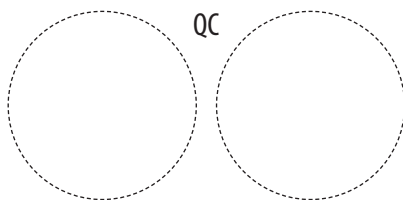


Catalogue No.

Production date



Galmet®

Installation and operation manual

Galmet solar systems

Collectors:

- | | |
|---|------------|
| <input type="checkbox"/> KSG21 Premium GT | _____ pcs. |
| <input type="checkbox"/> KSG21 GT | _____ pcs. |
| <input type="checkbox"/> KSG27 Premium GT | _____ pcs. |
| <input type="checkbox"/> KSG27 GT | _____ pcs. |
| <input type="checkbox"/> KSG PT 15 | _____ pcs. |
| <input type="checkbox"/> KSG PT 20 | _____ pcs. |

Vessel:

- | |
|----------------------------------|
| <input type="checkbox"/> 18/19 l |
| <input type="checkbox"/> 24/25 l |
| <input type="checkbox"/> 35/36 l |
| <input type="checkbox"/> 50 l |

Glycol:

- | |
|-------------------------------|
| <input type="checkbox"/> 20 l |
| <input type="checkbox"/> 40 l |

Water heater:

- | |
|---|
| <input type="checkbox"/> without spiral coil |
| <input type="checkbox"/> with one spiral coil |
| <input type="checkbox"/> bivalent |
| <input type="checkbox"/> combined vessel |

Pump group:

- | |
|---|
| <input type="checkbox"/> two-way with air separator |
| <input type="checkbox"/> one-way |

Controller:

- | |
|---------------------------------------|
| <input type="checkbox"/> STDC |
| <input type="checkbox"/> MTDC |
| <input type="checkbox"/> Smart GT Sol |
| <input type="checkbox"/> ST-402N |

Connection kit:

- | |
|---|
| <input type="checkbox"/> a set of connectors with mechanical vent |
|---|

Capacity:

- | | |
|--------------------------------|------------------------------------|
| <input type="checkbox"/> 140 l | <input type="checkbox"/> 300/80 l |
| <input type="checkbox"/> 200 l | <input type="checkbox"/> 380/120 l |
| <input type="checkbox"/> 250 l | <input type="checkbox"/> 500/160 l |
| <input type="checkbox"/> 300 l | <input type="checkbox"/> 600/200 l |
| <input type="checkbox"/> 400 l | <input type="checkbox"/> 800/200 l |
| <input type="checkbox"/> 500 l | |

⚠ Please read the instructions carefully before beginning the installation and use of the product.

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1. Basic information



Wiring and start-up of the solar installation can be made only by a company or a person trained by the manufacturer, which has the appropriate permissions. Otherwise, the warranty on the device will not be granted.



The symbol presented beside signifies that it is prohibited to dispose of worn electrical and electronic devices together with other waste. These products should be delivered to assigned waste collection points for waste processing. A proper recycling of electrical and electronic devices helps to protect the natural environment and prevents negative impact on human health.

1.1. Work safety

Prior to doing any installation work, please read the user manuals of each of the devices and follow the safety instructions associated with working at heights. Please read this user manual carefully. Improper use will invalidate the warranty and can cause permanent damage to the device. The device is not intended for use by persons (including children) with reduced physical, sensory or mental disability or lack of experience and knowledge. Unless it is done under the supervision of a person responsible for their safety and in accordance with the user manual. The device should be installed in accordance with good engineering practice and in accordance with the rules and standards relevant in a given country.

Water temperature that exceeds 55°C can cause serious tissue damage. It is recommended to use anti-burn mixing valve on the DHW exit. Special attention should be paid to avoid burns while the heated water is used by the children, the disabled or elderly people.

The device is connected to the mains by a cord. Electrical outlet must be earthed (grounded). In case of malfunction, the device should be shut down, disconnect from the power and service should be contacted.



If the power cord is damaged, it should be replaced by a special cord available from the manufacturer or at a proper service centres.

This manual contains a description of the elements included in the mounting kit for the flat solar collectors on the pitched roof (30° to 60°) and can not be used as a guide for the mounting of other devices. Assembly in accordance with the manufacturer's instructions guarantees the safety and proper operation of the solar installation. It is recommended to hire a professional roofing company to work on the roof, as this kind of working environment is very dangerous.



There is a risk of burns, especially when parts of the solar system (especially the solar collector) are exposed to the sun for a long time! Therefore, it is recommended to use protective clothing and to cover (f.ex. with a tarpaulin) solar panels and other components of the solar system when the work is done near them.

Prior to doing any installation work, check for all of the solar system components and their condition, as they could get damaged during transportation.

1.2. Device description

Solar collectors are used to collect sun's energy and pass it through the so-called heating medium and an exchanger located in the storage DHW tank, to heat the boiler or the pool water. The collectors can be used throughout the year. For proper operation of the solar collector, and for maximum efficiency of the entire installation it is recommended to install the collectors perpendicular to the oncoming sunlight. Recommended angle of the collector: 35° to 45° - for the year-round installations; -30° - for installations used in summer; -60° - for installations used in winter; - collector's orientation in the southern direction or close to it. It is recommended to install solar collectors on the south side of the roof. When installing the collectors, pay attention to wind protection, as strong winds can overturn the collectors. The collector's field should be located in a manner that will not cast shadows on the absorber, shadows that could be cast by buildings, trees, etc. When installing more than one row of the solar collectors, it is important that the previous row does not cast shadow on the next row. Our offer includes 2 types of solar collectors: flat and evacuated tube. Flat solar collectors are a double harp construction, and the evacuated tube collectors are of a heat-pipe type.

2. Installation

2. Installation



Warning! Aluminium collectors must be connected to the installation by stainless steel pipes. In addition, aluminium collectors use different connection sets, as well as special glycol type, intended for aluminium collectors only.

2.1. Connection kit

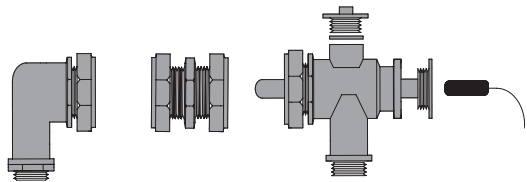
The connection kit includes:

Part	pcs.	Remarks
X-piece on clamp Ø22 mm x 1/2"GW x 1/2"GW x 3/4"GZ with submersion sleeve and mechanical vent	1	-
Bend on clamp Ø22 mm x 3/4" GZ	1	-
Double-clamp coupling Ø22 mm x Ø22 mm	1	Applies to sets with two flat solar collector of a Premium type, as well as tube collectors - type KSG PT. Each additional collector (above 2) requires an additional coupling.

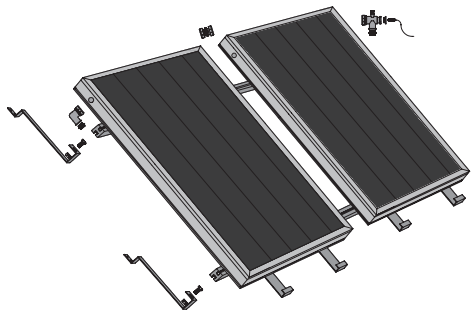


When using the stainless steel, flexible pipes - FLEX in the installation, it is recommended to use a self-inflating station for venting and filling the installation. When venting and filling the installation manually aeration may frequently occur.

