

# Heat pumps

*Heat energy provided by nature*

Efficient heating technology for  
comfortable heat generation



System technology made in Bavaria

## ***Air/Water Heat Pump WP 16 AeroMono***

*For new buildings and modernization*

*A cozy climate even with  
an outside temperature of -20°C*



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**Tested in accordance with DIN EN 14511**  
Meets the basic parameters of the Market Incentive Program (MAP) at the Federal Office of Economics and Export control (BAFA).

Technical data			Heat pump WP 16 AeroMono
nominal output		kW	16
dimensions h x w x d		mm	1418 x 1435 x 382
weight		kg	180
casing color/material			ivory white/coated galvanized steel plate
airflow capacity	heating mode	m³/h	5.400
compressor			scroll compressor
operating range (air side)	space heating (min/max) hot water (min/max)	°C °C	-20,0 / +35,0 -20,0 / +35,0
operating range (water side)	space heating (min/max) hot water (min/max)	°C °C	+25,0 / +55,0 +25,0 / +50,0
Sound pressure level	at 1 m	dB(A)	53
refrigerant medium	type capacity	kg	R-410A 2,95
refrigerant oil	type capacity	kg	Daphne FVC68D 1
main power supply	voltage		400 V / 50 Hz (three-phase current)
operating power max.	heating	A	14
recommended fuse		A	20

### Test results air/water heat pump WP 16 AeroMono

[test report: ILK Dresden ILK-B-2-12-1210]

#### Heating capacity, Wirkleistungsaufnahme, COP:

test point [°C]	heating capacity [kW]	power input [kW]	coefficient of performance (COP)
A+7/W35*	16,16	3,66	4,42
A+2/W35*	10,84	3,26	3,33
A-7/W35*	11,13	3,67	3,03

**SEER\*\***  
3,80

nominal volume flow rate  $q_w$  at A+7/W35 \*A = outside temperature; W = water flow line temperature  
(heat sink): **43,3** [l/min] =  $7,216 \cdot 10^{-4}$  [m³/s]

\*\* SEER = seasonal energy efficiency ratio

### Brief description

#### Compact outdoor unit with integrated hydraulic components

- ✓ flexible installation and very low in operating mode
- ✓ heating mode up to an outside temperature of -20°C
- ✓ solid design
- ✓ automatic switchover between heating mode and heating up DHW
- ✓ comfortable controller technology
- ✓ integrated high efficient pump
- ✓ integrated electric heating element
- ✓ high operating liability
- ✓ low investment cost
- ✓ suitable for new buildings and renovation
- ✓ perfectly combinable with our patented storage tank systems WP, SPS and HSK-SLS



#### Ready to plug-in

The power supply, electric heating element, heating as well as the sensor cable and the cables for changeover valves are ready for plug-in.

**This guarantees a fast and easy installation.**



The heat pump control unit is perfectly combinable with our heating controller and guarantees a comfortable heat management.

## Certified system technology – made by Solarbayer

The application of this high efficient Solarbayer air/water heat pump in combination with our full system technology, which had already been checked by the testing laboratory together with the heat pump, offers you an optimization of your complete heating system. An optimized application and an easy installation is guaranteed by the system components offered in our heat pump sets, especially with the patented HSK-SLS stratification buffer tank and the connection box developed by Solarbayer as well as with the connection components for a plug-in installation. A combination with other heat sources (solar thermal collectors/wood log boiler/ photovoltaic panels, etc.) is possible without any problems.  
The tank bridges the usual blocking time of the heat pump power.

# Air/water Heat pump WP 16 AeroMono

## The future-proof of heating

### Why heat pumps!

The Solarbayer heat pump WP 16 AeroMono is operating environmentally friendly, clean and without any emission. The majority of the heating energy, approx. up to 75%, is taken from ambient air. Thus only approx. 25% of the energy needed is provided by electric current (either by your own photovoltaic system or by your local energy provider).

The majority of the energy is directly in front of your door and thus offers a soothing supply guarantee. The operator of such an economical system has the possibility to guarantee an almost independent self supply, f.e. by the application of a photovoltaic system. With an appropriately dimensioned system it even is possible to have a surplus on energy which can be fed into the public grid.

### Comfortable, efficient and environmentally friendly!

The application of a heat pump is your contribution to the conservation of nature and environment as well as to elongate the availability of fossile energy sources such as oil and gas. In order to further develop the market share of renewable energies on the thermal market heat pumps are often supported by the government or also by the communities. The heat pump which in best case is operated in combination with a low temperature panel heating (mainly wall or underfloor heating) offers the highest possible comfort of heating, operating and living. The low flow line temperatures increase the economic efficiency of the heat pump. Furthermore, the cozy warmth of the panel heating takes care of a steady indoor temperature.

