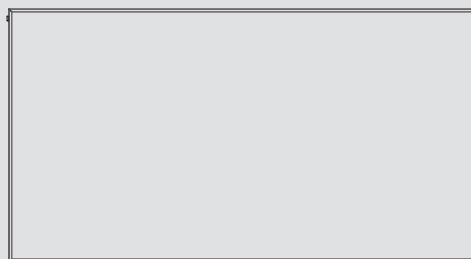
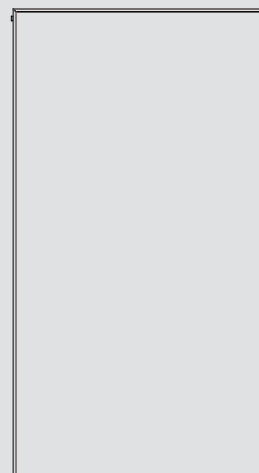


OPERATION AND INSTALLATION

HIGH PERFORMANCE FLAT-PLATE COLLECTOR

- » SOL 27 PREMIUM S
- » SOL 27 PREMIUM W



STIEBEL ELTRON

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

Table of Contents

- 1 Safety instructions
- 2 Collector basics
- 3 Assembly instructions
 - 3.1 Important information
- 4 Installation instructions
 - 4.1 Planning & installation
- 5 Mounting
 - 5.1 General mounting system information
- 6 System Startup
 - 6.1 Pressure & Leak Test
 - 6.2 Setting the Expansion Tank Pre-charge Pressure
 - 6.3 Final Chargin & Venting
- 7 Mainenance & care
- 8 Warranty
- Appendix
 - A Certifications



CAUTION: READ ALL INSTRUCTIONS BEFORE INSTALLING THESE COLLECTORS. ADDITIONAL ITEMS WILL BE NEEDED TO MOUNT THIS ASSEMBLY.

1 Safety Instructions

General Information

Read this entire manual. Failure to follow all the guides, instructions and rules could cause personal injury or property damage. Improper installation, adjustment, alteration, service and use of this unit can result in serious injury. This unit must be installed by a professional installer. The installation must comply with all national, state and local plumbing and electric codes. Proper installation is the

responsibility of the installer. Failure to comply with the installation and operating instructions or improper use voids the warranty. Save these instructions for future reference. Installers should leave these instructions with the consumer. If you have any questions regarding the installation, use or operation of this product, or need any additional manuals, please call our technical service line at 800.582.8423.

Safety Instructions



COLLECTOR WARNING: A SOLAR COLLECTOR GENERATED HEAT FROM SUNLIGHT. THIS LEADS TO THE COLLECTORS AND THEIR CONNECTORS GETTING VERY HOT, EVEN WHEN THEY ARE NOT FILLED. COVER THE COLLECTORS WITH OPAQUE MATERIAL UNTIL THE INSTALLATION HAS BEEN COMPLETED.



SAFETY VALVE WARNING: NEVER INSTALL ANY VALVES OR SHUT-OFF DEVICES IN THE PIPING BETWEEN THE COLLECTORS AND THE SAFETY VALVE. THE SAFETY VALVE IS ACTIVATED AT 87 PSI.

NEVER SET THE SOLAR LOOP PRESSURE GREATER THAN THE DHW WATER SUPPLY PRESSURE. IF THE POTABLE WATER PRESSURE IS TOO LOW, A BOOSTER PUMP MAY BE NEEDED TO ASSURE THAT IT EXCEEDS THE REQUIRED SOLAR LOOP PRESSURE.

The solar system must not bypass auxiliary system safety devices.

Check Valve

The Flowstar pump station is equipped with two check valves to prevent heat loss from single pipe thermo-siphoning between the storage tanks and the solar loop and collectors.

Drain Valve

Install a drain valve at the lowest point of the system.

Expansion Tanks

The diaphragm-type expansion tanks are designed for an operating pressure of 87 psi and are resistant to deterioration from propylene glycol mixtures.

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

The air-side inlet pressure should be set to 5-7 psi less than the system start-up (cold) pressure; check it when the system has not been filled or when the wet side of the expansion tank is open to the atmosphere.



WARNING: SETTING THE MAXIMUM TANK TEMPERATURE HIGHER THAN 140°F AT THE CONTROL UNIT IS PERMISSABLE ONLY WITH A THERMOSTATICALLY-CONTROLLED DHW MIXING VALVE. OTHERWISE THERE CAN BE A RISK OF SCALDING AT THE DRAWOFF POINT.



IMPORTANT: ALL SENSOR WIRING SHOULD BE RATED FOR EXPECTED TEMPERATURES AND MUST BE PROTECTED FROM DEGRADATION AND ELECTRICAL INTERFERENCE. FOR MORE INFORMATION, CONSULT THE USER MANUAL FOR THE CONTROLLER.

Solar Loop

Use only a mixture of 50% food-grade Propylene Glycol and de-ionized water in the solar loop.



WARNING: FLUID MAY BE DISCHARGED AT HIGH TEMPERATURE AND/OR PRESSURE.

NO OTHER FLUID SHALL BE USED THAT WOULD CHANGE THE ORIGINAL CLASSIFICATION OF THE SYSTEM. UNAUTHORIZED ALTERATIONS TO THIS SYSTEM COULD RESULT IN A HAZARDOUS CONDITION, AND COULD VOID THE MANUFACTURER'S WARRANTY.

Shut-down

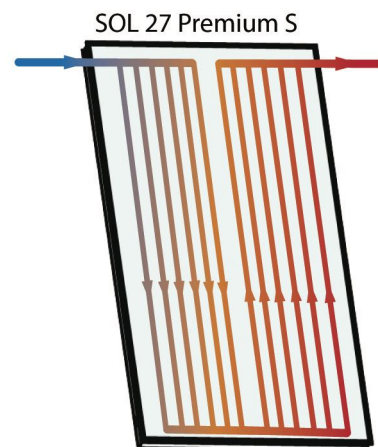
Except for repair and/or emergency, the control unit and the pump must remain powered and activated in order to avoid overheating the collectors. Prior to shutting down the system for repairs, cover the solar collectors or work at night.

If emergency shut-down is needed, unplug the control unit and call for service.

2 Collector Basics

The SOL 27 Premium is a highly efficient solar thermal collector. The net absorber surface of over 25 ft² helps result in a maximum output of 31,300 BTU/day per panel (SRCC clear day rating). The SOL 27 Premium also offers features such as a highly selective absorber coating, low-iron, tempered solar glazing, and very effective insulation around the absorber plate. The internal fluid tubes are copper and the absorber plate is aluminum.

The internal fluid tubes are organized in a "harp style" configuration. This consists of two headers. The top header is split in the middle, resulting in half of the tubes directing flow downward, and half directing flow upward.



