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★ Please read this user manual carefully before use, any wrong operation will do damage to this machine.

Solar Sine Wave Inverter

User Manual

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1. Safety Instruction

1.1 Open box

Sandi SDP series inverters have been tested strictly before leaving our factory, however they may be damaged during the transportation, please check them carefully if the products received are completed and if the following items: model, power, DC input voltage, AC output voltage and Frequency (Hz) are consistent with the order. If any damages or discrepancy found, please contact transportation company or us immediately. Meanwhile, please provide the damaged pictures to help us solve the problem for you asap.

1.2 Storage environment

In order to ensure good performance and long service life, the product should pay attent ion to the following items to avoid adverse effects suffered in the store:

- ♦ Away from direct sunlight (avoid for outdoor);
- ♦ No corrosive liquid, oil mist, splashing water, salt fog, rain, humidity;
- ♦ placed no dust and dry air and ventilated place
- ♦ no combustible and explosive goods;
- ♦ Environment temperature: -10 °C ~ 50 °C;
- ♦ If don't use the machine for a long time, it should be power on every six months;

1.3 Transport

During the process of handling the product, should avoid strong vibration and bump. It's strictly prohibited packing upside down, when open the carton and carry the product out, please don't missing accessories, instruction manual and warranty card when moving out of the box. In addition, this product is big volume and heavy, please pay attention to safety to avoid hurt your body when handling.



1.4 Notice

This user manual allows you to easily operate and maintain the system, be sure to take good care of it. Before use this product, please read these instructions carefully.

- 1, Before use carefully read and understand the full content of manual instruction.
- 2, Be careful when moving the machine, avoid the dropping impact.
- 2, To avoid injuring personal safety, the installation must be grounded.
- 6, The Machine must be installed in a horizontal ground. The cable must be connected strengthened, to prevent the damaged of mouse.
- 7, Please do not put the machine near heating, warmer, air-conditioner or exhaust pipe.
- 8, Please do not overload to use this machine in order to avoid overload failure.
- 9, In order to avoid electric shock, please do not disassemble the machine. When you need to maintain, please find and seek support from the professionals.
- 10, The machine will have heating, which is the normal condition. But it should keep good ventilation and clean and tidy in the installation place.
- 11, Please keep the manual instruction well for the future reference.



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2. Product outside view



♦ Product size and shape varies from different power model, it's subject to the actual size confirmation.



3. Product Introduction

Characteristic:

• Two types of start mode: Step-down Voltage Start and Variable Frequency Start. Customers can set start mode according to the nature of their load. If the inverter take inductive load, especially for taking motor, the instantaneous start current of motor is very big, then inverter's power need enlarge many times. However our this new inverter don't need enlarge too many power, you could set Variable Frequency Start to take your inductive load easily. This function is very convenient for users and also reduce frequency converter's usage, which reduced the cost of equipment investment, also easy to connect wires and control.

• The output frequency can be set. For example, if you want to control the motor speed 30Hz, you could set the frequency 30Hz and the inverter output will be 30Hz. Because it belongs to low frequency inverter, we suggest choose the output frequency over 30Hz to avoid transformer overheating. This function is also convenient for customer, you can change the frequency setting on the LCD screen.

◆ The output voltage can be set between -40 % to +20 % of rated voltage. For example, the output rated phase voltage(L to N) is 220V, you can set the output voltage between 80-264V. And the accuracy of output voltage is very high, usually no more than 1%.

The DC input voltage range can also be set. Over-voltage point, under-voltage point, over-voltage recovery point and under-voltage recovery point can be set via the LCD panel. Convenient for increasing or reducing the quantity of batteries, photovoltaic modules also can be used flexibly. Not need worry about adding new photovoltaic modules or change battery voltage in solar power system, change these parameters settings on LCD then all is ok. It reduced the cost of investment again. If the customer want to change these parameters, please try to communicate with our engineers, we will provide you professional service for free.

Powerful data display and fault instruction function. The LCD can display DC input voltage, output frequency, phase voltage, phase current, AC bypass input voltage, Generated amount KWH, time and date, temperature, fault code display.

◆ Pure sine wave output with good transient response less than 50ms, waveform distortion is very little, higher conversion efficiency and stable output voltage.

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• Using the fifth generation efficient IPM intelligent module from Japanese Mitsubishi, with high efficiency and stable performance. It also with powerful protection function, the protection for short circuit, over load, over temperature is more safe and reliable. It's service life can up to 15 years or more.

• Wide input voltage can be set according to customer's requirement. Input voltage range can be selected from 100-500V or 200-850V.

