Assembly Instructions
Solar collector
FKA 240 / 270

Roof-mounted collectors
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Notes and remarks

Responsibilities:

The manufacturer
of the installation is responsible for the integration of the installation according to regulations and for compliance with the safety regulations.

The operator
of the installation is responsible for an operation of the installation according to regulations and for consultation of experts in case of problems.

Concerning manufacture and operation of the installation the following guidelines and regulations are valid (amongst others):

- accident prevention regulations
- guidelines and regulations of professional associations
- regulations of suppliers of assembly parts

Attention:
- The collectors may never be operated or tested under pressure with water.
- Being very careful it is possible to walk onto the collectors, however, the seals must not be loaded by that.

For transport and stocking of the collectors the following regulations are valid:

- Never abandon the delivered collectors unprotected at the building site.
- Never lay down the collectors onto a rough surface with overhanging pieces like stones, timbers, etc.
- Stock the collectors always upright leaning against a solid surface.
- The rigidity of the collectors is limited. During transport to the building site always ensure a torsion-free transport type.
- In case of an elevated intermediate storage make sure that the collectors are protected against sliding down.
- Regulations and instructions of transporters in charge have to be observed.

Maintenance:
Service intervals are to be specified system-dependent. A optical check of all system components is recommended once a year. Adequate function of the sytem must be checked once a year.

Lightning protection:

The regulations concerning lightning protection have to be observed strictly.
In case of doubt an expert or the office in charge must be contacted.

This instruction is not subjected to the control of a service of modifications. It does not absolve the manufacturer and operator of the installation of its responsibility to install and operate all parts of the installation according to utmost professional knowledge.

The manufacturer of the installation is responsible to observe and keep all appropriate regulations and instructions, The copyright of this instruction incl. graphical material remains in any case at the STI GmbH. The instruction can only be duplicated completely or in parts with written authorisation of the STI GmbH.
Collector field dimensions

<table>
<thead>
<tr>
<th>Collector data:</th>
<th>Collector type</th>
<th>Width</th>
<th>Height</th>
<th>Thickness</th>
<th>Weight</th>
<th>Fluid content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FKA-240-V</td>
<td>116.7</td>
<td>206.7</td>
<td>11</td>
<td>44 kg</td>
<td>2.2 L</td>
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<tr>
<td></td>
<td>FKA-240-H</td>
<td>206.7</td>
<td>116.7</td>
<td>11</td>
<td>44 kg</td>
<td>2.3 L</td>
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<tr>
<td></td>
<td>FKA-270-V</td>
<td>116.7</td>
<td>234.0</td>
<td>11</td>
<td>54 kg</td>
<td>2.5 L</td>
</tr>
<tr>
<td></td>
<td>FKA-270-H</td>
<td>234.0</td>
<td>116.7</td>
<td>11</td>
<td>54 kg</td>
<td>2.6 L</td>
</tr>
</tbody>
</table>

Vertical collectors

<table>
<thead>
<tr>
<th>Number</th>
<th>Width</th>
<th>Height</th>
<th>Thickness</th>
<th>Weight</th>
<th>Fluid content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>206.7</td>
<td>234.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>413.4</td>
<td>468.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>620.1</td>
<td>702.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>826.8</td>
<td>936.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1033.5</td>
<td>1170.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Horizontal collectors

<table>
<thead>
<tr>
<th>Number</th>
<th>Width</th>
<th>Height</th>
<th>Thickness</th>
<th>Weight</th>
<th>Fluid content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>240-H</td>
<td>270-H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>116.7</td>
<td>116.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>233.4</td>
<td>233.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>350.1</td>
<td>350.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>466.8</td>
<td>466.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+116.7 +116.7 all measures in cm
Collector field - arrangement

Vertical section across a collector field

Horizontal section across a collector field

Middle cover sheet
5 Base console / Concrete blocks

Construction of solar collectors

The height of the concrete blocks (15 + 3 cm) must be added for the total height.

In case of construction of solar collectors you have to be careful that the consoles are fixed either onto a solid ground or onto the concrete blocks drawn in these instructions. The weights indicated by us are sufficient for locations up to 800 m above sea level with no extreme wind disposition. In case of locations that are higher or exposed to extreme wind speeds the weights have to be raised and, if necessary, additional safety measures have to be taken. If the consoles are fixed onto building parts you have to make sure that the impermeability is guaranteed in any case.

