SWIMMING POOL

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Dehumidification systems for indoor swimming pools and spas



Humidification, dehumidification and evaporative cooling



Dehumidification systems for private indoor swimming pools, wellness and therapy areas.







Why install a dehumidification system in an indoor pool?

A high degree of water evaporation is common with indoor pools, especially in combination with elevated air temperatures, leading to high indoor humidities and an oppressive atmosphere.

Without controlling the humidity, the stay in an indoor swimming pool can feel uncomfortable and the subtropical climate might lead to cardio-vascular problems. Furthermore, there is a risk that the condensation on metal fixtures, exterior walls or glass surfaces may lead to the formation of mold, corrosion and cause mustiness. When this occurs, it could eventually lead to damage to the building, resulting in costly renovation and business interruptions.

An efficient air dehumidification system, which actively decreases the humidity levels, ensures a pleasant and comfortable atmosphere for visitors and staff while helping to maintain the building.

Method for dehumidifying room air

A current and common way of lowering the humidity inside a swimming pool is by a constant and uncontrolled ventilation of outdoor air. This method uses a fan to discharge the moist and warm air from the swimming pool to the outside, while more arid outside air is drawn into the indoor pool. Subsequently, this constant supply of untreated air must be reheated, which is associated with high energy costs. Using ventilation in order to lower the air humidity wastes energy and is an out dated solution.

Specially designed swimming pool air dehumidification systems, which operate on the basis of a closed refrigeration cycle, are a more energy-efficient approach of controlling the humidity. Compared to a simple ventilation system with an intake and exhaust air system, a swimming pool dehumidifier can be up to 60% more efficient.

All Condair swimming pool dehumidifiers are based on the heat pump principle. The heat emitted by the heat pump circuit has an additional benefit of heating the indoor pool area. This can lead to a considerable saving in the operating costs of the heating system.

Types of dehumidifiers

Condair GmbH offers a wide range of dehumidifier products for all types of pool requirements:

- Condair DP-W chest-type wall mounted units for installation in the indoor pool area
- Condair DP-R wall-mounted units for installation in an adjacent room
- Condair DP units installed in the equipment room for circulating air operation
- Condair DP-HE high-efficiency dehumidifier for outdoor air operation with cross-flow heat exchanger



CONDAIR **DP-W** Wall-mounted dehumidifier

The Condair DP-W swimming pool dehumidifier is a chest-type unit mounted directly onto a wall in the pool area. Five models are available with a maximum dehumidifying capacity of 49 to 190 l/day.

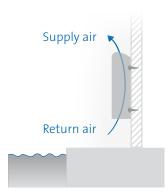
Installation is very simple with low assembly costs and required connections for just the electrical power and condensation drain. The unit has a slim depth of 260mm or 310mm, with smart and durable housing, in pure white RAL 9010, to blend perfectly with the architecture of the swimming pool area. The units are particularly recommended for retrofitting. The efficient R410A is used as refrigerant.

The thermal energy released by the heat-pump circuit is completely

transferred back to the room, helping to reduce heating costs. Optional hot water or electric heaters are available for additional heating if required to quickly heat the air to the required temperature in the swimming pool area.

The internal control electronics ensure the economic operation of the system. All the control functions are easy to operate. The refrigeration system of the Condair DP-W incorporates only high quality, branded components, and housed inside a compact and stylish enclosure. Alongside the optional hot water or electric heater, electronic and mechanical hygrostats, and standing feet are also available, to suit the requirements of the room.







CONDAIR **DP-R** Remotely located dehumidifier

The Condair DP-R is recommended for installations when the dehumidifier needs to be housed away from the swimming pool area, either due to space or aesthetic reasons. With the compressor and fans housed away from the pool, any machine noise is reduced to a minimum.

The Condair DP-R pool dehumidifier is available in five different sizes with a maximum dehumidifying capacity ranging from 49 to 190 l/day.

This model is wall-mounted in a room adjacent to the swimming pool. The connection to the pool area is made by using an optional 90° ducting kit through the wall, leaving only the supply and return air grilles visible.

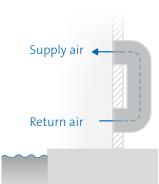
The heat released by the heat pump circuit is completely transferred back

to the room. This contributes to a considerable saving in heating costs. In addition, optional hot water or electric heaters can rapidly heat the air to the desired temperature in the swimming pool area.

