

Modern dehumidification and purification of air in private swimming pools, hotel pools and fitness centres

DPD 40/80/120 Ducted Swimming Pool Dehumidifiers



 **Dan-Poltherm**[®]
Kierujemy powietrzem



Ducted Swimming Pool Dehumidifiers

Pool dehumidifiers are used in all locations in which water is accompanied by huge quantities of water vapour. The devices included in Dan-Poltherm offer have been created especially to be used in private and hotel swimming and recreation pools. Small, compact devices were designed with the view to servicing smaller pools, spas, changing rooms, showers and wellness centres, in which the humidity can lower the user comfort and have negative impact on the building or cause corrosion.

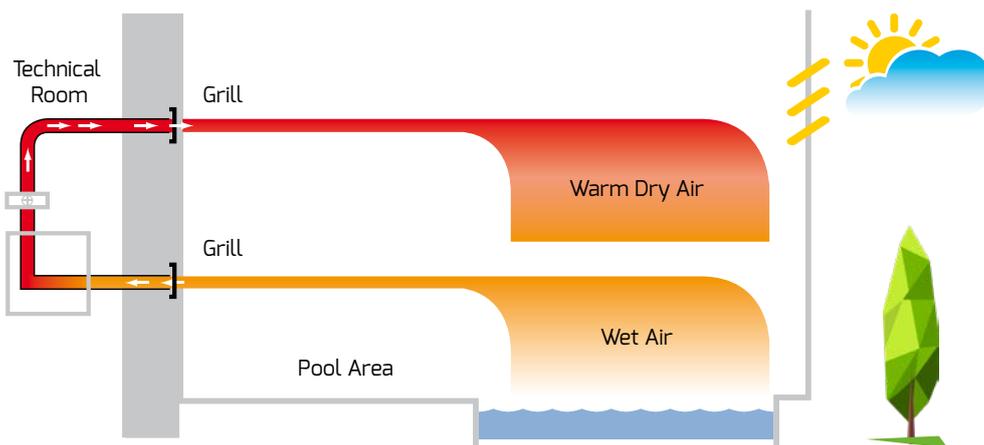
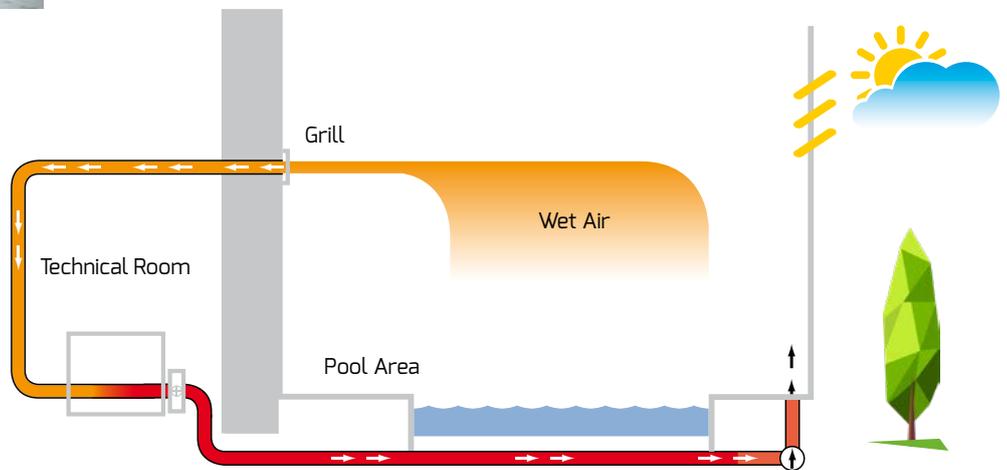


Recommended installation manners



Air circulation in the pool hall is very important in the dehumidification process. The air which is dried and heated by DPD Duct dehumidifier is best distributed by means of a system of ducts and blown using slot diffusers along the windows. This prevents condensation on the windows.

The exhaust draught should be organized at the opposite side of the supply at the highest possible point of the facility. Supply slot diffusers shall ensure a natural, convection flow of the air along cool partitions. The air is mixed with the inside air filling the pool hall, thus counteracting the creation of dead zones.