- **Weight concrete block**: 70 kg
- **Additional weight**: 50 kg
- **Console**: 8 kg
- **Collector**: 50 kg
- **Total weight construction**: 178 kg
Base console for construction of the collectors onto different grounds e.g. concrete blocks, concrete console with additional weight, constructions of the building contractor etc.

When setting up the console adjust positioning angle according to the table on page 5.

Fastening cut in base console for mounting of the collectors

Collector mounting with double fastening plate (screw M8x25 and nut).

Fastening plates between two collectors clamp one collector on each side and there for determine the distance between the collectors.

Before installing the second collector take note of the collector connector on page 19!

Collector mounting with single fastening plate is used on the right an left edge of a collector field.
Distance of the triangular consoles (centre-centre)
The two outer triangular consoles are each offset by 6 cm to the inside.

Distance = A minus 9 cm
Distance = A
Distance = 2 x A
Distance = 3 x A minus 9 cm

Initial position: take all measures from this point

Height and depth of the consoles constructions

<table>
<thead>
<tr>
<th>Collector type</th>
<th>Measure A</th>
<th>Measure H in cm (Height)</th>
<th>Measure T in cm (Depth)</th>
<th>Measure W in cm (Upper edge collector up to centre hole)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in cm</td>
<td>20°</td>
<td>30°</td>
<td>45°</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>212</td>
<td>114</td>
<td>107</td>
<td>91</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>239.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measure Z in cm
hole spacing of the wall sided fastening holes

Collector Type
Measure Z in cm

<table>
<thead>
<tr>
<th>Collector Type</th>
<th>Measure H in cm (Height)</th>
<th>Measure T in cm (Depth)</th>
<th>Measure W in cm (Upper edge collector up to centre hole)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20°</td>
<td>30°</td>
<td>45°</td>
</tr>
<tr>
<td>upper hole</td>
<td>83.4</td>
<td>75.3</td>
<td>57.8</td>
</tr>
<tr>
<td>middle hole</td>
<td>83.3</td>
<td>83.3</td>
<td>58.5</td>
</tr>
<tr>
<td>lower hole</td>
<td>91.4</td>
<td>91.3</td>
<td></td>
</tr>
</tbody>
</table>

Fix it here onto an appropriate ground with a screw

2 cylinder head screws M8x25
2 nuts M8
2 fastening plates

Initial position: take all measures from this point

Collector Type
Measure Z in cm

<table>
<thead>
<tr>
<th>Collector Type</th>
<th>Measure Z in cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>FKA-240-H/270-H</td>
<td>83.4</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>83.3</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>91.4</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>91.3</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>57.8</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>65.8</td>
</tr>
<tr>
<td>FKA-240-H/270-H</td>
<td>73.8</td>
</tr>
</tbody>
</table>
Wall console for the installation of collectors onto façades, balcony railings or other vertical building parts.

Fastening cut in wall console for mounting of the collectors

**Before installing the second collector take note of the collector connectors on page 19!**

Collector mounting with double fastening plate (screw M8x25 and nut).

Fastening plates between two collectors clamp one collector on each side and therefore determine the distance between the collectors.

Fastening of the collectors on the left and right edge of a collector field with the help of a M8 - cylinder head screw, on the upper and lower side one screw each.
Spacing single row collector field

Installation onto roof-tiles

The mounting of the tiles is described on pages 11 to 16.

After the mounting of the roof-tiles the aluminium profiles are fixed onto them horizontally. The „Profiles below“ are fixed onto the lowest row roof-tiles. The „Profiles standard“ are fixed onto the roof-tiles lying on top of them (therefore have a look at page 17). Make sure that the profiles are laterally exactly aligned. After the mounting of the profiles you can start with the assembly of the collectors.

<table>
<thead>
<tr>
<th>Measure</th>
<th>FKA-240-H</th>
<th>FKA-240-V</th>
<th>FKA-270-H</th>
<th>FKA-270-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>212 cm</td>
<td>122 cm</td>
<td>239.3 cm</td>
<td>122 cm</td>
</tr>
<tr>
<td>H</td>
<td>116 cm</td>
<td>206 cm</td>
<td>116 cm</td>
<td>234 cm</td>
</tr>
</tbody>
</table>

Initial position: take all measures from this point

Distance = A-20cm
Distance = A+20cm
Distance = 2xA-20cm
Spacing multi-row collector fields

Installation onto roof-tiles multi-row

Placement of the roof-tiles (view)

