

READ AND SAVE THESE INSTRUCTIONS



**MICROVAP**  
**Models CWL, CPE & CLMD**  
**Installation & Operation Manual**



Key to be removed from the door and retained by the maintenance engineer.

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## Important Installation Points

- Ensure at least 600mm (2 ft) clear side access to the electrical panel of the cabinet.
- Do not locate the cabinet where the ambient temperature around the unit could exceed 35°C e.g. an unventilated roof-mounted enclosure.
- Do not locate the cabinet where a ladder is required for service access as this could make servicing and cylinder exchange hazardous.
- Make sure steam line(s) have adequate slope (12 - 20%) for condensate drainage and use condensate separators if the pipe is lower than the unit.
- Provide adequate support to prevent sags developing in flexible steam lines which can fill with water and create a "trap".
- Do not locate vented drain directly under the cabinet.

## Important Electrical Connection Items

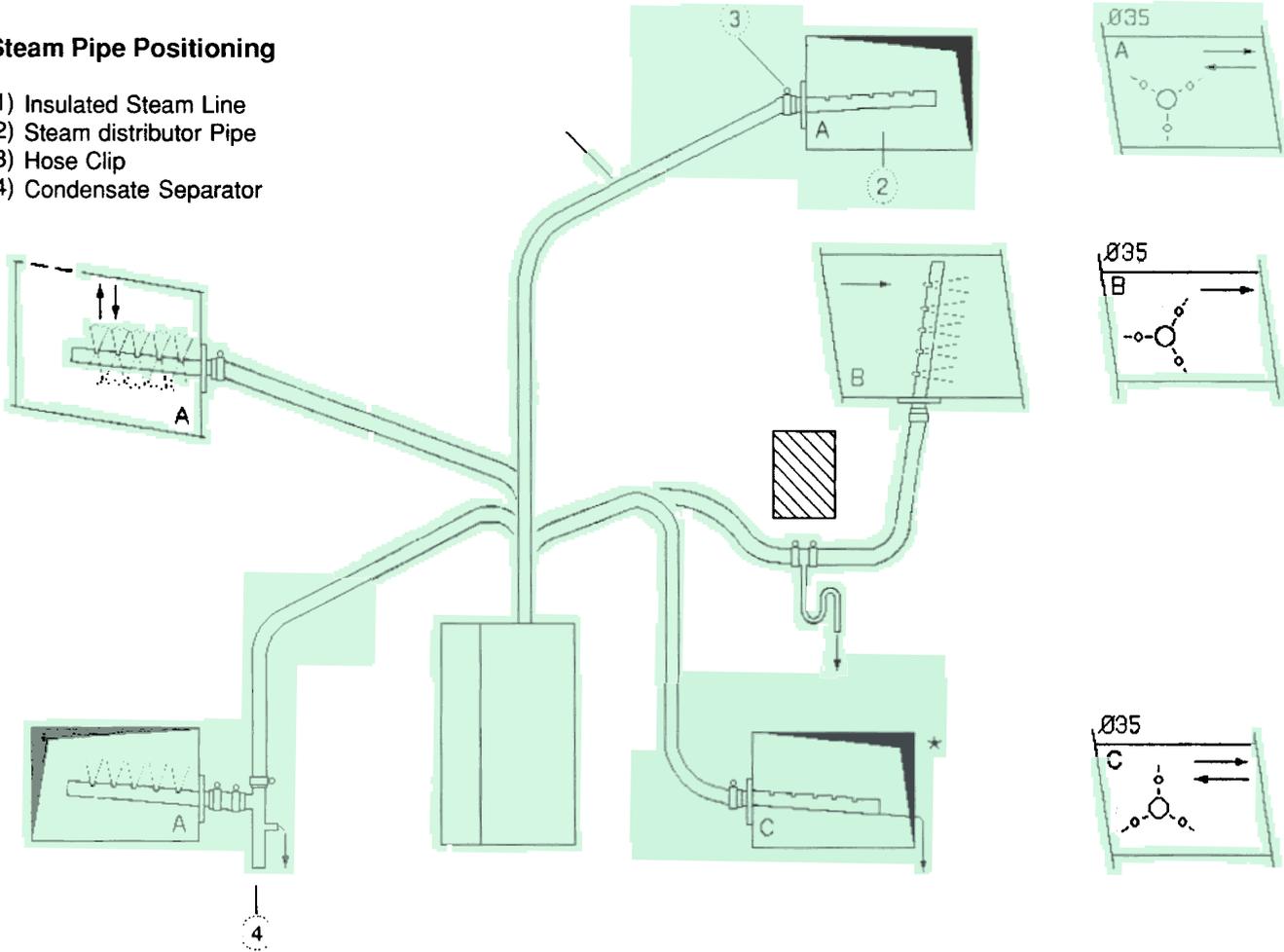
- Check that the transformer primary winding connection is correct for the supply Voltage at Vapac terminals 1 & 2.
- The Vapac transformer must not be used to power other equipment.
- Use a high-limit humidistat connected to Vapac terminals 9 & 10 to ensure positive interruption of unit operation when over-humidification is detected.





