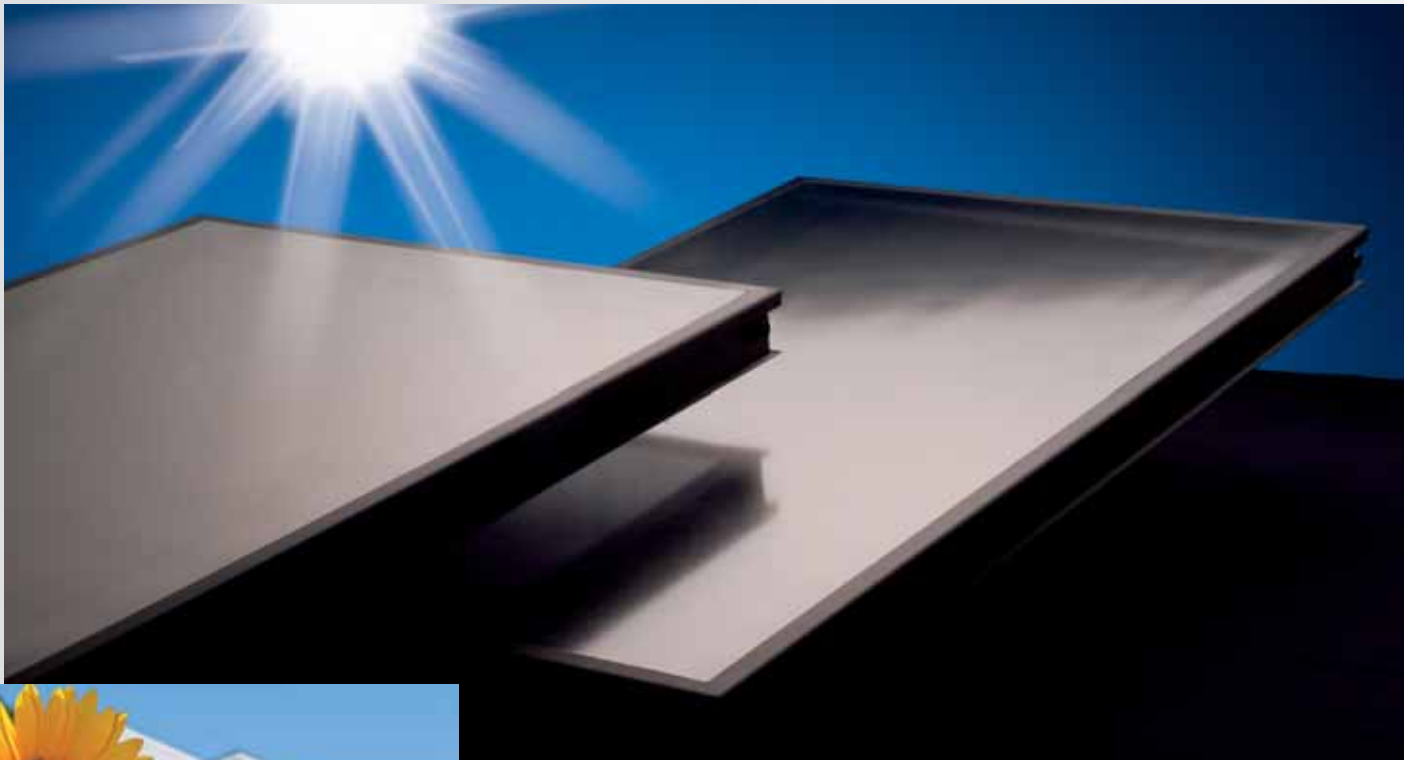


ROTEX Solaris: Use the energy of the sun.



ROTEX Solaris –

Solar energy for hot water
and heating.



ROTEX
The heating!

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.

ROTEX Solaris

- Unpressurised and direct Drain-Back solar system
- Solar energy for hot water and heating
- High efficiency flat collectors
- Without anti-freeze agents
- High efficiency stratified storage tank
- Optimum water hygiene
- Maintenance-free

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.

Low expenditure - High yield

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.

Heat pump + Solar

Solar energy and heat pump complement each other in an ideal way.

The heat pump directs the required heat to the heating system, depending on the demand.



Condensing + solar

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



Gas: ROTEX Gas-SolarUnit, 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 (Germany).