### More living space inside the house and an extremely economical consumption!

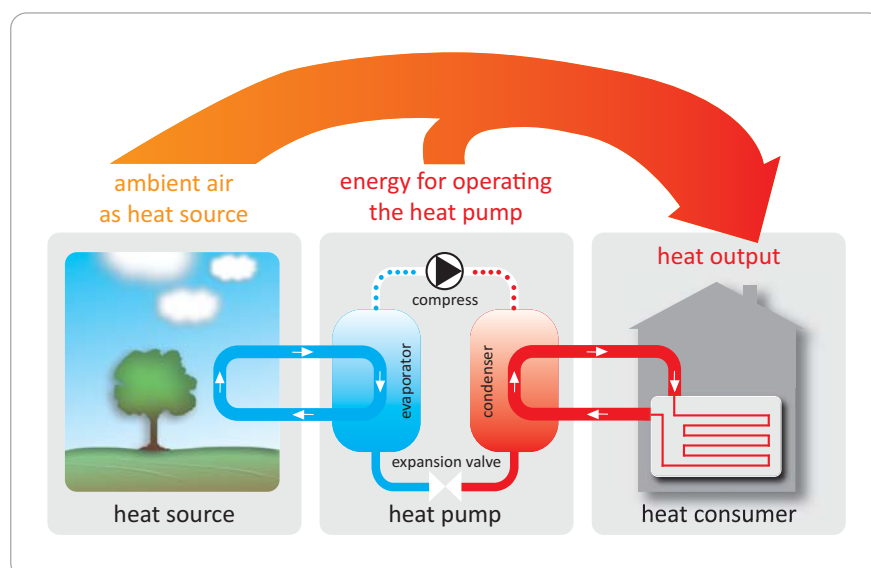
You no longer are in use of a boiler room as formerly needed for „outdated“ heating sources such as oil or gas boilers and thus, the room can now be used as a recreation or utility room for example. You no longer need a storage room for fuels, the installation or assembly of a chimney as well as the measurement costs by the chimney sweeper are omitted. Therefore the operating costs are low and manageable.

One of the best solutions is to combine the heat pump heating system with a solar thermal system because it can then function not only as central heating device but it can also fulfill several other thermo-technical tasks in the low temperature area, for example pool heating.

The entry into heat pump technology is made easy by the technically mature and easy system. The compact heat pump is assembled outside and thus no separate boiler room is needed inside the house, it is only the tank that is located inside. Systemic hydraulic components are pre-installed in the outdoor device due to this, the installation of the air/water heat pump WP16 is easy and fast. The biggest advantage however is that the professional installer of heating systems only has to connect the heating water inside with the outside whereas all cooling technical components are already pre-installed. Thus, all installation work can be mastered fast and easy.

You get a complete heating system with highest efficiency when you combine our heat pump with a Solarbayer SLS stratification tank. Several energy sources can be used due to the perfectly aligned hydraulic.

No matter if you would like to use wood log boilers, thermal solar systems, photovoltaic systems, electric heating or conventional oil/gas/pellet boilers, almost everything is possible.



### The mode of operation of an air/water heat pump

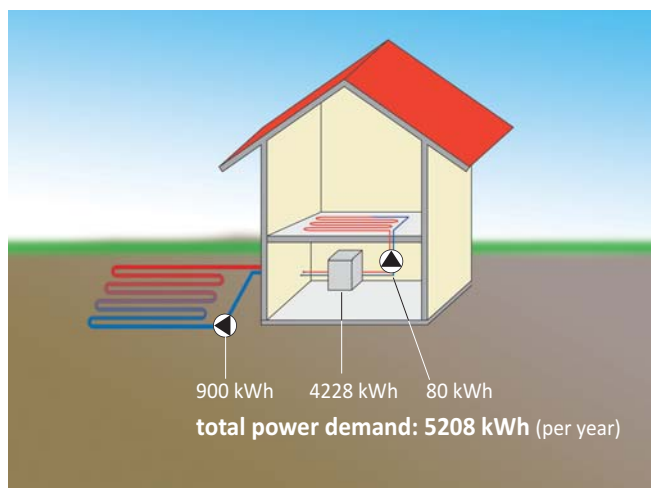
The air/water heat pump WP16 operates in a similar way as a refrigerator – only the energy flow is in a reverse way. In a refrigerator the detracted heat is dispensed to the outside. Whereas the heat pump takes the heat from ambient temperature and converts low temperature into high temperatures (temperature lift). This happens due to the continuous changes of the state of the refrigerant medium in the heat pump circuit. First of all, the medium is evaporated, then compressed in order to dispense the heat to the heating water in the condenser afterwards. The heat pump WP16 is able to reach a maximum flow line temperature of approx. 55 °C and is thus perfectly suitable for low temperature heating systems in new or in already redeveloped buildings.



## Air/water heat pump – Unbeatable price-performance-ratio

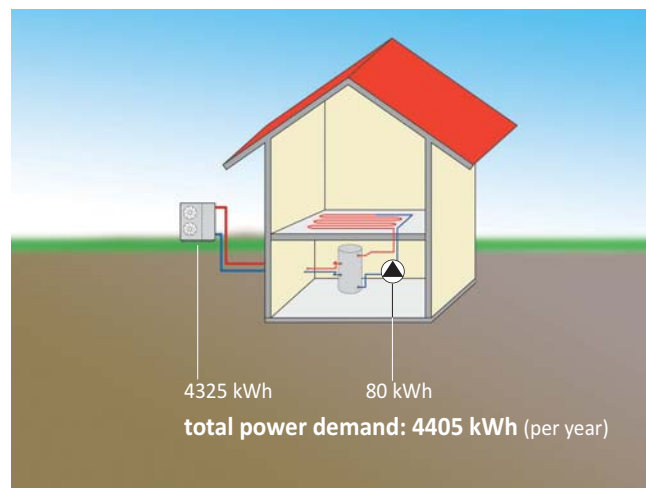
An often occurring misapprehension is the generalizing argument that air/water heat pumps are obviously bad to calculate and more expensive in the end due to the low outdoor temperature. The following comparison shall contribute a more critical and qualified view on this issue.

