

radel & hahn



POOL DEHUMIDIFICATION PROSPECT



POOL DEHUMIDIFICATION

2013

Successful years

Radel & Hahn Building Engineering Ltd. was established in April, 1972. Our mission statement is from the beginning:

„Clean air - Better quality of life“

„Energy saving by optimization“



Our company established a department for swimming pool dehumidifiers one year after the opening of air conditioning and ventilation department. We have been produced countless number of equipments since that time and our customers operate them with the greatest satisfaction. From the very beginning we aimed to design equipments which perform heat recovery in the most wide variety possible. We have already produced the first heat pump dehumidifier equipment in 1972, which operates based on condensation principle.



Pioneer innovations – More and more unique design

Our company won the Burgenland Innovation Award for creating an EWP swimming pool dehumidifier which is equipped with heat pump and we received an award from the Austrian Chamber of Industry for producing an air handling system of 90% heat recovery grade. (For more information about **EWP** swimming pool dehumidifier, please go to the end of our prospect!)

International orientation

„Radel-Hahn“ is a company group with 400 employees in a whole. Besides our parent company in Mattersburg, there is a manufacturing facility included a modern machine park in Debrecen (Hungary). An engineering office is operating in our subsidiary company in Sag, which is located not so far from Timisoara in Romania. We own registered branch offices in the Czech Republic; in Slovakia and in Ukraine as well.

PRODUCT RANGE

COMPACT

...for use in indoor swimming pools and in hot tubs

Dehumidification, which based on the principle of fresh air-exhaust air exchange, is realized with 80% heat recovery in average.

An integrated heating system serves for post-heating and for the heating of the air of the room by pumping warm water into the machine, which is connected to the heating system of the house.



EGK

...for use in private indoor swimming pools

Dehumidification is realized by an evaporator which operates based on condensation principle. The heat surplus can be used for heating of the air or for heating of pool water. (Optional choice!). An integrated heat recovery, which is connected to the heating system of the house, serves for heating of the swimming pool room.



EWP

... for use in private swimming pools and in swimming pools of hotels

Depending on their equipment rate, devices are used for heating, dehumidification, cooling, as additional fresh air supplier which operates based on condensation principle (Optional choice!)

Heating of the water in pool basin; of tap water and water flowing in the heating system is performed by heat pump. Heat is recovered from outer air, from groundwater or well water.



EGKR

...for use in Wellness departments and in public baths

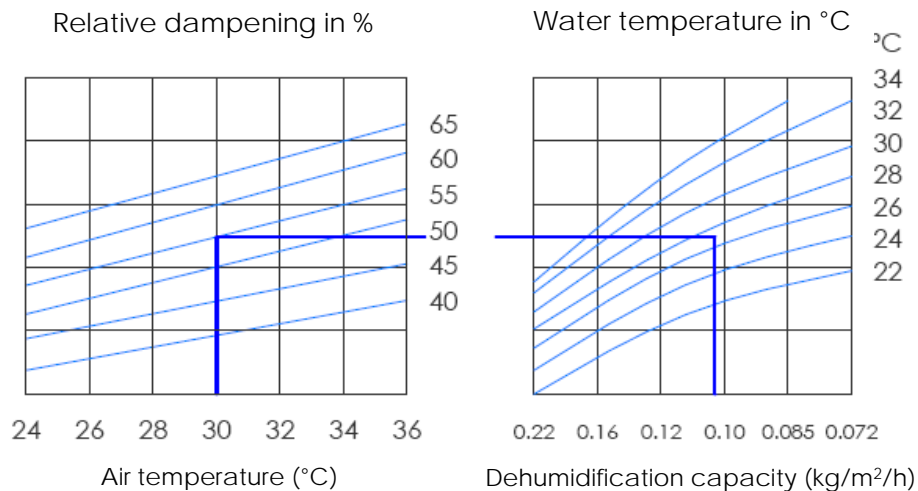
The evaporation is based on the following principle: used air is exhausted; air humidity is condensed, than fresh air is blown back into the room. The energy gained by heat pump can be used for heating of the basin water and as an additional air heater. The air postheater is connected to the heating center.



Why is dehumidification needed?

When planning a pool, it should be considered that it is a wet room. We cannot avoid the condensation of the humidity on the ceiling and on the walls, so windows and walls should be excellently insulated. The pool water evaporates continually and its intensity depends on the temperature of the water and the air.

Based on the facts that the average water temperature is 27°C and air temperature is 30°C in swimming pools, as it is shown in the diagram 3,84 liter water evaporates in every hour or 92 liter in 24 hours time, when the surface of the swimming pool basin is 32 m². If the room temperature doesn't change but the water temperature reaches 32 °C, 5,76 kg water evaporates in every hour. By covering the swimming pool basin, we can achieve that with 70% less water evaporates.



The data shown in this diagram must be multiplied with a factor number based on what the type of swimming pool is considered:

- the factor number is 1,7 in case of frequently used swimming pool in hotels
- the factor number is 1,2 in case of overflow swimming pools

The bigger the difference between air temperature and water temperature, the less the evaporation is.

Heat is absorbed in 80% on the surface of the swimming pool basin. Ca. 100 Watt energy should be given to every m² on the surface of the water pool basin in every hour.

Dehumidification is realized by **COMPACT** machines as follows: dry fresh air is supplied to the room, while humid indoor air is exhausted. A heat recovery of very high efficiency recovers the heat from the exhausted air.

In case of **EGK** and **EWP** systems evaporation is realized through condensation. A heat generated during condensation is supplied back to the room or used for warming up of the swimming pool water. We reuse the heat gained from exhausted air to the greatest degree. Fresh air is supplied back into the room through hybrid module and humid air is exhausted, only after heat recovery.

We use environmental thermal energy when the device is equipped with heat pump. This thermal energy can be gained from the outdoor air; from spring water; solar collector system; from ground source.

Air is supplied into the room through a pipeline in case of every system, which creates a warm air curtain in front of the windows. This contributes to the higher feeling of comfort and moisture condensation is prevented by increase of the temperature on the surface.

COMPACT Swimming Pool Dehumidifiers

... for use in private indoor swimming pools and hot tubes

A COMPACT Swimming Pool Dehumidifier serves for dehumidification and heating of smaller swimming pools and hot tubes.



Dehumidification is realized by outtaking humid air into the open air while supplying back warmed, dry fresh air into the room. A two-stage heat recovery warms up the air. The heat recoverer extracts not only the heat from the pool's air – but **warms up the supplied fresh air without using any additional source of energy.**

The efficiency of the heat-recovery is 80-90% considering thermal comfort. The air of the swimming pool room can be heated by operating an additional hot-water or an electrical heating coil.

The casing of the equipment is of frameless structure made of white painted Alu-plate panels. There are air duct connections equipped with vibration absorber on both the exhaust and supply sides.

The device is made up of the following components viewed from the direction of the air:

AIR SUPPLY

Machine parts:

Vibration absorber, fresh air damper, direct driven free-running fan, air filter of F5 filtration grade, 2-stage lamella heat exchanger made of stainless aluminium, warm water post-heater.