Special features of the series Condair DP-W/DP-R:

- Efficient recirculating air dehumidification
- Energy efficient due to the heat pump principle
- Refrigerant R410A
- Low noise fans
- Easy installation and operation
- Corrosion-resistant finish
- Many options for flexible operation







CONDAIR **DP-C** Ceiling-mounted dehumidifiers

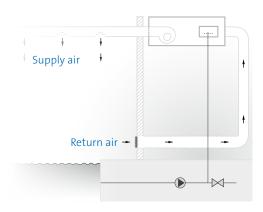
The Condair DP-C is a compact solution for air dehumidification. The flat design of this model makes it ideal for mounting under the ceiling or in a suspended ceiling. This type of installation is particularly suitable where there is no plant room or the existing plant room is too small to install a floor-mounted unit. All emitting components, such as compressors and fans, are located outside the swimming pool area.

The Condair DP-C pool dehumidifiers are available in five different sizes, with a maximum dehumidifying capacity of 49 to 190 l/day. As an alternative to the optionally available hot water-coil or electrical heaters, a partial heat recovery unit is available for transferring the waste heat from the dehumidifier directly into the pool water.

Features of the series Condair DP-C:

- Efficient recirculating air dehumidification
- Energy efficient due to the heat pump principle
- Refrigerant R410A
- Low noise fans
- Very compact and flat design of the housing
- Partial heat recovery option to heat the pool water
- Chlorine-resistant coating to internal components
- Additional options







CONDAIR **DP** Dehumidifier for the installation in the mechanical room

The Condair DP dehumidifiers can be used in hotel indoor swimming pools, wellness centres and therapeutic areas. These units are installed in a central utility room with ventilation ducts channeling the air to the pool area. This process of recirculating air ensures a safe and energy-efficient dehumidification system.

Ten different capacities are available with dehumidification from 73 to 940 l/day, covering a wide range of applications.

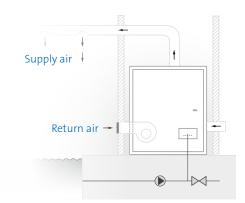
The recuperated thermal energy from the high-performance heat pump circuit is completely returned to the room air. This helps reduce the room's heating costs. As a result of the highpower output of the equipment, the thermal energy is often sufficient to maintain a constant temperature inside the pool area. An optional partial heat recovery system can be installed to channel a portion of the generated heat into the pool water. This is particularly useful in a therapeutic area, where high room temperatures are needed. A partial heat recovery system can prevent overheating inside the pool area. An optional extra of a hot water coil or an electric heater can be provided for additional heating of the indoor air or to support the existing room heating system.

A wide range of other options are available to help meet the specific requirements of the swimming pool.

Features of the Condair DP series

- Efficient, recirculating air dehumidification
- Powerful heat pump circuit
- Partial heat recovery option to heat the pool water
- Hot water or electric heaters
- Chlorine-resistant coating to internal components
- Special versions available upon request





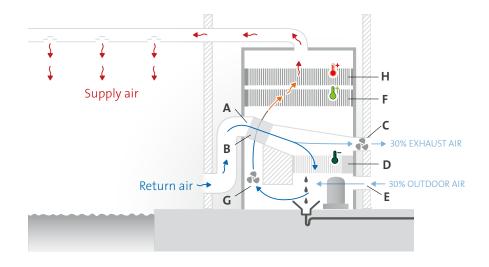


CONDAIR **DP HE** High-efficiency dehumidifier

The highly efficient Condair DP-HE swimming pool dehumidifier is used for humidity and temperature control with simultaneous heat recovery and external air supply, which can be controlled automatically to offer maximum comfort in the swimming pool area. Seven models are available with a maximum dehumidifying capacity range from 133 l/day to 565 l/day while operating at recirculation mode. When run at outdoor air operation mode, the dehumidification capacities can reach a maximum 1054 l/day.

