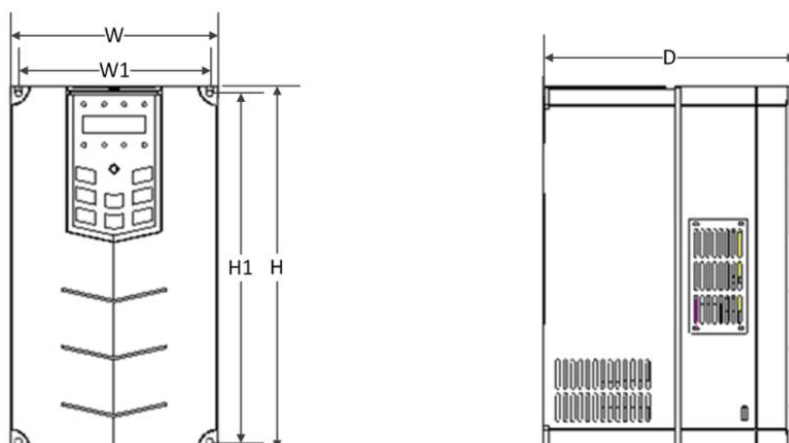
Figure 3 Dimensions (11kW and below)

Figure 4 Dimensions (15KW~132KW)

Power (kw)	Size（mm）						Installation Hole(mm)	Weight （kg）	Shape of Inverter
	W	H	D	W1	H1	H2			
LAR100-2S-0.4G	140	230	172	128	218	---	5.5	3.5	C1
LAR100-2S-0.7G									
LAR100-2S-1.5G									
LAR100-2S-2.2G									
LAR100-2S-4.0G									
LAR100-2T-0.7G									
LAR100-2T-1.5G									
LAR100-2T-2.2G									
LAR100-2T-4.0G									
LAR100-2T-5.5G									
LAR100-4T-0.7G									
LAR100-4T-1.5G									
LAR100-4T-2.2G									
LAR100-4T-4.0G									

Model									
LAR100-4T-5.5G									
LAR100-4T-7.5G	165	285	200	153	273		5.5	5.2	C2
LAR100-4T-11G									
LAR100-4T-15G									
LAR100-4T-18.5G	214	360	203	184	385	410	6.5	11.5	C3
LAR100-4T-22G									
LAR100-4T-30G	250	450	230	220	400	425	6.5	19	C4
LAR100-4T-37G									
LAR100-4T-45G	300	600	280	240	540	580	8.5	30	C5
LAR100-4T-55G									
LAR100-4T-75G									
LAR100-4T-90G	330	660	330	250	600	640	8.5	56	C6
LAR100-4T-110G									
LAR100-4T-132G									

2.5 Technical Parameter Table

2.5.1 Single Phase Inverter (LAR100-2S-0.4G~4.0G)

Input specification	
PV Input	
Maximum Input PV Voltage (PV Open-Circuit Voltage)	450VDC
Recommended MPPT Voltage Range	320~370VDC(Vmp)
Recommended Input Operation Voltage	388~450VDC (VOC)
Output specification	
Rated output voltage	2PH 220V
Output frequency	0～600.00Hz（default: 0～60.00Hz）
Protection	
Built-in Protection	Lighting Protection, over-current, over voltage, output phase-lose, under-load, under-voltage, short circuit, overheating, water pump run dry etc.

2.5.2 Three Phase Inverter (LAR100-2T-0.7G~5.5G)

Input specification	
PV Input	
Maximum Input PV Voltage (PV Open-circuit Voltage)	450VDC
Recommended MPPT Voltage Range	320~370VDC (Vmp)
Recommended Input Operation Voltage	388~450VDC (VOC)

Grid or backup generator input	
Input voltage	1PH & 3PH 220V(-15%～30%)
Output specification	
Rated output voltage	1PH & 3PH 220V
Output frequency	0～600.00Hz（default: 0～60.00Hz）
Protection	
Built-in Protection	Lighting Protection, over-current, over voltage, output phase-lose, under-load, under-voltage, short circuit, overheating, water pump run dry etc.

2.5.3 Three Phase inverter (LAR100-4T-0.7G~132G)

Input specification	
PV Input	
Maximum Input DC Voltage (PV Open-circuit Voltage)	780VDC
Recommended MPPT Voltage Range	540~630VDC(Vmp)
Recommended Input Operation Voltage	670~780VDC (VOC)
Grid or backup generator input	
Input Voltage	Three phase 380VAC(-15%～30%)
Output specification	
Rated output voltage	3PH 380VAC
Output frequency	0～600.00Hz（Default 0～60.00Hz）
Protection	
Built-in Protection	Lighting Protection, over-current, over voltage, output phase-lose, under-load, under-voltage, short circuit, overheating, water pump run dry etc.
General Parameters	
Application Site	No direct sunshine, no dust, corrosive gas, combustible gas, oil mist, steam, dripping or salinity etc.
Altitude	0～2000 m Derated use above 1000m,per 100m, the rated output current decrease 1%.
Environment Temperature	-10℃～50℃ (Environment Temperature be 40℃～50℃, please keep derated use.)
Humidity	5～95%,non-condensation
Vibration	less than 5.9 m/s^2（0.6g）
Storage Temperature	-20℃～+70℃
Efficiency	Rated Power Run≥93%
Installation	Wall or rail mounting
Cooling	Forced Air Cooling

Chapter 3   System Collection Diagram

3.1   Main Circuit Terminals

3.1.1   Schematic Diagram for Connection of Main Circuit Terminals
① Connection diagram of main circuit for the inverter of 220v

（+）	PB	（-）	R	S		U	V	W	PE

② Connection diagram of main circuit for the inverter of 380v   0.7~22KW

（+）	PB	（-）	R	S	T	U	V	W	PE

③ Connection diagram of main circuit for the inverter of 380v 30~37KW

PE	R	S	T	PB	(+)	(-)	U	V	W	PE

④ Connection diagram of main circuit for the inverter of 380v 45~55kw

R	S	T	P1	(+)	(-)	U	V	W

⑤ Connection diagram of main circuit for the inverter of 380v 75~132kw

R	S	T	P1	(+)	(-)

