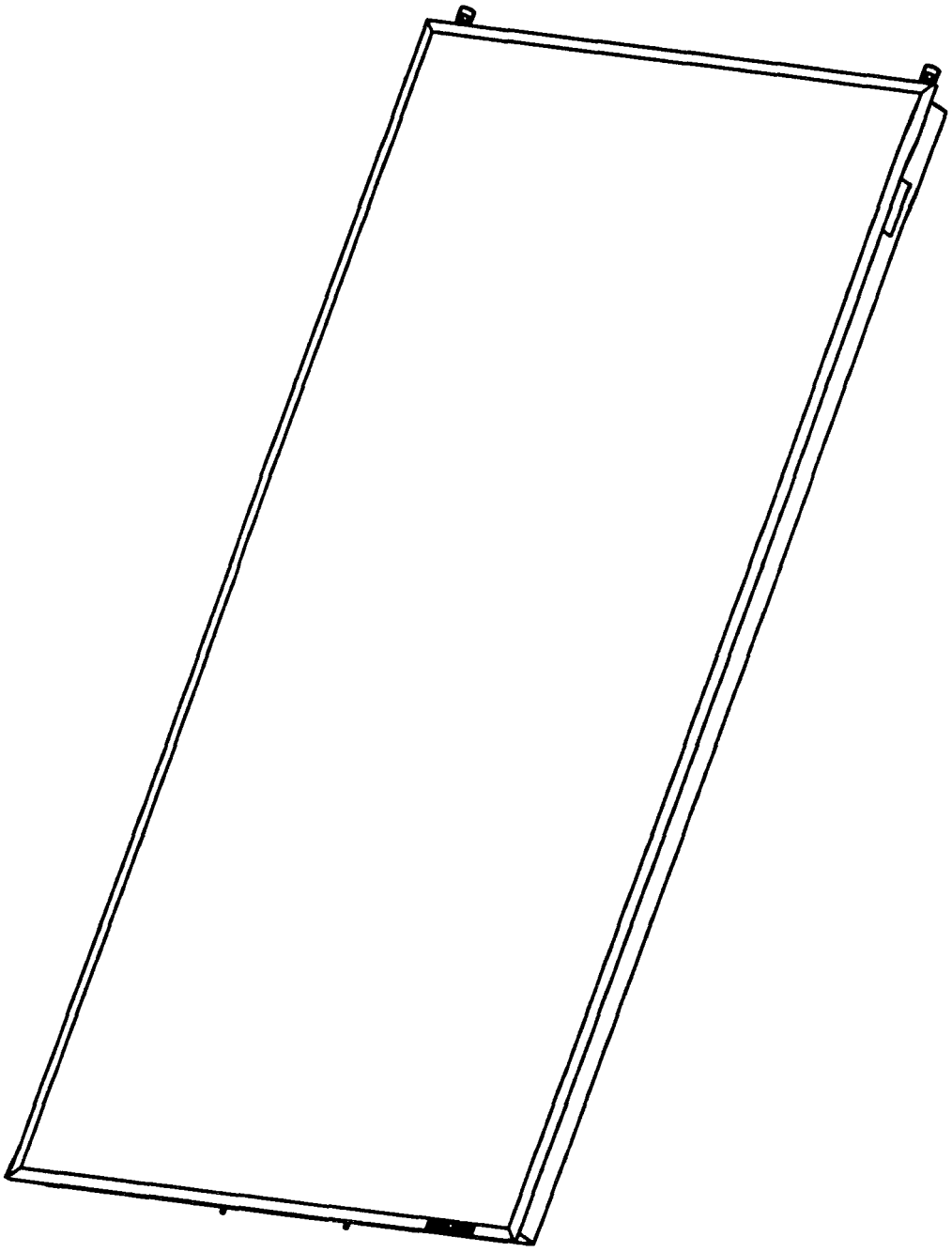
STIEBEL ELTRON

Flat Collector SOL 25 S

English

Operating and Assembly Instructions

04/02



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Assembly (water and electrical installation) as well as the initial start-up and maintenance of the appliance may be performed only by authorised, skilled personnel in accordance with these instructions.

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Contents

1. Operating Instructions for the User and the Professional

1.1 Accessories

07 42 74 SOL 25 SR1 frame laths for a SOL 25 S collector.
Contents:
- 2 Frame laths
- 2 Safety brackets
- 5 M6 nuts (jaw span 10)
- 3 Washers for M6

07 42 75 SOL 25 SR2 frame laths for two SOL 25 S collectors.
Contents:
- 2 Frame laths
- 4 Safety brackets
- 9 M6 nuts (jaw span 10)
- 5 Washers for M6
- 1 Collector connecting elbow with slotted venting screw

07 42 78 SOL 25 BP roof hooks for fastening frame laths to a pantiled roof.
Contents:
- 2 Rafter plates
- 2 Roof hooks
- 2 Angle plates
- 17 M6 screws (jaw span 10)
- 17 M6 nuts (jaw span 10)

07 42 79 SOL 25 BF roof hooks for fastening frame laths to a corrugated sheet roof.
Contents:
- 2 U-shaped laths
- 2 M16 threaded rods
- 5 M6 screws (jaw span 10)
- 5 M6 nuts (jaw span 10)
- 5 Washers for M6
- 8 M16 nuts (jaw span 24)
- 4 Washers for M6
- 2 Washers, large
- 2 Tooth lock washers

07 42 80 SOL 25 SF roof fastening for flat roof and wall fastening of the SOL 25 SR1/2 frame laths.
Contents:
- 1 Lath, vertical
- 1 Lath, horizontal
- 1 Support strut
- 1 Cross strut
- 7 M6 screws (jaw span 10)
- 7 M6 nuts (jaw span 10)
- 7 Washers for M6

07 42 81 SOL 25 RV frame connection laths for frame laths.
Contents:
- 2 Frame connectors
- 9 M6 screws (jaw span 10)
- 1 Collector connection bend with slotted venting screw

07 42 82 SOL 25 RA frame support for SOL 25 SR1/2 frame laths on pantiled and corrugated sheet roofs.
Contents:
- 2 Laths
- 4 Turn angles
- 1 Strut
- 16 M6 screws (jaw span 10)
- 16 M6 nuts (jaw span 10)
- 16 Washers for M6

07 21 87 G3/4 male, **collector submersible bushings** for supporting the temperature sensor at the collector

07 43 54 SOKI 40 K compact installation with three-stage circulation pump provided with system venting, 6 bar safety valve, manometer, dial thermometer in the forward and reverse flow, unlockable non-return valve, shut-off valves before and after the pump, a valve for filling and draining the system, optical flow rate display.

07 43 55 SOKI 60 K compact installation with three-stage circulation pump provided with system venting, 6 bar safety valve, manometer, dial thermometer in the forward and reverse flow, unlockable non-return valve, shut-off valves before and after the pump, a valve for filling and draining the system, optical flow rate display.

07 43 48 SOM 6K temperature difference control with display for a consumer.
Contents:
- 1 Control device
- 2 Pt-1000 temperature sensors

1.2 Technical data

TYPE		SOL 25 S
Order no.		**07 42 72**
Design certification no.		02-328-038
Dimensions/weight		
Height	mm	2233
Width	mm	1223
Depth	mm	78
Grid dimension (incl. fitting)	mm	1223 x 2327
Weight, empty	kg	49
Standstill temperature (at 1000W/m²)	°C	205
Operating pressure, min.	bar	3.5
Permissible operating overpressure	bar	6
Pressure test		
Test pressure (absorber)	bar	11 (ex factory)
Test medium		Water (ex factory)
Pressure test of compl. solar plant	bar	7.8 bar with H-30L or H-30LS
Rated capacity	l/h	50–300
Pressure drops of collector (100 l/h)	mbar	approx. 2 (20 °C heat-transfer medium temperature)
Pressure drops of collector (200 l/h)	mbar	approx. 6 (20 °C heat-transfer medium temperature)
Connection		G 3/4 male
Heat-transfer medium		H-30 L or H-30 LS, already mixed
Heat-transfer medium content, incl. distributor		1.6
Total area	m²	2.7
Effective collector area (aperture area)	m²	2.5
Absorber area	m²	2.5
Installation angle	°	20 to 90
Design features		
Housing		aluminium (saltwater-proof)
Cover		toughened, 4 mm safety glass with structuring (interior), super-transparent, poor in iron
Absorber		copper, highly-selectively vacuum-coated
Pipe		copper, header pipe Ø 22x1, pot pipe Ø 8x0.4
Thermal insulation, rear wall		mineral wool, 40 mm thick
Thermal insulation, side wall		mineral wool, 10 mm thick
Seal		EPDM
Connection fittings		pipe bend (copper) with union nut (brass) G3/4
Power capacity *	W/collector	0 to 2000
Conversion factor h_0		0.80
Heat loss value a_0	W/(m²K)	3.53
Heat loss value a_1	W/(m²K²)	0.0118

* Dependent on solar and sky radiation, installation conditions, temperature of heat-transfer medium and characteristics of the system.

1.3 Equipment provisions and function of the SOL 25 S collector system

The solar system can be used for heating up water for domestic or industrial use, for reinforcing heating systems, heating swimming pool water (using separate heat exchangers) or in combination with heating up water for domestic or industrial use, heating system reinforcement or heating swimming pool water (using separate heat exchangers).

Flat collector SOL 25 S

The flat collector converts light (radiation) into heat. The light penetrates the glass cover. This consists of tempered, super-transparent, toughened safety glass. The light strikes the highly-selectively vacuum-coated absorber, where it is converted into heat. Heat losses to the environment are reduced by the vacuum, highly-selective coating of the absorber and the thermal insulation at the rear of the absorber. The thermal energy gained by the collector is transported to the hot-water tank by means of the circulating heat-transfer fluid and a pump. The selective layer can, due to interference, be tinted in differing colours, which do not give rise to performance reductions. Under certain operating conditions (e.g. a large storage tank with a low temperature level compared to the environment, a high percentage of air humidity) it is possible for condensation to form inside the collector. Venting holes are provided in the aluminium housing to vent the collector.

Solar control

The solar controls are straight temperature-difference controls. The temperature difference (between collector and consumer temperature) measured by two sensors is monitored and compared with an adjustable temperature difference $_{\Delta}t$ = 3 to 11 K. The control turns on the circulation pump if the measured value (actual value) exceeds the set target value. If the measured value falls below the set target value minus a hysteresis of 1.5 K the pump is turned off.

The separate assembly instructions for the controls must be observed.

Solar compact installation

The solar compact installation (SOKI) enables easy fitting of a solar system and includes the important parts required for the hydraulic circuit.

The separate assembly instructions for the solar compact installation must be observed.

2.4 Solar storage system

The concept of the Stiebel Eltron SBB .. SOL solar, stationary storage system was developed especially for combination with Stiebel Eltron solar collectors. At their top side and bottom side two enamelled, bare-tube heat exchangers are rigidly integrated on the side of the water for domestic or industrial use.
It is possible to mount an electrical, screwed-in heating element (BGC) in a fitting with a G 1½ female thread..
The separate assembly instructions for the storage system must be observed.

H-30L or H-30LS heat-transfer fluid

The ready mixed heat-transfer medium fluid H-30L or H-30 LS (up to -30 °C) is filled into the solar system circuit to protect it from frost and corrosion damage.
It is forbidden to dilute it with water.

Building codes and regulations as well as all other local authority conditions must be complied with.

1.4 Control and operation

The detailed control and operating instructions in the separate assembly instructions for the control, compact installation and storage system must be observed.

Setting the control data

Perform setting of the temperature difference and, if required, the hysteresis and temperature restriction as described in the control assembly instructions. The hysteresis (hys) must always be set lower than the temperature difference (Δ_T).

Inspections

Regular inspections increase operational reliability of the equipment.

Cleaning

Due to their self-cleaning feature it is, as a rule, unnecessary to clean the solar collectors. In cases of great dirt accumulation (e.g. dust or bird droppings) they can be cleaned with just clean water (do not do this during intensive insolation).

Equipment pressure

The gauge of the heat-transfer medium circuit at the SOKI (solar compact installation) should be regularly checked.
Reading (target value): 3.5 to 4 bar when the equipment is cold (below 30 °C).

Consult a professional if deviations from the target value are registered.
Refill only with H -30L or H -30 LS!

Shutting down

The design of the Stiebel Eltron solar system is such that no particular operational measures are required even if no hot water is drawn for an extended period (e.g. summer holidays).

To exclude the possibility of the installation overheating it is not permissible to switch off the control.

It is not permissible for the operator of the system to drain the heat-transfer fluid when it is shut down.