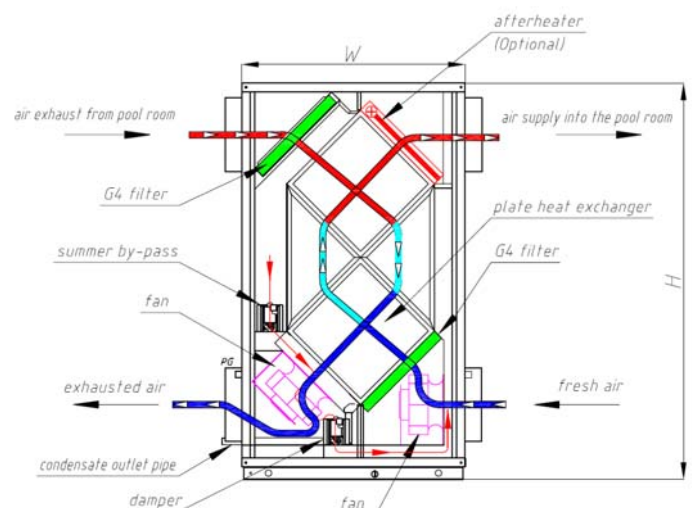
AIR EXHAUST

Machine parts:

Vibration absorber, filter of G4 filtration grade, 2-stage plate heat exchanger made from stainless aluminium plate, direct drive freewheeling fan, exhaust and bypass damper, vibration absorber.

A control cabinet with the necessary switches and control lamps are integrated into the unit.

We deliver 24V voltage thermo-hygrostat built into our equipment, which should be placed in the swimming pool area. The thermo-hygrostat is equipped furthermore with an operation switch.



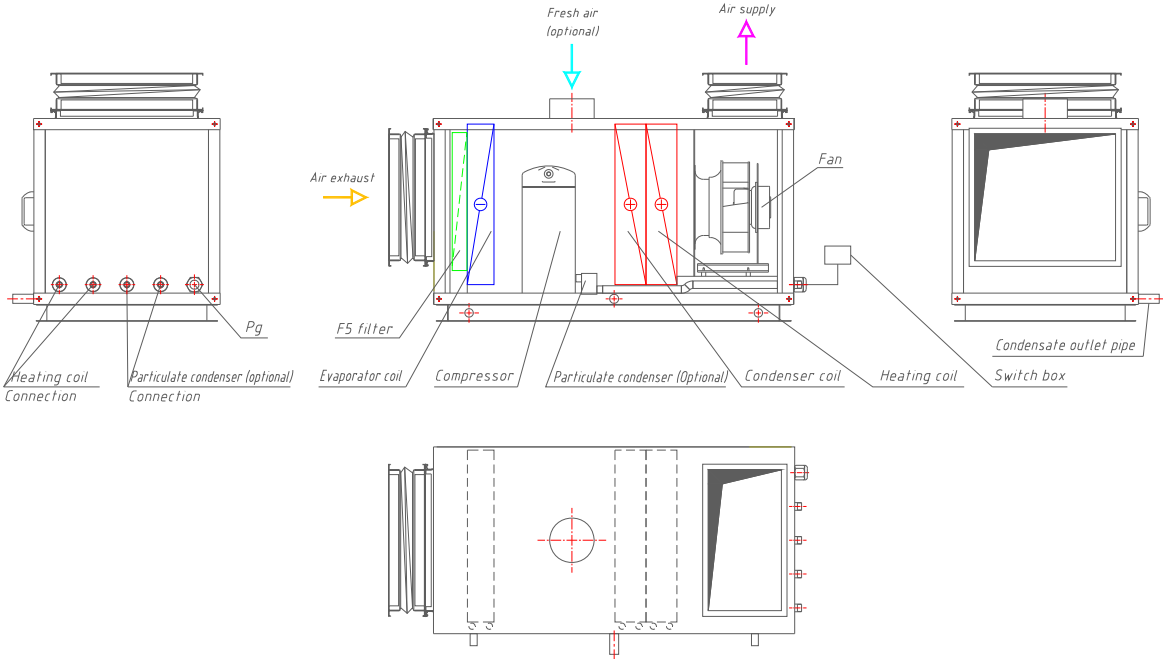
COMPACT Swimming pool dehumidifier – Technical data

Description	Unit	Compact 250	Compact 500	Compact 1000	Compact 1500	Notes
Nominal performance	m ³ /h	250	500	1000	1500	
Dehumidification performance	kg/h	1,85	3,7	7,4	11,1	According to VDI 2089
Exhausted air temperature if relative humidity is 55%	°C	30	30	30	30	
Outdoor air temperature	°C	-12	-12	-12	-12	
Discharge air temperature - after recuperator	°C	24,2	22,3	20,2	21,5	
Dry air exchange	%	86	82	77	80	
Recuperated heat	KW	3	5,7	11	17	
Condensation on the register (Tcon 19,1)	kg/h	1,9	3,5	6,4	10,2	
Outdoor air temperature	°C	8	8	8	8	
Discharge air temperature - after recuperator	°C	25,9	24,6	23,2	24	
Dry air exchange	%	81	75	69	73	
Recuperated heat	KW	1,5	2,8	5,1	8	
Outdoor air ratio	%	0-100	0-100	0-100	0-100	
Ext. pressure drop Supplied air - fresh air	Pa	120	300	220	220	
Ext. pressure drop Exhausted air - discharged air	Pa	100	300	220	220	
Supply fan nominal performance	KW	0,058	0,24	0,28	0,5	
Exhaust fan Nominal performance	KW	0,058	0,24	0,28	0,5	
Total connection capacity	KW	0,12	0,5	0,56	1	
Air heating capacity if water temperature is 70/60 °C	Watt		3200	6400	9800	
Air heating capacity if water temperature is 50/45 °C	Watt	800	1700	3400	5100	
Waterside pressure drop	kPa	11	13	12	14	
Width	mm	600	680	680	1240	with valve
Height	mm	1000	1380	1380	1200	
Depth	mm	440	525	680	650	
Stucni height	mm	148	250	315	350	
Weight	kg	40	60	85	110	

EGK Swimming Pool Dehumidifiers

...For private indoor swimming pool rooms

EGK swimming pool dehumidifiers are especially suitable for dehumidification of small and middle size private indoor swimming pool rooms. This device is equipped with a dehumidifier-heat pump unit. Post-register is dimensioned for warm water supply.



This device dehumidifies and warms up the air of the swimming pool room. Warm air is blown back toward the windows through air ducts, which are designed especially for this purpose and a warm air curtain is formed near the windows in order to keep the windows moisture-free. So nothing hinders our clear view and we can enjoy the beauties of the nice outside environment.



Machine parts:
 Supply-exhaust unit
 Pool water condensator
 DDC controller with integrated setpoint correction
 Water temperature display and controller

Dehumidification	Type	EGK 15	EGK 15T
Dehumidification	kg/h	4,0	6,0
with 150 m ³ /h fresh air rate	kg/h	4,9	6,9
Ventilation data			
Air volume	m ³ /h	Max. 1600	Max. 1500
ext. Pressure	Pa	160	160
Heating capacity PWW 70/60 °C	kW	7,9	7,9
Heating capacity PWW 50/45 °C	kW	3,2	3,2
Warm water	m ³ /h	0,7	0,7
Pressure drop	kPa	20	20
Heat surplus			
In case of Dehumidification ca.	kW	4,7	5,7
On air	kW	3,2	3,9
On water (Option)	kW	1,5	1,8
Geometric parameters			
Length (A)	mm	1283	1283
Height	mm	720	720
Width	mm	663	663
Weight	ca.kg	125	150
Performance data			
Supply fan	kW	0,2 – 0,4	0,2 – 0,4
Exhaust fan (Option)	kW	0,04	0,04
Power input of the compressor	kW	1,5	1,8
Type of the compressor		ZH06K1P-TFM	ZH09K1P-TFM
Refrigerant: R410 A			
Operating voltage 50Hz	V/Ph	400/3	400/3

EWP SWIMMING POOL DEHUMIDIFICATION DEVICE

...for swimming pools of Hotels and private swimming pools

HIGH-TECH IN THE SWIMMING POOL!