Functional principle

A fan (G) draws in the very warm and humid return air from the swimming pool. The air flows through the air filter (A) and passed through a cross-flow heat exchanger (B). When the air flows cross, some of the enthalpy content is transferred to the supply air. After the air passed through the cross-flow heat exchanger, a part of this air stream from the fan (C) can be discharged to the outside. The remaining air is passed through the direct evaporator heat exchanger (D), where it is dehumidified to the required level. Downstream of the evaporator, the dehumidified and cool air can be added and mixed with a portion of the outside air (from 0% to 30%). An adjustable external air flap (E) is used to regulate this setting. Subsequently, the air mixture is channelled through the second inlet of the cross-flow heat exchanger. The heat from the warm exhaust air of the swimming pool is dissipated and added to the cooler mixed supply air. Consequently, the pre-heated air passes through the condenser (F) and is returned to the swimming pool as supply air.





If the supply air does not reach the required temperature by passing though the condenser (e.g., with very low outside air temperatures), a downstream hot water heating coil (H) is used to heat the air.

The proportion of the mixed outside air is up to 30% of the total nominal airflow. Adding outside air improves the quality of the air inside the pool area considerably. Furthermore, depending on the outside air conditions, the cross-flow heat exchanger is used beneficial as a pre-dehumidifier of the humid return air. This requires less energy for the actual dehumidification process via the refrigeration circuit. The twice use of the cross-flow heat exchanger in the heat recovery leads

to an increased dehumidification output of up to 30% and a lower power consumption compared to conventional dehumidifiers. The energy efficiency can be further optimized by using the optional available energy saving setback system which can be utilized while the pool is not in operation.

The flexible control options guarantees the best possible efficiency in every operating mode and at every utilization level.

- Automatic mixing of up to 30% outside air
- Twice-use of the cross-flow heat exchanger
- Partial heat recover option to heat the pool water
- Hot water heating coil is included standard
- Electronic controller



WALL-MOUNTED Condair **DP-W**



Technical Data		DP 50-W	DP 75-W	DP 100-W	DP 150-W	DP 200-W
Dehumidification capacity at 30°C – 80%	l/24h	49	73	95	155	190
Dehumidification capacity at 30°C – 60%	l/24h	39	56.7	77.4	118.3	146.7
Dehumidification capacity at 28°C – 60%	l/24h	35.9	51.6	1.1	101.6	132.3
Dehumidification capacity at 26°C – 60%	l/24h	33.4	47.3	65.8	93.4	121.3
Air Flow	m³/h	500	800	1000	1400	1650
Available external preassure	Ра			40		
Nominal power consumption (1)(6)	kW	0.9	1.2	1.6	1.9	2.5
Maximum power consumption (2)(6)	kW	1.2	1.5	2	2.3	3.1
Power output of electrical heater (optional)	kW		3			5
Maximum current consumption	А	3.9	5.6	8.4	10.5	13.2
Hot water coil (4)	kW	3.5	7	7	11.5	11.8
Humidity/temp. operating range	% RH		50-99%	≤ RH / 20−36°C		
Voltage supply	V/Ph/Hz		2	30/1/50		
Sound pressure levels (3)	dB(A)	47	50	50	52	54
Refrigerant/charge amount	Type / g	R410A/470	R410A/600	R410A/700	R410A	/ 1200
Equivalent CO ₂ Charge ⁽¹⁰⁾	t-CO ₂ e	0.98	1.25	1.46	2.	51
Dimensions (H x W x D)	mm	750 x 835 x 260 750 x 1135 x 260 840 x 1384 x 3				84 x 310
Weight	kg	50	64	68	99	102

INSTALLATION BEHIND PARTITION Condair **DP-R**

Technical Data		DP 50-R	DP 75-R	DP 100-R	DP 150-R	DP 200-R
Dehumidification capacity at 30°C – 80%	l/24h	49	73	95	155	190
Dehumidification capacity at 30°C – 60%	l/24h	39	56.7	77.4	118.3	146.7
Dehumidification capacity at 28°C – 60%	l/24h	35.9	51.6	1.1	101.6	132.3
Dehumidification capacity at 26°C – 60%	l/24h	33.4	47.3	65.8	93.4	121.3
Air Flow	m³/h	500	800	1000	1400	1650
Available external preassure	Ра			40		
Nominal power consumption (1)(6)	kW	0.9	1.2	1.6	1.9	2.5
Maximum power consumption (2)(6)	kW	1.2	1.5	2	2.3	3.1
Power output of electrical heater (optional)	kW	3 6				6
Maximum current consumption	А	3.9	5.6	8.4	10.5	13.2
Hot water coil (4)	kW	3.5	7	7	11.5	11.8
Humidity/temp. operating range	% RH		50-9	9% RH / 20–36°	C	
Voltage supply	V/Ph/Hz			230/1/50		
Sound pressure levels (3)	dB(A)	47	50	50	52	54
Refrigerant/charge amount	Type / g	R410A/470	R410A/600	R410A/700	R410A	/ 1200
Equivalent CO ₂ Charge ⁽¹⁰⁾	t-CO ₂ e	0.98	1.25	1.46	2.	51
Dimensions (H x W x D)	mm	680 x 706 x 250 680 x 1006 x 250 770 x 1255				255 x 300
Weight	kg	41	57	61	82	87