PE	U	V	W	PE
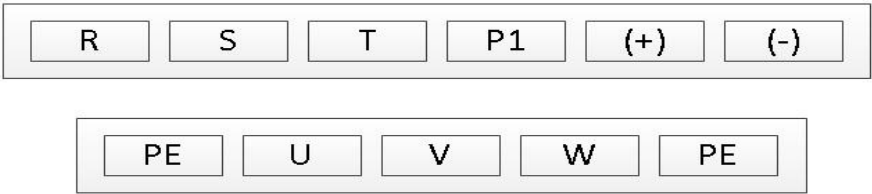
3.1.2 Instructions of Main Circuit Terminals of Inverter:

Terminal	Description
R、S、T	Terminals of 3 phase AC input
(+)、(-)	Terminals of 2 phase DC input
(+)、PB	Spare terminals of external braking resistor
P1、(+)	Spare terminals of external DC reactor
(-)	Terminal of negative DC bus
U、V、W	Terminals of 3 phase AC output
⏚	Terminal of ground

⚠ **DANGER**

● the voltage class of LAR100 series inverter 3phase power has 2 class: 220V, 380V, before connecting power, please make sure the power class on inverter nameplate is the same with the accessing power. Otherwise do not connect.

● DC bus (+) (-)terminal: take note that when power outrage there is residual voltage on DC bus P+ P- terminal, need to wait for a while until CHARGE LED off. Otherwise it is danger of electric shock.

●When selecting external brake unit, note the polarity of P= (-) cannot be reversely connected, otherwise it can result in damage or even fire.

Do not directly connect brake resistor to DC bus, it may result damage or fire.

⚠ **WARNING**

1)Input power L,N or R, S T: the cable connection at input side of the inverter has no phase sequence requirement.

2)Brake unit cable length should not exceed 10m, twisted pair or double cable parallel wiring should be used.

3)Brake resistor connecting terminal (+) (-): confirm whether the device has built-in brake unit, its brake resistor connecting terminal is effect. The brake resistor selection table 2-4 recommending value and the wiring distance should less than 5M.

Other it can damage inverter.

4)External DC electric reactor connecting terminal P1 (+): for external DC reactor to 45Kw and above power inverter, get rid off the connector between P1 (+) terminal during installation, reactor is installed between the 2 terminal.

5)Inverter output side U V W: the output side cannot connect capacitor or surge absorber, otherwise it will affect inverter in self-protection frequently or damage.

6)In case the motor cable is too long, it may generate electrical resonance easily due to the impact of distributed capacitance, thus damaging the motor insulation or generating higher leakage current to invoke over current protection of the inverter. When the length of motor cables longer than 100 meters, it needs to install a AC output reactor.

7)Earth terminal PE:

This terminal shall be earthed reliably, with resistance of earth cable of less than 10Ω.Otherwise, it may cause fault or damage the inverter.

Do not share the earth terminal with zero line R,S,T terminal, otherwise it will result equipment abnormal running or damage.

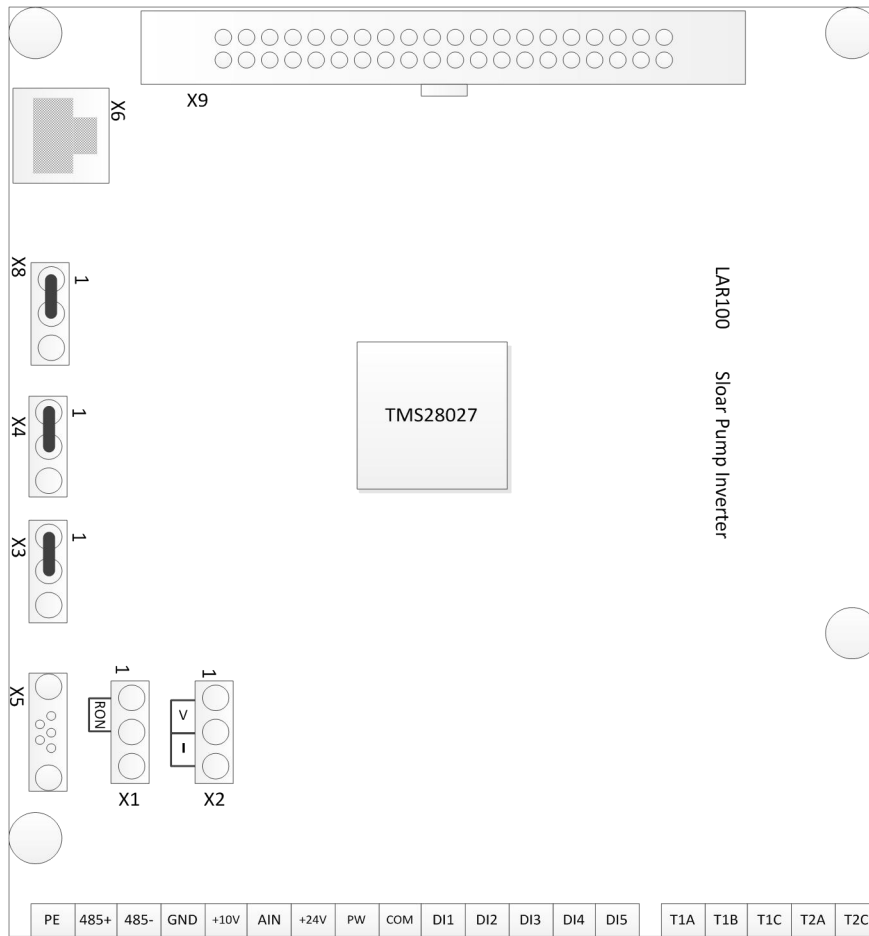### 3.1.3 Control Circuit Terminal
① Control Terminals and Function

Figure 5 Diagram of main control board and function extension card connection

② Function Description of Control Circuit

Terminal	Description
DI1～DI5	ON-OFF signal input, optical coupling with PW and COM. Input voltage range: 9~30V Input impedance: 3.3kΩ
PW	External power supply. +24V terminal is connected to PW terminal as default setting. If user need external power supply, disconnect +24V terminal with PW terminal and connect PW terminal with external power supply.
+24V	Provide output power supply of +24V. Maximum output current: 150mA
AIN	Analog input, 0~10V/ 0~20mA Input impedance: 10kΩ
GND	Common ground terminal of analog signal and +10V. GND must isolated from COM.
COM	Common ground terminal for digital signal and +24V (or external power supply).
+10V	Supply +10V for inverter.
PE	Ground Terminal.
T1A、T1B、T1C	RO1 relay output: RO1A—common; RO1B—NC; RO1C—NO. Contact capacity: AC 250V/3A, DC 30V/1A.
T2A、T2C	RO2 relay output: RO2A—common; RO2C—NO. Contact capacity: AC 250V/3A, DC 30V/1A.

