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HYDRA PRO



# INTRODUCTION

As a company we are devoted to creating ideal work environments with minimal expenses and to developing products that can satisfy even the most rigorous of quality and energy efficiency standards. Through compliance with sustainable development principles, our efforts are aimed at Termovent's future evolution.

Cleanroom is an environment that has a controlled level of contamination that is specified by the number of particles per cubic meter for the appropriate particle size.

Termovent specializes in production of modular panel systems, which are used in the field of clean room technology.

The whole system is aligned with GMP and FDA directives, as well as ISO 14644 standard. Compliance with applicable regulations in the field of clean room technology enables its use in rooms from ISO 9 to ISO 1 class (GMP classes A, B, C and D).



# OVERVIEW

Production facility:  
**Kladovo, Serbia**

**PART OF  
SWISS  
CORPORATION  
ARBONIA  
GROUP**

HQ  
**Belgrade  
Serbia**

Founded  
**1993**

Modular component systems are easily integrated with all other systems. By combining a variety of materials in panel production for cleanrooms, Termovent company offers a vast range of use in:

Pharmaceutical industry,  
Micro-electronics,  
Chemical industry,  
Food industry,  
Health facilities,  
Laboratories etc.

A team of young experts that is responsible for cleanrooms development consists of a group of people that participated in international competitions throughout Europe and Asia, and with their experience, hard work and devotion they are responsible for the great satisfaction of our partners.

Through the pursuit of modernization and contemporaneous business, the entire production and design system is based on automation and BiM design.





# CONTENT

INTRODUCTION	1
WHY DO YOU NEED US	5
SWIMMING POOL AIR HANDLING UNITS	7
HYDRAPRO COMPACT BASIC	11
HYDRAPRO COMPACT GENIUS	15
HYDRAPRO BASIC	19
HYDRAPRO GENIUS	23
DESIGNING RECOMMENDATION	27
REFERENCES	29
TERMOVENT AHU FAMILY	31
QUALITY MANAGEMENT SYSTEM	34





K15 Apartments, Senjak

## WHY DO YOU NEED US?

We provide and guarantee:

- Microclimate conditions that will allow:
  - great comfort
  - genuine relaxation
  - good mood
- Excellent quality in all stages and by all parameters:
  - system design
  - high thermal effects
  - modular construction
  - high-quality components
  - reliable system performances
  - reliable operation in all climate conditions

- The best prices:
  - optimal prices and low costs
  - value for money
- Special exploitation effects:
  - saving energy costs
  - controlled adverse effects of moisture on the swimming pool facility
- The lowest maintenance costs.

## IDEAL MICROCLIMATE CONDITIONS

- water temperature from 28° C to 32° C (sometimes even higher)
- air temperature from 30° C to 34° C
- relative humidity from 40% to 64%
- pool hall air flow speeds up to 0.25 m/s
- noise level up to 45db
- the highest hygiene levels

A broader range of water and air temperature can be provided in higher comfort-level swimming pools with proper temperature in the peripheral areas.

## HVAC FACILITY REQUIREMENTS

Efficient and continuous maintenance of microclimate conditions ensure:

- discharge of excess humidity from the hall - drying the air
- inlet and outlet of temperature into/out of the hall
- discharge of unpleasant odor by indoor-outdoor air exchange
- proper distribution of the air in the hall
- continuous monitoring of and synchronization with the external weather conditions
- noiseless operation
- minimal energy consumption
- state-of-the-art equipment
- reliable operation





Air handling unit production has been the core business of Termovent for 27 years, ever since the company's establishment. The innovations collected for years all over the world, coupled with the knowledge and experience of our employees, are used in production and execution of projects worldwide in the highly demanding field of pharmaceutical industry.



### HYDRapro COMPACT BASIC

Designed for home swimming pools, with small pool surface area.

Small dimensions, high energy savings at the double plate heat exchanger and a relatively low price are the features that make this air handling unit very popular.



### HYDRapro BASIC

Designed for all types of swimming pools, ranging from home to Olympic size pools.

The great energy savings at the plate heat exchanger and its acceptable price, place this air handling unit among the most sought-after swimming pool units that attract our customers.

### HYDRapro COMPACT GENIUS

Ideal for home swimming pools, with a small pool surface area.

Energy savings, the regulation of humidity and temperature regardless of outdoor conditions and small dimensions are the features that customers rely on. The air handling unit has two-step recuperation at the double heat exchanger and heat pump. The return on investment of the heat pump installation is one year of exploitation.



### HYDRapro GENIUS

Ideal for all types of swimming pools, ranging from home to Olympic size pools.

The highest level of comfort and a wide range of regulation parameters is what makes this air handling unit very popular with those seeking the first-class experience. Besides energy savings and temperature and humidity regulation, the unit has a two-step heat recuperation at the plate heat exchanger and heat pump. The return on investment on the heat pump installation is one year of exploitation.







### DIRECT DRIVE FANS

- contributes to the reduction of the air handling unit size
- simple air flow regulation
- integrated frequency regulator
- high energy efficiency

### PLATE HEAT EXCHANGER

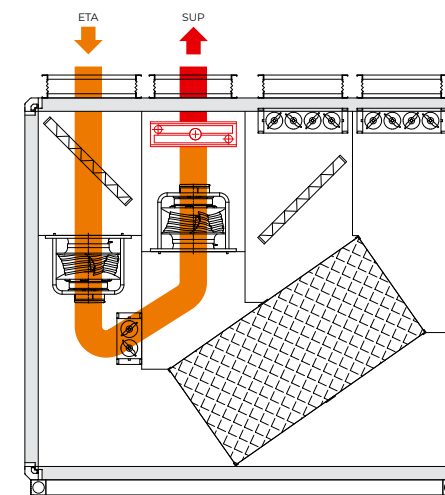
- over 60% energy savings
- made of aluminum lamellar panels
  - low pressure drops
  - no air currents mixing



### HEAT PUMP

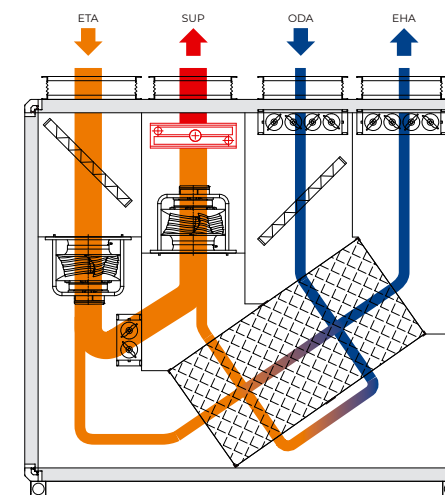
- maximum level of utilization (COP)
- compressor with "Digital Scroll" technology
- vaporizer and condenser are made of aluminum lamellar panels and copper pipes
- high energy savings
- indoor humidity regulation independent of outdoor conditions





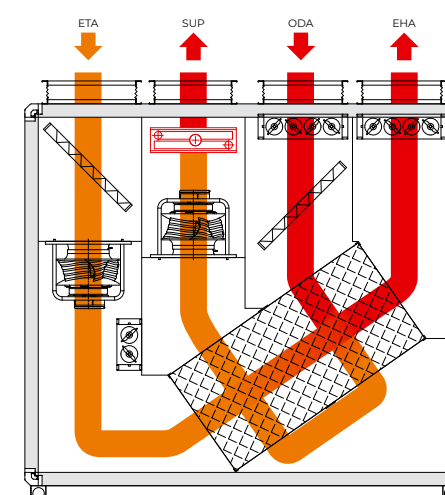
### STARTING MODE FOR FAST HEATING IN WINTER PERIOD

Heated air is discharged into the swimming pool hall by fans which blow air into the area over a recirculation damper, filter and a hot-water heater.



### DEHUMIDIFICATION MODE IN WINTER PERIOD

A highly economical mode that allows large volumes of fresh air to be discharged via the double plate heat exchanger, while a certain volume of air goes via the recirculation damper. Before it is discharged into the swimming pool hall, the air thus conditioned is additionally heated by the hot-water heater.



### DEHUMIDIFICATION MODE AT HIGHER OUTDOOR TEMPERATURES

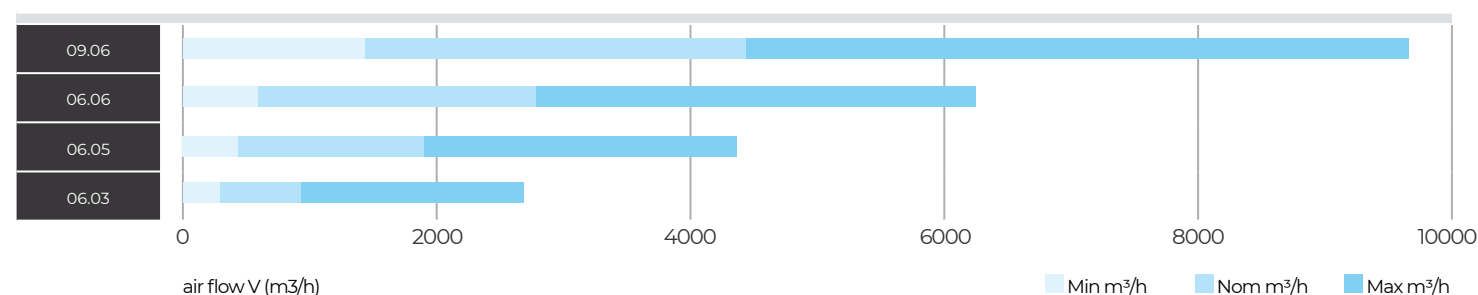
Better known as "energy saving" mode because the hot-water heater is off, this mode uses only the thermal energy of the hall air, which is then transferred to fresh air via the plate heat exchanger.

