

radel&hahn zrt



COMPACT AIR HANDLING UNITS



Compact air handling units



What are main features of radel&hahn compact air handling units?

Radel&Hahn air handling units are compact, standardized serialproducts with airflow capacity of 1.000 - 6.000 m³/h. These air supply and air exhaust units consist of standard machine parts, which are tried and tested. The sizes of Radel&Hahn compact air handling units enable their easy installation in narrow places for example in technical centers or in rooms with suspended ceilings as well .

What are compact air handling units use for?

Compact air handling units are mainly used for air conditioning in hotels, in schools, in restaurants, in nursery schools, in offices, in sport centers, in conference centers, in shops, in workshops and in multifunctional buildings.

What makes these machines unique?

Our air conditioning units speak for themselves taking into consideration the high quality of Radel & Hahn equipments and the modular structure of our units. Since these units are produced serially in our factory, their price ranges are favorable and they can be delivered quickly from stock.

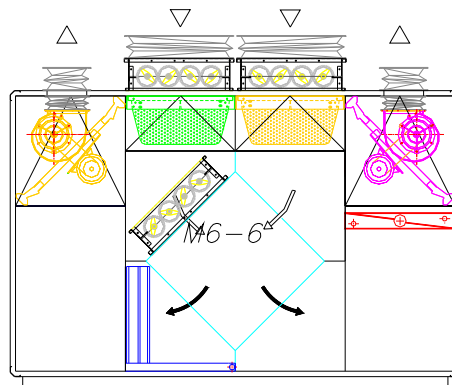
Radel&Hahn compact air handling unit-series can be transported disassembled in order they could be installed easily or the unit can be disassembled in the place of installation. Every machine component is of high efficiency, so they operate efficiently and economically. Thanks to the wide range of control units and components, we are can satisfy any customer request. Our customer reliable service is available to help, whenever it is needed.

Maximum performance: 6000 m³/h

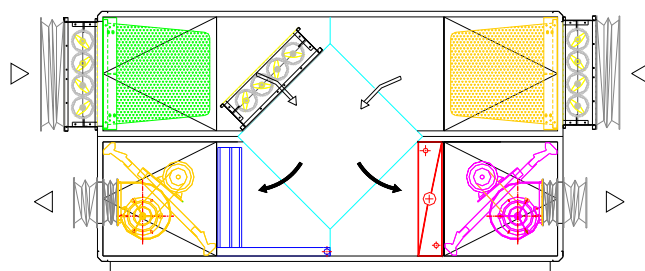
- ▶ **High performance**
- ▶ **Short delivery time**
- ▶ **Favorable price level**

Product range

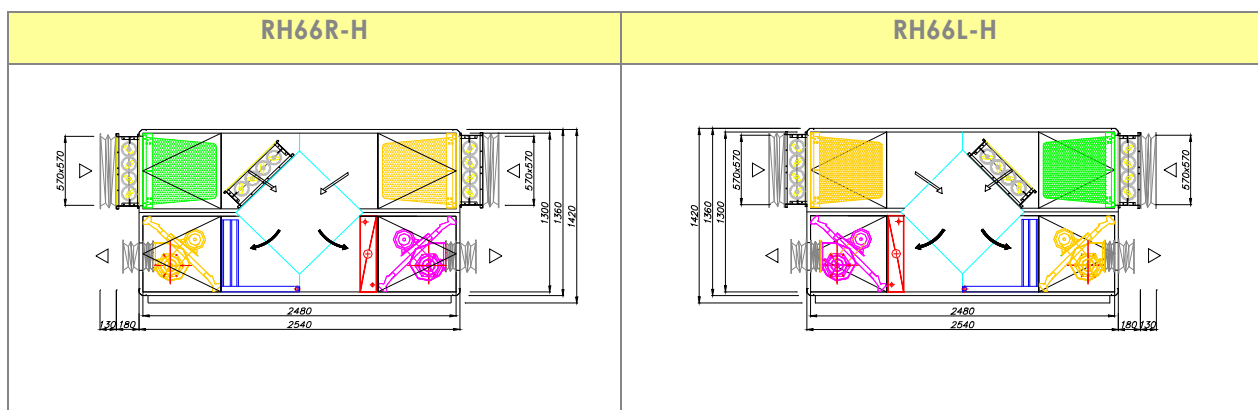
Max. air volume Supply/Exhaust m ³ /h	Module	Order number
2000	M6-3	RH63R-V
2000	M6-3	RH63L-V
2800	M9-3	RH93R-V
2800	M9-3	RH93L-V
4000	M6-6	RH66R-V
4000	M6-6	RH66L-V
6000	M9-6	RH96R-V
6000	M9-6	RH96L-V



