



2011 Solar Thermal Water Heating Solutions



Product Catalog
V1 - Effective January 1, 2011

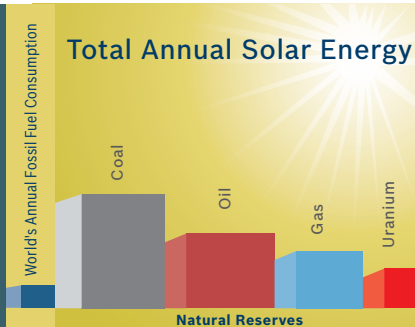


BOSCH
Invented for life

Benefits of going solar

“I’d put my money on the sun and solar energy. What a source of power! I hope we don’t have to wait ‘til oil and coal run out before we tackle that.”

- Thomas Edison (1847-1931)



Now is the time to start utilizing renewable resources:

- ▶ Every 20 minutes, enough energy is transmitted to the earth’s surface to supply the annual global energy demand
- ▶ The sun generates more energy in one day than all our fossil fuels combined
- ▶ Electricity generated by the U.S. by burning fossil fuels: 75%
- ▶ The estimated time to consume our remaining fossil fuels: 45 years
- ▶ Currently, solar energy accounts for < 1% of the U.S. energy supply

Why should you go solar?

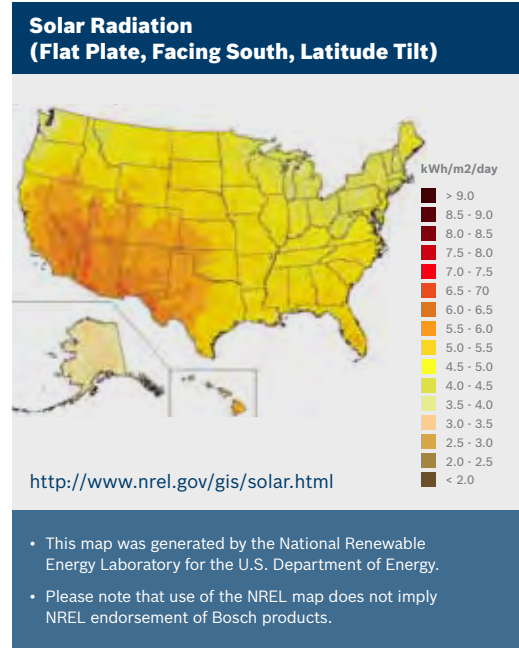
- ▶ Solar water heating systems can make a substantial reduction in utility bills, saving you as much as 75% of the cost for water heating
- ▶ Increase property values with an aesthetic design and a more efficient water heating system
- ▶ Attractive federal, state and local financial incentives support consumer transition to green energy efficient options (visit www.dsireusa.org / www.cansia.ca)

Choosing the right Bosch solar thermal system for you:

Proper sizing of a solar thermal system for water heating is crucial for performance, comfort, fuel savings, and a long service life. The conventional heat source must be able to provide 100% of the hot water in a building independently of the solar system.

A system putting too much emphasis on fuel savings may not meet the customer’s approval if it does not provide hot water comfort during periods of bad weather.

Did you know that a properly sized solar thermal system may provide as much as 75% of your annual hot water requirements? The energy that is provided by the sun can be used effectively in almost any part of North America. Coverage of 50% - 60% over the course of a whole year is ideal for water heating systems for single family homes and two-family homes.



For larger residential & commercial systems, proper sizing takes into account the following parameters:

- ▶ Daily hot water demand
- ▶ Daily & weekly profile, hot water demand
- ▶ Seasonal influence on the hot water demand (i.e. camp site)
- ▶ Set point temperature
- ▶ Existing water heating equipment (if an existing system is being extended)
- ▶ Recirculation losses
- ▶ Location & regional conditions
- ▶ Orientation
- ▶ Slope

How a solar thermal system works

Solar thermal systems from Bosch are fully integrated solutions with modular design allowing you to add more capacity to meet most hot water needs. Solar thermal systems utilize free energy from the sun to produce hot water which can also be used for space and/or pool heating for residential or commercial applications:



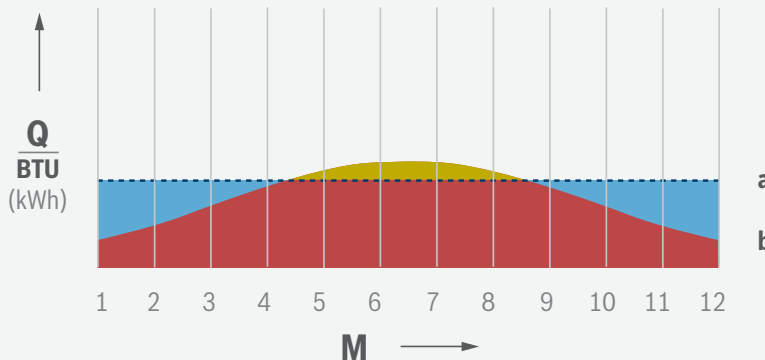
Here is how a Bosch solar thermal system works:

- ▶ Solar collectors contain an absorber that heats up when exposed to both diffused & direct sunlight
- ▶ The absorber contains pipes to transfer heat fluid. The absorber collects the heat and transports the solar heat to the tank where it can be stored for later use
- ▶ When the heat transfer fluid in the collectors is warmer than the bottom of the storage tank, the solar controller will turn on the solar loop pump to transport the hot fluid from the collectors through the solar tank coil where the solar energy is transferred to the stored water
- ▶ The collectors, the pump station, and the storage tank are connected with supply and return piping that is insulated to minimize heat loss
- ▶ As the system heats up or cools down, an expansion tank accounts for expansion and contraction of the heat transfer fluid

What happens if hot water demand fluctuates from the norm?

On days when more hot water is used than could be provided by the solar thermal system, i.e. during a series of cloudy days with limited insolation, Bosch tankless water heaters, boilers or heat pumps can serve as your back-up system.

Energy provided by a solar thermal system in relation to the annual energy demand for water heating



Legend

- a Energy demand
 - b Energy provided by the solar system
 - M Month
 - Q Heating energy
-
- Solar energy (available for a swimming pool for example)
 - Utilized solar energy (solar coverage)
 - Energy demand that needs to be provided by the back-up system (reheating)

Why Bosch is your best choice



Since 1886, the Bosch brand has stood for first class technology, innovation, reliability and quality. Understanding the need to utilize renewable resources, Bosch has created an extensive solar thermal product line to save energy, reduce CO₂ emissions and contribute to energy independence while lowering monthly water heating bills through customizable solutions for any hot water need.

Whether remodeling, building a new home, updating plumbing or water heating systems, there is no better time to enjoy the benefits of a Bosch solar thermal system:

- ▶ More than 25 years of solar thermal expertise
- ▶ Systems designed to facilitate system upgrades
- ▶ Confidence in being able to purchase all solar, tankless, boilers and heat pump needs through one source
- ▶ Reduce installation cost through "plug and play" components
- ▶ Reliable customer support with spare parts availability throughout North America
- ▶ Savings up to 75% off your water heating bills*
- ▶ Reduced CO₂ footprint
- ▶ Ideal for residential or commercial hot water, space heating and pool heating applications

*Results may vary depending on installation

Bosch products meet or exceed industry certification standards

Bosch products are also renowned for their reliability and longevity. All products are built using top-grade materials and tested to meet the highest standards for performance, sustainability and safety:

- ▶ SRCC OG300 certified systems
- ▶ ETL certified controls
- ▶ FSEC & CSA certified collectors
- ▶ UL certified pump station & module components



