SUN2000 Inverter Product Installation, Commissioning and Maintenance Introduction V1.0

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23/02/2016

Contents

- SUN2000 Family General Introduction
- SUN2000 Installation
- SUN2000 **Commissioning**
- SUN2000 Trouble Shooting
- SUN2000 Warranty Service
- Q&A

SUN2000 Solar Plant solution introduction

Full Range of Huawei Inverter Products

SUN2000 @400V	8/12kTL@2MPPT	17/20/23kTL	33KTL
SUN2000 @480V MV	28kTL		
Datalogger & Control	Smart Logger1000		PLC Module
Remote Monitoring	Neteco1000s	Neteco APP	FusionSolar Cloud

SUN 2000 Family

SUN2000-8KTL,12KTL,17KTL,20KTL,23KTL,28KTL

Front view

Bottom view

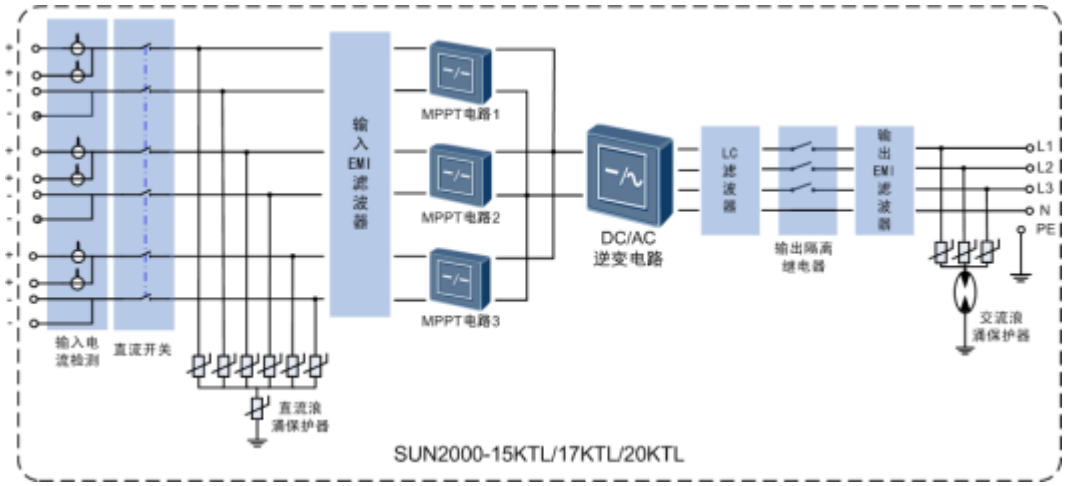
SUN2000 Family

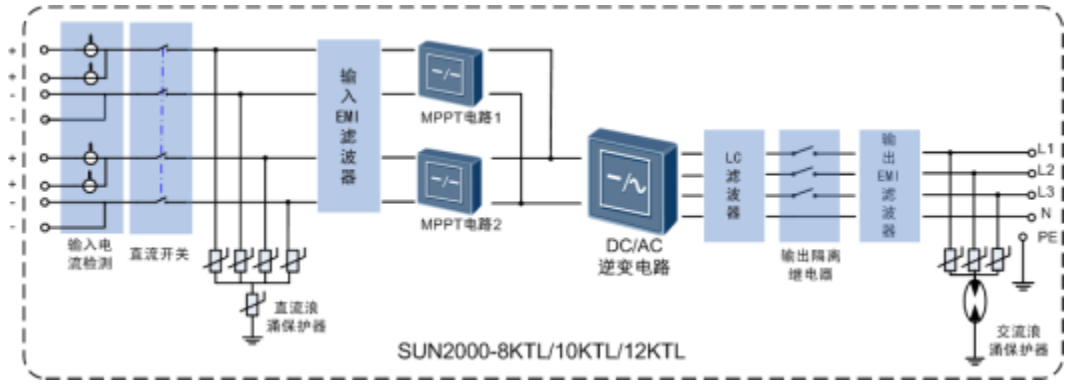
SUN2000-33KTL

Front view

Bottom view

SUN2000 Circuit Introduction

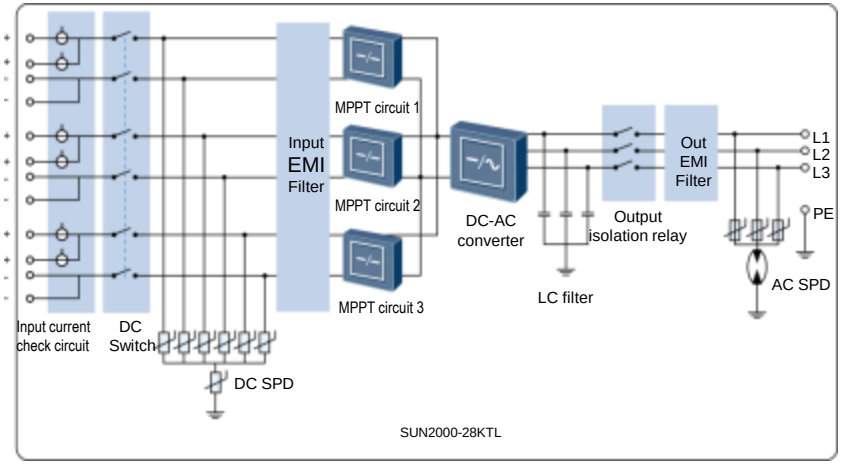




circuit	功能介绍
Input current detection	Monitor each string’s current and detect the failure
DC switch	Isolate the strings, it is easy and safe for maintenance.
SPD	SPD is designed to limit transient overvoltage and divert current to earth, so as to limit the amplitude of this overvoltage to a value that is not hazardous for the electrical installation
EMI Circuit	Filter the noise from the system and make sure to meet EMC standard
MPP Tracker	Monitor voltage, current and max power in real-time to get the max output efficiency.
Invert circuit	Convert DC power to AC power
LC filter	Filter the high frequency noise and get “clean” AC power
Relay	Redundant design and isolate the circuit to protect the system.

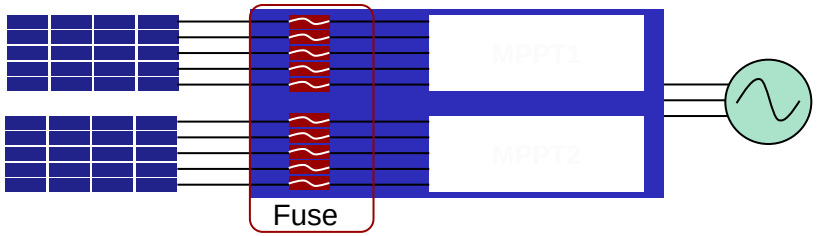
DC Fuse Free for Safe System

Huawei SUN2000: No DC fuse



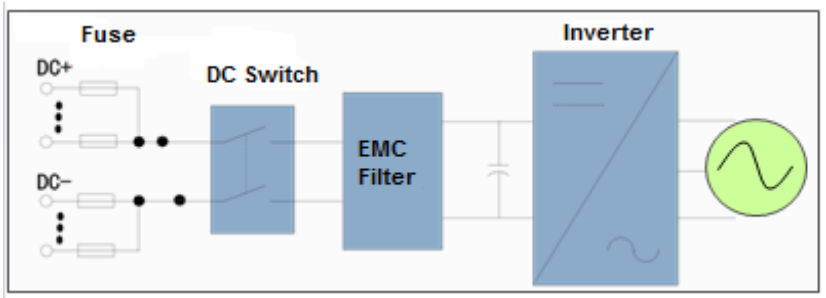
Huawei SUN2000: 3 MPPT in 2+2+2 configuration, Each MPPT short circuit current is less than 10A when fault happened in PV, the IGBT can withstand the current and no damage

Industry: 2-MPPT string inverter with DC fuse



Fuse: regular replacement in 4-5 years
Each MPPT with 5 strings, Need fuse protect when short circuit

Industry: Central inverter with fuse and load switch



DC distribution box integrated, fuse and load switch instead of breaker, it is hard to maintain.

String Inverter (SUN2000-8, 12, 17, 20 and 23KTL)

Technical Specifications	SUN2000-8KTL	SUN2000-12KTL	SUN2000-17KTL	SUN2000-20KTL	SUN2000-23KTL
Efficiency					
Max. efficiency	98.5%	98.5%	98.6%	98.6%	98.6%
European efficiency	98.0%	98.0%	98.3%	98.3%	98.3%
Input					
Max. DC input	9,100 W	13,700 W	19,200 W	22,500 W	23,600 W
Max. input voltage	1000 V	1000 V	1000 V	1000 V	1000 V
Max. input current per MPPT	18 A	18 A	18 A	18 A	18 A
Max. short circuit current per MPPT	25 A	25 A	25 A	25 A	25 A
Operating voltage range	200 V - 950 V	200 V - 950 V	200 V - 950 V	200 V - 950 V	200 V - 950 V
MPP voltage range at full loading	320 V - 800 V	380 V - 800 V	400 V - 800 V	480 V - 800 V	480 V - 800 V
Rated input voltage	620 V	620 V	620 V	620 V	620 V
Max. number of inputs	4	4	6	6	6
Number of MPP trackers	2	2	3	3	3
Output					
Rated output power	8,000 W	12,000 W	17,000 W	20,000 W	23,000 W
Max. apparent output power	8,800 VA	13,200 VA	18,700 VA	22,000 VA	23,000 VA
Rated output voltage	3×230V/400V+N+PE 3×220V/380V+N+PE	3×230V/400V+N+PE 3×220V/380V+N+PE	3×230V/400V+N+PE 3×220V/380V+N+PE	3×230V/400V+N+PE 3×220V/380V+N+PE	3×230V/400V+N+PE 3×220V/380V+N+PE
AC power frequency	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz
Max. output current	12.8 A	19.2 A	27.2 A	32 A	33.5 A
Adjustable power factor	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging
Max. total harmonic distortion	＜3%	＜3%	＜3%	＜3%	＜3%

String Inverter (SUN2000-28KTL)