2.2. Connecting the KSG21/27 Premium GT, KSG21/27 GT and KSG PT15, KSG PT20 collectors



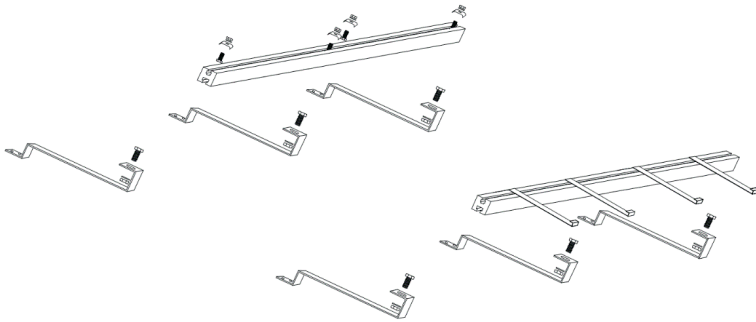
Connection kit for 2 collectors.



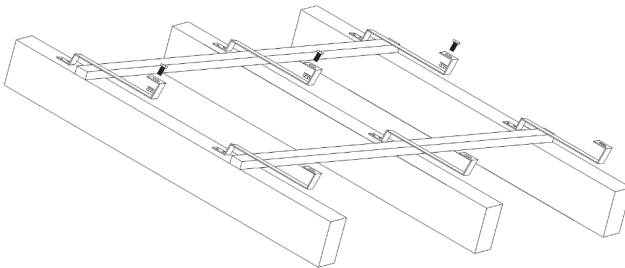
Exemplary mounting of the connection kit for Galmet's solar collectors

2.3. Installation kits for flat solar collectors

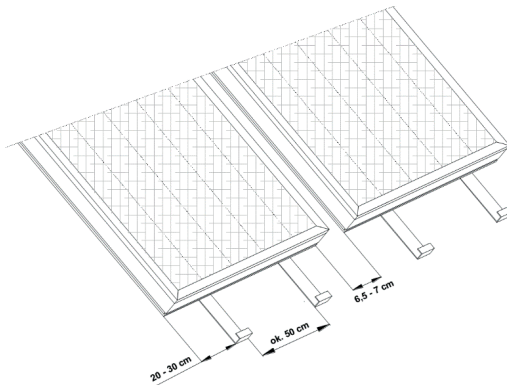
2.3.1. The elements included in the installation kit for the KSG21/27 Premium GT, KSG21/27 GT flat solar collectors, intended for pitched roofs covered with tiles



Installation kit for 2 flat solar collectors on a pitched roof covered with tiles.

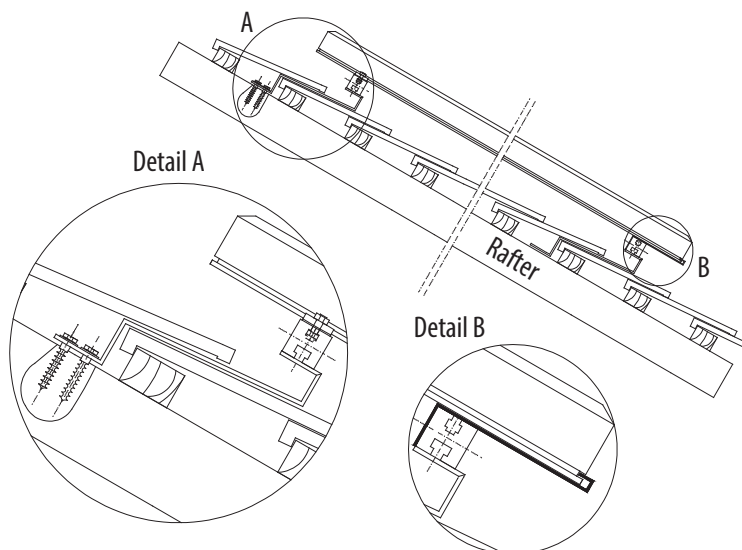


Exemplary mounting of the brackets to the rafters on a pitched roof covered with tiles.



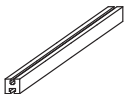

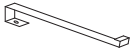





Spacing of the safety hooks.

2. Installation

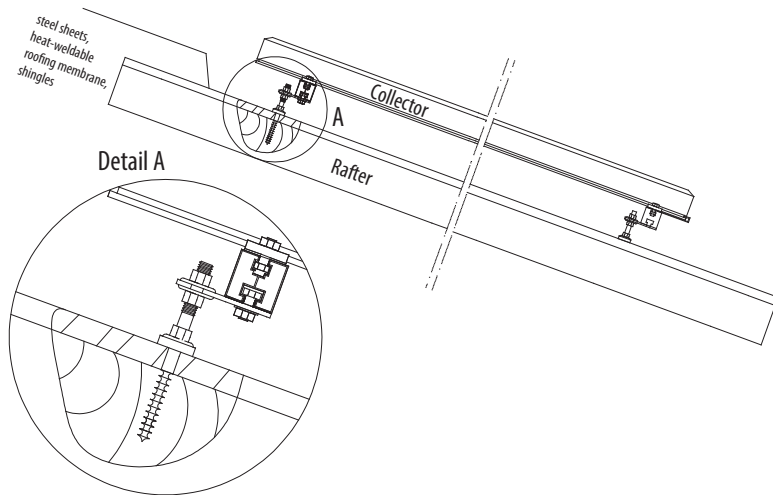


Exemplary mounting of the flat solar collectors on a pitched roof covered with tiles.

List of elements of the installation kit for a pitched roofs covered with tiles:

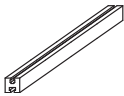
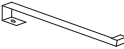

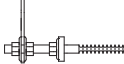



Element / Number of collectors		KSG21 Premium GT / KSG27 Premium GT				
		1	2	3	4	5
Two-pipe profile		2 x 112 cm	2 x 224 cm	2 x 112 cm 2 x 224 cm	4 x 224 cm	2 x 112 cm 4 x 224 cm
		2 x 144 cm	2 x 288 cm	2 x 144 cm 2 x 288 cm	4 x 288 cm	2 x 144 cm 4 x 288 cm
Stainless steel hook for tiles		4	6	8	10	12
Safety hook		2	4	6	8	10
Retaining plate		4	8	12	16	20
8 mm screw with a pin and a washer		8	12	16	20	24
M10 screw, washer, nut		6	10	18	22	30
M8 screw, washer, nut		4	8	12	16	20
Two-pipe profile connector		0	0	2	2	4

2.3.2. The elements included in the installation kit for the KSG21/27 Premium GT, KSG21/27 GT flat solar collectors, intended for pitched roofs covered with steel sheets, heat-weldable roofing membrane or shingles



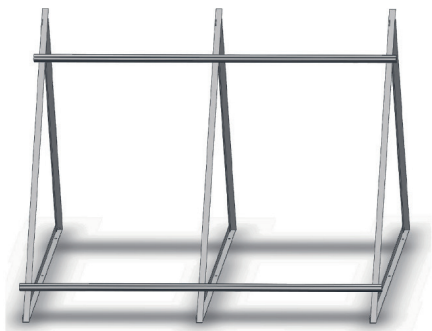
Exemplary mounting of the flat solar collectors on a pitched roof covered with steel sheets, heat-weldable roofing membrane or shingles.