If maintenance or repair work require draining of the heat-transfer fluid, this work must be performed by authorised skilled personnel. **During this time the collectors must be protected by a light-proof cover.**

2. Assembly Instructions for the Professional

2.1 Safety Information

General

⚠ Installation and assembly work must only be performed by authorized technical personnel. These technicians must be informed of the applicable accident prevention measures.

⚠ Even from low fall heights, there is some significant risk of injury that should also be prevented via safety measures.

⚠ Work on slanted roofs should, in principle, only be done when the roof surface is dry.

⚠ Appropriate measures must be taken to protect parts from falling down.

⚠ When working on a roof, people must wear a safety harness or use scaffolding.

⚠ Suitable measures must be taken to prevent a collector from slipping off during assembly.

⚠ To prevent the collector from freezing up, it should be filled and pressurized only with antifreeze.

⚠ Do not fill the systems in direct sunlight. The escaping steam poses a scalding risk.

Personal protective equipment

⚠ In principle, people performing assembly work on the roof should wear safety shoes, a hard hat, work gloves and appropriate work clothes.

⚠ If other fall prevention measures are not possible or logical, a safety harness must be used.

Safety harness

⚠ Only use an inspected safety harness.

⚠ Properly use a safety harness according to the instructions.

⚠ The catch point should be above the head, if possible, and must have sufficient load capacity (10 kN).

⚠ Use a safety harness even on flat roof edges and gabled edges.

⚠ Do not pull ropes over sharp edges.

Movable work platforms

⚠ Note the permissible load and do not exceed it under any circumstance.

⚠ Only use work platforms with three-part side protection.

⚠ Block the wheels.

Protection from falling objects

⚠ Advise customers who could encounter falling objects in hazardous areas.

⚠ Block off the hazardous area and prevent people from entering the hazardous area without your knowledge. Install suitable safety nets where applicable.

Standard ladders

⚠ Ladders should be set up at a 65° - 75° angle.

⚠ The ladder should be secured from sliding out, dropping down or tipping over.

⚠ Follow the manufacturer's specifications.

⚠ Only use the ladder up to a 7 m high.

⚠ The material carried along may not weigh more than 10 kg.

Collector

⚠ A solar collector generates heat from sunlight or other types of light. This causes the collector connections to heat up significantly if the collectors are not filled. This scenario poses a burn risk. Cover the collectors with a material that is impermeable to light until assembly is complete. It is recommended that the collector be left in its packaging until it is assembled.

⚠ The collector may not fall and no objects may fall on the collector.

⚠ Do not stand or walk over the collector.

⚠ Never leave the collector loose and unsecured. If the collector falls, the glass may break.

Other

⚠ If the maximum storage temperature is set over 60°C on the control, it must be done in conjunction with a thermostatic usable water mixer. Otherwise, there is a risk of being scalded at the tap.

⚠ All pipes (supply and discharge lines) must be connected to the building equipotential bonding using the shortest paths.

2.2 Installation

General

⚠ **Installation work of any sort may be performed only by authorised skilled personnel.**

To protect the solar equipment from frost and corrosion it is to be exclusively filled with either the H -30 L or the H -30 LS heat-transfer fluid (see section 2.12).

Pipe installation

Pipework for flow and return pipes shall be with copper, special steel pipes or corrugated special steel hose.
Recommended pipe diameter
- Up to 4 collectors: Ø 18 x 1

Pipe conduits to the interior of the building are to be laid on site. Venting pans are recommended for pantiled or tiled roofs with great roof pitches; feeding the pipe through an outer wall is recommended for flat and corrugated sheet roofs with low pitches.
Sawing off pipes should be avoided (chips). Non-cutting pipe separation is recommended.
The pipe installation shall be connected in accordance with the currently valid regulations with equipotential bonding.

Alle Rohrleitungen müssen auf kurzem Wege mit dem Gebäude-Potentialausgleich verbunden werden.

Soldered pipes

⚠ **Soldered pipes must be hard-soldered.**

Other pipes

Pipework produced with clamping-ring screw connections, press fittings and corrugated hose pipes must be provided with appropriate sealing means. The seals must be resistant to glycol and temperatures up to 180 °C.

Roof passage

Two flexible, stainless steel corrugated pipes connect the collector field with the pipe installation. The corrugated pipes can be fitted to the collector screw connections or to the collector submerged bush with flat packings and union nuts.
Ex works these roof passages are provided with temperature stable and UV-resistant thermal insulation.
Connection at both sides: G ¾ female.

Rated flow rate

The rated flow rate for a collector field (up to 4 collectors) is 100 to 300 l/h. The connection of all collector fields to each other must be parallel, which means that the flow rate is added up with every additional collector field, i.e. for a system consisting of three times three collectors the flow rate is 300 to 900 l/h.

Thermal insulation

Temperature stable and UV-resistant insulation material must be used for thermal insulation of outside pipes:
- Mineral wool covered with an aluminium latticed foil
- Flexible EPDM hose (e.g. types Aeroflex®, Armaflex®)

A rigid aluminium sheet covering is recommended for the mineral wool.
The EPDM hose can be covered with an UV-resistant coat of paint.
All pipes must be 100 % insulated for example, for a DN 20 pipe the minimum thickness d = 20 mm must be selected related to a calorific conductibility of λ = 0,035 W/(mK).

The thermal insulation is applied after the pressure test and the leak test.

Min. insulation thickness

Nominal dia. of pipes DN	Min. thickness of insulation layer, related to a calorific conductibility of 0,035 W/(mK)
up to 20	20 mm
greater than 20 to 35	30 mm
upwards of 40 to 100	identical to DN
greater than 100	100 mm

The insulation layer thicknesses must be converted when using insulation materials with other calorific conductibilities.

Safety

⚠ **It is not permissible for any shut-off devices to be incorporated in the pipes between the collectors and the safety valve. The pick-up pressure of the safety valve is 6 bar.**

Storage system

For the standard Stiebel Eltron storage water heater solar system the in series switched collectors are switched to the 300–600 l solar storage water heater.

The assembly instructions for the storage water heater must be observed.

Temperature sensor

Collector submersible bushing

The proper connection of the collector sensor is of great importance for trouble-free functioning of a solar installation.
The standard attachment position of the collector submersible bushing is to the top left of the collector.
Mount the sealed collector submersible bushing to the collector. Apply thermal conduction paste to the collector sensor of the control and insert it up to the stop into the small sensor tube. The cable is to be fastened.

Thermal insulation, which must be joined with joint sealing, be temperature stable and UV-resistant, is to be applied to the collector submersible bushing, the screw connections and the roof passage.
The thermal insulation should also be protected from being eaten by birds.

Storage sensor

For the SBB ... SOL storage water heaters the storage sensor is attached in the bare-tube heat exchanger. Thermal conduction paste is applied to the sensor, and then it is pushed into the submersible tube up to the stop. The sensor, including the cable are to be securely fastened (e.g. cable straps).

Installation example

The system sketch illustrates the principle design of a solar installation for domestic or industrial hot water.

Venting

⚠ **A manual venting valve (lockable) is to be provided at high points of the installation, or a venting line is to be paid to a manual venting valve. It is not permissible to use automatic venting devices.**

Safety

It is not permissible for any shut-off devices to be incorporated in the pipes between the collectors and the safety valve.
The pick-up pressure of the safety valve is 6 bar.
The discharge of the safety valve must discharge into a container able to hold the total contents of the installation. The empty heat-transfer medium canister suffices for smaller installations.

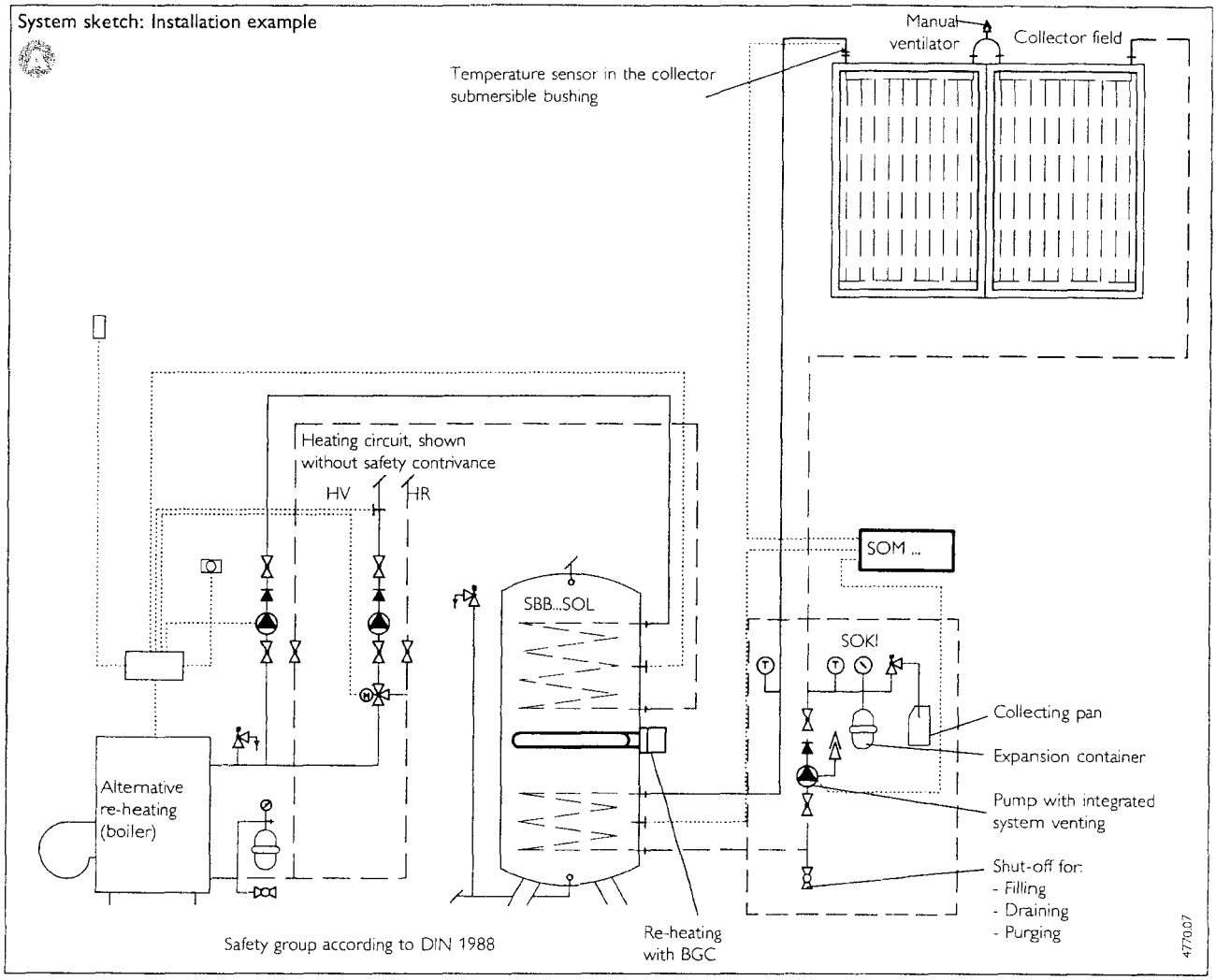
Non-return valve

It is necessary to incorporate a non-return valve. The solar compact installation SOKI includes, as part of standard equipment, an unlockable non-return valve.

Draining device

A draining device is to be provided at the lowest point of the installation.

