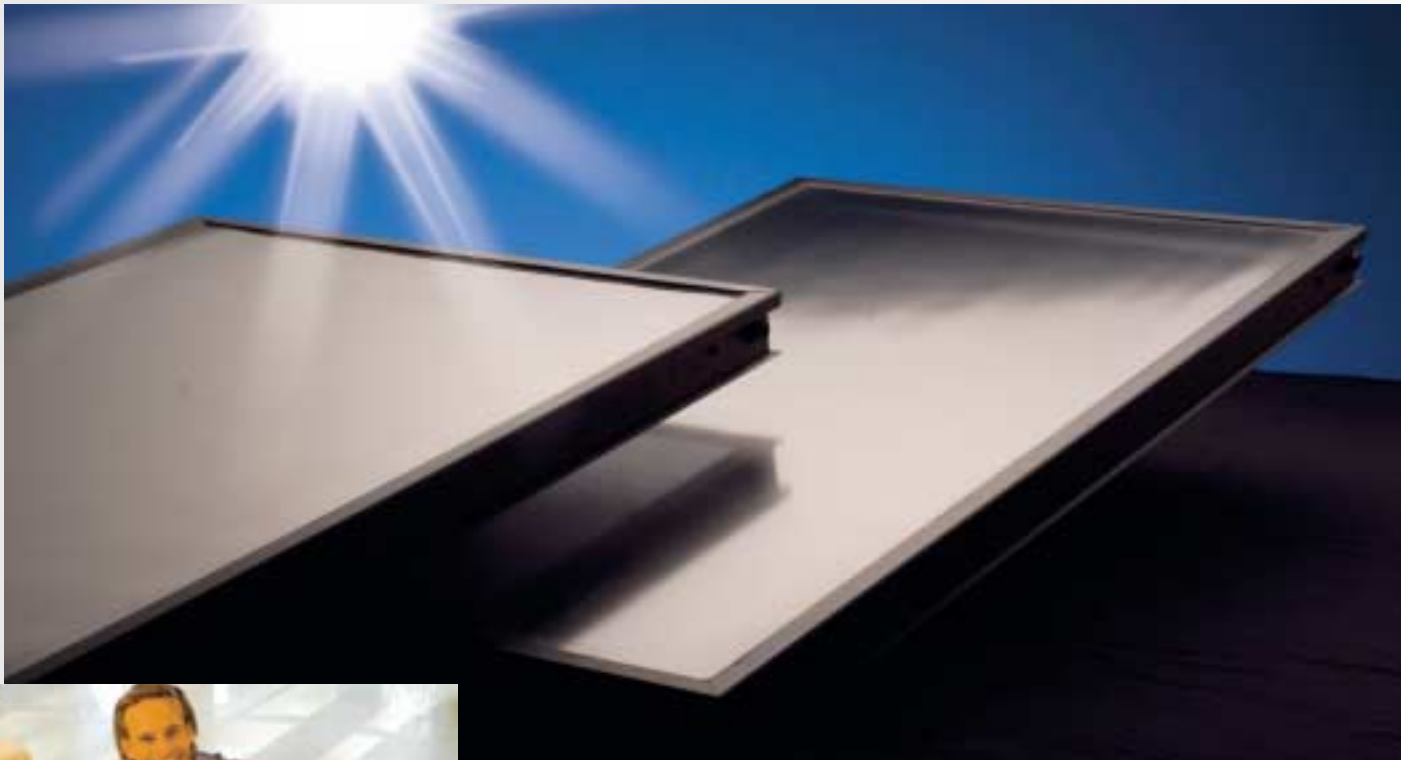
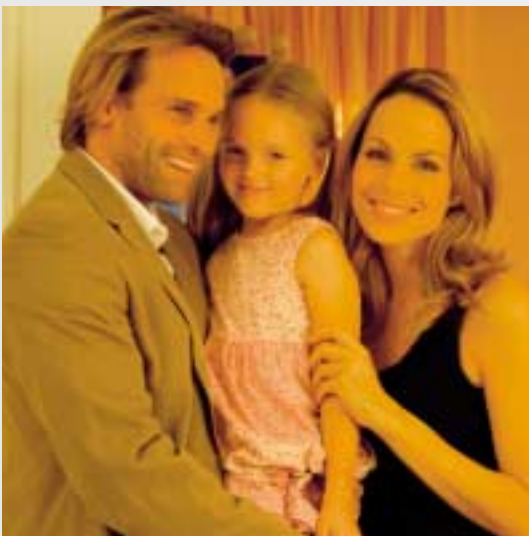


