

Air conditioning unit with cross-counterflow heat exchanger and integrated heat pump for private swimming pool halls



ThermoCond 29 20 01 - simplified illustration

Automatically selects the most economical operating mode!



ThermoCond 29

AIR VOLUME FLOW: 1,100 – 3,500 m³/h

At a glance:

- ▶ **Dehumidifies, ventilates and heats**
- ▶ **Corrosion-free heat exchanger made from polypropylene**
- ▶ **Integrated heat pump**
- ▶ **Energy-saving EC fans**
- ▶ **Constantly regulated recirculation air heating damper**
- ▶ **Compact design for minimal space requirements**
- ▶ **Variable air duct connections**
- ▶ **Integrated control and regulation system, compatible with all conventional building management systems**
- ▶ **Optionally: operation via smartphone or tablet**

The devices of the ThermoCond 29 series are multi-functional compact systems for air conditioning private swimming pool halls. The design and functionality of all systems are optimally adapted to your requirements. The integrated heat pump increases the total efficiency of the system and allows the dehumidification of swimming pool hall air in recirculation mode. In addition, an existing domestic heat pump can be used for energy-efficient heating of the swimming pool hall air. 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.

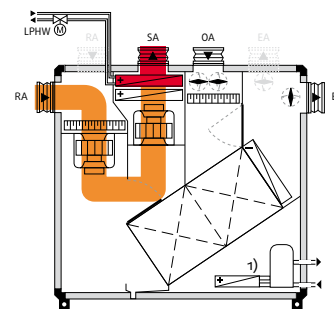
Further performance parameters and options:

- Filtering the air in any operating mode
 - Pumped hot water air heater
 - Sound-optimised plastic impellers for even quieter operation (from 29 20 01)
 - 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
 - Intensive quality inspection with factory test run
- Options
- Bypass damper
 - Water/air temperature interconnection
 - Filter design complies with VDI 6022
 - Pool water condenser
 - Domestic heat pump coupling
 - Remote maintenance
 - And many more

Functional description

Recirculating Air Operation (heating)

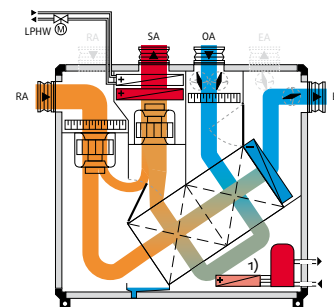
If no requirements are placed on temperature regulation or dehumidification when the device is in standby mode, the system operates only in recirculation mode with reduced air volume flow. The air circulation in the swimming pool hall is guaranteed. If heating is required, the return air is heated up using the heating coil to achieve the supply air temperature set-point.



Dehumidification using outside air in winter

A large proportion of the sensitive and latent heat is recovered from the return air, and is transferred to the supply air in the cross-counterflow heat exchanger and evaporator. If the heat output of the heat pump is not sufficient, the supply air will be reheated using the heating coil. Excess

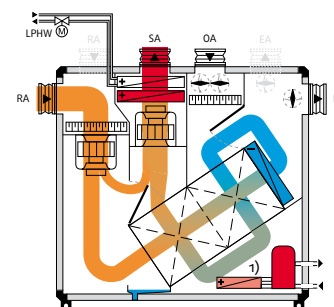
heat can be transferred to the optionally available pool water condenser for heating in the pool water.



Recirculating air dehumidification

In recirculation mode, the air is dehumidified in the evaporator of the heat pump. This process is boosted by the pre-cooling effect in the heat exchanger. The air that has already cooled down and been dried is preheated in the heat exchanger by the return air from the swimming pool hall. On the other side of the heat exchanger, the transmission of heat produces a pre-cooling effect, lowering the temperature of the drawn-in humid and warm air from the swimming pool hall near to its dew

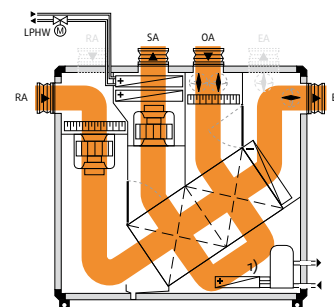
point. The preheated, dehumidified air is then mixed with a proportion of untreated recirculation air, is reheated at the condenser of the heat pump using the heat extracted during the dehumidification process, and is returned to the swimming pool hall as supply air. The heat pump is optimally designed, with a dehumidification energy requirement of less than 0.25 kWh/kg. If the heat output of the heat pump is not sufficient, the supply air will be reheated using the heating coil.



