AQUAIR® PREMIUM BCP

Air handling units for swimming pools

Electronic control
Optimised energy consumption
Scroll compressors and *R-410A*
Plug-fan with EC HEE motor
Heating and *dehumidification* of covered pools

Dehumidification capacity:
56 to 74 kg water/h

Dehumidification | **Air filtration** | **Heating** | **Condensation heat recovery** | **Free cooling** | **Heat recovery**

Description

AQUAIR® PREMIUM BCP are dehumidifi cation units by cooling circuit, with total condensing heat recovery, specially designed for conventional covered pools and other dehumidifi cation applications. These units have been designed for indoor or outdoor installation.

For outdoor installation (optional), these units add a hood at the new air intake.

Range

AQUAIR® PREMIUM BCP: 2 refrigerating circuits, 2 compressors, 2 models:

- 270 / 360

Operating limits

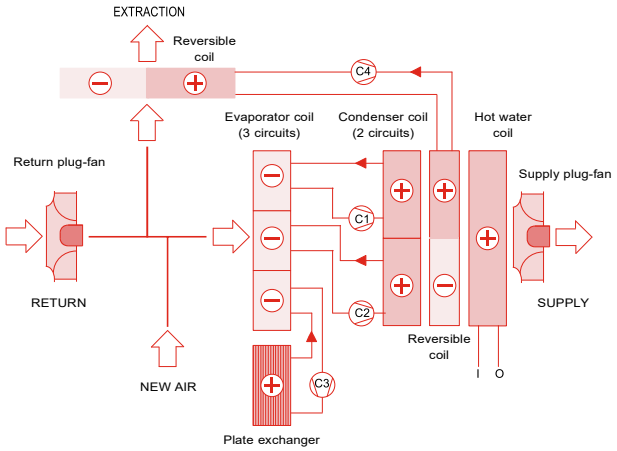
Air inlet dry temperature
Maximum: 35ºC (65% RH - 29ºC WB)
Minimum: 18ºC (90% RH - 17ºC WB)

Condenser water inlet temperature
Maximum: 50ºC
Minimum: 20ºC

Principle diagrams

This unit consists of three stages of dehumidifi cation by means of three cooling circuits:

- One of the circuits condensates on a plates exchanger of SMO 254 steel, alloyed with chromium and molybdenum, with high resistance against corrosion in presence of chloride, filled with pool water, recovering part of the energy from the evaporation process.
- The other two circuits condensate on two air coils installed at the outlet of the evaporator, heating the cold and dry air that comes from it.
- It also integrates a cooling reversible circuit to recover the heat from the extraction air.



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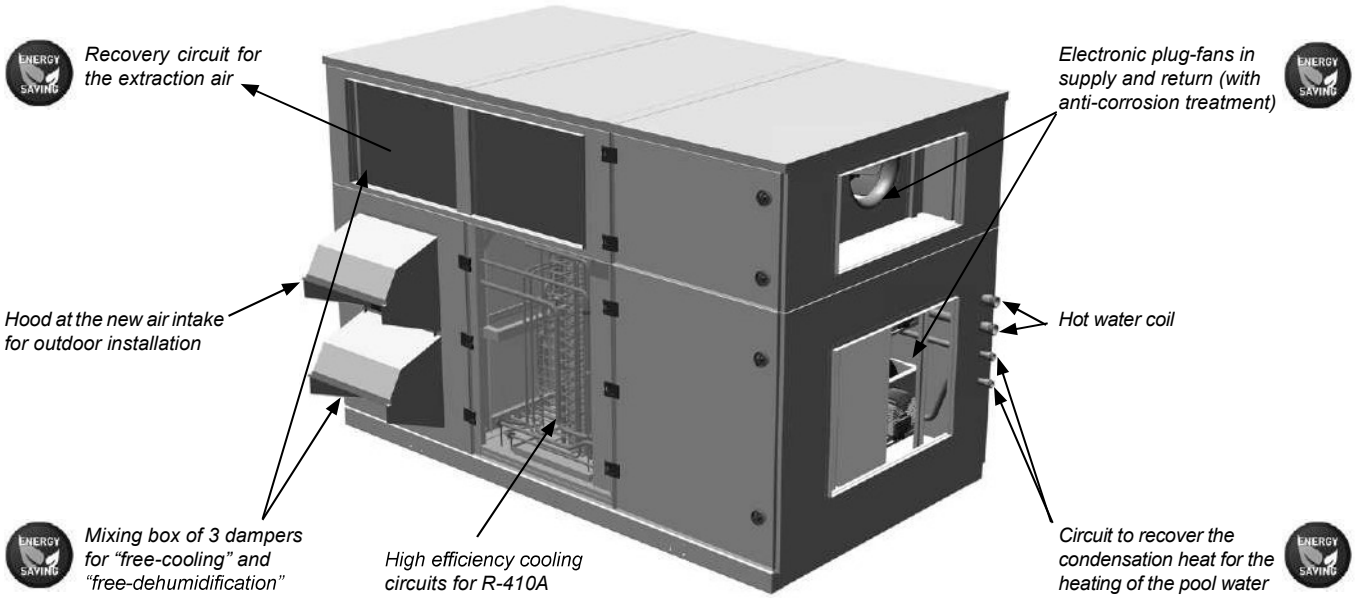


