Creating a good indoor climate.

First-class air conditioning.

menerga
a systemair company

Every innovation begins with a vision.

Our vision is "**M**inimal **ENERG**y **A**pplication".
Since 1980.

1980
Menerga company founded
Market launch of the unit series ThermoCond (intelligent swimming pool technology) and AquaCond (heat recovery from waste water)

1983
Market launch of the automatic heat exchanger cleaning system for the AquaCond unit series

1985
Market launch of the Resolair unit series, regenerative heat recovery with over 90 % coefficient of performance (COP)

1987
Market launch of the Drysolair unit series (energy-saving air drying)

1988
Replacement of the recuperative aluminium heat exchanger with polypropylen heat exchangers developed in-house

1991
Market launch of the Dosolair unit series (two-stage recuperative energy recovery) and the Adsolair unit series (cooling without power by means of adiabatic evaporative cooling)

1996
Market launch of the Trisolair unit series (three-stage recuperative energy recovery)

1999
Market launch of the Hybritemp hybrid compact chilled water unit, with integrated recooling system

2000
Menerga Designer: Design of complete air conditioning systems using software developed in-house as cloud solution

2003
Solar sorption-based air conditioning, initial pilot systems

2004
Market launch of energy-efficient compressors with integrated power modulation

2007
New generation of web-enabled control and regulation of ventilation and air conditioning systems

2008
Introduction of the remote control for the ThermoCond 29 unit series using smartphones

2009
Sorpsolair market launch (sorption-based air conditioning – cooling with the sun)

2011
Market launch of the Adcoolair unit series (Green IT) for rooms with high thermal loads

2012
Market launch of Adconair and ThermoCond with counterflow plate heat exchanger. Market launch of energy-efficient polypropylen regenerators for the Resolair unit series

2013
Menerga becomes part of the Systemair Group. Market launch of fresh water heater without energy from a circulator or heat pump circuit for ThermoCond 38

2014
Market launch of Adiabatic and Adiabatic^{Pro} for Adconair 76

2016
Market launch of replacement units for ThermoCond 22 and ThermoCond 33

2017
Market launch of the hybrid evaporative cooling Adiabatic^{zeroGWP} (combination of dew point cooling and indirect adiabatic evaporative cooling) and the thermally driven AdiabaticDX^{carbonfree} (with integrated, closed adsorption cooling circuit) for Adconair 76

2019
Market launch of the electrically driven AdiabaticDX^{carbonfree} (integrated turbo compressor with R718 as refrigerant) for Adconair 76

Dear customers and partners,

We are delighted to be able to present you some of our possible sample configurations within our product range in this catalogue. We invite you to get to know our apllications and technical solutions and our special energy philsophy. We have been implementing our philosophy, "Creating a good indoor climate – through Minimal ENERGy Application", on an everyday basis since 1980. Through continuous ongoing development, we are furthermore steadily redefining the state of the art.
Get to know a remarkable company with special technology. Join us in creating a good indoor climate – we look forward to it!

ADDITIONAL INFORMATION

About Menerga

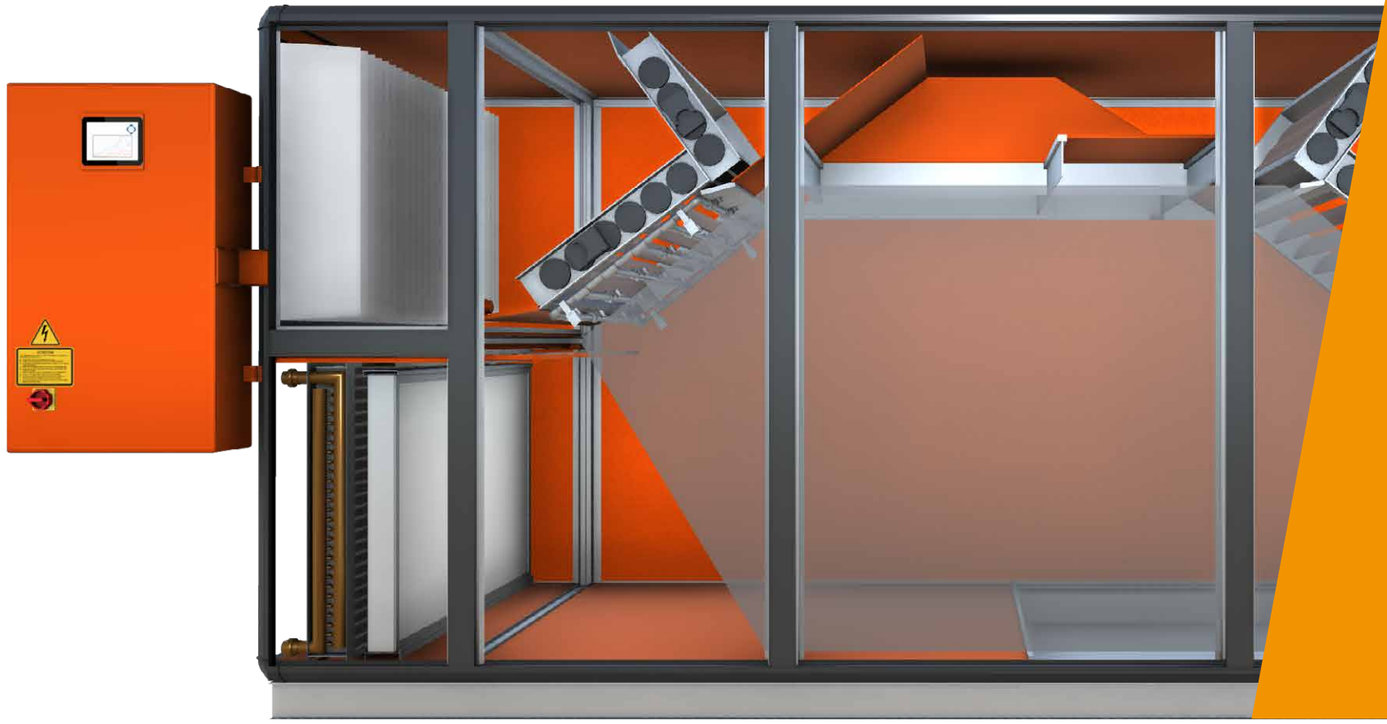
Minimal Energy Application

We supply air conditioning systems individually designed for your requirements. Our philosophy, „Creating a good indoor climate – through Minimal ENERGy Application“, is something we have succeeded in every single day, since the company was founded in 1980. We are proud to be part of the international successful Systemair group since 2013.

Our systems are first-class, intelligent works of engineering and handcraft. They remain reliable in operation for many years, significantly reducing operating costs. How is this possible? In the basic design stages we already integrate all the components for air conditioning, such as the ventilation, heating and refrigeration systems, and equip everything with an intelligent control and regulation system. Every system is fully tested before delivery within the framework of a test run. The compact units are always delivered „ready for connection“. At the building site, they are connected up and made operational in just a few work stages. With over 40,000 systems installed worldwide, we cover almost every area of application. We do not only sell the units, but also offer you our many years of experience. When looking for the best solution, we jointly analyse the specific conditions at the location together with you. For the optimal solution we ask a lot of questions. Might it also be possible to use an alternative source of energy in order to reduce the operating costs even further? In this manner, we and our partners have jointly implemented countless projects which have received many awards for beeing energy efficient. We are proud of this. But what we really like about this is the know-how from jointly developed solutions, which allows operators and investors to save hard earned money – day after day, month after month, and year after year. The investment costs are amortised within a short period. We will be happy to produce reference lists for the building types in which you are interested in. And in the event that you surprise us with a totally new project: We are convinced to find the right solution for you. With our eyes sharpened by countless special projects, e.g. the „ALMA“ telescope facility in the Atacama desert or the „Princess Elisabeth Station“ at the South Pole, we will be happy to accept the challenge.

Convincing arguments for Menerga

- Intelligent technology = lastingly low operating costs
- Utilisation of regenerative energy sources
- Very compact design
- Integrated control and regulation systems
- Factory test run as standard
- Ready-for-connection delivery
- Excellent maintenance concepts



Associations and guidelines

Menerga is active and certified!

Menerga participates in the Eurovent Certified Performance program for Menerga Air range. Check ongoing validity of certificate: www.eurovent-certification.com or www.certiflash.com

Eurovent

Most of our ventilation units are as standard version Eurovent certified. This means all series that are equipped with our Menerga Air housing “MB 50” with 50 mm panels.

Passive House Institute

The complete Resolair 64 and Adconair 76 series are officially certified components of the Passive House Institute. They are ideally suitable for passive houses and all other low energy buildings.

ATEX

The ATEX directive currently includes two directives in the field of explosion protection, the ATEX Directive 2014/34/EU and the ATEX Workplace Directive 1999/92/EC. On request we produce your unit according the ATEX regulations for explosion-hazardous areas.

Manufacturers Association "RLT Hersteller Verband"

Menerga is a member of the German Manufacturers Association for AHU "Herstellerverband Raumlufttechnische Geräte e.V.". Aim of this association is to develop air handling units at the highest technical level as well as standardization work and technical recommendations.

More...

Of course we also have all common other certificates such as TÜV (German Association for Technical Inspection) type examinations, hygiene certificates, ISO 9001 and more.

Please contact us - we are happy to send you an overview or copies of the certificates you might require.

With the new regulation (EU) No. 1253/2014 that came into entry in December 2014 the implementation of the Ecodesign Directive 2009/125/EC is set and with this the requirements for the environmentally friendly design of AHUs.
In addition to basic requirements for the design of AHUs the Ecodesign Directive defined in two stages (01.01.2016 and 01.01.2018) the minimum values for the efficiency of the heat recovery system and maximum power consumption of the fans. Aim is to reduce the energy consumption of the AHU’s during their lifespan. Ecodesign Guideline aims for reducing the primary energy consumption of the whole product group for more than 60 % until 2025 compared to the stage of 2010.

Due to our strict energy efficiency focus we are not only ready for this - we are prepared for this step since 1980!
Our units fulfill the requirements of the directive from January 2018. With Menerga you can plan your projects future-proof.

Core competencies

Our areas of application

© Stadt Rijeka

INDOOR SWIMMING POOL AIR CONDITIONING

Private swimming pools, public swimming pool halls, adventure pools, sports pools, saline baths, hotel pools, school pools, therapeutic pools and many more.
Last not least: heat recovery from waste water.

The air conditioning of swimming pool halls is one of the most challenging areas for air conditioning. Here we started in 1980, this is where we grew up, and we are now market leaders and innovation pioneers. Our special competency lies in the high heat recovery efficiency lowering operating costs, while robust system design overcomes adverse conditions.

COMFORT AIR CONDITIONING

Low-energy buildings, offices, museums, sports facilities, schools, clinics, hotels, banks, historical buildings and many more.

With comfort air conditioning, the focus is on people. Our technology is based on the respective requirements of a project, but simultaneously always looks for the most efficient method with the lowest consumption of energy. For example, we cool with water in order to save electrical energy, or make use of sorption-based air conditioning, with which you can carry out dehumidification by means of heat, e.g. from solar thermal energy or process waste heat. It is even possible to store excess solar heat for an indefinite period without any losses for the purposes of dehumidification.

PROCESS AIR CONDITIONING AND CHILLED WATER

Air conditioning of data centres, industrial drying, process cooling, air conditioning for warehouses, cold water generation and much more.
Last not least: heat recovery from waste water.

The process air conditioning system must ensure that defined air conditions prevail in a defined situation. Menerga systems guarantee reliable drying, cooling or heating. In the field of chilled water, our systems reliably provide the desired water conditions. Saving energy through the use of intelligent technology is our top priority in this sector as well.

© polarfoundation.org

SPECIAL SOLUTIONS

Research projects, special applications

Challenges and unusual projects are the milestones of Menerga's company history. Since the foundation of our company, we have designed individual solutions for many of our customers. We enjoy taking on challenging projects, knowing that these are the projects that bring valuable experience and which also improve the quality of our "standard" systems.

Insight:

Technology in detail

1 **Quality:** Menerga systems are developed in Germany and focus on highest quality.

2 **Profiles and frames:** the equipment design is based on a long-lasting, robust aluminium steel frame. Housing designs are available up to the highest thermal bridge class TB1.

3 **Control and regulation:** our systems are ready to connect upon delivery. The intelligent control and regulation equipment guarantees that the system always performs optimally.

4 **Filters:** all HVAC systems are equipped with an optimised filtration system, to protect both persons and technology.

5 **Heating or cooling coils:** for covering the transmission heating or cooling requirement.

6 **Fans:** energy-efficient EC fan motor units.

7 **Indirect adiabatic evaporative cooling:** for cooling purposes, we use natural processes wherever possible, e.g. cooling with water.

8 **Heat exchangers:** we use polypropylene instead of aluminium without any reduction in efficiency and thus minimise both the weight of the system and CO_2 emissions during production.

9 **Droplet eliminator:** efficient mist collectors reliably eliminate aerosols from the air, and prevent moisture from being carried into the air ducts.

10 **Air damper systems:** for precise distribution of the air flow.

11 **Air distribution:** intelligent bypass designs for efficient operation all year round.

12 **Compressor refrigeration system / heat pump:** corresponds to the regulations of DIN EN 378 and is type-tested and certified in accordance with the pressure equipment directive. An individual acceptance is not required.

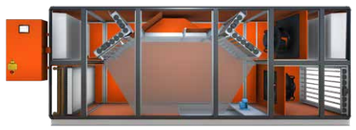
Always the right solution

Intelligent modular system

In almost 40 years of experience in air conditioning and with over 40,000 systems installed worldwide, we have learned a lot. We have adapted our system series to the requirements of the projects. This process has resulted in the creation of a modular system, that allows you to have your system individually adapted to your project.

1st

Selecting a system series allows you to choose the basic orientation of the air conditioning system. Systems in the Adconair series, for example, are equipped with adiabatic evaporative cooling. If you want to use cold water for the process cooling, the right choice would be the Hybritemp series. And in swimming pool halls, systems from the ThermoCond series create a good climate.



2nd

After the basic selection process of choosing a series, you can adapt each unit to your individual requirements. This allows you to choose, e.g. air connection part positions or the position of the controls cabinet. In this step, the unit is specifically adapted already to the requirements of the plant room, and the particular circumstances onsite.

3rd

And even more is possible, of course. For systems with heating coils the number of pipe rows and hence the heating capacity can be varied for example. Or you can select different filter quality categories, depending on intended use. Additional unit components can be integrated and further adaptations can be implemented, too.

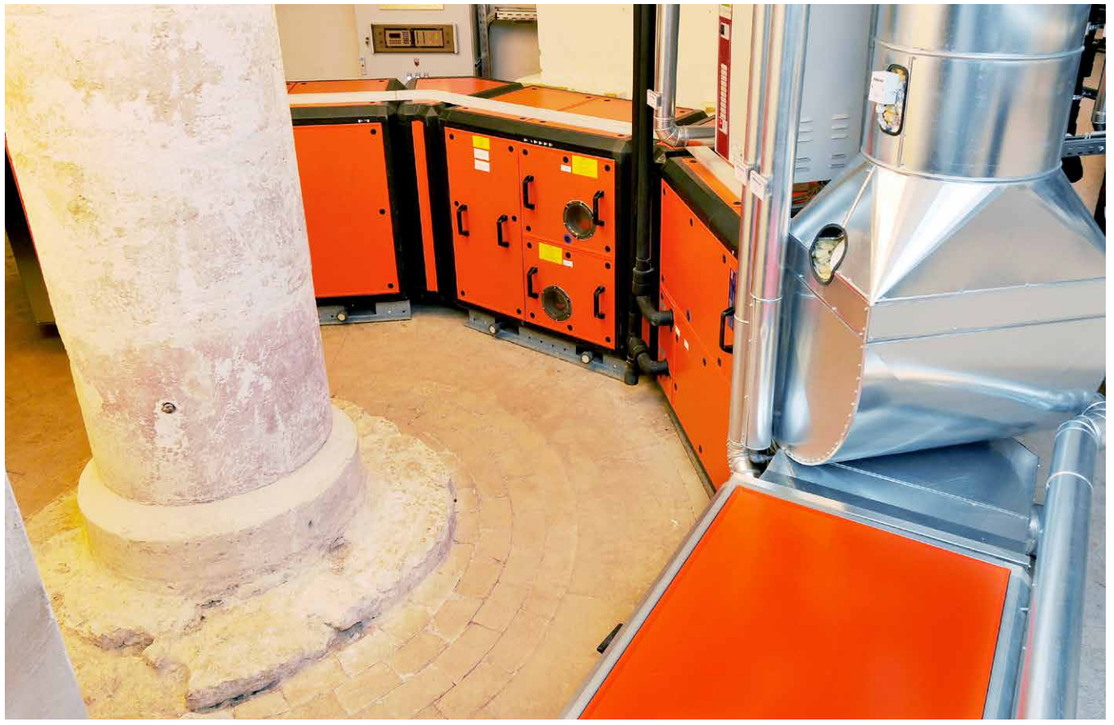
An overview of the most important options can be found on the pages 102 - 103. The fact that we are still using our regular product range, even where there are profound variations, shows you that we have intelligently combined the right modules from the very start.

When it comes to special requirements, we are pros

If necessary, we can build them round

We will find the perfect solution for any project. And if the requirements are ever too special, then we just make our systems even more special. We are the professionals for highly specialised systems and adapt our units faster than anyone else to meet special requirements. An example of this is the world-famous Anna Amalia library in Weimar, an UNESCO World Cultural Heritage Site. The air conditioning for the historically unique collection of books utilises Menerga systems. One of the Resolair units was installed in the cellar vaults, below the book tower. The round tower is approximately 15 metres high, has a wooden spiral staircase and is one of the highlights in the library's ensemble. The cellar vaults below are likewise round, and can only be reached via a single, narrow corridor. The special challenge was sensibly fitting the system into the round cellar. In cooperation with the installer, the air conditioning unit was divided into compact transportation units, carried in through a narrow hatch at the rear of the tower and installed. The special feature is the semi-round design of the system, which is certainly unique.

A nice reference project for the performance of Menerga, but only one example of the many possibilities. We are capable of reacting quickly and flexibly to meet your very specific requirements and onsite circumstances. In addition to the many options presented to you by our product range, we can also develop entirely new unit concepts for your special requirements. As, for example, we did for the Felsland Dahn leisure pool. The intention was to wisely make use of the excess heat from a combined heat and power system – and so our engineers developed the first sorption-based swimming pool dehumidification system in Germany. The result is a high-performance, reliable system that reduces the operating costs by approx. 40,000 Euros per year. We have countless examples of such special systems. Just ask us! We develop and manufacture these special systems for you. Because we can. Since 1980.



MB 50 unit housing

For all units in the Menerga Air range

Measured values according to DIN EN 1886	
Casing stability	D1 (M)
Air tightness -400 Pa	L1 (M)
Air tightness +700 Pa	L1 (M)
Filter bypass leakage	F7 (M), optional F9 (M)
Heat transfer	T2
Thermal bridge factor	TB1

Eurovent 2014

Use of the MB 50 housing	Unit standard	Menerga Air
ThermoCond 19	-	●
ThermoCond 23	-	●
ThermoCond 29	-	●
ThermoCond 38	●	●
ThermoCond 39	●	●
Drysolair 11	-	●
Adcoolair 75	-	●
Trisolair 52/59	-	●
Adsolair 56/58	●	●
Resolair 62/66	-	●
Resolair 64/68	●	●
Adconair 76	●	●

EUROVENT CERTIFIED PERFORMANCE
AHU No.: 14.11.003
Range: Menerga Air
www.eurovent-certification.com

Relates to the Menerga Air design.
Check the validity of the certificate:
www.eurovent-certification.com or
www.certiflash.com

Thermal insulation shell

The PUR thermal insulation shell reduces heat losses and hence energy expenditure. This means the best possible avoidance of thermal bridges, and virtually no condensation on the outside of the unit.

Thermal bridge factor TB1

Unit cover

Unit cover as a dual-shell sandwich element with a frame profile around the edge. Panel thickness 50 mm. Inside and outside sheet panels galvanised with a polyester coating. Corrosion category III. Colour RAL 2004 or RAL 7035. Sheet thickness 0.75 mm, optionally 1.5 mm. Inspection glasses as required. All unit covers that can be opened have integrated, replaceable seals. Above a clear unit height of 1.3 m, this is designed as a door.

Maximum leak tightness, Heat transfer T2

Hinges/fasteners

In areas requiring maintenance on the operating side, 180° 2D hinges with door fasteners are used. Door fastener with handle, in areas of overpressure with additional pressure relief and safety restraint to prevent bursting open. The door fasteners on doors with dangerous components can be locked (box spanner).

Simple to use, highest safety level

Cover locks

In areas not requiring maintenance on the operating side, covers are secured with plastic clamp fasteners, which are applied to the exterior of the unit and do not penetrate the unit casing. Additional handles make handling easier.

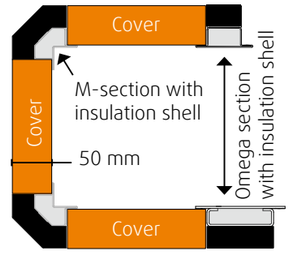
Lower leakage, simple to use

Profile design

Housing profile design made from galvanised steel, guaranteeing the highest stability.

Robust, durable design

Design of the housing, view from above:



Base

Circumferential base frame made from galvanised steel, standard height 120 mm. Other sizes also available. In the weatherproof design, welded base in a single piece or a few sections.

Extremely durable

"On the Top" since 1980!

The Menerga quality pledge

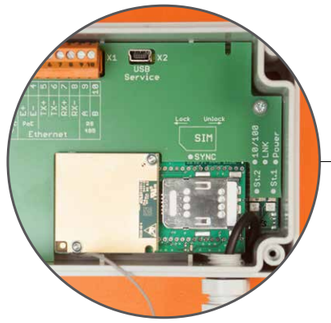
Control and regulation have always been an integral part of our units and ensure an optimum of operation with a focus on highest energy efficiency.

Bus connection of sensors and actuators create a failure-free connection, reliable measurements and thanks to integrated LED's they even bring light into the unit.

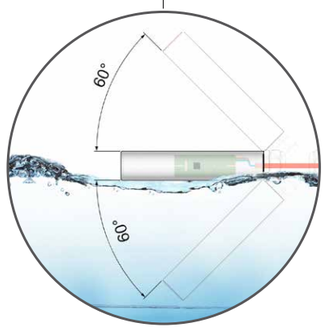
Solid and thermal bridge free housing with a steel frame, thermal cladding and for all outdoor units a weatherproof steel roof.

Indirect adiabatic evaporative cooling inside the heat exchanger. Hollow cone nozzles guarantee an extremely fine, homogeneous distribution of the water in the return air.

Microchannel condensers reduce the CO_2-emmission due to a reduced refrigerant volume of ⅔ and a halved airside pressure drop.



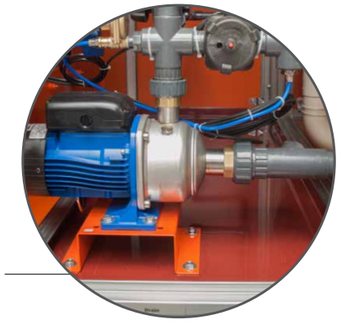
Outside air temperature sensor including GSM-router wirelessly transfers unit values and assures a connection in real-time.



Level detector including a gyro sensor in the water tank of the adiabatic evaporative cooling system is constantly monitoring the water level. Extremely low-maintenance.

Unit housing MB 50
as per DIN EN 1886:

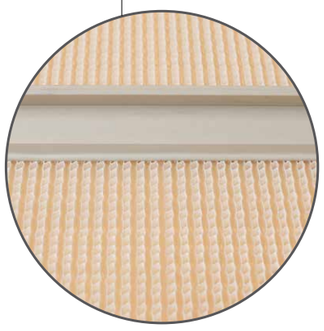
Thermal transmittance:	T2
Thermal bridge factor:	TB1
Mechanical rigidity:	D1
Air tightness class:	L1
Filter bypass leakage class:	up to F9



Coated surface in "wet zones" of the unit.

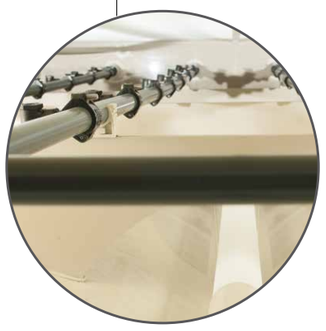
CNC-bended pipework for all compression cooling plants. That means significantly less solder connections and thus fewer weak spots.

Smartphone solutions for remote control, worldwide energy and fault monitoring.



Ultra durable heat exchangers, that are air- as well as water-tight in all areas. We use corrosion-free polypropylene and first class processing.

Fan walls with IE4 class motors for better performance and safety and compact units at the same time.



Recuperation tank, easy access to the tank of the adiabatic cooling system facilitates service and ensure a complete draining of the system after operation.

Indoor and outdoor units

Always appropriately equipped

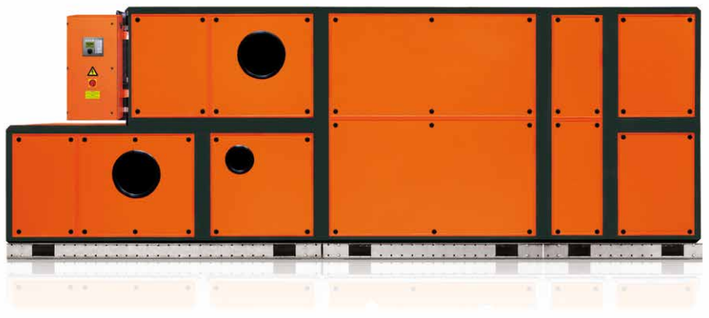
Outdoor installation

- Panel colour according to RAL 7035 light grey
- Galvanised steel base, welded
- Weather-resistant unit roof with drip edge
- Delivery in smallest possible numer of transportation units for simple installation
- Controls cabinet in the building, terminal box in the unit
- Condensate drainage with trace heating system
- Delivery complete with maintenance switch in the unit

Outdoor and indoor units are ideally equipped for their respective purposes. All outdoor units for example are equipped so that pipelines containing water cannot freeze during winter. A welded base frame increases stability. The maintenance switch mounted directly in the unit simplifies maintenance work, as it is possible to switch off fan motors directly at the unit location. So, for units with integrated control and regulation system, this function is fully integrated into the unit before it leaves the factory, whereas usually the installer would have to take care about this onsite. For indoor units on the other hand the focus is on the simplest possible installation of the units into the plant room. Depending on the space available and the size of the unit, the controls cabinet may be mounted directly on the unit, or can be installed onto a wall. Of course you decide on the details and features of your indoor or outdoor unit. We will be happy to advise you.

Indoor installation

- Panel colour according to RAL 2004 pure orange
- Galvanised steel base, bolted, 120 mm or unit feet
- Delivery in compact transportation units for simple installation into the building
- Controls cabinet mounted on the unit or on a wall
- Delivery with main switch/ maintenance switch on controls cabinet



Experts at your service

Technical Customer Service

Experts at your service, anytime, anywhere. With a comprehensive range of services and an extensive service network throughout Europe, the Menerga Technical Service guarantees the most economical and advanced services over the entire life cycle of your system, from the day of commissioning onwards.

More than 140 service technicians at various service centres, and 60 service engineers at the Menerga locations, provide a professional all-inclusive service with the objective of achieving high availability of the systems and a maximum of efficiency. The range of services offered by the Menerga Technical Service covers everything from the test run at the factory and on-site commissioning, through periodic servicing, repairs, remote maintenance and remote diagnosis by means of direct dial-up options, to the refurbishment and optimisation of the systems. And this all not only for Menerga units!

We supply you with the right service concept, customer-specific and application-specific. In the event of an emergency, you can reach us 24 hours a day on the following telephone number:
+49 208 9981-199

Air conditioning unit with cross-counterflow heat exchanger and heat pump (29) for private swimming pool halls

ThermoCond 19 20 01 and 29 20 01 - simplified illustration

Automatically selects the most economical operating mode!

ThermoCond 19 and 29

AIR VOLUME FLOW: 1,100 - 3,500 m³/h

At a glance:

- **Dehumidifies, ventilates and heats**
- **Corrosion-free heat exchanger made from polypropylene**
- **Two-stage recuperative heat recovery**
- **Energy-saving EC fans**
- **Integrated heat pump (ThermoCond 29)**
- **Constantly regulated recirculation air dampers for heating purposes**
- **Variable air duct connections**
- **Compact design for minimal space requirements**
- **Integrated control and regulation system, compatible with all conventional building management systems**
- **Optional: operation via smartphone or tablet**

Units of the series 19 and 29 dehumidify and heat the swimming pool hall and they reduce a possible concentration of harmful substances in the air. The units are multifunctional compact systems with integrated control and regulation. ThermoCond 19 is suitable for swimming halls with lower heating requirements. ThermoCond 29 is equipped with an integrated heat pump. This increases the overall efficiency of the system and enables the dehumidification of the pool hall air in recirculation mode. The design ensures the cleanability according to VDI 6022.

Further performance parameters and options:

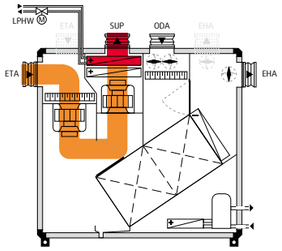
- Filtering the air in any operating mode
- Heating coil
- Sound-optimised plastic impellers for even quieter operation (from unit size 19/29 20 01)
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for air conditioning swimming pool hall air, including all control and regulation fittings
- Intensive quality inspection with factory test run

Options
- Bypass damper
- Water/air temperature interconnection
- Design complies with VDI 6022
- Pool water condenser (ThermoCond 29)
- Domestic heat pump coupling (ThermoCond 29)
- Remote maintenance
- and many more

Foto: ThermoCond 37 at Westfalenbad Hagen

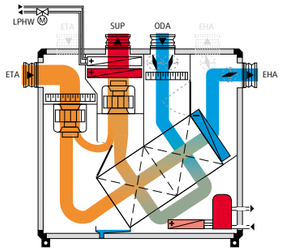
Functional description

Recirculating air operation (heating)
If no requirements are placed on temperature regulation or dehumidification when the unit is in standby mode, the system operates only in recirculation mode with reduced air volume flow. The air circulation in the swimming pool hall is guaranteed. If heating is required, the return air is heated up using the heating coil to achieve the supply air temperature set-point.



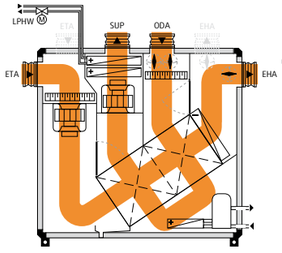
Dehumidification using outside air in winter
ThermoCond19: The swimming pool hall is dehumidified through the addition of outside air to the recirculated air volume flow. The proportion of outside air is continuously and automatically adjusted, depending on the current evaporation of water (occupancy level of the swimming pool hall), as well as the outside air humidity. If the waste heat recovery is not sufficient for achieving the desired supply air temperature, the supply air is reheated in the heating coil.

ThermoCond29: A large proportion of the sensitive and latent heat is recovered from the return air, and is transferred to the supply air in the cross-counterflow heat exchanger and evaporator. If the heat output of the heat pump is not sufficient, the supply air will be reheated using the heating coil. Excess heat can be transferred to the optionally available pool water condenser for heating the pool water.

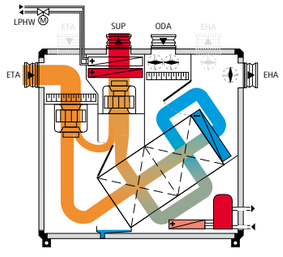


All images show ThermoCond 29 with heat pump.

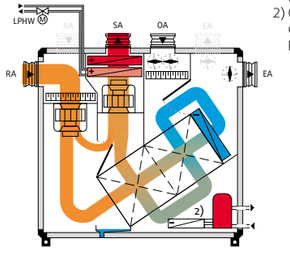
Dehumidification using outside air in summer
In case of rising outside air humidity, the recirculation air damper is continuously closing as required. When the outside air humidity is high, the damper closes completely. The system works at 100 % outside air / exhaust air operation through the heat exchanger.



Recirculating air dehumidification (ThermoCond 29)
The air is dehumidified in the evaporator of the heat pump, this process is boosted by the pre-cooling effect in the heat exchanger. The air that has already cooled down and been dried is preheated in the heat exchanger by the return air from the swimming pool hall. On the other side of the heat exchanger, the transmission of heat produces a precooling effect, lowering the temperature of the drawn-in humid and warm air from the swimming pool hall near to its dew point. The preheated, dehumidified air is then mixed with a proportion of untreated recirculation air, is reheated at the condenser of the heat pump using the heat extracted during the dehumidification process, and is returned to the swimming pool hall as supply air. The heat pump is optimally designed, with a dehumidification energy requirement < 0.25 kWh/kg. If required, the supply air will be reheated using the heating coil.



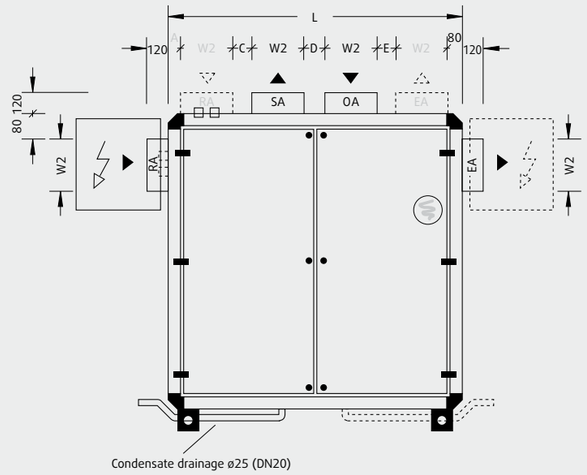
Domestic heat pump operation (ThermoCond 29)
An existing domestic heat pump can be used for energy-efficient heating of the swimming pool hall air. The domestic heat pump is connected to the heating coil. Typically, the low flow temperatures of the domestic heat pump are not sufficient for heating the swimming pool hall air – the heating coil is therefore installed upstream of the air condenser of the integrated heat pump. The domestic heat pump can so be operated with an optimal COP without a change in the low flow temperatures. In combination, the two systems heat the supply air to the desired temperature level.

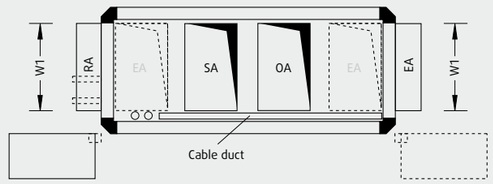


1) Option: pool water condenser
2) Option: domestic heat pump operation

ThermoCond Type 19 and 29

System dimensions and weights





Unit feet 100 mm
Optional: adjustable feet from 100 to 120 mm

In the case of controls cabinet, folding on unit: cabinet is folded on the front end for transportation. This reduces the transportation length by approx. 250 mm.

Return and exhaust air duct connection possible on top of unit.
Mirror-image design possible.

Unit type	L	W [1]	H [2]	W1	W2	H1	A	C	D	E	Weight Type 19	Weight Type 29
19 11 01	1,530	570	1,590	350	200	1,370	215	150	150	135	410	460
19 15 01	1,530	730	1,590	500	200	1,370	215	150	150	135	440	500
19 20 01	1,690	730	1,910	500	300	1,690	80	105	120	105	540	600
19 25 01	1,690	890	1,910	600	300	1,690	80	105	120	105	610	680
19 35 01	1,690	1,210	1,910	920	300	1,690	80	105	120	105	720	830

Controls cabinet

Unit Type	H x W x D	Position at unit
19 11 01	600 x 600 x 200	SA/RA side
19 15 01	600 x 600 x 200	SA/RA side
19 20 01	600 x 600 x 200	SA/RA side
19 25 01	600 x 600 x 200	SA/RA side
19 35 01	600 x 600 x 200	SA/RA side

For service work, a clearance corresponding to dimension B is required on the operating side of the unit. If dimension W is smaller than one metre, please leave a clearance of one metre.

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

Partitioning of unit for smaller apertures possible (at extra cost).

All lengths are given in mm, weights in kg.

1 Door fitting assembly increase unit width by 25 mm each operating side
2 incl. 100 mm unit feet, incl. 120 mm duct connection

Technical specifications and performance

Unit Type		19 11 01	19 15 01	19 20 01	19 25 01	19 35 01
Optimum flow rate	m³/h	770	1,020	1,380	1,730	2,420
Dehumidification capacity according to VDI 2089	kg/h	4.7	6.2	8.4	10.6	14.8
Coefficient of power efficiency according to EN13053:2012		72 %				
Heat recovery efficiency according to EN 308	%	73.1	73.2	73.1	73.1	73.0
Total electrical power rating [1]	kW	0.50	0.58	0.84	0.95	1.60
Max. current consumption [1]	A	3.2	3.2	3.8	3.8	7.6
Operating voltage		3 / N / PE 400 V 50 Hz				
Ext. pressure losses						
Supply and fresh air channel	Pa	300	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300	300
Sound power level [2]						
Acoustic pressure at a distance of 1 m from the unit [2]	dB(A)	57	55	55	50	57
Fan units						
Rated motor input for supply air [3]	kW	0.25	0.29	0.44	0.50	2x 0.42
Rated motor input for return air [3]	kW	0.25	0.29	0.40	0.45	2x 0.38
Rated motor input for return air [3]	kW	0.14	0.16	0.24	0.28	2x 0.22
Rated motor input for return air recirc mode [3]	kW	0.12	0.13	0.21	0.24	2x 0.19
SFP category (supply air | return air) recirc mode		1 | 1	1 | 1	1 | 1	1 | 1	1 | 1
Nominal rating supply air | return air	kW	1.05 | 1.05	1.05 | 1.05	1.15 | 1.15	1.15 | 1.15	2x 1.15 | 2x 1.15
Filtration according to ISO 16890						
Outside air		ISO ePM10 70% (M5)				
Return air		ISO ePM10 70% (M5)				
LPHW						
Heating capacity [4] recirc mode | OA-EA operation	kW	4.9 | 5.8	6.6 | 7.8	8.8 | 10.4	11.5 | 13.4	15.8 | 18.5
Water flow rates and pressure losses						
LPHW	m³/h | kPa	0.16 | 0.7	0.21 | 1.2	0.31 | 0.8	0.38 | 1.4	0.53 | 1.2
LPHW valve	m³/h | kPa	0.16 | 6.8	0.21 | 10.7	0.31 | 9.6	0.38 | 5.8	0.53 | 11.0
Connections						
LPHW connection	DN	15	15	20	20	20
LPHW control valve connection	DN	10	10	15	15	20
Condensate drainage | Floor drain	DN	20	20	20	20	20

Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m³), unless otherwise specified.

