



Heating-Cooling Units



INDEX	Page
1- AIR/WATER HEATING/COOLING PUMP	280
2- TITAN OPTIMA & TITAN OPTIMA PLUS POOL HEATER	288
3- EVOLUTION ELECTRIC POOL HEATER	290
4-B-100 DIGITALLY CONTROLLED ELECTRIC POOL HEATER	292
5- POOL SMART	293
6-G2 HEAT EXCHANGER	294
7- PLATE HEAT EXCHANGERS FOR HEATING & COOLING LIQUIDS	295
8- AQUA INDOOR POOL DEHUMIDIFIER	297
9- AQUA POOL DEHUMIDIFIERS WITH HEATING & COOLING FUNCTION	299

Heating-Cooling Units



1- AIR/WATER HEATING/COOLING PUMP

• Extend your swim season in comfort...

The AQUA heat pump can turn your backyard pool investment into resort style living almost year round. Get the most out of your pool by keeping it comfortable and open longer.

An AQUA heat pump will give you the flexibility of warming your pool water in the winter months. Your backyard evening events are rarely slowed down by cool weather when you have an AQUA heat pump on duty.

• Reversing Valve

Heat-Cool units have a unique reversing valve that allows the heat pump to cool the pool water during the hot summer months to pleasant temperatures allowing you to swim comfortably and enjoy cool water in extremely hot temperature.

• Set it and forget it

The AQUA heating/cooling unit allows you to set your desired temperature of the pool during all the year and it will simply do the rest without the need for any additional settings, comes with a unique LED control.

• Maximize your return...

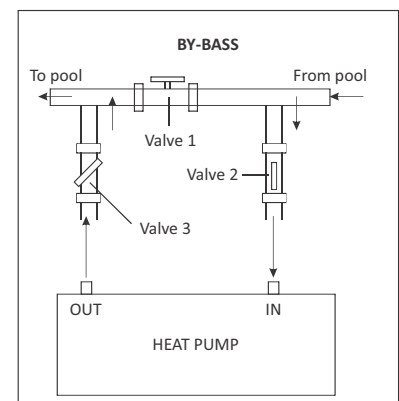
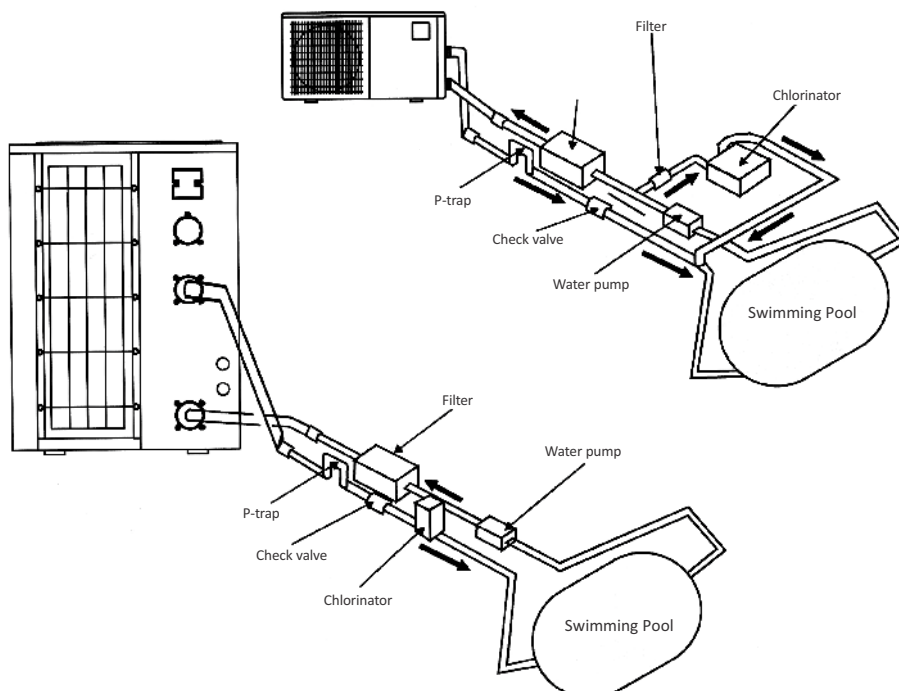
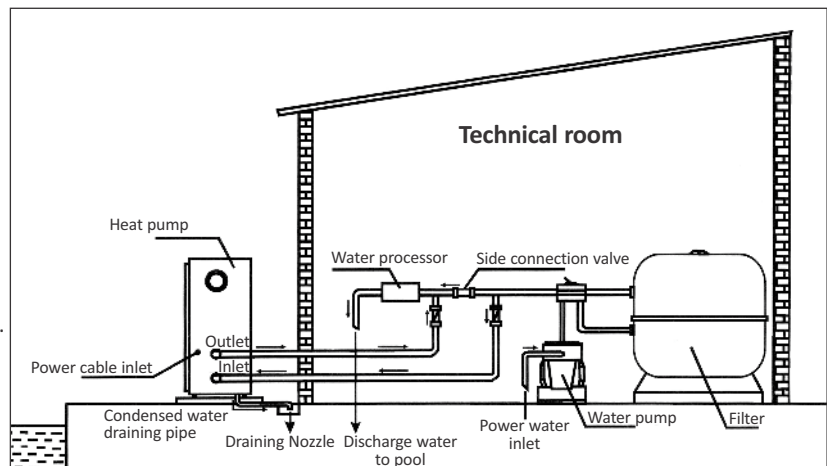
The heating/cooling unit of AQUA can cut your operating cost comparing to combustion oil or gas boilers & electrical heaters to up to 80%, not to mention the easy installation and environment friendly.

• Long operating life

Using high quality equipment and advance technology of TITANIUM, PPR or PVC water heat exchanger that withstands the abuses of harsh pool chemistry and erosion, the AQUA spiral exchanger also helps reduce deposit build-up.

FEATURES:

- Phase monitor: Protects the compressor in case of phase loss or inversion.
- Defrosting: The unit defrosts the evaporator when the ventilator is activated.
- Scroll Compressor for bigger sizes: For silent and efficient functioning.
- Easy access electrical hookup.
- Stainless steel hardware won't rust or deteriorate.
- UV resistant paint coated shell resistant to rust.
- Hydraulic circuit with new design flow switch in the water inlet, connections in PVC or PPR threaded fittings.
- Made to perform in Extreme conditions.
- New quiet fan design.
- Spiral heat exchanger in plastic shell (new design) for top performance.



Performance Data of Swimming Pool Heat Pump Unit

Verticle: Gas type – R22 and R407C

CODE		PH-02620-R22	PH-02625-R22	PH-02630-R22	PH-02640-R22	PH-02650-R22	PH-02660-R22
		PH-02620-R407C	PH-02625-R407C	PH-02630-R407C	PH-02640-R407C	PH-02650-R407C	PH-02660-R407C
HEATING CAPACITY	BTU/H	32500	41000	48000	55000	68000	85300
	KW/H	9.5	12	14	16	20	25
COOLING CAPACITY	BTU/H	27000	29000	30000	34000	58000	72000
	KW/H	8	8.5	9	10	17	21
POWER INPUT	KW	1.7	2.2	2.6	2.9	3.6	4.6
AMPERE	A	7.9	9.9	11.6	5.2	6.5	8.1
EFFICIENCY	COP	5.49	5.49	5.49	5.52	5.49	5.49
FAN COMPRESSOR		ROTARY*1	SCROLL*1	SCROLL*1	SCROLL*1	SCROLL*1	SCROLL*1
FAN POSITION		UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS
POWER INPUT	V/Ph/Hz	220/1/50	220/1/50	220/1/50	380/3/50	380/3/50	380/3/50
HEAT EXCHANGER SHELL		PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR
HEAT EXCHANGER SHELL		TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM
NOISE LEVEL	dB(A)	48	48	51	51	57	57
WATER CONNECTION	mm	50	50	50	50	50	50
WATER FLOW	m ³ /h	4~6	5~7	6~8	7~9	9~12	11~14
WATER PRESSURE DROP	kPa	10	10	11	12	12	12
OPERATING TEMPERATURE RANGE	C°	5~53	5~53	5~53	5~53	5~53	5~53
REFRIGERANT		R407C/R22	R407C/R22	R407C/R22	R407C/R22	R407C/R22	R407C/R22
NET DIMENSIONS (L / W / H)	mm	695/655/740	695/655/740	706/686/940	706/686/940	706/686/940	706/686/940
WEIGHT NET/ GROSS	kg	70/77	75/82	125/135	135/145	140/150	145/155

Verticle: Gas type – R22 and R407C

CODE		PH-02670-R22	PH-02710-R22	PH-02712-R22	PH-02713-R22	PH-02714-R22	PH-02715-R22
		PH-02670-R407C	PH-02710-R407C	PH-02712-R407C	PH-02713-R407C	PH-02714-R407C	PH-02715-R407C
HEATING CAPACITY	BTU/H	106000	136500	155000	170000	222000	273000
	KW/H	31	40	45	50	65	80
COOLING CAPACITY	BTU/H	75000	120000	123000	147000	188000	205000
	KW/H	22	35	36	43	55	70
POWER INPUT	KW	5.7	7.3	8.2	9.1	11.8	14.5
AMPERE	A	10.1	13.1	14.6	16.3	21.1	25.9
EFFICIENCY	COP	5.47	5.48	5.49	5.49	5.51	5.52
FAN COMPRESSOR		SCROLL*1	SCROLL*2	SCROLL*2	SCROLL*2	SCROLL*3	SCROLL*3
FAN POSITION		UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS
POWER INPUT	V/Ph/Hz	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
HEAT EXCHANGER SHELL		PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR
HEAT EXCHANGER		TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM
NOISE LEVEL	dB(A)	57	61	61	61	64	64
WATER CONNECTION	mm	50	63	63	63	63	63
WATER FLOW	m ³ /h	12~17	17~23	19~26	22~29	28~37	35~46
WATER PRESSURE DROP	kPa	13	15	15	15	18	20
OPERATING TEMPERATURE RANGE	C°	5~53	5~53	5~53	5~53	5~53	5~53
REFRIGERANT		R407C/R22	R407C/R22	R407C/R22	R407C/R22	R407C/R22	R407C/R22
NET DIMENSIONS (L / W / H)	mm	810/810/955	1450/705/1065	1450/705/1065	1450/705/1265	2150/765/1310	2150/764/1330
WEIGHT NET/ GROSS	kg	150/160	250/270	265/285	295/315	440/500	510/570