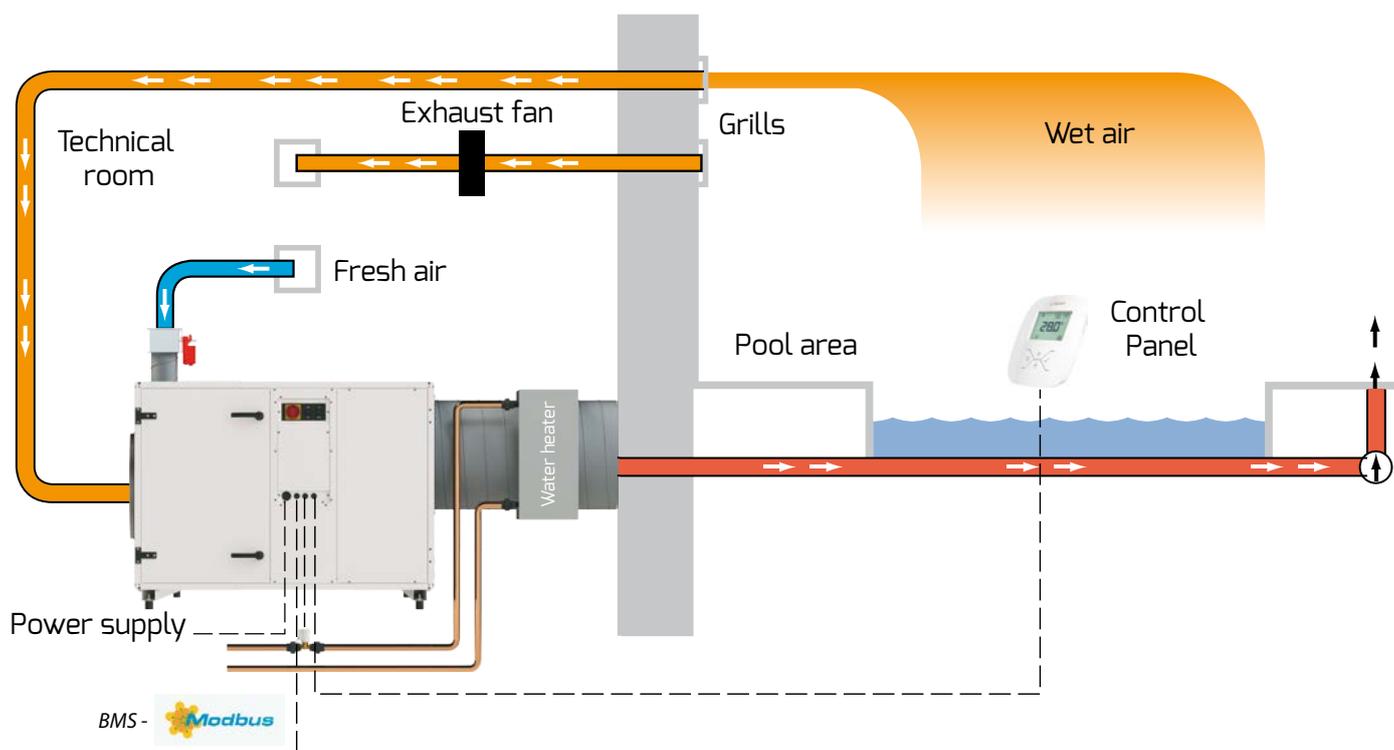
DPD Unit can also co-operate with a network of ducts as well as inlet and outlet grilles in the pool hall. The operating system is similar to the operation of dehumidifiers hidden behind the walls, the only element of which that is visible in the pool hall are the air grilles.

Automatic operation – control

DPD are equipped with an electronic control system which is fully enclosed in the device, as a result of which the operation is fully automated. The devices have an external panel with a display, which performs a role of a hygrosat and room thermostat at the same time. The panel enables the readout of current air parameters in the swimming pool hall and allows to edit set points i.e. expected humidity, temperature and fresh air supply. The dehumidifier can co-operate with the BMS system by means of Modbus RTU communication protocol.

The device has two main operating modes, AUTO and MANUAL, thanks to which the user can impact continuous or intermittent fan operation,

depending on the requirement on drying and heating. Upon selecting continuous operation of the fan, the dehumidifier can be equipped with a duct hygrosat, if the room readout in the control panel is not possible.



Principle of operation

Humid air from the pool hall is drawn into the dehumidifier by the fan forming an integral part of the device. After passing through the filter, purified air goes into the evaporator and then into the condenser of the heat pump inside the unit. The device condenses the humidity, which is transported outside using a drain hose. Thanks to the heat pump all electric power used in the drying process returns in the form of the heated and dried air, the temperature of which increases by approx. +4/5°C. The installation can be equipped with an external duct water heater, and thus fully automate air temperature adjustment in the pool hall, apart from the control of humidity. All DPD offer the possibility of connecting fresh air and optionally a condenser to the pool water heating system (water-cooled condenser).



