Hydrus AC

1000 - 12000

Specialist Environmental Control System For Moving Floor Pools

- Dual function dehumidifying and expelled room air heat pump
- Room air cooling via refrigeration or 'free' fresh air introduction
- High rate fresh air dilution
- 'Blue-EC' ultra efficient digital inverter fan system
- 'Auto fan' intelligent air recirculation fan management
- Active heat recycling into room air and pool water via dehumidifier
- Room air and pool water integral support heating provision
- Central ventilation with room air recirculation
- Fully compliant with 'Eco-Design' Directive (ERP)

Heatstar
Energy Technology Systems

Engineered with Excellence, Specified with Confidence.

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Multi-use pools room are now an established solution to optimise space usage within a property. The Hydrus is especially conceived to meet the markedly opposing environmental control demands of the room in different modes of use.

The Hydrus has the capability to tackle the strenuous demands of a high temperature and moisture laden swimming pool room environment, whilst maintaining excellent energy efficiency, and also features in-built facilities necessary to accommodate an entirely different environment requirement for the room, suitable for functions, parties and many other uses.

'Swimming Pool' mode

- ✓ Room heated or cooled between 30/32°C*
- ✓ Room dehumidification with active heat recycling back to air or pool water.
- ✓ Fresh air dilution.
- ✓ Pool water heating.

'Closed Floor' mode

- ✓ Room heated or cooled to between 21/23°C*
- ✓ Stale air extraction.
- ✓ Pool water heating.

* Example only - control settings are fully variably.

Dual function dehumidifying and expelled room air heat pump

During swimming pool mode, the room air is re-circulated through the Hydrus by the integral fan. Inside the unit the humid room air is passed through the cold refrigerated coil matrix of the dehumidifying heat pump where, upon contact, the excess humidity condenses to cold water, thus the air is dehumidified and de-energised prior to being returned back to the room and/or expelled to outside.

The warm, moisture laden pool room air is rich in energy and the heat pump is able to absorb both 'Sensible' (dry heat) and 'Latent' (steam-like energy present within the airborne water vapour). This absorbed heat, together with ALL the electrical energy used to operate the dehumidifying heat pump, is then recycled back into either the room air OR the pool water. Active energy recycling efficiencies of up to 380% are possible through this process.

Dual room air cooling systems

The Hydrus can provide cooling to the room utilising either the introduction of outside fresh air or, if the fresh air is too warm for the purpose, a refrigeration mechanical air cooling system. The Hydrus utilises a fresh air temperature sensor to automatically determine the optimum method depending upon prevailing conditions and chosen required temperature settings. Priority is given to fresh air 'free' cooling when possible, being the preferred method for energy efficiency, prior to the refrigeration mechanical cooling system being activated.

Air cooling system - integral fresh air condenser

The Hydrus refrigeration cooling system features an integral fresh air condenser, obviating the need for any noisy or unsightly condenser units located outside the building. When required, fresh air in drawn into the Hydrus via a duct channel, passed through the integral condenser and subsequently expelled back to atmosphere along with any unusable heat.

Air cooling system - integral pool water condenser

To maximise energy efficiency the Hydrus refrigeration cooling system also features an integral pool water condenser, which has the ability to also reclaim any unwanted heat from the room during air cooling function back into the pool water. A dedicated thermostat control is utilised to regulate how much energy is stored in the pool water through this function.

Air cooling system - fresh air purge facility

Air cooling potential via refrigeration is notably compromised if there is appreciable residual humidity within the room. This is because much of the cooling power provided by the system could be taken up through inadvertently condensing moisture from the room air ('latent' cooling duty), as opposed to reducing the measurable air temperature ('sensible' cooling duty).

Prior to the refrigeration cooling activating, the Hydrus automatically initiates a brief period of room air exchange with dryer fresh air in order to achieve a reduction in the moisture content of the room air, thereby reducing the cooling power lost to moisture condensing.

