

## Installation manual In roof mounting, vertical

### Flat plate collectors

#### Wikosun 2010 / 2510

roof angles from 30 - 60°

**Installation and commissioning should be undertaken by a specialist.**

General terms and conditions of warranty state that all installations must be performed by a suitably trained and qualified plumber by taking into account local norms and regulations.

Factory warranty will only be covered if the installation instructions are followed.

Warranty does not cover any damages, caused by non-observance of this manual.

The correct functioning is only guaranteed if the installation instructions are followed.

The system is to be checked annually by a specialized company. Independently, occurring defects must be repaired immediately.

**This document should be handed over to the client on completion of works.**

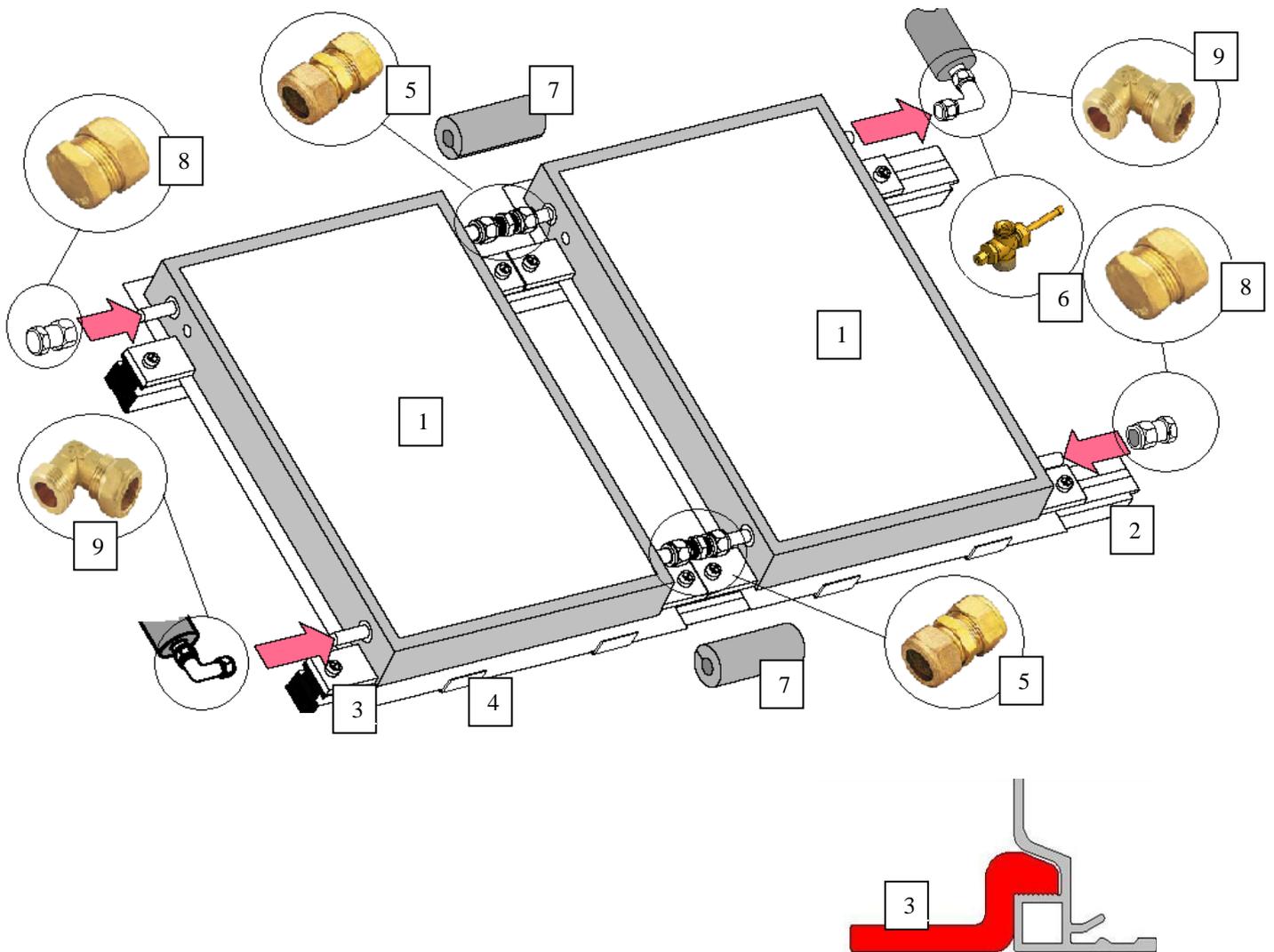


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Pos. Nr.	Description
1	Collector Wikosun 2010 / 2510
2	Profile rails, aluminum
3	Z-clamp
4	Collector support bracket
5	Parallel compression fitting 18mm
6	Compression -X-fitting 18x18x12"x3/4"FD incl. air screw and sensor pocket
7	Insulation, on site
8	Compression plug 18mm
9	Compression-elbow 18mm x 3/4"FD

Chart 1: Part list



# 1 Transport and storage of collectors

Collectors should be transported in their packaging horizontally (glass facing upward) or vertically. It must be ensured that collectors can at any time be safely put down (e.g. tilting danger by wind, endangering of other people). Collectors should never be put down over the edge! Please take special precaution while transporting the collectors on the roof. If collectors can not be put down at any time and/or if a risk of slipping exists, auxiliary material like safety ropes should be used.

