

DN3 Series(30-50KTL)

User Manual

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Notice

This manual contains important safety instructions, installation, electrical connections, commissioning, maintenance, and troubleshooting of the equipment.

Save the manual!

This manual must be stored carefully and be available at all times.

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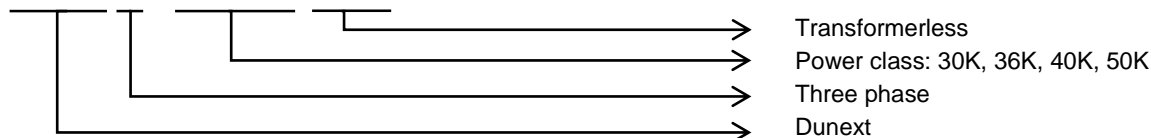
1. About this manual

1.1 Applicability

Please read the product manual carefully before installation, operation, or maintenance of the DN3 Series(30-50KTL). This manual contains important safety instructions and installation instructions that must be followed during installation and maintenance of the equipment.

Designation explanation of the DN3 Series(30-50KTL):

DN3-30KTL



1.2 Target group

This manual is intended for technical professionals for installation, commissioning and maintenance of the solar inverter. The technical personnel has to be familiar with the product, local standards, and electric systems.

1.3 Symbols used

The following types of safety instructions and general information appear in this document:

	'Danger' indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
	'Warning' indicates a hazard with a medium level of risk that, if not avoided, will result in death or serious injury.
	'Caution' indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.
<p>NOTICE</p>	'Notice' indicates a situation that, if not avoided, could result in equipment or property damage.
	'Note' provides tips that are valuable for the optimal operation of the product.

1.4 Acronyms and abbreviations

E	EMI	electromagnetic interference
L	LED	light emitting diode
M	MPP	maximum power point
	MPPT	maximum power point tracking
O	OLED	organic light-emitting diode
P	PV	photovoltaic
R	RCR	ripple control receive
T	THDi	total harmonic distortion

2. Safety







2.1 General safety

The solar inverter has been designed and tested strictly in accordance with international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the solar inverter. Incorrect operation or work may cause:

- ◆ Injury or death to the operator or a third party;
- ◆ Damage to the inverter or other properties.

2.2 Explanation of symbols


Symbols on the type label:

Symbol	Explanation
	Danger. Risk of electric shock!
	Danger of high voltage. Danger to life due to high voltage in the inverter!
	Danger to life due to high voltage. Inverter holds stored energy, wait for 5 minutes to discharge before opening lid.
	Beware of hot surface. The inverter can be hot during operation. Avoid touching during operation.
	Inverter should not be disposed of with the household waste. Disposal information can be found in this manual.
	CE Mark


Symbol	Explanation
RoHS	ROHS Mark

2.3 Important safety instructions

Read this before installing, operating or maintaining the inverter.

 WARNING!	<p>Before installation:</p> <p>Check for damage to inverter and packaging. If you are in doubt, please contact your supplier before installing the inverter. Check the voltages of the solar modules and make sure they are within the limits of the inverter specifications before connecting them to the inverter.</p>
	<p>Installation:</p> <p>Only trained and authorized personnel familiar with local electrical codes may install the inverter. For optimum safety, please follow the steps described in this manual. Keep in mind that the inverter has two voltage carrying sides, the PV input and the AC grid.</p>
	<p>Disconnecting the inverter:</p> <p>Always disconnect the AC line first! Afterwards disconnect the PV lines. Note that the inverter can still be charged with very high voltages at hazardous levels even when it is disconnected from grid and solar modules. Wait at least 5 min. before proceeding, after having disconnected from grid and PV panels.</p>
	<p>Operating the inverter:</p> <p>Before connecting the AC grid to the inverter, make sure that the installation cover is mounted again. The inverter must not be open during operation.</p>
	<p>Maintenance and modification:</p> <p>Only authorized personnel are allowed to repair or modify the inverter. To ensure optimum safety for user and environment, only the original spare parts available from your supplier should be used.</p>
	<p>Functional safety parameters:</p> <p>Unauthorized changes of functional safety parameters may cause injury or accidents to people or inverter. Additionally it will lead to the cancelling of all inverter operating approval certificates.</p>

2.4 System sizing

 WARNING!	<p>When dimensioning a photovoltaic system, it must be ensured that the open circuit voltage of the PV string never exceeds the maximum permissible input voltage of 1100V DC. The PV string open circuit voltage during parallel string operation is 1000V. Higher voltages may result in permanent damage to the inverter.</p>
--	--

The selection of PV string output should be based on the optimum utilization of the invested capital compared to the expected annual energy yield from the system. This optimization depends on local weather conditions and should be considered in each individual case.

The inverter incorporates an input power limiting device which automatically keeps the power at levels that are safe for the inverter. The limitation depends mainly on internal and ambient temperatures. The limitation is calculated continuously and always allows the maximum possible amount of energy to be produced.

Please use the tool supplied by Dunext when dimensioning a photovoltaic system.

3. Introduction

3.1 Block diagram

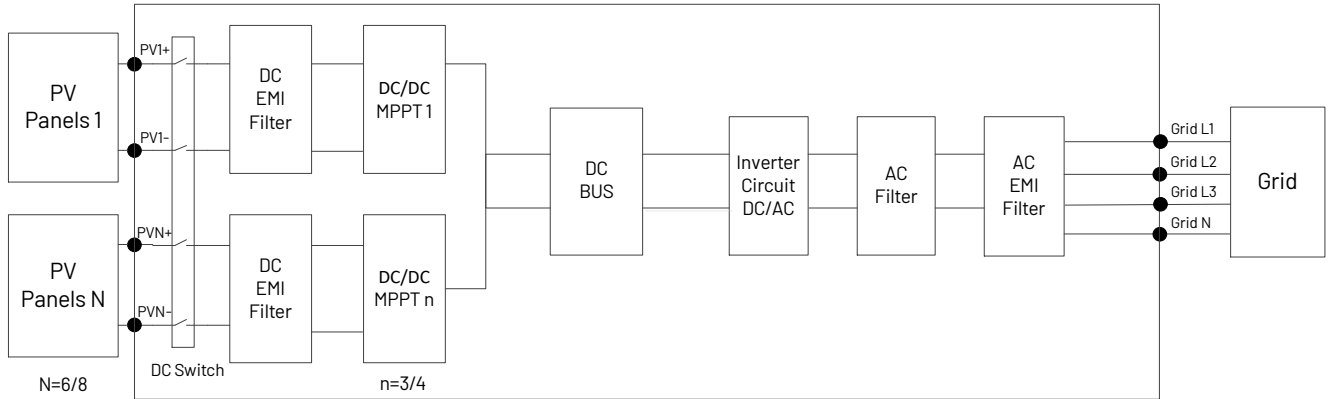
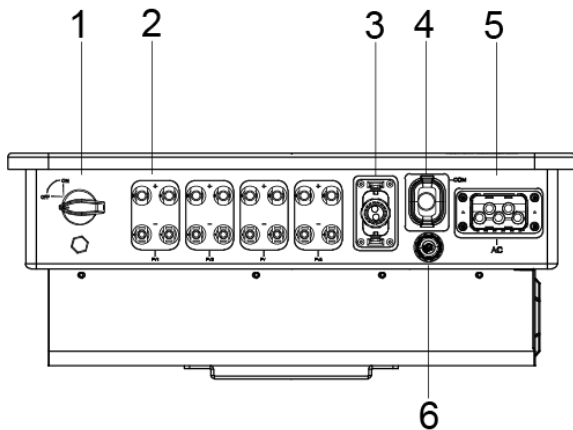


Figure 3-1 Block diagram of DN3 Series(30-50KTL)

3.2 Ports



- (1) DC Switch
- (2) DC (PV terminals)
- (3) I / O port
- (4) Communication port
- (5) AC terminal
- (6) RCR port (Europe Standard)

Figure 3-2 Ports of DN3 Series(30-50KTL)



NOTE!

For safety reasons, the use of a DC switch is recommended. Between the PV modules and the power modules may be mandatory in some countries.

3.3 Dimensions

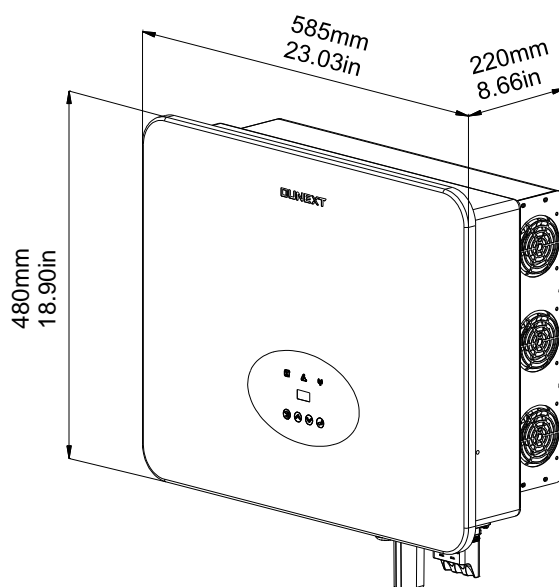


Figure 3-3 DN3 Series(30-50KTL) dimensions

3.4 Technical Specifications

Model	DN3-30KTL	DN3-36KTL	DN3-40KTL	DN3-50KTL
PV Input				
Max. Recommended PV Power [Wp]	45000	54000	60000	75000
Max. PV Input Voltage [V]	1100			
MPPT Voltage Range [V]	180 ~ 1000			
Rated Input Voltage [V]	600			
Start-up Voltage [V]	200			
No. of MPP Trackers	3	3	4	4
No. of Input Strings per Tracker	2 / 2 / 2	2 / 2 / 2	2 / 2 / 2 / 2	2 / 2 / 2 / 2
Max. PV Input Current [A]	40 / 40 / 40	40 / 40 / 40	40 / 40 / 40 / 40	40 / 40 / 40 / 40
Max. Short-circuit Current per MPPT [A]	50 / 50 / 50	50 / 50 / 50	50 / 50 / 50 / 50	50 / 50 / 50 / 50
AC Output				
Rated AC Power [W]	30000	36000	40000	50000
Max. Apparent Power [VA]	33000	39600	44000	55000
Max. AC Current [A]	50	60	66.6	83.3
Rated AC Voltage [V]	3 / N / PE, 220 / 380, 230 / 400			
Grid Frequency [Hz]	50 / 60			
Adjustable Power Factor [cos φ]	0.8 leading ... 0.8 lagging			
Output THDi (@Rated Output)	< 3%			
Efficiency				
Max. Efficiency	98.6%	98.7%	98.8%	98.8%

Model	DN3-30KTL	DN3-36KTL	DN3-40KTL	DN3-50KTL
European Efficiency	97.8%	98.0%	98.0%	98.0%
Protection				
DC Insulation Monitoring			Yes	
Input Reverse Polarity Protection			Yes	
Anti-island Protection			Yes	
Residual Current Monitoring			Yes	
AC Overcurrent Protection			Yes	
AC Short-circuit Protection			Yes	
DC Surge Protection			Yes (Type II)	
AC Surge Protection			Yes (Type II)	
AFCI Protection			Optional	
PID function			Optional	
DC Switch			Yes	
General Data				
Dimension (W * H * D) [mm]			585 * 480 * 220	
Weight [kg]			37	
Display			LED + OLED	
Communication			RS485 and USB (Standard), Wifi (Standard), 4G or Ethernet (Optional)	
Ambient Temperature Range [°C]			-25 ~ +60	
Relative Humidity			0 ~ 100%	
Operating Altitude [m]			≤ 2000	
Standby Self Consumption without PID [W]			< 1	
Topology			Transformerless	
Cooling			Air Cooling	
Degree of Protection			IP65	
Certifications & Standards				
Grid Regulation	NB/T32004, ORDINANCE140, VDE4105, VDE0126, VDE-AR-N 4105, UNE217002, EN 50549-1, EN 62920			
Safety Regulation	IEC 62109-1, IEC 62109-2			
EMC	EN/IEC 61000-6-1, EN IEC 61000-6-4, EN/IEC 61000-6-3, EN IEC 61000-6-2, EN IEC 61000-3-11, EN 61000-3-12			

4. Installation and startup

	Before installation and maintenance, AC and DC side doesn't carry electricity, but if DC side is just disconnected, capacitance still contains electricity, so please wait for at least 5 minutes to ensure the capacitors completely release the energy and inverter is not electrified.
	Inverters must be installed by qualified person.