'Blue EC' Ultra-efficient digital inverter fan system

Against the consideration that the permanent operation of an air fan motor may represent the largest consumer of energy within an indoor pool, the Hydrus employs a very special type of digital fan to offer the best possible energy efficiency and, so, the lowest operating cost of any such system. The digital fan uses a directly driven, backward curved, centrifugal impellor, which features a DC motor coupled to an AC inverter.

'Intelligent' Auto-Fan – Why run the fan at full power when you don't need to?

The Hydrus features 'auto-fan' technology, whereby the speed and power of the air recirculation fan is managed automatically to enable significant energy savings whenever there is low demand for dehumidification or air heating.

For a domestic pool equipped with a moving floor, there will typically be long durations of low demand and the energy saved by 'auto-fan' would be very considerable. Additionally, when the fan is operating on low power, ventilation air noise in the room can also be reduced.

Fully adjustable air re-circulation air flow

The air flow rate provided by the fan system can be adjusted on-site to precisely match the exact requirement of the room.

Perfect room air quality

The Hydrus always provides a modulated level of fresh air dilution to achieve an enhanced impression of freshness and to prevent any build up of chemical odours. A slightly negative air pressure is also achieved to help prevent the room atmosphere migrating into adjoining areas or compromising vapour barriers.

Variable mode humidity control

During swimming pool mode, the Hydrus maintains humidity control in stages, subject to activity within the pool, thereby automatically combining the high efficiency of a dehumidifying heat pump supported by the swift and assured effect of introduction of dryer fresh air. If a rise in pool room humidity continues beyond the immediate control of the dehumidifier, the Hydrus automatically increases the rate of introduction of dryer fresh air.

Close-Control precision fresh air ventilation management

As the quantity of air emitted to atmosphere has an increased relevance to the overall energy usage of the application, the expelled air volume is precisely regulated by the combined effect of a motorised air damper and the automated power of the exhaust air fan.

Integral support heating provision

To ensure that the optimum room air and pool water temperatures are always achieved, during periods when the heating requirements exceed the heat recycled and introduced by the dehumidifying heat pump, supplementary heat emitters can be incorporated within the Hydrus.

These heat exchanging coils transfer heat piped from a separate heat source, typically a fuel or heat pump boiler, into the room air or pool water. For installations where a separate heat pump boiler is used, special up-rated emitters and fan systems are used to compensate for the lower heating circuit temperature. If there is no boiler available, then direct electric heat emitters are also offered as an option.

A high capacity pool water heat emitter is used to ensure a swift initial warm-up period for the pool from cold and, for salt water pools, special titanium coils are available.

The Hydrus features a 'heat demand' signal which can be used to activate the heat source and which also incorporates a pool water overheat safety feature.

Central Ventilation - perfect air distribution and air curtain effects

Positioned out of sight within the pool equipment room, the Hydrus is able to be connected to an air duct channel, enabling central ventilation around the room for optimum condensation control.

The duct channel would feature air outlet grilles, positioned at strategic points around the room, to provide coverage to all areas and to discharge air directly over surfaces prone to condensation, such as glazing, creating an air curtain effect. The duct channel can be located either overhead or concealed under the floor. In addition, ducts would also be required to take fresh air to the Hydrus and also to exhaust some room air to outside.

Although the duct work would normally be designed and installed by a specialist ducting contractor, Heatstar are pleased to advise on this aspect as necessary.

Digital control panel

All functions of the Hydrus are completely automatic with the actual temperatures, conditions and system status clearly displayed upon the control panel.

Once the desired temperatures are set on the intuitive and easy-to-use controller, the integral sensors and processors accurately self-govern the various modes of operation. The controls permit the room temperature to automatically be reduced to a 'set back' to save energy when the pool is not in use, via a link to the moving floor or other switch facility.

The controls feature robust digital technology and are specifically selected for assured long term operation and serviceability within the equipment room atmosphere. Various optional BMS interfaces are also available.