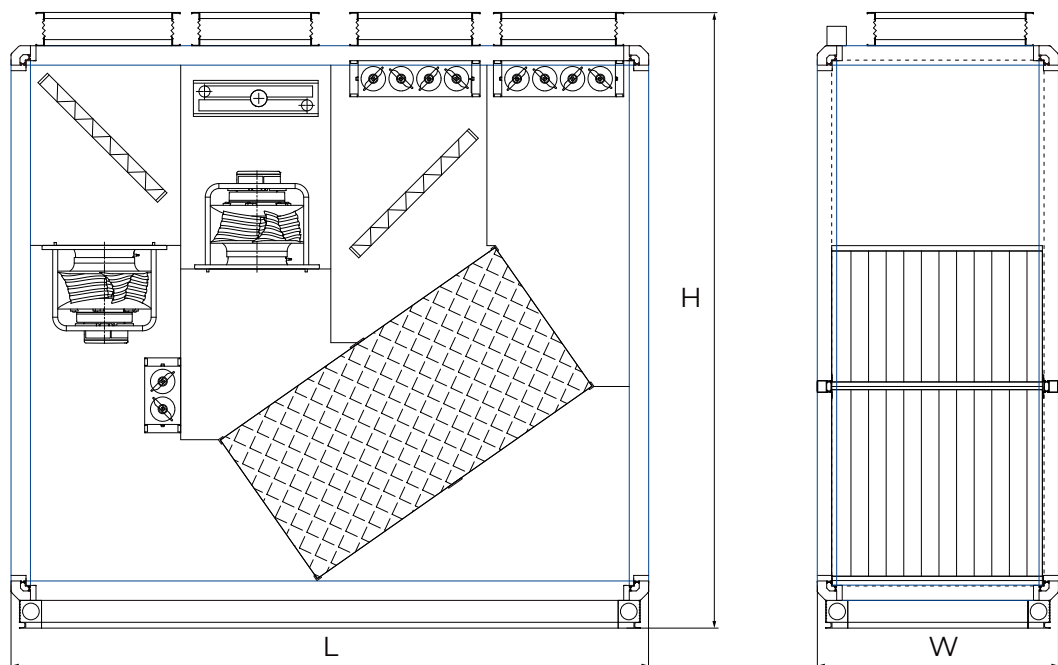
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Main features		min	max
Air flow	m <sup>3</sup> /h	450	3400
Dehumidification as per VDI 2089	kg/h	2.8	21.3
Double plate heat exchanger heat recovery	%	70	85

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Unit type	Nominal air flow	Dimensions *		
	m³/h	W (mm)	H (mm) <sup>1</sup>	L (mm)
06.03	800	720	1770	1860
06.05	1500	820	2020	2060
06.06	2200	870	2220	2300
09.06	3400	1025	2320	2700

Unit type	Min	Nom	Max
	m³/h	m³/h	m³/h
06.03	450	800	1600
06.05	650	1500	2500
06.06	850	2200	3400
09.06	1450	3400	4800

\* Dimensions vary depending on selected execution (indoor/outdoor, type of PHE)

## REGULATION

- humidity regulation
- air temperature regulation
- fan control
- damper control
- hot-water heater control

## INFORMATION

- information on the external, internal and discharge air humidity status
- information on the external, internal and discharge air temperature status
- information on filter contamination
- information on the system malfunction

		Unit type			
		06.03	06.05	06.06	09.06
Nominal air flow	m³/h	800	1500	2200	3400
Dehumidification capacity [VDI 2089]	kg/h	4.9	9.2	13.5	20.9
Filtration according to EN 779:2012 ISO 16890					
Fresh air			M5   ePM10 60%		
Return air			M5   ePM10 60%		
Double plate heat exchanger					
Material		Polypropylene			
Heat recovery efficiency [EN 308] <sup>1</sup>	%	82	82	82	84
Heat recovery class [EN 13053]	%	H1	H1	H1	H1
External pressure drop *					
Fresh and supply air duct	Pa	300	300	300	300
Return and exhaust air duct	Pa	300	300	300	300
Hot water coil <sup>2,3</sup>					
Heating capacity	kW	3.1	5.8	8.4	13.0
Water flow rate	m³/h	0.13	0.25	0.37	0.57
Water pressure drop	kPa	0.5	1.9	1.8	2.3
Connections	DN	20	20	20	20
Electrical data <sup>4</sup>					
Rated input - supply air fan	kW	0.23	0.45	0.66	1.04
Rated input - return air fan	kW	0.20	0.35	0.51	0.80
Total electrical power rating	kW	0.43	0.80	1.17	1.84
Total current consumption	A	5.0	7.6	13.2	13.6
Sound power level <sup>5</sup>					
Supply air connection	dB(A)	69	66	63	66
Return air connection	dB(A)	76	71	69	71
Fresh air connection	dB(A)	67	63	60	64
Exhaust air connection	dB(A)	74	68	65	68
Acoustic pressure in 1 m distance from device	dB(A)	76	71	69	71
Operating voltage	1~ 230V 50Hz				

1 Depends on operation conditions

2 At supply temperature 40°C for nominal air flow, FL = 60 °C , SA=40 °C

3 Inlet conditions after double plate heat exchanger

4 With average filter contamination

5 At 250 Hz mid-band frequency

The data is valid for the following parameters:	
Indoor temperature	30°C
Indoor relative humidity	54%
Outdoor temperature and relative humidity winter	-15°C/90%
Outdoor temperature and relative humidity summer	33°C/33%

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





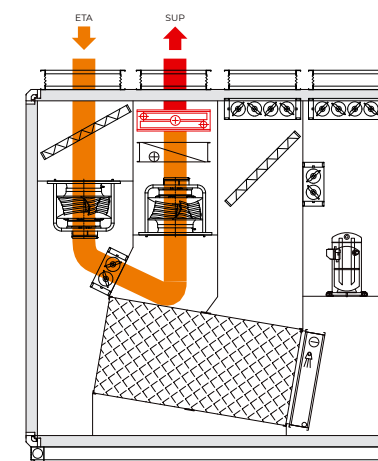
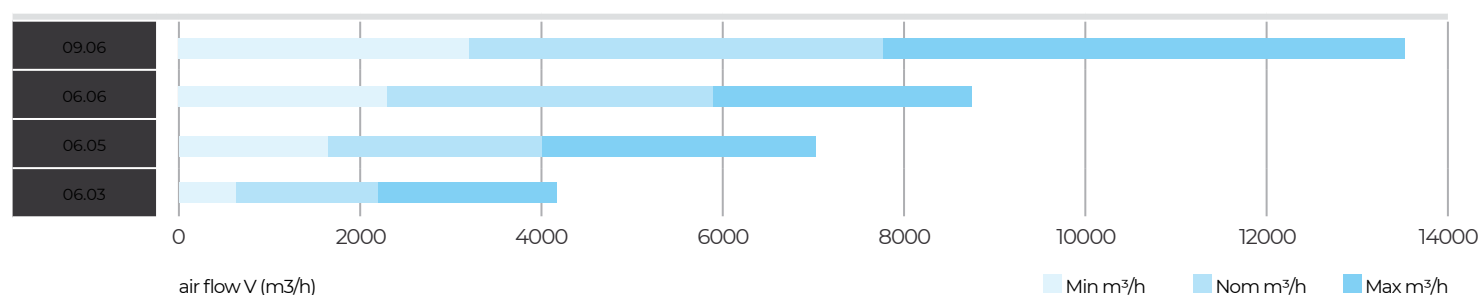
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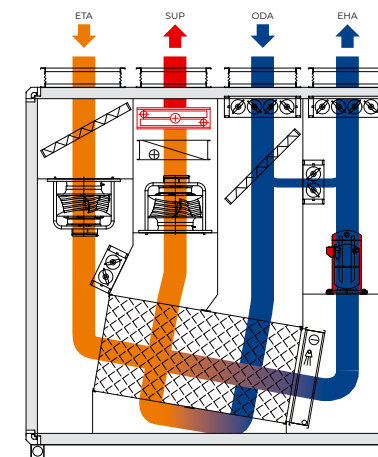
Main features		min	max
Air flow	m <sup>3</sup> /h	1000	4000
Dehumidification as per VDI 2089	kg/h	6.3	25.1
Double plate heat exchanger heat recovery	%	70	85

hydra | pro CompactGenious | AHU air flow diagram



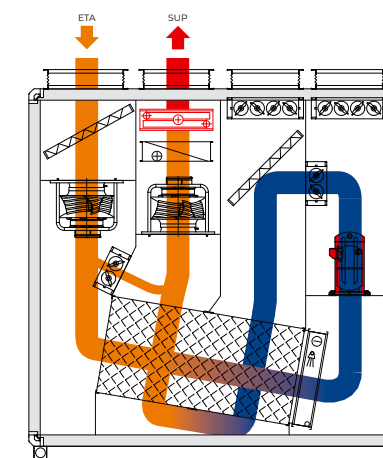
### STARTING MODE FOR FAST HEATING IN WINTER PERIOD

Heated air is discharged into the swimming pool hall by fans, as well as a recirculation damper, filter and a hot-water heater.



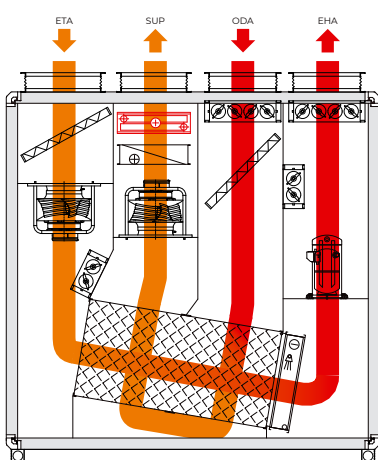
### DEHUMIDIFICATION MODE IN WINTER PERIOD WITHOUT USERS

This economical mode operates with 100% recirculation air, by reducing absolute air humidity at the heat pump vaporizer. The dehumidified air is then heated at the condenser and discharged into the swimming pool area.