Heating-Cooling Units

Verticle: Gas type – R22 and R407C

CODE		PH-02720-R22 PH-02720-R407C	PH-02730-R22 PH-02730-R407C	PH-02740-R22 PH-02740-R407C	PH-02750-R22 PH-02750-R407C	PH-02760-R22 PH-02760-R407C	PH-02770-R22 PH-02770-R407C
HEATING CAPACITY	BTU/H	358000	460000	540000	615000	716000	853000
	KW/H	105	135	158	180	210	250
COOLING CAPACITY	BTU/H	266000	341000	400000	460000	540000	615000
	KW/H	78	100	117	135	158	180
POWER INPUT	KW	19.1	24.6	28.8	32.7	38.5	45.5
AMPERE	A	34.1	44	51.5	58.5	68.8	81.3
EFFICIENCY	COP	5.5	5.49	5.49	5.5	5.45	5.49
FAN COMPRESSOR		SCROLL*4	SCROLL*5	SCROLL*6	SCROLL*7	SCROLL*8	SCROLL*10
FAN POSITION		UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS
POWER INPUT	V/Ph/Hz	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
HEAT EXCHANGER SHELL		PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR
HEAT EXCHANGER		TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM
NOISE LEVEL	dB(A)	64	65	65	65	65	68
WATER CONNECTION	mm	75	90	90	110	110	160
WATER FLOW	m ³ /h	45~60	58~77	68~91	77~103	90~120	107~143
WATER PRESSURE DROP	kPa	25	30	35	40	45	50
OPERATING TEMPERATURE RANGE	C°	5~53	5~53	5~53	5~53	5~53	5~53
REFRIGERANT		R407C /R22	R407C /R22	R407C /R22	R407C /R22	R407C /R22	R407C /R22
NET DIMENSIONS (L / W / H)	mm	2150/765/1310	2200/1615/1355	2200/1615/1355	2200/1615/1355	2200/1615/1355	2000/2000/2060
WEIGHT NET/ GROSS	kg	560/620	820/870	910/950	1180/1230	1200/1250	1420/1470

Verticle: Gas type – R410a

CODE		PH-02620-R410a	PH-02625-R410a	PH-02630-R410a	PH-02640-R410a	PH-02650-R410a	PH-02660-R410a
HEATING CAPACITY	BTU/H	32414	40944	47768	54592	71652	85300
	KW/H	9.5	12	14	16	21	25
COOLING CAPACITY	BTU/H	27296	28661	34802	37532	51180	58004
	KW/H	8	8.5	10.2	11	15	17
POWER INPUT	KW	1.7	2.2	2.6	2.9	3.8	4.6
AMPERE	A	7.9	9.9	11.6	5.2	6.5	8.1
EFFICIENCY	COP	5.5	5.5	5.5	5.5	5.5	5.5
FAN COMPRESSOR		ROTARY*1	SCROLL*1	SCROLL*1	SCROLL*1	SCROLL*1	SCROLL*1
FAN POSITION		UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS
POWER INPUT	V/Ph/Hz	220/1/50	220/1/50	220/1/50	380/3/50	380/3/50	380/3/50
HEAT EXCHANGER SHELL		PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR
HEAT EXCHANGER SHELL		TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM
NOISE LEVEL	dB(A)	48	48	50	50	53	55
WATER CONNECTION	mm	50	50	50	50	50	50
WATER FLOW	m ³ /h	4~6	5~7	6~8	7~9	9~12	11~14
WATER PRESSURE DROP	kPa	10	10	11	12	12	12
OPERATING TEMPERATURE RANGE	C°	5~53	5~53	5~53	5~53	5~53	5~53
REFRIGERANT		R410a	R410a	R410a	R410a	R410a	R410a
NET DIMENSIONS (L / W / H)	mm	695/655/740	695/655/740	706/686/940	706/686/940	706/686/940	706/686/940
WEIGHT NET/ GROSS	kg	70/77	75/82	125/135	135/145	140/150	145/155

Verticle: Gas type – R410a

CODE		PH-02670-R410a	PH-02710-R410a	PH-02712-R410a	PH-02713-R410a	PH-02714-R410a	PH-02715-R410a
HEATING CAPACITY	BTU/H	106772	136480	153540	187660	221780	279784
	KW/H	31	40	45	55	65	82
COOLING CAPACITY	BTU/H	68240	102360	116008	146716	170600	211544
	KW/H	20	30	34	43	50	62
POWER INPUT	KW	5.7	7.3	8.2	10.0	11.8	14.9
AMPERE	A	10.3	13.0	14.6	17.9	21.1	26.7
EFFICIENCY	COP	5.5	5.5	5.5	5.5	5.5	5.5
FAN COMPRESSOR		SCROLL*1	SCROLL*2	SCROLL*2	SCROLL*2	SCROLL*3	SCROLL*3
FAN POSITION		UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS
POWER INPUT	V/Ph/Hz	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
HEAT EXCHANGER SHELL		PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR
HEAT EXCHANGER		TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM
NOISE LEVEL	dB(A)	55	59	59	59	62	62
WATER CONNECTION	mm	50	63	63	63	63	63
WATER FLOW	m ³ /h	12~17	17~23	19~26	22~29	28~37	35~46
WATER PRESSURE DROP	kPa	13	15	15	15	18	20
OPERATING TEMPERATURE RANGE	C°	5~53	5~53	5~53	5~53	5~53	5~53
REFRIGERANT		R410a	R410a	R410a	R410a	R410a	R410a
NET DIMENSIONS (L / W / H)	mm	810/810/955	1450/705/1065	1450/705/1065	1450/705/1265	2150/765/1310	2150/764/1330
WEIGHT NET/ GROSS	kg	150/160	250/270	265/285	295/315	440/500	510/570

Verticle: Gas type – R410a

CODE		PH-02720-R410a	PH-02730-R410a	PH-02740-R410a	PH-02750-R410a	PH-02760-R410a	PH-02770-R410a
HEATING CAPACITY	BTU/H	358260	460620	545920	614160	750640	853000
	KW/H	105	135	160	180	220	250
COOLING CAPACITY	BTU/H	266136	341200	409440	460620	528860	614160
	KW/H	78	100	120	135	155	180
POWER INPUT	KW	19.1	24.5	29.1	32.7	40.0	45.5
AMPERE	A	34.1	43.9	52	58.5	71.5	81.3
EFFICIENCY	COP	5.5	5.5	5.5	5.5	5.5	5.5
FAN COMPRESSOR		SCROLL*4	SCROLL*5or4	SCROLL*6or4	SCROLL*7or4	SCROLL*8or4	SCROLL*10or4
FAN POSITION		UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS	UPWARDS
POWER INPUT	V/Ph/Hz	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
HEAT EXCHANGER SHELL		PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR	PVC/PPR
HEAT EXCHANGER		TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM	TITANIUM
NOISE LEVEL	dB(A)	62	65	65	65	65	68
WATER CONNECTION	mm	75	90	90	110	110	160
WATER FLOW	m ³ /h	45~60	58~77	68~91	77~103	90~120	107~143
WATER PRESSURE DROP	kPa	24	30	31	32	32	34
OPERATING TEMPERATURE RANGE	C°	5~53	5~53	5~53	5~53	5~53	5~53
REFRIGERANT		R410a	R410a	R410a	R410a	R410a	R410a
NET DIMENSIONS (L / W / H)	mm	2150/765/1310	2200/1615/1355	2200/1615/1355	2200/1615/1355	2200/1615/1355	2000/2000/2060
WEIGHT NET/ GROSS	kg	560/620	820/870	910/950	1180/1230	1200/1250	1420/1470