Max. air volume Supply/Exhaust m ³ /h	Module	Order number
2000	M6-3	RH63R-H
2000	M6-3	RH63L-H
4000	M6-6	RH66R-H
4000	M6-6	RH66L-H
6000	M9-6	RH96R-H
6000	M9-6	RH96L-H



Technical data



Air supply			
Fan:	V =	4.000	m ³ /h
	dp(ext) =	300	Pa
Motor: (With thermal overload relay)	n =	1.500/ 1.000	U/min
	P =	2,2/0,7	kW
	I =	5,3/2,6	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		
Heater coil:	Q(h) =	29,3	kW
	PWW =	65/50	°C
	dp(w) =	4,9	kPa
	m(w) =	0,47	kg/s

Air exhaust			
Fan:	V =	4.000	m ³ /h
	dp(ext) =	250	Pa
Motor: With thermal overload protection	n =	1.000	U/min
	P =	2,2/0,7	kW
	I =	5,3/2,6	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		

General specifications			
Sound performance L _{WA}	Outdoor air: L _w =	70	dB(A)
	Supply: L _w =	83	dB(A)
	Exhaust: L _w =	73	dB(A)
	Outlet air: L _w =	83	dB(A)
The weight of the machine (Without accessories)	m =	370	kg

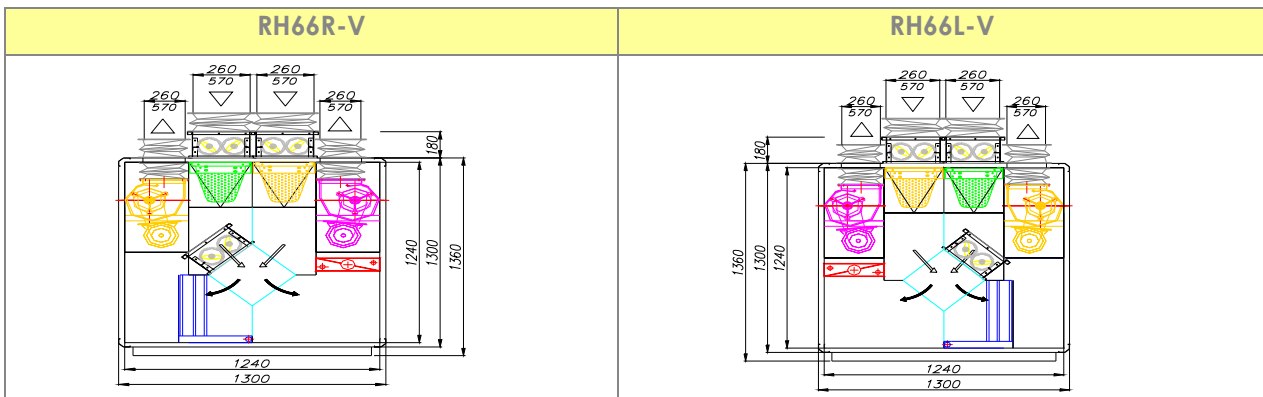
Fans				
Technical data				
		4.000 m ³ /h	3.000 m ³ /h	2.000 m ³ /h
SUPPLY				
dp _{total}	Pa	» 894	827	735
dp _{ext}	Pa	» 300	445	530
EXHAUST				
dp _{total}	Pa	» 775	727	635
dp _{ext}	Pa	» 250	390	460

Heater coil				
Technical data				
		4.000 m ³ /h	3.000 m ³ /h	2.000 m ³ /h
Outlet air	°C	» 1,0	2,5	4,0
Inlet air	°C	» 22,0	22,0	22,0
Capacity	kW	» 29,3	20,1	12,3
Medium inlet temp.	°C	» 65	65	65
Medium outlet temp.	°C	» 50	50	50
Glycol content	%	» 0	0	0
Air volume flow	l/s	» 0,47	0,32	0,2
dp _{water}	kPa	» 4,9	2,45	1
Tube rows	gew	» 3R	3R	3R
Water circuits		» 11	11	11
dp _{air}	Pa	» 89	55	28
Connections		» 1"	1"	1"
*) Supply: -14°C/90% r.F. and Exhaust: 22°C/40% r.F.				