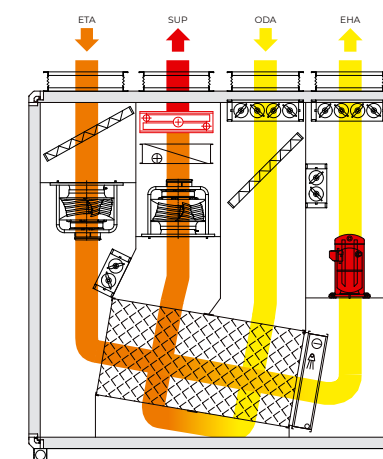
### DEHUMIDIFICATION MODE IN WINTER PERIOD WITH USERS

Dehumidification in winter period with high energy savings is achieved by discharging volumes of fresh air via the double plate heat exchanger, while a certain volume of air goes via recirculation damper. The waste air heats fresh air via a double plate heat exchanger. The heat is then transferred to the heat pump vaporizer which returns the given energy to the condenser. The air treated in this way is additionally heated in the hot-water heater and discharged into the swimming pool area.



### DEHUMIDIFICATION MODE IN TRANSITIONAL PERIOD

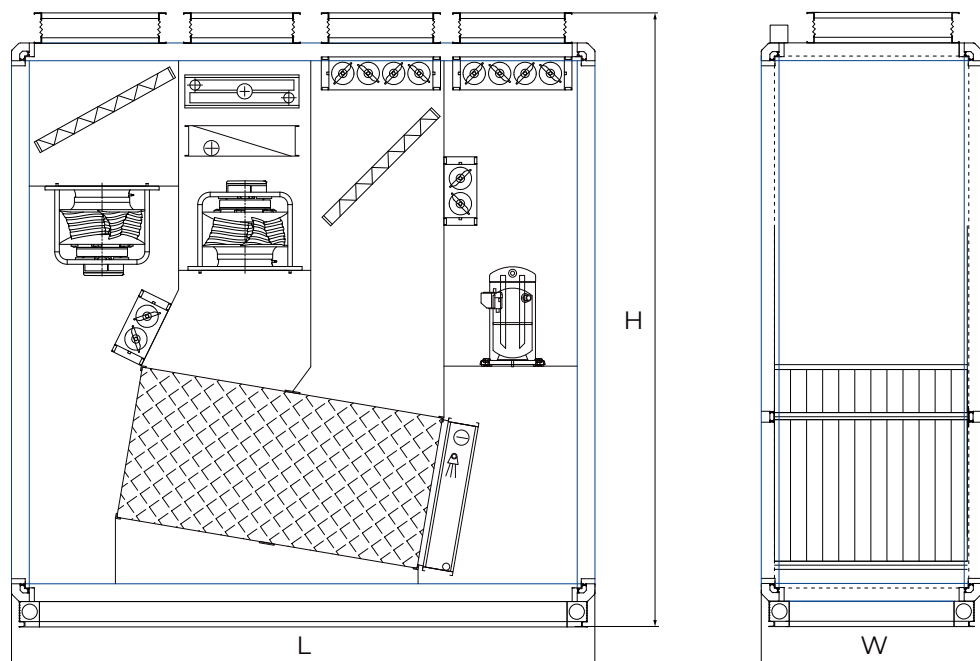
Dehumidification is done by introducing 100% fresh air. The swimming pool area air heats fresh air via the plate heat exchanger. The heat then transferred to the heat pump vaporizer that transfers it to the condenser and discharges it into the swimming pool hall.



### DEHUMIDIFICATION MODE AT HIGHER + OUTDOOR TEMPERATURES

Better known as "energy saving" mode because the hot water heater is off. This mode uses only the thermal energy of the hall air, which is then transferred to fresh air via the plate heat exchanger.





Unit type	Nominal air flow	Dimensions *		
	m³/h	W (mm)	H (mm) <sup>1</sup>	L (mm)
06.03	1500	720	2020	1860
06.05	2500	820	2220	2060
06.06	3500	870	2420	2300
09.06	4600	1025	2670	2620

Unit type	Min	Nom	Max
	m³/h	m³/h	m³/h
06.03	1000	1500	2000
06.05	1800	2500	3000
06.06	2700	3500	4000
09.06	3600	4600	5200

\* Dimensions vary depending on selected execution (indoor/outdoor, type of PHE)

## REGULATION

- humidity regulation
- air temperature regulation
- fan control
- damper control
- hot-water heater control

## INFORMATION

- information on the external, internal and discharge air humidity status
- information on the external, internal and discharge air temperature status
- information on filter contamination
- information on the system malfunction

		Unit type			
		06.03	06.05	06.06	09.06
Nominal air flow	m³/h	1500	2500	3500	4600
Dehumidification capacity [VDI 2089]	kg/h	9.2	15.4	21.5	28.3
Filtration according to EN 779:2012 ISO 16890					
Fresh air			M5   ePM10 60%		
Return air			M5   ePM10 60%		
Double plate heat exchanger					
Material		Polypropylene			
Heat recovery efficiency [EN 308] <sup>1</sup>	%	60	62	65	66
Heat recovery class [EN 13053]	%	H4	H4	H3	H3
Integrated heat pump <sup>1</sup>					
Heating capacity	kW	7.4	8.4	9.8	14.2
Heating capacity of heat pump	COP	4.5	5.4	5.5	5.6
External pressure drop *					
Fresh and supply air duct	Pa	300	300	300	300
Return and exhaust air duct	Pa	300	300	300	300
Hot water coil <sup>2,3</sup>					
Heating capacity	kW	8.4	13.2	17.1	24.7
Water flow rate	m³/h	0.37	0.57	0.74	1.07
Water pressure drop	kPa	3.3	9.2	6.3	9.1
Connections	DN	20	20	20	20
Electrical data <sup>4</sup>					
Rated input - supply air fan	kW	0.50	0.94	1.40	1.70
Rated input - return air fan	kW	0.37	0.67	0.97	1.27
Rated input - compressor	kW	1.66	1.55	1.79	2.52
Total electrical power rating	kW	2.53	3.16	4.16	5.49
Total current consumption	A	11.2	16.3	11.1	12.7
Sound power level <sup>5</sup>					
Supply air connection	dB(A)	72	74	74	74
Return air connection	dB(A)	78	83	79	82
Fresh air connection	dB(A)	65	65	73	72
Exhaust air connection	dB(A)	72	71	77	79
Acoustic pressure in 1 m distance from device	dB(A)	78	83	79	82
Operating voltage	1~ 230V 50Hz   3~ 400V 50Hz				

1 Depends on operation conditions

2 At supply temperature 40°C for nominal air flow, FL = 60 °C , SA=40 °C

3 Inlet conditions after double plate heat exchanger

4 With average filter contamination

5 At 250 Hz mid-band frequency

The data is valid for the following parameters:	
Indoor temperature	30°C
Indoor relative humidity	54%
Outdoor temperature and relative humidity winter	-15°C/90%
Outdoor temperature and relative humidity summer	33°C/33%