Pre-Packaged for easy installation

To reduce installation work and complexity to a minimum, the Hydrus is offered as a completely pre-assembled package, incorporating all heating coils, controls and motorised heating valves, providing dehumidification, heat recovery, air heating, air cooling, pool water heating and fresh air ventilation, all from a single, easily installed unit.

Therefore, the Hydrus would usually only require an electricity supply and simple pipe connections to a boiler, pool water filtration circuit and waste water drain.

Total flexibility of configuration

Each Hydrus unit is tailored to the precise individual requirements of the application, obviating the need to under or oversize performance aspects or tolerate inappropriate equipment room layout.

Dehumidification rates, air flows and heating duties are all selected individually to give a completely balanced, highly effective system, operating at ideal efficiency.

The unit is offered in various configurations and the position of the control panel, pipes, air duct spigots and maintenance access can also all be orientated during manufacture to accommodate the ideal equipment room layout.

Even special 'weatherproof' models are available for external positioning.

Highest quality construction

The Hydrus is designed and constructed to the highest possible standard and all components have been especially selected for use within corrosive swimming pool environments.

For maximum strength and durability, the units are constructed from a 50mm thick anodised aluminium skeleton frame. All exterior access panels are formed from galvanised steel, with a tough PVC coating to prevent corrosion, fixed via chrome latches.

All air heat exchange coils feature 'gold' epoxy coating to protect against corrosion. The heat pump utilises zero ozone depletion eco refrigerant and is completely hermetically sealed to guard against leakage.

High efficiency orbital scroll compressor

The refrigeration compressor which drives the heat pump uses a special 'orbital scroll' design, manufactured in the UK by Copeland, offering the best possible operating efficiency.

Energy Related Product Directive compliance (ERP)

The European Union Directive for 'Energy Related Products' is now in force and encompasses sweeping legislation which impacts upon ventilation product engineering, efficiency and performance rating.

The Hydrus is so energy efficient that, not only does it comply with the new directive, but it actually even exceeds the more stringent regulations proposed for the future.

Hydrus AC standard performance specifications

	Type	1000		2000		3000		4000		6000		8000		12000	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Air recirculation fan duty	M³/Hr.	1500	3500	1800	3500	2000	3500	2500	7000	3500	7000	5000	14000	7000	14000
Maximum external resistance	Pa	150		150		150		250		250		250		250	
Variable speed control range	%	0	100	0	100	0	100	0	100	0	100	0	100	0	100
Expelled / fresh air fan duty	M³/Hr.	900	3000	900	3000	900	3000	1400	5000	1400	5000	2800	10000	2800	10000
Maximum external resistance	Pa	50		50		50		100		100		100		100	
Variable speed control range	%	0	100	0	100	0	100	0	100	0	100	0	100	0	100
Fan type		'Blue EC' backward curved, direct drive, electronically commutated, brushless DC motor													
Dehumidification															
Dehumidifying heat pump	L/Hr.	4.5		6.3		7.6		9.3		15.3		18.6		30.6	
Fresh air induction: Summer	L/Hr.	5.6	18.6	5.6	18.6	5.6	18.6	8.7	30.9	8.7	30.9	17.3	61.9	17.3	61.9
Fresh air induction: Winter	L/Hr.	9.2	30.7	9.2	30.7	9.2	30.7	14.3	51.2	14.3	51.2	28.7	102.5	28.7	102.5
Room air heating potential															
Dehum heat pump recycled heat	kW	6.6		9.2		11.1		13.6		22.4		27.2		44.8	
LTHW coil	kW	9.8	22.9	11.8	22.9	13.1	22.9	16.3	45.7	22.9	45.7	32.7	91.4	45.7	91.4
Pool water heating potential															
Dehum heat pump recycled heat	kW	6.6		9.2		11.1		13.6		22.4		27.2		44.8	
LTHW coil	kW	13.2	46.2	13.2	46.2	13.2	46.2	26.4	68.6	26.4	68.6	68.6	137.9	68.6	137.9
Room air cooling potential															
Sensible cooling	kW	3.8		5.4		6.6		8.3		13.2		16.6		26.4	

Rated conditions

Pool air: 30˚C/60% R.H. Pool water: 28˚C

Ambient: 7˚C/100% R.H. Winter: 28˚C/45% R.H. summer

LTHW: 70˚C Flow/50˚C return

Rigorous testing procedures

Prior to every new Hydrus unit leaving the Heatstar factory, it is first subjected to a thorough procedure of testing and appraisal within Heatstar's own climatic chamber to ensure that all aspects meet the required quality and performance standards. Individual certificates of testing are provided.