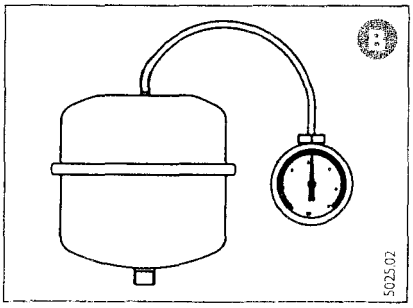
System sketch: Installation example

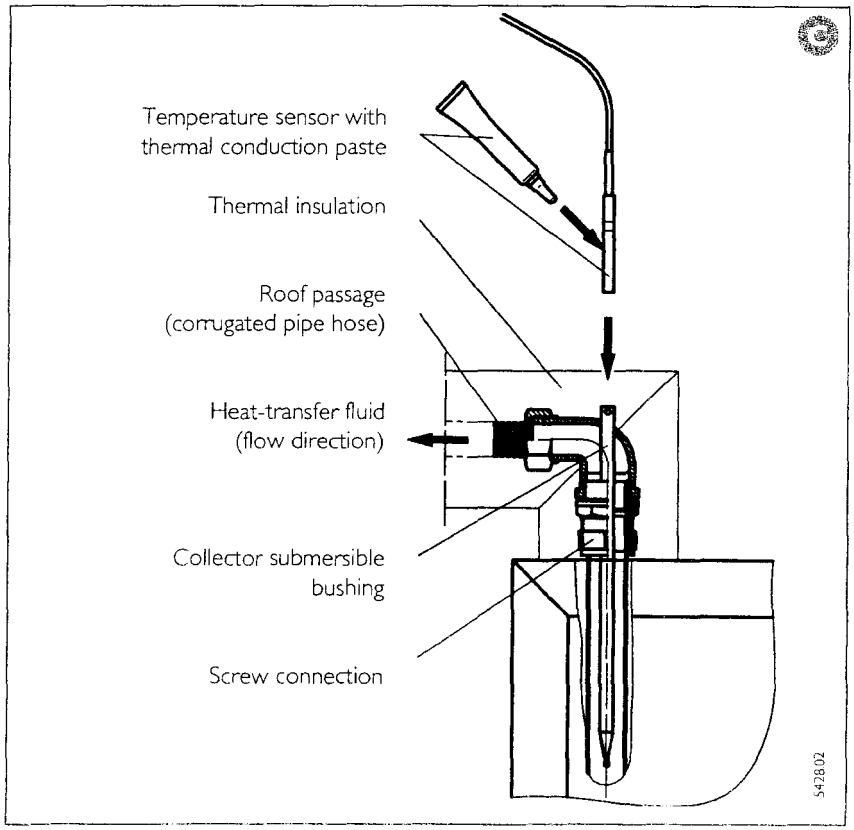


SOKI (Solar compact installation)
The separate assembly instructions of the SOKI must be observed.

Note
For energetic reasons, circulation pipes in domestic or industrial hot water circuits are to be avoided.

Pressure expansion container
The pressure expansion container is to be designed according to the Stiebel Eltron planning documentation. The pressure expansion containers offered as accessories are suitable for an operating overpressure of 6 bar and resistant to H -30 L and H -30 LS.
The admission pressure is 3 bar and is to be checked while the installation is unfilled. It is forbidden to further reduce it.





2.3 Fitting the assembly frame

General

⚠ **The existing roof construction must be checked for a perfect condition (statical check necessary, possibly construction research).**

All work on the roof must be performed by a roofer. Work on roofs must comply with safety regulations, especially "Safety Regulations for Work on and Involving Roofs" and "Safety and Rescue Harnesses"!

Transport

The collector can be pulled onto the roof along a ladder. A rope must be placed around the complete collector frame for this operation.

⚠ **It is not permissible to fasten this rope to the collector connections!**

Protect the glass cover from damage.

Assembly height

The design of the assembly frames is for a maximum assembly height of 20 m at a snow load of 1.25 kN/m².

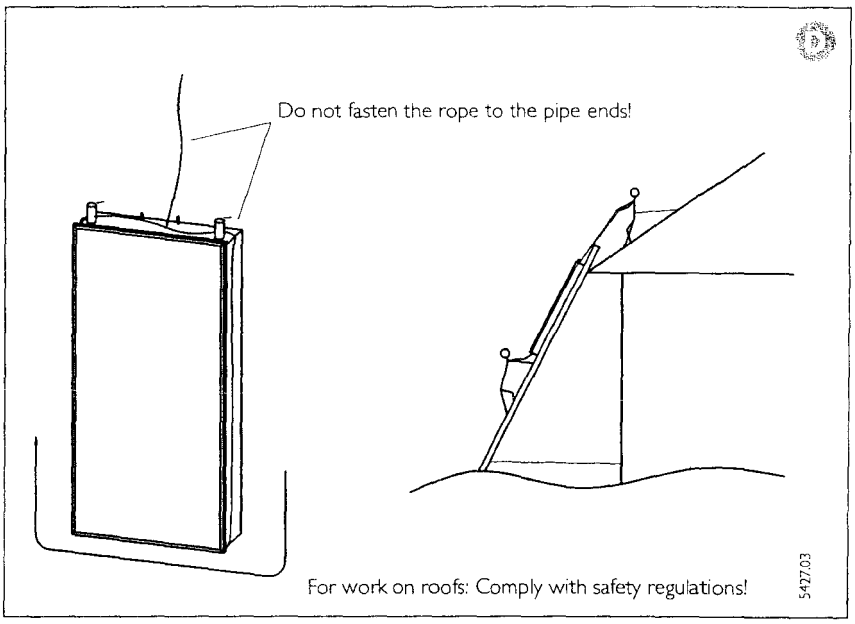
Assembly kits

The following assembly options are, on principle, possible:

- On the surface of a roof,
- Onto a flat roof,
- Onto a wall (to a vertical wall) or
- Onto a corrugated sheet roof.

The assembly frames are designed for a single or two collectors.
Collector fields of any required area can be configured by joining adjacent assembly frames.
Then the assembly frames must be connected with the connection kit for collector frames as described in section 2.8.
For flow-related reasons no more than 4 collectors may be connected in a row. The individual lines of fields must be parallel to each other.

The slant stands can be used raise the collectors to angles between 15–30° in order to make the best use of the solar angle of incidence (see section 2.9, page 14).
Orient the collectors, as far as possible, to the south.
To avoid unnecessary stop times do not position collectors prior to completing the piping installation. Fill the system with H -30 L or H -30 LS immediately upon completion of the installation as described in section 2.12, page 16, and start it up upon completion of the pressure test (see section 2.13, page 17).



Required tools

The following tools are required for the assembly work:

- Drilling machine with a 6.5 Ø drill bit, in case additional bore holes are required
- 2 spanners with a jaw span of 10
- 2 spanners with a jaw span of 24 (only required for assembly on corrugated sheet roofs)
- For joining the collectors: 2 fork spanners with a jaw span of 32 and 28

Standard snow load in Germany

When installing the solar collectors it must be taken into account that differing minimum collector installation angles must be observed within the I to IV snow load zones.

The minimum values are given in the following table.

Ice load

It is also not permissible for the standard snow load to be exceeded by

- Snow trap formation
- Snow drifts
- Ice formation.

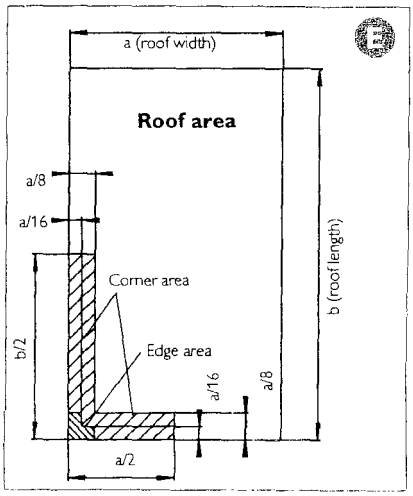
Minimum installation angle

Height in m exceeding MSL	I to IV snow load zones			
	I	II	III	IV
100	•	•	•	•
200	•	•	•	•
300	•	•	•	•
400	•	•	•	>37°
500	•	•	•	>46°
600	•	•	>39°	>51°
700	•	>37°	>45°	>55°
800	•	>43°	>50°	>57°
900	—	>48°	>54°	>59°
1000	—	—	>57°	>61°
> 1000	*			

• : optional installation angle
* : according to specifications of the appropriate building authority

Edge and corner areas

The assembly frames must be fastened outside the edge and corner areas.



2.4 On-roof installation for a pantiled roof up to a 20 m mounting height

Two collector frame types are available:
- On-roof assembly frame for 1 collector (07 42 74)
- On-roof assembly frame for 2 collectors (07 42 75)

In addition, two roof hook kits (07 42 78) are required for mounting one collector on a pantiled roof; upwards of two collectors the number of roof hook kits required is identical to the number of collectors.

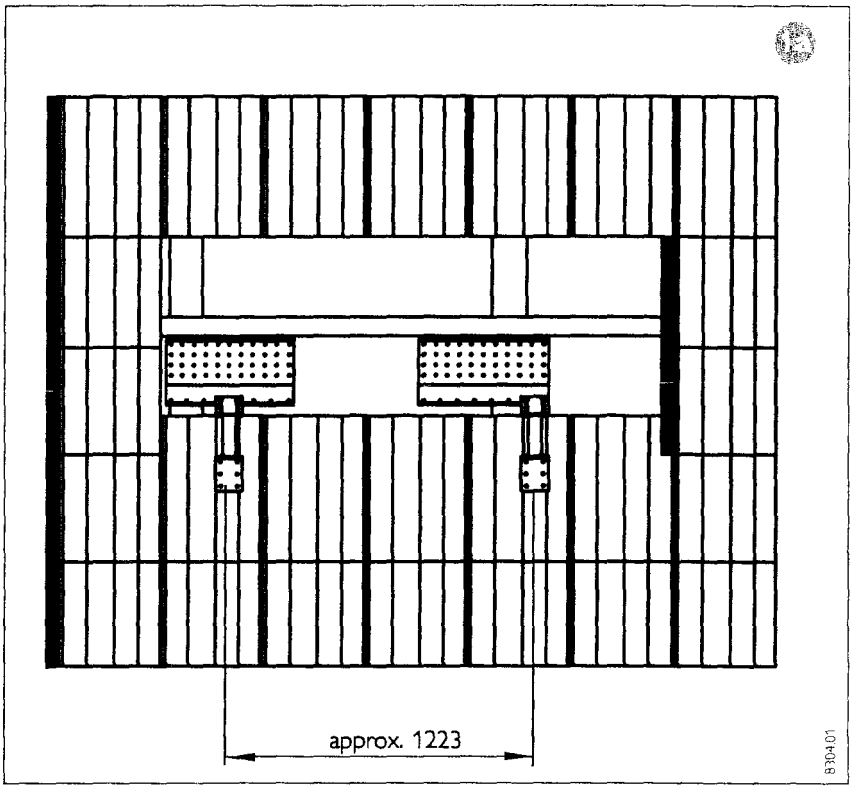
Preparations:

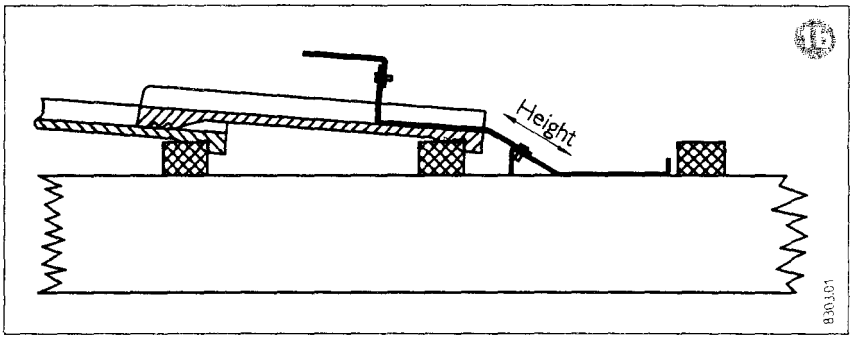
The customer must provide:

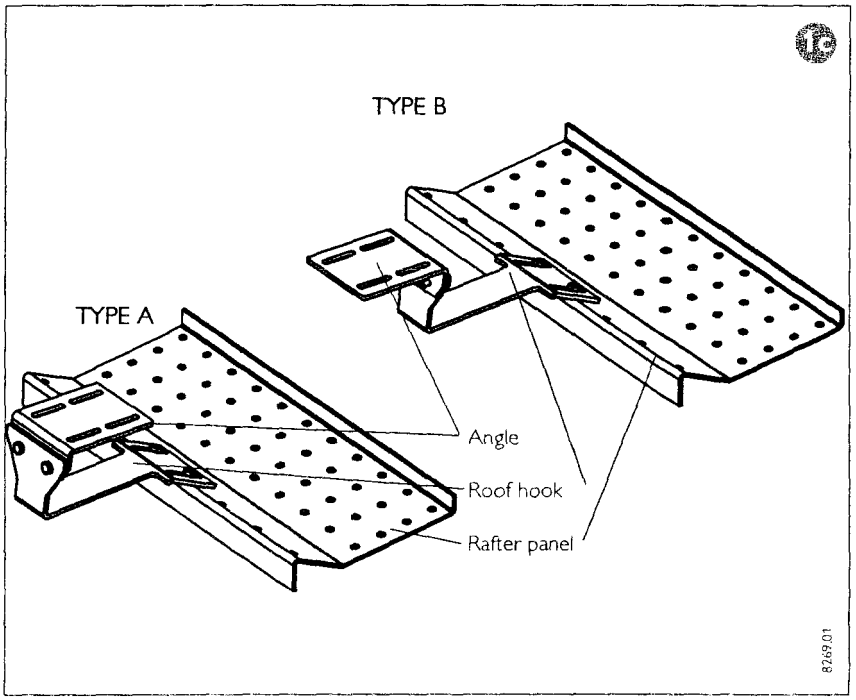
- Per roof hook kit 8 fixing plate screws, galvanised, Ø > 5 mm, or Ø > 4 mm, galvanised screw nails.