1 depends on configuration of measurement and control system/unit
2 at 250 Hz mid-band frequency
3 with average filter contamination
4 FL/RL = 70/50° C, SA ≈ 50° C

Please seek approval of technical data and specifications prior to start of the planning process.

Technical specifications and performance

Unit Type		29 11 01	29 15 01	29 20 01	29 25 01	29 35 01
Optimum flow rate	m³/h	1,100	1,500	2,000	2,500	3,500
Dehumidification capacity according to VDI 2089	kg/h	6.7	9.2	12.2	15.3	21.4
Dehumidification capacity in recirc mode	kg/h	5.0	5.7	7.0	9.1	13.1
Total electrical power rating [1]	kW	2.30	2.24	3.33	3.73	5.72
Max. current consumption [1]	A	7.4	7.4	8.9	10.1	17.6
Operating voltage		3 / N / PE 400 V 50 Hz				
Ext. pressure losses						
Return and exhaust air channel	Pa	300	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300	300
Sound power level						
Acoustic pressure at a distance of 1 m from the unit [3]	dB(A)	58	54	54	51	56
Fan units						
Rated motor input for supply air [3]	kW	0.45	0.51	0.84	0.95	2x 0.78
Rated motor input for return air [3]	kW	0.35	0.43	0.69	0.78	2x 0.63
Rated motor input (SA | RA) recirc dehumidification [3]	kW	0.22 | 0.27	0.27 | 0.33	0.44 | 0.53	0.53 | 0.63	2x 0.40 | 2x 0.49
SFP category (supply air | return air) recirc dehumidification		1 | 1	1 | 1	1 | 1	1 | 1	1 | 1
Nominal rating supply air | return air	kW	1.05 | 1.05	1.05 | 1.05	1.15 | 1.15	1.15 | 1.15	2x 1.15 | 2x 1.15
Integrated heat pump						
Refrigerant type [4]		R407C				
Heating capacity heat pump [5]	kW	6.4	7.2	8.8	11.1	15.8
Rated compressor input [5]	kW	1.5	1.3	1.8	2.0	2.9
Heating capacity of heat pump [5]	COP	4.3	5.5	4.9	5.6	5.4
Filtration according to ISO 16890						
Outside air		ISO ePM10 70% (M5)				
Return air		ISO ePM10 70% (M5)				
LPHW						
Heating capacity [6] recirc mode	kW	7.1	10.0	13.1	16.7	23.3
Water flow rates and pressure losses						
LPHW	m³/h | kPa	0.26 | 1.5	0.35 | 2.9	0.52 | 2.1	0.63 | 3.4	0.89 | 3.1
LPHW valve	m³/h | kPa	0.26 | 16.8	0.35 | 12.3	0.52 | 10.6	0.63 | 6.4	0.89 | 12.5
Pool water condenser [7] (supplementary equipment)						
Heating power [8]	kW	6.35	7.10	8.77	11.10	15.82
Pool water volume flow rate | water side pressure loss	m³/h | kPa	0.7 | 10.04	0.9 | 11.86	1.1 | 9.61	1.4 | 10.04	2.0 | 12.61
Spread of pool water temperature	K	0.7	0.9	1.1	1.4	2.0
Connections						
LPHW connection	DN	15	15	20	20	20
LPHW control valve connection	DN	10	10	15	15	20
Condensate drainage | Floor drain	DN	20	20	20	20	20
Pool water condenser connection [9]	DN	20	20	25	25	25

Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m³), unless otherwise specified.

1 depends on configuration of measurement and control system/unit
2 at 250 Hz mid-band frequency
3 with average filter contamination
4 where domestic heat pump coupling: Refrigerant type = R134a; filling volumes vary
5 dehumidifying in recirc mode without PWC
6 FL/RL = 70/50° C, SA ≈ 50° C
7 heat emission full and proportional; when water inlet temp. 28° C
8 dehumidifying in recirc mode with PWC
9 for units with pool water condenser

Please seek approval of technical data and specifications prior to start of the planning process.

Air conditioning unit with cross-counterflow-cross heat exchanger for private swimming pool halls

ThermoCond 23 26 01 - simplified illustration

Automatically selects the most economical operating mode!

ThermoCond 23

AIR VOLUME FLOW: 1,600 – 5,000 m³/h

At a glance:

- **Dehumidifies, ventilates and heats**
- **Corrosion-free heat exchanger made from polypropylene**
- **Over 80 % temperature efficiency through three-stage recuperative heat recovery**
- **Energy-saving EC fans**
- **Constantly regulated recirculation air dampers for heating purposes**
- **Flat design, ideal for integration into pool periphery**
- **Integrated control and regulation system, compatible with all conventional building management systems**
- **Optional: operation via smartphone or tablet**

Units of the series 23 dehumidify and heat the swimming pool hall and they reduce a possible concentration of harmful substances in the air. The units are multifunctional compact systems with integrated control and regulation.

ThermoCond 23 achieves a very high heat recovery rate based on a special heat exchanger. The design ensures the cleanability according to VDI 6022.

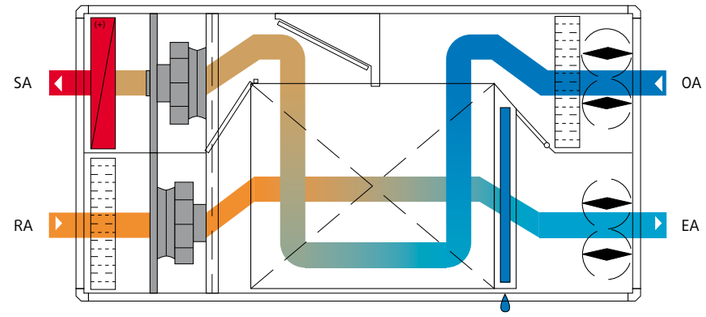
Further performance parameters and options:

- Filtering the air in any operating mode
- Heating coil
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for air conditioning swimming pool hall air, including all control and regulation fittings
- Bypass damper
- Intensive quality inspection with factory test run

Options

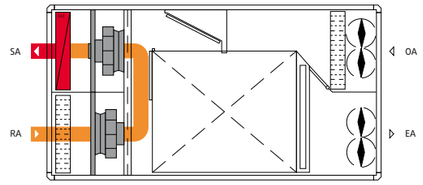
- Water/air temperature interconnection
- Remote maintenance
- and many more

Functional description

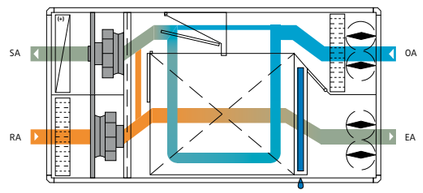


Dehumidification using outside air in winter
A large proportion of the sensitive and latent heat is recovered from the return air and is transferred to the supply air in the heat exchanger. The cross-counterflow-cross heat exchanger enables the recovery of up to 80 % of the heat contained in the return air. The ventilation heat losses that have to be covered by the heating coil are thus kept to a minimum.

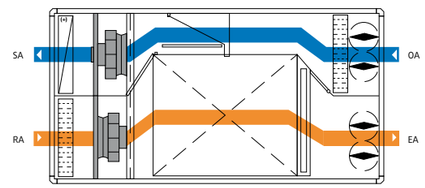
Recirculating air operation (heating)
If no requirements are placed on temperature regulation or dehumidification when the unit is in standby mode, the system operates only in recirculating mode with reduced air volume flow. The air circulation in the swimming pool hall is guaranteed. If heating is required, the return air is heated to the supply air temperature as required using the heating coil.



Dehumidification in the transitional period
When outside air temperatures rise, the output of the heating coil can be reduced. The heat recovered can be regulated by means of the controllable bypass damper. A proportion of the outside air is by-passed the plate heat exchanger.

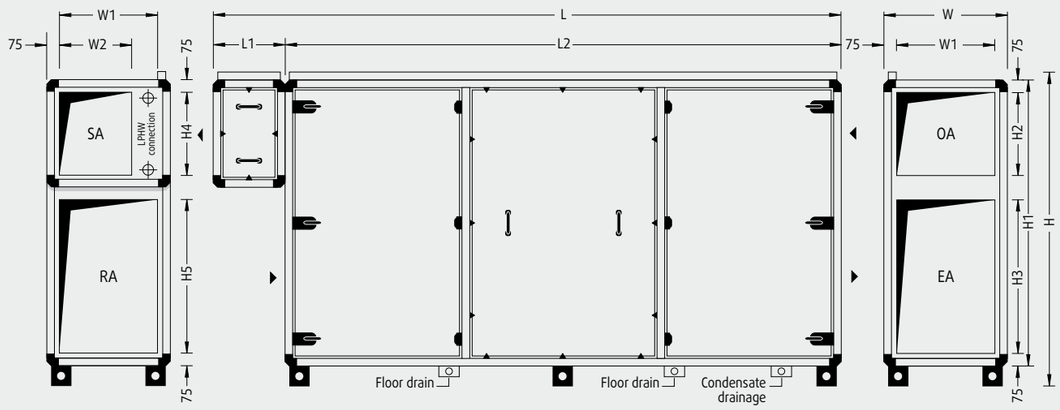


Summertime conditions
In the case of rising outside air humidity, the recirculation air damper is continuously closing as required. When the outside air humidity is high, the damper closes completely. The system works at 100 % outside air / exhaust air operation through the heat exchanger. Heat recovery is not required.



ThermoCond Type 23

System dimensions and weights



Unit feet 100 mm
Optionally: adjustable feet from 100 to 120 mm

Unit type	L	W [1]	H [2]	L1	L2	W1	W2	H1	H2	H3	H4	H5	Weight
23 12 01	2,580	570	1,210	410	2,170	420	350	1,050	325	420	420	325	450
23 18 01	3,060	730	1,530	410	2,650	580	505	1,370	485	580	580	485	600
23 26 01	3,700	730	1,850	410	3,290	580	505	1,690	485	900	580	580	870
23 36 01	3,700	1,050	1,850	410	3,290	900	825	1,690	485	900	580	580	1,100

Controls cabinet

Unit Type	H x W x D	Position at unit
23 12 01	600 x 600 x 200	OA/EA side
23 18 01	600 x 600 x 200	OA/EA side
23 26 01	600 x 600 x 200	OA/EA side
23 36 01	600 x 600 x 200	OA/EA side

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. 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.

Partitioning of unit for smaller apertures possible (at extra cost).

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

1 Door fitting assembly increase unit width by 25 mm each operating side
2 incl. 100 mm unit feet and 60 mm cable duct

Technical specifications and performance

Unit Type		23 12 01	23 18 01	23 26 01	23 36 01
Optimum flow rate	m^3/h	1,600	2,300	3,200	5,000
Dehumidification capacity according to VDI 2089	kg/h	9.8	14.0	19.5	30.5
Total electrical power rating [1]	kW	1.08	1.78	2.39	3.24
Max. current consumption [1]	A	6.6	13.8	8.0	6.6
Operating voltage		1 / N / PE 230 V 50 Hz		3 / N / PE 400 V 50 Hz	
Ext. pressure losses					
Supply and fresh air channel	Pa	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300
Sound power level					
Acoustic pressure at a distance of 1 m from the unit [2]	dB(A)	43	51	51	54
Fan units					
Rated motor input for supply air [3]	kW	0.53	0.82	1.21	1.63
Rated motor input for return air [3]	kW	0.37	0.54	0.89	1.30
Rated motor input for supply air recirc mode [3]	kW	0.26	0.38	0.53	0.82
Rated motor input for return air recirc mode [3]	kW	0.23	0.34	0.49	0.75
SFP category (supply air | return air) recirc mode		1 | 1	1 | 1	1 | 1	1 | 1
Nominal rating supply air | return air	kW	0.75 | 0.75	1.3 | 1.35	2.5 | 2.5	1.95 | 1.95
Filtration according to ISO 16890					
Outside air		ISO ePM10 70 % (M5)			
Return air		ISO ePM10 70 % (M5)			
LPHW					
Heating capacity recirc mode [4]	kW	9.2	14.8	17.6	28.8
Heating capacity OA-EA operation [4]	kW	10.9	17.7	20.1	33.7
Water flow rate and pressure losses					
LPHW	m^3/h | kPa	0.60 | 16.1	0.74 | 4.8	1.32 | 13.7	1.20 | 8.8
LPHW valve	m^3/h | kPa	0.74 | 21.4	0.88 | 4.8	1.60 | 15.9	1.41 | 12.4
Connections					
LPHW connection	DN	15	15	20	20
LPHW control valve connection	DN	10	10	15	15
Condensate drainage	DN	20	20	20	20
Floor drain	DN	20	20	20	20

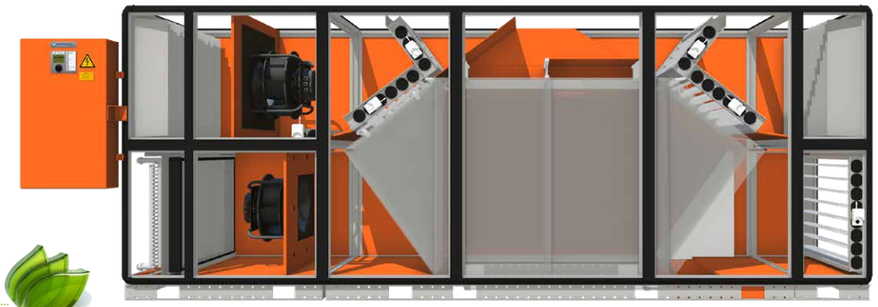
Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 depends on configuration of measurement and control system/unit
2 at 250 Hz mid-band frequency
3 with average filter contamination
4 FL/RL = 70/50° C, SA ≈ 50° C

Please seek approval of technical data and specifications prior to start of the planning process.

ThermoCond public

Air conditioning unit with counterflow plate heat exchanger for medium-sized and large public swimming pool halls



ThermoCond 38 13 01 - simplified illustration

Automatically selects the most economical operating mode!

ThermoCond 38

AIR VOLUME FLOW: 2,600 – 50,000 m³/h

Comes with our Eurovent certified MB 50 housing.

Energieeffizienzklasse A+

At a glance:

- **Heat recovery rate of more than 95% with just 115 Pa pressure drop**
- **Designed for the requirements of the highest energy efficiency classes**
- **HRC class H1, even at high air velocities**
- **Energy-saving EC fans**
- **Optionally: Clean water heater**
- **Integrated defrosting function**
- **Thermal bridge factor k_b = 0.78 - class TB1**
- **Two-stage supply air filtration**
- **Freely configurable HVAC system**
- **Load-dependent variable volume flow rate adjustment**
- **Fulfils the requirements of VDI 6022**

Units of the series 38 achieve a very high energy efficiency, since the integrated program only adds as much air as is required for dehumidification of the pool hall air. ThermoCond 38 dehumidifies exclusively with outside air. The design ensures the cleanability according to VDI 6022. The integrated counterflow plate heat exchanger reaches a real counterflow share of 80 % with highest heat recovery rates. Optionally the unit can be equipped with a fresh water heater for an even more efficient use of the heat energy contained in the exhaust air.

Further performance parameters and options:

- Corrosion-free counterflow plate heat exchanger made from polypropylene
- Heating coil
- Air filtration in all operating conditions, with filters in return, outside and supply air
- Constantly regulated recirculation air dampers for heating purposes
- Recirculation air defrost damper
- Integrated freely programmable control and regulation unit
- Complete unit, contains all structural elements for heating, dehumidification and ventilation
- Intensive quality inspection with factory test run
- Cleaning of the heat exchanger possible in mounted position

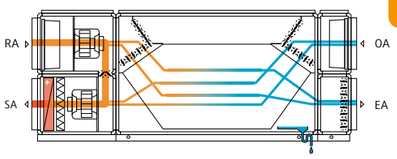
Options:

- Integrated heat recovery bypass by means of RA/EA and OA/SA dampers
- Recuperator in short version
- Sound absorber
- Outdoor installation
- Remote maintenance
- Clean water heater
- and many more

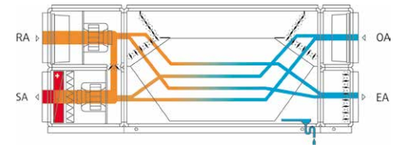
ThermoCond public

Functional description

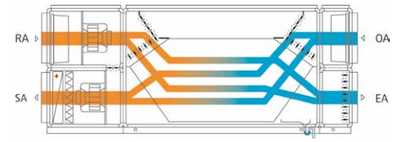
Standby mode
In standby operation of the swimming pool hall, the amount of water evaporation is lower. The air handling unit operates with reduced dehumidification performance. The proportion of recirculated air in this operation mode is maximized. For hygiene reasons and to ensure the pollutant removal, it is recommended to mix a small proportion of outside air to the supply air, thus continuous dehumidification of the pool hall air also takes place in idle mode. Despite reduced fan performance, the air circulation in the swimming pool is guaranteed. The swimming pool is heated, if required, by the heating coil.



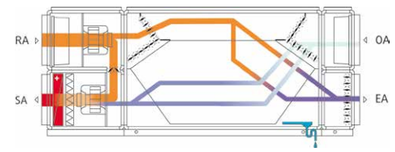
Swimming pool mode with dehumidification requirement
The swimming pool hall is dehumidified through the addition of outside air to the recirculation air volume flow. In swimming pool mode the minimum required amount of outside air is added to the recirculation air for hygienic reasons (VDI 2089). The proportion of outside air depends on the current evaporation of water (and therefore the occupancy level of the swimming pool hall), as well as the outside air humidity. This is continuously and automatically adjusted. If the waste heat recovery is not sufficient for achieving the desired supply air temperature, the supply air is reheated in the heating coil.



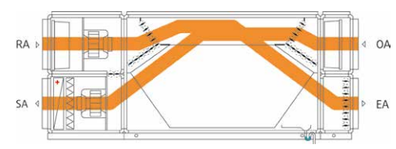
Outside air / exhaust air mode
In the case of rising outside air humidity, the recirculation air damper is continuously closing as required. When the outside air humidity is high, the damper closes completely. The system works at 100 % outside air / exhaust air operation through the counterflow plate heat exchanger.



Defrost operation
All recuperative heat exchangers tend to ice over in the case of low outside temperatures. The integrated defrost mode removes any icing by opening the return air/exhaust air bypass as the return air is directed to the area of possible icing. The fresh air supply is not stopped during the defrost operation.



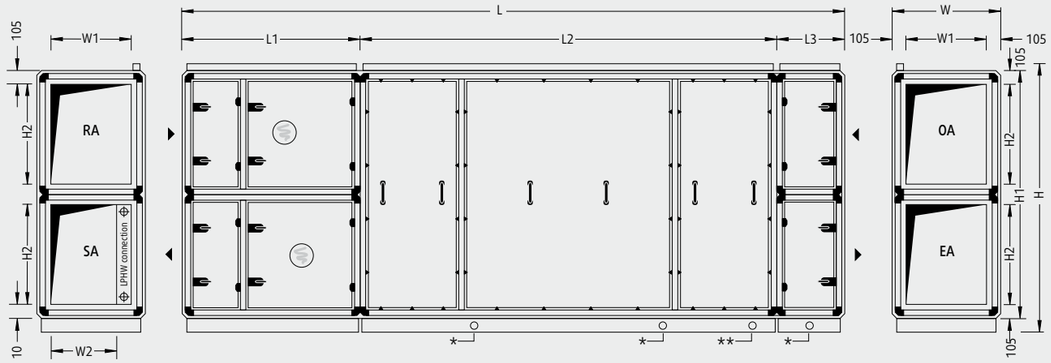
Bypass operation
The unit is equipped with a heat exchanger bypass. The proportion of the air guided through the heat exchanger and the bypass can be regulated as required up to free ventilation according to ErP-guidelines 1253/2014. In this way a heating up of the building can be delayed or avoided.



ThermoCond public

ThermoCond Type 38

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

* Floor drain
** Condensate drainage

Unit type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	W2	H1	H2	Weight[1]
38 03 01	4,810	790	1,700	1,240	2,970	600	580	510	1,520	580	1,220
38 05 01	4,970	1,110	1,700	1,400	2,970	600	900	830	1,520	580	1,500
38 06 01	5,610	790	2,340	1,400	3,610	600	580	420	2,160	900	1,650
38 10 01	5,610	1,110	2,340	1,400	3,610	600	900	740	2,160	900	1,900
38 13 01	5,770	1,430	2,340	1,560	3,610	600	1,220	1,060	2,160	900	2,350
38 16 01	5,770	1,750	2,340	1,560	3,610	600	1,540	1,380	2,160	900	2,650
38 19 01	5,770	2,070	2,340	1,560	3,610	600	1,860	1,700	2,160	900	3,000
38 25 01	6,250	2,070	2,980	1,560	4,090	600	1,860	1,700	2,800	1,220	3,900
38 29 01	6,250	2,390	2,980	1,560	4,090	600	2,180	2,020	2,800	1,220	4,300
38 37 01	6,250	3,030	2,980	1,560	4,090	600	2,820	2,660	2,800	1,220	5,700

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. For service work above the unit, please allow 50 mm working height clearance above the cable duct. For service work at unit type 38 37 01 a clearance at the rear of at least 1,500 mm is required.

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

All length dimensions in mm, weight in kg, weight incl. controls cabinet.

1 May change depending on choosen option, e.g. recuperator in short version (- 960 mm)
2 Door fitting assembly increase unit width by 65 mm each operating side
3 incl. 120 mm base frame, incl. 60 mm cable duct

3 transportation units are supplied, including controls cabinet until unit type 38 29 01. Unit type 38 37 01 is delivered in 4 transportation units including controls cabinet. Further partitioning for smaller apertures possible (at extra cost).

Largest transport unit

Unit Type	L[1]	W	H[3]	Weight[1]
38 03 01	2,970	790	1,700	660
38 05 01	2,970	1,110	1,700	810
38 06 01	3,610	790	2,340	930
38 10 01	3,610	1,110	2,340	1,110
38 13 01	3,610	1,430	2,340	1,300
38 16 01	3,610	1,750	2,340	1,500
38 19 01	3,610	2,070	2,340	1,720
38 25 01	4,090	2,070	2,980	2,330
38 29 01	4,090	2,390	2,980	2,600
38 37 01	4,090	1,515	2,980	1,750

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
38 03 01	1,120 x 640 x 210	SA/RA side
38 05 01	1,120 x 640 x 210	SA/RA side
38 06 01	1,120 x 640 x 210	SA/RA side
38 10 01	1,120 x 640 x 210	SA/RA side
38 13 01	1,120 x 640 x 210	SA/RA side
38 16 01	1,120 x 640 x 210	SA/RA side
38 19 01	1,120 x 640 x 210	SA/RA side
38 25 01	1,280 x 640 x 210	SA/RA side
38 29 01	1,280 x 640 x 210	SA/RA side
38 37 01	1,280 x 640 x 210	SA/RA side

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Technical specifications and performance

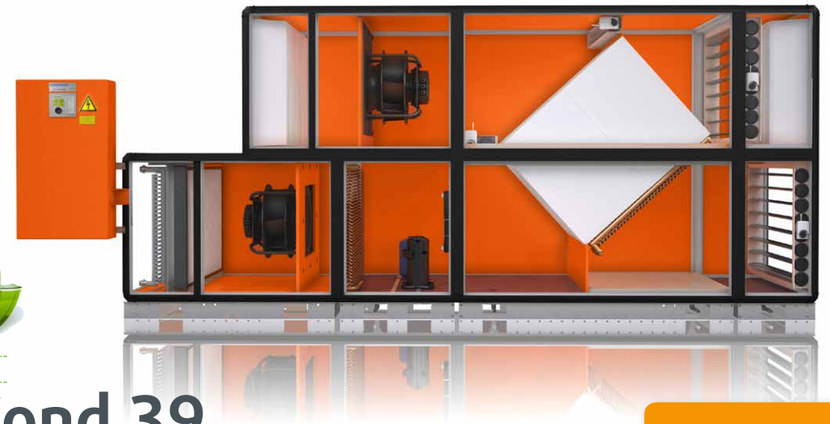
Unit Type		38 03 01	38 05 01	38 06 01	38 10 01	38 13 01	38 16 01	38 19 01	38 25 01	38 29 01	38 37 01
Optimum flow rate	m^3/h	3,100	4,600	4,600	6,800	9,200	11,200	13,200	17,600	20,500	26,000
Max. volume flow rate[1]	m^3/h	3,500	5,300	5,600	7,900	10,500	13,000	15,500	21,500	25,000	32,000
Heat recovery efficiency[2]	%	96.9	96.9	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0
Heat recovery efficiency acc. EN 308	%	75.1	75.1	77.3	77.3	77.1	77.4	77.5	79.5	79.5	79.4
Dehumidification capacity acc. VDI 2089 at V_{opt}	kg/h	18.9	28.1	28.1	41.5	56.2	68.4	80.6	107.5	197.9	158.8
Dehumidification capacity acc.VDI 2089 at V_{max}	kg/h	21.3	32.4	34.2	48.2	64.1	79.4	94.6	131.3	241.3	195.4
Total electrical power rating[3]	kW	1.98	2.70	2.77	4.04	5.24	6.39	8.60	11.76	15.22	19.44
Max. current consumption[3]	A	6.0	7.5	7.5	9.7	12.8	12.8	16.7	26.2	30.8	39.3
Operating voltage		3 / N / PE 400 V 50 Hz									
Ext. pressure losses											
Supply and fresh air channel	Pa	300	300	300	300	300	300	400	400	500	500
Return and exhaust air channel	Pa	300	300	300	300	300	300	400	400	500	500
Sound power level											
Acoustic pressure in 1 m distance from unit[4]	dB(A)	64	63	63	59	62	58	61	69	63	72
Fan units											
Rated motor input for SA 100% flow rate[5]	kW	1.12	1.60	1.71	2.46	3.06	3.62	5.22	7.02	9.04	11.67
Rated motor input for SA 60% flow rate[5]	kW	0.69	0.95	0.99	1.25	1.73	1.94	3.06	4.18	4.96	6.81
Rated motor input for RA 100% flow rate[5]	kW	0.85	1.20	1.27	2.03	2.39	2.92	4.15	5.72	7.34	9.78
Rated motor input for RA 60% flow rate[5]	kW	0.54	0.67	0.69	0.99	1.34	1.54	2.14	3.34	4.26	5.97
SFP category supply air | return air (60% V_{opt})		2 | 2	2 | 2	2 | 2	2 | 3	2 | 2	2 | 2	2 | 3	3 | 3	3 | 3	3 | 3
Nominal rating supply air | return air	kW	1.7 | 1.7	3.0 | 1.7	3.0 | 1.7	3.0 | 3.0	4.7 | 4.7	4.7 | 4.7	6.0 | 4.7	9.4 | 9.4	11.0 | 9.4	16.5 | 14.1
Efficiency classes according to EN 13053:2012											
Heat recovery class		H1	H1	H1	H1	H1	H1	H1	H1	H1	H1
Power consumption of fan motors SA | RA		P2 | P2	P2 | P1	P2 | P1	P1 | P1	P2 | P1	P1 | P1	P1 | P1	P1 | P1	P2 | P2	P2 | P2
Air velocity class		V1	V1	V2	V2	V2	V2	V2	V2	V2	V2
Filtration according to ISO 16890											
Supply air | Outside air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)									
Return air		ISO ePM10 60 % (M5)									
LPHW											
Heating capacity max.[6]	kW	19.9	29.6	29.4	43.5	36.6	71.9	60.5	112.5	130.7	165.5
Water flow rate and pressure losses											
LPHW	m^3/h | kPa	1.01 | 3.7	2.12 | 6.6	2.21 | 9.8	2.31 | 4.0	2.13 | 2.9	4.05 | 5.5	2.65 | 5.8	5.86 | 3.5	6.59 | 4.1	7.47 | 6.4
LPHW (pump warm water) valve	m^3/h | kPa	1.01 | 4.1	2.14 | 7.2	2.22 | 12.4	2.23 | 5.3	1.60 | 4.0	4.08 | 6.5	2.65 | 7.0	5.17 | 3.5	5.71 | 4.4	6.65 | 8.9
Clean water heater (optional)											
Capacity[7]	kW	1.46	2.52	2.40	3.57	5.03	6.44	7.64	9.87	11.51	14.52
Clean water volume flow rate	m^3/h	0.070	0.124	0.122	0.176	0.253	0.328	0.384	0.509	0.584	0.754
Connections											
LPHW connection	DN	32	32	32	32	40	40	40	50	65	65
LPHW control valve connection	DN	15	20	20	25	25	32	32	40	40	40
Condensate drainage	DN	40	40	40	40	40	40	40	40	40	40
Floor drain	DN	20	20	20	20	20	20	20	20	20	20
Clean water heater (optional)	DN	15	15	15	15	15	15	15	15	15	15

Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 With regard to return air condition; May require alteration of the technical equipment
2 RA = 30° C / 54% r.h.; OA = -12° C / 90% r.h.; 1/3 OA rate
3 Depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 FL = 70° C; SA ≈ 50° C
7 Water inlet temp = 10° C, Water outgoing temperature ≈ 28° C

Please seek approval of technical data and specifications prior to start of the planning process.

Air conditioning unit with asymmetrical high-capacity heat exchanger and integrated output-regulated heat pump and efficient volume flow control for medium-sized and large public swimming pool halls



ThermoCond 39 13 01 - simplified illustration

Automatically selects the most economical operating mode!

ThermoCond 39

AIR VOLUME FLOW: 2,600 – 35,100 m³/h

Comes with our Eurovent certified MB 50 housing.

At a glance:

- **Dehumidifies, ventilates and heats**
- **Corrosion-free heat exchanger made from polypropylene**
- **Integrated output-regulated heat pump**
- **Average heating capacity value COP up to 7.2**
- **Energy-saving EC fans / Menerga EcoWall**
- **Demand-oriented volume flow rate reduction for supply and return air**
- **Two-stage supply air filtration**
- **Precise measurement and regulation of the outside air volume**
- **Fulfils the requirements of VDI 6022**

Units of the series 39 achieve a very high energy efficiency, since the integrated program only adds as much air as is required for dehumidification of the pool hall air. The overall efficiency of the system is further enhanced by the integrated heat pump. Due to the structural design of the unit the cleanability according to VDI 6022 is ensured.

Further performance parameters and options:

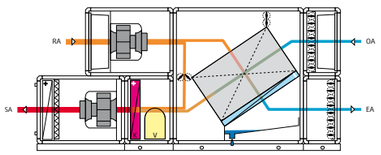
- Modular design with high variability
- Filtering the air in any operating mode
- Heating coil
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for air conditioning swimming pool hall air, including all control and regulation fittings
- Thermal bridge factor TB1
- Intensive quality inspection with factory test run

Options
- Pool water condenser
- HRC bypass function
- Dehumidification in recirculation mode
- Dehumidifying the outside air using additional outside and exhaust air connection pieces
- Reinforced compressor refrigeration system
- Fresh water heater
- Attenuator
- Outdoor installation
- Remote maintenance
- and many more

Functional description

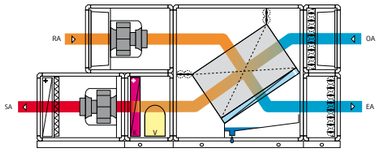
Standby mode and swimming pool mode with dehumidification requirements

In standby operation of the swimming pool hall, the amount of water evaporation is lower. The air handling unit operates with reduced dehumidification performance. The proportion of recirculated air in this operation mode is maximized. For hygiene reasons and to ensure the pollutant removal, it is recommended to mix a small proportion of outside air to the supply air, thus continuous dehumidification of the pool hall air also takes place in standby mode. Despite reduced fan performance, the air circulation in the swimming pool is guaranteed.
With increasing heating demand the extract air is cooled and dehumidified in the evaporator of the continuously adjustable heat pump, reinforced by the upstream heat exchanger. The outside air, with its low moisture content, is preheated in the heat exchanger, and is subsequently mixed with a proportion of untreated recirculated air, heated in the condenser using the heat energy from the dehumidification process, and fed into the swimming pool hall as supply air. If the heating capacity is not sufficient, the supply air is reheated with the heating coil. The use of the freely controllable heat pump allows the demand-oriented regulation of the volume flow rate. This guarantees a consistent humidity level in the swimming pool hall while consuming minimal energy. For hygiene reasons, a minimum of outside air is fed into the swimming pool hall also during swimming pool mode. The proportion of outside air is determined based on the current evaporation of water (and therefore the occupancy level of the swimming pool hall) and is continuously adjusted.



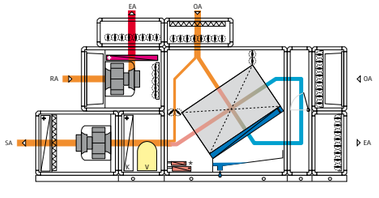
Outside air / exhaust air mode

In the case of rising outside air humidity, the recirculation air damper is continuously closing as required. If the outside air moisture is high, the damper closes completely, the system works exclusively in outside air-exhaust air mode via the heat exchanger. The demand-oriented flow rate control reduces energy consumption to a minimum.



Optionally

In order to achieve the hall humidity levels required by VDI 2089 in summertime conditions, it may be necessary and more economical to use an additional damper system. A second outside air duct is used to take in outside air. Some of the outside air is precooled via the recuperator, and then cooled below dew point in the evaporator. The air is then reheated in the recuperator, and then dried and cooled with some of the untreated outside air, before being introduced into the hall as supply air. If no heating of the swimming pool hall is required, the heat of condensation is discharged directly into the return air flow.



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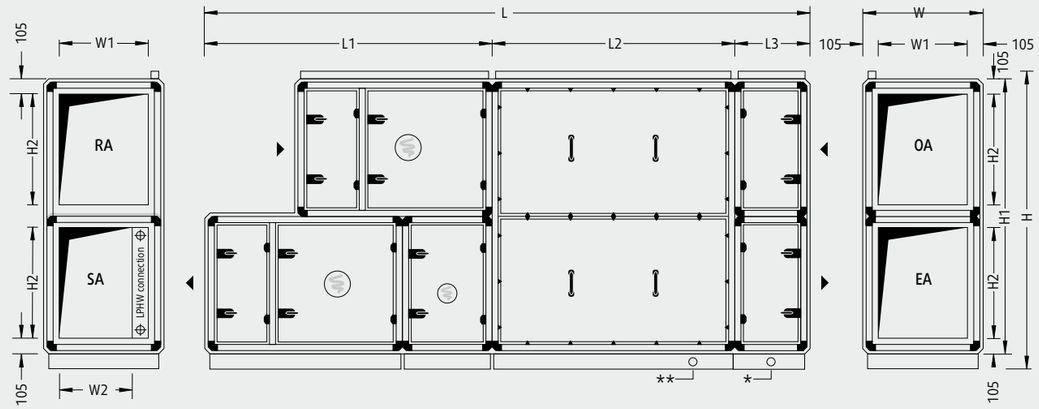
ThermoCond Type 39

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

* Floor drain
** Condensate drain

Unit type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	W2	H1	H2	Weight[1]
39 03 01	3,940	790	1,700	1,970	1,370	600	580	510	1,520	580	1,050
39 05 01	4,100	1,110	1,700	2,130	1,370	600	900	830	1,520	580	1,300
39 06 01	4,740	790	2,340	2,130	2,010	600	580	420	2,160	900	1,350
39 10 01	4,740	1,110	2,340	2,130	2,010	600	900	740	2,160	900	1,650
39 13 01	4,900	1,430	2,340	2,290	2,010	600	1,220	1,060	2,160	900	2,050
39 16 01	4,900	1,750	2,340	2,290	2,010	600	1,540	1,380	2,160	900	2,250
39 19 01	4,900	2,070	2,340	2,290	2,010	600	1,860	1,700	2,160	900	2,500
39 25 01	5,700	2,070	2,980	2,450	2,650	600	1,860	1,700	2,800	1,220	3,250
39 32 01	6,180	2,070	3,620	2,450	3,130	600	1,860	1,700	3,440	1,540	3,950
39 36 01	6,180	2,390	3,620	2,450	3,130	600	2,180	2,020	3,440	1,540	4,650

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. 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 controls cabinet.

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

1 May change depending on choosen option
2 Door fitting assembly increase unit width by 65 mm each operating side
2 incl. 120 mm base frame, incl. 60 mm cable duct

3 transportation units are supplied, including controls cabinet. Further partitioning for smaller apertures possible (at extra cost).

