

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

## **Owner/Installation Manual**

**AA300AVHF**

SD611250 iss b

10/08/09

### **HEALTH AND SAFETY WARNING**

**As the dehumidifier embodies electrical and rotational equipment, ONLY competent persons should carry out any work on this type of machine. (See Guarantee).**



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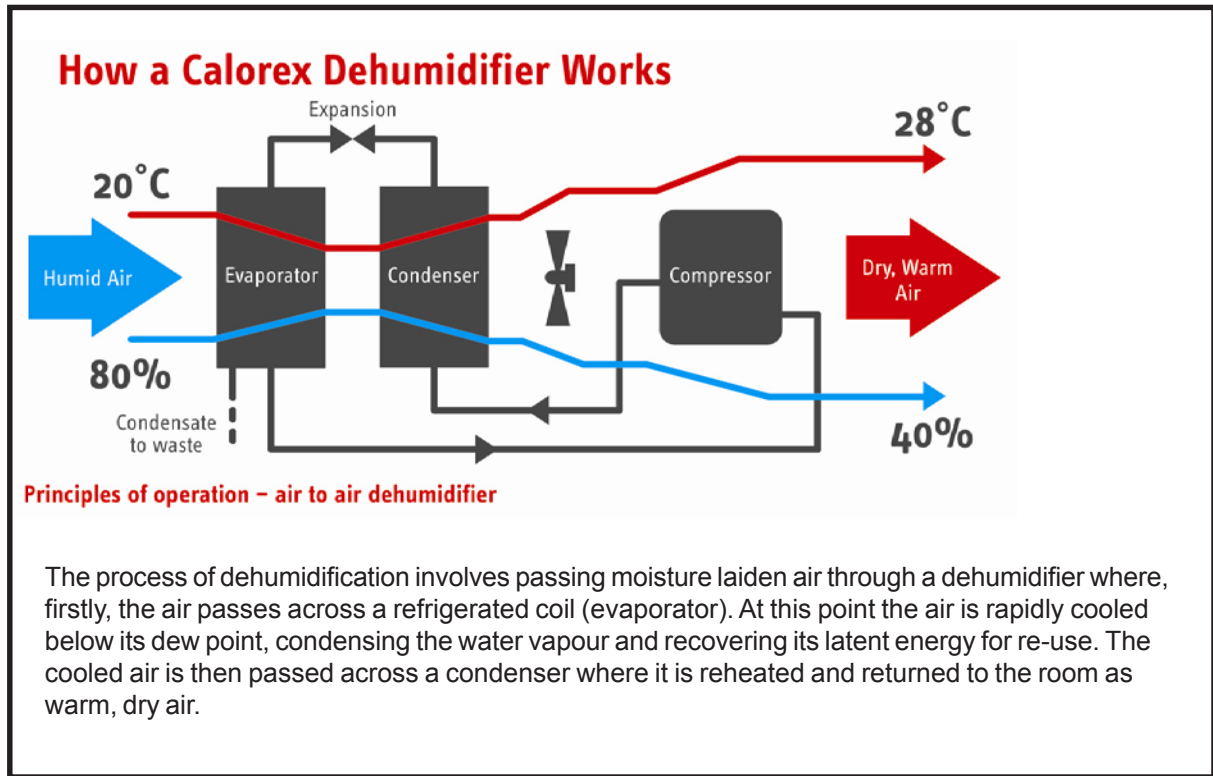
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## 1.0 HOW THE CALOREX 'AA300' WORKS

The Calorex 'AA300' is a packaged refrigerant type dehumidifier that is specifically designed to provide humidity control and room heating (optional) for a swimming pool hall.

The Calorex 'AA300' is designed to be connected into an air distribution system that will provide a uniform flow of air through out the hall. An optional fresh air entry point is available.



The Calorex 'AA300' works by physically removing excess moisture from the pool hall air. This is achieved by recirculating air from the pool hall through the unit and removing moisture from the air by use of the machines internal refrigeration circuit.

As a by product of this process the Calorex 'AA300' will convert the moisture it has removed into sensible heat. This heat is added back into the return air stream and consequently provides supplementary hall heating. For every 1kw of power consumed the Calorex 'AA300' will return approximately 2.5kW of heat. This process is controlled by a humidistat that measures the pool hall humidity and controls the machine to a set point that can be adjusted to suit the clients need.

As an option the Calorex 'AA300' can be supplied with a low pressure hot water (LPHW) air heater. The LPHW should be fed with hot water at 80°C# and will provide space heating for the pool hall. The LPHW is integrally fitted into the Calorex 'AA300' and is supplied with an adjustable thermostat, three way control valve and electrical connections to control a boiler or pump. The boiler and pump are not supplied with this option.

# Note.

Consult Calorex for heat exchangers that are suitable for lower flow temperatures.

## The CALOREX 'AA300'.

FEATURES :-

### 1. Remote control panel

The Calorex 'AA300' is supplied as standard with a remote control panel that can be mounted up to 20m away from the unit. The control panel features 12V circuits and interconnecting cable is easily connected to the unit by 'D' type fittings.

The control panel will indicate pool hall humidity through an adjustable set point digital humidistat, power on, fault, machine 'dehumidifying' and defrost status. An on/off switch is also provided.

When the unit is supplied with an optional LPHW the panel will also indicate pool hall air temperature through an adjustable set point thermostat. A time clock will allow 'set back air temperature' for unoccupied periods. An indicator light will show when the unit is heating.

The power to each model in the range is fed via din rail mounted terminal blocks located in the electric box of the unit.

#### CONTROL PANEL STANDARD UNIT

HUMIDITY DISPLAY  
AND LAMP



MAINS ON/OFF  
SWITCH

MAINS LAMP

FAULT LAMP

DEFROST LAMP

#### CONTROL PANEL WITH LPHW FITTED

HUMIDITY DISPLAY  
AND LAMP

AIR TEMPERATURE  
DISPLAY AND LAMP

TIME CLOCK



MAINS ON/OFF  
SWITCH

MAINS LAMP

FAULT LAMP

DEFROST LAMP

### 2. Variable speed centrifugal fan.

When the AA300 is delivered the fan is set to run at two speeds: medium speed when the machine senses a demand for dehumidification (and air heating) and low speed for when there are no demands.

If ducting is fitted and there is a resulting need for higher air flow than can be met by the machine in this condition, it is possible to change the top speed of the fan from medium to high. See instructions on page 10 and circuit diagram in section 2.5 for instructions on how to do this.

When fitting the remote sensor box it is possible to switch off the low speed fan MCB thus making the fan run only when there are demand for dehumidification and/or air heating. See page 25.

### 3. Optional flexible duct fittings.

### 4. Rotary compressor

### 5. A non CFC refrigeration circuit.

## 1.1 OPERATION

When the AA300 is connected to its control panel and a mains supply via an isolator and the isolator is energised, the MAINS light on the side of the heat pump will illuminate indicating mains ON. If the AA300 is fitted with an LPHW the time clock will start to run.

The time clock has a battery reserve fitted which when charged will run for 100 hours so that isolating the machine for short periods will not affect the time clock settings.

The AA300 unit is switched on to normal operation by an ON (I)/OFF (O) switch on the console.

When switched on the red indicator light will illuminate and digital controller(s) will light up.

Providing that the controls are set to the correct parameters; nominally 60% RH, (28°C air temperature), the machine will operate automatically.

For AA300s with LPHW fitted, the 'unoccupied' temperature is set on the digital air controller and will be switched in/out by the time set on the time clock.

As the unit operates, the indicator lights will show the state of the control conditions, ie dehumidification, heat to air.

See section 3.0 for control panel symbols.

### PARAMETER CONTROLLERS

Each parameter, Relative Humidity (and Air Temperature) is sensed within the machine and the signal is taken to the relevant digital controller.

The RH controller has two switching channels, OUT1 which is set from the front panel, OUT2 which is factory preset.

When fitted, the Air Temperature has three switching channels, one of which is for setting the OCCUPIED/ UNOCCUPIED air temperature.

Each channel has a switching differential which is also factory pre-set. None of the factory settings should be tampered with.

When the re-settable channel is adjusted all other settings and differentials automatically follow at the correct relationship.

