



sonnen_system 3_30/ 3_40/ 3_60/ 3_60CX

Bi-axial Tracking System for Photovoltaic Facility



English

General safety instructions

The German safety instructions is the original document





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Legal Mentions

Safety Instructions for the Bi-axial Tracking System for Photovoltaic Facility sonnen_system_3_xx

Kirchner Solar Group GmbH

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Printed on paper made of cellulose, bleached without chlorine or acid.

1 Symbols and words used in these instructions

The symbols and words used in these instructions have the following meanings:



Identifies a hazardous situation which will lead to death if not prevented.



Indicates a hazardous situation which could lead to death or serious injuries if not prevented.



Indicates a hazardous situation which could lead to minor or moderate injuries if not prevented.



Indicates a situation which will or could lead to damage to equipment if not prevented.



Additional information and tips.

2 Safety Advice

- Read the following safety information and the related manuals carefully and follow the instructions. Only commence with the installation when you have understood all of the steps. If not, please contact us beforehand. Contact details can be found in the chapter "Contact" in the installation instructions.
- Before installing the sonnen_system, enquire about the applicable local regulations on foundations, construction, equipotential bonding and lightning protection of the sonnen_system and follow them.
- The directives, guidelines and regulations for accident prevention applicable on-site must be known and adhered to.
- After starting up, ensure that you receive any error messages which may have been generated. Additional information on this can be found in the documentation of the SOLTRK; Section 6.3, Parameterizing Sunny WebBox and SOLTRK.
- Carefully read the documentation relating to the components used on the sonnen_system and follow the instructions.
- Keep the documentation on your sonnen_system and its components readily available at all times.

WARNING

Do **not** work on the **sonnen_system** in any of the following cases:

1. During wind speeds that may cause a hazard.
 - Check the wind speeds up to which work is permissible in your country, and comply with that.
 - Work with a crane must be completed before the maximum wind speed allowable for work is reached. Go by the data in the documentation for the crane deployed.
- ⇒ If work is performed at too high wind speeds, there is danger of crushing or collision, and of being struck by moving or falling components.
2. When the steel parts are iced over.
 - ⇒ When the steel parts are frozen over, there is danger of injury from accidental shifting of the steel components during installation, maintenance and dismantling.
3. During a thunderstorm.
 - ⇒ If work is carried out in a thunderstorm, there is life-threatening danger from lightning or surges resulting from lightning strikes.

If any repair work needs to be done, the **sonnen_system must be immediately shut down and if necessary must be secured.**

The shutdown may be cancelled only if the repair work was completed and the proper condition of the **sonnen_system** was ensured. The shutdown is described in the maintenance manual.

- ⇒ If the **sonnen_system** is not shut down, there is the risk of injury due to operation of a **sonnen_system** which is not fully functional.

De-energize the inverter and the solar generator before working on it or on the associated cables.

- Prevent switching on by marking, blocking or locking.
 - Use a voltage tester to ensure that all components are reliably dead.
 - Check all phases for being at zero potential.
 - For isolating the inverter or solar generator, respectively, go by the instructions in the documentation to the inverter or to the PV modules used, in particular the safety instructions.
- ⇒ If the inverter and the solar generator are not de-energized, there is danger of electric shock, burns or blindness of the eyes caused by arc or spark formation, as well as the risk of secondary accidents by startling.

WARNING

It is imperative that you use the included liquid thread locking varnish/self-locking nuts.

- Follow the respective instructions in these installation instructions.
 - Use the self-locking nuts only once.
- ⇒ If the thread locking varnish is not used as intended, parts can loosen or fall off and lead to injuries or damage to equipment.

You are not allowed to carry out welding work or mechanical rework on the sonnen_system or the components.

- The loading capacity of the sonnen_system may be impaired by welding or mechanical rework.
- ⇒ Parts can loosen or fall off and lead to injuries.

Wear your personal protective equipment.

- Working gloves, safety shoes, helmet, ear protection and safety harness to prevent falls when working on elevated positions.
 - If the regulations applicable on-site mandate additional protective equipment for work to be performed here, such equipment must be additionally worn.
- ⇒ Work on the sonnen_system entails danger of crushing, collision, cutting and falling. There is also the danger of burns or frostbites upon unprotected touching of very hot or very cold components and the risk of hearing damage through the use of assembly tools.