- 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

The anti-legionella storage tank.

The structure of the ROTEX Sanicube Solaris ensures that it has optimum inherent waterhygienic 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 3) 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.



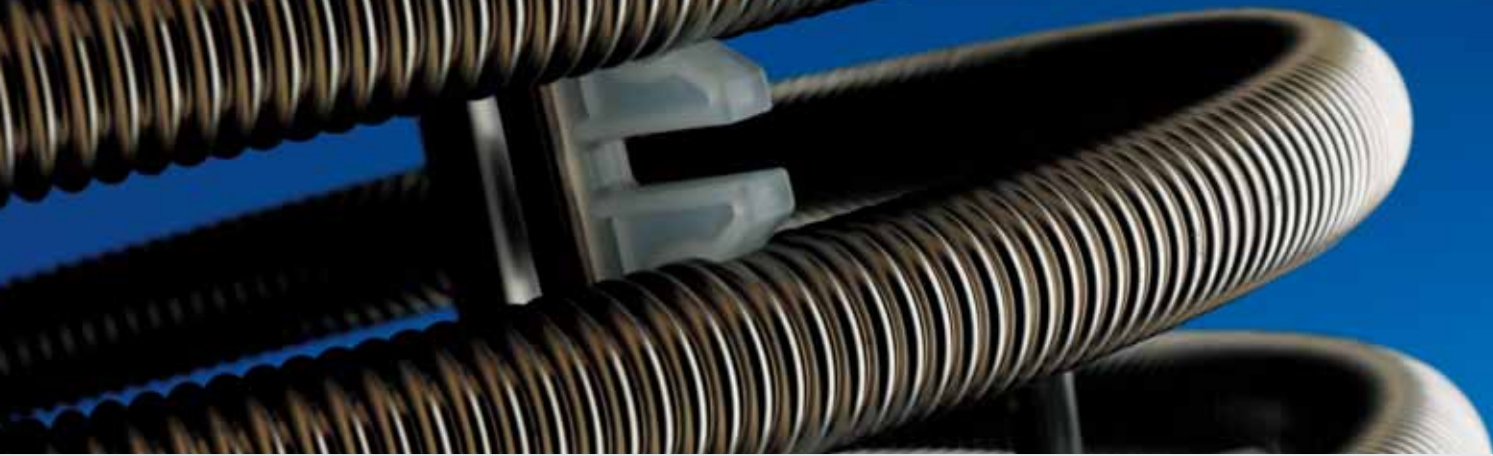
It thinks for you – Intelligent control technology RPS 3

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.