Nominal set point values & diffs	RH%	=	60%	diff	3%
	Air temperature	=	28°C	diff	0.5 °C

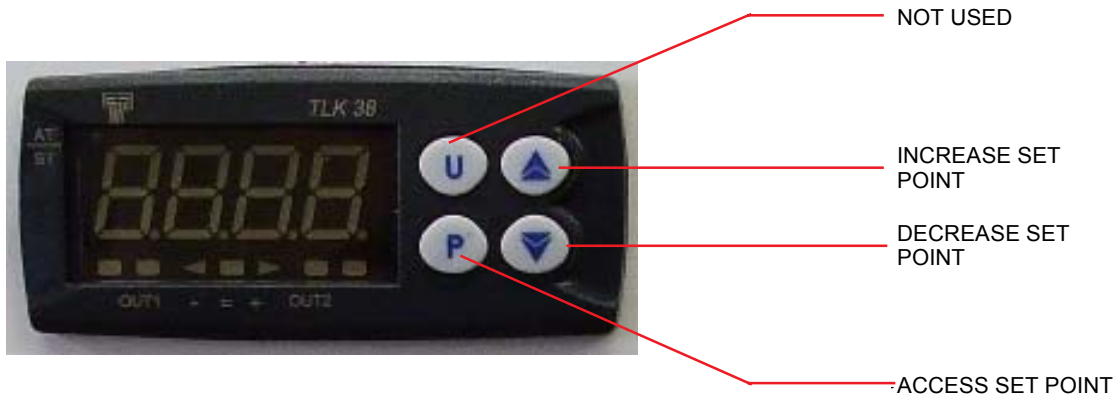
Please note: on AA machines with LPHW, in occupied mode dehumidification stops once the Air temperature is 2.5°C above set point.

## 1.2. HUMIDITY & AIR TEMPERATURE AND CONTROLS

### HUMIDITY DIGITAL CONTROLLERS

To Program the Set Point. Press down P, SP1 and Set Point value will be displayed alternately. Press the  $\Delta$  or  $\nabla$  key to change the value of SP1. Once the desired value is displayed press P to memorise the value. The display will revert to the present reading.

NOTE: If anything else shows on the display leave alone for 1 minute until the display returns to normal.



### AIR TEMPERATURE DIGITAL CONTROLLER AND AA MACHINES WITH AIR HEATING

The digital controller for controlling air temperature can be changed as follows:-

To program the set point, press P button once and release it. SP1 (set point) and set point value e.g. 28 will be displayed alternately. Press P again AL1 (-4.5) will show. This is the difference between the set point and AL1 plus a constant 0.5 e.g.  $28 - 4.5 + 0.5 = 24^{\circ}\text{C}$  (unoccupied) SP1 and AL1 can be changed in the same way as described for humidity and air.

NOTE: AL1 can only be set -1 to -10 below SP1 value.



**NOTE:** If the readings on the digital controllers are not the same as the actual pool hall conditions, an offset into the digital controller can be set. However, before this is done an inspection of the installation should be made to ensure air conditions into the unit are the same as those in the pool hall. Air leakage into the units return air from other spaces should be sealed before adjustments are made. See technical manual.

### 1.3 TIME CLOCK SETTINGS

#### TIME CLOCK AA 300 with LPHW only

The time clock is a quartz 24 hour clock with 100 hours battery reserve used to control the automatic operation on the AA300 unit per 24 hour time cycles.

The time clock setting determines the OCCUPIED/UNOCCUPIED periods and is set to match the operators requirements regarding opening and closing times for the pool and possible times where the pool is covered. The two settings are OCCUPIED or day time, and UNOCCUPIED or night time (covered).

The most obvious action of this change is to lower the pool hall air temperature to a determined level to conserve air heating energy. This lowering of temperature is allowable because of the quiescent, and ideally covered, condition of the pool.

Pool water occupied

(no pool cover)



Pool water unoccupied

(pool covered)



#### SETTING ACTUAL TIME

Turn the large clock hand clockwise until the correct time of day is set, ensuring that the correct half of the day is chosen (24 hour clock).

#### SETTING FOR AUTOMATIC OCCUPIED/UNOCCUPIED OPERATION WITH TIME CLOCK



To set for automatic time clock control of occupied/unoccupied, slide the lever to 'A'. Each yellow segment represents a 15 minute time period. Extend outward the segments for a period of time when the pool is occupied (i.e. used or uncovered) per day.

#### SETTING FOR AUTOMATIC OCCUPIED/UNOCCUPIED OPERATION WITH REMOTE INTERFACE

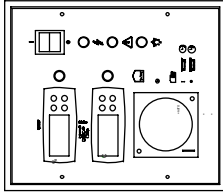
To set for remote control of occupied/unoccupied, slide lever to 'O'. See section 2.4, Note 1 for more information on remote interface.

#### SETTING FOR MANUAL OCCUPIED/UNOCCUPIED OPERATION

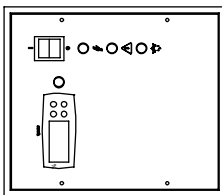
To set for manual occupied period (or override automatic unoccupied period) slide the lever to 'I' for 'occupied'.