Procedure:

- Select fastening location, do not forget to allow for an appropriate vent pan, etc. for the later required pipe passage.
- Take out or reposition the pans to enable placing the rafter panel up to the next rafter.
- Define fastening of the roof hooks on the rafter panel. The roof hooks must lie in a trough. The distance between the roof hooks is approx. 1223 mm (depending on the trough in the roof pan).
- Screw the roof hooks to the rafter panels. Set the height over the slots so that when mounted the roof hooks are on top of the pan in the trough.
- Fit the angle to the roof hook. The TYPE A and TYPE B angles are always appropriately mounted in pairs.
- Either the roof hook type A or B is fitted beneath the panel, depending on the distance between the laths.
  310-333 type A beneath, type B on top
  334-360 type B beneath, type A on top
- Starting either from the left or the right hand bottom, assemble the first pre-assembled roof hook assembly group. The distance between the bottom pan and the rafter panel or the distance between the pan and the roof hook is to be minimised. Fasten the rafter panel to the rafter with 4 fixing plate galvanised,
  Ø > 5 mm, screws, or galvanised,
  Ø > 4 mm screw nails. Assemble the last, lower assembly group in the same manner. An aligning string, to which all other roof hook assembly groups are to be aligned, is to be stretched between the two assembly groups.







The top roof hooks are set vertically to the roof hooks. Between the bore holes the distance to the bottom roof hooks is 2152 mm. Two slots have been provided on each angle. They can be used for adjustments, depending on the roof structure. The distance is defined by fastening the rafter panel. If required, the distance can be adapted at the slots.

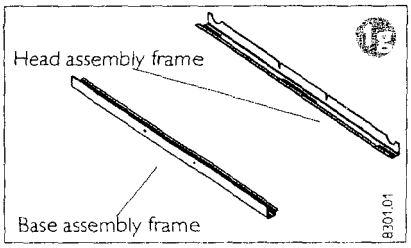
The head assembly frame is mounted to the top angles and the base assembly frame to the lower angles.

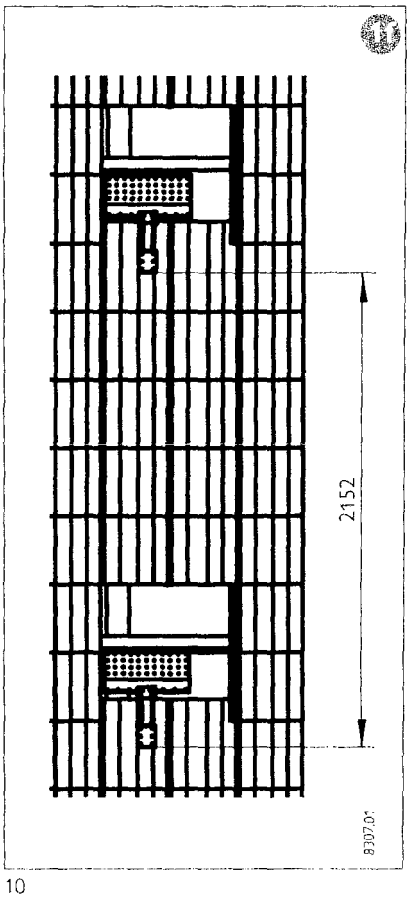
Nest the roof pans and test them for leaks.

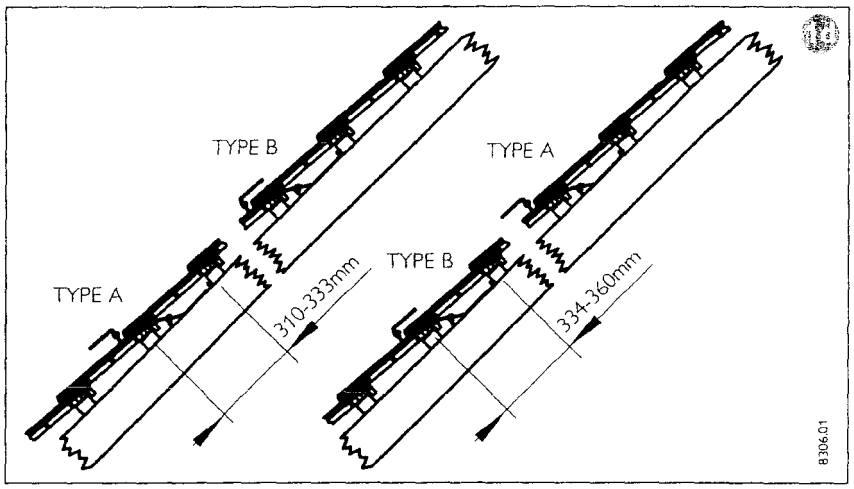
If several on-roof frames are used they must be joined with the frame connection kits (see section 2.8).

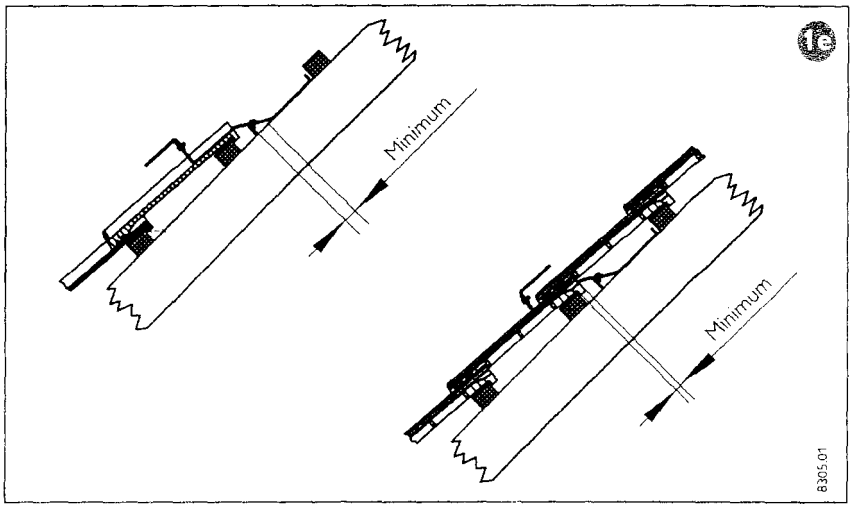
Have lightning protection work performed by authorised skilled personnel (see section 2.10).

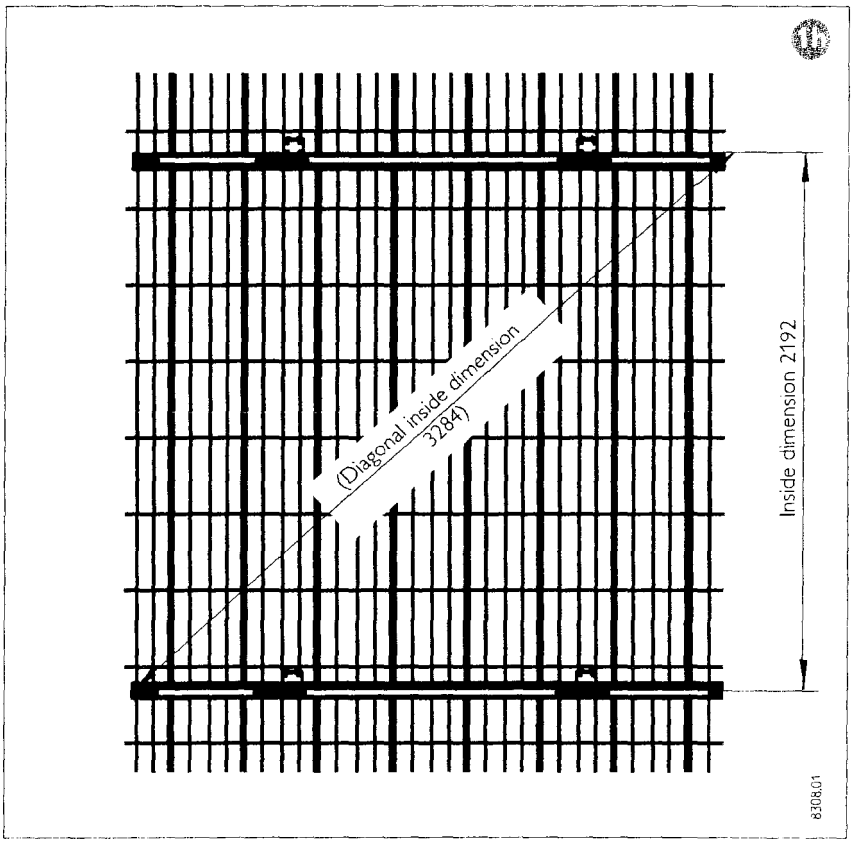
Then tighten all screws.











2.5 Installation on a flat roof up to a 20 m mounting height

Two collector frame types are available:
- On-roof assembly frame for 1 collector (07 42 74)
- On-roof assembly frame for 2 collectors (07 42 75)

In addition, two flat roof/wall assembly kits (07 42 80) are required for mounting one collector on a flat roof; upwards of two collectors the number of flat roof/wall assembly kits required is identical to the number of collectors.

Procedure:

Select the fastening location, do not forget to allow for the later required roof passage.

Screw top support, angle support and angle prop together to an angle.

Screw the resulting angle together with the top of the head assembly frame and the bottom of the base assembly frame.

The centre field is to be braced when more than 2 collectors are assembled. For assembling 4 or more collectors, both the end fields are to be braced. Upwards of 6 collectors struts are, in addition, to be arranged in an inside field.

If several flat roof assembly frames are assembled adjacently to each other they are to be connected by frame connection kits (see section 2.8). With a string the assembly stands are to be aligned so that the assembly frames form a straight line.

The flat roof assembly stands are to be appropriately joined to the roof, or up to an 8 m assembly height, to be weighted with a min. of 180 kg per collector (e.g. concrete slab).