UNIT COMPONENTS

Casing

- Sandwich-panel casing made up in galvanized steel plate of 1 mm covered with polyester paint outside and inside, with glass fiber insulation of 25 mm.
- Support frame and hinged doors to access to the sections of the unit. Panels and doors with rubber joints to ensure tightness.

Indoor circuit

- Direct expansion cooling coil with copper tubes and aluminium fins, with polyurethane coating.
- Condenser coil with copper tubes and aluminium fins, with polyurethane coating.
- Stainless steel condensates drain pan with drainage outlet. This pan is inclinated towards the drainage outlet so that the water does not stagnate in the pan, avoiding sanitary problems.
- Electronic EC plug-fans directly coupled with variable speed and flow sensor. Anti-corrosion treatment.
- Mixing box of 3 dampers, with motorized dampers and return EC plug-fan directly coupled with variable speed and flow sensor.
- Reusable air filters, assembled on a frame.

Main cooling circuits

- Unit with three cooling circuits:
  - All circuits participate in the air dehumidification when evaporating on the 3 circuit coil.
  - One of the circuits is condensed over a special SMO-254 plate exchanger welded with copper, filled with pool water, recovering part of the energy from the evaporation process
  - The other two circuits condensate over two air coils located at the evaporator air outlet, heating the cold and dry air, before discharge over the optional hot water coil.
- Three hermetic scroll-type compressor, assembled over antivibration mounts, with thermal insulation and integral protection of the motor temperature.
- Thermostatic expansion valve with external equalization.
- Antiacid dryer filter.

Recovery circuit in the extraction air

This reversible circuit allows to recover the energy from the extractionair to heat the air in the pool.

- Hermetic scroll-type compressor with sound insulation, and integral protection of the motor temperature, assembled over antivibration mounts.
- Air circuit comprised of coils with copper pipes and aluminium fins, with polyurethane coating.
- Thermostatic expansion valve with external equalisation.
- Antiacid filter drier.
- Crankcase heater.
- Four-way cycle reversing valves.
- Liquid receiver and liquid sight glass.

Protections

- High pressure pressostat.
- Low pressure pressostat.
- Main door switch.
- Magnetothermic protection switches for the power line of compressors and fan motors.
- Automatic switch in the control circuit.
- Probe for mixing air temperature.

Electric panel

- Complete and fully wired electrical panel. Insulated panel cover to prevent condensation. Protection IP55.
- Main ground connection and power supply with neutral.
- Compressor and fan motor contacts.