## 2.0 INSTALLATION UNPACKING

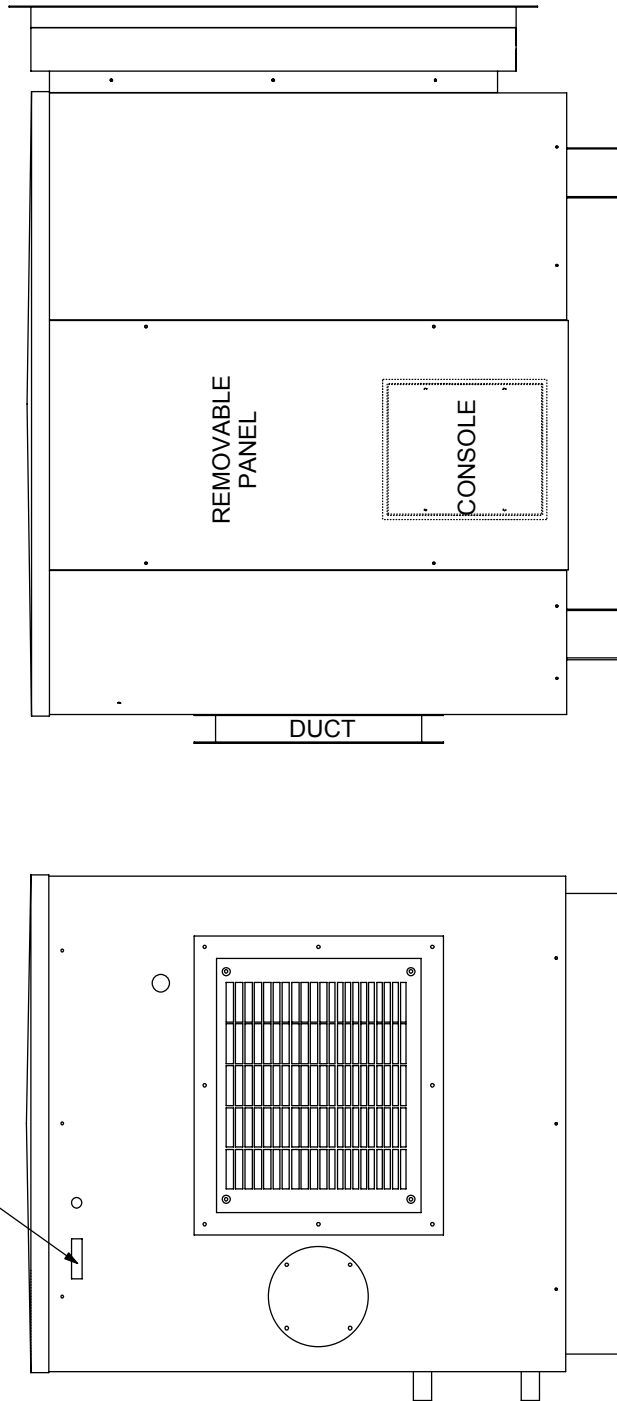
CONTROL CONSOLE  
LPHW FITTED



CONTROL CONSOLE

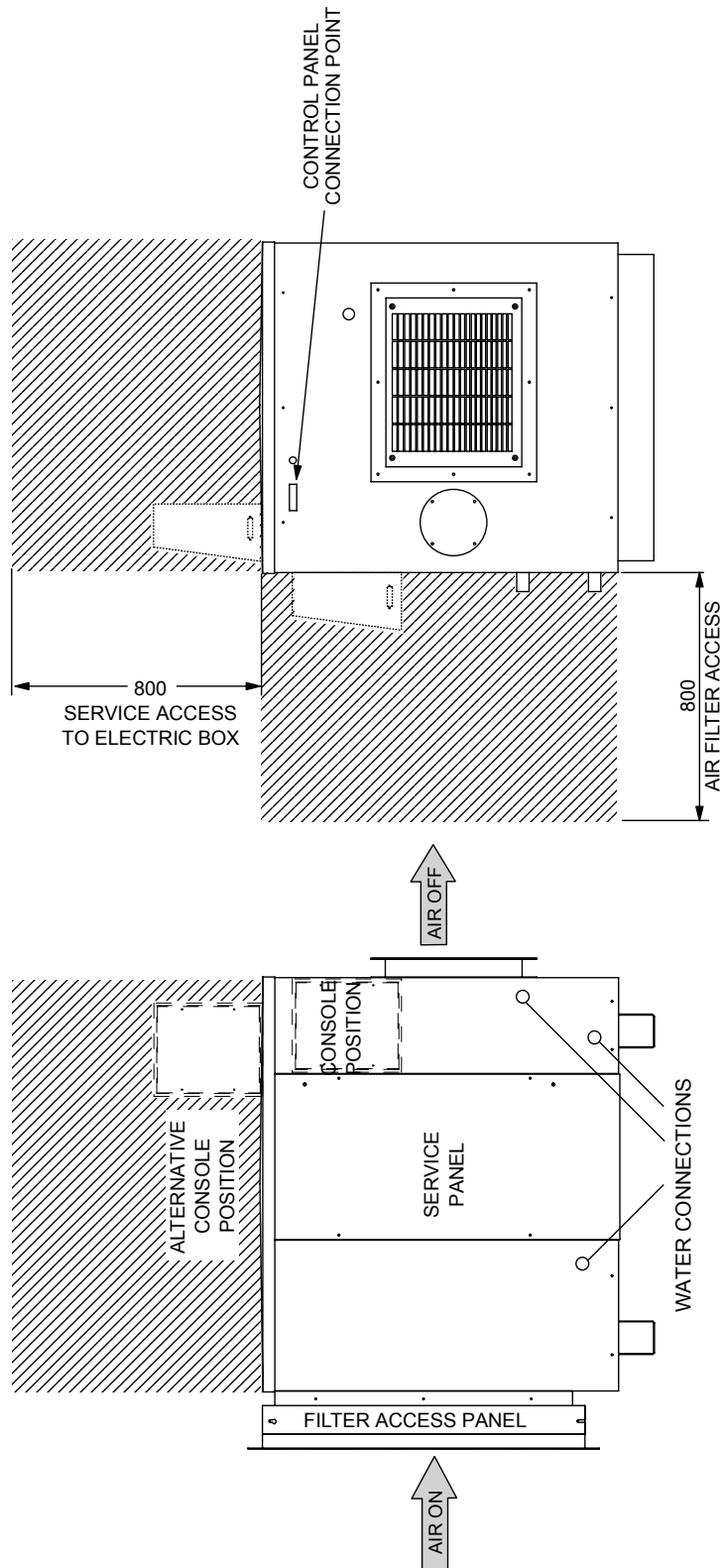


CONTROL PANEL  
CONNECTION POINT



On delivery the console for the AA300 will be inside the machine. To retrieve the console unfasten the removable panel on the heat pump. The console should be in the position shown, protected by bubblewrap. Note: the removable panel is on the opposite face of the heat pump to the water connections.

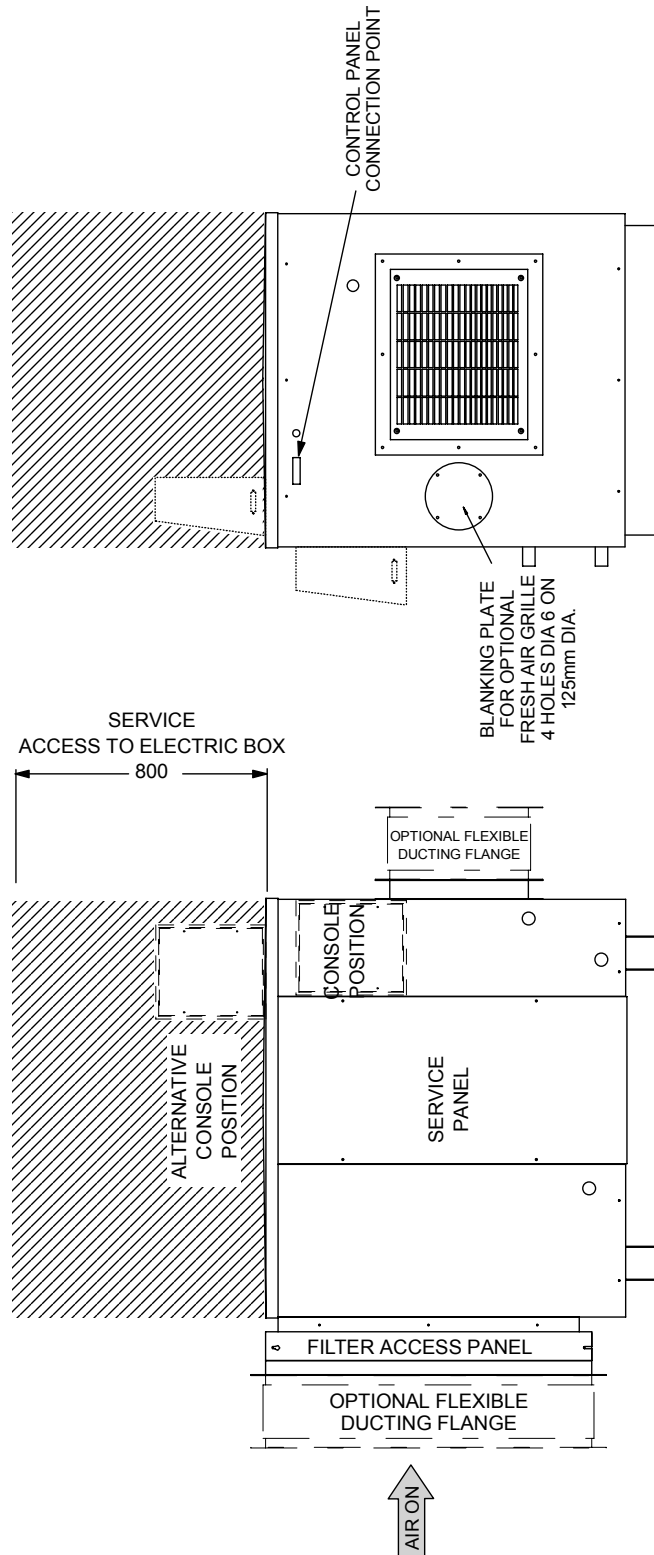
# SITING, MACHINE LOCATION



## NOTE:

If the optional flexible ducting flange is not used, due consideration to resonant noise through the duct work must be made.

# INSTALLATION WITH OPTIONAL FEATURES



Ensure duct work pressure drop does not exceed resistance given in data sheet.

If the static resistance drops below the figure stated in the data sheet and a greater air flow is required, it is possible to change the speed of the fan from non 'F' to 'F'.

**With the machine isolated** move the blue 1,0 wire connected to terminal 17 in the electric box to terminal 18 in the electric box. (See circuit diagram section 2.5)

If unit is located in a plant room at pool hall air temperatures, any ambient air ducting must be heavily insulated.

Recommend fresh air/spring return dampers to be fitted to Fresh air ductwork for sub zero ambient applications in case of power failure.

## **2.1 PLUMBING**

### **CONDENSATE DRAIN**

The condensate drip tray in the 'AA300VH' unit collects the water removed by the dehumidification process, It is therefore necessary to ensure that the 'AA300VH' unit is placed on a level plinth so that the condensate can run away and not overflow the edges of the drip tray inside the machine.

The 'AA300VH' has a 3/4" BSPM threaded condensate drain connection. The drain pipe should run away with adequate fall to waste ie 1/2" per foot min. and must incorporate a 'U' trap & tun dish.

