

ROOF-TOP DEVICES

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ROOF-TOP DEVICES FOR HEATING AND COOLING OF HALLS

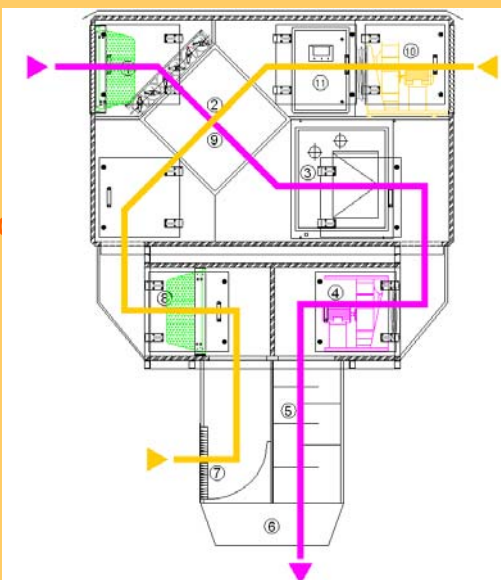
Radel & Hahn M series modular air handling unit casings are constructed for indoor usage, but they can be installed outside the buildings as well. (For example as a roof top unit) These outdoor rooftop devices are insulated in a special way.

Casing of this device is constructed from sandwich panel modules of high stability, frameless, so based on modular design machines of different sizes and forms can be constructed according to the needs of the customer and the wish of the architect. This constructional method is favored because it makes possible that devices are delivered to the place of construction as module elements and finally they are assembled there together.

Apart from one basic frame, sandwich panels are attached to each other by means of bolts and nuts. These parts are sealed; insulated, cut edges of the sheet metal are completely covered and they are reinforced with steel profiles additionally. The sandwich elements are accessible in different sizes, they are made from galvanized steel plate, which close round a polyurethane foam insulation and as a consequence of it they are of very high stability. The assembled units stand out more than 5000 Pa over- or under pressure. Our devices are stabile, even units of several tons can be lifted by a crane.

Roof-Top devices – ready for installation

as rooftop centres – for factory halls for workshops
for factory companies - for other industrial use



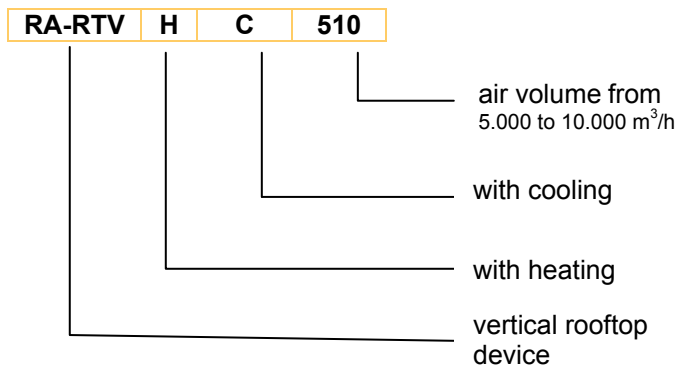
The thickness of the panels is 30-50 mm, thereby it of very good thermal insulation ($\lambda=0,034 \text{ W/mK}$). The assembled elements have smooth interior surfaces, so they can be cleaned and maintained easily. There is no airflow indoor and no remarkable air resistance along the casing.

At some parts of the device where regular maintenance is needed service doors can be placed. The door can be opened up fully, fixed with adjustable door hinge and with key tensioner lock and the special insulating material provides that the door is closed airtight.

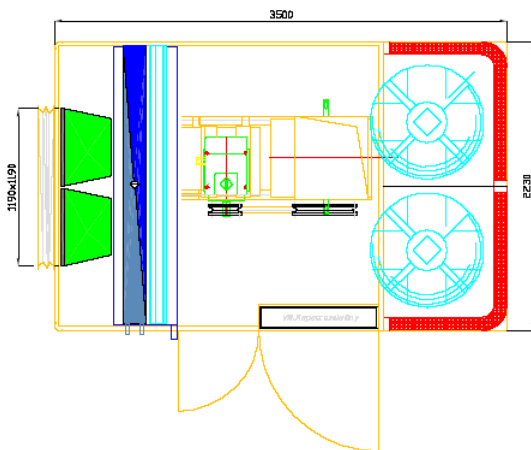
MACHINE TYPES

RA-RTV-H	Supply and exhaust machine with heating coil for heating of big halls
RA-RTV-C	Supply and exhaust machine with cooling coil for cooling of big halls
RA-RTV-G	Supply and exhaust machine with direct gas fired heating module in halls of high ceiling
RA-RTV-D	Supply and exhaust with evaporator for cooling in halls of high ceiling
RA-RTV-O	Supply and exhaust machine without cooling
RA-510	Transported air volume from 5.000 to 10.000 m ³ /h
RA-1520	Transported air volume from 15.000 to 20.000 m ³ /h