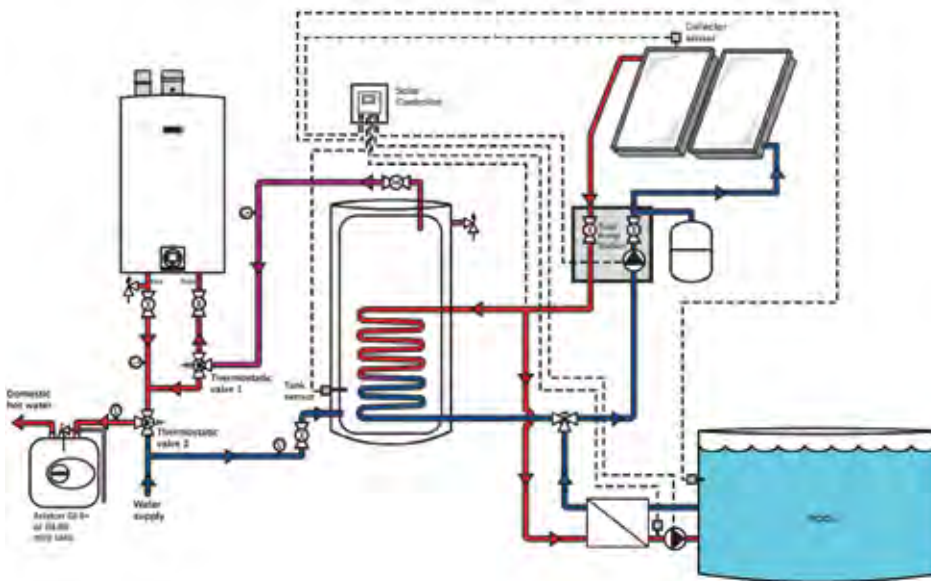


Residential domestic hot water + space heating + pool heating systems

Producing domestic hot water (DHW), space heating, and pool heating from a solar thermal system is a combination that makes sense in many cases. DHW typically takes first priority, and once at capacity, space heating takes second priority. If there are no space heating needs, the solar heat is diverted to the pool. If properly designed, this type of a system can provide the majority of DHW, resulting in significant fuel savings on the space heating side while extending the swim season of a pool. Four to ten panels and 200 to 500 gallon (750 to 2000 L) tanks are typically used in this type of application.

Residential system components include:

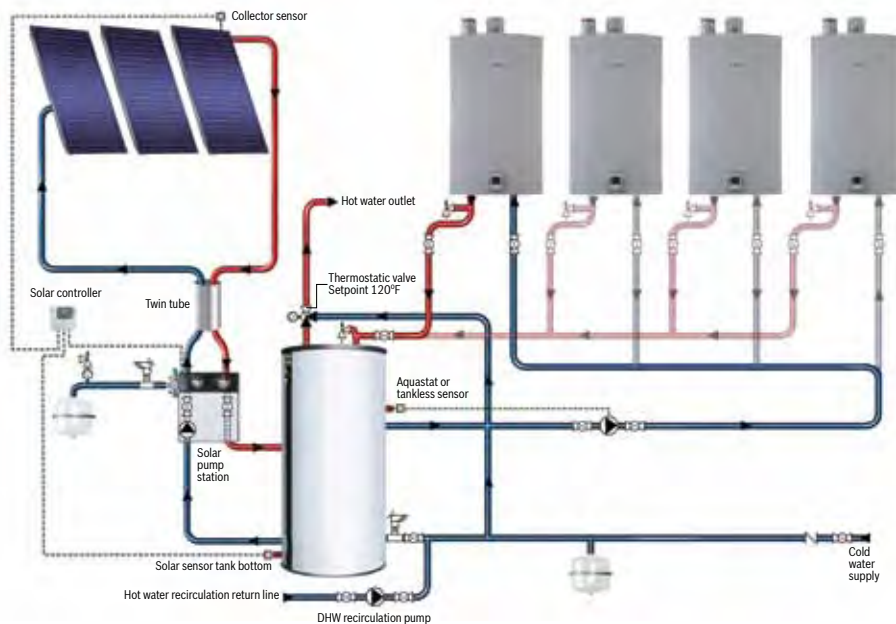
-  **COLLECTORS**
-  **PUMP STATION**
-  **LINE SET**
-  **CONNECTION SET**
-  **EXPANSION TANK**
-  **FLAT ROOF MOUNTING**
-  **CONTROLS**
-  **HEAT TRANSFER FLUID**
-  **ACCESSORIES**



Note: This schematic shows one of the many solar thermal Bosch back-up solutions.

Commercial hot water + space heating + pool heating systems

Volatile energy costs and tighter budgets make solar thermal heating a practical solution to offset future energy costs and reduce operating expenses. Hot water, space heating and pool heating for commercial buildings are ideal applications for a solar thermal system. In commercial systems with uniform consumption, solar pre-heating systems can be a financially viable solution. Integrating a solar thermal system with an existing system can greatly improve the overall energy efficiency. A solar pool heating system can also extend the swim season by providing a comfortably heated pool year round.



Note: This schematic shows one of the many solar thermal Bosch back-up solutions.

**Can't figure out which application to utilize?
Have a unique application you don't see listed?**

Contact your local representative for more information regarding system sizing and design services for large residential and commercial customers. Or, use our GetSolar professional sizing tool at www.bosch-climate.us/GetSolar

Commercial system components include:

-  **COLLECTORS**
-  **SOLAR STORAGE TANK**
-  **PUMP STATION**
-  **LINE SET**
-  **CONNECTION SET**
-  **EXPANSION TANK**
-  **FLAT ROOF MOUNTING**
-  **CONTROLS**
-  **HEAT TRANSFER FLUID**
-  **BACK-UP HEATER**
-  **ACCESSORIES**



Solar thermal flat plate collectors

FKT-1, FKC-1

Bosch collectors use the energy from the sun to heat water for domestic, space and pool heating applications and are combined with a storage tank and auxiliary back-up to provide comfort and reliability. The collectors are available in portrait (vertical) and landscape (horizontal) formats.

- ▶ Excellent value & optimal performance using high selective absorber coating
- ▶ Fiberglass frame and solar safety glass for robust & durable construction
- ▶ Fastest hydraulic collector connection on market
- ▶ Universal mounting systems



COLLECTORS



RESIDENTIAL



COMMERCIAL



PRODUCT SAFETY

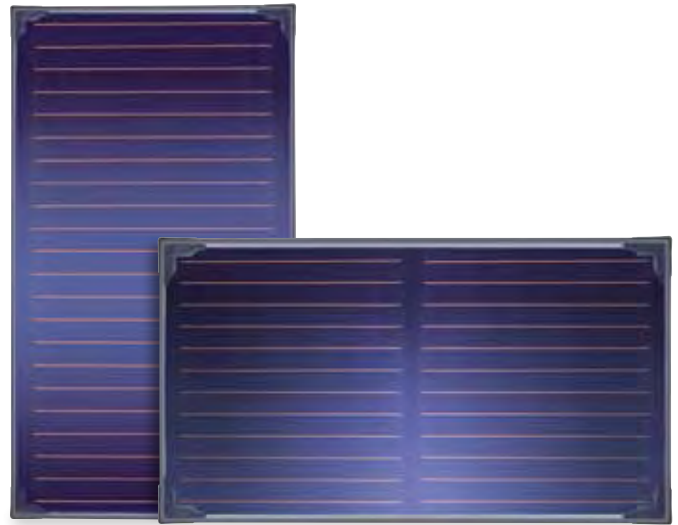


10-YEAR WARRANTY

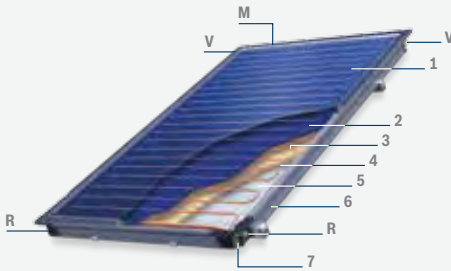


FKT-1

Top Line collectors



Collector Internal Construction View



- Item 1: Solar safety glass
- Item 2: Absorber plate
- Item 3: Double meander piping
- Item 4: Mineral wool insulation
- Item 5: Galvanized steel rear panel
- Item 6: Fiberglass frame
- Item 7: Extruded plastic end cap
- Item R: Return
- Item V: Supply
- Item M: Collector sensor well