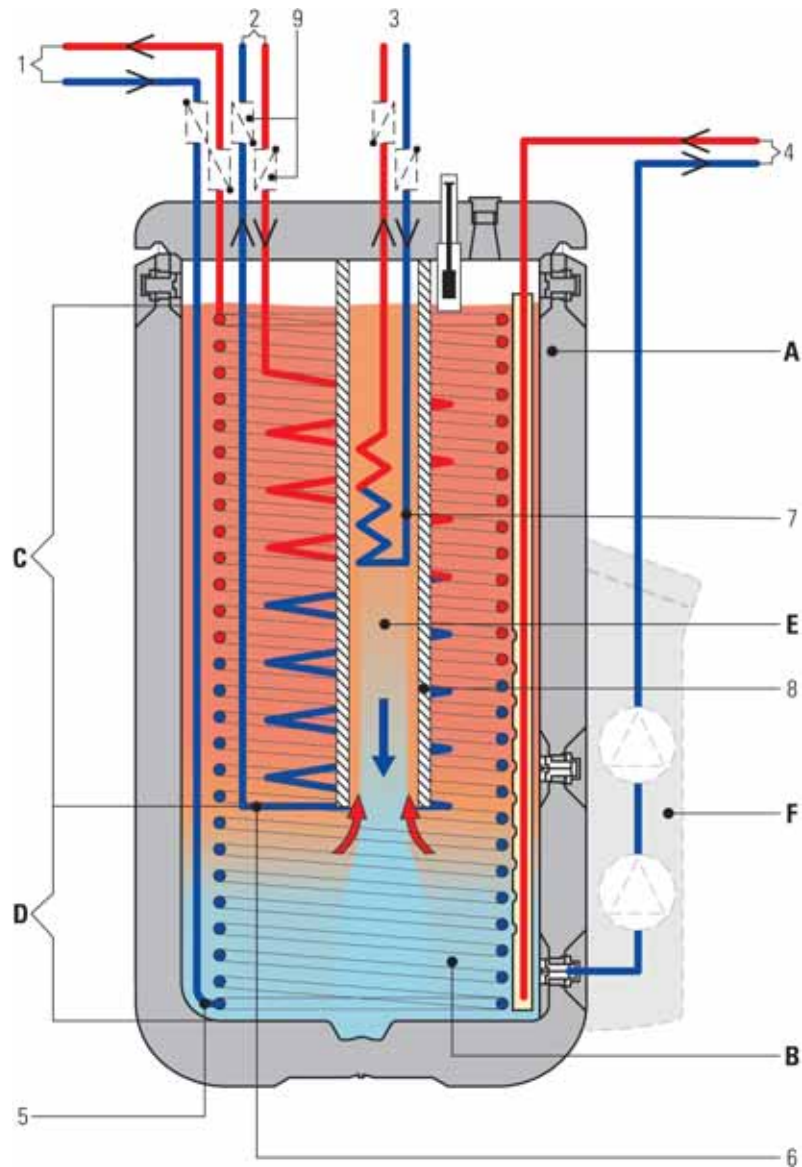
Direct and effective

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 |
| C Active water zone | 3 Heating support | 7 Heating support heat exchanger (stainless steel) |
| D Solar zone | 4 Solaris connection | 8 Heat insulation sleeve |
| E Heating support zone | 5 Domestic hot water heat exchanger (stainless steel) | 9 Non return valve (accessories) |
| 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.

ROTEX Solaris – Now available as a pressurised system

The ROTEX Solaris can now also be supplied as a pressure system: this allows you to set up systems that cannot be installed with a constant gradient. In this case we introduce a plate heat exchanger in the circuit.



Three different ways of installing the collectors: On-roof (top), in-roof (centre), flat roof (bottom).

Connection schematic of the ROTEX Solaris system for hot water production with solar support: with ROTEX HeatPumpSolarUnit