3.2 Collection Diagram For Different Motor

① 220V SINGLE PHASE INSTALLED WITHOUT WATER LEVEL SENSOR (INPUT:SOLAR PANEL)

② 220V SINGLE PHASE INSTALLED WITH WATER LEVEL SENSOR (INPUT:SOLAR PANEL)
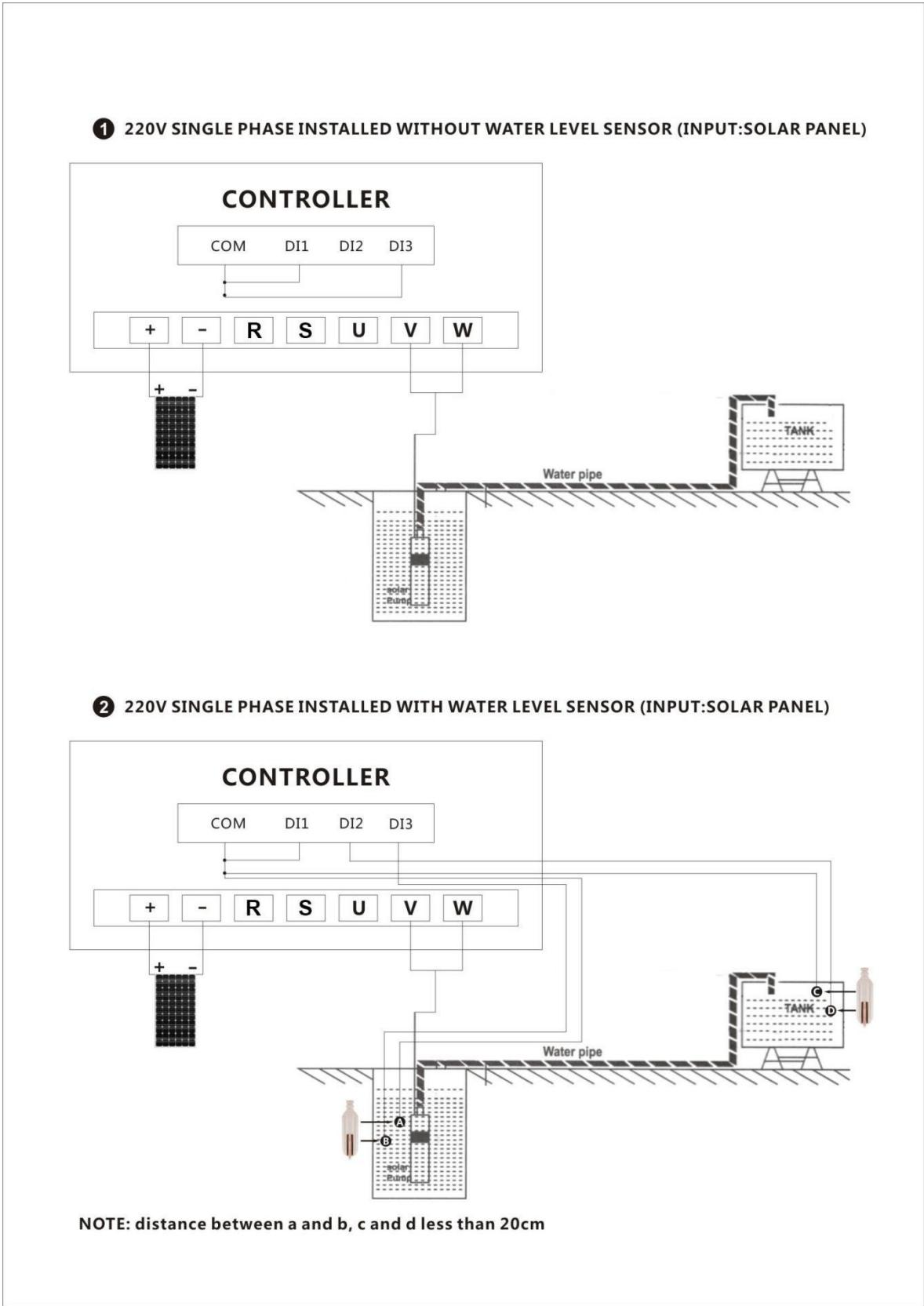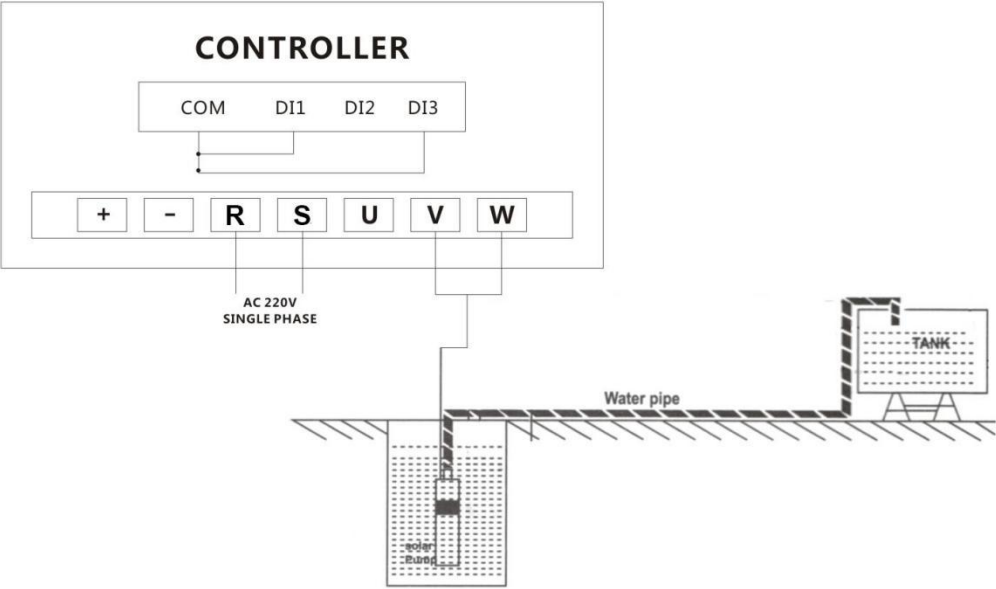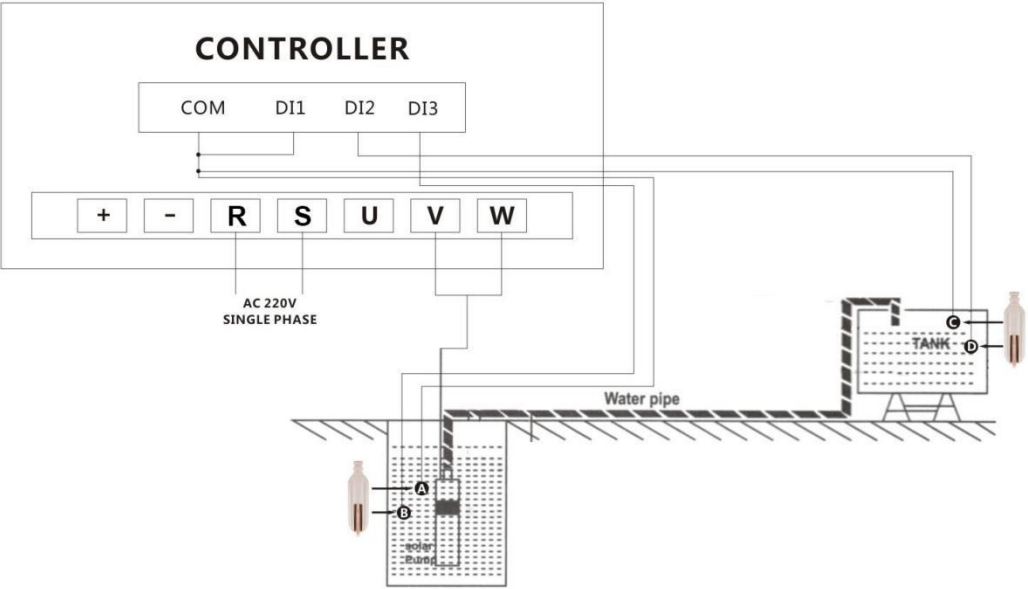
NOTE: distance between a and b, c and d less than 20cm