Accessories		Art. Nr.
<input type="checkbox"/>	Basic frame	
<input type="checkbox"/>	Flexible nozzle(2 pieces)	
<input type="checkbox"/>	Magnehelic 0-250 Pa with holder	
<input type="checkbox"/>	Siphone	
<input type="checkbox"/>	Service switch KG 10 6p+2 HK (2 pieces)	
(The ordered accessories will be delivered separately)		

We reserve the right to make technical changes without prior notice.

Technical data



Air supply			
Fan:	V =	2.000	m ³ /h
	dp(ext) =	300	Pa
Motor: (With thermal overload relay)	n =	1.500/ 1.000	U/min
	P =	1,5/0,37	kW
	I =	3,6/1,6	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		
Heater coil:	Q(h) =	12,6	kW
	PWW =	65/50	°C
	dp(w) =	4,3	kPa
	m(w) =	0,22	kg/s

Air exhaust			
Fan:	V =	2.000	m ³ /h
	dp(ext) =	250	Pa
Motor: With thermal overload protection	n =	1.500/ 1000	U/min
	P =	1,1/0,3	kW
	I =	3,0/1,5	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		

General specifications			
Sound performance L _{WA}	Outdoor air: L _w =	69	dB(A)
	Supply: L _w =	81	dB(A)
	Exhaust: L _w =	72	dB(A)
	Outlet air: L _w =	80	dB(A)
The weight of the machine (Without accessories)	m =	220	kg

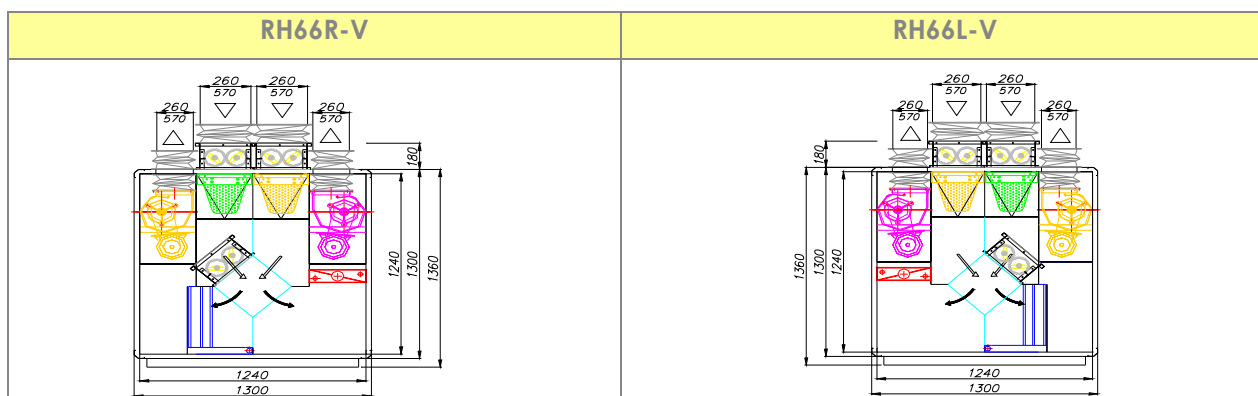
Fans					
		Technical data			
		2.000 m ³ /h	1.500 m ³ /h	1.000 m ³ /h	
SUPPLY					
dp _{total}	Pa	»	801	749	813
dp _{ext}	Pa		300	470	620
EXHAUST					
dp _{total}	Pa	»	662	649	663
dp _{ext}	Pa		250	380	500

Heater coil					
		Technical data			
		2.000 m ³ /h	1.500 m ³ /h	1.000 m ³ /h	
Outlet air	°C	»	2,5	3,0	4,0
Inlet air	°C	»	22,0	22,0	22,0
Capacity	kW		13,5	9,8	6,3
Medium inlet temp.	°C	»	65	65	65
Medium outlet temp.	°C	»	50	50	50
Glycol content	%	»	0	0	0
Air volume flow	l/s		0,22	0,16	0,35
dp _{water}	kPa		4,3	5,4	1,2
Tube rows	gew		3R	3R	3R
Water circuits			7	7	7
dp _{air}	Pa		89	55	30
Connections			3/4"	3/4"	3/4"
*) Supply: -14°C/90% r.F. and Exhaust: 22°C/40% r.F.					