ROTEX Solaris: Use the energy of the sun.



ROTEX Solaris -

Solar energy for hot water
and heating.



ROTEX

Solar energy: free and inexhaustible.

Energy and resources

The energy sources that we use today are limited and therefore precious and expensive. Our entire existence and standard of living is based on the free accessibility to energy.

The energy used must be utilised in an optimum manner in order to keep the consumption costs low and to protect the environment. At the same time renewable energy should be used as far as possible to reduce dependency and to protect the environment.

Thermal solar energy utilisation is the most effective method of replacing primary energy by regenerative (solar) energy.

The solar age has begun.

The use of a solar installation makes a vital contribution to environmental protection and you will also save hard cash over a long period.



Solar heat - free energy at the correct location

At the peak, up to 80% of the utilisable solar energy can be transformed into usable heat.

The extremely high thermal efficiency of the ROTEX Solaris flat collectors, in combination with the rapid direct storage of the heat gathered in the hot water storage tank ROTEX Sanicube Solaris ensures high levels of energy exploitation with relatively short periods of sunshine.

On the background of these requirements, the ROTEX Solaris was developed which represents a completely new type of solar system. ROTEX Solaris uses solar energy for hot water preparation and provides effective support for the heating system.

If the solar energy is not required immediately, the ROTEX Sanicube solar storage tank can store large quantities of solar energy and you can then use the heat for hot water or heating many hours or even more than a day later.

Condensing technology + solar - the ideal combination

Reduce your ongoing energy costs to the lowest level in the long-term.

With the ROTEX Solaris you are using the free energy from the sun for heating and hot water. The consumption of the additional fossil fuel required is kept to a minimum using the ROTEX condensing boiler for oil or gas.

ROTEX Solaris

- Unpressurised and direct Drain-Back solar system
- Solar energy for hot water and heating
- High efficiency flat collectors
- High efficiency stratified storage tank
- Optimum water hygiene

Oil: ROTEX A1 oil condensing boiler, the condensing technology specialist with 10 year guarantee against corrosion failure.



Gas: ROTEX GasSolar-Unit, Gas condensing boiler and solar storage tank in a single compact unit.





Water hygiene is our principle.

Your advantages with the ROTEX Solaris:

- Solar energy utilisation for hot water and heating support
- Highest energy utilisation by optimised overall system
- High efficiency flat collectors (flexible use as a result of 3 different sizes)
- Variable installation on the roof or in the roof or on frames on flat roofs
- High storage tank capacity and lowest possible storage tank losses
- Optimum temperature stratification in the storage tank increases solar utilisation
- Doubly environmentally friendly due to the omission of antifreeze and the avoidance of environmentally damaging materials
- Simple incorporation in existing heating and hot water systems



Low flow or not fully heated zones on the hot water side, as seen with large volume storage tanks, are entirely eliminated using the ROTEX Sanicube.

The hot water is entirely contained in a piping system so that the deposits such as sediment, rust or other deposits which can arise in large volume tanks are not produced.

Water that is charged first is also the first to be removed (first-in first-out principle).

The water hygiene advantages of the ROTEX Sanicube are thus considerable.