Figure 6 Diagram of single phase inverter connection method (PV Input)

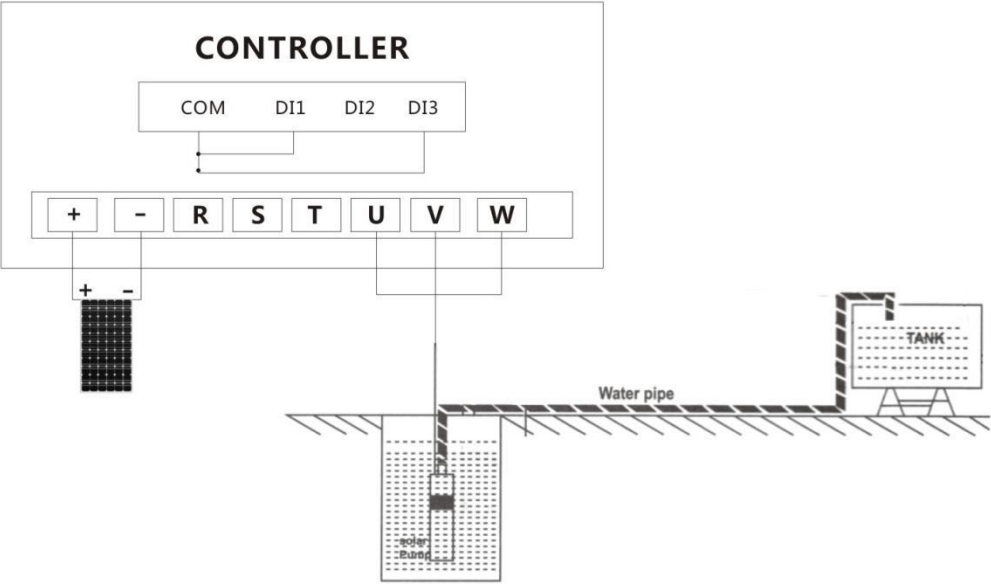❸ 220V SINGLE PHASE INSTALLED WITHOUT WATER LEVEL SENSOR (INPUT:AC 220V SINGLE PHASE)

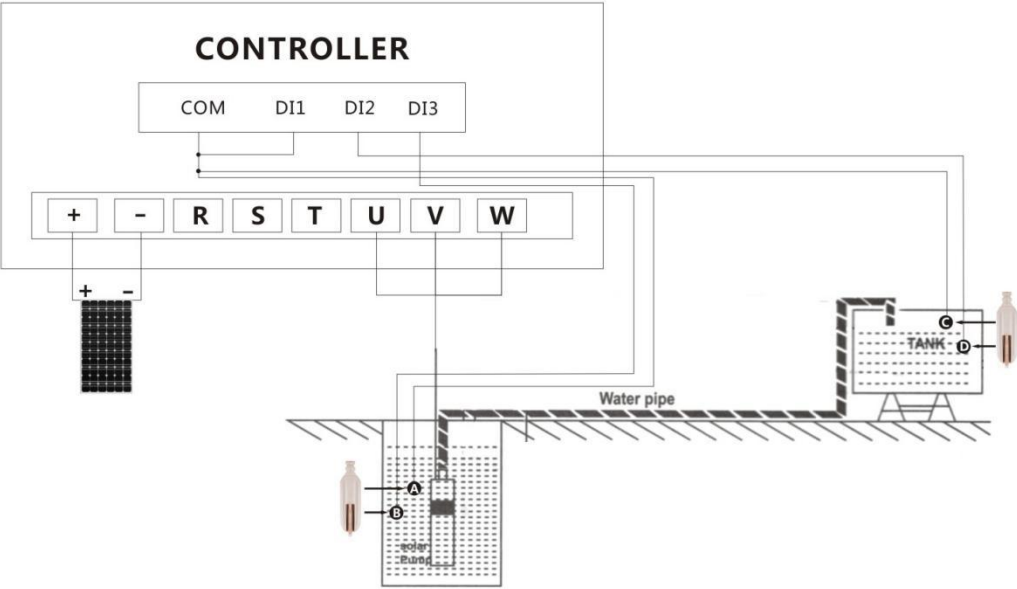❹ 220V SINGLE PHASE INSTALLED WITH WATER LEVEL SENSOR (INPUT:AC 220V SINGLE PHASE INS)