Additional equipment - accessories

DPD dehumidifiers are devices designed to be installed in technical rooms adjacent to the serviced space. An appropriate system of air distribution in the pool facility needs to be organized, and the supply and exhaust air needs to be directed via the ducts directly to the device. The dehumidifier can be hung up on a wall or set on the floor using a special **floor mounting kit**. Additionally, the DPD units can be equipped with an external **water heating coil**, mounted in the supply channel, **fresh air damper** and a condenser heating the pool water (**water-cooled condenser**).

Fresh air damper

DPD enable facility ventilation thanks to the possibility of supplying a limited amount of fresh air. Thanks to this solution, the device dehumidification capacity is increased and the quality of air in the swimming pool area improves. Each humidifier is equipped with a connection located in the upper part, enabling the supply of external air through a duct.

Additional elements such as exhaust fan or damper with spring return actuator should be provided by the installer.



Floor mounting kit



The devices can be hung on the wall or placed on the floor. Floor assembly requires a small pedestal to ensure the correct condensate drainage during dehumidification process. There is a factory floor-mounting kit with anti-vibration pads available as an option. The kit guarantees the right height for the condensate drainage installation and has the ability to adjust the height and levelling of the unit.

Slot diffusers

The air which is dried and heated by a dehumidifier is best distributed by means of a system of ducts and blown using Dan-Poltherm's slot diffusers along the windows. It is the optimal way of air distribution because in this way condensing of the window can be avoided. The distance between the diffuser and the overblown partition has to be within the range of 20-30 cm, and the speed of air outflow has to be within the range of 3-5 m/s, which is achieved through the selection of the appropriate number of slots.



Duct Water Heater with 2-way valve and actuator

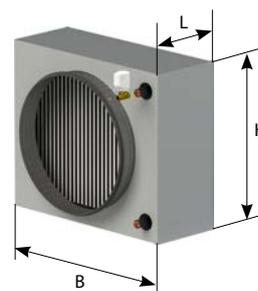
DPD are adapted to exact control of temperature inside the pool hall thanks to the duct water heater. The dehumidifier system can be additionally equipped in the set, consisting of a duct water heater and a two-way valve with an actuator, dedicated for each unit size.



The dehumidifier's controller will take care of appropriate opening of the heater valve, so that the facility temperature which has been set in the room panel could be achieved. This solution eliminates the need to install other heating systems in the swimming pool area, which are necessary for the maintenance of comfort and compensation of static heat losses of the building.

Duct Water Heater		DPD 40			DPD 80			DPD 120		
Water connection	"	3/4			3/4			1		
Air connection	mm	Ø 400			Ø 400			Ø 500		
Dimensions L / B / H	mm	280/615/550			280/615/550			280/720/615		
Water temperature	°C	90/70	80/60	70/50	90/70	80/60	70/50	90/70	80/60	70/50
Air volume	m ³ /h	1600			2600			3800		
Air outlet temperature	°C	49,9	44,8	40,1	45,8	41,5	37,3	45,5	41,3	37,1
Heating power	kW	12,38	9,62	7,07	16,51	12,73	9,04	23,73	18,34	12,95
Water flow	l/s	0,16	0,13	0,09	0,21	0,17	0,11	0,29	0,23	0,16
Pressure drop, water	kPa	7,5	4,7	2,8	11,7	7,6	3,7	12,9	8,1	4,6
Pressure drop, air	Pa	19,0	19,0	19,0	34,0	34,0	34,0	41,0	41,0	41,0
2 way valve	"	3/4"			3/4"			3/4"		
Actuator	~	on/off 1x230VAC			on/off 1x230VAC			on/off 1x230VAC		

Technical parameters of the water heating coils for room temperature 27°C



Heat recovery, water cooled condenser

An optional water cooled condenser enables the transfer of heat with the view to water heating, e.g. in the pool or in the hot utility water tank. The whole heat from the dehumidification process (the consumption of electric power by the heat pump) can be used for any purpose if it is not necessary to heat up the air returning to the pool hall, e.g. in the summer.