4.1 Package information

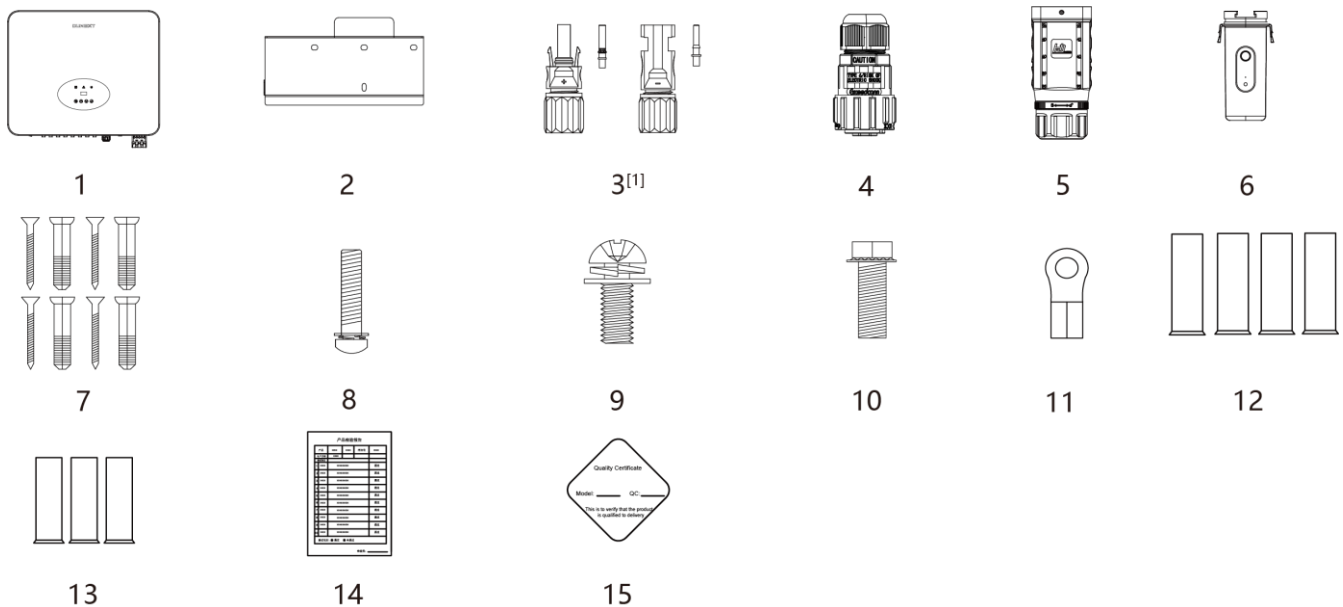


Figure 4-1 Product and accessories

No.	Name	Quantity
1	DN3 Series(30-50KTL)	1
2	Mounting Bracket	1
3	[1] There are 6 PV+ connectors for DN3-30KTL/36K; There are 8 PV+ connectors for DN3-40KTL/50K. There are 6 PV- connectors for DN3-30KTL/36K; There are 8 PV- connectors for DN3-40KTL/50K. (Recommended Vendors: Dongguan Vaconn Electronic Technology Co.,Ltd.)	6/8
4	RCR Terminal (Eur. Standard)	1
5	AC Waterproof Cover (Recommended Vendors: Jang Su Handa Power Technology Co.,Ltd.)	1
6	WIFI or 4G Module or Ethernet	1
7	Expansion tubes & Expansion screws	4
8	Hexagon socket set screw	1
9	Back panel fixing screw	1
10	Ground screw	1

No.	Name	Quantity
11	Ground Terminal	1
12	Tubular Terminal (E25-22)	4
13	Tubular Terminal (E16-18)	3
14	Factory Report	1
15	Quality Certificate	1

4.2 Installation environment

- In order to achieve optimal performance, the ambient temperature should be kept lower than 45 °C.
- For the convenience of checking the LCD display and possible maintenance activities, please install the inverter at eye level.
- Inverters should not be installed near inflammable or explosive items. Any strong electro-magnetic equipment should be kept away from installation site.
- Product label and warning symbol shall be clear to read after installation.
- Please do not install inverter under direct sunlight, rain and snow.

4.3 Installation position



WARNING!

- 1) The installation method and mounting location must be suitable for the inverter's weight and dimensions.
- 2) Mount on a solid surface.
- 3) Select a well-ventilated place sheltered from direct sun radiation.

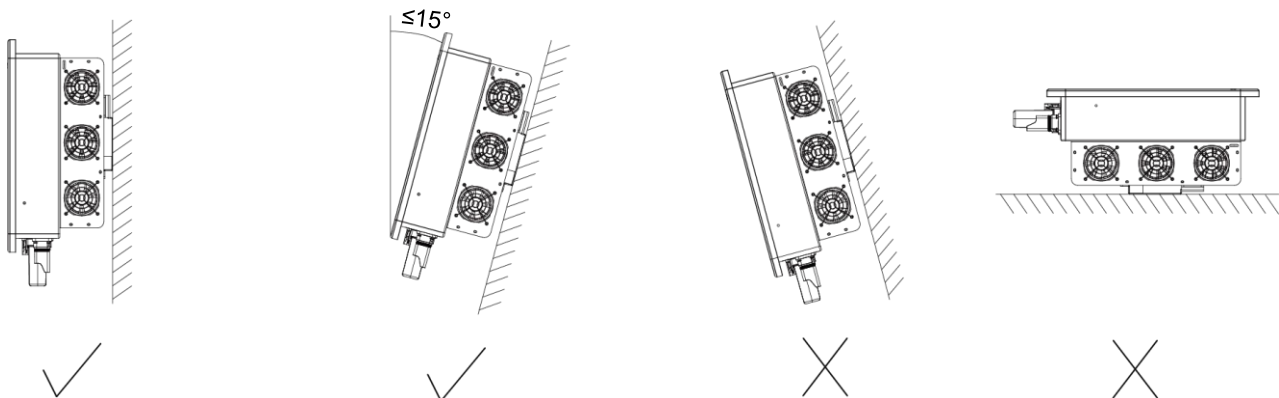


Figure 4-2 Installation position

In consideration of heat dissipation and convenient dismantlement, the minimum clearances around the inverter should be no less than the following value.