List of elements of the installation kit for a pitched roofs covered with steel sheets, heat-weldable roofing membrane or shingles:

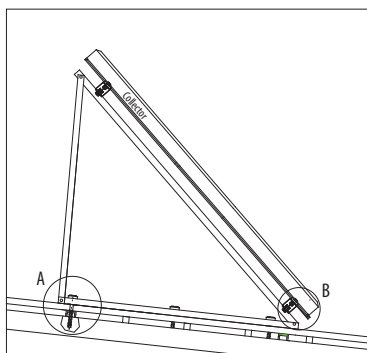
Element / Number of collectors		KSG21 Premium GT / KSG27 Premium GT				
		1	2	3	4	5
Two-pipe profile		2 x 112 cm	2 x 224 cm	2 x 112 cm 2 x 224 cm	4 x 224 cm	2 x 112 cm 4 x 224 cm
		2 x 144 cm	2 x 288 cm	2 x 144 cm 2 x 288 cm	4 x 288 cm	2 x 144 cm 4 x 288 cm
Safety hook		2	4	6	8	12
Retaining plate		4	8	12	16	10
Rafter bolt 10 x 200		4	6	8	10	12
M10 screw, washer, nut		6	10	18	22	30
M8 screw, washer, nut		4	8	12	16	20
Two-pipe profile connector		0	0	2	2	4

2. Installation

2.3.3. The elements included in the installation kit for the KSG21/27 Premium GT, KSG21/27 GT flat solar collectors, intended for a flat roof

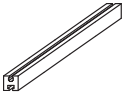
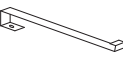


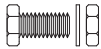




Frame for mounting flat solar collectors on a flat roof.



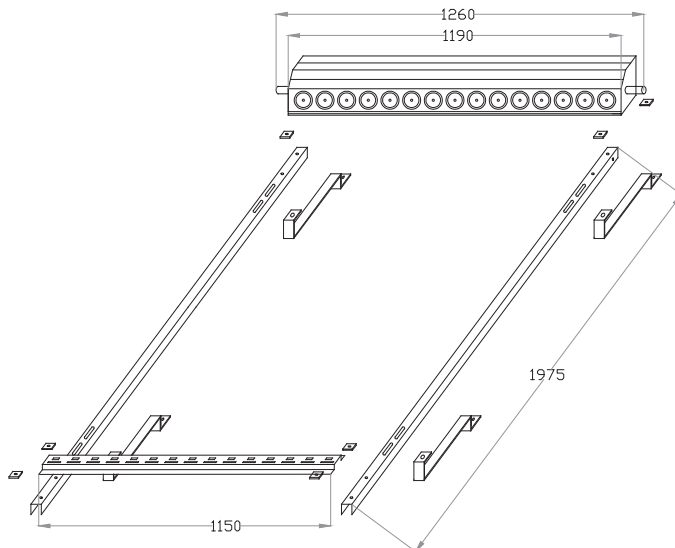
Exemplary mounting of the flat solar collectors on a flat roof.

List of elements of the installation kit for a flat roofs:

Element / Number of collectors		KSG21 Premium GT / KSG27 Premium GT				
		1	2	3	4	5
Two-pipe profile		2 x 112 cm	2 x 224 cm	2 x 112 cm 2 x 224 cm	4 x 224 cm	2 x 112 cm 4 x 224 cm
		2 x 144 cm	2 x 288 cm	2 x 144 cm 2 x 288 cm	4 x 288 cm	2 x 144 cm 4 x 288 cm
Triangle	-	2	3	4	5	6
Safety hook		2	4	6	8	10
Retaining plate		4	8	12	16	20
8 mm screw with a pin and a washer		6	9	12	15	18
M10 screw, washer, nut		6	10	18	22	30
M8 screw, washer, nut		10	17	24	31	38
Two-pipe profile connector		0	0	2	2	4

2.4. Installation kits for evacuated tube collectors

2.4.1. The elements included in the installation kit for the KSG PT 15 evacuated tube collectors, intended for pitched roofs covered with tiles



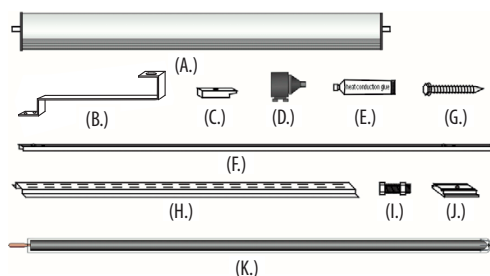
Measurements and components of the installation kit for the KSG PT 15 evacuated tube collector.

Specification of the KSG PT15 evacuated tube collector:

Model	Tube width	Frame length	Effective length of the tube	Lower beam width	Depth
KSG PT15	1190 mm	1975 mm	1720 mm	1150 mm	135 mm

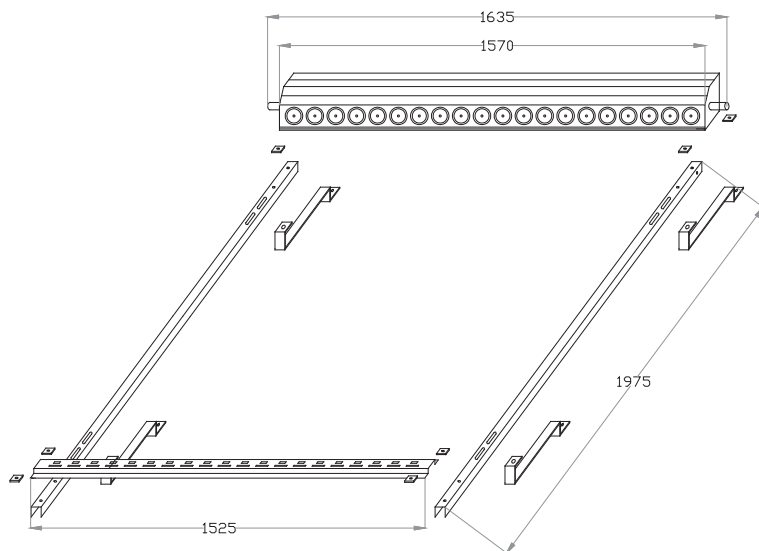
Components of the KSG PT 15 evacuated tube collector:

Symbol	Element	Quantity
(A.)	Collector's head	1
(B.)	Mounting hook	4
(C.)	Pressure Washer	4
(D.)	Support for the evacuated tube	15
(E.)	Thermal paste	1
(F.)	Longitudinal beam	2
(G.)	Wood screw	4
(H.)	Crossbeam	1
(I.)	Mounting screw	13
(J.)	Mounting plate	4
(K.)	Evacuated tube	15



2. Installation

2.4.2. The elements included in the installation kit for the KSG PT 20 evacuated tube collectors, intended for pitched roofs covered with tiles



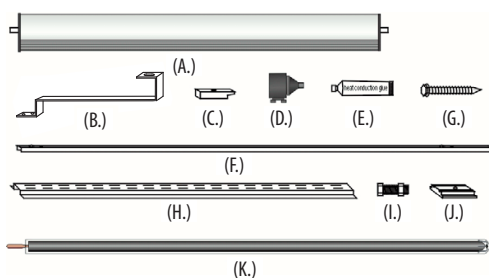
Measurements and components of the installation kit for the KSG PT 20 evacuated tube collector.