### **BOILER PLUMBING**

The boiler connections on the machine are 3/4" BSPM. for connecting the boiler water flow and return. Suitable breakable couplings, isolation, and drain down valves should be installed in the boiler water flow and return pipes local to the 'AA300VH' unit.

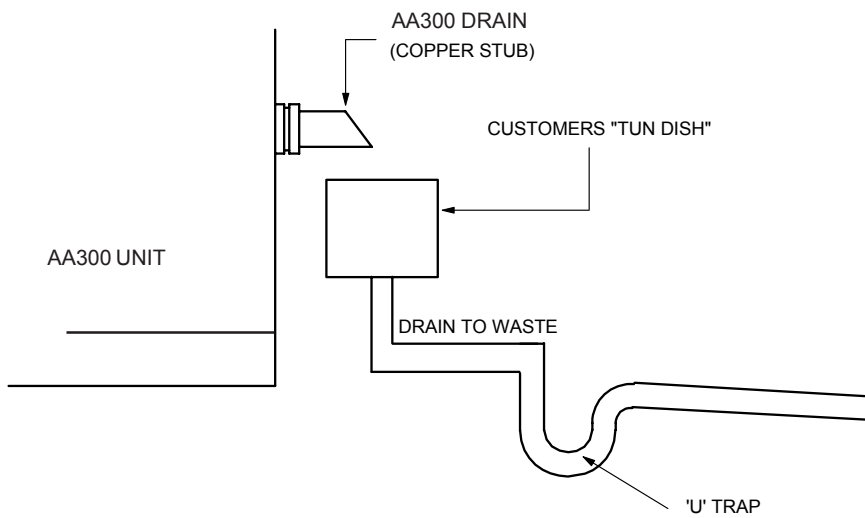
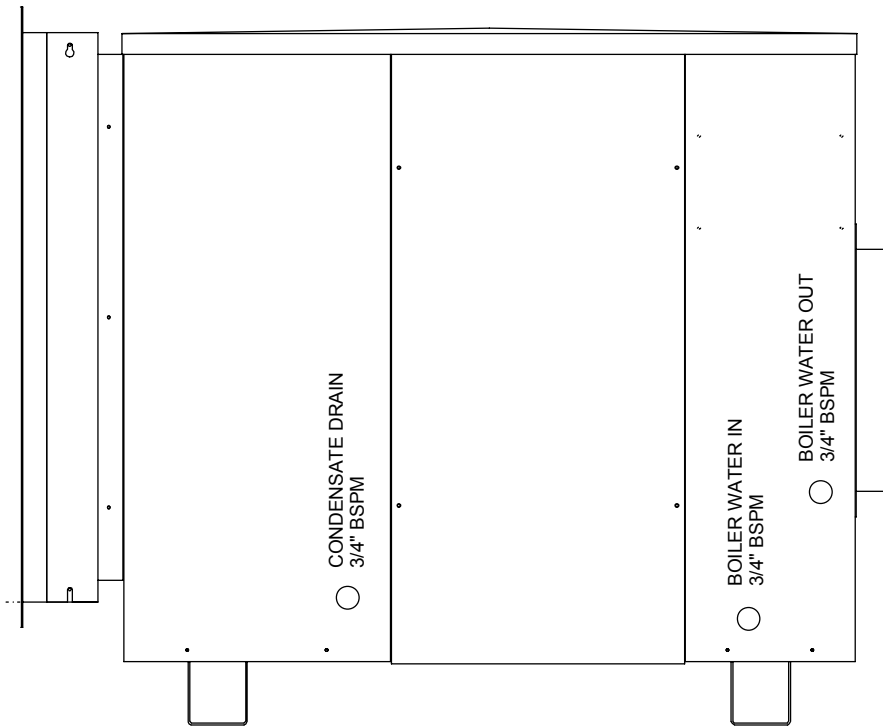
Refer to the boiler manufacturers instructions before designing the pipework system.

### **IMPORTANT GENERAL CONDITIONS**

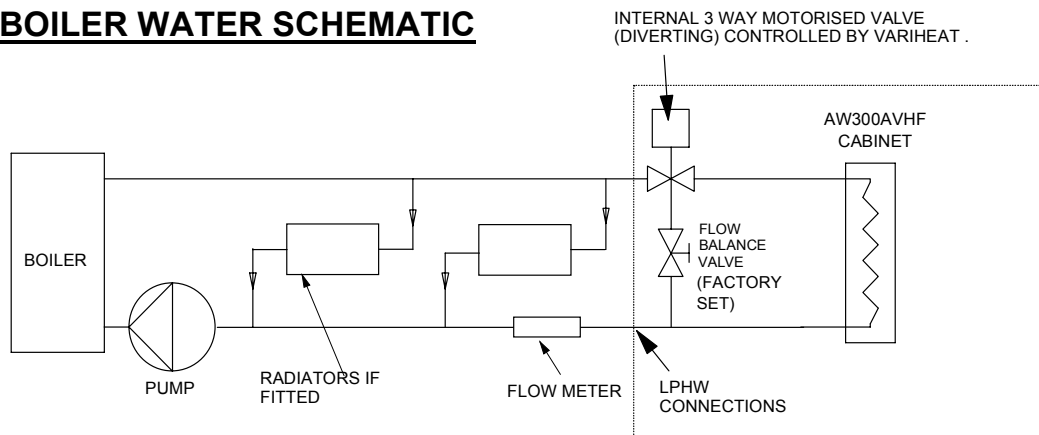
- 1) Do not route water pipes across service access panels or air inlet/outlets.
- 2) The water circuits to and from the 'AA300VH' unit should be capable of maintaining the specified water flow limits required by the machine.
- 3) All pipework must be adequately supported with allowance for expansion and contraction especially with regard to the plastic pipework.
- 4) It is recommended that when installing water systems the last connections to be made should be adjacent to the 'AA300AVH' unit to avoid undue stresses on the unit connections.

## 2.2 WATER CONNECTIONS

(also see SECTION 2.1)



## BOILER WATER SCHEMATIC



## 2.3 ELECTRICAL INSTALLATION

### ELECTRICAL SAFETY

It is important to ensure that all aspects of the installation comply with the latest I.E.E. Regulations. It is also important to ensure that any remote devices which terminate within the pool hall are of the type and voltage as specified in the latest I.E.E. Regulations.

The machine should be installed in accordance with EMC2004/108/EC.

### PROTECTED SUPPLY

Whilst not mandatory, Calorex recommend that an R.C.C.B. is always fitted or that the supply is to local electricity authority recommendations, and that all ducting is bonded in accordance with these regulations. The supply to the machine should incorporate fuses or motor rated circuit breakers (type GU, FAZC) to specified rating (see data sheet) H.R.C. fuses are recommended. An isolator must be fitted within clear view of the machine and not more than 2 metres away. The isolator must have a minimum of 3mm air gap when in the off position.

### INCONSISTENT ELECTRICAL SUPPLY.

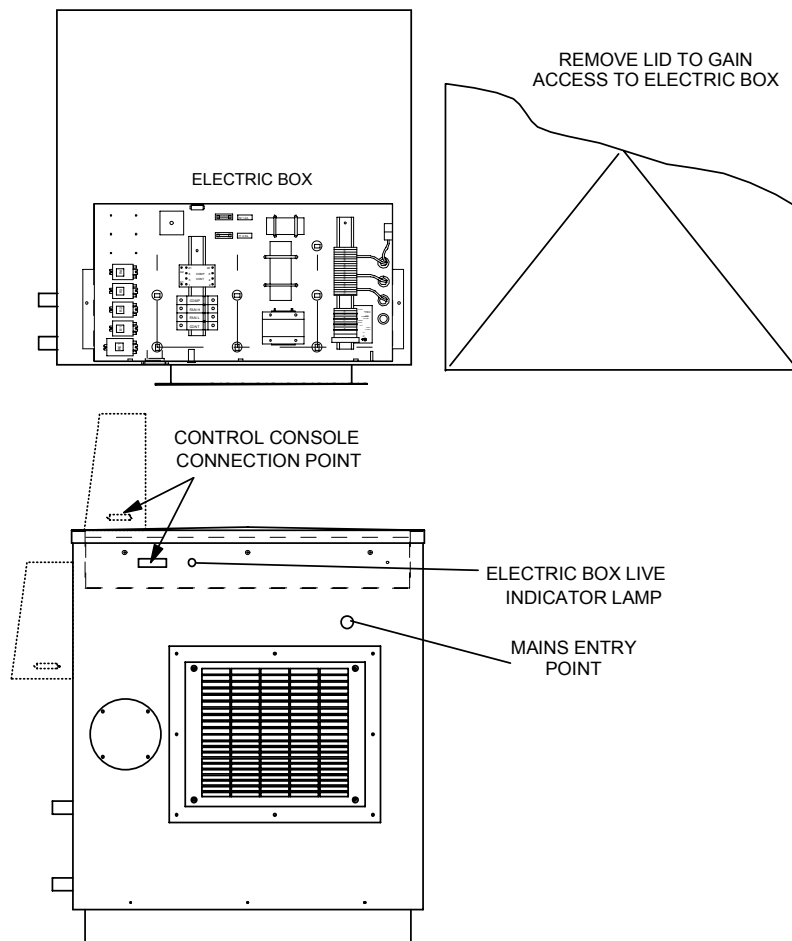
The following limits of operation must not be exceeded if Calorex machines are to be guaranteed either in performance or warranty terms :-

