



Installation Manual Compact Solar System



Innovation Prize 2008
for the development of NARVA
vacuum tubes

From glass factory to finished
high performance vacuum tubes,
HighTech "Made in Germany".



1. Additional Information

The solar collector tank systems are used for domestic water heating by solar radiation in a closed circuit.



In the tank collector systems are high performance vacuum tubes (heat pipes) directly plugged into an insulated water tank. Through solar radiation onto the heat pipe, an evaporation process in the vacuum tube occurs. The resulting steam rises up into the condenser head of the vacuum tube, which is situated in the tank. The water, that needs to be heated, ensures heat consumption through the condenser head. This means in turn, that the steam condenses and cools in the condenser head.

This process continues as long as solar / diffuse radiation is reaches the vacuum tubes or the hot water tank is heated.

In case of insufficient solar / diffuse radiation, an electric heating cartridge heats water until the desired temperature is reached.

- The collector tank systems are suitable for the operation with water only. If it is used a different medium, the product warranty will be invalid.
- When using the collector tank systems in regions with longer time periods of frost and without solar radiation, the systems have to be emptied, or protected by electrical heating against frost.
- The high-power vacuum tubes are hail proof according to DIN 12975-2.

2. Safety Notes



- Installation, maintenance and repairs should be conducted by professionals only.
- Contd. safety and accident prevention regulations have to be observed.
- The roof assembly is essential to ensure proper fall protection and reception facilities (eg DIN 18338, DIN 18451). If attachment of personal fall backups is not possible, safety harnesses need to be used.
- During the assembly, helmet, safety shoes and work gloves have to be worn.
- The vacuum tubes are made of glass. Destructed tubes increase the risk of injury. When working with the glass tubes (installation / replacement), it is necessary to work with gloves and goggles.
- The place for installation should be selected so, that any damage through children and unauthorized to the system is avoided.



3. Installation Instruction:

- Installation and commissioning have to be performed according to the recognized rules of technology.
- The maximum load capacity and required distances from roof edges have to be minded. If according to this, national regulations are available, they need to be minded.
- The systems need to be connected with suitable screws to the substructure, to ensure sufficient rigidity in case of a storm.
- Because of hot water, it is important to use heat resistant piping!
- Hot water pipes need to be protected by adequate insulation against direct contact and heat loss.
- In the systems may experience temperatures of up to 100 ° C. Measures shall be taken to avoid scalds.
! The installation of a scald protection valve is strongly recommended !
- The system has to be grounded in the storage rack according to national regulations (eg.VDE, IEC).
- The connection of the solar system to a lightning protection system should be performed by professionals only.

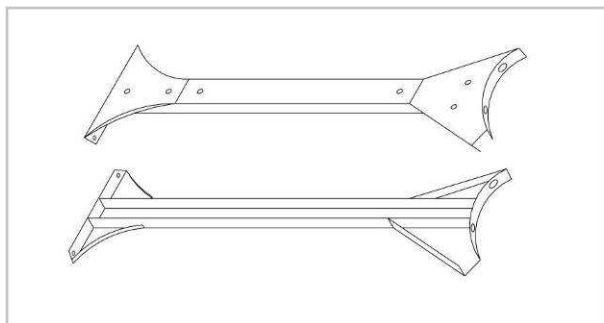


4. Needed Tools and Resources:

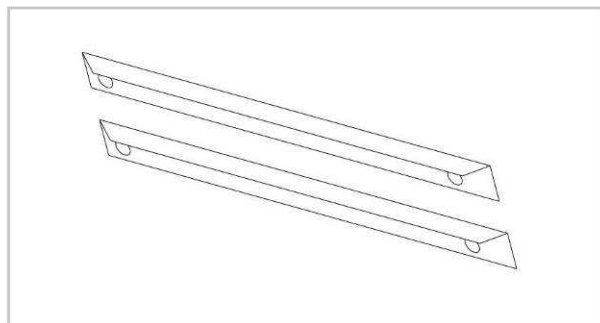
- 2 x wrench SW 13
- 1 x screw driver (small)
- 1 x spirit level
- 1 x drill
- working gloves
- goggles
- personal protective working