### Ground source heat pump (GSHP)



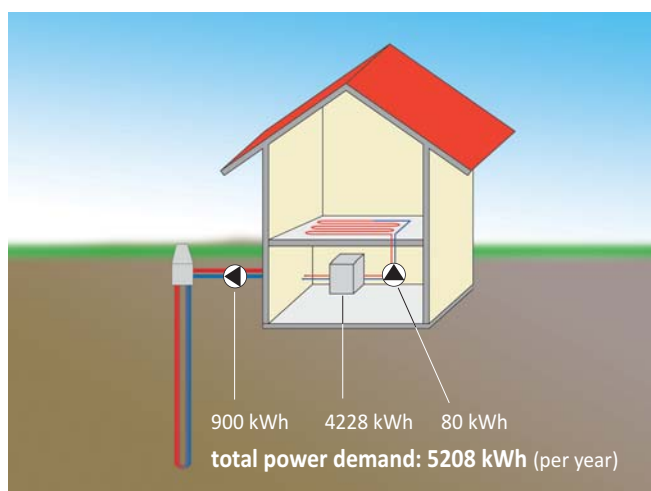
- + efficient mode of operation
- large space requirements
- extensive earthworks
- high investment costs
- high maintenance costs

### Air/water heat pump



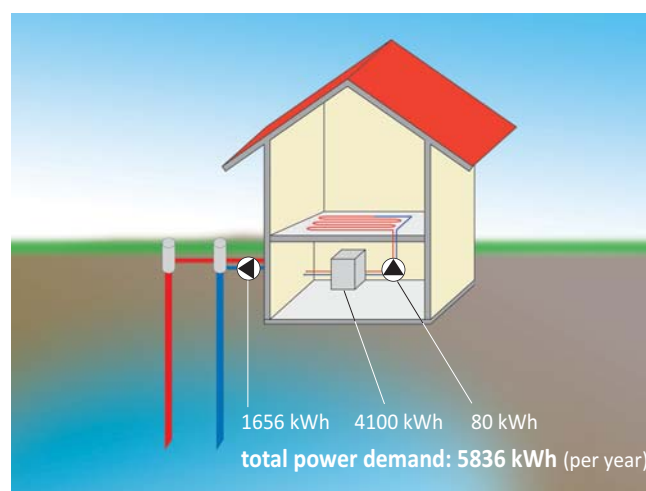
- + efficient mode of operation
- + easy installation
- + suitable for old/new buildings
- + low investment costs
- + low maintenance costs

### Geothermal probe heat pump



- + efficient mode of operation
- subject to regulatory approval
- high costs for probe drills
- high investment costs
- high maintenance costs

### Ground-water heat pump



- + efficient mode of operation
- subject to regulatory approval
- high costs for well drillings
- high investment costs
- high maintenance costs

basis of calculation:  
residential building (YOC 2012) with approx. 135 m<sup>2</sup>

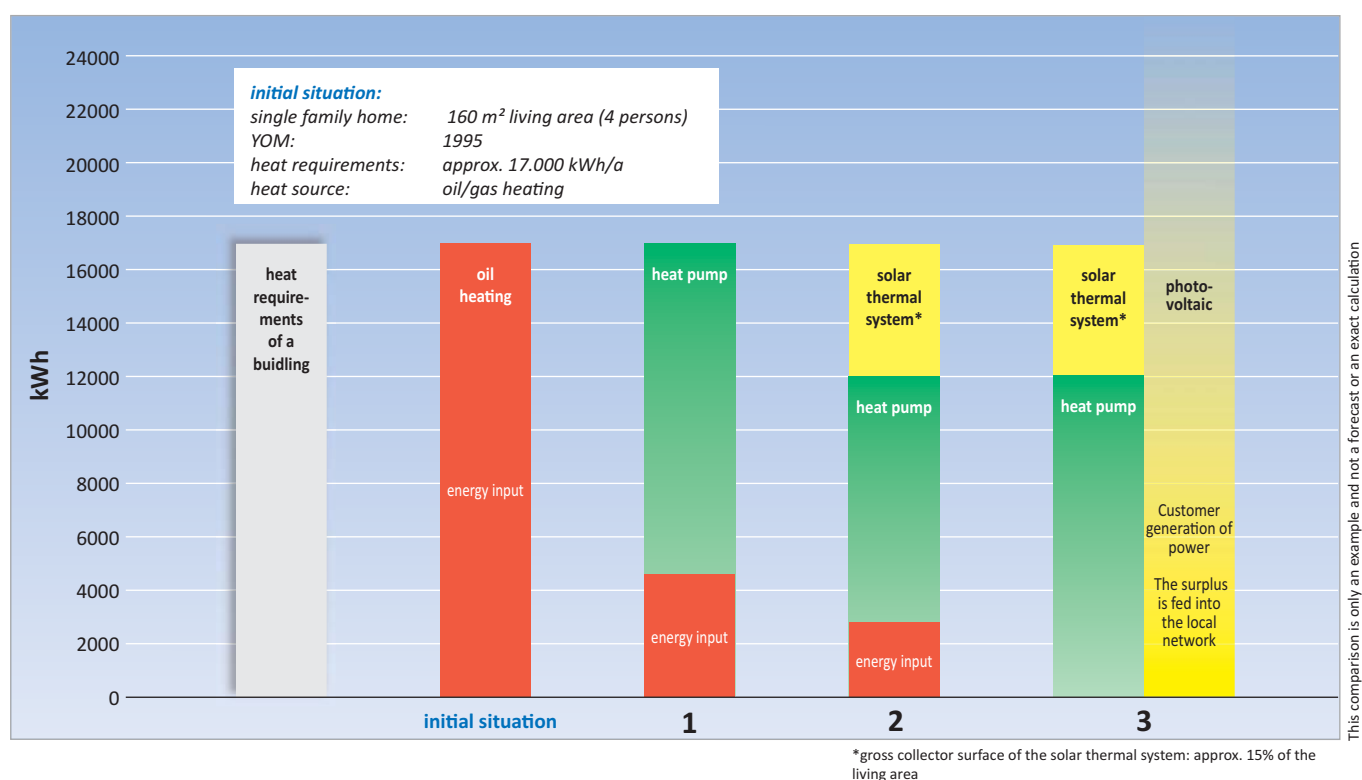
# Plus-energy home – self-sufficiency with heat and electricity