This unit serves for **dehumidification and for heating in swimming pool rooms**. Module elements represent High Tech construction, which meets all customer requirements in terms of comfort and economic. Standard swimming pool dehumidifier performs dehumidification based on condensation principle. The indoor air of the swimming pool is blown through a direct cold evaporator, where air humidity condenses. The water, which gathers here together, is drained through the condense drain pipe. So we gain dehumidified cold air and a condenser warms it up, then warmer air is blown back into the swimming pool room. During wintertime serially integrated heat recovery *can be used for ,bringing' some warm* from the house into the swimming pool area. No additional heating is needed, if the building of the swimming pool is well-designed thermodynamically.



STANDARD CONSTRUCTION

CASING

Frameless construction; made from white painted aluminium plates with special inner insulation

FAN

Freewheeling fan, backward curved impeller, corrosion resistant design, adjustable, with energy-saving direct drive.

AIR FILTER

Flat filter of F7 filtration grade, which can be pulled out

DIRECT EVAPORATOR

Drawn copper pipe with aluminium lamellas. aluminium frame, stainless condensate tray with drain pipe

CONDENSATOR

Condensator is combined with heat register. Copper pipes, aluminium lamellas, aluminium frame.

HEATING COIL

A heating system or an electric heat storage warms up the water which is pumped into the heating coil. The heating coil contains copper pipes with aluminium lamellas; its frame is made from aluminium.

COOLING COIL

A quietly operating Scroll compressor is equipped with the following accessories: thermal expansion valve, magnet valve, sightglass, dryer, controlling and protecting components. Refrigerant container, filled with refrigerant, cables.

CONTROL CABINET

In case of standard units the control cabinet is integrated into the unit. In other cases control cabinet is delivered separately; the junction box of the machine is wired to the proper degree.

The following parts belong to our product range as well:

- Air temperature and air humidity sensor with digital display
- Thermometer, which measures the outdoor air temperature
- Thermometer, which measures the temperature of the supplied air

You can select the operating mode by means of the operation mode switch, which receives the signal from the switch or from the end switch, which signalize, in what measure the swimming pool is covered. An integrated DCC controller operates the machine automatically. Humidity is exhausted depending on outdoor temperature. Higher air humidity level is allowed during summer than during winter.

Useful Accessories

„EWP-K“ water circulation condenser

It is compulsory to integrate this type of condenser into the machine, since it is needed during warm water pump operating mode. The heat we gain from condensation is transmitted to the swimming pool water or to the heating system.

„EWP-TK“ Pool water condenser

This is an additional element of the standard version which contributes to the increase of the efficiency. The heat of condensation is passed partly to the swimming pool water.

„EWP-EH“ deheater

During dehumidification or during heat pump operation mode the compressor gains heat from hot gas and heat is passed over to a domestic hot water container through a separated system. 55-80°C water temperature can be reached this way.

„EWP-SALZ“ Salt water heat exchanger

In some cases salty water is added to the pool water in order to gain clor for water treatment equipment. Special coatings should be applied on the surface of airside heat exchanger. Waterside heat exchanger are made from special alloy.

„EWP-Hybrid“ fresh air supply „hybrid“ module

Air is kept on supplied into the swimming pool room : 250 m³ in every hour.

We gain 86% of the heat quantity for free by operating a counterflow heat exchanger of high efficiency, which recovers the heat from the exhausted air of the room. An air- condenser serves for additional heating of the air if it is necessary. Slight underpressure is kept in the swimming pool area by this „hybrid“ module. If swimming pool basin is covered, dehumidification is performed mostly by hybrid module, so we can prolong the operation time, if heat pump is integrated into this device.

„EWP-SOMMER“ Summer operating mode

During summertime heat surplus is not used for warming up the air, instead of it heat is transferred mainly to the water in order to warm it up. (Pool water condenser is required.)

Heat pump circuit

Since it is not necessary to operate the evaporator with maximal performance continually (For example, when the swimming pool is out of use or the swimming pool basin is covered), the opportunity is given to operate the device as air-water or Sole-water heat pump, if it is completed with the suitable accessories. So if heating is needed, the machine should be switched to heat pump operating mode from dehumidifier mode. The gained heat is transmitted to the water of the basin or to the warm water container.

Air-Water heat pump „EWP- LWP“

During summertime and during transitional seasons, when heating is not needed, heating of the air and swimming pool water can be realized without operating an additional heater. Heating pump operational mode works well until outdoor temperature is higher than 7 °C. If temperature is lower than this, we switch on the heating system of the house or the electric heating.

Air-Water heat pump „LWP“ and Split.

In case of Split devices a fan assisted evaporator is installed outside, which utilize the heat gained from the environment. This operation mode works until outdoor temperature reaches -12 °C or -20 °C. Fan assisted evaporator can be placed inside the building optionally. Air is transported through an air duct system which are closed with weather protection grille at the end.

Water-water and salt water pool heat pump

Heat reduction is realized by transferring heat from environmental energy which is stored up in underground storage facilities, in subterranean probe or in quell water. The heat pump can be operated during the whole year. It is adviceable to switch on additional heating (boiler or electric heating equipment), when weather turns very cold outside.

Installation of the controlling system

The following controlling systems can be installed based on customer request:

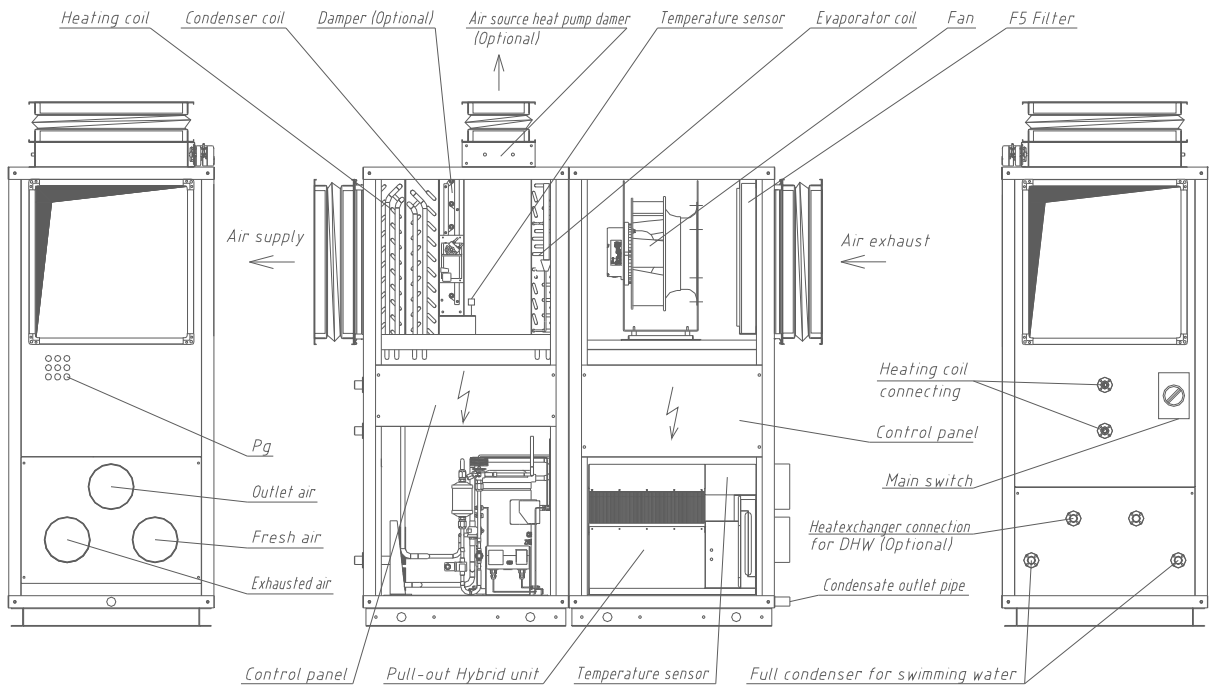
- * Controller of heat exchanger of swimming pool
- * Solar differential controller; heating circuit control
- * Special temperatur controller for the house

A central system control is performed by a computer, which is equipped with a touchscreen and it is capable for data recording.