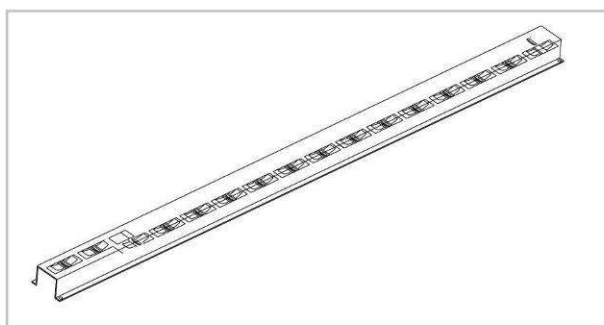
Components of the Installation Kits:



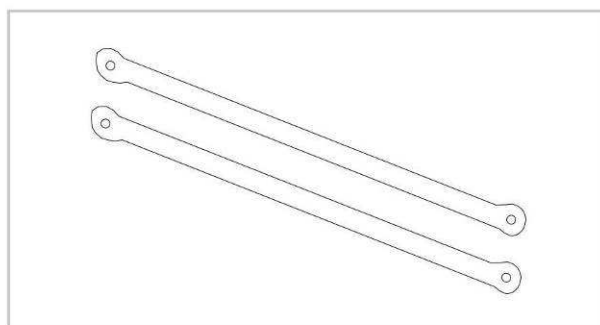
2 x tank support profil



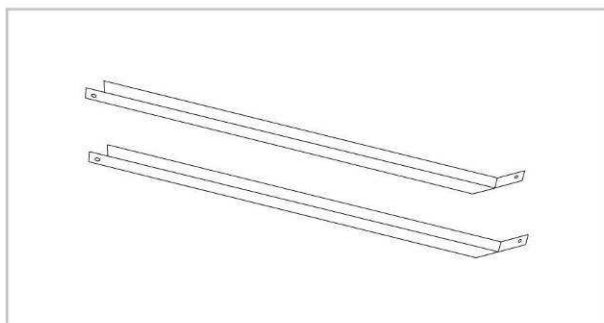
2 x stiffening profile



1 x profile for installation of vacuum tubes



2 x connection profile for tank support profiles



2 x bracing profile for tank support profiles



16 x mounting rings for vacuum tubes



14 x hexagon head screws M8/20
1 x hexagon head screw M8/30

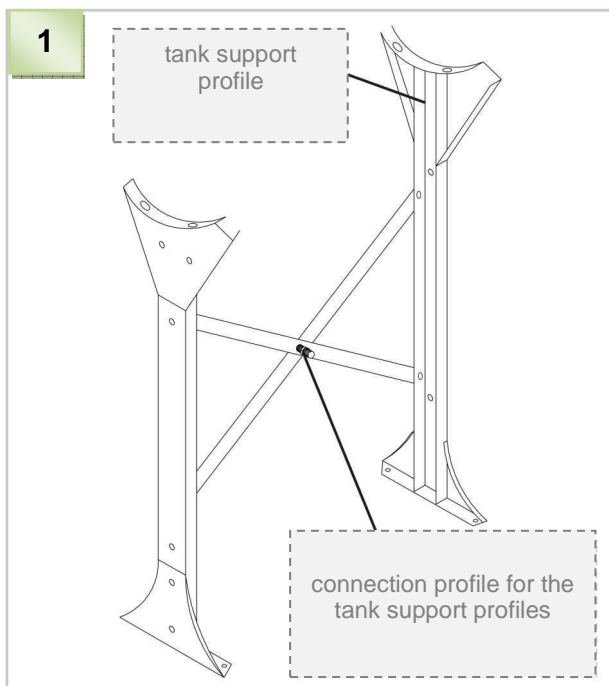


15 x hexagon nuts M8
30 x washers M8

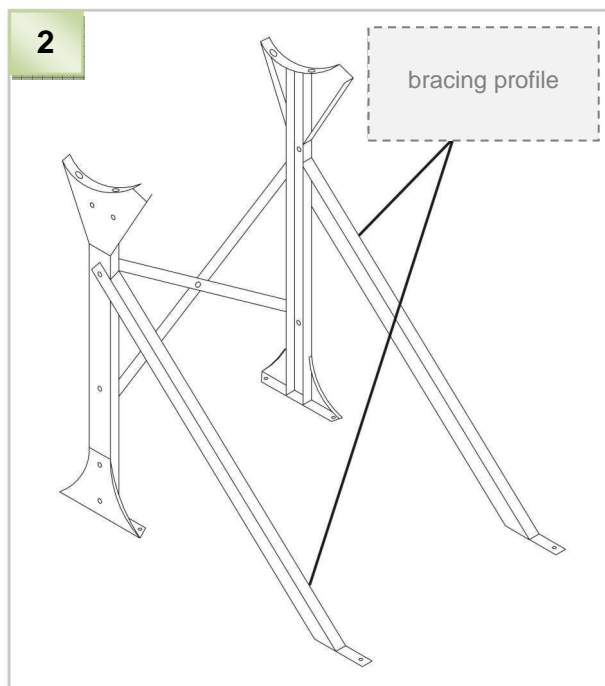


Installation Steps:

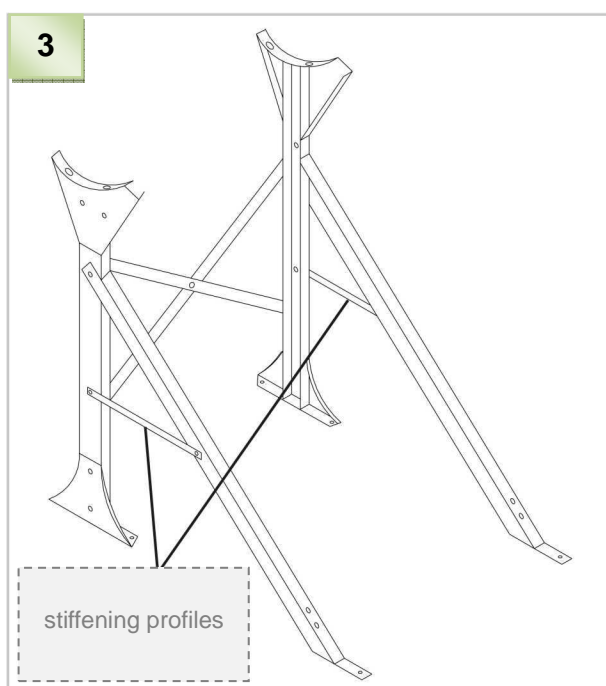
Connection of the tank support profiles



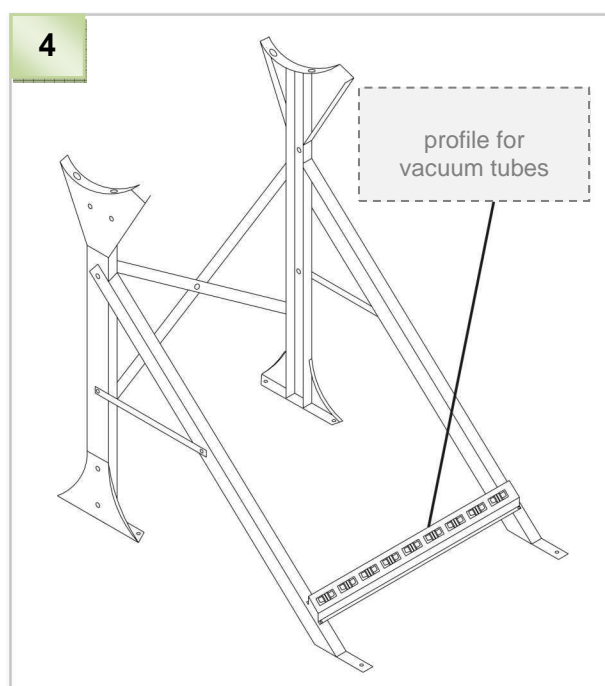
Connection of the bracing profiles



Connection of the stiffening profiles