## Steam Pipe Positioning

- 1) Insulated Steam Line
- 2) Steam distributor Pipe
- 3) Hose Clip
- 4) Condensate Separator



### Note:

No horizontal runs  
No 90° elbows

\* **Ø 35mm steam pipe** must be rotated in its socket and have end cap M520076 with outlet Ø 6 (1/4") fitted.  
To fit end cap, saw off steam distributor pipe, use 2 hose clips and a short piece of Ø35 hose to attach end cap to pipe, butting it up to the sawn end.

\* **Ø 54mm steam pipe**: a non-standard pipe is required which has reverse slope and an end outlet Ø15mm.

Pipe in-duct length 650mm (26") - Pt No. M520078

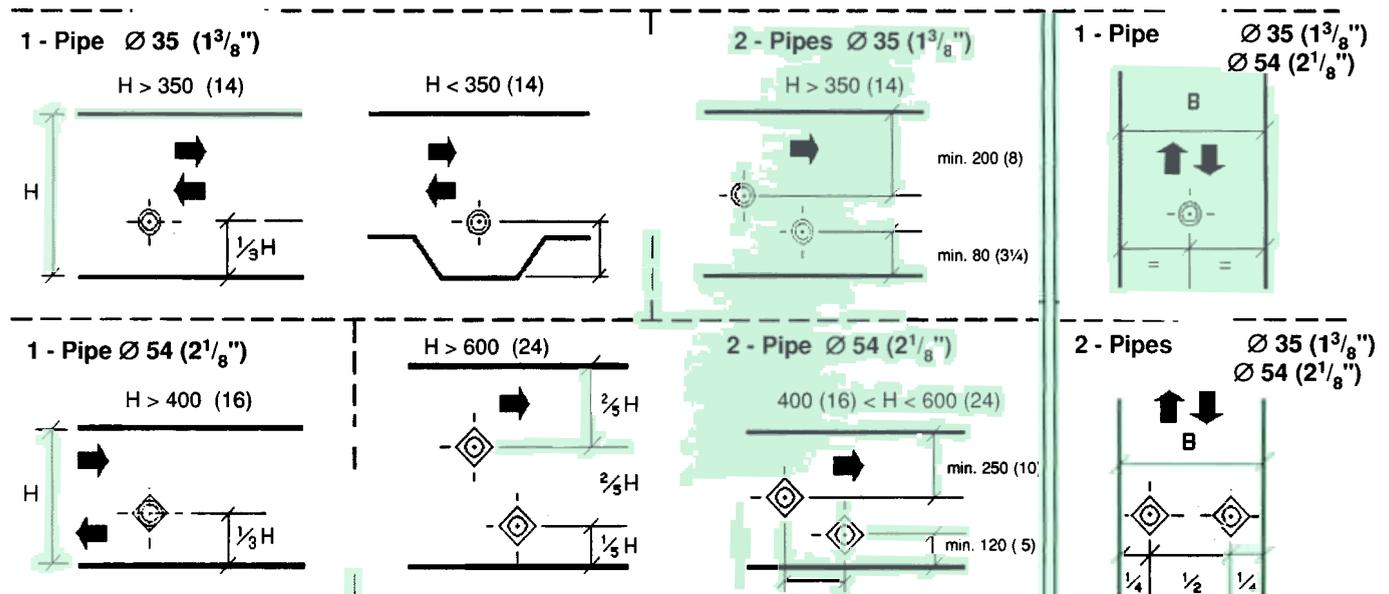
Pipe in-duct length 900mm (36") - Pt. No. M520079

Pipe in-duct length 1400mm (57") - Pt.No. M520080

## Mounting Positions for Steam Pipe(s)

Diameters 35mm (1 3/8") and 54mm (2 1/8")

Dimensions mm (inches)



# Steam Pipe Installation

## General positioning:

The position of the steam pipe in the air-conditioning system relative to other items - bends, filters, heat exchangers, etc., is critical and must be decided by the design engineer responsible for the project.