NOTE: distance between a and b, c and d less than 20cm

Figure 7 Diagram of single phase inverter connection method (AC Input)

❺ 220V or 380V THREE PHASE INSTALLED WITHOUT WATER LEVEL SENSOR (INPUT:SOLAR PANEL)
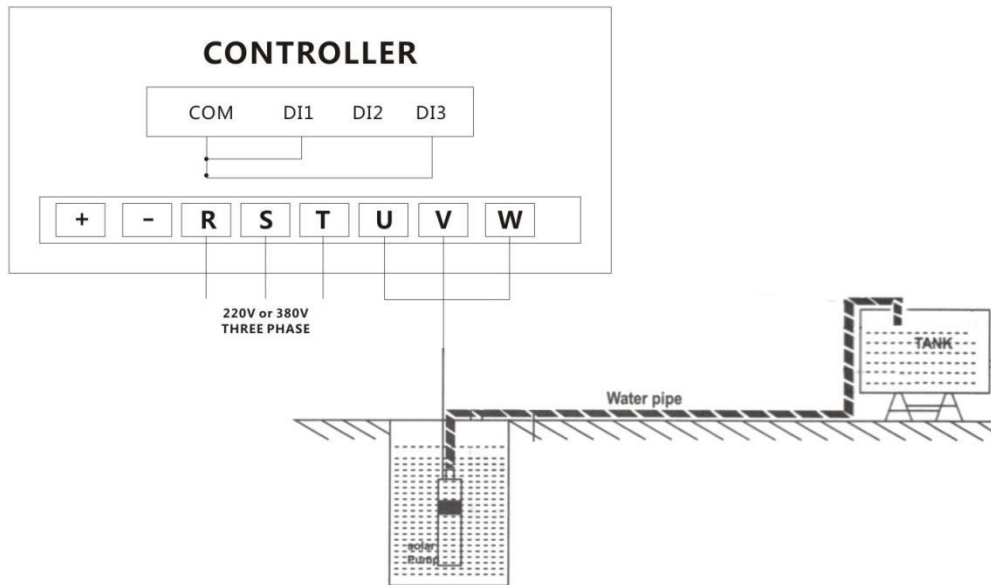

❻ 220V or 380V THREE PHASE INSTALLED WITH WATER LEVEL SENSOR (INPUT:SOLAR PANEL)
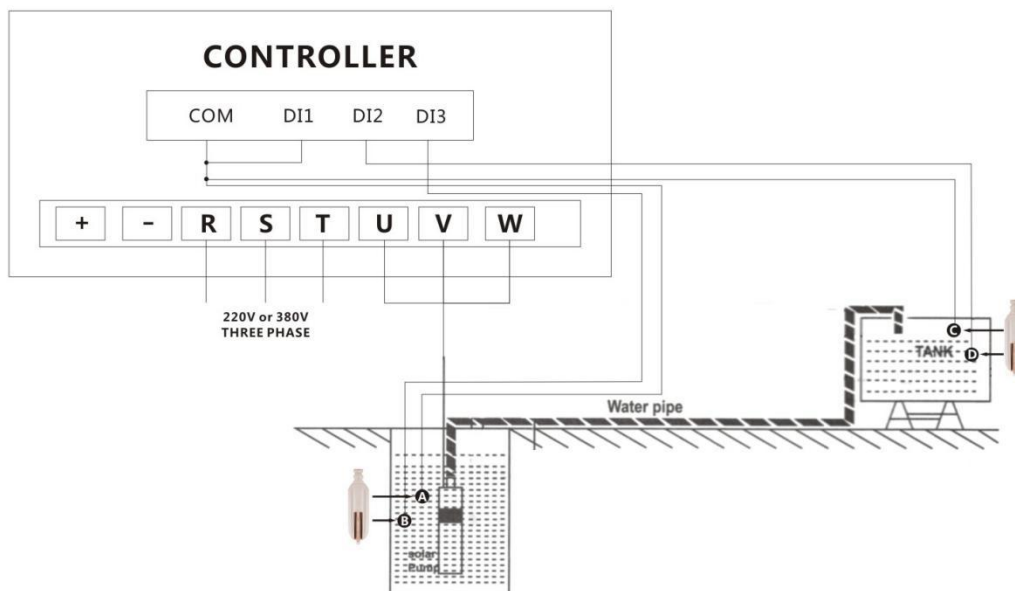

NOTE: distance between a and b, c and d less than 20cm

Figure 8 Diagram of 3phsae inverter connection method (PV Input)

7 220V or 380V THREE PHASE INSTALLED WITHOUT WATER LEVEL SENSOR (INPUT:220V or 380V THREE PHASE)

CONTROLLER

COM DI1 DI2 DI3

| + | - | R | S | T | U | V | W |

220V or 380V
THREE PHASE

Water pipe

TANK

Solar
Pump

8 220V or 380V THREE PHASE INSTALLED WITH WATER LEVEL SENSOR (INPUT:220V or 380V THREE PHASE)

CONTROLLER

COM DI1 DI2 DI3

| + | - | R | S | T | U | V | W |

220V or 380V
THREE PHASE

Water pipe

TANK

C
D

A
B

Solar
Pump

NOTE: distance between a and b, c and d less than 20cm

Figure 9 Diagram of 3phase inverter connection method (AC Input)

Note : If no need water level sensor of tank , please don't connect 'DI2' , 'COM' .

If you want to operate inverter by hand , no run/stop automatically , please don't connect 'DI1' , 'COM' .
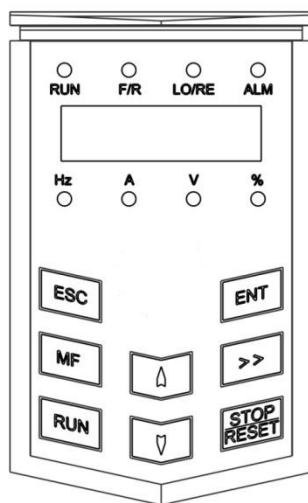
3.3 Inverter Introduction