Water condenser		DPD 40	DPD 80	DPD 120
Nom. Water flow	l/h	600	800	800
Nom. Capacity*	kW	4.0	6.0	6.0
Connection	mm	15	15	15
Pressure drop	kPa	10	14	16

Water temperature 28°C

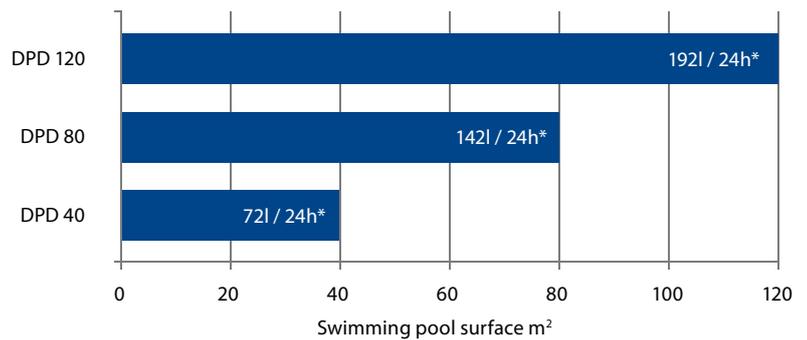
In addition to energy recovery, this solution can improve the comfort of pool users during the summer. The dehumidifier equipped with a water-cooled condenser can act as an air conditioner and, besides dehumidification, it can also cool the air which is particularly useful in the buildings with large glass inserts.

The DPD dehumidifier controller can regulate the flow of water delivered to the condenser by closing or opening the two-way valve with the actuator and the entire process is controlled by the user in the control panel. The valve with an actuator is available as optional equipment. The installer can arrange heat collection in any other way.

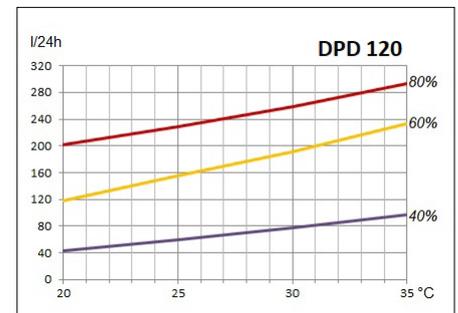
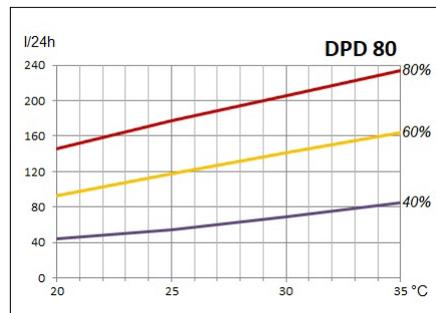
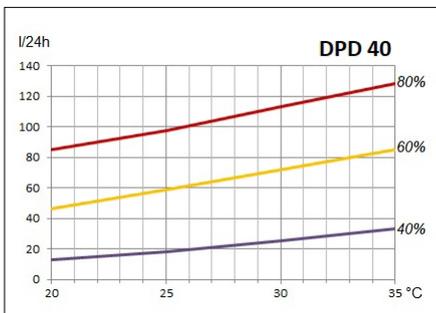
The fast selection diagram of dehumidifiers from DPD series

The selection of an appropriate dehumidifiers depends on a number of factors, while the surface of the water table is only one of them. Air temperature and the temperature of pool water, the nature of pool use and the use of shutters covering the pool basin are very important from the perspective of the drying level.

The whole range of DPD made by Dan-Poltherm is intended for swimming pools with the surface area of up to approx. 120 m², and even larger upon the compliance with certain conditions. The selection of an appropriate dehumidifier for a specific pool hall shall be at each time considered individually. The devices can also be used in larger facilities by means of an appropriate increase of the number of units.

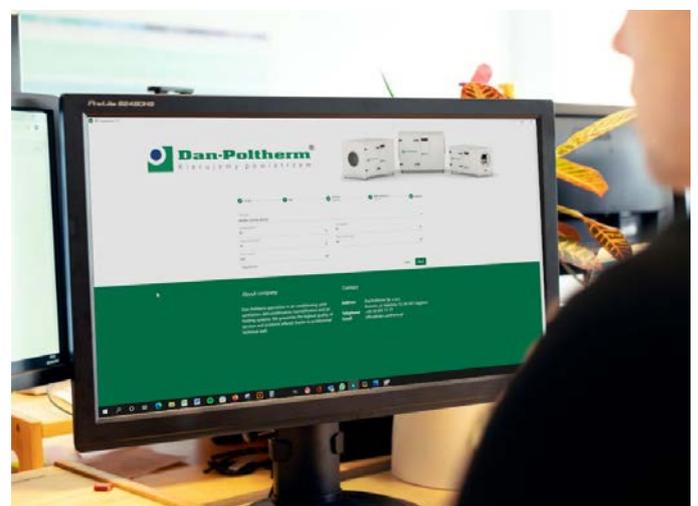


The symbol of each size of the dehumidifier contains a dedicated max. water surface area of the serviced pool expressed in sq. meters. In addition, the device code informs about the dehumidification capacity expressed in l/24h for air parameters inside the pool hall of 28°C/60%.