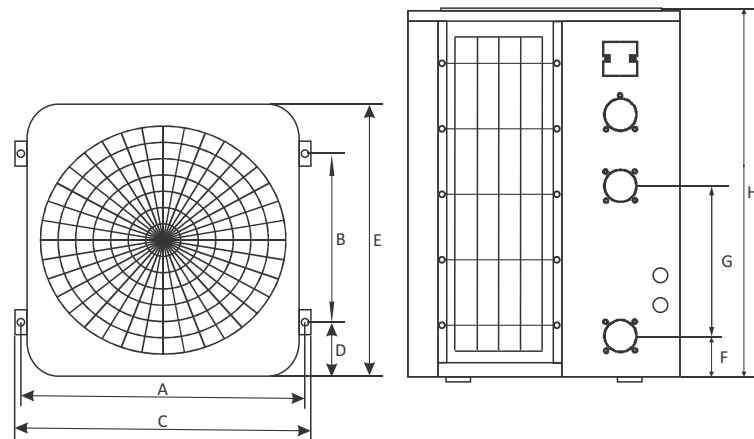
Heating-Cooling Units

Horizontal : Gas type – R410a/R407C/R22

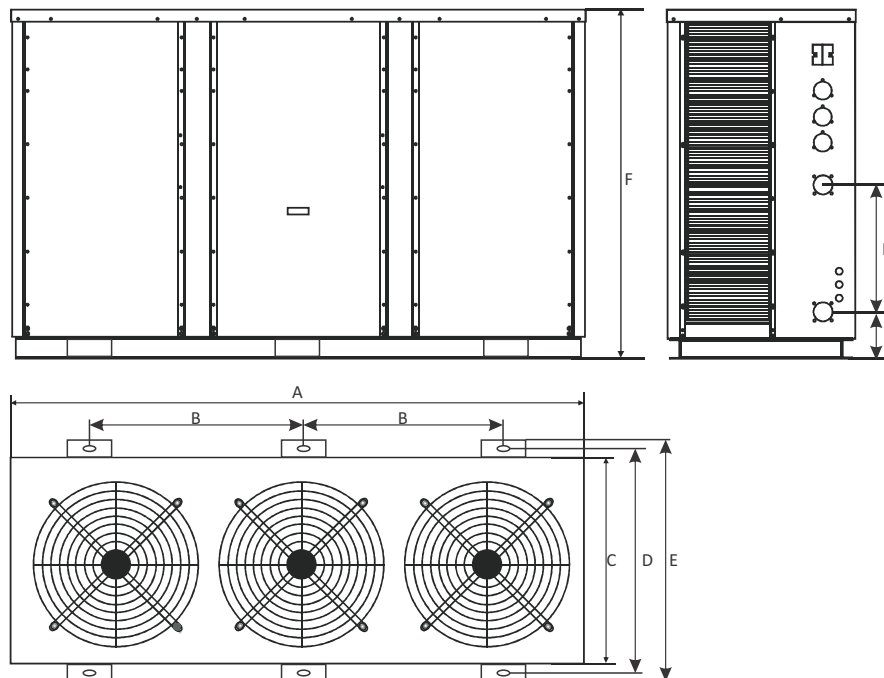
MODEL	PHFD-02620-R410a	PHFD-02625-R410a	PHFD-02630-R410a	PHFD-02645-R410a	PHFD-02650-R410a	PHFD-02660-R410a	PHFD-02670-R410a		
	PHFD-02620-R22	PHFD-02625-R22	PHFD-02630-R22	PHFD-02645-R22	PHFD-02650-R22	PHFD-02660-R22	PHFD-02670-R22		
	PHFD-02620-R407C	PHFD-02625-R407C	PHFD-02630-R407C	PHFD-02645-R407C	PHFD-02650-R407C	PHFD-02660-R407C	PHFD-02670-R407C		
POWER SUPPLY	220~240V/1/50			380~415/3/50					
REFRIGERANT	R410a/R407C/R22								
A24/W26°C	Heating capacity	9.5	12	14	16	19	21	25	31
	BTU/h	32414	40944	47768	54592	64828	71652	85300	105772
	Power input	1.73	2.18	2.50	2.86	3.45	3.87	4.57	5.63
	Running current	7.5	9.5	10.9	5.1	6.2	6.9	8.2	10.1
A15/W26°C	COP	5.5	5.5	5.6	5.6	5.5	5.42	5.47	5.51
	Heating capacity	7.8	9.8	11.5	13.1	15.6	17.2	20.5	25.4
	BTU/h	26563	33554	39146	44738	53127	58719	69903	86680
	Power input	1.71	2.16	2.47	2.82	3.42	3.83	4.52	5.56
COMPRESSOR	Running current	7.4	9.4	10.7	5.0	6.1	6.8	8.1	9.9
	COP	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.6
	Type	Rotary			Scroll				
	Direction	Horizontal							
DIMENSION (WxHxD)	Net	1010x360x620	1115x470x700	1115x470x700	1115x470x950	1115x470x950	1115x470x1250	1115x470x1250	
	Packing	1095x400x650	1200x485x790	1200x485x790	1200x485x1040	1200x485x1040	1200x485x1040	1200x485x1340	
NOISE LEVEL	DB(A)	48	49	49	49	53	53	53	
WATER TEMP. RANGE	°C	Heating:10°C-40°C / Cooling: 10°C-30°C							
AMBIENT TEMP. RANGE	°C	-15~53							
RATED WATER FLOW RATE	m³/h	4.1	5.2	6.0	6.9	8.2	9.0	10.7	13.3
RATED PRESSURE DROP	kPa	12	14	14	15	16	17	17	18
WATER CONNECTION	inch	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"
WEIGHT	Net	50	62	66	70	92	105	110	115
	Packing	53	66	70	74	98	113	120	125
LOADING	Set(s)	102/210/210	96/198/198	57/93/93	57/93/93	38/62/62	38/62/62	38/62/62	19/31/62

UNIT DIMENSIONS:

VERTICAL UNITS

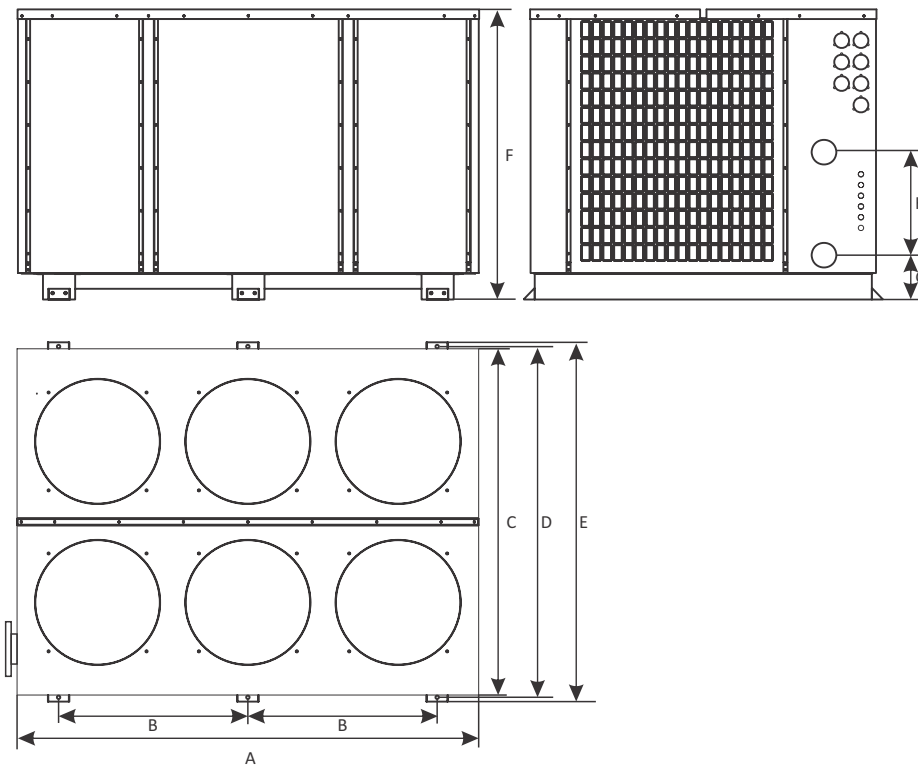


CODE	DIMENSIONS (mm)							
	A	B	C	D	E	F	G	H
PH-02620	682	450	714	125	703	84	300	796
PH-02625								
PH-02630								
PH-02640								
PH-02650	724	450	746	120	690	84	420	920
PH-02660								
PH-02670								



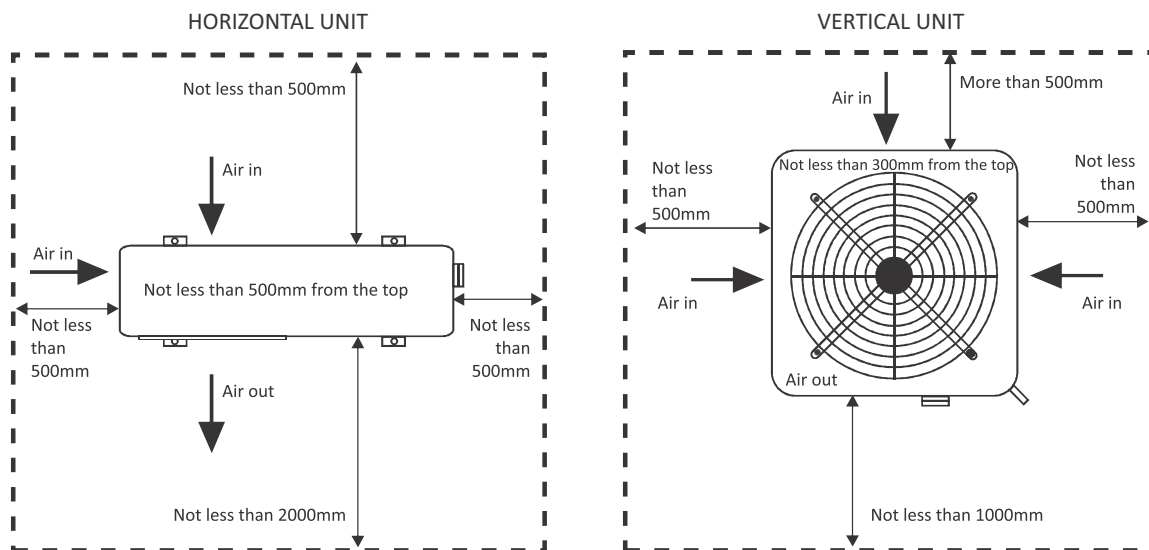
CODE	DIMENSIONS (mm)							
	A	B	C	D	E	F	G	H
PH-02714								
PH-02715	2150	908	765	788	828	1310	84	500
PH-02720								

Heating-Cooling Units

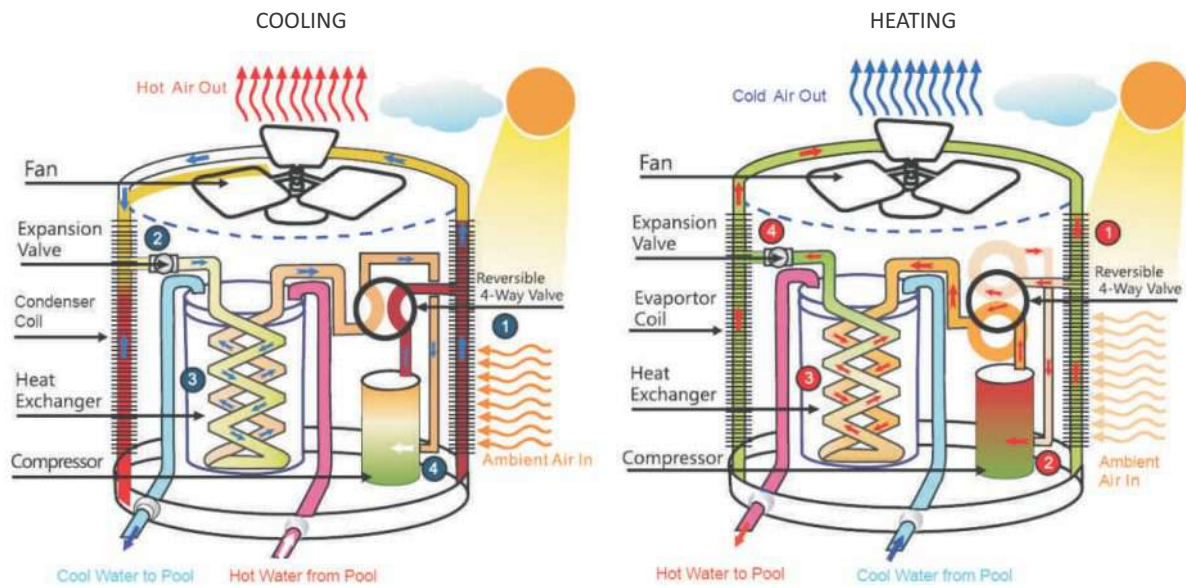


CODE	DIMENSIONS (mm)							
	A	B	C	D	E	F	G	H
PH-02730								
PH-02740								
PH-02750	2200	882	1615	1634	1674	1355	207	500
PH-02760								