Technical Specifications	SUN2000-28KTL
	Efficiency
Max. efficiency	98.7%
European efficiency	98.4%
	Input
Max. DC input	28,200 W
Max. input voltage	1000 V
Max. input current per MPPT	18 A
Max. short circuit current per MPPT	25 A
Operating voltage range	200 V - 950 V
MPP voltage range at full loading	480 V - 800 V
Rated input voltage	680 V
Max. number of inputs	6
Number of MPP trackers	3
	Output
Rated output power	27,500 W
Max. apparent output power	27,500 VA
Rated output voltage	3×277 V/480 V+PE
AC power frequency	50 Hz/60 Hz
Max . output current	33.5 A
Adjustable power factor	0.8 leading ... 0.8 lagging
Max. total harmonic distortion	< 3%

String Inverter (SUN2000-33KTL)

Technical Specifications	SUN2000-33KTL
	Efficiency
Max. efficiency	98.6%
European efficiency	98.3%
	Input
Max. DC input	33,800 W
Max. input voltage	1000 V
Max. input current per MPPT	23 A
Max. short circuit current per MPPT	32 A
Operating voltage range	200 V - 980 V
MPP voltage range at full loading	480 V - 850 V
Rated input voltage	620 V
Max. number of inputs	6
Number of MPP trackers	3
	Output
Rated AC output power	30,000 W
Max. apparent output power	33,000 VA
Rated output voltage	220V - 230V, 3W+N+PE / 380V - 400V, 3W+N+PE
AC power frequency	50 Hz / 60 Hz
Max. output current	48 A
Adjustable power factor	0.8 leading ... 0.8 lagging
Max. total harmonic distortion	< 3%

HUAWEI

String Inverter (SUN2000-8, 12, 17, 20 , 23, 28 and 33KTL)

Protection	
Input-side disconnection protection	Yes
Anti-Islanding protection	Yes
AC over current protection	Yes
DC reverse-polarity protection	Yes
PV array string fault monitoring	Yes
DC surge arresters	Type II
AC surge arresters	Type II
Insulation monitoring	Yes
Residual current detection	Yes

SUN2000 Family Dimensions and Weight

Model	Dimensions W*H*D(mm)	Weight(kg)
SUN2000-8KTL	520*610*255	40
SUN2000-12KTL		40
SUN2000-17KTL		48
SUN2000-20KTL		48
SUN2000-23KTL		48
SUN2000-28KTL		48
SUN2000-33KTL	550*770*270	50

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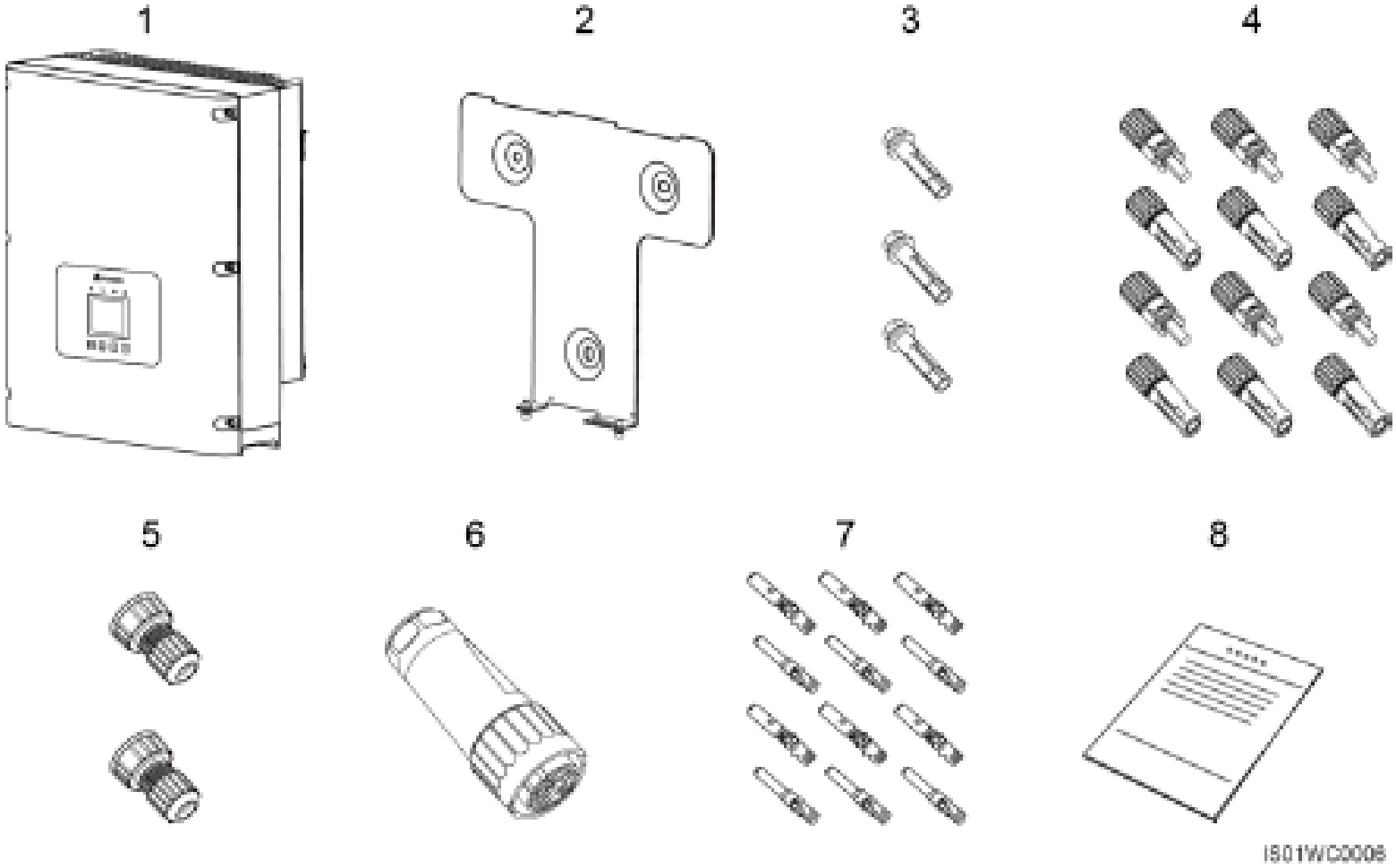
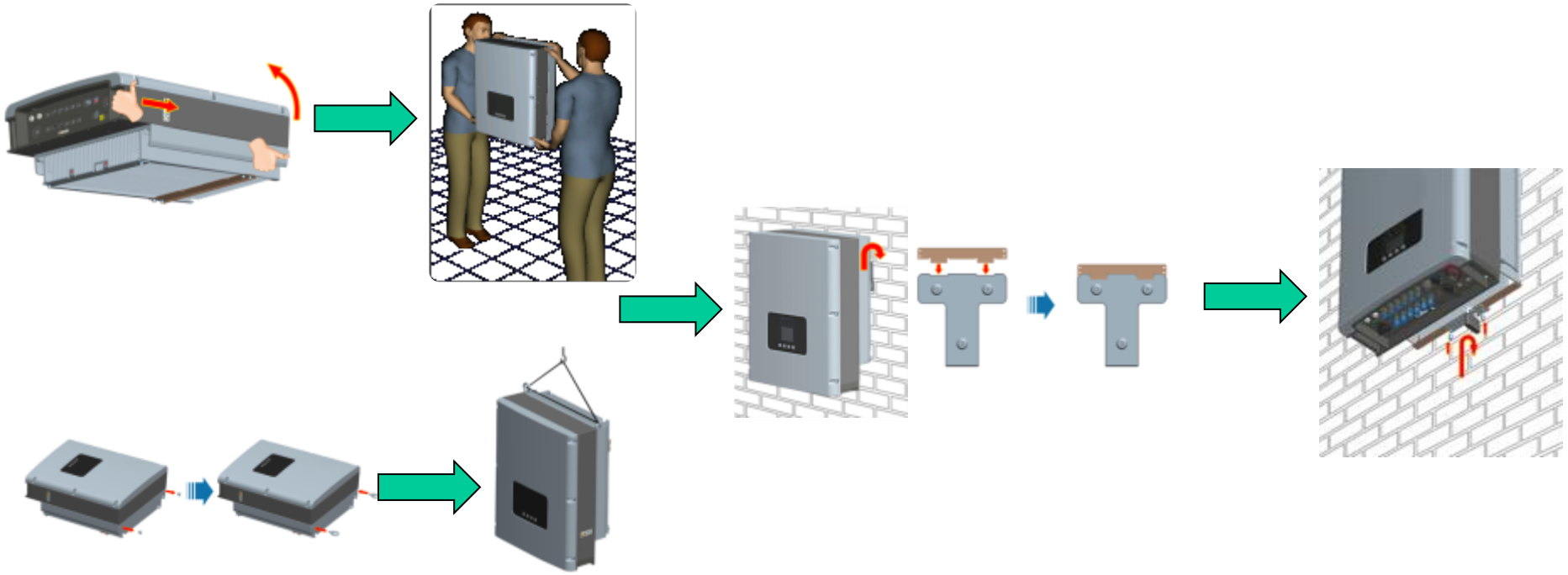
What is inside of the inverter box(8KTL to 28KTL)?