Accessories		Art. Nr.
<input type="checkbox"/>	Basic frame	
<input type="checkbox"/>	Flexible nozzle(2 pieces)	
<input type="checkbox"/>	Magnehelic 0-250 Pa with holder	
<input type="checkbox"/>	Siphone	
<input type="checkbox"/>	Service switch KG 10 6p+2 HK (2 pieces)	
(The ordered accessories will be delivered separately)		

We reserve the right to make technical changes without prior notice.

Technical data



Air supply

Fan:	V =	4.000	m ³ /h
	dp(ext) =	300	Pa
Motor: (With thermal overload relay)	n =	1.500/ 1.000	U/min
	P =	2,2/0,7	kW
	I =	5,3/2,6	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		
Heater coil:	Q(h) =	29,3	kW
	PWW =	65/50	°C
	dp(w) =	4,9	kPa
	m(w) =	0,47	kg/s

Air exhaust

Fan:	V =	4.000	m ³ /h
	dp(ext) =	250	Pa
Motor: With thermal overload protection	n =	1.500/ 1000	U/min
	P =	2,2/0,7	kW
	I =	5,3/2,6	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		

General specifications

Sound performance L _{WA}	Outdoor air: L _w =	70	dB(A)
	Supply: L _w =	83	dB(A)
	Exhaust: L _w =	73	dB(A)
	Outlet air: L _w =	82	dB(A)
The weight of the machine (Without accessories)	m =	400	kg

Fans

		Technical data			
		4.000 m ³ /h	3.000 m ³ /h	2.000 m ³ /h	
SUPPLY					
dp _{total}	Pa	»	894	827	735
dp _{ext}	Pa		300	445	530
EXHAUST					
dp _{total}	Pa	»	775	727	637
dp _{ext}	Pa		250	390	460

Heater coil

		Technical data			
		4.000 m ³ /h	3.000 m ³ /h	2.000 m ³ /h	
Outlet air	°C	»	1,0	2,5	4,0
Inlet air	°C	»	22,0	22,0	22,0
Capacity	kW		29,3	20,1	12,3
Medium inlet temp.	°C	»	65	65	65
Medium outlet temp.	°C	»	50	50	50
Glycol content	%	»	0	0	0
Air volume flow	l/s		0,47	0,32	0,20
dp _{water}	kPa		4,9	2,45	1,0
Tube rows	gew		3R	3R	3R
Water circuits			11	11	11
dp _{air}	Pa		89	55	28
Connections			1"	1"	1"

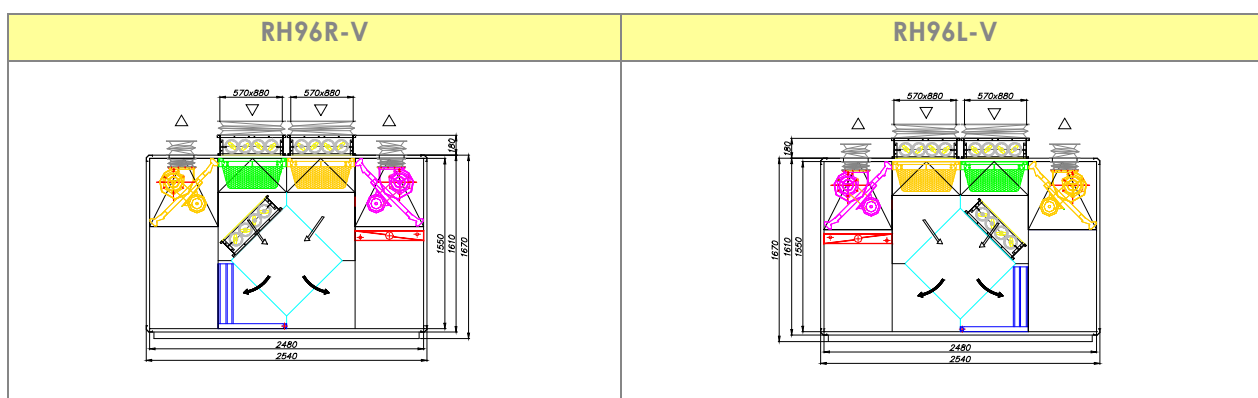
*) Supply: -14°C/90% r.F. and Exhaust: 22°C/40% r.F.