Largest transport unit

Unit Type	L[1]	W	H[3]	Weight[1]
39 03 01	1,970	790	1,700	510
39 05 01	2,130	1,110	1,700	660
39 06 01	2,130	790	2,340	630
39 10 01	2,130	1,110	2,340	750
39 13 01	2,290	1,430	2,340	980
39 16 01	2,290	1,750	2,340	1,130
39 19 01	2,290	2,070	2,340	1,270
39 25 01	2,650	2,070	2,980	1,210
39 32 01	3,130	2,070	3,620	1,700
39 36 01	3,130	2,390	3,620	2,050

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
39 03 01	1,120 x 640 x 210	SA/RA side
39 05 01	1,120 x 640 x 210	SA/RA side
39 06 01	1,280 x 640 x 210	SA/RA side
39 10 01	1,280 x 640 x 210	SA/RA side
39 13 01	1,280 x 640 x 210	SA/RA side
39 16 01	1,280 x 640 x 210	SA/RA side
39 19 01	1,280 x 640 x 210	SA/RA side
39 25 01	1,280 x 640 x 210	SA/RA side
39 32 01	1,600 x 640 x 250	SA/RA side
39 36 01	1,600 x 640 x 250	SA/RA side

Technical specifications and performance

Unit Type		39 03 01	39 05 01	39 06 01	39 10 01	39 13 01	39 16 01
Optimum flow rate	m³/h	2,600	3,900	4,000	6,000	7,900	9,800
Max. volume flow rate [1]	m³/h	3,500	5,300	6,300	9,500	10,500	14,000
Heat recovery efficiency [2]	%	84.9	84.9	85.7	85.8	85.9	86.1
Heat recovery efficiency acc. EN 308	%	52.1	52.1	60.5	60.5	60.6	60.6
Dehumidification capacity according to VDI 2089 V_{opt}	kg/h	15.6	23.5	24.1	36.1	47,5	58.9
Dehumidification capacity according to VDI 2089 V_{max} [1]	kg/h	21.0	31.9	36.2	57.2	63.1	84.1
Total electrical power rating [3, 6]	kW	3.6	4.6	4.5	6.6	8.0	9.7
Max. current consumption [3]	A	13.0	15.4	13.9	21.5	24.6	26.4
Operating voltage		3 / N / PE 400 V 50 Hz					
Ext. pressure losses							
Supply and fresh air channel	Pa	300	300	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300	300	300
Sound power level							
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	57	59	50	53	54	58
Fan units							
Rated motor input for supply air (100% | 60% volume flow rate) [5]	kW	0.94 | 0.60	1.31 | 0.86	1.22 | 0.71	1.79 | 0.98	2.33 | 1.21	2.76 | 1.55
Rated motor input for return air (100% | 60% volume flow rate) [5]	kW	0.66 | 0.43	0.94 | 0.54	0.98 | 0.55	1.35 | 0.77	1.71 | 1.02	2.13 | 1.19
SFP category supply air | return air (60% V_{opt})		1 | 1	2 | 1	1 | 1	1 | 1	1 | 1	1 | 1
Nominal rating supply air | return air	kW	1.9 | 1.9	1.9 | 1.9	1.9 | 1.9	3.35 | 2.9	2.9 | 3.3	3.3 | 3.3
Integrated heat pump							
Refrigerant type [6]		R410A					
Heating capacity of heat pump [7]	COP	6.9	7.7	7.5	7.5	7.6	8.0
Rated compressor input for OA operation (60% V_{opt})	kW	1.3	1.5	1.5	2.3	2.6	3.1
Heating capacity of heat pump for OA operation (60% V_{opt})	kW	7.0	9.2	9.0	13.5	15.9	19.9
Efficiency classes according to EN 13053:2012							
Heat recovery class		H1	H1	H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P2 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V2	V1	V1	V1	V1
Eurovent energy efficiency class		A+	A+	A+	A+	A+	A+
Filtration according to ISO 16890							
Supply air | Outside air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)					
Return air		ISO ePM10 60 % (M5)					
LPHW							
Max. heating power [7]	kW	16.6	24.9	25.5	25.0	50.6	63.0
Water flow rate and pressure losses							
LPHW	m³/h | kPa	1.03 | 6.4	1.42 | 3.2	1.34 | 4.1	2.14 | 3.6	2.44 | 5.1	3.30 | 3.8
LPHW valve	m³/h | kPa	0.89 | 6.7	1.25 | 5.1	1.30 | 4.6	1.14 | 4.6	2.20 | 5.9	2.84 | 4.2
Pool water condenser [8, 9]							
Heating capacity	kW	11.55	14.82	14.56	21.71	25,23	31,78
Spread of pool water temperature	K	6.6	8.0	7.8	7.8	7.0	7.2
Pool water volume flow rate	m³/h	1.5	1.6	1.6	2.4	3.1	3.8
Water side pressure loss	kPa	4.88	5.6	5.6	5.31	9.2	14.27
Connections							
LPHW connection	DN	32	32	32	32	40	40
LPHW control valve connection	DN	15	20	20	25	25	32
Condensate drainage	DN	50	50	50	50	50	50
Floor drain	DN	50	50	50	50	50	50
PWC connection [8]	DN	25	25	25	40	40	40

Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m³), unless otherwise specified.

1 May require alteration of the technical equipment
2 RA = 30° C / 54% r.h.; OA = -12° C / 90% r.h.; 1/3 OA rate
3 Depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 at Vopt = 100%
7 FL = 70° C; SA = 50° C
8 Pool water condenser (supplementary equipment)
9 Heat emission full and proportional; when water enters 28° C

Please seek approval of technical data and specifications prior to start of the planning process.

ThermoCond public

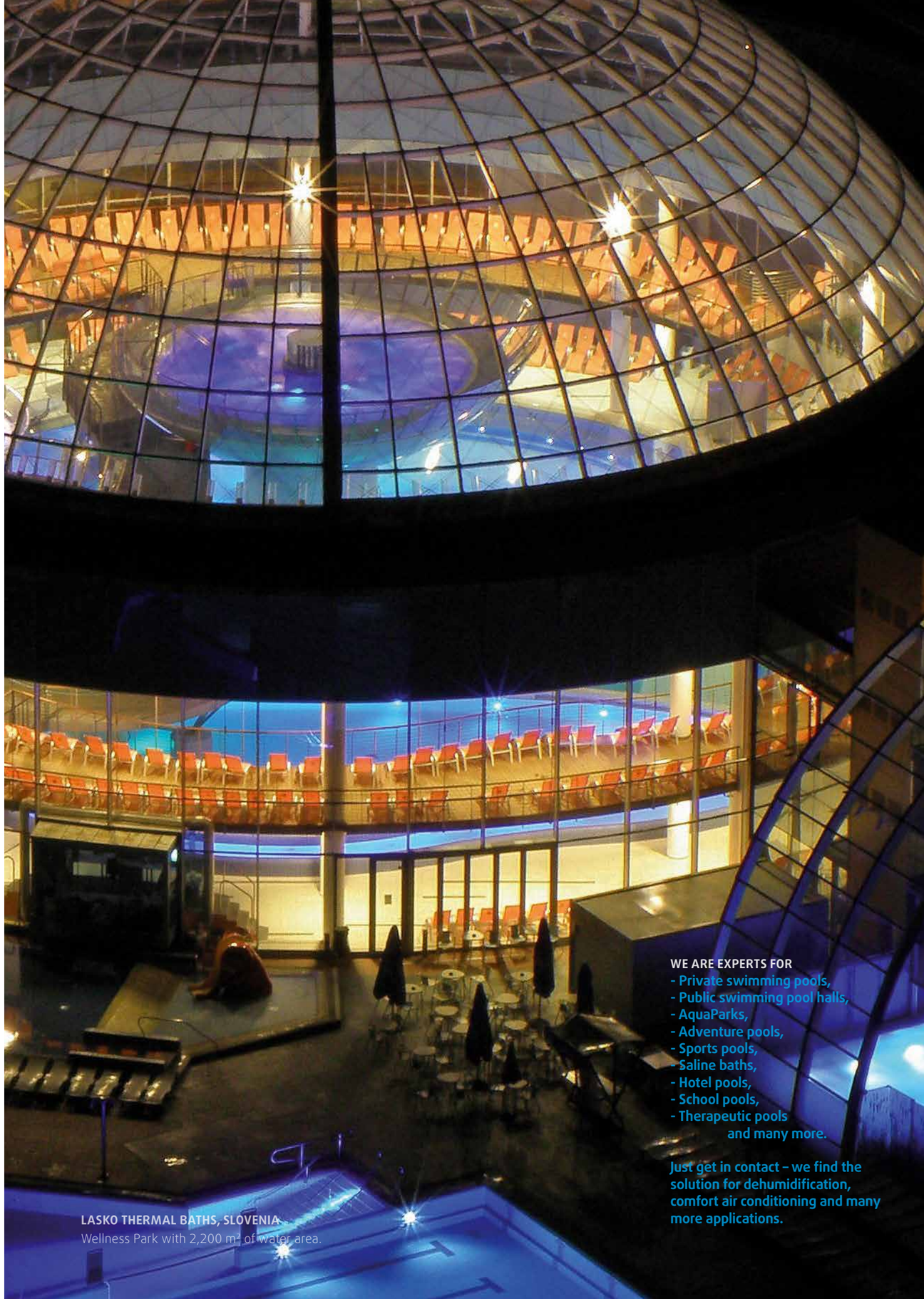
Technical specifications and performance

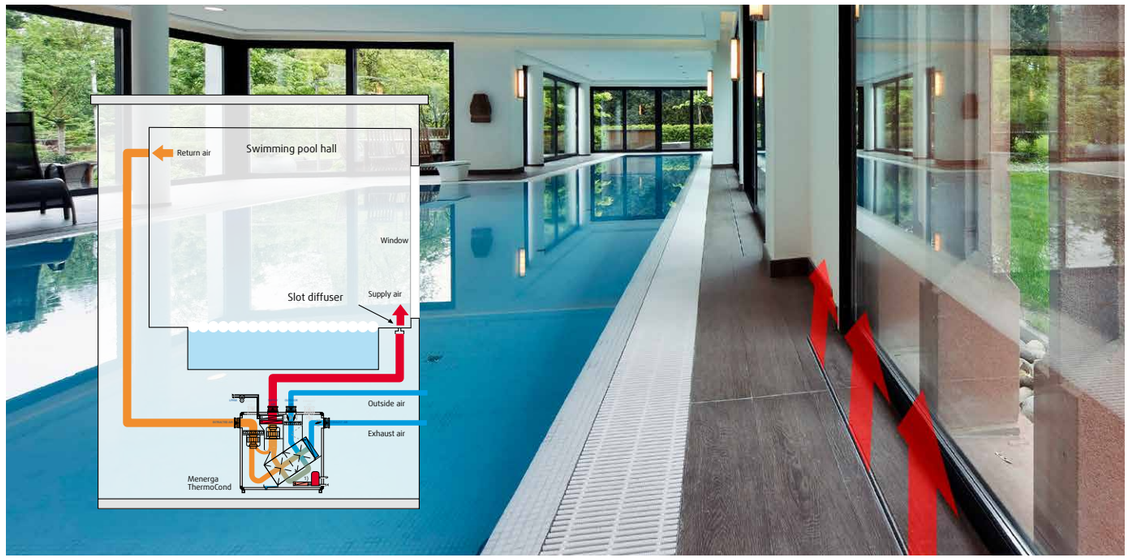
Unit type		39 19 01	39 25 01	39 32 01	39 36 01
Optimum flow rate	m^3/h	11,800	15,800	19,900	23,100
Max. volume flow rate[1]	m^3/h	18,000	22,500	25,900	35,100
Heat recovery efficiency [2]	%	86.0	86.3	86.2	86.3
Heat recovery efficiency acc. EN 308	%	60.6	64.4	64.1	64.1
Dehumidification capacity according to VDI 2089 V_{opt}	kg/h	71.0	95.0	119.7	138.9
Dehumidification capacity according to VDI 2089 V_{max} [1]	kg/h	108.3	135.3	155.8	211.1
Total electrical power rating [3,6]	kW	13.6	17.6	23.5	27.5
Max. current consumption [3]	A	37.0	51.4	64.8	69.7
Operating voltage		3 / N / PE 400 V 50 Hz			
Ext. pressure losses					
Supply and fresh air channel	Pa	400	400	500	500
Return and exhaust air channel	Pa	400	400	500	500
Sound power level					
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	56	54	59	62
Fan units					
Rated motor input for supply air (100% | 60% volume flow rate) [5]	kW	3.77 | 1.33	5.12 | 1.90	7.30 | 2.54	8.58 | 2.88
Rated motor input for return air (100% | 60% volume flow rate) [5]	kW	3.06 | 0.99	4.20 | 1.36	6.14 | 1.96	7.26 | 2.31
SFP category supply air | return air (60% V_{opt})		1 | 1	1 | 1	1 | 1	1 | 1
Nominal rating supply air | return air	kW	5.0 | 5.0	2x 3.3 | 2x 3.3	2x 5.0 | 2x 5.0	2x 5.7 | 3x 3.3
Integrated heat pump					
Refrigerant type		R410A			
Heating capacity of heat pump [6]	COP	7.5	7.8	6.9	7.0
Rated compressor input for OA operation (60% V_{opt})	kW	4.4	5.4	6.5	7.5
Heating capacity of heat pump for OA operation (60% V_{opt})	kW	26.4	34.0	40.8	48.2
Efficiency classes according to EN 13053:2012					
Heat recovery class		H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V2	V2	V2
Eurovent energy efficiency class		A+	A+	A+	A+
Filtration according to ISO 16890					
Supply air | Outside air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)			
Return air		ISO ePM10 60 % (M5)			
LPHW					
Max. heating capacity [7]	kW	75.3	101.0	126.8	146.7
Water flow rate and pressure losses					
LPHW	m^3/h | kPa	3.47 | 4.8	5.68 | 3.3	7.24 | 3.8	7.29 | 3.3
LPHW valve	m^3/h | kPa	3.14 | 7.7	4.53 | 5.2	5.71 | 5.3	6.20 | 3.3
Pool water condenser [8, 9]					
Heating capacity	kW	43.6	55.2	65.9	79.3
Spread of pool water temperature	K	7.7	8.6	9.1	7.9
Pool water volume flow rate	m^3/h	4.9	5.5	6.2	8.6
Water side pressure loss	kPa	4.28	5.53	7.20	4.53
Connections					
LPHW connection	DN	40	50	50	65
LPHW control valve connection	DN	32	40	40	40
Condensate drainage	DN	50	50	50	50
Floor drain	DN	50	50	50	50
PWC connection [8]	DN	50	50	50	50

Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 May require alteration of the technical equipment
2 RA = 30° C / 54% r.h.; OA = -12° C / 90% r.h.; 1/3 OA rate
3 Depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 at Vopt = 100%
7 FL = 70° C; SA = 50° C
8 Pool water condenser (supplementary equipment)
9 Heat emission full and proportional; when water enters 28° C

Please seek approval of technical data and specifications prior to start of the planning process.



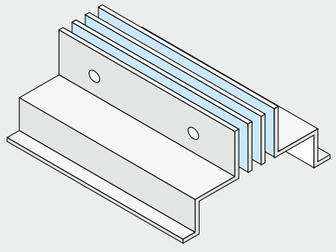


Accessories: Slot diffuser

AVAILABLE IN LENGTHS OF 500 TO 6,000 MM

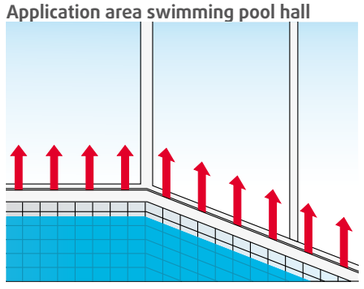
At a glance:

- **Simple installation using screws offset on the inside**
- **Corrosion-resistant aluminium anoded AlMgSi0F22, 3 or 4 mm**
- **Available lengths 500 to 6,000 mm, precise to 10 mm**
- **With fixed or removable centre piece for ease of cleaning**
- **End cover supplied mounted or loose**
- **With hygiene certificate**

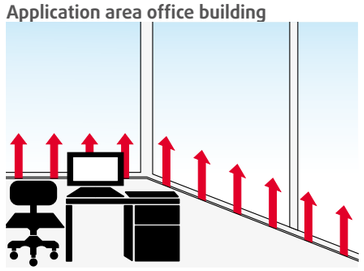


Menerga slot diffusers allow steady and effective distribution of air and heat in a room. They are only minimal visible and easy to install. They are mounted on window fronts in swimming pool halls in order to keep the windows mist-free and can also be used in every other building type. The introduction of the air via slot diffusers prevents draughts at floor level. Build-up of heat is also avoided in the event of strong sunlight.

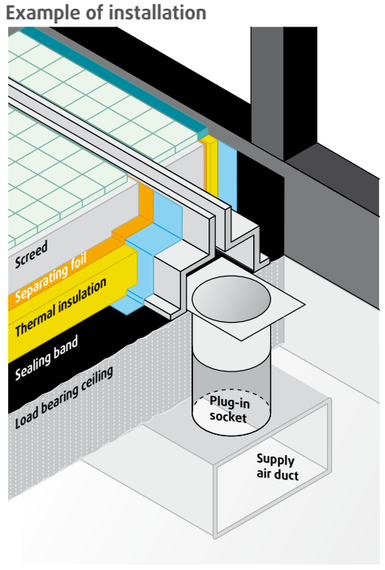
Application area swimming pool hall



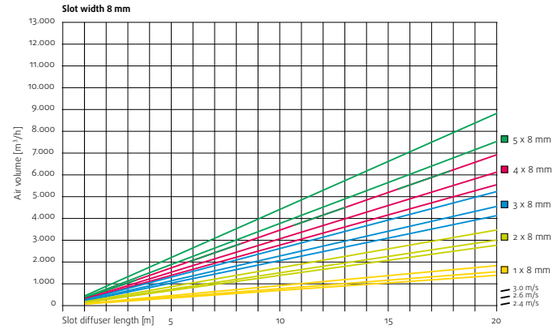
Application area office building



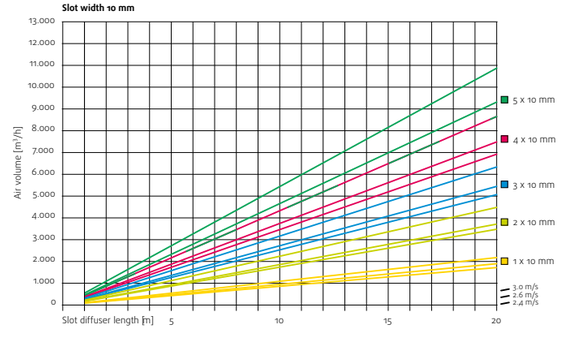
Example of installation



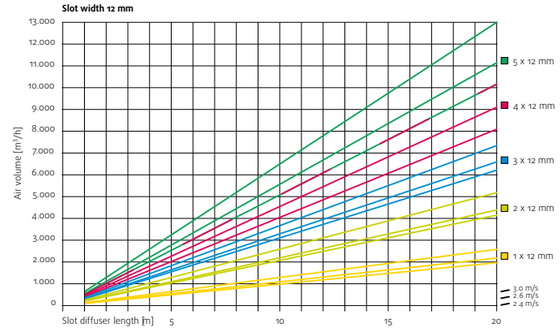
Slot width 8 mm



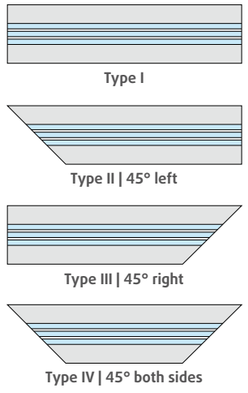
Slot width 10 mm



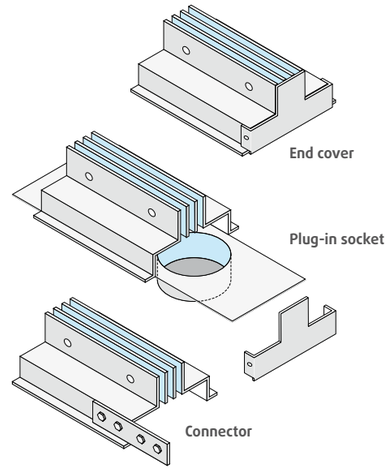
Slot width 12 mm



Optional miter cuts



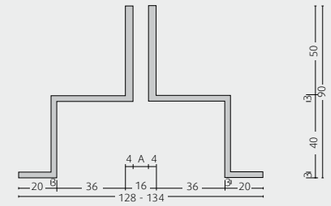
Accessories



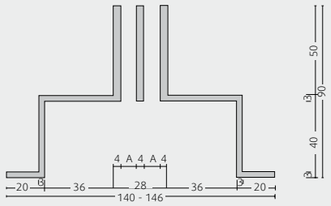
Available lengths and cross-sections

Length 500 - 6,000mm can be ordered up to 10 mm precisely. Consider linear expansion during assembly!
In floor range of public swimming pool halls exclusively type A is permitted!

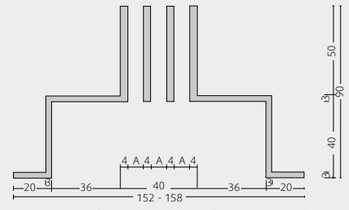
Type A = Slot width 8 mm
Type B = Slot width 10 mm
Type C = Slot width 12 mm



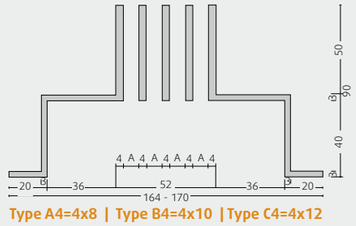
Type A1=1x8 | Type B1=1x10 | Type C1=1x12



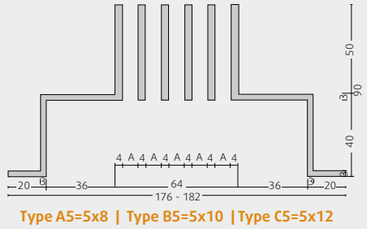
Type A2=2x8 | Type B2=2x10 | Type C2=2x12



Type A3=3x8 | Type B3=3x10 | Type C3=3x12



Type A4=4x8 | Type B4=4x10 | Type C4=4x12



Type A5=5x8 | Type B5=5x10 | Type C5=5x12

ETRIUM, COLOGNE
Office building in passive house standard, with DGNB quality seal in gold, equipped with Menerga Resolair.

Comfort air conditioning unit with cross-counterflow-cross heat exchanger

Trisolair 59 26 01 – simplified illustration

Automatically selects the most economical operating mode!

Trisolair 52 and 59

AIR VOLUME FLOW: 1,200 – 5,000 m³/h

At a glance:

- **Over 80 % temperature efficiency through three-stage recuperative heat recovery**
- **Energy efficiency class H1 according to EN 13053:2012**
- **Energy-saving EC fans**
- **Integrated compressor refrigeration system (59 series)**
- **Compact design**
- **Integrated defrosting function**
- **Integrated control and regulation system, compatible with all conventional building management systems**
- **Fulfils the requirements of VDI 6022**

Units in the Trisolair 52 and 59 series combine the highest heat recovery efficiency, low pressure drops and compact design. Ideal application areas are refurbishments at low to medium air volumes.

A compressor refrigeration system integrated into the 59 series increases the cooling capacity of the overall system at high temperatures and additionally allows dehumidification of the outside air.

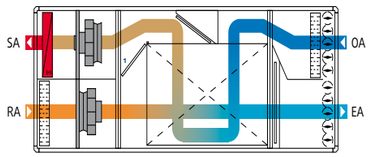
Further performance parameters and options:

- Filtering the air in any operating mode
- Corrosion-free heat exchanger made from polypropylene
- Heating coil
- Bypass damper
- 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

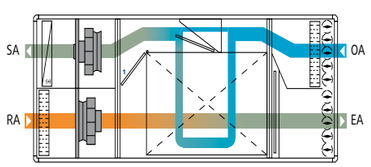
Options
- Recirculation air dampers for heating purposes
- Cooling coil
- Reversible compressor refrigeration system (series 59)
- Outdoor installation
- Thermal bridge factor TB1
- Remote maintenance
- and many more

Functional description

Heat recovery
In case of low outside temperatures the system operates completely in heat recovery mode. The cross-counterflow-cross plate heat exchanger enables the recovery of up to 80 % of the heat contained in the return air. The standard integrated heating coil compensates for ventilation and transmission heat losses of the building as required.

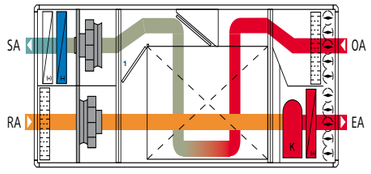


Reduced heat recovery
If the outside air temperatures rise, the heat recovery requirement is reduced. The bypass dampers, which run along the entire depth of the unit, are continuously regulated in order to achieve the desired supply air temperature. If the outside temperatures continue to rise, the heat recovery is completely bypassed. The design of the bypass reduces the internal pressure drop on the OA-SA path and hence also significantly reduces the power consumption of the fan motor as it is effective over the entire depth of the unit.



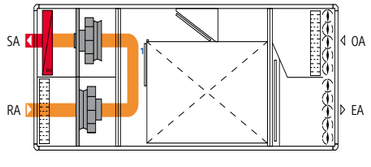
Summertime conditions
If the outside temperature rises above the return temperature, the highly efficient heat exchanger is used as a "cooling recovery system". The warm outside air is cooled by the return air.

Cooling operation type 59:
Where outside air temperatures are sufficiently high, the heat exchanger is used for precooling the outside air (cold recovery). This minimises the electrical capacity required by the integrated compressor refrigeration system, which cools the supply air to the desired temperature and dehumidifies it if required. If unfavourable temperature conditions mean that precooling is not practical, the heat exchanger is bypassed.



Recirculation air heating operation*
In recirculation air mode, the outdoor and exhaust air dampers are closed. The air is heated via the heating coil. Rooms which are not used all of the time, such as lecture halls or sports halls, can therefore be quickly heated before being used.

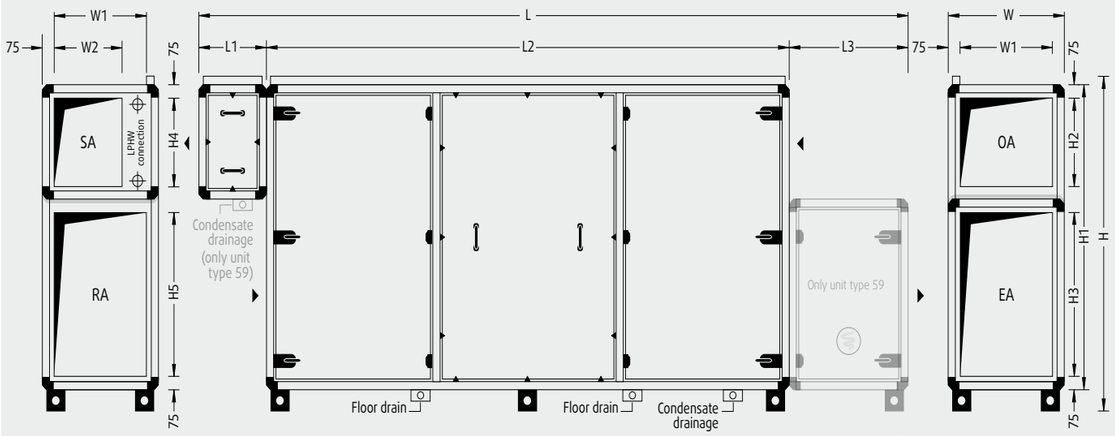
* only possible with optional recirculation air dampers for heating purposes



1 Recirculation air dampers (additional equipment)

Trisolair Type 52 and Type 59

System dimensions and weights



Unit feet 100 mm
Optional: adjustable feet from 100 to 120 mm

Mirror-image design possible.

Trisolair Type 52

Unit Type	L[1]	W[2]	H[3]	L1[1]	L2[1]	W1	W2	H1	H2	H3	H4	H5	Weight[1]
52 12 01	2,580	570	1,210*	410	2,170	420	350	1,050	325	420	420	325	420
52 18 01	3,060	730	1,530*	410	2,650	580	505	1,370	485	580	580	485	560
52 26 01	3,700	730	1,850	410	3,290	580	505	1,690	485	900	580	580	830
52 36 01	3,700	1,050	1,850	410	3,290	900	825	1,690	485	900	580	580	1,050

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
52 12 01	480 x 640 x 210	On top of unit
52 18 01	480 x 640 x 210	On top of unit
52 26 01	900 x 480 x 210	OA/EA side
52 36 01	900 x 480 x 210	OA/EA side

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. 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.

Partitioning of unit for smaller apertures possible (at extra cost).

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

1 May change depending on choosen option
2 Door fitting assembly increase unit width by 25 mm each operating side
3 Height incl. 100 mm unit feet and 60 mm cable duct
* Controls cabinet arranged on top of unit, please add controls cabinet height (480 mm).

Trisolair Type 59 with compressor refrigeration system

Unit Type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	W2	H1	H2	H3	H4	H5	Weight[1]
59 18 01	4,110	730	1,530	730	2,650	730	580	505	1,370	485	580	580	485	770
59 26 01	4,750	730	1,850	730	3,290	730	580	505	1,690	485	900	580	580	1,050
59 36 01	4,750	1,050	1,850	730	3,290	730	900	825	1,690	485	900	580	580	1,280

Controls cabinet

Unit Type	H x W x D[1]	Position
59 18 01	1,120 x 640 x 210	Wall mounting
59 26 01	1,120 x 640 x 210	Wall mounting
59 36 01	1,120 x 640 x 210	Wall mounting

Technical specifications and performance

Unit Type		52 12 01	52 18 01	52 26 01	52 36 01
Optimum flow rate	m^3/h	1,200	1,800	2,600	3,600
Max. volume flow rate [1]	m^3/h	1,500	2,200	3,200	5,000
Coefficient of power efficiency according to EN 13053:2012	%	75	74	77	76
Heat recovery rate according to EN 308	%	76.3	75.8	78.8	77.5
Total electrical power rating [2]	kW	0.70	1.14	1.65	1.95
Max. current consumption [2]	A	6.6	13.8	8.0	6.6
Operating voltage		1 / N / PE 230 V 50 Hz		3 / N / PE 400 V 50 Hz	
Ext. pressure loss					
Supply and fresh air channel	Pa	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300
Sound power level					
Acoustic pressure at a distance of 1 m from the unit [3]	dB(A)	56	50	51	51
Fan units					
Rated motor input for supply air [4]	kW	0.40	0.64	0.94	1.07
Rated motor input for return air [4]	kW	0.30	0.50	0.71	0.88
SFP category supply air | return air		2 | 1	2 | 2	3 | 2	2 | 1
Nominal rating supply air | return air	kW	0.75 | 0.75	1.35 | 1.35	2.50 | 2.50	1.95 | 1.95
Inner specific fan power (SFP_{int}) [5]	Ws/m^3	547	676	832	530
Efficiency classes according to EN 13053:2012					
Heat recovery class		H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V1	V2	V1
Filtration according to ISO 16890					
Outside air		ISO ePM1 55 % (F7)			
Return Air		ISO ePM10 60 % (M5)			
LPHW					
Heating capacity SA=30° C [6]	kW	5.4	8.0	10.7	15.7
Water flow rate and pressure losses					
LPHW	m^3/h | kPa	0.25 | 4.8	0.50 | 3.8	0.50 | 3.8	0.50 | 5.8
LPHW (pump warm water) valve	m^3/h | kPa	0.14 | 5.2	0.21 | 4.4	0.29 | 8.5	0.37 | 13.4
Connections					
LPHW	DN	32	32	32	32
LPHW control valve	DN	10	10	10	10
Floor drains	DN	20	20	20	20

Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 May require alteration of the technical equipment
2 Depends on configuration of measurement and control system/unit
3 at 250 Hz mid-band frequency
4 with average filter contamination
5 According EU guideline No. 1253/2014 [Ecodesign guideline]
6 FL = 70° C

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

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Technical specifications and performance

Unit Type		59 18 01	59 26 01	59 36 01
Optimum flow rate	m^3/h	1,800	2,600	3,600
Max. volume flow rate [1]	m^3/h	2,200	3,200	5,000
Coefficient of power efficiency according to EN 13053:2012	%	74	77	76
Heat recovery rate according to EN 308	%	75.8	78.8	77.5
Total electrical power rating [2]	kW	3.66	5.98	7.58
Max. current consumption [2]	A	20.8	18.0	21.6
Operating voltage		3 / N / PE 400 V 50 Hz		
Ext. pressure loss				
Supply and fresh air channel	Pa	300	300	300
Return and exhaust air channel	Pa	300	300	300
Sound power level				
Acoustic pressure at a distance of 1 m from the unit [3]	dB(A)	52	53	52
Fan units				
Rated motor input for supply air [4]	kW	0.54	1.05	1.17
Rated motor input for return air [4]	kW	0.52	0.73	0.91
SFP category supply air | return air		3 | 2	3 | 2	2 | 1
Nominal rating supply air | return air	kW	1.35 | 1.35	2.50 | 2.50	1.95 | .1.95
Inner specific fan power (SFP_{int}) [5]	Ws/m^3	1,016	1,080	910
Compressor refrigeration system [6]				
Refrigerant type		R410A		
Rated compressor input	kW	2.6	4.2	5.5
Refrigeration capacity	EER	3.31	3.05	3.24
Mechanical cooling capacity	kW	8.6	12.8	17.8
Efficiency classes according to EN 13053:2012				
Heat recovery class		H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V2	V1
Filtration according to ISO 16890				
Outside air		ISO ePM1 55 % (F7)		
Return Air		ISO ePM10 60 % (M5)		
LPHW [7]				
Heating capacity SA=30° C	kW	8.0	10.7	15.7
Water flow rate and pressure losses				
LPHW	m^3/h | kPa	0.5 | 3.8	0.5 | 3.8	0.5 | 5.8
LPHW (pump warm water) valve	m^3/h | kPa	0.21 | 4.4	0.29 | 8.5	0.37 | 13.3
Connections				
LPHW connection	DN	32	32	32
LPHW control valve connection	DN	10	10	10
Floor drains	DN	20	20	20

Specifications of technical data relate to the optimum flow rate and return air condition 30° C / 54% r.h., outside air condition 15° C / 84% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 May require alteration of the technical equipment
2 Depends on configuration of measurement and control system/unit
3 at 250 Hz mid-band frequency
4 with average filter contamination
5 According EU guideline No. 1253/2014 [Ecodesign guideline]
6 At RA = 26° C/55 % r.h., OA = 32° C/40% r.h. and standard density, SA = 17° C
7 FL = 70° C

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

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Comfort air conditioning unit with double plate heat exchanger and adiabatic evaporative cooling system

Adsolair 58 13 01 - simplified illustration

Automatically selects the most economical operating mode!

Comes with our Eurovent certified MB 50 housing.

Energieeffizienzklasse A+

Adsolair 56/58

AIR VOLUME FLOW: 2,600 – 40,800 m³/h

At a glance:

- For heat and cooling recovery
- Energy-saving EC fans / Menerga EcoWall
- Integrated compressor refrigeration system (58 series)
- Intelligent air bypass duct
- Two-stage supply air filtration
- Adiabatic evaporative cooling – Cooling without electricity
- Integrated defrosting function
- Compact design
- Freely configurable HVAC system
- Fulfils the requirements of VDI 6022

Requirements with high thermal loads can be ideally met with the different cooling options of the units in series Adsolair. Series 56 uses adiabatic evaporative cooling an achieves to cool up to 12 K* with water. At series 58 the total cooling capacity is further enhanced with an integrated compression refrigeration system.

Further performance parameters and options:

- Filtering the air in any operating mode
- Corrosion-free heat exchanger made from polypropylene
- Heating coil
- Thermal bridge factor TB1
- 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

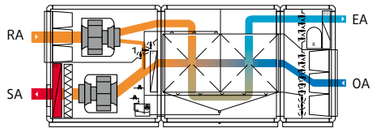
Options

- Recirculation air dampers for heating purposes
- Cooling coil (56 series)
- Pressure reversal
- Sound absorber
- Reversible refrigeration system (58 series)
- Outdoor installation
- Hot water extraction to use waste heat for heating purposes (58 series)
- Increased cooling capacity
- Remote maintenance
- and many more

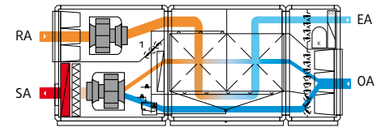
* at OA = 34° C / 40 % r.h.

Functional description

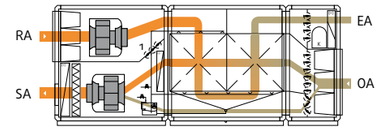
Wintertime conditions
In case of low outside temperatures the system operates completely in heat recovery mode. The standard heating coil (LPHW) compensates for ventilation and transmission heat losses of the building as required.



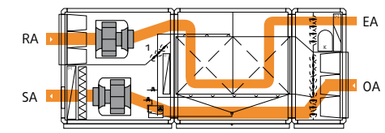
Defrosting circuit
All recuperative heat exchangers tend to ice over in the exhaust air section in case of low outside temperatures. In defrost operation, the OA-SA bypass opens, reducing the outside air flow rate going through the recuperator. The heat contained in the return air melts any ice in the heat exchanger, while the airflow rate routed past the recuperator is regulated as required.



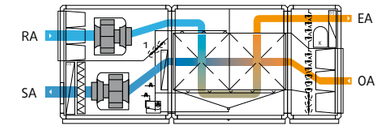
Transitional period
As the outside air temperatures rise, the heat recovery requirement is reduced. The OA/SA bypass damper, which runs along the entire depth of the unit, is continuously regulated in order to achieve the desired supply air temperature.



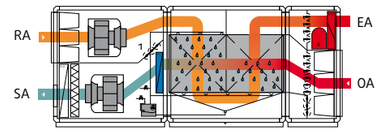
Free cooling
If the outside temperatures continue to rise, the heat recovery is bypassed. The structural design of the OA/SA bypass ensures that the pressure losses within the unit are low and that the power consumption of both fans in bypass mode is also low.



Summertime conditions
If the outside temperature rises above the return temperature, the highly efficient heat exchanger is used as a "cooling recovery system". The warm outside air is cooled by the return air.

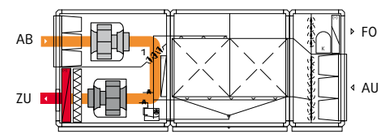


Indirect adiabatic evaporative cooling
The Menerga Adsolair principle uses the advantages of indirect adiabatic evaporative cooling without the disadvantages of supply air humidification. A major component of the Adsolair principle is the double plate heat exchanger, in which the return air is adiabatically cooled. In return, the outside air is cooled by the humid, cold exhaust air, without being humidified. The high efficiency rate 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*. If required, the compressor refrigeration system will switch on and cool the supply air even further.



* at OA = 34° C / 40 % r.h.

Recirculation air operation (heating)*
In recirculation air mode, the outdoor and exhaust air dampers are closed. The air is heated via the heating coil. Rooms which are not used all of the time, such as lecture halls or sports halls, can therefore be quickly heated before being used.

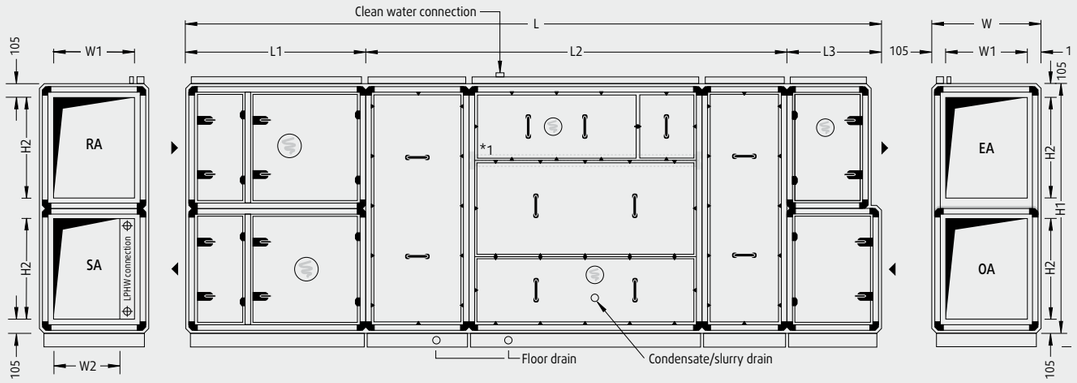


* only possible with optional recirculation air dampers for heating purposes

1 Recirculation air damper (additional equipment)

Adsolair Type 56

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Proportions/details vary depending on system size.