Store collectors in closed and sun-protected areas either horizontally with the glass facing upward or in an upright position. Do not stack collectors on their connectors.

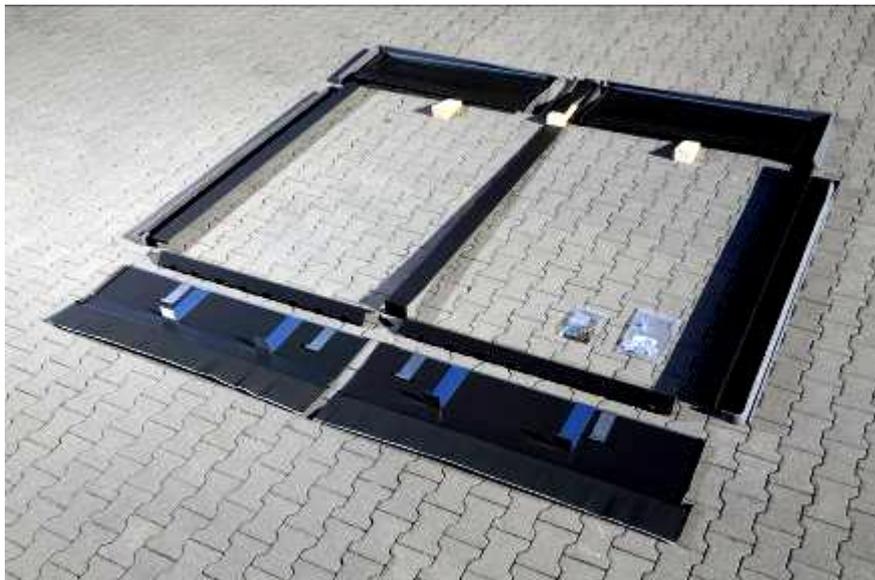
## 2 Mounting accessories

### 2.1 Fastening sets „in roof mounting“ – vertical installation – roof angles from 30°- 60°

Various fastening sets (basic kit, extension kit) are offered for the vertical installation of WIKOSUN 2010 / 2510. The total quantity of sets needed is defined by the number of collectors to be installed.

Fastening set	Content	Quantity
Basic kit „tile“ for 2 collectors WIKOSUN 2010 / 2510	Metal flashing piece bottom section, left	1
	Metal flashing piece bottom section, right	1
ST-BFS-IVG 1 (WIKOSUN 2010 vertical) ST-BFS-IVG 1.1 (WIKOSUN 2510 vertical)	Mounting frame bottom section	2
	Mounting frame side section, left	1
	Mounting frame side section, right	1
	Mounting frame upper covering section, left	1
	Mounting frame upper covering section, right	1
	Mounting frame connection strip, long	1
	Mounting frame connection strip, short	1
	Sheet metal screw 3,5 x 16	20
	Screw 4,5 x 35	1
	Batten brackets, VA 60 x 170	4
	Sheet fixing hooks with nails	2
	Alu Z-profile	8
	Chipboard screws 5 x 35	24
	Chipboard screws 6 x 60	8
	Chipboard screws 5 x 100	4
	Screwdriver bit	1
Snow load bracket	4	
Snow load wedge	3	

Chart. 2: Basic kits



Basic kit

Fastening set	Content	Quantity
<b>Extension kit „tile“ for 1 collector WIKOSUN 2010 / 2510</b>  <b>- unemployable separately-</b>  <b>ST-BFS-IVE 1</b> (WIKOSUN 2010 vertical) <b>ST-BFS-IVE 1.1</b> (WIKOSUN 2510 vertical)	Metal flashing piece bottom section, middle	1
	Mounting frame bottom section	1
	Mounting frame upper covering section, middle	1
	Mounting frame connection strip, long	1
	Mounting frame connection strip, short	1
	Sheet metal screw 3,5 x 16	10
	Screw 4,5 x 35	1
	Batten brackets, VA 60 x 170	2
	Alu Z-profile	4
	Chipboard screws 5 x 35	12
	Chipboard screws 6 x 60	4
	Chipboard screws 5 x 100	3
	Screwdriver bit	1
	Snow load hook	2
	Snow load wedge	2

Chart 3: Extension kits



Extension kit

## 2.2 Connection accessories

Connection accessories	Content
ST-AZV-1FK	1 cross piece 18mmxGi1/2"xGi1/2"xGa 3/4", 1 air vent 1/2", 1 sensor pocket 1/2", 2 end caps 18mm, 2 copper gaskets 1/2", angle 90° 18mm x Ga3/4"
ST-VZV-1FK	2 DG-fittings 18mmx18mm

Chart 4: Connection accessories - vertical installation

## 3 Installation

### 3.1 In general

#### Prior to installation:

- Check the content of the delivery with the delivery note!
- Read the installation instructions carefully and pay attention to the different steps!
- Respect the safety instructions!
- This mounting material is structurally approved for assembly with collectors 2010 / 2510 up to a maximum building height of eight metres.

#### 3.1.1 Snow/wind load

- For structural analysis purposes, we recommend calculations according to DIN 1055. Calculations of the pressure coefficients (wind) and shape coefficients (snow) are carried out with reference to DIN 1055 -100, DIN 1055-4 and DIN 1055-5. Determine the values of local snow loads according to country-specific data.
- Determine the values of local wind loads according to country-specific data. The loads that exist locally (in kN/m<sup>2</sup>) must be determined according to the nationally applicable norms. In the case of intermediate values, no interpolation should be done; instead, the next higher value should be selected.