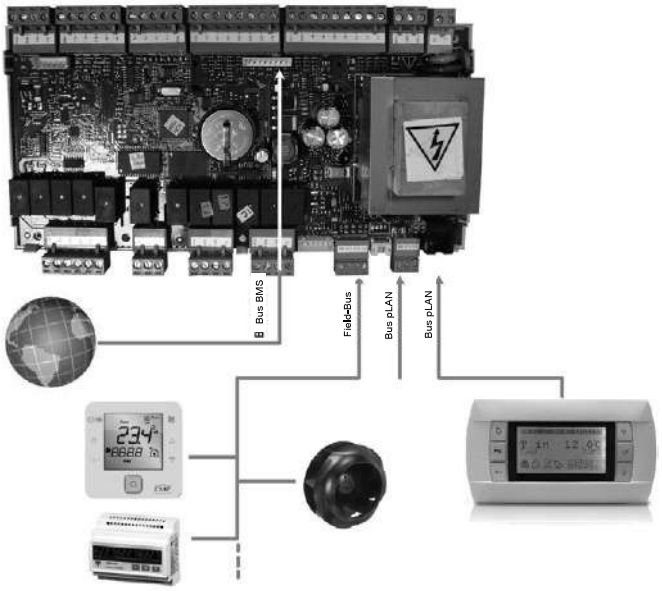
CIATpool electronic control

CIATpool carries out a control of the dehumidification of the pool depending on temperature and humidity of the ambient air probe reading.

This control is basically comprised of a µPC MEDIUM control board, a pGD1 graphic terminal, a TCO user terminal (optional) and sensors.

A BMS card (optional) allows the connection to a centralised technical management system.

It also manages a local connection between units through a pLAN network (µPC MEDIUM Local Area Network), thus allowing communication of data and information for a maximum of 15 units.



Main functions:

- Dehumidification control during operating modes: cooling / heating / AUTO
- Selection of setpoints.
- Temperature control (with optional hot water coil).
- Selection of control priorities.
- Timing of the compressors.
- Permanent control of the operating parameters.
- View of the values measured by the probes.
- Failure diagnosis and main alarm.
- Water circuit pump control.
- EC plug-fans control.
- Air flow control.
- Cooling recovery circuit control.

Optional functions:

- Free-dehumidification, free-cooling and regulation of the opening of the of the outdoor dampers.
- Proportional control of the hot water coil
- Clogged filter detection.
- Anti-fire safety.
- Connection to a centralised technical management system (BMS) for supervision.

pGD1 terminal:

This terminal, installed on the electric panel, allows:

- The initial programming of the unit and the modification of operating parameters.
- Unit ON / OFF.
- The selection of the operating mode and the setting of setpoints.
- On-screen display of controlled variables and sensor values measured.
- On-screen display of active alarms and historical record of alarms.

TCO user terminal (optional):

This terminal can be installed on the electric panel, instead of pGD1 terminal. In this case, the remote connection of the pGD1 terminal is posible.

Important: with this terminal, it is not possible the access to the parameters.

Options

Outdoor ambient

- INERA® coils with copper pipes and fins of an aluminium alloy, of high performance and great resistance to the corrosion.

Comfort / heating

- Hot water auxiliary coil of two or four rows, with a proportional three-way valve. Polyurethane coating or fins of INERA® aluminium alloy. This coil has an independent condensates drain pan.

Safety

- Differential pressostat for the detection of clogged filters.

Electric panel

- Energy meter for monitoring of the power consumption.
- Transformer for power supply without neutral (on request).

Comfort / indoor air quality options

- Gravimetric filters G4.
- Gravimetric filters G4 + opacimetric folded filters F6 to F9.
- Double stage folded opacimetric filters F6 + F8.

Installation

- Flexible hydraulic connections for water condenser and hot water coil.
- Antivibration mounts made of rubber.
- Hood at the new air intake for outdoor installation.

Control / communication

- Control with two ambient temperature and humidity probes.
- TCO user terminal, for installation on the electric panel, instead of pGD1 terminal.
- Kit remote control to 200 meters with pGD1 terminal (pGD1 terminal + 2 TCONN bypass cards). In this case it´s possible to install the TCO terminal on the electric panel.
- RS485 serial cards for network communication with protocols: Carel, Modbus, LonWorks®, BACnetTM MSTP, Konnex.
- Ethernet pCO Web card for network communication with protocols: Modbus TCP/IP, BACnetTM Ethernet, TCP/IP, SNMP V1-2-3, FTP and HTTP.