Mirror-image design possible.

Unit type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	W2	H1	H2	Weight[1]
56 03 01	4,510	790	1,700	1,240	2,670	600	580	510	1,520	580	1,120
56 05 01	4,670	1,110	1,700	1,400	2,670	600	900	830	1,520	580	1,370
56 06 01	5,790	790	2,340	1,400	3,790	600	580	420	2,160	900	1,570
56 10 01	5,790	1,110	2,340	1,400	3,790	600	900	740	2,160	900	1,880
56 13 01	5,950	1,430	2,340	1,560	3,790	600	1,220	1,060	2,160	900	2,230
56 16 01	5,950	1,750	2,340	1,560	3,790	600	1,540	1,380	2,160	900	2,560
56 19 01	5,950	2,070	2,340	1,560	3,790	600	1,860	1,700	2,160	900	2,840
56 25 01	6,590	2,070	2,980	1,560	4,430	600	1,860	1,700	2,800	1,220	3,840
56 32 01	7,390	2,070	3,620	1,560	5,230	600	1,860	1,700	3,440	1,540	4,700
56 36 01	7,390	2,390	3,620	1,560	5,230	600	2,180	2,020	3,440	1,540	5,280

Largest transport unit *

Unit Type	L[1]	W[2]	H[3]	Weight[1]
56 03 01	2,670	790	1,700	620
56 05 01	2,670	1,110	1,700	770
56 06 01	3,790	790	2,340	970
56 10 01	3,790	1,110	2,340	1,150
56 13 01	3,790	1,430	2,340	1,340
56 16 01	3,790	1,750	2,340	1,540
56 19 01	3,790	2,070	2,340	1,720
56 25 01	4,430	2,070	2,980	2,440
56 32 01	5,230	2,070	3,620	3,150
56 36 01	5,230	2,390	3,620	3,550

Operating weight

Unit Type	Weight[1]
56 03 01	1,160
56 05 01	1,410
56 06 01	1,620
56 10 01	1,950
56 13 01	2,320
56 16 01	2,670
56 19 01	2,980
56 25 01	4,030
56 32 01	4,930
56 36 01	5,840

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
56 03 01	1,120 x 640 x 210	SA/RA side
56 05 01	1,120 x 640 x 210	SA/RA side
56 06 01	1,120 x 640 x 210	SA/RA side
56 10 01	1,120 x 640 x 210	SA/RA side
56 13 01	1,120 x 640 x 210	SA/RA side
56 16 01	1,120 x 640 x 210	SA/RA side
56 19 01	1,120 x 640 x 210	SA/RA side
56 25 01	1,120 x 640 x 210	SA/RA side
56 32 01	1,280 x 640 x 210	SA/RA side
56 36 01	1,280 x 640 x 210	SA/RA side

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. 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 choosen option
2 Door fitting assembly increase unit width by 65 mm each operating side
3 incl. 120 mm base frame, plus 60 mm cable duct

* Partitioning of unit for smaller apertures possible (at extra cost).

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Technical specifications and performance

Unit Type		56 03 01	56 05 01	56 06 01	56 10 01	56 13 01	56 16 01
Max. volume flow rate	m³/h	2,200	3,200	3,800	5,500	7,300	9,100
Optimum flow rate	m³/h	2,200	3,200	4,200	6,000	7,900	9,900
Coefficient of power efficiency according to EN 13053:2012	%	71	71	73	73	73	73
Heat recovery rate according to EN 308	%	72.3	72.3	75.5	75.8	75.7	75.8
Total electrical power rating [1]	kW	1.76	2.30	2.76	3.82	4.95	5.92
Max. current consumption [1]	A	9.1	9.1	9.1	10.7	17.4	17.4
Operating voltage		3 / N / PE 400 V 50 Hz					
Ext. pressure loss							
Supply and fresh air channel	Pa	300	300	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300	300	300
Sound power level							
Acoustic pressure at a distance of 1 m from the unit [2]	dB(A)	40	42	43	47	42	47
Fan units							
Rated motor input for supply air [3]	kW	0.80	1.08	1.34	1.93	2.50	3.02
Rated motor input for return air [3]	kW	0.66	0.92	1.12	1.59	2.05	2.50
SFP category supply air | return air		1 | 2	1 | 2	1 | 2	1 | 2	1 | 2	1 | 2
Nominal rating supply air | return air	kW	2.5 | 2.5	2.5 | 2.5	2.5 | 2.5	2.9 | 2.9	5.0 | 5.0	5.0 | 5.0
Inner specific fan power (SFP_{int}) [4]	Ws/m3	637	595	842	807	782	769
Adiabatic evaporative cooling system [5]							
Cooling capacity [6]	kW	7.9	11.7	13.6	19.8	26.6	32.7
Rated pump input	kW	0,3	0,3	0,3	0,3	0,4	0,4
Efficiency classes according to EN 13053:2012							
Heat recovery class		H1	H1	H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V1	V1	V1	V1	V1
Eurovent energy efficiency class		A+	A+	A+	A+	A+	A+
Filtration according to ISO 16890							
Supply air | Outside air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)					
Return Air		ISO ePM10 60 % (M5)					
LPHW							
Heating capacity SA=22° C [7]	kW	5.3	8.1	7.4	10.4	14.0	17.6
Heating capacity Defrost [7, 8]	kW	6.8	10.4	10.9	16.3	21.3	26.6
Water flow rate and pressure losses at heating capacity SA=22° C							
LPHW	m3/h|kPa	0.51 | 4.2	0.88 | 3.5	0.88 | 3.9	1.38 | 3.8	2.14 | 3.3	2.16 | 4.0
LPHW valve	m3/h|kPa	0.11 | 10.1	0.16 | 4.8	0.15 | 4.9	0.20 | 4.8	0.27 | 4.6	0.34 | 4.7
LPCW (optional) [10]							
Cooling capacity SA = 17° C [11, 12] (latent | total)	kW	1.5 | 5.3	3.7 | 9.1	2.3 | 7.9	5.6 | 13.7	7.3 | 18.1	8.6 | 22.0
Air temperature (Inlet | Outlet)	°C	22.2 | 17.0	22.0 | 17.0	21.6 | 17.0	21.6 | 17.0	21.6 | 17.0	21.5 | 16.9
Water flow rate and pressure losses at cooling capacity SA=17° C							
LPCW	m3/h|kPa	0.66 | 0.4	1.19 | 2.9	0.82 | 0.5	1.90 | 2.2	2.58 | 1.8	3.05 | 1.2
LPCW valve	m3/h|kPa	0.66 | 17.0	1.19 | 8.8	0.82 | 10.9	1.90 | 9.1	2.58 | 10.4	3.05 | 9.3
Connections							
LPHW connection	DN	32	32	32	32	40	40
LPHW control valve connection	DN	15	15	15	15	15	15
LPCW connection	DN	32	40	40	50	50	65
LPCW control valve connection	DN	15	20	20	25	32	40
Fresh water connection [9]	DN	15	15	15	15	15	20
Condensate / slurry drain	DN	40	40	40	40	40	40
Floor drains	DN	40	40	40	40	40	40

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m³), unless otherwise specified.

1 dependent on configuration of measurement and control system/unit
2 at 250 Hz mid-band frequency
3 with average filter contamination
4 according EU guideline No. 1253/2014 [Ecodesign guideline]
5 water quality of make-up water corresponds to VDI 3803 table B3 with a bacteria count < 100 CFU/ml, water hardness range "middle".
6 for RA 26° C; 55% r.h. and OA 32° C; 40% r.h.
7 FL = 70° C
8 At OA=-15° C, SA=18° C, 66% optimum flow rate and active defrost function
9 2 bar system pressure required at 25 l/min flow rate.
10 may require of alteration of technical equipment
11 Note higher power consumption of SA fan units
12 FL = 6° C, return air condition 26° C / 55% r.h., outside air condition 32° C / 40% r.h

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

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Adsolair 56/58

Technical specifications and performance

Unit Type		56 19 01	56 25 01	56 32 01	56 36 01	56 xx xx
Optimum flow rate	m^3/h	10,900	12,800	16,800	19,900	
Max. volume flow rate	m^3/h	11,800	15,000	19,800	22,800	< 40,800
Coefficient of power efficiency according to EN 13053:2012	%	73	77	74	74	
Heat recovery rate according to EN 308	%	75.7	80.0	76.8	76.6	
Total electrical power rating [1]	kW	7.97	10.26	15.78	18.62	
Max. current consumption [1]	A	18.8	33.6	36.4	39.7	
Operating voltage		33/N/PE 400V 50Hz				
Ext. pressure loss						
Supply and fresh air duct	Pa	400	400	500	500	
Return and exhaust air duct	Pa	400	400	500	500	
Sound power level						
Acoustic pressure at a distance of 1 m from the unit [2]	dB(A)	55	49	53	57	
Fan units						
Rated motor input for supply air [3]	kW	3.99	2x 2.66	2x 3.45	2x 4.00	
Rated motor input for return air [3]	kW	3.48	2x 2.22	2x 3.03	2x 3.53	
SFP category supply air | return air		1 | 2	2 | 3	2 | 3	2 | 3	
Nominal rating supply air | return air	kW	6 | 5	2x 5 | 2x 5	2x 5 | 2x 5	2x 6 | 2x 6	
Inner specific fan power (SFP_{int}) [4]	Ws/m^3	768	833	706	725	
Adiabatic evaporative cooling system [5]						
Cooling capacity [6]	kW	39.1	48.3	61.0	72.1	
Rated pump input	kW	0.50	0.50	0.50	1.10	
Efficiency classes according to EN 13053:2012						
Heat recovery class		H1	H1	H1	H1	
Power consumption of fan motors SA | RA		P1 | P1	P2 | P1	P1 | P1	P1 | P1	
Air velocity class		V1	V1	V1	V1	
Eurovent energy efficiency class 2018		A+	A+	A+	A+	
Filtration according to ISO 16890						
Supply air | Outside air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)				
Return Air		ISO ePM10 60 % (M5)				
LPHW						
Heating capacity SA=22° C [7]	kW	20.8	17.0	29.5	36.1	
Heating capacity Defrost [7,8]	kW	28.3	30.3	42.6	50.9	
Water flow rate and pressure losses at heating capacity SA=22° C						
LPHW	m^3/h | kPa	2.14 | 4.8	3.86 | 3.9	4.77 | 3.5	4.77 | 3.9	
LPHW (pump warm water) valve	m^3/h | kPa	1.58 | 6.3	2.31 | 5.3	2.61 | 4.4	2.93 | 5.5	
LPCW (optional) [10]						
Cooling capacity SA = 17° C [11,12] (latent | total)	kW	9.6 | 25.4	10.4 | 28.0	13.9 | 38.0	19.3 | 50.0	
Air temperature (Inlet | Outlet)	°C	21.5 | 17.0	21.2 | 16.9	21.5 | 17.0	21.5 | 16.7	
Water flow rate and pressure losses						
LPCW	m^3/h | kPa	3,03 | 1,3	3,36 | 0,9	4,5 | 1,0	5,53 | 1,6	
LPCW valve	m^3/h | kPa	3,03 | 9,2	3,36 | 11,3	4,5 | 12,9	5,53 | 7,7	
Connections						
LPHW connection	DN	40	50	50	65	
LPHW control valve connection	DN	20	25	25	25	
LPCW	DN	80	80	80	100	
LPCW valve	DN	40	50	50	50	
Fresh water connection [9]	DN	20	20	20	20	
Condensate / slurry drain	DN	40	40	40	40	
Floor drains	DN	40	40	40	40	

Technical details upon request.

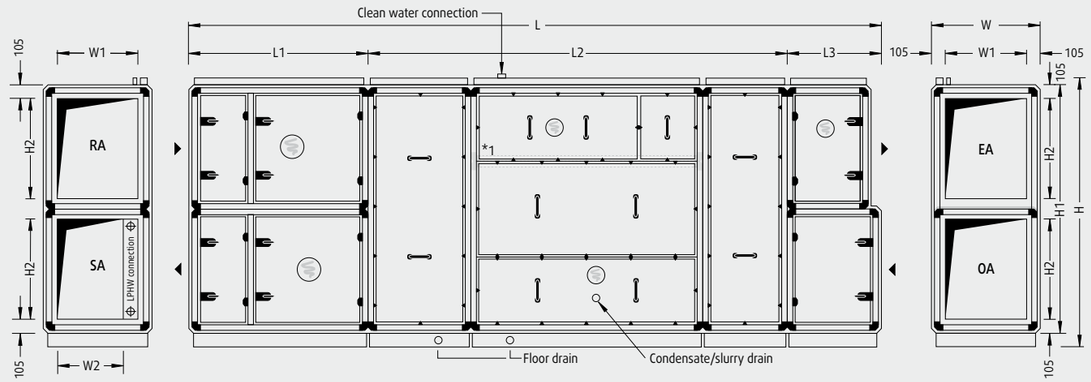
Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 dependent on configuration of measurement and control system/unit
2 at 250 Hz mid-band frequency
3 with average filter contamination
4 according EU guideline No. 1253/2014 [Ecodesign guideline]
5 water quality of make-up water corresponds to VDI 3803 table B3 with a bacteria count < 100 CFU/ml, water hardness range "middle".
6 for RA 26° C; 55 % r.h. and OA 32° C; 40% r.h.
7 FL = 70° C
8 At OA=-15° C, SA=18° C, 66% optimum flow rate and active defrost function
9 2 bar system pressure required at 25 l/min flow rate.
10 may require of alteration of technical equipment
11 Note higher power consumption of SA fan units
12 FL = 6° C, return air condition 26° C / 55% r.h., outside air condition 32° C / 40% r.h

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

Adsolair Type 58

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

Proportions/details vary depending on system size.

Unit Type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	W2	H1	H2	Weight[1]
58 03 01	4,830	790	1,700	1,240	2,670	920	580	510	1,520	580	1,320
58 05 01	4,990	1,110	1,700	1,400	2,670	920	900	830	1,520	580	1,620
58 06 01	6,110	790	2,340	1,400	3,790	920	580	420	2,160	900	1,800
58 10 01	6,110	1,110	2,340	1,400	3,790	920	900	740	2,160	900	2,130
58 13 01	6,270	1,430	2,340	1,560	3,790	920	1,220	1,060	2,160	900	2,590
58 16 01	6,270	1,750	2,340	1,560	3,790	920	1,540	1,380	2,160	900	2,830
58 19 01	6,270	2,070	2,340	1,560	3,790	920	1,860	1,700	2,160	900	3,340
58 25 01	6,910	2,070	2,980	1,560	4,430	920	1,860	1,700	2,800	1,220	4,440
58 32 01	7,910	2,070	3,620	1,560	5,230	920	1,860	1,700	3,440	1,540	5,400
58 36 01	7,910	2,390	3,620	1,560	5,230	920	2,180	2,020	3,440	1,540	6,400

Largest transport unit *

Unit Type	L[1]	W[2]	H[3]	Weight[1]
58 03 01	2,670	790	1,700	640
58 05 01	2,670	1,110	1,700	790
58 06 01	3,790	790	2,340	1,000
58 10 01	3,790	1,110	2,340	1,200
58 13 01	3,790	1,430	2,340	1,400
58 16 01	3,790	1,750	2,340	1,620
58 19 01	3,790	2,070	2,340	1,810
58 25 01	4,430	2,070	2,980	2,580
58 32 01	5,230	2,070	3,620	3,400
58 36 01	5,230	2,390	3,620	3,800

Operating weight

Unit Type	Weight[1]
58 03 01	1,340
58 05 01	1,640
58 06 01	1,830
58 10 01	2,170
58 13 01	2,640
58 16 01	2,940
58 19 01	3,440
58 25 01	4,590
58 32 01	5,580
58 36 01	6,990

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
58 03 01	1,280 x 640 x 210	SA/RA side
58 05 01	1,280 x 640 x 210	SA/RA side
58 06 01	1,280 x 640 x 210	SA/RA side
58 10 01	1,280 x 640 x 210	SA/RA side
58 13 01	1,280 x 640 x 210	SA/RA side
58 16 01	1,280 x 640 x 210	SA/RA side
58 19 01	1,280 x 640 x 210	SA/RA side
58 25 01	1,280 x 640 x 210	SA/RA side
58 32 01	1,280 x 640 x 210	SA/RA side
58 36 01	1,600 x 640 x 250	SA/RA side

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. 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 choosen option
2 Door fitting assembly increase unit width by 65 mm each operating side
3 incl. 120 mm base frame, plus 60 mm cable duct

* Partitioning of unit for smaller apertures possible (at extra cost).

Technical specifications and performance

Unit Type		58 03 01	58 05 01	58 06 01	58 10 01	58 13 01	58 16 01
Optimum flow rate	m^3/h	2,200	3,200	3,800	5,400	7,300	9,100
Max. volume flow rate	m^3/h	2,200	3,200	4,200	5,950	7,900	9,950
Total cooling capacity[1]	kW	16,5	23,3	23,6	35	44,9	57,2
Energy Efficiency Ratio [1, 2]	EER	6,9	8,3	10,3	10,3	11,5	10,0
Coefficient of power efficiency according to EN 13053:2012	%	71	71	73	74	73	73
Heat recovery rate according to EN 308	%	72.3	72.3	75.5	76.0	75.7	75.8
Total electrical power rating[3]	kW	3.95	4.88	4.87	6.99	8.65	11.44
Max. current consumption[3]	A	16.12	17.25	16.35	21.15	29.36	34.58
Operating voltage		3 / N / PE 400 V 50 Hz					
Ext. pressure loss							
Supply and fresh air duct	Pa	300	300	300	300	300	300
Return and exhaust air duct	Pa	300	300	300	300	300	300
Sound power level							
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	41	42	43	47	42	47
Fan units							
Rated fan input for supply air [5]	kW	0.85	1.12	1.40	1.97	2.61	3.14
Rated fan input for return air [5]	kW	0.70	0.96	1.17	1.62	2.14	2.60
SFP category supply air | return air		1 | 2	1 | 2	1 | 2	1 | 2	1 | 2	1 | 2
Nominal rating supply air | return air	kW	2.5 | 2.5	2.5 | 2.5	2.5 | 2.5	2.9 | 2.9	5.0 | 5.0	5.0 | 5.0
Inner specific fan power (SFP_{int}) [6]	Ws/m	640	591	835	787	781	766
Adiabatic evaporative cooling system [1, 7]							
Cooling capacity	kW	7.9	11.7	13.6	19.4	26.2	32.7
Rated pump input	kW	0.3	0.4	0.4	0.5	0.5	1.1
Compressor refrigeration system							
Refrigerant type		R410A					
Rated compressor input	kW	2.1	2.4	1.9	2.9	3.4	4.6
Mechanical cooling capacity [1, 8]	kW	8.6	11.6	10.0	15.6	18.7	24.5
Efficiency classes according to EN 13053:2012							
Heat recovery class		H1	H1	H1	H1	H1	H1
Power consumption of fans SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V1	V1	V1	V1	V1
Filtration according to ISO 16890							
Supply air | Outside air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)					
Return Air		ISO ePM10 60 % (M5)					
LPHW							
Heating capacity SA=22° C [9]	kW	5.3	8.0	7.4	10.1	13.9	17.5
Heating capacity Defrost [9,10]	kW	5.8	8.7	9.9	14.0	18.8	23.7
Water flow rate and pressure losses at heating capacity SA=22° C							
LPHW	m^3/h | kPa	0.51 | 4.2	0.88 | 3.5	0.88 | 3.9	1.39 | 3.8	2.14 | 3.3	2.16 | 4.0
LPHW valve	m^3/h | kPa	0.11 | 10.1	0.16 | 4.8	0.15 | 4.9	0.20 | 4.9	0.27 | 4.6	0.34 | 4.7
Connections							
LPHW connection	DN	32	32	32	32	40	40
LPHW control valve connection	DN	15	15	15	15	15	15
Fresh water connection [11]	DN	15	15	15	15	15	20
Condensate / slurry drain	DN	40	40	40	40	40	40
Floor drains	DN	40	40	40	40	40	40

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m³), unless otherwise specified.

1 for RA 26° C; 55% r.h. and OA 32° C; 40% r.h.
2 incl. evaporative cooling capacity taking into account power consumption for adiabatic pump(s)
3 dependent on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 according EU guideline No. 1253/2014 [Ecodesign guideline]
7 water quality of make-up water corresponds to VDI 3803 table B3 with a bacteria count < 100 CFU/ml, water hardness range "middle".
8 at supply air ≈ 17° C
9 FL = 70° C
10 At OA=-15° C, SA=18° C, 66% of optimum flow rate and active defrost function
11 2 bar system pressure required at 25 l/min flow rate

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

Technical specifications and performance

Unit Type		58 19 01	58 25 01	58 32 01	58 36 01	58 xx xx
Optimum flow rate	m^3/h	10,900	12,700	16,700	19,900	< 40,800
Max. volume flow rate	m^3/h	11,800	14,800	19,500	22,500	
Total cooling capacity [1]	kW	69.8	83.7	106.5	120.2	
Energy Efficiency Ratio [1, 2]	EER	10.0	10.7	11.0	12.8	
Coefficient of power efficiency according to EN 13053:2012	%	68	68	70	70	
Heat recovery rate according to EN 308	%	71	70	73	73	
Total electrical power rating [3]	kW	15.14	18.54	25.50	27.80	
Max. current consumption [3]	A	41.9	56.3	69.0	71.8	
Operating voltage		3 / N / PE 400 V 50 Hz				
Ext. pressure loss						
Supply and fresh air channel	Pa	400	400	500	500	
Return and exhaust air channel	Pa	400	400	500	500	
Sound power level						
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	54	49	54	57	
Fan units						
Rated fan input for supply air [5]	kW	4.12	2x 2.74	2x 3.55	2x 4.12	
Rated fan input for return air [5]	kW	3.56	2x 2.28	2x 3.11	2x 3.66	
SFP category supply air | return air		2 | 3	2 | 3	2 | 3	2 | 3	
Nominal rating supply air | return air	kW	6.0 | 6.0	2x 5.0 | 2x 5.0	2x 5.0 | 2x 5.0	2x 6.0 | 2x 6.0	
Inner specific fan power (SFP_{int}) [6]	Ws/m	764	846	718	722	
Adiabatic evaporative cooling system [1, 7]						
Cooling capacity	kW	39.1	47.9	60.6	72.1	
Rated pump input	kW	1.1	1.1	1.5	1.5	
Compressor refrigeration system						
Refrigerant type		R410A				
Rated compressor input	kW	5.9	6.7	8.2	7.9	
Mechanical cooling capacity [1, 8]	kW	30.7	35.8	45.9	48.1	
Efficiency classes according to EN 13053:2012						
Heat recovery class		H1	H1	H1	H1	
Power consumption of fans SA | RA		P1 | P1	P2 | P1	P1 | P1	P1 | P1	
Air velocity class		V1	V1	V1	V1	
Filtration according to ISO 16890						
Supply air | Outside air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)				
Return Air		ISO ePM10 60 % (M5)				
LPHW						
Heating capacity SA=22° C [9]	kW	20.8	16.6	29.1	36.0	
Heating capacity Defrost [9,10]	kW	28.3	30.3	42.1	50.9	
Water flow rate and pressure losses at heating capacity SA=22° C						
LPHW	m^3/h | kPa	2.13 | 4.5	3.88 | 3.3	4.81 | 3.6	4.78 | 3.6	
LPHW (pump warm water) valve	m^3/h | kPa	0.39 | 7.1	0.31 | 3.8	0.55 | 3.7	0.68 | 3.7	
Connections						
LPHW connection	DN	40	50	50	65	
LPHW control valve connection	DN	20	25	25	25	
Fresh water connection	DN	20	20	20	20	
Condensate / slurry drain	DN	40	40	40	40	
Floor drains	DN	40	40	40	40	

Technical details upon request.

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m³), unless otherwise specified.

1 for RA 26° C; 55% r.h. and OA 32° C; 40% r.h.
2 incl. evaporative cooling capacity taking into account power consumption for adiabatic pump(s)
3 dependent on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 according to EU-regulation No. 1253/2014 [Ecodesign Directive]
7 water quality of make-up water corresponds to VDI 3803 table B3 with a bacteria count < 100 CFU/ml, water hardness range "middle".
8 at supply air ≈ 17° C
9 FL = 70° C
10 At OA=-15° C, SA=18° C, 66% of optimum flow rate and active defrost function
11 2 bar system pressure required at 25 l/min flow rate

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Comfort air conditioning unit with highly efficient regenerative heat storage packages

Resolair 62 26 01 - simplified illustration

Automatically selects the most economical operating mode!

Resolair 62 and 66

AIR VOLUME FLOW: 1,200 – 4,320 m³/h

Comes with our Eurovent certified MB 50 housing.

At a glance:

- **For heat and cooling recovery**
- **Over 90 % temperature efficiency**
- **Energy efficiency class H1 according to EN 13053:2012**
- **Corrosion-free heat storage packages made from polypropylene for more compact and lighter units**
- **Energy-saving EC fans / Menerga EcoWall**
- **Integrated compressor refrigeration system (66 series)**
- **Compact design**
- **Humidity recovery up to 70 %**
- **Integrated control and regulation system, compatible with all conventional building management systems**
- **Fulfils the requirements of VDI 6022**

Units of the Resolair 62 and 66 series achieve a very high heat recovery efficiency up to 90 % and at the same time a moisture recovery up to 70 % thanks to the regenerative heat recovery system. The result is a comfortable climate at lowest energy costs. The integrated compression refrigeration system of series 66 increases the cooling capacity of the entire system at high temperatures.

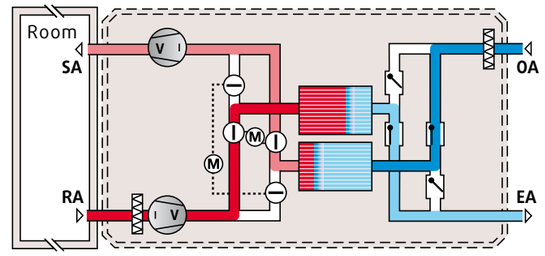
Further performance parameters and options:

- Filtering the air in any operating mode
- Cycle time adjustment for by-passing the heat recovery up to free cooling
- 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

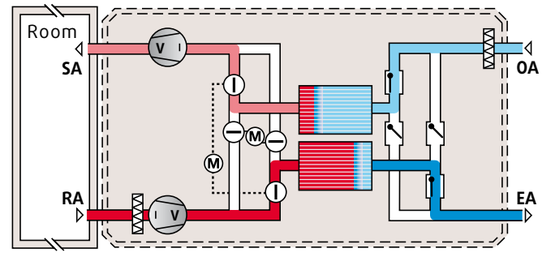
Options
- Recirculation air dampers for heating purposes
- Heating coil
- Cooling coil (62 series)
- Reversible compressor refrigeration system (66 series)
- Outdoor installation
- Thermal bridge factor TB1
- Remote maintenance
- and many more

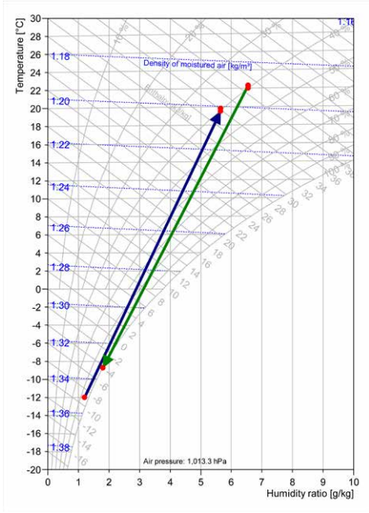
Functional description

Cycle 1



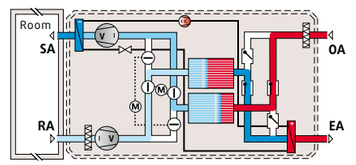
Cycle 2



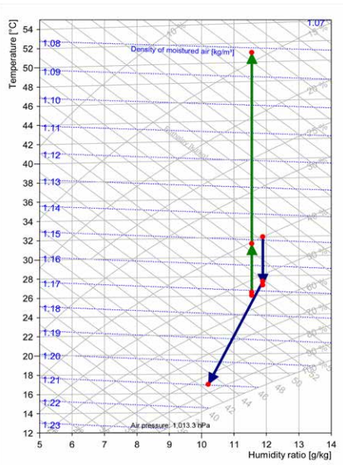


The unit contains two heat storage packets with highly sensitive accumulator mass, through which the outside and return air are transported alternately. The accumulator mass is able to capture heat from a warm air flow very rapidly and transferring this just as rapidly to the cold air flow.

There is a damper system installed upstream and downstream of the packets. The damper system at RA/SA side is actuated by electric motors, while the damper system at OA/EA side operates dynamically. The fans in the return air and supply air sections simultaneously supply cold outside air through one packet and warm return air through the other. One packet stores the heat from the return air, which the other packet simultaneously discharges stored heat into the outside air.
The temperature efficiency of the regenerative energy exchanger is over 90 %. Thus the unit obtains virtually all the heat energy back from the return air. This means that an additional supply air heating coil is not needed and the internal heat load covers the transmission heat loss. Despite the very high heat recovery efficiency of the Resolair series, the regenerative heat recovery system used requires no defrost mode. The heating capacity normally needed is not required in this case.



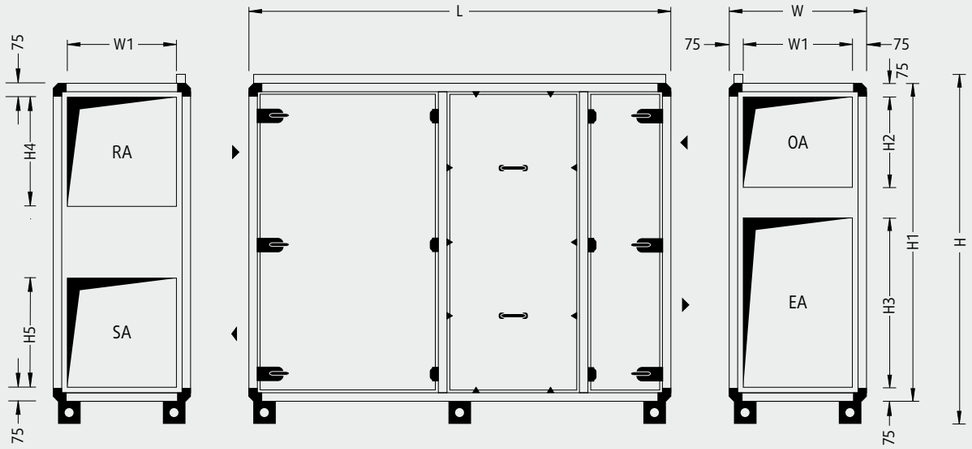
In wintertime conditions, the humidity recovery of the regenerative heat recovery system is up to 70 %, which in most applications makes an additional humidification system obsolete in winter. Where outside air temperatures are rising, variable alteration of the switching cycles allows heat recovery to be reduced all the way down to free cooling.
If the outside temperatures exceed the indoor temperature, the unit switches back into the basic cycle and then operates in "cooling recovery mode" with the same high degree of efficiency as for heat recovery.



For the removal of higher internal heat loads at high outside air temperatures the integrated compressor refrigeration system is switched on (66 series).

Resolair Type 62

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

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

Unit feet 100 mm
Optional: adjustable feet from 100 to 120 mm

Unit Type	L[1]	W[2]	H[3]	W1	H1	H2	H3	H4	H5	Weight[1]
62 12 01	2,010	570	1,210*	420	1,050	325	420	325	420	410
62 18 01	2,170	730	1,530*	580	1,370	485	580	485	580	550
62 26 01	2,330	730	1,850	580	1,690	485	900	580	580	600
62 36 01	2,330	1,050	1,850	900	1,690	485	900	580	580	810

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
62 12 01	480 x 640 x 210	on top of unit
62 18 01	480 x 640 x 210	on top of unit
62 26 01	900 x 480 x 210	OA/EA side
62 36 01	900 x 480 x 210	OA/EA side

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. 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.

Partitioning of unit for smaller apertures possible (at extra cost).

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

1 May change depending on choosen option
1 Door fitting assembly increase unit width by 25 mm each operating side
2 Height incl. 100 mm unit feet and 60 mm cable duct
* Controls cabinet arranged on top of unit, please add controls cabinet height (480 mm).

Technical specifications and performance

Unit Type		62 12 01	62 18 01	62 26 01	62 36 01
Optimum flow rate	m^3/h	1,200	1,800	2,600	3,600
Max, volume flow rate [1]	m^3/h	1,440	2,160	3,120	4,320
"Cooling recovery system" [2]	kW	1.9	2.9	4.2	5.9
Coefficient of power efficiency according to EN 13053:2012	%	86	88	86	87
Heat recovery rate according to EN 308	%	87.2	88.7	87.4	87.8
Humidity recovery		up to 70 %			
Total electrical power rating [3]	kW	0.63	0.95	1.35	1.69
Max. current consumption [3]	A	6.6	13.8	8.0	6.6
Operating voltage		3/N/PE 400V 50Hz			
Ext. pressure loss					
Supply and fresh air channel	Pa	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300
Sound power level					
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	46	36	39	40
Fan units					
Rated fan input for supply air [5]	kW	0.31	0.47	0.67	0.84
Rated fan input for return air [5]	kW	0.32	0.48	0.68	0.85
SFP category supply air | return air		2 | 2	2 | 2	2 | 2	1 | 1
Nominal rating supply air | return air	kW	0.75 | 0.75	1.35 | 1.35	2.50 | 2.50	1.95 | 1.95
Inner specific fan power (SFP_{int}) [6]	Ws/m3	536	476	601	440
Efficiency classes according to EN 13053:2012					
Heat recovery class		H1	H1	H1	H1
Power consumption of fans SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V1	V1	V1
Eurovent energy efficiency class		A+	A+	A+	A+
Filtration according to ISO 16890					
Outside air		ISO ePM1 55 % (F7)			
Return Air		ISO ePM1 55 % (F7)			
LPHW (optional) [7,8]					
Heating capacity SA=22° C	kW	0.9	1.0	1.9	2.5
Air temperature (Inlet | Outlet)	°C	19.8 | 22	20.3 | 22	19.8 | 22	19.8 | 22
LPCW (optional) [7,9]					
Cooling capacity SA ≈ 20° C [2]	kW	0.8 | 3.8	0.5 | 4.8	1.9 | 8.3	2.2 | 10.9
Air temperature (Inlet | Outlet)	°C	27.6 | 20	27.5 | 20	27.5 | 20	27.4 | 20
Water flow rate and pressure losses					
LPHW	m^3/h | kPa	0.25 | 5.6	0.51 | 4.4	0.50 | 4.3	0.50 | 6.5
LPHW (pump warm water) valve	m^3/h | kPa	0.02 | 0.4	0.02 | 0.6	0.04 | 2.0	0.05 | 3.4
LPCW	m^3/h | kPa	0.48 | 2.7	0.56 | 0.7	1.14 | 2.2	1.05 | 2.3
LPCW valve	m^3/h | kPa	0.48 | 8.9	0.56 | 12.2	1.14 | 8.2	1.05 | 6.9
Connections					
LPHW connection	DN	32	32	32	32
LPHW control valve connection	DN	10	10	10	10
LPCW connection	DN	32	32	32	32
LPCW control valve-connection	DN	15	20	25	25

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 May require alteration of the technical equipment
2 at OA = 26° C / 55% r.h., RA = 32° C / 40% r.h. and standard density
3 Depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 According EU guideline No. 1253/2014 [Ecodesign guideline]
7 Supplementary equipment, unit length extend at least 410 mm. Note higher power consumption of SA fan units
8 FL = 70° C
9 FL = 6° C

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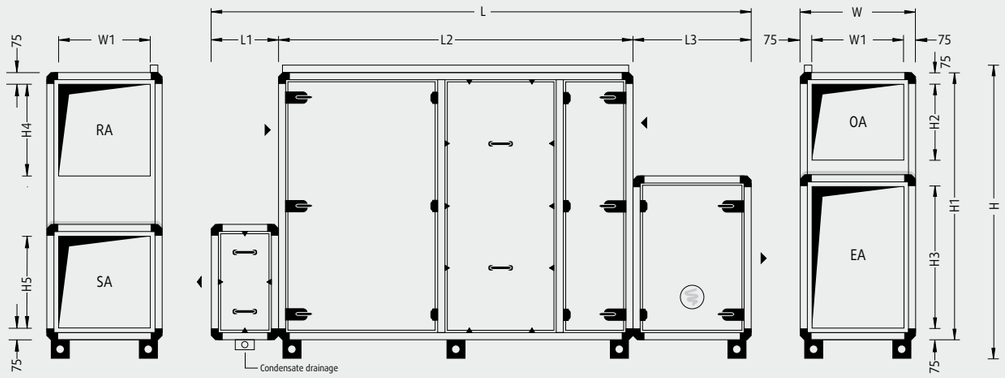
Resolair Type 66

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible

Unit feet 100 mm
Optional: adjustable feet from 100 to 120 mm

Unit Type	L[1]	W[2]	H[3]	L1	L2	L3	W1	H1	H2	H3	H4	H5	Weight[1]
66 18 01	3,310	730	1,530	410	2,170	730	580	1,370	485	580	485	580	790
66 26 01	3,470	730	1,850	410	2,330	730	580	1,690	485	900	580	580	850
66 36 01	3,470	1,050	1,850	410	2,330	730	900	1,690	485	900	580	580	1,100

Controls cabinet

Unit Type	H x W x D[1]	Position
66 18 01	1,120 x 640 x 210	Wall mouniting
66 26 01	1,120 x 640 x 210	Wall mouniting
66 36 01	1,120 x 640 x 210	Wall mouniting

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. 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.

Partitioning of unit for smaller apertures possible (at extra cost).