Necessary tools	Application
Cordless screwdriver	Installation of Z clamps
Open-ended spanner SW 24	Sensor pocket
Open-ended spanner SW 27	Parallel compression fitting
Pipe tongs	Parallel compression fitting
Angle grinder	Tile adjustment
Hammer	Installation of sheet fixing hooks
Yard stick	

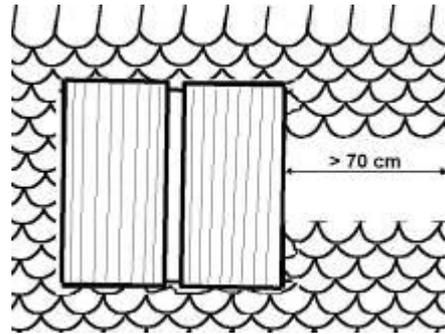
Chart 5: Tool list

## 3.2 In roof mounting, vertical

### 3.2.1 Positioning of collectors

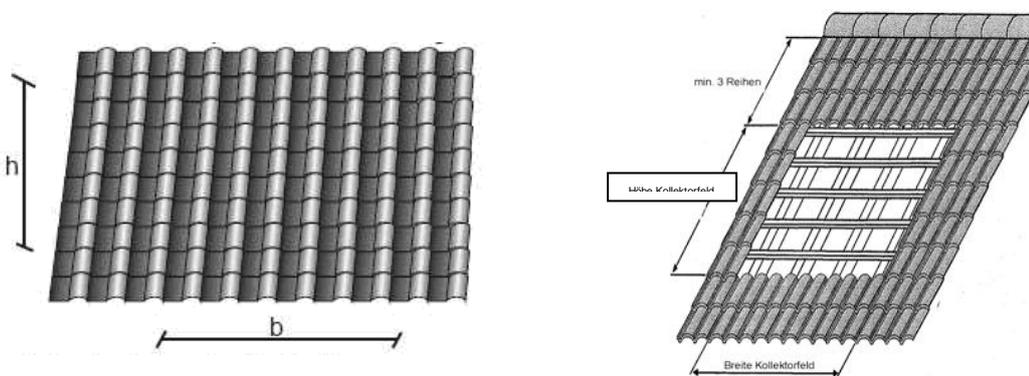
For protection against the penetration of water during extreme weather conditions (snow, humidity, rainwater), a roofing membrane (leading into the roof gutter) should be installed under the collector surface.

Wind loads on roofs can create suction forces on the solar collectors. In order to minimize suction forces, the distance between the outer edge of the roof and the collector should be minimum 70 cm (about 3 tiles). The distance from the roof ridge should be approx. 2 tile rows.



### 3.2.2 Measuring and exposing the roof area

Measure the area of the collector field on the roof and define the position of the collectors.



The bearing surface for the collector arrays must be adequately stable. If the gaps between the roof laths or rafters are very large, additional roof laths should be installed.

Number of collectors 2010 / 2510 vertical	2	3	4	5	6
Width of collector array b (mm) approx.	3200	4200	5400	6600	7800
Height of collector array h (mm) approx.	2800 (for WIKOSUN 2010) 3300 (for WIKOSUN 2510)				
Number of roof tiles to be removed per row, coverage width 30 cm	11	14	18	22	26
Number of roof tiles to be removed per row, coverage width 20 cm	16	21	27	33	39

### 3.2.3 Installation of the collectors and mounting frame, vertical installation:

Mark the left edge of the collector array on the battening. Here the start of the left piece of metal flashing should lie 100 mm to the left of the vertical axis of the first removed tile.

Depending on the spacing of the laths, it may be necessary to mount an auxiliary lath as support for the **bottom sections of the mounting frame**.



**Metal flashing pieces** are installed from left to right.

Mount the bottom sections of the mounting frame with the folded edge at the upper edge of the main battening. Fasten with sheet fixing hooks to allow for the pieces of metal flashing to be aligned later.



Mount the other **pieces of metal flashing** overlapping as described above.



Slide the **batten brackets** and **snow load brackets** into the cut-outs and screw them on (chipboard screws 5 x 35 mm). For an optimum alignment of the batten brackets we recommend fixing a taut string line between the first and the last batten bracket as a guideline.



Starting from the left, insert the **flat plate collectors** into the batten brackets and align them so that the gap between the batten bracket and the outer edge of the collector is the same on both sides.



Screw the **flat plate collectors** to the battening on both sides at the top and bottom with **aluminium Z-profiles** (chipboard screw 6 x 60 mm).



Plug the **compression fittings** into the collector pipes, mount the other **flat plate collectors** as described above.



Once all the **flat plate collectors** have been mounted, all the compression fittings (brackets, T-fitting with thermowell, end caps) are to be fitted and aligned. After that, uniformly tighten all the **compression fittings**.



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Before the mounting frame is mounted, the collector array is to be pressure tested at 6 bars independently of the rest of the solar installation and the screw connections checked for tightness!

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Insert **mounting frame connection strips, long**, from bottom to top between the flat plate collectors.



Fit, lock into place and align **bottom sections of mounting frame**.



Fit, lock into place and align **side sections of mounting frame** on the left and right.



Position and mount **snow load wedges** (chipboard screws 5 x 100 mm). If necessary, mount additional auxiliary lath.



Fit, lock into place and align **upper covering sections of mounting frame** on the left, in the middle and on the right.