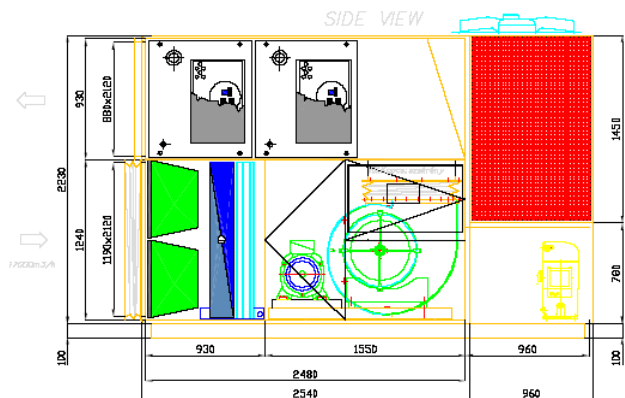
Key to the symbols:



RA-RTV-C-1520



RA-RTV-C-D-G-1520



STRUCTURE

► Fresh air and exhaust-side side exhaust pipe weather protective grille

► G4 Bag filter

The filter house consists of frameless modular elements without heat bridge and reinforced by polyurethane foam (Typ of Radel & Hahn) frameless designed .

The panels are assembled in the same plane, so all elements can be easily cleaned and disinfected.

The perfect closure of service door is provided by soft rubber seal and a door lock equipped with expansion anchor. The filter made from synthetec material, the frame is made of painted, galvanized steel plate. The structure; the material and condensate level of the filter meets the requirements of DIN 24 185 / EN 779. Spring elements are used for fixing the filter into its frame. The starting resistance of the filter is 10-50 Pa; it has a middle-class condensation level: 78-96 %; the maximal allowed air temperature is 80 °C. The maximal allowed air resistance of the filter is 350 Pa. Optionally we can equip our filter modules with pressure controller; with Manghelich differential manometer, with measurement range of 0-500 Pa, with service window; with door contact sensor.

► Cross section heat recovery coil

The casing of the cross section heat recovery coil consists of module elements, they are made from galvanized steel plate, which close round a polyurethane foam insulation. The cross section recovery coil provides the heat transfer between the supplied air an exhausted air through direct heat recovery. The performance of the cross section heat recovery coil is between 45-85%. An electric asynchronous motor drives the machine. There is an aluminium condense water plate in the heat recovery coil, placed on closed cell insulating material. The exhaust manifold of the condense water plate is DN 32mm.

Optionally we can equip our cross section heat recovery coil with service door, in order that we can clean the condense water plate; with inspection window; with service light; with service switch; with pressure controller; with door contact sensor and water seal for the condense plate.



STRUCTURE

► Heating coil module

The casing of heating coil consists of frameless modular elements without heat bridge and reinforced by polyurethane foam (Typ of Radel & Hahn) frameless designed. The parallel lamellas of the heating coil are connected through a pipeline system. The heat transfer medium flowing in the pipes gives heat over to the air through the lamellas. The heating surface of the heating coil is made from seamless copper pipe and aluminium plates firmly fixed to it. The frame of the heating coil is made from galvanized steel plate of thickness of 1,5 mm. The material of the header pipe and the distribution pipe is: cold drawn seamless tube. This system is checked after construction at 30 Pa test pressure by placing it into the water.

The connecting pipe is lead through the double - decked insulated casing. The gap between the pipes and the casing are closed with plastic sealing flange. The resistance of heating coil airside is 80-150 Pa; waterside 20-50 kPa. Since the heating coil stands on u-fom rails, it can be pulled out easily and good airside closing is provided. There are polyethylene protecting caps on the connecting pipes.

Optionally we can equip our heating coil with aluminium frame, pipes and lamellas can be made of stainless pipes of K-36 class.

There is a frost protection thermostat - which can be pulled out - integrated between the heating and cooling coil

► Der Ventilator module

The casing of heating coil consists of frameless modular elements without heat bridge and reinforced by polyurethane foam (Typ of Radel & Hahn) frameless designed. The panels are assembled in the same plane so all elements can be easily cleaned and disinfected. The perfect closure of service door is provided by soft rubber seal and a door lock equipped with expansion anchor.

A Ziehl-Abegg direct drive motor (Type: ER 40C-DN. E7.1R) is integrated into the ventilator module. The airflow rate of the ventilator is 8000 m³/ h; while the outer pressure drop is 400 Pa. The ventilator is placed on carefully dimensioned damper springs, the spring's attenuation measured on natural frequency is more than 80%. The fan's impeller is dynamically balanced. The ventilator is connected to the casing with a special damper, which prevents, that the vibration may pass over to the ventilator house. As additional equipments to the ventilator house we can order inspection window; door contact sensor, service switch; service light, built-in pressure controller.



STRUCTURE

Silencer

A silencer is installed on the exhaust air side. This silencer contains culissen inside which is made from moisture-resistant, abrasion-resistant and non-flammable absorption material. The width of the coulisse is 1000 mm, the distance between them is 200 mm. The length of the coulisse is 1300mm.

fm	63	125	250	500	1000	2000	4000	8000	Hz	
De	6	13	26	27	30	20	15	15	dB	
LW	56	52	48	44	40	36	32	28	dB	
LWA	30	36	40	41	40	38	33	27	47	dB(A)
									40	NC
									40	NR

Control cabinet

Control cabinet is placed inside the air handling but they can be operated from outside. Cabling is found inside the machine. It is proper for outdoor use as well.



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