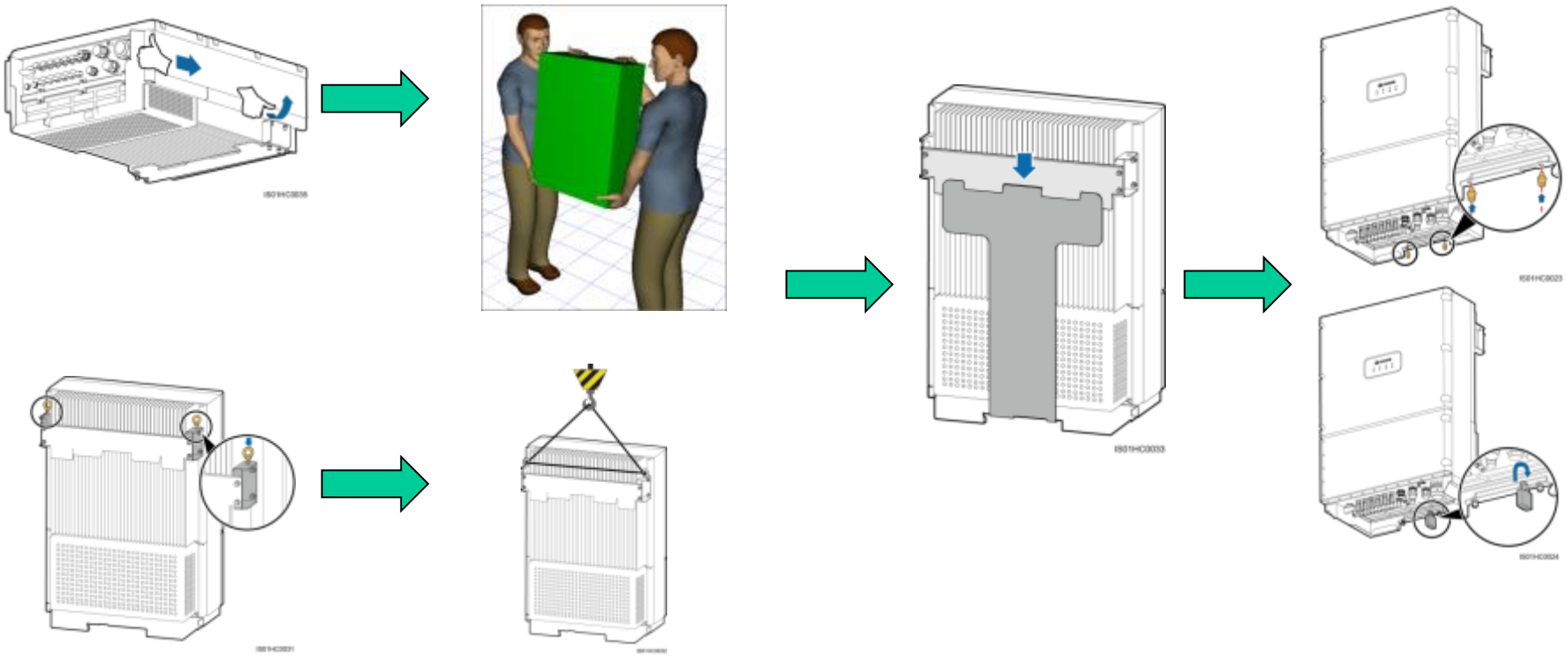


Sun2000 Installation Procedure



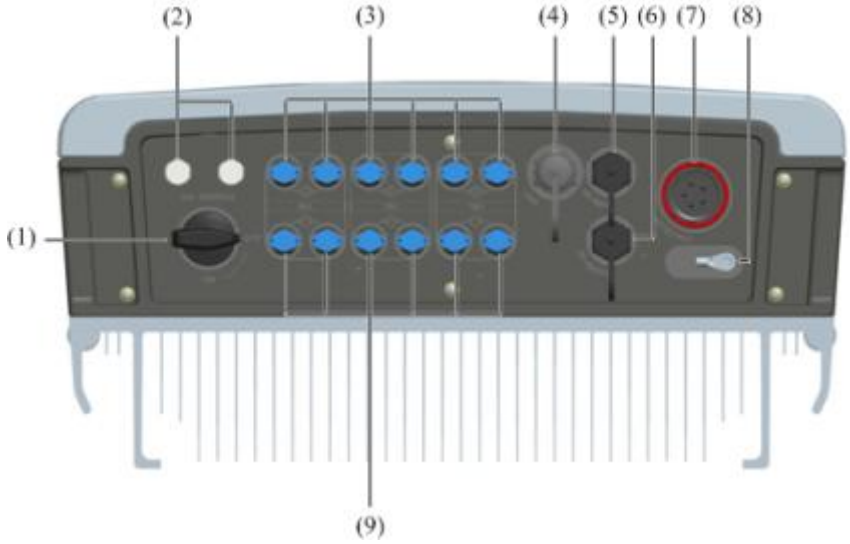
Two Technician Is A Must To Move The Inverter For Safety

Sun2000 Installation Procedure



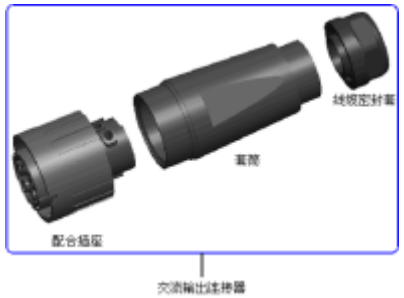
SUN2000-33KTL

Sun2000 Cable Connection



(1) DC switch
(2) Ventilation valves
(3) DC input terminals (positive)
(4) USB port
(5) RS485 IN port
(6) RS485 OUT port
(7) AC output terminal
(8) Protective earthing (PE) bolt
(9) DC input terminals (negative)

Amphenol H4

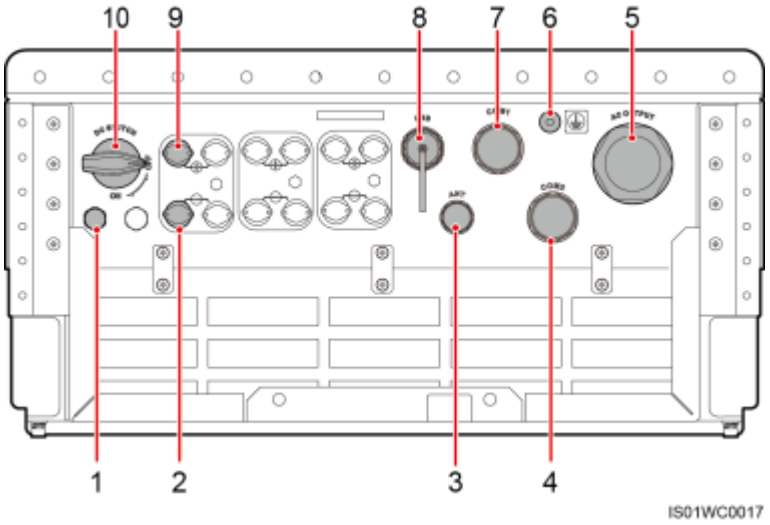


Amphenol C16/3

Notice

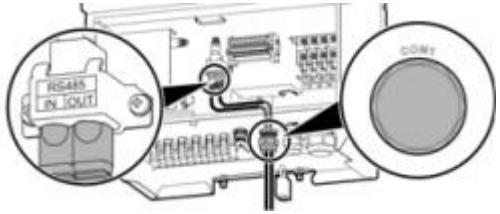
- **Grounding cable:** first connection should be grounding cable, then other cables. It is for safety , 10mm Socket wrench is the best tool to tight the cable. ;

Sun2000-33ktl Cable Connection

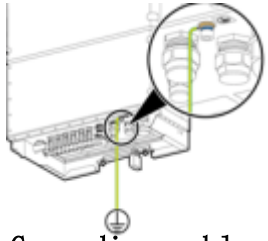


No.	Component Name (Silk Screen)	Description
1	Vent valve	2 PCS
2	Negative DC input terminal (-)	Six routes
3	Antenna (ANT)	Reserved WiFi port
4	RS485 port (COM2)	N/A
5	AC output port (AC OUTPUT)	N/A
6	Protective earthing (PE) bolt	N/A
7	RS485 port (COM1)	N/A
8	USB port (USB)	N/A
9	Positive DC input terminal (+)	Six routes
10	DC switch (DC SWITCH)	N/A

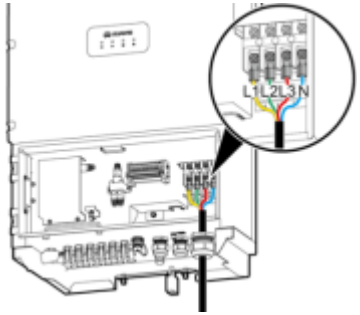
Amphenol H4



RJ45 Or terminal block

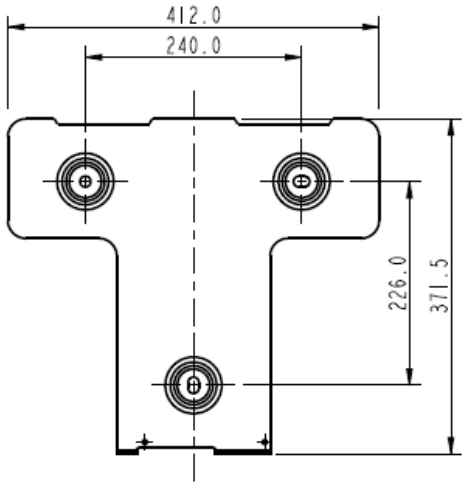
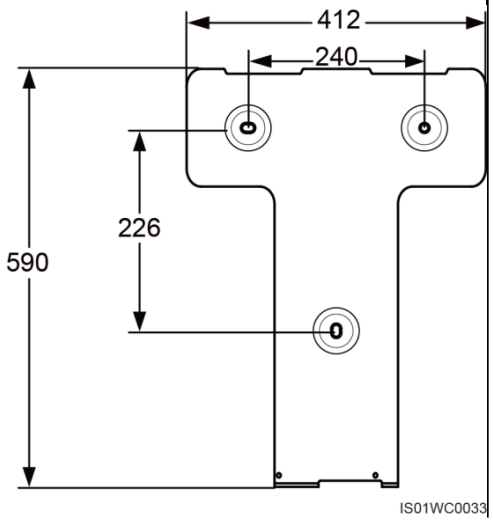