The outstanding water-hygienic advantages have been confirmed by an extensive test undertaken by the Hygiene Institute at the University of Tübingen.

- Water hygienic optimum solar storage tank (tested by the Institute of Hygiene at the University of Tübingen)
- Storage tank and solar installation maintenance free
- Operational safety because of lack of requirement of expansion vessel and safety valve
- Optimum evaluation by EnergySavingRegulation (EnEV)

The anti-legionella storage tank.

The structure of the ROTEX Sanicube Solaris ensures that it has optimum inherent water-hygienic properties since the domestic hot water to be heated is ducted and heated through a stainless steel corrugated tube heat exchanger system.



Keyword: Legionella

Legionella bacteria
There are about 35 types of Legionella. At least 17 of these produce illness.

The main consequences are:
Pontiac fever: flu-like symptoms which subside after a few days.

Legionnaire's disease:
severe bacterial lung infection.
In 15 to 20 percent of the cases the infection leads to death.



The hygienic solar storage tank.

Use the cost-free energy of the sun without being diverted

ROTEX Solaris uses a storage tank concept that is fundamentally different from normal systems. The storage tank water is directly fed to the solar collectors, without a heat exchanger, where it is heated and then stratified back into the storage tank. The heat is not stored in the domestic hot water, as normally happens, but rather in the separated unpressurised storage tank water. This considerably increases the efficiency of the solar collectors and the entire utilisation of the installation.

Since the system is unpressurised, the components that would otherwise be required, such as an expansion vessel, excess pressure valve and heat exchanger, are not required. This not only saves money when purchasing the installation, but also saves valuable energy in operation.

The Solaris Just-in-Time principle

The Solaris collectors are only filled when sufficient heat is being provided by the sun and when the storage system is capable of receiving this.

In this case, both pumps in the control and pump unit (RPS) switch on briefly and fill the collectors with storage tank water.

After filling, which takes less than a minute, one of the pumps switches off and the water circulation is maintained by the remaining pump.



Antifreeze not required - to the benefit of the environment

If the sunshine is insufficient, or if the Sanicube Solaris does not need any more heat, the feed pump switches off and the entire Solar System drains into the storage tank. The addition of antifreeze is not necessary since, if the installation is not in use, the collector surfaces are not filled with water - another environmental advantage!

Solar energy for hot water and heating.

The optimum temperature stratification in the Sanicube Solaris means that the solar energy is not used only for hot water preparation, but also for effective support of the heating system. This considerably increases the overall utilisation of the solar installation.

The principle functions only if the connection pipes in the building and on the roof are installed with a constant gradient, if the collectors are mounted exactly horizontal and the height of the installation corresponds to the output of the pump. For these reasons the ROTEX Solaris must only be installed by trained heating engineers.

We recommend that you make direct contact with your ROTEX dealer.

A ROTEX dealer in your vicinity can be found at www.rotex.de.



It thinks for you - Intelligent control technology RPS 3

The fully-automatic Solaris RPS 3 control system controls the systems independently to provide optimum utilisation of the solar energy. All parameters needed for smooth operation are already factory-set.

The flow sensor permits read-out and balancing of current outputs, peak outputs, and heat quantities.

In this way you will know at any time how efficiently your Solaris installation is operating.





Sanicube Solaris the perfect stratified storage tank

This is how it works

The storage tank of the ROTEX Sanicube Solaris is a twin shell structure made of plastic. The space between the internal and external tank is filled with expanded foam and is extremely heat insulating.

Inside there are two to four heat exchangers made of stainless steel, depending upon the version. The 500 litre tank is filled once with tap water at atmospheric pressure and without additives.

The Sanicube Solaris is split into two main sections:
The upper, always hot, section - the **active water zone** and the lower, colder section - the **solar zone**.



The correct temperature in each layer

On thermal solar systems it is important that the heat storage tank exhibits a defined temperature stratifying behaviour. Temperature stratifying is possible because hot water is lighter than cold water and thus rises.