Specification of the KSG PT 20 evacuated tube collector:

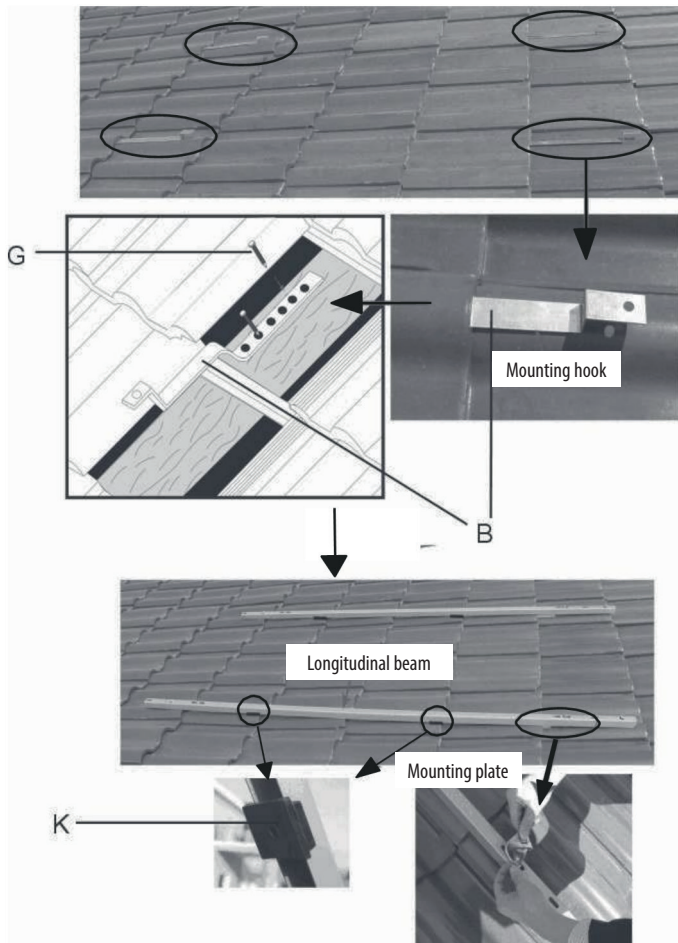
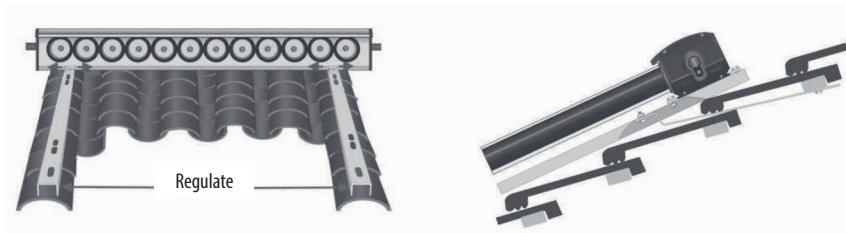
Model	Tube width	Frame length	Effective length of the tube	Lower beam width	Depth
KSG PT15	1570 mm	1975 mm	1720 mm	1525 mm	135 mm

Components of the KSG PT 20 evacuated tube collector:

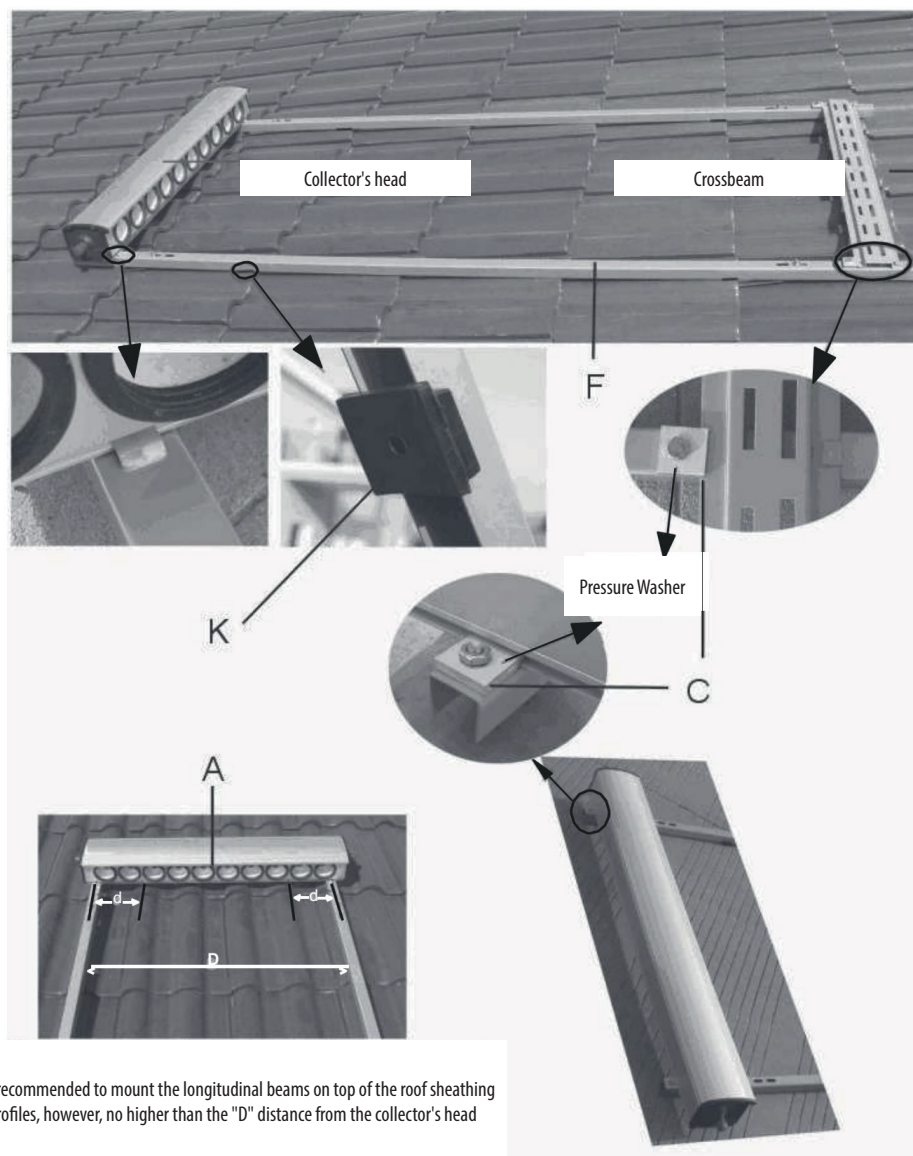
Symbol	Element	Quantity
(A.)	Collector's head	1
(B.)	Mounting hook	4
(C.)	Pressure Washer	4
(D.)	Support for the evacuated tube	20
(E.)	Thermal paste	1
(F.)	Longitudinal beam	2
(G.)	Wood screw	4
(H.)	Crossbeam	1
(I.)	Mounting screw	13
(J.)	Mounting plate	4
(K.)	Evacuated tube	20