EWP – Technical Data

Name	Unit	Type		
		EWP-1	EWP-2	EWP-3
Pool size	m ²	10-40	15-55	20-70
Dehumidification performance – with air recirculation LE=30°C/55%r.F	kg/h	4	6	8
Dehumidification performance with hybrid fan	kg/h	5,85	7,85	9,85
Air volume with air recirculation	m ³ /h	700-1600/160	800-2500/160	800-2500/160
Outside air quantity - Heating pump	m ³ /h/Pa	2000/120	2000/120	
Engine power - Fan	kW	0,2-0,4	0,36-0,8	0,36-0,8
Kompressor capacity - Dehumidification	kW	1,5	1,8	2,9
Heat surplus in case of Dehumidification	kW	4,7	5,7	7,6
Postheater PWW 70/60	kW	7,92	12,4	12,4
Postheater PWW 50/45	kW	3,2	5,5	5,5
Air inlet	°C/r.F.	30/55	30/55	30/55
Water quantity / Pressure loss	m ³ /h/kpa	0,7/20	1,1/30	1,1/30
Length x Height x Width	mm	1326/1700/680	1326/1700/680	1326/1700/680
Water quantity / Condenser	m ³ /h/kPa	1,4/18	1,76/21	2,54/22
AIR-WATER PUMPE ,LWP*		LWP	LWP	
Heating capacity L20/W35	kW	8,8	11	
Power input / load factor	kW /n	2,05/4,29	2,50/4,4	
Heating capacity L10/W35	kW	7	10,3	
Power input / load factor	kW /n	2,09 /3,34	2,80/3,67	
AIR-WATER PUMPE , Split*		Split	Split	Split
Heating capacity L20/W35	kW	9,5	11	15,6
Power input / load factor	kW /n	1,9/5,0	2,24/4,91	3,1/5,03
Heating capacity L10/W35	kW	7,1	8,94	12,85
Power input / load factor	kW /n	1,93/3,67	4,1	3,2/4,01
Heating capacity L2/W35	kW	6,15	7,3	10,5
Power input / load factor	kW /n	1,93/3,18	2,3/3,17	3,2/3,28
Heating capacity L-10/W35	kW	4,8	5,6	8
Power input / load factor	kW /n	1,9/2,52	2,34/2,39	3,2/2,5
Heating capacity L-20/W35	kW	3,92	5,21	6,9
Power input / load factor	kW /n	1,8/2,17	2,4/2,17	3,0/2,30
Salt water compatible HEAT PUMP				
Heating capacity –Salt water 0°C / W35	kW	7,0	9,62	12,7
Compressor performance / load factor	kW	1,7/4,1	2,39/4,2	2,8/4,53
Heating capacity Salt water 15°C / W35	kW	9,53	12,85	17
Compressor performance / load factor	kW	1,7/5,6	2,38/5,4	2,9/5,86
Salt water with 35% Glycol percentage	m ³ /h/kpa	2,3/26	2,8/26	4,05/40
WATER- HEAT PUMP				
Heating capacity - Well Water 10°/4°C W35	kW	8,23	11,15	14,55
Compressor performance	kW	1,83/4,49	2,08/4,56	2,93/4,67
Cooling capacity 6/12 °C (Optional)	kW	5,60	7,66	10,05
Compressor performance	kW	2,21	2,65	3,71
Water quantity/ load factor	m ³ /h/kpa	1,4/18	1,76/21	2,54/22
COMPRESSOR	Typ	ZH06K1P-TFM	ZH09K1P-TFM	ZH12K1P-TFM
Refrigerant		R410A	R410A	R410A
Max. Total power input	kW	2,29	2,96	3,8
Max. operating current / starting current	A	6 / 38	7 / 46	10,3/49,3
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50

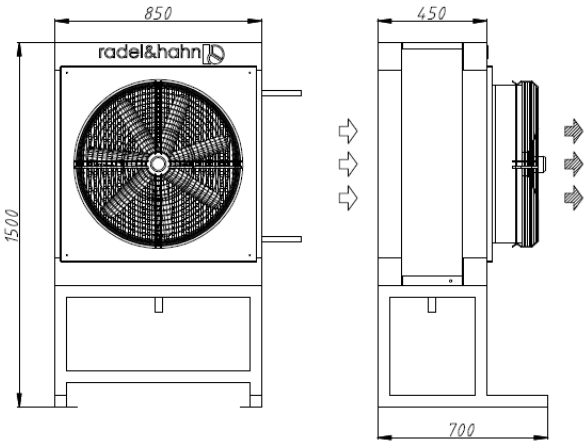
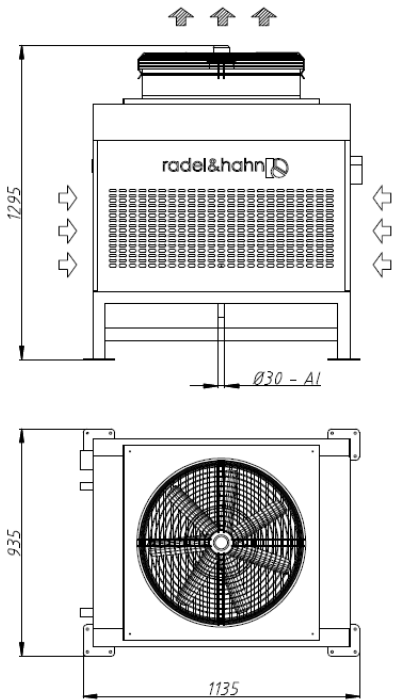
EWP – Dimensions



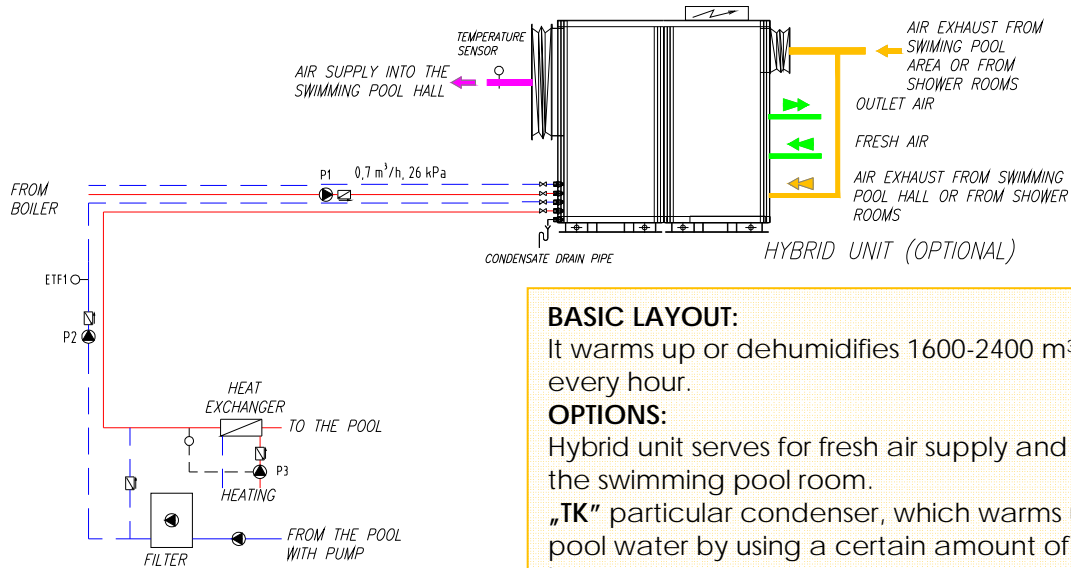
SPLIT UNIT

Horizontal design

Vertikal design



Function scheme



BASIC LAYOUT:

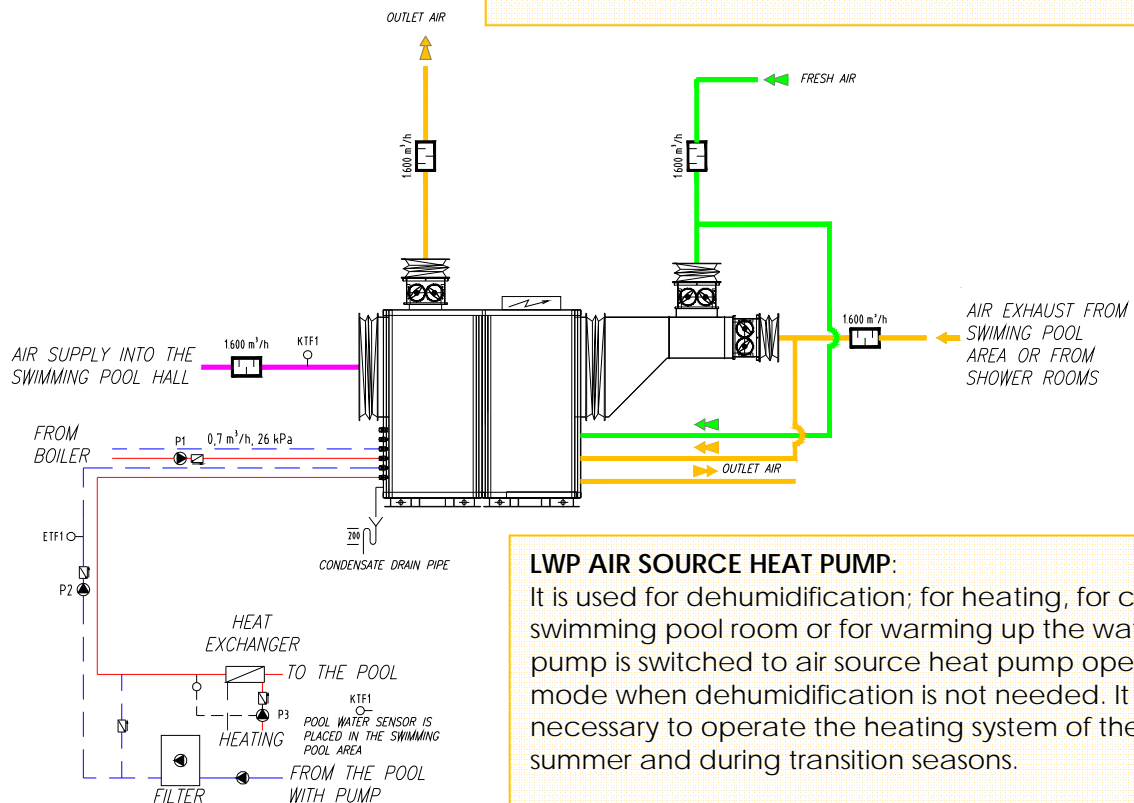
It warms up or dehumidifies 1600-2400 m³ air quantity in every hour.

OPTIONS:

Hybrid unit serves for fresh air supply and for ventilation in the swimming pool room.

„TK“ particular condenser, which warms up the swimming pool water by using a certain amount of condensation heat.

„K“ full condenser is really significant, when solar radiation is very strong during summer, because the full amount of the heat gained through condensation used for warming up the swimming pool water, which results that the air of swimming pool room cools down.



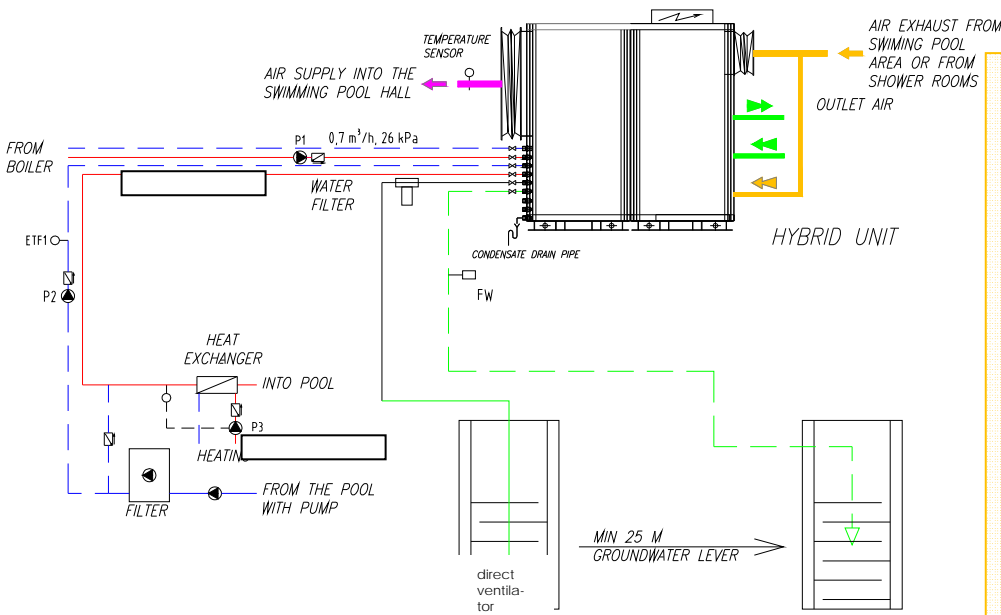
LWP AIR SOURCE HEAT PUMP:

It is used for dehumidification; for heating, for cooling the swimming pool room or for warming up the water if heat pump is switched to air source heat pump operational mode when dehumidification is not needed. It is not necessary to operate the heating system of the during the summer and during transition seasons.