- Output AC Power suitable for all types of home electric equipment, electronics load, electric tools and electric motors etc.
- With Low Frequency Transformer, which ensures high efficiency and low no-load loss.
- European CE (EMC & LVD) certificated and Australia CEC & ERAC approved.



4. Main Parameters

	Model	SDP-10KW	
	Isolation	Low frequency transformer	
	Input rated voltage (VDC)	160V	
DC Input	Input rated current (A)	62.5A	
	Input DC voltage range (VDC)	140~230V	
	Rated AC output power	10KW	
	Phases	Single phase, 2 wire	
	Output rated current (A)	42A	
	Power Factor (PF)	0.95	
	Output voltage (V)	240VAC±2%	
	Output frequency accuracy (Hz)	50Hz ± 0.05%	
AC Output	The dynamic response	4% (Load 0←→100%)	
	Overload	125% 1min、150% 10s	
	Inverter efficiency	>94%	
	Waveform distortion rate	≤2% (Linear load) ≤3% (The nonlinear loads)	
	Running mode	Working continuously	
	Display	LCD	
Protection	Inverter	Input reverse protection, under-voltage and over-voltage, output overload, short-circuit, overheat protection	
function	Short circuit protection	No automatic recovery, need to restart the machine	
	Cooling method	Fan-cooling	
	Ambient temperature	-10℃~+50℃	
\\/orl/in a	Using environment humidity	0~90%, No condensation	
environment	Noise (1 meter)	<50dB	
	Degree of protection	IP20 (indoor)	
	Using altitude (m)	≤2000	
Mechanical	Vertical type (D x W x H)	540x540x760mm	
dimension	Weight	95Kg	

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5. LCD display explanation

5.1, LCD display description



5.2 Indicator of LED light function

There has 5 LED light in the panel: Grid, Run, Fault, Auto, Manual.

Indicator description:

- A. Grid: AC bypass priority mode, it indicates the AC grid input condition.
- B. Run: Battery priority mode, it indicates the battery supply condition.
- C. Fault: System fault.
- D. Auto: Inversion running, it indicates the inverter work normally.

E. Manual: Variable frequency mode, the inverter work with variable frequency mode running

6. LCD parameter description

Inverter power on, the first interface display parameter, press "down" key to display as following 4 item

DC	IN:	054.6	V
AC	OUT:	001.7	V
AC	OUT:	000.0	A
Fre	eq:	050.0	Hz

DC IN	DC input voltage display
AC OUT	AC output voltage display
AC OUT	Output current display
Freq	Output frequency display



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AC INPUT: U:001.7 V OUT: W:0000000 kWh	AC INPUT: U: OUT: W:	V	AC bypass input Bypass phase voltage Total generated amounts Generated amounts
Inv State: Inv Pri Inv Run	Inv State:	Inverte	er working state:
DCU OVER N	DCU OVER	DCC	over-voltage
DCU UNDER N OVER LOAD N	DCU UNDER	DC	under-voltage
	OVER LOAD	Ove	r-load
MOD N OUTErr Y	MOD	Mod	ule error
	Fault display:	"N" indic	ate no error and "Y" indicate with error
	OUTErr	Outpu	ut voltage unbalance
This error only	for 3 phase out	put, single	phase output without this error display

Fault alarm can be divided into automatic recovery and non-automatic recovery: When the LCD screen display MOD error and overload, need to manually recovery, turn off the DC circuit breaker until the LCD screen is completely extinguished and then turn on the DC circuit breaker; over-voltage, under-voltage can automatic recovery (the under-voltage recovery default setting is 10 minutes), can set according to the customer needs.

Keypad function

- 1.Running Info
- 2. Inv Start Mode
- 3. Work Modes
- 4. Parameter Set
- 1. Running Info
- 2. Inv Start Mode
- 3. Work Modes
- 4. Parameter Set
- Inverter Start mode

Running state display

- Working Mode
- System parameter setting



Press " 2. Inv Start Mode " display as following



Press " 3. Work Modes " display as following



Press " 4. Parameter Set " need to enter password.

If you want to adjust the parameter setting, please contact the manufacturer ask for password



When inverter is working, please don't adjust parameters setting.
If you want to adjust parameter setting, please turn off start button, t hen operation.



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The following settings only for professionals operation, the non-professionals can't change parameters, otherwise, you will undertake all damages caused by privately settings.