## The plus-energy home

A plus-energy home with positive annual balance is a building that gains more energy in and on the building than it takes from the outside, f. e. electricity, oil, gas or wood. These energy standards can generally be achieved by each type of building, both a renovated old building and a passive house. Necessary is only the use of solar energy, e.g. by a solar thermal system for DHW and back-up heating and a PV system for generating electricity.

## The contribution of the heat pump

On the way to a plus-energy home the heat pump can also make a considerable contribution since it also makes use of solar energy and turns it into heat to release it into the heating system. A building's energy demand of power and heat is depending on the buildings standards and the applied technology, thus the requirements differ from building to building. Due to a clever combination of versatile energy sources a mixture of energy is created which is able to cover the complete energy requirements and to feed the surplus of power from an existing PV system into the local network.



## The energy mixture

The above diagram displays how a mixture of energy could be created by the application of different energy generating technologies:

**Initial situation:** at the beginning the heat demand is mostly covered by a oil or gas boiler.

- 1 This oil or gas boiler is now replaced by a heat pump. The heat pump extracts heat from the ambient air and gives it to the heating system. The energy input for the heat generation in proportion to the energy output is approx. 25%, thus the total power consumption is increased about the power demand that is necessary for the operation of the heat pump. According to this the oil/gas consumption is omitted.
- 2 By installing a solar thermal system the heat pump is supported by the provision of DHW and heating water, thus power is saved.
- 3 The now remaining power demand can be generated by a photovoltaic system. Even a surplus of power can be generated when the PV system is dimensioned appropriately.

## Your way to energetical self-sufficiency – We show you how to do it

### How to get energetical self-sufficiency?

#### 1<sup>st</sup> step

##### Installation of the high efficient air/water heat pump WP 16 AeroMono.

Air/water heat pump particularly poke out of the heat pump family due to the price-performance ratio. Low investment costs and little installation effort guarantee a cost-effective heating system.

#### 2<sup>nd</sup> step

##### Installation of a correctly dimensioned thermal solar system in order to reduce the necessary heat pump power.

Pay attention to the acquisition of a high efficient system and to the serviceability and operating life of all system components!

The solar thermal system is able to make its contribution to cover the heat demands of your home, especially in times of high energy requirements (cold outside temperatures), because there often is a clear cloudless sky with cold outside temperatures. When it is cloudy and foggy you rather have ideal conditions for air/water heat pumps.

With this system you have a perfect price-performance ratio.

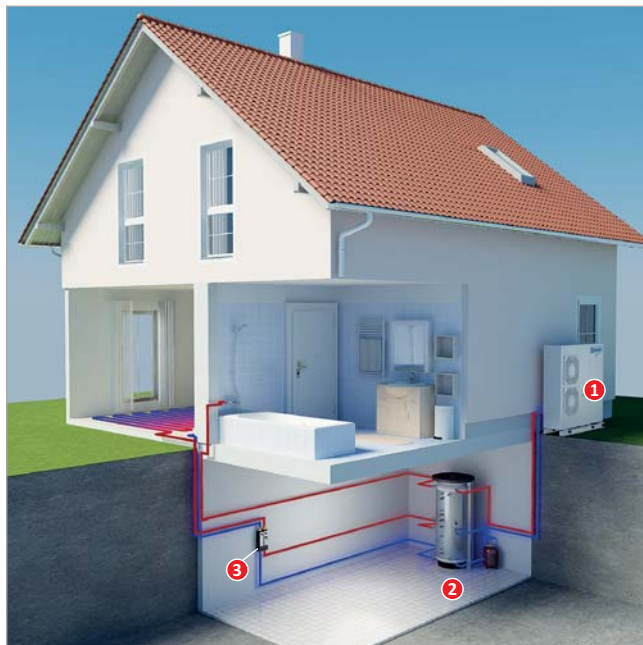
#### 3<sup>rd</sup> step

##### Additional installation of a photovoltaic system for the generation of the required current demand.

The installation of a photovoltaic system is a perfect supplementation of the first two steps. Your home will almost be turned into a zero energy home concerning the annual energy balance. When it is well dimensioned you even can achieve a surplus of energy. You provide your own energy and may be able to feed the surplus into the local power network.