2.4.3. Mounting of the evacuated tube collectors on a pitched roof



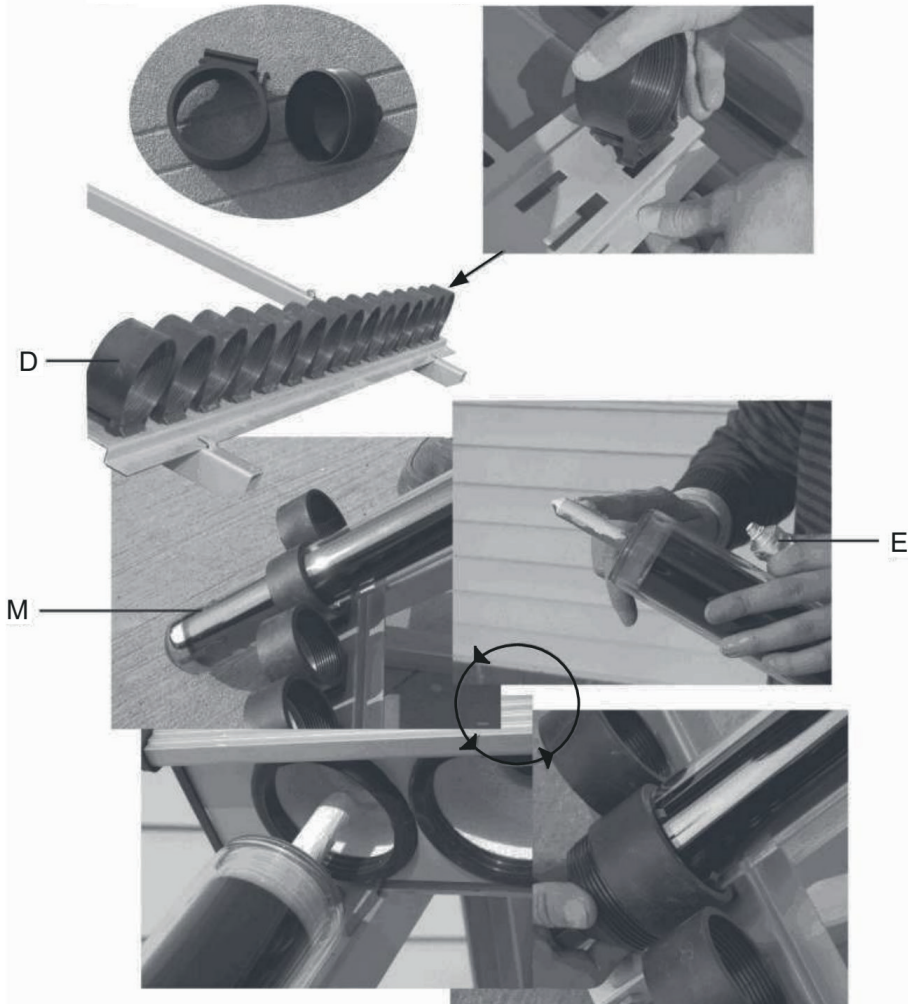
2. Installation



2. Installation

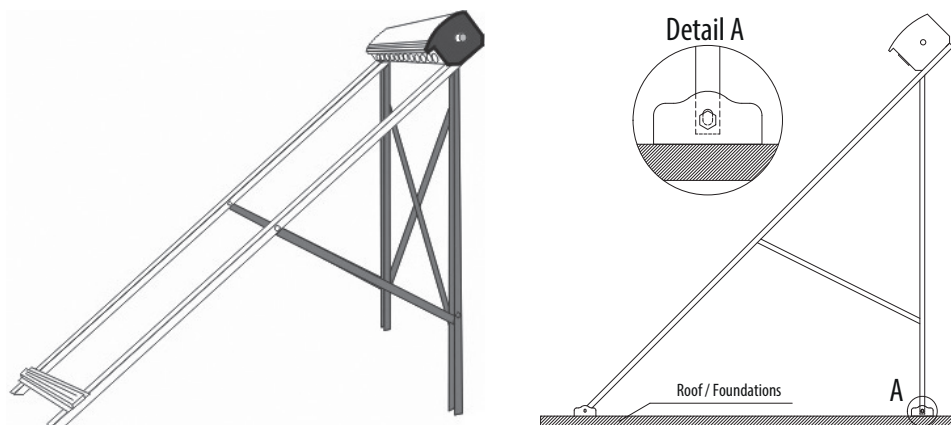


After installing the collector's frame it is necessary to carry out the tube's tightness test. The tubes should be installed in the frame right before starting the installation.



2. Installation

2.4.4. The elements included in the installation kit for the KSG PT 15 and KSG PT 20 evacuated tube collectors, intended for a flat roof



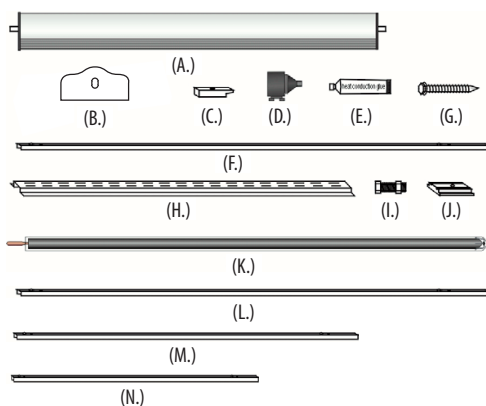
Installation kit for the KSG PT 15 and KSG PT 20 evacuated tube collectors - flat roof.

Specification of the KSG PT15 and KSG PT20 evacuated tube collectors:

Model	Tube width	Frame length	Effective length of the tube	Height with the frame	length with the frame	Depth
KSG PT15	1190 mm	1975 mm	1720 mm	1420 mm / 45°	1400	135 mm
KSG PT20	1570 mm	1975 mm	1720 mm	1420 mm / 45°	1400	135 mm

Components of the KSG PT15 and KSG PT20 evacuated tube collectors:

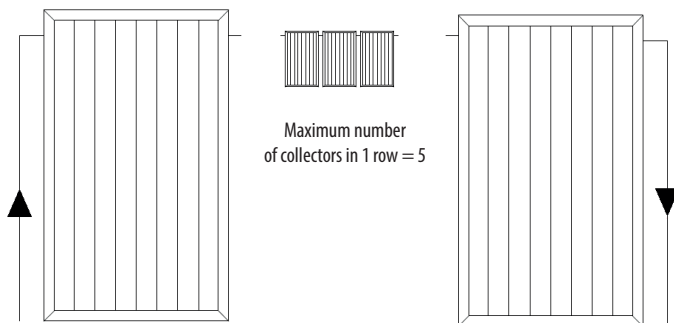
Symbol	Element	Quantity (KSG PT15)	Quantity (KSG PT20)
(A.)	Collector's head	1	1
(B.)	Angle bar	4	4
(C.)	Pressure Washer	4	4
(D.)	Support for the evacuated tube	15	20
(E.)	Thermal paste	1	1
(F.)	Longitudinal beam	2	2
(G.)	Wood screw	4	4
(H.)	Crossbeam	1	1
(I.)	Mounting screw	19	19
(J.)	Mounting plate	4	4
(K.)	Evacuated tube	15	20
(L.)	Main beam	2	2
(M.)	Cross beam	2	2
(N.)	Support beam	2	2