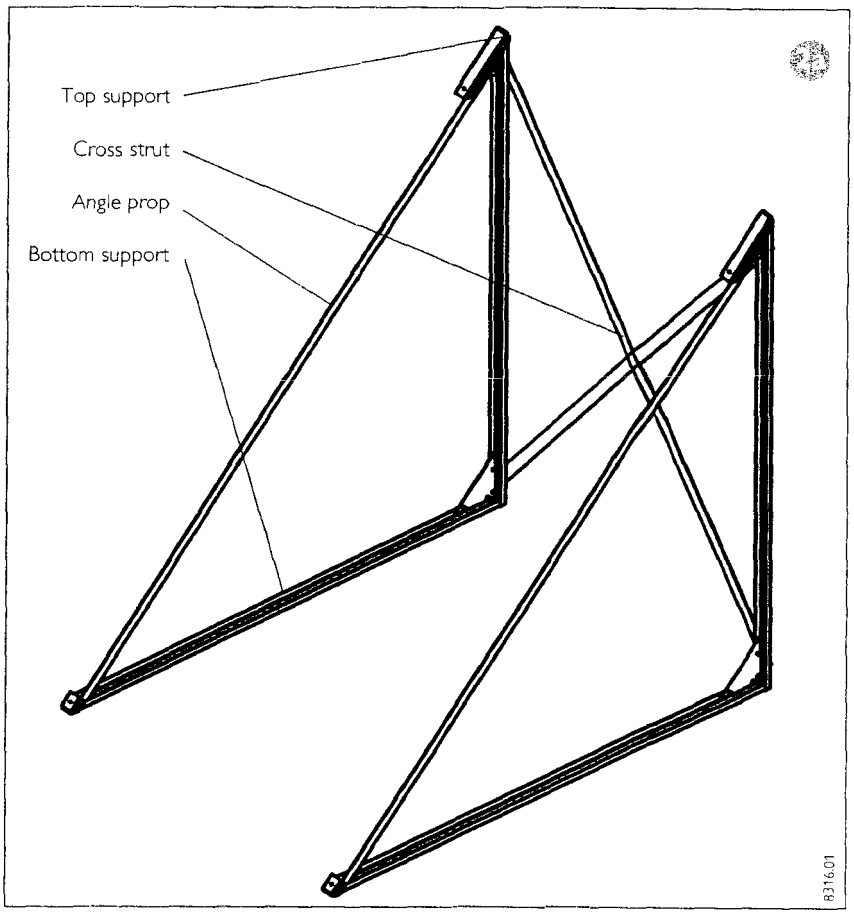
⚠ **Take statics into account!**

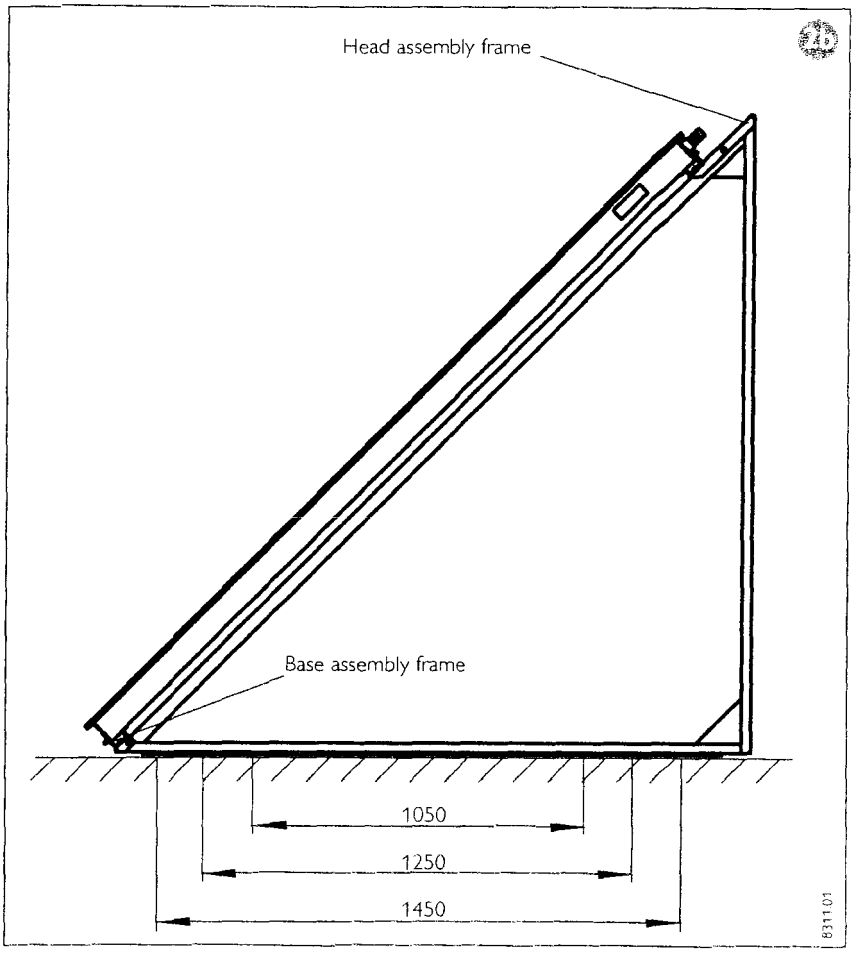
For an assembly height greater than 8 m weighting is not recommended due to the greater weight. In such cases the 6 bore holes of the cross strut are to be used for joining with the roof (6 M6 screws per cross strut).

If several flat roof assembly frames are to be set up **in series one behind the other** it is necessary to maintain a **minimum distance of 6 m** between them.

Have lightning protection work performed by authorised skilled personnel (see section 2.10).

Then tighten all screws.





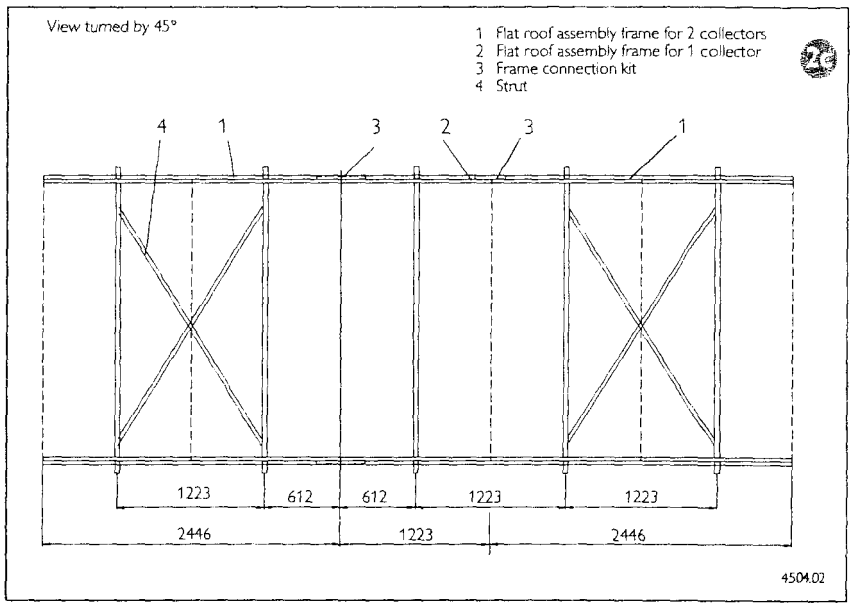
2.6 On-wall installation up to a 20 m mounting height

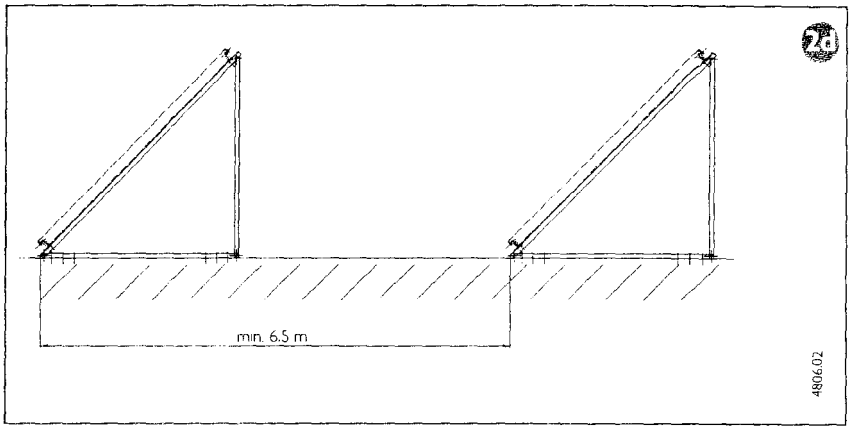
Two collector frame types are available:
- On-roof assembly frame for 1 collector (07 42 74)
- On-roof assembly frame for 2 collectors (07 42 75)

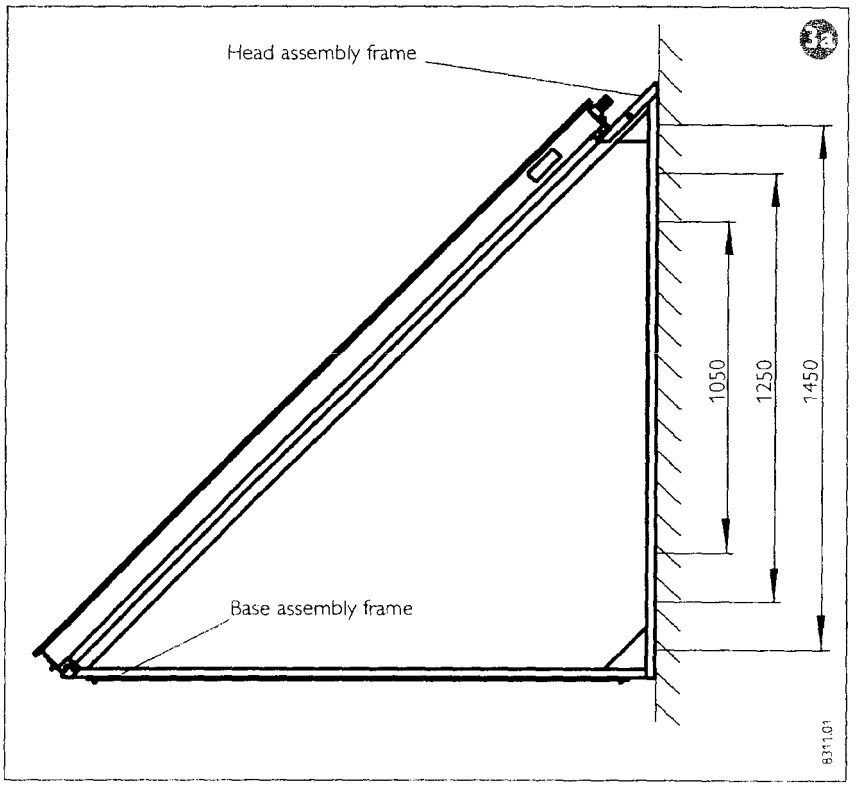
In addition, two flat roof/wall assembly kits (07 42 80) are required for mounting one collector on a wall; for more than two collectors the number of flat roof/wall assembly kits required is identical to the number of collectors.

Procedure:

- Select the fastening location, do not forget to allow for the later required pipe passage
- Screw top support, angle support and angle prop together to an angle.
- Screw the resulting angle together with the top of the head assembly frame and the bottom of the base assembly frame.
- *Onwards of mounting of two collectors the centre field is to be braced. Onwards of an assembly of 4 collectors both the end fields are to be braced. Onwards of 6 collectors struts are, in addition, to be arranged in an inside field.*
- If several flat roof assembly frames are to be assembled adjacently to each other they are to be connected by frame connection kits (see section 2.8). With a string the assembly stands are to be aligned so that the assembly frames form a straight line.
- The flat roof assembly stands are to be appropriately joined to the wall using the 6 bore holes of the cross strut.
- Have lightning protection work performed by authorised skilled personnel (see section 2.9).
- Then tighten all screws.
- ⚠ **The choice of fixing means is essentially governed by the type of wall. Take statics into account! The forces to be taken into account for one collector when dimensioning the fixing means are given in the Figure. The distance of the joining points to each other must be observed (manufacturer's recommendation).**
- Up to a 20 m mounting height:
  For anchorage in **concrete**:
  Per collector 6 M8 UPAT Multicone or M10 SM bolts, both made of stainless steel.
  For anchorage in **timber**:
  Per collector 6 wood screws, stainless steel and at least 10 x 80



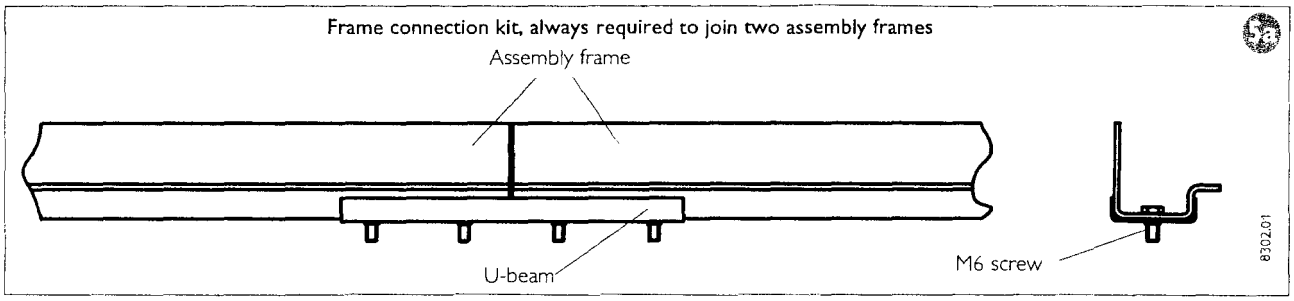




- Position the drilled corrugated sheets on the roof and refasten them.
- Position the plain washer and slightly tighten with the M16 nut on the corrugated sheet. Then spray proofing compound (silicone) into the annular gap in the building.
- Place the adapter (U-beam) (6) with the plain washer on the threaded rod (5) and tighten with the M16 nut (7) using the washer.

Fix the underlying M12 nut with a lock nut.

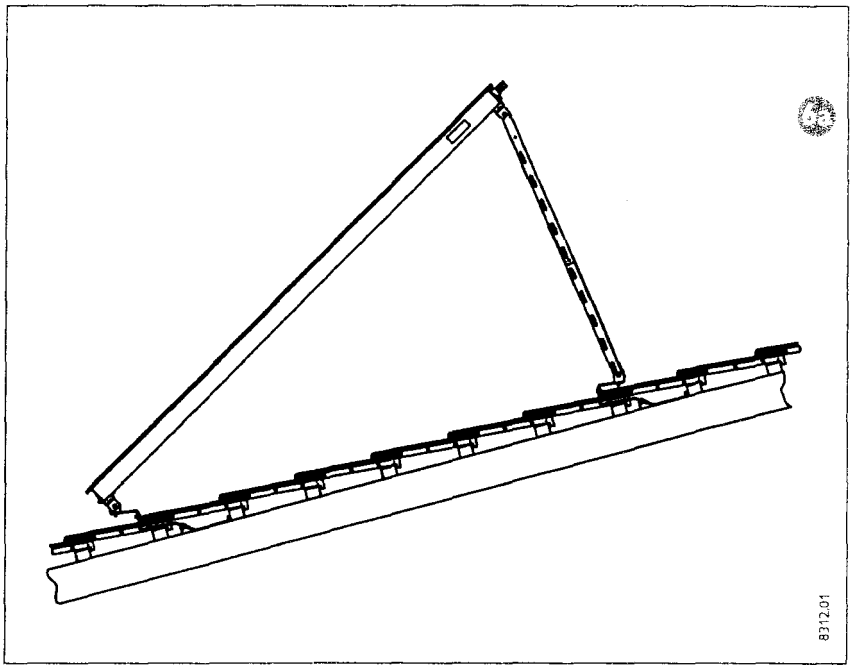
- The head assembly frame is mounted on the top adapters and the base assembly frame on the bottom adapters.
- If several assembly frames are used, connect them to each other using frame connection kits (see section 2.8).
- Have lightning protection work performed by authorised skilled personnel (see section 2.10).
- Then tighten all screws.