(4) at $t_R = 30^{\circ}$ C; water temperature 80/70°C, compressor at

(1) at t_{e} = 30°C; relative humidity = 80% (2) at t_{e} = 35°C; relative humidity = 75% (3) Laboratory values at 1 m in open air compliant with ISO

9614, actual values may vary

(a) at t_g = 30 °C; relative humidity = 80%; water temperature 27/32°C
(b) without electrical heater

(7) Sound power level compliant with ISO 9614 (8) without outside air mix
(9) incl. 30% outside air mix (-5°C, 80% r.H.)

(10) R410A global warming potential (GWP) = 2088 CO₂e



CEILING-MOUNTED Condair **DP-C**



Technical Data		DP 50-C	DP 75-C	DP 100-C	DP 150-C	DP 200-C
Dehumidification capacity at 30°C – 80%	l/24h	49	73	95	155	190
Dehumidification capacity at 30°C – 60%	l/24h	39	56.7	77.4	118.3	146.7
Dehumidification capacity at 28°C – 60%	l/24h	36	51.6	71.1	101.6	132.3
Dehumidification capacity at 26°C – 60%	l/24h	33.5	47.3	65.8	93.4	121.3
Air Flow	m³/h	500	800	1000	1400	1650
Available external preassure	Pa			50-150		
Nominal power consumption (1)(6)	kW	0.97	1.29	1.76	2.07	2.74
Maximum power consumption (2)(6)	kW	1.2	1.5	2	2.3	3.1
Power output of electrical heater (optional)	kW		3		6)
Maximum current consumption	А	3.9	5.6	8.4	10.5	13.2
Hot water coil ⁽⁴⁾	kW	3.5	7.5	8.5	13	14
Partial heat recovery unit (5)	kW		1.1	1.7	2.3	3
Humidity/temp. operating range	% RH		50-	99% RH / 20–36	°C	
Voltage supply	V/Ph/Hz			230/1/50		
Sound pressure levels (3)	dB(A)	50	52	54	59.5	61.5
Refrigerant/charge amount	Type / g	R410A/470	R410	A / 600	R410A / 900	R410A/ 1200
Equivalent CO ₂ Charge ⁽¹⁰⁾	t-CO ₂ e	0.75	1	.25	1.88	2.51
Dimensions (H x W x D)	mm	360 x 710 x 700 460 x 900 x 980 560 x 1050 x				0 x 1160
Weight	kg	63	95	122	131	140

at t_k = 30°C; relative humidity = 80%
 at t_k = 35°C; relative humidity = 75%
 Laboratory values at 1 m in open air compliant with ISO 9614, actual values may vary

(4) at t_R = 30°C; water temperature 80/70°C, compressor at standby
(5) at t_R = 30°C; relative humidity = 80%; water temperature 27/32°C
(6) without electrical heater

(7) Sound power level compliant with ISO 9614
(8) without outside air mix
(9) incl. 30% outside air mix (-5°C, 80% r.H.)
(10) R410A global warming potential (GWP) = 2088 CO₂e