Grounding cable

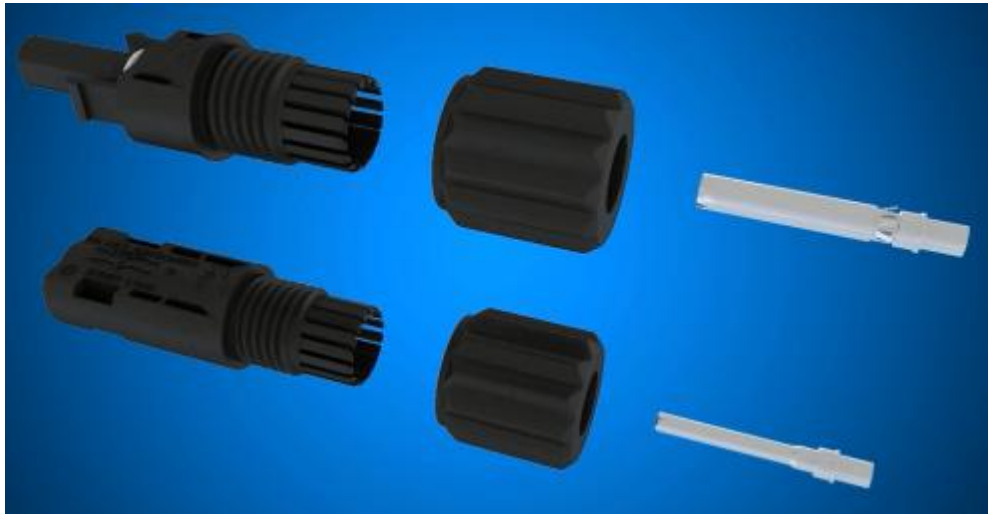


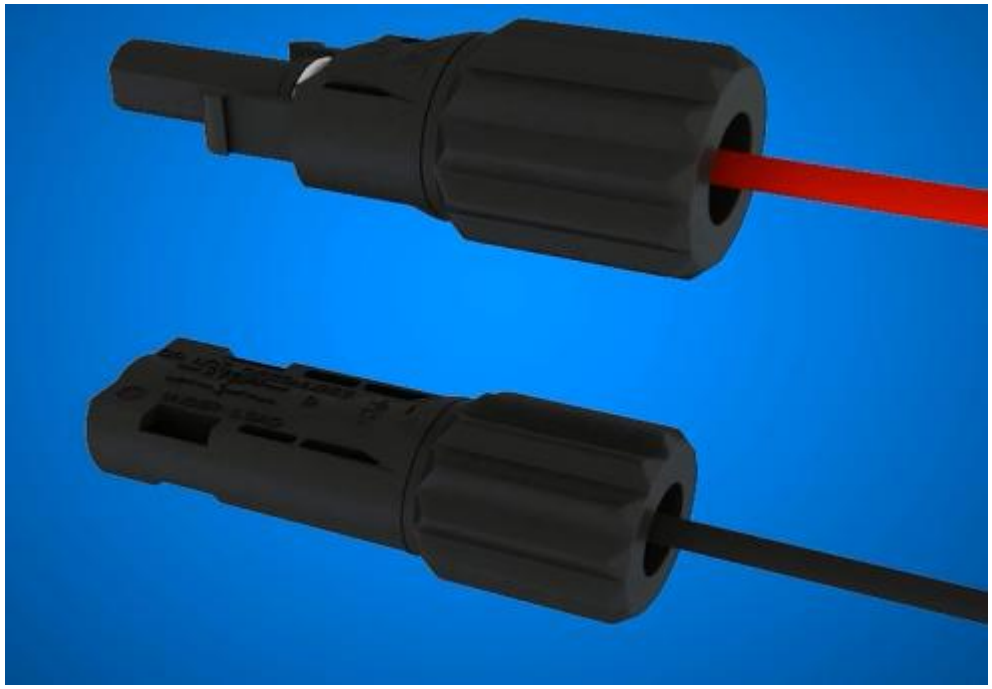
AC connector

Sun2000 Installation Comparison

Series	Panel	AC Connection	RS485
SUN2000-20/28KTL		Amphenol C16/3 3*10mm² Copper Cable 3*16mm² Aluminum Cable	Outdoor network cable + RJ45
SUN2000-33KTL		Waterproof PG Terminal + OT Connector 4*16mm² Copper Cable 4*25mm² Aluminum Cable	1. Outdoor network cable + RJ45 2. Armored shielded twisted pair

SUN2000 DC Strings Connection

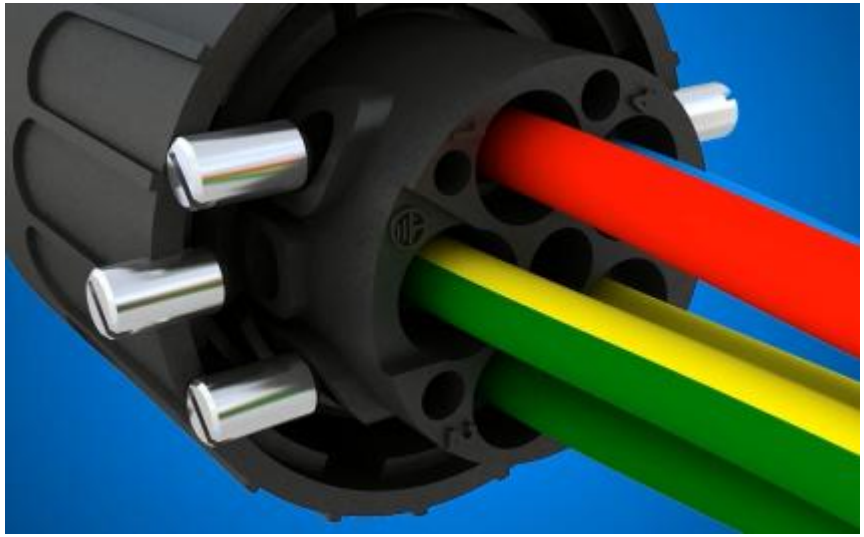




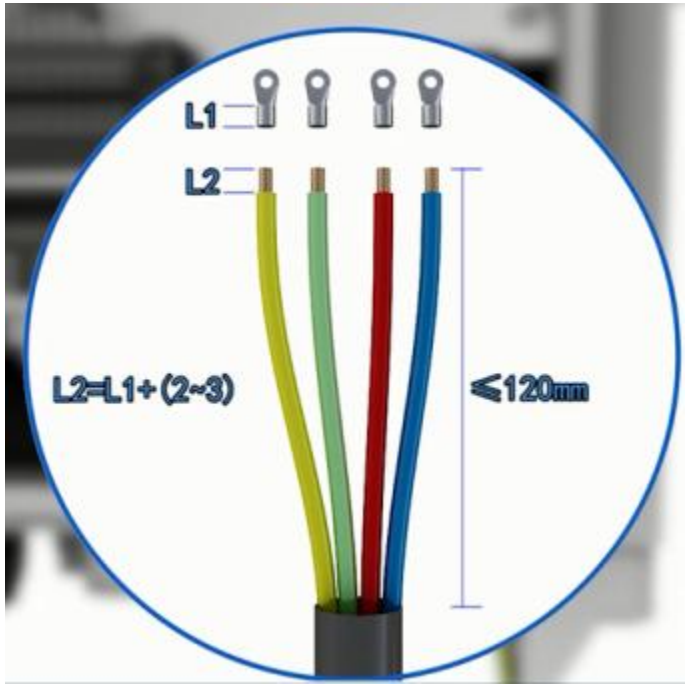
1. Fully intermateable with industry standard
2. Long-term UV and Ozone resistance
3. Highest current rating in industry
4. Highest voltage rating in industry
5. Complete Cable Assemblies available
6. Low contact resistance means low power loss
7. Ready for field assembly

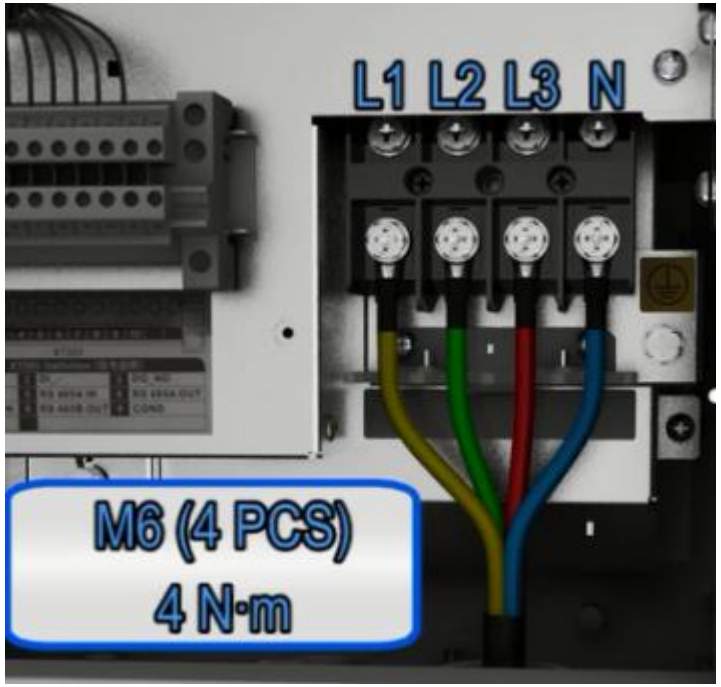
If you make a mistake and get reversed
- Do not disconnect it directly;
- Do not switch off the DC side;
- Solution is to wait until weak light, then disconnect the strings and switch off the inverter.