Free commissioning

All Hydrus units are commissioned free of charge within the UK by experienced Heatstar technicians to ensure correct installation and optimal performance.

Factory supported warranty and maintenance

The Hydrus comes with the assurance and peace of mind of a comprehensive, on-site warranty within the UK.

Also available are extended warranty options and the benefit and assurance of future routine servicing by Heatstar's own technicians to ensure minimal maintenance costs, a very long operating life and that the Hydrus is always able to obtain optimum efficiency.

Free system design service

Heatstar offer a free, computer-aided system design facility providing accurate and precise equipment selections, installation schemes and economic assessments. Heatstar's highly experienced team of experts are available for consultation on all related aspects, without charge or obligation.

Why chose Heatstar?

Heatstar is a specialist British manufacturer and the renowned leading authority for the application of environmental control technology for indoor swimming pools. Heatstar have pioneered the innovation, design and development of modern, highly energy efficient, systems and are specified with total confidence by the UK's leading pool building experts.

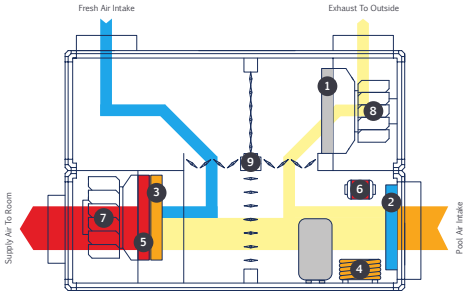
A flag-bearer for energy-efficiency for over three decades, Heatstar continue to play a huge part in making swimming pools role models for energy savings and reduced carbon emissions.

Heatstar have been producing pre-packaged climate control units like the Hydrus longer than any other company and this experience is evident throughout the product range. Through the years, over 10,000 Heatstar systems have been supplied within the UK and also exported to numerous Countries.

When investing in equipment of this nature, confidence and assurance in the brand are important considerations. Needless to say, the performance, quality and, very importantly, the long-term reliability and durability of Heatstar and their products systems have been demonstrated beyond question.

Hydrus AC modes of operation

Swimming Pool Mode Light Usage



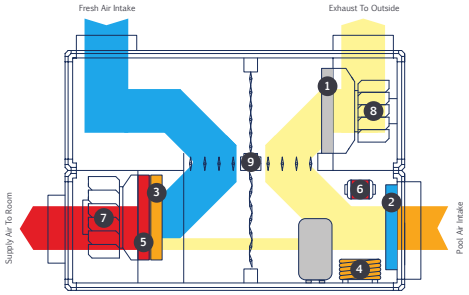
The Hydrus uses controlled fan power and the ability to re-circulate the room air to reduce ventilation to a minimum, saving unnecessary heat loss and electrical energy.

Should the moving floor be closed, the Hydrus will reduce energy consumption further by maintaining a lower 'set back' room air temperature.

The Hydrus automatically provides dilution with fresh air to maintain air quality and a negative pressure in the room.

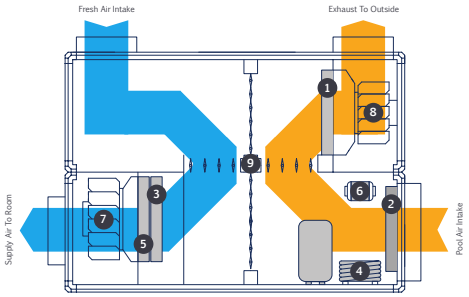
The dehumidifying heat pump is called upon as necessary and provides heat recycling.