Put sealing tape on the **mounting frame connection strips, short**, hook them in and screw them on (screw with attached washer 4.5 x 35 mm).



Fix **side sections and upper covering sections of mounting frame** to the battening with sheet fixing hooks, screw on **side sections and upper covering sections of mounting frame** (sheet metal screw 3.5 x 16 mm).



Screw together **bottom sections, side sections and connection strips of mounting frame** (sheet metal screw 3.5 x 16 mm).

Screw mounting frame and snow load hooks together (sheet metal screw 3.5 x 16 mm).



**Bottom sections and side sections of mounting frame** are to be connected to each other on the left and right by flipping over the metal plate.



Replace missing tiles and professionally cut to size if necessary. Remove film from self-adhesive roof connection strip and mould strip to shape of tiles.



### 3.3 Installation and connection of collectors

Slide the collectors down onto the collector support brackets and lower the collectors onto the top rail. Position the collectors and fix them carefully. The collectors are connected with each other by using the corresponding parallel compression fittings. Hand tighten the bolts and protect the connecting pipes against torsion (do not use force). Please note that the collector arrays are always connected at diagonal corners and the throughflow is diagonal. A one-sided connection is not permitted. After the hydraulic pressure test, the connections should be insulated. The collectors must not be covered in order to guarantee good ventilation.

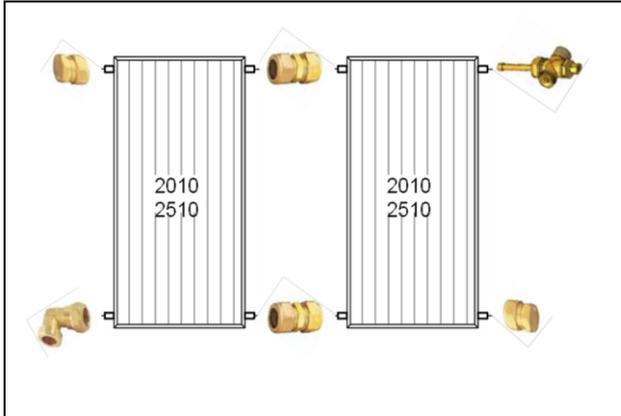


Fig. 1: Connection of collectors, vertical

### 3.4 Connection of additional collectors

For the installation of an additional collector, an additional connection kit is required (see mounting accessories). The profile rails are connected with the connection accessories ST-PSS-V. Maximum 6 collectors can be installed in series. After the hydraulic pressure test, the connections should be insulated. The collectors must not be covered in order to guarantee good ventilation.

### 3.5 Installation of collector temperature sensor

The collector temperature sensor is to be installed at the flow of the system (hot water side). Put the sensor into the sensor pocket as far as it will go. Apply a heat-conductive paste onto the sensor to improve the heat transfer. Screw carefully the cable sheet on the sensor pocket.

The 1 m cable is laid with the pipe work through the roofing. The cable can be extended in the interior (2 x 0,75<sup>2</sup>). For the connection of the temperature sensor cable with the controller the use of an over voltage protection (protection against over voltage damages) is recommended.

If there is a lightning protection system, the collector system is to be integrated professionally. If there is no lightning protection system, the solar flow and return are generally to be connected to the equipotential bonding. In every case, the regulations of the local energy provider / network operator should be observed here. Electrical and lightning protection work may only be carried out by authorized professionals.

### 3.6 Installation of pipe work

Install the pipe work:

- on shortest way to minimize losses.
- with a complete high temperature insulation (100% according to EnEv).
- rising to the collector to prevent air cushions.

### 3.7 Hydraulic pressure test

- After a successful installation, rinse the entire collector circulation with water!
- Before commissioning, the collector circulation must be checked with a water pressure of 6 bar!
- If the solar heating system is not commissioned immediately after installation, the collector area must be covered!
- Before filling the system with heat transfer fluid, the system must be completely purged!

Open the lower plug at the collector field to purge the system.

Subsequently, the system is to be filled with solar fluid. The liquid capacity amounts to 1,15 Liter for Wikosun 2010 and 2,2 Liter for Wikosun 2510.

#### **Important:**

Please note that only a solar concentrate released by Wikora may be refilled. Solar concentrate must be prepared according to manufacturer's specifications with clean, ph-neutral and lime-free water. Please use an antifreeze controller to ensure the antifreeze capacity. If another solar concentrate is applied, the warranty expires automatically. Moreover, damages that are due to an insufficient antifreeze protection are not part of the warranty.

### 3.8 Regulation of flow rate (flow regulation)

The set-up of the flow rate is important for an efficient functioning of the system. The lower the flow rate chosen, the higher the temperature difference between collector flow and return.

When setting the flow rate, it is absolutely essential to refer to the instruction manuals of the pump groups / temperature difference controller used (scale).



Fig. 2: Scale

## 4 Planning and layout data for collectors

### Recommendation:

System pressure	3,0 bar
Primary pressure of expansion vessel	2,5 bar
Flow rate	30 – 40l /m <sup>2</sup> /h
Switch-on temperature difference of controller	7 to 15 K *
Switch-off temperature difference of controller	3 to 8 K * (*internal to the plant)

Please note that for the layout of the collector circuit, the solar tube circuit and the heat exchanger circuit, the corresponding pressure losses and the total pressure loss in combination with the desired flow rate must be considered.