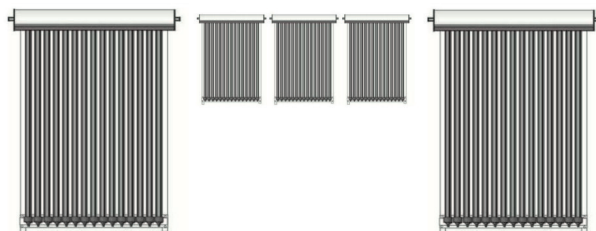
3. Connecting the collectors



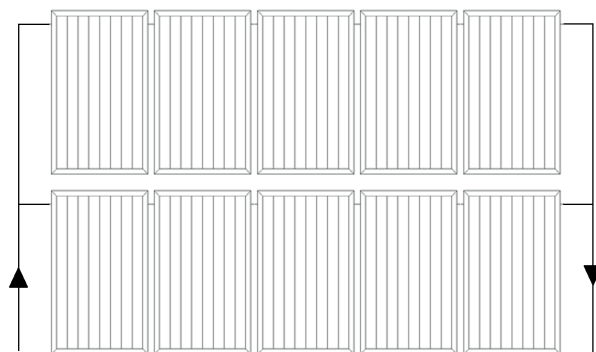
It is recommended to connect at most 5 KSG21/27 Premium GT, KSG21/27 GT or KSG PT 15/20 collectors in one row.



Serial connection of the flat collectors



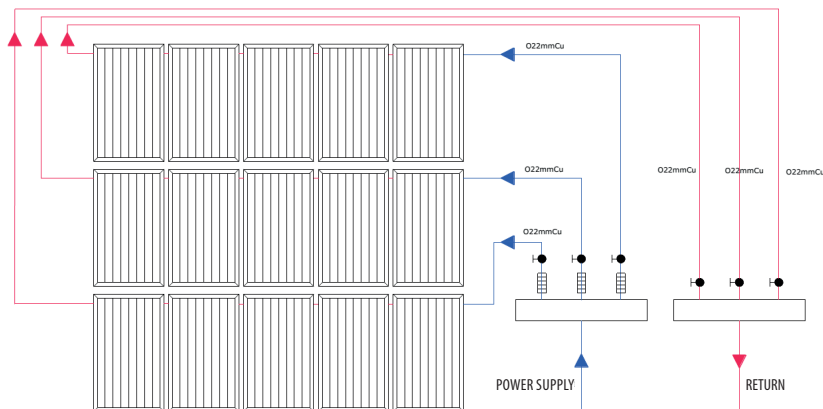
Serial connection of the evacuated tube collectors



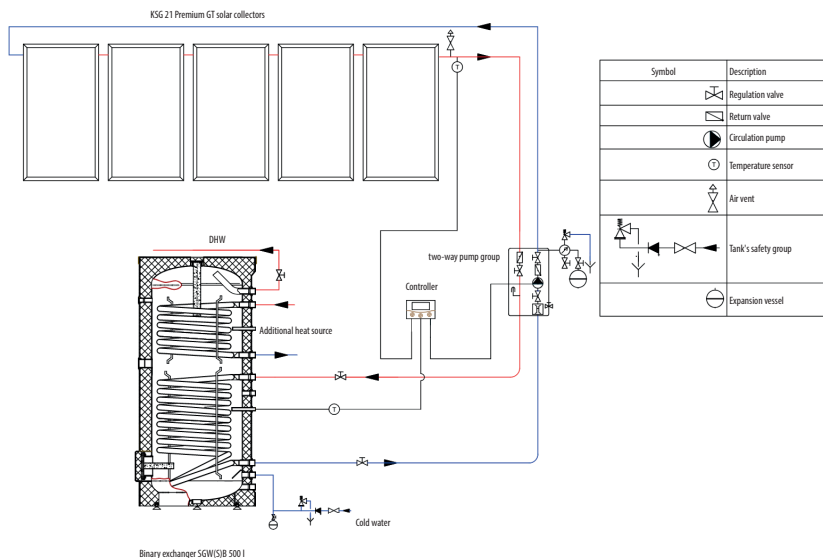
For larger installations, combine the collectors in a serial-to-parallel formation, with up to 5 collectors in one row

3. Connecting the collectors

i With the installations of more than 10 collectors, combine the collectors by using a separator system (no more than 5 collectors in a row) or by using the rotameters installed on each series' supply.



Exemplary mounting of the solar collectors by using a separator system.



Exemplary scheme of a solar installation.

4. Solar controllers / 5. Pump group installation

4. Solar controllers

4.1. STDC controller

It is a compact differential temperature controller designed for simple solar systems. The basic hydraulic schemes include: a solar collector connected to a water heater; and solar collector connected to a swimming pool.

4.2. MTDC controller

This controller is designed for more complex solar systems. It has 20 hydraulic schemes, as well as addition features, like east-west location of the collectors, a function to overload the water heaters, as well as functions to cooperate with heat exchanger and a swimming pool.

4.3. Smart GT Sol controller

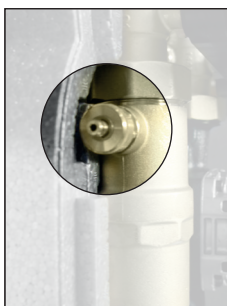
The regulator has 15 hydraulic schemes, colour display, USB port and a slot for a Micro SD memory card - so you can install a software update or read/write the controller's data (ie. error messages).

5. Pump group installation



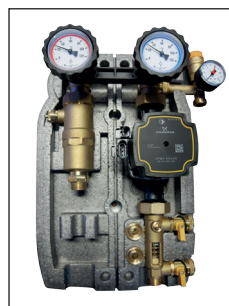
Thermal insulated housing - FFP
Dimensions 277 x 425 x 150 mm.

Front part of the housing covers the whole pump besides the safety valve. Mounting bracket for the 22 mm pipe is located inside. There is a hole in the housing used to control the flow state without the need to dismantle the housing. The back part of the housing is mounted on a steel plate, which allows for mounting of the unit on the walls or directly on the water tank.



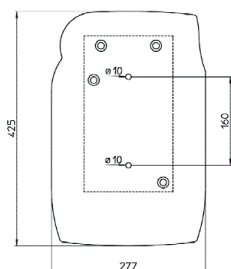
Model with air separator

Air separator is a device that separates the air (small air bubbles) from the glycol fluid. The air accumulates in the top of the separator and is removed by manually by valve during solar installation's operation. The venting is done by turning the valve by 360° repeatedly until the air is completely removed from the separator.



WARNING - RISK OF BURNS:

While venting the unit, the solar fluid - glycol, might leak. It is recommended to put tube on the tip of the venting valve to avoid the possible burns.



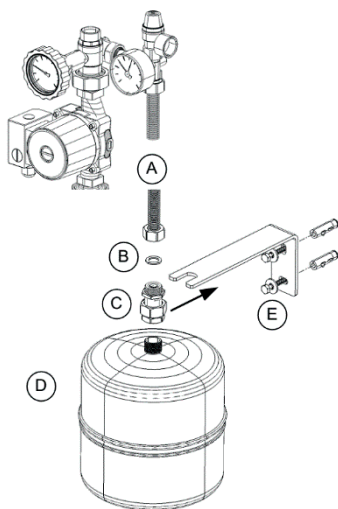
The metal back plate enhances the rigidity of the whole unit and eases the installation of the device on the wall or on the water tank directly.