2.8 Frame connection kit

The connection kit is for joining several assembly frames and consists of:
- 2 U-beams
- 8 M6 screws

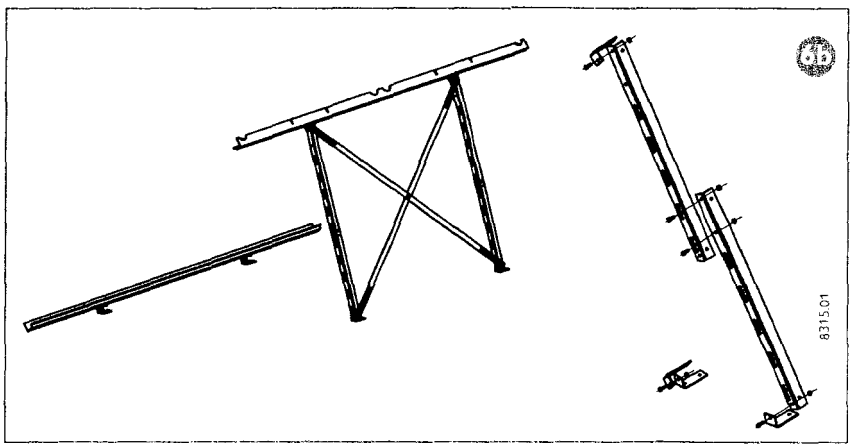
- The U-beams must be screwed to the transverse beams, as illustrated.



2.9 15°–30° slanting stand

The 15°–30° slanting stand kit serves to adapt the collector field to the optimum solar angle of incidence. One slanting kit is required per pantiled roof fastening kit and per corrugated sheet fastening kit.

Procedure:
- Erect the fastening kits as described in sections 2.3 and 2.5. The distance between the top and the bottom fastening points change with the slant angle as follows:
  15° 2080 mm
  22° 1995 mm
  30° 1864 mm
- Adjust the length of the laths of the slanting stand to the required angle. Only one lath per pivot is required for 15°.
- The centre field is to be braced when assembling two or more collectors. An assembly of 4 or more collectors requires bracing of both end fields. For 6 or more collectors additional cross struts are to be provided in an inside field.



2.10 Lightning protection

The **collector housing, the assembly frame and the pipework** must incorporated by a professional in the lightning protection measures in possibly existing lightning protection equipment.

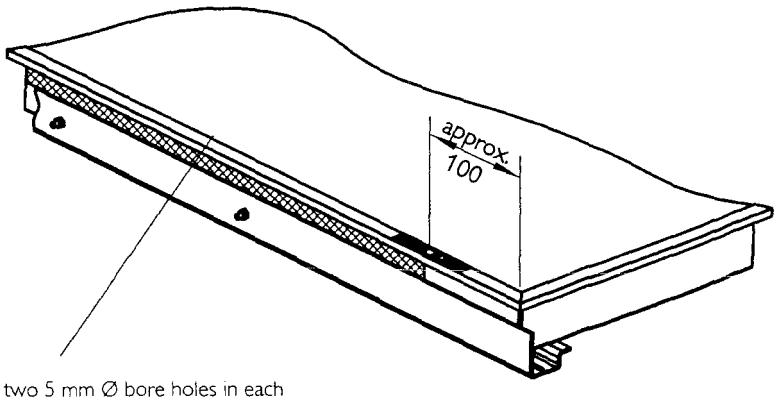
Collector housing
Spot drill the underside of every collector and incorporate it in the lightning protection equipment using screw devices. Use 2 stainless steel, 6.3 mm Ø tapping screws for every collector. Pilot-drill the bore holes with 5 mm Ø 5 bits.

Pipework
Connect the pipes closely to the collector (over the roof) using pipe clamps (take corrosion into account).

Assembly frame
Using screw or clamping joints, connect the assembly separately to the lightning protection equipment.

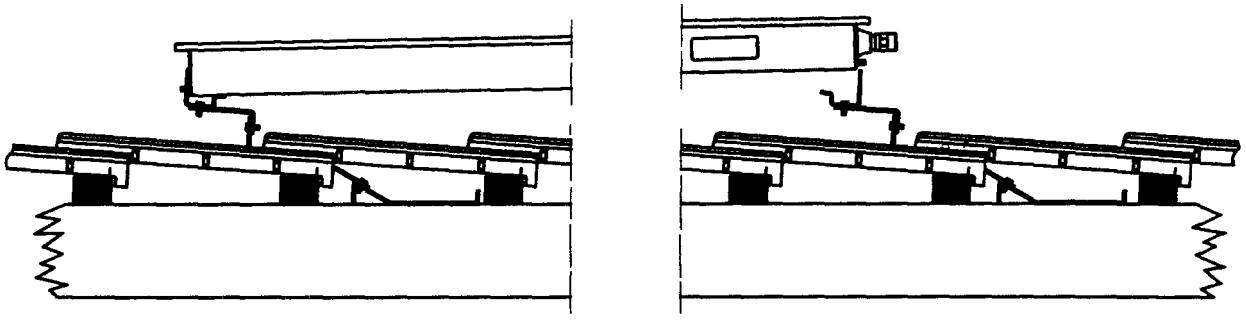
Die Vor- und Rücklaufverrohrung ist auf kurzem Wege mit dem Gebäude-Potential-ausgleich zu verbinden.

Lightning protection SOL 25 S



Drill two 5 mm Ø bore holes in each collector in the area marked with shaded lines and, using two 6.3 mm Ø stainless steel tapping screws, connect them to the lightning protection equipment.

5452.01



2.11 Positioning and connecting the collectors

Procedure:

The collector connections are on the upper side of the collector.

Transport the collectors onto the roof as described in section 2.3. Do not under any circumstances fasten the rope to the pipe ends.

Position the collector at an acute angle with the bottom set screws in the bore holes of the base assembly frame. Position the collector in the top set screws in the slots of the head assembly frame. If necessary, slightly slacken the head assembly frame and push it directly up to the collector.

Screw down the collector with M6 nuts and washers. Re-tighten head assembly frame.

The collector pipe elbow is for connecting the collectors. This elbow is included with each on-roof assembly frame for two collectors (07 42 75) and frame connection kit (07 42 81). The application of the thermal insulation (to be provided by the customer) follows installation of the pipe elbow. Slit the insulation laterally as required and bond the slit upon assembly completion.

Seal and mount the collector submersible bushing at the collector exit of the collector field.

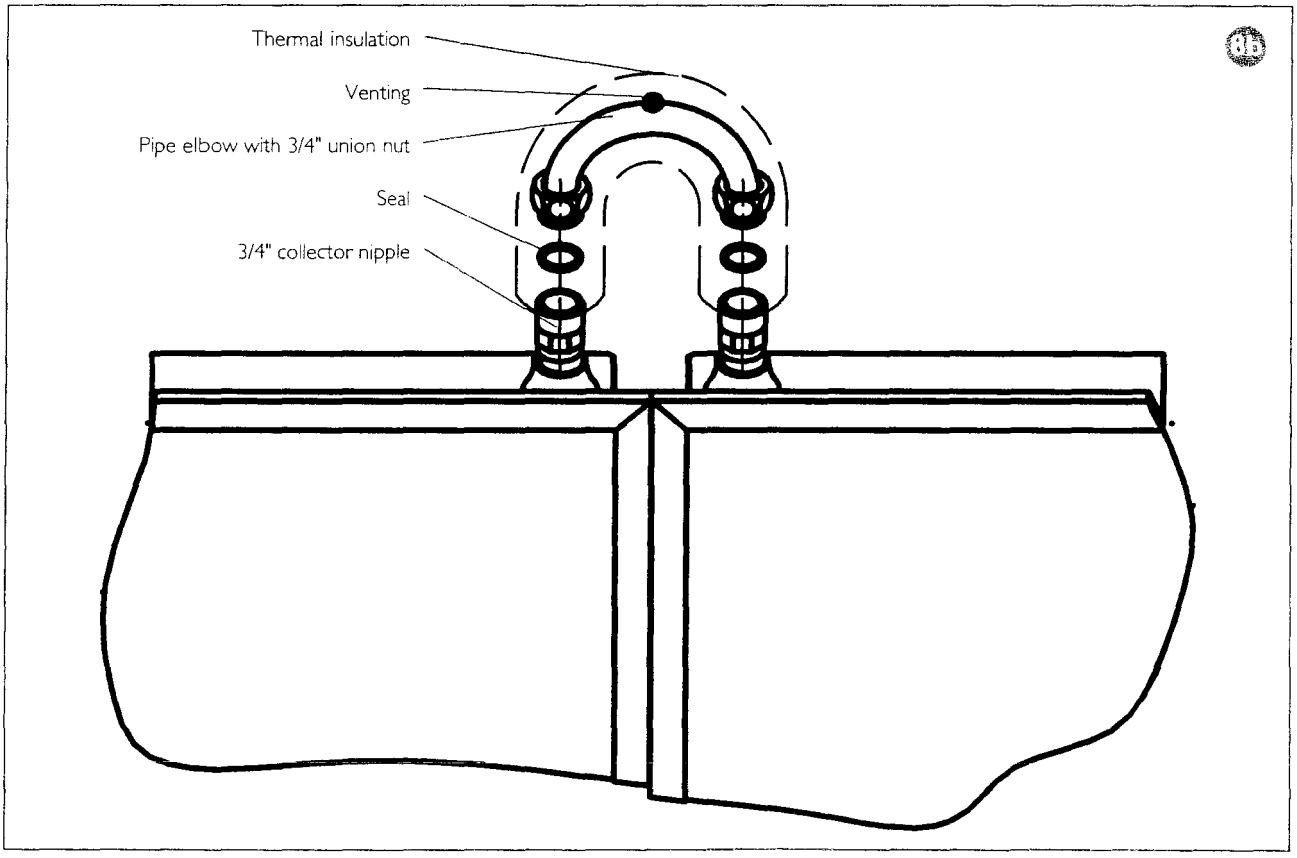
Apply thermal conduction paste to the collector sensor and push it into the small sensor tube up to the stop.

It is impermissible to turn or re-align the installed connections in any way.

Have lightning protection work performed by authorised skilled personnel (see section 2.10).

The roof passages can now be mounted at the free male thread of the R ¾ transition or the collector submersible bushing.

Fill the solar equipment immediately after its installation with H -30 L or H -30 LS as described in section 2.12 and start operating it upon completing the pressure test (see section 2.13).



2.12 Filling up the heat transfer medium circuit

⚠ It is especially important to wear protective gloves and goggles when working with H -30 L or H -30 LS.
Do not fill up the installation when there is great insolation; this can lead to steam condensation in the collector.

Fill up with the heat-transfer medium after completing the pipe installation, connecting the collectors and filling of the storage tank.

The Stiebel Eltron solar installation may be filled only with the H -30 L or the H -30 LS heat transfer medium. The medium in the canisters is ready for immediate use and does not require further treatment.

⚠ It is not permissible to add water or other heat-transfer mediums, since the required characteristics and corrosion-protection would no longer be ensured. Therefore, the installation may also not be topped up with water.

Slowly fill the heat-transfer medium circuit while the air bleed cocks are open to enable the air to escape. The heat-transfer fluid H -30 L or H-30 LS is filled using a press pump connected to the filler neck of the SOKI. Close the installation when the fluid discharged at the air bleed cock is free of air bubbles and fill the cold installation (below 30 °C) at 3.5 bar.

⚠ **The discharge of the safety valve must discharge into a container able to hold the total contents of the installation.** The empty heat-transfer medium canister suffices for smaller installations.

⚠ **The used heat-transfer fluid H -30 L must be taken to an appropriate waste disposal unit.**

2.13 Pressure test

The installation must be subjected to the pressure test after completion of the pipework assembly and connection of the collectors.