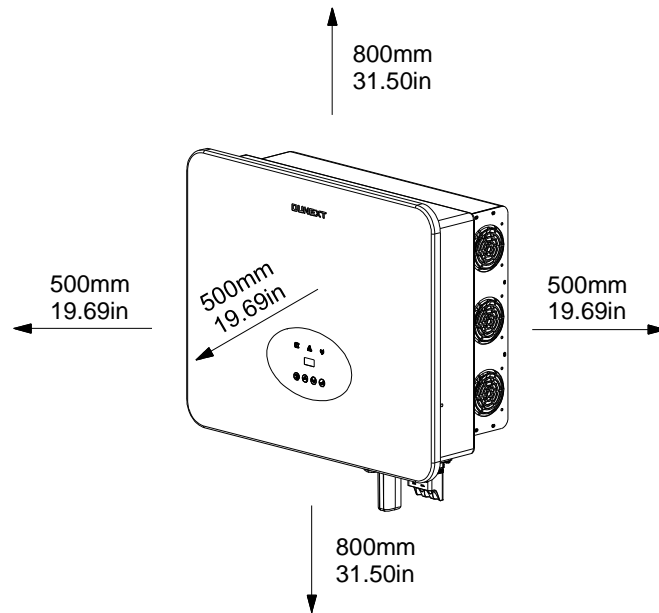


Figure 4-3 Installation space

4.4 Installation steps

1. Drill 4 fixed $\Phi 11$ holes in the wall according to the dimensions.

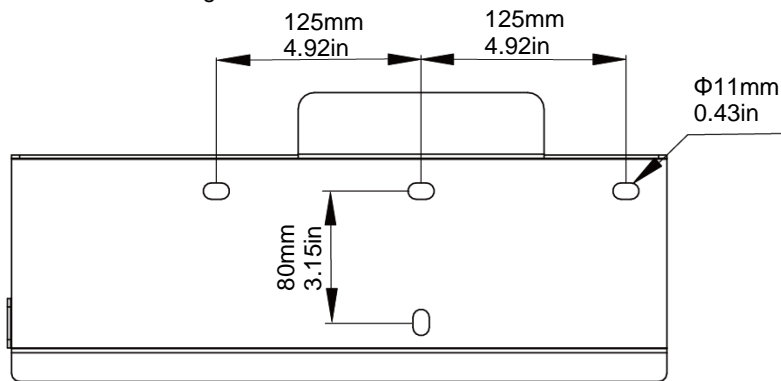


Figure 4-4

2. Fix the wall mounting bracket on the wall with 4 expansion bolts in accessory bag.

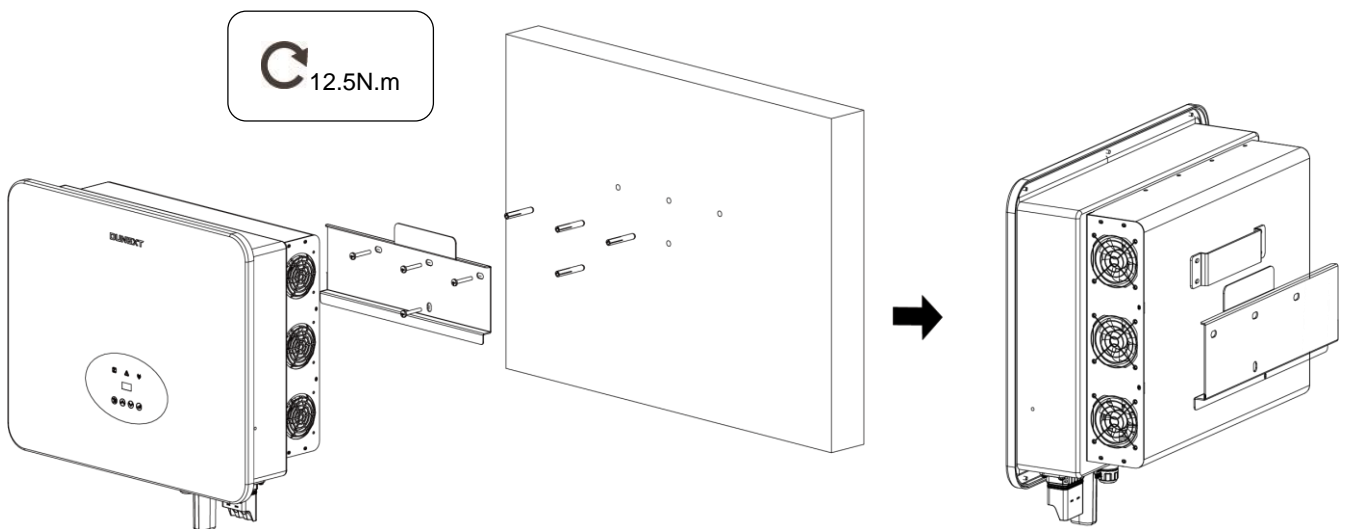


Figure 4-5 Wall mount bracket

3. Place the inverter on the wall-mounted bracket and install the M5 fix screw.

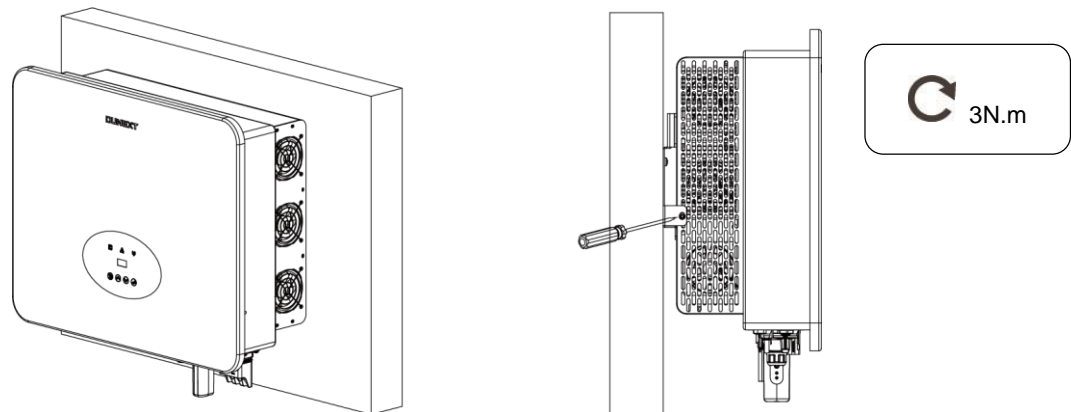


Figure 4-6 Mounting the inverter

4.5 Electrical connection

4.5.1 Connection to the PE cable

One can earth the inverter enclosure of a second PE or equipotential bonding, which is required under local regulations. This prevents touch current if the original protective conductor fails.

Cable size: 4mm²

Connection steps:

- Strip the PE cable insulation.
- Insert the stripped cable into the ring terminal.
- Clamp the end of the ring terminal.
- Unscrew the screw of the PE connector.
- Insert the ring terminal on the PE connector.
- Fix gasket on the PE connector.
- Tighten the screw of the PE connector.

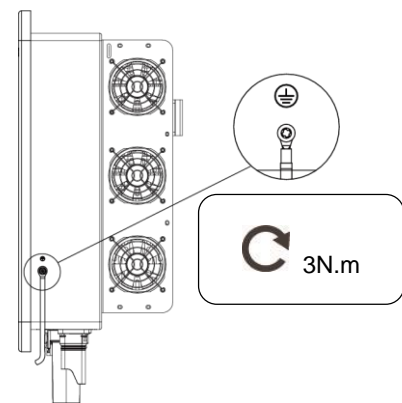


Figure 4-7

4.5.2 Connection to the grid (AC output)



WARNING!

- Add breaker or fuse to AC side, the specification should be more than 1.25 times of rated AC output current.
- The PE line of inverter should be connected to the earth, make sure the impedance of neutral wire and earth wire less than 10 ohm.
- Disconnect the breaker or fuse between the inverter and the utility grid.
- All inverters incorporate a certified internal Residual Current Device (RCD) in order to protect against possible electrocution and fire hazard in case of a malfunction in the PV array, cables or inverter. There are 2 trip thresholds for the RCD as required for certification (IEC 62109-2:2011). The default value for electrocution protection is 30mA, and for slow rising current is 300mA.

Connect the inverter to the grid as follows:

1. Strip off N/L1/L2/L3 cables as figure 4-8:

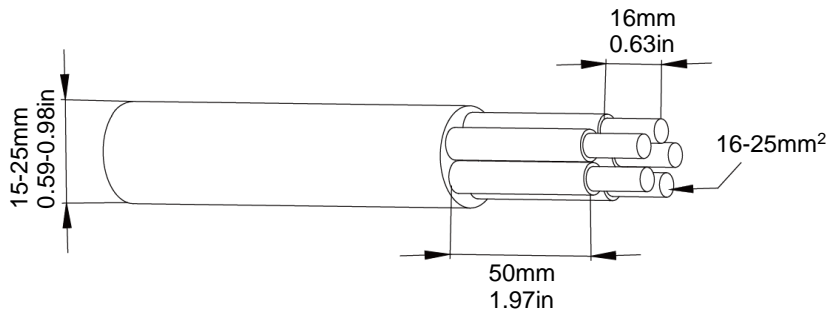


Figure 4-8 Recommended cable parameters

2. Crimp N/L1/L2/L3 cables as figure:

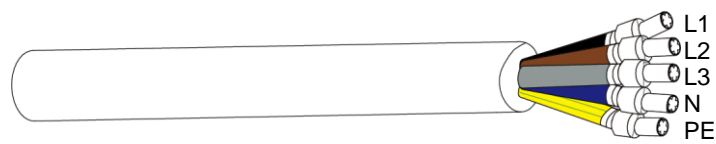


Figure 4-9

3. Pass the crimped AC wire into the AC connector.

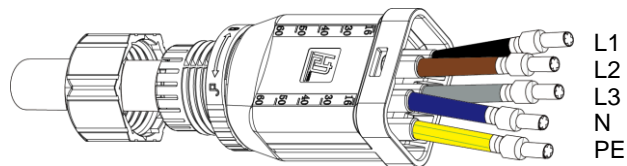


Figure 4-10

4. The cables are inserted into the terminal according to the wire sequence (L1/L2/L3/N/PE), so that the insulating terminal is flush with the surface of the terminal, and the crimping screw torque is $4.0 \pm 0.1\text{N.m}$.

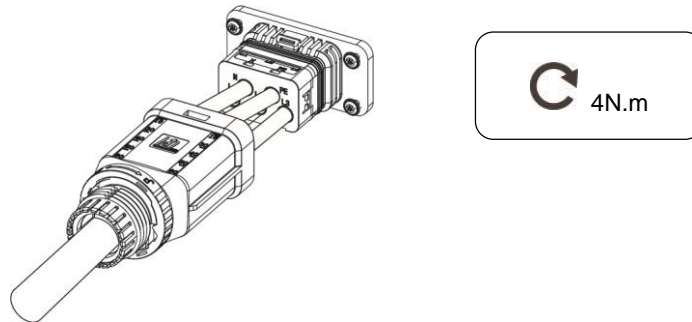


Figure 4-11

5. Insert the main part of AC connector into the terminal and hear a "click" sound.

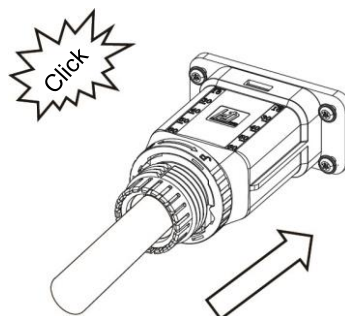


Figure 4-12

6. Use a wrench to tighten the nut, and there is a "click" sound.

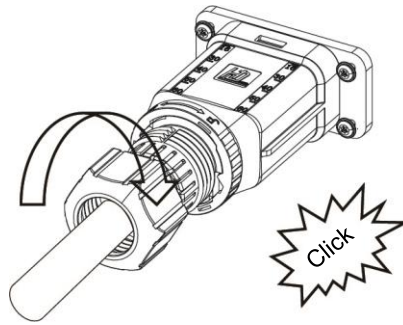


Figure 4-13

7. Complete the installation.

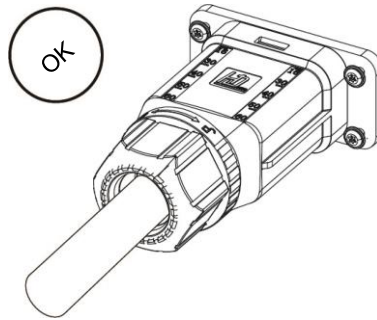


Figure 4-14

Disassembly the inverter from the Grid:

1. Hold the unlocking buckle with one hand and rotate it in the direction of the mark, and turn the nut in the opposite direction.

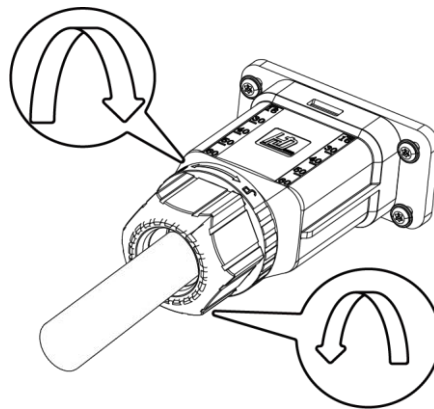


Figure 4-15

2. Use a screwdriver to press against the unlocked position and hold the wire nut and pull it back to complete the separation of the male and female ends.

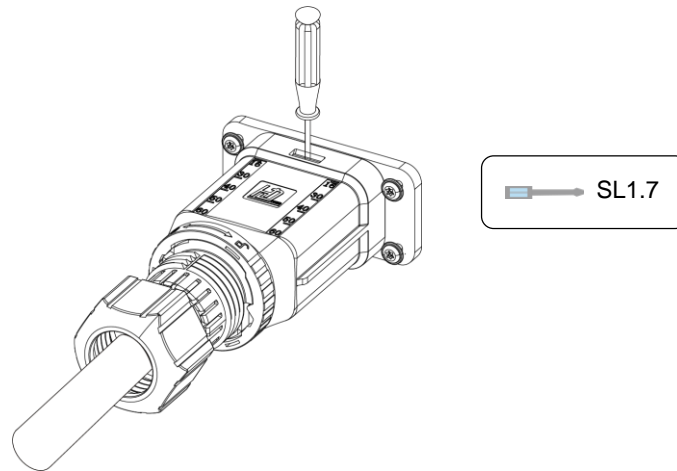


Figure 4-16

4.5.3 Connection to PV string (DC input)



WARNING!

- Before connecting PV string, make sure DC switch is turned off.
- Make sure PV string polarity confirms with DC connector, otherwise, it will cause damage to inverter.
- Make sure the maximum open circuit voltage (Voc) of each PV string does not exceed the inverter input voltage V_{max} under any condition.
- Do not connect positive or negative pole of PV string to earth wire. Otherwise, it will cause damage to inverter.