#### 1<sup>st</sup> step

##### Installation of a heat pump



- ① heat pump WP 16 AeroMono
- ② hygienic combination storage tank HSK-SLS
- ③ heating circuit station

#### Heat pump set

##### with hygienic combination storage tank HSK-SLS

Perfect comfort heating despite low heat demand

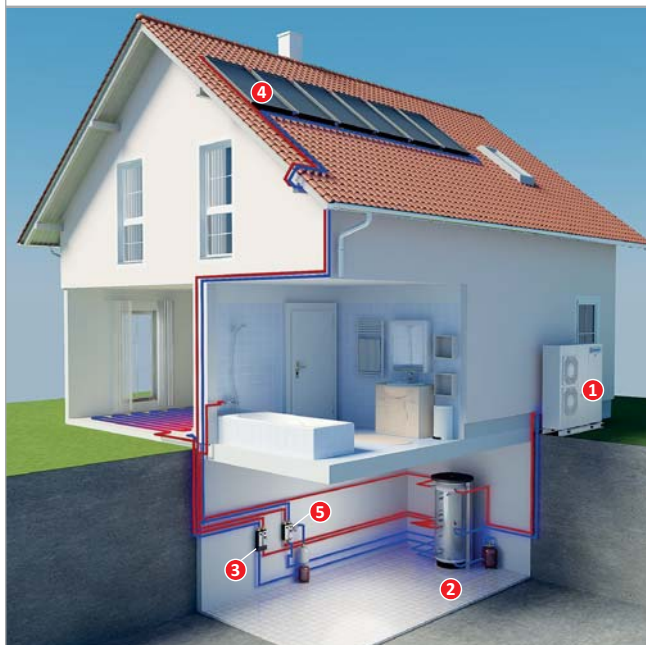
With an adequate dimensioned air/water heat pump  
the annual costs for heating  
will significantly be reduced  
in your home.

You can find perfectly aligned heat pump sets  
in our pricelist or on our homepage:

[www.solarbayer.de](http://www.solarbayer.de)

## 2<sup>nd</sup> step

### Supplementation of a solar system



- ① heat pump WP 16 AeroMono
- ② hygienic combination storage tank HSK-SLS
- ③ heating circuit station
- ④ high performance flat-plate collector PremiumPlus 2.86
- ⑤ solar station

## Heat pump set

### with hygienic combination storage tank HSK-SLS in combination with a solar thermal system

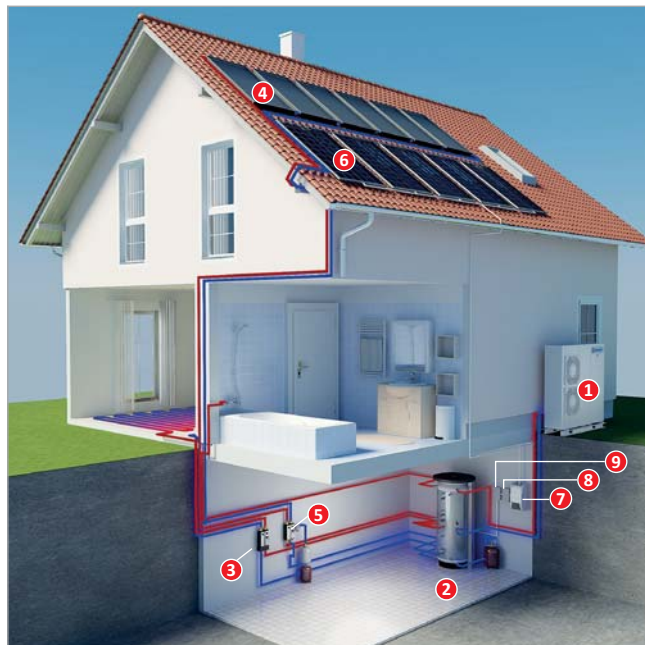
In combination with a solar thermal system the power costs will be significantly reduced. The solar thermal system takes over a considerable part of the heat generation and therefore decreases the operating times of the heat pumps.

The necessary energy demand is definitely reduced and thus the dependency on external energy sources as well!

Solar sets can be found  
in our pricelist or on our homepage:  
[www.solarbayer.de](http://www.solarbayer.de)

## 3<sup>rd</sup> step

### Additional installation of a PV system



- ① heat pump WP 16 AeroMono
- ② hygienic combination storage tank HSK-SLS
- ③ heating circuit station
- ④ high performance flat-plate collector PremiumPlus 2.86
- ⑤ solar station
- ⑥ photovoltaic system
- ⑦ inverter
- ⑧ input meter
- ⑨ meter

## Heat pump set

### with hygienic combination storage tank HSK-SLS in combination with a solar thermal system as well as a photovoltaic system

Perfect system with solar thermal and photovoltaic system. The solar thermal system takes over a considerable part of the building's total heat supply.

The photovoltaic system takes over the most part of the heat pump's power supply and, in best case, a surplus is achieved that can be fed into the local power network.

With a solar thermal and an additional PV system you achieve the highest possible independency of all other utilities!

