

ASTRALPOOL 

Pool dehumidification

 Airpool+

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The **new high performance Airpool+** dehumidifier is used for the dehumidification of indoor pools. Thanks to its design, in which the cooling circuit's components are arranged differently than in a conventional dehumidifier, the dehumidified air is reused by a recuperator, which significantly increases performance.

This innovative technology includes a new distribution of cooling circuit's components and a high performance recuperator, which together make considerable energy savings in comparison with the conventional technologies that can be found in the market.

Operating modes

The Airpool+ dehumidifier adjusts the conditions of an indoor pool to those desired by the user in its two operating modes: daytime (peak time) and night-time.

The regulation and recovery of heat in these two operating times make this dehumidifier a high performance unit.



The free cooling system serves a dual purpose

The first is its capacity for renewing air so that users breathe in the best quality of air possible and the second is to take advantage of outdoor conditions for dehumidifying, thus reducing the unit's consumption. This free cooling system regulates itself according to relative outdoor and indoor humidity, and the default value.

The unit has a hot water battery and its three-way valve is regulated depending on the return temperature to make up for heat losses from a pool facility.

Users can set the times the unit works. In night-time mode, conditions are less restrictive than in daytime mode as there is nobody in the pool, so settings are read to dehumidify it but not to regulate air quality.

Given the wide range of individual requirements, there are three operating modes for the fans:

- a / Fans off.
- b / Fans work at a rate of 50%.
- c / The user can select the rate at which fans work at night-time.

The dehumidifier has **five operating modes**:

- **Mode 1. RECIRCULATION**
- **Mode 2. ALPHA CYCLE**
- **Mode 3. OUTDOOR AIR**
- **Mode 4. ALPHA CYCLE + OUTDOOR AIR**
- **Mode 5. COOLING**



OPERATING MODES

Mode 1. RECIRCULATION

- > This operating mode is for night-time only.
- > The return flow rate fulfils all night-time default conditions required, so the cooling cycle does not have to be switched on and all of the water is recirculated. Users can set the fan speed to keep power consumption and noise down to a minimum.
- > Sometimes, although it is not necessary for the cooling cycle to run because the humidity conditions are right, the default night-time temperature is not reached. If this happens, the heater should be switched on and the three-way valve will open until the required return temperature is reached.



Mode 2. ALPHA CYCLE

- > The return conditions measured show that the pool should be dehumidified, so the cooling cycle starts up without any outdoor air being fed into it. This operating mode can only be run at night-time.
- > As is the case in Mode 1, the heater will only start up if the desired return temperature behind the condenser unit has not been reached.

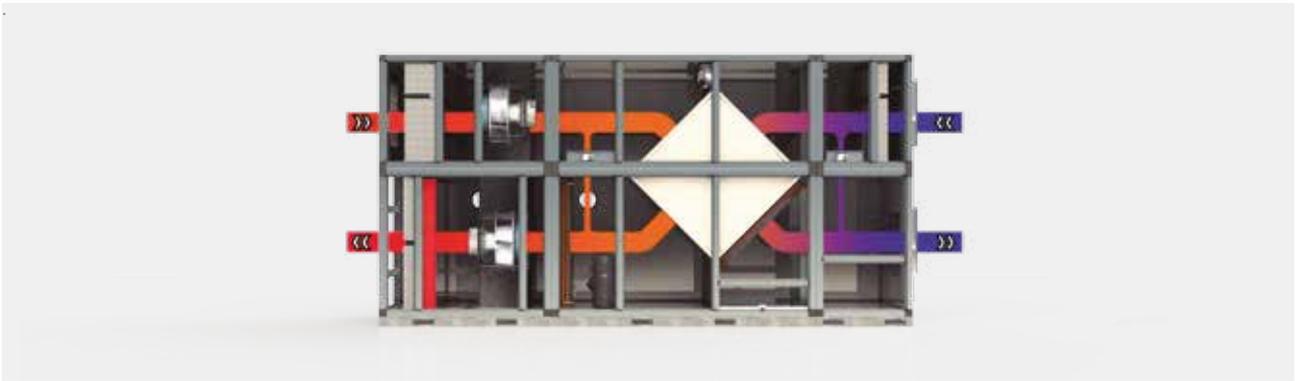


Mode 3. OUTDOOR AIR

—> The unit sets the minimum outdoor air flow rate. This is not unusual if it is taken into account that the unit has been designed to both dehumidify the air and adapt to the flow rate of outdoor air. This means that the air in a pool facility can be treated between 3 and 9 times per hour as the mixture of dry air returned should feed this amount of air into the pool so that it absorbs the whole mass of water vapour generated inside it and prevents the stratification of air in the facility.

—> In this operating mode, the unit is able to reach the desired return conditions thanks to the regulation of weir flaps. As the flow rate of outdoor air very often results in energy savings, outdoor conditions help bring down the humidity in the pool area and just a small inflow of heat can be enough to reach the desired temperature if the set return temperature has not been reached.