SUN2000 AC Connection

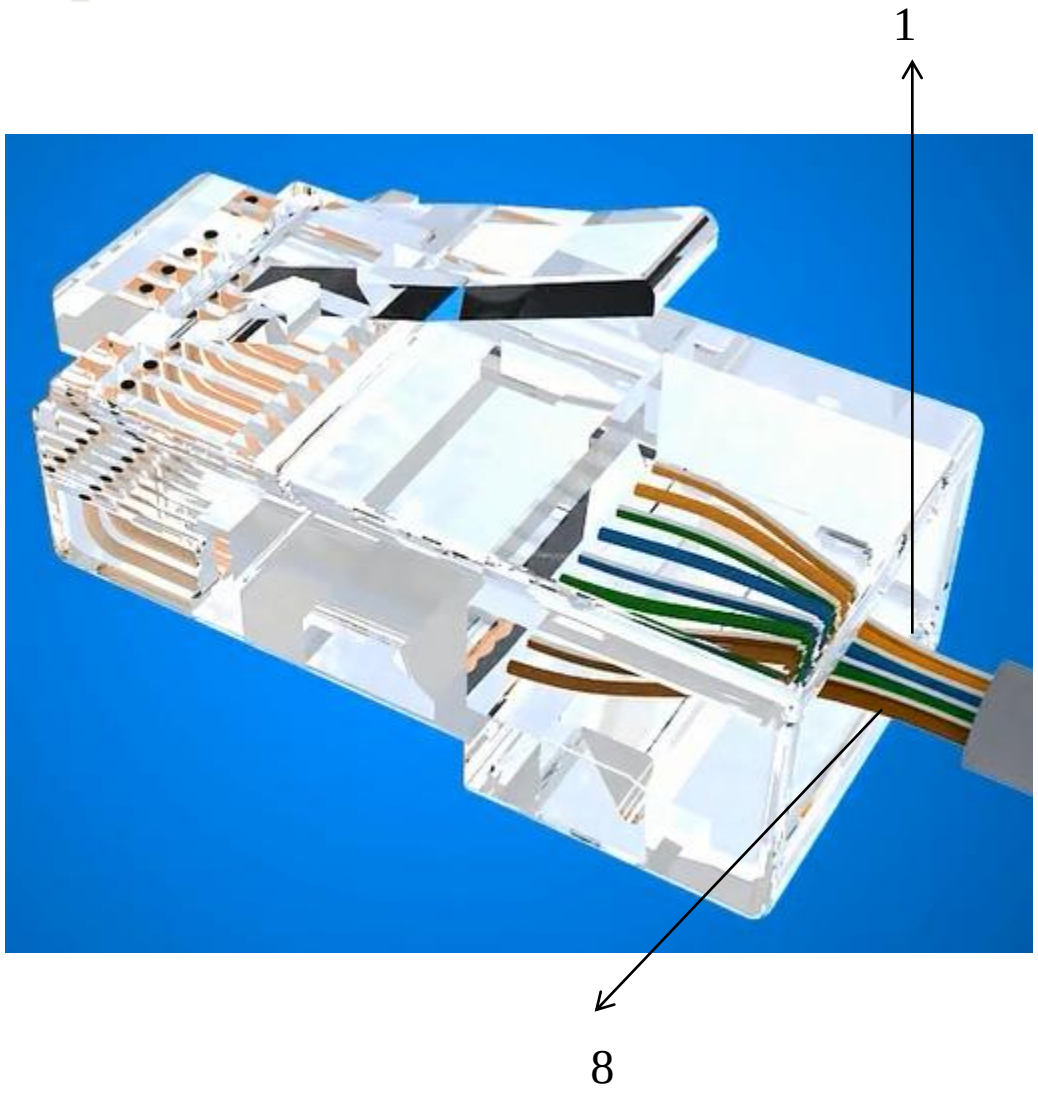


SUN2000-33KTL AC Connection



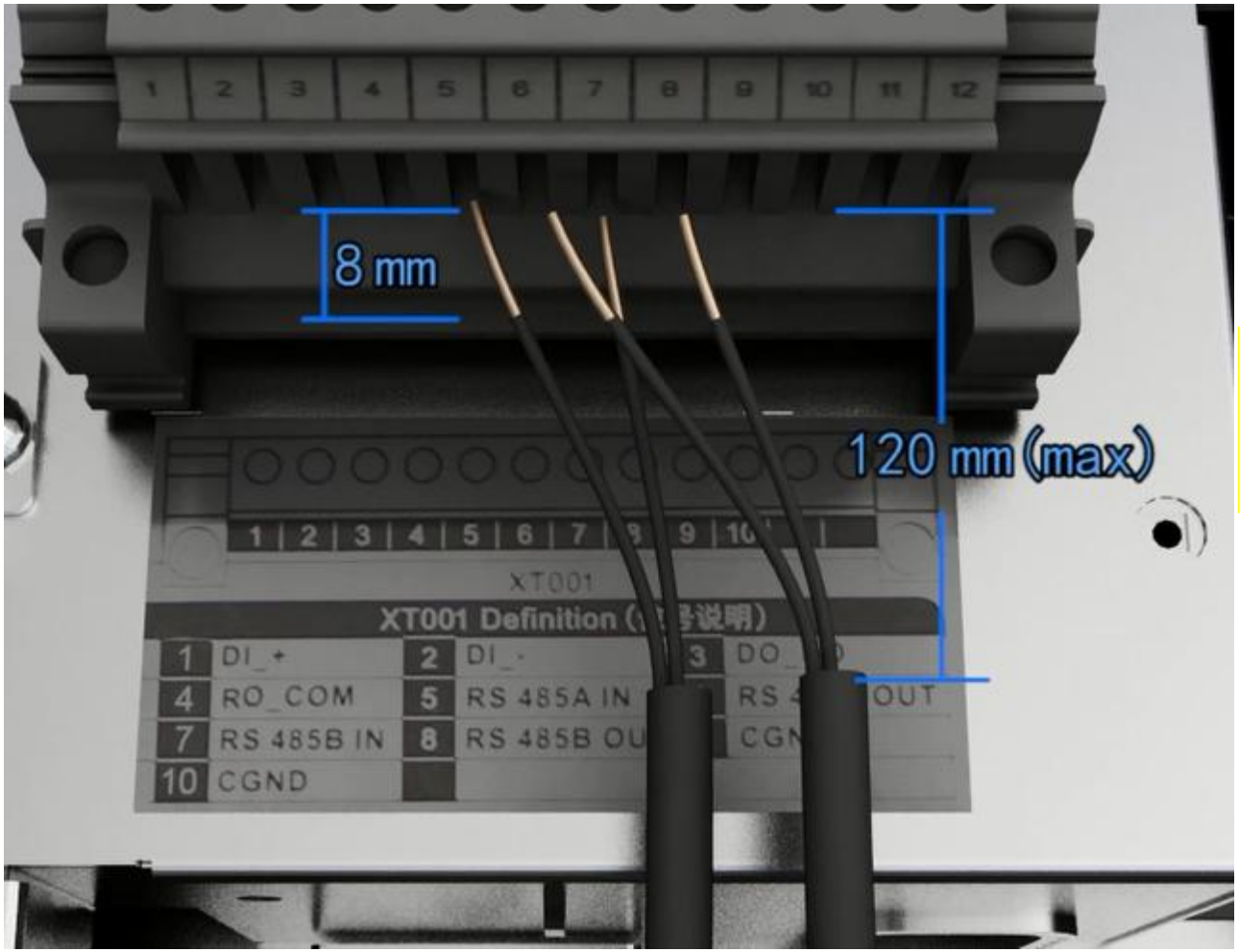


SUN2000 RJ45 Connection



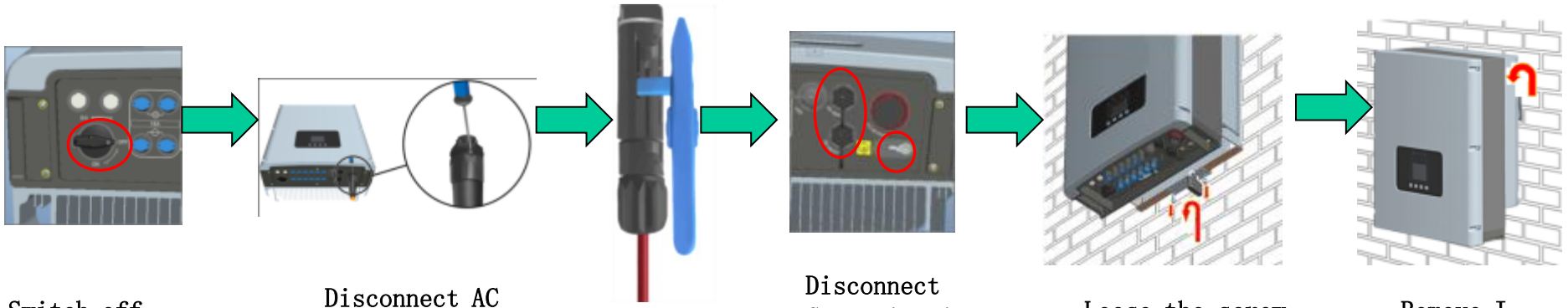
Pin	Definition
1	RS485A
2	RS485B
3	PGND
4	RS485A
5	RS485B
6	PGND
7	PGND
8	PGND

Sun2000-33KTL Communication Terminal Block Connection



No Grounding Cable For Communication Connection

Sun2000 Replacement Procedure



Switch off DC&AC power

Disconnect AC connector

Disconnect DC power

Disconnect Communication cable

Loose the screw at the bottom

Remove I Inverter

Notice

- If you only want to check the connection, switch off the inverter via display;
- If the inverter get failure or stop, be careful. The conduct maybe is live;
- Check the system and make sure it is safe to disconnect the strings or AC cables;

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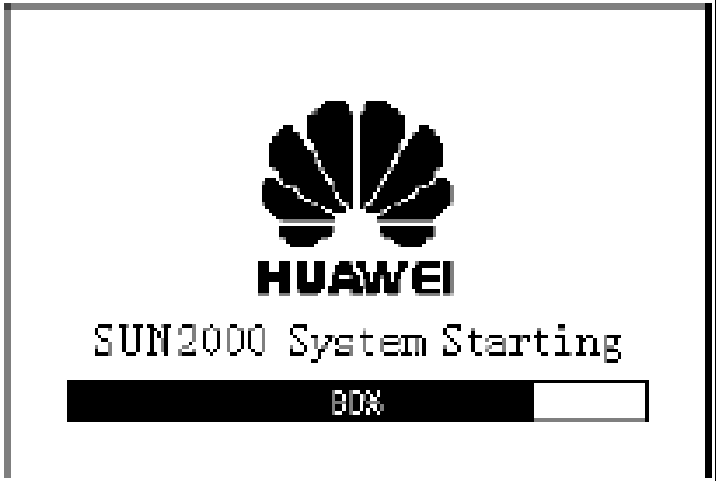
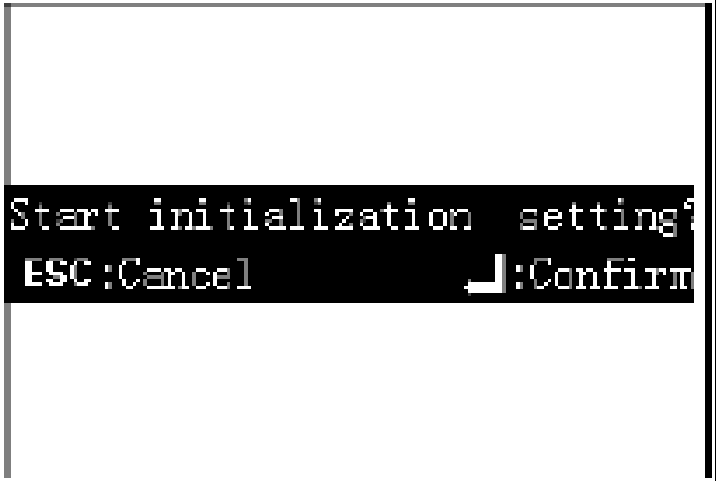
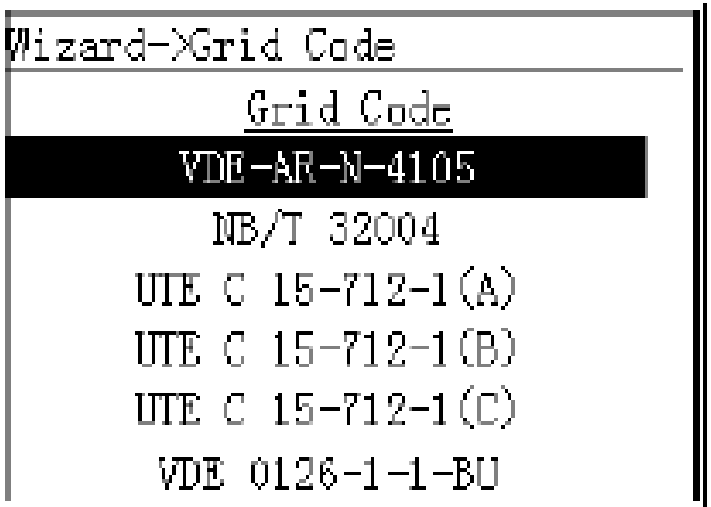
Sun2000 First Time Power On(1)