Accessories

	Art. Nr.
<input type="checkbox"/> Basic frame	
<input type="checkbox"/> Flexible nozzle(2 pieces)	
<input type="checkbox"/> Magnehelic 0-250 Pa with holder	
<input type="checkbox"/> Siphone	
<input type="checkbox"/> Service switch KG 10 6p+2 HK (2 pieces)	

(The ordered accessories will be delivered separately)

Technical data



Air supply			
Fan:	V =	6.000	m ³ /h
	dp(ext) =	300	Pa
Motor: (With thermal overload relay)	n =	1.500/1.000	U/min
	P =	3,0/1,0	kW
	I =	7,2/3,7	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		
Heater coil:	Q(h) =	41,3	kW
	PWW =	65/50	°C
	dp(w) =	4,7	kPa
	m(w) =	0,7	kg/s

Air exhaust			
Fan:	V =	6.000	m ³ /h
	dp(ext) =	250	Pa
Motor: With thermal overload protection	n =	1.500/1000	U/min
	P =	3,0/1,0	kW
	I =	7,2/3,7	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		

General specifications			
Sound performance L _{WA}	Outdoor air: L _w =	71	dB(A)
	Supply: L _w =	84	dB(A)
	Exhaust: L _w =	73	dB(A)
	Outlet air: L _w =	82	dB(A)
The weight of the machine (Without accessories)	m =	540	kg

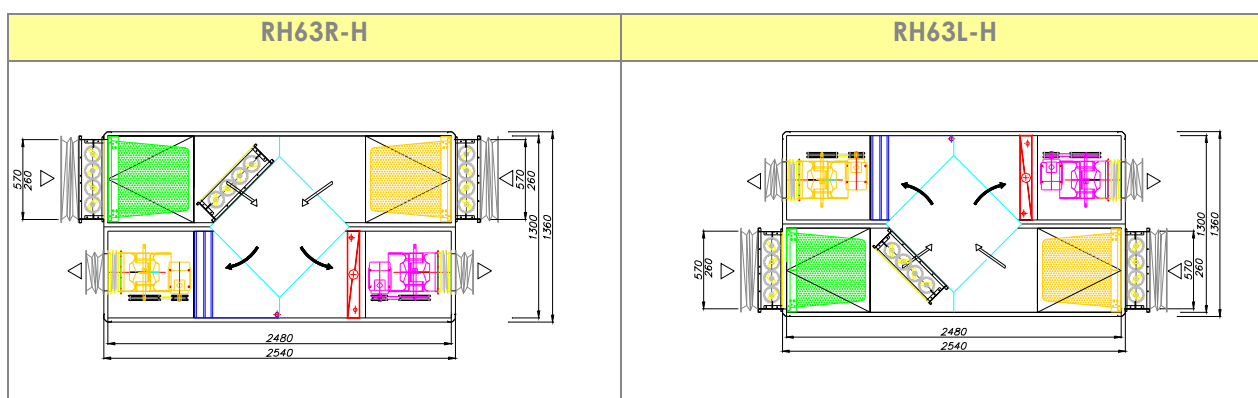
Fans					
		Technical data			
		6.000 m ³ /h	4.500 m ³ /h	3.000 m ³ /h	
SUPPLY					
dp _{total}	Pa	»	849	776	689
dp _{ext}	Pa		300	420	480
EXHAUST					
dp _{total}	Pa	»	738	782	599
dp _{ext}	Pa		250	365	410

Heater coil					
		Technical data			
		4.000 m ³ /h	3.000 m ³ /h	2.000 m ³ /h	
Outlet air	°C	»	1,5	3,1	4,5
Inlet air	°C	»	22,0	22,0	22,0
Capacity	kW		43,1	29,7	18,7
Medium inlet temp.	°C	»	65	65	65
Medium outlet temp.	°C	»	50	50	50
Glycol content	%	»	0	0	0
Air volume flow	l/s		0,7	0,48	1,1
dp _{water}	kPa		4,7	2,3	1,0
Tube rows	gew		3R	3R	3R
Water circuits			16	16	16
dp _{air}	Pa		78	49	25
Connections			1 1/4"	1 1/4"	1 1/4"
*) Supply: -14°C/90% r.F. and Exhaust: 22°C/40% r.F.					

Accessories		Art. Nr.
<input type="checkbox"/>	Basic frame	
<input type="checkbox"/>	Flexible nozzle(2 pieces)	
<input type="checkbox"/>	Magnehelic 0-250 Pa with holder	
<input type="checkbox"/>	Siphone	
<input type="checkbox"/>	Service switch KG 10 6p+2 HK (2 pieces)	
(The ordered accessories will be delivered separately)		

We reserve the right to make technical changes without prior notice.