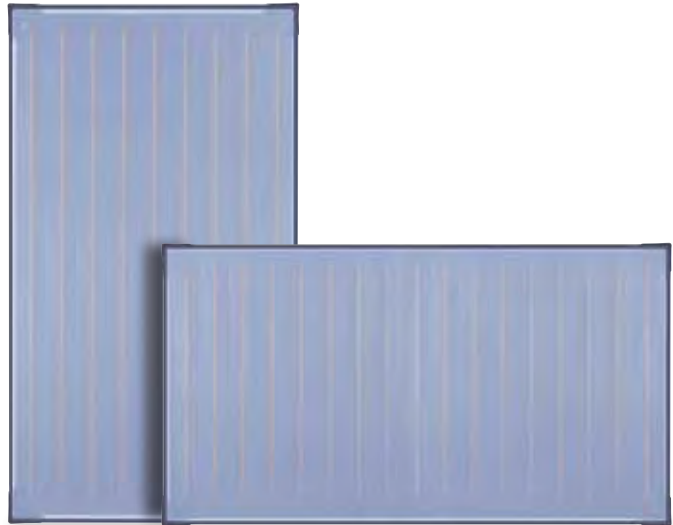
Technical Specifications

	FKT-1s Portrait	FKT-1w Landscape
Gross Collector Area (m ²)	25.95 Ft ² (2.41)	25.95 Ft ² (2.41)
Net Aperture Area (m ²)	24.3 Ft ² (2.25)	24.3 Ft ² (2.25)
Dry Weight (kg)	97 lbs. (44)	99 lbs. (45)
Fluid Content (L)	0.37 gal (1.43)	0.46 gal (1.76)
Max. Operating Temperature (°C)	248°F (120)	248°F (120)
Stagnation Temperature (°C)	370°F (188)	370°F (188)
Solar Glass Thickness (mm)	1/8" (3.2)	1/8" (3.2)
Solar Glass Transmissivity	91.5%	91.5%
Coating	Highly selective PVD	Highly selective PVD
Absorptivity	95% ± 2%	95% ± 2%
Emissivity	5% ± 2%	5% ± 2%
Absorber Material / Type	Copper with ultrasonic welding / double meander	
Collector Type / Construction	Plug and socket connector / open vented	
Thermal Insulation (mm)	2 1/8" mineral wool, high temperature resistant and outgassing free	
Max. Operation Pressure (bar)	145 psi (10)	145 psi (10)
Nominal Flow Rate (L/hr)	0.22 gpm (50)	0.22 gpm (50)
Efficiency η ₀ (%)	85.1	85.1
Effective Heat Transfer Coefficient		
k ₁ W/(m ² ≥ K ¹)	4.0360	4.0360
k ₂ W/(m ² ≥ K ²)	0.0108	0.0108
Collector Yield (Minimum Yield Verification [†])	> 525	> 525
Max. # Col/Tow Opposite Side Connection	10	10
Max. # Col/Row Same Side Connection	5	5
Y-intercept	0.746	0.746

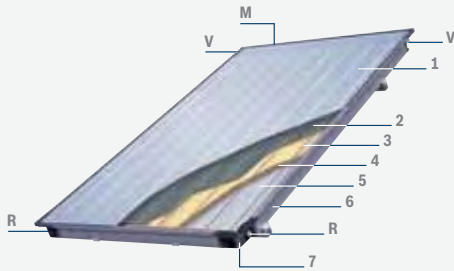
Performance Rating SRCC (OG100 Certified)	Category (Ti-Ta) Ti= inlet fluid temp Ta= ambient air temp	BTU Per Ft ² Per Day			Thousands of BTU Per Panel Per Day		
		Clear Day 2,000 BTU/ Ft ² .Day	Mildly Cloudy 1,500 BTU/ Ft ² .Day	Cloudy Day 1,000 BTU/ Ft ² .Day	Clear Day 2,000 BTU/ Ft ² .Day	Mildly Cloudy 1,500 BTU/ Ft ² .Day	Cloudy Day 1,000 BTU/ Ft ² .Day
FKT-1s / FKT-1w	A (-9 °)	1,486	1,119	757	36.1	27.2	18.4
	B (9 °)	1,358	992	630	33.0	24.1	15.3
	C (36 °)	1,156	798	444	28.1	19.4	10.8
	D (90 °)	757	432	128	18.4	10.5	3.1
	E (144 °)	391	128	0.0	9.5	3.1	0.0

FKC-1

Comfort Line collectors



Collector Internal Construction View



- Item 1: Solar safety glass
- Item 2: Absorber plate
- Item 3: Harp piping
- Item 4: Mineral wool insulation
- Item 5: Galvanized steel rear panel
- Item 6: Fiberglass frame
- Item 7: Extruded plastic end cap
- Item R: Return
- Item V: Supply
- Item M: Collector sensor well

Technical Specifications

	FKC-1s Portrait	FKC-1w Landscape
Gross Collector Area (m ²)	25.95 Ft ² (2.41)	25.95 Ft ² (2.41)
Net Aperture Area (m ²)	24.3 Ft ² (2.25)	24.3 Ft ² (2.25)
Dry Weight (kg)	90 lbs. (41)	92 lbs. (42)
Fluid Content (L)	0.23 gal (.86)	0.33 gal (1.25)
Max. Operating Temperature (°C)	248°F (120)	248°F (120)
Stagnation Temperature (°C)	370°F (188)	370°F (188)
Solar Glass Thickness (mm)	1/8" (3.2)	1/8" (3.2)
Solar Glass Transmissivity	91.5%	91.5%
Coating	Highly selective black chrome	Highly selective black chrome
Absorptivity	96% ± 2%	96% ± 2%
Emissivity	12% ± 2%	12% ± 2%
Absorber Material / Type	Copper with ultrasonic welding / harp	
Collector Type / Construction	Plug and socket connector / open vented	
Thermal Insulation (mm)	2 3/8" mineral wool, high temperature resistant and outgassing free	
Max. Operation Pressure (bar)	87 psi (6)	87 psi (6)
Nominal Flow Rate (L/hr)	0.22 gpm (50)	0.22 gpm (50)
Efficiency η ₀ (%)	85.1	85.1
Effective Heat Transfer Coefficient k ₁ W/(m ² ≥ K ²) k ₂ W/(m ² ≥ K ²)	3.6810 0.0173	3.6810 0.0173
Collector Yield (Minimum Yield Verification ¹)	> 525	> 525
Max. # Col/Row Opposite Side Connection	10	10
Max. # Col/Row Same Side Connection	Not permitted	Not permitted
Y-intercept	0.723	0.723

Performance Rating SRCC (OG100 Certified)	Category (Ti-Ta) Ti= inlet fluid temp Ta= ambient air temp	BTU Per Ft ² Per Day			Thousands of BTU Per Panel Per Day		
		Clear Day 2,000 BTU/ Ft ² .Day	Mildly Cloudy 1,500 BTU/ Ft ² .Day	Cloudy Day 1,000 BTU/ Ft ² .Day	Clear Day 2,000 BTU/ Ft ² .Day	Mildly Cloudy 1,500 BTU/ Ft ² .Day	Cloudy Day 1,000 BTU/ Ft ² .Day
FKC-1s / FKC-1w	A (-9 °)	1,481	1,111	782	36	27	19
	B (9 °)	1,317	988	617	32	24	15
	C (36 °)	1,111	741	412	27	18	10
	D (90 °)	700	412	82	17	10	2
	E (144 °)	370	82	0.0	9	2	0.0



Solar storage tanks

SOL-RET



Indirect storage tanks for closed loop pressurized solar water heating systems. 80 and 120 gallon (300 and 450 L) glass lined storage tanks with a single wrap-around heat exchanger that qualify for both single wall and double wall code jurisdictions. Tanks come equipped with a 4.5kW immersion element for supplemental water heating.



SOLAR STORAGE TANK



RESIDENTIAL



COMMERCIAL

SOL-RET

indirect solar storage tanks



Use 3/16" one hole strap (not supplied) to secure temperature sensor against tank using threaded post and nut



Copper Coil Data (Type L Copper)

Maximum Pressure= 150 psi
 Maximum Temperature= 185°F
 Tube I.D.= 5/8"

Pressure Drop Through Coil (Feet of H ₂ O)		
Flow Rate	Head Loss (Feet)	
	80 Gallon (300 L)	120 Gallon (450 L)
1 gpm	1.3	1.6
2 gpm	4.8	5.6
3 gpm	10.0	12.0

Technical Specifications			Roughing in Dimensions			Energy Information
Tank Capacity (L)	Coil Capacity (L)	Length of Tubing Around Tank (m)	Height A (mm)	Diameter B (mm)	Approx. Shipping Weight (kg)	Approx. R-Factor
80 gals (300)	2.2 gals (8.3)	120' (36.6)	58 3/4" (1492)	24 1/2" (622)	220 lbs. (100)	R-17.3
120 gals (450)	2.6 gals (9.8)	143' (43.6)	62" (1575)	28 3/4" (718)	380 lbs. (172)	R-17.3

* Heater furnished with standard 240 volt AC, single phase non-simultaneous wiring and 4500 watt element. To prevent corrosion, proper pH levels in heat transfer fluid must be maintained. SOL-RET models meet all current state requirements for storage tank.