MAIN UNIT Condair **DP**



Technical Data		DP 75	DP 100	DP 150	DP 200
Dehumidification capacity at 30°C – 80%	l/24h	73	95.2	157.1	194.3
Dehumidification capacity at 30°C – 60%	l/24h	56.6	76.5	111	145.3
Dehumidification capacity at 28°C – 60%	l/24h	51.6	71.1	103	133.5
Dehumidification capacity at 26°C – 60%	l/24h	47.3	65.8	92.6	123.3
Air Flow	m³/h	800	1000	1500	1800
Available external preassure	Pa		50-	150	
Nominal power consumption (1)(6)	kW	1.4	1.82	2.27	2.9
Maximum power consumption ⁽²⁾⁽⁶⁾	kW	1.59	2.05	2.68	3.44
Power output of electrical heater (optional)	kW	3 6			6
Maximum current consumption	A	7.8	9.1	12.4	15.7
Hot water coil ⁽⁴⁾	kW	7.5	8.5	13.9	15.2
Partial heat recovery unit ⁽⁵⁾	kW	1.1	1.7	2.3	3
Humidity/temp. operating range	% RH		50-99% RH	l∕20—36°C	
Voltage supply	V/Ph/Hz		230/	1/50	
Sound pressure levels (3)	dB(A)	52	54	60	62
Refrigerant/charge amount	Type / g	R410A / 550 R410A / 110		A/1100	
Equivalent CO ₂ Charge ⁽¹⁰⁾	t-CO ₂ e	1.15 2.3		2.3	
Dimensions (H x W x D)	mm	800 x 800 x 400 1000 x 1060 x			.060 x 550
Weight	kg	85	90	130	135

Technical Data		DP 270	DP 350	DP 450	DP 550	DP 750	DP 950
Dehumidification capacity at 30°C – 80%	l/24h	263.1	340.2	418.8	566.8	751.1	939.3
Dehumidification capacity at 30°C – 60%	l/24h	185.1	262.3	336.3	425	596.4	759.7
Dehumidification capacity at 28°C – 60%	l/24h	168.9	242.9	313.5	392.6	554.7	706.7
Dehumidification capacity at 26°C – 60%	l/24h	153.4	223.9	290.8	359.6	513.5	654.6
Air Flow	m³/h	3500	42	.00	5500	7000	8500
Available external preassure	Pa			50-	-150		
Nominal power consumption (1)(6)	kW	5.18	6.49	9.42	10.1	12.88	19.6
Maximum power consumption (2)(6)	kW	6.6	7.99	9.85	13	16	21
Power output of electrical heater (optional)	kW		9			9/18	
Maximum current consumption	А	12	14.2	17.9	22	27	39
Hot water coil (4)	kW	22.8	24	24	42	49	56
Partial heat recovery unit (5)	kW	1.8	2.2	2.7	3.5	-	-
Humidity/temp. operating range	% RH			50–99% RH	H∕20—36°C		
Voltage supply	V/Ph/Hz			400/	/3/50		
Sound pressure levels (3)	dB(A)	63 64 66					
Refrigerant/charge amount	Type / g	R410A / 3000 R410A / 2500 R410A / 9000		R410A / 8000			
Equivalent CO ₂ Charge ⁽¹⁰⁾	t-CO2 e	6.26 5.22 18.79		16	5.7		
Dimensions (H x W x D)	mm	1378 x 1154 x 704 1750 x 1504 x 854			4		
Weight	kg	207	211	215	415	423	430

at t_g = 30°C; relative humidity = 80%
 at t_g = 35°C; relative humidity = 75%
 Laboratory values at 1 m in open air compliant with ISO 9614, actual values may vary

(4) at t_R = 30°C; water temperature 80/70°C, compressor at standby
(5) at t_R = 30°C; relative humidity = 80%; water temperature 27/32°C
(6) without electrical heater
(7) Sound power level compliant with ISO 9614

(8) without outside air mix

(9) incl. 30% outside air mix (-5°C, 80% r.H.)
(10) R410A global warming potential (GWP) = 2088 CO₂e

HIGH-EFFICIENCY DEHUMIDIFIER Condair **DP-HE**



Technical Data		DP 1500-HE	DP 2000-HE	DP 2800-HE	DP 3500-HE
Dehumidification capacity at $30^{\circ}C - 60\%$ ⁽⁸⁾	l/24h	132.7	162.3	248.9	310.7
Dehumidification capacity at $30^{\circ}C - 60\%$ ⁽⁹⁾	l/24h	223	290.9	444.8	552.2
Dehumidification capacity at $28^{\circ}\text{C} - 60\%^{(8)}$	l/24h	123.4	152	232.2	290
Dehumidification capacity at $28^{\circ}\text{C} - 60\%$ ⁽⁹⁾	l/24h	236.3	309.8	472.9	575.7
Dehumidification capacity at $26^{\circ}C - 60\%$ ⁽⁸⁾	l/24h	114.4	140.8	218.3	270.2
Dehumidification capacity at $26^{\circ}C - 60\%$ ⁽⁹⁾	l/24h	212.1	276.9	423.2	525.4
Air Flow	m³/h	1500	2000	2800	3500
Available external preassure	Ра	200			
Fresh air available max.	m³/h	450	600	845	1050
Nominal power consumption (1)	kW	1.97	2.54	3.44	5.27
Maximum current consumption	А	6.8	9.4	12.7	17.7
Hot water coil (4)	kW	18	23	28	33
Voltage supply	V/Ph/Hz		400/	/3/50	
Sound pressure levels (3)	dB(A)	63	63	66	66
Refrigerant/charge amount	Type / g	R410A	/1600	R410A / 2500	R410A/3000
Equivalent CO ₂ Charge ⁽¹⁰⁾	t-CO₂e	3.34	3.34	5.22	6.26
Dimensions (H x W x D)	mm	1770 x 1000 x 640 1850 x 1500 x 75			500 x 750
Weight	kg	290	305	400	420