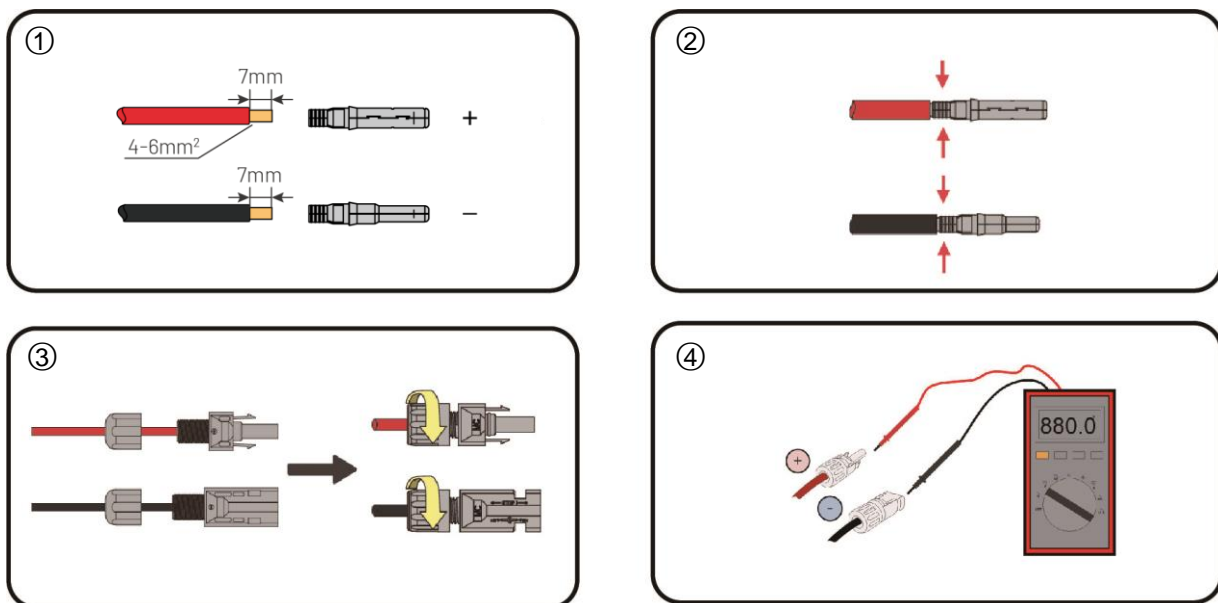


Figure 4-17 PV connection

4.5.4 Communication connection

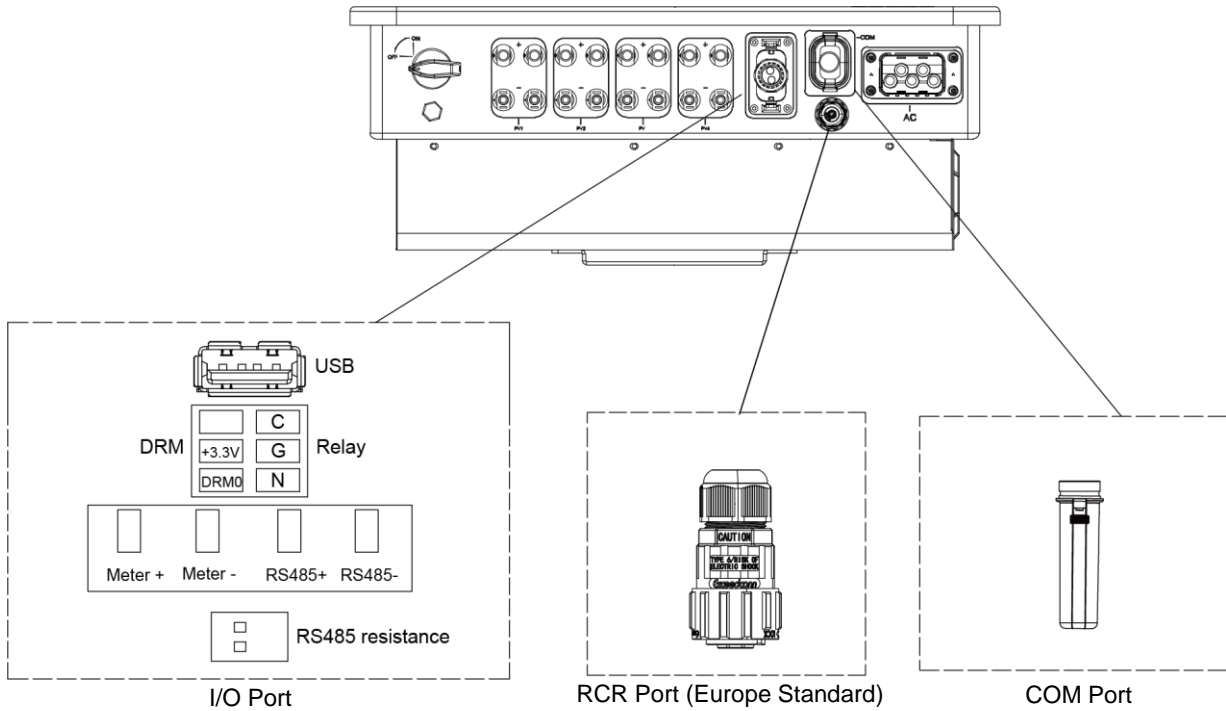


Figure 4-18 Communication port

4.5.4.1 RCR Port (Europe Standard)

In Europe, the grid company uses the RCR to convert the grid dispatching signal and send it as a dry contact signal. The wiring of the ripple control receiver dry contact cables is shown in the figure below.

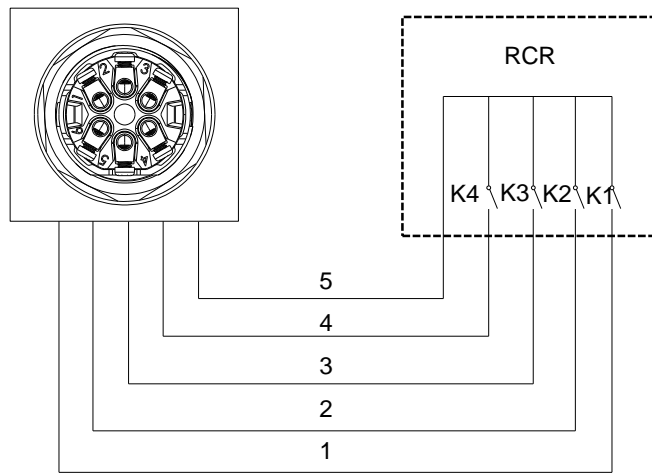


Figure 4-19

K1	K2	K3	K4	Switch Operation on External RCR	Output power (in % of the Rated AC output power)
1	0	0	0	Close K1	100%
0	1	0	0	Close K2	60%
0	0	1	0	Close K3	30%
0	0	0	1	Close K4	0%

Connect to the RCR port:

1. Strip five cables, and the diameter of the stripped cables cannot exceed 3mm.
2. Crimp the five cables as figure 4-20:

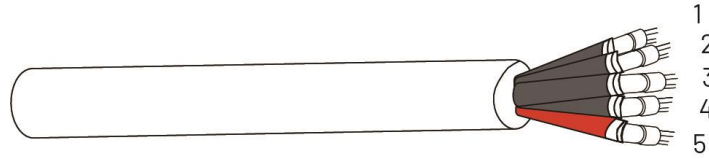


Figure 4-20

3. Pass the crimped wire into the RCR connector.

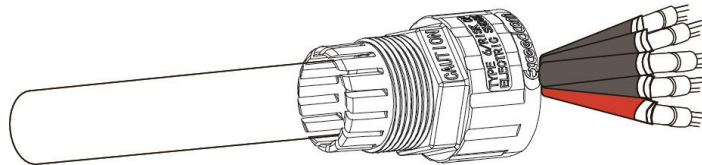


Figure 4-21

4. The cables are inserted into the terminal according to the wire sequence (k1/2/K3/K4/+3,3V) so that the insulating terminal is flush with the surface of the terminal, and the crimping screw torque is 0.18N.m.

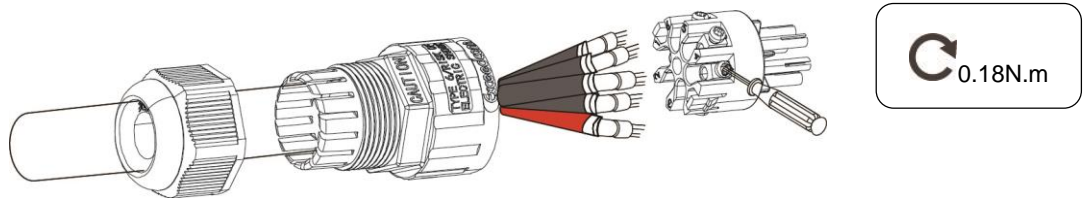


Figure 4-22

5. Insert the terminal block into the male head, and there is a "click" sound.

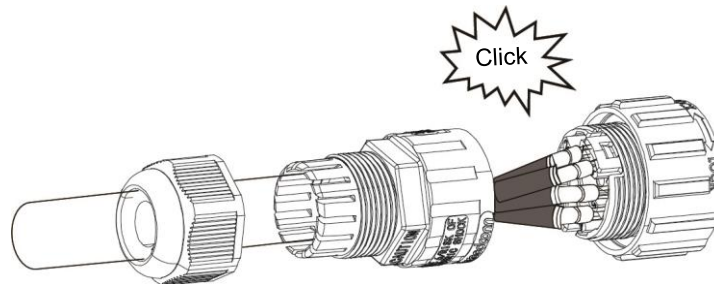


Figure 4-23

6. Use a wrench to tighten the nut.

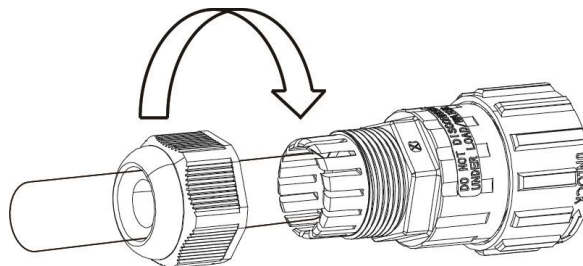


Figure 4-24

7. Screw the male head into the female and complete the installation.

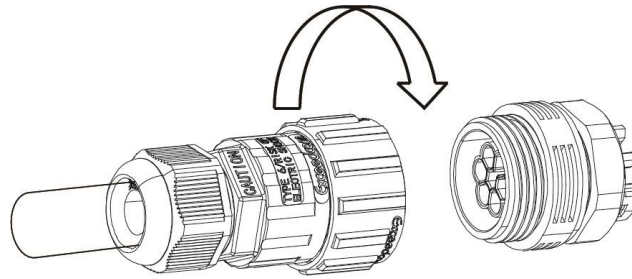


Figure 4-25

4.5.4.2 COM Port

Connect the WIFI / 4G / Ethernet module to the COM port of the inverter. After the connection is successful, you can view the inverter power generation, operation status and other information through the EnerLink. Please refer to the user manual of WIFI / 4G / Ethernet module for details.