The active water is heated in the upper section of the storage tank. High temperatures must be present here to ensure that sufficient hot water is always available. The water that is fed directly to the solar collectors in solar operation is stored in the lower section of the tank. Solar collectors work more efficiently the colder the water is that flows through them.

This means that we get the best out of it

The cold fresh water is fed in at the lowest point of the storage tank. From here it is fed upwards in a spiral in the stainless steel corrugated pipe which acts as a heat exchanger, and thus is heated in the flow heating principle. This means that the temperature in the lowest part of the storage tank, from where the collectors are supplied with water, receives maximum cooling.

This routing of the water produces a stable and precisely defined temperature stratification in the storage tank.

The low thermal conductivity of the plastic tank wall favours and stabilizes the stratification process. In contrast to metal storage tanks virtually no heat is conducted away downwards through the tank wall.

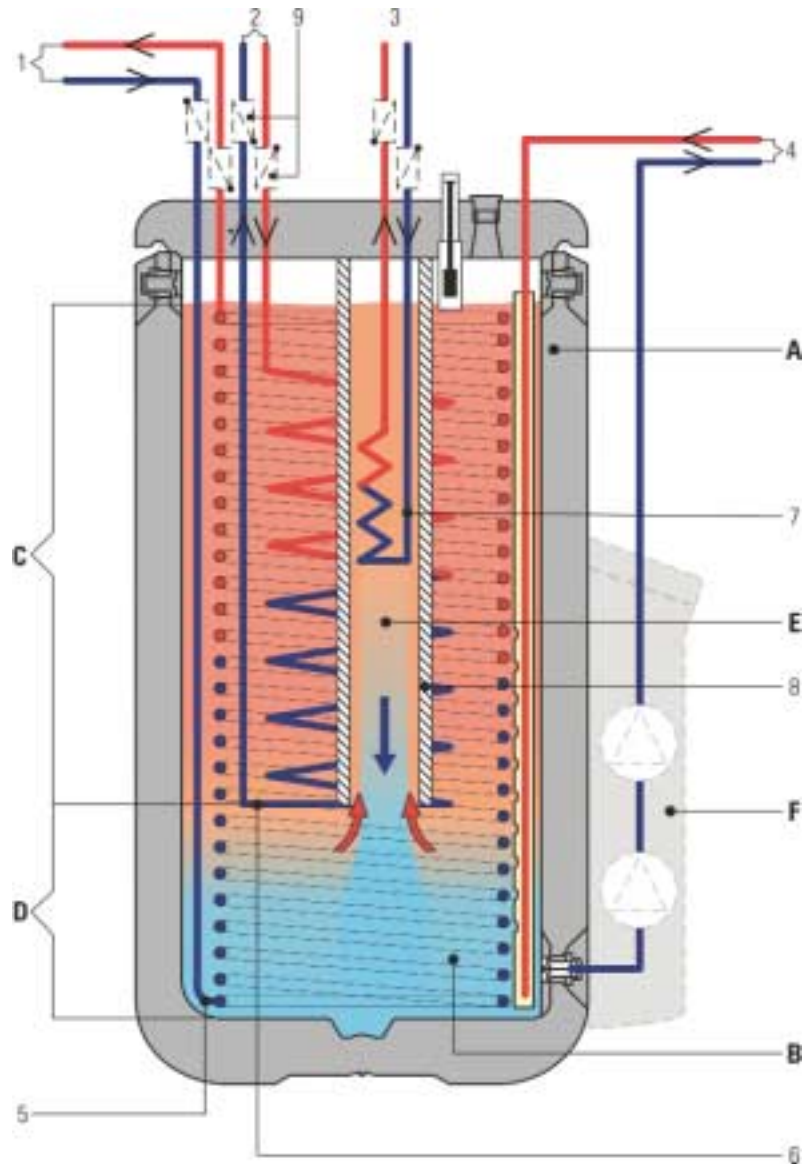
Direct and effective

The storage tank water heated directly in the collector without additional heat exchanger flows back into the storage tank via the special Solaris feed stratifying discharge pipe. Here it is



stratified into the correct location according to the temperature. If the power of the sun is not sufficient the upper active water zone is heated to the required comfort temperature by the heating system or by an electric immersion heater.