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





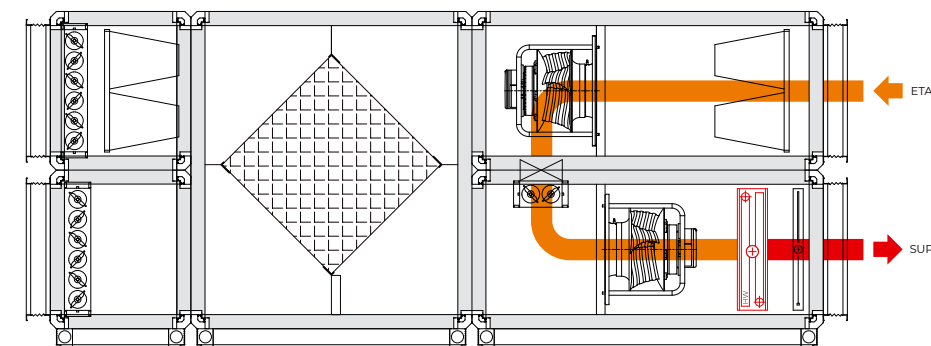
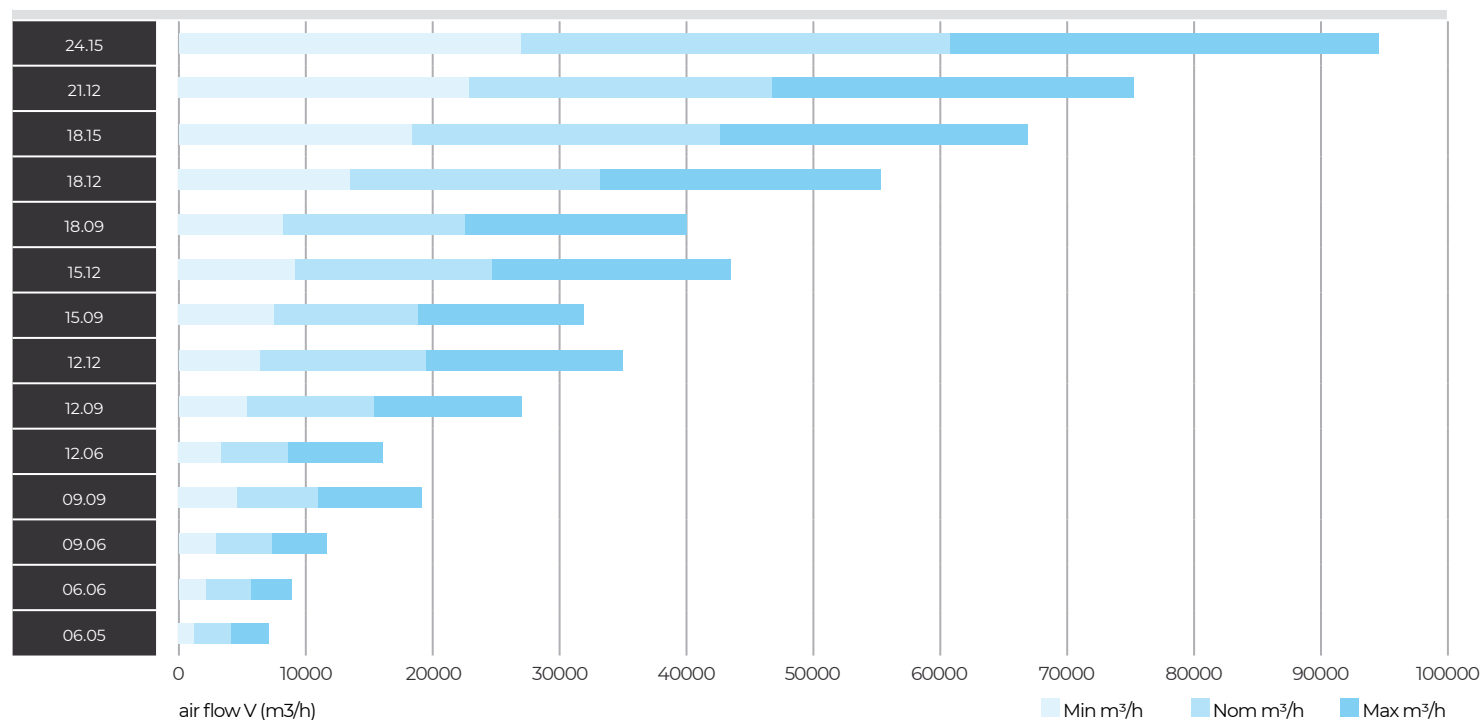
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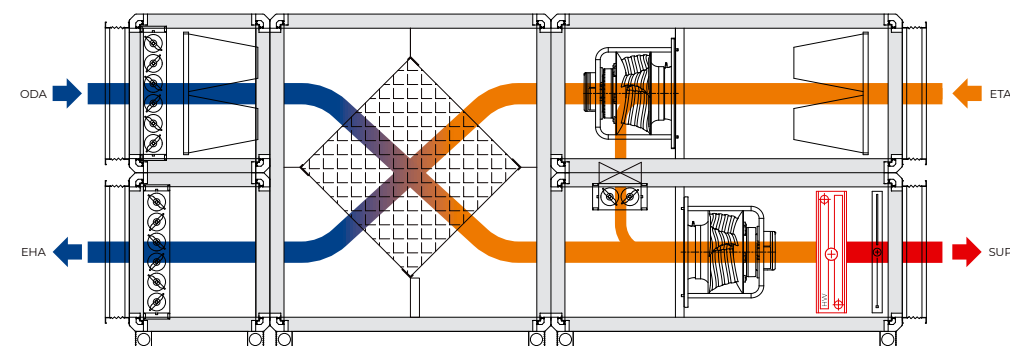
Main features		min	max
Air flow	m³/h	1200	37000
Dehumidification as per VDI 2089	kg/h	7.5	231.8
Double plate heat exchanger heat recovery	%	55	80

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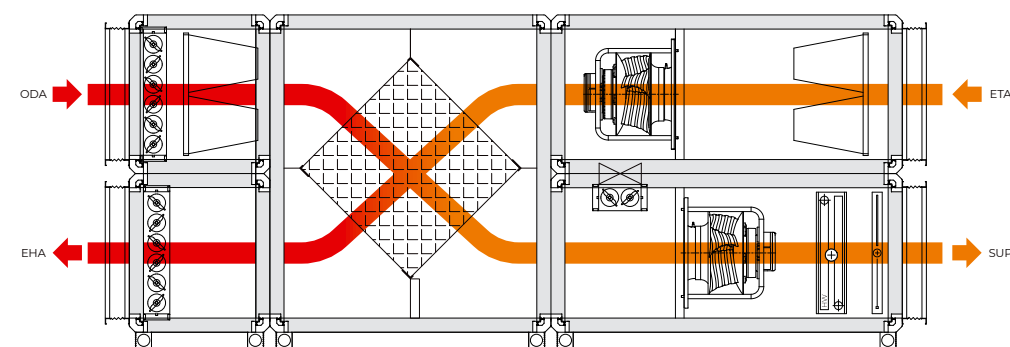
### STARTING MODE FOR FAST HEATING IN WINTER PERIOD

Heated air is discharged into the swimming pool hall by fans, as well as a recirculation damper, filter and a hot-water heater.



### DEHUMIDIFICATION MODE IN WINTER PERIOD

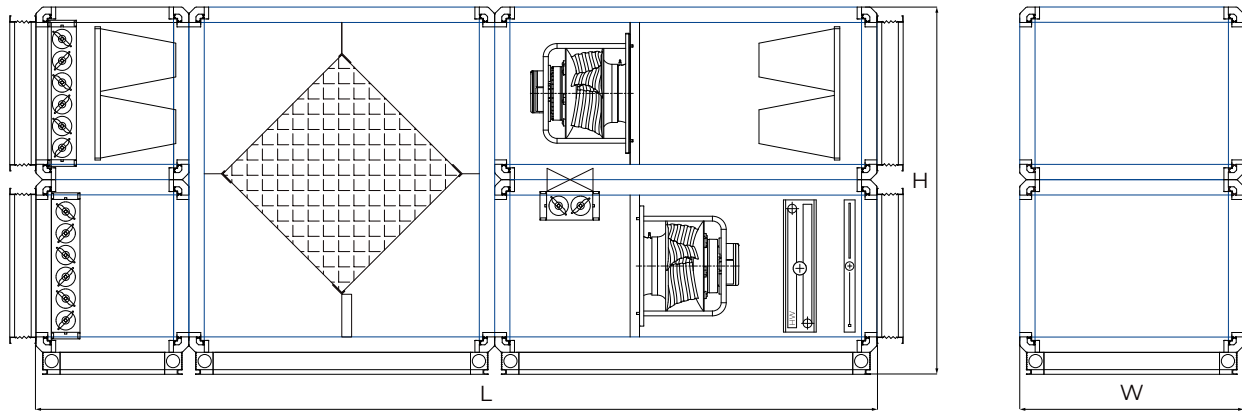
A highly economical mode that allows large volumes of fresh air to be discharged via the double plate heat exchanger, while a certain volume of air goes via recirculation damper. Before it is discharged into the swimming pool hall, the already conditioned air is additionally heated by the hot-water heater.



### DEHUMIDIFICATION MODE AT HIGHER OUTDOOR TEMPERATURES

Better known as "energy saving" mode because the hot-water heater is off. This mode uses only the thermal energy of the hall air, which is then transferred to fresh air via the plate heat exchanger.





Unit type	Nominal air flow	Dimensions *		
	m³/h	W (mm)	H(mm)	L (mm)
06.05	2100	720	1480	3590
06.06	2700	720	1680	3840
09.06	4100	1025	1680	3890
09.09	6400	1025	2290	4540
12.06	5200	1330	1680	4090
12.09	9000	1330	2290	4690
12.12	12000	1330	2900	4890
15.09	11000	1635	2290	4890
15.12	15000	1635	2900	4790
18.09	13500	1940	2290	4890
18.12	19000	1940	2900	5190
18.15	23000	1940	3205	5690
21.12	25500	2245	2900	5690
24.15	33000	2550	3205	5690

Unit type	Min	Nom	Max
	m³/h	m³/h	m³/h
06.05	1200	2100	3000
06.06	1800	2700	3700
09.06	2300	4100	5600
09.09	4400	6400	8000
12.06	3800	5200	6600
12.09	6400	9000	11200
12.12	7600	12000	16000
15.09	8000	11000	13500
15.12	10000	15000	19000
18.09	9000	13500	17600
18.12	13000	19000	23400
18.15	20000	23000	25000
21.12	22000	25500	28000
24.15	28000	33000	33500

\* Dimensions vary depending on selected execution (indoor/outdoor, type of PHE)

REGULATION

- humidity regulation
- air temperature regulation
- fan control
- damper control
- hot-water heater control

INFORMATION

- information on the external, internal and discharge air humidity status
- information on the external, internal and discharge air temperature status
- information on filter contamination
- information on the system malfunction