Features & benefits:

- ▶ Collector feed & return fittings located at front of tank for convenient installation
- ▶ Cold water inlet, hot water outlet, relief valve and anode rod at top of tank for easy access and fast, economical installation
- ▶ Isolated tank design for better heat retention
- ▶ High efficiency heating element
- ▶ Tank lining resists corrosion and prolongs tank life
- ▶ Heat exchanger: copper tubing wrapped around and secured to the tank
- ▶ Double wall, vented design for positive leak detection
- ▶ Cold water inlet brings cold water to tank bottom to prevent mixing with heated water
- ▶ Anode rod equalizes aggressive water action for prolonged tank life
- ▶ Automatic temperature control
- ▶ Temperature and pressure relief valve included
- ▶ Brass drain valve
- ▶ Warranty: 6-year limited tank and parts



Hydraulics

lifelines of the solar thermal system

Hydraulics are the lifelines of the solar thermal system. These units control extraction of the heat collected from direct sunlight and diffused rays via the collectors and then transferring this to heat the water in the storage tank. Bosch provides nearly all hydraulics components required for your solar needs, which are engineered and designed to work with each other to provide reliable performance.



PUMP STATION



CONNECTION SET



LINE SET



EXPANSION TANK



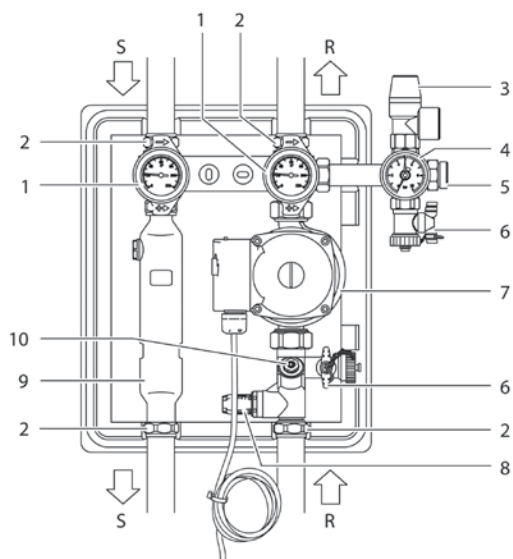
COOLING VESSEL



HEAT TRANSFER FLUID

Pump stations

Solar pump stations serve as the circulation system for transferring the heat drawn from the collectors via heat transfer fluid to the storage tank, working in conjunction with the control to maintain consistent high-efficiency. These compact units are completely integrated packages and come with all the operational and safety devices required for a reliable solar thermal system.



List of components

- | | |
|--|--|
| S Supply from collector to tank | 3 Safety relief valve |
| R Return from tank to collector | 4 Pressure gauge |
| 1 Ball valve with thermometer and integrated flow check | 5 Connection for expansion tank |
| Position 0° = flow check engaged, ball valve open | 6 Fill & drain valve |
| Position 45° = flow check manually open | 7 Solar circulator |
| Position 90° = ball valve closed | 8 Flow volume indicator |
| 2 Compression fitting (all supply & return connections) | 9 Air separator |
| | 10 Flow setter |

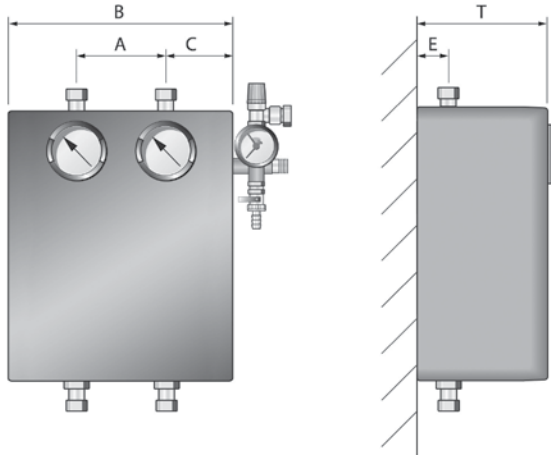
Features & benefits:

- ▶ Easy to install, with pre-assembled, fully integrated two-line pump kit
- ▶ Quiet, variable flow circulation solar system pump
- ▶ Line connections with compression fittings
- ▶ Integrated fill and drain valves for ease-of-service and maintenance
- ▶ Diverse performance levels depending on the size of the collector field

Recommended item to purchase:

- ▶ Controls (not included) (Please see pages 32-34 for Bosch controls)

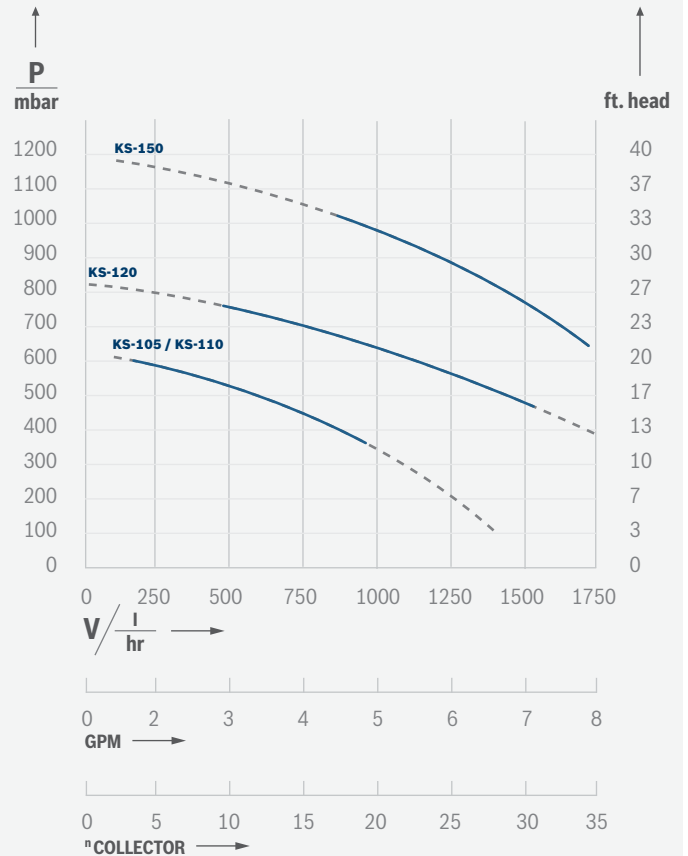
Pump stations



Dimensions

Dimensions (mm)	KS-105	KS-110	KS-120	KS-150
Height	14" (355)	14" (355)	14" (355)	14" (355)
Width (B)	11½" (290)	11½" (290)	11½" (290)	11½" (290)
Depth (T)	9 ¼" (235)	9 ¼" (235)	9 ¼" (235)	9 ¼" (235)
(A)	5 ⅞" (130)	5 ⅞" (130)	5 ⅞" (130)	5 ⅞" (130)
(C)	3 ⅞" (80)	3 ⅞" (80)	3 ⅞" (80)	3 ⅞" (80)
(E)	2" (50)	2" (50)	2" (50)	2" (50)

Pressure Drop Curve for n-Collectors



Technical Specifications

	KS-105	KS-110	KS-120	KS-150
Max. Recommended # of Collectors	5	10	20	50
Copper Pipe Connection Size (Compression Fitting) Supply/Return	½"	¾"	1"	1"
Expansion Tank Connection	¾"	¾"	¾"	1"
Safety Relief Valve (bar)	87 psi (6)	87 psi (6)	87 psi (6)	87 psi (6)
Circulation Pump Type	Bosch Solar 15-58	Bosch Solar 15-58	Bosch UPS 25-99	Bosch UPS 26-120
Circulation Pump Finished Length (mm)	5 ⅞" (130)	5 ⅞" (130)	7 ⅞" (180)	7 ⅞" (180)
Electrical Power Supply	120 V AC	120 V AC	120 V AC	120 V AC
Frequency	60 Hz	60 Hz	60 Hz	60 Hz
Max. Power Consumption	60 W	125 W	195 W	215 W
Max. Current Load	0.25 A	0.54 A	0.85 A	2.15 A
Throughput Limiter Adjusting Range (L/min)	½ - 1½ gpm (0.5-6)	½ - 4¼ gpm (2-16)	2 - 7 gpm (8-26)	5 - 11 gpm (20-42.5)
Weight (kg)	16 lbs. (7.1)	16 lbs. (7.1)	21 lbs. (9.3)	22 lbs. (10.0)

System modules for pump stations

Pump station modules are our building-blocks with pre-integrated components which plug into our solar pump station to provide common hydraulic options for solar applications.