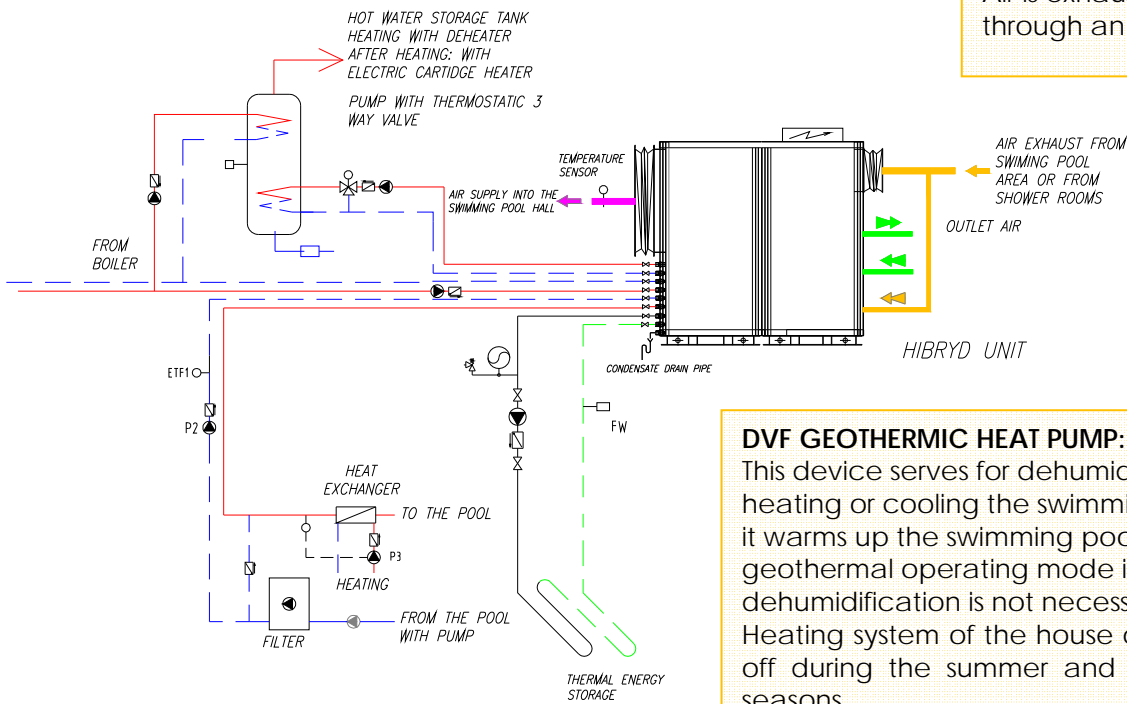
OPTIONS:

Hybrid unit, which used for fresh air supply and for ventilation of the swimming pool room.

Function scheme

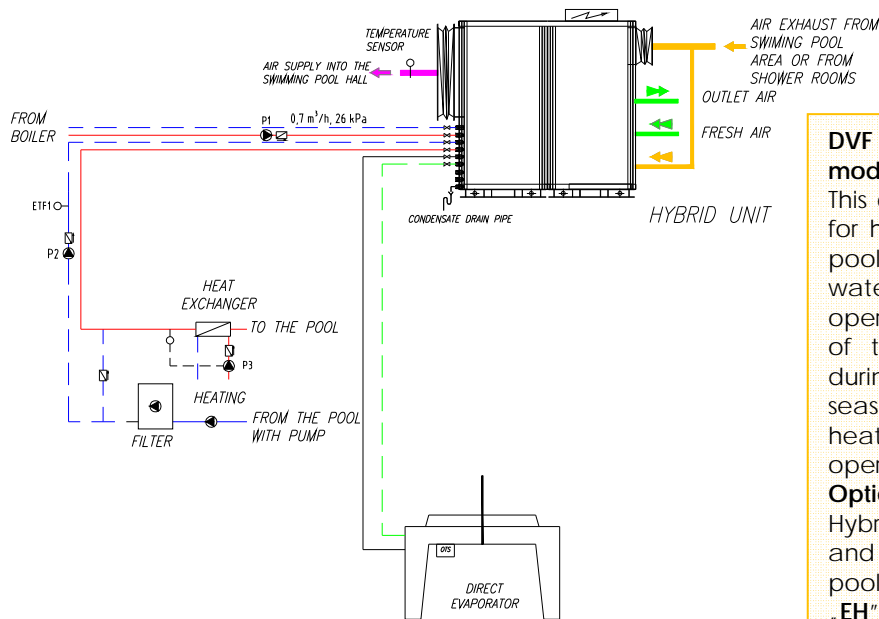


Split AIR PUMP:
 It is used for dehumidification; for heating and cooling of the swimming pool room or air-heat pump can be switched on when dehumidification mode is off. It is not necessary to operate the heating system the during the summer and during transition seasons.
 If additional electric heating is available, the heat pump can be operated without any heater, until outer temperature falls under 20°C degree.
OPTIONALLY INTEGRATED ELEMENTS:
Hybrid unit serves for fresh air supply and for ventilation in the swimming pool room.
Deheater serves for hot water supply.
 Integrated direct evaporator
 Air is exhausted outdoor through an air duct system



DVF GEOTHERMIC HEAT PUMP:
 This device serves for dehumidification; for heating or cooling the swimming pool room or it warms up the swimming pool water, if geothermal operating mode is set, but dehumidification is not necessary.
 Heating system of the house can be switched off during the summer and during transition seasons.
OPTIONS: A hybrid unit serves for fresh air supply and for ventilation in the swimming pool room.
 „EH“ deheater serves for warming up of the domestic hot water or it cools the air in the house during summertime.

Function scheme



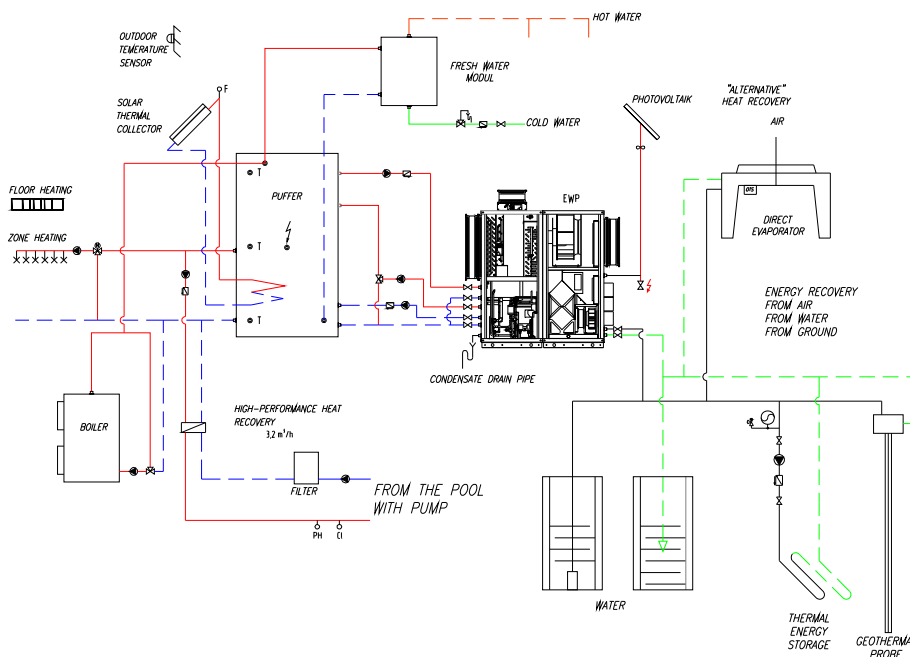
DVF HEAT PUMP for well water operating mode

This device serves for dehumidification; for heating and cooling the swimming pool room; or serves for warming up the water, when water heat pump operational mode is on. Heating system of the house can be switched off during the summer and during transition seasons. If we use additional electric heating, heating pump can be operated during the whole year.

Options:

Hybrid fan serves for the fresh air supply and for ventilation in the swimming pool room.

„EH“ deheater serves for warming up of the domestic hot water



Connection with the heating system of the house:

It is used for dehumidification; for heating or cooling of the swimming pool room; or serves for warming up the water in operation mode of solar assisted heat pump. If outside temperature is low, it is necessary to switch on the heater additionally or the use of electric heating can be considered alternatively.

