Zeversolar Service Line

China (incl. Hongkong, Macau)
Jiangsu Zeversolar New Energy Co., Ltd.
Tel.: +86 512 6937 0998-8866
E-mail: service.china@zeversolar.com
Add.: Building 9, No.198 Xiangyang Road, Suzhou 215011, China

Australia
Zeversolar Australia
Tel.: +61(0)1300101883
E-mail: service.apac@zeversolar.com
Add.: Suite 2.23 Level 2, 838 Collins Street, Melbourne, Docklands Vic 3008, Australia

Europe Region
Zeversolar GmbH
Tel.: +49(0) 2102 420 944
E-mail: service.eu@zeversolar.net
Add.: Luxemburger Straße 59, 50674 Köln, Germany

United Kingdom:

Tel.: +44 (0) 800 731 0899

E-mail: service.eu@zeversolar.net

Rest of the world

E-mail: service.row@zeversolar.com

Installation and Operating Instructions

Evershine TLC8000/TLC10000 Solar Inverters

zeversolar

Table of Contents

1 About this manual

General Notes

Evershine is a transformerless solar inverter with two MPP trackers.It converts the direct current (DC) from aphoto-voltaic (PV) generator to grid-compliant alternating current (AC) and feeds it into the grid.

1.1 Validity

This manual describes the mounting, installation, commissioning and maintenance of the following Zeversolar inverters:

EvershineTLC8000, EvershineTLC10000.

Observe all documentation that accompanies the inverter. Keep them in a convenient place and available at all times.

1.2 Target group

This manual is for qualified electricians only who must perform the tasks exactly as described.

All persons installing inverters must be trained and experiencedin general safety which must be observed when working on electrical equipment. Installation personnel should also befamiliar with local requirements, rules and regulations.

1.3 Symbols used in this manual

The following safety precautions and general information are used in this manual:

> ⚠ **DANGER**
>
> DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

> ⚠ **WARNING**
>
> WARNING indicates a hazardous situation which, if not avoided, can result in death or serious injury.

> ⚠ **CAUTION**
>
> CAUTION indicates a hazardous situation which, if not avoided, can result in minor or moderate injury.

> **NOTICE**
>
> NOTICE indicates a situation which, if not avoided, can result in propertydamage.

> ⓘ
>
> INFORMATION provides tips which are valuable for the optimal installation and operation of the inverter.

2 Safety

2.1 Intended use

1. Evershine converts the direct current from a PV generator into grid-compliant alternating current.
2. Evershine is suitable for indoor and outdoor use.
3. Evershine must only be operated with PV arrays (PV modules and cabling) of protection class II, in accordance with IEC 61730, application class A.
    Do not connect any sources of energy other than PV modules to the Evershine.
4. PV modules with a high capacitance to earth may only be used if their coupling capacity does not exceed 1.0 μ F.
5. When the PV modules are exposed to light, a DC voltage is supplied to this equipment.
6. When designing the PV installation, ensure that the values comply with the permitted operating range of all components at all times. The free design program "Zeverplan" (http://www.zeverplan.com)will assist you.

2.2 Safety standards

Evershine complies with the EU Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC. Evershine also complies with the requirement for safety and EMC in Australia and New Zealand market.

The inverters are labeled with the CE and RCM mark and fulfill the requirements specified in the specific standards.

For more information about certificates in other countries and regions, please visit website (*Http://www.zeversolar.com*).

2.3 Important safety information

> ### ⚠ DANGER
> · All work on the inverter must only be carried out by qualified personnel who have read and fully understood all safety information contained in this manual.
> · Children must be supervised to ensure that they do not play with this device.

> ### ⚠ WARNING
> **Risk of injury due to electric shock and fire caused by high leakage current !**
> · The inverter must be reliably grounded in order to protect property and personal safety.

> ### ⚠ CAUTION
> **Risk of injury due to hot heat sink !**
> · The heat sink may get hot during operation. Do not touch!

> ### ⚠ CAUTION
> **Possible damage to health as a result of the effects of electromagnetic radiation !**
> · Please maintain a distance of at least 20cm from the inverter when it is inoperation.

NOTICE

Grounding the PV array !

· Comply with local regulations for grounding the PV array. We suggest the
  frames of PV modules must be reliably grounded.

· Do not ground any of the terminals of the strings.

NOTICE

Damage to the seal of the cover in sub-zero conditions !

· If you open the cover in sub-zero condition, the sealing of the cover can be
  damaged.This can lead moisture entering the inverter.

· Do not open the inverter at ambient temperatures lower than -5℃.

· If a layer of ice has formed on the seal of the cover in sub-zero comditions,
  remove it prior to opening the inverter (e.g. by melting the ice with warm air).
  Observe the applicable safety regulation.

2.4 Symbols on the type label

Icon	Explanation
⚠	Risk of danger, warning and caution Safety information important for human safety. Failure to observe the safety information in this manual may result in injury or death.
⚡	Danger to life due to electric shock The product operates at high voltages. All work on the product must be carried out by qualified persons only.
♨	Risk of burns from hot surfaces The product can get hot during operation. Avoid contact during operation. Allow the product to cool down sufficiently before carrying out any work.
🗑	Do not dispose of this inverter with household waste. For more information on disposal, please see chapter 13 "Recycling and disposal".
CE	CE mark. The inverter complies with the requirements of the applicable CE guideline.
TÜV SÜD	Certified safety The product is TUV-tested and complies with the requirements of the German Equipment and Product Safety Act.
RCM	RCM The product complies with the requirements of the applicable Australian low voltage and electromagnetic compatibility standards.
⚡ ↻ 5min	Capacitor discharge Before opening the covers, the inverter must be disconnected from the grid andPV generator.Wait at least five minutes to allow the energy storage capacitors to fully discharge.
📖	Refer to the manual accompanying the inverter.

2.5 Basic safety protection

We provide the following safety protection:

1. Overvoltage, undervoltage protection.
2. Overfrequency, underfrequency protection.
3. Overtemperature monitoring.
4. Residual current monitoring.
5. Isolation fault detection.
6. Anti islanding protection.
7. DC feed-in monitoring.

3 Unpacking

3.1 Scope of delivery

Object	Description	Quantity
A	Inverter	1
B	Wall bracket	1
C	Mounting accessory kit: large plain washers (2×) M5×12 pan head screw (2×) wall anchors and bolts(4×), terminal lug (1×), ground washer (1×)	1
D	DC connector	3
E	AC connection plug	1
F	RJ45 plug	2
G	Documentation	1
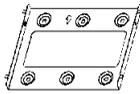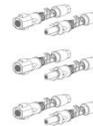
A   B   C   D

E   F   G

Please carefully check all of the components in the carton. If anything is missing, contact your dealer at once.

3.2 Check for transport damage

Thoroughly inspect the packaging upon delivery.If you detect any damage to the packaging which indicates the inverter may have been damaged, inform the responsible shipping company immediately. We will be glad to assist you if required.

4 Mounting

4.1 Ambient conditions

1. Be sure that the inverter is installed out of the reach of children.
2. Mount the inverter in areas where it cannot be touched inadvertently.
3. Ensure good access to the inverter for installation and possible service.
4. The ambient temperature should be below 40°C to ensure optimal operation.
5. Observe the minimum clearances to walls, other inverters, or objects as follows to ensure sufficient heat dissipation.

Direction	Min. clearance (mm)
above	300
below	500
sides	200
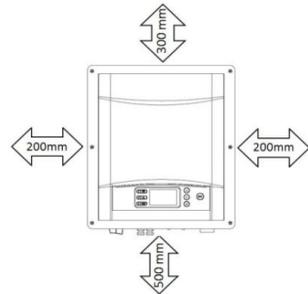
Clearances for one inverter
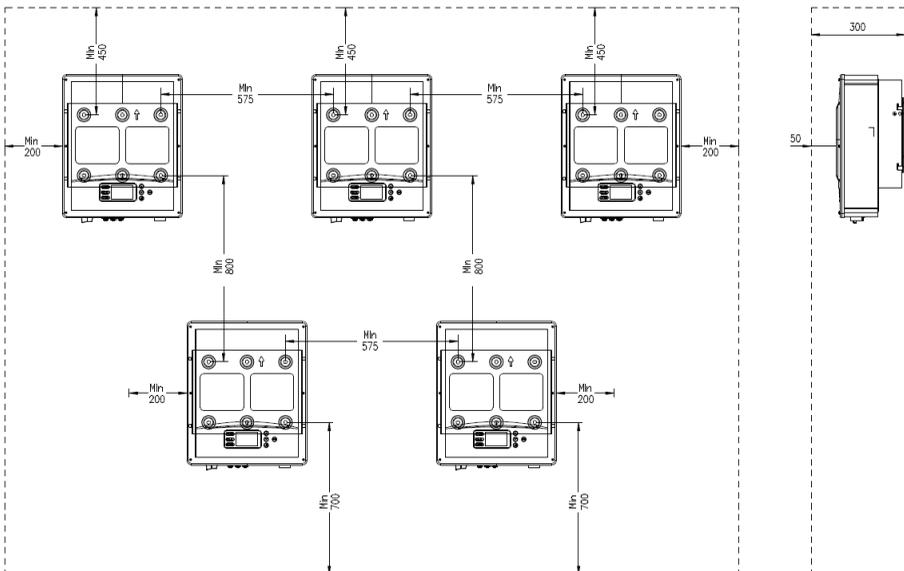
Clearances for multiple inverters

6. In order to avoid power reduction caused by overheating, do not mount the inverter in a location that allows long-term exposure to direct sunlight.

7. Avoid exposing the inverter to direct sunlight, rain and snow to ensure optimal operation and extend service life.
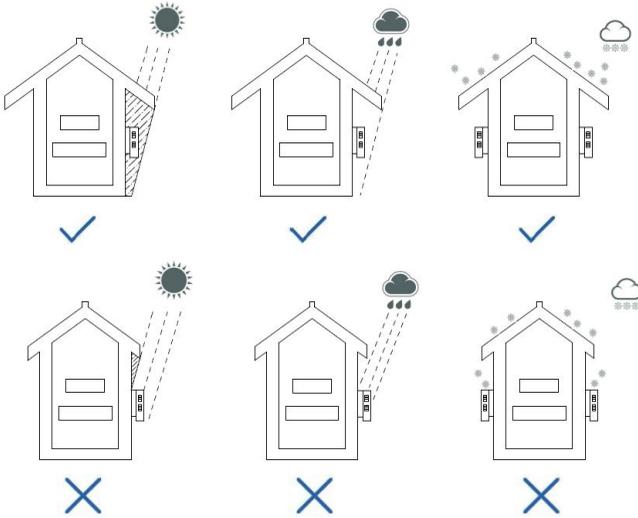
8. The mounting method, location and surface must be suitable for the inverter's weight and dimensions.

