

Contact name :	T	F
Company :		26/01/2004
Project Title / Ref:		P11624

Equipment Selection :

Model :	Andromeda	2000	Super Plus
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To provide :

Dehumidification	-	By heat pump dehumidifier
Heat recovery	-	To air and water by active heatpump technology
Air heating	-	By integral LTHW heating coil
Water heating	-	By integral LTHW heat exchanger coil
Fresh air	-	Not included
Air cooling	-	Not Included
Ducting required	-	Pool air intake, pool air supply

Project Design Criteria :

Av. Relative Humidity :	65 %
Pool Hall Air temperature :	30.0 °C
Pool water surface area :	60 m ²
Pool water temperature :	29.0 °C
Uncovered Hrs. Norm/Max :	4 / 12
'In use' Hrs. Norm/Max :	2 / 4
No spa included	

Structural details :

	Areas :	U-value W/m ² /°K
Exterior walls :	110.5 m ²	0.35
Exterior wall glass :	22.0 m ²	2.80
Roof / ceiling :	185.0 m ²	0.25
Floor :	88.2 m ²	0.25
Pool Hall Volume :	444 m ³	

Prob. annual H&V costs (Gas) :

Heating & ventilation :	£ 1,342
Energy consump. kWh :	60,010

Dimensions of selected unit :

L / W / H (mm) :	735 / 850 / 1930
Weight (approx) :	195 kg

Unit Performance data :

Dehum via heatpump :	6.8 L/Hr.
Supply airflow :	2500 M ³ /Hr.
External resistance :	150 Pa
Air heating coil :	25 kW (LTHW)
Pool Heat Exchanger :	30 kW (LTHW)
Integral controls type :	Digital Electronic.

Installation services required :

Electrical supply options :	
Single phase :	230v / 50Hz 30 Amps
Three phase :	400v / 50Hz 10 Amps / phase
Boiler pump :	UPS 25-80 82 / 71
Total Boiler duty :	KW / BTU 30 / 103,000
LTHW pipes :	28 mm flow and return
Pool Water :	1.5 inch flow and return
Condensate :	22 mm PVC

HEATSTAR: Tel: 01983 521465 Fax: 01983 822016 e-mail: info@heatstar.com

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Project Title:

System specified : **Andromeda 2000 Super Plus**

Mains Electricity: 3 ph-Neutral-Earth 400v / 50 Hz Protected supply or
1 ph-Neutral-Earth 230v / 50 Hz Protected supply

Supply rating : Three phase: 10 Amps/phase. or
Single phase: 30 Amps.

F.L. Running current : Three phase: 5 Amps/phase. or
Single phase: 16 Amps.

Protection required : RCD (30mA) / Short circuit (MCB) / local isolator switch.

Other wiring available : Volt free switch contact to request LTHW demand.

Air Flow Rating: Supply/Return Air Flow: 2,500 M³/Hr.
Max. External Res.: 150 Pa

Linear Sound Power

Lw dB :

Frequency Hz	Return air	Supply air		
63	68.3	65.4		
125	69.6	66.7		
250	67.3	64.4		
500	68.3	65.5		
1000	65.3	62.5		
2000	67.3	64.4		
4000	64.5	61.6		
8000	54.9	52.0		

Condensate Water Drain:

Max. rate of flow : 6.2 L/Hr.

Pipe connection : 22 mm PVC / compression

Trapping required : 100 mm Minimum height 'P' trap.

L.T.H.W. Supply: (From Fuel Boiler)

Rated Flow / Rtn temp : (Closed circuit Flow/return) 82 / 71 °C

Supply output rating : 30 kW / 103,000 BTUs

Flow rate required : 0.66 L/Sec @ 28.4 kPa Internal Res.

Pump size for flow : (Or equivalent duty model) UPS 25-80

Connection size / type: 28 mm Copper / Compression

Other requirements : **Automatic by-pass valve.**

Pool Water Supply:

Connection size / type: 1.5 Inch PVC / Couplers on balanced by-pass.

Flow rate required : 2.1 L/Sec @ 0.7 kPa Internal Res.

Refrigerant Data : 1.3 kG of R407C : Hermetically sealed

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Project Title:

System Specified: **Andromeda 2000 Super Plus**

Description of System:

Swimming pool Climate Control Unit incorporating:

Supply air fan.

Air heating coil.

Integral digital control panel.

Dehumidification Heat Pump.

Pool water heating coil.

Motorised heating control valves.

To Provide:

Humidity control.

Heat pump active heat reclaim to air and water.

Air heating.

Complete pool water heating.

Dehumidification Duty: 6.8 Litres/Hr. Via Refrigeration Heat Pump.

Dehumidifier Heat output : 7.5 kW (Reclaimed heat + motor input).

Reclaimed Heat Control : 100% Diversion : Priority to maintaining correct pool hall temperature.

Pool Hall Air Heating Coil: 25 kW rated integral finned tube coil.

Pool Heat Exchanger : 30 kW rated shell & tube heat exchanger.

Air Flow Rating: 2,500 M³/Hr. SUPPLY / RETURN AIR FLOW
150 Pa MAX. EXTERNAL RES.

Air flow rated via vane anemometer.

Fan Format: Direct drive, double inlet, forward curved.