3.3.1 Brief Instruction

Figure 10   Inverter keypad

3.3.2 Operation panel button and potentiometer function

Button	Name	Description
ESC	Programming Key	Entry or escape of first-level menu.
ENT	Enter Key	Progressively enter menu and confirm parameters.
∆	UP Increment Key	Progressively increase data or function codes.
∇	DOWN Decrement Key	Progressive decrease data or function codes.
>>	Shift Key	In parameter setting mode, press this button to select the bit to be modified. In other modes, cyclically displays parameters by right shift
RUN	Run Key	Start to run the inverter in keypad control mode.
STOP RESET	STOP/RESET Key	In running status, restricted by F05.05, can be used to stop the inverter. When fault alarm, can be used to reset the inverter without any restriction.
MF	Shortcut Key	Determined by Function Code F05.04 0: Jog operation 1: Switch between forward and reverse 2: Clear the UP/DOWN settings. 3: Quick debugging mode1 (by menu) 4: Quick debugging mode2 (by latest order) 5: Quick debugging mode3 (by non-factory setting parameters)

3.3.3 Indicator Light Description
3.3.3.1 Unit Indicator Light Description

Light	Unit indicator	Description
Status Light	RUN	Light on ：Run Light off：Stop Flash：Sleeping mode
	F/R	Light on：Reverse Light off：Forward
	LO/RE	Light on：Communication control; Light off：Keypad control Flash：Terminal control
	ALM	Light on ：Fault alarm; Light off：No fault alarm Flash：Overload warning
Units Light	Hz	Frequency unit
	A	Current unit
	V	Voltage unit
	RPM	Rotating speed unit
	%	Percentage

3.3.3.2 Keypad Display Description

Figure 11 Keypad display description

Chapter 4 Function Parameters

4.1 The Basic Function Parameters

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

"○" means the value of this parameter can be modified in stop and running status of drive;

"☆" means the value of this parameter cannot be modified when drive is running;

"●" means this parameter is a measured value that cannot be modified;

Default: The value when restored to factory default. Neither measured parameter value nor recorded value will be restored.

Setting Range: the scope of setting and display of parameters.

Code	Name	Description	Factory Default	Attribute
F00.01	Command Source Selection of Run/Start	0：Operation Panel（LED off） 1：Terminal Panel（L/R on） 2：Computer Communications（L/R flash）	1	○
F00.03	Maximum frequency	F00.04～600.00Hz	50.00Hz	☆
F00.04	Upper frequency limit	F00.05～F00.03	50.00Hz	☆
F00.05	Lower frequency limit	0.00 Hz～F00.04	0.00Hz	☆
F00.11	Acceleration Time 0	0.0s~3600.0s	2.0s	○
F00.12	Deceleration Time 0	0.0s~3600.0s	0.1s	○
F00.14	Carrier frequency set	1.0~15.0kHz	Model Set	○
F00.18	Restore parameters	0：No action 1：Restore factory setting 2：Clear fault records	0	☆
F01.08	Stop mode selection	0：Deceleration stop 1：Free stop	0	○
F01.18	Terminal Control When Power-On	0：Terminal Command Enabled 1：Terminal Command Disabled	1	○
F01.21	Restart when Power-off	0：Forbid to Restart 1：Allow to restart	1	○
F01.24	Wait Time of Restart When Power-off	0.0~3600.0s(whenP01.23, 1Mean Enabled)	1.0s	○
F02.00	Motor1 type	0：Asynchronous motor	0	●
F02.01	Motor 1 Rated Power	0.1kW~3000.0kW	Model Set	☆

F02.02	Motor 1 Rated Frequency	0.00Hz~F00.03	50.00Hz	☆
F02.03	Motor 1 Rated Rotational Speed	1RPM~36000RPM	Model Set	☆
F02.04	Motor 1 Rated Voltage	0V~1200V	Model Set	☆
F02.05	Motor 1 Rated Current	0.8A~6000.0A	Model Set	☆
F04.01	Motor 1 Torque Boost	F04.01 Set range: 0.0%　(automatic)0.1%~10.0%	0.0%	○
F04.02	Motor 1 Torque Boost to Stop	F04.02 Set range: 0.0%~50.0%	20.0%	○
F05.01	Terminal DI1 Function Selection	0： Disabled 1： Forward run 42：PV Inverter Forbid 43：Full-Water 44：Dry -Water	1	☆
F05.02	Terminal DI2 Function Selection		43	☆
F05.03	Terminal DI3 Function Selection		44	☆
F05.04	Terminal DI4 Function Selection		0	☆
F05.05	Terminal DI5 Function Selection		0	☆
F05.10	Terminal DI1~DI5 Positive/Negative Logic	0x00~0x1F	4	☆
F05.11	DI Terminal Filtering Time	0.000~1.000s	0.010s	○
F06.03	Relay T1 Output Function	0：Disabled 1：invert run 5：inverter fault	1	○
F06.04	RelayT2 Output Function		5	○
F06.05	Output Terminal Positive/Negative Logic	0x0~0x1F	0x0	○
F06.10	Relay T1 Output delay time	0.000~50.000	0.000s	○
F06.11	Relay T1 Disconnect delay time	0.000~50.000	0.000s	○
F06.12	Relay T2 Output Delay Time	0.000~50.000	0.000s	○
F.6.13	Relay T2 disconnect Delay Time	0.000~50.000	0.000s	○
F07.00	User Password	0~65535	0	○
F07.05	Running Status Display Selection	0x0000~0xFFFF BIT0：Output frequency BIT1：Reference frequency BIT2：DC bus voltage	0x05F	○

		BIT3：Output voltage BIT4：Output current BIT5：Rotation speed BIT6：Output power		
F07.07	Stop Status Display Selection	0x0000~0xFFFF BIT0：Reference frequency BIT1：DC bus voltage BIT2：Input terminal status BIT3：Output terminal status	0x00FF	○
F07.18	Inverter Rate Power	0.4~3000.0kW		●
F07.19	Inverter Rate Voltage	50~1200V		●
F07.20	Inverter Rate Current	0.1~6000.0A		●
F07.27	Now Fault Type	0：Not fault		●
F07.28	Latest Fault Type	1：Over-current when acceleration（OC1）		●
F07.29	The Second Fault Type	2：Over-current when deceleration（OC2）		●
F07.30	The Third Fault Type	3：Over-current when constant speed running（OC3）		●
F07.31	The Fourth Fault Type			●
F07.32	The Fifth Fault Type	4：Over-voltage when acceleration（OV1） 5：Over-voltage when deceleration（OV2） 6：Over-voltage when constant speed running（OV3） 7：DC bus Under-voltage（UV） 8：IGBT Ph-U fault（OUT1） 9：IGBT Ph-V fault（OUT2） 10：IGBT Ph-W fault（OUT3） 11：Motor overload（OL1） 12：Inverter overload（OL2） 13：overload alarm（OL3） 14：IGBT overheat（OH1） 15：Rectify overheat（OH2） 16：Input phase failure（SFI） 17：Output phase failure（SFO） 18：Brake unit fault（bCE） 19：Ground short-circuit fault (ETH) 20：Under load fault (LL) 21：Communication fault（E.485） 22：External fault（EF） 23：EEPROM fault（EEE） 24：Trial time reached（END）		●