TECHNICAL CHARACTERISTICS

AQUAIR® Premium BCP		270	360
Main circuits capacities + extraction air recovery	Dehumidification capacity ❶ (kg/h)	56.2	73.5
	Useful heating capacity in air / water ❷ (kW)	18,9 / 34,1	26,1 / 43,5
	Heating capacity of extraction air recovery (kW)	32.1	43.3
	Power input ❸ (kW)	20.6	27.6
	Useful thermodynamic efficiency	5.8	5.9
Air citcuit: supply fan	Nominal air flow (m^3/h)	15 900	24 000
	Available static pressure (mm.w.c)	25	25
	Type	EC Plug Fan	
	Number / Diameter (mm)	2 / 500	3 / 500
	Motor output (kW)	2 x 5,5	3 x 5,5
	Power input (kW)	4.6	6.9
	Maximum speed (r.p.m.)	2 x 2 220	3 x 2 220
Air circuit: Return fan	Nominal air flow (m^3/h)	15 900	24 000
	Available static pressure (mm.w.c)	15	15
	Type	EC Plug Fan	
	Number / Diameter (mm)	2 / 560	2 / 560
	Motor output (kW)	2 x 4,7	2 x 4,7
	Power input (kW)	2.38	3.74
	Maximum speed (r.p.m.)	2 x 1 763	2 x 1 763
Water condenser	Nominal water flow (m^3/h)	5.9	7.5
	Pressure drop (m.w.c.)	9.1	5.1
	Hydraulic connections	1 1/4" M	
Hot water coil (optional)	Heating capacity (2-row coil) ❹ (kW)	130.0	147.0
	Nominal water flow (m3/h)	6.6	7.4
	Pressure drop (m.w.c.)	2.0	2.6
	Hydraulic connections	2 1/8"	
Compressor	Type	Scroll	
	Number of compressors	4	
	No. circuits of air/water condensat. heat recovery	2 / 1	
	No. circuits of extraction air heat recovery	1	
	Oil type	Copeland 3MAF 32cST, Danfoss POE 160SZ, ICI Emkarate RL 32CF, Mobil EAL Artic 22CC	
	Oil volume (l)	4 x 2,5	4 x 3,3
Electrical characteristics	Mains voltage	400 V / III ph / 50 Hz (±10%)	
	Power supply	3 Wires + Ground + Neutral	
Maximum absorbed current	Compressors (A)	60.8	82.0
	Supply fan (A)	16.6	24.9
	Return fan (A)	14.6	14.6
	Control (A)	0.4	0.4
	Total (A)	92.4	121.9
Sound level	Sound pressure level ❺ dBA	62.5	63.5
Refrigerant	Type	R410A	
	Global warming potential (GWP) (GWP) ❻	2 088	
	Charge (kg)	C1 : 7,5 / C2 : 7,0 / C3 : 4,8 / C4 : 11,2	C1 : 7,8 / C2 : 7,3 / C3 : 5,5 / C4 : 12,2
	Environment impact (tCO2eq)	63.7	68.5
Weight	Length (mm)	3 389	
	Width (mm)	1 900	
	Height (mm)	2 267	
Poids	(kg)	2 220	2 270
Condensate outlet Ø		3/4" M gas threaded	

❶ Unit cooling dehumidification capacity. For unit selection, it should be taken into account the dehumidification which provides fresh air of ventilation (UNE 100011).
❷ Useful heating capacity in air / water. Air inlet temperature conditions of 28ºC and 65% RH (taking into account the contribution of condensation less the sensitive cooling capacity previously provided in the evaporator). Water recovery conditions of 28 / 33ºC.
❸ Total power input by compressors under nominal conditions
❹ Water from boiler for hot water coil 82 / 65ºC and air inlet at 20ºC.
❺ Measurement conditions: in a clear field, measured at a distance of 5 metres, directivity 2 and at 1,5 metres from the ground.
❻ Climate warming potential of one kg of greenhouse-effect fluored gas relative to one kilogram of carbon dioxide over a period of 100 years.