OPTION:

Hybrid fan serves for the fresh air supply and for ventilation in the swimming pool room.

A deheater serves for warming up of the domestic hot water.

We generate electric power by operating solar collectors.

EGKR swimming pool dehumidifier

...for wellness and public swimming pools

What advantages do these machines have?

It allows more energy savings

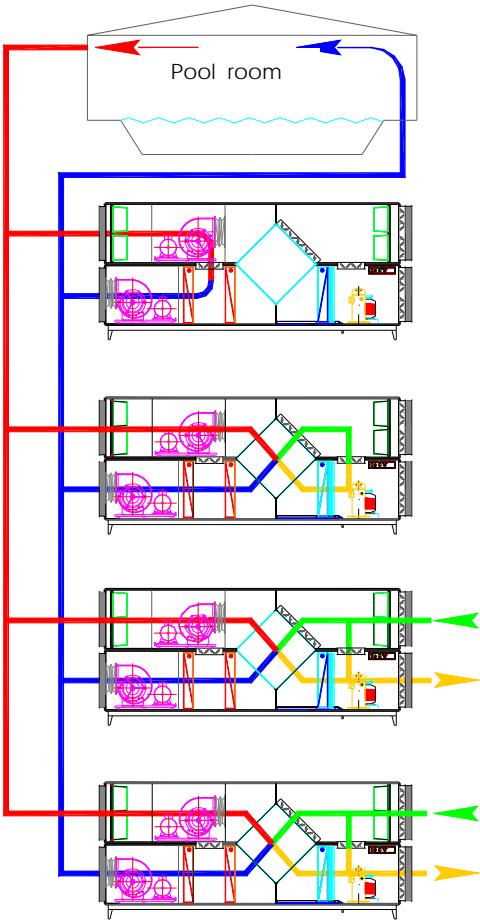
EGKR swimming pool dehumidifier machines are equipped with recuperative heat exchanger, so it is enough to integrate a compressor of smaller size, so the power consumption of the machine can be decreased drastically.

We can save more energy this way!

More fresh air can be gained!

The amount of fresh air can be set freely between 0 and 100% közt. And what's more EGKR swimming pool dehumidifier operates very energy saving.

Fields of application: private and public swimming pools. EGKR machines are equipped in different measure.



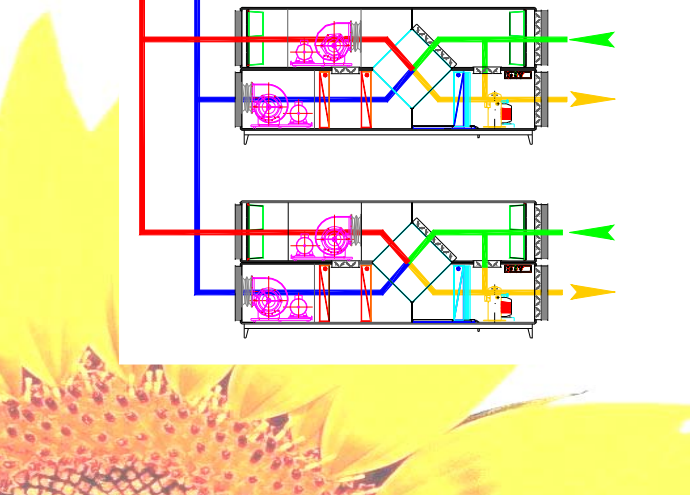
Schematic diagram of operation

Heating

Heat pump operating mode
Heat recovery

Heat pump operating mode
Heat recovery by fresh air supply, with Bypass-section

Fresh air operating mode only

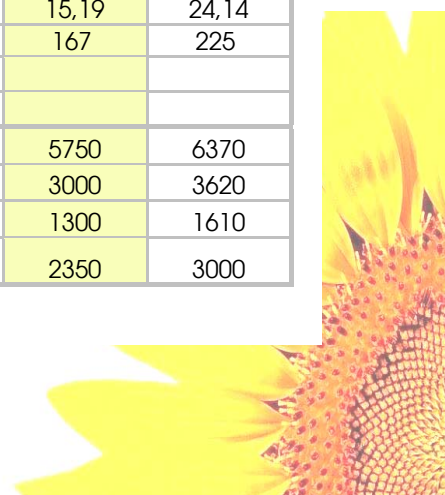


EGKR Swimming pool dehumidifier – Technical data

		EGKR-25	EGKR-43	EGKR-70	EGKR-96	EGKR-125	EGKR-200
Performance data							
Indoor air 30°C 55% r.F.							
Water temperature 28°C							
Outdoor air 8°C 85% r.F.							
FIELDS OF APPLICATION							
Pool size		30 - 120	50 - 200	84 - 336	115 - 460	150 - 600	240 - 960
Indoor temperature		22 - 36	22 - 36	22 - 36	22 - 36	22 - 36	22 - 36
Dehumidification - With recirculated air	kg/h	7,8	13,5	21,8	30	39	55
Dehumidification - With 30% fresh air	kg/h	17	29	47	65	84	110
Airflow rate							
Air volume (Supply/Exhaust air)	m³/h	2500/1666	4300/2867	7000//4667	9600/6400	12500/8333	20000/13333
Engine capacity - supplied air fan	KW	1,5/0,5	2,2/0,75	3/0,9	4/1,2	5,5/1,8	8,5/3
Engine capacity - exhaust air fan	KW	1,5/0,5	2,2/0,75	3/0,9	4/1,2	5,5/1,8	8,5/3
Outer Pressure/ per airstream	Pa	250	250	250	250	250	250
HEAT CAPACITY							
PWW 70/60°C, LE=30°C	KW	12	21	35	47	61	98
PWW 50/45°C, LE=30°C	KW	9	15	24	33	43	68
Heating water volume	m³/h	1,1	1,8	3	4	5,3	8,4
Surplus heat amount produced during dehumidification	KW	8,5	14	23	32	41	66
Heat amount used for warming up the pool water	KW	2	3,5	5,6	7,7	10	16

ELECTRICAL DATA AND DIMENSIONS

		EGKR-25	EGKR-43	EGKR-70	EGKR-96	EGKR-125	EGKR-200
ELECTRICAL DATA							
Compressor capacity	KW	1,63	3,11	4,06	5,52	8,25	13,5
Operating current	V/Ph	400/3	400/3	400/3	400/3	400/3	400/3
Nominal current	A	3,54	6,8	8,77	11,53	15,19	24,14
Maximal starting current	A	40	65,5	101	123	167	225
DIMENSIONS - WEIGHT							
Full length	mm	3890	4200	4820	5130	5750	6370
Full height	mm	1720	1720	2340	2340	3000	3620
Width	mm	680	990	990	1300	1300	1610
Weight	kg ca.	680	850	1100	1500	2350	3000



Air ducts and optional accessories

We deliver and assemble complete ventilation systems at the scene of integration based on customer request. Elements are made of galvanized steel plate; aluminium; stainless steel. Air ducts are insulated where it is needed. We usually insulate the outer surface of air ducts with aluminum coated insulation. Air duct connections are covered with aluminium bands. The air ducts, which serve for fresh air supply, are insulated with Armaflex insulation material to avoid condensation.

When sizing an air duct system, we carefully observe the relevant technical requirements. We pay special attention for acoustic insulation. The airflow velocity is 4-6 m/s inside the air ducts, so we install silencers in the air duct system, which makes operation economical and pleasant.