Furthermore, please note that the calculation of the piping cross-sections must be carried out under the aspect of the necessary flow velocity for solar installations from min. 0.4 m/s up to max. 1,5 m/s with the required flow rate liter/h.

Moreover, it must be considered that the hydraulic faulty wiring results in a system specific and demand specific flow rate which involves a loss of pressure. This again has an influence on the layout of piping cross-sections, solar medium capacities, pump pressures, flow-meter set-ups and flow-meter configurations as well as on their number.

The values indicated in chart 6 apply only for pipe works up to an overall length of 30 m and heat exchangers with a capacity of 16 l.

Number of collectors	2	3	4	5	6	7	8	9	10
External diameter of the CU-connection pipe in mm	15	15	18	18	18	22	22	22	28
Flow rate in l/min*	3	4,5	6	7,5	9	10,5	12	13,5	15
Flow rate in l/h*	180	270	360	450	540	630	720	810	900
Expansion vessel in l	18	18	25	25	40	40	50	50	80

\*Valid for parallel collector connection . In the case of series connection of the same collector arrays, the flow rate is halved.

Chart 6: Reference values for pipe work size, flow rates and diaphragm type expansion vessels.

**Each solar system needs an adequate and competent planning and execution.** Please note that only a specialized company is responsible for the layout of piping cross-sections, the layout of diaphragm type expansion vessel, the determination of the solar pump group as well as the necessary flow-meter. Our data do not relieve of a special planning.

### 4.1 Hydraulic faulty wiring possibilities

Our warranty covers the following configurations. Up to 6 collectors can be connected in parallel (see fig. 3). In case of an installation in two lines, up to 3 collectors can be connected in series (see fig. 4). Please always ensure that all collectors are connected uniformly and with a diagonal throughflow. A one-sided connection is not permitted. The connections between the collectors must be realized with copper tubes of 18mm and an appropriate insulation. The collector fittings must be prepared with the corresponding compression.

Crimp connections in the pipe work system are allowed. Seals must be approved for use in combination with solar systems and temperatures up to 200°C. In case of a multiple-line installation, the return (cold water connection) should be located at the collector line on the bottom.

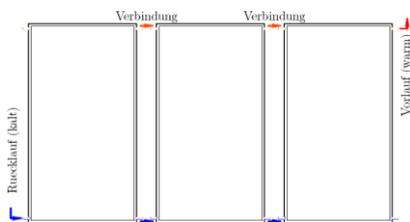


Fig. 3: Installation in one line (4-5l / min.)

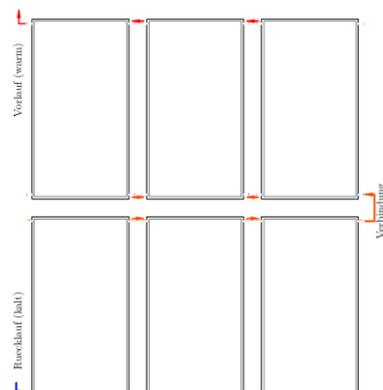


Fig. 4: Installation in two lines (4-5l / min.)

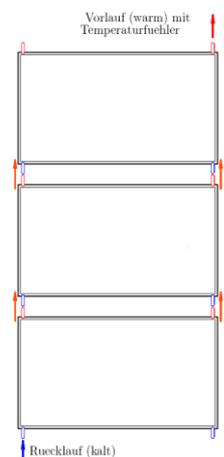


Fig. 5: Vertical installation (4-5l / min.)

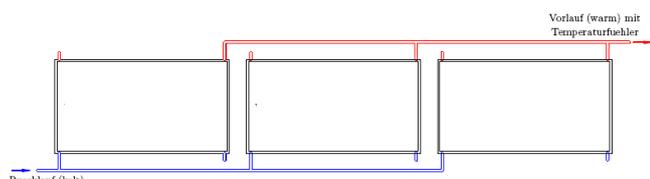


Fig. 6: Horizontal series installation according to Tichelmann (4-5l / min.)

## 5 Technical data

Description	WIKOSUN 2010	WIKOSUN 2510
System	Flat plate collector	Flat plate collector
Collector gross surface	1,98 m <sup>2</sup>	2,47m <sup>2</sup>
Absorber surface	1,87 m <sup>2</sup>	2,32 m <sup>2</sup>
Aperture surface	1,87 m <sup>2</sup>	2,32m <sup>2</sup>
Frame	Aluminum extruded profile	Aluminum extruded profile
<b>Dimensions:</b>		
Length x width x height	1740 x 1140 x 75 mm	2170 x 1140 x 75 mm
Weight	32 kg	40 kg
Cover	3,2 mm safety glass, super transparent, hailstone safe	3,2 mm safety glass, super transparent, hailstone safe
Connections Cu-tube	d=18 mm	d=18 mm
<b>Thermal insulation:</b>	40 mm of mineral wool	40 mm of mineral wool
<b>Absorber:</b>		
Material	Aluminium plate on copper	Aluminium plate on copper
Absorber coating	TINOX ENERGY / Alanod Mirotherm	TINOX ENERGY / Alanod Mirotherm
<b>Pressure loss:</b>		
50\,l/h	49 Pa/collector	54 Pa/ collector
100\,l/h	120 Pa/ collector	133 Pa/ collector
150\,l/h	214 Pa/ collector	239 Pa/ collector
Efficiency	$\eta = 74,4$	$\eta = 76,1$
Peak power	1380 Watt per collector	1750 Watt per collector
Capacity	1,15 Liter	1,33 Liter
Max. working pressure	10 bar	10 bar
Stagnation temperature	179 °C	197°C
Installation	on-roof, flat-roof, in-roof	on-roof, flat-roof, in-roof

### Return:

Collectors can be returned to Wikora after use. All collector material will be recycled accordingly by Wikora.