Swimming Pool Mode Increased Usage



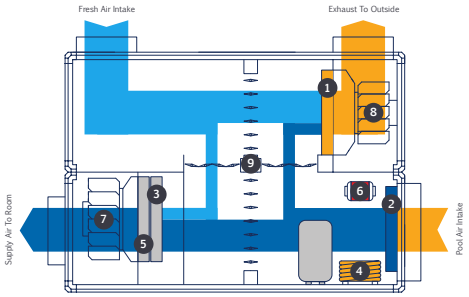
The Hydrus automatically increases introduction of dryer fresh air in line with the demand for humidity control. The expelled room air is first passed through the dehumidifying heat pump for heat extraction.

Room Air Cooling via Fresh Air



If the room air exceeds the maximum pre-set temperature, the Hydrus automatically increases the rate of introduction of cooler fresh air to help dissipate the excess heat.

Room Air Cooling via Refrigeration



If the temperature of the outside fresh air is too warm to permit 'free' cooling, the Hydrus refrigeration circuit will operate to provide room air cooling, with the excess heat dissipated to atmosphere using a fresh air 'condenser'. The introduction of fresh air to the room is limited to avoid adding to the cooling load necessary.

Key:
1__Heat Pump 'heat rejection' fresh air condenser coil
2__Heat Pump air 'cooling' evaporator coil
3__Heat Pump 'heating' room air condenser coil
4__Heat Pump 'heating' pool water condenser coil
5__Support room air heat emitter
6__Support pool water heat emitter
7__Room air re-circulation digital fan
8__Exhaust air digital fan
9__Automated control dampers

Hydrus AC installation

Key:

1: Pool air intake

2: Supply air duct to pool hall (overhead or underfloor)

3: Fuel or heat pump boiler

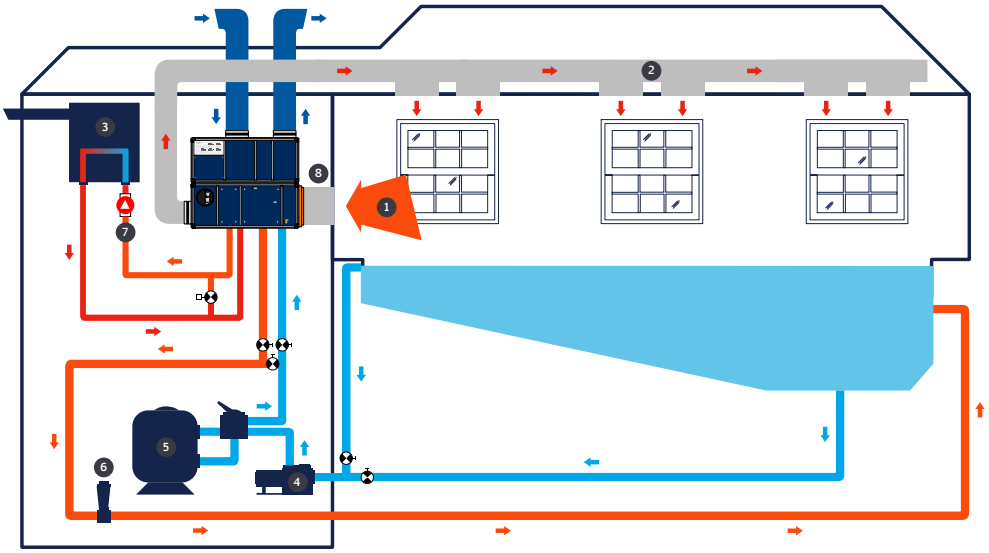
4: Pool water pump

5: Pool water filter

6: Chemical introduction

7: Boiler water pump

8: Attenuator (where utilised)



Contact us

Contact Heatstar for detailed specifications and a full analysis of your swimming pool heating and environmental control requirements.

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