The collector converts sunlight into heat. Light penetrates the glass cover, which is pre-stressed, highly transparent

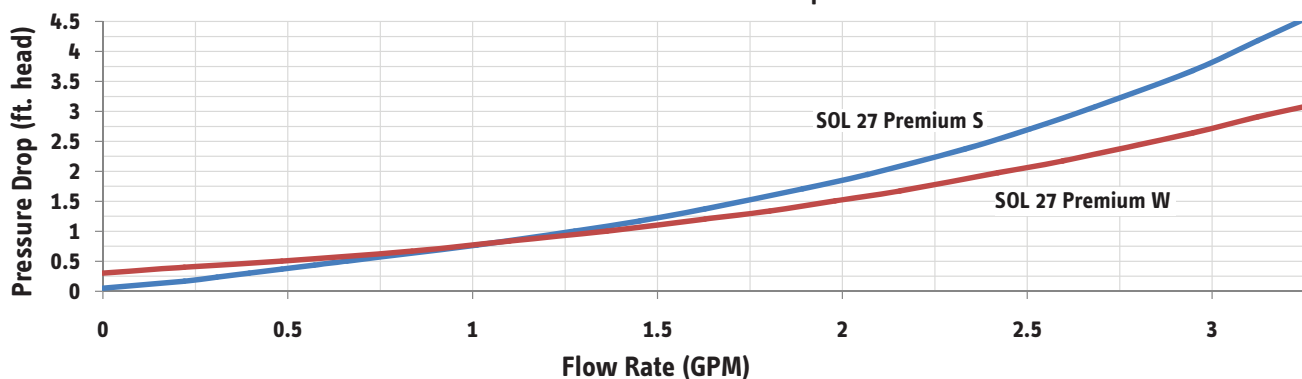
INSTALLATION INSTRUCTIONS**SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017**

single pane safety glass. As the light strikes the absorber plate, it is converted to heat. The highly selective vacuum coating of the absorber and the thermal insulation on the back of the absorber keep heat loss to the environment to a minimum.

The thermal energy produced by the collector is transported by the heat transfer medium (solar loop fluid), via a circulating pump, to the storage tank(s). The inside of the collector can fog up under certain operating conditions (e.g., large tank with low temperature compared to the outdoor temperature and/or high relative humidity). Vent holes are provided in the collectors for venting humidity and equalizing air pressure.

Technical Data & Specifications

Type	SOL 27 Premium S	SOL 27 Premium W
Item Number	230016	230017
Type	Standard / Vertical	Wide / Horizontal
Height	85.5" / 2171 mm	46.1" / 1171 mm
Width	46.1" / 1171 mm	85.5" / 2171 mm
Depth	3.8" / 96 mm	3.8" / 96 mm
Weight	88.2 lb / 40 kg	89.3 lb / 40.5 kg
Casing material	Aluminum, corrosion resistant	
Glass cover	ESG	
Glass thickness	0.125" / 3.2 mm	
Thermal insulation thickness	2" / 50 mm	
Thermal insulation material	Mineral wool, low outgassing, WLG 040	
Collector connection	22 mm plug-in connector	
Max. idle temperature	<410°F / 210°C	
Min. operating pressure	50.75 psi / 0.35 MPa	
Max. permissible pressure	87 psi / 0.6 MPa	
Pressure drop @ 1 gpm	0.75 ft. head	
Test pressure	247 psi / 1.7 MPa	
Test medium	40% Propylene Glycol	
Fluid capacity	0.4 gal / 1.5 l	0.48 gal / 1.83 l
Nominal flow rate	0.25 - 3.75 gpm	
Angle of inclination	10 - 90°	
Total area	27.34 ft² / 2.54 m²	
Aperture area	25.73 ft² / 2.39 m²	
Absorber area	25.62 ft² / 2.38 m²	
Absorber material	Aluminum, highly selective coating, copper pipes, laser welded	
Gasket	EPDM	
Conversion factor η_0	0.82	0.83
Effective heat transfer coef. a1	3.46 W / (m²K)	
Effective heat transfer coef. a2	0.0153 W / m²K²	
Absorption level α	95% \pm 2%	
Emission level ϵ	5% \pm 1%	
Collector yield	>525 kWh / (m²) per year	

SOL 27 Premium S & W Pressure Drop Curves

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

3 Assembly instructions

3.1 Important Information



WARNING: RISK OF SCALDING. TO PREVENT THE SOLAR FLUID FROM BOILING IN THE COLLECTORS, THE SYSTEM SHOULD NOT BE FLUSHED OR FILLED DURING PERIODS OF STRONG SUNSHINE.

System Pressure

Regularly check the pressure gauge of the heat transfer circuit at the pump station. The pressure should range between 30-70 psi during all operating times. If the system is above or below this pressure, troubleshooting may be required.

After-heating Backup

The backup heater should be of adequate capacity to provide sufficient hot water. The backup water heater must be certified, listed, and labeled by an accredited safety certification organization.

Expansion Tank

An expansion tank must be included in the solar loop, and is typically connected via the dedicated expansion tank connection on the pump station. The expansion tank should be sized according to standard design practices. More information about expansion tank sizing can be accessed via the expansion tank users manual.



IMPORTANT: TO PROTECT THE SYSTEM AGAINST FROST AND CORROSION, FILL THE SOLAR SYSTEM EXCLUSIVELY WITH THE RECOMMENDED PROPYLENE GLYCOL MIXTURE.

4 Installation Instructions

4.1 Planning and Installation

Pipework Installation

Use copper or stainless steel pipes or corrugated stainless steel hoses for the supply and return lines. Pipe diameter is depended on length of run and expected flow rates.

Recinnebbed pipe diameter for systems of up to eight collectors is $\frac{3}{4}$ ". If the pipe run is longer than 60 feet, a larger pipe diameter may be needed.

Vent tiles are recommended for pipe run penetrations into the roof. On flat roofs and roofs with shallow pitches, passing the pipes through an external wall is recommended to avoid water leaks. Pipe hangers must provide correct support and pitch and must meet building codes. Hangers must not comporess insulation and should allow for thermal contraction and expansion of the pipework. Installers must comply with all Local, State and National Codes.

We recommend trimming pipes with pipe cutters to avoid creating metal filings. Electrically ground the pipework in accordance with electrical codes. Connect all pipework to the building's ground over the shortest possible distance.

Soldered Pipe

Soldered pipe must be hard-soldered using 95/5 lead-free solder.

Alternative Piping

Piping made with locking ring fittings, press fittings, and corrugated hoses must be sealed using suitable sealants. Seals must be resistant to propylene glycol and temperatures up to 356°F.

Rated Volumetric Flow Rate

The rated volumetric flow rate for a collector array (max. 5 collectors) is 0.25 - 1.25 gpm, but it is recommended to be 0.75 gpm. The flow rate for every additional collector array, so in a system of 3 x 3 collectors, the flow rate would be 2.25 - 11.25 gpm, but Stiebel Eltron would recommend 6.75 gpm.

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

Thermal Insulation

All exterior piping also requires UV and moisture protection. Insulation must be resistant to temperatures up to 356°F. Use the following recommended temperature and UV-resistant thermal insulation to insulate the external pipework:

- » Polyisocyanurate, PVC cover
- » Armaflex®
- » Mineral wool backed by aluminum mesh foil
- » Flexible EPDM hose

A rigid aluminum sheath is recommended as protection for the mineral wool. The EPDM hose can be finished with UV-resistant paint. Where required, protect the thermal insulation against bird or rodent attack. Insulate all lines of the solar loop. Apply the thermal insulation after pressure testing and checking the system for leaks.

Extremely cold climates that experience nighttime winter temperatures below -30°F may need thicker pipe insulation to prevent pipe freeze-ups or slushing of the antifreeze mixture.

Minimum Insulation Thickness

Diameter of Pipe	Minimum thickness of insulation layer
Less than 3/4"	3/4"
3/4" to 1 1/4"	1"
1 1/4" to 4"	Identical to pipe diameter
Greater than 4"	4"

Collector Temperature Sensor

The collector sensor is immersed into the outlet pipe of the collector array (i.e., positioned at the hot side). Secure the lead to the outside of the insulation (to avoid melting under high temperature operation) and under a protective cover.