—> As in the abovementioned modes, the heater will only consume the power required to reach the desired temperature and adjust consumption to the minimum required to do so.



Mode 4. ALPHA CYCLE + OUTDOOR AIR

—> In the daytime (peak time), the minimum flow rate of outdoor air will depend on the quality of air required inside the pool. Air quality is subject to the RITE and VDI 2089 (section 6.2) standards, so the unit is designed to meet both of these standards and thus fulfil the requirements of both national and international customers in terms of indoor air quality (IAQ).

—> This operating mode should be used when the inflow of outdoor air is unable to reach the desired conditions. This does not mean that the weir flaps on the free cooling system close to keep the flow rate to a minimum as the regulation system used ensures that the flaps open to the optimum position to make the most of the outdoor air.

—> The unit will run in mode 4 when the inflow of outdoor air is unable to reach the desired conditions. The unit will ensure there is the minimum inflow of outdoor air to run properly.



*This operating mode may also sometimes be used at night-time when outdoor air conditions are good and this option has been selected by the user.



OPERATING MODES

Mode 5. COOLING

—> Without exterior condenser or water condenser

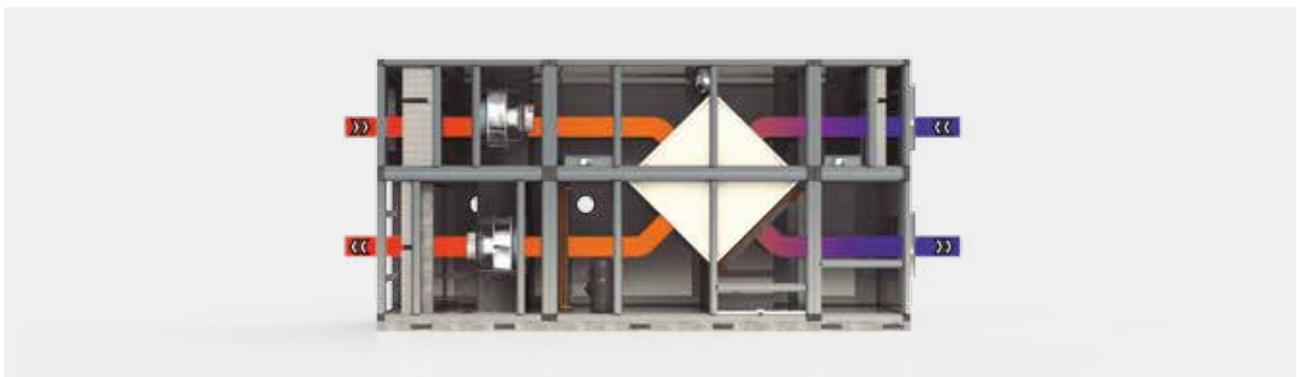
The unit's free cooling system will endeavour to reach the conditions selected by the user as well as keeping to IAQ standards. The by-pass valve on the recuperator is used to make the most of outdoor conditions.

—> With exterior condenser

This optional feature is recommended for facilities in areas with high humidity and high temperatures. As this feature is built into the unit, no additional installation is required. It expels excess heat outdoors and feeds cool, dry air into the pool.

—> With water condenser

When temperatures in a pool facility rise above the default temperature, warm air will no longer be fed into it. However, it may still be necessary to dehumidify the air but as the outdoor air cannot be used to do so the cooling cycle will start to run and instead of condensing the air, both the air and water will be condensed.



Components

HOUSING

- The housing is made of aluminium profiles with reinforced nylon on the corners and 50-mm sandwich panels with self-locking handles.
- The mounting system means that the housing bears pressure evenly, and is airtight, soundproof and heat-insulated as required by standard UNE-1886.
- Collection tray for condensers with drainage.

COOLING CIRCUIT

- High performance evaporator coils made of copper piping and lacquered aluminium fins specially designed for corrosive atmospheres.
- Scroll or rotary compressors depending on power input.
- Titanium condensers made of PVC casing and a titanium coil that enables the pool water to be directly condensed. R-410A refrigerant gas (environmentally friendly)
- One or two nitrogenous, dehydrated and deoxidised copper cooling circuits.
- Electronic expansion valve.
- Dehydrating anti-acid filter.

