This manual should be left with the user of the machine after installation/commissioning.

Owner/Installation Manual
Variheat Models
(AW550/800/1200/1400/1800/4000)

SD092750 iss 34
28/09/12

Please read these instructions carefully as they will enable you to get maximum efficiency and reliability from your new Calorex Heat Pump.

HEALTH & SAFETY WARNING

As the Heat Pump embodies electrical and rotational equipment it is recommended that ONLY competent persons carry out any work on this type of machine (see warranty conditions)

Contents

General Introduction

An indoor swimming pool produces large quantities of water vapour which forms damaging condensation unless removed.

The usual method of removing this water vapour is by ventilating an otherwise energy efficient building, exhausting the heat already inside the building and making it necessary to heat the incoming air.

Evaporation losses account for approximately 70% of the total heat energy required to heat the pool water. The ideal solution would be to eliminate the need for ventilation by removing the water vapour from the pool hall and converting the latent heat contained therein back into sensible heat to the pool water and or air.

CALOREX Variheat Pumps minimise the energy input required to maintain pool hall air and pool water temperatures by dehumidification and recycling energy into the pool water and pool hall air thus dramatically reducing running costs over conventional systems.
Pool water and pool hall air heating are still required but at a lower rate than that required by conventional systems.

CALOREX Variheat Pumps also provide continuous air circulation and thus with good air distribution will give uniform pool hall conditions.

How It Works (see Figure 1)
Warm humid air is drawn through the evaporator and is cooled and dehumidified. The resulting cool dry air is reheated above the original pool hall temperature by a secondary air heat exchanger.

This heat exchanger has utilised some of the energy from the dehumidification process; the remainder is transferred to the pool water via a water cooled condenser.

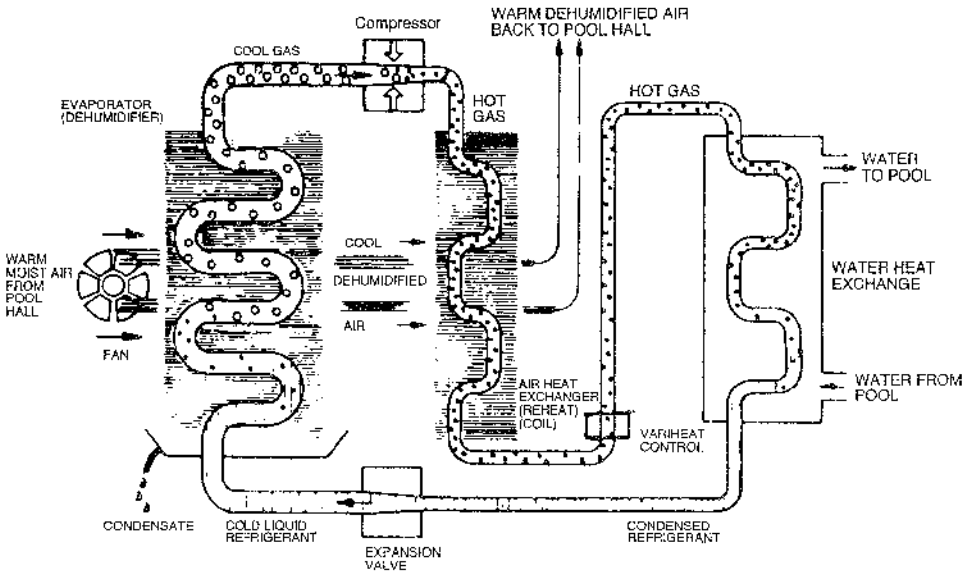
The Variheat unit, when matched correctly to the evaporation rate of the pool water, should maintain the pool hall between 55% and 65% R.H. by means of an integral humidistat.

It must be noted that the minimum evaporation loss occurs when the pool hall air temperature is maintained at 1°-2°C above the water temperature. Evaporation loss can dramatically increase if the pool hall temperatures are allowed to fall below the water temperature.

It is not recommended that these units are used in a pool hall environment ***below 20°C***, i.e. not in lightweight structures as air temperatures could not be economically maintained at 26/28°C i.e. (1°-2°C above water temperature in winter period).

NOTE: As the Variheat Unit will cycle on Humidity control, full back up heating must be incorporated on pool water and pool hall air.

Figure 1 THE CALOREX VARIHEAT PRINCIPLE



When water temperature is satisfied by integral thermostat, heat rejected to water is reduced and heat output to air is increased.

Installation

1. Siting

a) Ensure heat pump on site is as ordered, i.e. model electrical supply and factory fitted options.

b) Inspect unit for damage, in paticular inspect the evaporator (finned side) to ensure that it is undamaged (minor indentations in the fins do not affect performance). If severely damaged endorse delivery note in presence of the driver and send a recorded delivery letter to the transport company giving details.

c) Protect the unit if installation is delayed.

d) Provide a firm level base capable of supporting operational weight of unit. Spread load if on timber floor.

e) Ensure water cannot collect under the unit. It is recommended that units are installed on plinths 100mm above finished floor level and also to aid condensate drainage.

f) Allow adequate clearance to service panels on unit; recommend 500mm minimum (see installation drawings).

g) All Calorex heat pumps are designed to be as quiet as practicable, however, due consideration should be given to siting in order to fully exploit this feature, i.e. orientate inlet/ outlet parallel to occupied premises.

h) Ensure loose debris will not block air filters or grilles.

IMPORTANT

As Variheat units are handling air at Pool Hall temperatures, they must be sited in a warm environment, i.e. pool hall, or insulated plenum. They ***must not*** be sited in ***cold areas***, i.e subject to ambient air.

2. Ducting See Figs. 2, 3, 4, and 5.

In order that moisture can be removed and humidity control can be effected within the pool hall, it is essential that correct air movement and distribution is achieved.

The Variheat unit must extract the humid air generated at pool surface and discharge the drier air to areas which are subject tio condensation problems (windows etc and, or comfort zones, spectators, sitting out areas.

This can generally only be achieved by use of ducting and correct application of grilles/ louvres to effect air distribution and movement to these areas.

NOTE: Variheat unit and ducting will be at pool hall temperature and will require insulation if exposed to lower air temperatures.

Exhaust from Pool Hall - Humid Air

Should be taken as low as practicable to inlet of Variheat unit. In many instances siting of Variheat unit in hall or changing rooms can eliminate use of duct work to inlet. If duct work is to be fitted, an inlet duct should be ordered from Calorex distributer.

Inlet to Pool Hall- Dry Air

Generally achieved by overhead ducting with suitable grilles to give balance and direction of air flow. Consideration must be given to duct position in relation to pool surface, material and finishes so as not to promote maintenance problems.

The quantity of air flow handled by each Variheat unit is given on the data sheet together with the maximum pressure available from the fan to overcome total ducting resistance to air flow, i.e. inlet, discharge ducting, grilles, and where installed, air heater batteries.

It is recommended that a reputable duct work company is associated with the duct design/ manufacture and selection of grilles for the total system.

Note:

1. The humidity sensing tube situated by the air inlet is to be encompassed by or extended to any inlet air ducting. Refer to installation drawings.
2. All units have discharge ducting spigots as standard.
3. Inlet ducting spigots are available from stockists.
4. Final connections to Variheat spigots must be made of flexible ducting (rubber or canvas) to eliminate transmission of vibration down the duct.
5. Before any discharge ducting is attached remove plate (if fitted) from machine outlet or fan grille.
6. After completion of installation including all grilles, ductwork etc., ensure that the air flow through the machine is as specified in the data sheet ±10%. If air flow is high, damp outlet to obtain correct airflow. If airflow is low or high the unit will not function correctly.

Table 1

Required free areas to provide airflow to and from heat pumps when installed in and enclosed area or where required to pass air through a wall etc.

Free area is the available area through which air can pass through a grille or louvres.

Note: If multiple units are installed in an enclosed area then the inlet free areas required for each unit can be added together to form one inlet aperture.

But discharge from each unit must be kept separate and must not be incorporated into one common duct system, unless non return dampers are used for each machine.

	Minimum Free Air m²
Model	Inlet
AW/AC 550/800VH	0,35
AW/AC 1200VH	0,45
AW/AC 1400/1800VH	0,56
AW/AC 4000VH	1,1

Figure 2 CALOREX VARIHEAT SYSTEM

Installed Inside Pool Hall without Ducting

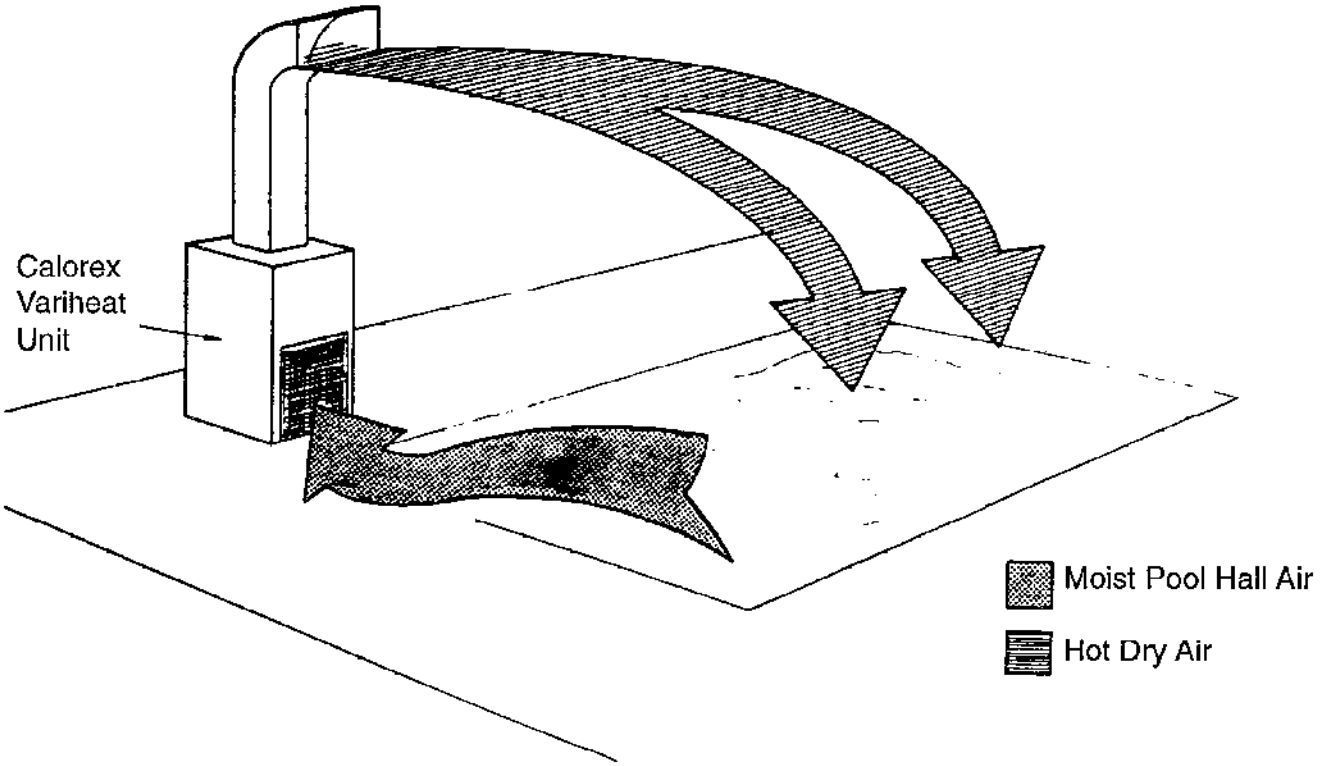


Figure 3 CALOREX VARIHEAT SYSTEM

Installed Inside Pool Hall with Ducting

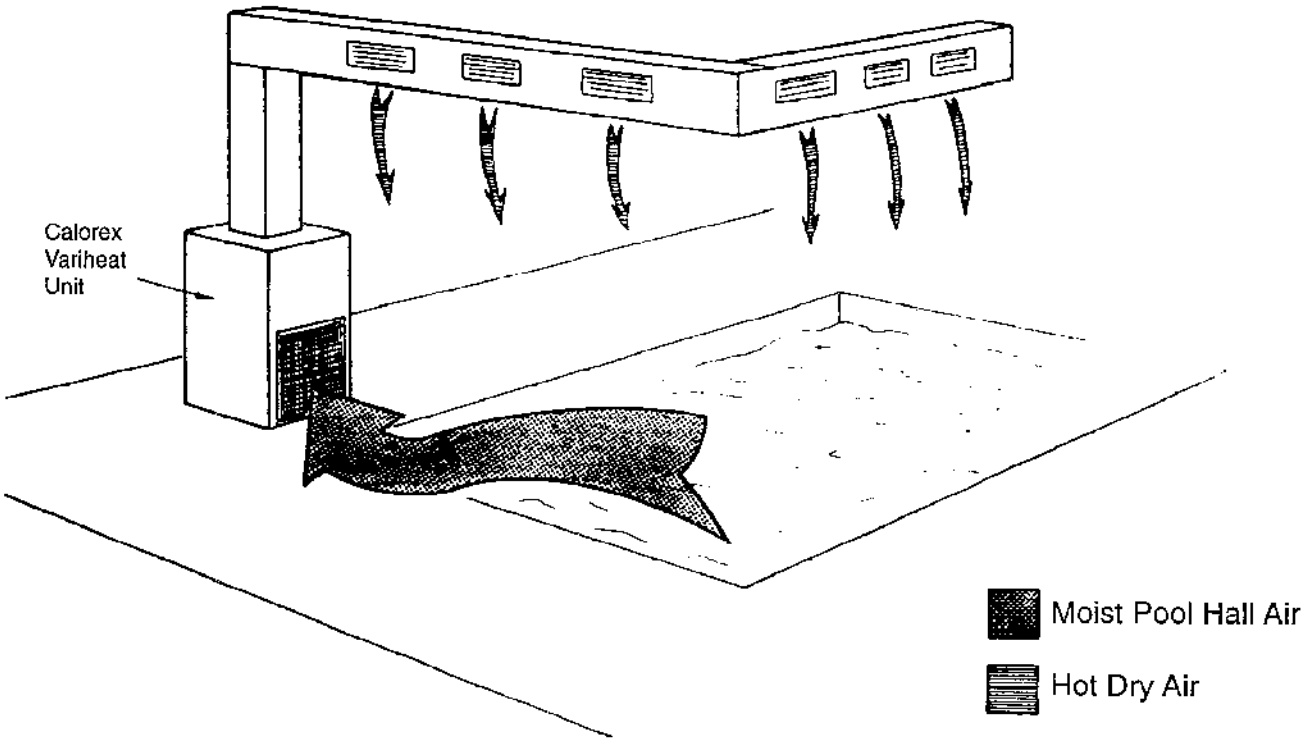


Figure 4 CALOREX VARIHEAT SYSTEM

Installed without Ducting in Plenum Chamber

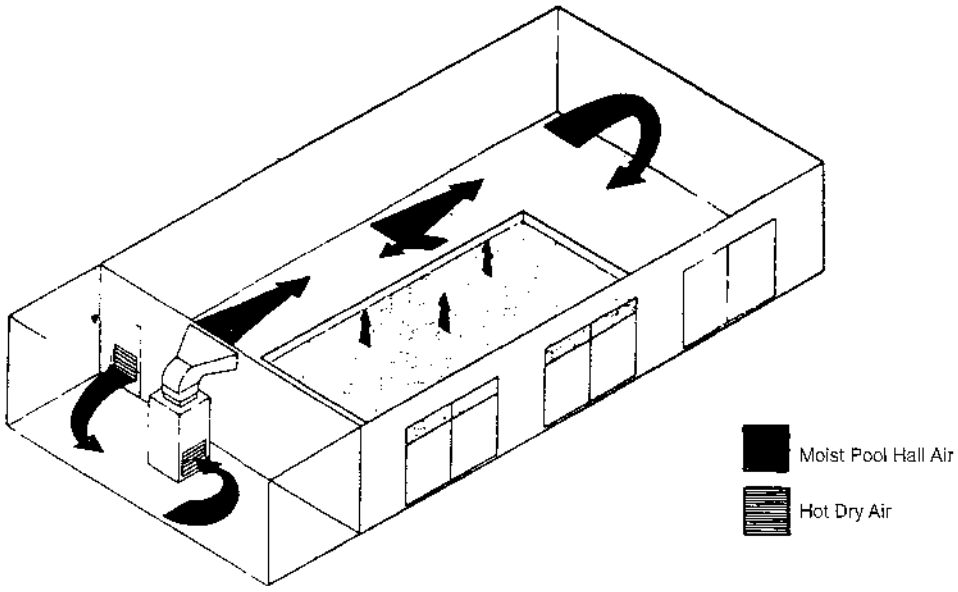


Figure 5 CALOREX VARIHEAT SYSTEM

Installed with Ducting for Specific Dissipation of Processed Air

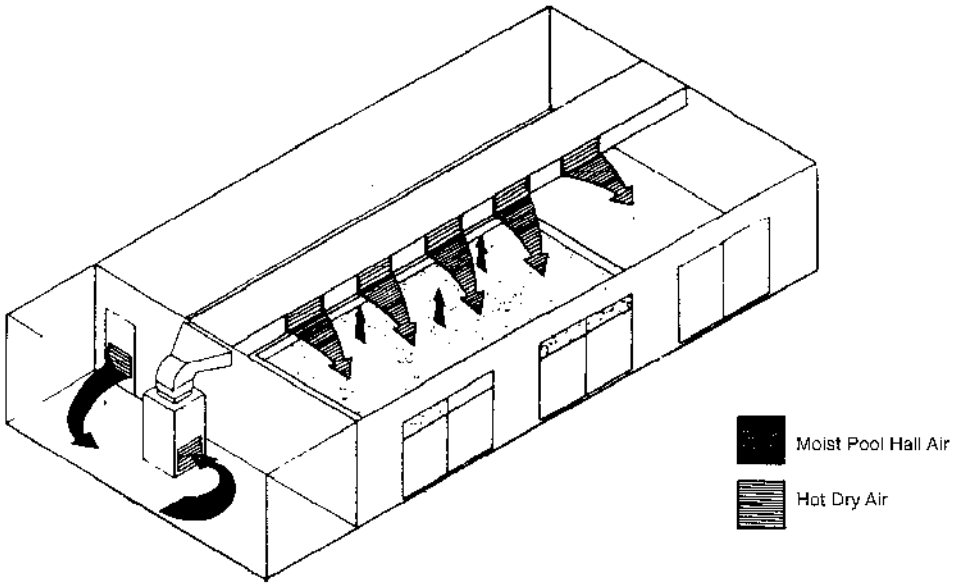
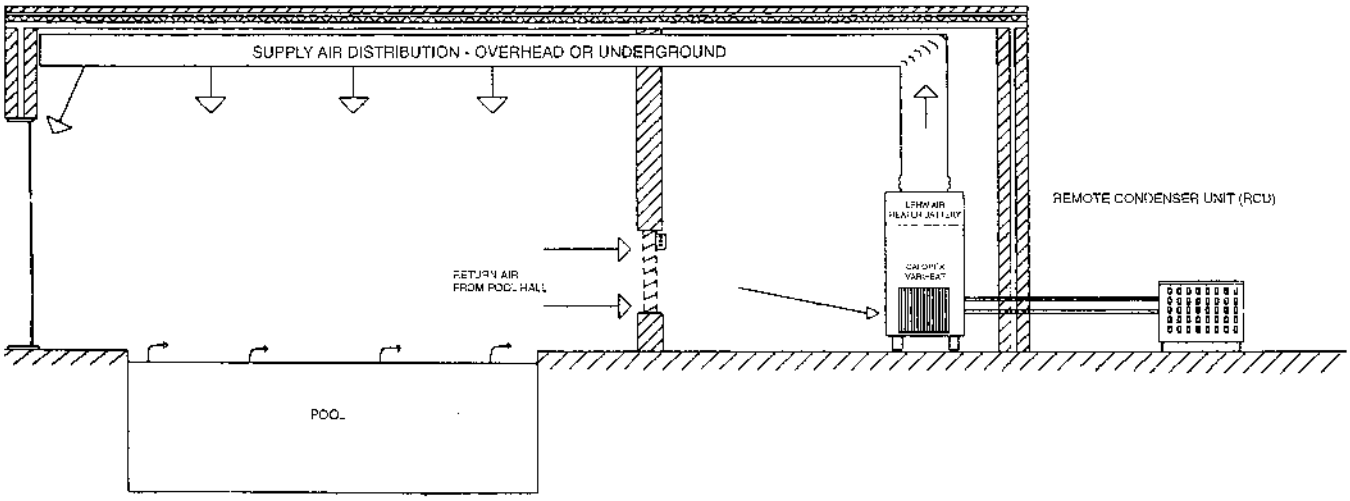


Figure 5a CALOREX A/C VARIHEAT CONNECTED TO A REMOTE CONDENSER UNIT



3. Plumbing

a) The Calorex Variheat Heat Pump must be connected after the filter in the return pipe to the pool. If an existing heater is being retained, then the Calorex unit should be connected between the filter and the other heater, see figure 6.

b) Calorex heat pumps have water inlet/oulet connections as follows:

Models 550,800,1200 1½" BSP parallel, female.