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

1 May change depending on choosen option
2 Door fitting assembly increase unit width by 25 mm each operating side. Refrigerant pipe duct on backside of the unit increases unit widht by 80 mm.
3 Height incl. 100 mm unit feet and 60 mm cable duct

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Technical specifications and performance

Unit Type		66 18 01	66 26 01	66 36 01
Optimum flow rate	m^3/h	1,800	2,600	3,600
Max. volume flow rate [1]	m^3/h	2,160	3,120	4,320
"Cooling recovery system" [2]	kW	2.9	4.2	5.9
Coefficient of power efficiency according to EN 13053:2012	%	88	86	87
Heat recovery rate according to EN 308	%	88.7	87.4	87.8
Recovery of humidity		up to 70		
Total electrical power rating [3]	kW	3.81	5.90	7.50
Max. current consumption [3]	A	20.8	18.0	21.6
Operating voltage		3 / N / PE 400 V 50 Hz		
Ext. pressure loss				
Supply and fresh air channel	Pa	300	300	300
Return and exhaust air channel	Pa	300	300	300
Sound power level				
Acoustic pressure at distance of 1 m from unit [4]	dB(A)	47	48	48
Fan units				
Rated fan input for supply air [5]	kW	0.59	0.87	1.08
Rated fan input for return air [5]	kW	0.52	0.73	0.92
SFP category supply air | return air		2 | 2	2 | 2	2 | 1
Nominal rating supply air | return air	kW	1.35 | 1.35	2.50 | 2.50	1.95 | 1.95
Inner specific fan power (SFP_{int}) [6]	Ws/m^3	474	598	437
Compressor refrigeration system [2, 7]				
Refrigerant type		R410A		
Rated compressor input	kW	2.7	4.3	5.5
Mechanical cooling capacity	kW	8.4	12.5	17.4
Air temperature (Inlet | Outlet)	°C	27.5 | 16.9	27.5 | 17.2	27.4 | 16.9
Energy Efficiency Ratio [8]	EER	4.2	3.9	4.2
Efficiency classes according to EN 13053:2012				
Heat recovery class		H1	H1	H1
Power consumption of fans SA | RA		P1 | P1	P1 | P1	P1 | P1
Air velocity class		V1	V1	V1
Eurovent		A+	A+	A+
Filtration according to ISO 16890				
Outside air		ISO ePM1 55% (F7)		
Return Air		ISO ePM1 55% (F7)		
LPHW (optional) [9, 10]				
Heating capacity SA=22° C	kW	1	1,8	2,5
Additional power consumption supply air	W	20	50	50
Water flow rate and pressure losses				
LPHW	m^3/h | kPa	0.50 | 4.3	0.50 | 4.3	0.50 | 6.4
LPHW (pump warm water) valve	m^3/h | kPa	0.02 | 0.5	0.03 | 1.9	0.05 | 3.4
Connections				
LPHW connection	DN	32	32	32
LPHW control valve connection	DN	10	10	10
Condensate drain	DN	20	20	20

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 May require alteration of the technical equipment
2 at OA = 26° C / 55% r.h., RA = 32° C / 40% r.h. and standard density
3 Depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 According EU guideline No. 1253/2014 [Ecodesign guideline]
7 SA ≈ 17° C
8 Incl. „coolimg recovery"
9 Supplementary equipment, unit length extend at least 320 mm. Note higher power consumption of SA fan units
10 FL = 70° C

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

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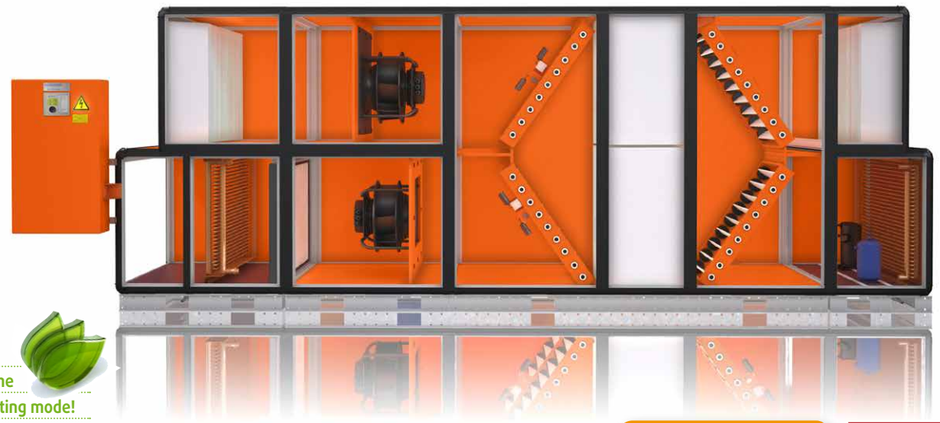
Comfort air conditioning unit with highly efficient regenerative heat storage packages



Resolair 68 10 01 - simplified illustration

Automatically selects the most economical operating mode!

Resolair 64 and 68

AIR VOLUME FLOW: 3,900 – 51,000 m³/h

Comes with our Eurovent certified MB 50 housing.

CERTIFIED COMPONENT Passive House Institute

At a glance:

- **For heat and cooling recovery**
- **Over 90 % temperature efficiency**
- **Energy efficiency class H1 according to EN 13053:2012**
- **Corrosion-free heat storage packages made from polypropylene for more compact and lighter units**
- **Energy-saving EC fans / Menerga EcoWall**
- **Integrated compressor refrigeration system (68 series)**
- **Two-stage supply air filtration**
- **Humidity recovery up to 70 %**
- **Fulfils the requirements of VDI 6022**

Units of the Resolair 64 and 68 series combine medium and large air volumes with the advantages of regenerative heat recovery: up to over 90 % heat recovery and up to 70 % humidity recovery allow a comfortable climate with minimal energy costs. The units are built in a modular construction and offer a very high flexibility with regards to design and optional features.

Further performance parameters and options:

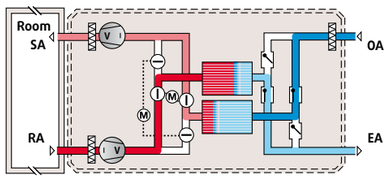
- Filtering the air in any operating mode
- Cycle time adjustment for by-passing the heat recovery up to free cooling
- Integrated bypass function
- Thermal bridge factor TB1
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for comfort air conditioning, including all control and regulation fittings
- Intensive quality inspection with factory test run

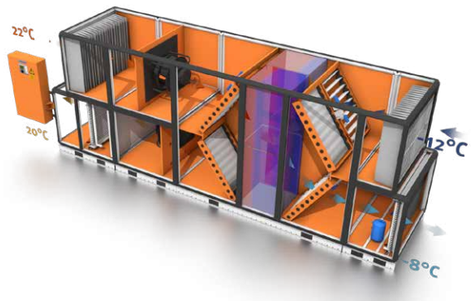
Options

- Recirculation air dampers for heating purposes
- Heating coil
- Cooling coil (64 series)
- Reversible compressor refrigeration system (68 series)
- Supply / return airflow path exchanged (64 series)
- Attenuator
- Outdoor installation
- Hot water extraction to use waste heat for heating purposes (68 series)
- Remote maintenance
- and many more

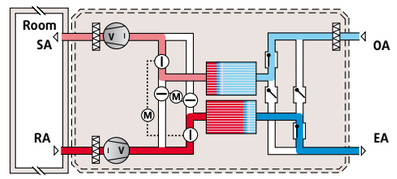
Functional description

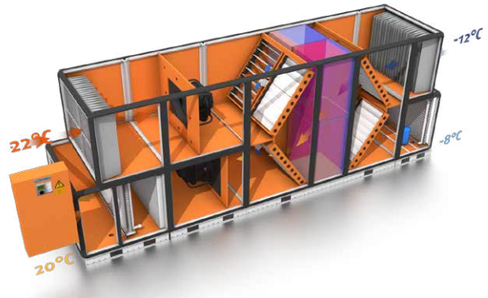
Cycle 1





Cycle 2





The unit contains two heat storage packets with highly sensitive accumulator mass, through which the outside and return air are transported alternately. The accumulator mass is able to capture heat from a warm air flow very rapidly and transferring this just as rapidly to the cold air flow.

A damper system is installed upstream and downstream of the packets. The damper system at RA/SA side is actuated by electric motors, while the damper system at OA/EA side operates dynamically (at series 68 also mechanically). The fans in the return and supply air sections simultaneously supply cold outside air through one packet and warm return air through the other. One packet stores the heat from the return air, which the other packet simultaneously discharges stored heat into the outside air.

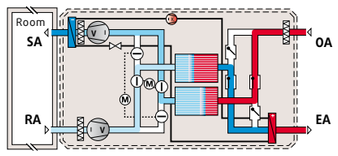
The temperature efficiency of the regenerative energy exchanger is over 90 %. The unit thus obtains virtually all the heat energy back from the return air. This means that an additional supply air heating coil is not required and the internal heat load covers the transmission heat loss. Despite the very high heat recovery efficiency of the Resolair series, the regenerative heat recovery system used requires no defrost mode. The heating capacity normally needed is not required in this case.

In wintertime conditions, the humidity recovery of the regenerative heat recovery system is up to 70 %, which in most applications makes an additional humidification system unnecessary in wintertime.

Where outside air temperatures are rising, variable alteration of the switching cycles allows heat recovery to be reduced all the way down to free cooling.

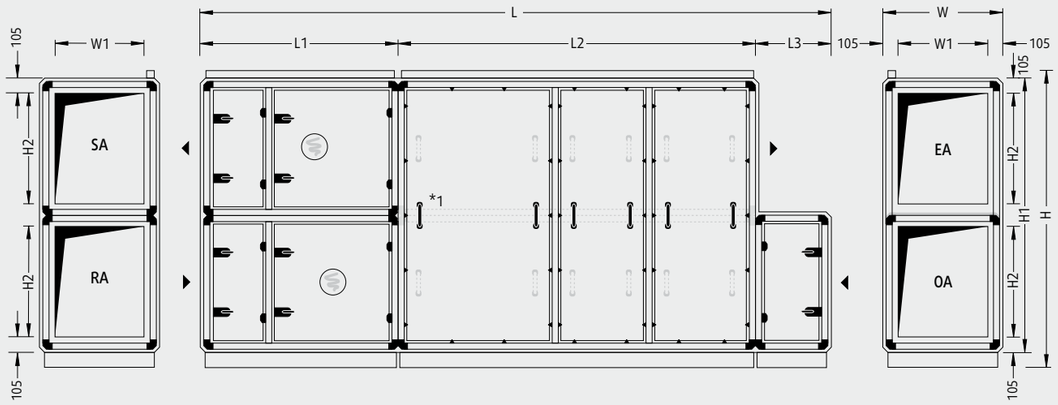
If the outside temperatures exceed the indoor temperature, the unit switched back into the basic cycle and then operates in "cooling recovery mode" with the same high degree of efficiency as for heat recovery.

For the removal of higher internal heat loads at high outside air temperatures the integrated compression refrigeration system is switched on (68 series).



Resolair Type 64

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.
Supply air / return air airflow path exchanged optionally possible

*1 starting at unit type 64 21 01
horizontal cube partition

Unit type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	H1	H2	Weight[1]
64 05 01	4,330	1,110	1,700	1,400	2,330	600	900	1,520	580	1,300
64 07 01	4,650	1,110	2,340	1,400	2,650	600	900	2,160	900	1,650
64 10 01	4,810	1,430	2,340	1,560	2,650	600	1,220	2,160	900	2,050
64 12 01	4,810	1,750	2,340	1,560	2,650	600	1,540	2,160	900	2,350
64 15 01	4,970	2,070	2,340	1,560	2,810	600	1,860	2,160	900	2,600
64 21 01	5,610	2,070	2,980	1,560	3,450	600	1,860	2,800	1,220	3,550
64 26 01	5,930	2,070	3,620	1,560	3,770	600	1,860	3,440	1,540	4,000
64 32 01	5,930	2,390	3,620	1,560	3,770	600	2,180	3,440	1,540	4,400

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. 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 choosen option
2 Door fitting assembly increase unit width by 65 mm each operating side
3 incl. 120 mm base frame, incl. 60 mm cable duct
* Further partitioning for smaller apertures possible (at extra cost).

Largest transport unit*

Unit type	L[1]	W[2]	H[3]	Weight[1]
64 05 01	2,330	1,110	1,700	700
64 07 01	2,650	1,110	2,340	960
64 10 01	2,650	1,430	2,340	1,220
64 12 01	2,650	1,750	2,340	1,370
64 15 01	2,810	2,070	2,340	1,550
64 21 01	3,450	2,070	2,980	2,200
64 26 01	3,770	2,070	3,620	2,600
64 32 01	3,770	2,390	3,620	2,800

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
64 05 01	1,120 x 640 x 210	SA/RA side
64 07 01	1,120 x 640 x 210	SA/RA side
64 10 01	1,120 x 640 x 210	SA/RA side
64 12 01	1,120 x 640 x 210	SA/RA side
64 15 01	1,120 x 640 x 210	SA/RA side
64 21 01	1,120 x 640 x 210	SA/RA side
64 26 01	1,120 x 640 x 210	SA/RA side
64 32 01	1,280 x 640 x 210	SA/RA side

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Technical specifications and performance

Unit Type		64 05 01	64 07 01	64 10 01	64 12 01	64 15 01	64 21 01	64 26 01	64 32 01	64 xx xx
Optimum flow rate	m^3/h	3,900	6,000	7,900	9,800	11,800	15,800	19,900	23,100	up to 51,000
Max. volume flow rate [1]	m^3/h	6,000	8,500	10,500	13,500	16,000	22,000	25,000	32,800	
"Cooling recovery system" [2]	kW	6.3	9.7	12.7	15.7	18.7	24.9	31.2	36.9	
Coefficient of power efficiency according to EN 13053:2012	%	87.6	87.3	87.4	86.9	86.9	86.6	86.7	86.9	
Heat recovery rate according to EN 308	%	86	85	85	85	85	85	85	85	
Recovery of humidity		up to 70 %								
Total electrical power rating [3]	kW	2.32	3.63	5.18	6.14	8.2	11.66	15.44	17.12	
Max. current consumption [3]	A	8.0	9.6	16.0	16.0	17.4	32.0	32.0	37.6	
Operating voltage		3 / N / PE 400 V 50 Hz								
Ext. pressure loss										
Supply and fresh air channel	Pa	300	300	300	300	400	400	500	500	
Return and exhaust air channel	Pa	300	300	300	300	400	400	500	500	
Sound power level										
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	48	54	55	57	60	59	61	62	
Fan units										
Rated fan input for supply air [5]	kW	1.28	2.02	2.88	3.43	4.28	2x 3.21	2x 4.01	2x 4.62	
Rated fan input for return air [5]	kW	1.04	1.61	2.30	2.74	3.92	2x 2.62	2x 3.71	2x 3.94	
SFP category supply air | return air		1 | 2	1 | 2	1 | 2	1 | 2	1 | 3	2 | 2	2 | 3	2 | 3	
Nominal rating supply air | return air	kW	2.5 | 2.5	2.9 | 2.9	5.0 | 5.0	5.0 | 5.0	6.0 | 5.0	2x 5.| 2x 5	2x 6 | 2x 5	2x 6 | 2x 6	
Inner specific fan power (SFP_{int}) [6]	Ws/m^3	638	672	785	718	701	728	684	650	
Efficiency classes according to EN 13053:2012										
Heat recovery class		H1	H1	H1	H1	H1	H1	H1	H1	
Power consumption of fans SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P2 | P1	P1 | P1	P1 | P1	
Air velocity class		V1	V2	V2	V2	V2	V2	V2	V2	
Eurovent energy efficiency		A+	A+	A+	A+	A+	A+	A+	A+	
Filtration according to ISO 16890										
Supply air | Outside air		ISO ePM1 55 % (F7)								
Return Air		ISO ePM1 55 % (F7)								
LPHW (optional) [7]										
Heating capacity SA=22° C	kW	2.8	4.4	5.6	7.7	9.2	12.1	15.7	17.5	
Air temperature (Inlet | Outlet)	°C	19.8 | 22	19.8 | 22	19.9 | 22	19.7 | 22	19.6 | 22	19.7 | 22	19.6 | 22	19.7 | 22	
LPCW (optional)										
Cooling capacity SA ≈ 18° C [2,8]	kW	5.4	8.0	10.7	12.0	25.3	33.4	40.8	45.2	
Air temperature (Inlet | Outlet)	°C	27.5 | 18	27.6 | 18	27.7 | 17.9	27.7 | 17.9	27.6 | 18	27.8 | 18	27.7 | 18	27.7 | 18	
Water flow rate and pressure losses										
LPHW	m^3/h | kPa	0.88 | 3.6	1.39 | 3.7	2.13 | 3.4	2.15 | 4.1	2.13 | 4.7	3.89 | 3.4	4.75 | 3.6	5.94 | 3.3	
LPHW valve	m^3/h | kPa	0.05 | 4.0	0.08 | 4.5	0.10 | 6.8	0.14 | 5.2	0.17 | 3.7	0.22 | 5.0	0.29 | 8.4	0.32 | 4.1	
LPCW	m^3/h | kPa	1.6 | 2.2	2.49 | 1.9	3.57 | 1.8	4.08 | 1.1	7.6 | 6.6	9.93 | 6.1	11.9 | 5.6	13.06 | 4.9	
LPCW valve	m^3/h | kPa	1.6 | 10.2	2.49 | 9.7	3.57 | 8.2	4.08 | 10.7	7.6 | 9.2	9.93 | 6.2	11.9 | 8.9	13.06 | 10.7	
Connections										
LPHW connection	DN	32	32	40	40	40	50	50	65	
LPHW control valve connection	DN	15	15	15	15	20	25	25	25	
LPCW connection	DN	40	50	50	65	80	80	80	100	
LPCW control valve-connection	DN	20	25	32	40	40	50	50	50	

Technical details upon request.

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 May require alteration of the technical equipment
2 at OA = 26° C / 55% r.h., RA = 32° C / 40% r.h. and
3 Depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 According EU guideline No. 1253/2014 [Ecodesign guideline]
7 FL = 70° C
8 FL = 6° C

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

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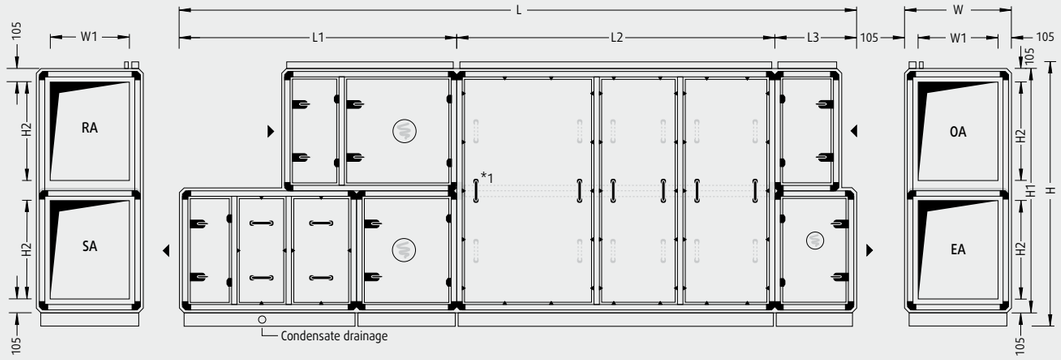
Resolair Type 68

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

*1 starting at unit type 68 21 01 horizontal cube partition

Unit Type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	H1	H2	Weight[1]
68 05 01	5,380	1,110	1,700	2,290	2,330	760	900	1,520	580	1,750
68 07 01	5,700	1,110	2,340	2,290	2,650	760	900	2,160	900	2,150
68 10 01	5,860	1,430	2,340	2,450	2,650	760	1,220	2,160	900	2,700
68 12 01	6,020	1,750	2,340	2,610	2,650	760	1,540	2,160	900	3,050
68 15 01	6,180	2,070	2,340	2,610	2,810	760	1,860	2,160	900	3,500
68 21 01	6,980	2,070	2,980	2,610	3,450	920	1,860	2,800	1,220	4,450
68 26 01	7,300	2,070	3,620	2,610	3,770	920	1,860	3,440	1,540	5,100
68 32 01	7,300	2,390	3,620	2,610	3,770	920	2,180	3,440	1,540	5,500

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. 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 choosen option
2 Door fitting assembly increase unit width by 65 mm each operating side
3 incl. cable duct, cold air duct and base frame
* Further partitioning for smaller apertures possible (at extra cost).

Largest transport unit*

Unit Type	L[1]	W[2]	H[3]	Weight[1]
68 05 01	2,330	1,110	1,700	720
68 07 01	2,650	1,110	2,340	980
68 10 01	2,650	1,430	2,340	1,250
68 12 01	2,650	1,750	2,340	1,400
68 15 01	2,810	2,070	2,340	1,570
68 21 01	3,450	2,070	2,980	2,220
68 26 01	3,770	2,070	3,620	2,620
68 32 01	3,770	2,390	3,620	2,820

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
68 05 01	1,120 x 640 x 210	SA/RA side
68 07 01	1,120 x 640 x 210	SA/RA side
68 10 01	1,120 x 640 x 210	SA/RA side
68 12 01	1,120 x 640 x 210	SA/RA side
68 15 01	1,280 x 640 x 210	SA/RA side
68 21 01	1,280 x 640 x 210	SA/RA side
68 26 01	1,600 x 640 x 250	SA/RA side
68 32 01	1,600 x 640 x 250	SA/RA side

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Technical specifications and performance

Unit Type		68 05 01	68 07 01	68 10 01	68 12 01	68 15 01	68 21 01	68 26 01	68 32 01	68 xx xx
Optimum flow rate	m³/h	3,900	6,000	7,900	9,800	11,800	15,800	19,900	23,100	up to 51,000
Max. volume flow rate [1]	m³/h	6,000	8,500	10,500	13,500	16,000	22,000	25,000	32,800	
"Cooling recovery system"[2]	kW	6.3	9.7	12.7	15.7	18.7	24.9	31.2	36.9	
Coefficient of power efficiency according to EN 13053:2012	%	87.6	87.3	87.4	86.9	86.9	86.6	86.7	86.9	
Heat recovery rate according to EN 308	%	86	85	85	85	85	85	85	85	
Recovery of humidity		up to 70 %								
Total electrical power rating[3]	kW	7.86	10.8	16.0	16.5	22.4	27.2	40.9	42.0	
Max. current consumption[3]	A	23.0	34.2	47.0	47.0	60.8	76.0	102.8	112.0	
Operating voltage		3 / N / PE 400 V 50 Hz								
Ext. pressure loss										
Supply and fresh air channel	Pa	300	300	300	300	400	400	500	500	
Return and exhaust air channel	Pa	300	300	300	300	400	400	500	500	
Sound power level										
Acoustic pressure at distance of 1 m from unit[4]	dB(A)	43	43	49	44	50	55	50	57	
Fan units										
Rated fan input for supply air[5]	kW	1.28	2.02	2.88	3.43	4.28	2x 3.21	2x 4.01	2x 4.62	
Rated fan input for return air[5]	kW	1.04	1.61	2.30	2.74	3.92	2x 2.62	2x 3.71	2x 3.94	
SFP category supply air | return air		1 | 2	1 | 2	1 | 2	1 | 2	1 | 3	2 | 2	2 | 3	2 | 3	
Nominal rating supply air | return air	kW	2.5 | 2.5	2.9 | 2.9	5 | 5	5 | 5	6 | 5	2x 5 | 2x 5	2x 6 | 2x 5	2x 6 | 2x 6	
Inner specific fan power (SFP_{int})[6]	Ws/m³	638	672	785	718	701	728	684	650	
Compressor refrigeration system										
Refrigerant		R410A								
Rated compressor input[2]	kW	5.7	7.6	11.6	11.0	15.1	17.0	21.9	25.8	
Mechanical cooling capacity[7]	kW	17.4	26.8	37.9	41.4	53.0	66.8	84.2	98.5	
Energy Efficiency Ratio[8]	EER	4.2	4.9	4.4	5.3	4.8	5.5	5.4	5.3	
Efficiency classes according to EN 13053:2012										
Heat recovery class		H1	H1	H1	H1	H1	H1	H1	H1	
Power consumption of fans SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	
Air velocity class		V1	V2	V2	V2	V2	V2	V2	V2	
Eurovent energy efficiency		A+	A+	A+	A+	A+	A+	A+	A+	
Filtration according to ISO 16890										
Supply air | Outside air		ePM1 55% (F7) | ePM10 60% (M5)								
Return Air		ePM10 60% (M5)								
LPHW (optional)[9]										
Heating capacity SA=22° C	kW	2.8	4.4	5.7	7.7	9.6	12.2	15.6	17.4	
Air temperature (Inlet | Outlet)	°C	19.8 | 22	19.8 | 22	19.9 | 22	19.7 | 22	19.6 | 22	19.7 | 22	19.9 | 22	19.8 | 22	
Water flow rate and pressure losses										
LPHW	m³/h | kPa	0.05 | 3.6	0.08 | 3.9	0.11 | 3.4	0.14 | 4.1	0.18 | 4.7	0.23 | 3.4	0.29 | 3.6	0.32 | 3.2	
LPHW valve	m³/h | kPa	0.05 | 4.3	0.08 | 4.2	0.11 | 7.0	0.14 | 5.1	0.18 | 7.9	0.23 | 5.1	0.29 | 8.3	0.32 | 4.0	
Connections										
LPHW connection	DN	32	32	40	40	40	50	50	65	
LPHW control valve connection	DN	15	15	15	15	15	20	20	20	
Condensate drainage	DN	40	40	40	40	40	40	40	40	

Technical details upon request.

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m³), unless otherwise specified.

1 May require alteration of the technical equipment
2 at OA = 26° C / 55% r.h., RA = 32° C / 40% r.h. and standard density
3 Depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 According EU guideline No. 1253/2014 [Ecodesign guideline]
7 at SA ≈ 17° C
8 incl. „cooling recovery"
9 FL = 70° C

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

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Ventilation technology
for industry and trade

Resolair 65 26 01 - simplified illustration

Automatically selects the most economical operating mode!

Resolair 65

AIR VOLUME FLOW: 10,000 – 40,000 m³/h

At a glance:

- **For heat and cooling recovery**
- **Over 90 % temperature efficiency thanks to highly sensitive heat storage packages**
- **Energy efficiency class H1 according to EN 13053:2012**
- **Energy-saving EC fans**
- **Compact design**
- **Humidity recovery up to 70 %**
- **Integrated control and regulation system, compatible with all conventional building management systems**
- **Ideal for retrofitting**

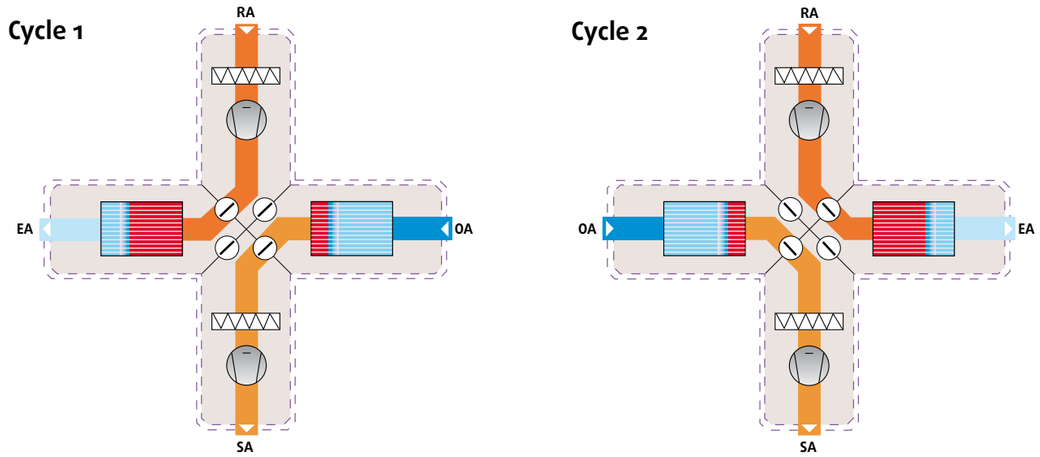
Units in the 65 series use a regenerative heat recovery system to achieve the highest heat recovery efficiency with low internal pressure losses. The system was specially developed for industrial purposes, for outdoor installation. Its unique construction makes it ideal for retrofitting, as the effort for installation is reduced to the supply of electrical power to the unit and the generally very short supply and return air ducts. The combination of first-class components with precise control and regulation systems guarantees economical operation at all times.

Further performance parameters and options:

- Filtering the air in any operating mode
- Cycle time adjustment for by-passing the heat recovery up to free cooling
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for air conditioning, including all control and regulation fittings
- Intensive quality inspection with factory test run
- Outdoor installation

Options
- Heating coil
- Cooling coil
- Attenuator
- Remote maintenance
- and many more

Functional description



The unit contains two heat storage packets with highly sensitive accumulator mass, through which the outside and return air are transported alternately. The accumulator mass is capable of capturing heat from a warm air flow very rapidly and transferring this just as rapidly to the cold air flow.

In the middle of the unit there is a cross-shaped damper system which allows alternating loading of the heat accumulators. The fans in the return air and supply air sections simultaneously supply cold outside air through one packet and warm return air through the other. One packet stores the heat from the return air, which the other packet simultaneously discharges stored heat into the outside air.

The temperature efficiency of the Menerga regenerative energy exchanger is over 90 %. Thus the unit obtains virtually all the heat energy back from the return air. This means that an additional supply air heating coil is not needed and the internal heat load covers the transmission heat loss.

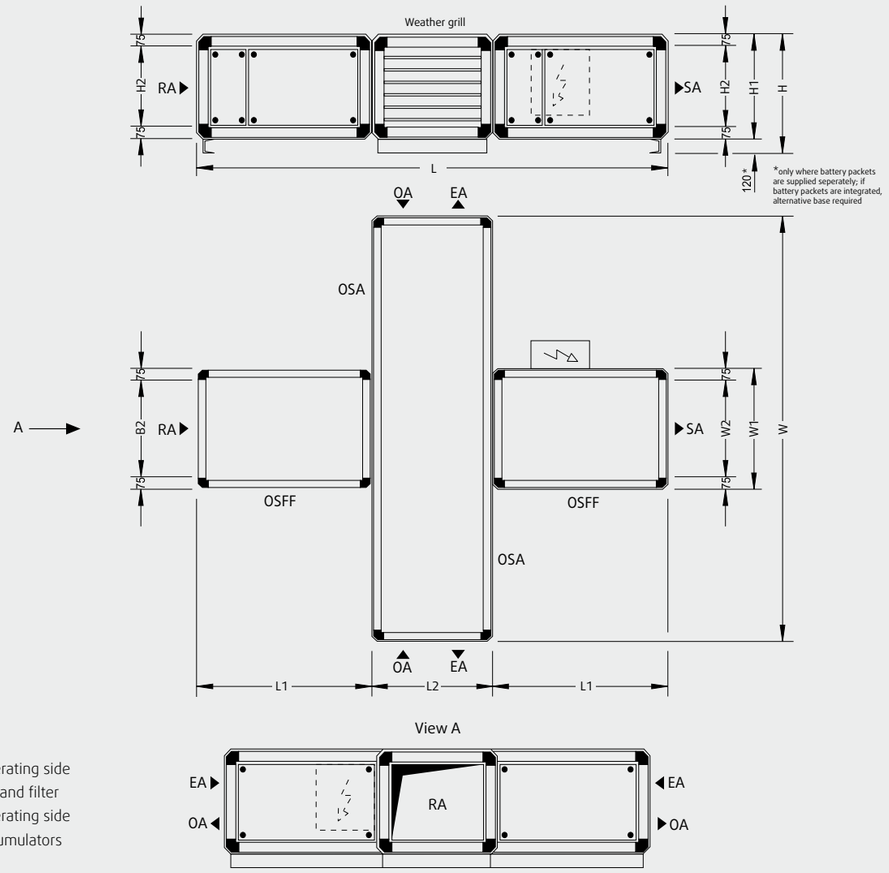
Despite the very high heat recovery efficiency of the Resolair series, the regenerative heat recovery system used requires no defrost mode. The heating capacity normally needed is not required in this case.

In wintertime conditions, the humidity recovery of the regenerative heat recovery system is up to 70 %, which in most applications makes an additional humidification of the supply air obsolete in wintertimes.

Where OA temperatures are rising, variable alteration of the switching cycles allows heat recovery to be reduced all the way down to free cooling. If the outside temperatures exceed the indoor temperature, the unit switches back into the basic cycle and then operates in “cooling recovery mode” with the same high degree of efficiency as for heat recovery.

Resolair Type 65

System dimensions and weights



OSFF = Operating side fan and filter
OSA = Operating side accumulators

Unit type	L[1]	W[2]	H	L1[1]	L2[1]	B1	B2	H1	H2	Weight[1]	Weight battery packets[1]	Weight fan cube[1]
65 07 91	4,110	3,700	1,170	1,530	1,050	1,050	900	1,050	900	2,300	700	480
65 17 91	5,390	4,340	1,490	1,850	1,690	1,690	1,540	1,370	1,220	4,550	1,600	660
65 26 91	6,030	4,660	1,810	2,010	2,010	2,010	1,860	1,690	1,540	6,100	2,000	1,000
65 36 91	6,030	4,980	2,130	1,850	2,330	2,330	2,180	2,010	1,860	8,050	4,700	1,200

Largest transportation unit (accumulator/ damper cube)

Unit Type	L[1]	W	H	Weight[1]
65 07 91	1,050	3,700	1,170	1,540
65 17 91	1,690	4,340	1,490	3,160
65 26 91	2,010	4,660	1,810	3,900
65 36 91	2,330	4,980	2,130	5,560

Controls cabinet

Unit Type	H x W x D[1]	Position
65 07 91	760 x 760 x 300	At unit
65 17 91	760 x 760 x 300	At unit
65 26 91	760 x 760 x 300	At unit
65 36 91	1,000 x 800 x 300	At unit

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.

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 choosen option
2 Door fitting assembly increase unit width by 25 mm each operating side

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Technical specifications and performance

Unit Type		65 07 91	65 17 91	65 26 91	65 36 91
Max. flow rate	m^3/h	10,000	20,000	30,000	40,000
"Cooling recovery system" [1]	kW	16.3	33.0	50.3	66.1
Coefficient of power efficiency according to EN 13053:2012	%	88	89	89	89
Heat recovery rate according to EN 308	%	91	91	91	91
Recovery of humidity		up to 70 %			
Total electrical power rating [2]	kW	7.65	13.22	18.57	25.36
Max. current consumption [2]	A	16.8	33.6	43.8	67.2
Operating voltage		3 / N / PE 400 V 50 Hz			
Ext. pressure loss					
Supply air	Pa	200	150	190	160
Return Air	Pa	200	150	190	160
Sound power level					
Acoustic pressure at a distance of 1 m from the unit [3]	dB(A)	60	62	63	65
Fan units					
Rated fan input for supply air [4]	kW	3.77	6.52	9.15	12.52
Rated fan input for return air [4]	kW	3.88	6.70	9.42	12.84
SFP category supply air | return air		3 | 3	2 | 3	2 | 2	2 | 2
Nominal rating supply air | return air	kW	5.5 | 5.5	11.0 | 11.0	14.1 | 14.1	22.0 | 22.0
Inner specific fan power (SFP_{int}) [5]	Ws/m^3	1,260	1,174	1,050	1,085
Efficiency classes according to EN 13053:2012					
Heat recovery class		H1	H1	H1	H1
Power consumption of fans SA | RA		P1 | P1	P2 | P2	P1 | P1	P3 | P3
Air velocity class		V6	V6	V6	V5
Filtration according to ISO 16890					
Outside air		ISO ePM10 60 % (M5)			
Return Air		ISO ePM10 60 % (M5)			
LPHW (optional) [6,7]					
Heating capacity SA=22° C	kW	7.3	15.1	24.3	30.5
Heating capacity SA=30° C	kW	34.3	69.6	105.7	139.5
Additional power consumption supply air	W	540	560	930	1,120
LPCW (optional) [6,8]					
Cooling capacity SA=20° C	kW	30.7	74.3	110.0	157.6
Additional power consumption supply air	W	1,440	2,520	3,510	4,240
Water flow rate and pressure losses					
LPHW	m^3/h | kPa	2.74 | 4.8	5.50 | 3.9	7.33 | 3.9	8.88 | 4.1
LPHW (pump warm water) valve	m^3/h | kPa	0.75 | 9.1	1.62 | 4.1	2.41 | 3.7	3.11 | 6.2
LPCW	m^3/h | kPa	4.40 | 4.9	10.63 | 5.9	15.73 | 4.8	18.77 | 2.7
LPCW valve	m^3/h | kPa	4.40 | 7.6	10.63 | 7.1	15.73 | 6.2	18.77 | 8.9
Connections					
LPHW connection	DN	32	50	65	65
LPHW control valve connection	DN	15	20	25	32
LPCW connection	DN	40	65	80	80
LPCW control valve-connection	DN	25	50	50	50

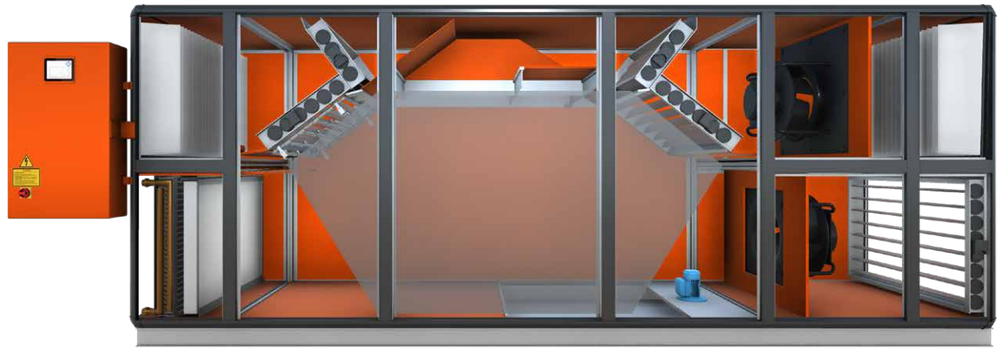
Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 at OA = 26° C / 55% r.h., RA = 32° C / 40% r.h. and standard density
2 Depends on configuration of measurement and control system/unit
3 at 250 Hz mid-band frequency
4 with average filter contamination
5 According EU guideline No. 1253/2014 [Ecodesign guideline]
6 Supplimentary equipment, unit length extends; may require alteration of technical equipment. Note higher power consumption of SA fan units
7 FL = 70° C
8 FL = 12° C

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance.

Comfort air conditioning unit with counterflow plate heat exchanger

Automatically selects the most economical operating mode!



Adconair 76 13 01 with adiabatic - simplified illustration

Comes with our Eurovent certified MB 50 housing.