9. If mounted in a residential area, we recommend mounting the inverter on a solid surface. Plasterboard and similar materials are not recommended due to audible vibrations when in use.

10. Don't put any objects on the inverter.Do not cover the inverter.

4.2 Selecting the mounting location

> **⚠ WARNING**
>
> **Danger to life due to fire or explosion!**
>
> ·Do not mount the inverter on flammable construction materials.
>
> ·Do not mount the inverter in areas where flammable materials are stored.
>
> ·Do not mount the inverter in areas where there is a risk of explosion.
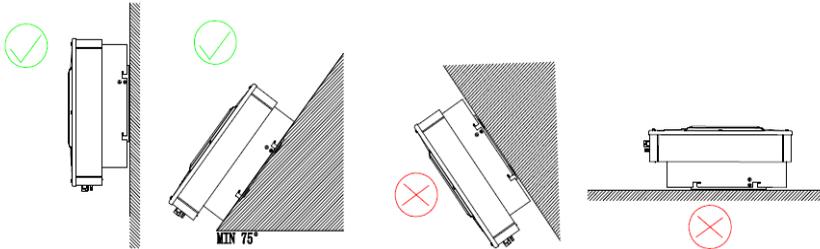
1. Mount the inverter vertically or tilted backward by max. 15°.
2. Never mount the inverter tilted forward or sideways.
3. Never mount the inverter horizontally.
4. Mount the inverter at eye level to make it easy to operate and to read the display.
5. The electrical connection area must point downwards.

4.3 Mounting the inverter with the wall bracket

> ### ⚠ CAUTION
>
> **Risk of injury when lifting the inverter, or if it is dropped!**
> · The inverter weighs 25 kg.There is risk of injury if the inverter is lifted incorrectly or
>   dropped while being transported or when attaching it to or removing it from the
>   wall mounting bracket.
> · Transport and lift the inverter carefully.

Mounting procedures:

1. Use the wall bracket as a drilling template
    and mark the positions of the drill holes, then
    drill 4 holes (Φ10) to a depth about 70mm.
    During operation, keep the drill vertical to the
    wall, and hold the drill steady to avoid tilted
    holes. After cleaning the dust from the holes,
    measure their net depth.
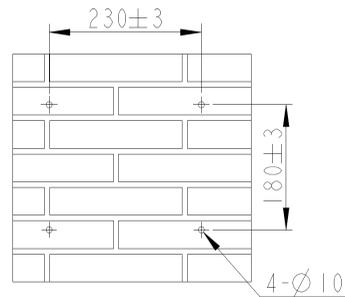
2. After drilling holes in the wall, place 4 wall anchors into the holes, then attach
    the wall bracket to the wall using the self-tapping bolts delivered with the
    inverter.
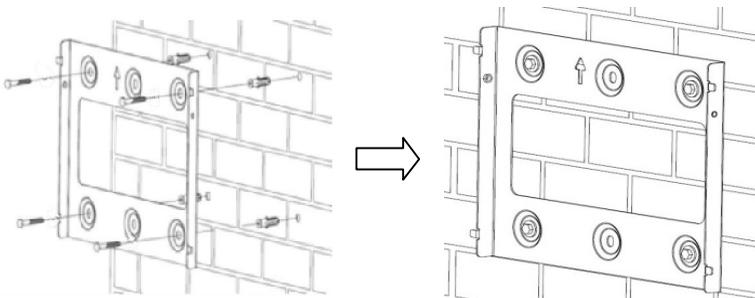
3. Hold the inverter using the handles on the coner, attach the inverter onto the wall bracket tilted slightly downwards.
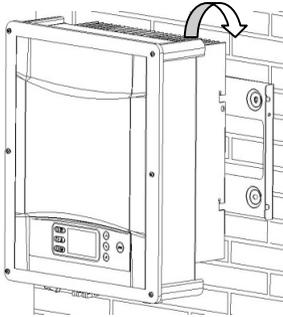
4. Check both sides of the inverter to ensure that it is securely in place..
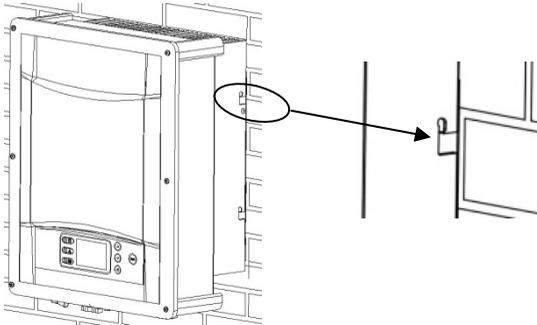
5. Attach the outer fin of the heatsink to both sides of the wall bracket using the M5 screws and washers(screw driver type: T25, torque: 2.5Nm).
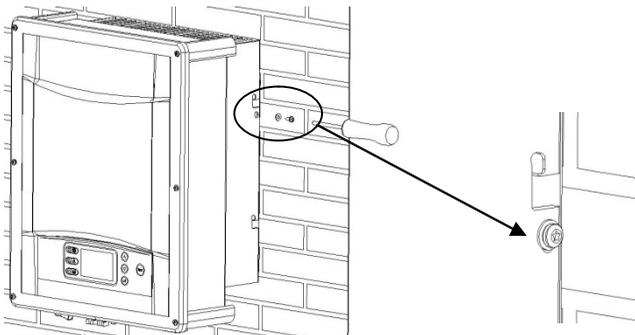
If a second protective conductor is required locally, ground the inverter and secure it so that it cannot be lifted off the wall bracket (see section 5.4.3 "Second protective grounding connection", page 24).

5 Electrical connection

5.1 Safety

⚠ **WARNING**

Risk of injury due to electric shock!

· The inverter must be installed only by trained and authorized electricians.

· All electrical installations must be done in accordance with the National Wiring Rules Standards and Local Code.

⚠ **CAUTION**

Risk of injury due to electric shock!

· The external protective earthing conductor is connected to the inverter's protective grounding terminal through the AC connector. Make sure the connection is reliable.

· When connecting, connect the AC connector first to ensure the inverter grounding and then connect the DC inputs.

· When disconnecting, disconnect the DC inputs first and then disconnect the AC connector.

· Under any circumstances, do not connect the DC inputs when the AC connector is unplugged.

5.2 System layout of units without integrated DC-switch

Local standardsor codes may require that PV systems are fitted with an external DC-switch on the DC side. The DC-switch must be able to safely disconnect the open-circuit voltage of the PV array plus a safety reserve of 20%.
Install a DC-switch to each PV array to isolate theDC side of the inverter. We recommend the following electrical connection:
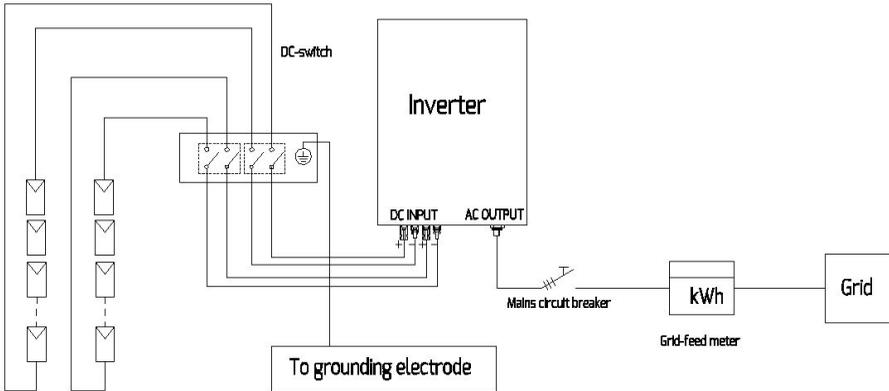
5.3 Overview of the connection area
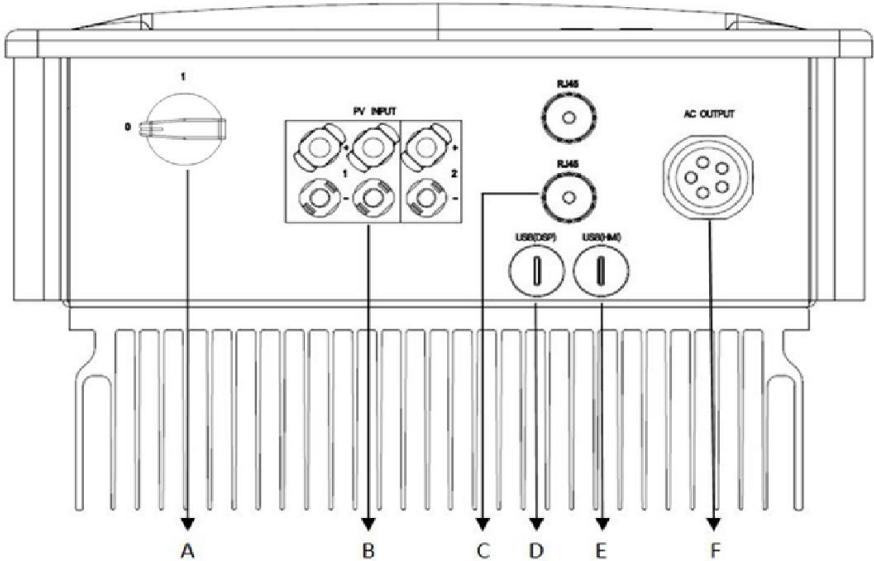
Object	Description
A	DC-switch (optional): switch on or off for PV-load
B	DC input: plug-in connectors to connect the strings
C	RJ45 interface: connect the monitoring device
D	USB (DSP) interface: update the DSP firmware
E	USB (HMI) interface: update the HMI firmware
F	AC output: plug-in connector to connect the grid

5.4 AC Connection

> ## ⚠ DANGER
>
> **Danger to life due to high voltages in the inverter!**
>
> Before do the electrical connection, ensure that the AC circuit-breaker is switched off and cannot be reactivated.

5.4.1 Conditions for the AC connection

Cable Requirements

The grid connection is made using 5 conductors (L1, L2, L3, N, and PE). We recommend the following requirements for stranded copper wire.
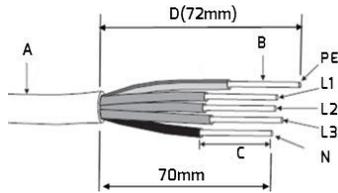
Object	Description	Value
A	External diameter	12...21mm
B	Conductor cross-section	2.5...6mm^2
C	Stripping length of the insulated conductors	Approx. 9mm
D	Stripping length of the AC cable's outer sheath	Approx.72mm
The PE insulated conductor must be 2 mm longer than the L and N conductors		

Larger cross-sections should be used for longer leads.

