

DUPLEX RDH5

fully stainless steel ventilation unit
with air circulation for ventilation,
reducing humidity and warm air
swimming pools heating



CP TOUCH CONTROLLER

touchscreen display



setting the modes,
programming
a unit operation

CP Touch controller

low voltage cabling



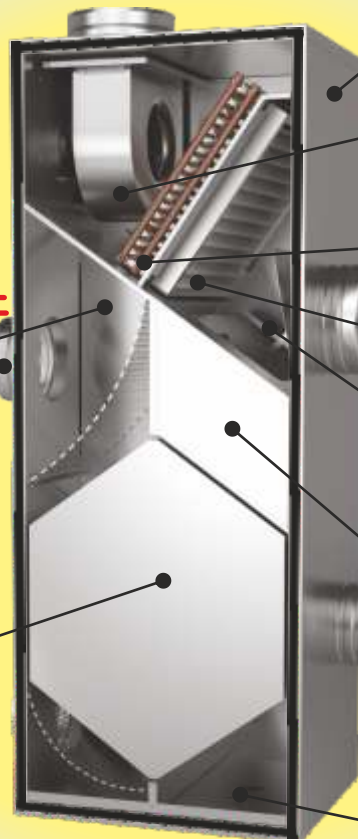
Internet access
(as standard)

DUPLEX RDH5

RD5 digital control
module with web-server

circular connecting
ports 5 pcs

counterflow recovery
heat exchanger with
efficiency up to **93 %**



Unit casing and all
components of
stainless steel
AISI 316

Low-speed circulation
EC fan

low-temperature
hot-water based
heater

filter G4, F7 for
recirculation air
and supply air

mixing and shutting
flap with servo drive

built-in by-pass double
flap with servo drive

condensate drain
incl. siphon trap



RESIDENTIAL VENTILATION & HEATING

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SWIMMING POOL VENTILATION

FAMILY SWIMMING POOLS AND WELLNESS AREAS

Swimming pool ventilation

For convenient use of the family swimming pools, wellness centers and smaller public pools it is necessary to ensure their perfect ventilation and heating. To reduce the humidity it is appropriate to ensure the water level covering films to suppress evaporation from water level and thereby reducing energy consumption. When using the swimming pools and wellness areas, issues from chemical water treatment evaporations such as chlorine and ozone etc. can arise. Application of dehumidifiers does not resolve the chemical load, it decreases only humidity without ensuring air circulation with sufficient reach in all pool nooks and corners, in which the areas of mold can create during condensation. Controlled ventilation discharge chemical load together with higher humidity. The supply of fresh, warm and dry air to glass surfaces and to all pools corners suppresses and eliminates dew condensation. For energy optimum operation the heat recovery equipment is used, reducing ventilation costs by up to 90 % compared to direct ventilation, with providing a ventilation output control, reheating of supplied air and maintaining the pool hall in a slight vacuum. The object building parts are protected that way. DUPLEX RDH5 unit meets all the above requirements with minimal energy requirements due to high-economy EC fans and sophisticated system of high-end digital control with automatic functions.

All main components and DUPLEX RDH5 unit casing are also completely made of special chemical AISI 316 stainless steel, which perfectly resists all common chemical compounds used for pool water treating. **However, it may not be completely resistant to higher concentrations of chemicals in swimming pools with salt water – in this case, please consult the specific application.**

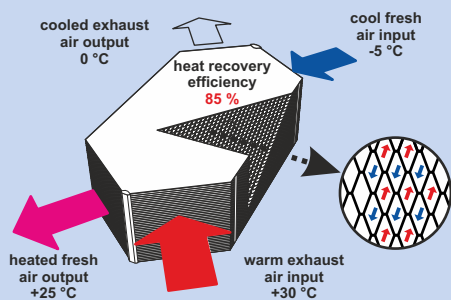
Principles of design and dimensioning

For smaller pools conventional spaces the requirements for exchange of air have been established and verified, i.e. fresh air supply and effluent air drainage according to seasons – for each m² of swimming pool area 11 m³/h in winter, 16 m³/h during transition period and 32 m³/h in summer. Optimal dimensioning is performed for the transition period, followed by a shorter ventilation duration in winter and necessary strengthening of controlled ventilation system through opening of glass surfaces in summer. Air must be supplied to glass surfaces (due to restrictions of dew condensation on colder surfaces) and wiring must be designed from durable material.