Models 1400, 1800 & 4000 1½" BSP parallel, male.

c) Suitable breakable couplings should be installed local to heat pump.

d) If heat pump installed at lower level than pool water then isolation valves should be fitted.

e) Drain valve or plug should be fitted to lower to facilitate completedrain down in winter period.

f) Connections on all models from 550 to 1200 are by parallel male fittings sealed by 'O' ring or silicone mastic these should be *hand tightened only*, otherwise damage may result to the threads.

Note: Do not route pipes across service panels or Air In/Outlet

g) The heat exchanger in the Heat Pump will, on small pools, take the full flow rate of the recirculating system (see Figure 6). On larger pools a by-pass or separate auxiliary pump may be necessary. (bypass 1½ hp or larger water pumps) see Figures 7 and 8.

h) The condensate drain at the base of the unit collects the condensation from the evaporator fins. It is therefore necessary to ensure that the Calorex is placed on a level plinth so that the condensate water can run away and not overflow the edges of the drip-tray inside the machine.

Models 550,800,1200

drain connection to waste via 22mm push fit domestic waste system.

Models 1400, 1800 and 4000

drain connection to waste via ¾2 & 1½" BSPM stubs respectively.

N.B Hose must be a watertight fit.

i) When the pipework installation is complete the pool pump should be switched on and the system tested for leaks. Also check the filter gauge to see that there is not an excessive increase in back pressure. If everything is then working normally the water circulating system is ready to use.

j) Water circuit to and from unit to be capable of maintaining within specified limits the rate of flow required by heat pump (see data sheet).

k) All pipework must be adequately supported with allowance for expansion/ contraction especially with plastic pipework.

l) It is recommended that when installing water system the last connections to be made in the system should be the breakable connections to avoid any stresses on to the unit connections.

m) To ensure efficient operation of the Heat Pump, an adequate constant flow of water is required through the condenser.

This is normally achieved by ensuring that the filter pump is always operating at the same time as the Heat Pump but this requires consumption of electricity which would not normally be used during the filter 'off cycle' period.

To reduce energy consumption the installation of a two speed or small auxillary water pump (by-passing the filter) should be considered. This method should only be used on heavily used pools (4 hours turnover or less to reduce the risk of overheating due to main pump heat input.

The circuit can be incorporated in the initial installation or added to an existing standard circuit.

IMPORTANT

1) The Calorex unit must never be connected in such a way that the Heat Pump can be switched on without adequate water flow through the condenser. Integral interlock terminals provided on all models (see figure 9).

2) All Pool Purifying Devices and Chemical Injection Systems to be fitted down stream of heat pump with a non return valve to prevent concentrated chemicals back feeding into the heat exchanger. The practice of dosing chemicals direct into Skimmer Basket, which results in concentrated corrosive liquids passing over vulnerable metal components must not be allowed.

3) Water quality must be maintained not only related to solids, etc, but also pH between 7,4 ±0,4 and, if pool water is saline at maximum concentration of 6% wt/wt.

4) Maximum pressure of water in heat pump circuit id 3kg/cm².

(140psi) 1400, 1800,4000 models.

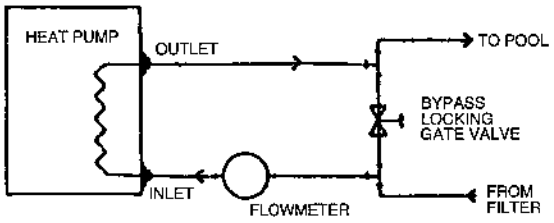
APPROVED METHODS OF DETERMINING WATER FLOW

Method 1-Direct Reading Flow Meter

With clean filter set flow rate to maximum.
(See table 2).
Throttle gate valve until flow rate is obtained.

TABLE 2. *(EXAMPLE)*

	Maximum	Minimum
Model AW 1400	35	30 Litres/min
Model AW 1800		
Model AW 4000	95	90 Litres/min



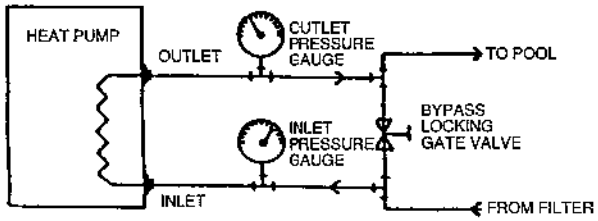
This will ensure flow rate will not drop below minimum when filter requires cleaning.

Note: When water flow rate is set to correct rate - LOCK GATE VALVE, or render it tamper-proof.

Method 2-Differential Pressure
By simply installing two filter pressure indicating gauges, one each on the inlet and outlet of the heat pump, and a locking type gate valve in the by-pass line, the flow rate through the heat pump can accurately be determined by the difference in the readings of the gauges.

TABLE 3. *(EXAMPLE)*

	Maximum	Minimum
	m WG = l/min = psi	m WG = l/min = psi
Model AW 1400/1800	2.5 = 35 = 3.5	1.8 = 30 = 2.5
Model AW 4000	3.4 = 95 = 4.7	3.1 = 90 = 4.4



Flow rate should be set at max differential with a clean filter. This differential pressure will drop as the filter becomes dirty. Provided the filter is cleaned before min differential is reached (which would normally be the case with a well managed pool) then no problems should be encountered.

SETTING UP THE DIFFERENTIAL

When the installation is complete, the procedure for setting the flow rate through the heat pump using two gauges is as follows:

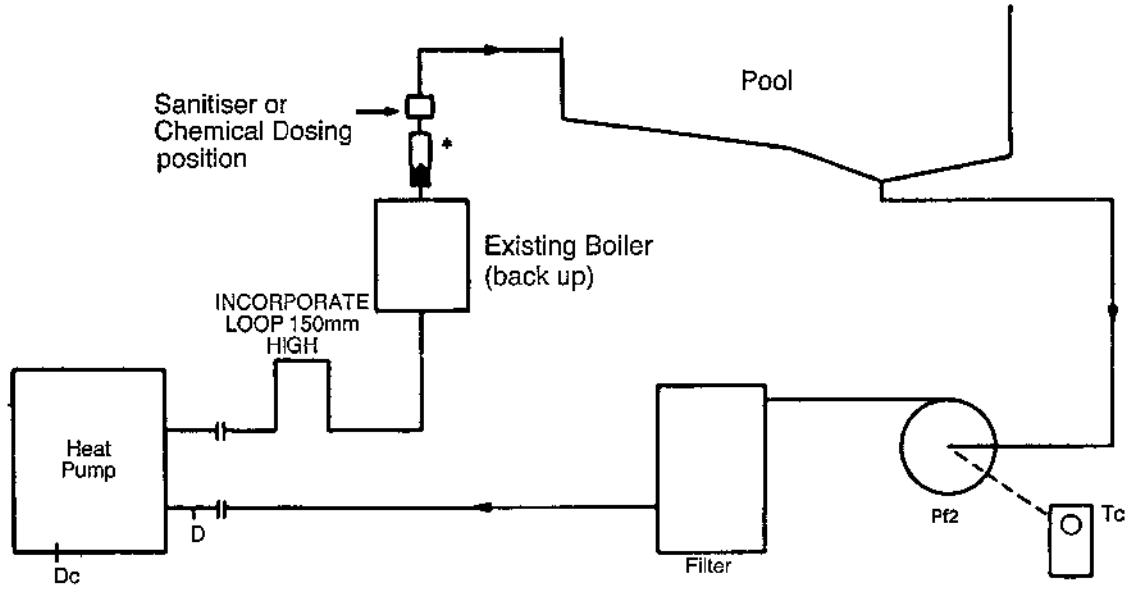
1. With the heat pump switched off-open by-pass valve FULLY.
2. Switch on pool water circulating pump.
3. Note the Water System Pressure on both gauges - they should read the same, but because of manufacturing tolerance they may read different. For example; with a water system pressure of 5 the gauge on the inlet may read 5 and the outlet gauge 5.5 therefore there is a STATIC DIFFERENCE of 0.5. This Static Difference must be noted and added or subtracted from the final figure.
4. Gradually close the bypass valve until there is a difference in pressure between the two gauges. It will be noted that the INLET gauge goes up in pressure.

	Valve fully open gauge pressure is:	After adjusting valve gauge pressure is:
INLET	5.0	6.0
OUTLET	5.5	3.0
DIFFERENCE	0.5	3.0

Therefore corrected
pressure difference is 3.0 + 0.5 = 3.5

5. Lock the bypass valve, or render it tamper proof

Plumbing Circuit Diagrams
Figure 6
TWO SPEED PUMP SYSTEM



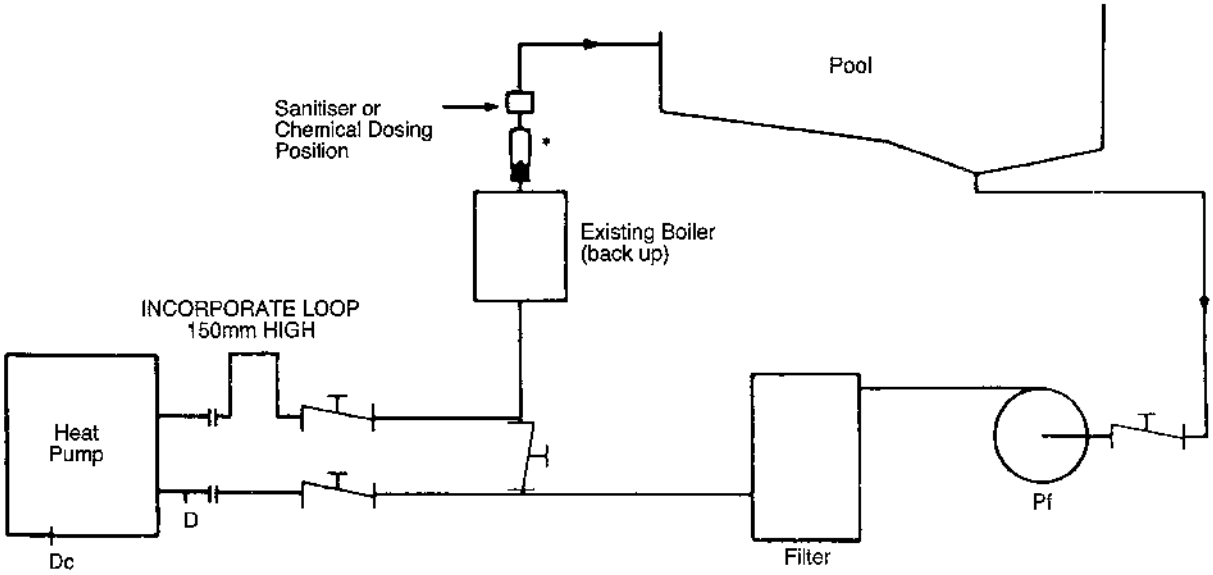
Time clock control water pump:

Full speed to effect filtration period (7 hours)
Slow speed remainder of period (17 hours)

Note: **ON FULL SPEED** water flow rate not to exceed **MAXIMUM** Design flow rate for heat pump. **ON SLOW SPEED** flow rate not to fall below **MINIMUM** design flow rate.

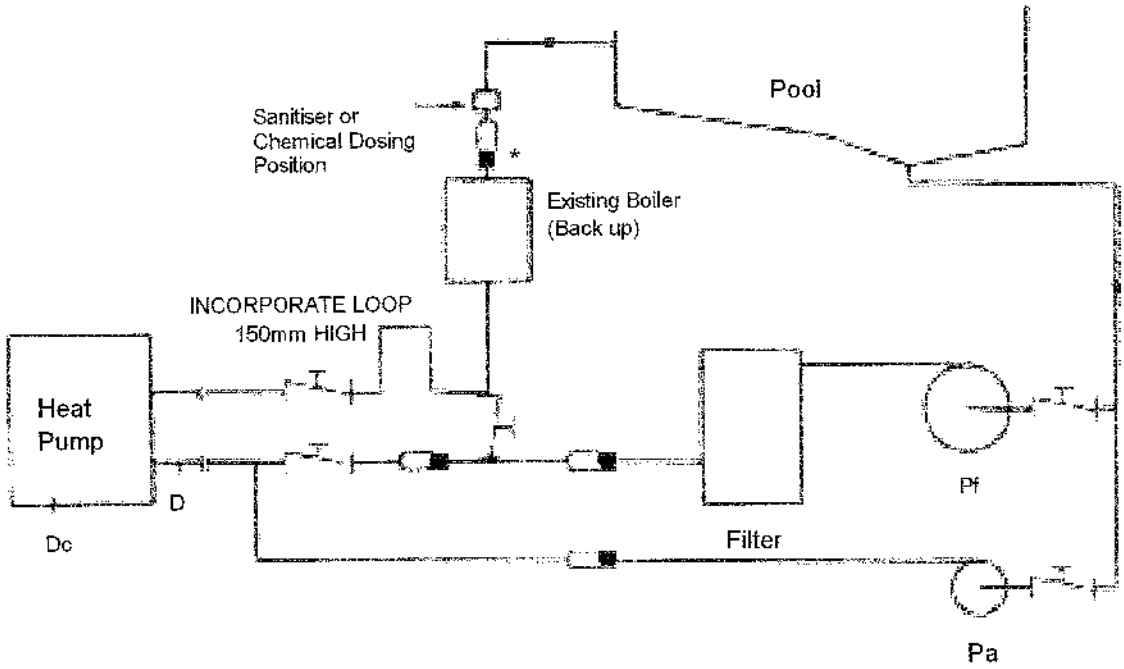
	Service Valve (Ball or Gate)	Pf	Filter Pump Pf2 2 Speed
	Non return Valve (Direction of flow)	D	Drain
‖	Breakable Coupling	Pa	Auxiliary Pump
Tc	Time Clock	Dc	Drain condensate

Figure 7
STANDARD CIRCUIT (Incorporating Bypass)



* A non return valve must be fitted upstream of sanitiser to eliminate any possibility of high concentrates of chemicals runnuing back into the heat pump

Figure 8
RECOMMENDED CIRCUIT INCORPORATING
AUXILLIARY PUMP FOR REDUCED ELECTRICITY COMSUMPTION



4.0 Electrolytic corrosion in swimming pools

Electrolytic corrosion will occur when dissimilar metals that are in contact with each other create a potential difference between themselves. Sometimes separated by a conductive substance known as an electrolyte, the dissimilar metals will create a small voltage (potential difference) that allows the ions of one material to pass to the other.
Just like a battery, ions will pass from the most positive material to the more negative material.

Anything more than 0.3 volts can cause the most positive material to degrade.

A swimming pool with its associated equipment can create this effect. The pool water being an ideal electrolyte and components of the filtration circuit, heating system, steps, lights etc providing the dissimilar metals needed to complete the circuit.
Whilst these small voltages are rarely a safety threat, they can create premature failure through corrosion. Not dissimilar to corrosion through oxidation, electrolytic corrosion can cause complete failure of a metallic material in a very short period of time.

In order to prevent this type of corrosion all metallic components in contact with swimming pool water should be bonded together using 10mm² bonding cable. This includes non-electrical items such as metal filters, pump strainer boxes, heat exchangers, steps and handrails. It is highly recommended that bonding be retrofitted to existing pools, which may not be protected by this system.

4.1 Electrical

(MACHINE WIRING AND SUPPLY)

To be in accordance with I.E.E. standards latest issue or local codes of practice, also EMC 2006/108/EC.

Protected supply to incorporate fuses or motor rated circuit breakers to specified rating, (see Data Sheet). H.R.C. fuses are recommended. An isolator must be fitted within 2m and in sight of the machine.†

All units must be correctly earthed/grounded. An earth leakage trip of the current operating type is recommended to be fitted to all pool electrics.

Inconsistent Electrical Supply

The following limits of operation must noy be exceeded if Calorex machines are to be guaranteed either in performance or warranty terms.

N.B This voltage must be available at the heat pump whilst running.

† Note the Isolator must have a minimum of 3mm air gap when turned off.

Voltage	**Minimum**	**Maximum**
Single Phase Machines (U.K)	207V	253V
Three Phase machines (U.K)	360V	440V
Single Phase Machines (60Hz)	187	253
Three Phase machines (60Hz)	187	253
Cycle Frequency 50Hz	47.5Hz	52.5Hz
Cycle Frequency 60Hz	57.0Hz	63.0Hz

INTERLOCK

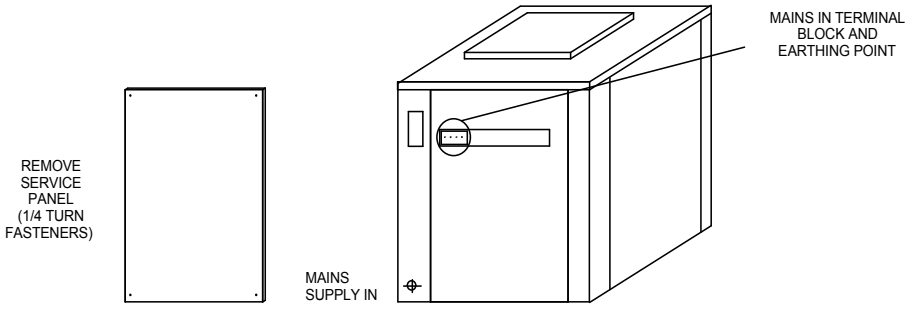
All units have interlock circuits incorporated in control circuit brought out to two terminals. These terminals are shorted out for factory testing.
On site the shorting loop should be removed and two wires taken to pair of voltage free contacts in water pump starter/contactor/relay so that Heat Pump cannot operate unless water pump is operating (see page 18 fig 9).