		25:Current detection fault (ItE)		
F08.28	Fault Auto Reset Times	0~10	0	○
F08.29	Reset Interval	0.1~3600.0s	1.0s	○
F11.01	Reduced Frequency Selection When Outage Instantly	0: Disabled 1: Enabled		○
F15.00	PV Inverter Selection	0: Disabled 1: Enabled	1	○
F15.01	Vmpp Voltage Selection	0: Constant Voltage 1: Max. Power Point Tacking(MPPT)	1	○
F15.02	Vmpp Voltage Keypad Set	0.0~6553.5Vdc	555.0V	○
F15.03	PID Off Set Limits	0.0~100.0%(100.0% refer P11.18)	0.0%	☆
F15.04	PID Max. Output Frequency	0~100.0%	100.0%	○
F15.05	PID Min. Output Frequency	0.0%~100.0%	0.0%	○
F15.06	KP1	0.00~100.00	1.00	○
F15.07	KI1	0.00~100.00	1.00	○
F15.08	KP2	0.00~100.00	4.00	○
F15.09	KI2	0.00~100.00	4.00	○
F15.10	PI Amplitude	0.0~6553.5Vdc	50.0V	○
F15.11	Dry Pumping Function	0: Disabled 1: Enabled	0	○
F15.12	Dry-Water Threshold	0.0~100.0%	0.0%	○
F15.13	Delay Time of Dry-Water	0~3600.0s	60.0s	○
F15.14	Wake-up Delay Time of Dry-Water	0~3600.0s	600.0s	○
F15.15	Reserved	Reserved	Reserved	○
F15.16	Reserved	Reserved	Reserved	○
F15.17	Delay Time of Full-Water	0.0~3600.0s	60.0s	○
F15.18	Reset Delay of Full-Water	0.0~3600.0s	120.0s	○
F15.19	Frequency of Weak Light	0~50.00Hz	5.00Hz	○
F15.20	Delay Time of Weak	0.0~3600.0s	100.0s	○

	Light			
F15.21	Reset Delay of Weak Light	0.0~3600.0s	300.0s	○
F15.22	Reference Voltage of Given Display	0.0~2000.0V	0V	●
F15.23	Min. Voltage of MPPT	0.0~6553.5Vdc	100.0V	○
F15.24	Max. Voltage of MPPT	0.0~6553.5Vdc	780.0V	○

Chapter 5 Troubles Shooting

5.1 Main Circuit Terminals

Fault Code	P.OFF	Fault Type	Power Off
Reason	External power supply close	Solution	Check the three-phase power is off or not
Fault Code	E.Out1 E.Out2 E.Out3	Fault Type	IGBT Ph-U fault IGBT Ph-V fault IGBT Ph-W fault
Reason	Acc/Dec time is too short IGBT module fault Malfunction caused by interference Ground is not properly	Solution	Increase Acc/Dec time Ask for support Inspect external equipment and eliminate interference
Fault Code	E.oC1	Fault Type	Over-current when acceleration
Reason	Acc time is too short Input voltage is too low Capacity of inverter is too small	Solution	Increase Acc time Check the power supply Select bigger capacity inverter
Fault Code	E.oC2	Fault Type	Over-current when deceleration
Reason	Dec time is too short Load is too heavy Capacity of inverter is too small	Solution	Increase Dec time Install proper external braking unit Select bigger capacity inverter
Fault Code	E.oC3	Fault Type	Over-current when constant speed running
Reason	Sudden change of load or abnormal Input voltage is too low Capacity of inverter is too small	Solution	Check the load or reduce sudden change of load Check the power supply Select bigger capacity inverter
Fault Code	E.oU1	Fault Type	Over-voltage when acceleration
Reason	Input voltage abnormal After instant power off, restart the rotating motor	Solution	Check the power supply Void restart after power off
Fault Code	E.oU2	Fault Type	Over-voltage when deceleration
Reason	Dec time is too short Load is too heavy Input voltage abnormal	Solution	Increase Dec time Increase braking resistance /unit Check the power supply
Fault	E.oU3	Fault Type	Over-voltage when constant speed

Code				running
Reason	Input voltage abnormal	**Solution**		Install input DC reactor
	Load is too heavy			Install proper external braking unit
Fault Code	E.LU	**Fault Type**		DC bus Under-voltage
Reason	Input voltage is too low	**Solution**		Inspect the input power supply
Fault Code	E.oL1	**Fault Type**		Motor overload
Reason	Input voltage is too low	**Solution**		Inspect the input power supply
	Improper motor's overload protection threshold			Set proper motor rated current
	Motor block or sudden change of load			Check the load and adjust torque boost
	Motor drive heavy load at low speed for a long time			Select variable frequency motor
Fault Code	E.oL2	**Fault Type**		Inverter overload
Reason	Acc time is too short	**Solution**		Decrease acceleration
	Restart the rotating motor			Avoid restart after power off
	Input voltage is too low			Check the power supply
	Load is too heavy			Select bigger capacity inverter
Fault Code	E.SPI	**Fault Type**		Input phase failure
Reason	Phase loss of R,S,T input	**Solution**		1.Check power supply 2.Check the wiring installation
Fault Code	E.SPo	**Fault Type**		Output phase failure
Reason	Phase loss of U,V,W output (or a serious unbalance in 3phase input)	**Solution**		Check the wiring installation of output
	Connection loose			Check the motor and wiring
Fault Code	E.oH1	**Fault Type**		Rectify overheat
	E.oH2			IGBT overheat
Reason	Instant over current of inverter	**Solution**		Refer to over current solution
	Short-circuit or ground fault occurred at inverter output			Check the wiring and install again
	Obstruction of ventilation channel or Cooling fans of inverter stops or damaged			Clear the ventilation Channel or Replace cooling fan
	Ambient temperature is too high			Reduce Ambient temperature
	Control board wire or plug-ins loss			Check the wiring and Installation
	Auxiliary power damaged or under voltage of driver voltage			Ask for support
	Power module bridge short			Ask for support