FREE SPACE REQUIREMENT



SYSTEM DIAGRAM

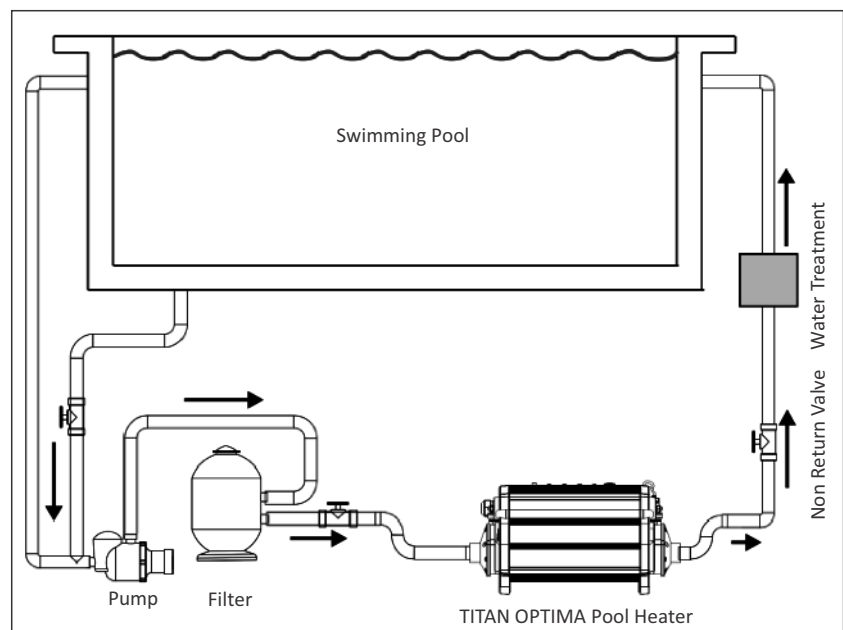


Heating-Cooling Units



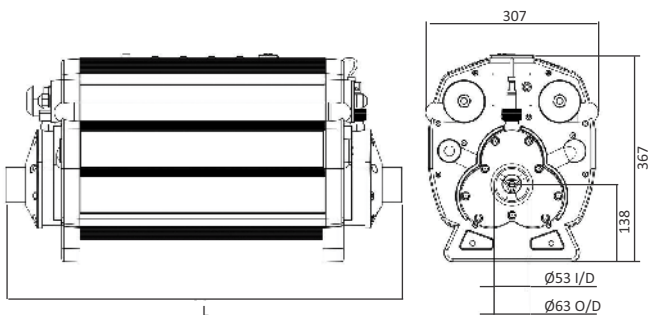
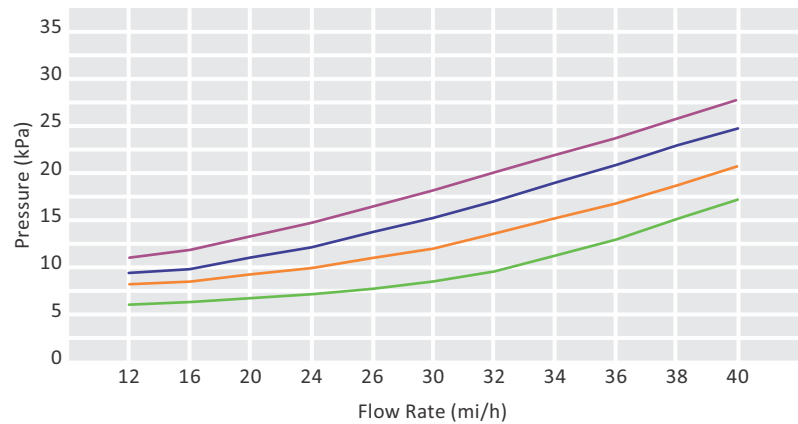
2- TITAN OPTIMA & TITAN OPTIMA PLUS POOL HEATER

- The AQUA Titan Optima can be easily operated using the control panel touch screen.
- The inlet manifold has been designed to minimise flow imbalance between the flow tubes, greatly reducing the risks of air locking. Safety and equipment protection is provided by the highly reliable flow switch, over temperature protection is provided by the four safety thermal cut out's (auto-reset) and a safety thermal cut out (manual reset).
- The digital control board allows accurate control of pool water temperature thanks to its high precision. The blue digital characters on the touch screen are clearly legible, even in bright sunlight.
- To reduce voltage drop on start-up, the heater element banks are energised in a staged cascaded sequence, with a time delay between energising each bank.
- Heating Elements: Titanium, high MgO compaction - 21.4 and 25.4 W/cm² at 230V 3ph and 400V 3ph resp
- Flow tubes: BS 316 stainless steel (Titan Optima) or pure titanium (Titan Optima plus)
- Cladding panels: Moulded aluminium, epoxy powder coated
- Contactors: Cascade wired dual Schneider contactors for each element bank
- Thermostats:
 - 1 x 60 C safety thermal cut out (auto reset) per flow tube against over-temperature
 - 1 x 60 C safety thermal cut out (auto reset) against enclosure over-temperature
 - 1 x 55 C safety thermal cut out (manual reset)
- Flow switch: Gold tipped reed switch with titanium fulcrum pin
- Wiring: High temperature, silicone sheathed, multi-strand copper conductors
- Seals: High temperature special formula EPDM
- Water connections: 63 mm spigot with adaptor for 2" NB
- Working pressure: 4 bar maximum
- Mounting: Floor or wall mounting (wall bracket supplied)
- Standards compliance: European Electromagnetic Compatibility directive 89/336/EEC and 93/068/EEC
- Harmonised Standards: EN 55014 – EN55104, EN 5501, EN 5502, CEI 801-4, CEI 801-2, CEI 801-3
- The European Low Voltage Directive 72/23/EEC
- The Harmonised Standard EN 60335-2-35



TITAN OPTIMA (230V) Heater Pressure Drop

Flow Rate (m ³ /h)	12	16	20	24	26	30	32	34	36	38	40
24 kW & 30 kW	6.49	6.76	7.17	7.58	8.14	8.89	9.93	1.58	13.24	15.38	17.37
36 kW & 45 kW	7.99	8.3	9.11	9.79	10.91	11.96	13.62	15.33	16.96	18.96	21.09
60 kW	9.31	9.72	10.96	12.06	13.72	15.24	17.03	19.02	20.96	23.06	24.089
75 kW	10.76	11.58	13.03	14.48	16.2	17.93	19.86	21.72	23.51	25.58	27.6



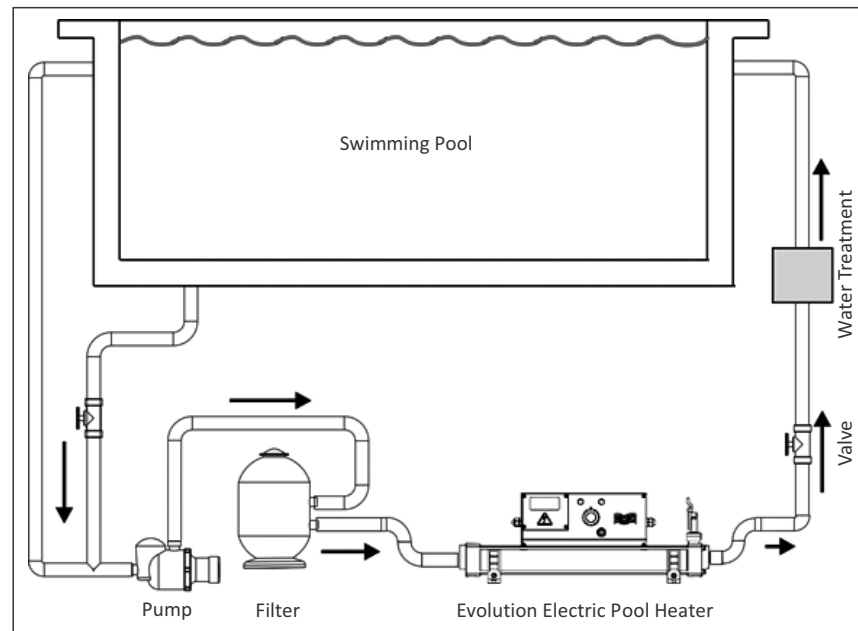
CODE		POWER OUTPUT 400V 3 Phase kw	LOAD Amp	L mm	PACKING WEIGHT VOLUME	
TITAN OPTIMA	TITAN OPTIMA PLUS				kg	m ³
C-18	CP-18	18	26	699	1	
C-24	CP-24	24	35	699	1	
C-30	CP-30	30	44	699	1	
C-36	CP-36	36	52	699	1	
C-45	CP-45	45	66	699	1	
C-54	CP-54	54	78	699	1	
C-60	CP-60	60	89	877	1	
C-72	CP-72	72	104	877	1	
C-96	CP-96	96	139	1042	1	
C-120	CP-120	120	174	1042	1	