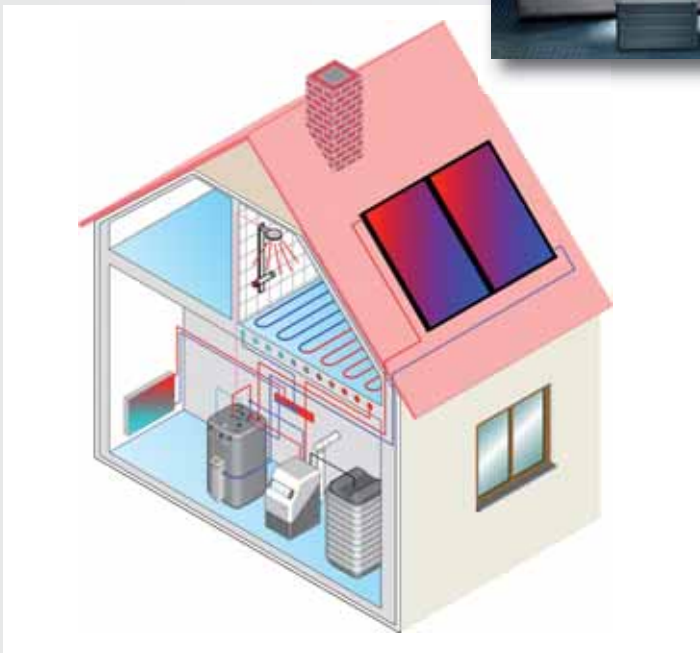
Heat pump + Solar



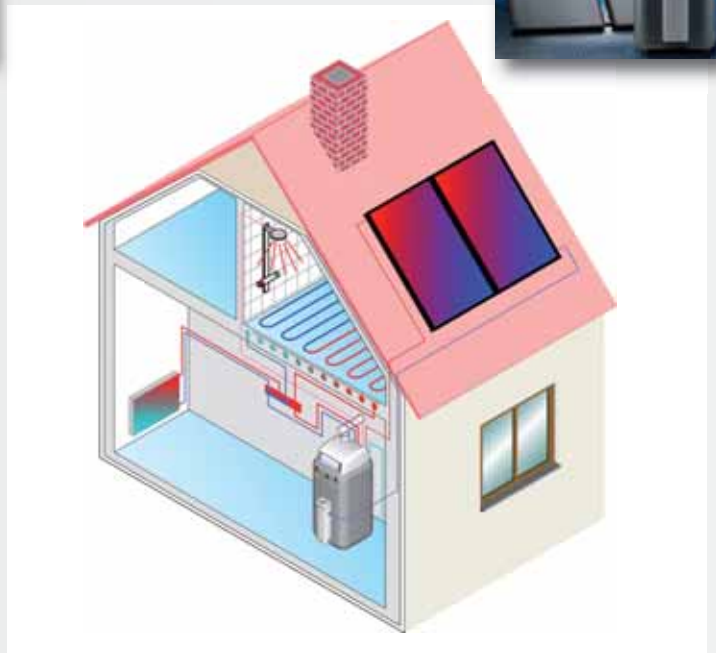
Connection drawing for the ROTEX Solaris System for hot water preparation with heating support: with ROTEX A1 Oil condensing boiler





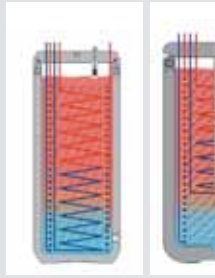
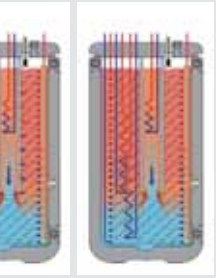
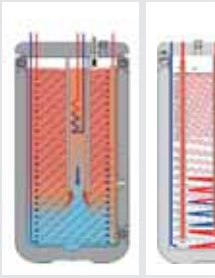
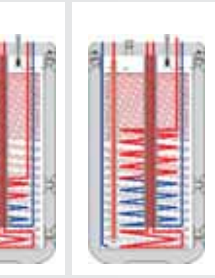
Connection drawing for the ROTEX Solaris System for hot water preparation with heating support: with ROTEX GasSolarUnit



Oil condensing + Solar



Gas condensing + Solar




Technical data Sanicube Solaris and HybridCube		SCS 328/14/0	SCS 538/16/0	SCS 538/16/16	SCS 538/0/0	HYC 544/19/0	HYC 544/32/0
							
Basic data							
Total storage capacity	Litres	300	500	500	500	500	500
Empty weight	kg	55	87	93	81	86	92
Total filled weight	kg	335	587	593	581	586	592
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	79 x 79 x 159	79 x 79 x 159
Max. permissible storage tank water temperature	°C	85	85	85	85	85	85
Readiness heat consumption at 60 °C	kWh/24h	1,3	1,4	1,4	1,4	1,4	1,4
Domestic water heating							
Domestic water capacity	Litres	19	24,5	24,5	24,5	28,4	28,4
Maximum operating pressure	bar	6	6	6	6	6	6
Material of the heat exchanger		stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
Domestic water heat exchanger surface	m ²	4,1	5,5	5,5	5,5	5,9	5,9
Domestic water capacity	W/K	1820	2470	2470	2470	2860	2860
Storage tank charging heat exchanger (stainless steel)							
Water capacity heat exchanger	Litres	9,1	10,4	10,4	–	9,5	17,4
Surface area charging heat exchanger	m ²	2,1	2,3	2,3	–	2,0	3,7
Average specific heat capacity	W/K	910	1040	1040	–	960	1810
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	4,8	4,8
Heat exchanger surface area	m ²	–	0,4	0,4	0,4	1,0	1,0
Average specific heat capacity	W/K	–	200	200	200	310	310
Thermal output data Sanicube							
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 °C/T _{WW} = 40 °C/T _{SP} = 60 °C)	l/min	21	22	24	22	–	–
Hot water quantity without reheating up to 15 l/min tapping rate (T _{KW} = 10 °C/T _{WW} = 40 °C/T _{SP} = 60 °C)	Litres	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 °C/T _{WW} = 40 °C/T _{SP} = 60 °C)	Litres	400	442	453	442	–	–
Short-term water quantity in 10 min	Litres	210	220	240	220	–	–
Thermal output data ROTEX HybridCube*							
Volume of hot water without reheating at 8 l/min / 12 l/min draw-off rate (T _{KW} = 10 °C/T _{WW} = 40 °C/T _{SP} = 50 °C)	Litres	–	–	–	–	338 / 272	338 / 272
Volume of hot water without reheating at 8 l/min / 12 l/min draw-off rate (T _{KW} = 10 °C/T _{WW} = 40 °C/T _{SP} = 60 °C)	Litres	–	–	–	–	527 / 468	527 / 468
Volume of hot water without reheating at 8 l/min / 12 l/min draw-off rate (T _{KW} = 10 °C/T _{WW} = 40 °C/T _{SP} = 65 °C)	Litres	–	–	–	–	614 / 560	614 / 560
Min. reheating time draw-off volume 140 l -> 5820 Wh (tapping one bathtub)	min	–	–	–	–	45 (HPSU 008)	25 (HPSU 016)
Min. reheating time draw-off volume 90 l -> 3660 Wh (tapping one shower)	min	–	–	–	–	30 (HPSU 008)	17 (HPSU 016)
Pipe connections							
Cold and hot water	Inch	1" AG	1" AG	1" AG	1" AG	1" AG	1" AG
Primary Heating flow and return flow	Inch	1" AG	1" AG	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