Technical data



Air supply			
Fan:	V =	2.000	m ³ /h
	dp(ext) =	300	Pa
Motor: (With thermal overload relay)	n =	1.500/ 1.000	U/min
	P =	1,5/0,37	kW
	I =	3,6/1,6	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		
Heater coil:	Q(h) =	12,9	kW
	PWW =	65/50	°C
	dp(w) =	2,9	kPa
	m(w) =	0,21	kg/s

Air exhaust			
Fan:	V =	2.000	m ³ /h
	dp(ext) =	250	Pa
Motor: With thermal overload protection	n =	1.500/ 1000	U/min
	P =	1,1/0,3	kW
	I =	3,0/1,5	A
	U =	3x400	V (50 Hz)
Filter:	Bag filter; Type: G4		

General specifications			
Sound performance L _{WA}	Outdoor air: L _w =	69	dB(A)
	Supply: L _w =	81	dB(A)
	Exhaust: L _w =	72	dB(A)
	Outlet air: L _w =	80	dB(A)
The weight of the machine (Without accessories)	m =	240	kg

Fans					
		Technical data			
		2.000 m ³ /h	1.500 m ³ /h	1.000 m ³ /h	
SUPPLY					
dp _{total}	Pa	»	814	806	823
dp _{ext}	Pa		300	470	620
EXHAUST					
dp _{total}	Pa	»	709	701	712
dp _{ext}	Pa		250	400	530

Heater coil					
		Technical data			
		2.000 m ³ /h	1.500 m ³ /h	1.000 m ³ /h	
Outlet air	°C	»	3,5	5,0	6,0
Inlet air	°C	»	22,0	22,0	22,0
Capacity	kW		12,9	9,4	5,6
Medium inlet temp.	°C	»	65	65	65
Medium outlet temp.	°C	»	50	50	50
Glycol content	%	»	0	0	0
Air volume flow	l/s		0,21	0,15	0,35
dp _{water}	kPa		2,9	1,6	0,6
Tube rows	gew		2R	2R	2R
Water circuits			5	5	5
dp _{air}	Pa		71	44	25
Connections			3/4"	3/4"	3/4"
*) Supply: -14°C/90% r.F. and Exhaust: 22°C/40% r.F.					

Accessories		Art. Nr.
<input type="checkbox"/>	Basic frame	
<input type="checkbox"/>	Flexible nozzle(2 pieces)	
<input type="checkbox"/>	Magnehelic 0-250 Pa with holder	
<input type="checkbox"/>	Siphone	
<input type="checkbox"/>	Service switch KG 10 6p+2 HK (2 pieces)	
(The ordered accessories will be delivered separately)		

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Quality components

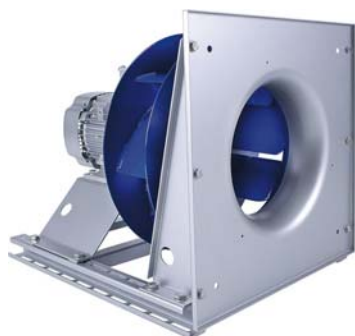
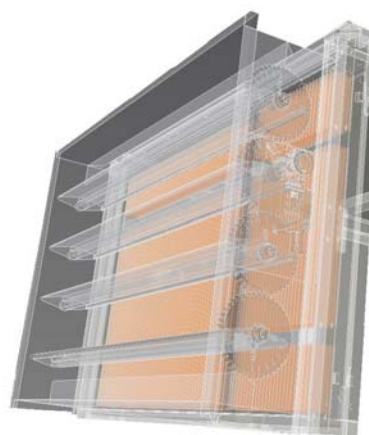
Modularly designed casing



The casing of the devices are assembled from sandwich modules of different sizes. They can be assembled without frames, so there are different options for construction based on modular principles. Sandwich modules are of different sizes made of galvanized steel sheet; which surrounds a rockwool or environmentally friendly polyurethane foam core, which results an especially stabile structure. Where regular maintenance work on units is needed, access doors with door hinge and key or latch tension lock can be set up and airtight sealing is ensured by mounting of difficult aging circumferential seals

Frost damper

Damper leaves are made from extruded aluminium, and a gummi profile is integrated at the edge. Perfect closing is provided by the gummi profile and by excentric design of damper axis. Damper frame is made of galvanized steel plate which is of thickness 1,1 mm. Damper is prepared to be connected to an engine.



Fans

We install fans into our devices, which are produced by Ziehl-Abegg or Comefri, their energy consume is very low, they operate silently and they are longevity.