Summertime conditions

In case of rising outside air humidity, the recirculation air damper is continuously closing as required. When the outside air humidity is high, the damper closes

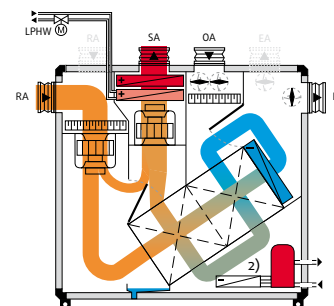
completely. The system works at 100% outside air / exhaust air operation through the heat exchanger.



Domestic heat pump operation (for unit type 29 xx 01)

An existing domestic heat pump can be used for energy-efficient heating of the swimming pool hall air. The domestic heat pump is connected to the heating coil. Typically, the low flow temperatures of the domestic heat pump are not sufficient for heating the swimming pool hall air – the heating coil is therefore

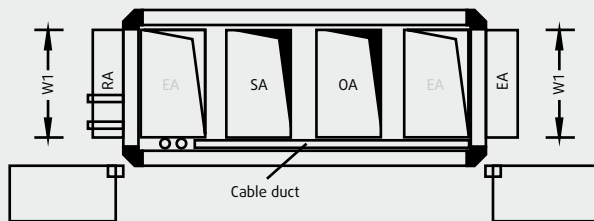
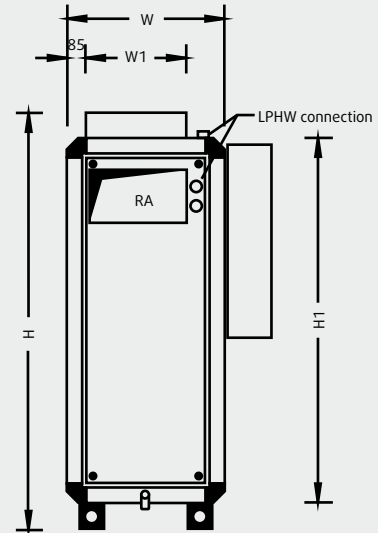
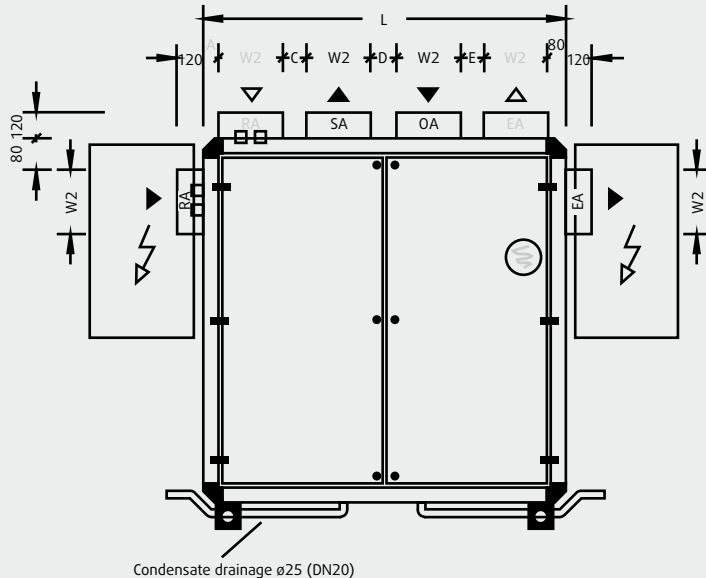
installed upstream of the air condenser of the integrated heat pump. The advantage of this is that the domestic heat pump can be operated with an optimal COP without a change in the low flow temperatures. In combination, the two systems heat the supply air to the desired temperature level.



- 1 Option: pool water condenser
- 2 Option: domestic heat pump operation

ThermoCond Type 29

System dimensions and weights



Unit feet 100 mm
Optional: adjustable feet from 100 to 120 mm

In the case of controls cabinet, folding on device: Controls cabinet is folded on the front end for transportation. This reduces the transportation length by approx. 250 mm.

Return and exhaust air duct connections possible on top of unit.
Mirror-image design possible.

Unit type	L	W ¹	H ²	W1	W2	H1	A	C	D	E	Weight
29 11 01	1,530	570	1,590	350	200	1,370	215	150	150	135	460
29 15 01	1,530	730	1,590	500	200	1,370	215	150	150	135	500
29 20 01	1,690	730	1,910	500	300	1,690	80	105	120	105	600
29 25 01	1,690	890	1,910	600	300	1,690	80	105	120	105	680
29 35 01	1,690	1,210	1,910	920	300	1,690	80	105	120	105	830

For service work, a clearance corresponding to dimension W is required on the operating side of the unit. If dimension B is smaller than one metre, please leave a clearance of one metre.

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

Partitioning of unit for smaller apertures possible (at extra cost).

