ThermoCond public

Air conditioning unit with asymmetrical high-capacity heat exchanger and integrated output-regulated heat pump and efficient volume flow control for medium-sized and large public swimming pool halls

ThermoCond 39 13 01 - simplified illustration

Automatically selects the most economical operating mode!

ThermoCond 39

AIR VOLUME FLOW: 2,600 – 33,500 m^3/h

At a glance:

- **Dehumidifies, ventilates and heats**
- **Corrosion-free heat exchanger made from polypropylene**
- **Integrated output-regulated heat pump**
- **Average heating capacity value COP up to 7.2**
- **Energy-saving EC fans/EffiVent**
- **Demand-oriented volume flow rate reduction for supply and return air**
- **Integrated clean water heater**
- **Two-stage supply air filtration**
- **Precise measurement and regulation of the outside air volume**
- **Modular design with high variability**

The devices of the ThermoCond 39 series are multi-functional systems for air conditioning public swimming pool halls. The design and functionality of all systems are optimally adapted to your requirements. The integrated output-regulated heat pump increases the total efficiency of the system. The combination of first-class components with precise control and regulation systems guarantees economical operation at all times, while ensuring the highest degree of comfort air conditioning. ThermoCond systems dehumidify, heat and ventilate the swimming pool hall, and simultaneously create good climate and ideal protection for the material of the building. Additional components such as radiators or panel heating systems are generally not required.

Further performance parameters and options:

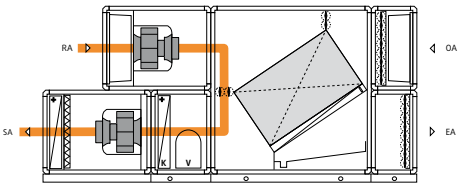
- Filtering the air in any operating mode
- Pumped hot water air heater
- Individually controllable performance parameters
- Complete unit, ready to connect, contains all structural elements for air conditioning swimming pool hall air, including all control and regulation fittings
- Thermal bridge factor TB1
- Intensive quality inspection with factory test run

Options

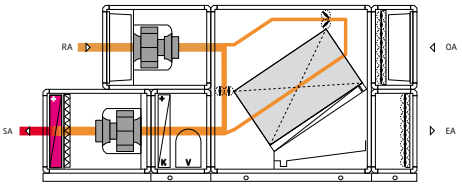
- Pool water condenser
- HRC bypass function
- Dehumidification in recirculation mode
- Dehumidifying the outside air using additional outside and exhaust air connection pieces
- Reinforced compressor refrigeration system
- Clean water heater in double-walled design
- Attenuator
- Outdoor installation
- Remote maintenance
- And many more

Functional Description

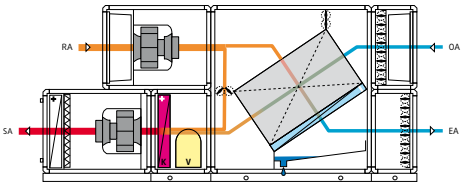
Standby mode
If no requirements are specified regarding temperature regulation or dehumidification when the swimming pool hall is in standby mode, the system operates only in recirculation mode. The air circulation in the swimming pool hall is guaranteed, with the fans working at a lower capacity.



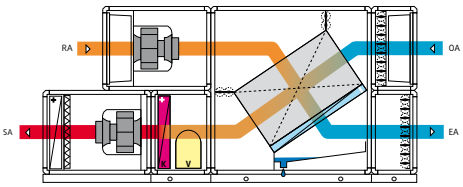
Recirculation Air Operation (heating)
The pumped hot water heating coil heats the swimming pool hall as required in recirculation mode. In order to reduce the internal pressure losses, the recirculation air defrost damper is also opened. The outside air and exhaust air dampers are closed.