⚠ **The pressure test is to be performed with the H -30 L or H -30 LS heat-transfer fluid.**

The test pressure is 7.8 bar (1.3 times the permissible operating pressure). Connect the pump to the SOKI filler neck prior to having removed the safety valve and closed the connection.

⚠ **Remount the safety valve properly after completing the pressure test.**

Do not apply the thermal insulation until after the leak test.

2.14 Start-up

Tighten all screw connections prior to start-up.

Starting up the installation is permissible only if it is filled with the genuine H -30 L or H -30 LS heat-transfer medium.

⚠ **The minimum filling pressure for a cold installation (below 30 °C) is 3.5 bar.**

First of all set the operating mode selector switch of the electronic control to "1". This enables checking the proper pumping action at the running noise. Then set the operating mode selector switch to "Auto".

2.15 Maintenance

Once a year authorised skilled personnel must **check the solar equipment** for its perfect function, including the control, safety devices and storage system.
Installation components subjected to atmospheric corrosion are also to be checked for their proper function (fastenings, thermal insulation, dirt contamination, etc.).

Once a year authorised skilled personnel must check the pH value (>7) and frost-resistance (-30 °C) of the heat-transfer fluid and, if necessary, replace it with H -30 L or H -30 LS using the filler neck of the SOKI.

⚠ **Do not fill up the installation when there is great insolation; this can lead to steam condensation in the collector.**

STIEBEL ELTRON

Customer Service Request

Please fill in completely and post to us in an envelope

Sender (block capitals)

Name _____

Street, number _____

Postal code, city _____

You will find these details on the appliance's type plate.

Type: **SOL 25 S**

No.

07 42 72– ☐☐☐☐ – ☐☐☐☐☐☐

Manufacture no / Factory no.

Installed by:

_____

_____

What is the problem?

_____

_____

_____

_____

STIEBEL ELTRON

Guarantee Certificate

Sold on: _____

No. 07 42 72– ☐☐☐☐ – ☐☐☐☐☐☐

Manufacture no. / Factory no.

Guarantee Certificate:

SOL 25 S

Stamp and signature of authorised dealer

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CAP 171973/3310/2/7644 · HD · These instructions are subject to alteration notice!

5. Check List

On the Start-Up of Solar Installations Provided with SOL 25 S Flat Collectors

Caution: It is mandatory to perform the work in compliance with the "Safety Regulations for Work on and Involving Roofs" and the instructions "Safety and Rescue Harnesses" published by the trade association. These assembly and operating instructions and the assembly and operating instructions for the control of the SOKI and the storage system are to be complied with during the assembly work.

Installation operator: _____ Name
_____ Street
_____ Place

Fitting company: _____ Name
_____ Street
_____ Place

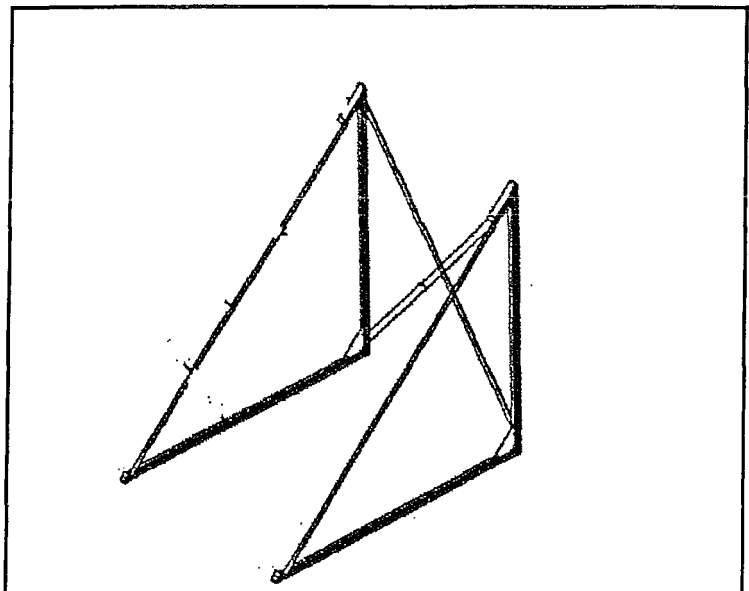
		Yes	No
1	**Solar circuit**		
1.01	Are the flat collectors built in the stand in their proper position and secured free of play with the top and the bottom screws (section 2.11)?	☐	☐
1.02	Has the installation of the pipework between the collectors and the SOKI been performed in accordance with the Stiebel Eltron installation example (section 2.2)?	☐	☐
1.03	Has the pipework been hard-soldered with the solders CP105 or CP203 without flux?	☐	☐
1.04	Have the safety valve (6 bar) and the vent been installed in accordance with the installation example?	☐	☐
1.05	Was the pressure test performed with H -30 L or H -30 LS at 7.8 bar?	☐	☐
1.06	Is the circuit of the heat-transfer medium filled and vented using only the H -30 L or H -30 LS heat-transfer medium (filling pressure: 3.5 bar; section 2.12)?	☐	☐
1.07	Is a collecting pan for the H -30 L or H -30 LS heat-transfer medium installed at the safety valve (section 2.13)?	☐	☐
1.08	Are the shut-off valves open, and is the non-return valve activated (SOKI assembly instructions)?	☐	☐
1.09	Is the collector temperature sensor mounted at the specified position and electrically connected?	☐	☐
1.10	Has the electrical wiring been performed in accordance with the Stiebel Eltron wiring diagram (SOM 6K, SOM 7/2 and SOM 6/3 D assembly instructions)?	☐	☐
1.11	Is the solar control set according to the assembly and operating instructions?	☐	☐
1.12	Has the test run of the circulation pump been performed – Noise? – Thermal transport during insolation?	☐	☐
2	**Hot water circuit**		
2.01	Has the solar storage system been installed to the water mains in accordance with the Stiebel Eltron installation example and the appropriate regulations?	☐	☐
2.02	Has the temperature sensor in the solar storage system been mounted and electrically connected in accordance with the Stiebel Eltron installation example?	☐	☐
2.03	Have exclusively Stiebel Eltron Group appliances been used and properly installed for re-heating? If not, specify which: _____	☐	☐
2.04	Is the SOKI connected to the existing potential equalisation line?	☐	☐
2.05	Was the lightning protection equipment connected by authorised skilled personnel according to section 2.10?	☐	☐

_____
Place/date

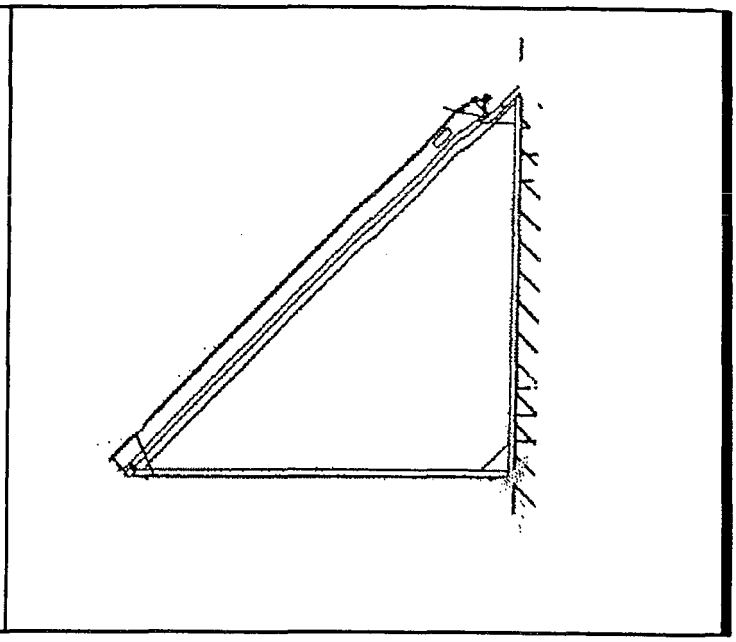
_____
Inspected by
(Company, name)