The two holes located on the back of the device allows for easy installation without the need of dismantling the whole unit.

6. Mounting and connecting the diaphragm vessel

6. Mounting and connecting the diaphragm vessel

6.1. Mounting the diaphragm vessel



(A) - elastic pipe $\frac{3}{4}$ " connects the safety valve of the solar safety group.

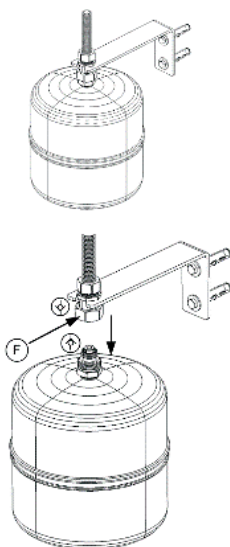
(B) - gasket.

(C) - stopping valve designed to disconnect the diaphragm vessel in a quick and efficient way, without any leakage of the glycol (option).

(D) - diaphragm vessel with a $\frac{3}{4}$ " connection.

(E) - Type L mounting bar with wall plugs and mounting screws. Mount the bar (E) on the wall. Diaphragm vessel (D) to the stopping valve (C) and place it on the L bar in a place it was designed, then tighten the locking nut. Place the gasket (B) on the stopping valve and tighten the nut on the elastic pipe (A).

6.2. Replacing the diaphragm vessel



Stopping valve mounted on the L bar holds the diaphragm vessel and allows for a quick detaching without the risk of glycol leakage.

Unscrewing of the stopping valve's nut (F) allows for easy replacement of the diaphragm vessel. The top but of the stopping valve can NOT be unscrewed!

The two sides of the stopping valve have a lock valve, which prevents the leakage of the glycol in case diaphragm vessel is disconnected and from the vessel itself after unscrewing the top nut of the stopping valve.

Re-tightening of the diaphragm vessel's nut (F) will result in opening of the stopping valve and connection the system without any leakage of the glycol.

7. Device for filling and venting the solar installation

7. Device for filling and venting the solar installation

7.1. Device's description



Professional station for rinsing, filling, venting and servicing closed-circuit solar systems, heat pumps, floor and wall heating. The device is used for quick and reliable filling of the thermal solar systems as well as others cold/hot water and glycol mixture systems. The device eliminates the formation of air bubbles and decontaminates the installation.

Application: solar systems; heat pump systems; central heating systems; boilers / heat exchangers.

The device consists of the following elements: a trolley on stable wheels made of powder coated steel; strong, efficient pump; polythene tank with a capacity of 30 l; transparent pressure hoses which allow for strophic control as well as eliminate the aeration of the returning factor; ball valves for connecting hoses; cleanable, external filter.

7.2. Start-up

As the pump used in the device is not a suction pump, it must be filled with water before first use. This is done by filling the device's tank or the cup on the pump. Before start-up, carefully check all hoses and connections (each filling station is pressure checked).



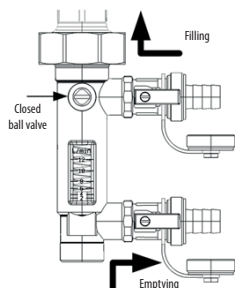
Do not fill the solar installation during sun exposure. The solar system can develop a temperature above 100°C, filling the preheated installation like this can cause damage (and the guarantee does not include this type of damage).

7.3. Specification

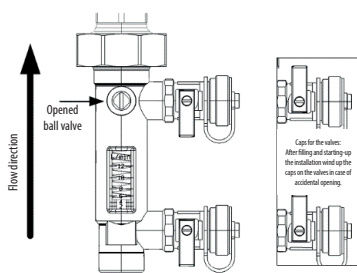
H x W x L	Weight (empty)	Tank volume	Tank's diameter	Flow rate	Lift height	Pump	Stop valves	Drain valve	Medium	Medium's max. temp.
950 x 420 x 530 mm	25 kg	30 l	155 mm	60 l/min	50 m	1100 W, 230 V	3/4"	1/2"	water, glycol mix	60°

7.4. Filling and venting the solar installation

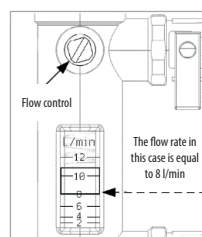
The device's hoses are connected to the sockets marked as "Filling" and "Emptying" in the drawing below. When filling, it is important that the ball valve on the rotameter is closed and to turn on the pump while filling the solar system (switch to manual mode on the solar controller). During the filling it is recommended to vent the installation through the manual air valve located in the 4-way coupling near the solar collectors.



(1) – Filling the installation:
Attach the hose to tip of the filling valve, close the rotameter's ball valve (regulatory), open the filling valve and the drain valve, fill the installation.



(2) Start-up:
Open the ball valve and close the filling and drain valves. The connectors of the filling and draining valves can be removed.



(3) – Adjust the flow rate until the correct flow is shown on the flowmeter.

Attention: The correct flow rate reading is the one on the lower edge of the disc/cursor (as shown in the drawing above).

8. Galmet's indirect water heaters

8. Galmet's indirect water heaters

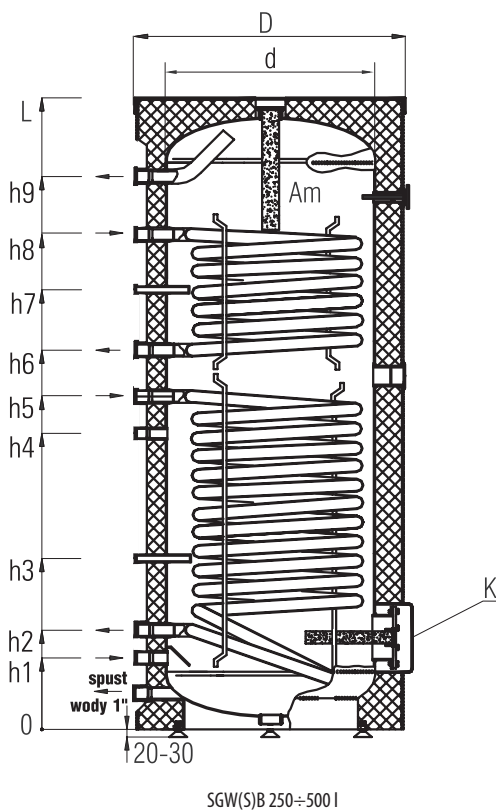
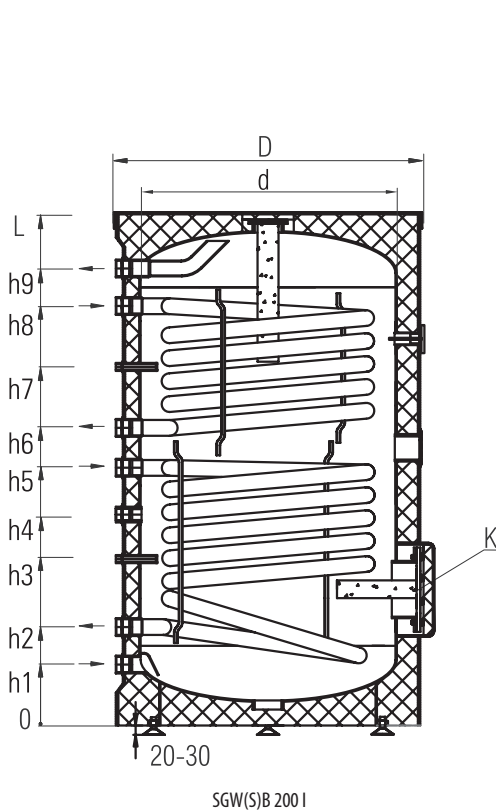
8.1. Specification of the SGW(S)B 200÷500 l water heaters