LCD Screen	Procedure
	1. Start with the initialization screen displayed while the system is loading. The default system language is **English**.
	2. Press ↵ to enter the **Wizard** screen. To return to the default screen, press ESC. To reset initialization parameters, choose **Settings** > **Wizard** as **Advanced User**.

Sun2000 First Time Power On(2)

LCD Screen	Procedure
	3. Select a display language and press ↵. The screens will be displayed in the selected language.
	4. Set the date and time and press ↵. • To select a parameter, press ↵. To set the parameter value, press ▲ or ▼. • The date format is **YYYY-MM-DD**. **YYYY**, **MM**, and DD stand for year, month, and day respectively. The time format is **hh-mm-ss**. **hh**, **mm**, and ss stand for hour, minute, and second respectively.

Sun2000 First Time Power On(3)



5. Set the power grid code and press ↵.

To select a power grid code, click ▲ or ▼.

NOTICE

Incorrectly setting **Grid Code** will cause a SUN2000 startup failure.

NOTE

- For details about power grid codes, see B Power Grid Codes. Select an appropriate power grid code based on the requirements of the country or region.

6. On the **Finished** screen, press ↵.

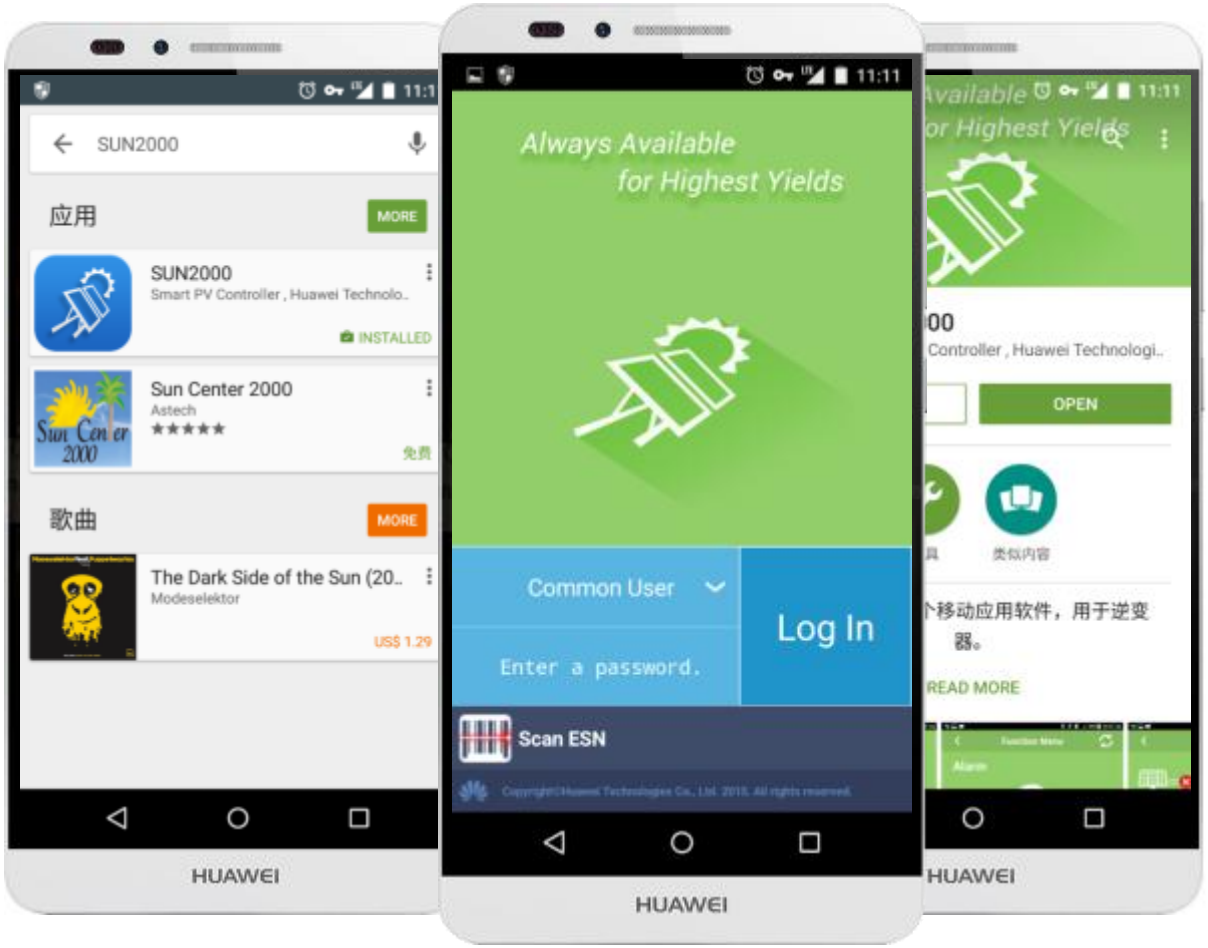
Preparing for SUN2000-33KTL Commissioning

1. Search ‘SUN2000’ in Google Play
2. Click SUN2000, and install the app.
3. Click Open to launch the app.

OR

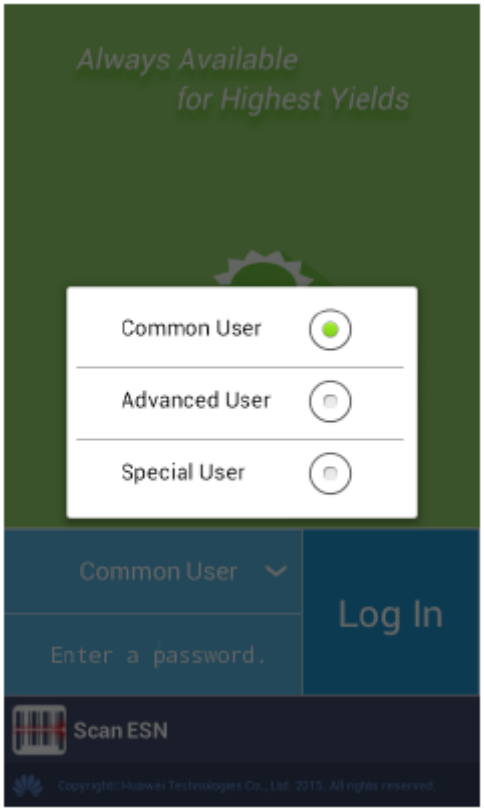
Download the app via the link below:

https://play.google.com/store/apps/details?id=com.huawei.inverterapp&hl=zh-en



Sun2000-33KTL First Time Power On(1)

1
Open
SUN2000 app

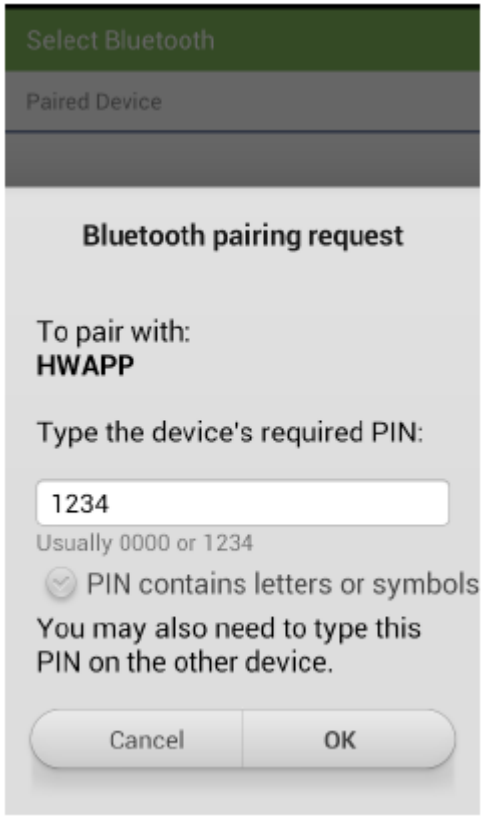


2
Advanced user
Password:00000a

3
Search
Inverters

Sun2000-33KTL First Time Power On(2)