Cable Design

The conductor cross-section should be dimensioned to avoidpower loss in cables exceeding 1% of rated output power.

The maximum cable lengths relative to the conductor cross-section as follows:

Conductor cross-section	Maximum cable length	
	TLC8000	TLC10000
4mm^2	34 m	27 m
6mm^2	51 m	41 m

The required conductor cross-section depends on the inverter rating, ambient temperature, routing method, cable type, cable losses, valid installation requirements of the country of installation, etc.

5.4.2 Grid connection

Overview of the AC connection plug and the plastic fixture

| | | A | B | C | D | E | F |
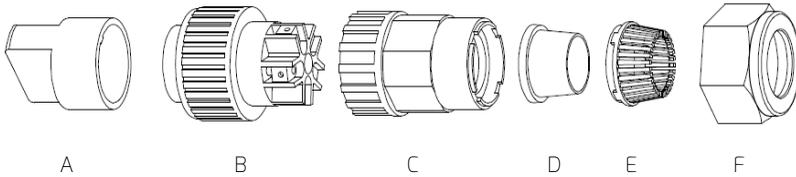
	Object	Description	
Accessory	A	Plastic fixture	
AC Connection Plug	B	Socket element	
	C	Adapter	
	D ✱	Seal ring	Thicker seal ring is suitable for cable diameter 12-18mm
			Thinner seal ring is suitable for cable diameter 16-21mm
	E	Fasteningcase	
	F	Swivel nut	

✱ There are two seal rings in the AC connection plug kit, please choose the suitable one according to different cable external diameter.

Procedure

1. Switch off the AC circuit breaker and secure it reconnection.
2. Guide the swivel nut, the fastening case with sealing ring and the adapter over the AC cable.
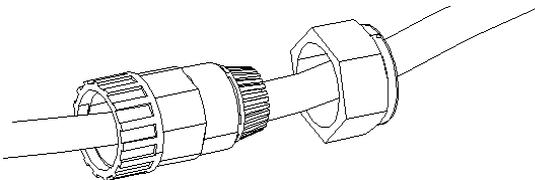
3. Strip the cable's outer sheath (72mm) and the conductors' insulation (9mm).

4. Insert bared conductors into the cord end terminals and crimp them by using a crimping tool.
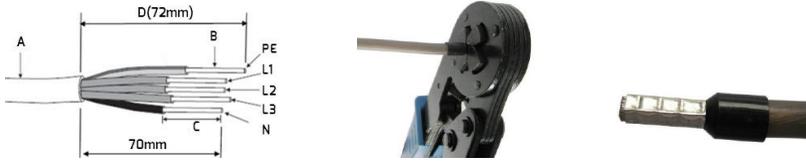
5. Insert the crimped conductors L1, L2, L3, N and PE into the corresponding terminals and tighten the screw with torque 2.0Nm using an Allen key(AF 2.5).
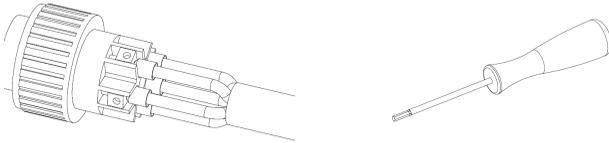
> ## ⚠ CAUTION
>
> **The inverter can be destroyed due to the wrong wiring!**
>
> Please ensure that the phase of the conductors matches the signs of the screw terminals on the socket element.

6. Assemble the socket element, adapter and swivel nut together. Match the plastic fixture with the socket element and grip them, then screw the adapter and swivel nut as shown below with a torque of 3-4Nm.
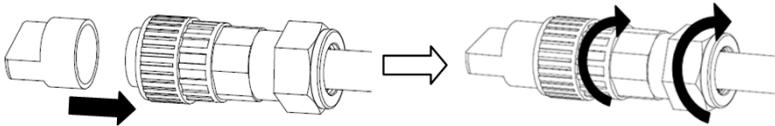
7. Insert the AC connect plug into the receptacle with the arrow aimed at the corresponding slot. Finally rotate the socket element clockwise until it audibly snaps into place.
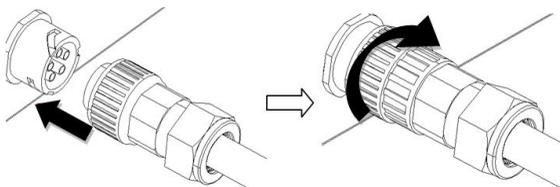
5.4.3 Second protective grounding connection

If required, the grounding terminal can be used to connect a second protective conductoror as equipotential bonding.

Procedure

1. Take out the terminal lug, insert the stripped earthing conductor into the terminal lugand crimp the contact.
2. Align the washer, the terminal lug with protective conductor and the ground washer on the screw. The teeth of the ground washer must be facing the heat sink.
3. Insert the screw through the hole located at the side of the heat sink and tighten it into the wall bracket firmly(screw driver type: T25, torque: 2Nm).
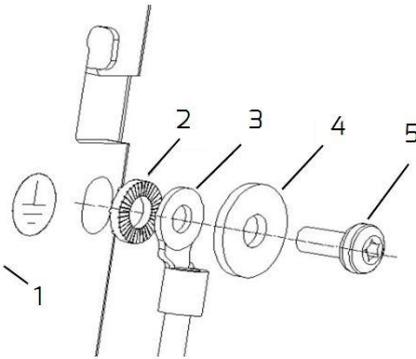
Earthing parts information：

No.	Description
1	Heatsink
2	Ground washer φ5
3	Terminal lug(M5) with protective conductor
4	Large plain washer φ6
5	M5×12 pan head screw

5.4.4 Residual current protection

The inverter is equipped with an all-pole sensitive residual current monitoring unit(RCMU) with an integrated differential current sensor which fulfills the requirement of DIN VDE 0100-712 (IEC60364-7-712:2002).

Therefore, an external residual current device (RCD) is not required. If an external RCD needs to be installed because of local regulations, a RCD type A or type B can be installed as an additional safety measure.

The all-pole sensitive residual current monitoring unit (RCMU) detects alternating and direct differential currents. The integrated differential current sensor detects the current difference between the neutral conductor and the line conductor. If the current difference increases suddenly, the inverter disconnects from the grid. The function of the all-pole sensitive residual current monitoring unit(RCMU) has been tested according to IEC 62109-2.

> **i** **INFORMATION**
> **If an external residual current device (RCD) needs to be used, please refer to the information below.**
>
> Where an external residual current device (RCD) is required in a TT or TN-S system, install a residualcurrent device which trips at aresidual current of 100mA or higher.
>
> For each connected inverter, a rated residual current of 100mA has to be provided. The rated residual currentof the RCD must be equal to at least the sum of the rated residual currents of the connectedinverters.That means that, if, for example, 2 transformerless inverters are connected, the rated residual current of the RCD must be at least 200mA.

5.4.5 Overvoltage category

The inverter can be deployed in grids of installation category III or lower, as defined under IEC 60664-1. This means that it can be permanently connected at the grid-connection point in a building. In installations involving long outdoor cable routing, additional overvoltage-reducing measures must be taken so that the overvoltage category is reduced from IV to III.

5.4.6 AC circuit breaker

> ### ⚠ DANGER
>
> **Danger to life due to fire!**
>
> You must safeguard each inverter with an individual AC circuit breaker in order that the inverter can be disconnected safely.

No consumer load should be applied between AC circuit breaker and the inverter. The selection of the AC circuit breaker rating depends on the wiring design (wire cross-section area), cable type, wiring method, ambient temperature, inverter current rating, etc. Derating of the AC circuit breaker rating may be necessary due to self-heating or if exposed to heat.

The maximum output current of the inverters can be found in the following table.

Type	TLC8000	TLC10000
Max. output current	13.3A	15.1A
Recommended fuse type gL/gG or comparable automatic circuit breaker rating	25A	

5.5 DC Connection

> ## ⚠ DANGER
>
> **Danger to life due to high voltages in the inverter!**
>
> ·Before connecting the PV generator, ensure that the DC-switch is switchedoff and that it
>   cannot be reactivated.
>
> ·Do not disconnect the DC connectors under load.

5.5.1 Requirements for the DC connection

> ## ℹ INFORMATION
> **If it is necessaryto use Y adaptors, please refer to the information below.**
>
> Y adaptors must not be visible or freely accessible in the immediate vicinity of the inverter.
>
> ·The DC circuit must not be interrupted by Y adaptors.
>
> ·In order to interrupt the DC electric circuit, disconnect the inverter from all voltage sources.

·PV modules of the connected strings must be of:

– the same type

– the same number of series-connected PV modules

– identical alignment

– identical tilt

· The connection cables of the PV modules must be equipped with the connectors
  included in the scope of delivery.

· At the DC input of the inverter, the following limits must not be exceeded:

Type	Max.DC voltage*	Max.DC current	I_{sc} PV, absolute max. input 1/2
TLC8000	1000V	15A/11A	22.5A /16.5A
TLC10000	1000V	15A/11A	22.5A/16.5A

*)The maximum open-circuit voltage, which can occur at solar panel temperatures of -10°C must
not exceed the maximum DC voltage of the inverter.

· The positive connection cables of the PV modules must be equipped with positive DC connectors.

·The negative connection cables of the PV modules must be equipped with negative DC connectors.

·At an ambient temperature over 10℃, the open-circuit voltage of the PV strings must notexceed 90% of the maximum DC input voltage of the inverter. This prevents the voltage from exceeding the maximum DC input voltage of the inverter at lower ambient temperatures.

5.5.2 Assembling the DC Connectors

Assemble the DC connectors as described below. Be sure to observe the correct polarity.The DC connectors are marked with the symbols "+" and " – ".
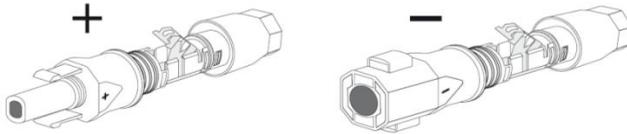
Cable requirements：

The cable must be of type PV1-F，UL-ZKLA or USE2 and comply with the following properties：

- ✧ External diameter：5-8mm
- ✧ Conductor cross-section：2.5-6mm^2
- ✧ Number of conductors：at least 7
- ✧ Nominal voltage：at least 1000V

Proceed as follows to assemble each DC connector.