Heating-Cooling Units



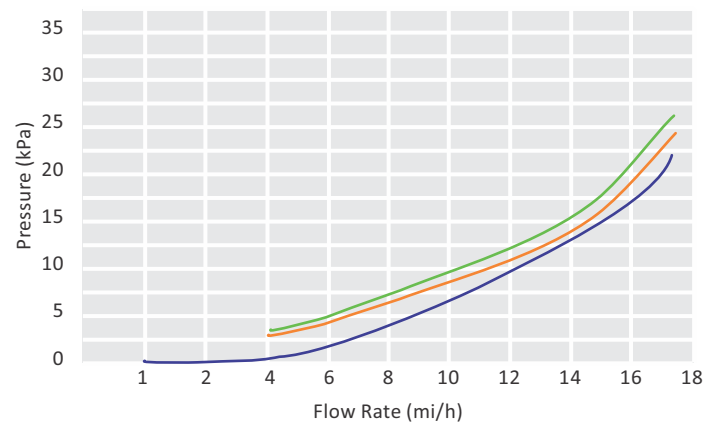
3- EVOLUTION ELECTRIC POOL HEATER

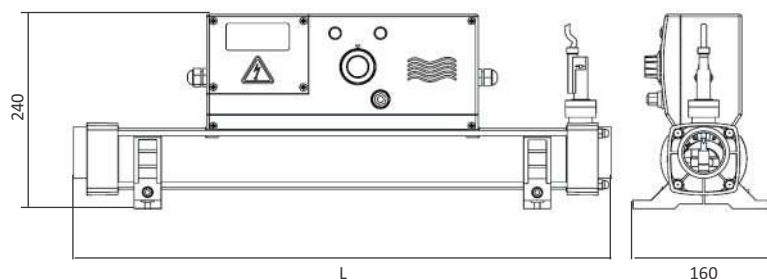
- Fully equipped and pre-wired including a super sensitive and reversible flow switch, allowing water input from either direction.
- Complete with a control thermostat, safety thermostat and integral contactor relay.
- Very easy to install, requiring only final connection to a mandatory separate RCD.
- Fitted with 1½" BSP female threaded adapters for easy connection to all pipework.
- Supplied with hose tail adapters for connection to flexible pipework, and heater sizes 12kW through to 18kW are also supplied with 1½" BSP unions for connection to rigid pipework.
- Suitable for use with chlorinated pools & are NOT suitable for salt water pools.
- Main Tank Stainless Steel BS316, available with pure Titanium upon request.
- Heating elements: Incoloy 825 or pure titanium on request.
- Control thermostat 0°C - 40°C with 1.5°C differential safety thermostat 50°C.
- Manual reset minimum flow requirement 1,000-litres per hour Maximum Flow Velocity 13,000-litres per hour



EVO Heater Pressure Drop

Flow Rate (m³/h)	1	2	4	6	8	10	12	14	15	16	17
3 kW & 6 kW Single phase	0	0	0.75	2	4.2	7.1	10.2	14.1	15.8	18.2	22.1
9 kW & 12 kW Single phase	0	0	2.5	4.8	6.8	8.8	11.25	14.7	16.9	20.6	23.8
15 kW & 24 kW Single phase & all Three phase	0	0	3.2	5.4	7.6	10.2	12.8	15.8	19.2	22.8	26





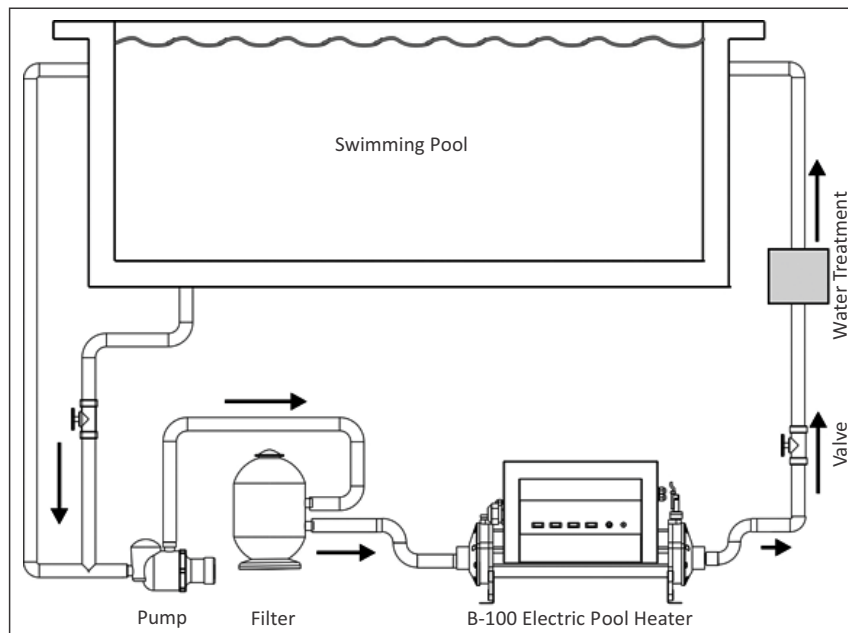
	CODE	POWER OUTPUT	VOLTAGE	LOAD	L	PACKING	WEIGHT	VOLUME
		kw	V	Amp	mm			
Single Phase	PHS-030-EV	3	230	13	462	1	3.5	0.04
	PHS-060-EV	6	230	27	462	1	4	0.04
	PHS-090-EV	9	230	40	462	1	4.5	0.04
	PHS-120-EV	12	230	53	462	1	5	0.04
	PHS-150-EV	15	230	66	592	1	5.5	0.04
	PHS-180-EV	18	230	79	592	1	6	0.04
Three Phase	PHT-060-EV	6	400	9	462	1	4	0.04
	PHT-090-EV	9	400	13	462	1	4.5	0.04
	PHT-120-EV	12	400	18	462	1	5	0.04
	PHT-150-EV	15	400	22	462	1	5.5	0.04
	PHT-180-EV	18	400	26	592	1	6	0.04
	PHT-240-EV	24	400	35	592	1	6.5	0.04

Heating-Cooling Units



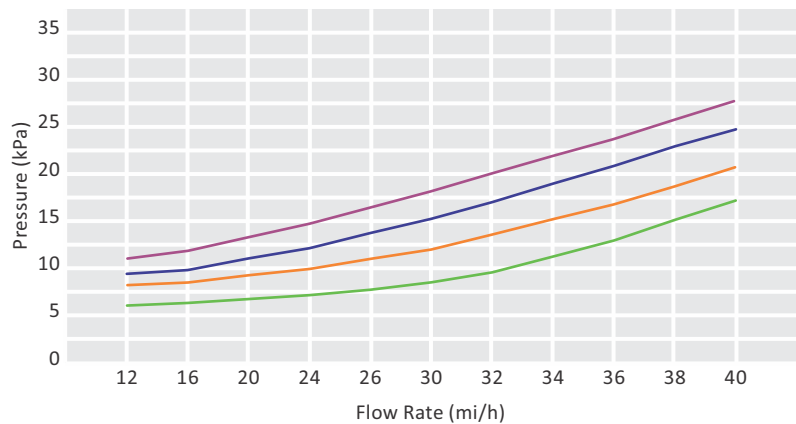
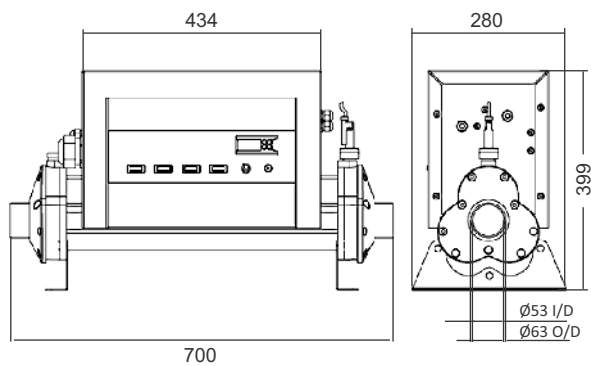
4- B-100 DIGITALLY CONTROLLED ELECTRIC POOL HEATER

- Designed for ultimate safety and market leading reliability.
- With two conductors per element bank, cascade wired for ultimate safety.
- All element banks have timers for staged energizing: only a maximum of 24 kW will be energized at any one time.
- Perfect for use on larger pools. Available in outputs from 24-72 kW.
- Multiple heaters can be installed in parallel to achieve greater outputs.
- Supplied fully equipped and pre-wired to ensure easy installation.
- Heating elements: Incoloy 825 or pure titanium on request.
- Flow tube: stainless steel BS-316 or pure titanium on request for total protection against corrosion.
- Flow Switch: to protect equipment when flow stops.
- Multi point temperature detection: For accurate and safe control of the heating process.
- Anti cycle delay protection: Prevents the heater from 'cycle' switching to ensure component life is maximized.
- Indication lamps: Provide clear and easily understandable display of the heaters status.
- Mounting brackets: Ensure the heater can be easily wall or base mounted
- Unique case design: Gives easy technician access for connection, inspection and component replacement.



B-100 Heater Pressure Drop

Flow Rate (m ³ /h)	12	16	20	24	26	30	32	34	36	38	40
30 kW	6.49	6.76	7.17	7.58	8.14	8.89	9.93	1.58	13.24	15.38	17.37
36 kW & 45 kW	7.99	8.3	9.11	9.79	10.91	11.96	13.62	15.33	16.96	18.96	21.09
54 kW & 60 kW	9.31	9.72	10.96	12.06	13.72	15.24	17.03	19.02	20.96	23.06	24.089
72 kW	10.76	11.58	13.03	14.48	16.2	17.93	19.86	21.72	23.51	25.58	27.6



CODE	POWER OUTPUT	VOLTAGE	LOAD	PACKING	WEIGHT	VOLUME
	kw	V	Amp		kg	m ³
PH-30-B100	30	400	44	1	24	0.1
PH-36-B100	36	400	52	1	25	0.1
PH-45-B100	45	400	66	1	26	0.1
PH-54-B100	54	400	78	1	27	0.1
PH-60-B100	60	400	87	1	28	0.1
PH-72-B100	72	400	104	1	29	0.1

5- POOL SMART

- An intelligent pool control system that allows the control and maintenance of the pool to the perfect temperature as economically as possible.
- Complete control solution for: Filtration pumps, electric heaters, heat exchangers and heat pumps to the filtration system and boiler.
- Accurate temperature control to 0.5°C.
- Diagnostic display.
- Fully programmable with timed control.
- User defined dual set points to utilize off-peak electricity rates.
- Supplied with flow switch, temperature sensor probe pre-fitted in custom T-piece with 63mm solvent weld connections (50mm reducers are also supplied), for simple integration into any pool technical facility.