Adconair 76

AIR VOLUME FLOW: 2,600 – 45,200 m³/h

At a glance:

- **Suitable for all building types**
- **Designed for the requirements of the highest energy efficiency classes**
- **Use of natural refrigenants (R718 or R290)**
- **Heat recovery rate of more than 90 % with just 115 Pa pressure loss**
- **HRC class H1, even at high air velocities**
- **Demand-based defrosting with low peak output**
- **Thermal bridge factor k_b = 0.78 - class TB1**
- **Two-stage supply air filtration**
- **Fulfils requirements of German Energy Saving Ordinance (EnEV), the German Renewable Energies Heat Act (EEWärmeG) & VDI 6022**
- **Summer bypass of the heat recovery system for both air flow paths**

With its counterflow plate heat exchanger, the Adconair 76 series is setting highest standards in the ventilation industry. The heat exchanger works with a real counterflow proportion of over 80 %. The internal pressure losses of the heat recovery system measure just 115 Pa. Adconair units are optimally adapted for use in comfort air conditioning. The unit series is designed to comply with the requirements of the highest energy efficiency classes. Ideal areas of application include all residential and non-residential buildings. Thanks to its high capacity and intelligent regulation system, the units always create an excellent indoor climate.

Further performance parameters and options:

- Corrosion-free counterflow plate heat exchanger made from polypropylene
- EC fans / Menerga EcoWall
- Heating coil
- Integrated heat recovery bypass for free cooling
- Integrated freely programmable control and regulation unit
- Complete unit – the unit is delivered ready to install
- Intensive quality inspection with factory test run
- Complete cleaning of the heat exchanger possible without dismantling

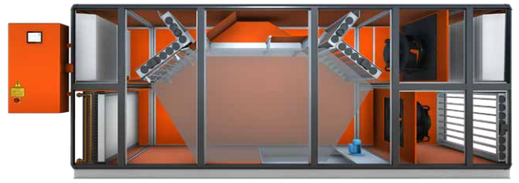
Options:

- Hybrid adiabatic
- Integrated turbo compressor with R718 (water) as refrigerant
- Thermally driven adsorption process for cold water generation
- Integrated compressor refrigeration system type approved (PED 2014/68/EU) with output-regulated heat-pump and microchannel condenser
- Available as reversable system
- Constantly regulated recirculation air dampers for heating purposes
- Recuperator shortened about 960 mm lenght, optimal for minimal space requirements
- And many more

Functional description

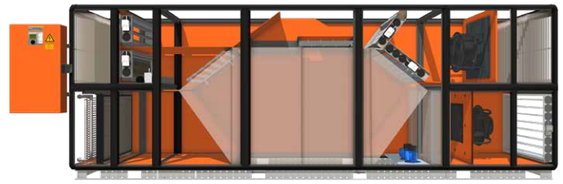
Adconair without optional equipment
Basic unit without additional equipment. The central element is the counterflow plate heat exchanger. Ideal application areas are applications in which a high heat recovery is in the focus.

Additional equipment adiabatic evaporative cooling
Classic adiabatic evaporative cooling with temperature lowering up to 14 K*. The ideal application area is a high demand for cooling and simultaneously high demands for heat recovery, without the need for dehumidification.

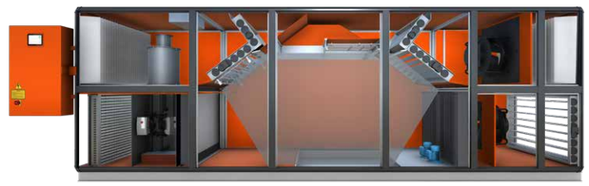


Additional equipment compressor refrigeration system
To increase the cooling capacity and for dehumidification. This option can be combined with adiabatic evaporation cooling. Ideally suited, if supreme comfort air with minimum energy requirements is in the focus.

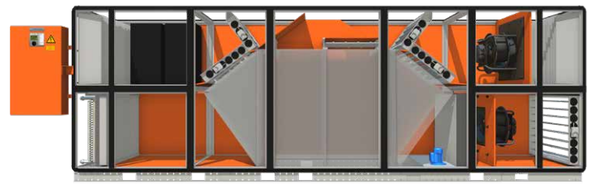
Optional: Hybrid adiabatic
By combining the processes of indirect, adiabatic evaporative cooling and dew point cooling, supply air temperatures of down to 18 °C can be achieved. This allows a high removal of sensible heat loads from the rooms.



Optional: Turbo compressor
The electrically driven variant is based on a turbo compressor with the refrigerant R718 (water), which is evaporated and condensed at very low pressures. This process produces cold water, which is used for the LPCW in the supply air.



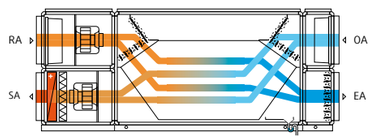
Optional: Adsorption cooling
Cooling is provided by an integrated, closed adsorption cooling circuit which supplies the heating coil used for supply air heating in winter with cold water for cooling in summer. As the adsorption cooling circuit is operated thermally, existing waste heat can be used efficiently.



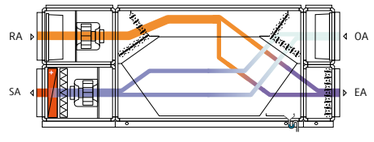
* for RA=26° C; 55 % r.h., OA=34° C; 40% r.h. and optimum air volume flow and standard density

Functional description

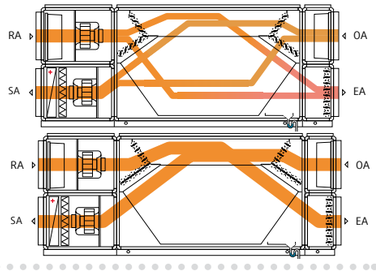
Wintertime conditions
In case of low outside temperatures the system operates completely in heat recovery mode. The counterflow plate heat exchanger enables the recovery of more than 90 % of the heat contained in the return air. The standard heating coil compensates for ventilation and transmission heat losses of the building as required.



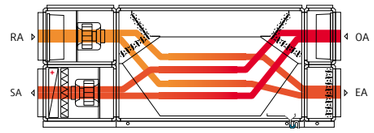
Defrosting circuit
The integrated defrosting circuit melts any ice build-up by opening the extract air-exhaust air bypass, which directs the return air straight to the area of any possible ice without interrupting the fresh air supply. In this way, the peak load on the LPHW for reheating the extremely cold outside air is significantly reduced.



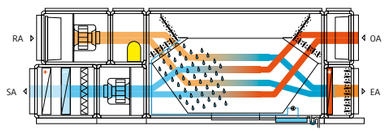
Transitional period
As the outside air temperatures rise, the heat recovery requirement is reduced. The bypass dampers, which run along the entire depth of the unit, are continuously regulated in order to achieve the desired supply air temperature.
If the outside temperatures continue to rise, the heat recovery is completely bypassed. The structural design of the bypasses over both airflow paths ensures that the pressure losses within the unit are low and that the power consumption of both fans in bypass mode is also reduced to a minimum.



Summertime conditions
If the outside temperature rises above the return air temperature, the highly efficient heat exchanger is used as a "cooling recovery system". The warm outside air is cooled by the return air.

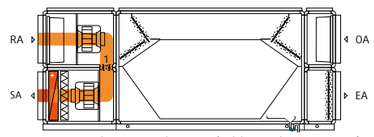


Compressor refrigeration system
At high outside temperatures, both the integrated adiabatic cooling and the compression refrigeration system are activated so that the supply air is cooled to the desired temperature and dehumidified if necessary. The adiabatic system supports the compression refrigeration system and increases the SEER considerably.



Recirculation air operation (heating)*
In recirculation air mode, the outdoor and exhaust air dampers are closed. The air is heated as required via the heating coil. Rooms which are not used all of the time, such as lecture halls or sports halls, can therefore be quickly heated before being used.

* only possible with optional recirculation air dampers for heating purposes



1 Recirculation air damper (additional equipment)

Adconair adiabatic systems

What is adiabatics?
Adiabatic evaporative cooling – or short „adibiatics" – is a very efficient principle that can be found in nature. It makes use of the physical effect when water evaporates it removes thermal energy from the air, which cools it down. Everybody has experienced this effect themselves, e.g. doing sport and sweating. When the sweat film evaporates on the skin, sensible heat, i.e. heat that you can feel, is taken away and the body temperature falls.

Menerga has been using this principle for over 25 years in their highly efficient air conditioning technology. The air temperature can be reduced up to 14 K using evaporative cooling, without any energy input for the cooling process! Evaporative cooling has its limits in physical terms due to the respective wet-bulb temperature. Systems which are exclusively adibiatic cannot achieve a lower temperature than approximately 21 degrees Celsius. Therefore it has been necessary so far during hot summer months to add a compressor refrigeration system with noticeable higher energy and maintenance requirements. Menerga has now managed to expand the capacity limits of adibiatic systems. For many areas of application, a separate compression refrigeration system is therefore no longer needed!

From an economic standpoint as well, adiabatic systems pay off for the plant owner. Low power consumption reduces operating costs. Furthermore, elimination of maintenance of a compression refrigeration system, as well as no regular leakage testing otherwise necessary for FC-filled refrigeration systems (and stipulated in the F-Gas Regulation), reduce maintenance costs sustainably. With these new developments, rising costs for refrigerants containing FC – as a result of official quantity limitation (phase-down) for marketing of FC until the year 2035 – pose no cost risk for the later maintenance of these air handling units.

Our adiabatic systems are available in various models:

- Adiabatic - integrated evaporative cooling
- Adiabatic^{zeroGWP} - hybrid evaporative cooling
- Electrically driven AdiabaticDX^{carbonfree} - with a turbo compressor which uses R718 as refrigerant
- Thermally driven AdiabaticDX^{carbonfree} - integrated adsorption process on the basis of R718

All variants at a glance	Supply air temperature	Outdoor air dehumidification	Extract of sensitive loads (heat)	Extract of latent loads (humidity)
Adiabatic	20 °C	-	+	+
Adiabatic^{zeroGWP}	18 °C	-	++	++
AdiabaticDX^{carbonfree}	< 18 °C	up to 4g/kg	+++	+++

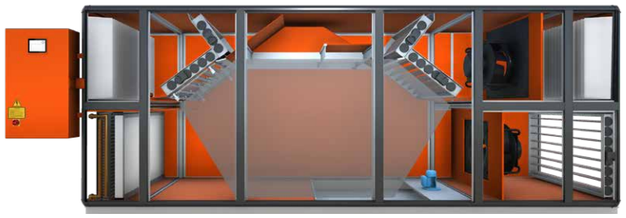
Adconair

At a glance:

- **Adiabatic cooling efficiency Φ_{Adi} > 90 %**
- **No additional air-side pressure drop resulting from components installed in the air path, e.g. humidifiers**
- **Minimal water consumption of 2.2 l/person & day during summertime**
- **Operation with rain water possible**
- **Reduction of the required DX cooling duty by up to 70 %**
- **Great output, even with particularly high internal thermal loads**
- **Cooling of outdoor air by up to 14 K possible**

Adconair Adiabatic

An essential component of this function is the counterflow plate heat exchanger, in which the exhaust air is cooled adiabatically. In counter flow principle, the outdoor air is cooled by the humid and cool exhaust air. Due to a complete separation of the air ways, there is no moisture transfer from the exhaust air to the supply air. The high efficiency is based on the fact that both processes of the adiabatic evaporative cooling of the extract air and the cooling of the outside air, take place within the heat exchanger simultaneously. The high temperature efficiency of this plate heat exchanger and the high counterflow proportion of > 80 % ensure a high post-evaporation. In this way, a large cooling capacity of the outdoor air, supply air with more than 14 K can be achieved.
This variant can be extended by an integrated compression refrigeration system. It is switched on at high outside air temperatures in order to cool the supply air to the desired temperature and dehumidification level if necessary.

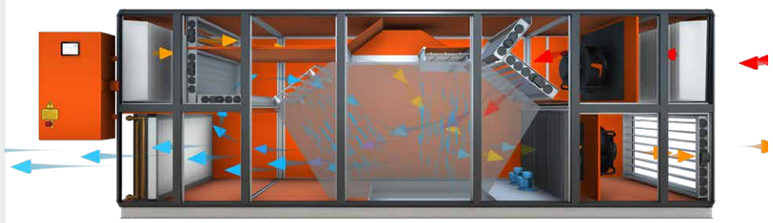


At a glance:

- **Adiabatic cooling efficiency > 115 % (based on the wet-bulb temperature of the extracted air)**
- **Low water consumption of 3.6 l/kWh**
- **Adiabatic operation with rain water possible**
- **Minimal power consumption with a SEER of 36**
- **Great output, even with particularly high internal thermal loads**
- **Cooling of outdoor air by up to 20 K possible**
- **No need for a conventional refrigeration system**
- **Rising humidity of the extracted air does not result in notable power reduction**

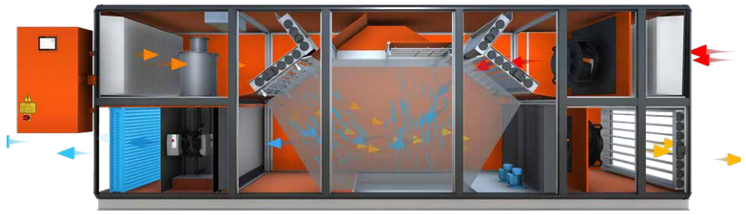
Adconair Adiabatic^{zeroGWP}

Within the first-half of the heat exchanger, indirect, adiabatic evaporation cooling takes place, as familiar from Adconair Adiabatic systems. Outside air is therefore already extensively cooled down. In the second-half of the heat exchanger, so-called dew point cooling takes place. For this purpose, a part of the already pre-cooled outdoor air is withdrawn after its exit from the heat exchanger as process air flow. Then it is directed back to the heat exchanger in accordance with the counterflow principle and again humidified. In this way, indirect evaporative cooling takes place again. Unlike conventional systems, the lowest possible temperature is no longer dependent on the wet-bulb temperature of the extracted air, but rather on the dew-point temperature of the pre-cooled outside air. The process air flow is up to 50 % of the nominal flow and is controlled continuously such that a constant supply air temperature is maintained. This has to be taken into account during the planning phase.



Adconair AdiabaticDX^{carbonfree} electrically

The key components of this system are the turbo compressor and an integrated hydraulic module. The sytem makes it possible to use the natural refrigerant R718 (water), which evaporates and condenses at low pressures,similar to the principle of conventional DX cooling. This makes it possible to reliably achieve supply air temperatures of as low as 12 °C. The re-cooling of the system also takes directly within the air handling unit itself, so that no external peripherals are required. The distinctive feature of this solution is that the evaporator, compressor and condenser are integrated into the system as a single component. In addition, the noise level is extremely low and vibration-free compared to conventional compressors.

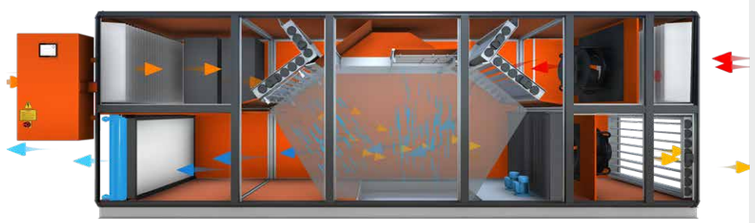


At a glance:

- **FC-free, due to the use of water (R718) as refrigerant with GWP = 0**
- **Output-regulated turbo compressor**
- **EER > 11 (total EER, includes indirect evaporative cooling)**
- **Re-cooling directly within the unit, i.e. no external re-cooling system**
- **Completely encapsulated hydraulics in the supply air**
- **Usage of the combined heating and cooling coil in the supply air for cooling in summer and heating in winter**
- **System is neither subject to the F-Gas Regulation nor to the pressure equipment directive**

Adconair AdiabaticDX^{carbonfree} thermally

The key components of this system consist of two modules, which are equipped with silica gel as an adsorption material. The physical process of adsorption produces cold water, which is used in a change-over coil to cool and dehumidify the supply air. The flow temperatures from the refrigeration circuit are low enough to cool the outside air from 32 down to around 16 °C, in combination with indirect, adiabatic evaporative cooling.
While one module generates the cold water by this process, the second module is regenerated during the same process. For this purpose, hot water (from 55 °C) is applied, which leads to desorption of the saturated silica gel. The desorption is at least as fast as the adsorption, so that enough cooling energy is always available.
The special feature of this concept is that there are no mechanically moving parts in the vacuum and the noise level is extremely low and vibration-free compared to conventional compressors.

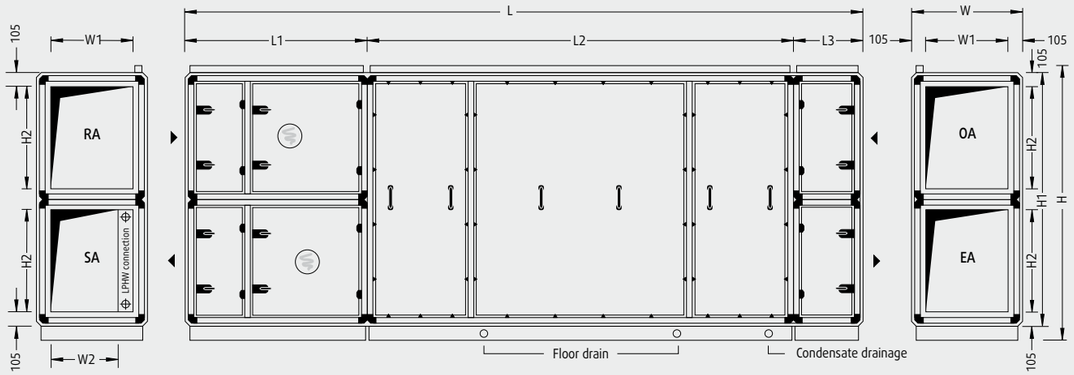


At a glance:

- **No additional energy consumption for supply air cooling and dehumidifying**
- **Operating heat for adsorption process from 55 °C**
- **Possible energy sources: solar heat, district heating, waste heat from combined heat and power plants, process heat, or the heating connection for the heating coil, required in any case for winter operation**
- **Integrated re-cooling, no external re-cooling plant required**
- **Hydraulically separated heat and cold supply, no mixing possible**
- **No certified refrigeration technicians for maintenance needed**
- **Is not subject to the F-Gas regulation**
- **Adiabatic operation with rain water possible**

Adconair Type 76

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

Unit type	L[1]	W[2]	H[3]	L1[1]	L2[1]	L3[1]	W1	W2	H1	H2	Weight[1,4]
76 03 01	4,810	790	1,700	1,240	2,970	600	580	510	1,520	580	1,220
76 05 01	4,970	1,110	1,700	1,400	2,970	600	900	830	1,520	580	1,500
76 06 01	5,610	790	2,340	1,400	3,610	600	580	420	2,160	900	1,650
76 10 01	5,610	1,110	2,340	1,400	3,610	600	900	740	2,160	900	1,900
76 13 01	5,770	1,430	2,340	1,560	3,610	600	1,220	1,060	2,160	900	2,350
76 16 01	5,770	1,750	2,340	1,560	3,610	600	1,540	1,380	2,160	900	2,650
76 19 01	5,770	2,070	2,340	1,560	3,610	600	1,860	1,700	2,160	900	3,000
76 25 01	6,250	2,070	2,980	1,560	4,090	600	1,860	1,700	2,800	1,220	3,900
76 29 01	6,250	2,390	2,980	1,560	4,090	600	2,180	2,020	2,800	1,220	4,300
76 37 01	6,250	3,030	2,980	1,560	4,090	600	2,820	2,660	2,800	1,220	5,700

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. For service work above the unit, please allow 50 mm working height clearance above the cable duct. For service work at unit type 76 37 01 a clearance at the rear of at least 1.500 mm is required.

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 choosen option, e.g. AdiabaticPro, compressor refrigeration system, recuperator in short version (- 960 mm)
2 Door fitting assembly increase unit width by 65 mm each operating side
3 incl. 120 mm base frame, incl. 60 mm cable duct
4 If option Adiabatic or AdiabaticPro is choosen, please affirm possible additional weight!

Three transportation units are supplied, including controls cabinet until unit type 38 29 01. Unit type 38 37 01 is delivered in 4 transportation units including controls cabinet. Further partitioning for smaller apertures possible (at extra cost).

Largest transport unit

Unit Type	L[1]	W	H[3]	Weight[1,4]
76 03 01	2,970	790	1,700	660
76 05 01	2,970	1,110	1,700	810
76 06 01	3,610	790	2,340	930
76 10 01	3,610	1,110	2,340	1,110
76 13 01	3,610	1,430	2,340	1,300
76 16 01	3,610	1,750	2,340	1,500
76 19 01	3,610	2,070	2,340	1,720
76 25 01	4,090	2,070	2,980	2,330
76 29 01	4,090	2,390	2,980	2,600
76 37 01	4,090	1,515	2,980	1,750

Controls cabinet

Unit Type	H x W x D[1]	Position at unit
76 03 01	1,120 x 640 x 210	SA/RA side
76 05 01	1,120 x 640 x 210	SA/RA side
76 06 01	1,120 x 640 x 210	SA/RA side
76 10 01	1,120 x 640 x 210	SA/RA side
76 13 01	1,120 x 640 x 210	SA/RA side
76 16 01	1,120 x 640 x 210	SA/RA side
76 19 01	1,120 x 640 x 210	SA/RA side
76 25 01	1,280 x 640 x 210	SA/RA side
76 29 01	1,280 x 640 x 210	SA/RA side
76 37 01	1,280 x 640 x 210	SA/RA side

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Technical specifications and performance

Unit type		76 03 01	76 05 01	76 06 01	76 10 01	76 13 01	76 16 01	76 19 01	76 25 01	76 29 01	76 37 01
Max. flow rate [1]	m^3/h	3,000	4,400	4,700	6,800	9,500	11,500	13,000	18,900	21,800	28,000
Optimum flow rate	m^3/h	3,500	5,100	5,000	6,900	9,600	11,800	13,700	19,500	22,600	28,700
Coefficient of power efficiency acc. to EN 13053:2012	%	73	73	74	75	74	74	75	76	76	75
Heat recovery rate according to EN 308	%	75.1	75.1	76.7	76.9	76.4	76.7	77.3	78.3	78.4	78.1
Total electrical power rating [1]	kW	1.73	2.53	2.83	4.06	5.35	6.53	8.41	12.34	15.70	26.55
Max. current consumption [1]	A	9.45	9.45	10.25	11.05	17.45	17.45	20.25	33.45	36.25	47.50
Operating voltage		3/N/PE 400V 50Hz									
Ext. pressure loss											
Supply and fresh air duct	Pa	300	300	300	300	300	300	400	400	500	500
Return and exhaust air duct	Pa	300	300	300	300	300	300	400	400	500	500
Sound power level											
Acoustic pressure in 1 m distance from unit [2]	dB(A)	42	44	44	50	48	53	57	54	58	61
Fan units											
Rated motor input for supply air [3]	kW	0.95	1.35	1.56	2.17	2.88	3.48	4.41	2x 2.38	2x 4.09	3x 3.76
Rated motor input for return air [3]	kW	0.78	1.18	1.27	1.89	2.74	3.05	4.00	2x 2.89	2x 3.76	2x 5.09
SFP category supply air | return air		1 | 2	1 | 2	1 | 2	1 | 2	1 | 2	1 | 2	1 | 2	2 | 2	2 | 3	2 | 3
Nominal rating supply air | return air	kW	2.5 | 2.5	2.5 | 2.5	2.5 | 2.9	2.9 | 2.9	5 | 5	5 | 5	6 | 6	2x 5 | 2x 5	2x 6 | 2x 5	3x 5.4 | 2x 6
Inner specific fan power (SFPint) [4]	Ws/m^3	776	764	871	861	838	836	795	879	861	916
Efficiency classes according to EN 13053:2012											
Heat recovery class		H1	H1	H1	H1	H1	H1	H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P2 | P1
Air velocity class		V2	V2	V2	V3	V3	V3	V3	V3	V3	V3
Eurovent energy efficiency class		A+	A+	A+	A+	A+	A+	A+	A+	A+	A
Filtration according to ISO 16890											
Supply air | Outdoor air		ISO ePM1 55 % (F7) | ISO ePM10 60 % (M5)									
Return air		ISO ePM10 60 % (M5)									
Adiabatic / evaporative cooling (optional) [5] we recommend: optimum flow rate = max. flow rate											
Supply air temperature	°C	20.7	20.7	20.6	20.5	20.6	20.6	20.5	20.4	20.4	20.4
Cooling capacity evaporative cooling [6]	kW	11.6	16.9	18.4	26.6	36.9	44.7	50.9	74.9	86.4	111.7
Rated pump input	kW	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.90
Rated input reverse osmosis system [7]	kW	0.25	0.25	0.25	0.25	0.38	0.38	0.38	0.38	0.38	0.78
Water consumption [8]	l/h	50	80	80	120	160	200	240	320	360	480
Adiabatic[zeroGWP] (optional) [5,] optimum flow rate = max. flow rate											
Supply air temperature	°C	-	-	19.1	19.0	18.0	19.1	18.9	19.0	19.2	19.1
Cooling capacity evaporative cooling [6]	kW	-	-	20.5	29.9	32.2	50.3	58.0	83.6	95.4	118.7
Rated pump input	kW	-	-	0.9	0.9	0.9	0.9	0.9	1.0	1.0	2.0
Rated input reverse osmosis system [7]	kW	-	-	0.25	0.25	0.38	0.38	0.38	0.38	0.38	0.78
Water consumption [8]	l/h	-	-	120	180	240	320	360	480	540	720
DX compressor refrigeration system (optional) [9, 10, 11]											
Supply air temperature	°C	19.0	19.3	18.6	18.2	18.3	18.4	18.1	18.5	18.5	18.5
Filling volume for refrigerant type R410A[13]	kg	3	4	4	5	7	8	12	18	21	22
Rated compressor input	kW	2.3	2.7	4.5	6.3	8.3	9.0	12.6	13.8	16.2	20.3
Mechanical cooling capacity SA=18°C [6]	kW	9.7	12.7	16.4	24.8	34.8	39.2	48.8	60.8	70.2	88.2
DX[carbonfree] thermally driven (optional)											
Supply air temperature	°C	-	-	17.7	17.6	18.0	17.7	17.7	17.8	17.5	17.8
Capacity of heating circuit	kW	-	-	15.9	23.0	24.1	36.2	36.9	49.1	71.0	74.0
Cooling capacity	kW	-	-	7.7	11.0	12.0	17.8	18.4	24.5	34.5	37.0
LPHW [12]											
Heating capacity SA=22° C	kW	6.3	9.1	8.8	12.5	18.3	21.7	23.5	31.5	35.9	47.5
Air inlet temperature	°C	15.7	15.7	16.3	16.4	16.2	16.3	16.6	17.0	17.0	16.9
Heating capacity defrost [13]	kW	8.1	12.0	12.7	18.4	25.9	31.2	35.5	51.3	59.2	131.7
Connections											
LPHW connection	DN	32	32	32	32	40	40	40	50	65	65
LPHW control valve connection	DN	15	15	15	20	25	25	25	32	32	32
Condensate drainage	DN	40	40	40	40	40	40	40	40	40	40

Specifications of technical data relate to the optimum flow rate and return air condition 22° C / 40% r.h., outside air condition -12° C / 90% r.h. and standard density (1.204 kg/m^3), unless otherwise specified.

1 dependent on configuration of measurement and control system/unit
2 at 250 Hz mid-band frequency
3 with average filter contamination
4 According EU guideline No. 1253/2014 [Ecodesign guideline]
5 water quality of make-up water corresponds to VDI 3803 table B3 with a bacteria count < 100 CFU/ml, maximum water hardness 15° dH
6 for RA=26° C / 55 % r.h., OA=32° C / 40% r.h. and optimum air volume flow and standard density
7 discontinuous operation, dependend on water consumption
8 Cold water connection 1/2"; 2-4 bar; <15°dH; max 6 l/min
9 may require alteration of the technical equipment.
10 supplementary equipment, unit length extends.
Note higher power consumption of RA/SA fan units
11 Refrigerant R290 and R718 allowed
12 FL = 70° C
13 at OA=-15° C, SA=18° C, 66% of optimum flow rate and active defrost function

Please seek approval of technical data and specifications prior to start of the planning process. With every single selection we do to your individual requirements our certified selection software automatically checks the Ecodesign compliance level 1 and 2.

Heat recovery from waste water with
counterflow coaxial recuperator and heat pump

AquaCond 44 08 21 - simplified illustration
Picture shows special equipment heat recovery bypass

Automatically selects the most economical operating mode!

AquaCond 44

QUANTITY OF FLOW: 1.2 – 5.4 m^3/h

At a glance:

- **Heat recovery from clean or contaminated waste water for heating fresh water**
- **Reduction of energy required to heat the fresh water by up to 90 %**
- **Automatic heat exchanger cleaning**
- **Flow rate regulation**
- **Integrated control and regulation system, compatible with all conventional building management systems**

Far too often, warm waste water is discharged into the sewer system, together with all the energy it contains. Units in the AquaCond 44 series recover the majority of this heat energy and transfer it to the fresh water. The combination of recuperator and heat pump means that only approx. 10 % of the energy is required that would be needed by a conventional heating system. The heat exchanger cleaning system integrated in this series even allows the units to be used where the waste water is contaminated. Recovering valuable energy – anytime when warm waste water is produced and simultaneously warm fresh water has to be provided, e.g. in the shower areas of swimming pools, hospitals or residential homes, in laundries and in many other industrial processes.

Further performance parameters and options:

- Uniform pipe cross-sections throughout the waste water ducts for constant flow velocities
- Heat pump system with fully sealed suction gas-cooled compressor, mounted on vibration dampers
- Complete unit, ready to connect, contains all structural elements for heat recovery from waste water, including all control and regulation fittings
- Intensive quality inspection with factory test run

Options
- Additional pre-filtration of the waste water with coarse filters
- Design of the heat exchanger as a safety heat exchanger, for additional separation of fresh and waste water
- Recuperator bypass
- and many more

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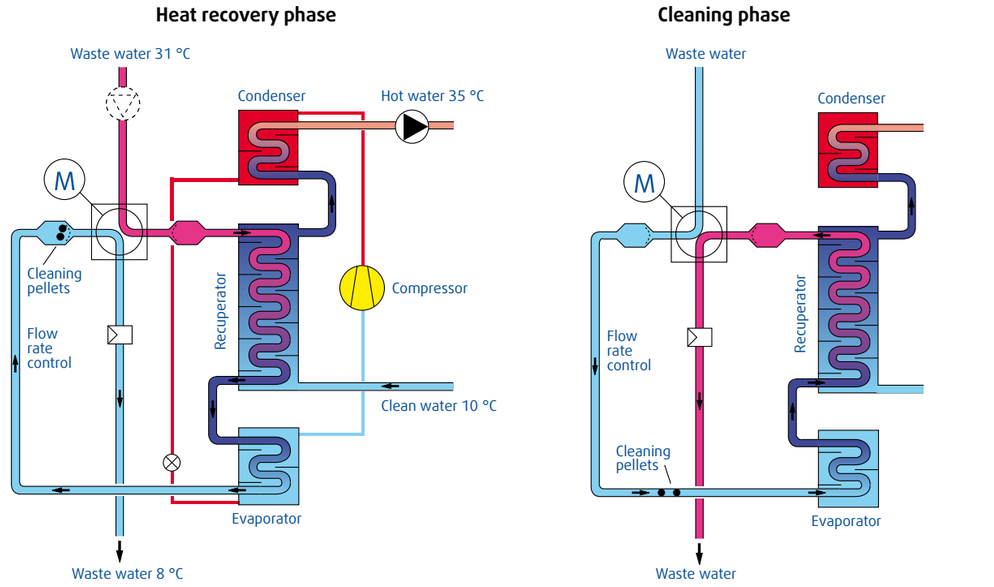
Functional description



The principle of an AquaCond unit is to heat cold clean water to process water temperature in an energy-efficient manner. The heat source used is energy from warm waste water. The transmission of heat takes place through the combination of a recuperative heat exchanger with a heat pump.

In the first stage, the warm waste water flows through the recuperator and then passes through the evaporator of the heat pump. In counterflow and physically separated, the same volume of fresh water first passes through the recuperator and then through the condenser of the heat pump. In the recuperator, the majority of the heat contained in the waste water is transferred to the cold fresh water. This process takes place by means of the efficient counterflow principle and requires no energy input whatsoever.

In the evaporator of the heat pump, a further part of the heat is utilized from the waste water. In the condenser of the heat pump it is transferred to the already pre-heated fresh water. Thanks to the optimal design of the individual components, a total efficiency score of 11 is achieved.

Uniform pipe cross-sections in the waste water ducts guarantee uniformly high flow velocities. This means that the design reduces deposits of contaminants in the heat exchanger pipes and hence any worsening of the heat exchanger efficiency rating. Despite the uniform flow rates, there is a possibility that soap, grease and other substances dissolved in the warm waste water could be deposited on the exchange surfaces during the cooling phase. If the waste water is organically contaminated, bacteria growth and organic sludge formation will possibly adhere to the surface of the heat exchanger. In order to prevent this, the automatic heat exchanger cleaning system regularly passes cleaning pellets through the waste water ducts. The cleaning pellets loosen the deposits from the pipes and prevent the formation of layers on the surfaces.

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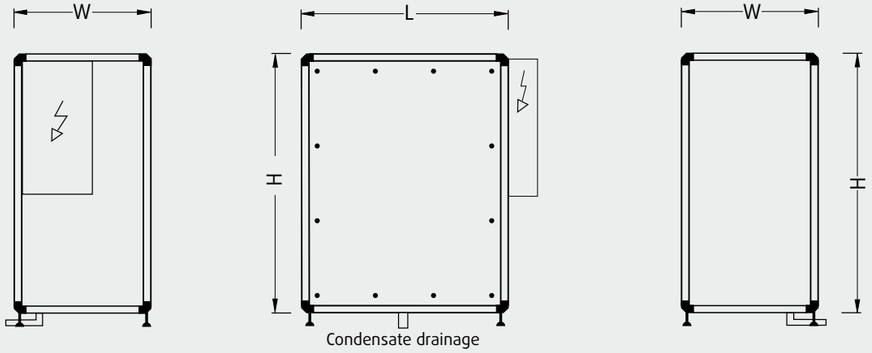
AquaCond Type 44

System dimensions and weights



Unit feet 100 mm
Optional: adjustable feet from 100 to 120 mm

Unit Type	L	W[1]	H[2]	Weight
44 12 .1	1,210	890	1,530	450
44 18 .1	1,370	890	1,690	650
44 24 .2	2,420	890	1,530	860
44 36 .2	2,740	890	1,690	1,260
44 54 .3	4,110	890	1,690	1,900

Largest transport unit

Unit Type	L	W	H[2]	Weight
44 12 .1	1,210	890	1,530	450
44 18 .1	1,370	890	1,690	650
44 24 .2	1,210	890	1,530	460
44 36 .2	1,370	890	1,690	660
44 54 .3	1,370	890	1,690	700

Controls cabinet

Unit Type	H x W x D	Position at unit
44 12 .1	900 x 480 x 210	front side right
44 18 .1	900 x 480 x 210	front side right
44 24 .2	1,120 x 640 x 210	front side right
44 36 .2	1,120 x 640 x 210	front side right
44 54 .3	1,600 x 640 x 250	front side right

Please comply with the dimensions for body size and electrical switch cabinet.

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

1 Door fitting assembly increase unit width by 25 mm each operating side
2 plus unit feet

All pipes to be fitted with locking devices onsite.

Technical specifications and performance

Unit Type		44 12 .1	44 18 .1	44 24 .2	44 36 .2	44 54 .3
Max. quantity of flow	m^3/h	1.2	1.8	2.4	3.6	5.4
Heating capacity	kW	37	52	74	104	156
Rated compressor input	kW	2.6	3.4	2 x 2.6	2 x 3.4	3 x 3.4
Combined COP [1]	COP	11.4	11.8	11.5	11.6	11.8
Filling volume for refrigerant type R407C	kg	4.0	5.0	8.0	10.0	15.0
Max. connection capacity	kW	6.4	9.6	13.0	20.0	29.0
Operating voltage		3 / N / PE 400 V 50 Hz				
Residual delivery head on clean water side	kPa	5	5	5	5	5
Pressure loss on waste water side	kPa	90	90	95	95	98
Connections						
Waste water	mm	32	40	40	50	50
Clean water CU	mm	22	28	28	35	35
Clean water PVC	mm	32	32	40	50	50

Technical data specified refer to max. volume flow rate and waste water temperature 31° C / clean water temperature 10° C

1 Power consumption including process water pump and external waste water pump

Please seek approval of technical data and specifications prior to start of the planning process.

Material key *

Key	Waste water heat exchanger	Waste water side piping	Clean water heat exchanger	Clean water side piping
44 .. 0.	Cu	PVC	Cu	Cu
44 .. 1.	Cu	PVC	Cu tin-plated	PVC
44 .. 2.	Cu-Ni-10Fe	PVC	Cu	Cu
44 .. 3.	Cu-Ni-10Fe	PVC	Cu tin-plated	PVC

* Cu-Ni-10Fe for aggressive waste water (e.g. swimming pool waste water)
Cu tin-plated, if the clean water installation downstream of the unit is made of galvanised steel pipe

Air dehumidification unit with
cross counterflow plate heat exchanger and heat pump

Drysolair 11 15 01 - simplified illustration

Automatically selects the most economical operating mode!

Drysolair 11

AIR VOLUME FLOW: 1,000 – 6,000 m³/h

At a glance:

- **For all drying applications**
- **Low connection capacity due to an upstream installation of a recuperator**
- **Corrosion-free cross counterflow plate heat exchanger made from polypropylene**
- **Energy-saving EC fans**
- **Intelligent air bypass duct**
- **Compact design**
- **Integrated control and regulation system, compatible with all conventional building management systems**

Units in the Drysolair 11 series were developed especially for discharging high levels of internal moisture to the atmosphere. Through the pre-cooling in the recuperator of the air to be dried, the unit works with considerably lower compressor performance than a simple heat pump system and creates a consistently good climate in ice rinks, the drying of buildings or industrial drying processes. The combination of first-class components with precise control and regulation guarantees economical operation at all times and adjusts the temperature and humidity as required.