Plate heat exchanger

The frame our cross-flow heat exchanger with aluminum lamellas is of excellent quality and made of reinforced design aluminium profile. Thanks to the geometric design of the lamella the necessary airflow is granted to ensure the favorable heat transfer quality. The performance of the heat exchanger can be adjusted with the help of the bypass element and with a mixing damper. The condensate tray of the plate heat exchanger are made from aluminium.



Compact devices

Delivery, accessories

In case of delivery designated as "r-1", devices are assembled in our factory but it can be disassembled again at the place of installation.

In case of delivery designated as "r-2", devices are transported as modules, which number is shown on the datasheet and they are assembled by our customer at the construction site.

- The devices are equipped with 4 pieces DMS 6 pressure ports (filter monitoring) and 4 pieces cable bushing
 - V-belt drive is set to maximum
 - Other accessories are delivered separately packed. Standard fine filters can be installed into the devices as well
 - CE Marking
- Standard devices are equipped with safety door locks and with equalizer at the ventilator unit.

Service switch

2 pieces of service switches,
Type: KG 10 p +2 HK, (6-pole; 2 auxiliary contacts, 1 piece / engine)



Magnehelic 2000

Differential pressure gauge 0-250 Pa; 1 piece / device; with PVC hose, with MS 6 pressure ports installed on the machine.

Attention!

We deliver switch cabinet with S300/1-C2 pressure difference switch and filter monitoring on customer request.

The most important advantages of the machines at first glance:

Hygienic

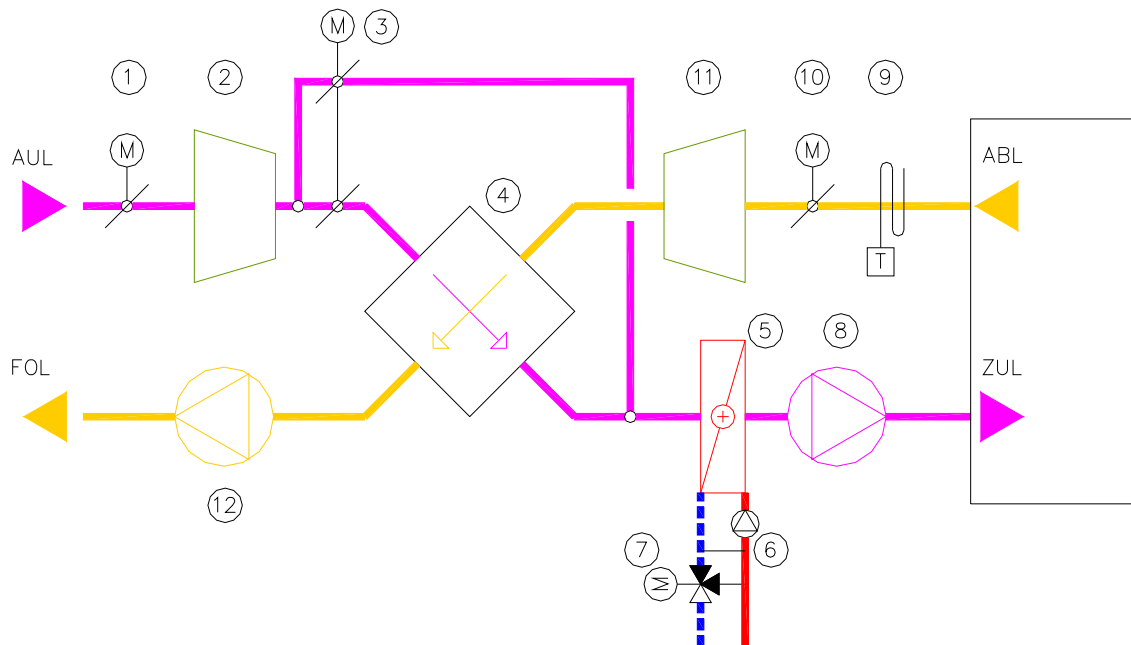
Thanks to the flat inner and outer surfaces and the maintenance doors the device can be cleaned easily and thoroughly

Maintenance friendly

- ▶ motor tensioners
- ▶ adjustable belt pulleys with tensioner bushings
- ▶ large openings for maintenance
- ▶ filters can be replaced easily