Cover the outlet pipe and the roof outlet with thermal insulation, which must be tightly sealed and must be temperature and UV resistant.

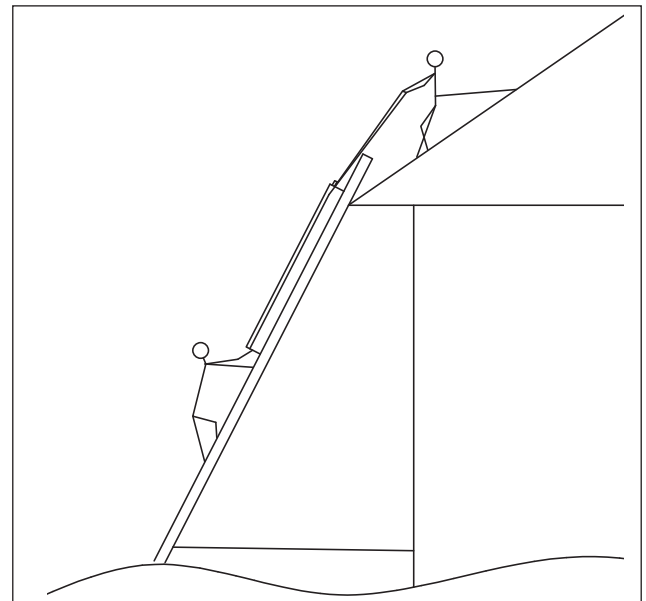
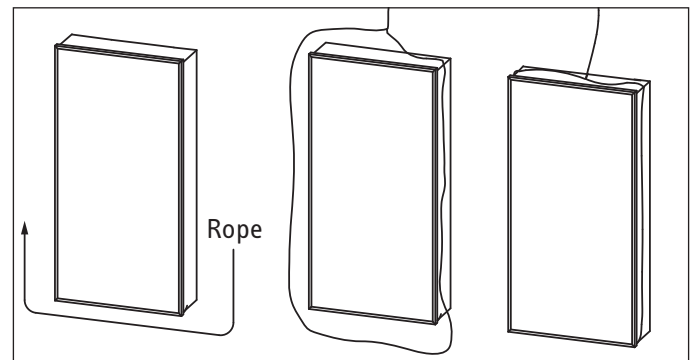
4.2 Lifting onto the Roof



WARNING: TO PREVENT DAMAGE TO THE COLLECTOR, NEVER TOUCH THE GLASS PANE. IF THE GLASS SURFACE BECOMES DIRTY, CLEAN THE COLLECTOR SURFACE WITH A CLOTH.

Using a Rope

You can pull the collector onto the roof over a ladder. To do this, place a rope around the collector frame. Never secure the rope to the collector connections.



Using SOL 27 Premium Handles

1. Using the star-shaped knobs, screw both fixing screws

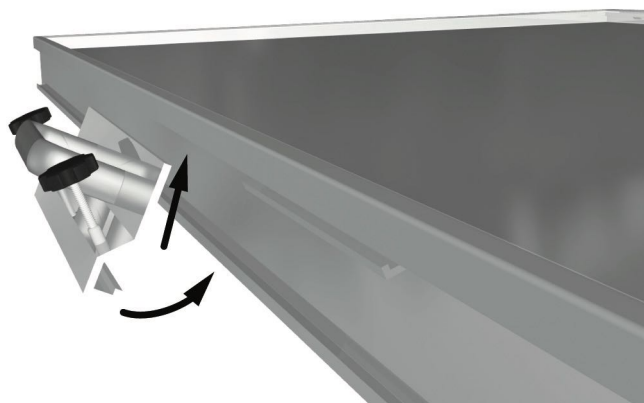
INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

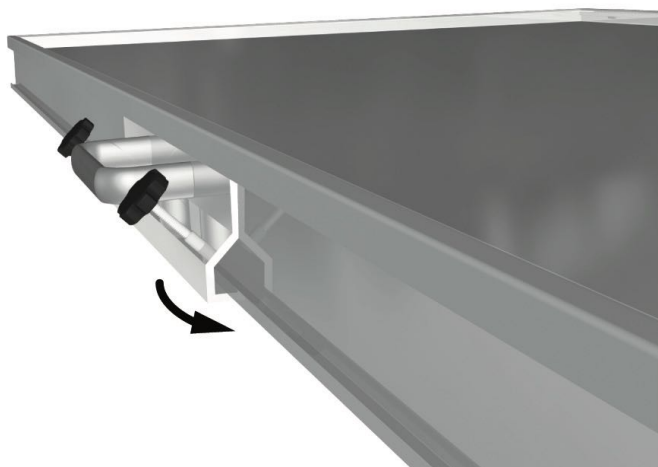
in or out until they are seated flush with the rivet nuts.

2. Position the grip on the collector so that it engages around the foot of the collector at the bottom.

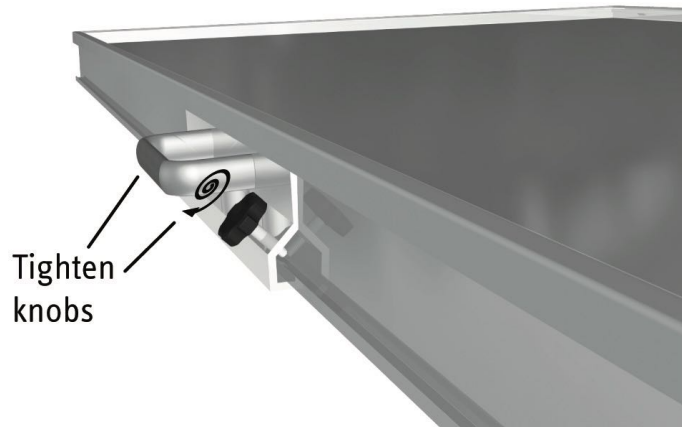
3. Slide the grip upwards.



4. Make sure it is seated in the groove of the collector trim at the top and in the bottom groove of the collector.

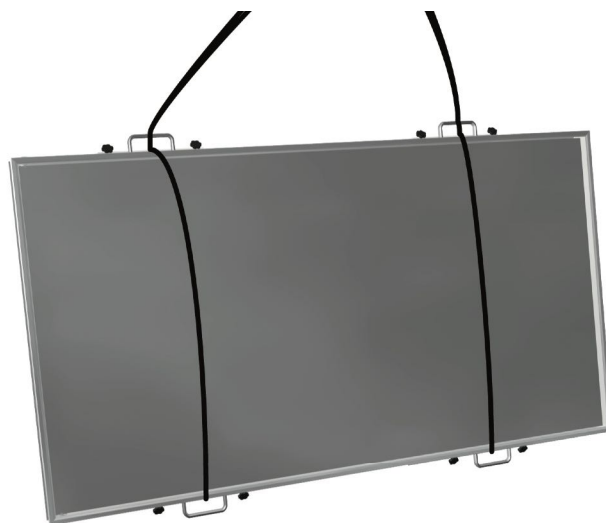


5. When the grip is positioned correctly, tighten the fixing screws.



6. Attach the remaining grips on in the same manner.

7. Thread a rope through the handles as shown below. This ensures that the handles are not subjected directly to the load of the collector. Stiebel Eltron accepts no responsibility for the improper use of the handles.