SBU change over module

Used with solar thermal systems with two storage tanks and one solar pump station. Priority / first tank connects on the left side; second tank is on the bottom. Overlap of the rear panel is needed for cooling of the pump station. Connects directly below the pump station.



Features & benefits:

- ▶ Easy planning with reduced component complexity
- ▶ Fast & easy installation with pre-integrated, “plug & play” parts, reducing labor costs
- ▶ Prevention of failure with clearly defined combinations & piping structure designs to lower likelihood of malfunction



SBH heating support module

For solar space heating with return temperature increase.
Portrait / landscape mounting.



SBT system division module

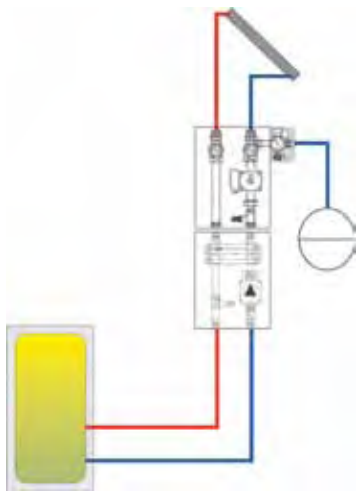
Includes heat exchanger for heat transfer fluid. Overlap of the rear panel is needed for cooling of the pump station.



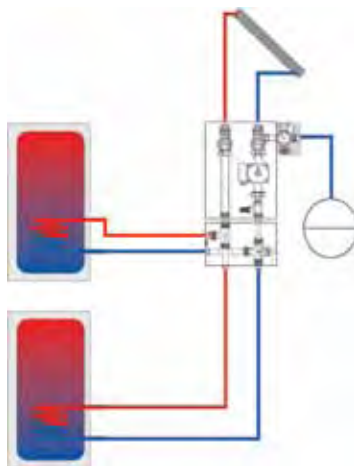
System modules for pump stations

System options:

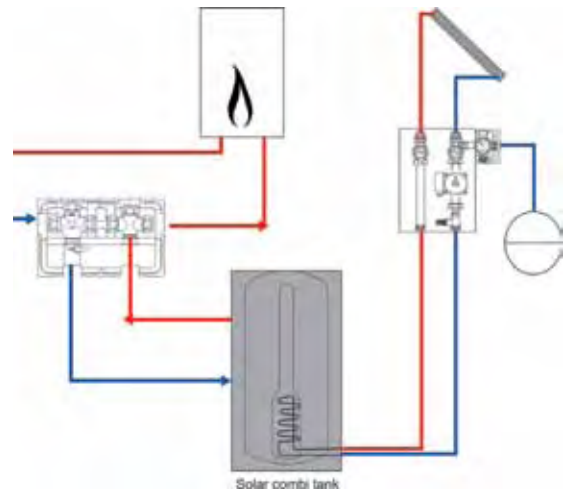
SBT MODULE



SBU MODULE



SBH MODULE



Technical Specifications				
Type		SBU	SBH	SBT
Part Number		8718572675	8718572677	8718572704
Width x Height x Depth (mm)		290" / 203" / 217" (11.4 / 8 / 8.5)	290" / 174" / 135" (11.4 / 6.9 / 5.3)	290" / 374" / 217" (11.4 / 14.7 / 8.5)
Connection	Solar Loop Secondary Loop	Compression ring ½" Compression ring ¾"	- Compression ring ¾"	Compression ring ½" Compression ring ¾"
Max. Pressure (bar)		87 psi (6)	87 psi (6)	87 psi (6)
Flow Meter (L/min)		-	-	0.5 - 4.2 gal/min (2 - 16)
Delivery Height Pump (m)		-	-	18' (4) (UPS 15 - 58)
Socket Temperature Sensor (mm)		-	-	6" (9,7)
Actuator		120 V (2.5 W normally open)	120 V (2.5 W normally closed)	-
Flow Coefficient Value for Valves		Kvs 4,5	Kvs 4,5	-
Pressure Drop		-	-	SBT 10 mbar / 4 inch H ₂ O
Max # Collectors		10	-	8
Performance Heat Exchanger		-	-	10 kW/34,000 BTU/h (solar 1.8 gpm Δ 45° F (solar 131° F/86° F heating 77° F/122° F))

Connection sets

These flexible line sets allow easily fitting in tight corners and penetrations under the roof with no tools required. The connection sets also offer flexibility whether or not an air vent is being installed. There is a separate connection set for the FKT-1 and FKC-1; FKT-1 uses corrugated metal pipe, FKC-1 uses rubber hose.

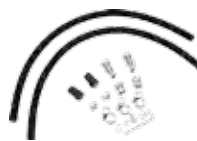


Sloped roof connection sets

The sloped roof connection set is designed to connect the supply and return manifolds on the collector array with the solar line sets using a flexible connector that adapts to copper piping.



Part Number 8718530495
Description FKT-1 collector connection set, sloped roof



Part Number 7747021988
Description FKC-1 collector connection set, sloped roof



Flat roof connection sets

The flat roof connection set is designed to connect the supply and return manifolds on the collector array with the solar line sets using a 90° elbow fitting that adapts to copper piping.



Part Number 8718530496
Description FKT-1 collector connection set, flat roof



Part Number 7747021989
Description FKC-1 collector connection set, flat roof



Series connection sets

The series connection set allows piping two rows of collectors together with flexible lines that allow fitting in tight corners using the same quick connects as the collectors.



Part Number 7747025431
Description FKT-1 series connection set



Part Number 83077300
Description FKC-1 series connection set



Air vent sets

Solar heating systems consisting of more than 20 collectors should be vented via responsive air vent valves at the highest point of the system. For systems consisting of less than 20 collectors, an air vent is optional when operating the system using a high volume and high pressure filling station with air separator.



Part Number 83077210
Description FKT-1 solar air vent set



Part Number 83077200
Description FKC-1 solar air vent set

Line sets

Designed to minimize heat loss and protect against freezing, the twin tubing assembly has an embedded collector temperature sensor and is surrounded by a pre-insulated, robust weather/UV resistant jacket to simplify the installation of tube connections between Bosch collectors and the solar storage tanks.



Twin tube copper line set

Flexible copper line set can be bent in shape to easily fit the most challenging installations.



Part Number 7747208380
Description Twin tube set copper 1/2" 50' incl. adapters



Twin tube stainless steel line sets

Flexible stainless steel line sets can be bent in shape to easily fit the most challenging installations.



Part Number 8718530798
Description Twin tube set stainless steel 1/2" 50' incl. adapters



Part Number 8718530799
Description Twin tube set stainless steel 3/4" 50' incl. adapters



Wall mounting bracket set

Accessory for twin tube line set.



Part Number 83007300
Description Wall mounting bracket set, accessory for twin tube 1/2"



Part Number 8718530800
Description Adapter for twin tube stainless steel 1/2" x 1/2" pipe 2pcs.



Part Number 8718530803
Description Adapter for twin tube stainless steel 3/4" x 3/4" pipe 2pcs.



Part Number 8718530801
Description Adapter for twin tube stainless steel 1/2" x 3/4" pipe 2pcs.



Part Number 8718530814
Description Coupling for twin tube stainless steel 1/2" 2pcs.



Part Number 8718530802
Description Adapter for twin tube stainless steel 3/4" x 1/2" pipe 2pcs.



Part Number 8718530815
Description Coupling for twin tube stainless steel 3/4" 2pcs.

Expansion tanks



Bosch expansion tanks are safety devices that capture the expansion and condensation of the heat transfer fluid during stagnation. Each system's expansion tank capacity depends on system pressure, collector area, system volume and static height of the system.



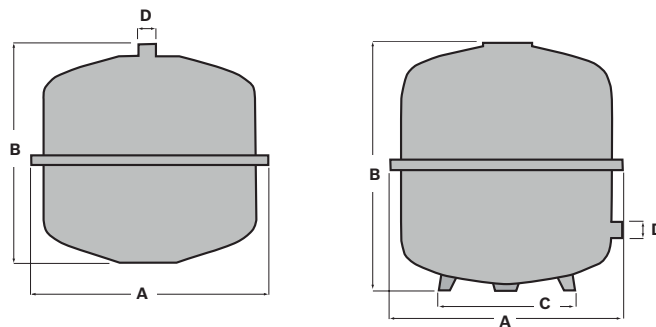
AAS / solar expansion tank connection set

Part Number 63003891

Description Only required for 5-13 gallon (18-50 L) tanks. Includes 24" of 3/4" corrugated stainless steel line, wall mounting bracket with flexfast connection fitting and mounting hardware.