Photovoltaic sets can be found  
in our pricelist or on our homepage:  
[www.solarbayer.de](http://www.solarbayer.de)

## Heating and saving at the same time – Favorable heat pump prices for cozy warmth



Reliable heat supply. Cost saving and economical even with low outdoor temperatures and increased energy demand of the building.

### The economic comparison



\*energy input (kWh electrical power) for heating up the building when a heat pump is applied.  
Calculated on the basis of the SEER of 3,8 achieved by the Solarbayer heat pump WP 16 (building with approx. 135 m<sup>2</sup>, YOM 2012)

**By the application of an air/water heat pump you can reduce the costs for the energy input needed for heating up the building to approximately 1/4, the remaining 3/4 can be taken from ambient air for free.**

### Observation of the price development of energy costs / security of energy supplies

When observing the price trend of oil/gas and electrical power you will see that the relative rise in prices of power has been considerably lower than that of oil and gas during the last 10 years. According to the Federal Statistical Office this is due to the following:

*„The electrical power used nationwide in Germany is for most parts generated in Germany as well und thus the power prices are not so much influenced by the enormous fluctuations in price on the global market of energy sources as for example oil is.“ (extract from Wirtschaft und Statistik magazine, Oktober 2004, S. 1210)*

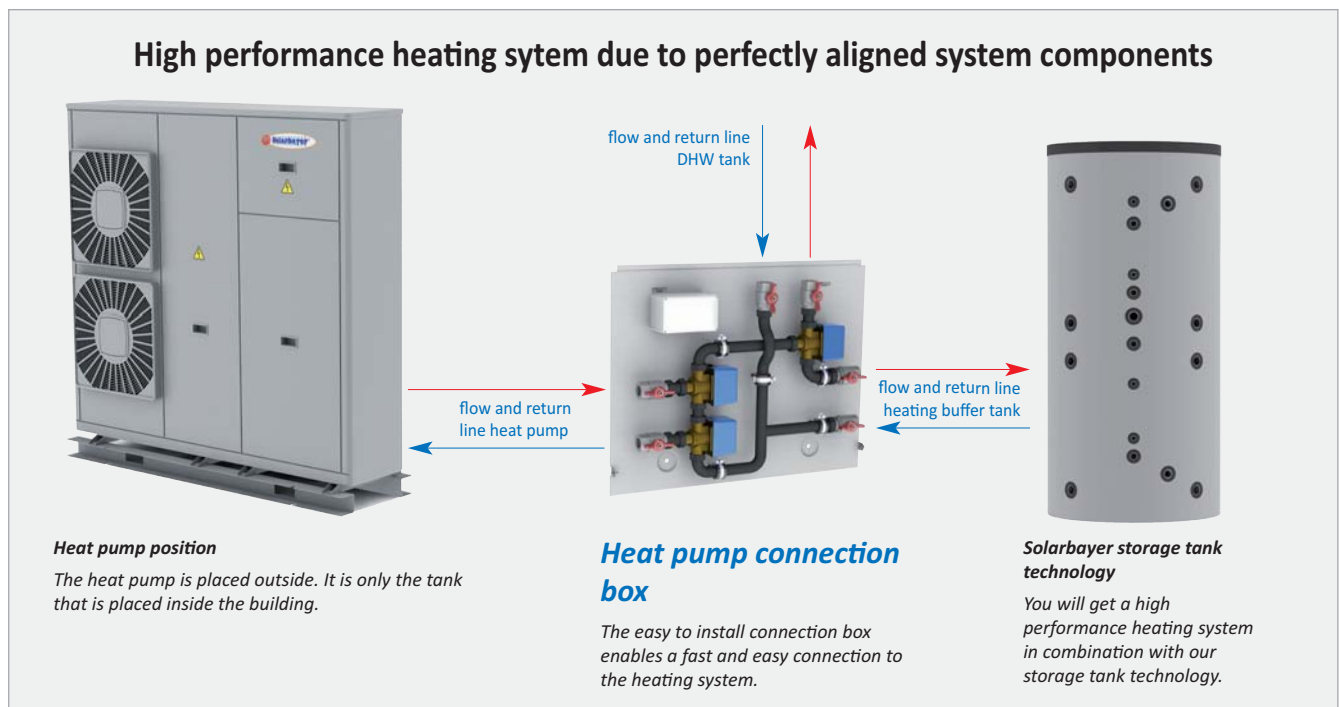
**When applying an air/water heat pump the remaining energy demand of electrical power will be liable to an increase in price in a much lower way than the comparabel amount of kWh in oil or gas.**

**Moreover, there are often reduced electricity tariffs for heat pumps.**

The necessary power requirements could also be covered by a PV system. When the PV system is well dimensioned it even can produce a surplus of energy. Suitable sets can be found in our pricelist.