The heat exchanger for solar heating support is located in the middle of the storage tank. If there is any excess solar heat, it is transferred to the heating system by the heating water flowing through the supporting heat exchanger.



- | | | | | | |
|---|-------------------------------------|---|---|---|--|
| A | Hot water stratified storage tank | 1 | Domestic hot water | 6 | Storage tank primary loading exchanger (stainless steel) |
| B | Pressure-free storage tank water | 2 | Storage tank primary loading coil | 7 | Heating support heat exchanger (stainless steel) |
| C | Active water zone | 3 | Heating support | 8 | Heat insulation sleeve |
| D | Solar zone | 4 | Solaris connection | 9 | Non return valve (accessories) |
| E | Heating support zone | 5 | Domestic hot water heat exchanger (stainless steel) | | |
| f | Control and pump unit (accessories) | | | | |

No chance for lime

The storage tank is filled with storage water during commissioning. This water is unpressurised and is not exchanged during operation. Thus, limescale can only be deposited once. The immersion heater therefore remains limescale-free, as do all the heat exchanger pipes located in the storage water.

On the active water side of the stainless steel pipe heat exchanger virtually no limescale will be deposited on the inner wall because of the high flow rate.



The Solaris collectors.

Always ready - The Solaris collector

The Solaris high-efficiency collectors transform virtually all the short-wave solar radiation into heat as a result of their highly selective coating.

As soon as the temperature of the water located in the collector exceeds the temperature of the solar zone by a preset value, the digital Solaris control system starts the charging process.

Fits on any roof

Since every building is different there are different ways of mounting the ROTEX flat collectors on the roof.

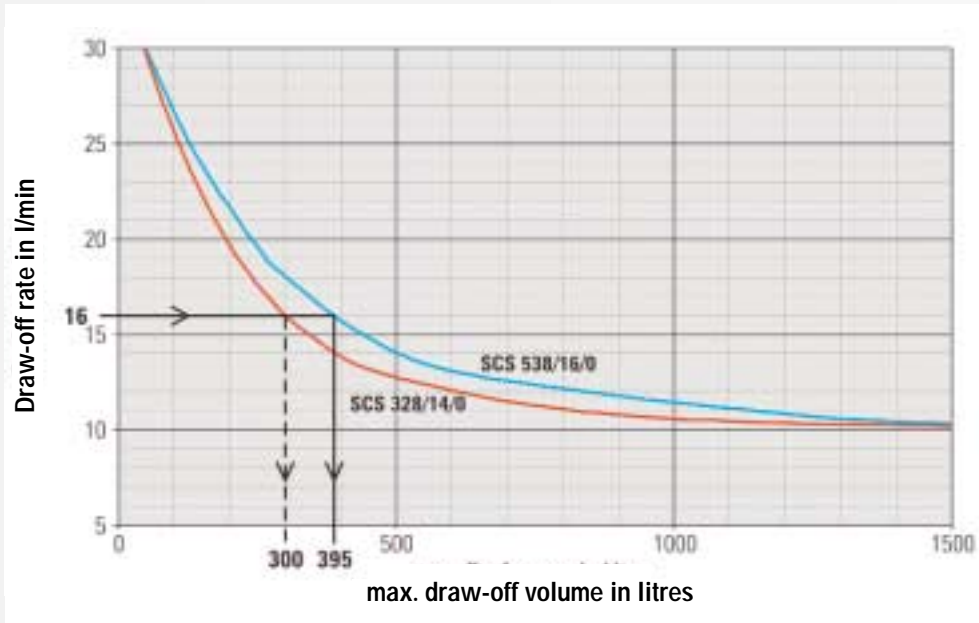
The collectors can be mounted on the tiles (on the roof), integrated within the roof (in the roof) or mounted on special frames on a flat roof.