To design HVAC system for the pool always separately from the other areas. Choice of DUPLEX RDH5 stainless steel ventilation unit, designed for demanding pools operating conditions, ensures air exchange with heat recovery intensity according to immediate needs. To cover area heat loss in energy saving mode it is appropriate to design eg. floor heating. DUPLEX RDH5 unit, connected to the heat source, ensures heat losses coverage and rapid increase of air temperature after energy saving mode. RD5 control system sensitively reacts to changes and allows the user to control and switch between preset modes. Built-in web server allows remote control over the Internet or even via application for smartphones.

For design of equipment for a specific pool or wellness it is advisable to use a specialized ATREA design software, available free on www.atrea.eu, which also includes the calculation of required ventilation output according to the type of pool.

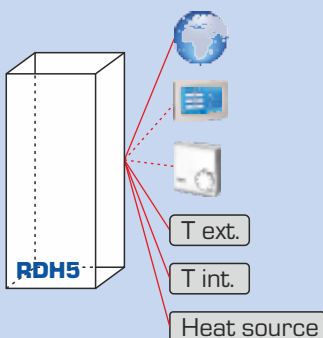
RDH5 UNIT RECOVERY HEAT EXCHANGER



DUPLEX RDH5 unit is equipped with up-to-date recovery heat exchanger – S5 series recuperator. It conducts heat transfer through the separating walls – warmer exhaust air preheats incoming outdoor cooler air in winter.

Recovery efficiency – thanks to special design and high recovery efficiency of exchanges it reaches high efficiency costs ratio between electric energy consumed (for fans driving) and heat backward gain (recovery). The ratio of input power of fans to recovery gain during the pools ventilation reaches the energy efficiency value 17–45, i.e. up to 45 W of the energy from the pool exhaust air is recovered from 1 W of the electric energy used for the DUPLEX RDH5 unit operation in the ventilation mode. **Effective ratio 1: 45.** For use in swimming pools the recuperator material is also important – the whole recovery heat exchanger is made of plastic, which is thanks to its properties highly resistant to aggressive environments, forming during condensation of exhaust air.

BUILT-IN RD5 CONTROL WITH INTERNET ACCESS

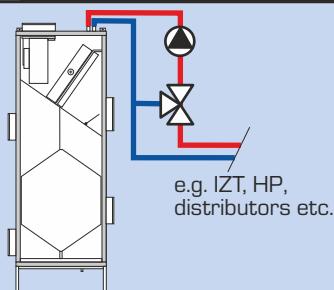


DUPLEX RDH5 unit includes built up-to-date RD5 control by default. For swimming pools operation this control provides the possibility of selectable modes using - energy saving (typically 24 °C) and operating (typically 28–30 °C). Switching between these modes may be done according to weekly schedule or based on immediate requirement – and even remotely through the Internet connection. During this control transfer based on room temperature sensor it automatically adjusts the circulation output and controls the heat source (e.g., mixing valves, gas boilers, heat pump etc.). After reaching the required space temperature it transfers to the circulating output needed for uniform space ventilating and keeps the supply air temperature. Should an increase of relative humidity above level set in hygrostat occurs, it automatically increases the ventilation air volume.



The user can use prepared pool modes with preset operation temperatures and automatic switching of ventilation requirement through the space hygrostat. Selection of other operating modes is also available – circulation, circulation and ventilation, equal-pressure ventilation incl. temperatures setting, also in weekly programming mode.

For more information about control options and electrical terminal connection the ATREA design program should be used with detailed output for related electrical professions, ZTI and UT.