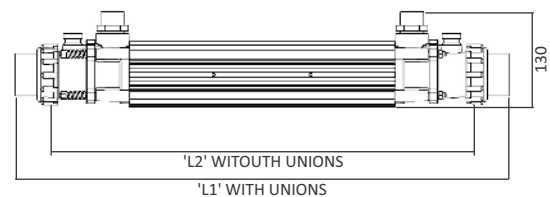
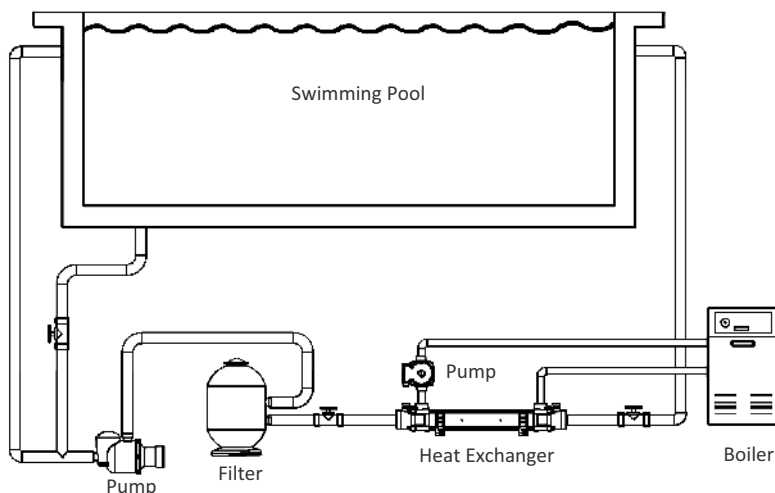
CODE	PACKING	WEIGHT	VOLUME
		kg	m ³
PH-SMART	1	2	0.02

Heating-Cooling Units

6- G2 HEAT EXCHANGER



- The G2 Heat Exchanger is manufactured from top quality components and materials.
- Robust, durable construction.
- Titanium tube bundle.
- 316 Stainless Steel shell with special polyamide fittings
- Wall mountable (bracket supplied)
- Available with fully equipped Analogue or Digital control (optional).
- The heat exchanger construction gives a vast heat transfer surface area, consisting of a densely populated multi-tubular bundle, secured by the uniquely designed polyamide-rubber tube sheet.
- The heat exchanger shell is constructed from BS 316 Stainless Steel enclosed by a rigid thermal shell for enhanced insulation of the primary (HOT) water, enabling even greater heat transfer; this is capped at each end with primary and secondary moulded fittings manufactured from specially formulated polymer alloy material.
- The standard G2 heat exchanger is supplied complete with:
 - 2 x 1" male/male Brass Primary connections.
 - 1 x 1" Non-Return Valve.
 - Titanium thermostat pocket.
 - 1 x Blanking Cap and Gasket (for non-thermostat side).
- The G2 Heat Exchanger has been designed to allow the installation engineer to select which way to plumb the primary and secondary water to achieve maximum thermal gain; this is achieved by routing the primary (HOT) flow in an opposing direction to the secondary (POOL) water.
- The G2 heat exchanger is installed in the pool filtration circuit from which water passes through the tube side of the exchanger. Water from the primary heating circuit flows counter-current through the shell side of the exchanger, heating the swimming pool water. Ideal for use with gas or oil fired boiler circuits, solar panels, heat pumps or chillers.
- Tube bundle: Pure titanium.
- Water connections:
 - Primary (HOT) 1" BSP male (brass fittings supplied).
 - Secondary (POOL): 1.5" or 50-mm NB adapters for connection to PVC or ABS pipe.
- Working pressure: 4 bar maximum.



CODE	STANDARD POWER OUTPUT	DIMENSIONS		PRIMARY (HOT) FLOW	PRIMARY (HOT) HEAD LOSS	SECONDARY (POOL) FLOW	SECONDARY (POOL) HEAD LOSS	ΔT 15°C	ΔT 20°C	ΔT 30°C	ΔT 40°C	ΔT 50°C	ΔT 60°C	ΔT 70°C
		L1	L2											
G2-HE-30T	30 kW (102K BTU)	540	426	1.1	6.1	10	5	9	11	16	20	26	30	33
				1.3	6.8	10	5	10	13	18	23	31	34	39
				1.3	6.8	14	7	11	15	20	26	34	41	46
G2-HE-49T	49 kW (167K BTU)	710	596	1.6	7.7	16	9.2	13	18	25	34	41	50	56
				1.8	8.3	16	9.2	14	20	28	38	45	55	62
				2.2	9.6	17	9.8	16	22	33	44	52	64	73
G2-HE-85T	85 kW (290K BTU)	840	726	2.4	11.3	17	10.6	22	28	40	53	64	75	81
				2.7	12.9	17	10.6	26	32	46	60	73	82	89
				3.2	14.7	17	10.6	28	34	49	64	77	90	102
G2-HE-122T	122 kW (416K BTU)	1000	836	3.8	18.3	19	12.6	33	43	68	75	93	108	120
				4.2	20	19	12.6	36	48	70	89	108	126	143
				4.6	21.1	19	12.6	38	52	73	95	116	137	156

▲T = temperature difference between Primary (HOT) and Secondary (POOL)

7- PLATE HEAT EXCHANGERS FOR HEATING & COOLING LIQUIDS

- Ideal for heating ,cooling, heat-recovery, condensing and evaporation processes.
- High overall heat transfer coefficient for efficient heat transfer.
- Compact design gives maximum surface area to material volume without compromising mechanical robustness.
- Low installation cost.
- Easy dismantling for rapid cleaning.
- High performance with low hold-up volume.
- Versatile, modular design.
- Plate and gasket materials available to suit most fluid types
- Standard units available from stock: 100-kW to 819-kW for heating applications; 53-kW to 397kW for cooling applications.
- Short lead-time custom build service.
- The Plate heat exchangers comprise an epoxy coated steel frame consisting of one removable and one fixed cover fitted with top and bottom plate hangers.
- The fluid connections are heavy gauge, stainless steel, male threaded nozzles welded into the front cover.
- Flanges are available on request.
- The heat transfer plates are corrugated in a herringbone pattern with port holes for the passage of the two fluids and have clip on re-usable seals.
- Plate materials available: Titanium (standard), BS 316 Stainless Steel ,Hastelloy alloy, Nickel.
- Seal materials available: EPDM (standard), HNBR, NBR, NEOPRENE.
- Maximum working pressure: 0.6-MPa.
- Maximum operating temperature: 150°C.



Cooling Performance Table (water/water)

CODE	PLATE MATERIAL SUFFIX		TRANSFER		AREA OF PLATE m ²	NUMBER OF PLATES	COLD CIRCUIT (8°C/15°C)			PROCESS CIRCUIT (31°C/26°C)			DIMENSIONS		
	Titanium	316 S.Steel					FLOW	PRESSURE DROP	CONN.	FLOW	PRESSURE DROP	CONN.			
PHE-100	TI	SS	53	45,700	0.04	18	6.0	42	1½"	83	45	1½"	543	250	664
PHE-140	TI	SS	66	56,900	0.04	22	7.5	42	1½"	10.4	45	1½"	543	250	664
PHE-180	TI	SS	92.7	79,700	0.04	30	10.5	42	1½"	14.6	45	1½"	543	250	664
PHE-240	TI	SS	125.9	108,200	0.04	40	14.3	42	1½"	19.9	45	1½"	543	250	664
PHE-290	TI	SS	149	128,200	0.04	47	16.8	42	1½"	23.5	45	1½"	543	250	664
PHE-330	TI	SS	172.3	148,400	0.04	54	19.5	42	1½"	27.2	45	1½"	543	250	664
PHE-370	TI	SS	192.1	165,200	0.04	60	21.7	42	1½"	30.3	45	1½"	543	250	664
PHE-410	TI	SS	215	185,100	0.04	67	24.3	42	1½"	34.0	45	1½"	543	250	664
PHE-450	TI	SS	231.8	199,400	0.04	72	26.2	42	1½"	36.6	45	1½"	543	250	664
PHE-500	TI	SS	244.8	240,300	0.15	26	27.6	40	2½"	38.7	42	2½"	971	360	910
PHE-550	TI	SS	265.2	228,000	0.15	28	29.9	40	2½"	41.9	42	2½"	971	360	910
PHE-610	TI	SS	295.8	254,300	0.15	31	33.4	40	2½"	46.7	42	2½"	971	360	910
PHE-670	TI	SS	326.4	280,600	0.15	34	36.8	40	2½"	51.6	42	2½"	971	360	910
PHE-730	TI	SS	357	307,000	0.15	37	40.3	40	2½"	56.4	42	2½"	971	360	910
PHE-780	TI	SS	377.4	324,500	0.15	39	42.6	40	2½"	59.6	42	2½"	971	360	910
PHE-820	TI	SS	397.8	342,000	0.15	41	44.9	40	2½"	62.8	42	2½"	971	360	910

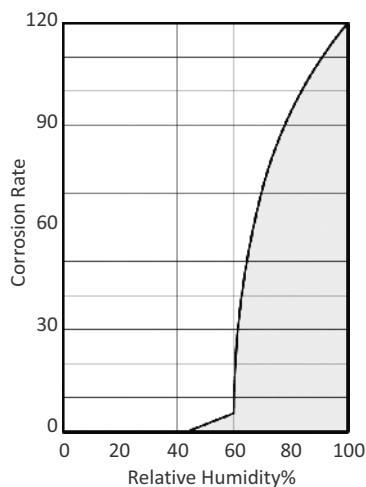
Heating-Cooling Units

Heating Performance Table (water/water)