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

- 1 Door fitting assembly increase unit width by 25 mm each operating side incl. 100 mm unit feet, incl. 120 mm duct connection
- 2

Controls cabinet

Unit type	H x W x D	Position at unit
29 11 01	900 x 480 x 210	SA/RA side
29 15 01	900 x 480 x 210	SA/RA side
29 20 01	900 x 480 x 210	SA/RA side
29 25 01	900 x 480 x 210	SA/RA side
29 35 01	900 x 480 x 210	SA/RA side

Technical specifications and services

Unit Type		29 11 01	29 15 01	29 20 01	29 25 01	29 35 01
Optimum flow rate	m ³ /h	1,100	1,500	2,000	2,500	3,500
Heat recovery efficiency ¹	%	76	76	79	79	80
Dehumidification capacity according to VDI 2089	kg/h	6.6	9.0	12.1	15.1	21.1
Dehumidification capacity in recirc mode	kg/h	4.0	4.9	6.4	8.2	11.8
Heating capacity of heat pump ²	COP	4.82	5.08	4.94	5.25	5.17
Total electrical power rating ³	kW	2.07	2.38	3.37	3.90	5.96
Current consumption ³	A	13.3	7.5	8.9	10.1	17.6
Operating voltage		3 / N / PE 400 V 50 Hz				
Ext. pressure losses						
Supply and fresh air channel	Pa	300	300	300	300	300
Return and exhaust air channel	Pa	300	300	300	300	300
Sound power level ⁴						
Supply air vent	dB(A)	77	78	69	66	74
RA connection	dB(A)	72	71	63	61	67
Outside air vent	dB(A)	67	66	58	56	63
EA connection	dB(A)	69	70	60	57	63
Acoustic pressure at a distance of 1 m from the device ⁴	dB(A)	62	63	54	51	58
Fan units						
Rated motor input for supply air ⁵	kW	0.56	0.61	0.91	1.04	1.72
Rated motor input for return air ⁵	kW	0.41	0.47	0.76	0.86	1.34
Rated motor input for supply air recirc mode ⁵	kW	0.24	0.28	0.48	0.59	0.88
Rated motor input for return air recirc mode ⁵	kW	0.31	0.35	0.60	0.71	1.10
SFP category (supply air return air) recirc mode		1 2	1 1	2 2	2 2	2 3
Nominal rating supply air return air	kW	1.0 1.0	1.0 1.0	1.2 1.2	1.2 1.2	2.4 2.4
Integrated heat pump						
Filling volume of refrigerant type R407C ⁶ (without with PWC)	kg	1.8 2.5	2.0 3.5	2.3 3.5	2.5 4.0	3.5 5.0
Heating capacity heat pump	kW	5.3	6.6	8.4	10.5	15.0
Rated compressor input for recirc air dehumidification	kW	1.1	1.3	1.7	2.0	2.9
Rated compressor input for OA-EA operation ⁷	kW	1.0	1.2	1.5	1.8	2.5
Filtration according to DIN EN 779						
Outside air				M5		
Return air				M5		
LPHW						
Heating capacity ⁸ recirc mode	kW	6.5	8.8	11.3	14.0	20.7
Heating capacity ^{7,8} OA-EA operation	kW	4.6	6.8	8.6	10.9	16.1
Water flow rate and pressure losses						
LPHW	m ³ /h kPa	0.29 6.5	0.39 4.8	0.49 8.2	0.61 7.1	0.91 17.7
LPHW (pump warm water) valve	m ³ /h kPa	0.29 8.1	0.39 5.8	0.49 9.5	0.61 14.6	0.91 13.2
Pool water condenser ⁹ (supplementary equipment)						
Heating power ¹⁰	kW	5.4	6.6	8.4	10.5	14.8
Spread of pool water temperature	K	6.6	6.3	6.6	6.5	6.4
Pool water volume flow rate	m ³ /h	0.7	0.9	1.1	1.4	2.0
water side pressure loss	kPa	12.3	14.1	12.0	12.5	15.2
Connections						
LPHW connection	DN	15	15	15	20	20
LPHW control valve connection	DN	10	10	10	10	15
Condensate drainage	DN	20	20	20	20	20
Floor drain	DN	20	20	20	20	20
PWC connection ¹¹	DN	20	20	25	25	25

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 condition
2 dehumidifying in recirc mode without PWC

- 3 depends on configuration of measurement and control system/unit
4 at 250 Hz mid-band frequency
5 with average filter contamination
6 where domestic heat pump coupling: Refrigerant type = R134a; filling volumes vary
7 OA = -12°C / 90% r.h., 2/3 proportion of air from outside

- 8 FL = 70°C; SA = 50°C
9 heat emission full and proportional; when water inlet temp. 28°C
10 dehumidifying in recirc mode with PWC
11 for units with pool water condensers

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