4. 7. 0. (1. Freq Set	Frequency setting
1. Freq Set	2. Vlout Set	Output voltage setting
2. VIOUL SEL	3. CT&Temp Set	Current ratio setting and temperature
4 Alarm Set		Protection setting
I.MIUIM 000	4. Alarm Set	DC over-voltage and under-voltage setting
	5. UdcR Set	Recovery setting of DC over-voltage
5.UdcR Set		and under-voltage
6.UdcUnderDelay	6. UdcUnder Delay	Default recovery time of under-voltage
7.Time Set		is 10 minutes
8. OverLoad Set	7. Time Set	Date and time setting
	8. Overload Set	Overload times and overload time setting

Press "1. Freq Set " output frequency setting display as following



Max Fre:	ΗZ	Recommend maximum output
		frequency setting between 30-100Hz
Min Fre:	ΗZ	The minimum frequency of output Starting
		can't less than 5Hz

Press " 2. Vout Set " output voltage and current setting display as following



Vout SetOutput voltage settinglout –Max Set:Output current settingNoticed: Output voltage and current value setting not more than20% of the rated power, if the transformer damaged caused bywrong settings will out of the warranty



Press " 3. CT&Temp Set " Current and mutual inductance ratio and Protection temperature setting display as following



CT Set: Current and mutual inductance ratio setting

Temp Set:

Protection temperature setting

Press "4. Alarm Set " over-voltage and under-voltage setting display as following



DC over-voltage protection setting

DC under-voltage protection setting

Press " 5. UdcR Set " DC over-voltage and under-voltage recovery setting display as following



Udc-over Set:DC over-voltage recovery settingUdc-under Set:DC under-voltage recovery setting

Press " 6. Udc Under Delay " Under-voltage recovery time setting display as following



Udc Under Delay:Under-voltage recovery time settingMinMinute



Press "7. Time Set " to display as following



7. Schematic Diagram

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Over load Time Set: Overload time setting



AC Output curve



8. Installation and Running Status

8.1, When wiring should attention to the following:

1.1 Check the front panel breakers are in "OFF" state, check whether there is a short circuit on load.

1.2 DC input cable must be through from the DC input terminals, correctly connect to the positive and

negative pole of the machine, attention can't be reversed.

1.3 Absolutely prohibit DC input power supply connect to the inverter output terminal.

1.4 The connection cable between the battery and inverter should be as short as possible, otherwise the harmonic leakage current from cables will be harmful to inverter and the system equipment.

1.5 System grounding terminal must be grounded, and make the ground wire's length as short as possible. Do not allow welding machine, motor and other high current device in this system common ground. Ensure all system's ground wires are separately layout from high current electrical equipment.







1, Please don't turn off the DC Input Breaker often, otherwise it will cause will cause DC input breaker damaged. If you want to shut down the inverter, just need tu rn off the AC output breaker and Start button.

2, If you have to turn off the DC input breaker, please turn off the AC Output Breaker and Start button to make inverter stop working, then turn off the DC Input breaker.

2, Power on and running status:

2.1 The power of load that inverter will take can't exceed the rated power of inverter, otherwise it will shorten the service life of equipment or cause the device trouble.

2.2 After inverter start-up normally under no-load conditions, then connect with the load. Load should be added one by one to avoid excessive inrush current of adding all loads at same time to cause inverter overload protection.

2.3 During operation, if the LCD panel display default light on, the device will automatically alarm protection, no AC output, the indicator for 30 seconds, then you should turn off the start switch. After identified default reasons, you could start inverter under no-load to test.

3, Connect with wires and operation procedure

3.1 Confirm the machine is in OFF condition.

3.2 correctly connect with input wires, be careful of the positive and negative pole of input wires, which cannot reverse connection.

3.3 Correctly connect with output wires.

3.4 Recommend to turn on the DC input circuit breaker firstly, then turn on AC output breaker then start switch.



Please see the following, which is the wiring terminals:



Remarks: DC Input: positive pole (+), negative pole (-) AC Output: L and N wires



9. Maintenance and Notice

1), Caution for use

1.1 Be careful of the positive pole and negative pole of battery input, which can't reverse.

1.2 Turn on the DC input breaker, if the breaker happen to the trip at the first time, it's a normal

phenomenon, because the capacitor is charging.

1.3 Please don't turn off DC input breaker under the inverter with load, otherwise it will cause DC input breaker damaged.

1.4 When the machine happen MOD, overload, output error and fault alarm, turn off the DC input breaker to restart the machine.

1.5 Put the inverter on ventilated and away from sunlight, confirmed the machine and wall distance is greater than 30cm.

1.6 Don't block the vents, if found the vents blocked, please clean up in time.

1.7 When the inverter is running normally and temperature is rising. If the fan stop working,

please replace the fan in time. (The starting temperature of the fan is 45°C).