4
Find the Bluetooth device



5
Pairing

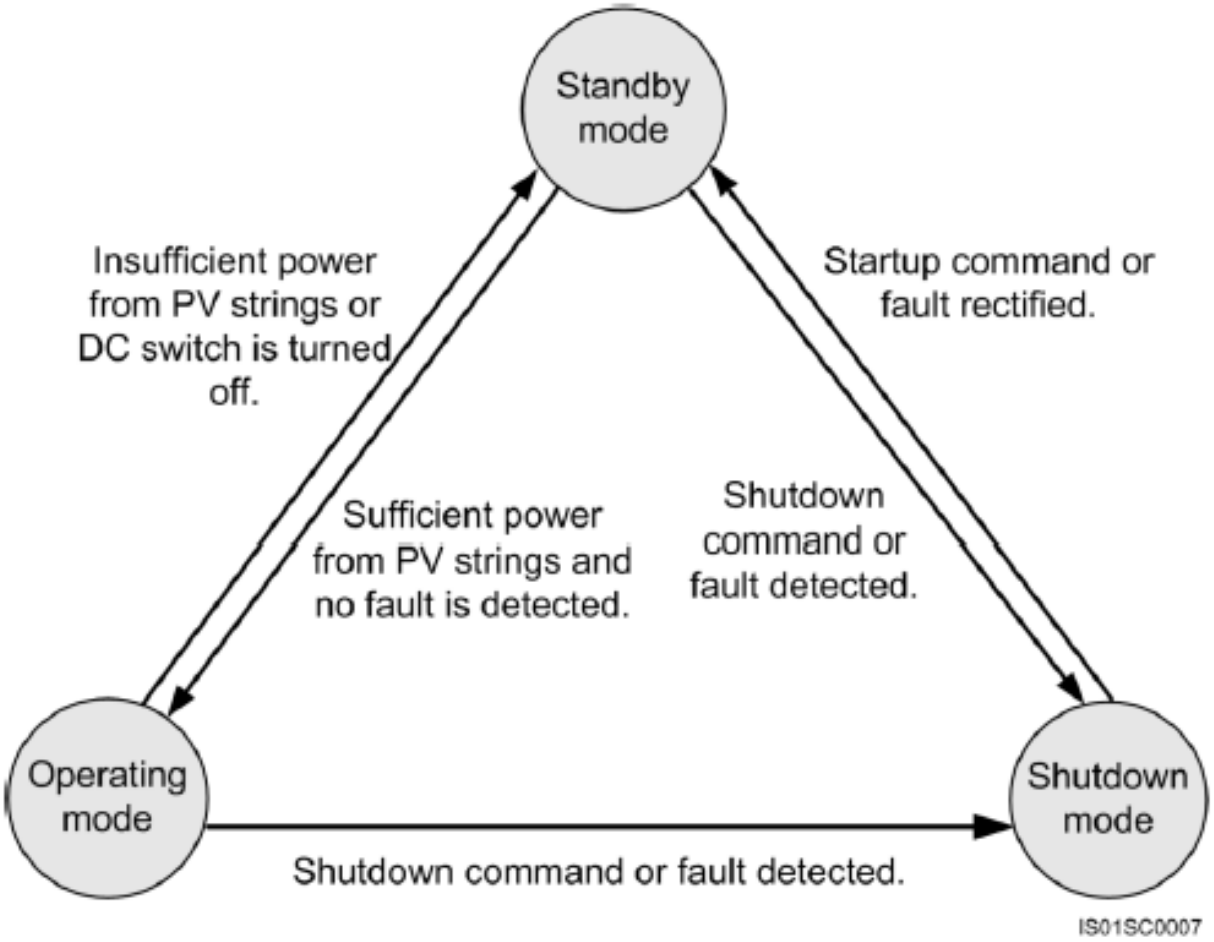
6
Set parameters

Sun2000 Commissioning Parameters

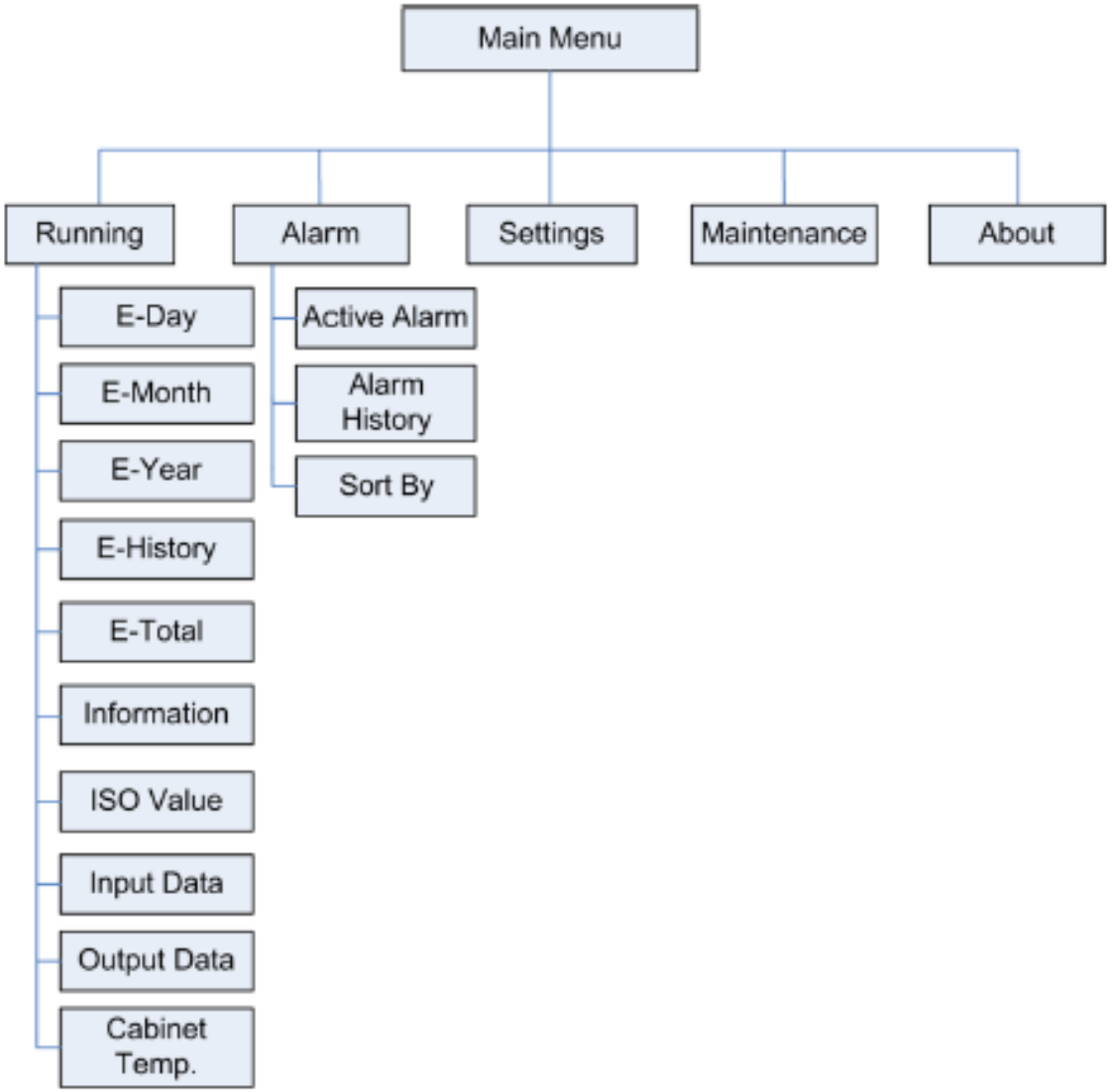
Just remember 4 parameters in mind for commissioning setting
1.Language;
2.Data and time
3.Grid code;
4.RS485 Address(if the inverter is the last one, please enable the match resistor);

If you want to change the commissioning parameters, do it again in 《setting-wizard》。

SUN2000 Working Mode



SUN2000 Menu



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- SUN2000 Trouble Shooting
- SUN2000 Warranty Service
- Q&A

Sun2000 Trouble Shooting for HUAWEI Inverter

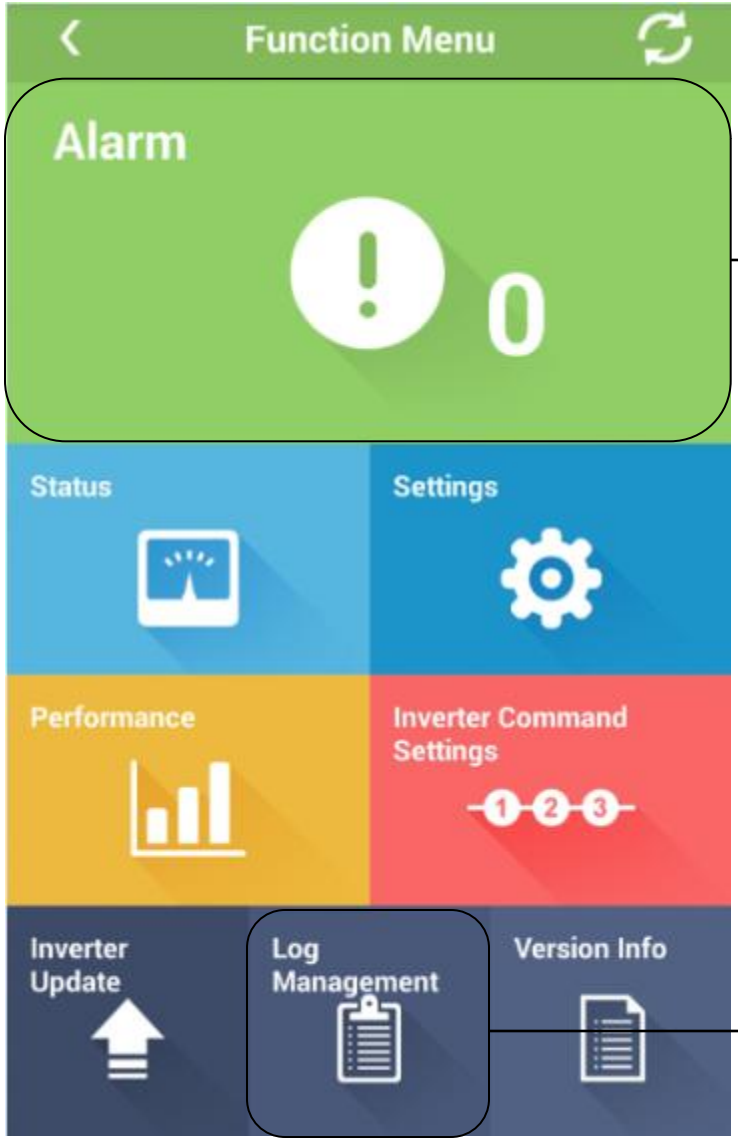
1. Check Input And Output Parameters, if parameter are nomal, then go to next;
2. Check The Alarm ID And Reason ID, please refer to the alarm list;
3. Export The Logs From Inverter Via USB Or Phone;
4. Send to uk_inverter_support@huawei.com, we will come back in 30 minutes;

Input: Each String Voltage And Current

Output : Each Phase Voltage And Current

Alarm ID And Reason ID

SUN2000-33KTLTrouble Shooting



Alarm ID and Reason ID

Download the data and keep the data in the phone

Sun2000 Trouble Shooting Checking

Polarity of each string to verify that wires are connected properly—check before connecting to the inverter, since reverse polarity could harm it.
Open-circuit voltage (Voc) to confirm that series strings are properly wired. All parallel strings' Voc should be within 5% of each.
Short-circuit current (Isc) to confirm that all strings' short-circuit currents are within 5% of each other.
Grounding continuity to verify that adequate grounding has been established by measuring the array to earth ground resistance. A very high resistance means that there's a bad connection (for example, an improperly torqued ground screw) in the grounding system.
Insulation resistance testing (sometimes referred to as "megger testing") confirms that there is no short-circuit connection between the positive and negative conductors and ground (see "Insulation Resistance" table for the pass/fail criteria and test voltages as recommended by IEC62446).
Performance verifications ensure that the inverter is supplying the predicted output under operation based on the irradiance, ambient and cell temperatures, AC and DC voltage drop, and the inverter's efficiency.