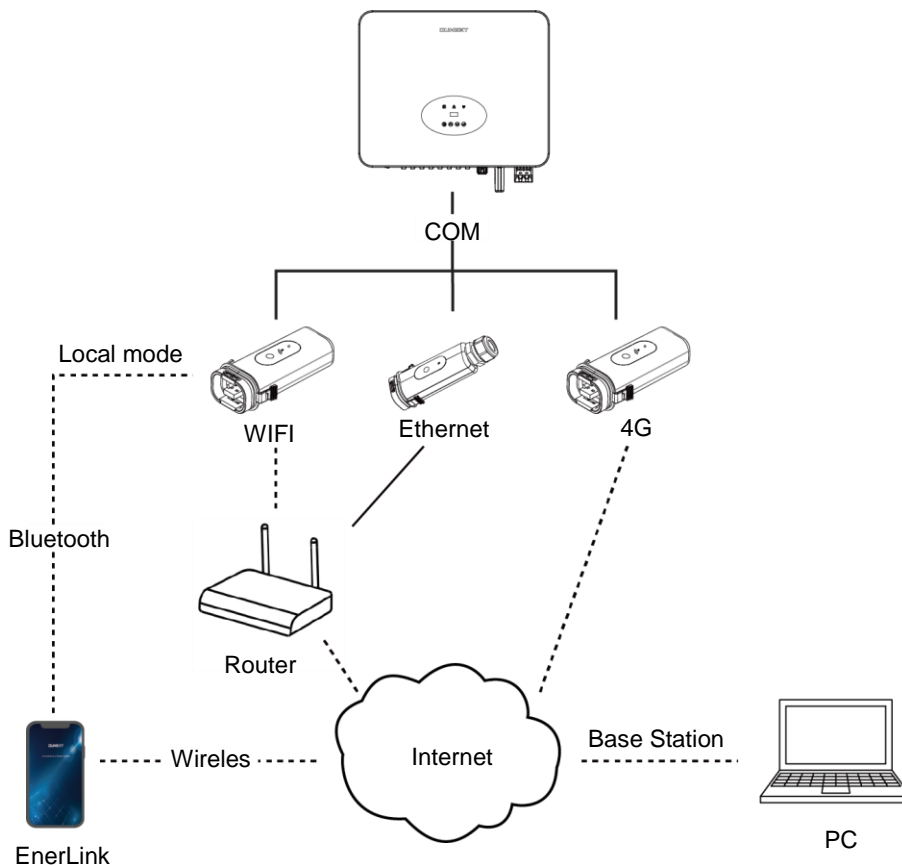


Figure 4-26

4.5.4.3 USB Port

Insert a USB flash disk for local software upgrade. Please contact after-sales personnel for details.

4.5.4.4 Meter connection (Optional)

Dunext DN3 Series(30-50KTL) inverter has the function of anti-reverse current, which can control the power exported to the grid by connecting an intelligent electricity meter.

Note: Connect meter CT1 to Grid L1, CT2 to Grid L2, CT3 to Grid L3. CT's white cable connects to S1 of the meter, and the black cable connects to S2. The CT direction must be facing to the load and inverter.

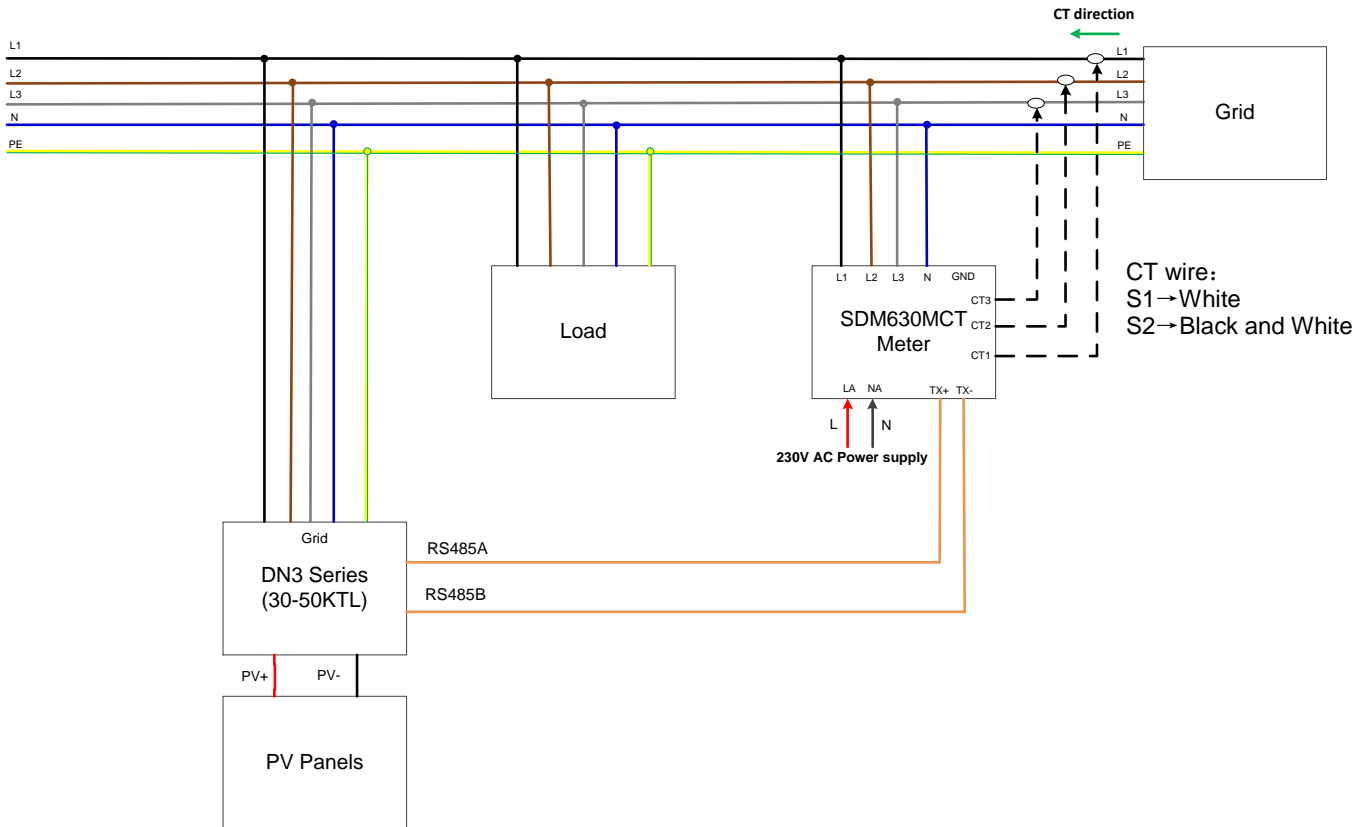


Figure 4-27

4.5.4.5 COM connection

- ① Single inverter communication system:

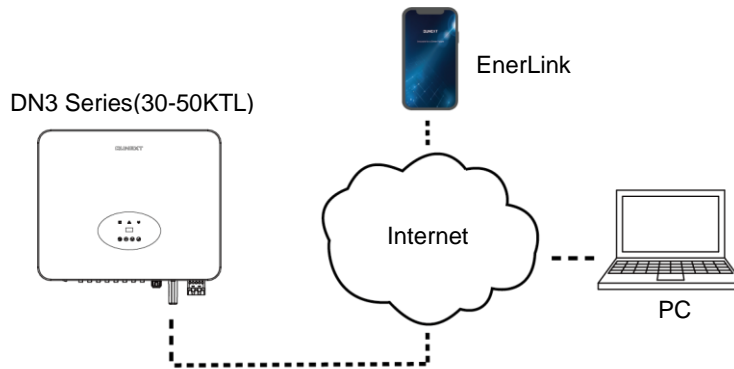


Figure 4-28

The DN3 Series (30-50KTL) can upload data to EnerLink and cloud platform through the collection module. Please refer to the ST-WIF-G2 User Manual in detail.

② Multi-inverter communication system:

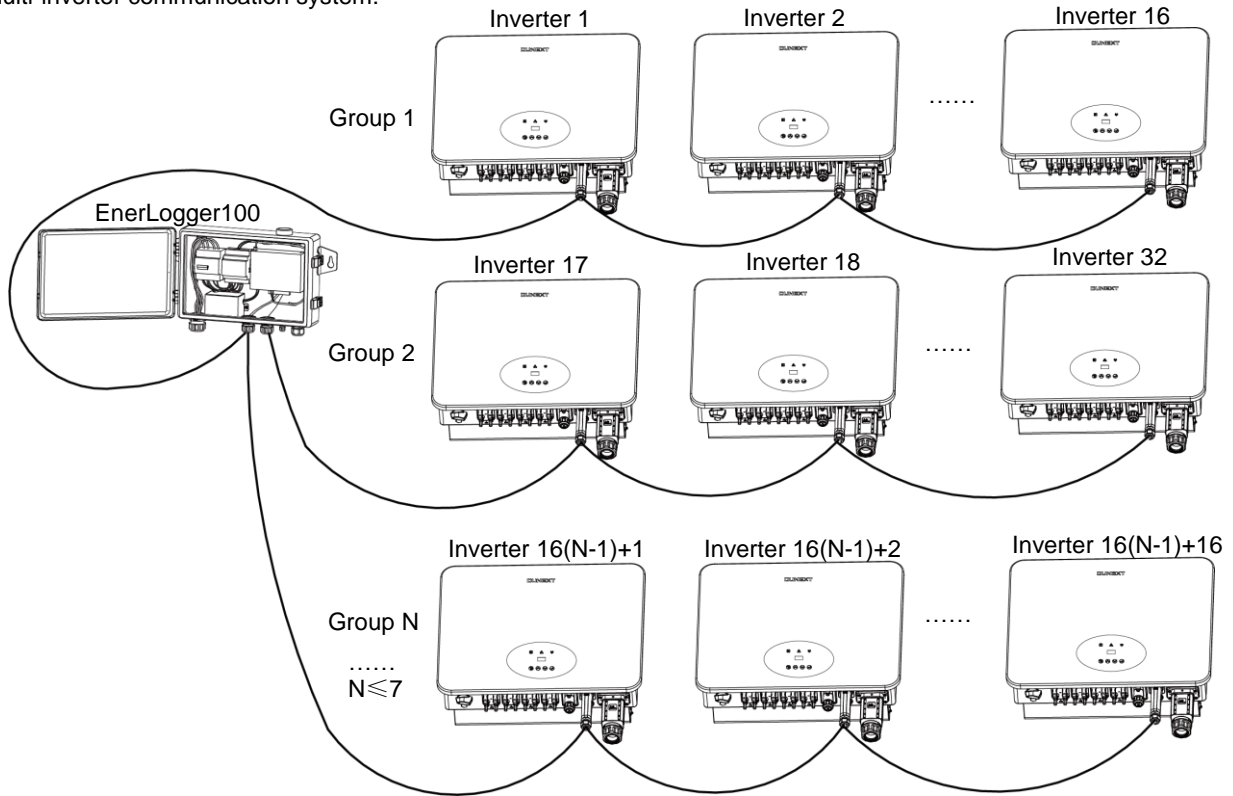


Figure 4-29

In a large power plant, the EMB-100 (Optional) enables the networking of 112 inverters. EMB-100 has the functions of Reactive Power Compensation, Active Power Regulation, Backflow prevention, etc. Please refer to the EMB-100 User Manual in detail.

5. Power on and off the inverter

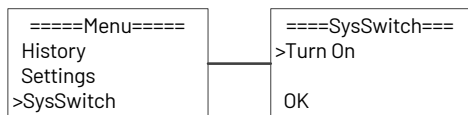
5.1 Power on the inverter

Before powering on the inverter, please confirm:

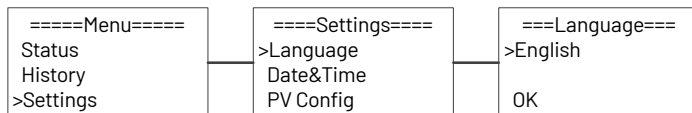
- 1) Three phases of five wires (PE/L1/L2/L3/N) cable correctly connected to the inverter AC side through the AC circuit breaker;
- 2) The DC cable is connected correctly to the inverter DC side through the DC circuit breaker. Please pay attention to the cable connected to the string correctly and its polarity;
- 3) The unused terminals are covered.