HOT WATER COIL (OPTIONAL)

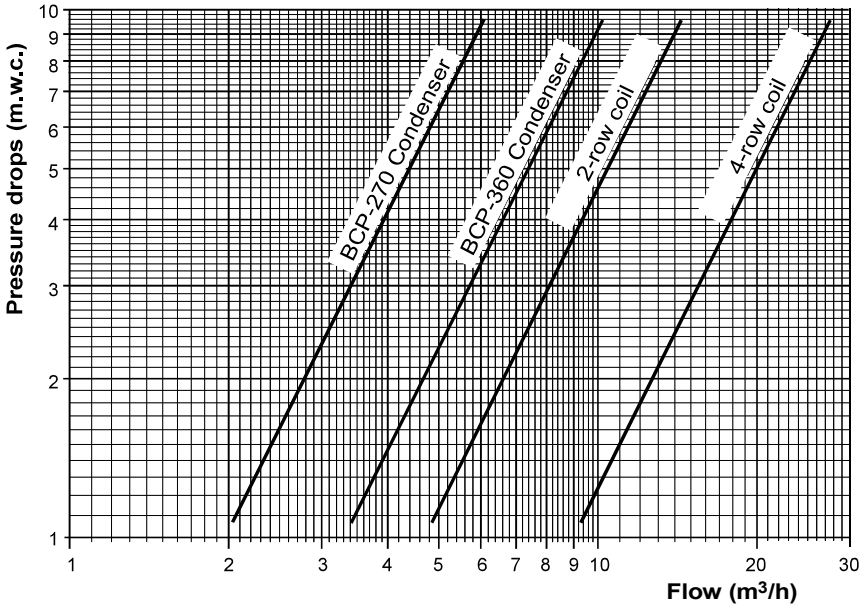
Model	Air flow (m3/h)	Air inlet temperature (ºC)	Air relative humidity (%)	Water inlet temperature (ºC)	Water outlet temperature (ºC)	2-row			4-row		
						Heating capacity (kW)	Water flow (m3/h)	Water pressure drop (m.w.c.)	Heating capacity (kW)	Water flow (m3/h)	Water pressure drop (m.w.c.)
270	15900	20	60	82	65	129.9	6.6	2.0	193.6	9.8	1.2
		20	60	55	47	75.2	8.1	3.1	111.1	11.9	1.9
		28	65	82	65	107.6	5.4	1.4	161.2	8.1	0.9
		28	65	55	47	53.8	5.8	1.7	80.4	8.6	1.0
		35	50	82	65	88.5	4.5	1.0	133.6	6.8	0.6
		35	50	55	47	35.4	3.8	0.8	54.1	5.8	0.5
360	24000	20	60	82	65	146.9	7.4	2.6	225.9	11.4	1.6
		20	60	55	47	85.1	9.1	3.8	129.7	13.9	2.5
		28	65	82	65	121.7	6.2	1.8	187.9	9.5	1.6
		28	65	55	47	60.9	6.5	2.1	93.6	10.1	1.4
		35	50	82	65	100.1	5.1	1.3	155.5	7.9	0.8
		35	50	55	47	40.0	4.3	1.0	62.9	6.8	0.7

AIR PRESSURE DROPS

Model	Air flow (m3/h)	Pressure drop (mm.w.c.)					
		standard filter ❶	G4 filter	F6 filter	F8 filter	2-row water coil	4-row water coil
270	15900	5.2	11.7	16.8	22.3	2.5	5.0
360	24000	11.9	14.5	19.6	28.0	5.6	11.4

❶ Perte de charge incluse dans la machine standard, à soustraire en cas d'ajout du filtre G4 (en option).
Remarque : les pertes de charge dans les filtres ont été calculées pour un niveau d'encrassement moyen.

WATER PRESSURE DROPS



Note: hot water coil with water at 82 / 65ºC and air inlet at 20ºC

REACTION TO CORROSION

See detail info in AQUAIR® BPC