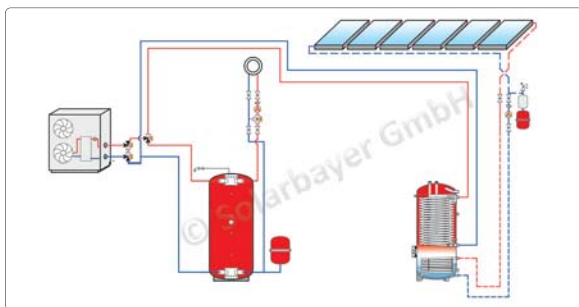


## System components ready for plug-in – easy and efficient installation



### Monovalent system:

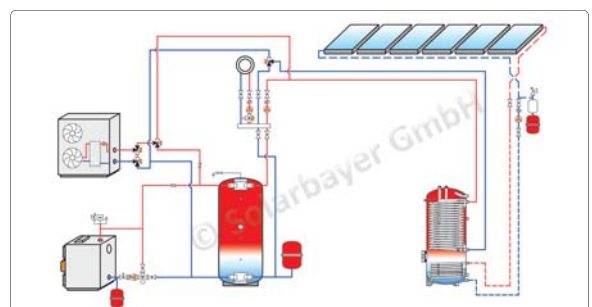
For heating applications with low heat demand, e. g. new buildings with a living area of up to approx. 300 m<sup>2</sup>  
Due to the low flow line temperature of approx. 35°C a underfloor or panel heating is necessary for this one.



The heating performance of the heat pump is sufficient enough to cover 100% of the heat demand on the coldest day.  
This solution is recommended for buildings with a low heat demand.  
With the application of a suitable thermal solar system an obvious decrease of the heat pump's power consumption is possible throughout the whole year.

### Bivalent system:

For heating applications with a higher heat demand, e. g. suitable for old buildings.  
Bivalent systems combine the heat pump with an ordinary heat generator. On days with higher heat demand an additional heat source, f. e. a wood log boiler, takes care of the heat generation.



During extremely cold periods an additional wood log boiler, for example, could cover the increased heat demand.  
With the application of a suitable thermal solar system an obvious decrease of the heat pump's power consumption is possible throughout the whole year.

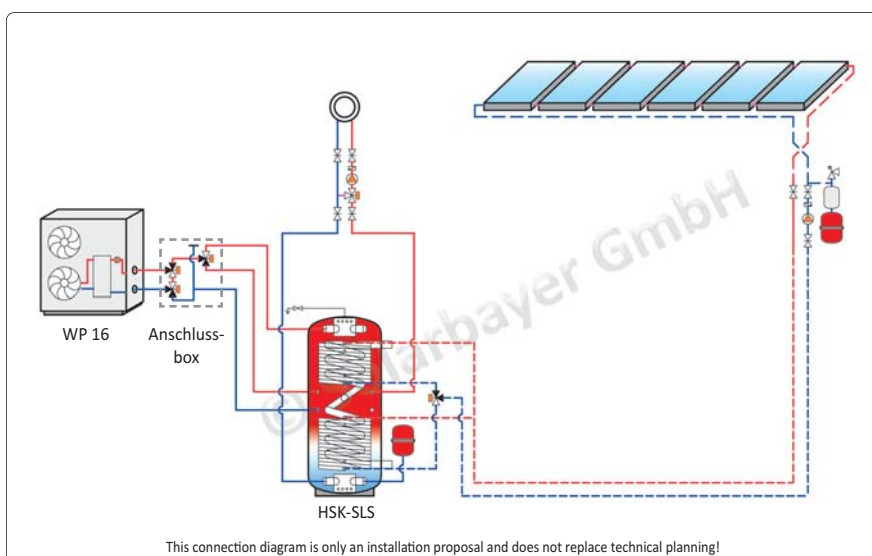
You can find perfectly aligned heat pump sets in our pricelist or on our homepage: [www.solarbayer.de](http://www.solarbayer.de)

## Heat pump sets with hygienic stratification buffer tank HSK-SLS



### Set contains:

- heat pump WP 16 AeroMono
- hygienic stratification buffer tank HSK-SLS
- connection box including immersion thermostat
- system controller
- heating expansion vessel including cap valve
- sanitary expansion vessel including cap valve and wall fastening
- thermostatic DHW mixing valve
- boiler safety unit
- air-separator heating



### Heat pump system with heat pump WP 16, hygienic stratification buffer tank HSK-SLS.

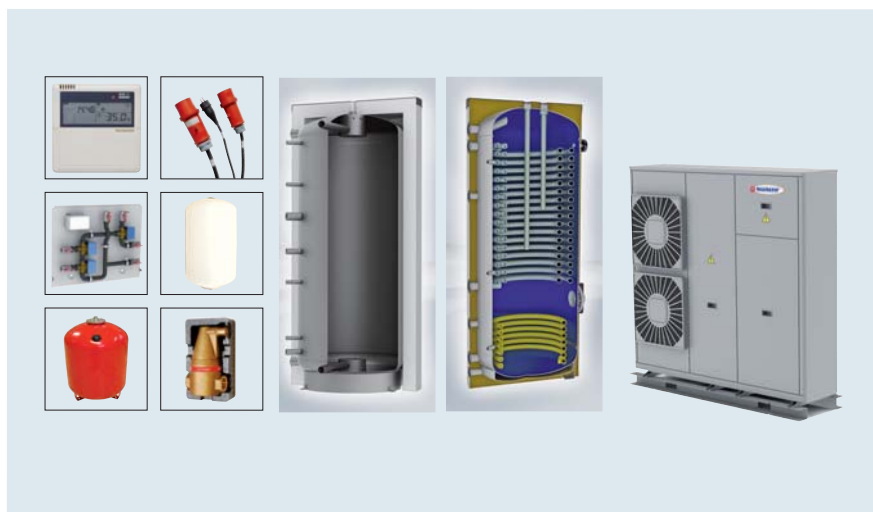
#### In combination with an optional available thermal solar system for heating up DHW.