1. Strip 12 mm of the cable insulation.

2.5 to 6 mm^2 5 to 8 mm

≈ 12 mm
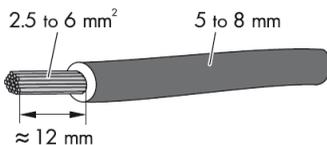
2. Route the stripped cable all the way into the DC connector. Ensure that the stripped cable and the DC connector have the same polarity.
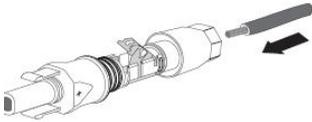
3. Press the clamping bracket down until it audiblysnaps into place.
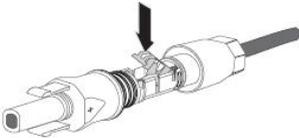
4. Ensure that the cable is correctly positioned:

Result	Measure
If the stranded wires are visible in the chamber of the clamping bracket, the cableis correctly positioned.	·Proceed to step 5.
If the stranded wires are not visible in thechamber, the cable is not correctly positioned.	·Release the clamping bracket. To do so, insert a flat-blade screwdriver (blade width: 3.5 mm) into the clamping bracket and lever it open. ·Remove the cable and go back to step 2.
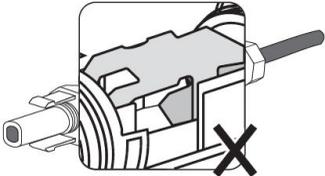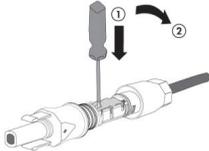
5. Push the swivel nut up to the thread and tighten (torque: 2 Nm).
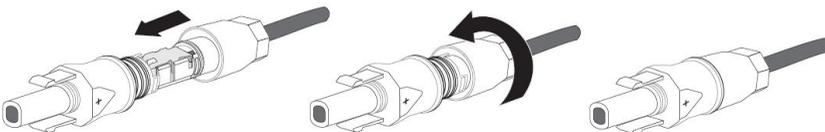
5.5.3 Disassembling the DC Connectors

1. Unscrew the swivel nut.
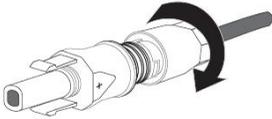
2. To release the DC connector, insert a flat-blade screwdriver (blade width: 3.5 mm) into the side catch mechanism and leveropen.
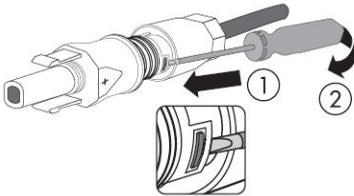
3. Carefully pull the DC connector apart.
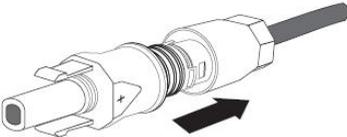
4. Release the clamping bracket. To do so, insert a flat-blade screwdriver (blade width: 3.5 mm) into the clamping bracket andlever it open.
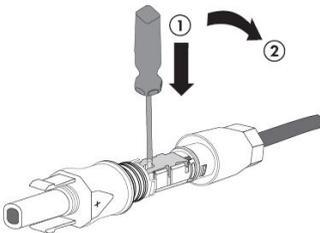
5. Remove the cable.
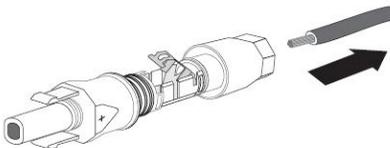
5.5.4 Connecting the PV Array

> ### **NOTICE**
>
> **The inverter can be destroyed by overvoltage!**
>
> If the voltage of the strings exceeds the maximum DC input voltage of the inverter, it can be destroyed due to overvoltage. All warranty claims become void.
>
> ·Do not connect strings with an open-circuit voltage greater than the maximum DC input voltage of the inverter.
>
> ·Check the design of the PV system.

1. Ensure that the individual AC circuit breaker is switched off and secure it against reconnected.
2. Ensure that the DC-switch is switched off and secure it against reconnected.
3. Ensure that there is no ground fault in the PV array.
4. Check whether the DC connector has the correct polarity.
   If the DC connector is equipped with a DC cable having the wrong polarity, the DC connector must be assembled again. The DC cable must always have the same polarity as the DC connector.
5. Ensure that the open-circuit voltage of the PV array does not exceed the maximum DC input voltage of the inverter.
6. Connect the assembled DC connectors to the inverter until they audibly snap into place. Ensure that all DC connectors are securely in place.
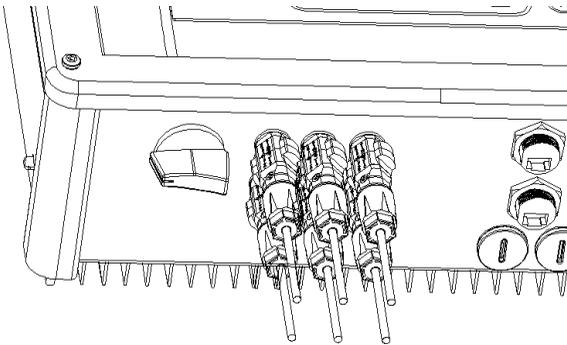
> ## *NOTICE*
>
> **Damage to the inverter due to moisture and dust penetration!**
>
> Seal the unused DC inputs with sealing plugs so that moisture and dust cannot penetrate the Inverter.
>
> · Make sure all DC connectors are securely sealed.

7. The inverter is only properly sealed when all the unused DC inputs are closed with sealing plugs.
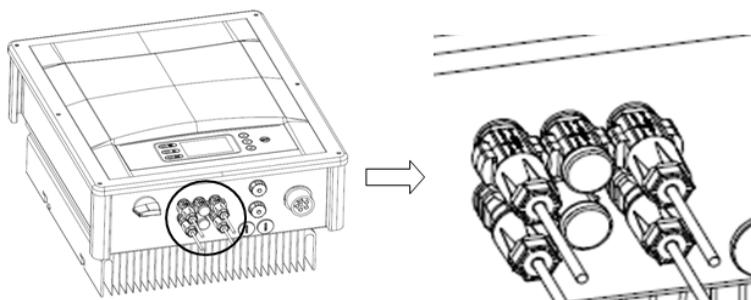
6 Communication

6.1 Monitoring system

The inverter is equipped with RJ45 interface for external communication. Monitoring of multiple inverters can be achieved by connecting multiple inverters in series onto a RS485 bus, and eventually to Zever Manager. The overall length of the network cable should not exceed 1000m. The monitoring system layout for inverters is as follows:
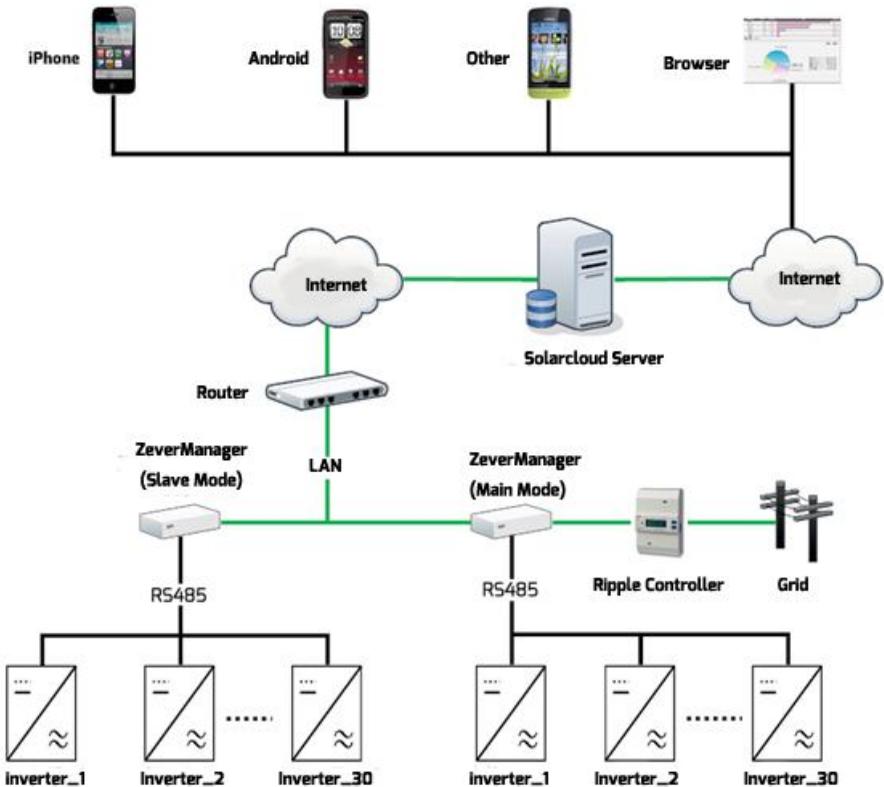
The ZeverManager connects to the inverter via the RJ45 interface, and it connects to the router via Ethernet. Then you will be able to connect the inverter to the remote monitoring platform "Solarcloud". You can monitor the operating status or power generation data via a smart phone or PC. The website address of the "Solarcloud" is *http://solarcloud.zeversolar.com*

The pin assignment of the RJ45 port on the inverter as follows:
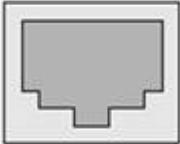
Pin1------- TX_RS485A	**PIN1--->8**
Pin2-------TX_RS485B	
Pin3-------RX_RS485A	
Pin4-------GND	
Pin5-------GND	
Pin6-------RX_RS485B	**RJ45 SOCKET**
Pin7-------+7V	
Pin8-------+7V	

For detailed information, please refer to ZeverManager user manual.

⚠ CAUTION

CAT-5 with shield or higher leveled cable is required as the communication cable RS485 between inverter and ZeverManager. Assignment of pins on both ends of the cable shall comply with IA/TIA568A or 568B standard.

It shall be UV resistant if used outdoors.

NOTICE

Damage to the inverter due to moisture and dust penetration!

If the the RJ45 plugs are not installed or not installed properly, the inverter can be destroyed due to moisture and dust corrode the RJ45 port. All warranty claims become void.

Make sure the RJ45 plug has been tightened firmly.