Voltage single phase -	207V min, 253V max
Frequency -	47.5Hz min, 52.5Hz max.

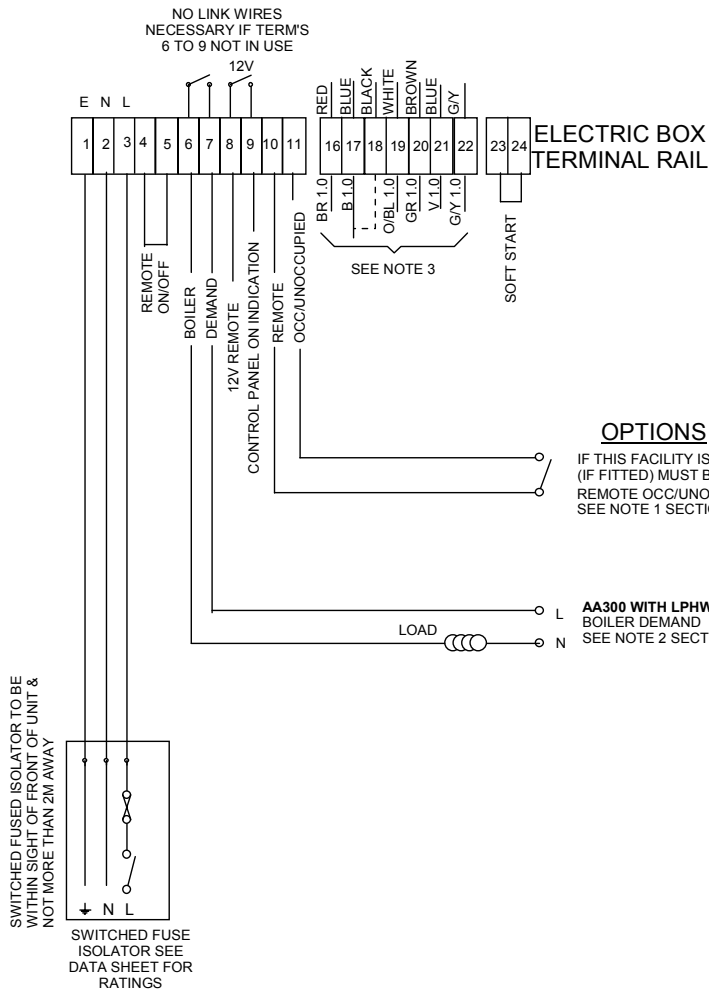
**N.B** The voltage must be measured at the heat pump mains terminals with all the fans/compressors running at the rated condition.

### CORRECT CABLE SIZING

The cable supplying electricity to a machine with a given load must increase in cross sectional area (CSA) as the length increases in order that the voltage drop within the cable does not exceed recommended limits. Cable sizing should be calculated by an approved electrician with due consideration to I.E.E. and local codes of practice.



### 2.3.1 MAINS SUPPLY TERMINAL BLOCK LAYOUT

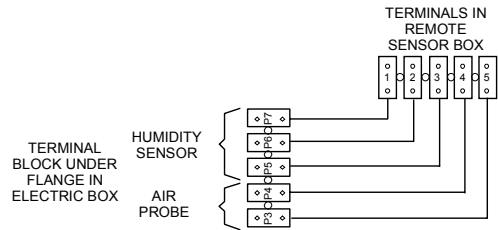


#### OPTIONS

IF THIS FACILITY IS USED TIME CLOCK (IF FITTED) MUST BE SET TO UNOCCUPIED  
REMOTE OCC/UNOCCUPIED  
SEE NOTE 1 SECTION 2.3.2

NOTE 'a'  
LINK THESE TERMINALS WHEN REMOTE NOT REQUIRED  
REMOVAL OF LINK WILL STOP FAN, COMPRESSOR & DIGITAL CONTROLLERS .

#### OPTIONAL REMOTE SENSOR BOX



## 2.3.2 NOTES ON TERMINAL BLOCK CONNECTIONS

### **NOTE 1 - Remote occupied/unoccupied**

These contacts (from terminals 10 & 11) are to enable the air temperature set back facility to be remotely overridden.

There is a 12 V AC output from these terminals and closing a remote switch will enable the unit to regain the normal operating air temperature for when the pool is in use.

This can be done via a voltage free pool cover switch or some other form of voltage free switch.

If this facility is used then the time clock (if fitted) on the control panel of the unit should be set to the 'unoccupied' (o) position. (See note on time clock and switch settings, section 3.2.1).

If these terminals are fitted on versions without time clocks then they **MUST BE LINKED**.

### **NOTE 2 - Boiler demand -AA+LPHW machines only**

These are voltage free contacts (from terminals 6 & 7) rated at 3(1) Amp at 230 Volts.

If the low pressure hot water supply to the unit is to be governed by the Calorex unit then these contacts should be utilised to bring water to the unit via the boiler, motorised valve, boiler pump etc. Remember the maximum inductive load is one amp.

This is dependant on how the low pressure hot water supply to the unit has been designed.

If the supply of low pressure hot water to the unit is not dependant on a signal from the unit then these contacts can be ignored.

### **NOTE 3 - RUNNING FAN IN 'F' MODE**

If when the AA300 is installed, the static resistance drops below the figure stated in the datasheet and greater air flow is required, change the fan speed of the fan from non 'F' to 'F' by moving the blue 1.0 wire from the electric box terminal 17 to terminal 18.

### **CONTROL PANEL 25 WAY CABLE CONNECTION**

Data signal between the console and the heat pump is via a 25 way cable with 'D' connection (plug & socket) both ends. The cable provided with the heat pump is 1.8m in length. An optional 10m cable is available, part number SD434052. A recommended maximum distance between the console and the heat pump is 20 metres, 2 cables being used.

## 2.4 COMMISSIONING CHECKLIST

- a) Is the building finished in accordance with the original plans and specification.
- b) Is the plenum chamber and all ductwork insulated, special attention should be made to the insulation of the fresh air inlet ducting to prevent condensation problems.
- c) Are there any significant draughts in the pool hall or plant room (plenum installation) through poorly fitting doors, windows, pipe ducts, etc. This will let in unwanted ambient air raising the heating duty required.
- d) Is fresh air ducting (if fitted) perfectly sealed from plant room.