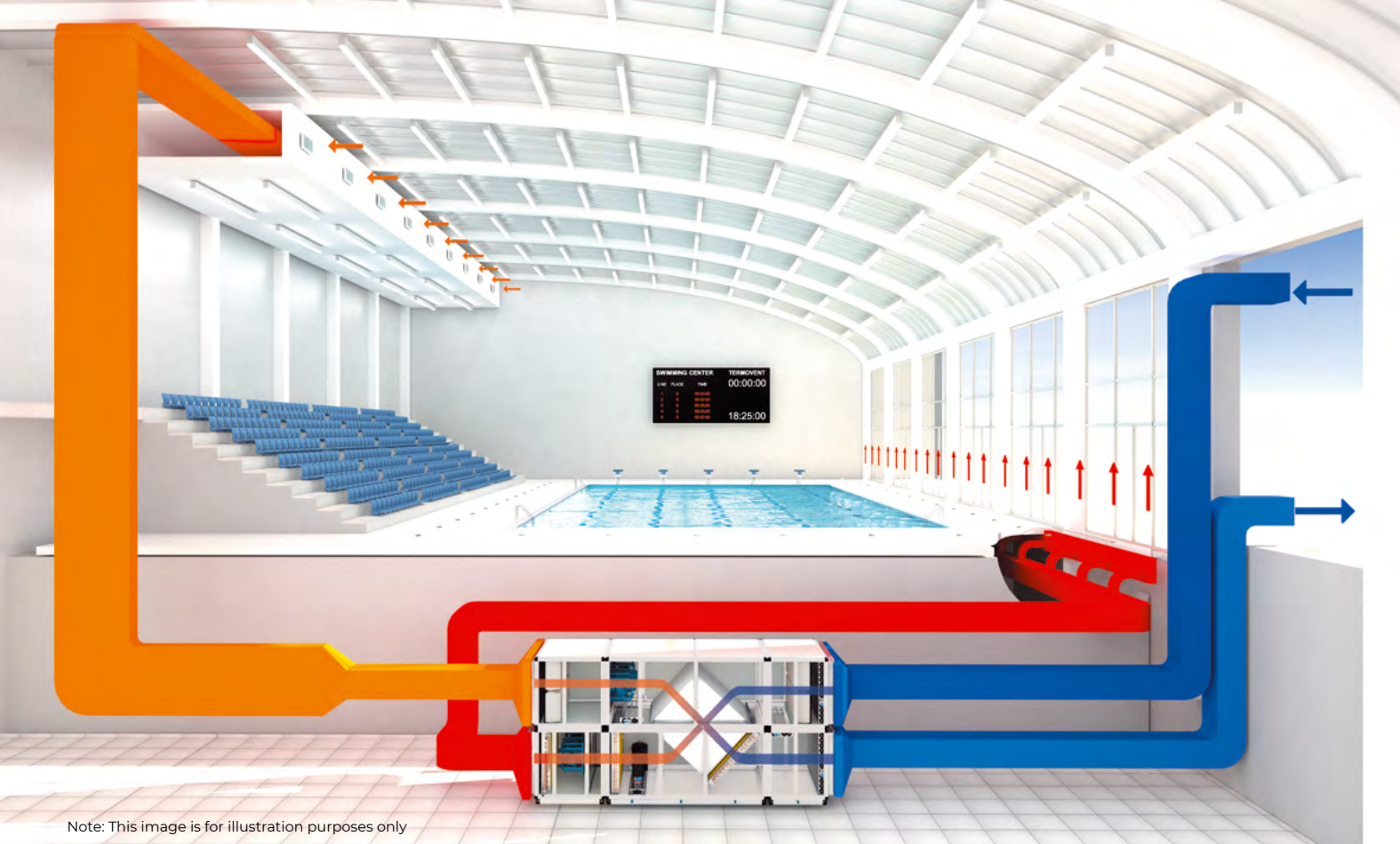
		Unit type													
		06.05	06.06	09.06	09.09	12.06	12.09	12.12	15.09	15.12	18.09	18.12	18.15	21.12	24.15
Nominal air flow	m³/h	2100	2700	4100	6400	5200	9000	12000	11000	15000	13500	19000	23000	25500	33000
Dehumidification capacity [VDI 2089]	kg/h	12.9	16.6	25.2	39.4	32.0	55.4	73.9	67.7	92.3	83.1	117.0	141.6	157.0	203.1
Filtration according to EN 779:2012 ISO 16890															
Fresh air								F7   ePM1 60%							
Return air								M5   ePM10 60%							
Double plate heat exchanger															
Material		Polypropylene													
Heat recovery efficiency [EN 308] <sup>1</sup>	%	73	74	74	74	76	74	73	74	73	74	77	76	77	78
Heat recovery class [EN 13053]	%	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1
External pressure drop *															
Fresh and supply air duct	Pa	300	300	300	300	300	300	300	300	300	300	400	400	400	400
Return and exhaust air duct	Pa	300	300	300	300	300	300	300	300	300	300	400	400	400	400
Hot water coil <sup>2 3</sup>															
Heating capacity	kW	6.8	7.3	11.1	16.6	13.9	26.7	32.0	29.0	39.3	35.5	50.7	61.1	67.0	87.7
Water flow rate	m³/h	0.30	0.32	0.48	0.72	0.61	1.17	1.40	1.26	1.71	1.55	2.21	2.66	2.92	3.82
Water pressure drop	kPa	1.2	1.6	1.4	1.1	1.4	2.0	1.6	1.2	1.7	1.4	1.2	1.9	1.4	1.6
Connections	DN	20	20	20	25	25	25	32	32	40	32	50	50	50	65
Electrical data <sup>4</sup>															
Rated input - supply air fan	kW	0.57	0.72	1.10	1.98	1.37	2.32	3.55	2.85	4.85	3.70	6.30	7.69	9.96	12.07
Rated input - return air fan	kW	0.44	0.56	0.86	1.60	1.08	2.09	3.05	2.48	4.16	3.19	5.32	7.01	8.90	11.20
Total electrical power rating	kW	1.01	1.28	1.96	3.58	2.45	4.41	6.60	5.33	9.01	6.89	11.62	14.70	18.86	23.27
Total current consumption	A	7.6	7.6	8.0	11.6	6.8	14.8	28.8	16.4	33.6	32	30.4	32	50.4	52.8
Sound power level <sup>5</sup>															
Supply air connection	dB(A)	64	65	69	77	72	76	81	73	85	77	82	85	94	92
Return air connection	dB(A)	69	71	75	82	78	79	84	77	89	79	84	89	97	95
Fresh air connection	dB(A)	62	65	69	76	72	75	80	73	85	77	82	84	93	92
Exhaust air connection	dB(A)	66	71	74	81	77	79	84	77	89	79	84	88	96	95
Acoustic pressure in 1 m distance from device	dB(A)	69	71	75	82	78	79	84	77	89	79	84	89	97	95
Operating voltage	3~ 400V 50Hz														

- 1 Depends on operation conditions  
2 At supply temperature 36°C for nominal air flow, FL = 60 °C , SA=40 °C  
3 Inlet conditions after double plate heat exchanger  
4 With average filter contamination  
5 At 250 Hz mid-band frequency

The data is valid for the following parameters:	
Indoor temperature	30°C
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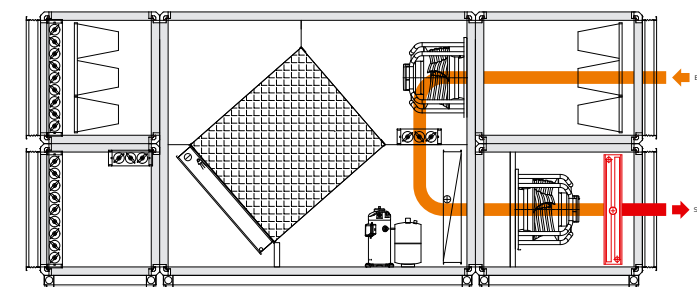
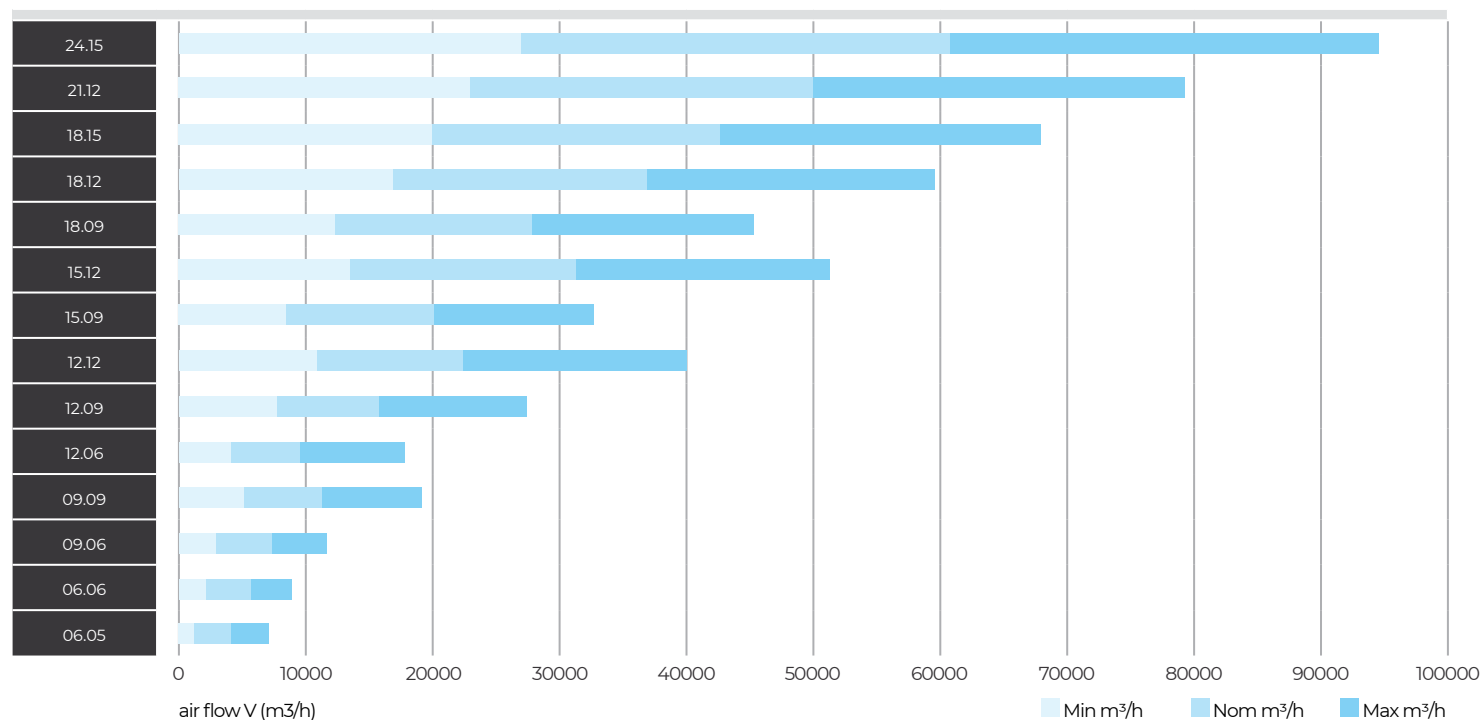
Note: This image is for illustration purposes only

hydra | pro  
Genius



Main features		min	max
Air flow	m <sup>3</sup> /h	2000	37000
Dehumidification as per VDI 2089	kg/h	12.5	231.8
Double plate heat exchanger heat recovery	%	55	90

hydra | pro Genius | AHU airflow diagram

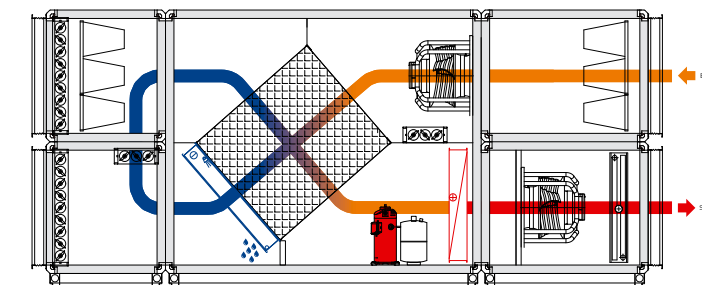


### STARTING MODE FOR FAST HEATING IN WINTER PERIOD

Heated air is discharged into the swimming pool hall by fans, as well as a recirculation damper, filter and a hot-water heater.