Conceptual schema

Conceptual schema of supply / exhaust units with heat recovery



Standard controlling

Key to symbols

Outer air / Supplied air

Exhausted air/ Outgoing air

1. Damper actuator with actuator	9. Exhausted air sensor (optional)
2. Air filter	10. Damper with actuator
3. Bypass damper with actuator	11. Air filter
4. Cross-flow plate heat exchanger	12. Fan
5. Heating coil	
6. Pump	
7. 3-port valve with actuator	
8. Fan	

Compact machines - Automation components

Standard control cabinet for air handling units

- ▶ Favorable price level
- ▶ Easy to operate
- ▶ All of the functions can be set easily and it is visualized on the control panel
- ▶ Compact sizes
- ▶ We install control cabinet accessories of good quality



System control is performed by controlling the temperature of the supplied air, when air handling unit exchanges the air of the room and provides fresh the air, or if we control the temperature of exhausted air and limit the amount of the supplied air, which is used for heating and ventilation of the room.

Temperature of the room is measured by using temperature sensors: they measure the temperature of the supplied air and exhausted air. The controller compares

this temperature with the setpoint temperature. Based on the heat demand, the mixing damper starts to operate or based on the needs, the heating or cooling valve opens. Heat pump starts to operate when heating is needed; cooling pump is switched on when cooling is needed.

The casing of control cabinet is made of painted steel plate or steel plate without painting, but in this latter case casing is embedded into the air handling unit. Protection rating: IP55.

SIEMENS Automatisation system

SIMATIC modular controllers

This universal control system has a menu-driven keypad, which LCD-display visualizes every important data. These universal controllers are preprogrammed in the factory and they can be operated immediately.

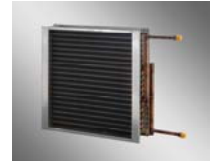
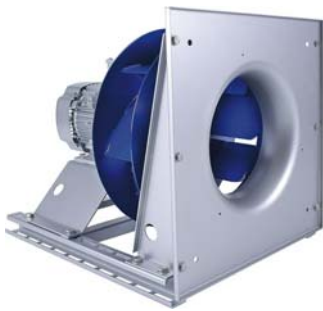


SIMATIC modular controllers



LOGO ! Logic module

Quality parts



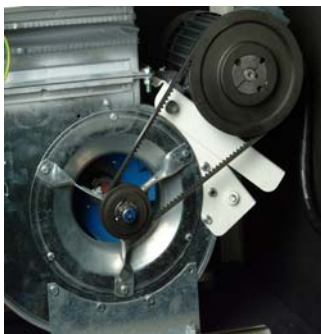
Hygiene

Smooth inside surfaces and large inspection / maintenance openings enable thorough cleaning.



Maintenance friendliness

- motor driven bearing
- pulleys with clamping chucks
- high-performance centrifugal impeller
- large inspection windows and lighting
- filter part with differential pressure monitoring system



We have since 2004 a certificate for the management system according to ISO 9001:2008 in the scope of planning and type of building technological annexes, planning, production and service of climate and ventilation equipment as well as clean room technological annexes.



Delivery and assembling



The air handling and air conditioning units are delivered in different variants:

Completely assembled units: from the smallest to the largest centers, provided the transport and local installation conditions permit this.

In individual modules of any length, according to the customers requirements. Assembled on the site.

Completely disassembled for assembly on the site. This variant is used in particular in the case of large plants and locations with small openings for bringing the unit into the plant.

References

LEGO Manufacturing Kft. Nyíregyháza
DIEHL Aircabin Hungary Kft. Nyírbátor
MERCEDES BENZ Manufacturing Kft. Kecskemét
GE Hungary Nyrt. Budapest
SOUTH BUDA BUSINESS PARK Irodaház, Budapest
KIKA Áruház Debrecen és Kassa
GETRAG FORD Kechnec
SHELLING Kechnec
FLEXTRONICS Nyíregyháza, Sárvár, Brno, Zalaegerszeg, Zalalövő
ROBERT BOSCH Elektronika Kft Hatvan
SIEMENS Gönyü
INFOPARK Budapest
ÁRPÁD CENTER Budapest
CITY GATE IRODAHÁZ Budapest
DOTE Debrecen
HUMAN Gödöllő
HIETE Budapest

You may download the full referenclist from our web-seite
www.radel-hahn.hu.



radel & hahn zrt

H-4028 Debrecen, Kassai út 92.

Telefon: 0036 52448441 Fax: 0036 52415258

E-mail: info@radel-hahn.hu Web-site: www.radel-hahn.hu