It is imperative to observe the safety concept provided from Kirchner Solar Group, in particular if our controller SOLTRK and the safeguard is not used.

- ⇒ If the safety concept is not followed, parts can loosen or fall off and lead to injuries or damage to equipment.

CAUTION

During operation, no other persons or objects are allowed to be in the swivel and tilt area of the sonnen_system, even outside of the normal travel path.

- ⇒ The automatic traversal of the sonnen_system in operation can lead to injuries and damage to equipment!

Starting up!

When starting up, the SOLTRK/ controller must only be switched on in manual mode and without an external overdrive safeguard. Carefully read the documentation on the SOLTRK / controller and follow the instructions, especially the safety information.

- ⇒ The inadvertent automatic traversal of the sonnen_system can lead to injuries and damage to equipment!

NOTICE

Do not make the provided prefabricated cable any longer!

- ⇒ Making these cables longer can cause the sonnen_system to malfunction.

Use metric tools when installing the sonnen_system.

- ⇒ The use of other tools will damage the sonnen_system.



Installation of multiple sonnen_systems!

Assign each sonnen_system one fastenings case, e.g. by marking them, before beginning installation work. This makes the subsequent installation easier.

2.1. Responsibility of the site management

1. Deployment of staff

Any work on the sonnen_system may be performed only by persons certified by Kirchner Solar Group, by persons certified by a contract partner of Kirchner Solar Group or by staff of Kirchner Solar Group itself. Otherwise all warranty claims shall be invalidated.

1. General qualifications of the employees:

- No fear of heights
- Knowing and applying the regulations for accident prevention which are valid on-site

- Demonstrated experience and knowledge in their field of activities, especially with regard to the dangers occurring
 - Selecting transport, hoisting and lifting equipment, assessing their operational readiness and using them, taking into account the relevant regulations
2. Qualifications for work on the steel structure:
- Completed occupational training in the installation of steel components.
 - Identifying components, preparing them in compliance with the technical documentation for the necessary work and performing the work on them
 - Planning and use of auxiliary constructions
3. Qualifications for work on the electrical components and drives:
- Completed occupational training in electrical installation, with a focus on the installation of photovoltaic systems
 - Being able to understand and apply technical documents and wiring diagrams
 - Selecting and preparing lines for power engineering and communications technology, and connecting devices with differing connection technologies
 - Earthing and equipotential bonding
 - Parametrization and functional tests
4. Qualifications for the creation of the foundation:
- Producing rebars, selecting concrete and casting foundations
- 2. Securing the site, in particular against unauthorized access.**
- ⇒ For unauthorized persons there is danger of injury on the site.
- 3. Use of construction site vehicles of any kind for transport of the components, or for work on the sonnen_system.**
- Go by the transport instructions and information about the dimensions of the components in the installation instructions.
 - If work must be performed under a suspended load, the duration of the same should be kept as short as possible.
- ⇒ Improper transportation entails danger of crushing or collision, and the risk of being struck by falling components.
- Do not use leaning ladders to work on the sonnen_system. Use only firm, approved working platforms, scaffolding or the like.
- ⇒ Accidental shifting or tilting of leaning ladders entails danger of falling.

2.2. Intended use

The standard sonnen_system 3_30/_40/_60 was designed solely for the installation of framed standard photovoltaic modules. All other applications, in particular the installation of thermal collectors are deemed to be misuses and are not allowed. Only the sonnen_system 3_60 CX also allows the installation of concentrated photovoltaic modules with suitable modifications.

Modifications not expressly approved by Kirchner Solar Group GmbH are not permissible. Approval by Kirchner Solar Group GmbH is not an assumption of liability for the suitability and regularity of the modifications, however.

Kirchner Solar Group GmbH makes no warranty and assumes no liability for any damage arising through the use of other profile rails not supplied by Kirchner Solar Group GmbH.

2.3. Technical data

All information in this section relates to an ambient temperature of 20°C.