Note

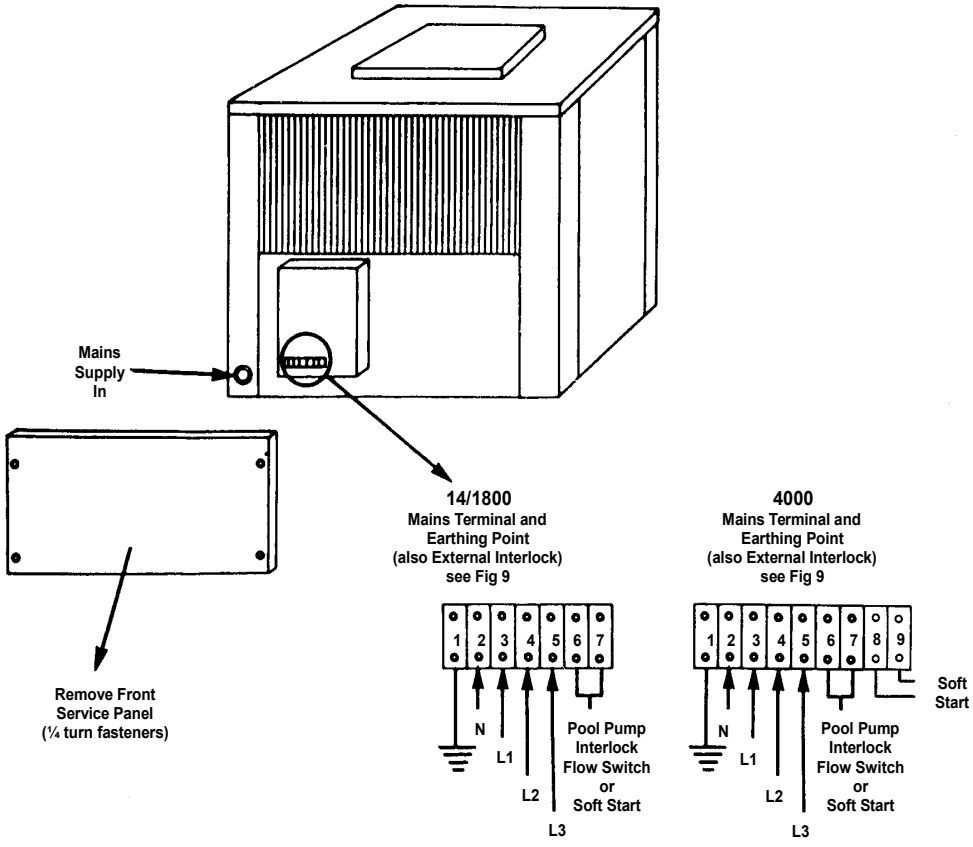
1200 and 4000 three phase machines are fitted with a phase rotation relay and will not run if the phases are not connected in the correct order (phase sequence) or if the supply voltage is 15% less than the nominal voltage. (415V for 3~N 50Hz) . The lamp on the phase rotation relay, situated in the electric box, is illuminated when the phases are correctly connected and the voltage is sufficient. The undervoltage protection feature is not present in phase protection relays fitted in 3~ 60Hz machines.

Locations of Machine Supply Terminal Blocks

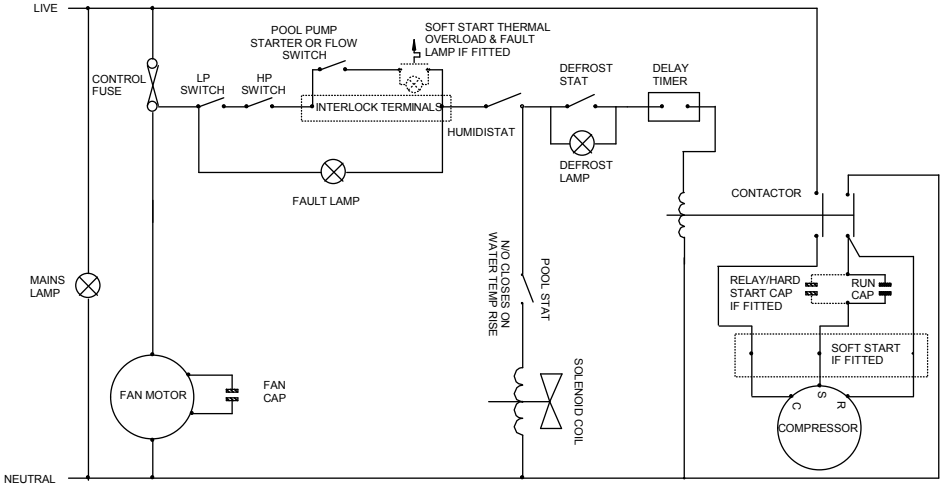
AW/AC550,800,1200



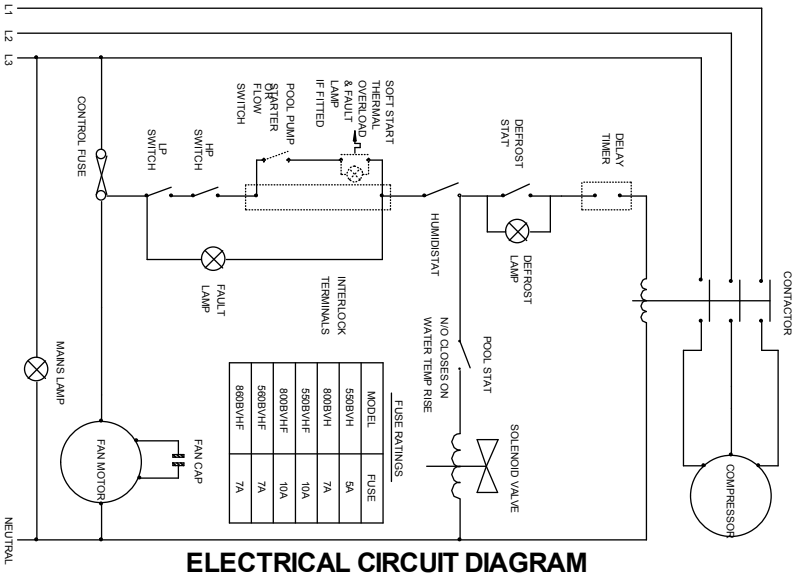
AW/AC1400,1800,4000



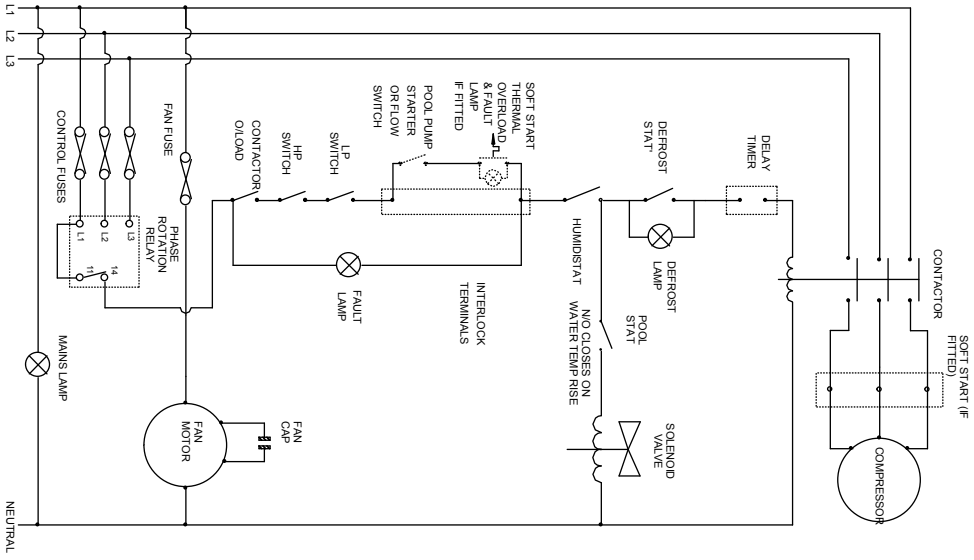
ELECTRICAL CIRCUIT DIAGRAM
AW 550/800/1200 AVH SINGLE PHASE (1 ~ N 50Hz)



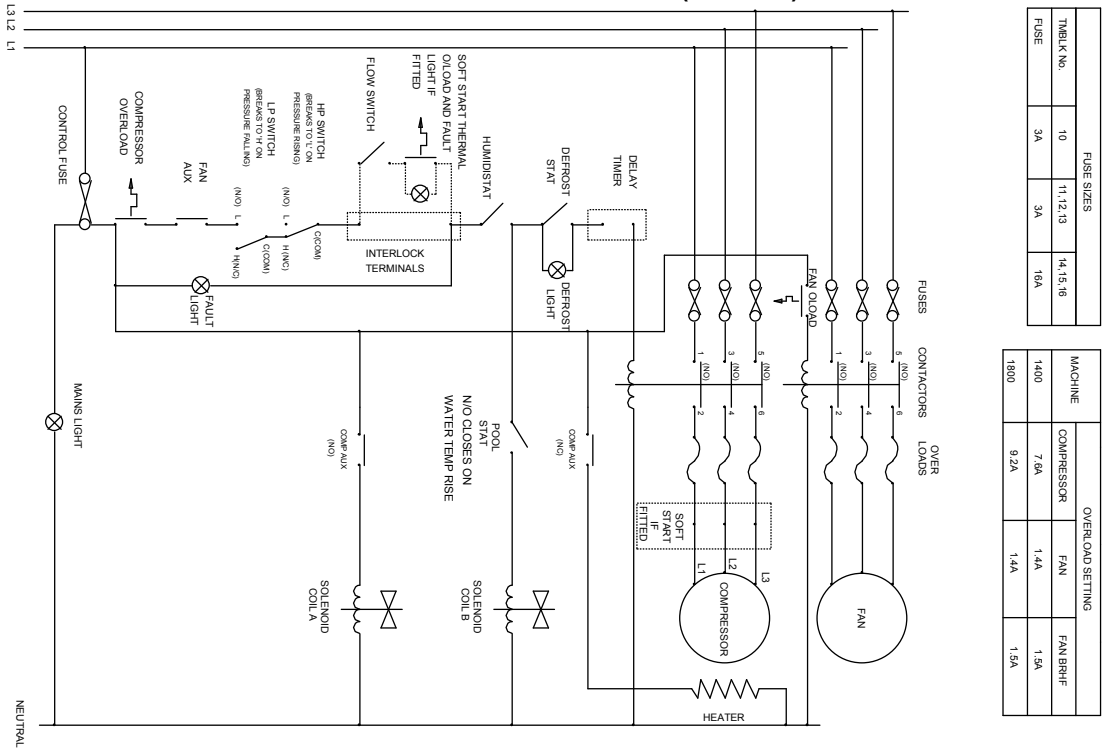
ELECTRICAL CIRCUIT DIAGRAM
AW 550/800 BVH THREE PHASE (3 ~ 50Hz)



ELECTRICAL CIRCUIT DIAGRAM
AW 1200 BVH THREE PHASE (3 ~ 50Hz)



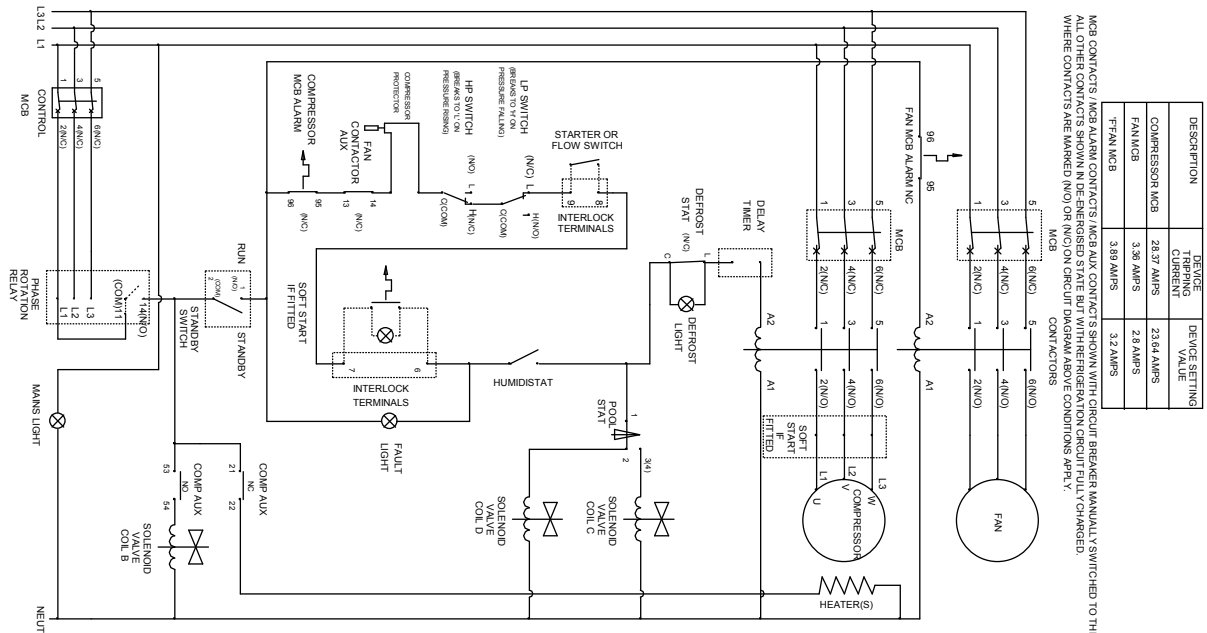
ELECTRICAL CIRCUIT DIAGRAM
AW 1400/1800 BVH THREE PHASE (3 ~ 50Hz)



FUSE SIZES			
TM/BLK No.	10	11,12,13	14,15,16
FUSE	3A	3A	16A

MACHINE	OVERLOAD SETTING		
	COMPRESSOR	FAN	FAN BRHF
1400	7.6A	1.4A	1.5A
1800	9.2A	1.4A	1.5A

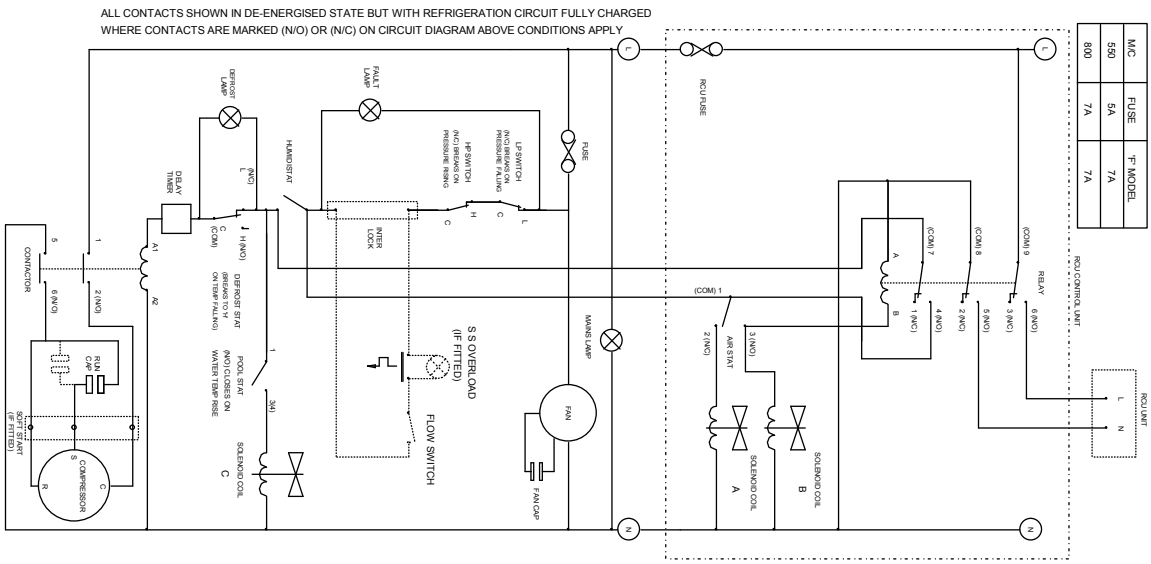
ELECTRICAL CIRCUIT DIAGRAM
AW 4000 BVH THREE PHASE 400V 50Hz (3 ~ N)



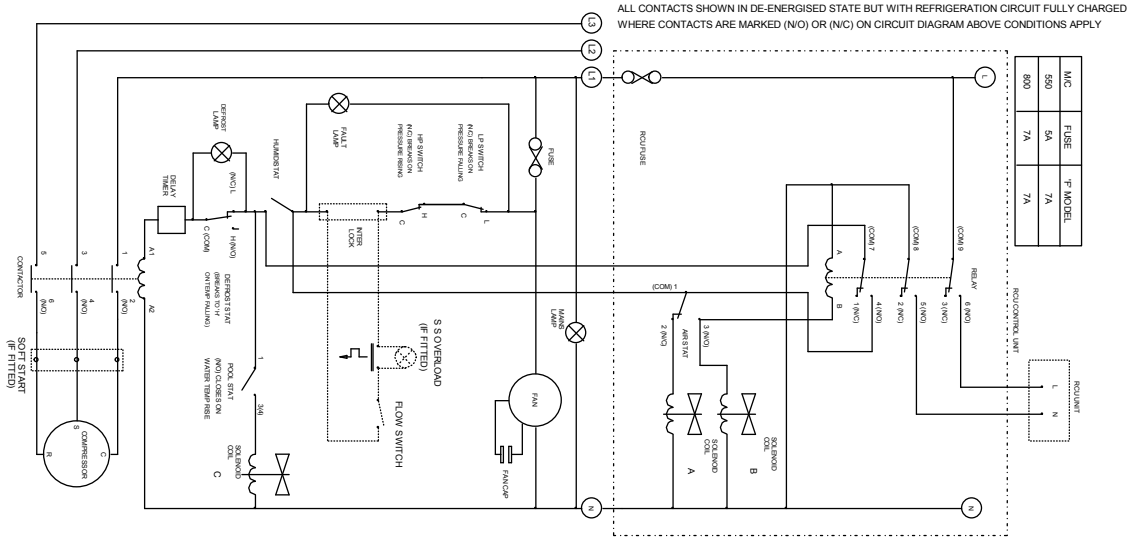
DESCRIPTION	DEVICE TRIPPING CURRENT	DEVICE SETTING VALUE
COMPRESSOR MCB	28.37 AMPS	23.64 AMPS
FAN MCB	3.36 AMPS	2.8 AMPS
'FFAN MCB	3.89 AMPS	3.2 AMPS

MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION.
ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED.
WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY.