Power on the inverter:

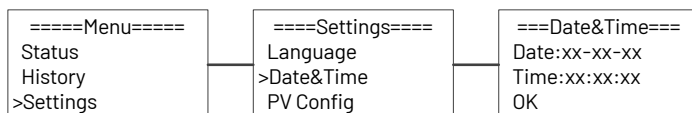
- 1) Turn on the external AC switch and ensure the switch does not trip.
- 2) Turn on the DC switch of the inverter. If the PV cables are reversed, the inverter will report an error when turning the DC switch on.
- 3) If the PV panels provide enough energy, the power module will work, and the LCD panel will be lit; Then the inverter will turn into self-check mode, and the LCD panel will display the remaining time of connection simultaneously;
- 4) Turn on the system switch: Menu>- SysSwitch. Set SysSwitch to 'Turn on' and press 'OK' to confirm.



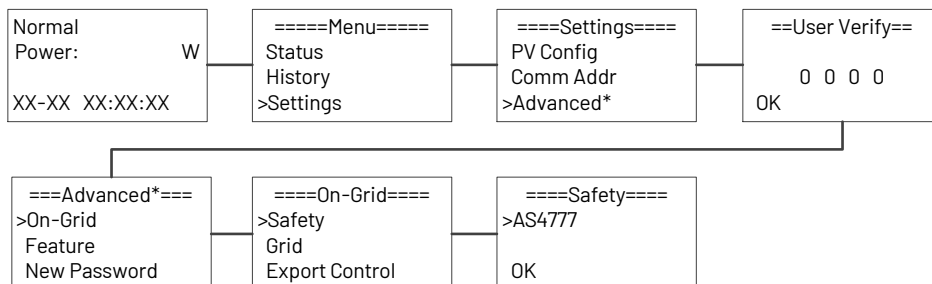
5) Set the language: Menu-> Settings-> Language. Set the language of the installation site and press 'OK' to confirm. The default language is English.



6) Set date and time: Menu-> Settings-> Date&Time. Set the current date and time of the installation site and press 'OK' to confirm.



7) Set the grid code: Menu-> Settings-> Advanced*> On-Grid-> Safety. Advanced settings require the original password "0000" and press 'OK' to enter. Set the safety code of the installation site and press 'OK' to confirm.



Note:

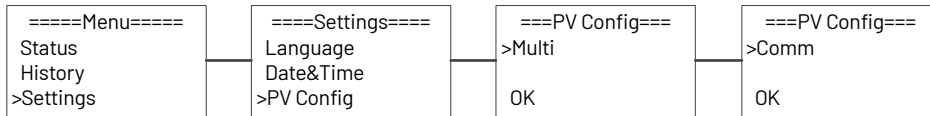
Please contact your local grid operator to select the region according to the grid code list. The grid codes are subject to change. The listed codes are updated without notice.

Grid codes

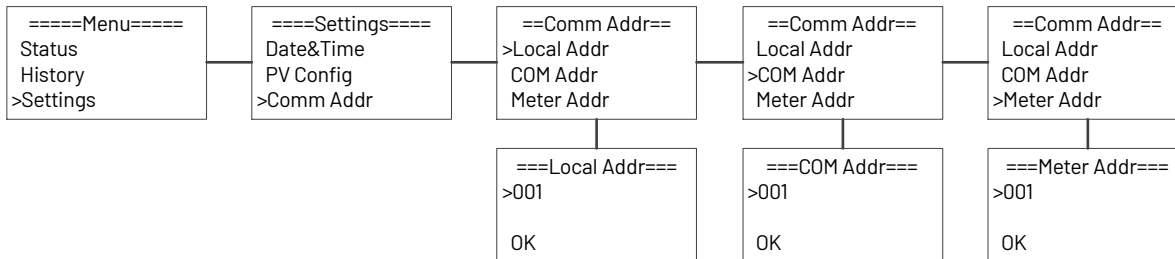
No.	National/Regional Grid Code	Description
0	VDE4105-DE	Germany power Grid, meet Grid standards "VDE-AR-N-4105".
1	CE10-21	Italy power Grid.
2	AS4777	Australia power Grid.
3	RD1699	Spain power Grid.
4	EN50549	Default EN50549 Grid setting.
5	EN50549-DK-W	West Denmark power Grid.
6	Greece	Greece power Grid.
7	EN50549-NL	Netherland power Grid, meet Grid standards "EN50438".
8	C10/11	Belgium power Grid.
9	G99	UK power Grid.
10	China	China power Grid, meet Grid standards "CN-NBT".
11	VDE0126-FR	France power Grid, meet Grid standards "VDE 0126".
12	EN50549-PL	Poland power Grid.
13	Brazil-180s	Brazil power Grid, connect/reconnect time 180s
14	VDE0126-DE	Germany power Grid, meet Grid standards "VDE 0126".

No.	National/Regional Grid Code	Description
15	CEI0-16	Italy power Grid, meet Grid standards "CEI 0-16.
16	G98	UK power Grid.
17	Greece Island	Greece Island power Grid.
18	EN50549-CZ	Czech Republic power Grid, meet Grid standards "EN50438Y2007-CZ.
19	EC61727-N	India power Grid.
20	Korea	Korea power Grid.
21	EN50549-SW	Sweden power Grid.
22	China-W	China power Grid, Grid voltage range: 160-290V. Grid frequency range: 47-53HZ.
23	China-H	China power Grid, meet standards "CQC".
24	EC61727-IN-W	India power Grid, meet Grid standards "IEC61727".
25	Brazil	ABNT NBR 16149/16150.
26	IEC61727-SL	Sri Lanka power Grid, meet Grid standards "IEC61727.
27	Mexico	Mexico power Grid, meet Grid standards "IEC61727 60HZ.
28	NZ4777	New Zealand power Grid, meet Grid standards "NZ4777
29	Philippines	Philippines power Grid, meet Grid standards "IEC61727 60HZ spec".
30	IEC61727-SL-W	Sri Lanka power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
31	PEA	Thailand power Grid
32	PEA-W	Thailand power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
33	IEC61727-VN	Vietnam power Grid.
34	IEC61727-VN-W	Vietnam power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
35	Tunisia	Tunisia
36	MEA	Thailand power Grid.
37	MEA-W	Thailand power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
38	Brazil-LV	120V 60Hz voltage of grid L to N(DN3-10-15KTL-LV only, others reserved.
39	EN50549-DK-E	East Denmark power Grid
40	Tunisia-W	Tunisia wide range
41	Chile	Chile Power Grid
42	Brazi-W	Brazil power Grid, meet Grid standards "NBT 16150".
43	EN50549-PL-W	Poland power Grid.
44	Brazil-180s-W	Brazil power Grid, meet Grid standards "NBT 16150.
45	UNE217002-ES	Spain power Grid.
46	G98-N	G98 for Northern Ireland
47	G99-N	G99 for Northern Ireland
48	EN50549-NW	Norway-400VLine
49	EN50549-NW-LV	Norway-230VLine-DN3-10-15KTL-LV only, others reserved.
50	IEC61727-LV	133V 50Hz, low voltage power grid

8) Set the PV configuration: Menu>- Settings>- PV Config. There are two modes for selection: Comm and Multi. The 'Comm' mode means single MPP tracking, 2 MPPT working together; 'Multi' means multi-MPP tracking, 2 MPPT work independently. The default PV connection is Multi. Set the mode of PV input and press 'OK' to confirm.

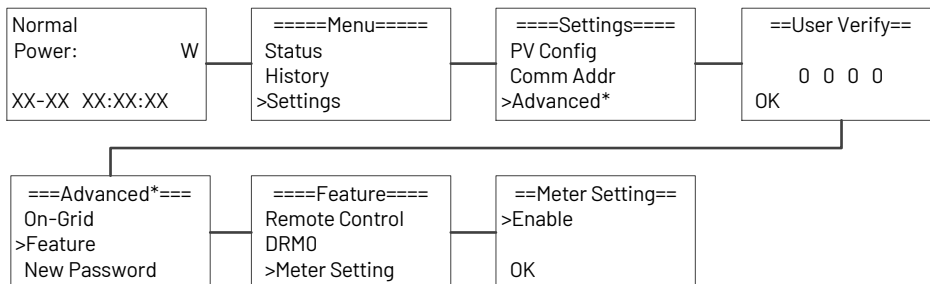


9) Set the local, COM, and meter address: Menu>- Settings>- Comm Addr. Set the local address, COM address, and meter address and press 'OK' to confirm. The default local address, COM address and meter address is 001.

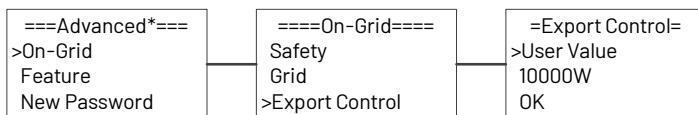


10) Set the export control:

Step1: Enable the meter setting first. Menu>- Settings>- Advanced*>- Feature>-Meter Setting. Advanced settings require the original password "0000" and press 'OK' to enter. Enable the Meter Setting and press 'OK' to confirm.



Step 2: Setting the power exported to the grid. Menu>- Settings>- Advanced*>- On-Grid>- Export Control. Set the safety code of the installation site and press 'OK' to confirm.



11) After the inverter turns into normal mode, it feeds electrical energy into the grid, and the LCD panel will display the generated electrical energy.

As long as the inverter works, it will automatically track the maximum power point to absorb the maximum energy from solar. When night comes, the irradiance is not strong enough to provide energy, and the inverter will power off automatically. When the next day comes, the input voltage reaches the start value, and it will start again automatically.

5.2 Power off the inverter



Danger of burns!

Even if the inverter is shut down, it may still be hot and cause burns. Wear protective gloves before working on the inverter.

For maintenance or other service, you must power off the inverter. The steps are as follows:

1) Turn off the external AC switch and secure it against reconnection.

- 2) Turn off the DC switch of the inverter for disconnecting all of the PV string inputs.
- 3) Wait about 5 minutes until the capacitors inside the inverter discharge completely.