## 6 Safety instructions

The installation of collector and solar components must comply with the local regulations and conditions. Technical standards and rules have to be respected.

## 7 General operation and maintenance instruction

Present operation and maintenance instruction and the compliance with it in combination with the installation and maintenance record is part of the guarantee and warranty!

### Operation

- Your Wikora solar heating system is preset according to the present installation and maintenance record. In general, there is no need of changing the preset parameters.
- Please do not change the preset parameters by yourself. You will lose any warranty and guarantee claim.
- If you do not conform to the preset parameters, please let them change and document by a specialist.
- The various system parameters can be accessed according to enclosed instruction manual of the controller.
- It is recommended to vent the solar heating system approx. 4 weeks after the initial operation. This should be undertaken by a specialist. If you wish to vent the system by yourself, you can do it one-time at the central vent of the solar pump group.

### Venting procedure

- Please switch off your solar heating system in the evening.
- Open the air valve at the central vent by using a radiator vent key. Once liquid pours out, close this air valve. The procedure is terminated.
- Switch on again your solar heating system.
- Please never vent at sunshine or running pump!
- Please do not undertake an additional venting process. If the system's working pressure drops later on or if the system does not give any heat, please call a specialist.

### Maintenance of solar heating system

- Your Wikora solar heating system is a closed heating system. It corresponds to the safety regulations of DIN 4751, DIN 702 and DIN 721.
- Such systems have to be built and maintained exclusively by qualified and specialized companies.
- Please do not refill water in case of pressure loss but call a specialist for assistance.
- Only a solar concentrate released by Wikora may be refilled.
- The valid system working pressure is shown in the installation and maintenance record and corresponds to 3.0 bar, in general.
- Please do never remove the drain bottle under the exhaust line of the safety valve which is to collect the blast solar liquid in case of over pressure.
- The solar heating system and the condition of the solar concentrate are to be checked and documented annually by a specialist. Otherwise, any guarantee and warranty claim expires.

### 7.1 Evidence of maintenance

	Date	Name / Company	Executed activity	Kg refilled sole	Color medium
1					<input type="checkbox"/> uncolored <input type="checkbox"/> brown <input type="checkbox"/> black <input type="checkbox"/> cloudy
2					<input type="checkbox"/> uncolored <input type="checkbox"/> brown <input type="checkbox"/> black <input type="checkbox"/> cloudy
3					<input type="checkbox"/> uncolored <input type="checkbox"/> brown <input type="checkbox"/> black <input type="checkbox"/> cloudy
4					<input type="checkbox"/> uncolored <input type="checkbox"/> brown <input type="checkbox"/> black <input type="checkbox"/> cloudy
5					<input type="checkbox"/> uncolored <input type="checkbox"/> brown <input type="checkbox"/> black <input type="checkbox"/> cloudy

Chart 7: Evidence of maintenance

## 8 Solar fluid

### 8.1 Product information Solarliquid ready for use (WIK-PE20)

Environmentally friendly, ready-to-use long-term antifreeze with corrosion inhibitors especially for flat plate and vacuum tube collectors with a high thermal load (up to 260 °C).

#### Product data:

Appearance:	clear, amber liquid
Base:	superior glycol
Flashpoint (°C):	> 100 (ASTM D 51758)
Boiling point (°C):	> 102 (ASTM D 1120)
Density (20 °C):	1.02 – 1.04 g/cm <sup>3</sup> (DIN 51757)
Antifreeze (crystallization point):	approx. -23 °C
Antifreeze (solidification point):	approx. -29 °C
pH value (20 °C):	7.5 – 8.5 (ASTM D 1287)
Viscosity (20 °C):	approx. 15.0 mm <sup>2</sup> /s

#### Product properties:

**SOLARLIQUID HT ready for use** is an odorless liquid that is used as antifreeze or heat transfer fluid for thermal solar installations (flat plate and vacuum tube collectors) with a high thermal load. The special corrosion inhibitors protect the metal and plastic materials commonly used in construction, including aluminium, against corrosion and deposits. The sealing materials commonly used in heating installations are not affected by Solarliquid HT ready for use.

#### SOLARLIQUID HT ready for use

- cannot be mixed with any other type of antifreeze
- is inhibited nitrite-, amine- and phosphate-free
- is biodegradable

According to the German Ordinance on Hazardous Substances, no specific labeling is required for Solarliquid L concentrate ready for use and HT ready for use (see safety data sheet).

#### General information:

The systems must conform to DIN standard 4757, part 1, and be implemented as a closed system, since there must be no atmospheric oxygen in the system. It must be ensured that the circulating pump is suitable for operation with antifreeze agents. Before being filled, the system should be flushed with water and the tightness of all connections checked through pressure testing. The system must be free of impurities and free of other liquids. There must be no deposits on the metal surfaces. After pressure testing, the system must immediately be filled with Solarliquid HT ready for use. Do not allow any air to enter! Galvanized system components should be avoided since zinc is not resistant to glycols. In the case of leakage, only top up with the same product, never utilize different solar liquids in the same system. In our experience, Solarliquid HT ready for use can be stored or used for several years. Nonetheless, the concentration (frost resistance) should be checked annually. In the case of a loss of liquid, never top up with water.