Initial position: take all measures from this point

<table>
<thead>
<tr>
<th>Horizontal measure</th>
<th>Collector type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure A</td>
<td>FKA-240-H</td>
</tr>
<tr>
<td></td>
<td>212 cm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vertical measure</th>
<th>Collector type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure H1</td>
<td>FKA-240-H</td>
</tr>
<tr>
<td></td>
<td>112 - 87cm</td>
</tr>
<tr>
<td>Measure H2</td>
<td>127 - 152cm</td>
</tr>
<tr>
<td>Measure H3</td>
<td>224 - 204cm</td>
</tr>
<tr>
<td>Measure H4</td>
<td>244 - 264cm</td>
</tr>
<tr>
<td>Measure H5</td>
<td>341 - 321cm</td>
</tr>
</tbody>
</table>

After the mounting of the roof-tiles the aluminium profiles are fixed onto them horizontally. The „Profiles below“ are fixed onto the lowest row roof-tiles. The „Profiles standard“ are fixed onto the roof-tiles lying on top of them (therefore have a look at page 17).
11 Assembly roof-tile clamps

Removal of the tiles after previous determination of the placement of the roof tile clamps according to the sheet „Installation onto roof-tiles“

Fixation of the lower lath 24x80x600 with two screws 4 x 50 mm

If the lath is placed in the region of a counter lath the lath 24x80x600 must not be applied.

Mounting of the tile clamp support:

Lath 24x150x270 with two screws 6 x 60 mm see also page 12

Apply this lath also if the counter lath serves as support.
Grind the tile coarsely: The tile clamp may not rest on the tile.

Adjustment und fixation of the tile clamp: The tile clamp must be mounted in the non-corrugated area of the tile.

The tile clamp may not rest on the tile.

Clamp tile completely mounted before refoofing.

Grinding of the cover tile and reroofing of the remaining tiles.

Tile clamp with reroofed tiles.

Attention: All further tile clamps in one row must be adjusted exactly (e.g. by a line mark)
Mount the lower lath 24x80x600 as described on page 11.

Fixation of the tile clamp support 24x150x270 with two screws 6x60 mm.

Place the first lead sheet in such a way that the lower tile is covered and that the sheet lies below the tiles on both sides (bend up the lead sheet laterally).

Mount the tile clamp in such a way that the lower tile is not overlaped. The tile clamp may not cover the lower tile because otherwise a pressure point would arise on the lower tile.

Mounting of the upper lead sheet. Bend up the sheet also laterally. The screws of the tile clamp must be covered. Protect the lead against slipping.

The added foam wedge is placed under the adjacent tiles on both sides as well as above (protection against splash water and snow)

Completely mounted tile clamp.

Attention:
All further tile clamps in one row must be adjusted exactly (e.g. by a line mark)
Mounting of the laths as described on page 6. Laterally adjustment in such a way that only one tile has to be grinded.

Adjust the tiles in the height so that there is enough space for the cover tile. Fixation of the tile clamp with two screws 5 x 60 mm.

The tile clamp may not rest on the tile resp. cause pressure points onto the tile.

If the tile clamp is mounted too low the added 5mm lumbers can be placed under the tile clamp.

Reroofing of the tiles

Grinding of the tile and reroofing

Covering of the remaining tiles

Attention:
All tile clamps in an horizontal row must be adjusted exactly (e.g. by a line mark)
Roof before untiling

After untiling the lath 24x80x600 must firstly be mounted under the tile lath (see page 11 photo 2+3)

Untiling of the tiles for the assembly of the tile clamps.

Mounting of the upper tile clamp support with two screws 5x60.

Mounting of the lower tile clamp support with screw 5x60.
Lumber excess length 5mm (Lumber is higher than tile)

Completely mounted support lumbers.

Bend the corners on both sides down.

Mounting of the lower lead sheet. The lead is placed laterally under the tiles.

Fixation of the tile clamp with screw 5x60. Lower screw in tile lath, upper screw in tile clamp support.

Tile clamp with lower lead sheet completely mounted.

The tile clamp must have a minimum distance to the underlying tile of 5mm.

Distance of tile clamp 5mm

Mounting of the upper lead sheet. The lead is placed laterally under the tiles.

Upper lead sheet mounted.

Covering of the upper tiles.

View of a readily mounted tile clamp. All further tile clamps must be adjusted exactly, see also page 12 last photo.
The placing of the roof clamps corrugated iron roof is determined according to page 10. Pay attention that the roof clamps are placed in the area of an existing mounting lath. The angle for the fixation of the aluminium profiles must always be below.

The holes for the fixation screws have to be pre-drilled with an 8mm borer. The fixation is realised by a façade screw 6.5x100 with sealing gasket.