4.3 Collector Mounting

After determining the appropriate mounting hardware, install the mounting system in accordance with the instructions in its specific installation manual.

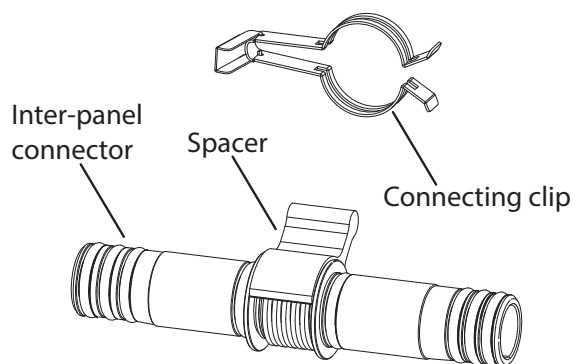
INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

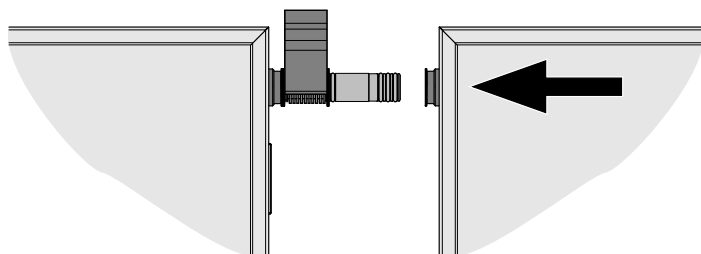
4.4 Collector Connections

Inter-panel Connection

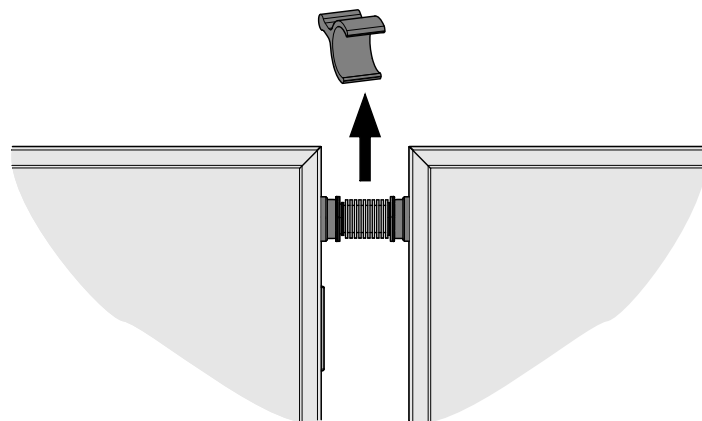
WARNING: THE SPACER SHOULD NOT BE REMOVED UNTIL THE COLLECTORS HAVE BEEN LINKED TO ONE ANOTHER. IF THE SPACER IS REMOVED BEFOREHAND, THE CONNECTOR MAY BE DAMAGED WHEN THE SECOND COLLECTOR IS PUSHED INTO PLACE.



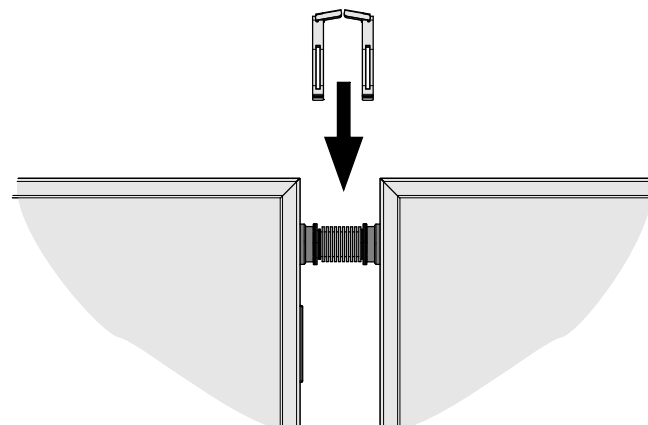
1. Insert the plug-in connection into the collector connection.
2. Push the adjacent collector into place in such a way that its collector connection is pushed onto the inter-panel connector.



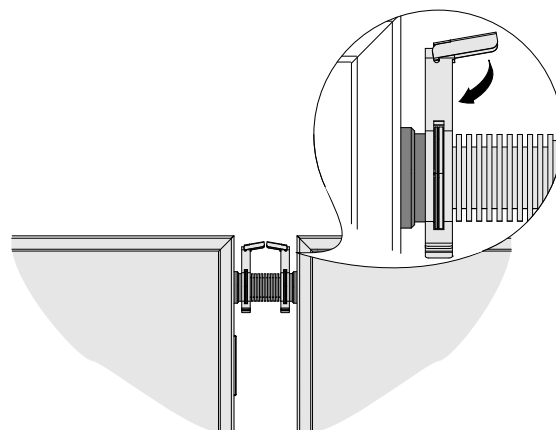
3. Remove the spacer.



4. Fit the connecting clips at the junction between the collector connection and the inter-panel connector.



5. Secure the connecting clips by pushing down the tab.



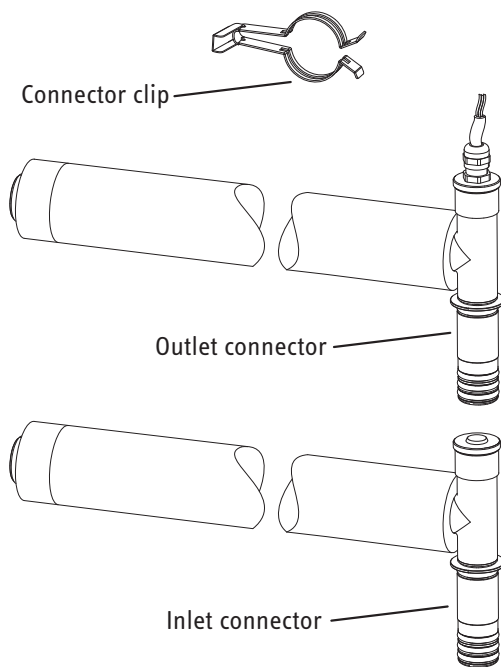
INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

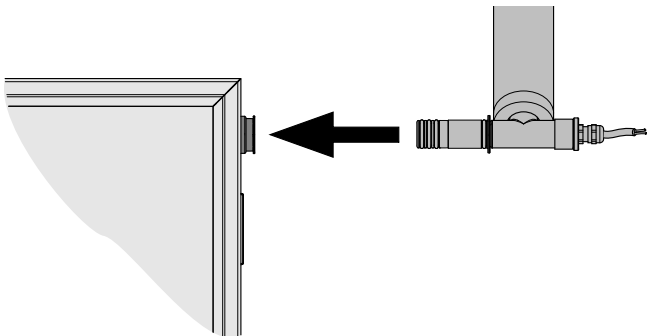
6. Insulate the connection using the provided thermal insulation.

Inlet & Outlet Connection

The inlets & outlets are plug-in style connections identical to the inter-panel connections. The installation method is the same as the inter-panel connection.