Specification	unit	SGW(S)B 200	SGW(S)B 250	SGW(S)B 300	SGW(S)B 400	SGW(S)B 500
Nominal capacity	l	218	263	302	404	480
Actual capacity ¹	l	204	249	282	379	453
Tank's maximum working temperature	°C	100	100	100	100	100
Coil's maximum working temperature	°C	110	110	110	110	110
Tank's maximum working pressure	MPa	1,0	1,0	1,0	1,0	1,0
Coil's maximum working pressure	MPa	1,6	1,6	1,6	1,6	1,6
Surface of the solar collector's coil	m ²	1,0	1,2	1,4	1,8	2,0
Solar collector coil power (70/10/45°C)	kW	24	29	33,6	43	48
Efficiency	l/h	570	635	800	1030	1150
Surface of the CH coil	m ²	0,7	0,7	1,1	1,1	1,1
CH coil power (70/10/45°C)	kW	17	17	26,4	26,4	26,4
Efficiency	l/h	410	410	630	630	630
Magnesium anode	Upper bottom plug 5/4" ³	38x400	38x400	38x400	38x400	38x600
	Insp. hole, M8 screw	38x200	38x200	38x200	38x400	38x200
Dimensions						
h1 - Cold water inflow	G" / mm	1 / 130	1 / 210	1 / 210	1 / 240	1 / 240
h2 - Water outflow to solar coil	G" / mm	1 / 210	1 / 290	1 / 290	1 / 320	1 / 320
h3 - Sensor cover I	G" / mm	R ¾ / 355	R ¾ / 400	R ¾ / 440	R ¾ / 570	R ¾ / 530
h4 - Circulation	G" / mm	¾ / 450	¾ / 595	¾ / 650	¾ / 770	¾ / 850
h5 - Hot water inflow from solar collector	G" / mm	1 / 550	1 / 695	1 / 760	1 / 870	1 / 970
h6 - CH water outflow	G" / mm	1 / 635	1 / 795	1 / 845	1 / 980	1 / 1090
h7 - Sensor cover II	G" / mm	1 / 765	1 / 900	1 / 1015	1 / 1150	1 / 1260
h8 - CH hot water inflow	G" / mm	1 / 895	1 / 1005	1 / 1190	1 / 1330	1 / 1440
h9 - DHW outflow	G" / mm	1 / 975	1 / 1085	1 / 1260	1 / 1410	1 / 1650
d - Internal diameter	Ø	550	550	550	600	600
D - External diameter	Ø	670	670	670	700	700
L - Height with insulation	mm	1140	1300	1450	1660	1890
Net weight	kg	98	115	133	162	215

¹ Tank volume without coils.

8. Galmet's indirect water heaters

8.2. Diagrams of the SGW(S)B 200÷500 l water heaters



9. Maintenance and operation of the installation

9. Maintenance and operation of the installation

9.1. Regular inspections and maintenance

Solar installation is expected to operate automatically all year round. Once a year, check the following:

1. Operating pressure on the solar group's gauge,
2. Correct operation of the control system,
3. State of the thermal insulation, especially in places exposed to atmospheric conditions,
4. The required flow rate in the solar installation,
5. Organoleptic identification for the potential leaks of the heating medium,
6. Concentration of the heating agent (propylene glycol). In case the concentration is lower than the minimum value, it is required to top-up or replace the heating medium. Recommended replacement every 5 years.
7. Condition of the magnesium anode in the water heater - The anode should be replaced at least once every 18 months.

* It is recommended to schedule an annual, paid verification of the installation by a qualified installer.

* Galmet is not responsible for incorrect selection of elements of the solar installation made by wholesalers, installers, the user, etc. Complaints/defects must be reported directly to the manufacturer. Contact information: tel. 77 403 45 30, serwis@galmet.com.pl. When filing the claim, provide the following information: catalogue/serial number, purchase date, description of the problem, address of the installation and phone number. Galmet is not liable and will not be refunding any costs of the previous, unfamiliar services, operating without prior agreement with Galmet.

9.2. Transportation and storage

During transport, the whole solar system is shipped on a pallet for easy transport, furthermore, the collector's connections are sealed with rubber caps - collectors and accessories should be stored in a dry place, in case of outdoor storage, the equipment must be protected against weather conditions.

9.3. Technical documentation

The whole system consists of several different elements. Prior to installation, please refer to the appropriate instruction, all the instructions are included with each element of the system.

9.4. Finishing touches

After installation, the installer checks if all of the operations were done correctly. Then, the installer should perform a tightness test and thoroughly rinse the installation. After following the above steps, the system will be ready to be filled with a glycol solution.

9.5. Terms of warranty

During the first start-up, the solar installation must be thoroughly rinsed and vented by using the device for filling and venting (described on page 19). It is not allowed to connect the copper pipe directly to the solar collector (we recommend using a flexible hose made of stainless steel). One of the conditions for maintaining the guarantee is to use only original components of the solar system (ie. connection kit, installation kit, heating medium) provided by the manufacturer. Detailed warranty conditions can be found in the individual warranty cards of the solar installation's elements.

10. Troubleshooting

Typical problems				Cause	Solution
During a sunny day the temperature of the water in the water heater does not increase (the solar system is not heating)	Solar pump does not work	No temperature displayed on the controller's panel		No power, the controller is turned off	Check the power, turn on the controller
		The controller correctly displays the temperature, the pump LED flashes	The collectors' temperature displayed is high	No power supply for the pump, faulty controller	Check the connection between the controller and the pump, replace the controller
				Collector's pump blocked, failure of the pump's motor	Check the pump's RPM after unscrewing the vent screw, replace the pump (service)
During operation of the solar system there is a large difference in temperature between the collector and water in the water heater (of more than 20°C)		Not enough flow	Improper flow regulation	Adjust the flow as recommended	
			Air in the system	Vent the installation as recommended	
Frequent on/off switching of the collectors' pump		Too much flow	Improper flow regulation	Adjust the flow as recommended	
		Improperly adjusted controller	Temperature difference set too high	Adjust the controller's settings as recommended	
Significant fluctuations in system pressure			Abnormal pressure in the diaphragm vessel	Check and adjust the pressure in the diaphragm vessel	
Systematic reduction of pressure in the system			Leak in the system	Locate and remove fluid leak	
			Emergency fluid discharge during reflux	Refill the installation	
			Leakage in expansion vessel's air valve	Check and raise the pressure in the expansion vessel to the recommended values	
The apparent low efficiency of the solar collector			A large partition of water during heating	Gross surface area of the collectors is too small	
			Heat loss through the circulation	Limit the working time of the circulation to the absolute minimum	
			Heat loss to the CH system (DHW exchanger with two spiral coils)	Eliminate the possibility of the gravitational heat losses	



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