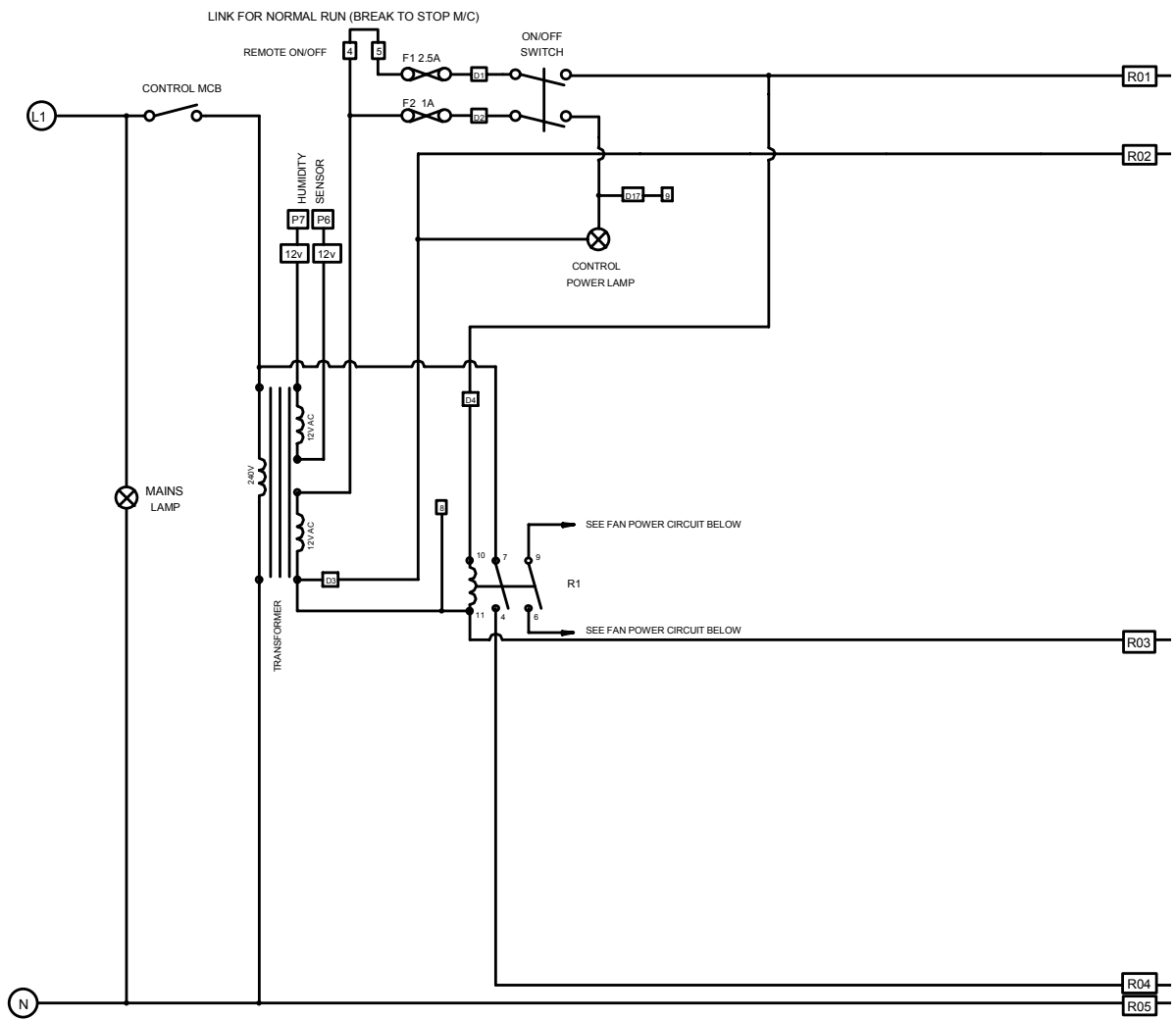
NOTE: (c) and (d) above should be checked by measuring plant room and pool hall air temperatures. If the plant room is acting as a plenum chamber both temperatures should correspond. If the plant room temperature is lower than ambient air is leaking in, this leak should be located and rectified.

- e) Are the fresh air inlets free from obstructions ie, undersize grilles, objects in the path of exhaust air deflecting it back to the fresh air inlet, etc.
- f) Is 'occupied / unoccupied' set correctly, (set with air thermostat) see section 3.2.2.
- g) Is the time clock set correctly.
- h) Has the fan speed been set to match the sensors fitted.
- j) Any sign of abnormal operation such as water dripping should be reported immediately to an installer or Calorex.

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## 2.5 CIRCUIT DIAGRAMS

### ELECTRICAL CONTROL & POWER CIRCUIT 'AA' VERSION



#### NOTES

'R' LETTER RELAYS ARE 12v

'RE' LETTER RELAYS ARE 230v

'P' LETTERS ARE CONNECTOR BLOCK PIN NUMBERS

**15** = DIN RAIL MOUNTED TERMINAL BLOCK NUMBERS

**D25** = 25 WAY 'D' PLUG PIN NUMBERS

**D** = DELAY TIMER

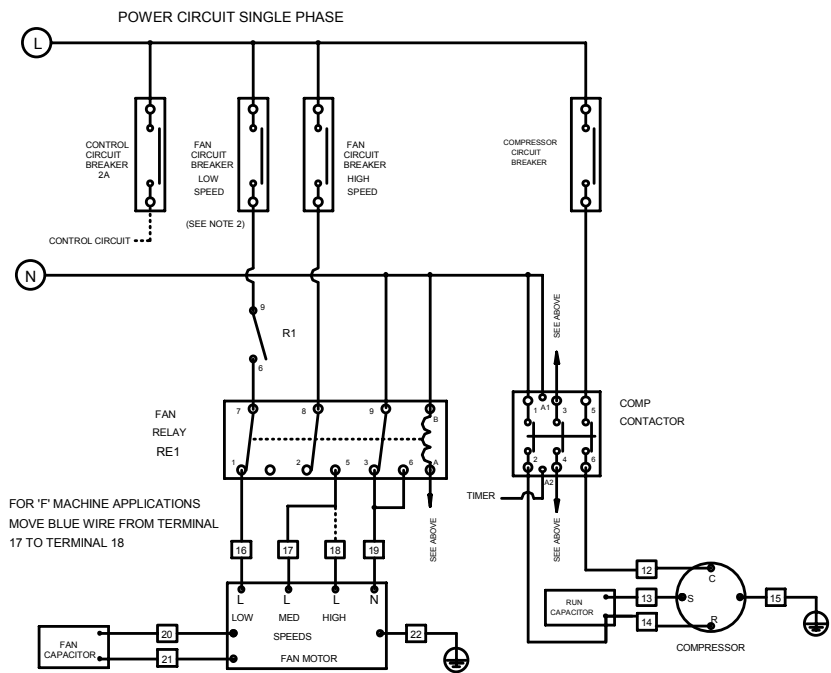
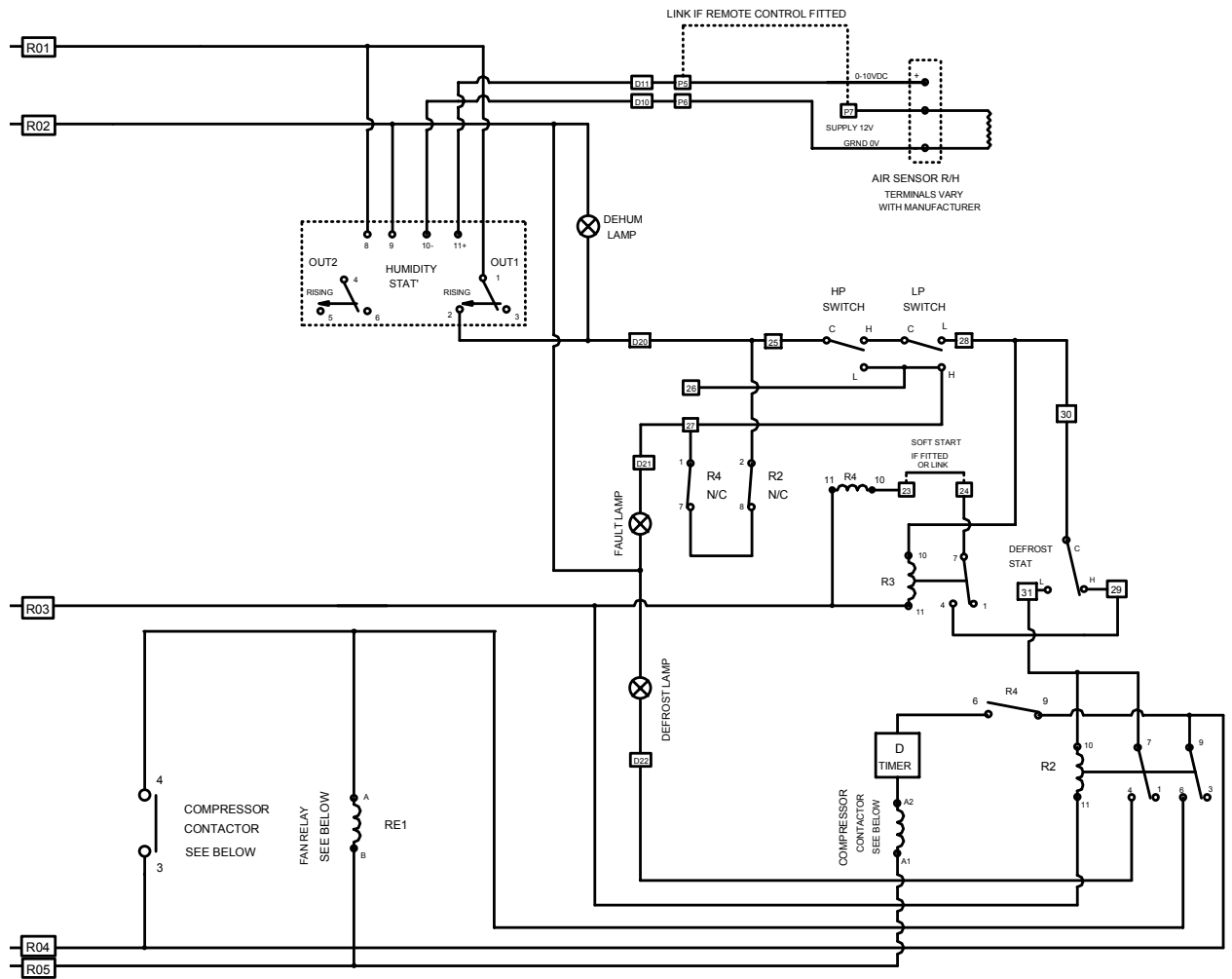
2 ISOLATE LOW SPEED FAN CIRCUIT BREAKER  
WHEN REMOTE SENSORS KIT IS FITTED