**Use only Solarliquid HT ready for use for topping up!**

#### Recommendation for use:

The optimum temperature for use is between -23 °C and 230 °C. For prolonged temperatures of more than 230 °C we recommend installing adequately large expansion tanks so that the heat transfer fluid can flow out of the collectors.

#### Method of testing corrosion properties:

We recommend that the solar fluid with which the system is filled be checked regularly (roughly annually). With the pH value you can test the corrosion properties of our solar fluid. The pH value should be > 7.5. This is measured using pH test strips. If the value is lower than this, the solar fluid should be replaced.

#### Method of testing frost protection:

Frost protection	Krüss device		Refractometer	
	Brix	RI	MEG scale	MPG scale
-8 °C	22.3	1.3676	-17 °C	-13 °C
-15 °C	29.6	1.3807	-29 °C	-22 °C
-23 °C	35.7	1.3915	-46 °C	-35 °C

## 8.2 Safety Data Sheet

According to 1907/2006/EG, article 31– extract  
Printing date:: 27.02.2013

revised on: 27.02.2013

Product information:

Commercial name: Solarliquid HT gebr.  
Article code: 1004081523000  
Application: Antifreeze / Solar liquid of solar heating systems  
Decomposition products:: Carbon monoxide and carbon dioxide  
Supplier: Staub & Co. Chemiehandelsgesellschaft mbH  
Ostendstraße 124  
90428 Nürnberg  
Tel.: 0911/5482- 0

**Emergency: Giftnotruf Universität Mainz - Tel.: 06131/19240**

### General safety and hygienic measures

The usual precautionary measures while handling chemicals are to be considered

- Soiled and soaked clothes should be taken off immediately.
- Wash your hands before breaks and after end of work.
- Don't eat, drink and smoke during work.
- Don't inhale gases, vapors and ensure sufficient ventilation.
- Wary perfection equipment; unprotected persons should be kept away.
- Eye protection: wear safety glasses during the filling procedure.
- Respiratory protection: wear respiratory protection during aerosol or fog formation.
- Hand protection: Use protection gloves of butyl rubber, nitril rubber/nitrilatex

The product doesn't require any specific labeling according to the last version of the „Allgemeinen Einstufungsrichtlinie für Zubereitungen der EG“.

Keep the liquid out of the reachability of canalizations or waters. If the product enters the soil, waters or canalization, please inform the local authority in charge.

Cleaning: clean with liquid binding material (sand, kieselguhr, acid binder or universal binder). Recycle contaminated material separately.

Keep the concentrate in a cool and dry environment. Protect against humidity and water. Provide sufficient ventilation during work.

### First aid

If the product gets in contact with the eye, a slight irritation can occur.

- After inhalation: take fresh air and consult a doctor in case of medical condition.
- After skin contact: wash immediately with water and soap.
- After eye contact: wash the open eye for several minutes. Consult a doctor in case of medical condition.
- After swallowing: rinse the mouth and drink plenty of water. Consult a doctor in case of medical condition.
- After contact with cloths: remove soiled clothes immediately.

### Fire fighting

- Suitable fire extinguishing agents: CO<sub>2</sub>, solid extinguishing agent or water. Fight larger fire with water jet or alcohol-steady foam. Cool tanks at risk with water jet. Collect contaminated fire water separately. It must not reach canalization.
- Combustion products: carbon monoxide (CO); carbon dioxide (CO<sub>2</sub>).
- Special protection equipment: carry protective respirator that is not depending on the ambient air.

### Recycling

Recycling must be carried out according to local regulations. The waste code number (according to AVV) is to be determined separately.

The product is only designated for commercial processing / use. The data is based on our today's knowledge but does not represent any confirmation of product properties and does not constitute a legal position.

All data according to manufacturer data of Fa. Staub & CO Chemiehandelsgesellschaft mbH

## 9 Warranties

**Warranty conditions for Wikora flat plate collectors. All deliveries and services are carried out according to our general terms and conditions.**