AIR CIRCUIT

- F6 filters in pool air suction unit, F6 air filters in air inlet and outlet, and F8 filters in return unit.
- Electronic radial plug fan with flow rate control.
- Free cooling system made up of three motorised weir flaps, mixing chamber and return fan. Uses the energy in the air discharged from the high performance crossed flow recuperator.
- High performance backup evaporator coil made of copper piping and lacquered aluminium fins specially designed for corrosive atmospheres. Has a built-in two- or three-way valve

PROTECTION

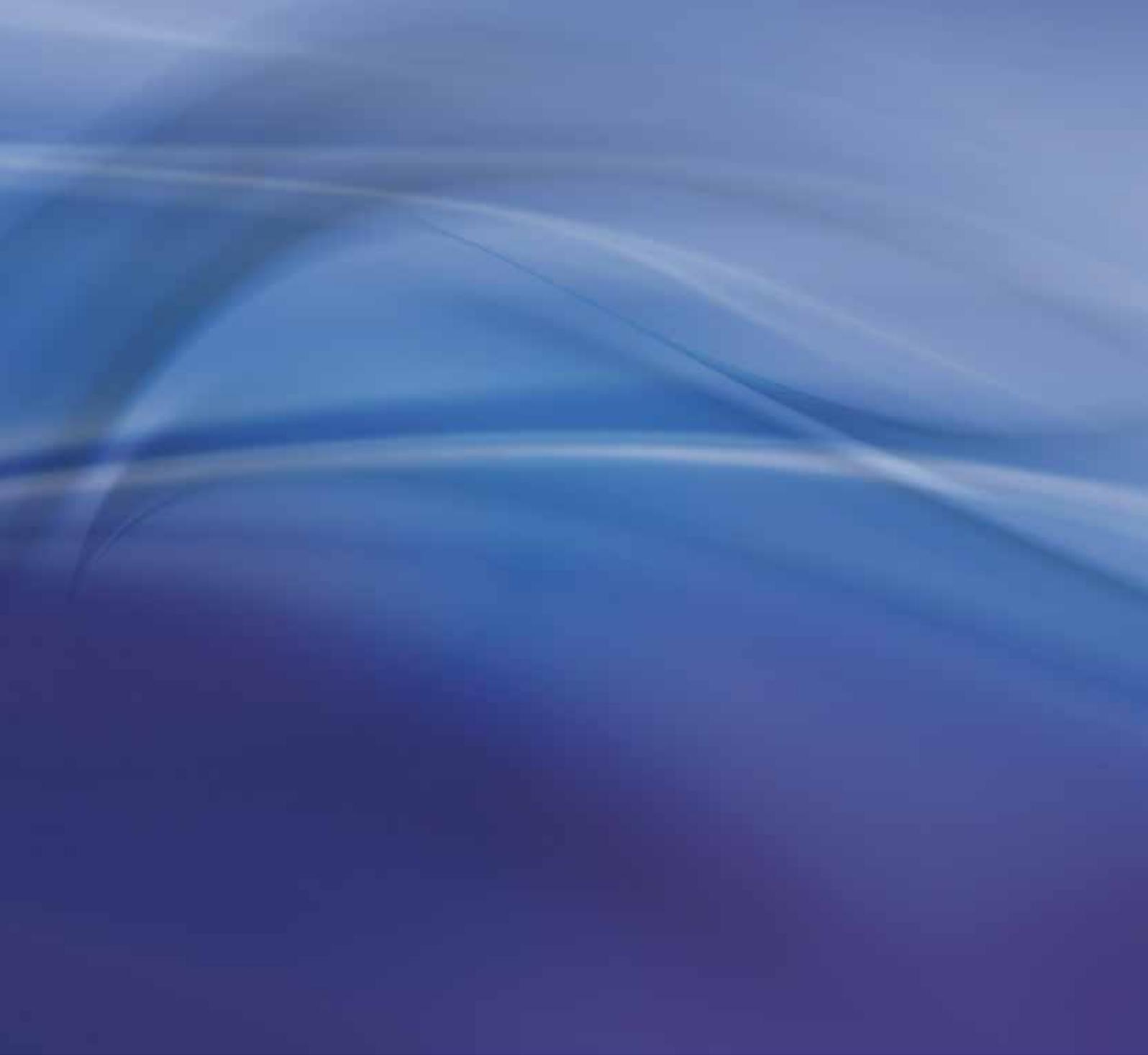
- High and low pressure switches, and pressure sensors depending on model. Flow switch for controlling water condensation.
- General safety switch.
- Circuit breakers for the control and drive (compressors and fans).
- Timed start-up of compressor.

REGULATORS

- Programmable electronic regulator.
- Humidity and temperature probes of the return air and outside air, and pool water temperature probe.
- Dirty filter pressure switches.
- Control of the pool water circulation pump through a voltage-free contact.
- Servo-motors for free cooling weir flaps.
- Enthalpically driven regulation with web server and Modbus communications protocol.

OPTIONAL FEATURES

- Water-water exchanger with a standard water condenser for heating pool water.
- Increased air and pressure flow available in fans.
- Remote condenser for expelling excess heat from a pool facility, with the option of axial or radial fans.
- Weatherproofed.
- Optional CO₂ probes for controlling the quality of the air and adjusting it.



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