6. User interface

6.1 Led and key

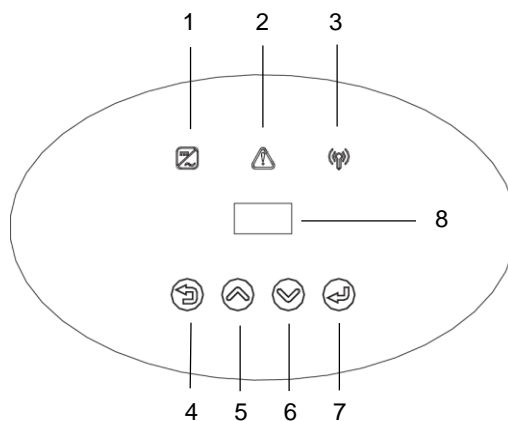
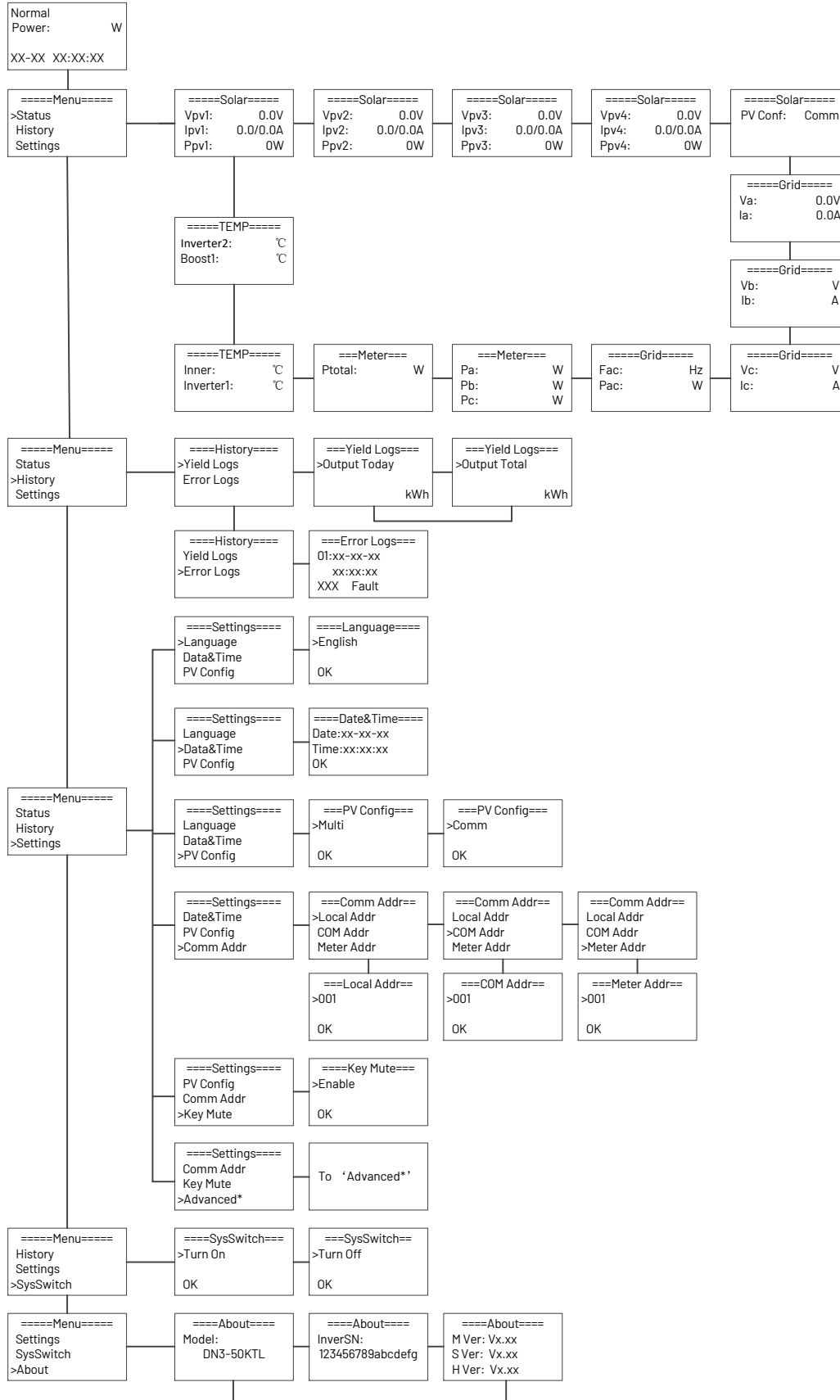


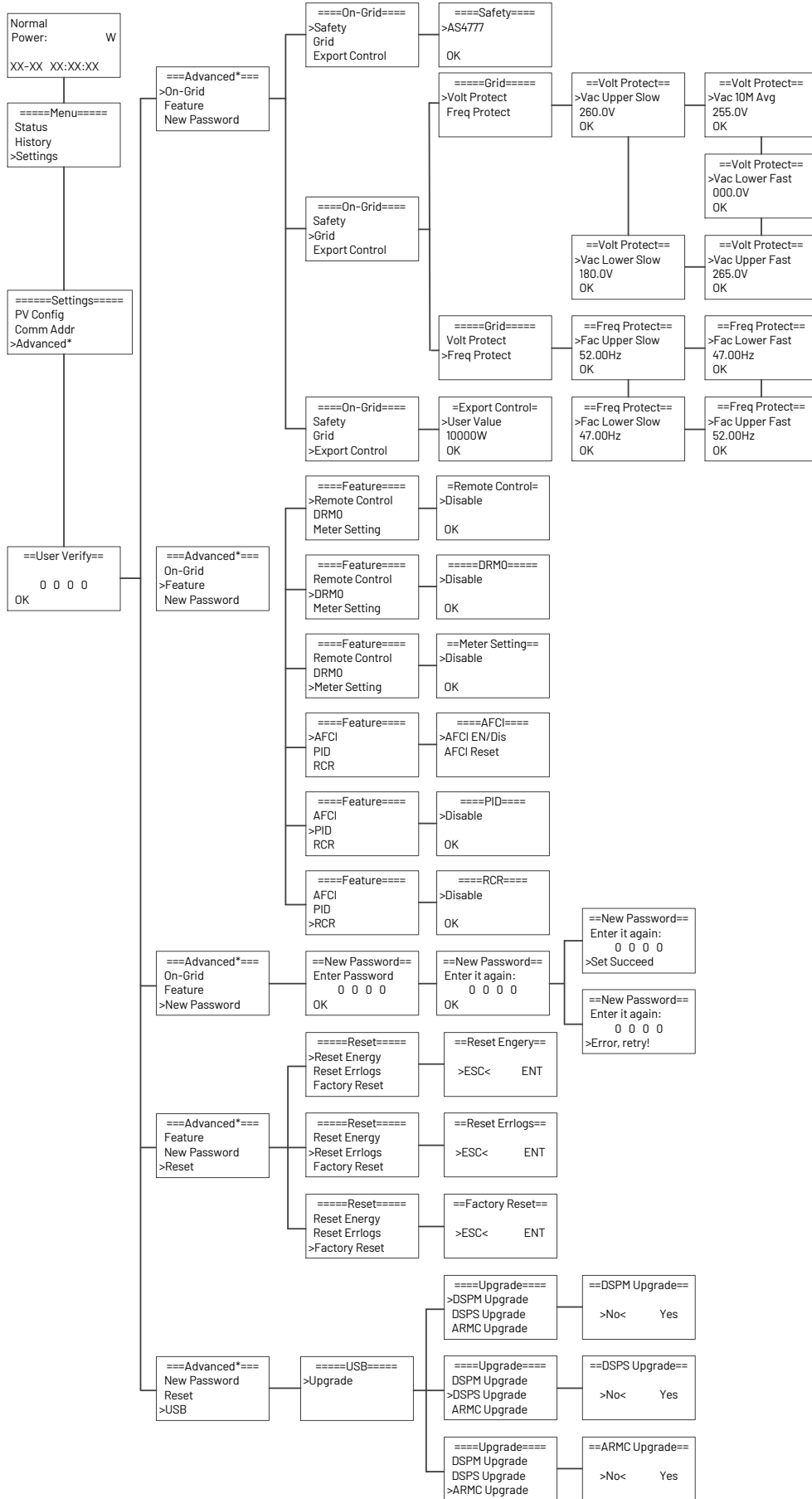
Figure 6-1 LED display

No.	Name	Description	
1	Green indicator	Steady	The inverter is operating in on-grid mode.
		Blinking	1. The inverter enters the self-test mode. 2. The DC is on, the AC is on, but the energy transfer between the inverter and the grid is abnormal.
		Off	The DC is off and the AC is on.
2	Red indicator	Steady	The inverter has a warning.
		Off	The inverter is normal.
3	Yellow indicator	N / A	Reserve
4	ESC button	Leave from current interface or function.	
5	Up button	Move cursor to upside or increase value.	
6	Down button	Move cursor to downside or decrease value.	
7	OK button	Press and hold for 2~3 seconds to confirm the selection.	
8	LCD Screen	Display the information of the inverter.	

6.2 LCD display

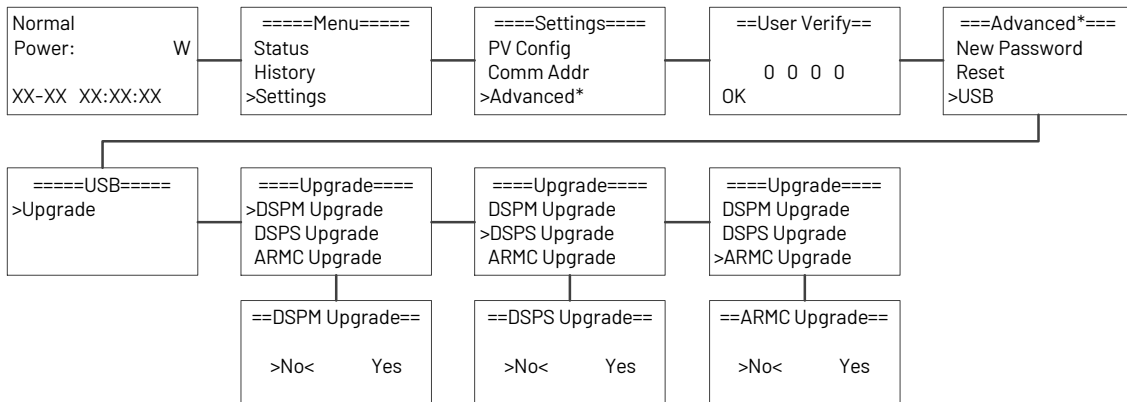
Mean Structure:





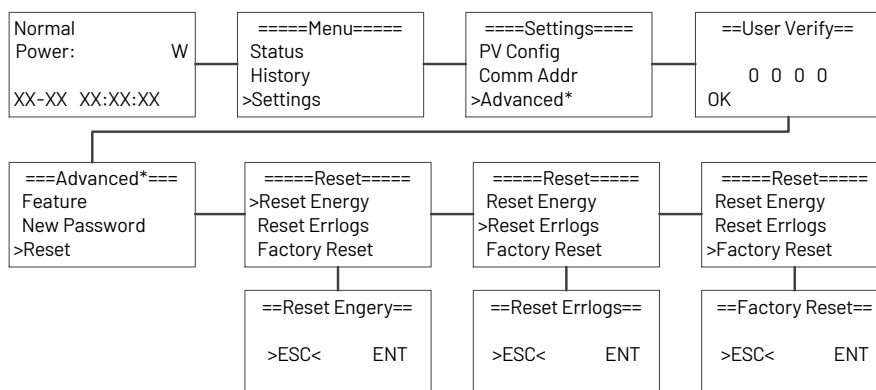
6.3 LCD operation

6.3.1 Upgrading the inverter

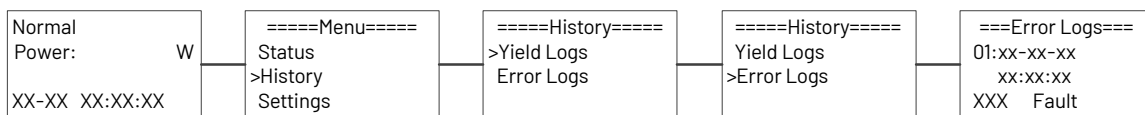


1. Please contact Dunext technicians to obtain the upgrade program.
2. Insert the USB disk into the computer and copy the upgrade program to the USB disk.
3. Insert the USB disk into the USB port of the inverter.
4. Refer to the above figure to upgrade DSPM, DSPS and ARMC respectively.
5. After the upgrade, the inverter will start to work automatically.