Features & benefits:

- ▶ Designed to meet solar thermal system requirements
- ▶ Resistant to high temperatures and degradation from heat transfer fluid
- ▶ A properly designed system will compensate volume changes in the solar thermal system and diminish the need to have a safety valve open



Technical Specifications

Tank (L)	A (mm)	B (mm)	C (mm)	D Connection (male)	Pre-Pressure (bar)	Weight (kg)	Max. Operating Pressure (bar)
5 gal (18)	12.91" (328)	12.05" (306)	-	3/4"	21.76 psi (1.5)	16.53 lbs (7.5)	87.02 psi (6)
7 gal (25)	14.09" (358)	14.13" (359)	-	3/4"	21.76 psi (1.5)	21.16 lbs (9.6)	87.02 psi (6)
9 gal (35)	15.59" (396)	16.38" (416)	10.35" (263)	3/4"	21.76 psi (1.5)	26.01 lbs (11.8)	87.02 psi (6)
13 gal (50)	17.20" (437)	18.62" (473)	10.35" (263)	3/4"	21.76 psi (1.5)	33.29 lbs (15.1)	87.02 psi (6)
21 gal (80)	20.43" (519)	21.26" (540)	14.17" (360)	1"	21.76 psi (1.5)	48.72 lbs (22.1)	87.02 psi (6)
26 gal (100)	20.16" (512)	26.77" (680)	14.17" (360)	1"	21.76 psi (1.5)	45.2 lbs (20.5)	87.02 psi (6)
36 gal (140)	20.16" (512)	35.04" (890)	14.17" (360)	1"	21.76 psi (1.5)	63.05 lbs (28.6)	87.02 psi (6)

Cooling vessel

The cooling vessel is for larger volume closed loop solar hot water systems used to pre-cool the heat transfer fluid, minimizing high temperature exposure of the expansion tank. It is connected up-stream from the expansion tank and is typically installed in commercial systems with larger volumes of heat transfer fluid.



Part Number 83001626
Description Cooling vessel, 4 gallon (12 L)



Heat transfer fluid

Bosch collectors contain an absorber that heats up when exposed to sunlight. The absorber contains pipes that are filled with heat transfer fluid that is transported to the tank where it can be stored for later use. The heat transfer fluid is specifically designed to protect the system components from frost and corrosion.



Part Number 8718660945
Description Pre-mixed solar fluid Tyfocor® L, 5.2 gallon (20 L)



Part Number 8718571374
Description Pre-mixed solar fluid Tyfocor® L "G" OG300, 5.2 gallon (20 L)

Features & benefits:

- ▶ Specifically engineered for use in Bosch solar thermal systems
- ▶ High quality, pre-mixed solar fluid mixture consisting of polypropylene glycol and water
- ▶ Non-toxic / food grade and biologically degradable
- ▶ Broad operational range from -35°F to 338°F (-37°C to 170°C)



Mounting hardware

versatile mounting solutions for quick, easy installation

Offering the perfect collector mounting solution for sloped roofs and flat roofs including shingle, tile and corrugated metal, as well as wall mounting installation.

Features & benefits:

- ▶ Designed to ensure the most aesthetic installations
- ▶ Use of high quality aluminum hardware that can withstand the most challenging environments, such as those exposed to high wind and snow loads
- ▶ Allow for flexible collector angles to optimize system performance based on application requirements
- ▶ Adjustable roof-jacks and pre-drilled rails require only an Allen wrench to install Bosch collectors
- ▶ Wind load calculations are PE stamped according to building codes throughout North America



SLOPED ROOF MOUNTING



FLAT ROOF MOUNTING



TILT MOUNTING



WALL MOUNTING

Sloped roof mounting hardware

Three different roof attachments are available from Bosch, providing optimal and secure fastening for collectors on sloped roofs quickly and easily.

Roof-jack sets



Part Number 7739300281
Description Roof-jack set for asphalt shingle (set of 4)

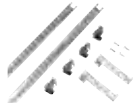


Part Number 7739300436
Description Roof-jack set, adjustable for interlocking tile (set of 4)

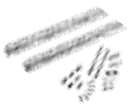


Part Number 7739300439
Description Roof-jack set, hanger bolts for corrugated sheet, flat shingle (set of 4)

Basic roof mounting sets



Part Number 7739300440
Description Basic roof mounting set, portrait

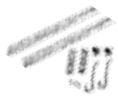


Part Number 7739300442
Description Basic roof mounting set, landscape

Extension roof mounting sets



Part Number 7739300441
Description Extension roof mounting set, portrait



Part Number 7739300443
Description Extension roof mounting set, landscape

Auxiliary mounting sets





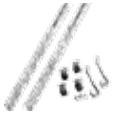
Part Number 7739300444
Description Auxiliary rail, basic roof mounting set, portrait



Part Number 7739300445
Description Auxiliary rail, extension roof mounting set, portrait

Wind, snow & ice loads*



			
Part Number	7739300448	7739300449	7739300450
Description	Snow load rail, interlocking tile, portrait	Snow load rail, flat shingle, portrait	Snow load rail, corrugated sheet, portrait



Features & benefits:

- ▶ Adjustable roof-jacks were specifically designed to offer the necessary flexibility and adaptation for S-tile, barrel tile and similar interlocking tile roofs
- ▶ Hanger bolts are suitable for corrugated metal roofs, flat shingle roofs, mission and similar tile roofs, as well as other roofing materials, offering flexibility with attachment to the substructure while being height adjustable and easy to install

*Please reference Bosch engineering & sizing documents for wind, snow & ice load conditions.

Flat roof mounting hardware

Intended for installation of Bosch collectors on flat surfaces, surfaces with a shallow pitch of 6/12 (25°) or less and landscape positioned collectors mounted on-wall. Collector tilt angle can be adjusted from 30° - 60°. For situations where the flat roof mounting system cannot be attached to the substructure of the building, or where additional support is needed, ballast trays are available in sets of four per collector to be loaded with concrete blocks or similar ballast for added weight.



Basic roof mounting sets



Part Number 7739300454
Description Basic roof mounting set, 1 collector, portrait



Part Number 7739300456
Description Basic roof mounting set, 1 collector, landscape

Extension roof mounting sets



Part Number 7739300455
Description Extension roof mounting set, 1 collector, portrait



Part Number 7739300457
Description Extension roof mounting set, 1 collector, landscape

Auxiliary mounting sets



Part Number 7739300444
Description Auxiliary, basic roof mounting set, portrait



Part Number 7739300445
Description Auxiliary, extension roof mounting set, portrait



Part Number 7739300459
Description Auxiliary mounting bracket, portrait



Part Number 7739300446
Description Auxiliary, basic roof mounting set, landscape



Part Number 7739300447
Description Auxiliary, extension roof mounting set, landscape



Part Number 7739300460
Description Auxiliary mounting bracket, landscape

Ballast tray set



Part Number 7739300458
Description Ballast tray set, 1 collector, 4 trays, portrait & landscape

A system consists of:

- ▶ Adjustable tilt angle
- ▶ Anti-slip protection for ease of installation
- ▶ Integrated collector clamps

Installers select:

- ▶ One basic system for the first collector in each row
- ▶ One extension system for each additional collector in that row
- ▶ In addition to these, choose the correct roof hooks depending on the type of roof surface

Tilt mounting hardware

Tilt mounting hardware offers rack mounting for flat and shallow tilted roofs at a competitive price, approximately 30% - 40% lower than standard flat roof racks. Collector tilt angle can be adjusted from 15° - 35°. There is a basic set that covers the first collector of each row, and each additional collector requires an extension set.



Basic roof mounting sets



Part Number 7747025400
Description Tilt mount basic set, portrait



Part Number 7747025405
Description Tilt mount basic set, landscape

Extension roof mounting sets



Part Number 7747025401
Description Tilt mount extension, portrait



Part Number 7747025406
Description Tilt mount extension, landscape

Auxiliary mounting sets



Part Number 7747025403
Description Tilt mount auxiliary rail, portrait



Part Number 7739300444
Description Auxiliary, basic roof mounting set, portrait



Part Number 7739300445
Description Auxiliary, extension roof mounting set, portrait



Part Number 7739300446
Description Auxiliary, basic roof mounting set, landscape



Part Number 7739300447
Description Auxiliary, extension roof mounting set, landscape

Roof-jack sets & support



Part Number 7747025402
Description Tilt mount support, portrait



Part Number 7747025408
Description Tilt mount support, landscape



Part Number 7747025413
Description Roof-jack slate / shingle, twin set, portrait & landscape



Part Number 7747029184
Description Roof-jack corrugated roof, twin set, portrait & landscape

Features & benefits:

- ▶ Simplified mounting system for tilt angles up to 35°
- ▶ Made of light weight, anodized aluminum for corrosion resistance

A system consists of:

- ▶ Adjustable tilt angles
- ▶ Rails
- ▶ Integrated collector clamps

Wall mounting hardware

Bosch offers basic and extension roof mounting sets suitable for wall mounting. Suitable for buildings where a roof installation is not possible. Wall must have adequate load bearing capacity.