CIRCUIT DIAGRAM  
AA300AVH

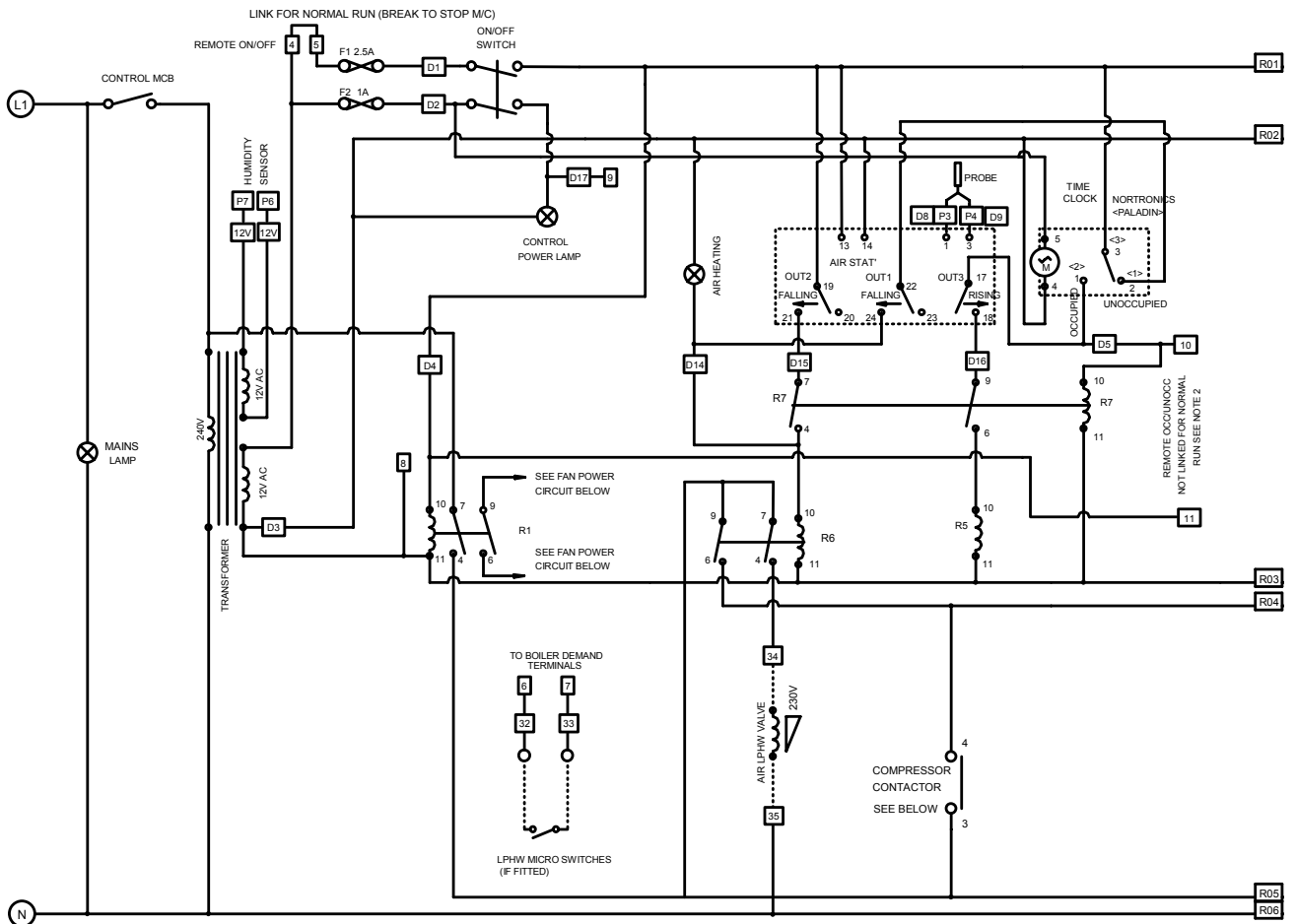
D604450

MODEL	FAN MCB'S		COMP MCB
	HIGH	LOW	DEVICE VALUE
AA300AVHF LPHW	6A	4A	16A

# ELEC CONTROL & POWER CIRCUIT 'AA' VERSION CONTINUED



# ELECTRICAL CONTROL & POWER CIRCUIT 'AA+LPHW' VERSION



## NOTES

'R' LETTER RELAYS ARE 12v

'RE' LETTER RELAYS ARE 230v

'P' LETTERS ARE CONNECTOR BLOCK PIN NUMBERS

**15** = DIN RAIL MOUNTED TERMINAL BLOCK NUMBERS

**D25** = 25 WAY 'D' PLUG PIN NUMBERS

**D** = DELAY TIMER

2 IF REMOTE OCC/UNOCC FEATURE USED

a) FORCE TIME CLOCK TO 'UNOCCUPIED'

b) 10/11 NO = 'UNOCCUPIED'

c) 10/11 NC = 'OCCUPIED'

3 ISOLATE LOW SPEED FAN CIRCUIT BREAKER  
WHEN REMOTE SENSORS KIT IS FITTED

CIRCUIT DIAGRAM

AA300AVH/F + LPHW

**D604452**

MODEL	FAN MCB'S		COMP MCB
	HIGH	LOW	DEVICE VALUE
AA300AVHF LPHW	6A	4A	16A



## 2.6 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.

### 3.0 CONTROLS





#### STANDARD CONTROL PANEL MODULE (12V)

HUMIDITY DISPLAY  
AND 6. DEHUMIDIFICATION  
LAMP



1. POWER ON/OFF SWITCH
2. POWER LAMP
3. FAULT LAMP
5. DEFROST LAMP

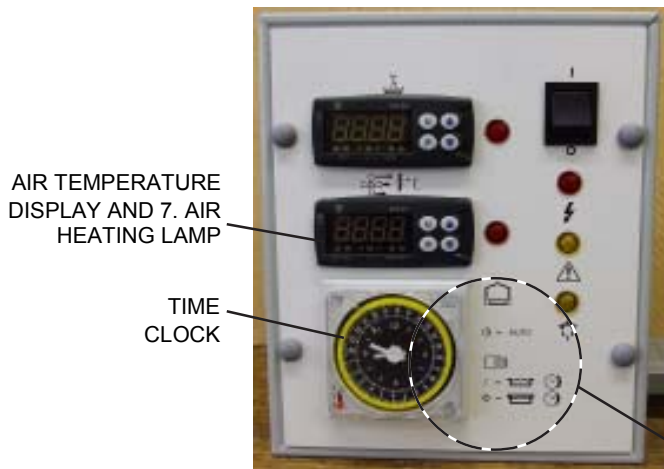
CONSOLE AA300

1		Power on	
2	⊙	Power off	
3		Power symbol	
		Power lamp	Indicates presence of 12V electricity supply to the console.
4		Fault lamp	Check that the pool hall air and water flow through the unit are within specified limits. Check M.C.B.'s & pressure switches see note a (also soft start overload if fitted) and push all to reset. Call for a service check if fault lamp stays on.
5		Defrost lamp	Unit is temporarily defrosting evaporator machine will automatically reset.
6		Dehumidification lamp	Indicates that there is a demand for the unit to dehumidify.