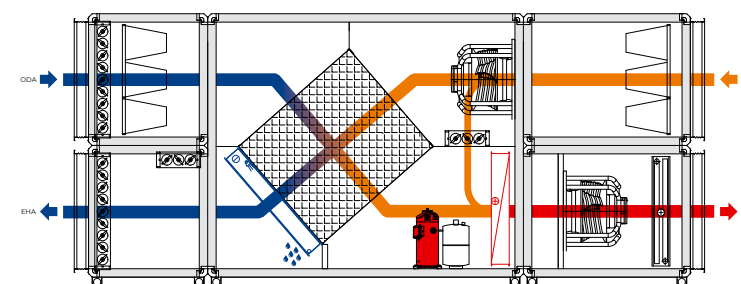
### DEHUMIDIFICATION MODE IN WINTER PERIOD WITHOUT USERS

This economical mode operates with 100% recirculation air, by reducing absolute air humidity at the heat pump vaporizer. The dehumidified air is then heated at the condenser and discharged into the swimming pool area.



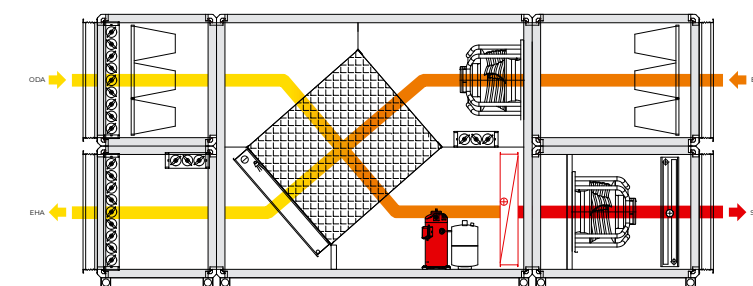
### DEHUMIDIFICATION MODE IN WINTER PERIOD WITH USERS

Dehumidification in winter period with high energy savings is achieved by discharging volumes of fresh air via the double plate heat exchanger, while a certain volume of air goes via recirculation damper. The waste air heats fresh air via a double plate heat exchanger. The heat is then transferred to the heat pump vaporizer which returns the given energy to the condenser. The air treated in this way is additionally heated in the hot-water heater and discharged into the swimming pool area.



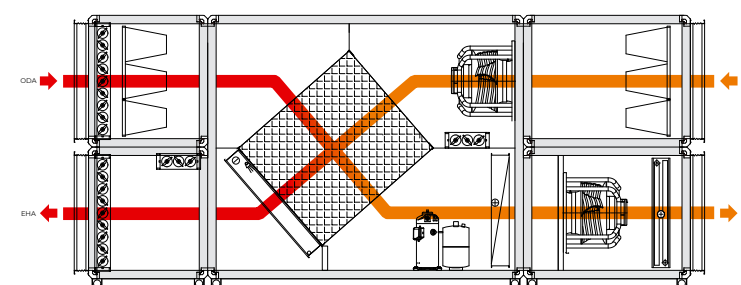
### DEHUMIDIFICATION MODE IN TRANSITIONAL PERIOD

Dehumidification is done by introducing 100% fresh air. The swimming pool area air heats fresh air via the plate heat exchanger. The heat then transferred to the heat pump vaporizer that transfers it to the condenser and discharges it into the swimming pool hall.

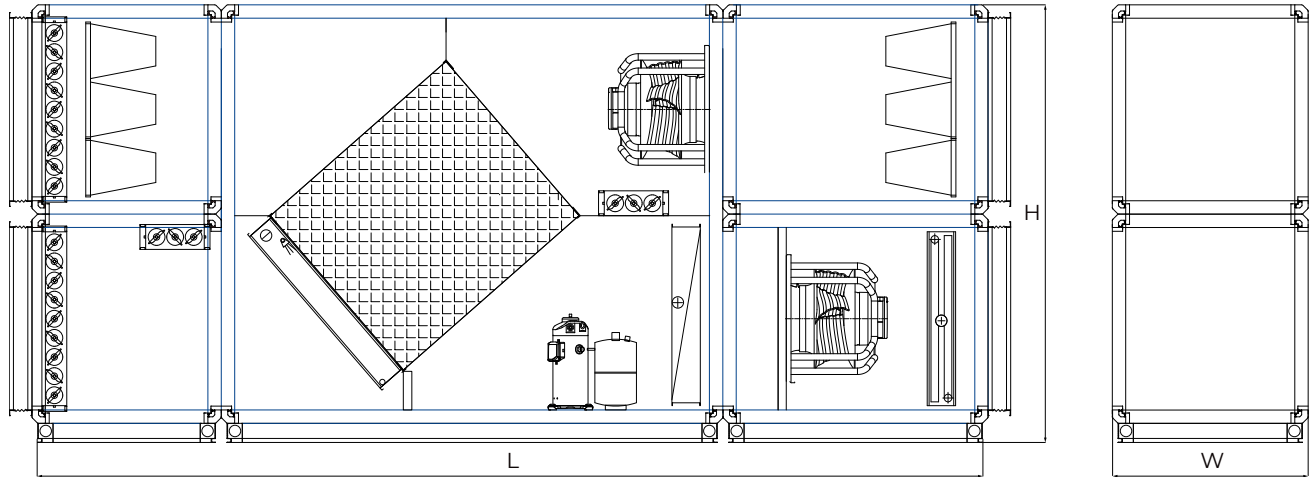


### DEHUMIDIFICATION MODE AT HIGHER OUTDOOR TEMPERATURES

Better known as "energy saving" mode because the hot water heater is off. This mode uses only the thermal energy of the hall air, which is then transferred to fresh air via the plate heat exchanger.







Unit type	Nominal air flow	Dimensions *		
	m³/h	W (mm)	H (mm)	L (mm)
06.05	2500	720	1480	4490
06.06	3400	720	1680	4590
09.06	4600	1025	1680	4590
09.09	6700	1025	2290	5240
12.06	5600	1330	1680	4690
12.09	9000	1330	2290	5290
12.12	13000	1330	2900	5990
15.09	11000	1635	2290	5740
15.12	17000	1635	2900	5940
18.09	15000	1940	2290	5490
18.12	20000	1940	2900	6140
18.15	23000	1940	3205	6440
21.12	27000	2245	2900	6540
24.15	33000	2345	3205	7240

Unit type	Min	Nom	Max
	m³/h	m³/h	m³/h
06.05	2000	2500	3000
06.06	2800	3400	3800
09.06	3600	4600	5200
09.09	5900	6700	7500
12.06	4800	5600	6200
12.09	7500	9000	10500
12.12	11500	13000	16000
15.09	9500	11000	12500
15.12	15500	17000	19000
18.09	13500	15000	17000
18.12	17500	20000	22500
18.15	21000	23000	25000
21.12	24000	27000	29000
24.15	28500	33000	33500

\* Dimensions vary depending on selected execution (indoor/outdoor, type of PHE)

REGULATION

- humidity regulation
- air temperature regulation
- fan control
- damper control
- hot-water heater control

INFORMATION

- information on the external, internal and discharge air humidity status
- information on the external, internal and discharge air temperature status
- information on filter contamination
- information on the system malfunction