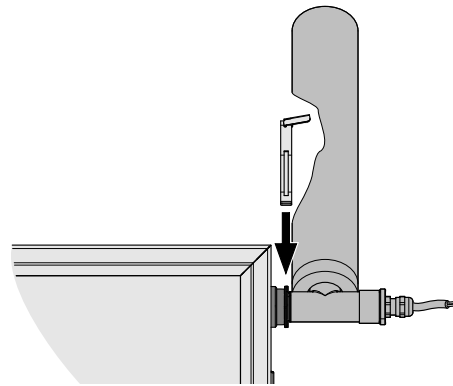


1. Insert the inlet/outlet connector into the collector connection on each end of the array. Make sure to insert the connection with a sensor well on the end of the array that you intend to be the hot side (the outlet of flow of the array).



2. Fit the connecting clip at the junction between collector

and plug-in connection.



3. Secure the connecting clip by pushing down on the locking tab.

4. Install the inlet of the collector array in the same manner.

Collector Sensor

The correct connection of the collector sensor is crucial to the correct function of the solar system.

1. Secure the sensor lead.
2. Connect the sensor lead to the controller. Be sure to properly insulate the sensor wire using standard procedures.

Lightning Protection

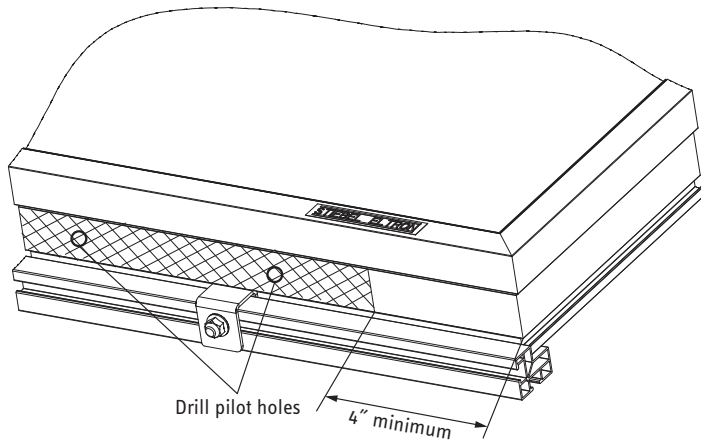
If the building has a lightning protection system, the collector casing, mounting frame and pipework must be connected to the existing lightning protection scheme.

Connect the collector to the lightning protection system using screw fittings. Use two stainless steel self-tapping screws per collector.

1. Pre-drill the holes. Position the drill holes on the lower part of the front of the collector in the area shaded in the following illustration. When drilling the holes, maintain a distance of at least 4 inches from the corner of the collector casing.

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017



Mounting Frame Lightning Protection

1. Connect the mounting frame to the lightning protection system using screws similar to those used for the collectors.

5 Mounting Instructions

Select the collector mounting kit that is capable of providing the required tilt and azimuth in a mounting location that is not subject to excessive shading of the solar collectors. The mounting kit must be securely attached to a structure capable of supporting and maintaining its integrity under the static and dynamic (e.g., high wind) loading conditions.

The type of mounting system that is best-suited to the installation must be determined by the designer, and must take into consideration the details of the roof, wall, or ground on which the collectors are to be placed, the latitude and orientation of the site, the space available for the collectors, possible shading from nearby structures, other rows of collectors, or vegetation, etc. The intended use of the system should also be an important consideration.

For anchoring in concrete, use six M8 UPAT Multicones or SM M10 anchors, both of stainless steel, per collector.

For anchoring in wood, use six wood screws in accordance

with DIN 571, at least 10 x 80, of stainless steel, per collector.

If multiple arrays of collectors are being installed on a flat roof, one behind another, the recommended spacing between them should be:

At least 25 ft. (7.6 m) for vertical installations.

At least 14 ft. (4.0 m) for horizontal installations.

This spacing prevents excessive shading from adjacent rows for latitudes of up to 50°. For latitudes significantly higher than 50°, multiple rows of collectors may not be practical due to low sun altitude angles.

If installing in a high wind environment, 8 clamps per collector should be used. In vertical installations, 4 clamps per collector are supplied with the collector frames, so 4 additional clamps per collector should be added to the equipment list for the installation.

For more information on the specifications about Stiebel Eltron solar racking systems, consult the specific installation manuals.

The 45° vertical mounting racks can develop significant pull-out forces under heavy wind conditions; therefore it is important to take wind loads into account.

Wall Mounting

All of the Stiebel Eltron tilt racking systems can be mounted on a wall just as easily as on a roof.

The type of roof or wall is a crucial factor in the choice of fasteners. Remember to take the static and dynamic (live load) forces into account.

5.1 Flush Mounting

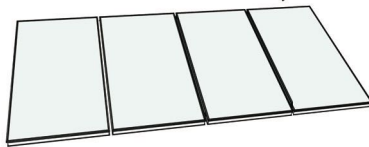
One of the most common types of collector installs are flush mounted arrays. Mounting in this way is the most visually appealing and structurally sound. The collectors are subjected to lower wind and snow loads when flush mounted to a roof.

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

Flush Mount Vertical Side-by-side

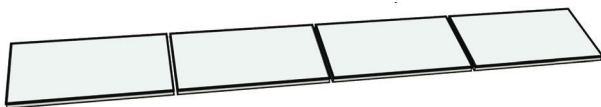
This array orientation is designed for SOL 27 Premium S collectors in portrait orientation. In certain applications, SOL 27 Premium W collectors can be used as well.



Flush Mount Rail Kits	Part #	# of Collectors			
		1	2	3	4
		# of Parts			
Flush Mount Vertical Side-by-side					
Vertical Flush Mount Rail	560104-27	2	2	3	4
Single Mounting Frame	230169	1	0	1	
Double Mounting Frame	230170	0	1	1	2
Frame Connector Kit	SFC 001	0	0	1	1
Mounting					
L-Bracket Flashing Kits (Asphalt)	560104-L	4	4	6	8
S5U & L-102 (Raised Seam)	S5U & L-102	4	4	6	8

Flush Mount Horizontal Side-by-side

This array orientation is designed for SOL 27 Premium W collectors in landscape orientation. In certain applications, SOL 27 Premium S collectors can be used as well.

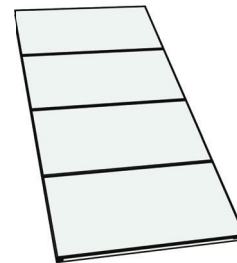


Flush Mount Rail Kits	Part #	# of Collectors			
		1	2	3	4
		# of Parts			
Flush Mount Horizontal Side-by-side					
Horizontal Flush Mount Rail	560107-27	2	4	6	8
Double Mounting Frame	230170	1	2	3	4
Frame Connector Kit	SFC 001	0	1	2	3
Mounting					
L-Bracket Flashing Kits (Asphalt)	560104-L	4	8	12	16
S5U & L-102 (Raised Seam)	S5U & L-102	4	8	12	16

Flush Mount Up-roof

This mounting system is designed to use SOL 27 Premium

S panels in a landscape orientation. This allows for fluid to be evacuated effectively during stagnation conditions. It is design to protect the solar fluid from overheating and will extend its life.



Flush Mount Rail Kits	Part #	# of Collectors			
		1	2	3	4
# of Parts					
Flush Mount Up-roof					
1 Collector Flush Mount Kit	560403	1	0	0	0
2 Collector Flush Mount Kit	560401	0	1	1	1
1 Collector Extension Rail Kit	560402	0	0	1	2
Mounting					
L-Bracket Flashing Kits (Asphalt)	560104-L	4	6	8	10
S5U & L-102 (Raised Seam)	S5U & L-102	4	6	8	10

5.2 Tilt Mounting

Tilt mounting is another way to mount either SOL 27 Premium S or W collectors. Mounting in this orientation allows for the customer to achieve the optimal angle of the solar array for maximum solar gain. A potential drawback of this way of mounting is that the collectors and racks are subjected to greater forces in windy and snowy conditions.

