

Comfort air conditioning unit with double plate heat exchanger, adiabatic evaporative cooling system, and sorption-based dehumidification system



Automatically selects the most economical operating mode!



Sorpsolair 73 22 01 - simplified illustration image shows additional equipment

Sorpsolair 72 and 73

AIR VOLUME FLOW: 2,900 – 14,900 m³/h



Sorpsolair

At a glance:

- ▶ Sorption-based air conditioning – dehumidifying without electricity
- ▶ Adiabatic evaporative cooling – Cooling without electricity
- ▶ Thermal coefficient of efficiency COP_{th} from 1.5
- ▶ Brine regeneration through the use of solar energy, district heat or excess process heat at a low-temperature level (from 65° C flow)
- ▶ Energy-saving EC fans
- ▶ Intelligent air bypass duct
- ▶ Integrated defrosting function

Units in the Sorpsolair 72 and 73 series were developed especially to utilise regenerative energy. The innovative air conditioning concept combines sorption-based dehumidification, adiabatic evaporative cooling and an efficient heat recovery system in a compact comfort air conditioning unit. The 72 series, without a brine accumulator, is suitable for directly utilising the waste heat e.g. from combined heat and power system (CHPS), while the brine accumulator integrated into the 73

series allows the storage of e.g. solar energy and hence increases the total efficiency of your installations. The combination of first-class components with precise control and regulation systems guarantees economical operation at all times, while ensuring the highest degree of comfort air conditioning. Sorpsolair systems are designed for all office and business buildings, as well as many other forms of application.

Further performance parameters and options:

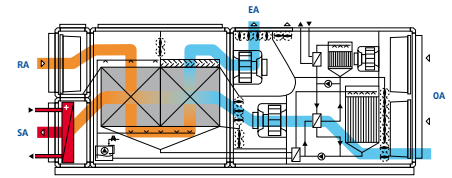
- Integrated absorber and desorber control and regulation fittings
 - Brine accumulator (73 series) for long-lasting storage of e.g. solar heat allows discontinuous dehumidification operation
 - Filtering the air in any operating mode
 - Corrosion-free heat exchanger made from polypropylene
 - Pumped hot water heating coil
 - Individually controllable performance parameters
 - Complete unit, ready to connect, contains all structural elements for comfort air conditioning, including all control and regulation fittings
 - Intensive quality inspection with factory test run
- Options
- Pumped chilled water cooling coil
 - Attenuator
 - Outdoor installation
 - Thermal bridge factor TB1
 - Remote maintenance
 - And many more

Functional description

Wintertime conditions

In case of low outside temperatures the system operates completely in heat recovery mode. The standard heating coil (LPHW) compensates for ventilation and transmission heat losses of the building as required.

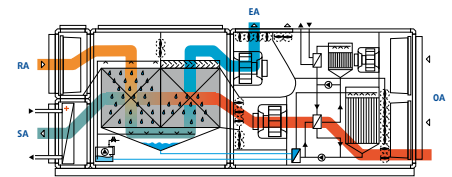
(LPHW) compensates for ventilation and transmission heat losses of the building as required.



Indirect adiabatic evaporative cooling

If during summertime conditions the outside air temperature is higher than the return air temperature, the outside air will be cooled by means of adiabatic evaporative cooling. A major component of this is the double plate heat exchanger, in which the return air is "adiabatically" cooled. The outside air is cooled by the counter-flowing humid, cold exhaust air, without itself being humidified. The high efficiency

rate of the principle lies in the fact that both processes (adiabatic evaporative cooling of the return air + cooling of the outside air) take place simultaneously in the heat exchanger. The high degree of temperature efficiency of the double plate heat exchanger allows significant cooling of the OA-SA, by over 12 K.

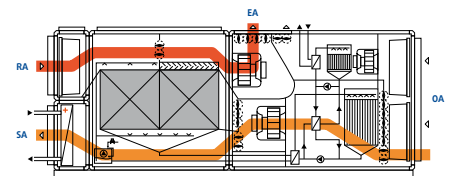


* at RA = 26° C / 45 r.H; OA = 34° C / 40% rh.