Basic roof mounting set



Part Number 7739300456
Description Basic roof mounting set, 1 collector, landscape

Extension roof mounting set

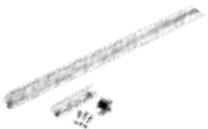


Part Number 7739300457
Description Extension roof mounting set, 1 collector, landscape

Auxiliary mounting set



Part Number 7739300446
Description Auxiliary, basic roof mounting set, landscape



Part Number 7739300447
Description Auxiliary, extension roof mounting set, landscape



Part Number 7739300460
Description Auxiliary mounting bracket, landscape

Features & benefits:

- ▶ Collectors can be mounted to provide shade to keep windows and rooms cool
- ▶ In winter, when the sun's path is lower, solar gain can provide an additional source of energy

Advisory:

- ▶ Snow and ice accumulating on the collectors may give way and slide off suddenly. Take provisions that the installation does not pose a risk to property or cause personal injury.

Mounting hardware kits

Applicable for sloped roof & flat roof mounting

Bosch offers complete mounting kits pre-configured to the number of collectors and type of roof installation.

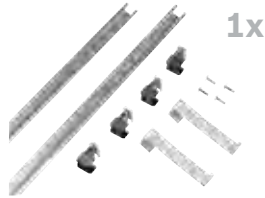
Sloped roof shingle mounting kits

Components included in two collector kit:

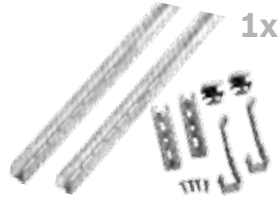
- 2 x Roof-jack connection sets, flat shingle
- 1 x Sloped roof basic mounting set, portrait
- 1 x Sloped roof extension mounting set, portrait



2x



1x



1x



2

Part Number ORMK2CS

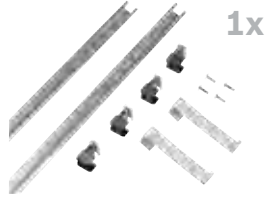
Description Sloped roof mounting kit, 2 collectors, shingle

Components included in three collector kit:

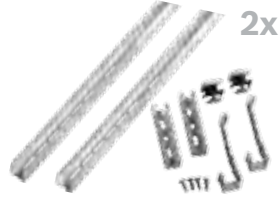
- 3 x Roof-jack connection sets, flat shingle
- 1 x Sloped roof basic mounting set, portrait
- 2 x Sloped roof extension mounting set, portrait



3x



1x



2x



3

Part Number ORMK3CS

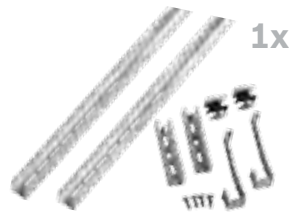
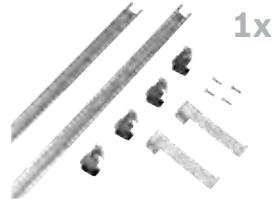
Description Sloped roof mounting kit, 3 collectors, shingle

Mounting hardware kits

Sloped roof tile mounting kits

Components included in two collector kit:

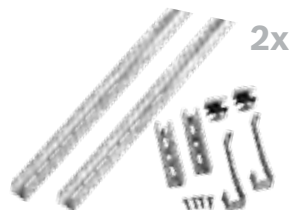
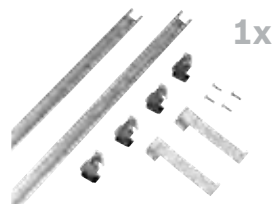
- 2 x Roof-jack connection sets, tile
- 1 x Sloped roof basic mounting set, portrait
- 1 x Sloped roof extension mounting set, portrait



Part Number ORMK2CT
Description Sloped roof mounting kit, 2 collectors, tile

Components included in three collector kit:

- 3 x Roof-jack connection sets, tile
- 1 x Sloped roof basic mounting set, portrait
- 2 x Sloped roof extension mounting set, portrait



Part Number ORMK3CT
Description Sloped roof mounting kit, 3 collectors, tile

Mounting hardware kits

Flat roof ballast mounting kits

Components included in two collector kit:

- 2 x flat roof ballast tray set, 1 collector
- 1 x flat roof basic mounting set, 1 collector, portrait
- 1 x flat roof extension mounting set, 1 collector, portrait
- 1 x flat roof auxiliary rail, portrait



Part Number FRMK2CB
Description Flat roof mounting kit, 2 collectors, ballast

Components included in three collector kit:

- 3 x flat roof ballast tray set, 1 collector
- 1 x flat roof basic mounting set, 1 collector, portrait
- 2 x flat roof extension mounting set, 1 collector, portrait
- 1 x flat roof auxiliary rail, portrait



Part Number FRMK3CB
Description Flat roof mounting kit, 3 collectors, ballast



Solar controls

TR0301 U, TR0603mc U



The solar controls ensure the circulation pump is running and automatically decide when to run the pump station to deliver heat from the collectors to the storage tank when the benefit of free solar energy is available.



CONTROLS



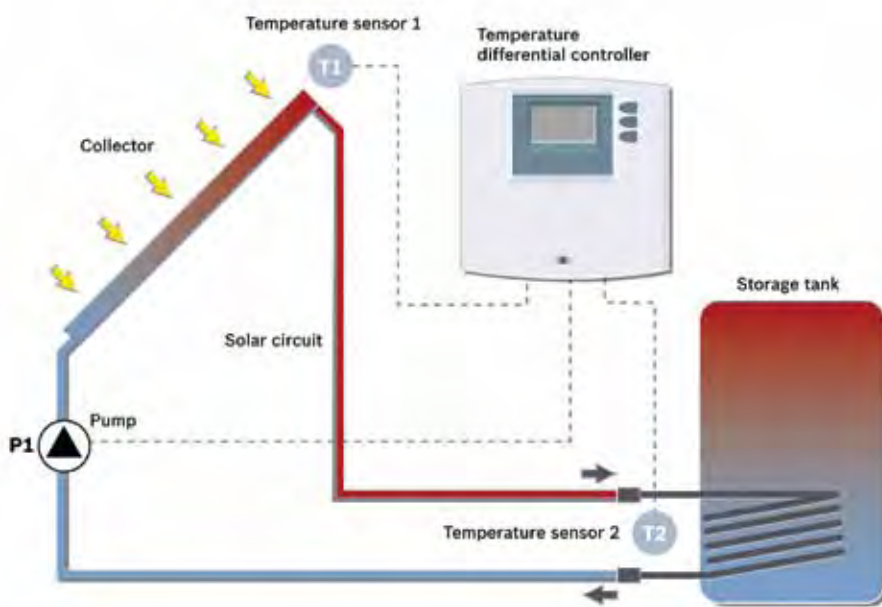
ACCESSORY

TR0301 U solar controller

The TR0301 U is a controller for basic solar thermal hot water systems. It features three temperature sensor inputs and an output for a solar circulator. The basic unit includes two temperature sensors (PT 1000 sensor).



Part Number 7747208381
Description TR0301 U solar controller



Features & benefits:

- ▶ Backlight LCD display
- ▶ Animated representation of solar system functions
- ▶ Anti-freeze function
- ▶ Tank discharge function for heat dissipation
- ▶ Storage tank max. temperature set-point
- ▶ Temperature display for storage tank and collector
- ▶ Pump operation status display
- ▶ Temperature sensor and system monitoring
- ▶ Temperature display in °C/°F

TR0603mc U solar controller

The TR0603mc U is an intelligent controller that manages solar systems from simple hot water systems to systems with multiple tanks, hot water, space heating and pool heating demands. It has six PT-1000 sensor inputs and three programmable outputs. The controller's animated display simplifies programming and provides important diagnostic information in real time. The TR0603mc U has data logging capability and can measure energy collected when a flow meter is connected. Data tracked can be displayed and analyzed using the TS analyzer software (see page 38) . The unit includes three temperature sensors (PT 1000 sensor).