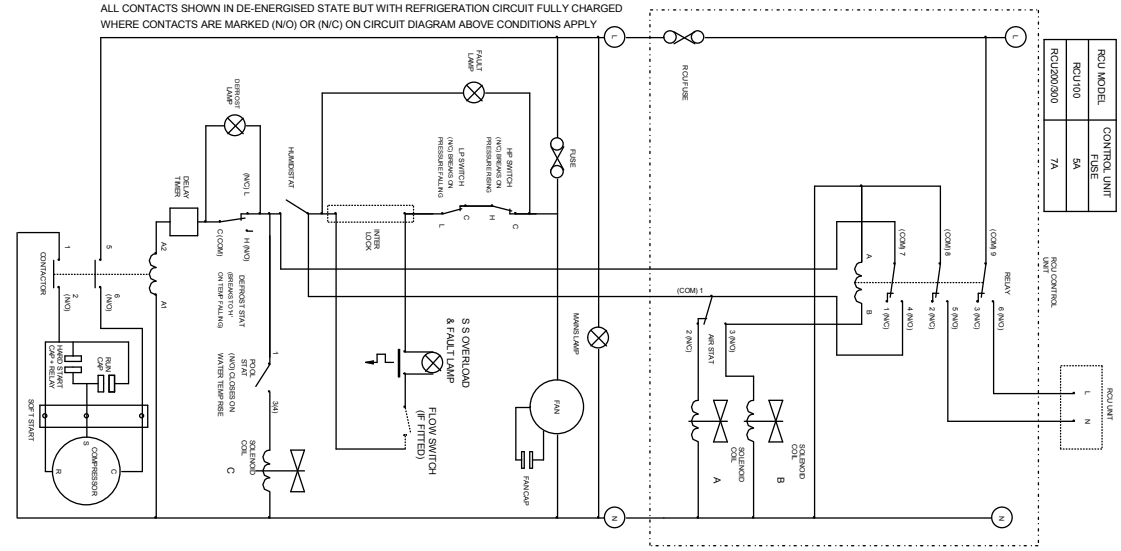
ELECTRICAL CIRCUIT DIAGRAM
AC 550/800 SINGLE PHASE 230V 50Hz (1 ~ N)



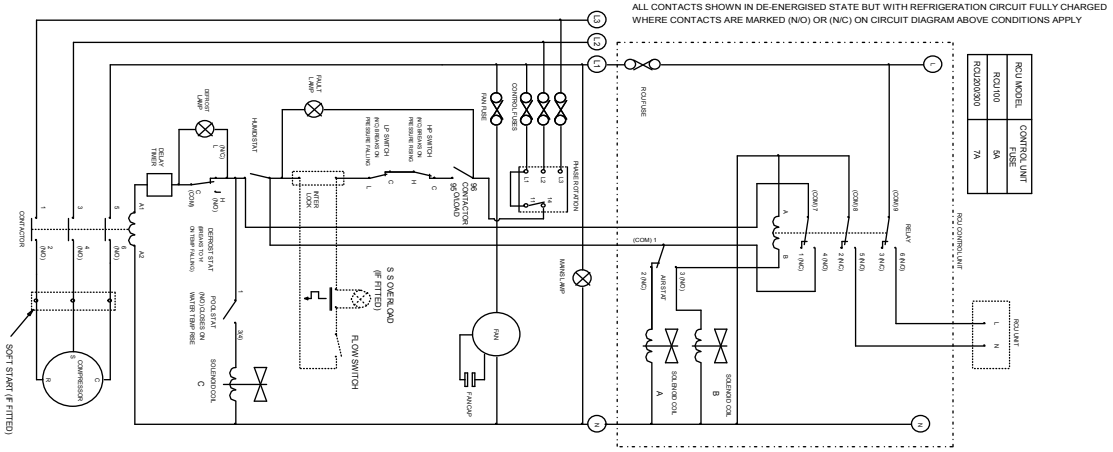
ELECTRICAL CIRCUIT DIAGRAM
AC 550/800 THREE PHASE 400V 50Hz (3 ~ N)



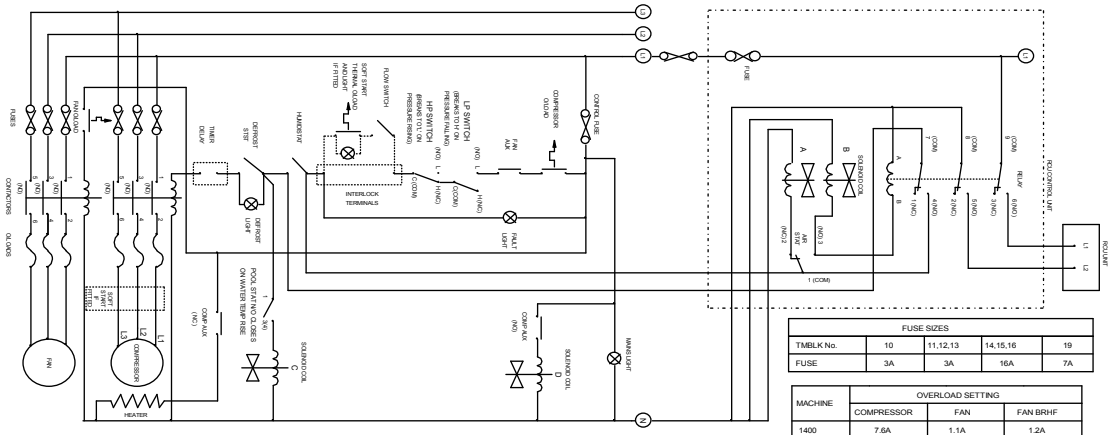
ELECTRICAL CIRCUIT DIAGRAM
AC 1200 SINGLE PHASE 230V 50Hz (1 ~ N)



ELECTRICAL CIRCUIT DIAGRAM
AC 1200 THREE PHASE 400V 50Hz (3 ~ N)



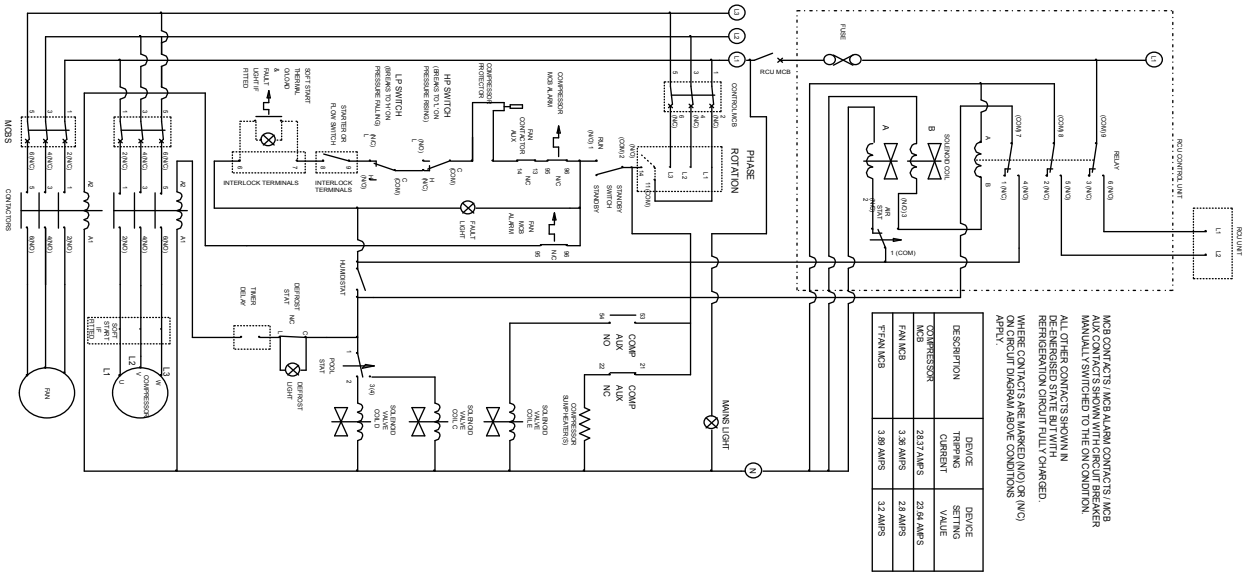
ELECTRICAL CIRCUIT DIAGRAM
AC 14/1800 THREE PHASE 400V 50Hz (3 ~ N)



FUSE SIZES				
TMBLK No.	10	11,12,13	14,15,16	19
FUSE	3A	3A	16A	7A

MACHINE	OVERLOAD SETTING		
	COMPRESSOR	FAN	FAN BRHF
1400	7.6A	1.1A	1.2A
1800	9.2A	1.1A	1.2A

ELECTRICAL CIRCUIT DIAGRAM
AC 4000 THREE PHASE 400V 50Hz (3 ~ N)



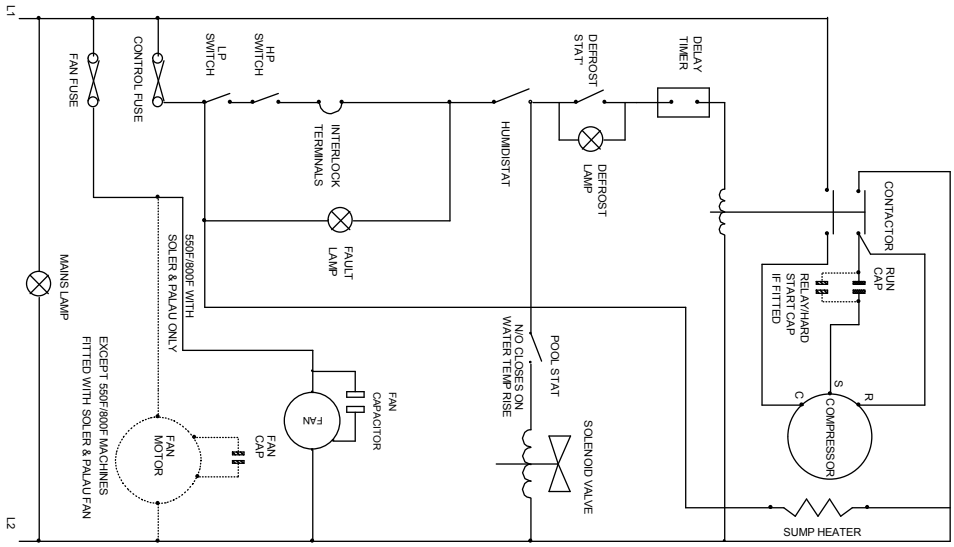
DESCRIPTION	DEVICE TRIPPING CURRENT	DEVICE SETTING VALUE
COMPRESSOR MCB	23.37 AMPS	20.64 AMPS
FAN MCB	3.36 AMPS	2.8 AMPS
"F"FAN MCB	3.89 AMPS	3.2 AMPS

MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

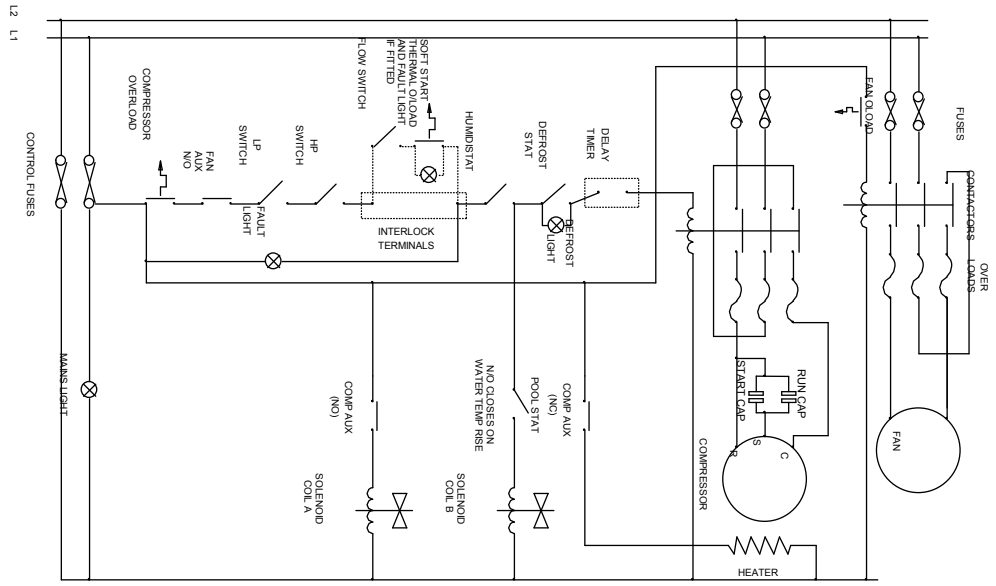
ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED.

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY.

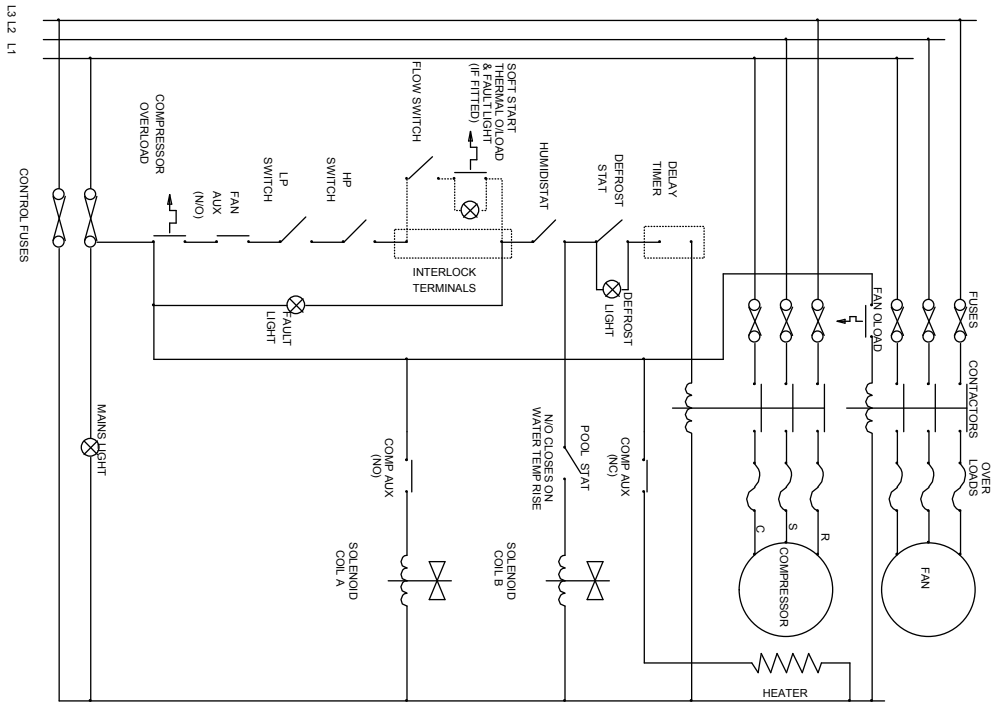
ELECTRICAL CIRCUIT DIAGRAM
AW550/800/1200 SINGLE PHASE 220V 60Hz (1 ~)



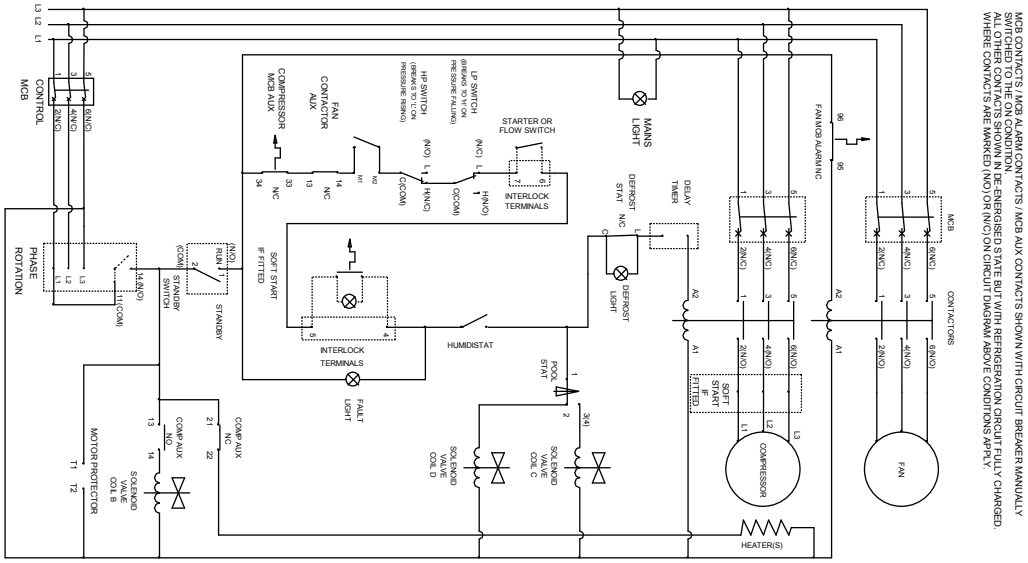
ELECTRICAL CIRCUIT DIAGRAM
AW1400/1800 SINGLE PHASE 220V 60Hz (1 ~)



ELECTRICAL CIRCUIT DIAGRAM
AW 1400/1800 THREE PHASE 230V 60Hz (3 ~)



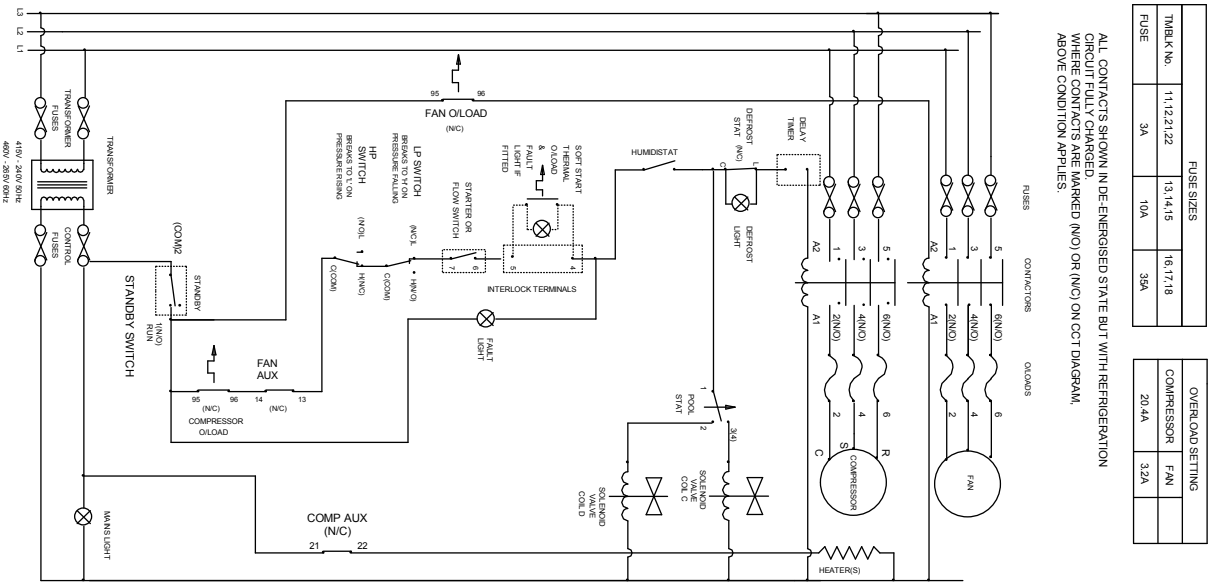
ELECTRICAL CIRCUIT DIAGRAM
AW 4000 THREE PHASE 230V 60Hz (3 ~)



DESCRIPTION	DEVICE TRIPPING CURRENT	DEVICE SETTING VALUE
COMPRESSOR MCB	48.67 AMPS	40.50 AMPS
FAN MCB	5.80 AMPS	4.9 AMPS
1*FAN MCB	6.51 AMPS	5.40 AMPS

MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO ON POSITION.
ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED.
WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY.