Connecting the RJ45 plug:

1. Unscrew the cap nut from the RJ45 keystone socket.
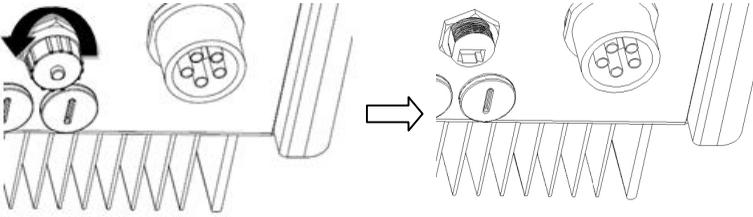
2. Take out the RJ45 plug which accompanies the inverter, and disassemble it.
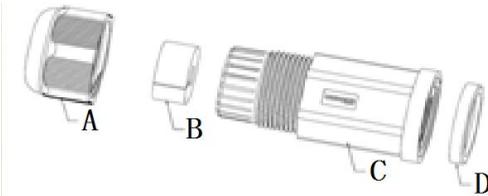
No.	Description	QTY	Color
A	Swivel nut	1	Black
B	Seal	1	Black
C	Threaded sleeve	1	Black
D	Gasket	1	Black

3. Guide the network cable through the components of RJ45 plug as follows.
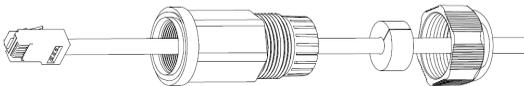
4. Insert the network cable to the RJ45 keystone socket then screw the threaded sleeve to the RJ45 socket tight (torque: 1.6 Nm).
   Push the seal into the threaded sleeve.
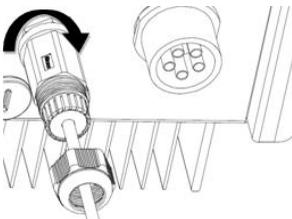
If necessary, an adjustable spannercan be used on-site during installation and dismantlement.

5. Screw the swivel nut to the threaded sleevetight (torque: 1.2 Nm).
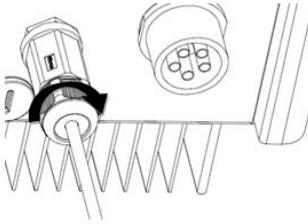
Disassemble the RJ45 plug:

6. Unscrew the swivel nut.
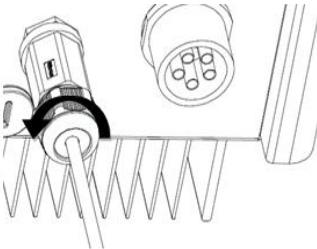
1. Unscrew thethreaded sleeve.
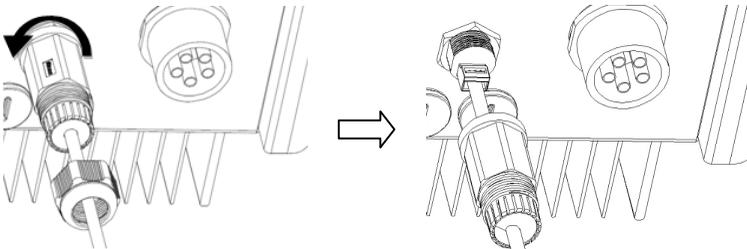
7. Remove the network cable and then screw the cap nut to the RJ45 keystone socket by hand.
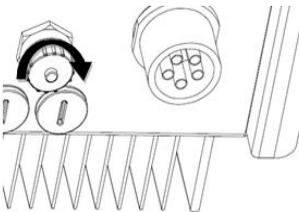
6.2 Updating the firmware via USB

If need to update the firmware, use a screwdriver (blade width: 9 mm) to unscrew the M20 screw plugs located at the bottom of the enclosure.

6.3 Communication with a third party monitoring equipment

The inverter supports communication with third party monitoring equipment such asMetecontrol, Solar-Log etc. For detailed wiring method please refer to operation manual of corresponding third party monitoring equipment.

7 Commissioning

> ## *NOTICE*
>
> **Risk of injury due to the faulty installation!**
>
> We strongly recommend carrying out preliminary checks before commissioning to avoid possible damage to the unit caused by faulty installation.

7.1 Electrical checks

Carry out the main electrical checks as follows:

①Check the PE connection with a multimeter: check that the inverter'sexposed metal surface has a grounding connection.

> ## ⚠ WARNING
>
> **Danger to life due tothe presence of DC-Voltage!**
>
> ·Only touch the insulation of the PV array cables.
>
> ·Do not touch parts of the sub-structure and frame of the PV array which isn't grouned
>
> ·Wear personal protective equipment such as insulating gloves.

②Check the DC voltage values: check that the DC voltage of the strings does not exceed the permitted limits. Refer tothe chapter "intended use" about designing the PV system (section 2.1.6) for the maximum allowed DC voltage.

③Check the polarity of the DC voltage: make sure the DC voltage has the correct polarity.

④Check the PV generator's insulation to earth with a multimeter: make sure that insulation resistanceto earth is greater than 1MOhm.

> ## ⚠ WARNING
>
> **Danger to life due to the presence ofAC-Voltage!**
>
> · Only touch the insulation of the AC cables.
>
> · Wear personal protectiveequipment such as insulating gloves.

⑤Check the grid voltage: check that the grid voltage at the point of connection of the inverter is within the permitted range.

7.2 Mechanical checks

Carry out the main mechanical checks to ensure the inverter is waterproof as follows:
①Use sealing caps for tight sealing of unused DC input connectors.
②Make sure the cap nut on the unneeded RJ45 keystone socket has beensolidly tightened.
③Make sure the AC connector has been mounted properly.

7.3 Start-up

After finishing the electrical and mechanical checks, switch on the AC circuit breakerand DC-switch in turn. The inverter starts up automatically.
Usually, there are three states during operation:

Waiting: When theinitial voltage of the strings is greater than the minimum DC input voltagebut lower than the start-up DC input voltage, the inverteris waiting for sufficient DC input voltage and cannot feed power into the grid.

Checking: When the initial voltage of the strings exceeds the start-up DC input voltage, the inverter will check feeding conditions at once. If there is anything wrong during checking, the inverter will switch to the "Fault" mode.

Normal: After checking, the inverterwill switch to"Normal" state and feed power into the grid.

During periods of low irradiation, the inverter may continuously startup and shut down. This is due to insufficient power generated by the PV generator. If this fault occurs often, contact the service.

i	**Quick troubleshooting**
	If the inverter is in "Fault" mode, refer to chapter 11 "Troubleshooting".

8 Disconnecting the inverter from voltage sources

Before performing any work on the inverter, disconnect it from all voltage sources as described in this section. Always adhere strictly to the given sequence.

1. Disconnect AC circuit breaker and secure against reconnection.
2. Disconnect the DC-switch and secure against reconnection.
3. Use a current probe to ensure that no current is present in the DC cables.
4. Release and disconnect all DC connectors. To do so, insert a flat-blade screwdriver or an angled screwdriver (blade width: 3.5 mm) into one of the side slits and pull the DC connectors straight out. Do not pull on the cable.
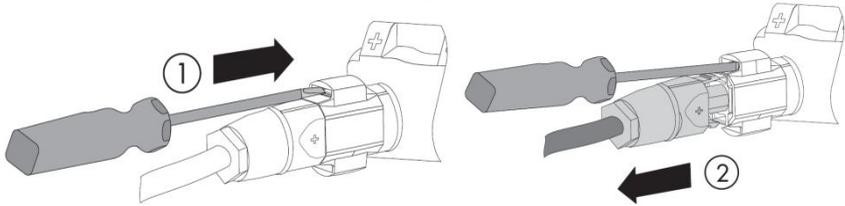
5. Release and disconnect the AC connector. Rotate the socket element counter-clockwise to open.
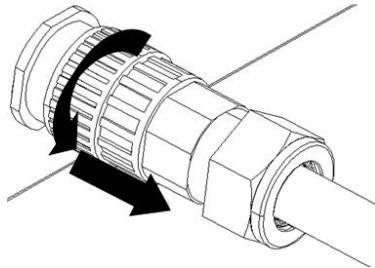
6. Wait until all LEDs and the display have gone out.

> ## ⚠ DANGER
>
> The capacitors in the inverter take 5 minutes to discharge.
>
> ·Wait 5 minutes before opening the inverter.

9 Operating

9.1 Overview of the control panel

The inverter is equipped with a control panel which includes a LCD, three LED indicators and four control buttons. You can view the data and set the parameters of the inverter using thetouchbuttons.
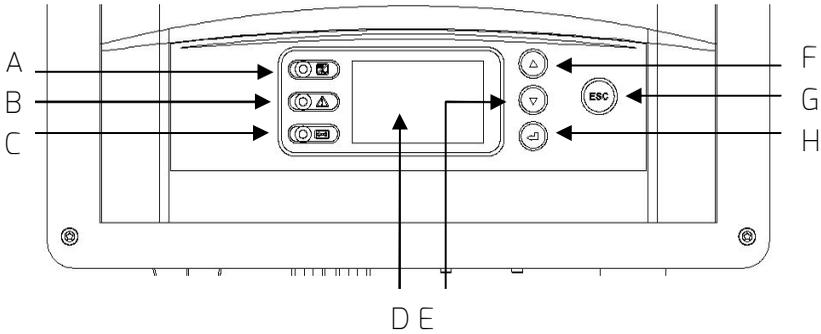
Object	Description
A	Normal(Green LED)
B	Fault(Red LED)
C	Communication (Bicolor LED)
D	LCD
E	▼ (Down button)
F	▲ (Up button)
G	ESC (Exit button)
H	↵ (Enter button)

9.2 LED indicators

The inverteris equipped with three LEDS including "green", "red" and "bicolor" which provide information about the various operating status as follows.

Green LED:
The green LED is lit when the inverter is operating normally.

Red LED:
The red LED is lit when the inverter has stopped feeding power into the grid due to a fault.The corresponding error code will be shown on the display at the same time.

Bicolor LED:
The bicolor LED can blink green or red. It blinks during communication with other devices such as a ZeverManager, Solarlog, etc. The bicolor LED blinks green when the ZeverManager is sending information to the inverter, and blinks red when the inverter is sending information to the ZeverManager. The LED will also blink green duringa firmware updating.

9.3 Display messages

Along with the various operating states, various messages may be shown on the display as follows.

State	Error code	Description	Causes
Initialization		Waiting	Initial PV voltage is between Min.DCinput voltage and start-up DC input voltage of the inverter.
		Checking	The inverteris checking feeding conditions after initial PV voltage exceeds start-up DC input voltage of the inverter.
		Reconnect	The inverteris checking feeding conditions after the last fault has been solved.
Normal		Normal	The inverteris operatingnormally.
Fault	1	SPI Fault	Communication between the master and slave CPU has failed.
	2	EEPROM R/W Fault	Reading or writing of EEPROM fails
	3	Rly-Check Fault	Output relay has failed.
	4	DC INJ. High	Output DC feed-in exceeds the permitted upper limit.
	8	ACHCT Fault	Output current sensor is abnormal.
	9	GFCI Fault	GFCI detection circuit is abnormal.
	10	Device Fault	Unknown Error
	11	M-S version unmatched	Different firmware version between the master and slave CPU.
	33	FacFault	The grid frequency lies outside the permitted range.
	34	VacFault	The grid voltage lies outside the permitted range.
	35	Utility Loss	The utilitycannot be detected, which may be caused by no utility, grid disconnected, AC cable damage,fuse broken or island.