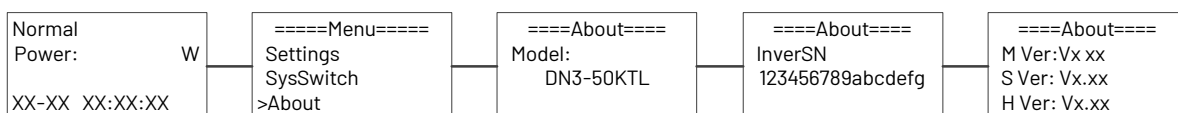
6.3.2 Factory reset



6.3.3 Error logs



6.3.4 About



6.4 Self-Test in accordance with CEI 0-21 (Applies to Italy only)

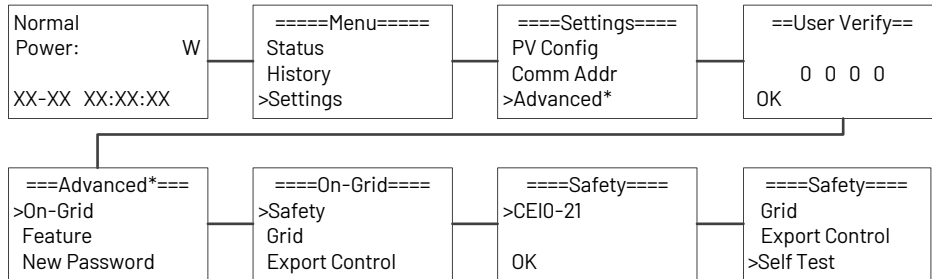
The self-test is only required for inverters, which are commissioned in Italy. The Italian standard requires that all inverters feeding into the utility grid are equipped with a self-test function in accordance with CEI 0-21. Please note that there is a

self-test option only when the inverter selects CEI 0-21. During the self-test, the inverter will consecutively check the protection reaction times and values for overvoltage, under voltage, over frequency and under frequency.

Self-test function is available at any time. It also allows end user get test reports shown on LCD display.

There are two ways to execute the self-test (You need to set the inverter country to CEI 0-21 before testing).

Auto-Test from screen:



Auto-Test from Solar Admin:

- 1) Download and install "Solar Admin" on laptop
- 2) Connect inverter to laptop via RS485 port.
- 3) When the inverter and "solar admin" are successfully connected. Click "Sys.setting" - "Other" - "AUTOEST" enter into "Auto-Test" interface.
- 4) Click "Execute" to start the test.
- 5) The inverter will automatically run the test until the screen shows "Test end".
- 6) Click "Read" to read the test value, and click "Export" to export the test report.
- 7) After click "Read" button, interface will show the test results, if the test passes, it will show "PASS" if the test is failed it will show "FAIL".

Parameter	Threshold Value	Reading	Status
U > (59.S1)	Vmax: 253.0	224.0	Pass
U >> (59.S2)	Vmax: 264.5	230.5	Pass
U < (27.S1)	Vmin: 195.5	230.2	Pass
U << (27.S2)	Vmin: 34.5	225.0	Pass
F > (81.S1)	Fmax: 50.2	50.01	Pass
F >> (81.S2)	Fmax: 51.5	51.02	Pass
F < (81.S1)	Fmin: 49.8	49.94	Pass
F << (81.S2)	Fmin: 47.50	50.03	Pass

7. Troubleshooting and maintenance

7.1 Troubleshooting

Sometimes, the PV system does not work normally: we recommend the following solutions for average troubleshooting. This can help the technician to understand the problem and take a proper action.

No.	LCD display	Possible actions
1	Grid Lost Fault	Grid voltage out of range. <ul style="list-style-type: none"> • System will reconnect if the utility grid is back to normal. • Or seek help from us, if not go back to normal state
2	Grid Volt Fault	Grid voltage out of range. <ul style="list-style-type: none"> • System will reconnect if the utility grid is back to normal! • Or seek help from us, if not go back to normal state.
3	Grid Freq Fault	Grid frequency out of range <ul style="list-style-type: none"> • System will reconnect if the utility grid is back to normal. • Or seek help from us, if not go back to normal state.
4	Pv Volt Fault	PV voltage out of range. <ul style="list-style-type: none"> • Please check the output voltage of PV panels. • Or seek for help from us.
5	Bus Volt Fault	Bus voltage out of range detected by hardware <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state
6	Vgrid 10M Fault	The grid voltage is out of range for the last 10 Minutes. <ul style="list-style-type: none"> • System will reconnect if the utility grid is back to normal. • Or seek help from us, if not go back to normal state
7	DCI OCP Fault	DC component is out of limit in output current. <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
8	Ground Fault	The inverter is not connected to the ground <ul style="list-style-type: none"> • Please check if the ground connection is normal, then reconnect. • Or seed help from us, if not go back to normal state.
9	SW OCP Fault	Output current high detected by software. <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
10	GFCI Fault	The residual current is high. <ul style="list-style-type: none"> • Please check if the insulation of electric wires is damaged. • Wait for a while to check if back to normal. • Or seek for help from us.
11	Iso Check Fault	The isolation is failed. <ul style="list-style-type: none"> • Please check if the insulation of electric wires is damaged. • Wait for a while to check if back to normal. • Or seek for help from us.

No.	LCD display	Possible actions
12	Temp Fault	The inverter temperature is high. <ul style="list-style-type: none"> • Please check if the environment temperature. • Wait for a while to check if back to normal. • Or seek for help from us
13	Meter Lost Fault	The communication between meter and Inverter is interrupted. <ul style="list-style-type: none"> • Check if the communication cable between meter and Inverter is correctly and well-connected.
14	Fan Fault	Fan Device Fault <ul style="list-style-type: none"> • Disconnect solar power PV+, PV- and battery, reconnect them. • Check if the fan is stopped by dust or other foreign. • Or seek help from us, if cannot go back to normal state.
15	PLL Error	The errors are internal faults of Dunext inverter <ul style="list-style-type: none"> • Turn off PV and grid, wait for 5 minutes, then reconnect. • Or seek help from us, if not go back to normal state.
16	Island Error	
17	Anti-PID	
18	SCI Fault	
19	Grid Flashover	The errors are internal faults of Dunext inverter <ul style="list-style-type: none"> • Turn off PV and grid, wait for 5 minutes, then reconnect. • Or seek help from us, if not go back to normal state.
20	Inv EEPROM Fault	
21	AD Sample Fault	
22	Arc Device Fault	The errors are internal faults of Dunext inverter <ul style="list-style-type: none"> • Turn off PV and grid, wait for 5 minutes, then reconnect. • Or seek help from us, if not go back to normal state.
23	GFCI HW Fault	
24	Relay S1 Short	
25	Relay S2 Short	The errors are internal faults of Dunext inverter <ul style="list-style-type: none"> • Turn off PV and grid, wait for 5 minutes, then reconnect. • Or seek help from us, if not go back to normal state.
26	Relay M1 Short	
27	Relay M2 Short	
28	Other Device Fault	The errors are internal faults of Dunext inverter <ul style="list-style-type: none"> • Turn off PV and grid, wait for 5 minutes, then reconnect. • Or seek help from us, if not go back to normal state.
29	Relay Open	
30	AuxVolt Error	
31	V Consist Fault	The errors are internal faults of Dunext inverter <ul style="list-style-type: none"> • Turn off PV and grid, wait for 5 minutes, then reconnect. • Or seek help from us, if not go back to normal state.
32	F Consist Fault	
33	I Consist Fault	
34	RC Consist Fault	The errors are internal faults of Dunext inverter <ul style="list-style-type: none"> • Turn off PV and grid, wait for 5 minutes, then reconnect. • Or seek help from us, if not go back to normal state.
35	SCI Fault	
36	HMI EEPROM Fault	


Remark

If you find the inverter has serious problems, including but not limited to the above content, please call Dunext dealer or the after-sales service. Please provide the following information to service@dunext.com for better service.

- 1) Customer Name
- 2) Contact Info
- 3) Project Name and Location
- 4) Project Scale
- 5) Quantity of Faulty Inverters
- 6) Problem Description

- 7) Inverter Model
- 8) Inverter SN

7.2 Routine Maintenance

 WARNING!	<p>Risk of inverter damage or personal injury due to incorrect service!</p> <ul style="list-style-type: none"> • Always keep in mind that the inverter is powered by dual sources: PV strings and utility grid. Before any service work, observe the following procedure. • Disconnect the AC circuit breaker and then set the DC load-break switch of the inverter to OFF. • Wait at least 5 minutes for inner capacitors to discharge completely. • Verify that there is no voltage or current before pulling any connector.
NOTICE NOTICE!	<p>Restart the inverter only after removing the fault that impairs safety performance. As the inverter contains no component parts that can be maintained, never arbitrarily replace any internal components. For any maintenance need, please contact Dunext. Otherwise, Dunext shall not be held liable for any damage caused.</p>

Maintenance Instruction:

Item	LCD display	Period
System clean	Check the temperature and dust of the inverter. Clean the inverter enclosure if necessary. Check if the air inlet and outlet are normal, Clean the air inlet and outlet if necessary.	Six months to a year (- depend on the dust contents in air.)
Cable entry	Check whether the cable entry is insufficiently sealed or the gap is excessively large, and reseal the entry when necessary!	Once a year
Electrical Connection	Check whether all cable are firmly in place. Check whether a cable is damaged, especially the part contacting the metal enclosure.	Six months to a year
Fans	Check whether there is an abnormal noise when the fan rotates. Clean or replace the fan if necessary (see the following sections)	Once a year

Cleaning Air Inlet and Outlet.

A huge amount of heat is generated in the process of running the inverter. The inverter adapts a controlled forced-air cooling method. In order to maintain good ventilation, please check to make sure the air inlet and outlet are not blocked. Clean the air inlet and outlet with soft brush or vacuum cleaner if necessary.

7.3 Fan Maintenance

The fan inside the inverter is used to cool the inverter during operation. If the fan does not operate properly, the inverter may not be able to cool, and the efficiency of the inverter may be reduced. Therefore, it is necessary to clean the dirty fan in time and replace the bad fan.

Procedure:

1. Stop the inverter (turn off the DC and AC switches of the inverter and wait for at least 5 minutes).
2. Screw down four screws of two fan modules.

3. Unscrew 4 screws for each fan module.
4. Disconnect the fan wire, pull out the fan module, clean the fan with a soft brush or vacuum cleaner, and replace the fan if necessary.
5. Reinstall the fan back into the inverter and restart the inverter in the opposite order.

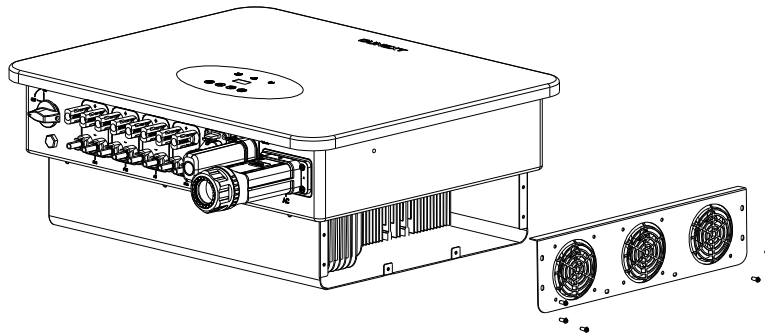


Figure 7-1



Innovate for a Green Future

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 www.dunext.com