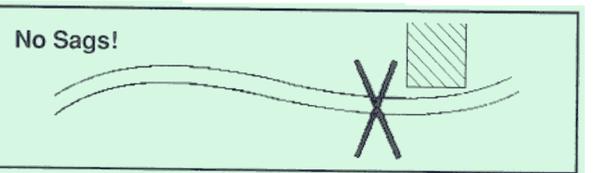
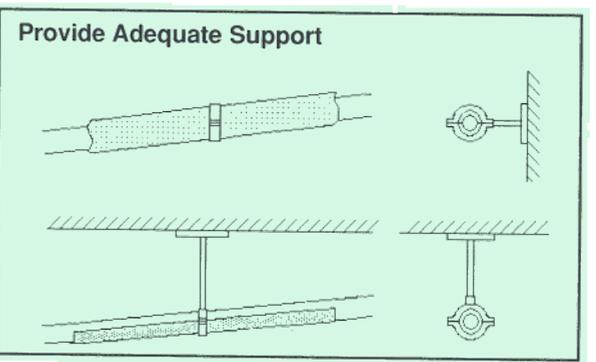
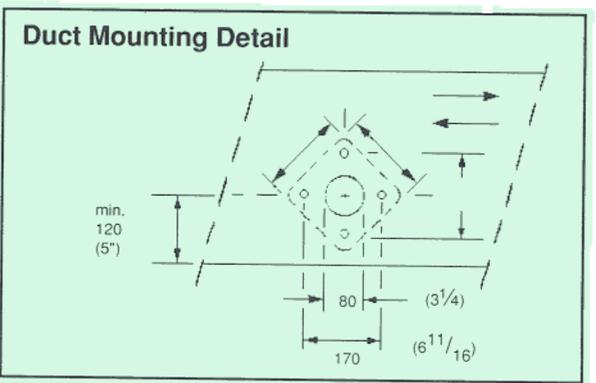
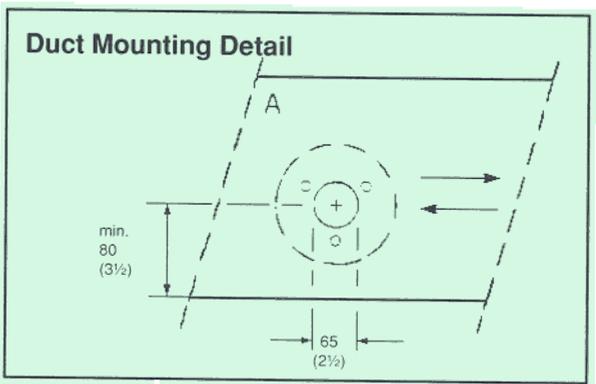
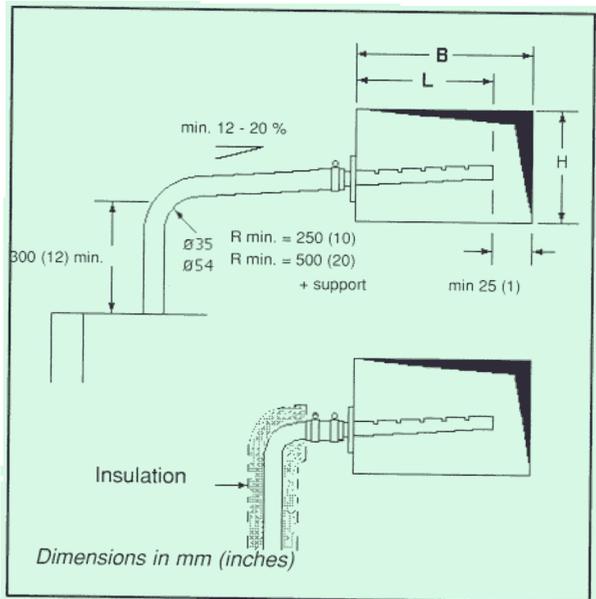
## DO's