Fault	36	Ground Fault	The residual current exceeds the permitted upper limit.
	37	PV Overvoltage	The voltage of the strings exceeds the permitted upper limit.
	38	ISO Fault	The PV generator's insulationresistanceto earthis below the permitted value, or the electrical insulation inside the inverter has failed.
	39	Fan Lock	The fan or internal circuit has failed.
	40	Over Temp.	The internal temperature exceeds the permitted value.
	41	Vac differs for M-S	A different value of grid voltage has been detected by the master and slave MCU.
	42	Fac differs for M-S	A different value of grid frequency has been detected by the master and slave MCU.
	43	Ground I differs for M-S	A different value of residual currenthas been detected by the master and slave MCU.
	44	DC Inj. differs for M-S	A different value of DC feed-in has been detected by the master and slave MCU.
	46	High DC Bus	The voltage of DC Bus exceeds the permitted upper limit.

The last 5 dated failure reports on the NS protection can be read. An interruption in the supply voltage of ≤ 3s does not result in any loss of failure reports (according to VDE-AR-N 4105).

9.4 Display

9.4.1 Overview of menu structure

The menu structure serves as a support to change to the individual information displays and setting displays.

MENU STRUCTURE

9.4.2 Initial page

When the inverter starts up, LCD will first display an initial page that shows
the current safety standard of the inverter. The page will display for about
5 seconds and then jump to the home page automatically.

```
                        Safety Standard



                      DE VDE-AR-N 4105


```
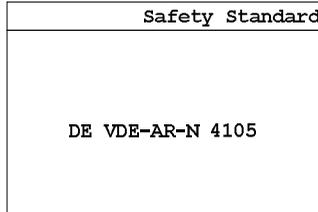
9.4.3 Unlock page

When the LCD backlighted, you must be slip from 'Down' to 'Esc' to unlock
to operate the LCD.

```
              ▼    unlock   Esc
                    ──────▶
            Slipe from 'Down' to 'Esc' to unlock
```
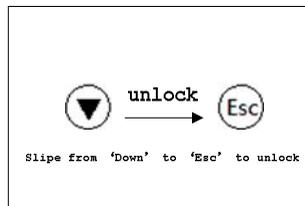
9.4.4 Home page

The home pageshows some of the most important running data of inverter
such as the real-time output power, daily energy, an error code, and the
power graph.

```
 A  19/11/2013 12:23  ◪  ▶53S   F

     Power         P  8
 B      7979 W                  G

     Etoday                     I
 C      123.4 KWh
                                H
     Etotal
 D   15234.5 KWh            t
 E  Error Code:02   4  8  13  17  22
```
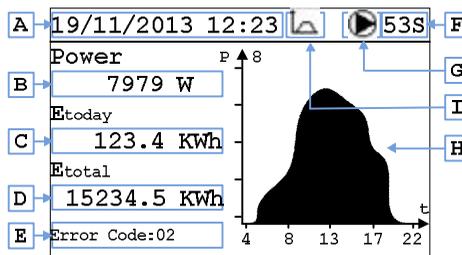
LCD will jump to the home page and the backlight will turn off when there is no button operation in 2 minutes.

Object	Description
A	Date&Time
B	Output power
C	Daily energy
D	Total energy
E	Error code(*), see chapter 9.3
F	Checking time
G	Operating status: ⊗ waiting, ◐operating, ⊗fault
H	Field area of output power from 4:00 to 22:00
I	Load limiting effective

(*) The inverter goes into fault mode when the temperature is lower than -25°C. LCD will show the error message "Temp.under -25°C".

9.4.5 Operation information

There are two pages show the operational information on the AC&DC side of the inverter respectively. Switch between these 2 pages by pressing the "▲" or "▼" button.

Object	Description
A	Grid voltage
B	Power factor
C	Grid frequency
D	Output current
E	Phase leading or lagging
F	Running hours of the current day
G	DC input voltage
H	DC input power of MPPT 1
I	DC input current
J	DC input power of MPPT 2

9.4.6 Main menu

Press the " ↵ " button to enter the main menu from the home page.

Press the "▼" or "▲" button to select the menu item.

Press the " ↵ " buttonto confirm.

Press the "ESC" button to return to the home page.

```
                                   Menu
     Statistics

     Event Log

     Settings

     Device Info
```
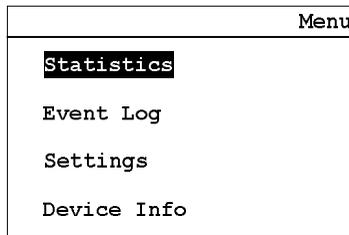
9.4.7 Statistics

Press the "▲" or "▼" button to select the "Statistics" item of main menu and press " ↵ " button to confirm.

Press the "▲" or "▼" button to select Daily historical data, Monthly historical dataor Yearly historical data.

Press the " ↵ " button to confirm.

Press the "▲" button one timeto display the previous history record.

Press the "▼" button one timeto displaythe next history record.

Press the "ESC" button to return to the menu.

```
                  Statistics  09/11/2013   Day Statistics

   Days                       Etoday            0.0 KWh

   Months                     Peak                0   W

   Years                      Runtime             0   h
```

9.4.8 Event log

Press the "▲" or "▼" button to select the "Event Log" item of main menu
and press the " ↵ " button to confirm.
Press the "▲" or "▼" button to check the fault messages.
Press the "ESC" button to return to the menu.

```
                      Event Logs

A → [1] 12/09/2013 08:45   E12 ← B
    [2] 11/09/2013 17:23   E03
    [3] 10/08/2013 15:23   E43
    [4] 07/07/2013 13:23   E45
    [5] 02/06/2013 12:23   E01
```

Object	Description
A	Date and time of the fault
B	Error code

9.4.9 Date&Time setting

Enter the sub-menu "Basic Setting" and press the "▼" or "▲" button to
select the "Date&Time Setting" item of the "Settings" sub-menu and press
the " ↵ " button to confirm.
Use the "▲"or "▼"button to set the year, month, day, hour and minute one
by one.
Press the " ↵ " button to confirm.
Press the "ESC" button to return to the Basic Setting page.

```
                              Date&Time


               dd/mm/yyyy hh:mm
               21/11/2013 12:34
```
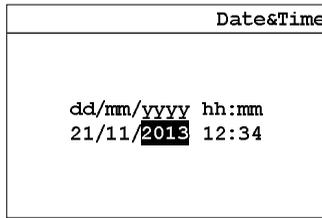
9.4.10 Language setting

Enter the sub-menu "Basic Setting" and press the "▼" or "▲" button to select the "Language Setting" and press the " ↵" button to confirm.
Use the "▲" or "▼" to choose the language.
Press the " ↵" button to confirm.
Press the "ESC" button to return to the Basic Setting page.

```
                               Language


                     English
                     Deutsch
                     简体中文
                     繁體中文
```

9.4.11 Contrast setting

Enter the sub-menu "Basic Setting" and press the "▼" or "▲" button to select the "Contrast Setting" and press the " ↵" button to confirm.
Use the "▲" or "▼" to choose the LCD contrast.
Press the " ↵" button to save.
Press the "ESC" button to return to the Basic Setting page.

```
                               Contrast


                  50
              ████████
```
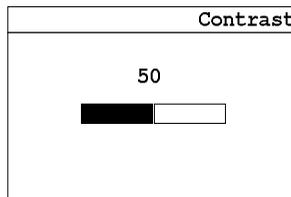
9.4.12 Safety regulations setting

Enter the sub-menu "Advanced Setting" and press the "⏎" button to input the password. The password is required if you want to change some parameters. Please get the correct password from the service engineer. Enter the correct password and "⏎" to enter the advanced setting sub-menu page.

Then select the "Safety Setting" item and press the "⏎" button then enter the safety parameters page.

```
                    Password         Advanced Setting
                                     Safety Setting
                                     Overload Setting
                                     Active power control
          Password: 0 0 0 0          Reactive power control
                                     PV Mode Setting
                                     EEG Setting
```
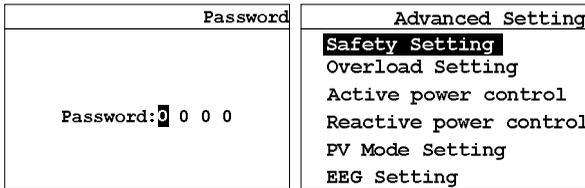
At the safety regulation parameter page, use the "▲" or "▼" button to modify the selected parameter and confirm with the "⏎" button. Then modify the next parameter in turn. Parameter modification is finished after the Enter key is pressed. Press the "ESC" button to cancel.

```
                      Safety                           Safety
  Standard: DE VDE-AR-N 4105
                              OFP2:           54.50 Hz
  OVP2:            265.5 V    OFP1:           53.50 Hz
  OVP1:            185.0 V    UFP1:           47.50 Hz
  UVP1:            255.0 V    UFP2:           45.50 Hz
  UVP2:            180.0 V
  10Min-Mean:      180.5 V
```

There are two pages for safety regulation parameters setup. After modifying the last parameter of the first page, the page will automatically jump to the second page.

NOTICE

The safety of the grid may be influenced due to the wrong safety setting!

The default parameters settings comply with the local regulations.

Don't change the values of the monitored operating limits unless the utility provider agrees with your requirement!

9.4.13 Overload setting

Enter the sub-menu "Advanced Setting" and press the "▼" or "▲" button to select the

"Overload Setting" and press the " ⏎ " button to set the status.

Use the "▲" or "▼" to choose "Enable" or "Disable".

Press the " ⏎ " button to confirm this function is effective on the inverter.

Press the "ESC" button to return to the Advanced Setting page.

```
                              Overload

  Overload Setting:
              Disable
              Enable

```
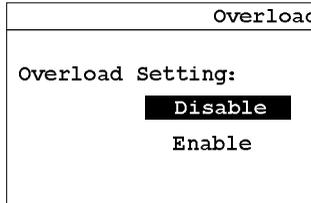
9.4.14 Active power control

Enter the sub-menu "Advanced Setting" and press the "▼" or "▲" button to select the

"Active Power Control" and press the " ⏎ " button to set the status.

Use the "▲" or "▼" to choose the active power of the status.

Press the " ⏎ " button to confirm this function is effective on the inverter.