ELECTRICAL CIRCUIT DIAGRAM
AW 4000 THREE PHASE 460V 60Hz (3 ~)

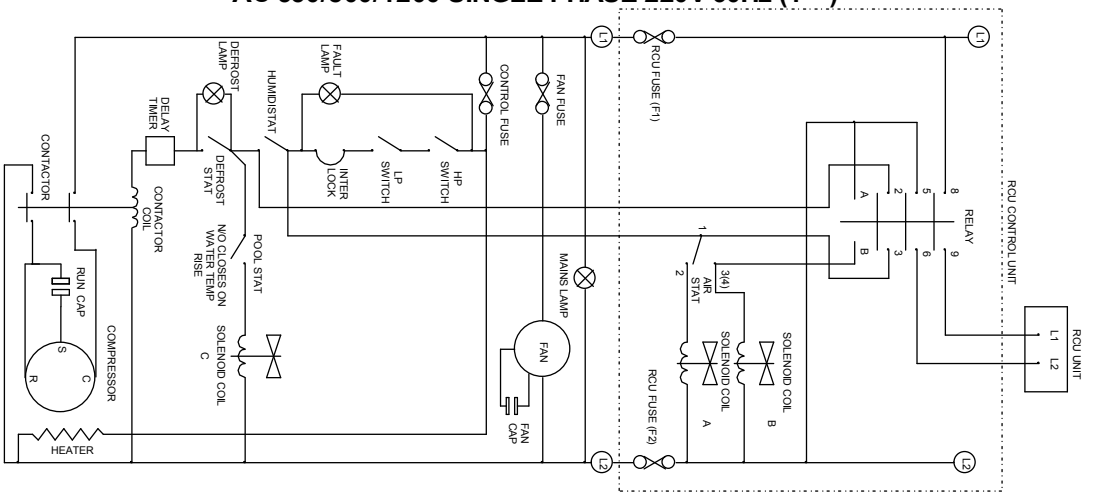


ALL CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED.
WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CCT DIAGRAM, ABOVE CONDITION APPLIES.

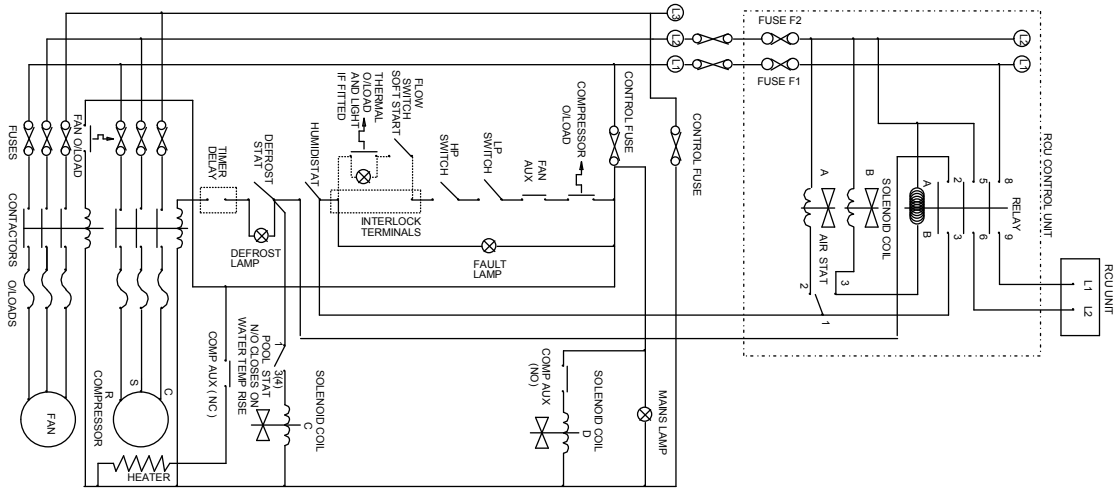
FUSE SIZES			
TMBLK No.	11;12,21;22	13;14;15	16;17;18
FUSE	3A	10A	35A

OVERLOAD SETTING		
COMPRESSOR	FAN	
20.4A	3.2A	

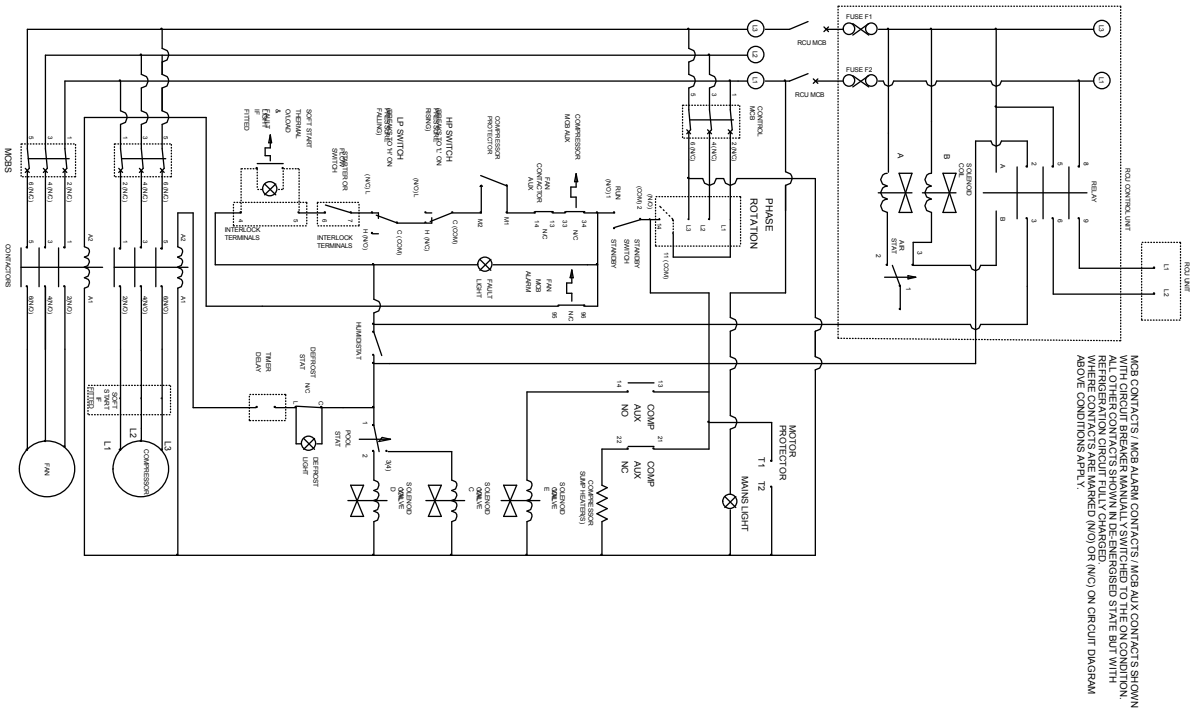
ELECTRICAL CIRCUIT DIAGRAM
AC 550/800/1200 SINGLE PHASE 220V 60Hz (1 ~)



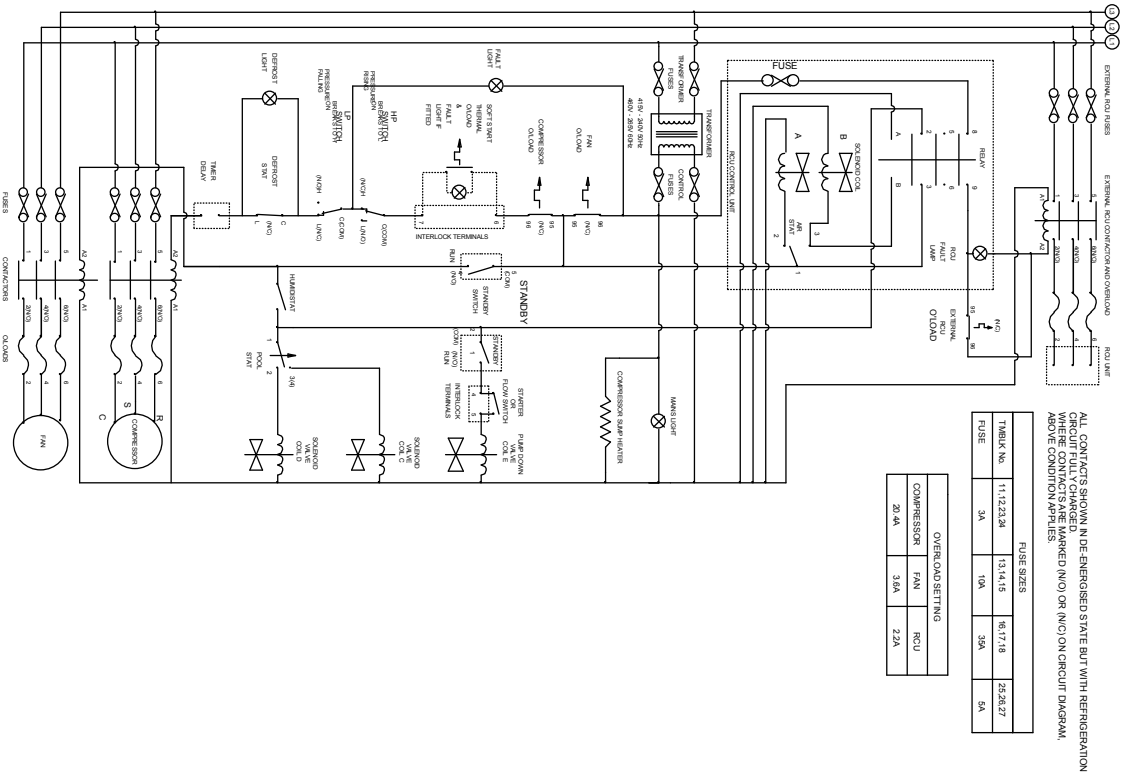
ELECTRICAL CIRCUIT DIAGRAM
AW 1400/1800 THREE PHASE 230V 60Hz (3 ~)



ELECTRICAL CIRCUIT DIAGRAM
AC 4000 THREE PHASE 230V 60Hz (3 ~)



ELECTRICAL CIRCUIT DIAGRAM
AC 4000 THREE PHASE 460V 60Hz (3 ~)



FUSE SIZES	
TMBLK No.	11,12,23,24
FUSE	13,14,15
3A	16,17,18
10A	25,26,27
35A	
5A	

OVERLOAD SETTING	
COMPRESSOR	FAN
20.4A	3.6A
	2.2A

Controls and Indication Lamps

An adjustable humidistat effects control of humidity. Range 20/80%. Normal setting is 60% for achieving comfort conditions and minimising condensation in a heated pool hall at 1°-2°C air temperature above that of pool water.
An adjustable thermostat effects control of pool water temperature.

Note
These controls are set by commissioning engineer to suit customers requirements.

Indicator Lamp

MAIN	RED	Electric supply ON
FAULT	AMBER	Internal and external fault (interlock)
DEFROST	WHITE	Defrost mode

Figure 9
Method of Wiring External Interlock
All machines ~ 4000

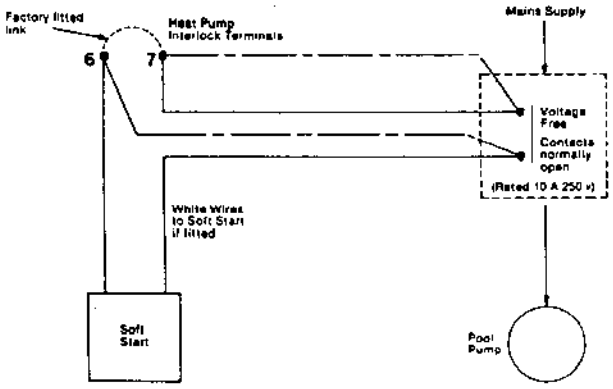
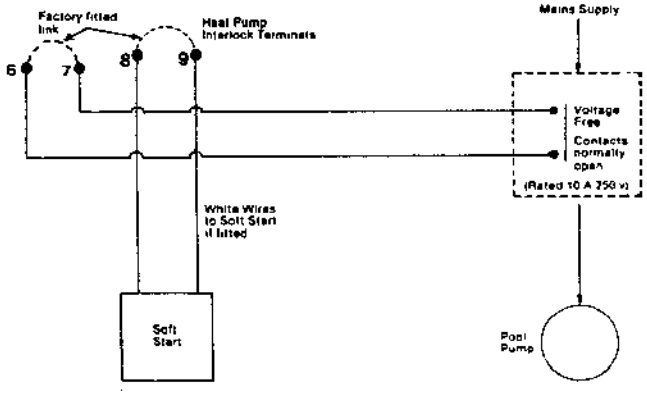


Figure 10
Method of Wiring External Interlock
4000 ONLY



1) Remove link if fitted
2) If soft start fitted connect as shown by solid lines ————————
3) If soft start not fitted connect as shown by chain lines —— - ——

1) Remove link if fitted
2) If soft start fitted connect as shown by solid lines ————————

Variheat Commissioning
HEALTH & SAFETY WARNING

As the Heat Pump embodies electrical and rotational equipment it is recommended that ONLY competent persons carry out any work on this type of machine (see Guarantee).

Pre-commissioning-all models.
Check installation, electrical, water and ducting services are in accordance with Calorex recommendations, i.e.:
Ensure water flow and rate are within design limits.
Condensate drain connected.
Check interlock to water circulating circuit has been installed, via voltage free contacts in water pump starter or flow switch.
Ensure electric supply and fuses are to correct capacity.
Ensure pool hall air temperature is 20°C minimum.

Ensure pool water calorifier thermostat is set slightly lower than variheat water thermostat

Models up to and including 1200

Main electrical supply OFF.
Humidistat to 80%. Pool thermostat to below required temperature.

1. Switch on main electrical supply-mains lamp ON-fan runs.
2. Turn down humidistat towards 20%, compressor operates after 8 minute delay. NOTE: Machine will only operate correctly when all service panels are in place.
3. Tum or switch off water circuit, interlock should operate, unit compressor stops. Fault lamp ON.
4. Restore water circuit and set humidistat to required control position; normally 60%.
5. Alter pool thermostat to below pool water temperature-check unit switches over to air heating.
6. Set water thermostat to required temperature.
7. Heat pump will not operate correctly with service panels removed.

Models AW 1400, 1800, 4000

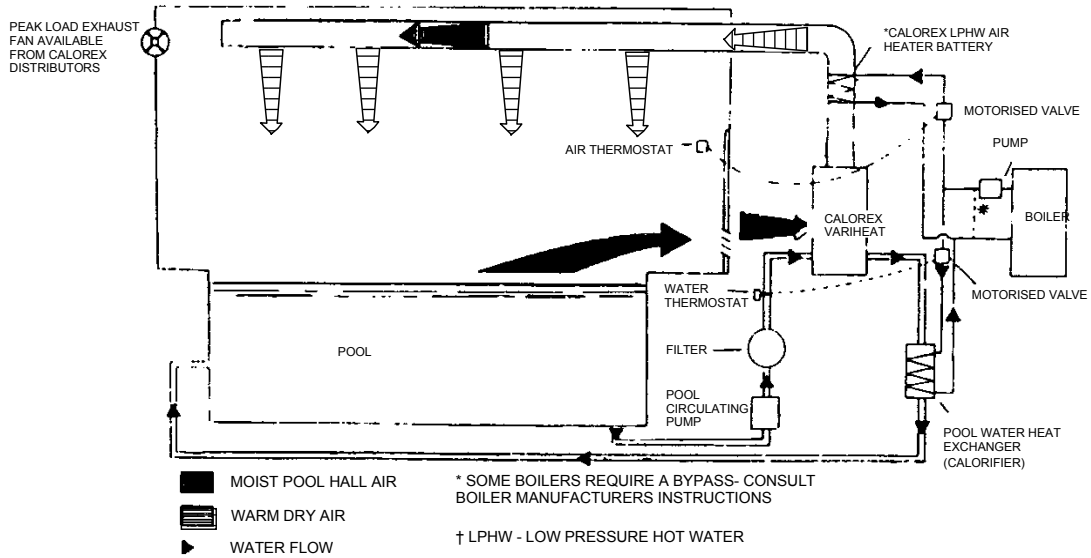
Main electrical supply OFF.
Humidistat to 80%. Pool thermostat to below required temperature. Remove compressor fuses.

1. Check fan and drive for foreign bodies or transit damage.
2. Mains supply ON-mains lamp ON.
3. Fan operates-check correct fan rotation; if incorrect on three phase unit switch off supply-change over two phases on mains input terminal block-switch on, recheck fan operation.LEAVE ON FOR 12 HOURS.
4. Switch off-replace compressor fuses.
5. Switch ON-fan operates correctly.
6. Turn humidistat towards 20%, compressor will start approx. 8 mins later.
7. Turn or switch off water circuit to prove interlock circuit operates, unit compressor stops. Fault lamp ON.
8. Restore water circuit and all switches to normal operation. Humidistat at normal, say 60%. Compressor will start up after time delay.
9. Alter pool thermostat to below pool water temperature-check unit switches over to air heating.
10. Set water thermostat to required temperature.
11. Check operation of any additional features Le. Indoor Control Panel, LPHW heater batteries etc. See pages 24-28.

Models with A/C Feature

1. After completing all of above alter air temp thermostat (in RCU controller located in VH unit) to below pool hall air temperature-ehecking unit switches on external RCU machine.

CALOREX VARIHEAT INSTALLATION WITH FUEL BOILER
MOTORISED VALVE BOILER SYSTEM



NOTE: LPHW FEED AND EXPANSION SYSTEM OMITTED FOR CLARITY

Heat Pump Malfunction

WARNING Isolate machine electrically befre entering machine or removing panels.

The user check list should be carried out before initiating a service call.

Do not attempt to interfere with any internal control setting as these have been factory calibrated and sealed.

If in doubt or if advice is required contact Calorex Service Department.