This space saving system is perfectly suitable for new buildings with a low energy demand. The DHW is heated up in the extra large dimensioned stainless steel DHW heat exchanger. The heat pump is supported by the thermal solar system on sunny days, or even totally replaced by it.

A variety of ready assembled solar sets can be found in our pricelist. We will be glad to assist you with the perfect dimension of your collector array.

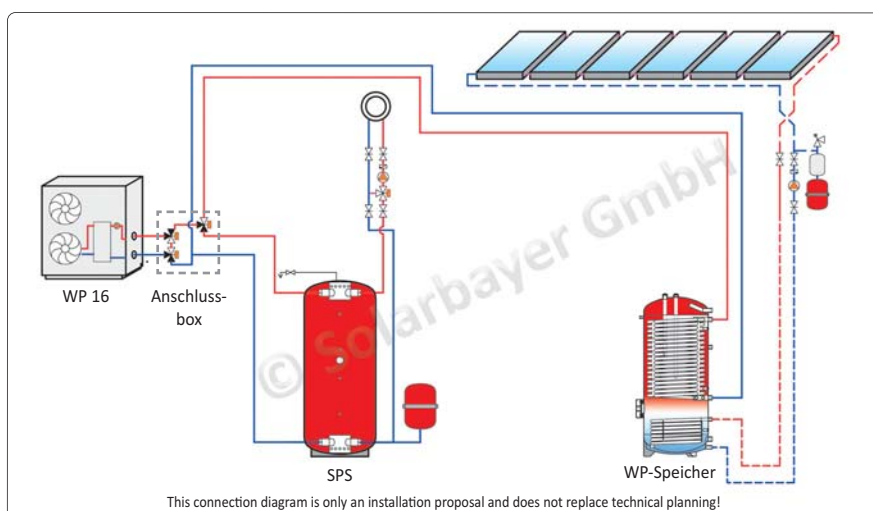
You will find further hydraulic examples in our hydraulic diagram brochure or on our homepage [www.solarbayer.de](http://www.solarbayer.de)

# Heat pumps sets with stratification buffer tank SPS and heat pump storage tank WP



## Set contains:

- heat pump WP 16 AeroMono
- heat pump storage tank WP
- stratification buffer tank SPS
- connection box including immersion thermostat
- system controller
- heating expansion vessel including cap valve
- sanitary expansion vessel including cap valve and wall fastening
- thermostatic DHW mixing valve
- boiler safety unit
- air-separator heating



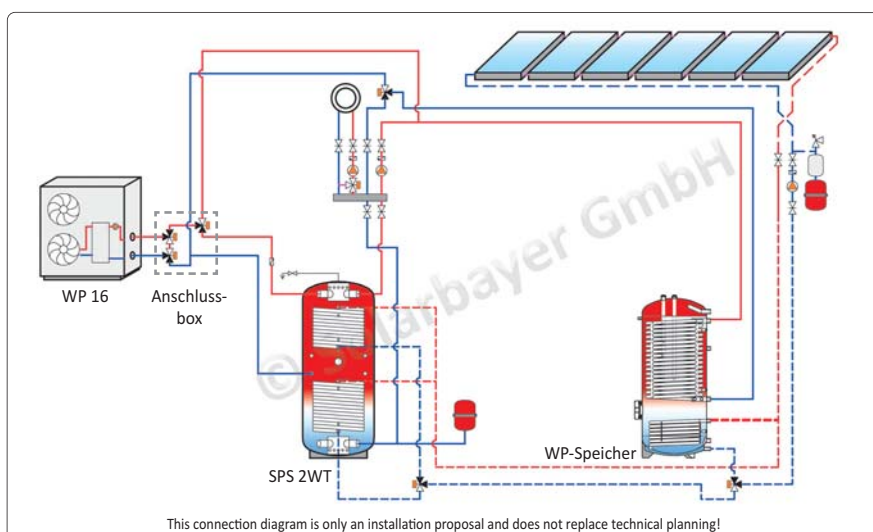
## Type 1:

**Heat pump system with heat pump WP 16, stratification buffer tank SPS as well as a heat pump storage tank WP.**

**In combination with an optional available thermal solar system for heating up DHW.**

The stratification buffer tank effects a more efficient operation of the heat pump due to longer operating times and little pulse frequency.

The DHW in the heat pump storage tank is directly heated up by the heat pump WP 16 in this system. You are able to retrofit a thermal solar system for heating up DHW at any time with this combination.



## Type 2:

**Heat pump system with heat pump WP 16, stratification buffer tank SPS, heat pump storage tank WP.**

**In combination with an optional available thermal solar system for backup heating.**

With type 2 the thermal solar system is generally intended for heating up DHW and backup heating. Besides the direct heating a reloading of DHW can be given by the buffer tank.

The heat pump will be supported by the thermal solar system on sunny days or even completely substituted.

A range of pre-designed solar sets can be found in our pricelist. We will be glad to assist you with dimensioning the necessary size of your collector array.

You will find further hydraulic examples in our hydraulic diagram brochure or on our homepage [www.solarbayer.de](http://www.solarbayer.de)

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