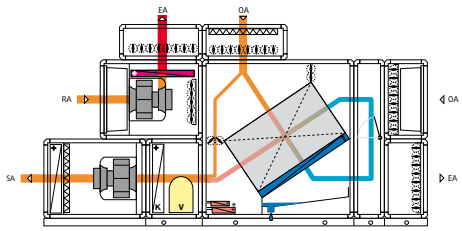
Swimming pool mode with dehumidification requirements
Return air is cooled and dehumidified in the evaporator of the continuously adjustable heat pump, reinforced by the upstream heat exchanger. The outside air, with its low moisture content, is preheated in the heat exchanger, and is subsequently mixed with a proportion of untreated recirculated air, heated in the condenser using the heat energy from the dehumidification process, and fed into the swimming pool hall as supply air. If the heating capacity is not sufficient, the supply air is reheated with the heating coil. The use of the freely controllable heat pump allows the demand-oriented regulation of the volume flow rate. This guarantees a consistent humidity level in the swimming pool hall while consuming minimal energy. For hygiene reasons, a minimum of outside air is fed into the swimming pool hall during swimming pool mode. The proportion of outside air is determined based on the current evaporation of water (and therefore the occupancy level of the swimming pool hall) and is continuously adjusted.



Outside Air Exhaust Air Mode
In the case of rising outside air humidity, the recirculation air damper is continuously closing as required. If the outside air moisture is high, the damper closes completely, the system works exclusively in outside air-exhaust air mode via the heat exchanger. The demand-oriented flow rate control reduces energy consumption to a minimum.

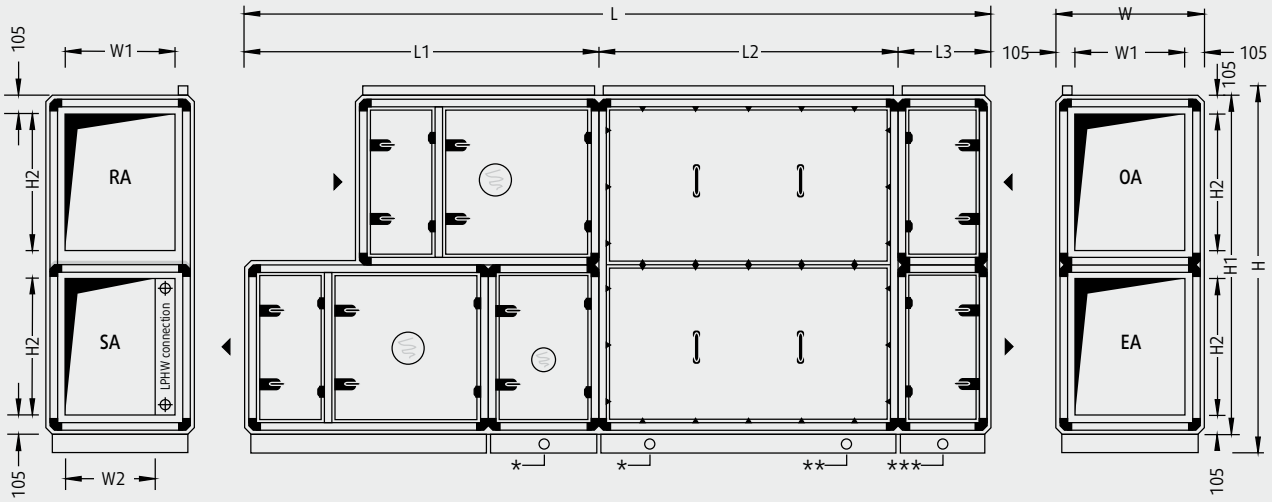


Optionally
In order to achieve the hall humidity levels required by VDI 2089 in summertime conditions, it may be necessary and more economical to use an additional damper system. A second outside air duct is used to take in outside air. Some of the outside air is precooled via the recuperator, and then cooled below dew point in the evaporator. The air is then reheated in the recuperator, and then dried and cooled with some of the untreated outside air, before being introduced into the hall as supply air. If no heating of the swimming pool hall is required, the heat of condensation is discharged directly into the return air flow.



ThermoCond Type 39

System dimensions and weights



Important! Where a system is operated in parallel, the supply air and return air ducts of the two units have to be brought together.