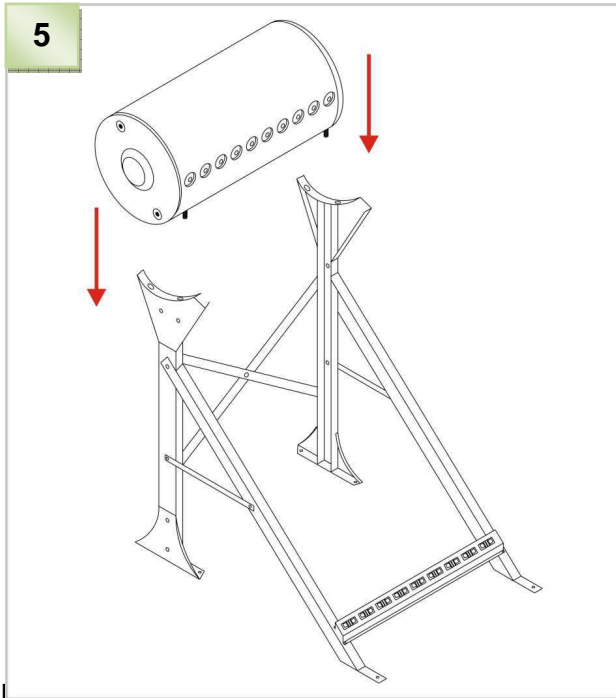
Connection of the profile for vacuum the tubes



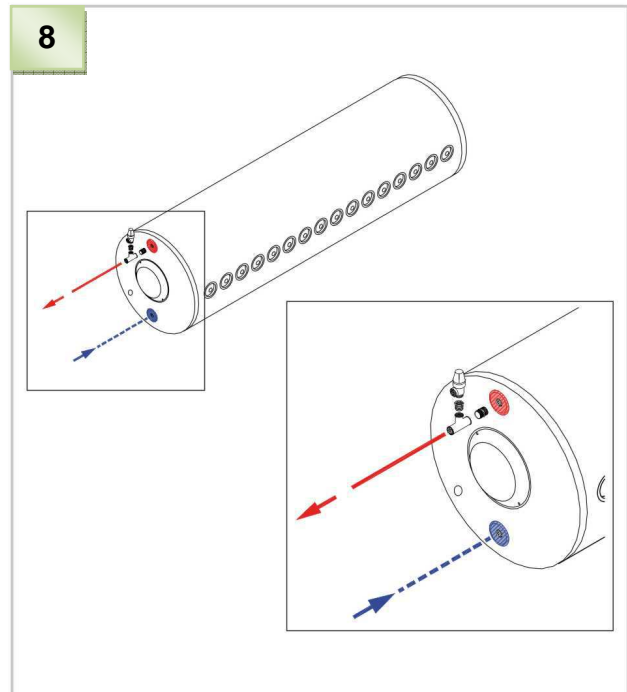
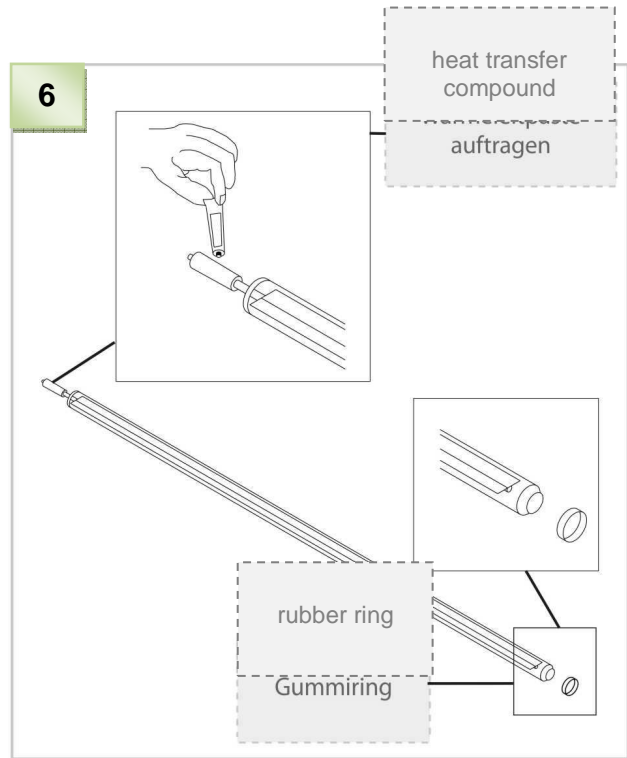