Contents

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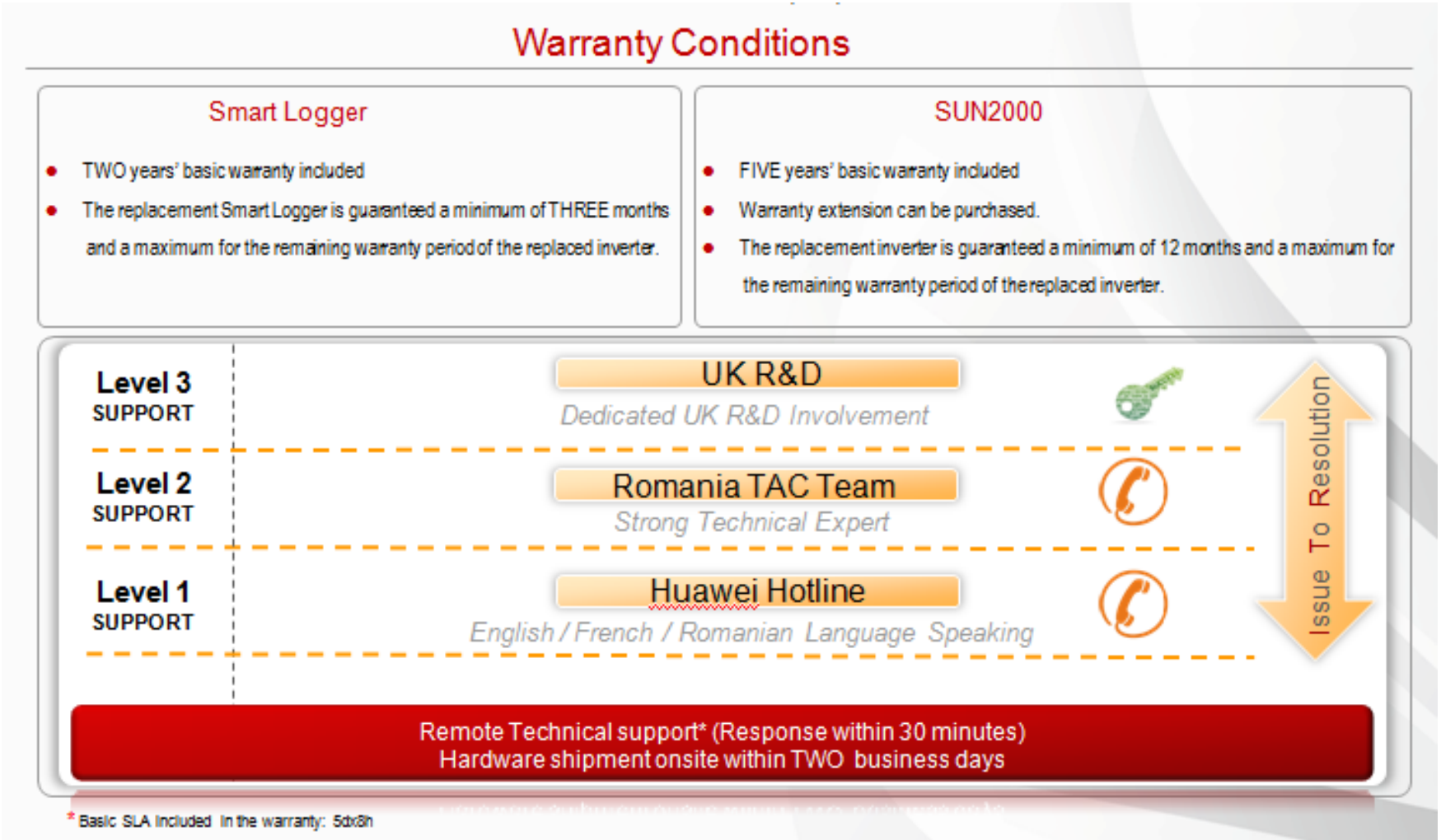
Technical Support

Technical Support

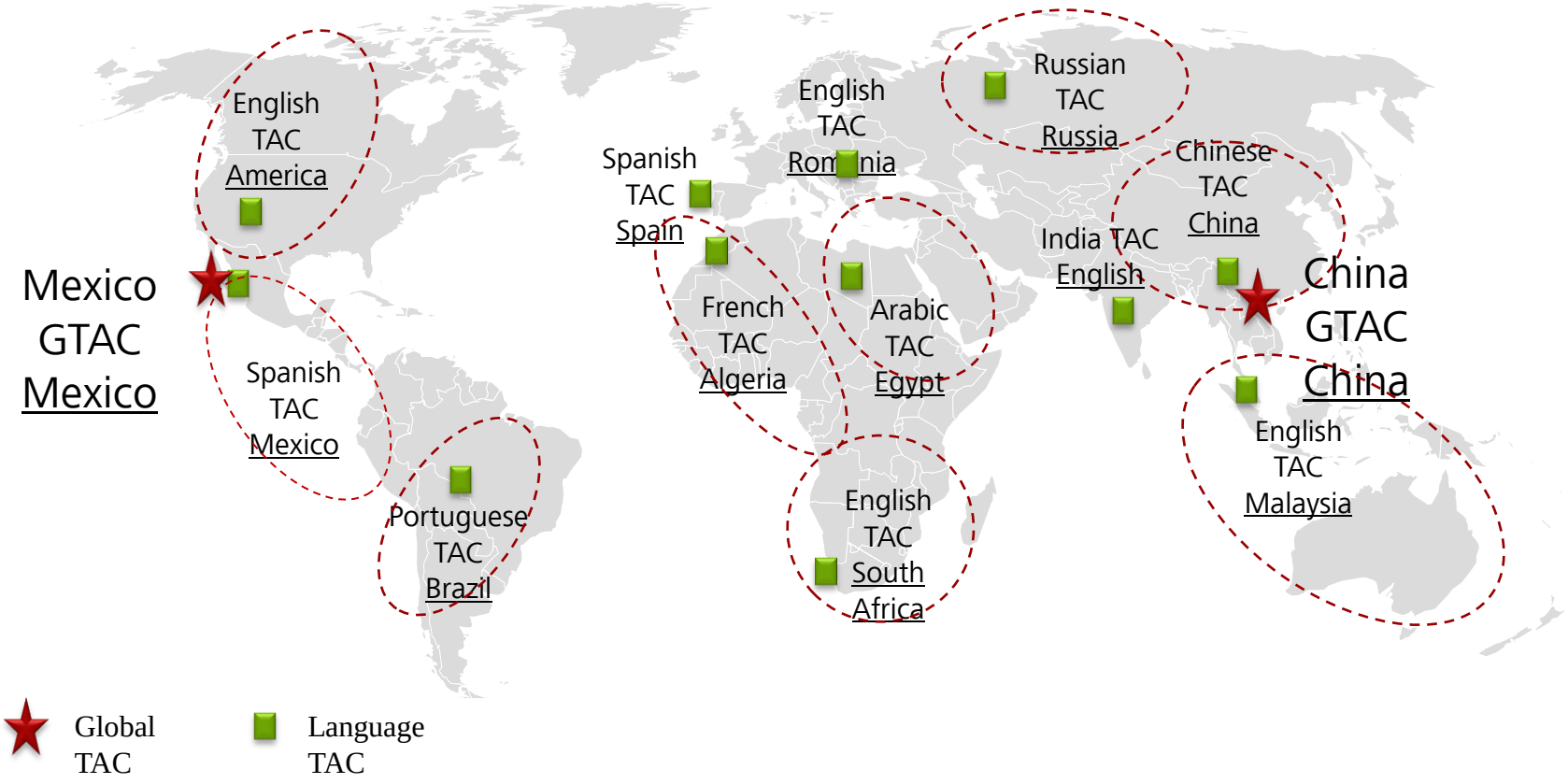
- Huawei Customer Support Center certified:
  - ISO/IEC 27001:2005 (data security)
  - ISO/IEC 20000:2011
- Available Hotline 24/7 in Four Languages*
- Remote Emergency Recovery
- Stong Technical Expertise
- SPOC Technical interface: **TAC_support@huawei.com**

Replacement agreement with Anesco:
1.O&M team will use Aneso spare parts first and collect failure inverters back to Anesco warehouse;
2.Anesco will send request to Liming for regular checking;
3. Huawei will send service to test the failure inverters and make a report for testing;
4. Repair or replace the failure inverters in following week;

Warranty Conditions



Global TAC Support



TAC: Technical Assistance Center

Training Reference Documentations

Reference documentation:

- Smart PV Power Plant Solution Description 01
- SUN2000 (8KTL-28KTL) Quick Installation Guide 13
- SUN2000 (8KTL-28KTL) User Manual 08
- SUN2000 APP User Manual
- SUN2000-(24.5KTL, 28KTL) Quick Installation Guide
- SUN2000-(33KTL, 40KTL) Quick Installation Guide 05
- SUN2000-(33KTL, 40KTL) User Manual 03
- iManager NetEco V600R007C60 APP User Manual

Q&A

Date: 14年1月

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