Where units are run in parallel, each unit has a controls cabinet.

Mirror-image design possible.

* Floor drain
** Condensate drainage

Unit type	L	W	H [1]	L1	L2	L3	W1	W2	H1	H2	Weight
39 03 01	3,940	790	1,700	1,970	1,370	600	580	510	1,520	580	1,050
39 05 01	4,100	1,110	1,700	2,130	1,370	600	900	830	1,520	580	1,300
39 06 01	4,740	790	2,340	2,130	2,010	600	580	420	2,160	900	1,350
39 10 01	4,740	1,110	2,340	2,130	2,010	600	900	740	2,160	900	1,650
39 13 01	4,900	1,430	2,340	2,290	2,010	600	1,220	1,060	2,160	900	2,050
39 16 01	4,900	1,750	2,340	2,290	2,010	600	1,540	1,380	2,160	900	2,250
39 19 01	4,900	2,070	2,340	2,290	2,010	600	1,860	1,700	2,160	900	2,500
39 25 01	5,700	2,070	2,980	2,450	2,650	600	1,860	1,700	2,800	1,220	3,250
39 32 01	6,180	2,070	3,620	2,450	3,130	600	1,860	1,700	3,440	1,540	3,950
39 36 01	6,180	2,390	3,620	2,450	3,130	600	2,180	2,020	3,440	1,540	4,650

For service work, a clearance corresponding to dimension W is required on the operating side of the unit. If dimension W is smaller than one metre, please leave a clearance of one metre. For service work above the unit, please allow 50 mm working height clearance above the cable duct.

Please comply with the dimensions for body size, air duct connections and electrical controls cabinet.

All lengths are given in mm, weights in kg, weight incl. Controls cabinet.

1 Door fitting assembly increase unit width by 65 mm each operating side
2 incl. 120 mm base frame, incl. 60 mm cable duct

3 transportation units are supplied, including controls cabinet. Further partitioning for smaller apertures possible (at extra cost).

Largest transport unit

Unit Type	L	W	H [2]	Weight
39 03 01	1,970	790	1,700	510
39 05 01	2,130	1,110	1,700	660
39 06 01	2,130	790	2,340	630
39 10 01	2,130	1,110	2,340	750
39 13 01	2,290	1,430	2,340	980
39 16 01	2,290	1,750	2,340	1,130
39 19 01	2,290	2,070	2,340	1,270
39 25 01	2,650	2,070	2,980	1,210
39 32 01	3,130	2,070	3,620	1,700
39 36 01	3,130	2,390	3,620	2,050

Controls cabinet

Unit Type	H x W x D	Position at unit
39 03 01	1,120 x 640 x 210	SA/RA side
39 05 01	1,120 x 640 x 210	SA/RA side
39 06 01	1,280 x 640 x 210	SA/RA side
39 10 01	1,280 x 640 x 210	SA/RA side
39 13 01	1,280 x 640 x 210	SA/RA side
39 16 01	1,280 x 640 x 210	SA/RA side
39 19 01	1,280 x 640 x 210	SA/RA side
39 25 01	1,280 x 640 x 210	SA/RA side
39 32 01	1,600 x 640 x 250	SA/RA side
39 36 01	1,600 x 640 x 250	SA/RA side