High & low pressure switches are mounted on a cross bracket fitted inside the fridge box assemblies. Push the red button on each switch to reset.

**MODEL WITH LPHW FITTED (12V)**

The AA 300 with LPHW console has the same basic controls as the standard machine with the following additional controls:

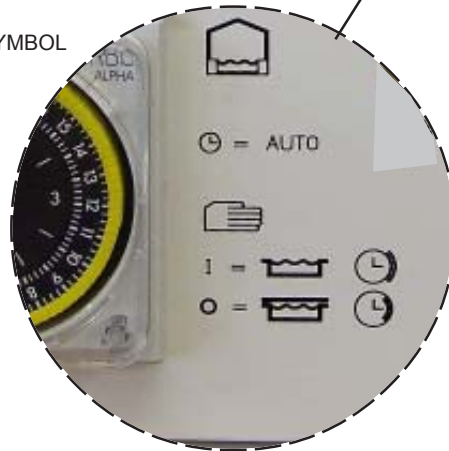


AIR TEMPERATURE  
DISPLAY AND 7. AIR  
HEATING LAMP

TIME  
CLOCK

CONSOLE AA300  
WHEN FITTED WITH LPHW

8. POOL HALL SYMBOL

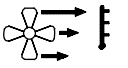


AUTO SYMBOL

9. MANUAL SYMBOL


10. OCCUPIED SYMBOL  
(no pool cover)


11. UNOCCUPIED SYMBOL  
(pool covered)

7  °C Air heating lamp Indicates that there is a demand for the unit to heat the pool hall air.

8  Pool hall symbol

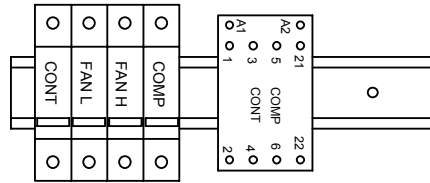
9  Manual override symbol

10 I =  Pool water occupied (no pool cover)

11 O =  Pool water unoccupied symbol (pool covered)

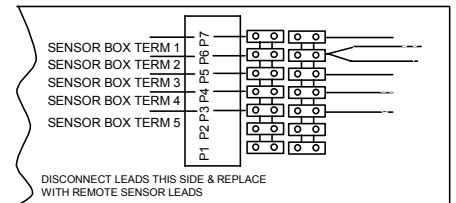
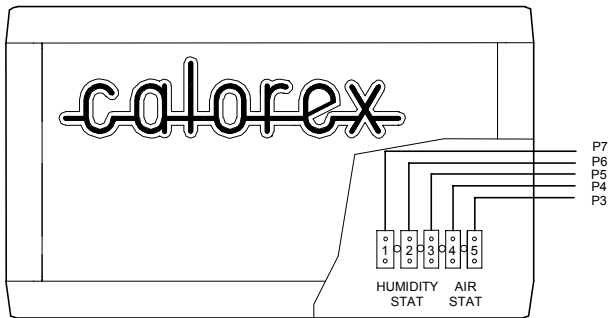
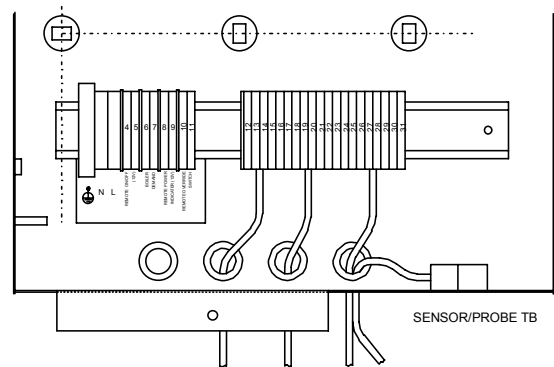
## OPTIONAL REMOTE SENSOR BOX

Isolate the Low Speed fan circuit breaker when the remote sensor box is fitted. (Marked FAN L). Position in electric box shown below. This stops the fan when there is no demand for humidity or air temperature control.



Disconnect wires to sensors at electric box terminals & run leads to sensor box & connect as shown use 0,5mm<sup>2</sup> cable up to 20 metres.

## SENSOR PLUG AND TERMINAL BLOCK



## 4.0 DATA SHEET

### AA300AVH(F)

MODEL:-		Units	AA300
AIR TEMPERATURE LIMITS	MINIMUM	°C	15
	MAXIMUM	°C	36
DEHUMIDIFICATION DUTY	VIA HEAT PUMP (30°C/60% rh)	litres/hr	3.6
HEAT TO AIR	VIA HEAT PUMP (MODE B):-	kW	4.4
	VIA LPHW @ 80°C :-	kW	7.3
	TOTAL :- (MODE B)	kW	9.8
RECOMMENDED BOILER CAPACITY (AA+LPHW)	RECOMMENDED BOILER CAPACITY	kW	7.3
	RECOMMENDED BOILER CAPACITY	Btu's/hr	25000
	FLOW RATE	l/min	10
	Pressure Drop @ Rated Flow	m/hd	2.9
	Max system working pressure	bar	6
ELECTRICAL	TOTAL POWER CONSUMED (nominal) :- 'F' & NON 'F'	kW	2
	MIN' SUPPLY CAPACITY (Max F.L.A.)	Amps	13
	MAX' SUPPLY FUSE 1 ph N:- 'F' & NON 'F'	Amps	20
MAIN FAN	AIR FLOW (anemometer @ air on filter, wet evaporator)	m³/hr	1300 ±10%
	MAX EXTERNAL STATIC PRESSURE:- NON 'F'	Pa	95
	MAX EXTERNAL STATIC PRESSURE:- 'F'	Pa	110
	DESIGN CONDITION Amps:-		
	1 ph N :- NON 'F'	Amps	1.04
1 ph N :- 'F'	Amps	1.5	
FLA:- 1 ph N:-	Amps	2.6	
COMPRESSOR	NOMINAL POWER CONSUMED:-	kW	1.9
	LRA:- 1 ph N:-	Amps	46
	RLA:- 1 ph N:-	Amps	8.6
	SOFT START Amps 1 ph N:-	Amps	24
GENERAL DATA	<b>Hermetic System</b>		
	GAS CHARGE (R407c)	kg	2.6
	LPHW battery volume	litres	1.15
PHYSICAL DIMENSIONS	WIDTH (Unpacked)	mm	730
	DEPTH (Unpacked)	mm	1025
	HEIGHT (Unpacked)	mm	850
	WEIGHT approx' (AA un-packed no options):-	kg	111
	NOISE LEVEL @ 1m	dBA	61

For accurate application sizing consult CALOREX Heat Pumps Ltd  
Boiler not required for AA versions without LPHW.

MODE B = recovered heat biased to pool hall air  
R407c Global warming potential (GWP) 1700.

1 mm WG = 9.8pa  
1 Mhd = 1.4psi  
1 L/min = 0.22 gall/min



## 6.0 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 any 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 heat pump has suffered frost damage.
7. The water pH level and/or chemical balance is outside the following limits:

Acidity pH	pH	7.2 - 7.8
Total Alkalinity, as CaCO <sub>3</sub>	ppm	80 - 120
Total Hardness, as CaCO <sub>3</sub>	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

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 in section 2.6.

### 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, model & serial number of your heat pump. A card will be sent to you for completion.

## 7.0 CONTACTING CALOREX

Email [service@calorex.com](mailto:service@calorex.com)

Web Site <http://www.calorex.com>

+44 (0)1621 857171



+44 (0)1621 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.

For details of extended warranty and maintenance packages please call the service department on the above number.