The three different sizes of collector permit flexible adaptation to the roof conditions.



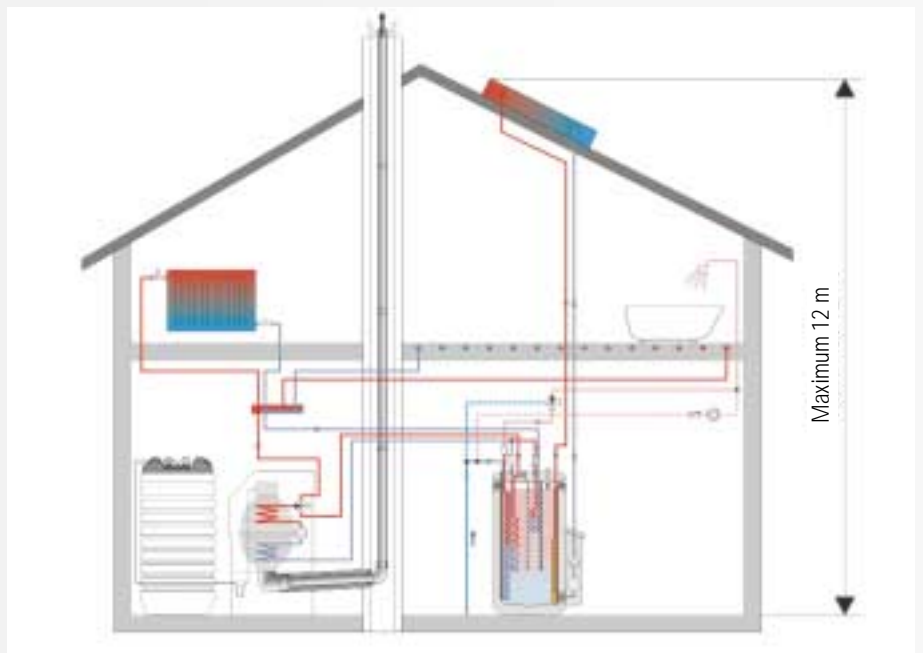
Maximum hot water draw-off volume from a Sanicube Solaris at 20 kW primary loading heating output

- Storage tank temperature 60 °C
- Draw-off temperature 40 °C
- Primary flow temperature 80 °C
- Cold water temperature 10 °C



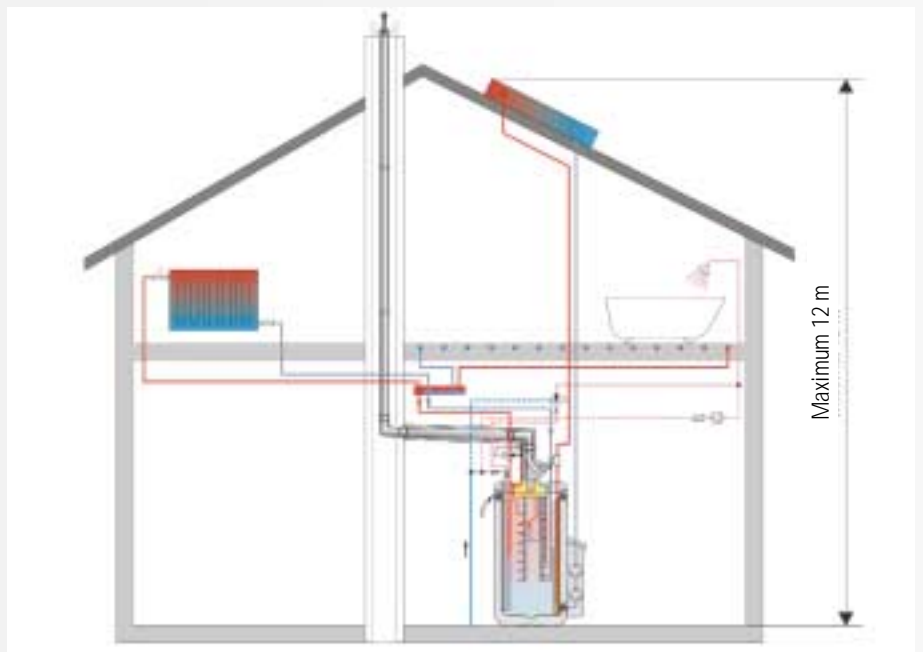
Connection drawing for the ROTEX Solaris System for hot water preparation with heating support:






with ROTEX A1 Oil condensing boiler



Connection drawing for the ROTEX Solaris System for hot water preparation with heating support:



with GasSolarUnit



| Technical data Sanicube Solaris | | SCS 328/14/0 | SCS 538/16/0 | SCS 538/16/16 | SCS 538/0/0 | |
|--|----------------|---|---|---|--|---|
| | |  |  |  |  |  |
| Basic data | | | | | | |
| Total storage capacity | Litres | 300 | 500 | 500 | 500 | |
| Empty weight | kg | 55 | 87 | 93 | 81 | |
| Total filled weight | kg | 335 | 587 | 593 | 581 | |
| Dimensions (L x B x H) | cm | 59.5 x 61.5 x 159 | 79 x 79 x 159 | 79 x 79 x 159 | 79 x 79 x 159 | |
| Max. permissible storage tank water temperature | °C | 85 | 85 | 85 | 85 | |
| Readiness heat consumption at 60 °C | kWh/24h | 1.3 | 1.4 | 1.4 | 1.4 | |
| Domestic water heating | | | | | | |
| Domestic water capacity | Litres | 19 | 24.5 | 24.5 | 24.5 | |
| Maximum operating pressure | bar | 10 | 10 | 10 | 10 | |
| Maximum operating pressure | | stainless steel | stainless steel | stainless steel | stainless steel | |
| Domestic water heat exchanger surface | m ² | 4.1 | 5.5 | 5.5 | 5.5 | |
| Domestic water capacity | W/K | 1820 | 2470 | 2470 | 2470 | |
| Storage tank charging heat exchanger (stainless steel) | | | | | | |
| Water capacity heat exchanger | Litres | 10 | 10.4 | 10.4 | – | |
| Surface area charging heat exchanger | m ² | 2.1 | 2.3 | 2.3 | – | |
| Average specific heat capacity | W/K | 910 | 1040 | 1040 | – | |
| Storage tank charging heat exchanger 2 (stainless steel) | | | | | | |
| Water capacity heat exchanger | Litres | – | – | 10.4 | – | |
| Surface area charging heat exchanger | m ² | – | – | 2.3 | – | |
| Average specific heat capacity | W/K | – | – | 1040 | – | |
| Solar heating support (stainless steel) | | | | | | |
| Water capacity heat exchanger | Litres | – | 2 | 2 | 2 | |
| Heat exchanger surface area | m ² | – | 0.43 | 0.43 | 0.43 | |
| Average specific heat capacity | W/K | – | 200 | 200 | 200 | |
| Thermal output data | | | | | | |
| Output characteristic value N_L according to DIN 4708 ¹⁾ | | 2.2 | 2.3 | 2.5 | 2.3 | |
| Continuous rating Q_D according to DIN 4708 | kW | 27 | 35 | 45 | 35 | |
| Max. draw-off rate for a period of 10 min at 35 kW at ($T_{KW} = 10\text{ °C}/T_{WW} = 40\text{ °C}/T_{SP} = 60\text{ °C}$) | l/min | 21 | 22 | 24 | 22 | |
| Hot water quantity without reheating up to 15 l/min tapping rate ($T_{KW} = 10\text{ °C}/T_{WW} = 40\text{ °C}/T_{SP} = 60\text{ °C}$) | Liter | 200 | 220 | 220 | 220 | |
| Hot water volume with heating up at a power rating of 20 kW and 15 l/min draw-off rate ($T_{KW} = 10\text{ °C}/T_{WW} = 40\text{ °C}/T_{SP} = 60\text{ °C}$) | Liter | 400 | 442 | 453 | 442 | |
| Short-term water quantity in 10 min | Liter | 210 | 220 | 240 | 220 | |
| Pipe connections | | | | | | |
| Cold and hot water | Inch | 1" AG | 1" AG | 1" AG | 1" AG | |
| Primary Heating flow and return flow | Inch | 1" AG | 1" AG | 1" AG | 1" AG | |