Technical Data		DP 4200-HE	DP 5200-HE	DP 6000-HE	
Dehumidification capacity at $30^{\circ}\text{C}-60\%$ $^{(8)}$	l/24h	376	464.4	565.2	
Dehumidification capacity at $30^{\circ}\text{C} - 60\%$ $^{(9)}$	l/24h	587.5	746.4	907.5	
Dehumidification capacity at $28^{\circ}\text{C}-60\%$ $^{(8)}$	l/24h	350.4	434.1	527.2	
Dehumidification capacity at $28^{\circ}\text{C} - 60\%$ $^{(9)}$	l/24h	618.9	766.5	930.2	
Dehumidification capacity at $26^{\circ}C-60\%$ $^{(8)}$	l/24h	325.8	407.8	492.4	
Dehumidification capacity at $26^{\circ}C-60\%$ ⁽⁹⁾	l/24h	545.8	681	822.2	
Air circulation	m³/h	4200	5200	6000	
Compression available	Pa		200		
Fresh air available max.	m³/h	1260	1560	1800	
Nominal power consumption (1)	kW	5.86	7.74	9.94	
Maximum current consumption	А	18.5	20.9	25.8	
PWW heater ⁽⁴⁾	kW	53	64	70	
Voltage supply	V/Ph/Hz		400/3/50	^ 	
Sound pressure levels (3)	dB(A)	68	6	9	
Refrigerant/charge amount	Type / g		R410A / 5000		
Equivalent CO ₂ Charge ⁽¹⁰⁾	t-CO2e	10.44			
Dimensions (H x W x D)	mm		1950 x 1950 x 1250		
Weight	kg	570	590	620	

at t_k = 30°C; relative humidity = 80%
 at t_k = 35°C; relative humidity = 75%
 Laboratory values at 1 m in open air compliant with ISO 9614, actual values may vary

(4) at $t_{\scriptscriptstyle R}$ = 30°C; water temperature 80/70°C, compressor at

(4) at t_k = 30°C; relative humidity = 80%; water temperature 27/32°C
(6) without electrical heater

(7) Sound power level compliant with ISO 9614
(8) without outside air mix
(9) incl. 30% outside air mix (-5°C, 80% r.H.)
(10) R410A global warming potential (GWP) = 2088 CO₂e

Efficiency

One traditional method of dehumidification that is still used today is a simple ventilation and exhaust system, where the damp air is pushed out via a ventilator and drier air streams come in from the outside. This external air must then be reheated, which requires a high amount of energy.

A more efficient way to run dehumidifiers is based on a closed cooling circuit system. All Condair industrial and indoor swimming pool dehumidifiers work according to the heat pump principle. The heat generated by the heat pump circuit is recycled to heat the indoor pool area. This helps reduce operating costs and makes it up to 60% more efficient when compared to a standard ventilation system.

Desiccant driers can be very efficient when available energy from on-site steam or warm water is combined with the electrical regeneration heater. Using hybrid regeneration heating saves energy, particularly with larger systems, to help reduce operating costs.

Planning and service

Condair offer a wide and comprehensive range of dehumidification systems and its experts can help you plan, design and select the best dehumidification system to meet your requirements.

We have a nationwide customer service program to help maintain, commission and service your dehumidifier as required. Condair offers the following product-related services:

- Planning support
- On-site consultation and sales with our specialists
- Software-supported design and calculations
- Nationwide after-sales service
- Spare parts supply



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