45⁰ Collector rack
vertical + horizontal available

Roof or ground mount



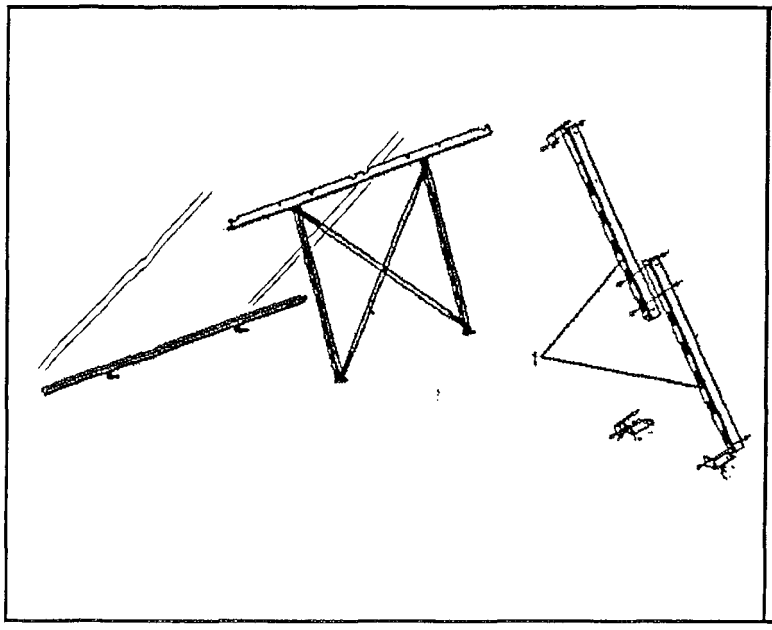
Wall mount

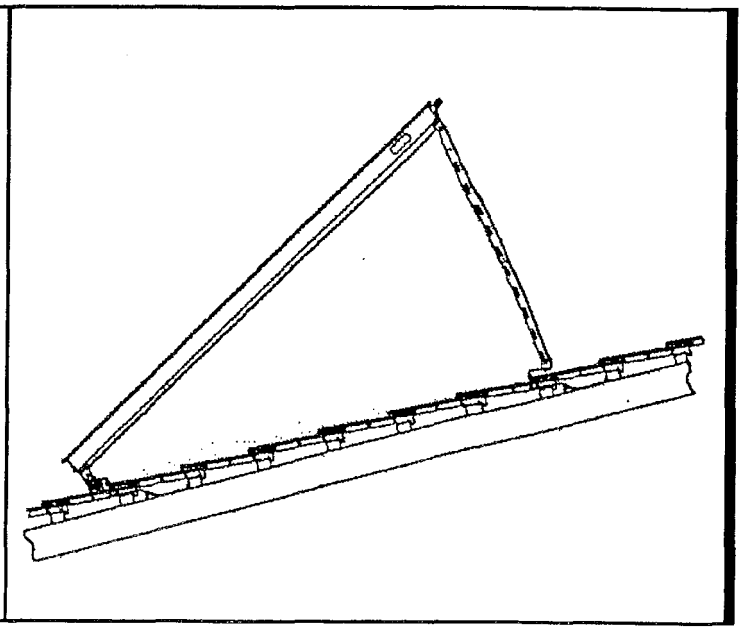


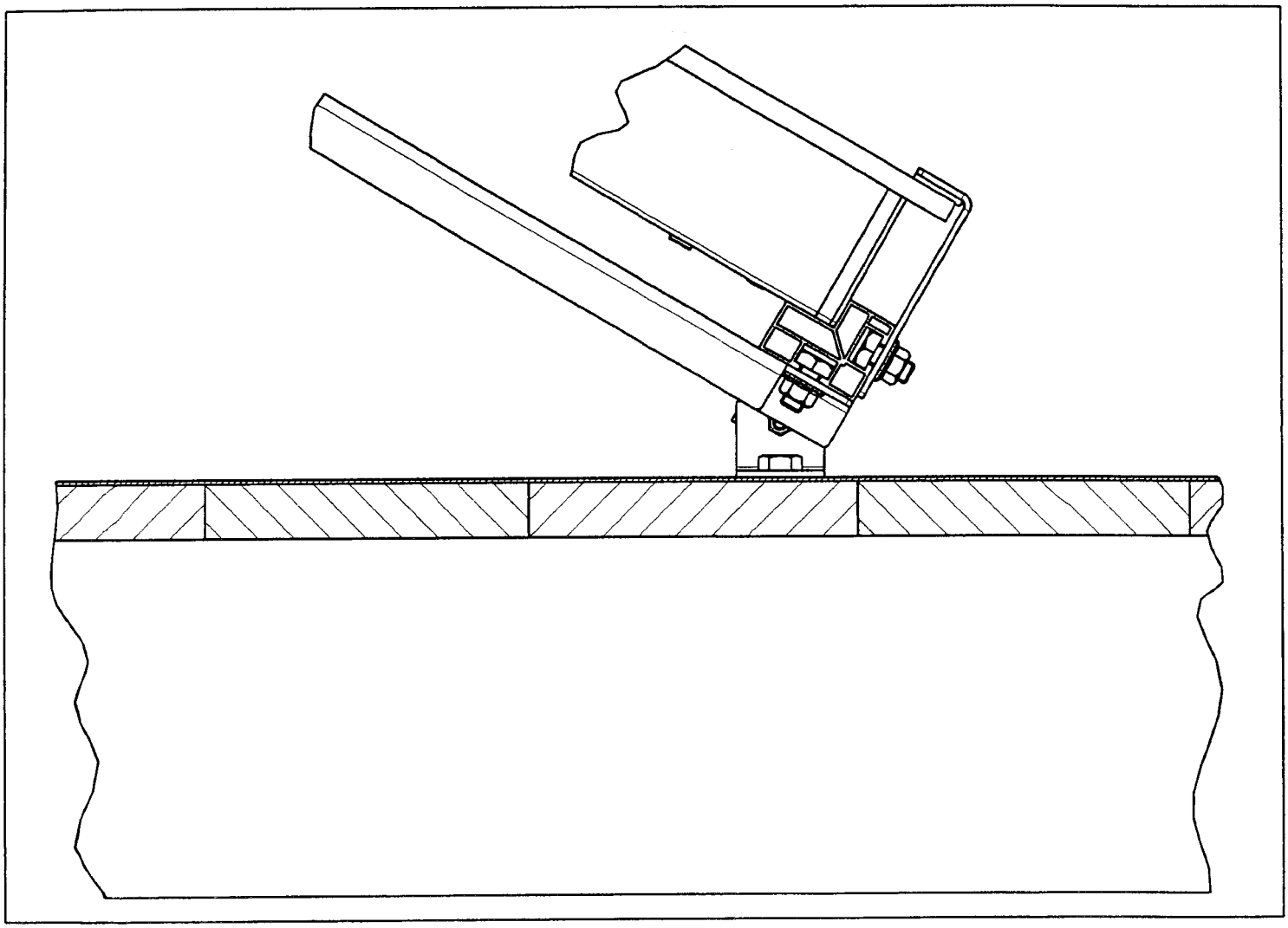
Two 45⁰ Kits
For vertical part # 185543BFS (Two for 1 or 2 collectors, 3 for 3, 4 for 4)
For horizontal part # 074324BFW (2 per collector)

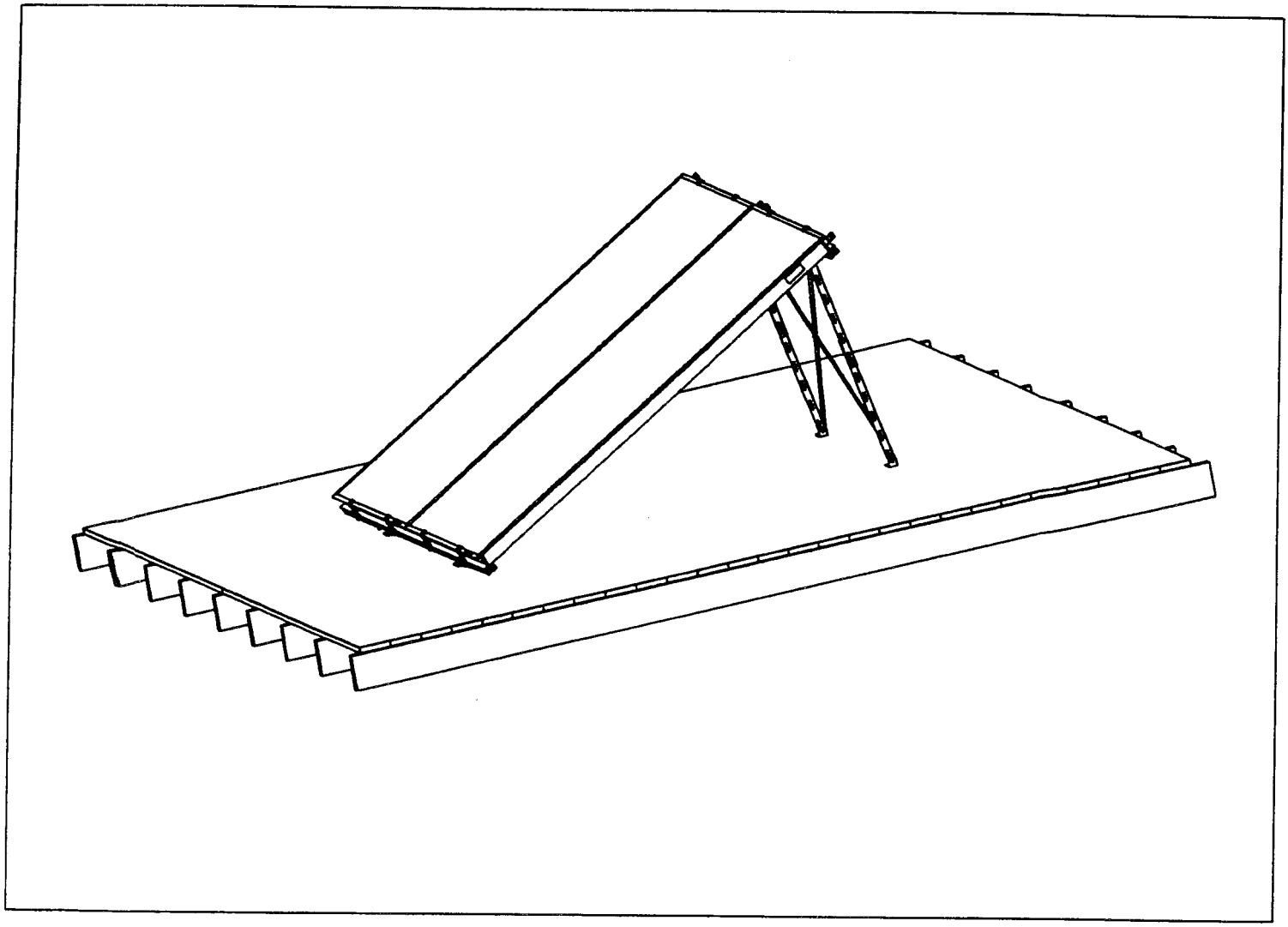
Tilt collector rack
10° to 300°
Vertical or horizontal

Horizontal -> 2 per collector
Vertical -> Two kits for 2, 3 for 3, and 4 for 4









Lag Bolt Mounting

When the attic is completely inaccessible, collectors or the mounting racks can be lag bolted directly to the roof from outside.

Lags must be fastened to rafters or trusses rather than to sheathing so wind cannot pull them free.

CAUTION!

Rafters or trusses can be located by tapping the roof with a hammer. The more solid sound indicates a framing member. Rafters or trusses generally will be on 16" or 24" centers (Figure 2.10).

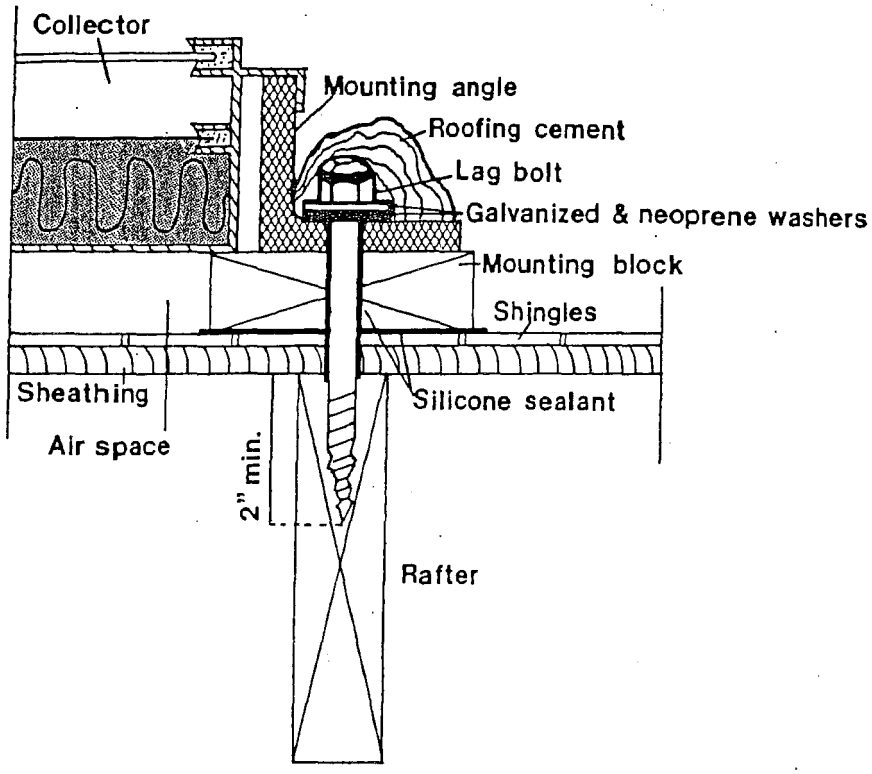


FIGURE 2.10: LAG BOLT MOUNTING

Drill holes through the roof several sizes smaller than the bolt to assure a tight fit. The lag bolt should penetrate the rafters at least two inches. Insert the lag bolt through a metal washer and then through a neoprene washer before going through the collector flange and mounting block. Be sure to apply a liberal quantity of sealant to the holes and between mounting blocks, washers, and the roof surface before tightening down lag bolts. After mounting, apply more sealant over the entire assembly.

GROUND MOUNTINGS

If there is too little roof space or the roof faces the wrong direction, collectors can be ground-mounted. Ground mounts make installation easier by eliminating roof work, simplifying maintenance, and in most cases, shortening the run from collectors to storage.

Zoning

Before starting construction of a ground-mounted collector array, check local zoning ordinances. The ground-mounted unit will have to conform with local requirements for setback, density, classification of structure (will it be considered a new building?) and aesthetic requirements. Aesthetics are particularly important in some localities, which may even require that the supporting framework be enclosed and finished off to resemble the house.

Footings

Collectors are mounted on a rack or frame that must be securely attached to footings extending below the local frost line. There should be at least four pier footings, 8" x 8" square or in diameter. Footing holes should be dug below the frost line and the bottoms filled with an inch or two of dry, washed pebbles. The footings should be poured with a frame member or a threaded rod protruding from the concrete (Figure 2.17).

If the frame is embedded, make a temporary jig so that the rack holds shape while the concrete sets. If the frame member is wood, it must be treated to slow deterioration. If you are using a threaded rod, it must be at least ⅜-inch in diameter. Instead of pouring four footings, you might want to pour two parallel walls (Figure 2.18).

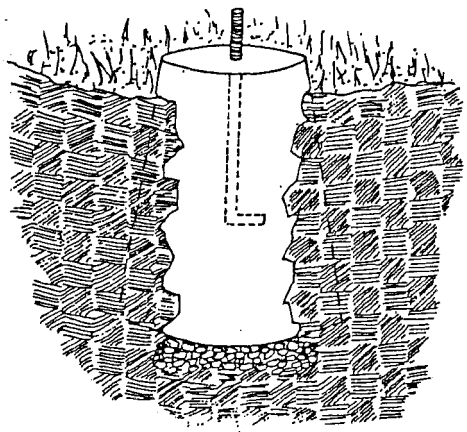


FIGURE 2.17: PIER FOOTING

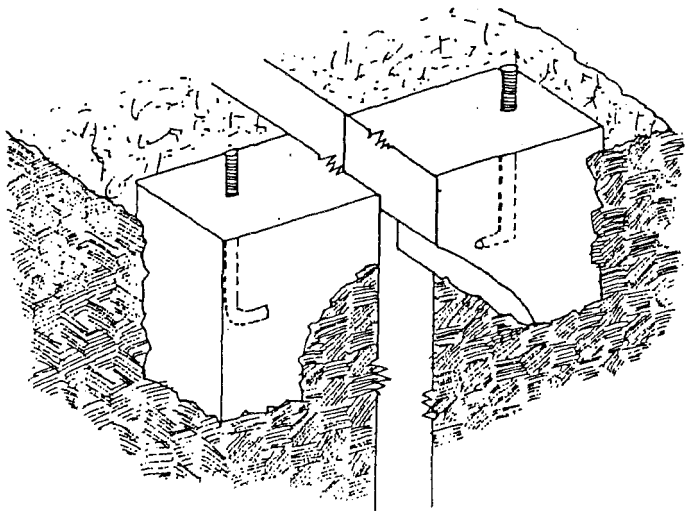


FIGURE 2.18: WALL FOOTING