Roof clamp completely mounted and ready for the assembly of the fastening profiles, therefore see also page 17.

If the roof clamps cannot be mounted within the limits indicated on page 10, you first have to mount horizontal or vertical C-profiles onto the roof clamps. Afterwards the added fastening profiles are mounted.
Readily mounted tile clamps for one collector field with two collectors.

Assembly of the aluminium profiles

| Fastening profile standard | Fastening profile below |

The mounting is effected with the added cylinder head screws M8 x 25 and the stop nut.

In case of tile clamps without connecting profile the 3mm supports are placed between tile clamp and aluminium profile.

The connecting profile is connected with the profiles by two additional cylinder head screws M8 x 25

Without 3mm support because connecting profile is placed onto tile clamp.

Completely mounted aluminium profiles ready for the assembly of the collectors

Pay attention that the profiles are exactly adjusted and the beginning of the upper profile is adjusted rectangularly to the lower profile.
18 Assembly collectors

Placing of the first collector (collector on the left).

Mount the collector with the help of the fastening plate on the left side. Afterwards the two collector connectors are mounted.

Before installation of the second collector, pay attention to page 19 Collector connection!

Place the second collector with a distance next to the first. Push carefully until collector connectors engage into flange. Mount the collector connections completely. Mount the double fastening plate between the collectors. Further collectors have to be mounted similarly.
Collector connectors

Compensator with O-ring seal 20x2mm slided on

Clamp collector connection bend up for mounting

Push compensator with cylindrical end into the collector connection.

Pay attention that the collector connection is clean.

Before tightening of the screw the clamp must be positioned by a rotary motion up and down.

Tighten clamp collector connection with cylinder head screw M4x16.

Completely mounted compensator on one side.

After positioning of the second collector the compensator is mounted in the same way.

Attention: Do not forget the O-ring seal

Tightening of the clamp until both nibs lay one upon the other all over the length.
Collector connections

Cover

is mounted on all non-used collector connections.

Connection for soldered or clamping ring joints

available dimensions:
12mm, 15mm, 18mm, 22mm

Connection 3/4"

Exhauster without extension

Exhauster completely mounted

All other connections as well as the covers are mounted in the same way.
Hydraulic connections

Connection warm = Connection to the consumer
Connection cold = Connection from the consumer
Flex-Connection = Art.Nr.
* = exhauster device

Installations with 1 to 6 collectors single-row

Connection warm above A or B
Connection cold below C or D
Close non-used connections with cover.

F = Temperature sensor bush
The temperature sensor can be inserted into any collector.
Protect the temperature sensor against slipping out.

Installations with 7 to 15 collectors single-row

Connection bottom left/right top cold=C / warm=B
Connection bottom right/left top cold=D / warm=A
Close non-used connections with cover.

F = Temperature sensor bush
The temperature sensor can be inserted into any collector.
Protect the temperature sensor against slipping out.

Installations with collector rows on top of each other

Connection warm A + E or B + F
Connection cold G + C or H + D
Exhauster A or B
Close non-used connections with cover.

F = Temperature sensor bush
The temperature sensor can be inserted into any collector.
Protect the temperature sensor against slipping out.

In case of installations that are smaller than 50m² the connecting pipe can be connected optionally from the bottom or from the top to the extern collecting pipe.
In case of installations that are bigger than 50m² the connecting pipe must always be connected to the extern collecting pipe via the diagonal e.g. left bottom and right top (therefore see also page 10).
Hydraulic connections for multi-row installations

- **Elbow collecting pipe connection**
  - O-ring seal 20mm
- **T-single collecting pipe connection**
  - O-ring seal 20mm
- **T-double collecting pipe connection**
  - O-ring seal 20mm
- **Elbow collecting pipe connection**
  - Insert O-ring seal 20mm at 1" connection
  - Insert O-ring seal 20mm at the collector connection
Overview hydraulic connections

Collector connection 12 mm
for soldered fittings or clamping ring joints

Collector connection 15 mm
for soldered fittings or clamping ring joints

Collector connection 18 mm
for soldered fittings or clamping ring joints

Collector connection 22 mm
for soldered fittings or clamping ring joints

Collector connection 3/4"
for thread fittings

Exhauster connection
for installation at the collector without extension

Collector connector hydraulic (Compensator)
connects two collectors and compensates the thermal dilations

Clamp collector connection and O-ring seal
Clamp for connection of the above mentioned hydraulic devices with the flange at the collector