Telephone (01621) 857171 or 856611
email service@calorex.com

User Check List

UNIT DOES NOT OPERATE

FAN OFF COMPRESSOR OFF

LAMP INDICATION			ACTION
MAINS	RED	ON/OFF	Check electrical supply-
FAULT	AMBER	OFF	external fuse isolator, etc.
DEFROST	WHITE	OFF	Check standby sitch 'ON' (4000 only).

FAN OFF COMPRESSOR OFF

MAINS	RED	ON	Check humidistat control
DEFROST	WHITE	OFF	Check internal fuse and overloads.

MAINS	RED	ON	Check the pool hall temperature is
FAULT	AMBER	OFF	above 20ºC and that air flow is
DEFROST	WHITE	ON	unrestricted, also all service panels fitted.

INTERMITTENT OPERATION - FAN ON

MAINS	RED	ON	Check water/air flows not restricted.
FAULT	AMBER	ON/OFF	
DEFROST	WHITE	ON	

Datasheet

AIR/WATER VARIHEAT HEAT PUMPS FOR INDOOR POOLS DEHUMIDIFICATION WITH HEAT RECOVERY TO WATER AND AIR (METRIC SPECIFICATIONS) (50Hz MACHINES)

MODEL:-	Units	550	800	1200	1400	1800	4000
DEHUMIDIFICATION DUTY	litres/hr	3·8	6·1	8·3	10·0	12·4	26·8
HEAT TO AIR							
VIA HEAT PUMP (MODE A):-	kW	1·6	2·3	3·0	1·5	2·5	8·0
VIA HEAT PUMP (MODE B):-	kW	3·0	3·5	5·2	5·0	8·5	20·0
HEAT TO WATER							
VIA HEAT PUMP (MODE A):-	kW	4·0	5·5	7·0	10·0	12·0	26·0
VIA HEAT PUMP (MODE B):-	kW	2·8	3·0	3·0	4·2	5·0	12·0
Flow Rate Pool Water max	L/min	100	100	120	35	35	95
Flow Rate Pool Water min	L/min	80	80	100	30	30	90
Pressure Drop @ Rated Flow max	M/hd	1·4	1·4	1·4	2·5	2·5	3·4
Pressure Drop @ Rated Flow min	M/hd	1·2	1·2	1·2	1·8	1·8	3·1
Water connections	inches	1½ BSPF	1½ BSPF	1½ BSPF	1½ BSPM	1½ BSPM	1½ BSPM
Condensate drain connections	inches	¾ domestic waste	¾ domestic waste	¾ domestic waste	¾ BSPM	¾ BSPM	1½ BSPM
ELECTRICAL							
TOTAL POWER CONSUMED (STD FAN)	kW	1·8	2·5	4.14	4·0	5·0	10·0
TOTAL POWER CONSUMED ('F' FAN)	kW	2·2	2·9	4·0	4·2	5·2	10.4
MAX RUNNING AMPS (STD FAN) 1 ph N:-	amps	12·8	17.2	24	N/A	N/A	N/A
MAX RUNNING AMPS ('F' FAN) 1 ph N:-	amps	13·9	20.6	24.7	N/A	N/A	N/A
MAX RUNNING AMPS (STD FAN) 3 ph N:-	amps	5·8	8	14	8·8	10.5	27.32
MAX RUNNING AMPS ('F' FAN) 3 ph N:-	amps	9.7	11.3	14.5	9	10.6	27.82
MAX' SUPPLY FUSE STD 1 ph N:-	amps	15	25	35	N/A	N/A	N/A
MAX' SUPPLY FUSE 'F' 1 ph N:-	amps	20	32	35	N/A	N/A	N/A
MAX' SUPPLY FUSE STD 3 ph N:-	amps	10	13	20	15	16	40
MAX' SUPPLY FUSE 'F' 3 ph N:-	amps	16	16	20	15	16	40
STARTING CURRENT STD MODEL 1ph	amps	42	76	103	N/A	N/A	N/A
STARTING CURRENT SOFT START (S) MODEL 1ph	amps	23	31	34	N/A	N/A	N/A
STARTING CURRENT STD MODEL 3ph	amps	30	42	48	45	76	167
STARTING CURRENT SOFT START (S) MODEL 3ph	amps	19	23	25	24	31	39
FAN							
AIR FLOW (anemometer @ air on, wet evaporator)	m³/hr	1800	2500	3000	3500	4300	9000
MAX EXTERNAL STATIC PRESSURE STD	mm Wg	5	6	6	4	4	8
MAX EXTERNAL STATIC PRESSURE 'F' MODEL	mm Wg	23	22	16	16	14	16
NOISE LEVEL @ 3M	dbA	58	58	60	60	60	63
GENERAL DATA							
HERMETIC SYSTEM							
GAS CHARGE R407c	kg	1·81	2·04	2·5	6·8	7·25	14·5
DIMENSIONS :-							
Width (un-packed)	mm	660	660	810	980	980	1730
Depth (un-packed)	mm	660	660	660	700	700	1250
Height (un-packed)	mm	1313	1313	1313	1490	1490	1600
WEIGHT approx' (Un-packed):-	kg	120	130	170	210	230	49

NOTES

(1) Performance data based on pool hall air @ 28ºC, 60% RH, Water @ 26ºC.
(2) Operation Mode 'A'. Pool water temperature not satisfied.
Operation Mode 'B'. Pool water temperature satisfied.
(3) Weight and Dimensions Nett.
(4) Allow 500mm clearance to service panels
(5) Min. Pool Hall air temperature 20ºC
(6) Pool water to have correct balance pH 7·4 ± 0·4. Free Chlorine 1·0 - 3·0 ppm.
(7) Calorex reserve the right to change or modify models without prior notice.
(8) R407c Global Warming Potential (GWP) 1700.

1mm WG = 9·8 Pa
1 m hd = 1·4 psi
1 l/hr = 2·2 lbs/hr

AIR/WATER VARIHEAT HEAT PUMPS FOR INDOOR POOLS DEHUMIDIFICATION WITH HEAT RECOVERY TO WATER AND AIR (METRIC SPECIFICATIONS) (60Hz MACHINES)

MODEL:-	Units	550	800	1200	1400	1800	4000
DEHUMIDIFICATION DUTY	litres/hr	3·8	6·1	8·3	10·0	12·4	26·8
HEAT TO AIR							
VIA HEAT PUMP (MODE A):-	kW	1·6	2·3	3·0	1·5	2·5	8·0
VIA HEAT PUMP (MODE B):-	kW	3·0	3·5	5·2	5·0	8·5	20·0
HEAT TO WATER							
VIA HEAT PUMP (MODE A):-	kW	4·0	5·5	7·0	10·0	12·0	26·0
VIA HEAT PUMP (MODE B):-	kW	2·8	3·0	3·0	4·2	5·0	12·0
Flow Rate Pool Water max	L/min	100	100	120	35	35	95
Flow Rate Pool Water min	L/min	80	80	100	30	30	90
Pressure Drop @ Rated Flow max	M/hd	1·4	1·4	1·4	2·5	2·5	3·4
Pressure Drop @ Rated Flow min	M/hd	1·2	1·2	1·2	1·8	1·8	3·1
Water connections	inches	1½ BSPF	1½ BSPF	1½ BSPF	1½ BSPM	1½ BSPM	1½ BSPM
Condensate drain connections	inches	¾ domestic waste	¾ domestic waste	¾ domestic waste	¾ BSPM	¾ BSPM	1½ BSPM
ELECTRICAL							
TOTAL POWER CONSUMED ('F' FAN)	kW	2·2	2·9	4·0	4·2	5·2	10.4
MAX RUNNING AMPS ('F' FAN) 1 ph:-	amps	16.1	21.4	33.3	29.3	32.2	N/A
MAX RUNNING AMPS ('F' FAN) 3 ph 230V:-	amps	N/A	N/A	N/A	16.7	18.6	44
MAX RUNNING AMPS ('F' FAN) 3 ph 460V:-	amps	N/A	N/A	N/A	N/A	N/A	27.8
MAX' SUPPLY FUSE 'F' 1 ph :-	amps	25	30	50	40	40	N/A
MAX' SUPPLY FUSE 'F' 3 ph 230V :-	amps	N/A	N/A	N/A	25	30	75
MAX' SUPPLY FUSE 'F' 3 ph 460V :-	amps	N/A	N/A	N/A	N/A	N/A	40
STARTING CURRENT STD MODEL 1ph	amps	60	82	140	118	147	N/A
STARTING CURRENT SOFT START (S) MODEL 1ph	amps	28	30	36	35	38	N/A
STARTING CURRENT STD MODEL 3ph 230V	amps	N/A	N/A	N/A	90	150	254
STARTING CURRENT SOFT START (S) MODEL 3ph 230V	amps	N/A	N/A	N/A	22	25	26
STARTING CURRENT STD MODEL 3ph 460V	amps	N/A	N/A	N/A	N/A	N/A	130
STARTING CURRENT SOFT START (S) MODEL 3ph 460V	amps	N/A	N/A	N/A	N/A	N/A	41
FAN							
AIR FLOW (anemometer @ air on, wet evaporator)	m³/hr	1800	2500	3000	3500	4300	9000
MAX EXTERNAL STATIC PRESSURE STD	mm Wg	5	6	6	4	4	8
MAX EXTERNAL STATIC PRESSURE 'F' MODEL	mm Wg	20	20	16	16	14	16
NOISE LEVEL @ 3M	dbA	58	58	60	60	60	63
GENERAL DATA							
HERMETIC SYSTEM							
GAS CHARGE R407c	kg	1·81	2·04	2·5	6·8	7·25	14·5
DIMENSIONS :-							
Width (un-packed)	mm	660	660	810	980	980	1730
Depth (un-packed)	mm	660	660	660	700	700	1250
Height (un-packed)	mm	1313	1313	1313	1490	1490	1600
WEIGHT approx' (Un-packed):-	kg	120	130	170	210	230	49

NOTES

(1) Performance data based on pool hall air @ 28ºC, 60% RH, Water @ 26ºC.
(2) Operation Mode 'A'. Pool water temperature not satisfied.
Operation Mode 'B'. Pool water temperature satisfied.
(3) Weight and Dimensions Nett.
(4) Allow 500mm clearance to service panels
(5) Min. Pool Hall air temperature 20ºC
(6) Pool water to have correct balance pH 7·4 ± 0·4. Free Chlorine 1·0 - 3·0 ppm.
(7) Calorex reserve the right to change or modify models without prior notice.
(8) R407c Global Warming Potential (GWP) 1700.

1mm WG = 9·8 Pa
1 m hd = 1·4 psi
1 l/hr = 2·2 lbs/hr

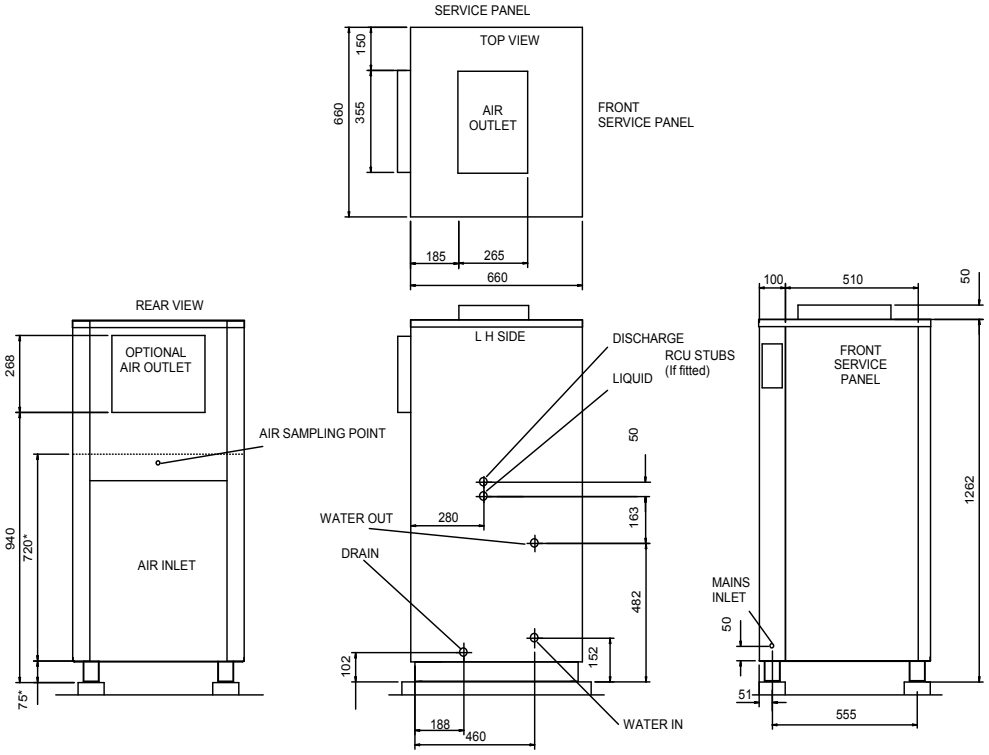
REMOTE CONDENSING UNITS (RCU) FOR USE WITH CALOREX VARIHEAT MODELS AC500/800/1200/1400/1800 SINGLE AND THREE PHASE AND MODEL AC4000 THREE PHASE

RCU MODEL		**100**	**200**	**300**
Performance				
Cooling Output kW				
(Sensible/Total/Rejected to External Ambient)				
Model 550 VH		2.0/3.6/5.6	-	-
Model 800 VH		2.65/4.8/7.5	-	-
Model 1200 VH		-	3.3/6.0/9.5	-
Model 1400 VH		-	3.5/6.4/10.6	-
Model 1800 VH		-	-	5.75/10.4/14
Model 4000 VH (2 units required)		-	-	12.1/22/30
Electrical Input	kW	0.36	0.72	0.72
Supply/Fuse 1	Amps		Power supplied from VH unit	
Fan Amps	Amps	1.5	2 x 1.5	2 x 1.5
Air Flow	m³/h	2000	3700	3700
External Resistance	mm wg	2	2	2
Noise Level @ 3M	dbA	58	62	64
(Max Fan Speed)				
Dimensions				
Width	mm	630	1010	1010
Depth	mm	690	690	690
Height	mm	580	580	580

NOTES

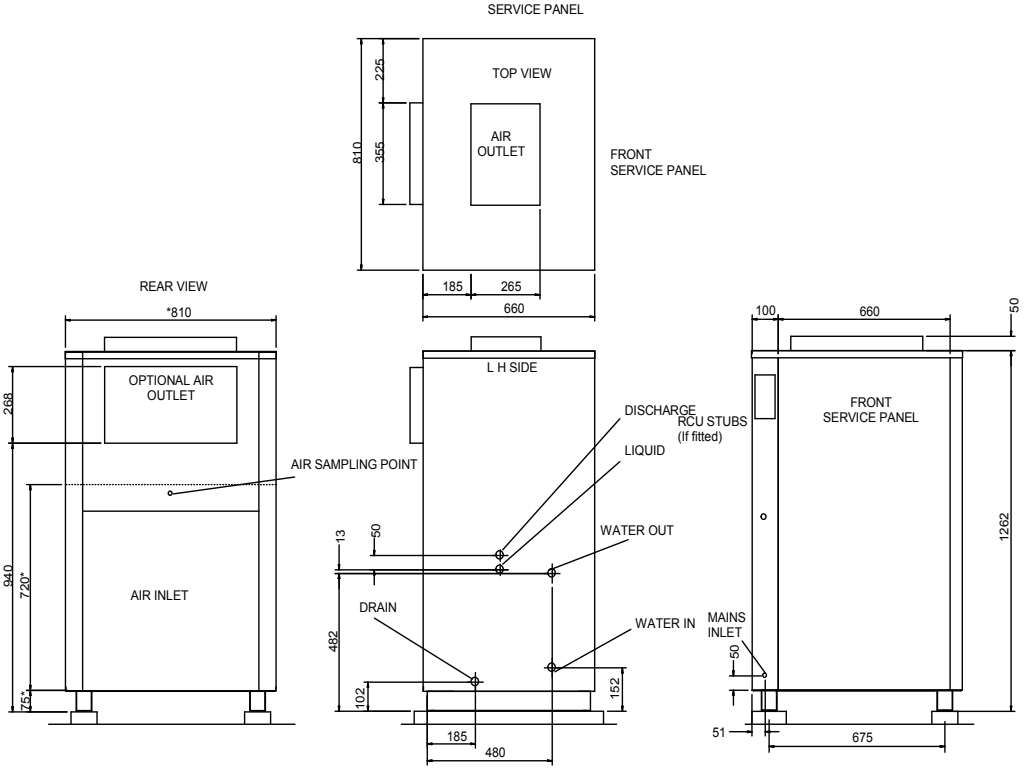
(1) Performance data is based on pool Hall air at 28°C, 60%RH, Ambient Air 35°C.
(2) Fan Speed Controller Fitted.
(3) Weight Dimensions Nett.
(4) Calorex reserve the right to change or modify models without prior notice.

Installation Drawings
AW/AC 550/800 VARIHEAT



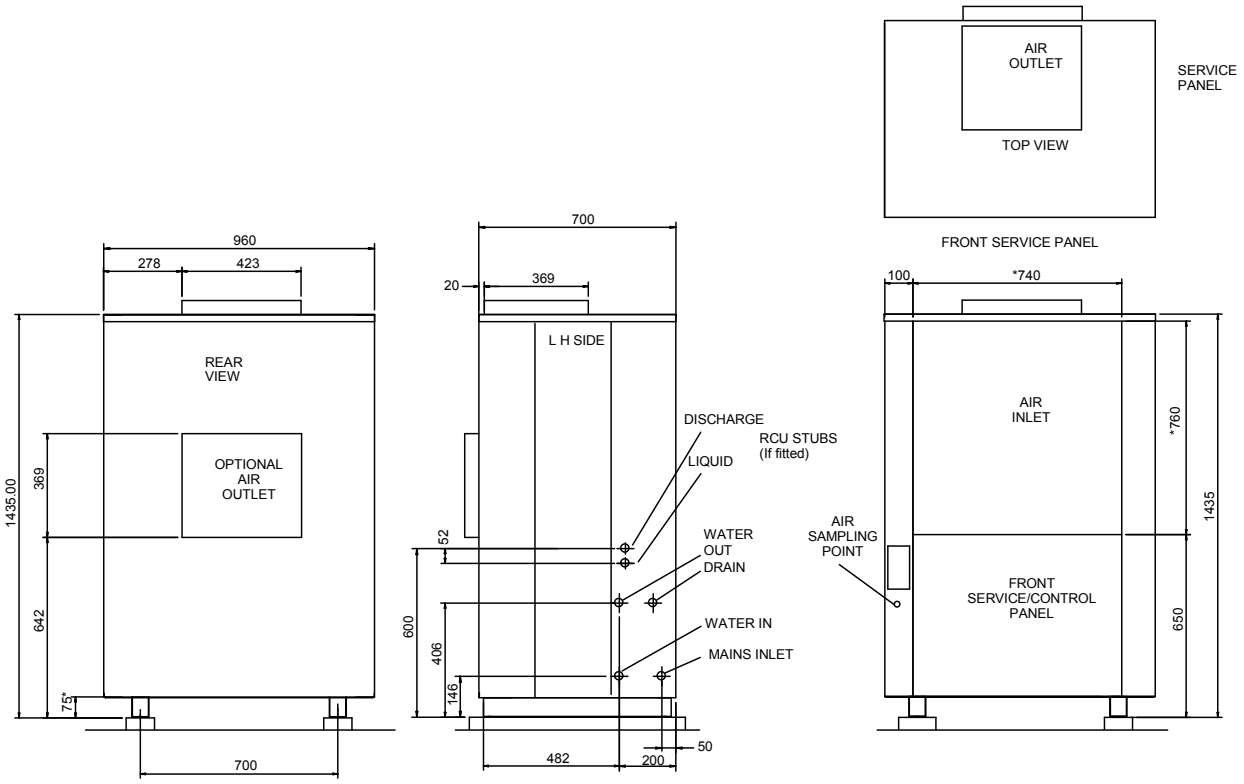
NOTE: Dimensions marked * refer to dimensions of DUCT FLANGE KIT 50mm deep, available from Calorex distributors. Inlet air filter kits also available.