		Unit type													
		06.05	06.06	09.06	09.09	12.06	12.09	12.12	15.09	15.12	18.09	18.12	18.15	21.12	24.15
Nominal air flow	m³/h	2500	3400	4600	6700	5600	9000	13000	11000	17000	15000	20000	23000	27000	33000
Dehumidification capacity [VDI 2089]	kg/h	15.4	20.9	28.3	41.2	34.5	55.4	80.0	67.7	104.7	92.3	123.1	141.6	166.2	203.1
Filtration according to EN 779:2012 ISO 16890															
Fresh air								F7   ePM1 60%							
Return air								M5   ePM10 60%							
Double plate heat exchanger															
Material								Polypropylene							
Heat recovery efficiency [EN 308] <sup>1</sup>	%	81	82	82	84	86	85	86	88	86	84	86	89	85	89
Heat recovery class [EN 13053]	%	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1
Integrated heat pump <sup>1</sup>															
Heating capacity	kW	11.9	11.9	14.9	21.3	19.0	28.9	42.2	36.3	53.1	47.1	62.8	72.8	82.2	105.8
Heating capacity of heat pump	COP	5.7	5.7	6.4	5.7	6.4	5.8	5.8	5.7	6.0	5.9	6.0	5.9	5.7	6.1
External pressure drop *															
Fresh and supply air duct	Pa	300	300	300	300	300	300	300	300	300	300	400	400	400	400
Return and exhaust air duct	Pa	300	300	300	300	300	300	300	300	300	300	400	400	400	400
Hot water coil <sup>2 3</sup>															
Heating capacity	kW	8.4	11.4	14.9	19.9	17.2	26.4	38.3	31.2	51.6	35.5	63.4	65.8	73.1	96.0
Water flow rate	m³/h	0.37	0.49	0.65	0.87	0.75	1.15	1.67	1.36	2.25	1.55	2.76	2.87	3.19	4.18
Water pressure drop	kPa	5.2	3.7	3.9	3.1	3.2	3.2	3.2	1.4	2.8	1.4	3.4	2.4	2.7	3.3
Connections	DN	20	20	20	25	25	25	32	32	40	32	40	50	50	50
Electrical data <sup>4</sup>															
Rated input - supply air fan	kW	0.80	1.14	1.45	2.21	1.63	2.92	4.47	3.15	5.73	4.67	6.36	8.54	12.77	12.58
Rated input - return air fan	kW	0.59	0.85	1.09	1.73	1.24	2.18	3.72	2.61	5.43	3.96	6.26	7.30	10.34	15.50
Rated input - compressor	kW	2.10	2.10	2.32	3.71	2.97	5.01	7.26	6.33	8.89	7.92	10.44	12.27	14.40	17.38
Total electrical power rating	kW	3.49	4.09	4.86	7.65	5.84	10.11	15.45	12.09	20.05	16.55	23.06	28.11	37.51	45.46
Total current consumption	A	11.7	11.7	12.4	15.1	13.9	21.1	43.7	29.4	40.3	36.9	44.6	57.6	91.2	101.1
Sound power level <sup>5</sup>															
Supply air connection	dB(A)	69	72	72	77	74	75	85	73	90	82	84	87	94	90
Return air connection	dB(A)	73	77	79	84	77	79	87	77	92	83	86	92	97	93
Fresh air connection	dB(A)	64	72	72	76	73	76	83	73	89	84	83	84	94	97
Exhaust air connection	dB(A)	69	75	77	82	76	79	86	77	92	83	85	88	97	97
Acoustic pressure in 1 m distance from device	dB(A)	73	77	79	84	77	79	87	77	92	83	86	92	97	97
Operating voltage	3~ 400V 50Hz														

- 1 Depends on operation conditions
- 2 At supply temperature 36°C for nominal air flow, FL = 60 °C , SA=40 °C
- 3 Inlet conditions after double plate heat exchanger
- 4 With average filter contamination
- 5 At 250 Hz mid-band frequency

The data is valid for the following parameters:	
Indoor temperature	30°C
Indoor relative humidity	54%
Outdoor temperature and relative humidity winter	-15°C/90%
Outdoor temperature and relative humidity summer	33°C/33%

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



# DESIGNING RECOMMENDATION



## WHAT DOES THE CHOICE OF SYSTEM DEPEND ON?

The final choice of air handling unit can be made only when the designer informs the buyer about all the aspects of swimming pool hall construction and when both sides have a clear picture of what the goal of the project is and what the optimal solutions are.

The designer's responsibility is to take into consideration and recommend a system that is desirable and appropriate for the space, which, at the same time, offers the best combination of price, quality, depreciation costs and reliability. The buyer, on the other hand has his own financial and functional objectives, which he should share with the designer. Only by finding the common ground between the interests of both sides, an optimal solution can be found.

## SYSTEM REQUIREMENTS

Besides having good ergonomic and economic features, system must meet the following requirements:

- to maintain the desired status of the indoor environment with acceptable tolerance in all climate conditions and all activities it is intended for;
- to fit physically into the internal space and the building.

Other requirements that influence the choice include humidity control, heating, ventilation and effective heat discharge into the space.

## ARCHITECTURAL REQUIREMENTS

The architectural factors that influence the choice of the system include, in the first place, air conditioning and distribution systems, as well as all the elements that are visible in the space: diffusers, fan convectors, radiators.

The notion of adequate space involves:

- enough space to accommodate the equipment
- enough space for replacement of all the parts.
- good AHU position
- maximum environmental protection

- authorized persons' access
- securing safety equipment
- keeping clear of minors or unauthorized persons.

System maintenance:  
Even the best air handling units require a regular and proper maintenance if we want to use them over a longer period. Therefore, we offer you an appropriate contract on maintenance and supply of all the necessary elements for normal function of the system.

## SELECTION REPORT

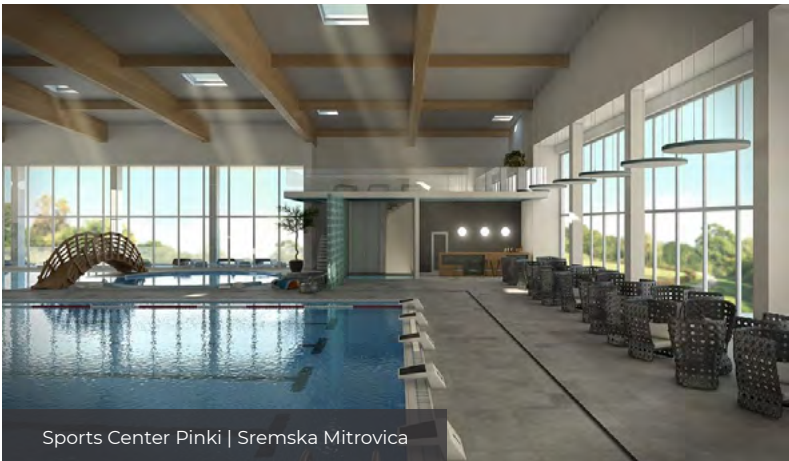
Selection criteria for choosing the most appropriate system, based on everything listed beforehand, designers could check by answering the following questions:

- does the system fit into the intended space or some architectural changes must be made first?
- is there an adequate space for the system equipment or additional building is needed?
- will the system function equally in all climate conditions?

- if compromises have been made regarding the ideal control zones, how large variations can be expected between the zones?
- how reliable is the chosen system? A malfunction of which components can have an impact on the entire building, and which can have an impact on a limited area?
- how fast can normal operation of the system be reestablished after various system malfunctions?
- what are the system's operating costs in comparison to the other options, including the costs of energy, maintenance, workforce, supply?
- what is the price of the system in comparison to other systems under consideration? What is the return on investment period, what will the profit be and the calculation of future costs of replacing parts?
- is the system flexible enough to meet the changes of the owner's needs?
- were there any additional requirements to the controlled zone?
- if additional equipment would be needed, is it possible to provide additional space?
- does the interior design affect the features of the space?



# REFERENCES



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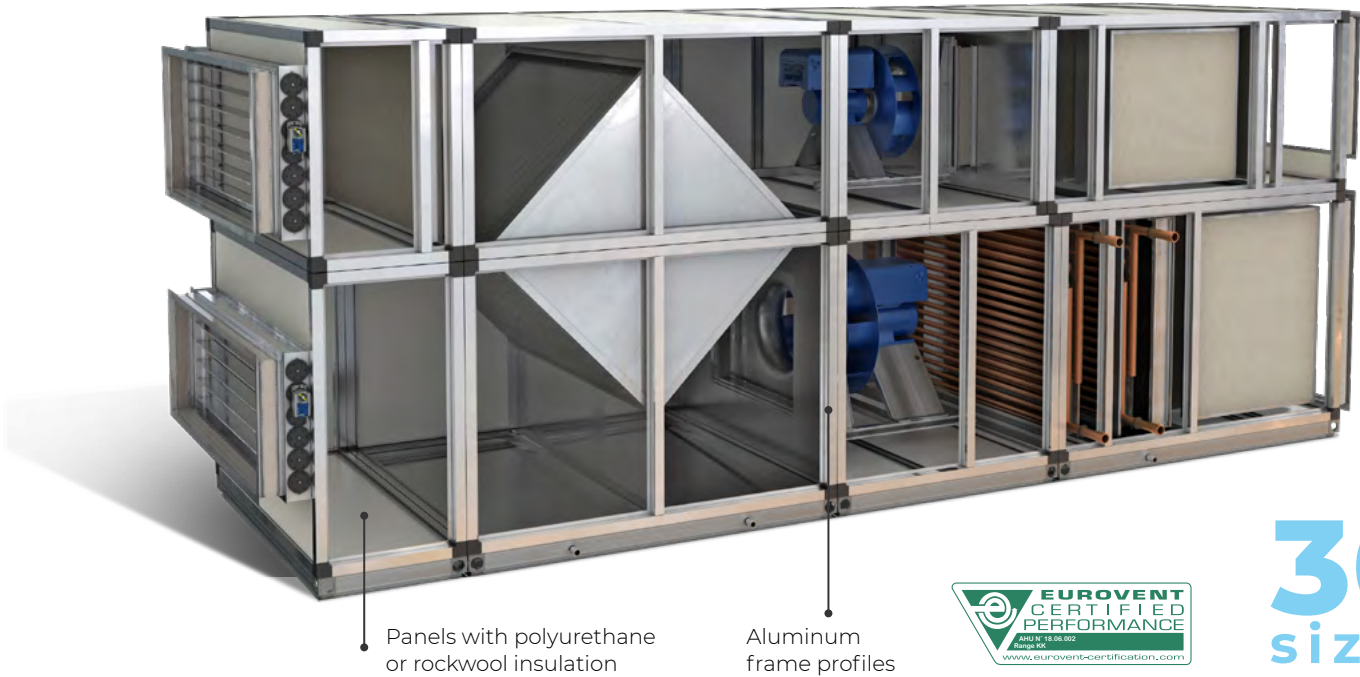
AND MORE THAN 100 PRIVATE SWIMMING POOLS