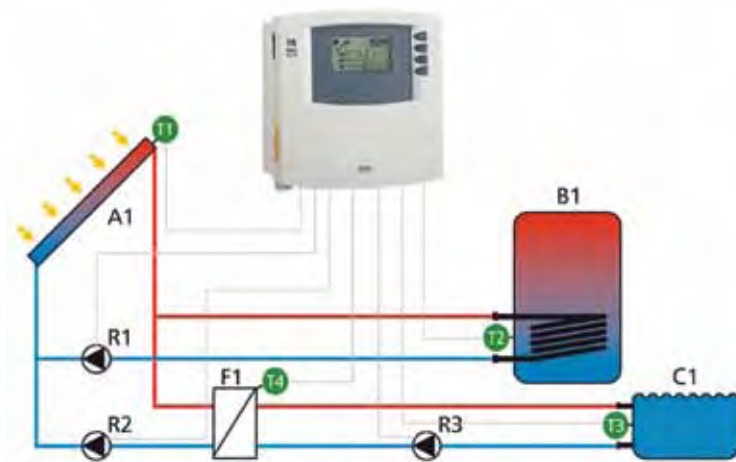


Part Number 8718572810
Description TR0603mc U solar controller



Features & benefits:

- ▶ Microprocessor controlled with date and time, data logging capability with data stored on an SD media card
- ▶ Electronic pump speed control on two outputs
- ▶ One relay output and animated multifunction LCD display
- ▶ Forty pre-programmed systems and numerous additional functions for meeting customer specific applications
- ▶ Onboard monitor that indicates error messages in full text for easy servicing and maintenance
- ▶ Warranty: 2-years



Solar PT1000 sensor

The PT1000 sensors are 1000 ohm temperature sensors for additional temperature control using the TR0301 U and TR0603mc U solar controllers.



Part Number 7739300062
Description Solar PT1000 sensor



Solar accessories

Lightning protection

The collector temperature sensor in the lead collector can be subject to overvoltage and potential damage during a thunderstorm because of its exposed location on the roof. The overvoltage protection junction box is designed for buffering lightning strikes in the vicinity of the solar collectors. Safety diodes limit this overvoltage to a level that will not damage the controller. The junction box must be located within 10 ft. (3.5 m) of the collector temperature sensor.



Part Number 83006120
Description Lightning protection

Solar filling station

The solar filling station is a powerful tool for flushing, filling, bleeding, and pressurizing solar thermal systems. This dedicated station with its cleanable filter prevents contaminated heat transfer fluid from entering solar thermal systems. The solar filling station has large wheels for easy transport to the job site and a large fluid reservoir with cleanout opening. A ten-foot long, high-temperature rubber hose is also included.



Part Number 8718530474
Description Solar filling station

Manual filling pump

Used for servicing pressurized solar thermal systems with antifreeze/water mixture. This low-cost filling system works quickly, by manually connecting direct to the pump station. The manual pump includes a check valve, and hose bib fitting. Please note the manual pump is recommended for topping off the system or increasing pressure - not filling or charging the system.



Part Number 83007262
Description Manual filling pump

Honeywell diverter valves



Part Number V404A1191/U
Description Honeywell AM-1 diverter / mixing valve
(2 needed for tankless with solar)

Watts / ESBE tempering valves



Part Number 83013079
Description ESBE tempering valve 3/4" MNPT; 95 - 140°F (35 - 60°C)



Residential solar packages selection tool

Pre-configured systems designed to meet a variety of hot water needs. Bosch residential package components include collectors, pump station, line set, connection set, expansion tank, controls and heat transfer fluid. Bosch OG300 certified solar thermal system packages are Energy Star® rated.



COLLECTORS



PUMP STATION



LINE SET



CONNECTION SET



EXPANSION TANK



CONTROLS



HEAT TRANSFER FLUID

Residential solar system selection



Part Number	FKT 1-1OG300	FKT 1-1	FKC 1-1OG300	FKC 1-1
Description	OG300 Top Line 1-2 person package	Top Line 1-2 person package	OG300 Comfort Line 1-2 person package	Comfort Line 1-2 person package



Part Number	FKT 1-2OG300	FKT 1-2	FKC 1-2OG300	FKC 1-2
Description	OG300 Top Line 2-4 person package	Top Line 2-4 person package	OG300 Comfort Line 2-4 person package	Comfort Line 2-4 person package



Part Number	FKT 1-3OG300	FKT 1-3	FKC 1-3OG300	FKC 1-3
Description	OG300 Top Line 3-5 person package	Top Line 3-5 person package	OG300 Comfort Line 3-5 person package	Comfort Line 3-5 person package

Bosch DHW Solar Package Specifications													
		1-2 Person				2-4 Person				3-5 Person			
Components Included	Item	Top Line		Comfort Line		Top Line		Comfort Line		Top Line		Comfort Line	
Part Number		FKT 1-1OG300	FKT 1-1	FKC 1-1OG300	FKC 1-1	FKT 1-2OG300	FKT 1-2	FKC 1-2OG300	FKC 1-2	FKT 1-3OG300	FKT 1-3	FKC 1-3OG300	FKC 1-3
SRCC Number		2009121L	-	2009121K	-	2009121M	-	2009121C	-	2009121N	-	2009121E	-
Collectors	Portrait	1	1	1	1	2	2	2	2	3	3	3	3
Controller	TR0301 U	x	x	x	x	x	x	x	x	x	x	x	x
Pump Stations	KS-105	x	x	x	x	x	x	x	x	x	x	x	x
Expansion Tank	7 gal (25L)	x	x	x	x	x	x	x	x	x	x	x	x
Expansion Tank Connection Set	AAS	x	x	x	x	x	x	x	x	x	x	x	x
Air Vent	FKT-1	x	x	-	-	x	x	-	-	x	x	-	-
	FKC-1	-	-	x	x	-	-	x	x	-	-	x	x
Connection Set	Sloped Roof	x	x	x	x	x	x	x	x	x	x	x	x
Line Set	50' Roll	x	x	x	x	x	x	x	x	x	x	x	x
Pre-Mixed Heat Transfer Fluid	Tyfocor® L "G"	x	-	x	-	x	-	x	-	x	-	x	-
	Tyfocor® L	-	x	-	x	-	x	-	x	-	x	-	x
Optional Components Not Included in Package													
Mounting Hardware	Sloped Roof Flat Roof On-Wall	o	o	o	o	o	o	o	o	o	o	o	o
Storage Tank	SOL-RET	SOL-RET 80	SOL-RET 80	SOL-RET 80	SOL-RET 80	SOL-RET 80	SOL-RET 80	SOL-RET 80	SOL-RET 80	SOL-RET 120	SOL-RET 120	SOL-RET 120	SOL-RET 120
Advanced Controller	TR0603mc U	o	o	o	o	o	o	o	o	o	o	o	o

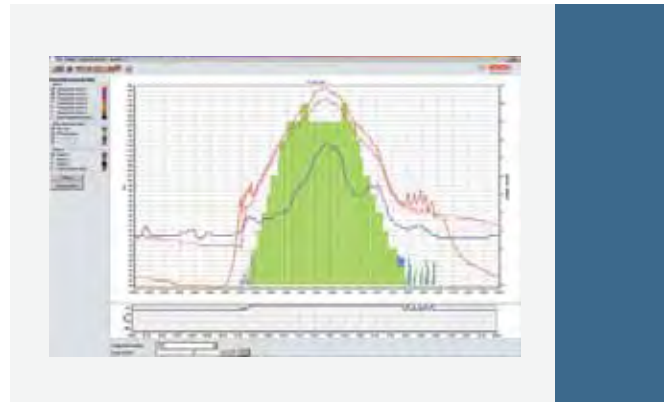
x = included | o = optional | - = N/A

Solar design tools & software

TS analyzer software

Analysis software used in conjunction with the data logging capability of the TR0603mc U controller. Provides visualization of the solar systems performance over time.

Visit www.bosch-climate.us/TSAnalyzer to download this software.



GetSolar professional sizing tool

GetSolar is a professional planning tool to help design and size solar thermal systems. The step-by-step wizard tool makes it easy to use for the novice. Experts can modify system parameters in order to fine tune the design of domestic hot water, space and pool heating systems.

Visit www.bosch-climate.us/GetSolar to access this tool.