CODE	PLATE MATERIAL SUFFIX		TRANSFER		AREA OF PLATE m ²	NUMBER OF PLATES	COLD CIRCUIT (8°C/15°C)			PROCESS CIRCUIT (31°C/26°C)			DIMENSIONS		
	Titanium	316 S.Steel					FLOW	PRESSURE DROP	CONN.	FLOW	PRESSURE DROP	CONN.			
			m ³ /h	kPa	BSPT	m ³ /h	kPa	BSPT	H	W	D				
PHE-100	TI	SS	102	88,440	0.04	18	4.0	38	1½"	9	47	1½"	543	250	664
PHE-140	TI	SS	140	120,600	0.04	22	5.6	38	1½"	11	47	1½"	543	250	664
PHE-180	TI	SS	178	153,500	0.04	30	7.0	38	1½"	15	47	1½"	543	250	664
PHE-240	TI	SS	242	208,300	0.04	40	9.6	38	1½"	20	47	1½"	543	250	664
PHE-290	TI	SS	287	246,700	0.04	47	11.3	38	1½"	24	47	1½"	543	250	664
PHE-330	TI	SS	332	285,000	0.04	54	13.1	38	1½"	27	47	1½"	543	250	664
PHE-370	TI	SS	370	318,000	0.04	60	14.6	38	1½"	30	47	1½"	543	250	664
PHE-410	TI	SS	414	356,300	0.04	67	16.3	38	1½"	34	47	1½"	543	250	664
PHE-450	TI	SS	446	383,700	0.04	72	17.6	38	1½"	36	47	1½"	543	250	664
PHE-500	TI	SS	504	433,300	0.15	26	19.9	36	2½"	40	45	2½"	971	360	910
PHE-550	TI	SS	546	469,500	0.15	28	21.5	36	2½"	43	45	2½"	971	360	910
PHE-610	TI	SS	609	523,600	0.15	31	24.0	36	2½"	48	45	2½"	971	360	910
PHE-670	TI	SS	672	577,800	0.15	34	26.5	36	2½"	53	45	2½"	971	360	910
PHE-730	TI	SS	735	632,000	0.15	37	29.0	36	2½"	58	45	2½"	971	360	910
PHE-780	TI	SS	777	668,000	0.15	39	30.6	36	2½"	61	45	2½"	971	360	910
PHE-820	TI	SS	819	704,200	0.15	41	32.2	36	2½"	64	45	2½"	971	360	910

8- AQUA INDOOR POOL DEHUMIDIFIER

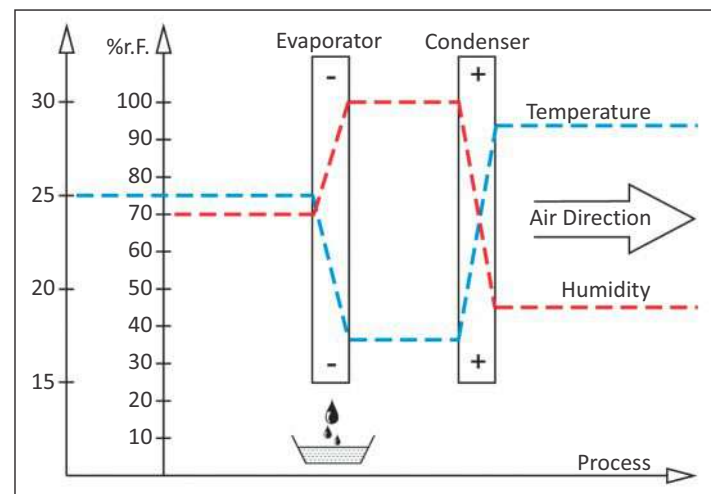
- Clear Windows, Dry Walls: No more foggy windows or condensation on walls in the pool room with AQUA dehumidifiers preserve the construction integrity and gives a pleasant feeling to the room occupants.
- Simple Installation: Can be free standing or remote. It is also duct ready, the control can be easily made in a 220 volts wiring.
- Quality Construction & Reliability: AQUA dehumidifier comes in white coated anti-humidity paint or in stainless steel body, Digital LCD controller & gas pressure gauge. The unit is covered under a 5 year warrantee.
- Low Electrical Cost: AQUA dehumidifier utilizes a refrigeration system that requires a smaller electrical load.
- Humidity Control: Stabilize room conditions through dehumidification, this reduces the maintenance cost of the room and gives a very pleasant environment to the pool room.
- Indoor Pool Room Heating: Recovering energy from the dehumidification process will often heat an entire pool room for the cost of operating the dehumidifier alone.
- Indoor Pool Room Cooling: An optional remote condenser will allow the DCA system to cool the pool room during the warm months.
- Easy to Maintain: The AQUA dehumidifier system is a closed loop system with nothing to oil or lubricate. Simple return air filter maintenance is all that is needed.



Air dehumidification

The correlations occurring when air is dehumidified are based on physical laws. These are depicted here in graphical form in order to provide you with a brief overview of the principles of air dehumidification.

Temp.	Water vapour content in g/m ³ at humidity of			
C	40%	60%	80%	100
-5	1.3	1.9	2.6	3.3
+10	3.8	5.6	7.5	9.4
+15	5.1	7.7	10.2	12.8
+20	6.9	10.4	13.8	17.3
+25	9.2	13.8	18.4	23.0
+30	12.9	18.2	24.3	30.3

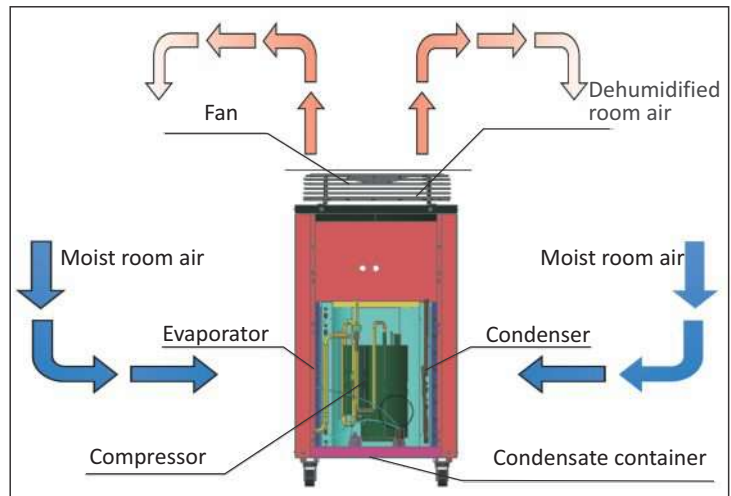


As it flows through or over the evaporator the air stream is cooled to dew point. The water vapour condenses, and is collected in a condensate trap from where it is drained off.

Heating-Cooling Units



Drain the condensate into a lower lying drain



Schematic depiction of the workings of a AQUA air dehumidifier

		DH-2	DH-4	DH-6	DH-15
OPERATING RANGE, TEMPERATURE	C	3-32	3-32	3-32	3-32
OPERATING RANGE, HUMIDITY	% RH	40-100	40-100	40-100	40-100
DEHUMIDIFICATION CAPACITY MAX.	l/h	2.2	4.1	6.2	15.2
AT 30 C/80% RH	l/h	2.0	3.9	6.0	15.0
VENTILATION CAPACITY MAX.	m ³ /h	400	1000	2800	4500
CONDENSATE DRAIN SIZE	mm	Φ20	Φ20	Φ20	Φ20
COMPRESSOR/CONDENSER	Configuration	Rotary	Rotary	Rotary	Scroll
REFRIGERANT	Freon	R22	R22	R22	R22
REFRIGERANT QUANTITY	g	450	900	1400	2400
POWER SUPPLY	V/Hz	220~240/1~/50	220~240/1~/50	220~240/1~/50	220~240/1~/50
MAX. RATED POWER CONSUMPTION	A	3.4	6.9	10.5	8.1
MAX. POWER CONSUMPTION	kW	0.76	1.53	2.3	2.3
AT 20 C/70% RH	kW	0.53	1.1	1.7	6.2
CUSTOMER-PROVIDED ELECTRICAL PROTECTION	A	16	16	16	40
DEFROSTING	Automatic	Hot gas	Hot gas	Hot gas	Hot gas
SOUND PRESSURE LEVEL LPA 1m*	dB (A)	45	49	49	53
DEPTH	mm	280	490	490	770
WIDTH	mm	960	490	490	770
HEIGHT	mm	520	950	950	995
HEIGHT INCL. TRANSPORTATION BRACKET	mm	600	1040	1040	1090
WEIGHT	kg	46	50	55	165

* Noise level measurement DIN 45635 - 13 - KL 3

9- AQUA POOL DEHUMIDIFIERS WITH HEATING & COOLING FUNCTION

AQUA Indoor Environmental Control Systems provide effective control of damaging moisture common with indoor pool facilities. They maintain a delicate balance of humidity control and manage air and water temperatures for maximum comfort at the lowest cost. This series uses heat pump technology to dehumidify the space and recycle the waste energy to heat both the air and pool water. They are available in many sizes and a variety of configurations for large indoor pools found in hotels, schools, natatoriums, aquatic centers and water parks.



Built for the Corrosive Pool Environment

AQUA dehumidifiers have many special design features to minimize maintenance and extend the life of the unit. All critical components are located out of the corrosive air stream, and coils are constructed from all copper and coated aluminum fins for long life. AQUA uses full-size air/water condensers for maximum pool and air heating or cooling. It utilizes a sophisticated controller that offers high efficient control strategies for more efficient intelligent pool operation. All units are constructed of heavy-gauge steel with side and roof panels galvanized and epoxy powder coated to resist corrosion. Panel insulation provides additional energy efficiency along with sound control for indoor and outdoor installations.

Recycled Energy Lessens the Need for Fossil Fuel Heating

Indoor pools demand large quantities of heat to maintain space and water comfort conditions. Rather than relying on fossil fuel as the primary heat source, AQUA units utilize waste heat generated during dehumidification to heat the space and pool water. AQUA units return much more energy than they use with average recorded savings ranging from 40% to 60% over conventional outside air dilution systems. For every kilowatt of electrical power used to operate AQUA system, five kilowatts of heat are delivered to the natatorium and water.