Controls System :

FULLY INTEGRATED PANEL COMPRISING OF:

Humidistat :	To activate refrigeration dehumidification system.
Air thermostat :	To govern dehum heat pump heat recovery diversion between pool room air and pool water.
Programable time switch :	To select between 'normal' & 'set back' pool room air temperature levels.
Air thermostat :	To activate Air Heating Coils to provide heating to 'normal' pool room air temperature level.
Air thermostat :	To activate Air Heating Coils to provide heating to 'set back' pool room air temperature level.
Heat pump pressure switch :	To stop operation of refrigeration circuits should internal pressures exceed pre-set limits.
Pool water flow sensor :	To automatically control operation when no pool water flow is available to the Heatstar unit.
Pool water thermostat :	To activate Pool Water Heating Coils.
Controls format :	Digital Electronic.

Unit Case Construction:

Anodised aluminium penta post frame construction with corrosion proof PVC coated access panels.

Electrical Data:

Three phase 400v / 50 Hz Protected supply.
Single phase 230v / 50 Hz Protected supply.

Compressor Motor Rating:	2.2 kW	S.F.P. :	1.5 W/L/sec.
Supply Fan Motor Rating:	1.8 kW		
Total Power Installed :	4.0 kW		

Unit Dimensions:

	1930 mm H
	735 mm L
	850 mm W
Weight:	195 kG Approx. net.

Installation Services Req.:

- Mains electrical supply - suitably protected.
- Air distribution duct work.
- Condensate water drain.
- Pool water pipe circuit.
- L.T.H.W. supply from Fuel Boiler System.

Additional Notes:

Controls, service access and connections can all be incorporated on which side of the unit best suits the ideal plant room layout.

All performance ratings are nominal.

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Project Title:

Pool Hall Air Criteria : AVERAGE POOL HALL RELATIVE HUMIDITY: 65 %

AIR TEMPERATURE:
Pool Uncovered: 30.0 °C
Pool Surface Covered: 22.0 °C

Fresh Air Ventilation: DILUTION RATE: 0.5 A.C./Hr.
222 M³/Hr.

Pool Water: POOL WATER TEMPERATURE: 29.0 °C
POOL WATER SURFACE AREA: 60.0 M²

Daily Usage:	<i>Norm.:</i>	<i>Max.:</i>
HRS. POOL HALL IN USE:	2	4
ACTIVITY FACTOR:	1.03	1.10
HRS. POOL UNCOVERED:	4	12

Pool Hall Structure: POOL HALL AIR VOLUME: 444 M³

SURFACE AREAS:	M ²	U-Value W/m ² /°K
Exterior Walls:	110.5	0.35
Exterior Wall Glass:	22.0	2.80
Roof:	185.0	0.25
Floor:	88.2	0.25

Climate Control Demand

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Project Title:

Water losses:	<i>Average:</i>	<i>Max.:</i>
WATER HEAT LOSS PER HOUR:	2.6 kW	7.4 kW
WATER EVAPORATION RATE:	0.9 L/Hr.	6.2 L/Hr.

Moisture expelled by introduction of fresh air:	<i>Average:</i>	<i>Min.:</i>
DILUTION RATE:	2.5 Litres/Hr.	1.7 Litres/Hr.

Pool Hall Heat Losses:				
AMBIENT AIR DESIGN TEMPERATURES:	26°C	12°C	-1°C	-5 °C
Exterior Walls:	0.2	0.7	1.2	1.4 kW
Exterior Wall Glass:	0.2	1.1	1.9	2.2 kW
Roof:	0.2	0.8	1.4	1.6 kW
Floor:	0.1	0.4	0.7	0.8 kW
TOTAL STRUCTURAL HEAT LOSS:	0.7	3.0	5.2	5.9 kW

HEAT LOSS VIA INTRODUCTION OF FRESH AIR:				
DILUTION RATE HEAT LOSS:	0.3	1.3	2.3	2.5 kW
MAX. INTRODUCTION RATE LOSS:	0.3	1.3	2.3	2.5 kW

HEAT LOAD TO INCREASE AIR FROM SET BACK TEMPERATURE:			
Air Temp. rise from Set Back : Cover on mode:	22.0 °C	to	30.0 °C
Air Temp. rise heating requirement:			3.5 kW

MAX. HEAT CONVECTION FROM POOL WATER INTO POOL HALL AIR: 2.0 kW

Heat Source Requirements:	
RECOMMENDED MINIMUM HEAT SOURCE OUT PUT:	30 kW
Max. simultaneous heat demand (excluding initial pool water heat-up) :	25 kW

The heat source capacity stated makes allowance for both pool room air and pool water heating requirements.

Energy Use Data

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Project Title: Dunkley

System Selected: Andromeda 2000

<i>Fuel Data:</i>		<i>Basic Cost :</i>	<i>kWh / Unit :</i>	<i>Efficiency % :</i>	<i>Real Cost :</i>	
ELEC. Stand. Rate:	p/kWh	5.92	1.00	100	5.92	p/kWh
MAINS GAS :	p/Therm	43.60	29.30	70	2.13	p/kWh

PROBABLE ANNUAL HEATING / CLIMATE CONTROL COSTS: £ 1,342

COST BREAKDOWN :	HEAT PUMP / VENTILATION :	£ 600
	POOL WATER HEATING :	£ 483
	AIR HEATING :	£ 260

PROBABLE ANNUAL ENERGY CONSUMPTION : 60,010 kWh

ANNUAL CARBON DIOXIDE EMISSION FROM ENERGY USED : 14,471 Kg

ANNUAL CARBON EMISSION FROM ENERGY USED : 3,947 Kg

Probable annual heating gas consumption : 1702 Therms

These figures, which are based on the indicated design conditions and past average weather conditions, are intended to provide a reasonable probable indication.

These figures are not intended to be binding and prospective clients should seek their own independent assessment if so desired.

The costs involved in operating the pool water circulation pump, lighting or any other electrical or heating equipment are in addition to this figure. Costs exclude V.A.T.

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