For tilt mounted arrays, either SOL 27 Premium S or W panels can be used.

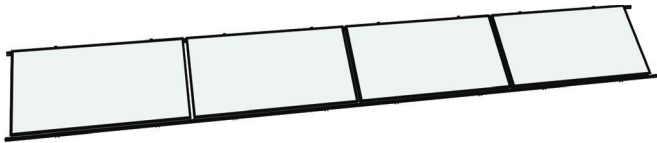
Use the following pictures and tables for reference when determining how to install your tilt mount collectors.

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

Horizontal Tilt Mount

The horizontal tilt mount kit is designed to be adjustable in the field to three different angles. It comes partially pre-assembled for easy and fast field installation. The possible angles range every 5° between 10 & 45°.

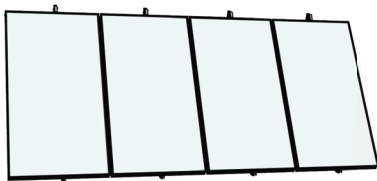


Horizontal Tilt Mount	Part #	# of Collectors			
		1	2	3	4
Horizontal Tilt Mount		# of Parts			
Low angle horizontal tilt mount (10-20°)*	560301	1	2	3	4
Mid angle horizontal tilt mount (20-30°)*	560302	1	2	3	4
High angle horizontal tilt mount (35-45°)*	560303	1	2	3	4
Frame Connector Kit	SFC 001	0	1	2	3
Mounting					
L-Bracket Flashing Kits (Asphalt)	560104-L	4	8	12	16
S5U & L-102 (Raised Seam)	S5U & L-102	4	8	12	16

* Each rack type is available in multiple angles. When determining quantity of parts, use only one type of rack.

Vertical Angled Rack

The vertical angled rack is a more robust version of the tilt mounting system. It is designed for higher angle installs in a portrait orientation. It is available in three different angles: 30, 45 & 60°.

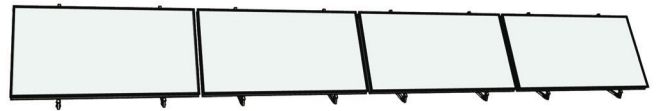


Flush Mount Rail Kits	Part #	# of Collectors			
		1	2	3	4
Vertical Angled Rack		# of Parts			
Vertical 45° Rack (45°)*	560101	2	2	3	4
Vertical 30-60° Rack (30, 60°)*	230170	1	2	3	4
Vertical X-Brace	560106	1	1	2	2
Single Mounting Frame	230169	1	0	1	0
Double Mounting Frame	230170	0	1	1	2
Frame Connector Kit	SFC 001	0	0	1	1
Mounting					
L-Bracket Flashing Kits (Asphalt)	560104-L	4	4	6	8
S5U & L-102 (Raised Seam)	S5U & L-102	4	4	6	8

* Each rack type is available in multiple angles. When determining quantity of parts, use only one type of rack.

Horizontal Angled Rack

The horizontal angled rack is a scaled-down version of the vertical angled rack. It is designed for higher angle installs in a landscape orientation. It is available in three different angles: 30, 45 & 60°.



Flush Mount Rail Kits	Part #	# of Collectors			
		1	2	3	4
Horizontal Angled Rack*		# of Parts			
Horizontal 45° Rack (45°)*	560201	1	0	0	0
Horizontal 30-60° Rack (30, 60°)*	560203	0	1	1	1
Horizontal X-Brace	560206	0	0	1	2
Double Mounting Frame	230170	1	2	3	4
Frame Connector Kit	SFC 001	0	1	2	3
Mounting					
L-Bracket Flashing Kits (Asphalt)	560104-L	4	8	12	16
S5U & L-102 (Raised Seam)	S5U & L-102	4	8	12	16

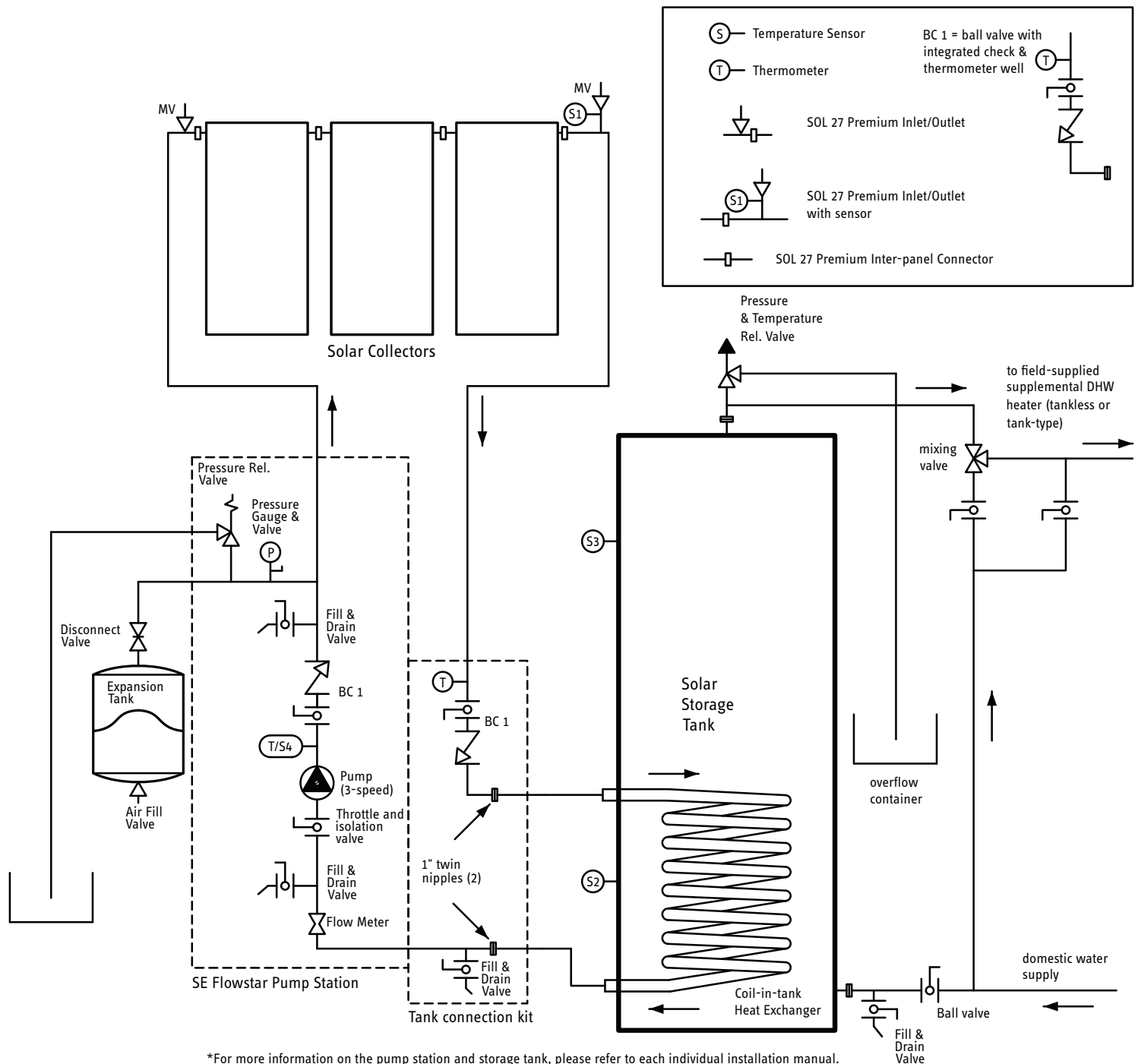
* Each rack type is available in multiple angles. When determining quantity of parts, use only one type of rack.

INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

Typical System Layout

Below is a schematic for a basic solar thermal system using Stiebel Eltron components. Specifics of this design may vary, depending on the demands of the job site.

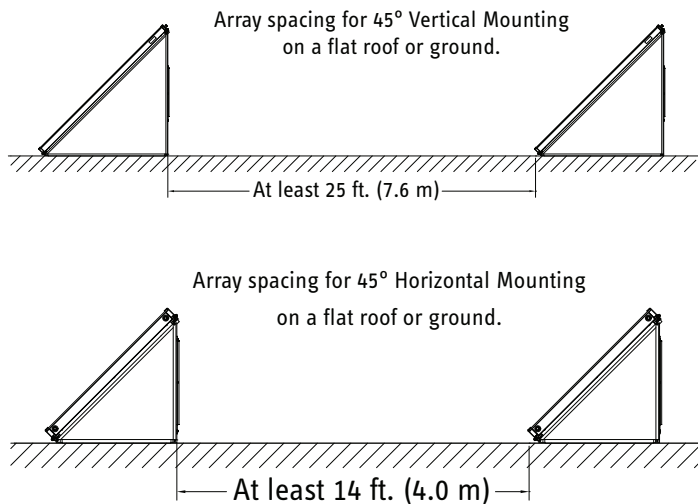


INSTALLATION INSTRUCTIONS

SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017

Collector Spacing

For latitudes up to 50°, use the following distances for mounting solar arrays behind each other. For higher latitudes, it may not be practical at all to orient solar arrays behind each other because of the low sun angle.



6 Commissioning the System

6.1 Pressure and Leak Test

After the pipe work has been installed and the collectors have been connected it will be necessary to pressure-test the system to detect leaks before filling the solar loop with heat transfer fluid. Propylene glycol solutions can leak from much smaller gaps than can water; so such testing is critical to assuring a successful installation. Recommended test pressure is 80 psi. Thermal pipe insulation should be installed only after the leak test has been successfully completed.

It is recommended that compressed air be used to test the system for leaks, as it is very easy to make repairs and it will prevent loss of solar medium, spills, property damage, and messy clean-up problems. Air is also capable of revealing very small leaks, that water may not reveal, through which propylene glycol will often leak. Leaks will be evident from the sound of escaping air, observation of bubbles emanating from fittings and other leak-prone components that are

coated with soapy water, and watching the pressure gauge over time. Bear in mind that the pressure gauge will vary some based on temperature of the air, so one must try to read the pressure at nights when the system cools down to ambient temperature or when covered.

6.2 Setting the Expansion Tank Pre-charge Pressure

While the leak testing is being performed, the installer should set the expansion tank's pre-charge pressure. Make sure that the "wet" side of the expansion tank (pipe connection) is vented to atmosphere. Using a compressor, pre-charge the tank with air (or use pressurized nitrogen) to a final pressure of 5 psi less than the target system pressure. For example, if the final target system (solar loop) pressure is to be 50 psig, fill the expansion tank to 45 psig (which is the recommended default value). When complete, cap the Schrader valve fitting and re-attach the tank to the pump station. Make sure the expansion tank always faces up (the Schrader valve must be pointed down).

6.3 Final Charging & Venting

The solar heating system must be filled exclusively with the premixed propylene glycol heat transfer medium. Stiebel Eltron glycol containers have been premixed and require no further treatment. Never mix water with the heat transfer fluid, otherwise the essential characteristics and corrosion protection can no longer be guaranteed. The system must not be topped off with water.

More Information

For more detailed instructions on how to fill, flush & charge the solar loop, consult the pump station manual.

7 Maintenance & Care

Specialists should carry out an annual inspection of the solar heating system to ensure proper functioning of the system and its components, including the control unit, safety equipment, and tank. System components (fittings, thermal insulation, mounting hardware, fasteners, etc.) exposed

INSTALLATION INSTRUCTIONS**SOL 27 PREMIUM S & W COLLECTORS - 230016 & 230017**

to the weather must also be checked periodically for their condition. Look for signs of abrasion, wear, corrosion, contamination, or damage. Check the pH value (> 7) and frost protection level ($< -20^{\circ}\text{F}$) of the heat transfer medium annually.

8 Warranty

Stiebel eltron warrants to the original owner that the sol 27 premium - flat plate solar collector will be free from defects in workmanship and materials for a period of ten (10) years from the date of purchase.

Should the part(s) prove to be defective under normal use during this period, stiebel eltron, inc. Will be responsible for replacement of the defective part(s) only. Stiebel eltron, inc. Will not be liable for any costs of transportation, removal, reinstallation, or any other labor or freight charges that may arise in connection with a warranty claim or any incidental or consequential expenses.

This warranty does not apply:

1. To conditions resulting from a failed component or part that is not part of the solar collector or absorber plate.
2. To freeze damage.
3. To conditions resulting from misuse, abuse, neglect, accident, or alteration.
4. To minor discoloration of the collector framewall or absorber plate.
5. To glass breakage.
6. To conditions resulting from the introduction of harmful chemicals, caustic fluids, or liquids deleterious to copper tubing, including improperly applied or maintained heat transfer fluids.
7. To propylene glycol ph levels above 10 or below 8.

8. To periods of stagnation in excess of 60 days.
9. To excessive pressure.
10. To clouding or similar occurrence resulting from the normal intrusion of moisture into.
11. To conditions resulting from floods, earthquakes, winds, fire, lightning, or circumstances beyond the manufacturer's control.
12. To installation methods which do not conform to relevant national, state or local.

Codes and ordinances, good industry practices or applicable manuals, diagrams, technical bulletins or written installation instructions; and, to applications other than medium temperature.

To obtain service under this warranty, the owner must first secure written authorization from stiebel eltron, inc. The owner shall be required to show proof of purchase date, and to pay all transportation costs to return the defective part(s) for repair or replacement.



For any service or warranty related issue, contact Stiebel Eltron at:

800.582.8423

STIEBEL ELTRON

17 West Street
West Hatfield, MA 01088

TOLL FREE 800.582.8423

PHONE 413.247.3380

FAX 413.247.3369

info@stiebel-eltron-usa.com

www.stiebel-eltron-usa.com

Printed on recycled chlorine-free paper with soy-based inks.

Due to our continuous process of engineering and technological advancement, specifications may change without notice.

APPENDIX A

SOL 27 PREMIUM S - SRCC OG-100 CERTIFICATION



SUPPLIER:
Stiebel Eltron
 17 West Street
 West Hatfield, MA 01088 USA
 www.stiebel-eltron-usa.com

CERTIFIED SOLAR COLLECTOR

BRAND: Stiebel Eltron
MODEL: SOL 27 Premium S
COLLECTOR TYPE: Glazed Flat Plate
CERTIFICATION #: 2011035A
Original Certification: May 26, 2011
Expiration Date: December 10, 2022

The solar collector listed below has been evaluated by the Solar Rating & Certification Corporation™ (SRCC™), an ANSI accredited and EPA recognized Certification Body, in accordance with SRCC OG-100, Operating Guidelines and Minimum Standards for Certifying Solar Collectors, and has been certified by the SRCC. This award of certification is subject to all terms and conditions of the Program Agreement and the documents incorporated therein by reference. This document must be reproduced in its entirety.

COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
Climate -> Category (Ti-Ta)	High Radiation (6.3 kWh/m².day)	Medium Radiation (4.7 kWh/m².day)	Low Radiation (3.1 kWh/m².day)	Climate -> Category (Ti-Ta)	High Radiation (2000 Btu/ft².day)	Medium Radiation (1500 Btu/ft².day)	Low Radiation (1000 Btu/ft².day)
A (-5 °C)	11.2	8.5	5.7	A (-9 °F)	38.3	28.9	19.6
B (5 °C)	10.3	7.6	4.9	B (9 °F)	35.3	25.9	16.6
C (20 °C)	8.9	6.2	3.6	C (36 °F)	30.4	21.2	12.1
D (50 °C)	6.1	3.6	1.2	D (90 °F)	20.9	12.2	4.1
E (80 °C)	3.4	1.2	0.0	E (144 °F)	11.6	4.2	0.0

A- Pool Heating (Warm Climate) **B-** Pool Heating (Cool Climate) **C-** Water Heating (Warm Climate)
D- Space & Water Heating (Cool Climate) **E-** Commercial Hot Water & Cooling

COLLECTOR SPECIFICATIONS					
Gross Area:	2.546 m²	27.40 ft²	Dry Weight:	40 kg	87 lb
Net Aperture Area:	2.394 m²	25.77 ft²	Fluid Capacity:	1.5 liter	0.4 gal
Absorber Area:	2.378 m²	25.59 ft²	Test Pressure:	1103 kPa	160 psi

TECHNICAL INFORMATION			Tested in accordance with:		
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
SI UNITS:	$\eta = 0.764 - 3.32510(P/G) - 0.01363(P^2/G)$	Y Intercept:	0.767	Slope:	-4.018 W/m².°C
IP UNITS:	$\eta = 0.764 - 0.58602(P/G) - 0.00133(P^2/G)$	Y Intercept:	0.767	Slope:	-0.708 Btu/hr.ft².°F

Incident Angle Modifier								Test Fluid:	
θ	10	20	30	40	50	60	70	Water	
K_{ra}	1.00	1.00	0.99	0.98	0.95	0.88	0.62	Test Mass Flow Rate:	0.0310 kg/(s m²) 22.12 lb/(hr ft²)
Impact Safety Rating:									

REMARKS:

Jim Higgins

Technical Director



Print Date: August, 2013 Page 1 of 3
 © Solar Rating & Certification Corporation™
 www.solar-rating.org ♦ 400 High Point Drive, Suite 400 ♦ Cocoa, Florida 32926 ♦ (321) 213-6037 ♦ Fax (321) 821-0910

APPENDIX A SOL 27 PREMIUM W - SRCC OG-100 CERTIFICATION



SUPPLIER:
Stiebel Eltron
17 West Street
West Hatfield, MA 01088 USA
www.stiebel-eltron-usa.com

CERTIFIED SOLAR COLLECTOR

BRAND: Stiebel Eltron
MODEL: SOL 27 Premium W
COLLECTOR TYPE: Glazed Flat Plate
CERTIFICATION #: 2011036A
Original Certification: May 26, 2011
Expiration Date: December 13, 2022

The solar collector listed below has been evaluated by the Solar Rating & Certification Corporation™ (SRCC™), an ANSI accredited and EPA recognized Certification Body, in accordance with SRCC OG-100, Operating Guidelines and Minimum Standards for Certifying Solar Collectors, and has been certified by the SRCC. This award of certification is subject to all terms and conditions of the Program Agreement and the documents incorporated therein by reference. This document must be reproduced in its entirety.

COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
Climate -> Category (Ti-Ta)	High Radiation (6.3 kWh/m².day)	Medium Radiation (4.7 kWh/m².day)	Low Radiation (3.1 kWh/m².day)	Climate -> Category (Ti-Ta)	High Radiation (2000 Btu/ft².day)	Medium Radiation (1500 Btu/ft².day)	Low Radiation (1000 Btu/ft².day)
A (-5 °C)	11.7	8.9	6.0	A (-9 °F)	40.0	30.3	20.5
B (5 °C)	10.7	7.9	5.0	B (9 °F)	36.7	26.9	17.2
C (20 °C)	9.2	6.4	3.6	C (36 °F)	31.3	21.8	12.3
D (50 °C)	6.2	3.6	1.2	D (90 °F)	21.3	12.3	4.0
E (80 °C)	3.5	1.2	0.0	E (144 °F)	11.8	4.2	0.0
A- Pool Heating (Warm Climate) B- Pool Heating (Cool Climate) C- Water Heating (Warm Climate) D- Space & Water Heating (Cool Climate) E- Commercial Hot Water & Cooling							

COLLECTOR SPECIFICATIONS					
Gross Area:	2.546 m²	27.40 ft²	Dry Weight:	40 kg	89 lb
Net Aperture Area:	2.393 m²	25.76 ft²	Fluid Capacity:	1.9 liter	0.5 gal
Absorber Area:	2.378 m²	25.59 ft²	Test Pressure:	1400 kPa	203 psi

TECHNICAL INFORMATION			Tested in accordance with:		
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
SI UNITS:	$\eta = 0.748 - 3.52440(P/G) - 0.01060(P^2/G)$	Y Intercept:	0.749	Slope:	-4.035 W/m².°C
IP UNITS:	$\eta = 0.748 - 0.62115(P/G) - 0.00104(P^2/G)$	Y Intercept:	0.749	Slope:	-0.711 Btu/hr.ft².°F

Incident Angle Modifier								Test Fluid:	
θ	10	20	30	40	50	60	70	Water	
K_{ra}	1.00	1.00	0.99	0.98	0.95	0.88	0.62	Test Mass Flow Rate:	0.0310 kg/(s m²) 22.12 lb/(hr ft²)
Impact Safety Rating:									

REMARKS:

Jim Higgins

Technical Director



Print Date: August, 2013 Page 1 of 3
© Solar Rating & Certification Corporation™
www.solar-rating.org ♦ 400 High Point Drive, Suite 400 ♦ Cocoa, Florida 32926 ♦ (321) 213-6037 ♦ Fax (321) 821-0910

COMMISSIONING LOG
SOL 27 PREMIUM COLLECTORS

The installer should fill out this sheet at the end of the installation, and leave it at the installation site.

Site:

System operator: _____

Installation site: _____

Collectors:

Collectors (number / type): _____

Collector surface area: _____

System specifications:

System height: _____

Pipe run length: _____

Ventilation: _____

Solar fluid (type / concentration): _____

Max. flow rate: _____

Pump station: _____

Pump setting (low/med/high): _____

System pressure (cold): _____

System pressure (hot): _____

Expansion tank: _____

Checklist:

Mark for condition (checked, closed, open, etc.)

Pressure relief valve: _____

Check valves: _____

Ball valves: _____

Serial numbers:

Pump station: _____

Controller: _____

Software version: _____

Installation company: _____

Signature: _____ Date: _____