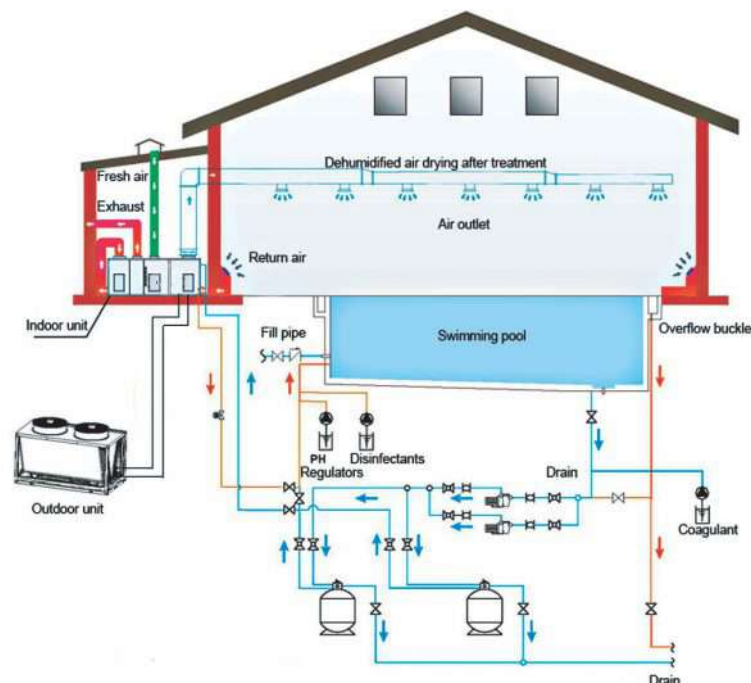


- Room hygrosat and thermostat.
- Automatically switches mode from heat to cool.
- Optional digital controller with display.

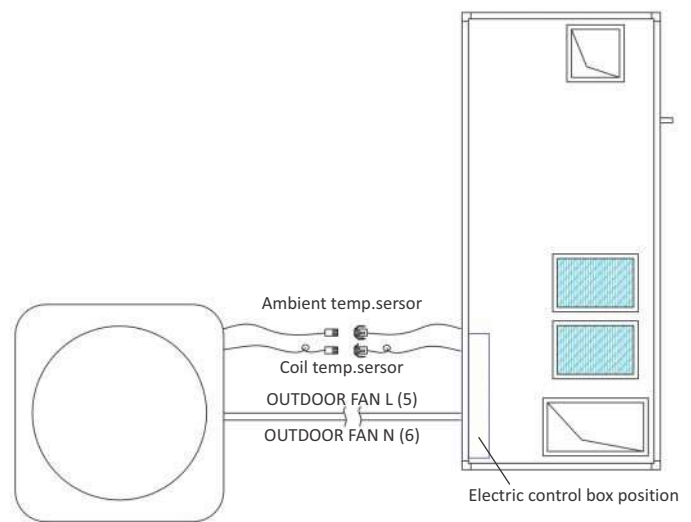
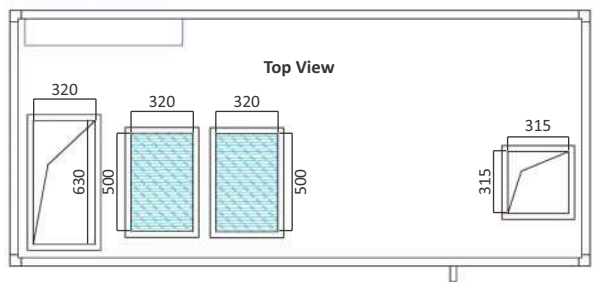
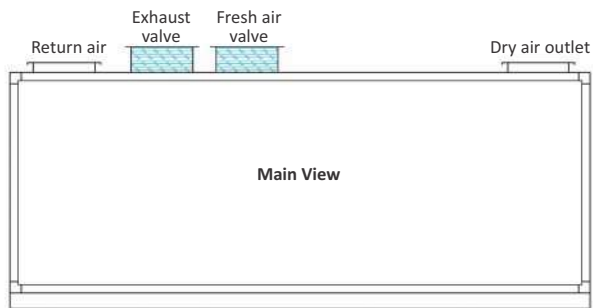
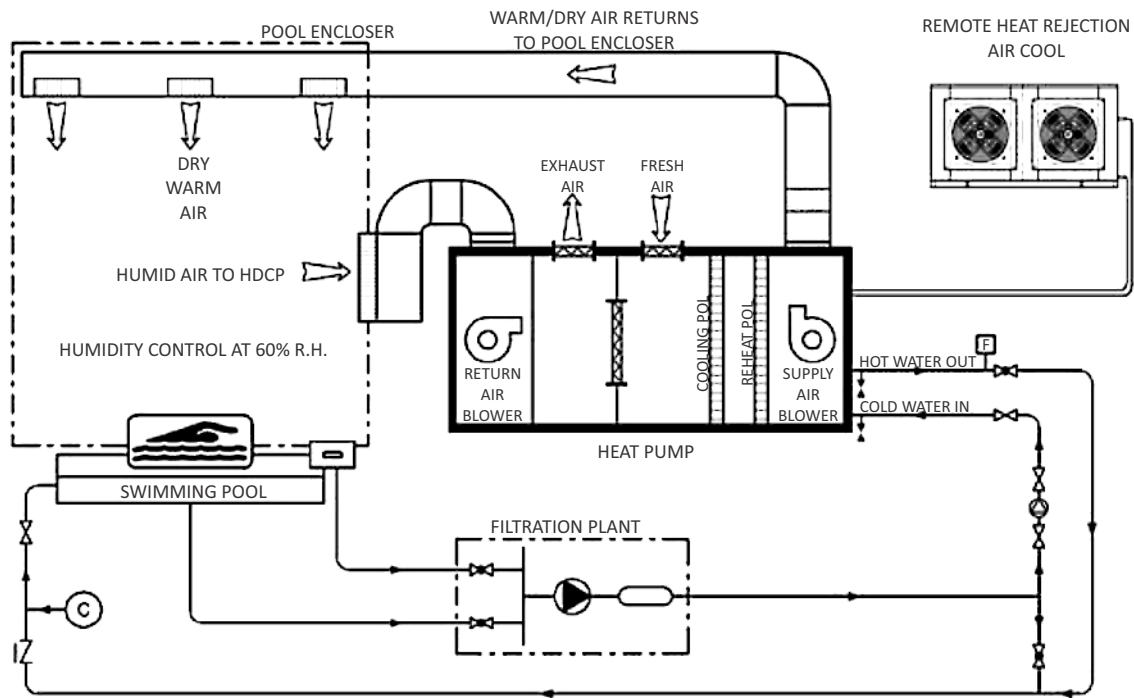
High Efficiency and Environmentally Friendly

All models use R22 or R417A refrigerant and deliver excellent performance characteristics. Stage compressor cycling ensures minimum compressor operation for any given load for greater efficiency, and also maintains a high quality environment. The systems can be configured to return condensate back to the pool, saving the equivalent of the entire pool's volume over one year. For improved air quality, plasma filters can be added.

- Rugged features delivers unrivaled performance
- Scroll compressor, efficient and quiet operation
- Coated evaporator and reheat condenser coils, long life
- Titanium tube-in-shell water heat exchanger
- Powder coated cabinet, corrosion resistant
- Controller with user friendly interface
- Self diagnosis



Heating-Cooling Units



			AD-15	AD-20	AD-25	AD-30	AD-40	AD-50	AD-60	AD-80	AD-100	AD-120	AD-160	
POWER SUPPLY		V/P/Hz	380-415/3/50											
OUTPUT	COOLING	kW/h	25	33	41	51	65	82	97	131	163	192	241	
	HEATING	kW/h	30	39	47	60	78	106	128	170	214	243	280	
DEHUMIDIFICATION CAPACITY		kg/h	17	22	26	33	43	51	62	84	102	122	160	
APPLICATION POOL SURFACE AREA		m ²	68	88	104	132	172	204	248	336	408	488	640	
RATED AIRFLOW		m ³ @300Pa	4000	5000	6000	7500	9000	11000	13000	16600	21000	25000	32000	
BLOWER	QTY		2	2	2	2	2	2	2	2	2	2	2	
	TYPE		CENTRIFUGAL											
	STATIC PRESSURE RANGE	Pa	100-500	100-500	100-500	100-500	100-850	100-850	100-850	100-850	100-850	100-850	100-850	100-850
	POWER INPUT	kW	1.5	1.5	2.2	2.2	3.5	4	5.5	6	7	7.5	11	
COMPRESSOR	QTY		1	1	1	2	2	2	2	2or4	2or4	2or4	2or4	
	TYPE													
	POWER INPUT	kW	5.5	7	8.5	5.4	7	8.5	11	7or13	8.5or16.5	11or22	13or25	
WATER HEAT EXCHANGER CONDENSER	RATED WORKING PRESSURE	Mpa	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
	MAX. WATER TEMPERATURE	C°	40	40	40	40	40	40	40	40	40	40	40	
	RATED WATER FLOW RATE	m ³	4.7	6.1	7.2	9.4	12.2	14.5	18.8	24.6	30.6	37.5	48	
	WATER CONN. SIZE	mm	32	32	38	50	50	63	63	75	75	90	100	
AIR COOLED CONDENSER	QTY		1	1	1	1	1	1	1	2	2	2	2	
	RATED CAPACITY	kW	30	39	47	60	78	96	118	150	184	223	278	
	RATED AIRFLOW	m ³	10000	12000	15000	20000	24000	30000	40000	48000	60000	80000	90000	
	No. OF FANS		1	1	1	2	2	2	2	4	4	4	4	
	FAN MOTOR POWER INPUT	kW	0.82	0.82	1.65	0.82	0.82	0.82	0.82	0.82	0.82	1.1	1.1	
DIMENSIONS	OUTDOOR CONDENSER	mm	706	1450	1450	1450	1800	1850	2110	1800	1850	2110	2500	
		mm	686	705	705	705	705	1000	1100	1000	1000	1100	1200	
		mm	940	1065	1065	1065	1065	1320	1350	1320	1320	1350	1350	
	INDOOR MAIN UNIT	mm	3000	3600	3600	3800	4200	4600	4900	5400	5800	6600	7000	
		mm	1300	1520	1570	1670	1670	1930	2160	2200	2200	2150	2200	
		mm	1200	1200	1260	1360	1450	1520	1690	1840	2150	2200	2500	
INDOOR MAIN UNIT WEIGHT		kg	500	800	900	1200	1500	1650	1850	2200	2500	2700	3300	