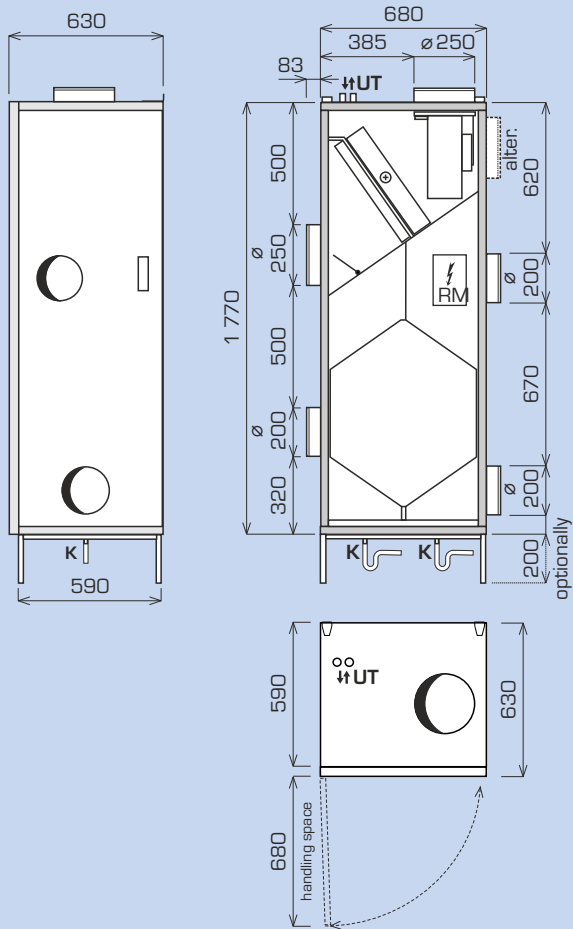
ENERGY INTERCONNECTION



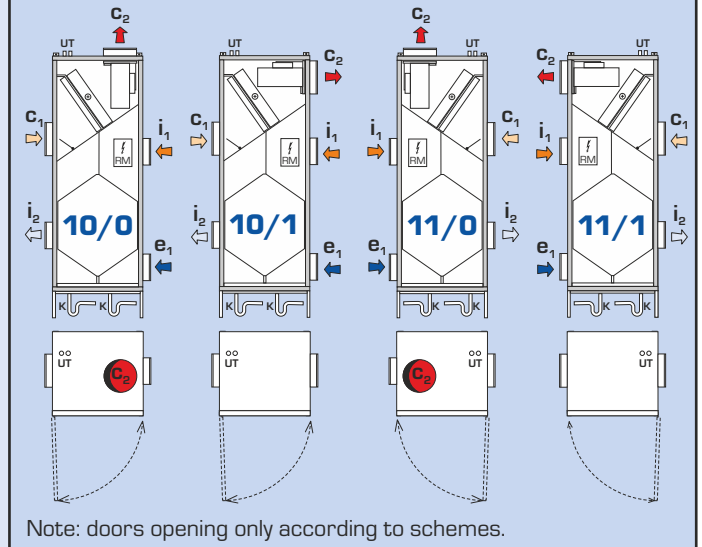
DUPLEX RDH5 air handling unit is equipped with a hot water heater optimized for low temperature gradients – and thus it is suitable for systems with a heat pump for example. RD5 control can power the circulating pump 230 V, control mixing valve through 0–10 V output, close valve 24 V DC or give instructions through switching contact for source operation. While controlling 0–10 V the control voltage is dependent on the air output temperature to pool area. System is not controlled upon outdoor temperature, operating performances depend only on the pool or wellness area requirements.

 
optional three- and four-way nodes to control supplying air temperature

DIMENSIONAL DIAGRAM DUPLEX RDH5



DUPLEX RDH5 CONFIGURATION



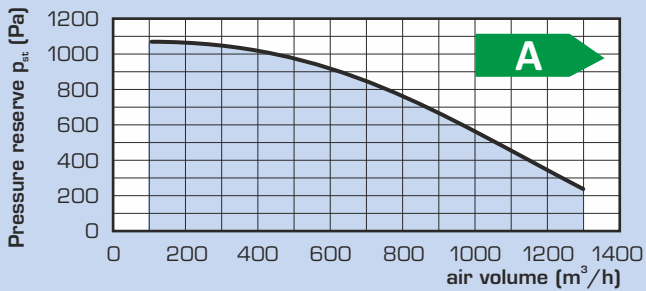
LEGEND

e ₁	fresh air inlet	i ₂	exhaust air output
c ₁	circulation air inlet	UT	heating water connection
c ₂	outlet of circulation air and fresh air	K	condensate drain
i ₁	exhaust air input	RM	digital control RM module