1. The warranty period for the collector function amounts to **10 years**. Within that period, all parts proven to be useless or considerably reduced in their usability due to production or material defects are repaired or replaced ex works. At expiration of the legal warranty period, we have the choice between rectification or replacement.
2. The warranty begins with the delivery of the collectors to the end user and under condition that the system has been installed and setup by a specialised company according to our installation and operating instructions as well as the locally valid norms and regulations. Further, the warranty is dependent on a carefully completed installation and maintenance record which must be filled out by the installer and kept by the system owner.
3. The guaranteeing implies that
  - the collectors are transported, installed, operated and maintained according to our installation and operating instructions
  - the collector system is exclusively operated with our solar liquid.
4. The guaranteeing does not refer to damages due to
  - wear and tear, excessive wear, inappropriate operation or inappropriate use,
  - use of a unsuitable solar fluid or results of corrosion provoked by a solar fluid,
  - chemical or electro-chemical influences,
  - incorrect system layout.
5. Moreover, the warranty does not apply for
  - damages as a result of an inappropriate storage of the collectors prior to installation and
  - damages that are ascribed to force majeure,
  - The warranty regarding the safety glass refers to its condition, and here only to manufacturing and material defects. The cullet security is examined in the context of the inspection requirements for collectors and ensured only according to these requirements.
6. The warranty expires
  - if arising and obvious defects are not notified in writing within 10 days after receipt or hidden defects immediately after emerging. In case of hidden defects it is only valid for the warranty exceeding the legal warranty period,
  - if the collectors are changed or maintained by non-specialised persons or companies or undertaken without our prior agreement,
  - if the possibility to peer the entire system is not granted or if the collectors are removed without our agreement,
  - if original Wikora components are exchanged by other components or if inappropriate installation material and system components as well as nonauthorized solar fluid are used,
  - if the annual inspection is not realized within the time limit. The proper execution is to be documented by the specialized company in charge.
7. Transport damages are to be notified immediately, stipulated on the delivery note and signed by the sub-contractor. §447b BGB remains untouched.
8. After the expiration of the legal warranty period, the warrantee must provide the necessary aide in case of reparation work and is obliged to assume the necessary services like transport, installation etc. In the event of warranty, we recompense
  - for on-roof installation max. 200,00 € + VAT for the first collector and max 80,00 € + VAT for each additional collector, incl. all consumables.
  - for in-roof installation max 300.00 € + VAT for the first collector and max. 90.00 € + VAT for each additional collector, incl. all consumables.
9. This warranty does not justify claims exceeding the legal liability for physical or personal injuries that have been caused by the defects of the purchased object. Redhibitory actions and abatements exceeding legal regulations are not justified either.
10. Other legal claims for warranty and damages in respect of BGB and ProdHaftG remain untouched by this warranty.
11. The exchange or rectification of the collectors or other parts of the solar system must be carried out by the installer and only after having consulted Wikora. Otherwise an entitlement to compensation does not exist.
12. Notifications of claim are to be announced in writing to WIKORA GmbH and by presenting the installation and maintenance record as well as the respective proofs immediately after the damage is occurred.
13. Solar accessories are subject to the legal warranty.

\*) flat rate only valid for Germany

# 10 Installation and maintenance record

Please complete carefully.

The installation and maintenance record is part of the warranty and will be requested in case of complaints with the corresponding invoice.

Installation       Maintenance

Contact Data	Final customer	Installer
Name		
Company		
Street No		
ZIP / Town		
Phone		
Mobile		
E-mail		
First installation	Last maintenance	
Date		
Installer		

Material overview	Brand (designation)	Type (serial no.)	Characteristics (dimensions)	Material	For stainless steel tank(s): Additional corrosion protection needed? (please consider indications of the local water supplier)	
Collector						
Pipeline (single)			Ø , m			
Insulation			Thickness mm			
Heat exchanger					Yes No	Anode type
Tank 1			Vol.   l	m <sup>2</sup>	<input type="checkbox"/> <input type="checkbox"/>	
Tank 2			Vol.   l	m <sup>2</sup>	<input type="checkbox"/> <input type="checkbox"/>	
Controller						
Solar pump			Level	I II III		
Expansion vessel			Vol.   l			

System - settings (Controller setting = *)	Type	Max. temperature	Difference in temperature	Hystere = Delta t off	
Consumer 1* = e.g. DHW		°C	K	K	
Consumer 2* = e.g. buffer tank 1		°C	K	K	
Consumer 3* = e.g. buffer tank 2		°C	K	K	
Consumer 4* = e.g. swimming pool		°C	K	K	
Max. collector temperature*	°C	Cooling function * from		°C	
Backup heat target temperature*	°C	Flow rate	Target : l/min	Actual: l/min	
System working pressure at	°C	bar	Primary pressure exp. vessel	Target : bar	Actual : bar

Solar liquid						
Visual control		<input type="checkbox"/> colour unchanged <input type="checkbox"/> brown <input type="checkbox"/> black <input type="checkbox"/> cloudy				
Brand / type			Minimum value	Actual value	<b>System</b>	<input type="checkbox"/> rinsed
Filling capacity	Liter	ph-value	7			<input type="checkbox"/> filtered
Mixing ratio	%	antifreeze upto	-25°C			<input type="checkbox"/> purged

DHW system	yes / no	Number of collectors	
Space heating	yes / no	Mounting type	OR / IR / FR / horizontal / vertical
DHW-mixing valve	yes / no	Hydr. connection	single row / double row / parallel / series
		Orientation/Pitch	S / SE / SW / E / W   ca.   Grad
How is the solar ventilation system designed?			
<input type="checkbox"/> with AIR-Stop in the solar circuit		In case of quick vent valve, please add drawing.	
<input type="checkbox"/> with quick vent valve at collectors			

General checklist			
Collector is clean	<input type="checkbox"/> ok	Operation of pumps checked	<input type="checkbox"/> ok
Collector fastening is stable	<input type="checkbox"/> ok	Temperature sensores indicate realistic values	<input type="checkbox"/> ok
Collector interior is not fogged	<input type="checkbox"/> ok	System is grounded	<input type="checkbox"/> ok
Return valves	<input type="checkbox"/> ok	Solar liquid for re-filling is available	<input type="checkbox"/> ok
DHW-mixing valve	<input type="checkbox"/> ok	Anode(s) checked	<input type="checkbox"/> ok

Meter reading	Pump 1	h	Pump 2	h	Heat quantity meter	kWh

User has been instructed	<input type="checkbox"/> yes	<input type="checkbox"/> no	
Maintenance contract	<input type="checkbox"/> yes	<input type="checkbox"/> no	
Inspection interval	<input type="checkbox"/> annually	<input type="checkbox"/> every 2 years, no later than	

Drawing of collector array

Date, signature and stamp of solar company

Datum, signature of customer

Remark : Please add proof of invoice.