Press the "ESC" button to return to the Advanced Setting page.

```
          Active power control

  Active power control:
              Disable
              Enable

```
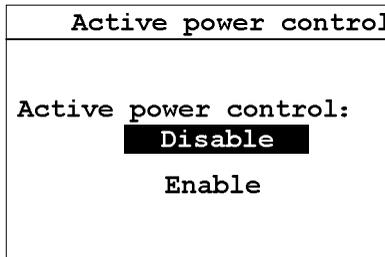
9.4.15 Reactive power control

Enter the "Advanced Setting" menu and press the "▼" or "▲" button to select the "Reactive Power Control" and press the " ↵ " button to enter the sub menu.

```
 Reactive Power Control
 PF Enabling
 PF Setting
```
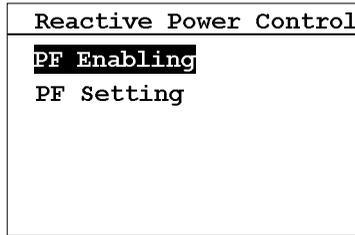
Select the "PF Enabling" item and press "Enter" to enter the PF Enabling page.
Then press "▲" or "▼" button to disable or enable the function.
Press "Enter" button to enter the reactive power control menu.

```
              PF Enabling
 PF Enabling:
              Enable
              Disable
```
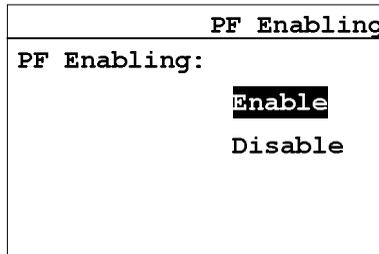
Choose the "PF Setting" item and press"Enter" button toenter the PF Setting page.
Use the "▲" or "▼" to choose the reactive powercontrol mode "Default" or "Fixed".
Choose the "Default" and press"Enter" button to restore the PF parameters to factory setting.
You can set a fixed PF and phase to the inverter when choose the "Fixed" mode.
Use the "▲" or "▼".
Choose the "Fixed" mode and press"Enter" button. Then you can modify the PF and phase in turn.
Press the " ↵ " button to confirm this function is effective on the inverter.

Press the "ESC" button to return previous menu.

```
                    PF Setting              PF Setting
Mode:          Default      Mode:              Fixed



                                   PF: 0.98  Phase:leading
```

> **NOTICE**
>
> You should enable the function in the "PF Enabling" page first to make sure the PF setting effective.

9.4.16 PV Mode setting

Enter the sub-menu "Advanced Setting" and press the "▼" or "▲" button to select the "PV Mode Setting" and press the "⏎" button to set the status. Use the "▲" or "▼" to choose the PV Mode.

Press the "⏎" button to confirm this function is effective on the inverter. Press the "ESC" button to return to the Advanced Setting page.

```
                    PV Mode

   PV Mode Setting:
        Independent Mode
          Parallel Mode

```

9.4.17 EEG setting

Enter the sub-menu "Advanced Setting" and press the "▼" or "▲" button to select the "EEG Setting" and press the " ↵ " button to set the status.
Use the "▲" or "▼" to choose the EEG of the status.

Press the " ↵ " button to confirm this function is effective on the inverter.
Press the "ESC" button to return to the Advanced Setting page.

```
                                    EEG

  EEG Setting:
            Disable
            Enable


```
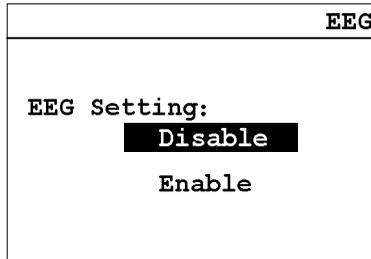
9.4.18 Communication setting

Select the "Communication Setting" item with the "▼" or "▲" button in the "Settings" sub-menu and press " ↵ " button to enter the setting page.
Use the "▲" or "▼" to choose the Modbusaddress.

Press the " ↵ " button to confirm this function is effective on the inverter.
Press the "ESC" button to return to the menu.

```
                  Communication

        Device Address: N


```
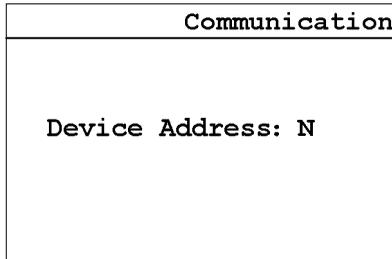
9.4.19 Device information

Press the "▼" or "▲" button to select the "Device Info" item of the main menu and press the " ↵ " button to confirm.Press the "ESC" button to return to the menu.

```
                     Device Info
  TYPE: TLC8K
  S/N:1234567890123456
  MCU:V1.00      .B-list
   HMI:G14718-302R.A-list02
  STD:DE VDE-AR-N 4105
```
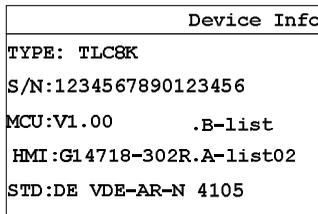
9.4.20 Clear the history data

Enter the "safety setting" page, enter the correct password, and enter the data clear page.

```
┌─────────────────────────────┐
│                             │
├─────────────────────────────┤
│                             │
│                             │
│         Clear Data?         │
│                             │
│                             │
└─────────────────────────────┘
```
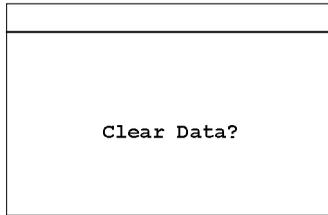
Press the " ↵ " button to confirm to clear the historical data. Press the "ESC" button to cancel.

```
┌───────────────────┐  ┌───────────────────┐
│                   │  │                   │
├───────────────────┤  ├───────────────────┤
│                   │  │                   │
│  Wait a Second... │  │  Clear Completed! │
│                   │  │                   │
└───────────────────┘  └───────────────────┘
```
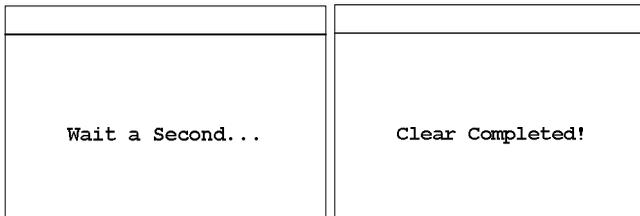
10 Technical data

10.1 DC input data

Type	TLC8000	TLC10000
DC convertible power (@cos φ =1)	9250W	10500W
Max. input voltage	1000V	
MPP voltage range / rated input voltage	200-900V / 640V	
Min. start voltage	250V	
Min. feed-in power	12W	
Max. input current per MPPT	15A/11A	
Number of MPPTs	2	
Number of independent MPP inputs	2/1	

10.2 AC output data

Type	TLC8000	TLC10000
Rated active power	8000W	10000W
Max. apparent AC power	8800W[3]	10000W
Nominal AC voltage	3/N/PE, 220/380V, 230/400V, 240/415V	
Nominal AC voltage range (line to line) [4]	277-520V	277-520V
AC power frequency / range[5]	50 / +-5Hz	
Rated power frequency / rated grid voltage	50Hz / 230V	
Max. output current	3×13.3A	3×15.1A
Power factor (@rated power)	> 0.99	
Adjustable displacement power factor	0.85 inductive ... 0.85 capacitive	
Feed-in phases / connection phases	3 / 3	
Harmonic distortion (THD) at rated output	< 3%	

(3) Onlywhen overload is enable, this power can be reached.

(4) The AC voltage range depends on the local safety standards.

(5) The AC frequency range depends on the local safety standards.

10.3 General data

Type	TLC8000	TLC10000
Interfaces: RS485 / Ethernet / WIFI	● / - / -	
Display	graphical LCD	
Dimensions (W x H x D)	405 x 498 x 255mm	
Weight	25kg	
Cooling concept	convection	
Noise emission (typical)	<45 dB(A) @1m	
Installation	indoor & outdoor	
Mounting information	wall mounting bracket	
DC connection technology	SUNCLIX	
AC connection technology	plug-in connector	
Operating temperature range	-25℃···+60℃/-13℉···+140℉	
Relative humidity (non-condensing)	0% ... 100%	
Max. operating altitude	2000m	
Degree of protection (according to IEC 60529)	IP65	
Climatic category (according to IEC 60721-3-4)	4K4H	
Topology	transformerless	
Self-consumption (night)	<0.6W	
Standby power	<12W	

10.4 Safety regulations

Type	TLC8000	TLC10000
DC isolator	○	
PV iso / Grid monitoring	● / ●	
DC reverse polarity protection / AC short-circuit current capability	● / ●	
Residual current monitoring(GFCI) function	●	
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / II (DC), III (AC)	
Internal overvoltage protection	Integrated	
DC feed-in monitoring	Integrated	
Islanding protection	Integrated (Three-phase monitoring)	
EMC immunity	EN61000-6-1, EN61000-6-2	
EMC emission	EN61000-6-3, EN61000-6-4	
Utility interference	EN61000-3-2, EN61000-3-3	

1) Certification roadmap completed in Q3-2015. Please refer to our local sales organization for detailed information.

2) ● standard   ○ optional   - not available

---

i   **INFORMATION**

   If you choose the standard VDE-AR-N 4105, please refer to information below.

·If a central NS protection device is used for power generation system, then the value of the rise-in-voltage protection U > of 1.1Un presented in the integrated NS protection can be changed, but need password.

10.5 Efficiency

The operating efficiency is shown for the three input voltages (Vmppmax, Vdc, r and Vmppmin) graphically. In all cases the efficiency refers to the standardizedpower output (Pac/Pac,r). (According to EN 50524 (VDE 0126-13): 2008-10, cl. 4.5.3).

Notes: Values are based on ratedgrid voltage, cos(phi) = 1 and an ambient temperature of 25℃.