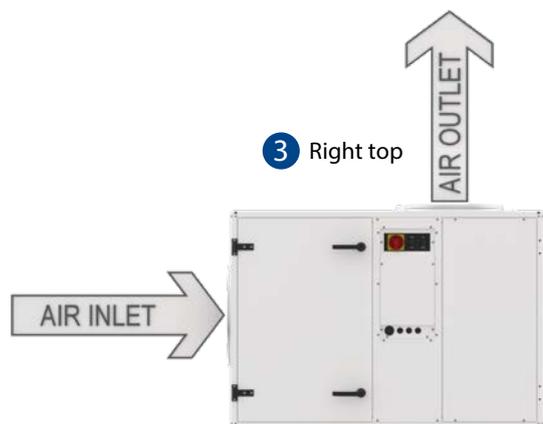
Selection software

DP Select software simplifies the process of sizing and configuring ducted swimming pool dehumidifiers and compact air handling units. It allows you to perform advanced humidity, air and energy calculations to ensure that the solution is optimised to meet your requirements. Extensive technical documentation and print-outs are available, as well as exports to PDF. Selection software is also useful for calculations of slot diffusers and air distribution system with detailed specification of necessary components.



A universal configuration

Only one universal configuration, thanks to which internal components of the DPD can be easily moved during the installation with the view to obtaining the supply from the right or from the left hand-side. The installer decides about the configuration on his own so that left-handed or right-handed service access to the device can be provided, depending on the direction of device door opening or walls location.



Additionally, in the case of technical space limitations, the outflow of dried air can take place from the device top (from above) instead of one of the side walls thanks to the ready connection and a duct plug, which have to be swapped if such configuration is selected.

As a standard, the dehumidifiers are supplied with horizontal flow and air outlet on the right side **1**. However, the installer adjusts the configuration according to requirements of the construction site. The devices can be delivered in a different configuration: **2 3 4**



Corrosion resistance

DPD have been designed for continuous operation in an aggressive pool environment. The galvanised casing is fully powder coated, just like all internal structural elements. Refrigeration exchangers of the heat pump (evaporator and condenser) with a special structure are made from materials resistant to corrosion in the pool environment, and powder painting of such elements is an additional protection.

Features of devices:



- Sub-assemblies of the DPD are mounted in the casing made from two layers of galvanised steel sheet, powder painted and filled with 50 mm insulation.
- The evaporator and the condenser are covered with an epoxy layer with the view to increasing corrosion resistance.
- All external and internal elements of the casing are powder coated
- Condensate drain is located on the air intake side. A hose can be connected to the drain through the stub pipe.
- Air inlet through the filter.
- Air outlet is located at the side or on the top of the device.
- The inspection side can be moved to the second side of the dehumidifier.
- The supply of fresh air from the outside is possible through the stub pipe.
- The dehumidifier can additionally be equipped with the water condenser.
- The dryer can be mounted onto the wall and to the floor using an anti-vibration set.
- In order to additionally heat up the dried air, the device can be optionally equipped with a duct water heater.

Technical data

Dehumidifier		DPD 40	DPD 80	DPD 120
Water surface	m ²	40	80	120
Dehumidification capacity at 28°C/60%	l/24h	72	142	192
Air flow	m ³ /h	1600	2600	3800
Max. external pressure	Pa	180	250	250
Fresh air supply	m ³ /h	160-240	260-390	380-570
Operating range - temperature	oC	18-42	18-42	18-42
Operating range - humidity	%	20-100	20-100	20-100
Power supply	V/HZ	1x230/50	3x400/50+N	3x400/50+N
Max. current	A	9,6	7,8	12,1
Nominal power consumption	kW	1,56	2,3	2,8
Refrigerant	-	R410a	R410a	R410a
Quantity of refrigerant	kg	2,3	4	4,8
Dimensions A/B/C	mm	1300/680/680	1300/880/880	1400/980/980
Duct connections D	mm	400	400	500
Fresh air connection	mm	125	125	125
Weight	kg	140	165	198
Sound level (1 m)	db(A)	54	56	60
Filter dimensions	mm	558x535x25 - 1 pcs.	379x735x25 - 2 pcs.	429x835x25 - 2 pcs.
Filter class	mm	G3	G3	G3