AW/AC 1200 VARIHEAT



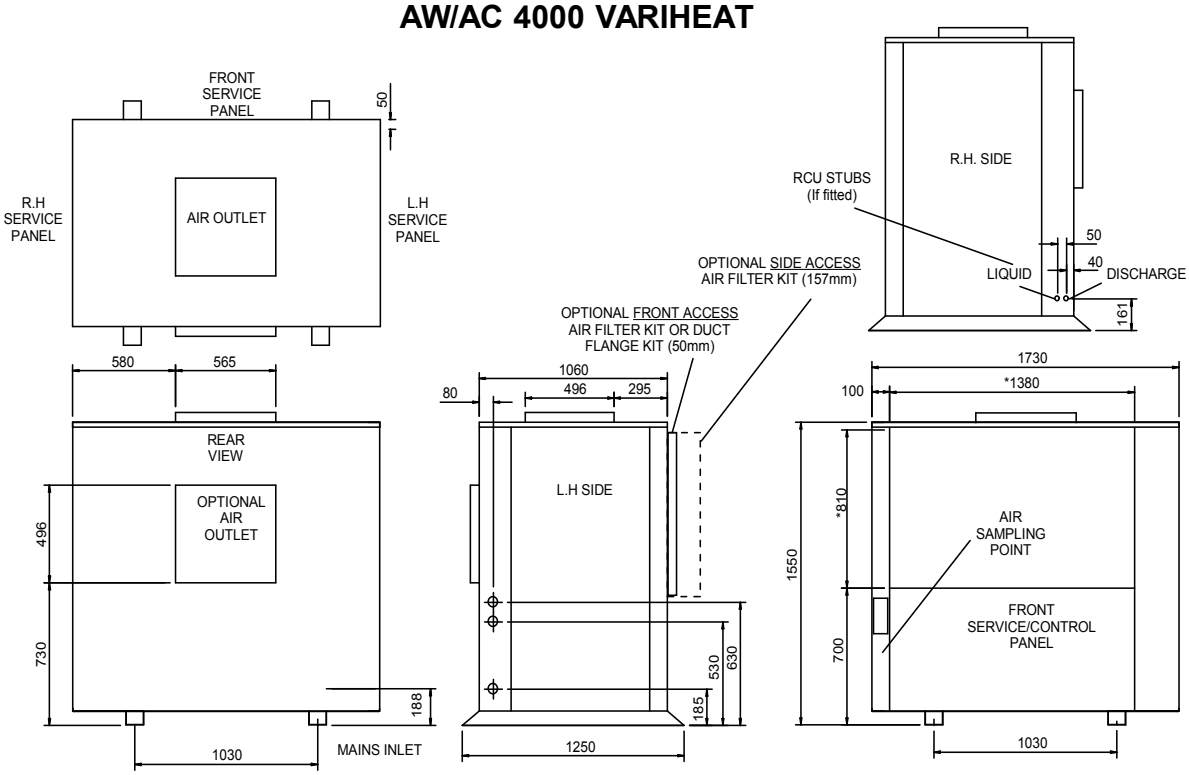
NOTE: Dimensions marked * refer to dimensions of DUCT FLANGE KIT 50mm deep, available from Calorex distributors. Inlet air filter kits also available.

AW/AC 1400/1800 VARIHEAT



NOTE: Dimensions marked * refer to dimensions of DUCT FLANGE KIT 50mm deep, available from Calorex distributors. Inlet air filter kits also available.

AW/AC 4000 VARIHEAT



NOTE: Dimensions marked * refer to dimensions of DUCT FLANGE KIT 50mm deep, available from Calorex distributors. Dimensions are the same for the Front Access Inlet air filter kits, also available.

Alternative Side Access Inlet filter kit is 157mm deep.

Installation Instructions
MODELS R.C.U. 100/200/300
for use with Variheats with A/C feature

NOTE: Installation/Service should only be carried out by a competent Refrigeration Engineer.

Fig 1

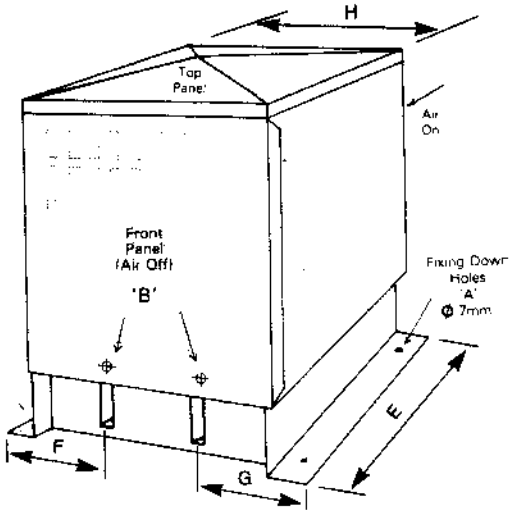
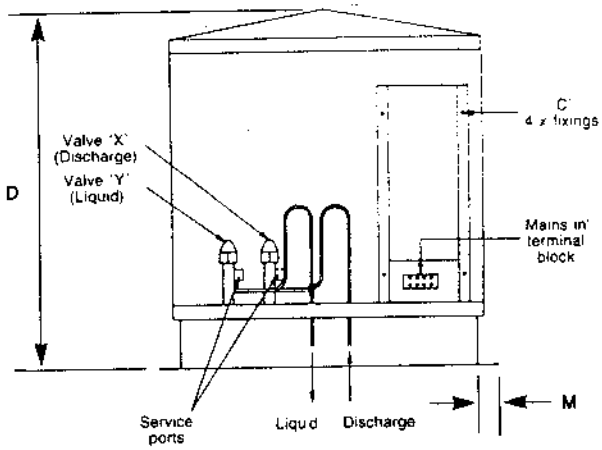


Fig 2



SITING - Locate R.C.U. unit in required position with consideration of the following points.

AIR FLOW - must be unobstructed on/off unit without any recirculation.

NOISE - The units are intrinsically quiet but should not be sited in sensitive areas.

PIPE RUNS - A cheaper and more efficient installation will result from the pipe run lengths being kept to a minimum.

SERVICE - In the event of service being required access (800mm) will be needed to front and top panels, see Fig.1.

REFRIGERATION 'HOOK UP'

1. Remove 2 x 'B' fixings see Fig. 1, and pull bottom of front panel away and downwards to remove.

2. Run discharge and liquid lines from Variheat to cond. unit, sizing according to data overleaf.

3. Enter unit through grommet holes provided.

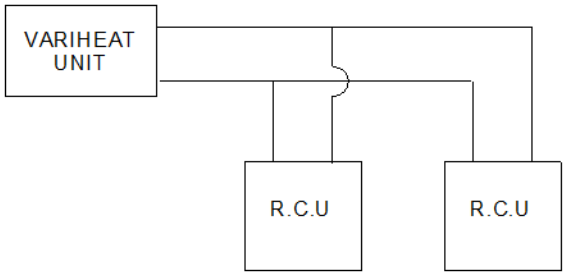
Liquid to pipe from valve 'Y' Fig 2, discharge to pipe from valve 'X' Fig 2. Expand and braze up joints.

4. LEAVE VALVED IN VARIHEAT SHUT AT THIS TIME.

5. Evacuate to better than 712mm Hg (65mbar) for 30 mins minimum through service connection on liquid valve 'Y', with both valves unseated.

6. Before breaking vacuum add oil and gas charge (see graph overleaf).

7. Pipe multiple installations must be as follows:

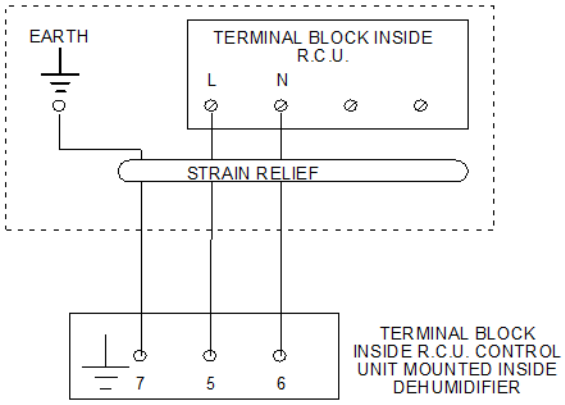


8. Seal off system, open all valves, check for leaks and run units.

ELECTRICAL CIRCUIT

1.Remove electrical enclosure cover (4 x 'C' fixings, see Fig. 2).

2. Connect up to terminal block Fig. 2. as shown below using grommet or conduit entry hole in base of unit, utilising cable strain relief clamps fitted.



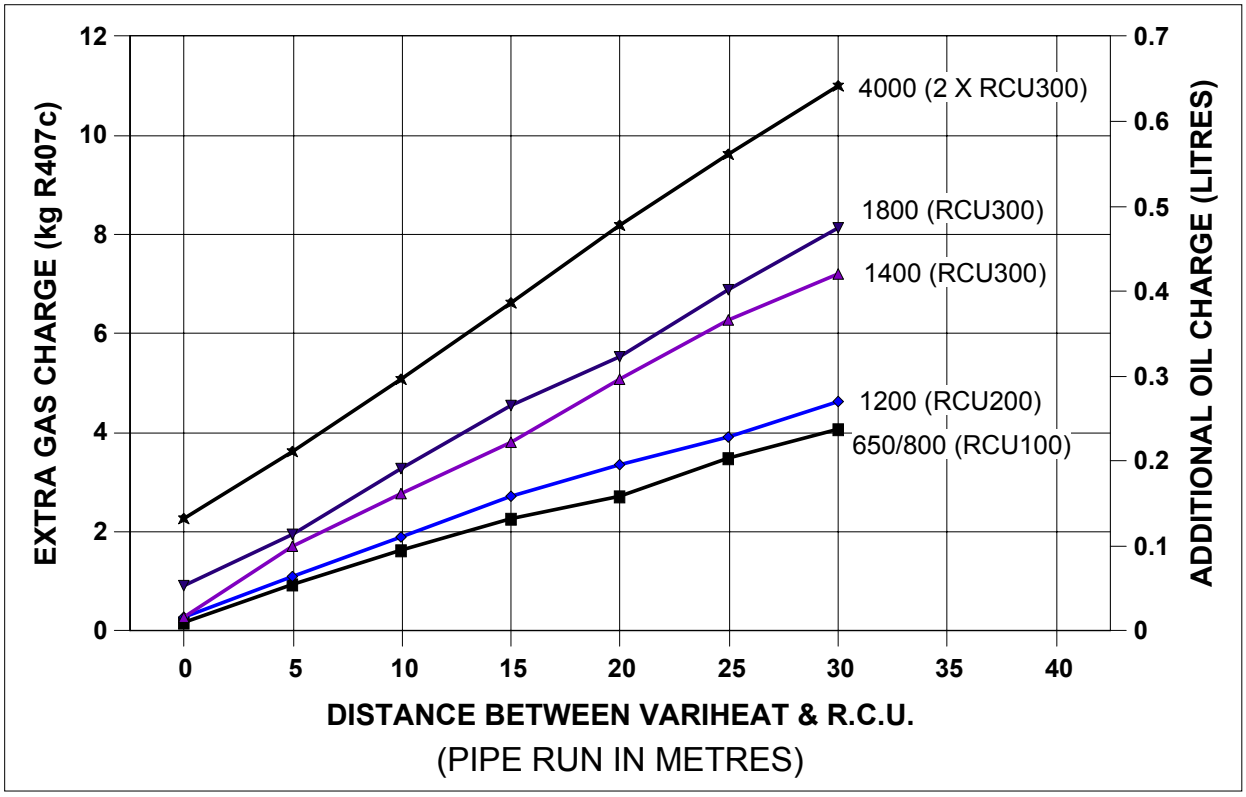
GENERAL DATA

MODEL No.	100	200	300
Nominal kW (Fan)	0.187	2 X 0.187	2 X 0.187
Air flow m³/h	2000	3700	3700
Number of Fans	1	2	2
Condenser Rows	4	3	5
Fins per inch	10	10	10
Fuse Size Amps	5	7	7
FLA amps	1.3	2.6	2.6
Suction Size	1/2"	5/8"	3/4"
Liquid Size	1/2"	5/8"	3/4"
Heat of Rejection kW @55ºC C.T Ambient 35ºC	8.1	12.8	17
BTUs @130ºF C.T. Ambient 95ºF	27637	43673	58004
Dimensions mm			
D	580	580	580
E	690	690	690
F	292	500	500
G	292	475	475
H	630	1010	1010
M	25	25	25
Weight maximum kg	45	68	68

REMOTE CONDENSER FOR VARIHEAT MODELS

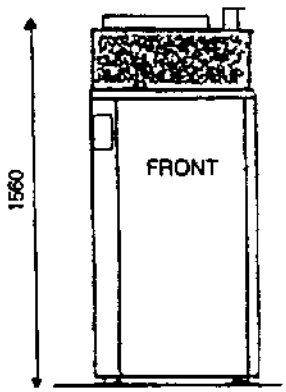
MODEL	TUBE SIZE			FOR MAX. 35ºC AMBIENT CONSENSER UNIT MODEL
	DISCHARGE	LIQUID		
550	1/2"	1/2"	15m	RCU 100
	1/2"	1/2"	30m	
800	1/2"	1/2"	15m	RCU 100
	1/2"	1/2"	30m	
1200	1/2"	1/2"	15m	RCU 200
	5/8"	1/2"	30m	
1400	5/8"	5/8"	15m	RCU 200
	5/8"	5/8"	30m	
1800	5/8"	5/8"	15m	RCU 300
	5/8"	5/8"	30m	
4000	7/8"	3/4"	15m	2 X RCU 300
	7/8"	3/4"	30m	

ALL FIGURES ± 5%

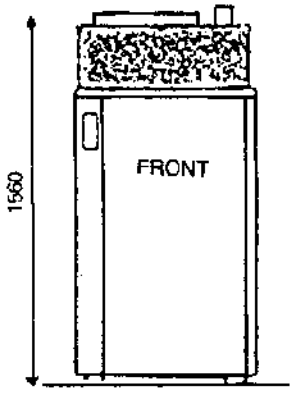


LPHW fitted to 500/800/1200
AIR HEATER BATTERIES

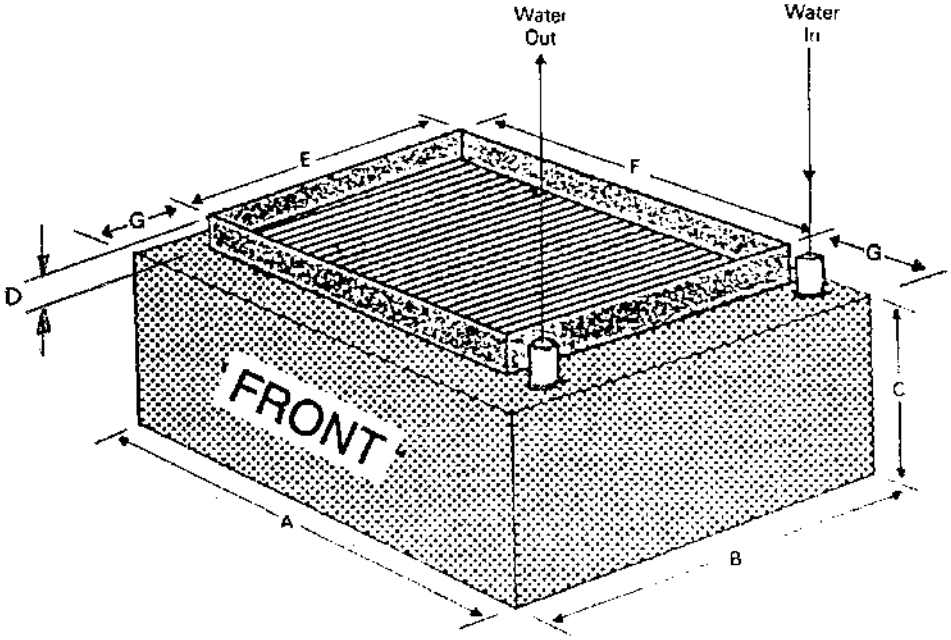
For use with Calorex Variheat Units AW550/800/1200
available from your Calorex Distributor