# TERMOVENT AHU FAMILY

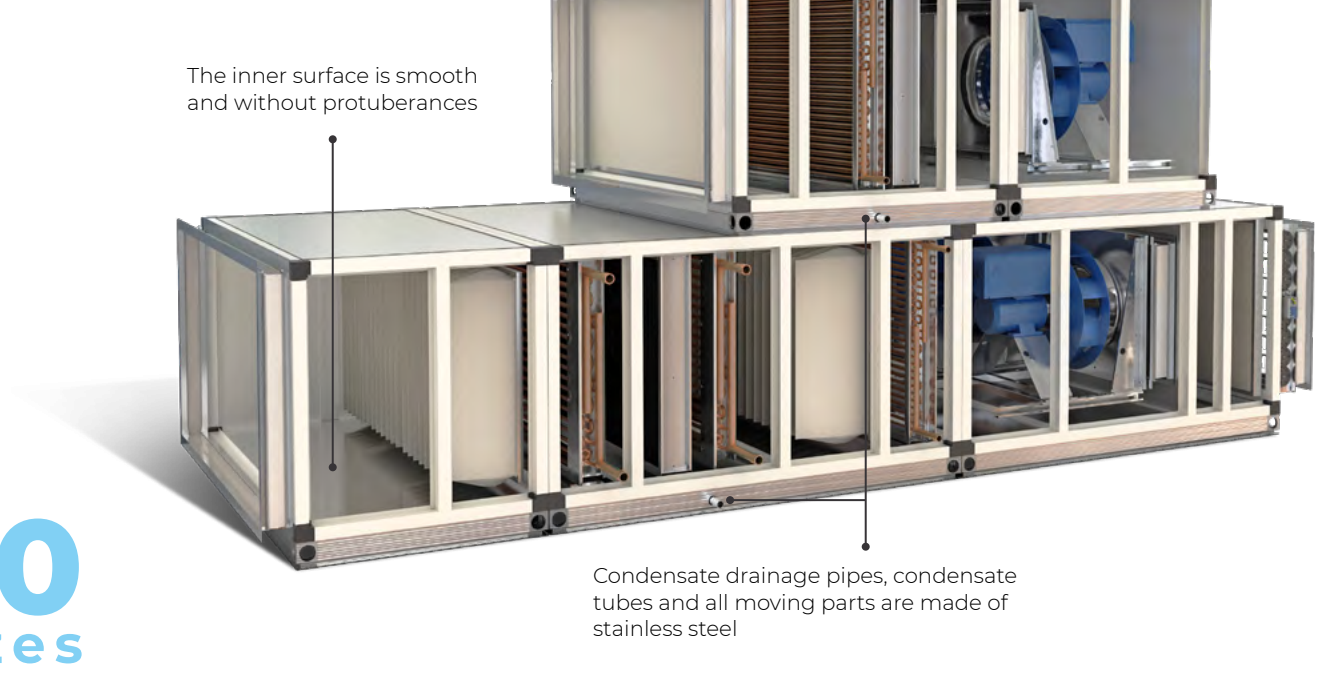
std | pro

hygiene | pro



- Widespread use - catering facilities, cafes, restaurants, hotels, shopping malls, public facilities, industrial plants, warehouses...
- Modular design
- Thermally separated modular design
- Construction is a combination of aluminum profiles and pre-varnished panels, filled with polyurethane or rock wool
- Exterior or interior installation

Air flow  
from **1.000** m³/h  
to **100.000** m³/h

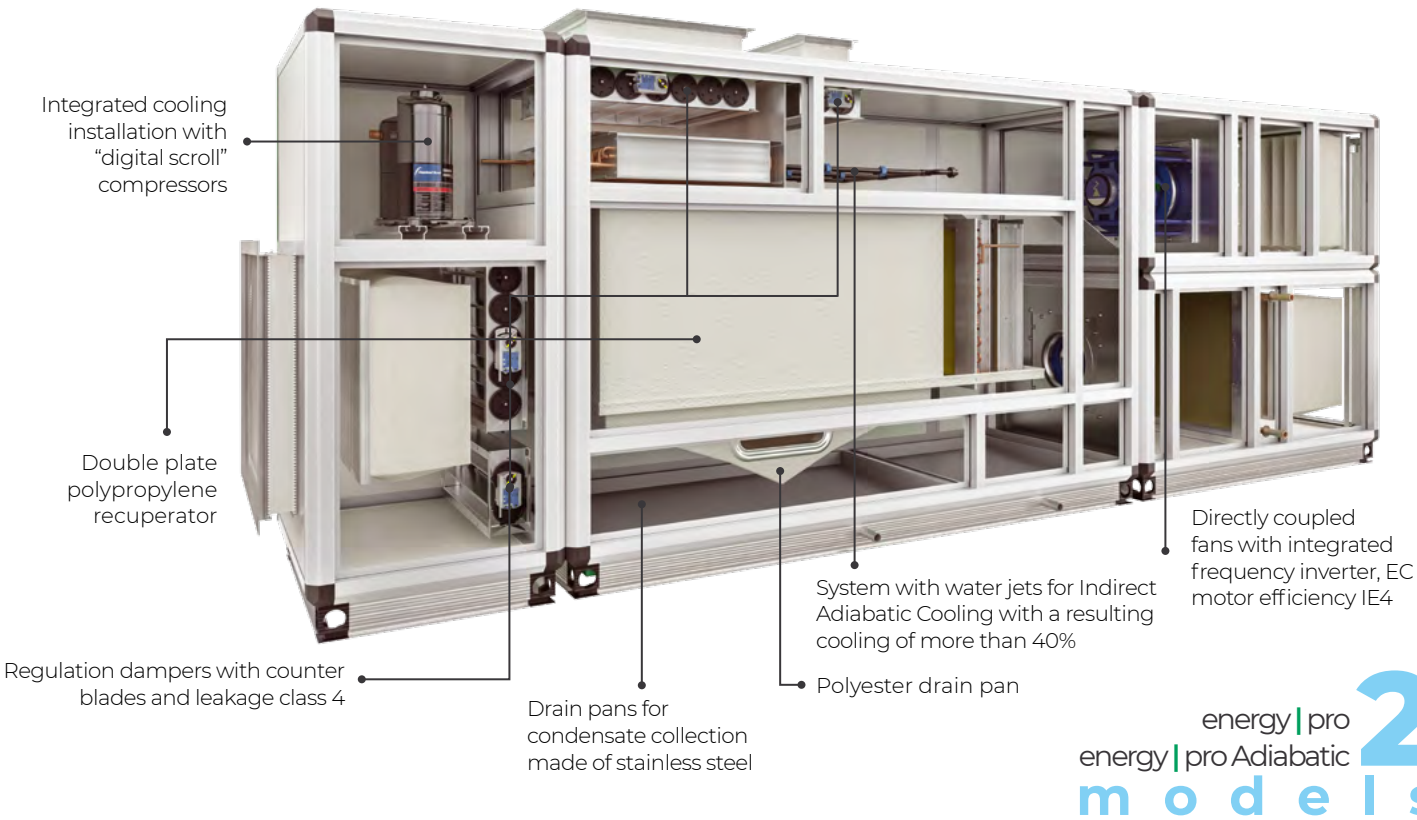


- Application – operating rooms, laboratories, pharmaceutical production facilities, food, military or electronics industries...
- In conformity with GMP, FDA and HACCAP
- Prevention of space contamination
- All elements are easily approachable for washing and disinfection
- Formation of undesirable microorganisms is prevented

Air flow  
from **1.000** m³/h  
to **100.000** m³/h







- Prevented the occurrence of condensate in a stream of supply air
- Ecological system with low power consumption and low CO<sub>2</sub> emissions
- Prevented water leakage into the exchange section
- The optional energy | pro design without integrated cooling installations with compressors

Air flow  
from **800** m<sup>3</sup>/h  
to **40.000** m<sup>3</sup>/h

HEAT RECOVERY  
**80%** RATE



# QUALITY MANAGEMENT SYSTEM

## CERTIFICATES AS THE GUARANTEE OF QUALITY

Tervovent is fully committed to meeting the customer's requirements in terms of quality, environmental protection and safety. The set high quality standards are the cornerstone of our operations.

In order to achieve the goals we set at all times, our employees are involved in the processes of continuous improvement and optimization of our products and services. The success of this approach is confirmed by numerous certificates held by Tervovent, which guarantee the highest standards to our customers.



**Eurovent Certita Certification**  
Eurovent Certita Certification Eurovent Certita Certification has certified that Tervovent Air Handling Units, Range KK, and Software for calculation of performances SELECT:pro, Trade name TERMOVENT, have been assessed according to requirements of the following standard: OM-5-2017  
\* Models so marked are not Eurovent certificated



**CE marking for Tervovent AHUs**  
CE marking for Tervovent AHUs Tervovent Air handling Units hold CE Marking of Conformity to Machinery Directive 2006[42]EC Annex II, Point A. In addition, Tervovent AHUs are designed and produced according to set of harmonized standards: EN ISO 12100:2010, EN ISO 12100:2010, EN ISO 13850:2015, EN 1037:1995+A1:2008, EN ISO 14120:2015, EN 60204-1:2006/A1:2009 and EN 61000-6-2:2005/AC:2005



**ISO 13485:2016**  
ISO 13485:2016 Certification body SIQ confirmed that Tervovent introduced Quality Management System in accordance with ISO 13485:2016 in the field of manufacturing, design and installation of Tervovent panels for the construction of clean rooms.



**ISO 9001: 2015**  
ISO 9001: 2015 Certification body TUV SUD Management Service GmbH confirmed that Tervovent introduced Quality Management System in accordance with ISO 9001:2015 standard in the field of manufacturing, installation and sales of equipment for air conditioning, heating and cooling.



**ISO 14001:2015**  
ISO 9001: 2015 Certification body TUV SUD Management Service GmbH confirmed that Tervovent introduced Quality Management System in accordance with ISO 9001:2015 standard in the field of manufacturing, installation and sales of equipment for air conditioning, heating and cooling.



**ISO 45001:2018**  
OHSAS 18001:2007 Certification body TUV SUD Management Service GmbH confirmed that Tervovent introduced Health and Safety Management System in accordance with OHSAS 18001:2007 in the field of manufacturing, installation and automation of air conditioning, heating and cooling equipment and systems.



**AAA Creditworthiness Rating**  
AAA Creditworthiness Rating Bisnode Serbia awards Golden certificate of Creditworthiness Rating



# TERMOVENT

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