WEIGHT AND CONNECTION

DUPLEX		RDH5
diameter of connection ports	mm	3x ø 200 / 2x ø 250
weight	kg	121
condensate drain	mm	1x ø 30
UT connecting pipes	mm	2x ø 18

CIRCULATION AIR FAN



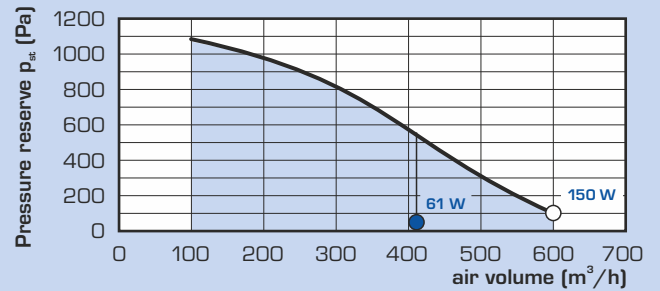
Legend:

- Q_{ref} reference flow **
- Q_{max} maximum flow **

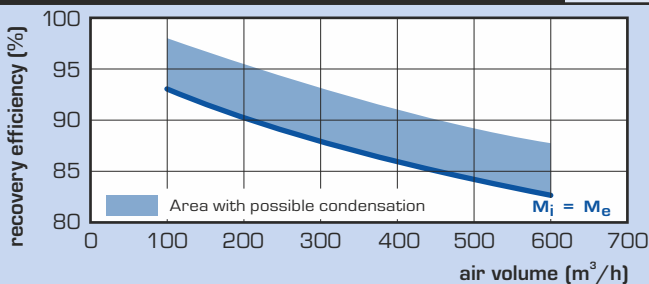
pressure reserve with G4 filter *

* max. pressure reserve curve is indicated
 ** electrical power consumption of the entire unit (both fans including the regulation) is indicated at the same flow in the ventilation mode

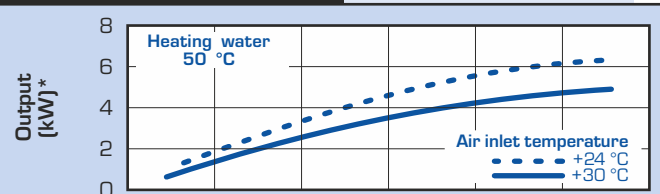
EXHAUST AIR FAN



RDH5 HEAT RECOVERY EFFICIENCY



HOT WATER HEATER



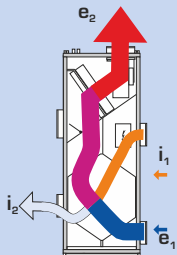
TECHNICAL DATA OF ERP DUPLEX RDH5

DUPLEX		RDH5
energy efficiency class	-	A ¹⁾
specific energy consumption	SEC-W kWh/m ² .a	-16,76
	SEC-A kWh/m ² .a	-41,34
	SEC-C kWh/m ² .a	-79,66
maximum flow ²⁾	m ³ .h	590
sound power level ³⁾	L _{WA} dB	49

¹⁾ All types of the regulation built-in in the unit standardly include a minimum of two inputs for connecting electrical signals arising as a result of human manipulation with lighting, or for connecting other devices that automatically regulate the unit output. These inputs must always be connected, or other types of sensors (e.g. CO₂, VOC, rH and the like) must be connected instead.
²⁾ The maximum flow rate is set at the pressure disposition of 100 Pa
³⁾ The stated value refers to the reference flow rate i.e. 70 % of the maximum flow rate, and to the pressure disposition of 50 Pa

OPERATING MODES, DISTRIBUTION SYSTEMS

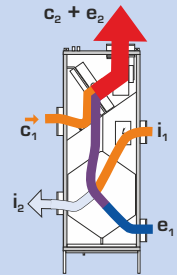
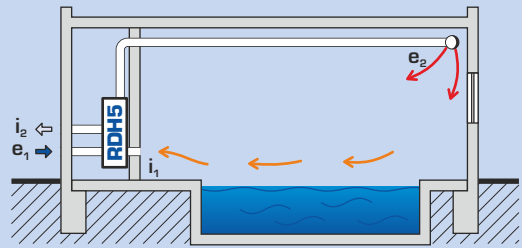
POOL UNIT DUPLEX RDH5 VENTILATION AND HEATING MODES