Technical specifications and services

Unit Type		39 03 01	39 05 01	39 06 01	39 10 01	39 13 01	39 16 01
Optimum flow rate	m^3/h	2,600	3,900	4,000	6,000	7,900	9,800
max. volume flow rate	m^3/h	3,500	5,300	6,300	9,500	12,300	15,800
Heat recovery efficiency [1]	%	83	83	83	83	84	84
Dehumidification capacity according to VDI 2089 V_{opt}	kg/h	15.7	23.5	24.1	36.2	47.6	59.1
Heating capacity of heat pump [2]	COP	5.0	6.5	6.4	6.7	6.7	6.7
Total electrical power rating [3]	kW	4.5	4.7	4.7	7.4	9.3	10.6
Current consumption[2]	A	12.2	12.2	12.2	18.8	29.6	30.5
Operating voltage		3 / N / PE 400 V 50 Hz					
Ext. pressure losses							
Supply and fresh air channel	Pa	300	300	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300	300	300
Sound power level [4]							
Supply air vent	dB(A)	78	66	66	70	76	70
RA connection	dB(A)	71	62	63	71	66	67
Outside air vent	dB(A)	68	64	61	65	65	63
EA connection	dB(A)	72	61	61	68	65	66
Acoustic pressure at a distance of 1 m from the device [4]	dB(A)	63	52	52	57	61	56
Fan units							
Rated motor input for supply air (100% | 60% volume flow rate) [5]	kW	0.99 | 0.62	1.28 | 0.75	1.28 | 0.74	1.99 | 1.08	2.46 | 1.50	2.90 | 1.67
Rated motor input for return air (100% | 60% volume flow rate) [5]	kW	0.69 | 0.44	1.00 | 0.55	1.02 | 0.54	1.62 | 0.81	1.86 | 1.10	2.30 | 1.27
SFP category supply air | return air (60% V_{opt})		1 | 2	1 | 1	1 | 1	1 | 1	1 | 1	1 | 1
Integrated heat pump							
Filling volume refrigerant type R407C (without PWC | with PWC [6])	kg	5.0 | 5.0	5.0 | 6.0	4.0 | 7.0	6.0 | 14.0	12.0 | 18.0	12.0 | 27.0
Rated compressor input for OA operation (60% V_{opt})	kW	2.8	2.4	2.4	3.8	5.0	5.4
Heating capacity of heat pump for OA operation (60% V_{opt})	kW	11.2	13.0	13.0	21.1	28.0	30.6
Clean water heating [7]							
Heating capacity for OA operation	kW	2.8	2.5	2.4	4.2	5.4	5.7
Quantity of flow	m^3/h	0.09	0.10	0.10	0.14	0.18	0.23
Efficiency classes according to EN 13053:2012							
Heat recovery class		H1	H1	H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V2	V2	V2	V2	V2	V2
Flitration according to DIN EN 779							
Supply air | Outside air		F7 | M5					
Return air		M5					
LPHW							
Heating power [8]	kW	14.8	21.9	22.3	34.0	52.0	61.0
Water flow rate and pressure losses							
LPHW [8]	m^3/h | kPa	0.75 | 4.1	1.39 | 3.6	1.25 | 4.1	2.13 | 3.5	2.28 | 4.8	3.25 | 4.3
LPHW valve [8]	m^3/h | kPa	0.75 | 3.5	1.39 | 4.8	1.25 | 3.9	2.13 | 4.5	2.28 | 5.2	3.25 | 4.1
Pool water condenser [6, 9]							
Heating capacity	kW	11.7	13.6	13.6	22.3	29.5	31.1
Spread of pool water temperature	K	6.8	7.2	7.2	8.0	8.2	7.1
Pool water volume flow rate	m^3/h	1.5	1.6	1.6	2.4	3.1	3.8
Water side pressure loss	kPa	5.9	7.0	7.0	6.7	10.9	16.1
Connections							
LPHW connection	DN	32	32	32	32	40	40
LPHW control valve connection	DN	15	20	20	25	25	32
Clean water heater connection	DN	15	15	15	15	15	15
Condensate drainage	DN	40	40	40	40	40	40
Floor drain	DN	20 | 40	20 | 40	20 | 40	20 | 40	20 | 40	20 | 40
PWC connection [6]	DN	25	25	25	40	40	40

Specifications of technical data relate to the optimum flow rate and return air condition 30°C / 53.7% r.h., outside air condition 15°C / 84% r.h. and an altitude height of zero metres above sea level, unless otherwise specified

1 depends on operation mode
2 incl. heating capacity of clean water heating system in OA operation
3 dependent on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 pool water condenser (supplementary equipment)
7 at water inlet temperature 10°C
8 in recirculation heating; FL = 70°C, SA ≒ 50°C
9 heat emission full and proportional; when water enters 28°C