	Control board abnormal		Ask for support
Fault Code	E.EF	**Fault Type**	External fault
Reason	SI External fault input terminal take effect	**Solution**	Inspect input of external equipment
Fault Code	E.CE	**Fault Type**	Communication fault
Reason	Improper baud rate setting	**Solution**	Set proper baud rate
	Receive wrong data		Press STOP/RESET to reset. Ask for support
	Communication is interrupted for long time		Check wiring of communication interface
Fault Code	E.ItE	**Fault Type**	Current detection fault
Reason	Wires or connectors of control boards are loose	**Solution**	Check the signal linker and insert it again
	Auxiliary power damaged		Ask for support
	Hall sensor is damaged		Ask for support
	Amplifying circuit is abnormal		Ask for support
Fault Code	E.tE	**Fault Type**	Motor auto tuning fault
Reason	Capacity of motor is not meet that of inverter	**Solution**	Change the model of inverter
	Improper setting of motor rated parameters		Set rated parameters according to motor nameplate
	The motor parameter auto-tuning are warped with the standard parameter		Run the motor without load and do auto-tuning again
	Overtime of auto-tuning		Check motor's wiring and parameters
Fault Code	E.EEP	**Fault Type**	EPROM fault
Reason	R/W fault of control parameters	**Solution**	Press STOP/RESET to Reset. Ask for support
	EEPROM damaged		Ask for support
Fault Code	E.PIDE	**Fault Type**	Ask for support
Reason	PID feedback disconnect	**Solution**	Inspect PID feedback signal wire
	PID feedback source disappears		Inspect PID feedback source
Fault Code	E.bCE	**Fault Type**	Brake unit fault
Reason	Braking circuit failure or brake tube damaged	**Solution**	Inspect braking unit, replace braking tube
	Too low resistance of externally		Increased braking resistance

Fault Code	connected braking resistor		
Fault Code	E.ENd	Fault Type	Setting time has finished
Reason	The actual running time is beyond the setting time	Solution	Ask for support
Fault Code	E.oL3	Fault Type	Electronic overload
Reason	Load is too heavy	Solution	Check the load
	Electronic warning point is too low		Check electronic warning point
Fault Code	E.EAH1	Fault Type	Output is short-circuited to ground
Reason	One phase Output of inverter is short-circuited to ground	Solution	Check the motor wiring
	Current detect circuit is broken		Ask for support
Fault Code	E.EAH2	Fault Type	Output is short-circuited to ground
Reason	One phase Output of inverter is short-circuited to ground	Solution	Check the motor wiring
	Current detect circuit is broken		Ask for support
Fault Code	A-LS	Fault Type	Weak light
Reason	Light is too weak to keep running state	Solution	Wait for stronger sunshine
Fault Code	A-tF	Fault Type	Full water
Reason	Water is adequate	Solution	Wait for clearing alert
Fault Code	A-LL	Fault Type	Water shortage
Reason	Water sources are lacking of water	Solution	Wait for clearing alert
Fault Code	A-LL1	Fault Type	Water shortage
Reason	Water sources are lacking of water	Solution	Wait for clearing alert

5.2 Common faults and solutions

The drive may have following faults or malfunctions during operation, please refer to the following solutions.

No display after power on:

Inspect whether the voltage of power supply is same as the inverter rated voltage or not with multi-meter. If the power supply has problem, inspect and solve it. Inspect whether the 3 phase rectify bridge is in good condition or not. If the rectification bridge is burst out, ask for support.

Check the CHARGE light. If the light is off, the fault is mainly in the rectify bridge or the buffer resistor. If the light is on, the fault may be lies in the switching power supply. Please ask for support. Power supply air switch trips off when power on:

Inspect whether the input power supply is grounded or short circuit. Please solve the problem. Inspect whether the rectify bridge has been burnt or not. If it is damaged, ask for support.

Motor doesn't move after inverter running:

Inspect if there is balanced three-phase output among U, V, W. If yes, then motor could be damaged, or mechanically locked. Please solve it.

If the output is unbalanced or lost, the inverter drive board or the output module may be damaged, ask for support.

If there is not output voltage, the drive board or the output module may be damaged. Ask for support.

Inverter displays normally when power on, but breaker switch at the input side trips when running: Please check whether inverter or motor has short circuit or wrongly connecting earth.

If the breaker is occasionally switch off and the distance is too long between motor and inverter, please consider to add AC output choke.

Chapter 6 Warranty

6.1 Warranty

The warranty of this inverter is 18 months , or we provide 2% spare parts for free. When any fault or damage occurs on the product,within the warranty period,our company will provide free maintenance. After the warranty time,we can provide life time paid warranty service.

6.2 Supplementary

In order to enjoy better after-sales service , please pay attention to the following ：

Provide below information when inquiry,we will make good configuration for you.		
1	Pump	Power,Voltage,Phase
2	Solar Panel	Each panel power,voc voltage,vmp voltage
Providebelowphotosandinformationafterinstallation.		
1	Pump	Photos show pump,pump specification,pump and inverter connection
2	Inverter	Photos show inverter installation environment,inverter connection and switch, LCD screen parameter setting.
3	Solar Panel	Photos show solar panel and inverter connection,solar panel specification,solar panel array and quantity.

Prompt:Warranty only covers the body of the inverter

6.3 Warranty agreement

1　The warranty of this inverter is 18 months , or 2% spare parts for free.When any fault or damage occurs on the product,within the warranty period,our company will provide free maintenance.After the warranty time,we can provide life time paid warranty service.

2　The warranty time starts from the date when the product is leaving the factory,and the machine frame code is the only proof to determine the warranty period.

3　Certain maintenance charge should be considered during warranty period if the fault is caused by the following reason:

·Fault caused by operating against the manual or surpass the standard specification

·Fault caused by self fix and modification without permission.

·Fault caused by poor preservation

·Fault by using the inverter in a normal function

·Machine damage caused by fire,salt corrosion,gas corrosion,earthquake,storm,lood,lightning,abnormal voltage or other for cemajeure.

4　Please be sure to retain this card and show it to the maintenance service.

User's Information

User Company:

Contact person:

Address:

Telephone:

Dealer company:

Repair Record

Date	Record	Abstract	Technician	Signature