1.8 Recommend to turn on the output circuit breaker firstly, then turn on start switch. Make the inverter starting load, can effectively avoid the damage of large inrush current to the machine.

1.9 Don't connect ground wire (GND) of cabinet and neutral wire (N) together.



2), Notice:

2.1 All operations of equipment must be done by professionals, please remove metal jewelry on hands before the operation in case of electric shock !

2.2 The inside cooling fan of the machine is controlled by temperature, it's a normal phenomenon that the fan is not running when inverter just start soon or taking little load, the fan only will run when cabinet internal temperature exceeds 45 $^{\circ}$ C.

2.3 When the machine is working, in case of accidents and to avoid electric shock, please don't open the cover of cabinet.

2.4 Please don't make change to the circuit line privately when regular checking, in case of damage.

2.5 It's a normal phenomenon that the inverter has a certain degree of fever during the use process, but should keep the environment of installation ventilated, cooling and clean, especially can't block air ventilator.

2.6 The inside all CMOS components of the machine can't touch, when the circuit is powered on don't connect or disconnect the wires and terminals.

2.7 After connect all wires, please must be carefully check (voltage value, positive and negative pole are consistency, grounding is well).

2.8 Even if the all switch on the panel is OFF, but inverter's part of capacitor still electric, please don't touch.

2.9 When take with motor and pump or other inductive loads, the inverter had best leave 30% of the power margin, should be considered the impact current to the machine, to ensure reliable power supply to inverter

3), Regular checking

To ensure SDP series inverter continuously and normally running, it is required regular maintenance, usually every six months for regular inspections.

Before opening the cover of cabinet maintenance, should completely cut off the power and shut down inverter 10 minutes or longer, after capacitors end discharging, then can proceed maintenance (the machine inside has many capacitors and discharge need some time), be careful not to damage any parts and components, pay attention to the order of wiring.



Parts	Check the contents	Solutions
Input and output terminals	loose	Tightening
Input and output cable	The cable whether is aging	Replace cable
Control board	Accumulation of dust	Using 392kPa-588kPa pressure dry
	and dirt	compressed air to blow off
Bus capacitor	Discoloration or smell	Replace capacitor
Radiator Fan	Not work	Replace fan
Incide of appingt	Accumulation of dust	Using 392kPa-588kPa pressure dry
Inside of cabinet	and dirt	compressed air to blow off
Button coll	LCD doesn't display	Replace the CR1220 Button Cell on the
DULION CEII	Time	motherboard

4), Troubleshooting

Fault phenomenon	Fault reason	solution method	
	DC input abnormal	Check the battery is normal	
		Check the DC input voltage (battery	
		voltage) and positive, negative connection	
		Check there has any displays in the LCD	
The inverter can't start		such as overvoltage or under-voltage of	
		battery	
	DC input breaker is ON	Check DC input breaker	
	Output overload or short circuit	Close the load, check whether there has breakage or short circuit of load cable	
When the inverter is in the			
normal state, still no AC	AC output breaker is ON	Check AC output breaker	
output			



10. After-Sales Service

Sales staff cooperate with Engineering department, delivery the products that meet the needs of users and be in good condition to the user. Terms are stipulated as following:

We usually adopt entrust transport way to delivered the goods, when the user sign for the goods by delegating transport, should carefully check whether the structure and appearance of product is damaged, if with doubt, the user shall not sign for it, if you sign for it then means you agree the goods without any fault or damage during transportation.

1. Our company seriously promised: For all sold out inverter, we provide one year warranty from the date of delivery and supply maintenance services all the time.

2. Within warranty time, when inverter meets all the installation environment and using conditions, also operation correctly, if the inverter have damage or accident happens, please inform our company after-sales service department, when contact us, please provide the equipment model, serial number and complete problem explanation. We will provide free components for replacement firstly, if the problems still can't be solved, please contact the manufacturer as soon as possible, prohibit remove the parts by yourself ! However, any of the following situation happened, are not included in the warranty:

3.1 Damage caused by any modification or repair privately and without company's permission.

3.2 Damage because of an irresistible natural disasters and man-made damage.

3.3 Damage caused by supply power not according to the electrical specification or the bad environment.

3.4 Damage caused by not following user manual's security items and using instruction3.5 Damage caused by without the permission of the company maintenance person,disassemble, repair, modification or add additional accessories privately.

3.6 Irresistible natural disasters.

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