Further performance parameters and options:

- Specific power consumption of less than 500 Wh/kg dehumidification capacity
- Air filtration
- Corrosion-free heat exchanger made from polypropylene
- 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
- Indoor air humidity regulation
- Warm water condenser
- Remote maintenance
- and many more

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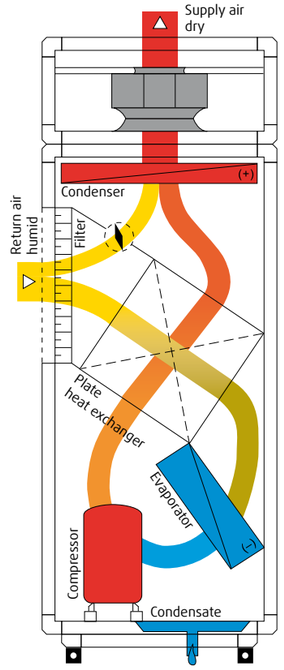
Functional description

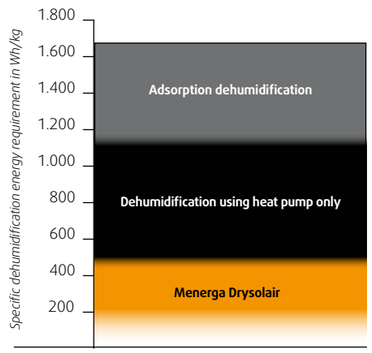


Recirculation mode
In recirculation mode humid air is dehumidified in two stages and supplied into the room as dry supply air. The return air is pre-cooled and dehumidified in the plate heat exchanger.

The dehumidification to the desired supply air humidity level takes place by means of cooling the air to below its dew point in the evaporator of the heat pump. The air that has been dried in this manner is then warmed back up again in the condenser of the heat pump using its own heat, which was removed during cooling, and is brought to the required condition.

The pre-cooling in the plate heat exchanger of the air to be dried means that the air dehumidification unit operates with a considerably lower compressor performance and hence a significantly lower energy consumption than a simple heat pump solution. The integrated bypass allows fast and precise control and adjustment to the condition of the return air. The cooling capacity is thus continuously adapted to the respective requirements.

Specific dehumidification energy requirement
Drysolair achieves a specific dehumidification energy requirement of far less than 500 Wh/kg. With one kilowatt hour of electrical energy, it is therefore possible to remove more than 2 kg of humidity from the recirculation air. In contrast, classical solutions without integrated heat recovery systems reach peak values in excess of 1,000 Wh/kg.



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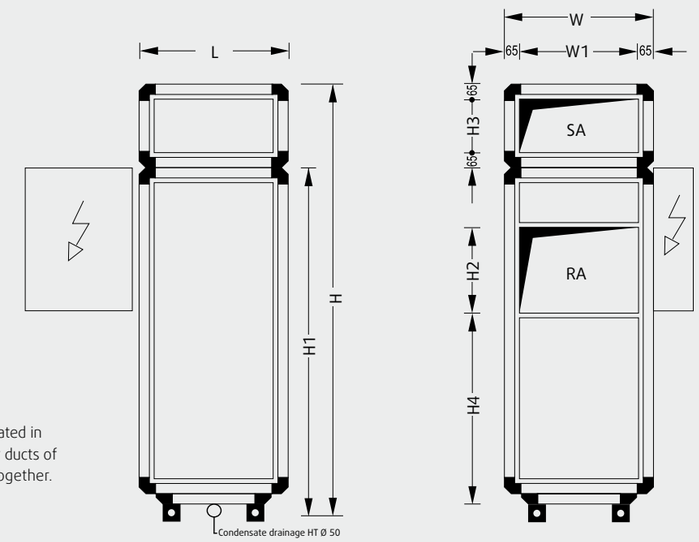
Drysolair Type 11

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Mirror-image design possible.

Unit feet 100 mm

Optional: adjustable feet from 100 to 120 mm

Unit type	L	W[1]	H[2]	W1	H1	H2	H3	H4	Weight
11 10 01	730	730	2,245	600	1,755	440	360	910	450
11 15 01	730	730	2,245	600	1,755	440	360	910	450
11 40 01	1,050	1,050	2,725	920	2,155	580	440	1,200	660
11 60 01	1,050	1,050	2,725	920	2,155	580	440	1,200	680

Largest transport unit

Unit Type	L	W	H[2]	Weight
11 10 01	730	730	1,655	300
11 15 01	730	730	1,655	300
11 40 01	1,050	1,050	2,055	500
11 60 01	1,050	1,050	2,055	500

Controls cabinet

Unit Type	H x W x D	Position at unit
11 10 01	900 x 480 x 210	SA/RA side
11 15 01	900 x 480 x 210	SA/RA side
11 40 01	900 x 480 x 210	SA/RA side
11 60 01	900 x 480 x 210	SA/RA side

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.

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 Door fitting assembly increase unit width by 25 mm each operating side
2 incl. 100 mm unit feet

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Technical specifications and performance

Unit Type		11 10 01	11 15 01	11 40 01	11 60 01
Optimum flow rate	m^3/h	1,000	1,500	4,000	6,000
General specifications					
Max. current consumption[2]	A	9.1	11.9	18.5	24.2
Operating voltage		3 / N / PE 400 V 50 Hz			
External pressure loss					
Supply and return air channel	Pa	300	300	300	300
Sound power level [6]					
Supply air vent	dB(A)	70	67	70	76
RA connection	dB(A)	65	61	62	69
Acoustic pressure at a distance of 1 m from the unit [6]	dB(A)	50	47	50	56
Filling volume for refrigerant type	kg	3.5	3.5	9.0	9.0
Air inlet 20° C / 70% r.h. [1]					
Dehumidification capacity	kg/h	4.5	6.8	17.6	21.6
Heating capacity	kW	4.7	7.5	18.3	23.4
Specific dehumidification energy requirement	Wh/kg	382	443	386	455
Total power rating[2]	kW	1.7	3.0	6.8	9.8
Compressor rated input	kW	1.2	2.3	5.5	7.1
Fan motor power rating [3]	kW	0.5	0.7	1.3	2.7
SFP category		4	4	3	4
Refrigerant type [4]		R407C			
Air inlet 10° C / 85% r.h. [1]					
Dehumidification capacity [5]	kg/h	2.7	4.4	10.6	12.9
Heating capacity	kW	2.8	4.4	10.3	13.4
Specific dehumidification energy requirement	Wh/kg	411	407	370	485
Total power rating	kW	1.1	1.8	3.9	6.3
Compressor rated input	kW	0.6	1.1	2.7	3.6
Fan motor power rating [3]	kW	0.5	0.7	1.2	2.7
SFP category		4	4	3	4
Refrigerant type [4]		R134a			
Connections					
Condensate drainage	DN	25	25	25	25

All technical data relate to optimum flow rate through heat recovery system and the air inlet conditions specified above and at standard density (1.204 kg/m^3).

1 other designs available upon request
2 dependent on configuration of measurement and control system/unit
3 with average filter contamination
4 the refrigerant type used is dependent on the application/return air conditions/design conditions
5 reduction of the dehumidification capacity during defrosting intervals to be taken into account

6 at 250 Hz mid-band frequency

Please seek approval of technical data and specifications prior to start of the planning process.

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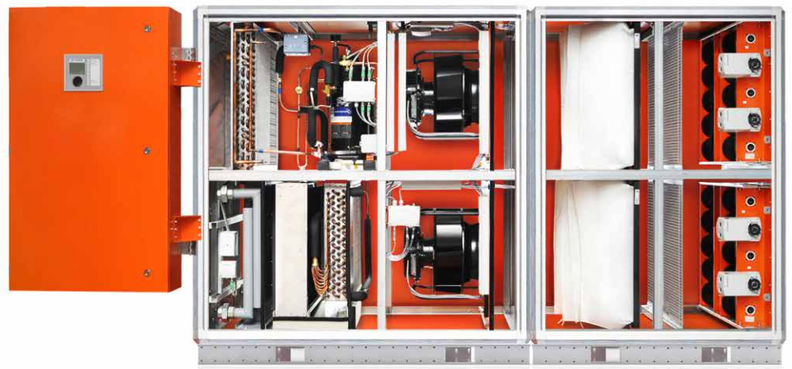
Ventilation unit with compressor refrigeration system
for free cooling of rooms with high thermal loads



Frecolair 14 03 01 with supplementary equipment LPHW and additional unit division - simplified illustration

Automatically selects the most economical operating mode!

Frecolair 14

AIR VOLUME FLOW: 2,600 – 36,000 m³/h

At a glance:

- **For discharging high heat loads**
- **Advantages of free cooling and recirculation mode in a single unit**
- **Energy-saving EC fans**
- **Integrated output-regulated compressor refrigeration system**
- **High electrical efficiency thanks to the lowest possible internal pressure losses**
- **Low space requirement, no additional construction measures for cooling required**
- **Integrated control and regulation system, compatible with all conventional building management systems**

Units in the Frecolair 14 series were developed especially for discharging high internal heat loads into the atmosphere from buildings without humidity requirements. In data processing centres and technical facilities, these units ensure reliable operation and precisely regulate the supply air temperature absolutely spot on. The variability of the operating modes, in combination with first-class components and precise control and regulation systems, guarantees economical operation at all times.

Further performance parameters and options:

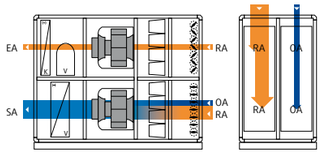
- Focussing on free cooling for maximum savings on operating costs
- Filtering the air in any operating mode
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for comfort air conditioning, including all control and regulation fittings
- Intensive quality inspection with factory test run

Options

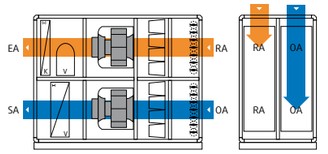
- Two-circuit cooling system to increase redundancy
- Cooling coil
- Heating coil
- Attenuator
- Outdoor installation
- Remote maintenance
- and many more

Functional description

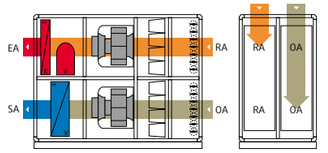
Cooling at low outside temperatures
In order to avoid excessive drops in room temperature at low outside temperatures, a small proportion of the warm return air is added to the cold outside air during partial recirculation mode. The proportion of outside air is variably controlled.



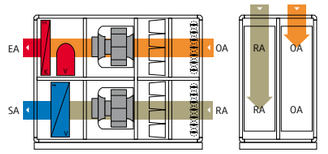
Free cooling at medium outside temperatures
In free cooling mode, the inside heat load is discharged directly via the return air. The cooling takes place exclusively through the continuously controllable proportion of outside air.



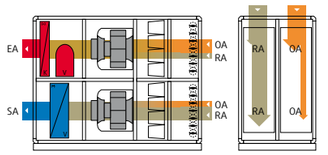
Cooling with outside air at high outside temperatures
The internal heat load is discharged directly with the return air, while in part-load operation the compressor refrigeration system cools the warm outside air to the desired supply air temperature.



Cooling in recirculation mode at very high outside temperatures
If the outside temperature exceeds the return air temperature, the system will automatically switch over into recirculation mode, which is more economical in that case. The return air is cooled to the desired supply air temperature directly by the output-regulated compressor refrigeration system. No addition of warm outside air is necessary.

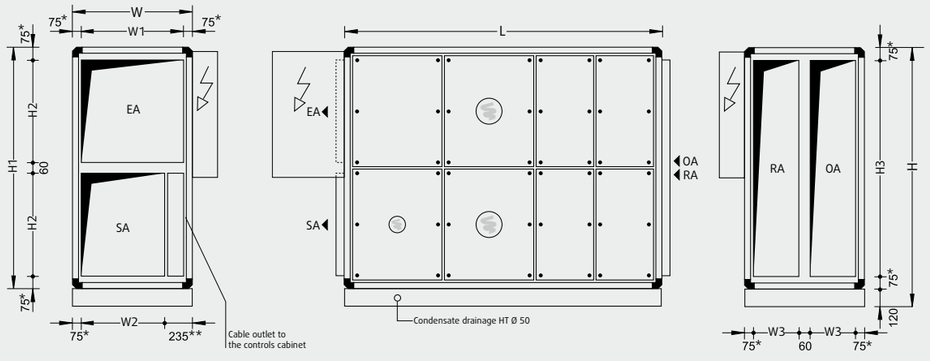


Cooling with a low proportion of air from outside at high outside temperatures
If the outside air temperature is higher than the return air temperature and if a proportion of air from outside is required for hygiene reasons, some outside air can be added in a regulated and hence controlled manner during partial recirculation mode. The return air is cooled to the desired supply air temperature directly by the output-regulated compressor refrigeration system.



Frecolair Type 14

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

* up to unit type 14 05 01 = 65 mm
** up to unit type 14 05 01 = 225 mm

Unit Type	L	W[1]	H[2]	W1	W2	W3	H1	H2	H3	Weight
14 03 01	2,330	730	1,490	600	440	280	1,370	600	1,240	660
14 04 01	2,490	890	1,490	760	600	360	1,370	600	1,240	700
14 05 01	2,490	1,050	1,490	920	760	440	1,370	600	1,240	800
14 06 01	2,490	730	2,130	580	420	260	2,010	900	1,860	850
14 10 01	2,650	1,050	2,130	900	740	420	2,010	900	1,860	1,210
14 13 01	2,810	1,370	2,130	1,220	1,060	580	2,010	900	1,860	1,450
14 16 01	2,970	1,690	2,130	1,540	1,380	740	2,010	900	1,860	1,670
14 19 01	2,970	2,010	2,130	1,860	1,700	900	2,010	900	1,860	1,850

Largest transport unit *

Unit Type	L	W	H[2]	Weight
14 03 01	2,330	730	1,370	660
14 04 01	2,490	890	1,370	700
14 05 01	2,490	1,050	1,370	800
14 06 01	2,490	730	2,010	850
14 10 01	2,650	1,050	2,010	1,210
14 13 01	2,810	1,370	2,010	1,450
14 16 01	2,970	1,690	2,010	1,670
14 19 01	2,970	2,010	2,010	1,850

Controls cabinet

Unit Type	H x W x D	Position at unit
14 03 01	1120 x 640 x 210	SA/RA side
14 04 01	1120 x 640 x 210	SA/RA side
14 05 01	1120 x 640 x 210	SA/RA side
14 06 01	1280 x 640 x 210	SA/RA side
14 10 01	1280 x 640 x 210	SA/RA side
14 13 01	1280 x 640 x 210	SA/RA side
14 16 01	1280 x 640 x 210	SA/RA side
14 19 01	1280 x 640 x 210	SA/RA side

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.

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 Door fitting assembly increase unit width by 25 mm each operating side
2 incl. 120 mm base frame
* Further partitioning for smaller apertures possible (at extra cost).

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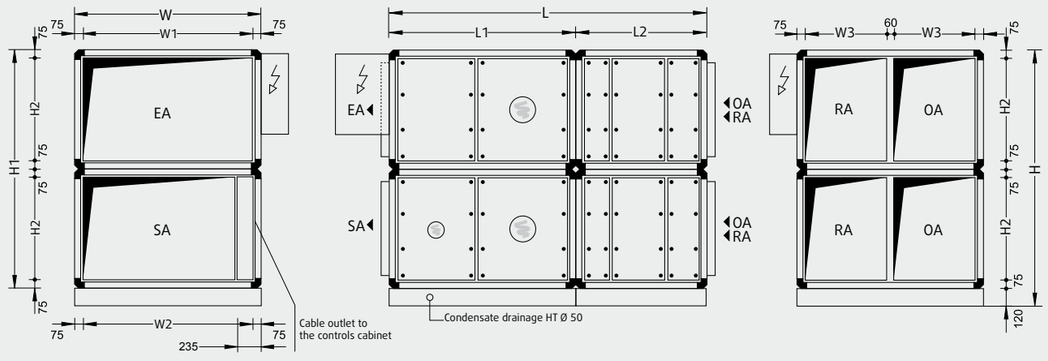
Frecolair Type 14

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

Unit Type	L	W[1]	H[2]	L1	L2	W1	W2	W3	H1	H2	Weight
14 25 01	3,220	2,010	2,860	2,010	1,210	1,860	1,700	900	2,740	1,220	2,150
14 32 01	3,540	2,010	3,500	2,330	1,210	1,860	1,700	900	3,380	1,540	2,350
14 36 01	3,540	2,330	3,500	2,330	1,210	2,180	2,020	1,060	3,380	1,540	2,550

Largest transport unit *

Unit Type	L	W	H[2]	Weight
14 25 01	2,010	2,010	2,740	1,800
14 32 01	2,330	2,010	3,380	1,950
14 36 01	2,330	2,330	3,380	2,100

Controls cabinet

Unit Type	H x W x D	Position at unit
14 25 01	1,280 x 640 x 210	SA/RA side
14 32 01	1,600 x 640 x 250	SA/RA side
14 36 01	1,600 x 640 x 250	SA/RA side

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.

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

All lengths are given in mm, weights in kg.

1 Door fitting assembly increase unit width by 25 mm each operating side
2 inkl. 120 mm base frame
* Further partitioning for smaller apertures possible (at extra cost).

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Technical specifications and performance

Unit Type		14 03 01	14 04 01	14 05 01	14 06 01	14 10 01	14 13 01	14 16 01	14 19 01	14 25 01	14 32 01	14 36 01
Optimum flow rate												
Return air/supply air	m^3/h	2,600	3,300	4,000	4,700	7,100	9,500	11,800	14,200	18,700	24,000	27,000
Outside air/exhaust air	m^3/h	3,500	4,600	5,300	6,300	9,500	12,600	15,800	19,000	25,000	32,000	36,000
Total electrical power rating[1]	kW	4.6	5.7	6.8	8.2	12.9	14.7	19.5	23.2	30.6	37.8	45.6
Max. current consumption [1]	A	12.2	15.2	18.2	19.7	29.8	34.2	39.1	63.2	80.8	84.8	107.5
Operating voltage		3 / N / PE 400 V 50 Hz										
Compressor refrigeration system [2]												
Cooling capacity	kW	11.3	14.2	17.5	19.9	30.8	38.7	47.5	58.1	72.6	85.4	99.0
Effective cooling capacity	kW	10.5	13.1	16.2	18.2	28.1	35.2	43.4	52.7	65.7	76.7	88.8
Compressor	kW	2.6	3.3	4.0	4.7	7.6	8.3	10.4	12.1	16.3	19.5	24.8
Refrigeration capacity	EER	4.3	4.3	4.4	4.2	4.1	4.7	4.6	4.8	4.5	4.4	4.0
External pressure loss												
Outside air/exhaust air duct	Pa	300	300	300	300	300	300	400	400	400	400	400
Return air/supply air duct	Pa	300	300	300	300	300	300	400	400	400	400	400
Sound power level [3]												
RA connection	dB(A)	80	76	76	77	84	80	82	86	84	86	86
EA connection	dB(A)	74	76	79	81	84	81	83	82	86	85	89
Outside air vent	dB(A)	78	73	74	76	83	79	81	82	82	82	83
Supply air vent	dB(A)	77	76	80	82	82	82	84	85	86	86	88
Fan units												
Rated motor input for supply air [4]	kW	0.86	0.99	1.17	1.41	2.31	2.58	3.80	4.80	5.92	7.95	8.61
Rated motor input for exhaust air [4]	kW	1.11	1.39	1.61	2.09	3.03	3.83	5.34	6.26	8.37	10.38	12.16
Nominal rating supply air | return air	kW	1.7 | 1.7	1.7 | 1.7	1.7 | 3.0	1.7 | 3.0	3.0 | 5.5	4.7 | 4.7	4.7 | 11.0	9.4 | 9.4	9.4 | 16.5	14.1 | 14.1	14.1 | 22.0
LPHW (optional) [5]												
Heating capacity [6]	kW	32.1	41.4	50.4	52	78	105	131	158	211	270	309
Pressure loss LPHW	kPa	8.9	12.6	10.7	11	6	5	5	5	5	7	7
Pressure loss LPHW valve	kPa	12.3	20.0	12.2	12	11	8	12	8	5	9	11
LPHW connection	DN	20	20	25	25	32	40	50	50	65	65	65
LPHW control valve connection	DN	15	15	20	20	25	32	32	40	50	50	50

All technical data relate to the optimum flow rate through heat recovery system and outside air conditions 32° C / 40% r.h., return air conditions 28° C / 40% r.h.

1 dependent on configuration of measurement and control system/unit
2 recirc air cooling mode, SA ≈ 17° C
3 at 250 Hz mid-band frequency
4 with average filter contamination
5 note higher power consumption of OA fan units
6 FL = 70° C; Air on temperature 15° C

Please seek approval of technical data and specifications prior to start of the planning process.

Cooling of rooms with high thermal loads by means of indirect free cooling, adiabatic evaporative cooling, and an output-regulated compressor refrigeration system

Adcoolair 75 13 01 - simplified illustration

Automatically selects the most economical operating mode!

Adcoolair 75

TOTAL COOLING CAPACITY: 11.1 kW – 246.5 kW

At a glance:

- **Efficient cooling through the use of natural resources**
- **Compact dimensions, optimised for installation in plant rooms without an additional cooling tower**
- **Reliable cooling, even when outside temperatures are very high**
- **No contamination of the process airflow with dust or corrosive pollutants**
- **Moisture content of the process air remains unaffected**
- **Low airflow rate required for heat dissipation**
- **Excellent PUE values of up to 1.1**
- **Integrated control and regulation system, compatible with all conventional building management systems**

Thanks to the combination of indirect free cooling, adiabatic evaporative cooling and the integrated output-regulated compressor refrigeration system, each of which supports the effectiveness of the others, the Adcoolair 75 unit series allows heat dissipation in recirculation mode from data processing centres and other rooms with high thermal loads, with minimal space requirements, low air pressure drops within the unit and very little energy consumption. The use of energy-efficient EC fan units, in combination with a demand-based flow rate control system, additionally contributes to the reduction of operating costs. The Adcoolair 75 unit series is optimally adapted to high return air temperatures. The combination of first-class components with precise control and regulation systems guarantees economical operation at all times.

Further performance parameters and options:

- Highest electrical efficiency, as all components are designed for minimal pressure losses
- Energy-saving EC fans
- Corrosion-free cross counterflow plate heat exchanger made from polypropylene
- Oil sump heater that can be switched off
- Use of electronic expansion valves
- Filtering the air in any operating mode
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for recirculation air cooling, including all control and regulation fittings
- Intensive quality inspection with factory test run

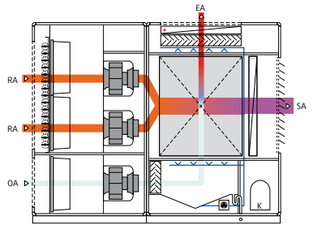
Options

- Integrated exhaust air/outside air bypass to avoid formation of condensate at low outside temperatures
- Hot water extraction, to use waste heat for heating purposes
- Cooling coil instead of integrated compressor refrigeration system
- Outdoor installation
- Remote maintenance
- and many more

Functional description

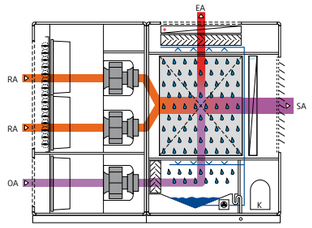
Indirect free cooling at low outside air temperatures

The warm process air from the room with high thermal loads is drawn in via the return air fan and through an asymmetrical cross-counterflow recuperator. In order to extract the heat from the process air. The outside air is passed through the recuperator in a second air flow path, physically separated from the process air. The process air is cooled down in the recuperator through the cooling potential of the outside air. The outside air is variably adjusted, depending on the outside air temperature: with lower outside air temperature, the volume flow rate is reduced. The use of adiabatic evaporative cooling and the compressor refrigeration system is not required at that stage.



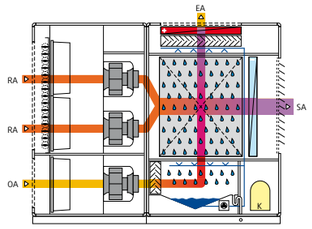
Adiabatic mode at moderate outside air temperatures

The process air is cooled down using indirect adiabatic evaporative cooling. The use of the compressor refrigeration system is not yet required. Even at low outside temperatures, heat exchange can take place using adiabatic humidification. As a result of this, the OA/EA volume flow rate dissipating the heat can be kept low, and this reduces the power consumption of the fan/motor unit.



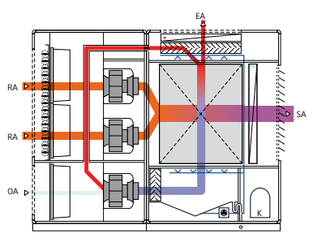
Operation at high outside temperatures

In summertime conditions at very high outside air temperatures and in addition to the adiabatic evaporative cooling, the compressor refrigeration system with output-controlled scroll compressors is activated. In the first stage, the outside air is humidified and then cooled through the evaporation of the water. The cooled outside air indirectly extracts heat from the warm process air in the recuperator. Thus, the process air is significantly cooled, but not humidified. In the second stage, the downstream evaporator is used to cool the process air to the desired supply air temperature. The heat extracted from the process air is transferred to the exhaust air. As the adiabatic evaporative cooling delivers approximately 50 % of the required refrigeration capacity, the continuously adjustable compressor refrigeration system is correspondingly dimensioned for approximately 50 % of the total cooling capacity. This allows the lowest possible pressure losses to be maintained at the evaporator and condenser.



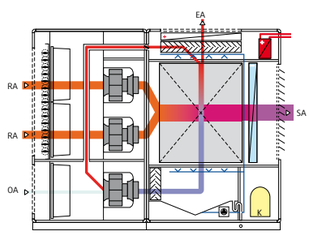
Optional:
EA/OA bypass

In order to prevent dehumidification of the process air, the outside air can be preheated by means of an integrated EA/OA bypass. This prevents condensation of the return air humidity in the recuperator.



Optional:
Warm water condenser

Via a warm water condenser, the heat extracted from the process air at the evaporator can be used for heating or hot process water. The integrated compressor refrigeration system operates as a heat pump in this mode. The control system ensures that the heat pump is primarily used when heat is required.



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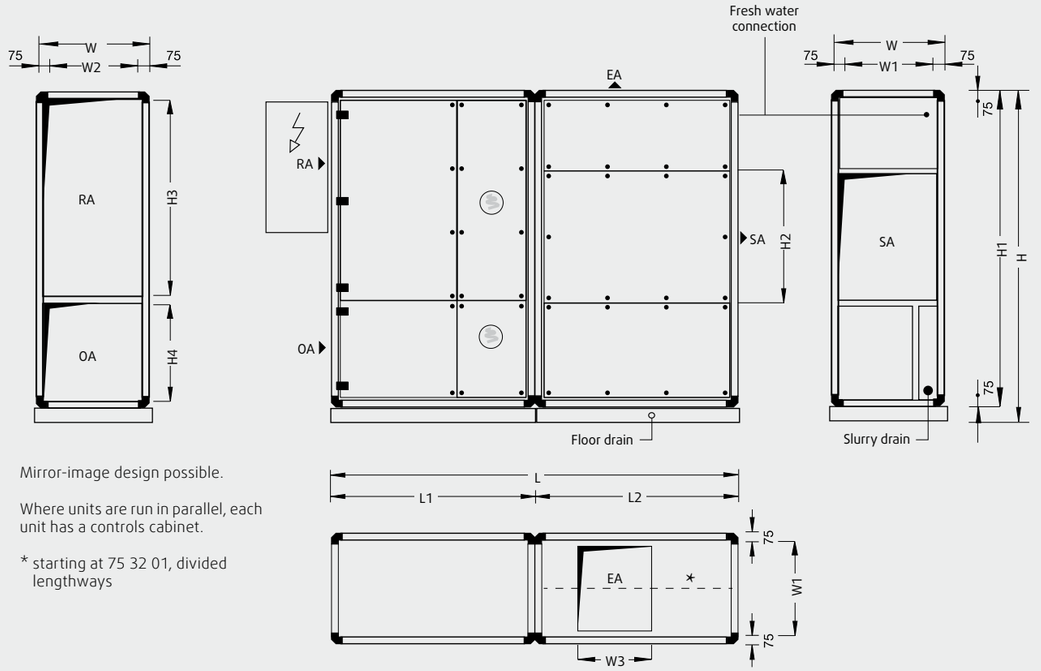
Adcoolair Type 75

System dimensions and weights



Mirror-image design possible.

Where units are run in parallel, each unit has a controls cabinet.

* starting at 75 32 01, divided lengthways

Unit type	L	W[1]	H[2]	L1	L2	W1	W2	W3	H1	H2	H3	H4	Weight
75 02 01	2,900	730	2,130	1,370	1,530	580	580	580	2,010	740	1,220	580	1,020
75 04 01	2,900	1,050	2,130	1,370	1,530	900	900	580	2,010	740	1,220	580	1,240
75 06 01	2,900	1,370	2,130	1,370	1,530	1,220	1,220	580	2,010	740	1,220	580	1,430
75 08 01	3,380	1,050	2,770	1,690	1,690	900	900	940	2,650	1,220	1,540	900	1,490
75 13 01	3,380	1,370	2,770	1,690	1,690	1,220	1,220	940	2,650	1,220	1,540	900	1,800
75 22 01	3,380	2,650	2,770	1,690	1,690	2,500	2,500	940	2,650	1,220	1,540	900	2,660
75 32 01	4,020	3,060	3,250	1,850	2,170	2 x 1,380	2,910	1,300	3,130	1,540	2,020	900	4,180
75 42 01	4,020	4,020	3,250	1,850	2,170	2 x 1,860	3,870	1,300	3,130	1,540	2,020	900	5,360
75 52 01	4,020	4,660	3,250	1,850	2,170	2 x 2,180	4,510	1,300	3,130	1,540	2,020	900	6,170

Largest transport unit

Unit Type	L	W	H[2]	Weight
75 02 01	1,530	730	2,130	600
75 04 01	1,530	1,050	2,130	720
75 06 01	1,530	1,370	2,130	840
75 08 01	1,690	1,050	2,770	850
75 13 01	1,690	1,370	2,770	1,050
75 22 01	1,690	2,650	2,770	1,500
75 32 01	2,170	3,060	3,250	2,500
75 42 01	2,170	4,020	3,250	3,150
75 52 01	2,170	4,660	3,250	3,630

Controls cabinet

Unit Type	H x W x D	Position at unit
75 02 01	1,120 x 640 x 210	SA/RA side
75 04 01	1,120 x 640 x 210	SA/RA side
75 06 01	1,280 x 640 x 210	SA/RA side
75 08 01	1,280 x 640 x 210	SA/RA side
75 13 01	1,280 x 640 x 210	SA/RA side
75 22 01	1,280 x 640 x 210	SA/RA side
75 32 01	1,280 x 640 x 210	SA/RA side
75 42 01	1,600 x 640 x 210	SA/RA side
75 52 01	1,600 x 640 x 210	SA/RA side

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.

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 Door fitting assembly increase unit width by 25 mm each operating side
2 incl. 120 mm base frame

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Technical specifications and performance

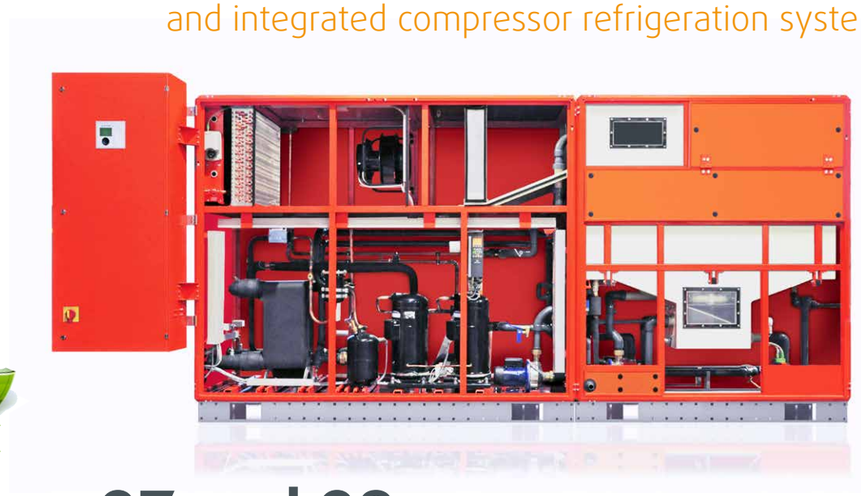
Unit Type		75 02 01	75 04 01	75 06 01	75 08 01	75 13 01	75 22 01	75 32 01	75 42 01	75 52 01
Total cooling capacity [1]	kW	11.7	22.1	31.1	37.8	54.1	103.5	156.1	201.9	246.5
Air volume flow process air	m^3/h	2,200	4,500	6,300	7,900	11,000	22,000	32,000	42,000	50,000
Air volume flow OA-EA	m^3/h	1,300	2,700	3,800	4,700	6,600	13,200	19,200	25,200	30,000
Energy Efficiency Ratio [2]	EER	5.5	7.5	7.5	8.3	8.2	9.3	9.0	9.1	9.2
Total electrical power rating[3]	kW	3.2	5.1	7.3	8.3	11.7	21.3	31.3	40.3	49.2
Max. current consumption [3]	A	8.9	13.7	21.7	29.3	33.3	62.0	81.3	116.7	127.7
Operating voltage		3 / N / PE 400 V 50 Hz								
Ext. pressure loss										
Process air (Return air and supply air duct)	Pa	250	250	250	250	250	250	250	250	250
Outside air and exhaust air duct	Pa	250	250	250	250	250	250	250	250	250
Sound power level [4]										
Supply air vent	dB(A)	60	64	71	68	69	72	73	74	78
RA connection	dB(A)	61	67	72	72	70	73	75	76	80
Outside air vent	dB(A)	70	66	68	75	68	71	73	73	75
EA connection	dB(A)	74	65	68	74	69	72	71	72	73
Acoustic pressure in 1 m distance from unit [4]	dB(A)	58	52	57	59	56	59	59	60	63
Fan units										
Rated motor input for process air [5]	kW	0.56	1.28	1.94	2.21	3.02	6.06	8.40	10.80	13.92
Rated motor input for outside air [5]	kW	0.48	0.88	1.22	1.59	2.05	4.10	5.58	7.20	8.64
SFP category supply air/outside air		3 | 3	3 | 3	3 | 3	3 | 3	3 | 3	3 | 3	3 | 3	3 | 3	3 | 3
Evaporative cooling[6]										
Cooling capacity of adiabatic evaporative cooling system	kW	4.8	9.9	14.0	17.4	24.2	48.4	70.3	92.2	110.5
Rated pump input for evaporative cooling	kW	0.64	0.64	0.64	0.64	0.79	0.79	1.58	1.58	1.58
Compressor refrigeration system										
Filling volume for refrigerant type R407C	kg	5.0	7.0	9.0	11.0	17.0	34.0	46.0	70.0	78.0
Rated compressor input	kW	1.5	2.3	3.5	3.9	5.8	10.3	15.7	20.7	25.1
Mechanical cooling capacity	kW	6.9	12.2	17.1	20.4	29.9	55.1	85.8	109.7	136.0
Number of cooling circuits		1	1	1	1	1	1	2	2	2
Number of compressors		1	1	1	1	1	2	2	2	4
Compressor power modulation		single stage	output-controlled scroll compressor 10 - 100%							
Filtration according to ISO 16890										
Outside air		ISO ePM10 60% (M5)								
Return Air		ISO ePM10 60% (M5)								
Connections										
Clean water connection [7]	DN	15	15	15	15	15	15	15	15	15
Slurry drain	DN	50	50	50	50	50	50	50	50	50
Floor drain	DN	40	40	40	40	40	40	40	40	40

Specifications of technical data relate to the return air conditions 34° C / 20% r.h., outside air conditions 35° C / 40% r.h., at standard density (1.204 kg/m^3), unless otherwise specified

1 Evaporative cooling + compressor refrigeration system; SA = 20° C
2 Taking into account power consumption for adiabatic pump(s)
3 dependent on configuration of measurement and control system/unit
4 At 250 Hz mid-band frequency and standard unit housing
5 with average filter contamination
6 water quality of make-up water corresponds to VDI 3803 table B3 with a bacteria count < 100 CFU/ml, water hardness range "soft".
7 2 bar system pressure required at 25 l/min flow rate

Please seek approval of technical data and specifications prior to start of the planning process.

Compact chilled water unit for indoor installation with free cooling, adiabatic evaporative cooling and integrated compressor refrigeration system



Hybritemp 98 93 01 - simplified illustration

Automatically selects the most economical operating mode!

Hybritemp 97 and 98

TOTAL COOLING CAPACITY: 33 kW – 455 kW

At a glance:

- **Efficient cooling through the use of natural resources**
- **Very high performance with high EER and ESEER values at the same time**
- **Reliable cooling, even when outside temperatures are very high**
- **Compressor refrigeration system and free cooler optimally adapted to the respective application**
- **Compact design thanks to integrated recooling system, removing the need for cooling system components on the facade or on the roof**
- **Low air volumes required for heat dissipation**
- **Integrated control and regulation system, compatible with all conventional building management systems**

Cooling systems using chilled water can be found in a wide range of areas: For discharging excess heat from rooms with high thermal loads, for cooling industrial manufacturing processes or for comfort air conditioning of buildings. The units of the Hybritemp 97 and 98 series are optimally adapted to these requirements. The "all-in-one" unit offers efficient cooling in a very compact way. It is generally not necessary for cooling system components to be installed at or on the exterior of the building – and this drastically reduces the overall investment costs. Hybritemp has been developed in two design variants: The COP-optimised 97 series is characterised by its very high efficiency, while the development of the 98 series focussed on achieving maximum performance with minimum space requirements. The combination of first-class components with precise control and regulation systems guarantees economical operation at all times.

Further performance parameters and options:

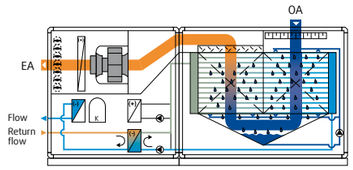
- High corrosion prevention through the use of zinc sacrificial anodes, EPD-coated parts and components made from plastic
- Use of electronic expansion valves
- Energy-saving EC fans
- Filtering the air in any operating mode
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for chilled water generation, including all control and regulation fittings
- Intensive quality inspection with factory test run

Options
- Conductivity-controlled elutriation control when using softened water
- Hot water extraction, to use waste heat for heating purposes
- Remote maintenance
- and many more

Functional description

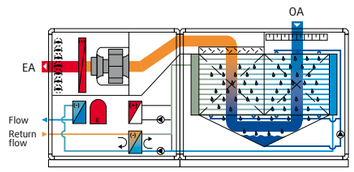
Free and evaporative cooling

At respective low outside air temperatures and humidity, the heat in the process water is dissipated to the outside air. In order to reduce the outside air temperature further and to increase the cooling capacity, evaporative cooling is activated. In an intermediate heat exchanger, the process water is cooled down to the required flow temperature. The cooling capacity is controlled continuously by varying the air volume flow rate.