AW 550/800 VARIHEAT
LPHW 580

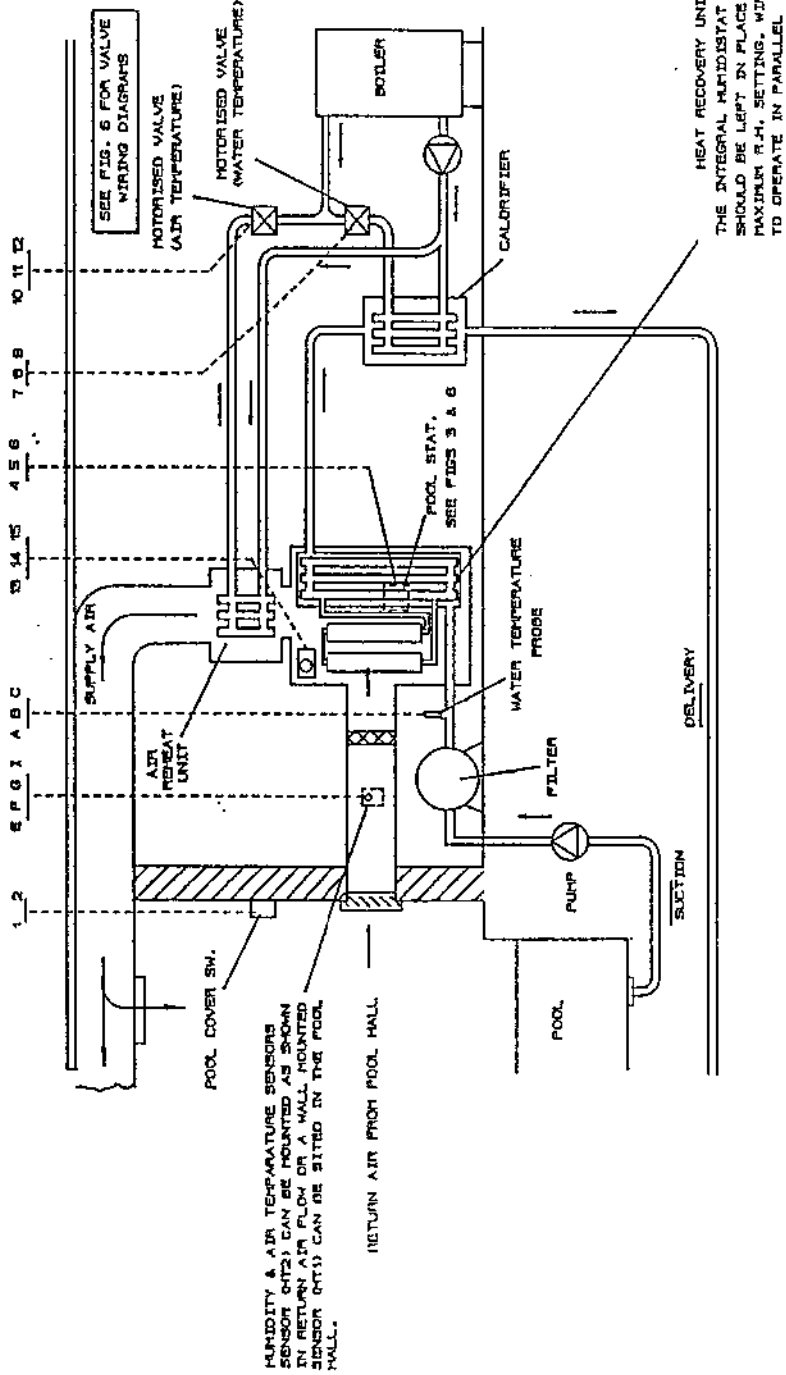


AW1200 VARIHEAT
LPHW 1200



MODEL		LPHW 580		LPHW 1200
Suitable for Variheat Model		550	800	1200
Output (water 80°C, air 30°C)	kW	12	15	21
Water Connections	mm	22mm Stubs		
Water Pressure Drop	psig	0.3	0.5	0.9
Air Pressure Drop	mmWG	1.5	2.5	3.5
Dimensions	A	650		800
	B	620		620
	C	250		250
	D	50		50
	E	500		510
	F	540		685
	G	60		60
Water Flow	l/min	18	23	32
Water Volume	litres	2.5	2.5	3.3
Approx Temp	°C	50	48	51

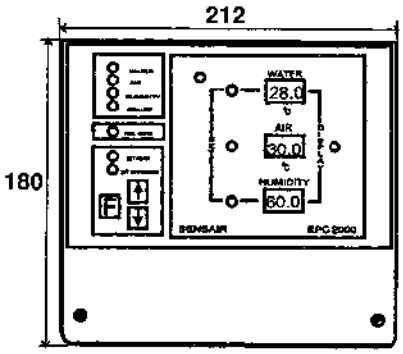
SCHEMATIC LAYOUT FOR A VARIHEAT AND BOILER INSTALLATION CONNECTED TO AN INDOOR POOL CONTROL PANEL



NOTE: IF THE BOILER IS TO BE HOUSED IN THE SUCTION PLENUM TOGETHER WITH THE VARIHEAT, THE BOILER MUST BE A BALANCED FUEL MODEL.

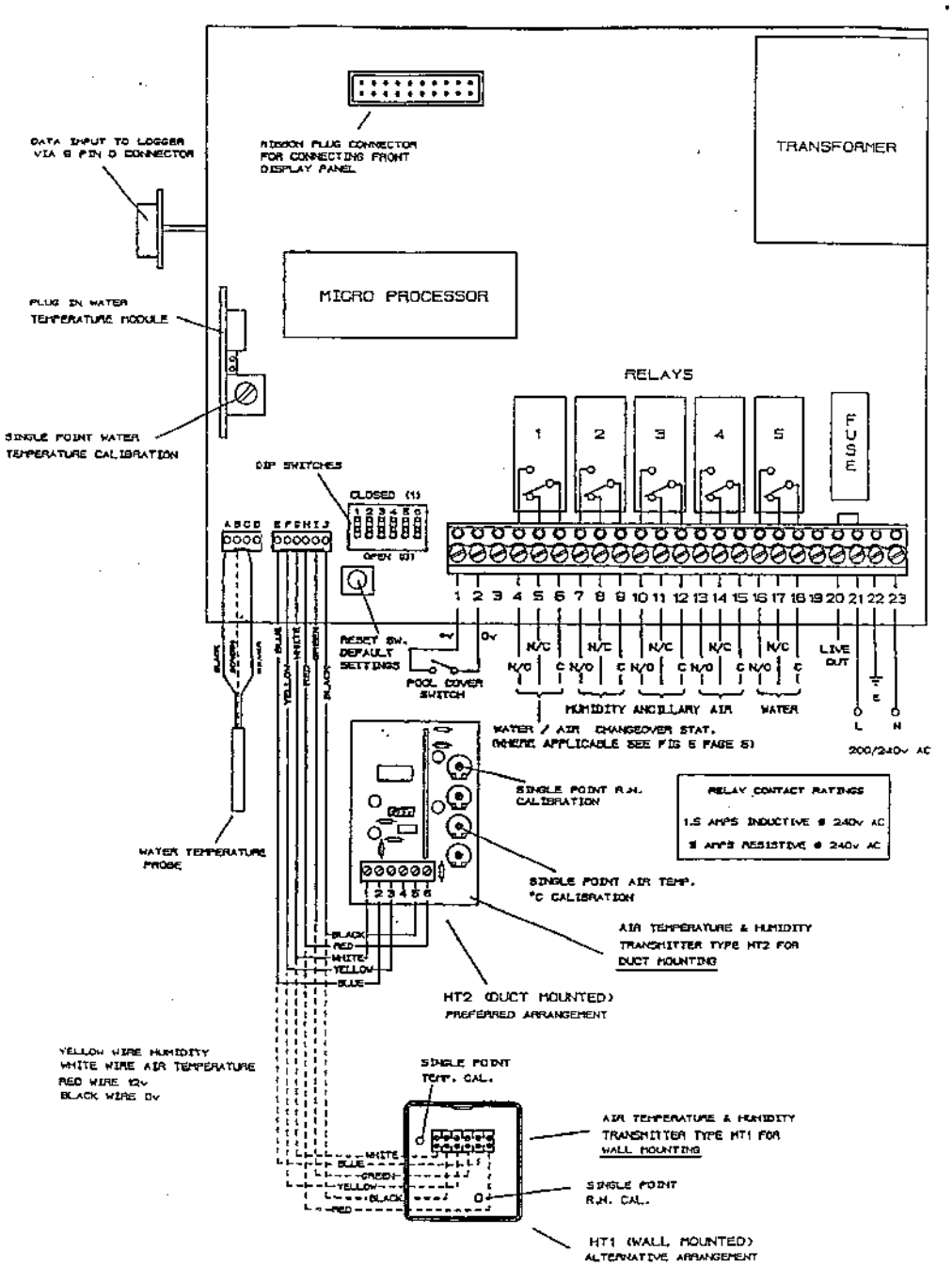
IF A CONVENTIONALLY VENTILATED BOILER IS TO BE USED EITHER:-
1. PARTITION OFF THE BOILER FROM THE PLENUM OR
2. CONNECT A RETURN AIR DUCT DIRECTLY ONTO THE VARIHEAT.
THESE MEASURES WILL ENSURE THAT THE AIR MOVEMENT AND NEGATIVE PESSURE IN THE PLENUM WILL NOT INTERFERE WITH THE COMBUSTION AND EXHAUST OF THE BOILER.

Optional Indoor Control Panel - WIRING DIAGRAM



CALOREX VARIHEAT UNIT

Connect 8 and 9 to the same terminals as existing humidistat in the Variheat unit (do not remove existing wires). Set humidistat in Variheat to 80%. The humidistat can be reset and used as a standby control in the event of a panel failure.



Optional Inlet Duct Flanges and/or Filters

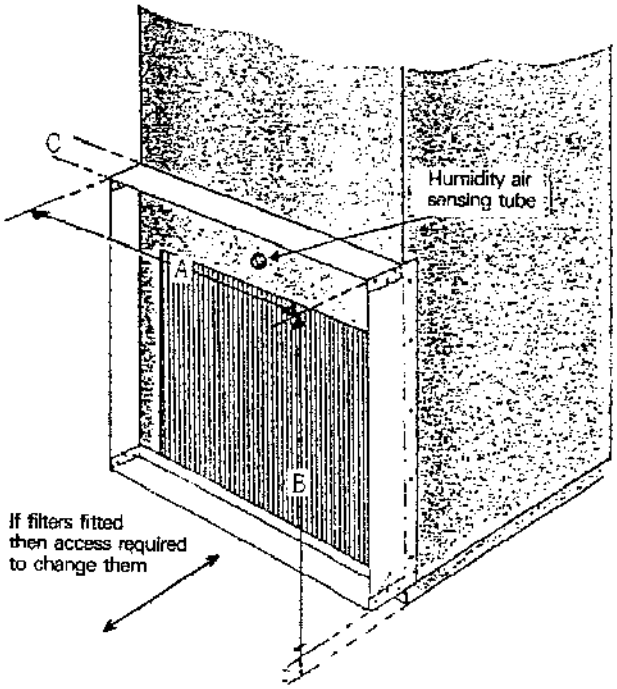
AIR INLET DUCT SPIGOT - FRONT ACCESS

The spigot kit is supplied complete with necessary pop rivets and self adhesive gasket material for the return air ductwork connection to the Variheat unit.

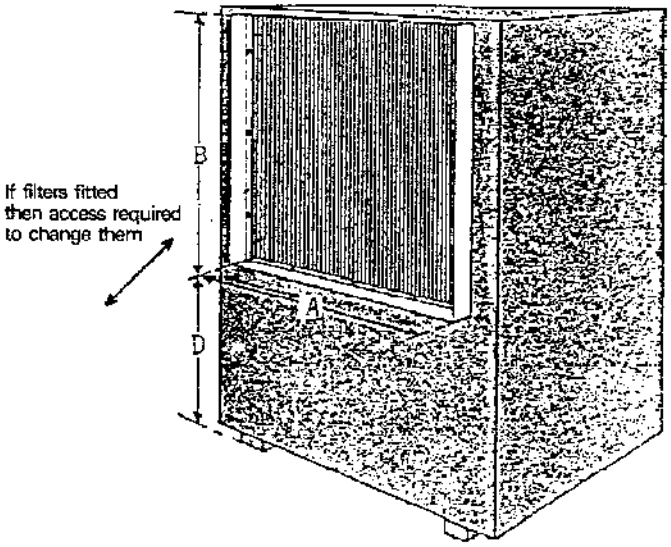
The spigot for the 550, 800 and the 1200 models encloses the evaporator and the humidity air sensing tube to allow the Variheat to monitor the true humidity level of the pool hall air.

The spigot for the 1400, 1800 and 4000 models encloses the evaporator only, therefore the air sensing tube must be extended and connected into the return air duct.

On 4000 models a side access air filter kit is also available. (See next page).



Air Inlet Spigot Position for 550, 800 and 1200 models



Air Inlet Spigot Position for 1400, 1800 and 4000 models

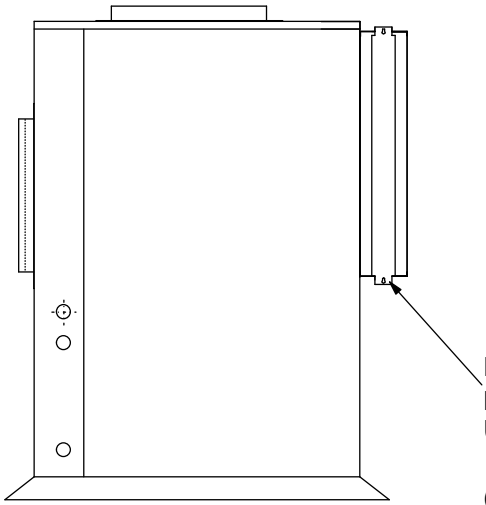
Air Inlet Spigot to fit	Dimensions mm			
	A	B	C	D
550 & 800 Variheat	660	720	50	75
1200 Variheat	810	720	50	75
1400 & 1800 Variheat	740	760	50	650
4000 Variheat Front Access	1380	810	50	700
4000 Variheat Side Access	1380	810	157	700

Air Filter Kit: Available for all models, fits inside the air inlet spigot.

See next page for details of side access version for AW/AC4000 models.

AIR INLET DUCT SPIGOT - SIDE OUTLET OPTION AW/AC4000 ONLY

When the side access air filter kit is fitted it is necessary to leave space at either one or both sides of the machine to allow for the access to the filters.



FILTER ACCESS PANEL
LOOSEN SCREWS, PUSH ACCESS PANEL UP AND LIFT AWAY.

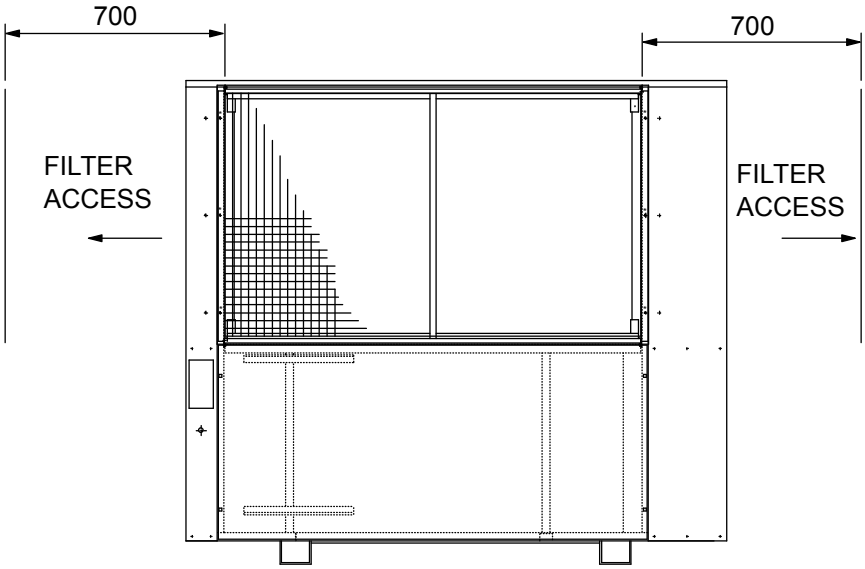
(ONE EACH SIDE) 0.7m CLEARANCE FROM EDGE OF ACCESS PANEL IS NECESSARY

Remove filter access panel(s) from machine. (There is one at each side).

Insert or change the filters.

Replace filter access panel(s).

NOTE: If access is limited to one side it may be helpful to tape the filters together before putting them in the machine.



Warranty Conditions

The following exclusions apply to the Warranty given by Calorex Heat Pumps Ltd. No claims will be accepted if :-

1. The heat pump is incorrectly sized for the application.
2. The heat pump is installed in ay way that is not in accordance with the current procedures as defined by Calorex Heat Pumps Ltd.
3. The heat pump has been worked upon or is adjusted by anyone other than a person authorised to do so by Calorex Heat Pumps Ltd.
4. The air flow to and from the machine is outside the specified limits.
5. The water flow through the machine is outside the specified limits.
6. The water pH level and/or chemical balance is outside the following limits:-

Acidity pH	pH	7.2 - 7.8
Total Alkalinity, as $CaCO_3$	ppm	80 - 120
Total Hardness, as $CaCO_3$	ppm	150 - 250
Total Dissolved Solids	ppm	1000
Maximum Salt Content	ppm	8000
Free Chlorine Range	ppm	1 - 2 Domestic
Free Chlorine Range	ppm	3 - 6 Commercial
Superchlorination	max	30ppm for 24 hrs
Bromine	ppm	2 - 5
Baquacil	ppm	25 - 50
Ozone	ppm	0.9 Max
Maximum Copper Content	ppm	1
Aquamatic Ionic Purifier	ppm	2 Max

7. The heat pump has suffered frost damage.
8. The electrical supply is insufficient or in any way incorrect.
9. The fan amps and duct pressure are outside the specified limits.
10. The heat pump must be maintained to the service requirements on page 37.

For details of extended warranty and maintenance packages available to United Kingdom customers please call the service number below.

IF IN ANY DOUBT PLEASE ASK

Note:- The Reply Paid Warranty Registration Card must be returned, to ensure that the correct warranty is given. If you do not find a Registration Card with your Heat Pump please contact the Calorex Service Department giving your name, address and serial number of your heat pump. A card will be sent to you for completion.

Email service @ calorex.com

Web Site http://www.calorex.com

01621 857171

01621 856611

Please give MODEL NUMBER and SERIAL NUMBER of your heat pump when making technical or service enquiries. This will assist in correct diagnosis and ensure service can be provided with the minimum delay.

Machine Record Log

In order to comply with European Union F-Gas regulations, it is necessary to leak test hermetically sealed systems with more than 6kg refrigerant annually. The operator of the unit is responsible for seeing that the test is carried out.
For machines affected see datasheet page 17. A sample log sheet can be seen below.

General Information				
Plant Name				Serial Number
Location of Plant				
Plant Operator[1]				
Operator Contact[2]				
Refrigerant Type				Refrigerant Quantity installed (kg)
Plant manufacturer	Calorex Heat Pumps Limited			Year of installation

Refrigerant Additions

Date	Engineer[3]		Amount Added kg	Reason for addition
	Company	Name		

Refrigerant Removals

Date	Engineer		Amount Removed kg	Reason for removal What done with recovered refrigerant
	Company	Name		

Leak Tests

Date	Engineer		Test Result	Follow up action required
	Company	Name		

Follow up Actions

Date	Engineer		Related to test on	Actions taken
	Company	Name		

Testing of Automatic Leak Detection System (if fitted)

Date	Engineer		Test Result	Comments
	Company	Name		

[1] Name and address of company operating plant.

[2] Contact details for operator's nominated person responsible for F Gas compliance.

[3] Company and technician carrying out work, with details to provide evidence of compliance.

Regular Planned Maintenance

Operations to be carried out during a regular planned maintenance visit are as follows:

1) Replace all belts where fitted.

2) Clean or replace filters as applicable. (This action may be required more frequently than regular servicing).

3) Check operation and condition of all fans and compressors.

4) Check capacitor tolerances (where fitted).

5) Check condition of all heat exchangers/evaporators.

6) Check refrigeration system parameters.

7) Check operation of control valves.

8) Check for water leaks.

9) Check drip trays and internal drain lines for blockages and clear.

10) Check operation of controls and calibrate as necessary.

11) Check operation of interlocks in use.

12) Final check on overall operation of unit.

13) Indicate on report any faults found or causes for concern.

Frequencies recommended:	Light to medium use	2 visits per year.
	Heavy use	4 visits per year.