10.5.1 Efficiency curve TLC8000
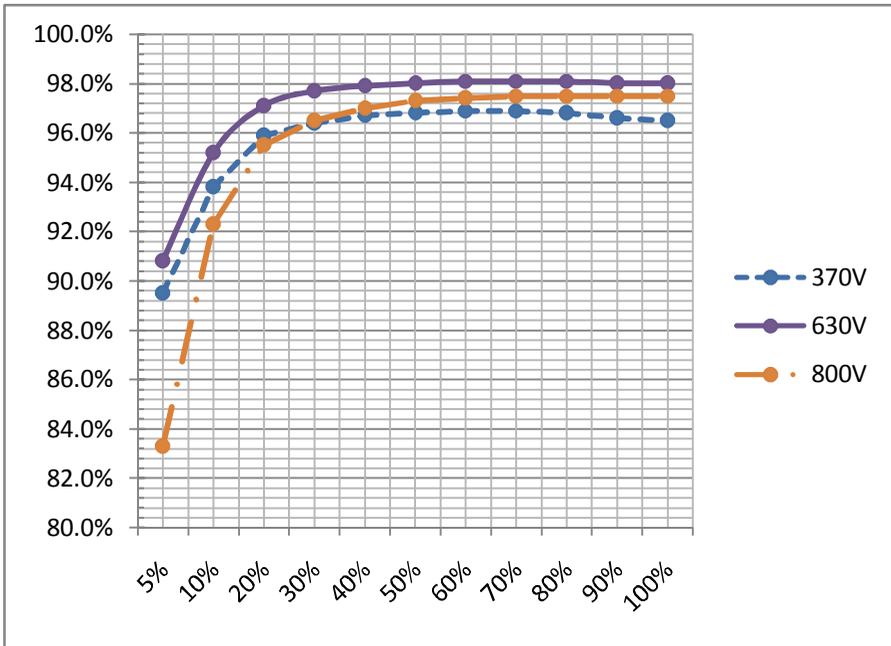
Max. efficiency, η max	98.1 %
European weighted efficiency, η EU	97.5%
MPPT efficiency	99.50%

10.5.2 Efficiency curve TLC10000
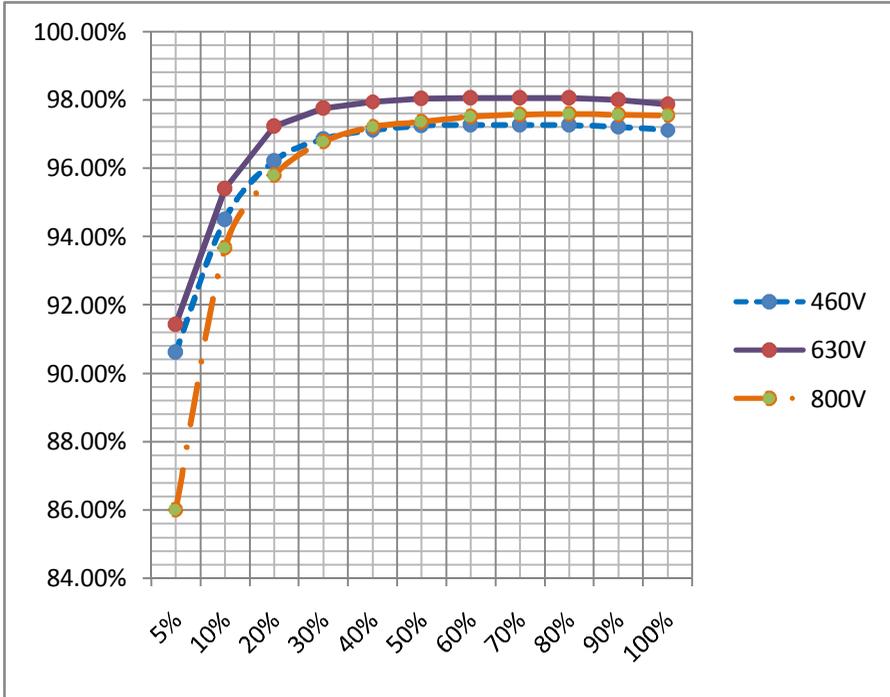
Max. efficiency, η max	98.1 %
European weighted efficiency, η EU	97.6%
MPPT efficiency	99.50%

10.6 Power reduction

In order to ensure inverter operation under safe conditions, the device may automatically decrease power output.

Power reduction depends on many operating parameters including ambient temperature and input voltage, grid voltage, grid frequency and power available from the PV modules. This device can decrease power output during certain periods of the day according to these parameters.

Notes: Values based on ratedgrid voltage andcos (phi) = 1.
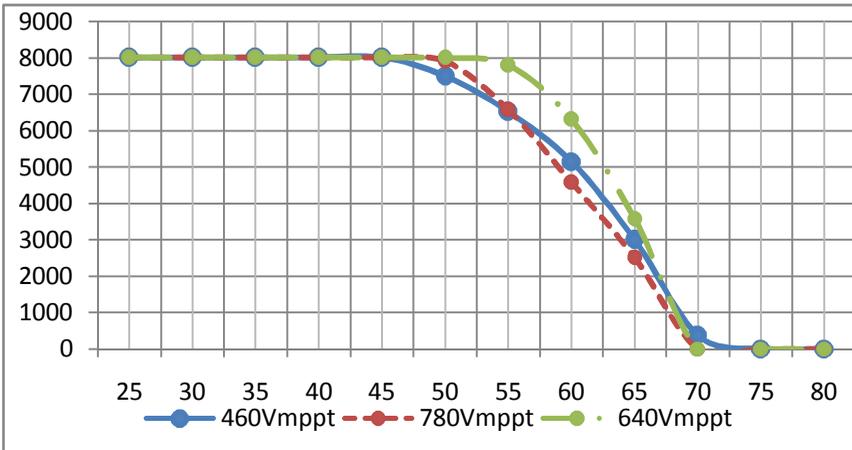
Power reduction with increased ambient temperature (TLC8000)
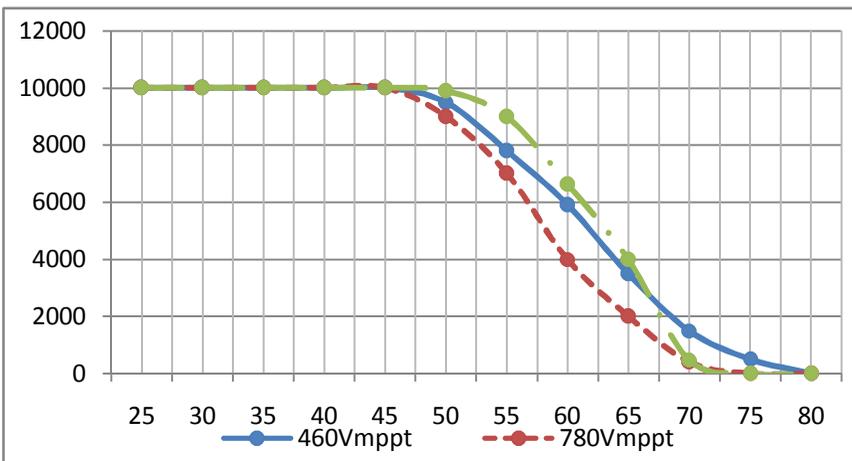
Power reduction with increased ambient temperature (TLC10000)

11 Troubleshooting

Whenthe PV systemdoes notoperate normally, we recommend the following solutions for quick troubleshooting. When system is in fault condition, fault information will be show up outlet display and monitor device, the red LED will light up.

The corresponding causes are described in section 9.3 "Display messages".

The correspondingcorrective measures are as follows:

Object	Error code	Corrective measures
Resumable Fault	33	·Check the grid frequencyand observe how often majorfluctuations occur. If this faultis caused by frequent fluctuations, try to modify theoperating parameters after informing the utilityprovider first.
	34	·Check the grid voltage and grid connection on the inverter. ·Check the grid voltage at the point ofconnection of the inverter. If the grid voltage is outside the permitted range due to local grid conditions, try to modify the values of the monitored operating limits after informing the electric utility company first. If the grid voltage lies within the permitted range and this fault still occurs, contact the service.
	35	·Check the fuseand the triggering of AC circuit breakerin thedistribution box. ·Check grid voltage, grid usability. ·Check AC cable, grid connection on the inverter. If this fault is still being shown, contact the service.
	36	·Make surethe earth connection of the inverter is reliable. ·Make a visual inspection of all PV cablesand modules. If this fault is still shown, contact the service.
	37	·Check the open-circuit voltages of the strings, make sure it is lower than the Max. DC input voltage of the inverter. If the input voltage lies within the permitted range andthe fault still occurs, contact the service.

	38	·Check the PV generator's insulation to earth, make sure that the insulation resistance to earth is greater than 1MOhm; Otherwise, make a visual inspection of all PV cablesand modules. ·Make surethe earth connection of the inverter is reliable. If this fault occurs often, contact the service.
	40	·Check whether the airflow to the heat sink is obstructed. ·Check whether the ambient temperature around the inverter is too high.
Resumable Fault	41, 42 43, 44	·Disconnect the inverter from the grid and the PV generator, reconnect them after 3 minutes. If this fault is still being shown, contact the service.
	46	·Check the open-circuit voltages of the strings, make sure it is lower than the Max. DC input voltage of the inverter; If the input voltage lies within the permitted range, and the fault still occurs, maybe the internal circuit has broken, contact the service.
Permanent Fault	1,2,3,4,8, 9,10, 11,39	Disconnect the inverter from the grid and the PV generator, reconnect them after 3 minutes. If this fault is still being shown, contact the service.

12 Maintenance

Normally, the inverter needs no maintenance or calibration. Regularly inspect the inverter and the cables for visible damage. Disconnect the inverter from all power sources before cleaning. Clean the enclosure and display with a soft cloth. Ensure the heatsink at the rear of the inverter is not covered.

12.1 Cleaning the contacts of the DC-switch

Clean the contacts of the DC-switch once per year. Perform cleaning by cycling the switch to "1" and "0" positions 5 times. The DC-switch is located at the lower left of theenclosure.

12.2 Cleaning the heat sink

> ### ⚠ CAUTION
>
> **Risk injury due to hot heat sink!**
>
> · The heat sink may exceed 70℃ during operation. Do not touch the heatsink during operation.
>
> ·Wait approx.30 minutes before cleaning until the heatsink has cooled down.

Clean the heat sinkwithpressurized airor a soft brush.Do not use aggressive chemicals, cleaning solvents or strong detergents.
For proper function and long service life, ensure free air circulationaround the heatsink.

13 Recycling and disposal

Both the inverter and its transport packaging are predominantly made from recyclable raw materials.

Do not dispose of the defective inverter and its accessories with normal domestic waste.

> **ℹ INFORMATION**
> · Do not dispose of the product together with the household waste but
>   in accordance with the disposal regulations for electronic waste applicable
>   at the installation site.

14 Warranty

The warranty cardis enclosed with the package, whichalso can be downloadedat www.zeversolar.com if required.Please keep well the warranty card. When the customer needs warranty service during the warranty period, the customer must provide a copy of the invoice, warranty card, and ensure the electrical label of the inverter is legible. If these conditions are not met, Zeversolar has the right to refuse to provide with the relevant warranty service.

15 Contact

If you have any technical problems concerning our products, please contact Zeversolar service.We require the following information in order to provide you with the necessary assistance:

· Inverter device type
· Inverter serial number
· Type and number of connected PV modules
· Error code
· Mounting location
· Warranty card

ZeversolarFactory Warranty

The current warranty conditions come enclosed with your device. They are also available online at www.zeversolar.com and canbe downloaded and are available on paper from the usual sales channels if required.

Jiangsu ZeversolarNew EnergyCo., Ltd.

Tel.: +86 512 6937 0998
Fax: +86 512 6937 3159
Web: www.zeversolar.com
Factory add.: No.588 Gangxing Road, Yangzhong Jiangsu, China
Headquarters add.: Building 9, No.198 Xiangyang Road, Suzhou 215011, China