Free cooling in summer

If during summertime conditions the outside air temperature is lower than the return air temperature, the unit can be used for free cooling. The return air/exhaust air volume flow and the out-

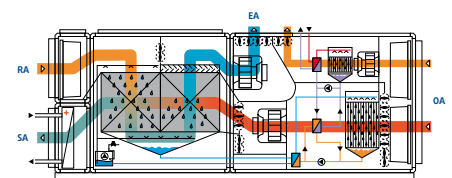
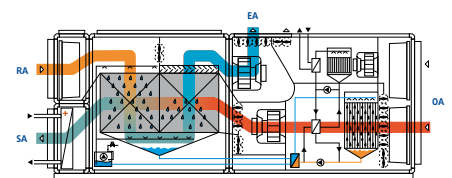
side air/supply air volume flow are fed through the bypass above and below the heat exchanger and the lower pressure loss reduces the power consumption of the fan units.



Sorption-based air conditioning

Sorption-based air conditioning takes place in two stages: air dehumidification and air cooling. For dehumidification, warm outside air is passed through a water-absorbing material (the sorbent, a highly concentrated salt solution). The dried outside air then flows through the double plate heat exchanger with indirect evaporative cooling and is significantly cooled in the process. The diluted brine is regenerated for reuse using heat. The heat sources that might be used are solar thermal plants, district heat networks or waste

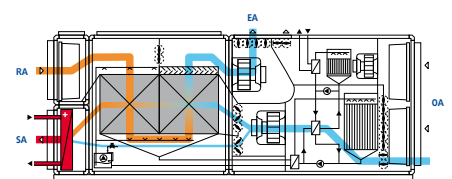
heat e.g. from combined heat and power plants or industrial processes. The air dehumidification and the regeneration of the brine take place in separate circuits. The heat can thus be stored almost indefinitely and without loss in a liquid form and can be used especially where there is no constant heat supply. Sorption-based air conditioning allows cooling and dehumidification without mechanical refrigerating systems and without peak loads in electricity consumption during the summer.



Defrosting Circuit

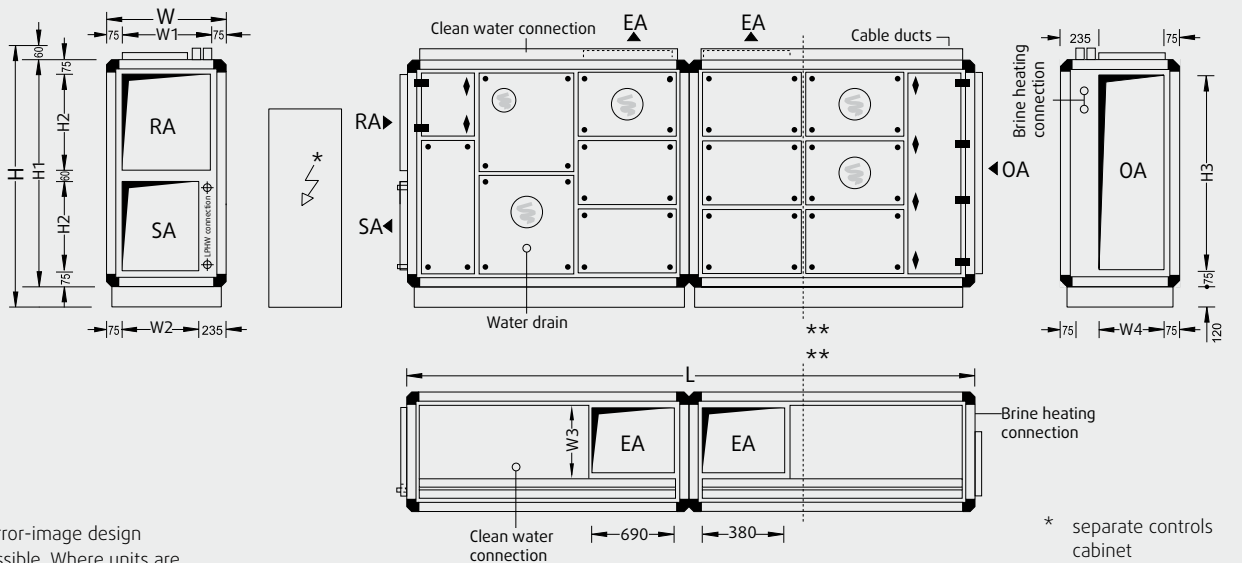
All recuperative heat exchangers tend to ice over in the exhaust air section in the case of low outside temperatures. In defrost operation, the OA-SA bypass opens, reducing the outside air flow rate going

through the recuperator. The heat contained in the return air melts any ice in the heat exchanger, while the airflow is precisely regulated.