¹⁾ at 35 kW charging, 80 °C feed temperature, 65 °C storage tank temperature, 45 °C hot water temperature and 10 °C cold water temperature



| Solaris flat collectors | V 21 A | V 26 A | H 26 A |
|-----------------------------|--|--|---|
| |  |  |  |
| Dimensions L x B x H | 2000 x 1006 x 95 mm | 2000 x 1300 x 95 mm | 1300 x 2000 x 95 mm |
| Net surface area | 2.01 m ² | 2.60 m ² | 2.60 m ² |
| Aperture surface area | 1.80 m ² | 2.35 m ² | 2.35 m ² |
| Absorbing surface area | 1.78 m ² | 2.33 m ² | 2.33 m ² |
| Weight | 40 kg | 50 kg | 50 kg |
| Water content | 1.6 Liter | 2.0 Liter | 2.2 Liter |
| Absorber | harp-shaped copper pipe register with laser-welded highly selective coated aluminium plate | | |
| Coating | Sunselect, Absorption approx. 97 %, Emission approx. 4 % | | |
| Glazing | Single pane safety glass, Transmission approx. 92 % | | |
| Heat insulation | Rock wool (collector base 50 mm, side components 20 mm) | | |
| Max. standstill temperature | approx. 200 °C The collectors are standstill resistant over a long period and are tested for thermal shock. Minimum collector yield over 525 kWh/m ² at 40 % covering proportion, Location Würzburg | | |
| Mounting on the roof | Yes | Yes | Yes |
| Mounting in the roof | Yes | Yes | No |
| Mounting on flat roof | No | Yes | Yes |

Control and pump unit RPS 3



| | |
|--|---|
| Dimensions W x D x H | 230 x 142 x 815 mm |
| Operating voltage | 230 V/50 Hz |
| Max. electrical power consumption | 20-90 W (modulating*) |
| Control | digital differential temperature controller with clear text display |
| Collector sensor | Pt 1000 |
| Storage tank and return sensor | PTC |
| Feed temperature and flow sensor (accessories) | FLS |

* modulating operation mode only possible with FLS





Enjoy energy savings: ROTEX - The heating system with a future.

Cosy heating and hygienic hot water make a house a home.

Energy is becoming more and more precious and expensive. An energy saving heating system can increase personal comfort and save energy at the same time.

You are therefore investing in the future today. The potential for energy saving in heating systems is enormous and has an effect for decades.

ROTEX, the heating system of the future, incorporates energy components which are perfectly matched to each other.

- Condensing boilers for oil and gas
- Hygienic high-efficiency hot water storage tank
- Pressure-free and environmentally friendly solar installations
- Floor heating and radiators using just one water distribution system
- Odour-blocked safety storage tank
- An interconnecting plastic installation system for sanitary and heating applications

Further information can be obtained from www.rotex.de,
www.carbontrust.co.uk,
www.lowcarbonbuildings.org.uk,
www.eca.gov.uk

ROTEX

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