The air volume supplied by **EWP**-devices can be vary considering the given situation.

Installation of air ducts



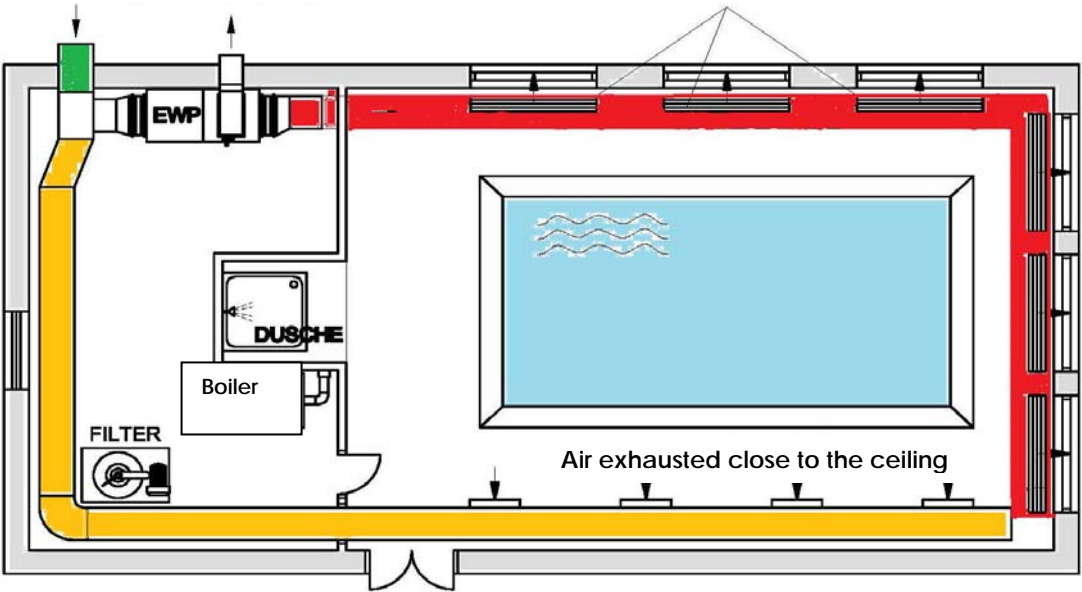
Air outlet grille mainly integrated into the floor around the swimming pool. Air is supplied into the swimming pool hall through nozzles / openings of the ceiling. Air outlet is made of galvanized aluminium and we can freely walk on it. Lamellas are turned with 15° toward the window, so a hot air heat curtain is created in front of the window. So condensation on the surface of the window can be avoided this way.

As if we circumvented the laws of physics!

The width of the grille is 110 mm. Lamellas can be easily pulled out from their frame, when their cleaning is needed and they are made from natural anodised aluminium. Exhaust air streams through aluminium grilles which are integrated into the wall close to the ceiling, in the opposite side of the supply openings.

Fresh air supply in heat pump mode

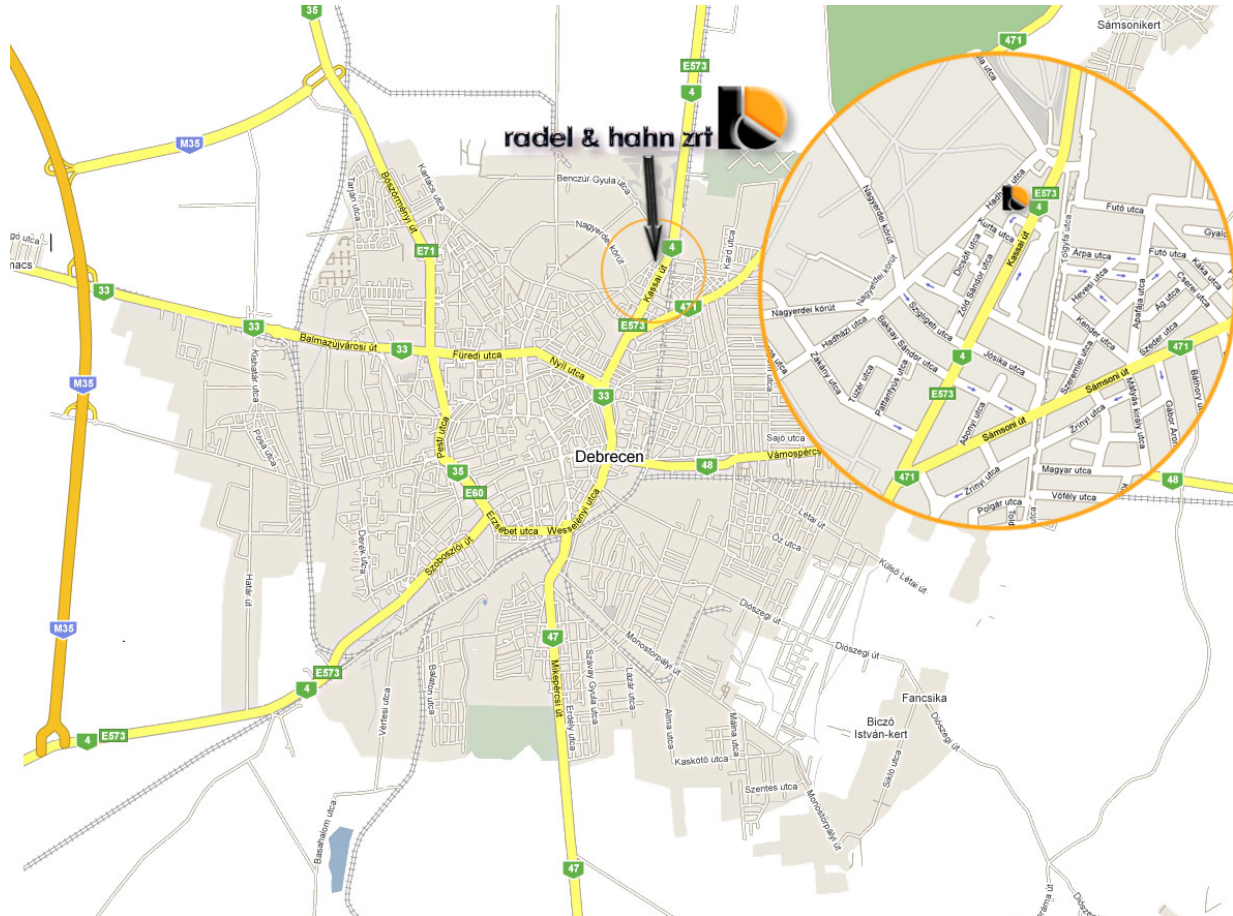
Air supply through walkable floor grille



The usual method of mounting of AF15AG supply grille

Toward the house

Roads leading to our facility!



HEADQUATER:

radel & hahn Klimatechnik GesmbH
 Wienerstraße 22
 A - 7210 Mattersburg

Tel.: 0043 2626 62744
 Fax: 0043 2626 65259

e-mail: office@radel-hahn.at
 web: www.radel-hahn.at

radel & hahn zrt.
 Kassai ut. 92
 H-4028 Debrecen

Tel.: 0036 52 410 804
 Fax: 0036 52415 258

e-mail: info@radel-hahn.hu
 web: www.radel-hahn.hu

radel & hahn Srl.
 Str. XI-a, nr. 84
 Ro – 307395 Comuna Sag, Timisoara

Tel.: 0040 356100-608
 Fax: 0040 356100-609

e-mail: office@radel-hahn.ro
 web: www.radel-hahn.ro