Installation Steps:

Mounting of the tank



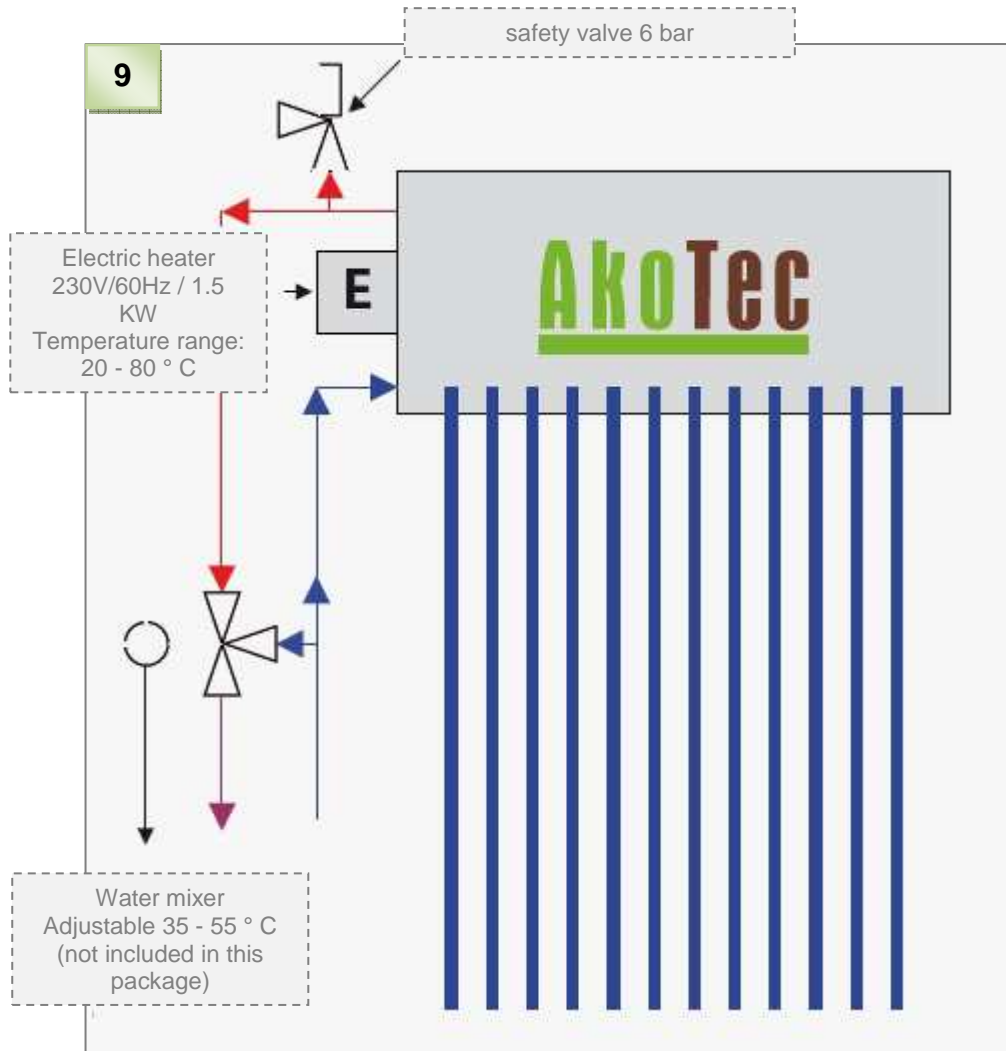
Preparation of the vacuum tubes





Installation Step:

Hydraulic connection of the premium collector tank system



- With a safety valve the max. pressure is limited to 6 bar.
- When using a water mixer (not included in this package) the hot water outlet temperature is limited to 60° C.
- The max. vacuum tube temperature is limited to 158° C.
- It is recommended that the safety valve is connected to a drip line in order to prevent an uncontrolled escape of steam and hot water (Scalding).

IMPORTANT: Please pay attention to all planning, installation and commissioning manuals. These documents are available at all times on <http://akotec.eu/downloads/>.