1

Equal-pressure ventilation mode

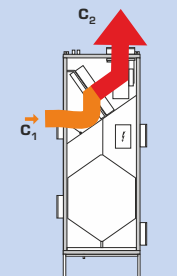
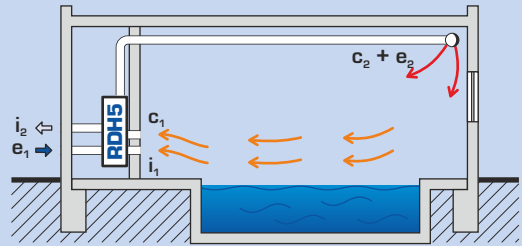
Equal-pressure ventilation mode with heat recovery, max. ventilation output up to 600 m³/h. Activated by hygrostat when increasing room humidity, while the system is off. Both fans in operation, the mixing flap closed.



2

Circulation heating and ventilation mode

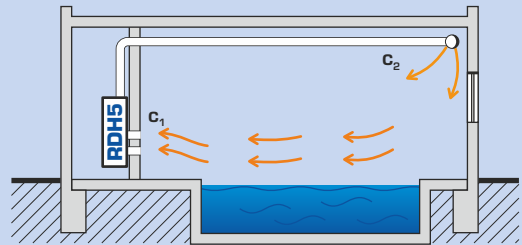
Hot-air circulation heating and equal-pressure ventilation with heat recovery, automatically controlled by hygrostat and room temperature sensor, with a circulation output of up to 1,300 m³/h and ventilation output up to 600 m³/h. Both fans in operation, the mixing flap mixes outdoor air and circulating air.



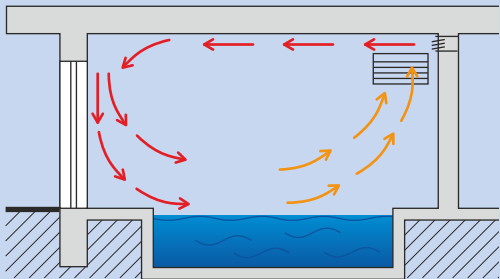
3

Circulation heating mode

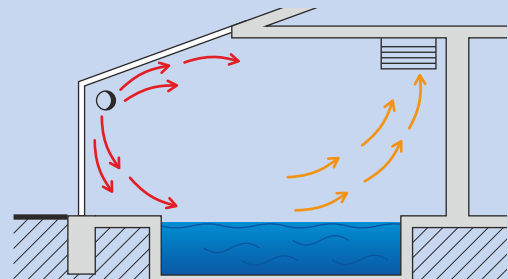
Used for unattended pools heating and tempering. Exhaust air fan OFF, mixing flap closed. When increasing relative humidity it automatically switches to mode no. 2 through hygrostat. Temperature is controlled on the basis of temperature sensor in the pool area.



POOL SPACE VENTILATION CROSS SCHEME



Supply with far-reaching nozzle on the glass wall. Central exhaust through a stainless grille. Suitable for max. distance of approx. 5 m.



Longitudinal supply of ventilation air in the glass wall, circular distributing pipe made of stainless steel sheet AISI 304 or 316, air distribution vertically or diagonally on the glass surfaces through the perforation or nozzles.

DUPLEX RDH5 UNIT AND OPTIONAL ACCESSORIES



DUPLEX RDH5	Ord. No. A170450	Three-way mixing kit	Ord. No. R700083
CP Touch controller	Ord. No. A170130	Four-way mixing kit	Ord. No. R700084
HYG 6001	Ord. No. A141303	EC-25 circulating pump	Ord. No. R700085
200 mm stainless steel base	Ord. No. A170455	Electrical shut-off valve 24 V DC	Ord. No. R700096

DESIGN DOCUMENTS ATREA



Catalogue of components



www.atrea.eu



CD Selection software with pool ventilation calculation