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

Technical specifications and services

Unit Type		39 19 01	39 25 01	39 32 01	39 36 01
Optimum flow rate	m^3/h	11,800	15,800	19,900	23,100
Max. volume flow rate	m^3/h	19,000	25,000	30,000	33,500
Heat recovery efficiency [1]	%	84	84	84	84
Dehumidification capacity according to VDI 2089 V_{opt}	kg/h	71.2	95.3	120.0	139.3
Heating capacity of heat pump [2]	COP	6.3	7.2	6.5	7.2
Total electrical power rating [3]	kW	15.5	18.7	28.3	30.1
Current consumption [3]	A	36.1	54.7	66.9	75.3
Operating voltage		3 / N / PE 400 V 50 Hz			
Ext. pressure losses					
Supply and fresh air channel	Pa	400	400	500	500
Return and exhaust air channel	Pa	400	400	500	500
Sound power level [4]					
Supply air vent	dB(A)	74	83	76	86
RA connection	dB(A)	72	71	74	74
Outside air vent	dB(A)	68	71	71	79
EA connection	dB(A)	69	70	72	72
Acoustic pressure at a distance of 1 m from the device [4]	dB(A)	60	68	62	70
Fan units					
Rated motor input for supply air (100% | 60% volume flow rate) [5]	kW	4.32 | 2.50	5.62 | 3.64	8.02 | 4.60	9.36 | 5.91
Rated motor input for return air (100% | 60% volume flow rate) [5]	kW	3.36 | 1.82	4.68 | 2.78	5.65 | 3.80	7.62 | 4.22
SFP category supply air | return air (60% V_{opt})		1 | 2	1 | 2	2 | 2	2 | 2
Integrated heat pump					
Filling volume refrigerant type R407C (without PWC | with PWC [6])	kg	18.0 | 31.0	18.0 | 40.0	28.0 | 50.0	35.0 | 50.0
Rated compressor input for OA operation (60% V_{opt})	kW	7.8	8.4	13.7	13.6
Heating capacity of heat pump for OA operation (60% V_{opt})	kW	40.9	51.0	76.3	79.1
Clean water heating [7]					
Heating capacity for OA operation	kW	8.1	9.5	13.2	15.3
Quantity of flow	m^3/h	0.29	0.33	0.37	0.51
Efficiency classes according to EN 13053:2012					
Heat recovery class		H1	H1	H1	H1
Power consumption of fan motors SA | RA		P1 | P1	P1 | P1	P1 | P1	P1 | P1
Air velocity class		V2	V2	V2	V2
Flitration according to DIN EN 779					
Supply air | Outside air		F7 | M5			
Return air		M5			
LPHW					
Heating capacity [8]	kW	78.9	98.3	122.2	152.3
Water flow rate and pressure losses					
LPHW [8]	m^3/h | kPa	3.45 | 5.3	3.65 | 3.3	7.22 | 2.9	7.24 | 3.2
LPHW valve [8]	m^3/h | kPa	3.45 | 4.6	3.65 | 5.1	7.22 | 8.3	7.24 | 8.4
Pool water condenser [6, 9]					
Heating capacity	kW	43.2	54.7	80.3	84.8
Spread of pool water temperature	K	7.7	8.5	11.1	8.5
Pool water volume flow rate	m^3/h	4.9	5.5	6.2	8.6
Water side pressure loss	kPa	8.4	10.8	13.5	8.2
Connections					
LPHW connection	DN	40	50	50	65
LPHW control valve connection	DN	32	40	40	40
Clean water heater connection	DN	22	22	22	22
Condensate drainage	DN	40	40	40	40
Floor drain	DN	20 | 40	20 | 40	20 | 40	20 | 40
PWC connection [6]	DN	50	50	50	63

Specifications of technical data relate to the optimum flow rate and return air condition 30°C / 53.7% r.h., outside air condition 15°C / 84% r.h. and an altitude height of zero metres above sea level, unless otherwise specified

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2 incl. heating capacity of clean water heating system in OA operation
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