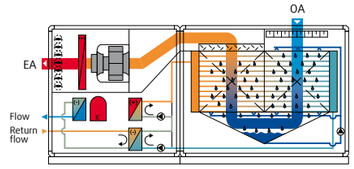
Part-load operation with free and evaporative cooling: Compressor refrigeration system condenses in the exhaust air

When outside air temperature and humidity are rising, the amount of heat that can be dissipated by evaporative cooling will reduce. If the process water in the intermediate heat exchanger can no longer be cooled down to the required flow temperature, after-cooling takes place in the evaporator of the integrated compressor refrigeration system. The heat of condensation from the multi-stage compressor refrigeration system in part-load operation is passed onto the exhaust air.



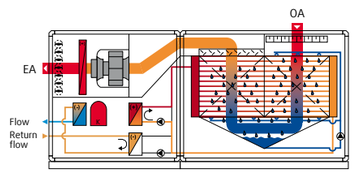
Free and evaporative cooling in operation under load: Compressor refrigeration system condenses in the exhaust air and secondary circuit

When an increasing part of the total cooling performance is carried out by the compressor refrigeration system, the condensation heat can no longer be passed solely onto the exhaust air. A proportion of the water is directed from the secondary circuit downstream of the intermediate heat exchanger to the water-cooled condenser of the compressor refrigeration system in order to discharge the residual heat of condensation. The controller regulates the condensation pressure in order to operate the chilled water with an optimum EER.



Operation under full load: Cooling by the compressor refrigeration system

If the water temperature in the secondary circuit is higher than the process water temperature, the total cooling capacity required comes from the compressor refrigeration system. Due to the two-stage condensation heat output in the air condenser (desuperheater) to the exhaust air and in the water condenser to the secondary circuit, only a very low air volume is required. Thanks to the upstream evaporative cooling system, low condensation pressures are achieved, which in return lead to a high EER in the compressor refrigeration system.



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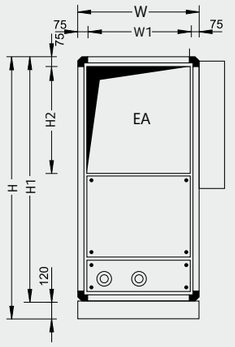
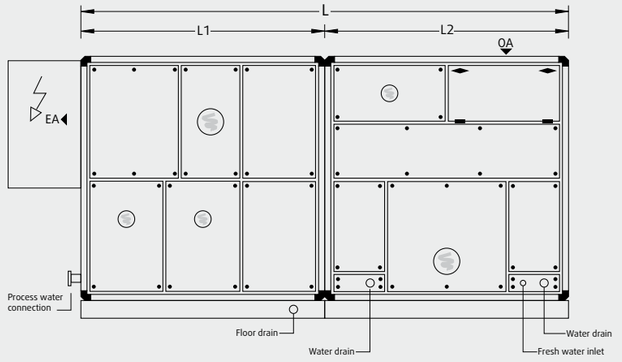
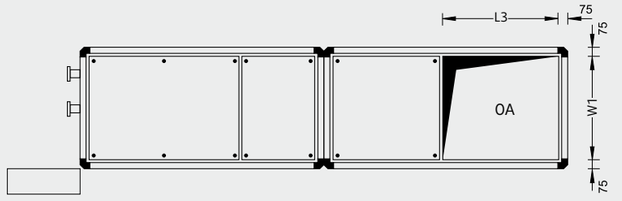
Hybritemp Type 97 and Type 98

System dimensions and weights







Caution! Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

	Unit Type	L	W[1]	H[2]	L1	L2	L3	W1	H1	H2	Weight	Operating weight
Type 97 efficiency-optimised	97 04 01	3,700	890	1,650	2,010	1,690	900	740	1,530	580	1,300	1,470
	97 05 01	3,700	1,050	1,650	2,010	1,690	900	900	1,530	580	1,500	2,070
	97 06 01	4,340	730	2,310	2,010	2,330	1,220	580	2,190	900	1,800	2,490
	97 10 01	4,500	1,050	2,130	2,170	2,330	1,220	900	2,010	900	2,200	3,250
	97 13 01	4,660	1,370	2,130	2,330	2,330	1,220	1,220	2,010	900	3,000	4,390
	97 16 01	4,820	1,690	2,130	2,490	2,330	1,220	1,540	2,010	900	3,500	5,240
	97 19 01	4,820	2,010	2,130	2,490	2,330	1,220	1,860	2,010	900	4,000	6,110
Type 98 performance-optimised	98 04 01	3,700	890	1,970	2,010	1,690	900	740	1,850	580	1,600	2,070
	98 05 01	3,700	1,050	1,970	2,010	1,690	900	900	1,850	580	1,700	2,270
	98 06 01	4,980	730	2,450	2,650	2,330	1,220	580	2,330	900	2,100	2,800
	98 10 01	4,980	1,050	2,450	2,650	2,330	1,220	900	2,330	900	2,550	3,220
	98 13 01	4,660	1,370	2,450	2,330	2,330	1,220	1,220	2,330	900	3,400	4,830
	98 16 01	4,820	1,690	2,450	2,490	2,330	1,220	1,540	2,330	900	3,900	5,700
	98 19 01	4,820	2,010	2,450	2,490	2,330	1,220	1,860	2,330	900	5,000	7,170

Largest transport unit *

Unit Type	L	W	H[2]	Weight
97 04 01	2,010	890	1,650	770
97 05 01	2,010	1,050	1,650	930
97 06 01	2,330	730	2,310	730
97 10 01	2,330	1,050	2,130	910
97 13 01	2,330	1,370	2,130	1,830
97 16 01	2,490	1,690	2,130	2,140
97 19 01	2,490	2,010	2,130	2,490
98 04 01	2,010	890	1,970	1,030
98 05 01	2,010	1,050	1,970	1,100
98 06 01	2,650	730	2,450	1,300
98 10 01	2,650	1,050	2,450	1,590
98 13 01	2,330	1,370	2,450	2,160
98 16 01	2,490	1,690	2,450	2,500
98 19 01	2,490	2,010	2,450	3,420

Controls cabinet

Unit Type	H x W x D	Position/design
97 04 01	1,600 x 640 x 250	EA side
97 05 01	1,600 x 640 x 250	EA side
97 06 01	1,600 x 640 x 250	EA side
97 10 01	1,600 x 640 x 250	EA side
97 13 01	1,800 x 1,000 x 400	Floor standing cabinet
97 16 01	1,800 x 1,000 x 400	Floor standing cabinet
97 19 01	1,800 x 1,200 x 400	Floor standing cabinet
98 04 01	1,600 x 640 x 250	EA side
98 05 01	1,600 x 640 x 250	EA side
98 06 01	1,800 x 1,000 x 400	Floor standing cabinet
98 10 01	1,800 x 1,000 x 400	Floor standing cabinet
98 13 01	1,800 x 1,000 x 400	Floor standing cabinet
98 16 01	1,800 x 1,200 x 400	Floor standing cabinet
98 19 01	1,800 x 1,200 x 400	Floor standing cabinet

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. For service work a clearance at the rear of at least 1.500 mm is required.

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 Door fitting assembly increase unit width by 25 mm each operating side
2 incl. 120 mm base frame
* Further partitioning for smaller apertures possible (at extra cost).

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Hybritemp Type 97
efficiency-optimised

Technical specifications and performance

Unit Type		97 04 01	97 05 01	97 06 01	97 10 01	97 13 01	97 16 01	97 19 01
Cooling capacity [1, 5]	kW	33 - 48	45 - 64	56 - 81	74 - 106	118 - 168	148 - 217	172 - 247
Refrigeration capacity [2]	ESEER	5.5	5.5	5.5	5.4	5.5	5.5	5.2
Nominal water volume flow rate for process water	m^3/h	5.0	7.0	8.0	11.0	17.0	21.0	25.0
Air volume flow OA-EA	m^3/h	4,400	5,300	6,300	9,500	13,000	16,000	19,000
Rated fan motor input for exhaust air [3]	kW	2.0	2.3	3.3	4.6	6.4	7.6	8.8
Rated pump input	kW	1.3	1.3	1.3	1.3	1.4	1.4	1.6
Filling volume for refrigerant type R407C	kg	10	12	17	22	18	20	23
Number of performance stages		2	2	3	3	4	4	4
Number of cooling circuits		1	1	2	2	2	2	2
Max. current consumption	A	37.6	43.4	61.9	70.8	104.1	150.1	165.0
Operating voltage		3 / N / PE 400 V 50 Hz						
Ext. pressure loss								
Outside air and exhaust air duct	Pa	300	300	300	300	300	300	300
Sound power level [4]								
Outside air vent	dB(A)	66	64	71	67	73	75	71
EA connection	dB(A)	76	74	77	76	79	80	79
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	58	56	59	58	61	62	61
6° C process water flow								
Total cooling capacity [5]	kW	33.3	45.1	55.7	73.6	117.5	148.3	171.7
Energy Efficiency Ratio	EER	5.0	4.8	4.7	4.9	4.8	4.7	4.5
Rated compressor input	kW	6.7	9.3	11.7	15.1	24.5	31.8	37.9
Alternative process water temperatures								
12° C process water flow								
Total cooling capacity [5]	kW	39.5	53.3	66.5	87.3	139.1	177.5	203.5
Energy Efficiency Ratio	EER	5.6	5.5	5.4	5.5	5.4	5.3	5.1
Rated compressor input	kW	7.0	9.6	12.3	15.8	25.6	33.3	39.8
18° C process water flow								
Total cooling capacity [5]	kW	47.8	64.4	81.4	106.0	168.4	217.2	246.6
Energy Efficiency Ratio	EER	6.5	6.4	6.2	6.3	6.2	6.1	5.8
Rated compressor input	kW	7.4	10.0	13.3	16.9	27.2	35.4	42.6
Connections								
Clean water connection [6, 7]	DN	15	15	20	20	20	20	20
Slurry drain	DN	50	50	80	80	80	80	80
Water drain	DN	25	25	25	32	32	40	40
Floor drains	DN	40	40	40	40	40	40	40
Process water flange	DN	50	50	50	65	80	80	80
Pressure loss process water	kPa	80	80	80	80	80	80	80

Technical data specified refer to nominal volume flow rate at 6° C flow temperature and outside air conditions 32° C 40% r.h., unless otherwise specified

Please seek approval of technical data and specifications prior to start of the planning process.

1 dependent on flow/return temperature and water flow rate
2 at flow = 6° C
3 with average filter contamination
4 at 250 Hz mid-band frequency
5 at OA = 32° C; 40% r.h.
6 2 bar system pressure required at 25 l/min flow rate
7 water quality of make-up water corresponds to VDI 3803 table B2 with a bacteria count < 100 CFU/ml, water hardness range "soft".

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Hybritemp Type 98
performance-optimised

Technical specifications and performance

Unit Type		98 04 01	98 0501	98 06 01	98 10 01	98 13 01	98 16 01	98 19 01
Cooling capacity [1, 5]	kW	65 - 93	79 - 112	102 - 145	133 - 189	196 - 278	244 - 350	319 - 455
Refrigeration capacity [2]	ESEER	4.7	4.7	4.7	5.0	4.9	5.1	4.9
Nominal water volume flow rate for process water	m^3/h	10.0	12.0	15.0	20.0	29.0	36.0	45.0
Air volume flow OA-EA	m^3/h	4,400	5,300	6,300	9,500	13,000	16,000	19,000
Rated fan motor input for exhaust air [3]	kW	2.0	2.3	3.5	4.8	6.6	7.8	9.2
Rated pump input	kW	1.3	1.3	1.3	1.3	2.2	1.4	1.6
Filling volume for refrigerant type R407C	kg	9	16	25	45	55	60	85
Number of performance stages		2	2	2	2	3	3	4
Number of cooling circuits		1						
Max. current consumption	A	58.6	79.6	97.8	121.0	183.7	213.6	279.0
Operating voltage		3 / N / PE 400 V 50 Hz						
Ext. pressure losses								
Outside air and exhaust air duct	Pa	300	300	300	300	300	300	300
Sound power level [4]								
Outside air vent	dB(A)	66	64	71	68	73	76	72
EA connection	dB(A)	76	74	78	77	80	81	79
Acoustic pressure at a distance of 1 m from the unit [4]	dB(A)	58	56	60	59	62	63	61
6° C process water flow								
Total cooling capacity [5]	kW	65.0	78.8	102.4	132.9	195.8	244.4	318.5
Energy Efficiency Ratio	EER	3.5	3.6	3.4	3.8	3.6	3.8	3.6
Rated compressor input	kW	18.6	21.9	29.7	35.0	53.9	64.4	88.9
Alternative process water temperatures								
12° C process water flow								
Total cooling capacity [5]	kW	76.8	93.0	120.4	156.9	231.0	289.3	376.5
Energy Efficiency Ratio	EER	3.9	4.0	3.8	4.2	4.0	4.2	4.0
Rated compressor input	kW	19.5	23.1	31.6	37.1	57.1	68.3	94.3
18° C process water flow								
Total cooling capacity [5]	kW	92.7	111.9	144.7	189.3	278.4	350.4	455.4
Energy Efficiency Ratio	EER	4.5	4.5	4.3	4.8	4.5	4.8	4.5
Rated compressor input	kW	20.6	24.7	34.0	39.8	61.4	73.5	101.6
Connections								
Clean water connection [6, 7]	DN	15	15	15	15	15	20	20
Slurry drain	DN	50	50	80	80	80	80	80
Water drain	DN	25	25	25	32	32	40	40
Floor drains	DN	40	40	40	40	40	40	40
Process water flange	DN	50	50	50	65	80	80	100
Pressure loss process water	kPa	80	80	80	80	80	80	80

Technical data specified refer to nominal volume flow rate at 6° C flow temperature and outside air conditions 32° C 40% r.h., unless otherwise specified

Please seek approval of technical data and specifications prior to start of the planning process.

1 dependent on flow/return temperature and water flow rate
2 at flow = 6° C
3 with average filter contamination
4 at 250 Hz mid-band frequency
5 at OA = 32° C; 40% r.h.
6 2 bar system pressure required at 25 l/min flow rate
7 water quality of make-up water corresponds to VDI 3803 table B2 with a bacteria count < 100 CFU/ml, water hardness range "soft".

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Mini glossary

Heat recovery efficiency
According to VDI 2071, this is defined as the ratio of the temperature difference between the supply air and the outside air to the temperature difference between the return air and the outside air in a ventilation system with heat recovery. This key figure describes the proportion of the theoretically useable energy from the return air that is transferred to the supply air. Sensitive and latent heat are taken into consideration. Described in %. Heat recovery rates of over 100 % are theoretically possible.

Temperature efficiency = heat recovery efficiency = heat provision level
Ratio of the transferred temperature in the heat recovery system to the difference of temperature of the inlet media. This key figure describes how much energy can be recovered from the return air and transferred to the outside air to heat the supply air. Caution: waste heat from the fans is taken into consideration! The energy content of humid air (latent heat) is not taken into consideration. On the basis of EN 308, the values must be specified under dry conditions. The heat recovery efficiency is indicated using Φ, and lies between 0 and 1. If balanced volume flows and low internal leakage are assumed, the temperature efficiency fundamentally corresponds to the heat provision level.

Efficiency
Specification of the heat recovery efficiency as a percentage. In a counterflow plate heat exchanger, for example, the heat recovery efficiency related to the outside air is Φ = 0.8. The efficiency is thus 80 %.

Moisture recovery efficiency
Is calculated in a similar manner to the heat recovery efficiency, for the recovery of atmospheric moisture. The moisture recovery efficiency is specified using Ψ, and the absolute moisture content is specified in g/kg using X.

Energy efficiency under DIN EN 13053
Taking into consideration the dry temperature efficiency under EN 308 and the electrical energy requirements for overcoming the pressure loss in the heat recovery system in both paths.

SFP classes
The specific fan power defines the ratio of electrical fan power consumed to the air volume flow rate moved. The smaller the SFP value, the less electrical energy is required to move one cubic metre of air.

Air velocity class V according to DIN EN 13053:2012
Measured penetration velocity (m/s) in the clear opening of the housing cross-section related to the filter unit, or to the fan unit if no filter is present. The greater the value (and correspondingly the V class in the classification, V1 - V9), the higher the velocity.
Classification, see below.

Power input Fan-motor unit P according to DIN EN 13053:2012
Reference values in classes P1 - P7, determined by the air volume flow rate and the static pressure increase of a free-running fan. The power measurement also includes losses from the frequency converter and the fan motor. The lower the class, the higher the efficiency of the fan-motor unit.
Classification, see below.

Energy efficiency H1 according to DIN EN 13053:2012
The energy efficiency is calculated from the temperature transfer rate and the electrical consumption generated by the pressure loss of the air volume flow rate and the motor power for the fans and pump. Classification of values in classes H1 - H6: the lower the class, the higher the efficiency.
Classification, see below.

VDI 2089
Basic planning standard for heating, dehumidification, indoor air-conditioning, sanitary, and electrical systems in indoor swimming pool buildings open to the public. Applies both to new constructions and to the modernisation of existing facilities.

VDI 6022
Basic planning standard for hygiene in ventilation and air conditioning systems and equipment, with the objective of at least having no negative effect on indoor air. Definition of requirements for the planning, installation and operation of HVAC systems, HVAC units, and their components.

VDI 3803 Sheet 3
Directive for air humidification in the supply, return and exhaust air sections of central HVAC systems. It gives an overview of various humidifier systems, and of criteria to take into consideration when selecting. Definition of requirements for the planning, installation, operation and maintenance of air humidifier systems.

Air velocity class V	
Class	Velocity (m/s)
V1	≤ 1.6
V2	> 1.6 - 1.8
V3	> 1.8 - 2.0
V4	> 2.0 - 2.2
V5	> 2.2 - 2.5
V6	> 2.5 - 2.8
V7	> 2.8 - 3.2
V8	> 3.2 - 3.6
V9	> 3.6

Efficiency parameter P	
Class	Energy efficiency η_E 1-1 [%]
P1	≤ $P_{m\,ref}$ * 0.85
P2	≤ $P_{m\,ref}$ * 0.90
P3	≤ $P_{m\,ref}$ * 0.95
P4	≤ $P_{m\,ref}$ * 1.00
P5	≤ $P_{m\,ref}$ * 1.06
P6	≤ $P_{m\,ref}$ * 1.12
P7	> $P_{m\,ref}$ * 1.12

$P_{m\,ref} = (\Delta P_{stat}/450)^{0.925} * (qv + 0.08)^{0.95}$
$P_{m\,ref}$ [kW] electrical power consumption
ΔP_{stat} [Pa] static pressure increase at fan
qv [m³/s] air volume flow rate

Efficiency parameter H	
Class	Energy efficiency η_E 1-1 [%]
H1	≥ 71
H2	≥ 64
H3	≥ 55
H4	≥ 45
H5	≥ 36
H6	no requirement

The values apply for balanced mass flow rates.

$\eta_E = \eta_t * (1-1 / \varepsilon)$
η_E [%] Energy efficiency
η_t [%] temperature transfer rate (dry)
ε [-] performance rating

Unit equipment and functions

The functions and unit types shown here are only examples of possible designs. Within the Menerga Air Group, we can build any combination you desire.

	Heat exchanger		Equipment and functions									
	Regenerative	Recuperative	Adiabatic	Adsorption process	Turbo compressor	Compressor refrigeration system	Dehumidification	Heat pump	Heating	Cooling	Free cooling	Control + regulation
ThermoCond 19		●					●		●		●	●
ThermoCond 23		●					●		●		●	●
ThermoCond 29		●					●	●	●		●	●
ThermoCond 38		●					●		●		●	●
ThermoCond 39		●					●	●	●		●	●
Trisolair 52		●							●	●	●	●
Trisolair 59		●				●	●		●	●	●	●
Adsolair 56		●	●						●	●	●	●
Adsolair 58		●	●			●	●		●	●	●	●
Resolair 62	●								●	●	●	●
Resolair 64	●					●	●		●	●	●	●
Resolair 66	●								●	●	●	●
Resolair 68	●					●	●		●	●	●	●
Resolair 65	●								●	●	●	●
Adconair 76		●	●	●	●	●	●		●	●	●	●
Drysolair 11		●					●	●	●			●
Frecolair 14		●				●			●	●	●	●
Adcoolair 75		●	●			●				●	●	●
Hybritemp 97/98		●	●			●				●	●	●

Unit options

The following overview shows a selection of possible unit options for systems in the swimming pool hall and comfort air conditioning ranges. Further options for other system types and special requests are possible at any time. Please contact your sales office with any questions.

Included as standard	●
Optional	○
Optional at extra cost	□
Deselectable	■

	Swimming pool hall air conditioning					Comfort air conditioning								
Unit series	**19**	**23**	**29**	**38**	**39**	**52**	**56**	**58**	**59**	**62**	**64**	**66**	**68**	**76**
Unit housing														
Unit cover 50 mm / MB 50	□	□	□	●	●	□	●	●	□	□	●	□	●	●
Operating side, supply air, left or right	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Panel colour in RAL 7035 (light grey)	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Insulating material mineral wool or PUR foam for housing cover	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Housing cover with reinforced inside sheet panel	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Height-adjustable corner foot	□	□	□			□			□	□		□		
Unit base	□	□	□	●	●	□	●	●	□	□	●	□	●	●
Unit delivery in additional partial units [1]		□		□	□	□	□	□	□		□	□	□	□
Delivery of the heat recovery system separately on a pallet for customer installation onsite					□					□	□	□	□	
Recuperator section can be separated horizontally				□	□									□
Vertical separation	□	□	□	●	●	□	●	●	□	□	●	□	●	●
Additional inspection windows							□	□			□		□	
Switch cabinet														
Switch cabinet on the unit	●	●	●	●	●	●	●	●		●	●		●	●
Control panel for wall mounting	□	□	□	□	□	□	□	□	●	□	□	●	□	□
Connection flange														
Flexible duct connections	●	●	●	□	□	□	□	□	□	□	□	□	□	□
Air filter														
Filter categories and sizes optional	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Fan system														
Adaptation of the external pressing	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Handle protection in front of impeller and jet nozzle of the fans	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Air damper system														
Recirculated air damper	●	●	●	●	●	□	□	□	□	□	□	□	□	□
Outside air bypass damper in the unit	□	●	□	●		●	●	●	●					●
Exhaust air bypass damper in the unit				□	□		□	□						●
Recirculated air dehumidification sector					□									
Servomotor with emergency return and position feedback system	□	□	□	□	□	□	□	□	□					□
Motor-actuated outside air/exhaust air dampers instead of dynamic dampers											□		●	
Supply air/return air - air flow path exchanged and motor-actuated outside air/exhaust air dampers											□			
Heat sector														
LPHW	●	●	●	●	●	●	●	●	●	□	□	□	□	●
Adaptation of LPHW capacity	□	■	□	■	□	□	□	□	□	□	□	□	□	□
LPHW pump controls for electronic pump	●	●	●	●	●	●	●	●	●	□	□	□	□	●
LPHW pump controls with contactor and bi-relay	□	□	□	□	□	□	□	□	□	□	□	□	□	□
LPHW valve supplied loose for installation by the customer	●	●	●	□	□	□	□	□	□	□	□	□	□	□

1 all modules can be packed in separate transport units

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Unit options

	Swimming pool hall air conditioning					Comfort air conditioning								
Unit series	**19**	**23**	**29**	**38**	**39**	**52**	**54**	**56**	**58**	**59**	**62**	**64**	**66**	**68**	**76**
Cooling sector															
PCW				□	□	□	□	□	□		□	□		□	□
Adaptation of PCW capacity				□	□	□	□	□	□		□	□		□	□
PCW pump controls for electronic pump				□	□	□	□	□	□		□	□		□	□
PCW pump controls with contactor and bi-relay				□	□	□	□	□	□		□	□		□	□
PCW valve supplied loose for installation by the customer				□	□	□	□	□	□		□	□		□	□
Refrigeration system															
Refrigeration system selectable/deselectable					■										□
Cooling capacity control					●				●	●			●	●	
Adaptation of the refrigeration capacity									□						
Refrigerant sub-cooler/fresh water heater				□	●				□						
Heat extraction to LPHW with separate WWC changeover valve									□	□			□	□	
Reversible compressor refrigeration system									□	□			□	□	
Building heat pump switch for LPHW [2]			□												
Adiabatic evaporative cooling								●	●						□
Adiabatic^{zeroGWP}, AdiabaticDX^{carbonfree} (electrically or thermally driven)															□
Installation of zinc sacrificial anode								□	□						
Flushing device for plate heat exchanger								□	□						
Control system															
vicomo	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Analogue modem for DDC	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Remote control panel	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Supply air temperature constant control programmed and available						●	●	●	●	●	●	●	●	●	●
Supply air duct thermometer sensor supplied separate						□	□	□	□	□	□	□	□	□	□
LPHW return flow temperature limitation programmed and available				●	●	●	●	●	●	●	●	●	●	●	●
Contact sensor supplied separately				□	□	□	□	□	□	□	□	□	□	□	□
Supply air pressure control programmed and available						●	●	●	●	●	●	●	●	●	●
Supply air differential pressure socket (C-Bus) supplied separately						□	□	□	□	□	□	□	□	□	□
Return air pressure control programmed and available						●	●	●	●	●	●	●	●	●	●
Return air differential pressure socket (C-Bus) supplied separately						□	□	□	□	□	□	□	□	□	□
Water-guided temperature control programmed and available	●	●	●	●	●										
Immersion sensor L = 55 o. L = 100 (C-Bus) supplied loose	□	□	□	□	□										
Humidity shift in suspend mode	●	●	●	●	●										
Swimming break switch with separate return air combi-sensor IP54, supplied separately	□	□	□	□	□										
ModBus RTU interface for data transmission to BMS	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
BACnet interface for data transmission to BMS	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Interface for Ospa Blue Control	□	□	□	□	□										
Unlocking of WEB server via ethernet in DDC	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Recirculating air control system	●	●	●	●	●	□	□	□	□	□	□	□	□	□	□
CO_2-dependent recirculated air/outside air control system and/or flow rate control						□	□	□	□	□	□	□	□	□	□
Heat extraction to pool water															
Pool water condenser			□		□										
Pool water condenser pump controls			□		□										
Pool water pump			□		□										
Pool water temperature control programmed and available			●		●										
Immersion sensor L = 55 o. L = 100 (C-Bus) supplied loose			□		□										
Plastic cone flow meter supplied loose for installation by the customer			□		□										

2 not in combination with pool water condenser

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REFERENCE PROJECTS

RESEARCH // SPECIALS

© ESO/José Francisco Salgado (josefrancisco.org)

Unit type: **customer specific**

ALMA RESEARCH PROJECT, CHILE

60 telescopes in the Atacama desert that collect data on the origins of the universe.

© polarfoundation.org

Unit type: **Resolair**

PRINCESS ELISABETH STATION

Belgian zero-emission research station with passive house design. Location: Antarctica.

© ZEH

Unit type: **Adsolair**

ZERO ENERGY HOUSE, SEOUL

Flagship project on the subject of energy efficiency, regenerative energy storage media and sustainability.

MUSEUMS // GALLERIES

Unit type: **Resolair**

GERMAN MUSEUM SCHLEISSHEIM

The airfield displays an important aerospace collection on historic premises.

Unit type: **Adsolair**

URBIS, MANCHESTER

The glass building exhibits a journey of discovery through various world metropolises.

Unit type: **Adsolair**

TRAUTMANNSDORF PALACE, MERAN

Formerly the holiday residence of Empress Elisabeth of Austria, the palace now houses the South Tirolean State Museum for Tourism.

LOW-ENERGY BUILDINGS

Unit type: **Adsolair**

IBEROSTAR, PALMA DE MALLORCA

Modern headquarters with A-grade energy certification.

Unit type: **Resolair**

MENERGA SLOVENIA

Office building of Menerga Slovenia, winner of the Green Building Award 2008.

Unit type: **Resolair**

ETRIUM, COLOGNE

Passive house office building with DGNB quality seal in gold.

Creating a good climate.

REFERENCE PROJECTS

THEATRES // CULTURAL VENUES

Unit type: **Adsolair**

GERMAN OPERA, DUESSELDORF

A charming jewel of the 50s at the edge of the old town.

Unit type: **Resolair**

TUSCHINSKI THEATER, AMSTERDAM

Since 1921, the high floral carpets of the luxurious film theatre have enticed visitors into a colourful fairytale world.

Unit type: **customer specific**

STUTTGART STATE THEATRE

The air conditioning for the choir practice hall required an absolutely "silent" variant.

HISTORICAL BUILDINGS

Unit type: **Resolair, Hybritemp**

HERZOGIN ANNA AMALIA LIBRARY

World-famous building with a stock of over 110,000 books.

Unit type: **Adsolair**

SCHLOSS BAD BERLEBURG

Residence of the princely Sayn-Wittgenstein-Berleburg family.

Unit type: **ThermoCond**

HILTON SA TORRE, MALLORCA

5-star luxury hotel from the 14th century.

SPORTING VENUES // MULTI-FUNCTIONAL HALLS

Unit type: **Resolair**

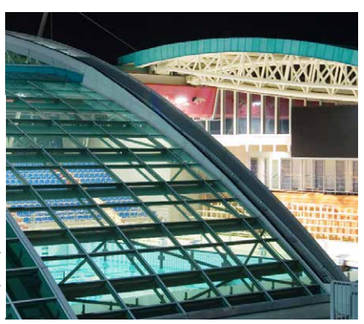
GROSS-OSTHEIM SPORTS HALL

Winner of the IOC/IAKS AWARD 2003 in silver.

Unit type: **Adsolair, Hybritemp**

OSIJEK MULTI-FUNCTIONAL HALL

One of the venues for the 2009 Handball World Championships, the largest athletics hall in Croatia.



© City of Rijeka

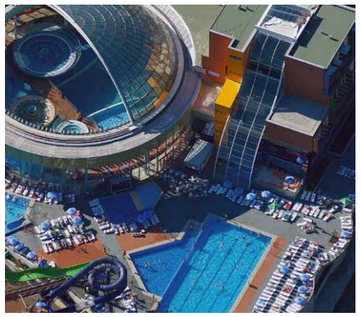
Unit type: **ThermoCond, AquaCond**

KANTRIDA RIJEKA, CROATIA

Olympic swimming stadium with a completely opening roof structure.

REFERENCE PROJECTS

PUBLIC SWIMMING POOL HALLS



Unit Type: **customer specific, ThermoCond, AquaCond, Adsolair, Resolair**

THERME LASKO, SLOVENIA

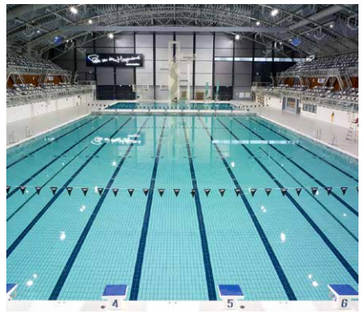
Wellness park with 2,200 m² water area.

© Bädergesellschaft Lünen mbH

Unit type: **ThermoCond**

LIPPE POOL IN LÜNEN

First public passive house swimming pool hall in Europe.



Unit type: **ThermoCond, Resolair**

NATIONAL ZWEMCENTRUM DE TONGELREEP, NETHERLANDS

The largest swimming centre in Europe serves amongst other things for hosting national competitions.

PRIVATE // HOTEL POOLS

© T. Philippi

Unit type: **ThermoCond**

PRIVATE SWIMMING POOL

Glorious wellness accommodation in a luxurious atmosphere.

© T. Philippi

Unit type: **ThermoCond**

PRIVATE SWIMMING POOL

The private swimming pool seems to float over the roofs of the city.

Unit type: **ThermoCond**

5-STAR VILLA AM RUHRUFER HOTEL

Spa area of one of the smallest and most exclusive 5-star hotels in North Rhine-Westphalia, Germany.

HOTELS // RESTAURANTS

Unit type: **Adsolair**

PIZ SETEUR, SELVA DI VAL GARDENA, IT

The restaurant in the heart of the Dolomites on 2,064 meters altitude intvites the guests to stay.

Unit type: **Trisolair, ThermoCond**

HOTEL DOLLENBERG

5-star superior hotel at 650 metres elevation, at Dollenberg in the Black Forest.

Unit type: **customer specific, Trisolair, ThermoCond**

WEISSENHÄUSER BEACH

Holiday and leisure park with adventure playground on the Baltic Sea.

Creating a good climate.

REFERENCE PROJECTS

SCHOOLS // UNIVERSITIES

Unit type: **Resolair**

ANGELASCHULE OSNABRÜCK

Historical school complex with listed facade.

© Schindelbeck

Unit type: **Resolair**

NECKARGMÜND SCHOOL CENTRE

The largest passive school building in Germany has 206 rooms, offering space for 1,250 high school students.

Unit type: **Adsolair, Resolair, Trisolair, Hybritemp**

PASSAU UNIVERSITY

Over 100 Menerga systems create good climate at the youngest University in Bavaria.

CLINICS // LABORATORIES

© Hamburg-Eppendorf University Hospital

Unit type: **Adsolair**

HAMBURG-EPPENDORF HOSPITAL Good climate in lecture theatre, seminar and work rooms.

© Freiburg University Hospital

Unit type: **customer specific**

FREIBURG UNIVERSITY HOSPITAL

Sorption-based air conditioning of the outpatient and emergency room areas.

Unit type: **customer specific, Adsolair**

TLLV BAD LANGENSALZA

Thuringian State Office for Food Safety and Consumer Protection.

MALLS // SHOPPING CENTRES

Unit type: **Adsolair, Resolair**

MERCATOR PESNICA, SLOVENIA

Shopping centre 5,000m² in size, winner of the Green Building Award 2011.

Unit type: **Resolair**

AUDI TERMINAL IN LUDWIGSBURG

Generously dimensioned vehicle centre of Hahn Automobile.

© Unger-Steel-Group

Unit type: **customer specific**

TOYOTA FREY, SALZBURG

The "greenest" car dealer in the world was recently classified as "excellent" under BREEAM.

REFERENCE PROJECTS

OFFICE BUILDING // ADMINISTRATION

INDUSTRY // PRODUCTION FACILITIES

DATA CENTRES // SERVER ROOMS

© Otto Group

Unit type: **Adsolair, Resolair**

OTTO GROUP, HAMBURG

This trading and services group is one of the largest online trader in the world.

Unit type: **Adsolair**

MAPAL, AALEN

Headquarters of the manufacturer for precision tools.

Unit type: **Adcoolair**

BANCO SANTANDER, SPAIN

Data processing centre with 16 MW total cooling capacity.

Unit type: **Adsolair**

KÄRCHER CENTER, WINNENDEN

Sales centre and office building of one of the largest cleaning equipment manufacturers in the world.

Unit type: **Adsolair**

STIHL, WAIBLINGEN

This family company is active in over 160 countries, and is famous for power saws.

Unit type: **Hybritemp**

FREIBURG DISTRICT OFFICE

Air conditioning for the data processing centre, refrigeration capacity 59.1 kW.

© USM

Unit type: **Adsolair**

USM, MÜNSINGEN

The corporate office of the Swiss furniture manufacturer has been setting trends for many years.

Unit type: **Resolair**

TECHNO, BUBSHEIM

Specialist in the sale of turned parts, offices in Bubsheim near Stuttgart.

Unit type: **Adcoolair**

COMMUNICODE ESSEN

Communicode specialises in hosting webshops, e.g. of Deichmann.

THE MENERGA UNIT CODE

e.g. Resolair 64 12 01

Resolair	64	12	01
Name	Series	Installation size	Design

Series	Name	Function	Equipment	Design
11	Drysolair	Air drying	Heat pump, recuperator	
14	Frecolair	Ventilation/cooling	Free cooling, compressor refrigeration system	
19	ThermoCond	Indoor swimming pool air conditioning	Cross-counterflow heat exchanger	
23	ThermoCond		Cross-counterflow-cross heat exchanger	01 Indoor installation 91 Outdoor installation
29	ThermoCond		Cross-counterflow heat exchanger, heat pump	
38	ThermoCond		Counterflow plate heat exchanger, volume flow reduction as required	
39	ThermoCond		Asymmetrical high-capacity heat exchanger, output-controlled heat pump, fresh water heater, volume flow reduction as required	
44	AquaCond	Heat recovery from waste water	Heat pump, counterflow coaxial recuperator, heat pump, automatic heat exchanger cleaning	0 WWHE: Cu FWHE: Cu 1 WWHE: Cu FWHE: Cu tin-plated 2 WWHE: Cu-Ni FWHE: Cu 3 WWHE: Cu-Ni FWHE: Cu tin-plated * WWHE=Waste Water Heat Exchanger * FWHE=Fresh Water Heat Exchanger
52	Trisolair	Comfort air conditioning, recuperative heat recovery	Cross-counterflow-cross heat exchanger, air volume flow rate up to 5,000 m^3/h	01 Indoor installation 91 Outdoor installation
56	Adsolair		Double plate heat exchanger, adiabatic evaporative cooling, optimum flow rates up to 40,800 m^3/h	
58	Adsolair		Double plate heat exchanger, adiabatic evaporative cooling, compressor refrigeration system, max. flow rates up to 40,800 m^3/h	
59	Trisolair		Cross-counterflow-cross heat exchanger, compressor refrigeration system, air volume flow rate up to 5,000 m^3/h	
62	Resolair	Comfort and process air conditioning, regenerative heat recovery	Heat accumulator module, max. flow rates up to 4,320 m^3/h	
64	Resolair		Heat accumulator module, max. flow rates up to 51,000 m^3/h	
65	Resolair		Heat accumulator module, air flow rates up to 40,000 m^3/h	
66	Resolair		Heat accumulator module, compressor refrigeration system, max. flow rates up to 4,320 m^3/h	
68	Resolair		Heat accumulator module, compressor refrigeration system, max. flow rates up to 51,000 m^3/h	
75	Adcoolair	Recirculating air cooling	Free cooling, adiabatic evaporative cooling, compressor refrigeration system	
76	Adconair	Comfort air conditioning, recuperative heat recovery	Counterflow plate heat exchanger, max. air volume flow up to 45,200 m^3/h, with adiabatic evaporative cooling, refrigeration system, integrated adsorption process or turbo compressor	
97	Hybritemp	Cold water set	Indirect free cooling, adiabatic evaporative cooling, efficiency-optimised compressor refrigeration system	
98	Hybritemp		Free cooling, adiabatic evaporative cooling, efficiency-optimised compressor refrigeration system	

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OUR FIELDS OF APPLICATION

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