*** Definition:**

DHWV = The volume of hot water, which is available without additional heating at a mixing temperature of 40 °C and a cold water temperature of 10 °C of the specified draw-off rate!

Reheating time = The time needed to reheat the hot water storage tank to the storage temperature of 50 °C after a certain quantity of DHW has been discharged.

Solaris flat collectors	V 21 P	V 26 P	H 26 P
			
Dimensions L x B x H	2000 x 1006 x 85 mm	2000 x 1300 x 85 mm	1300 x 2000 x 85 mm
Net surface area	2,01 m ²	2,60 m ²	2,60 m ²
Aperture surface area	1,79 m ²	2,35 m ²	2,35 m ²
Absorbing surface area	1,80 m ²	2,36 m ²	2,36 m ²
Weight	35 kg	42 kg	42 kg
Water content	1,3 Litres	1,7 Litres	2,1 Litres
Absorber	harp-shaped copper pipe register with laser-welded highly selective coated aluminium plate		
Coating	Sunselect (absorption max. 96 %, emission approx. 5 % ± 2 %)		
Glazing	Single pane safety glass, Transmission approx. 92 %		
Heat insulation	Rock wool 50 mm		
Max. pressure drop at 100 l/min	3,5 mbar	3,0 mbar	0,5 mbar
Possible pitch min. - max.	15° - 80°		
On-roof and flat roof Possible pitch min. - max.	15° - 80°		
In-roof			
Max. standstill temperature	approx. 200 °C		
Max. operating pressure	6 bar		
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, Germany.			

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	245 W (modulating* 20-120 W)
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 20

* modulating operation mode only possible with FLS

For pressure applications, please use the RPS3 M.





ROTEX EcoHybrid® – the complete heating system.

What is EcoHybrid®?

The word "hybrid" originates from Greek and means "mixed, from two different origins". A hybrid heating system allows the different types of energy to work together, such as heat pumps and solar energy, but also allows other types of energy to be integrated, such as oil, gas, pellet, or even log burning boilers. This means you are equipped to face any contingencies in the future. Consistent use of renewable energies and efficiency that is practically impossible to surpass.

Everything from a single source

ROTEX manufactures all the important system components for the EcoHybrid® heating system itself. This means you can rely on the fact that all components are optimally made to work together and thus guarantee the greatest energy efficiency and highest level of comfort. As a system manufacturer for know-how in development and manufacturing, ROTEX stands for decades of system experience. Your heating is our profession!

ROTEX EcoHybrid® – variable and extendable

Regardless of the way in which you start using hybrid technology today, the good thing about the EcoHybrid® is that you can extend the system at a later date.

ROTEX EcoHybrid® – Safety and comfort for your future!

The entire system from a single source:

- Modern calorific value technology
- Regenerative air / water heat pump
- Thermal solar plant for heating and hot water
- Hygienic hot water storage tank
- Cosy underfloor heating system
- Odour-locked safety heating oil tank
- A plastic pipework connection system suitable for both domestic water and heating installations.

You can find additional information at www.rotex.de.



ROTEX Heating Systems GmbH
Langwiesenstraße 10 · D-74363 Güglingen
Fon +49(71 35)103-0 · Fax +49(71 35)103-200
e-mail info@rotex.de · www.rotex.de