Typ	3_30	3_40	3_60	3_60CX
Basic data				
Deployment location	Longitude: +180° bis -180°, Latitude: +65° bis -65°			
Tracking accuracy	0.5°	0.5°	0.5°	0.1° ¹
Energy consumption	0.11 kWh	0.13 kWh	0.15 kWh	0.17 kWh ¹
Operation temperature	-40°C bis + 55°C			
Rated voltage	24 VDC			24 VDC, motor voltage 12 VDC ¹
Max. installation height (Top edge of module surface above ground level)	25 m	25 m	25 m	10 m
Min. distance: lower edge of module surface above ground level	0,5 m			
Max. allowed declination of the mast	0,5 °			
Stow position from a wind speed of	13 m/s			
Sound power level LA _{eq}	43 dB(A)			
Protection class	IP 65 except for the slewing drive (IP 55)			
Dimensions and Weights				
Max. load approx.	600 kg [1302 lbs]	1200 kg [2645 lbs]	1200 kg [2645 lbs]	2000 kg [4410 lbs]
Weight (without profile rails and PV/CPV-Modules) approx.	800 kg [1764 lbs]	950 kg [2095 lbs]	1000 kg [2205 lbs]	1100 kg [2425 lbs]
Max. dimensions module surface (max. height x max width)	35 m ² (5 m x 7 m)	45 m ² (5,5 m x 8,6 m)	61 m ² (6,8 m x 10,2 m)	67 m ² (6,4 m x 10,5 m)
Drives ²				
Azimuth:				
Nominal current consumption I _N	5,2 A	5,2 A	5,2 A	5,2 A
Max. Torque M _{Zul}	50 Nm	50 Nm	50 Nm	100 Nm
Reduction gear ratio i	400 : 1	400 : 1	400 : 1	710,5 : 1
Elevation:				
Nominal current consumption I _N	4 A	4 A	4 A	5 A
Peak demand, dynamic F	4.000 N	4.000 N	4.000 N	10.000 N
Peak demand, static, retracted F	bis 45.000 N	bis 45.000 N	bis 45.000 N	bis 60.000 N
Duty cycle	KB 6 min ³	KB 6 min ³	KB 6 min ³	KB 20 min
Reduction gear ratio i	225 : 1	225 : 1	225 : 1	250 : 1

¹ With use of the Kirchner Solar Group control unit SolTrk

² With use of another control unit the data sheets of the drives and the motor gear units must be observed.

³ KB: short-time duty. In case of emergency (e.g. storm) the elevation drive can run an additional traverse with a duty cycle of KB 8 min.

2.4. Target audience

See chapter 2.1 "Responsibility of the site management" on page 6.

2.5. About this manual

- This manual covers the installation, commissioning, maintenance and dismantling of the sonnen_system. It does not include installation, commissioning, maintenance and dismantling of the inverter or of the PV modules.
- These manual use consistent terminology for parts and assigned enumeration.
- In addition, the capital letter corresponding to the compartment in the supplied fastenings cases is assigned to the attachment hardware used.
- All parameters such as length, weight and torque are stated in metric units (SI). The values in the squared brackets are only guideline values.
- The standard quality of the bolts is 8.8.

Abbreviation

- PV-module: Photovoltaic-module
- CPV-module: Concentrator photovoltaic-module
- Solar generator: PV system consisting of PV modules
- KB: Short-time duty

Disclaimer

The general conditions of supply of Kirchner Solar Group GmbH are applicable.

The content of this documentation is continually checked and updated as required. However inconsistencies cannot be entirely excluded. We make no guarantee of completeness. Kirchner Solar Group GmbH reserves the right to make changes in the interests of technical progress. These will be documented in the next revision of these instructions.

Claims under warranty and liability are excluded in respect of claims for any sort of damage if they arise from one or more of the following causes:

- Faulty installation
- Improper or inappropriate use of the product
- Installing and operating the product in an environment other than that intended
- Installing and operating the product disregarding the statutory safety regulations and any building regulations relevant to the place of use
- Disregarding the safety instructions in any of the documentation relevant to the product
- Unauthorised modifications to the product
- Malfunction of the product due to the effects of connected or adjoining equipment beyond the levels permitted by statute
- Catastrophes and force majeure

Trademarks

Names and products are mentioned without referring to existing patents, utility patterns and trademarks. The absence of a corresponding reference shall not give reason for the assumption that such names could be freely utilised.