Sorpsolair Type 72 and 73 (with brine tank)

System dimensions and weights



Mirror-image design possible. Where units are run in parallel, each unit has a controls cabinet.

* separate controls cabinet

** starting at unit type 72 10 01 three-cube construction

Unit type	L ¹	W ²	H ³	W1	W2	W3	W4	H1	H2	H3	Weight ¹	Operating weight ¹
72 04 01	6,580	890	2,190	740	580	370	380	2,010	580	2,040	2,300	2,800
72 05 01	6,580	1,050	2,190	900	740	530	540	2,010	580	2,040	2,500	3,000
72 06 01	6,580	1,370	2,190	1,220	1,060	850	860	2,010	580	2,040	2,800	3,300
72 10 01	8,430	1,050	2,510	900	740	370	530	2,330	900	2,360	3,600	4,400
72 13 01	8,430	1,370	2,510	1,220	1,060	690	850	2,330	900	2,360	4,000	4,900
72 16 01	8,430	1,690	2,510	1,540	1,380	1,010	1,170	2,330	900	2,360	4,500	5,500
72 19 01	8,590	2,010	2,510	1,860	1,700	1,330	1,490	2,330	900	2,360	5,000	6,150
72 22 01	8,590	2,330	2,510	2,180	2,020	1,650	1,810	2,330	900	2,360	5,800	7,300

Largest transport unit *

Unit Type	L ¹	W	H ³	Weight ¹
73 04 01	3,610	890	2,190	1,400
73 05 01	3,610	1,050	2,190	1,600
73 06 01	3,770	1,370	2,190	2,050
73 10 01	3,770	1,050	2,510	1,200
73 13 01	3,770	1,370	2,510	1,300
73 16 01	3,770	1,690	2,510	1,500
73 19 01	3,770	2,010	2,510	1,800
73 22 01	3,770	2,330	2,510	2,400

Brine accumulator (separate)

Unit Type	L	W	H	Weight
73 04 01	4,180	1,050	2,010	430
73 05 01	4,180	1,050	2,010	430
73 06 01	4,180	1,050	2,010	430
73 10 01	4,180	1,050	2,010	430
73 13 01	4,500	1,050	2,330	535
73 16 01	4,500	1,050	2,330	535
73 19 01	5,460	1,050	2,330	650
73 22 01	5,460	1,050	2,330	650

For service work, a clearance corresponding to dimension W is required on the operating side of the unit. If dimension W is smaller than one metre, please leave a clearance of one metre. At least one metre of clearance is required at the rear. For service work above the unit, please allow 50 mm working height clearance above the cable duct.

Please comply with the dimensions for body size, air duct connections and electrical switch cabinet.

All lengths are given in mm, weights in kg, weight incl. controls cabinet.

- 1 May change depending on chosen option
 - 2 Door fitting assembly increase unit width by 25 mm each operating side
 - 3 incl. 120 mm base frame, plus 60 mm cable duct
 - 4 incl. 200 mm base frame
- * Further partitioning for smaller apertures possible (at extra cost).

Controls cabinet

Unit Type	H x W x D ¹	Design
73 04 01	2,000 x 1,000 x 400	Floor standing cabinet
73 05 01	2,000 x 1,000 x 400	Floor standing cabinet
73 06 01	2,000 x 1,000 x 400	Floor standing cabinet
73 10 01	2,000 x 1,000 x 400	Floor standing cabinet
73 13 01	2,000 x 1,000 x 400	Floor standing cabinet
73 16 01	2,000 x 1,000 x 400	Floor standing cabinet
73 19 01	2,000 x 1,000 x 400	Floor standing cabinet
73 22 01	2,000 x 1,000 x 400	Floor standing cabinet

Technical data for Sorpsolair 72 and 73 on request

AIRPORT MUNICH, GERMANY

Air conditioning of the freight staff canteen via Sorpsolair, regeneration of the brine with solarthermics.

POSSIBLE REGENERATION SOURCES FOR THE BRINE BY INSTALLED SYSTEMS

- ▀ Solarthermics
- ▀ Solarthermics and waste heat from refrigeration
- ▀ Solarthermics and grid gas
- ▀ Solarthermics and waste heat from cogeneration
- ▀ Solarthermics and heat pump
- ▀ Solarthermics and district heating
- ▀ Waste heat from cogeneration
- ▀ District heat