- Do obtain project engineer's instruction/drawing for chosen location of pipe.
- Do obtain project engineer's instruction/drawing for pipe position relative to the top & bottom of the duct (or sides if airflow is vertical).
- Do check if alternative slope of Ø35mm (1<sup>3</sup>/<sub>8</sub>" ) pipe has been specified requiring rotation of pipe in its socket before installation.
- Do use bracket/lug on the end of Ø54mm (2<sup>1</sup>/<sub>8</sub>" ) pipes for extra support.

## Steam Hose Connection

### DO's

- Do use Vapac steam hose or well insulated copper pipe.
- Do keep steam hose as short as possible - under 2m (6ft) for max efficiency.
- Do arrange to have a vertical rise immediately over the unit of 300mm.
- Do use the full height available between unit and steam pipe to provide maximum slope (min 12-20% for condensate to drain back to the steam cylinder (or down to a condensate separator). Always provide a continuous slope.
- Do provide adequate support to prevent sagging.
  - (a) fit pipe clips every 30-50cm (10" - 20")
  - or(b) support straight lengths on cable trays or in heat resistant plastic pipe.
- Do use a Vapac condensate separator or simple trapped side pipe connection to drain off condensate from extended steam lines.
- Do ensure radius hose bends are fully supported to prevent kinks developing when in service.
- Do add extra insulation to steam hose for longer runs (2m-5m)(6ft -16ft) and in cold ambient conditions to avoid excess condensate and reduction in delivered output.



## DON'Ts

- Don't allow steam hose to develop kinks or sags.
- Don't include horizontal runs or 90° elbows in the steam line.

Dimensions in mm (inches) in tables below.

Steam Distributor Pipe requirement					
Microvap Model		CWL5 CWL9 CWL18 CPE5 CPE9 CPE18	CLMD5 CLMD9 CLMD18	CWL30 CWL45 CPE30 CPE45	CWL60 CWL90 CPE60 CPE90 CLMD30 CLMD45
Ø 35mm Pipe	No.	1	2	-	-
Ø 54mm Pipe	No.	-	-	1	2
*Duct Pressure	Pa.	+1000 (4" w.g.) -600 (2 1/4" w.g.)		+2000 (8" w.g.) -600 (2 1/4" w.g.)	

\* For systems with a duct pressure over +1000Pa (4"w.g.), it may be necessary to fit a suitably sized trap in the water feed line between the Vapac tundish and the feed/drain manifold to ensure water can enter the cylinder when it is empty.

Ø 35mm Pipe Selection	
Duct Width B (")	In-Duct Length L (")
330- 480 (13-19)	300 (12)
480- 635 (19 25)	450 (18)
635- 790 (25-31)	600 (24)
790- 940 (31-37)	750 (30)
940-1090 (37-43)	900 (36)
1090 -1245 (43-49)	1050 (42)

Ø 54mm Pipe selection		kg (lb)
Duct Width B (")	In-Duct Length L (")	
760-1020 (30-40)	650 (26)	1.8 (4)
1020-1520 (40-60)	900 (36)	2.2 (5)
1520 + (60+)	1400 (55)	3.2 (7)

## Plumbing - Cold Water Connections

### DO's

- Do connect only to normal town piped water supplies.
- Do install a stop-valve/shut-off valve and a strainer close to the unit.
- Do provide a water supply with sufficient pressure and pipe size to ensure an adequate flow rate to all units connected to the system.
- Do use the water connection with nylon nut provided.
- Do thoroughly flush through new pipework before connecting to the unit.

### DON'Ts

- Don't connect to a water supply that has been softened using a salt exchange system (sometimes called base exchange or ion exchange system).
- Don't connect to demineralized water supplies.
- Don't overtighten the water supply connection with a wrench or spanner - a nylon nut with washer is provided to allow a firm hand-tightening - if water seepage occurs, undo the nut to wipe the washer clean and then re-seat it.

## Plumbing - Drain Connection

### DO's

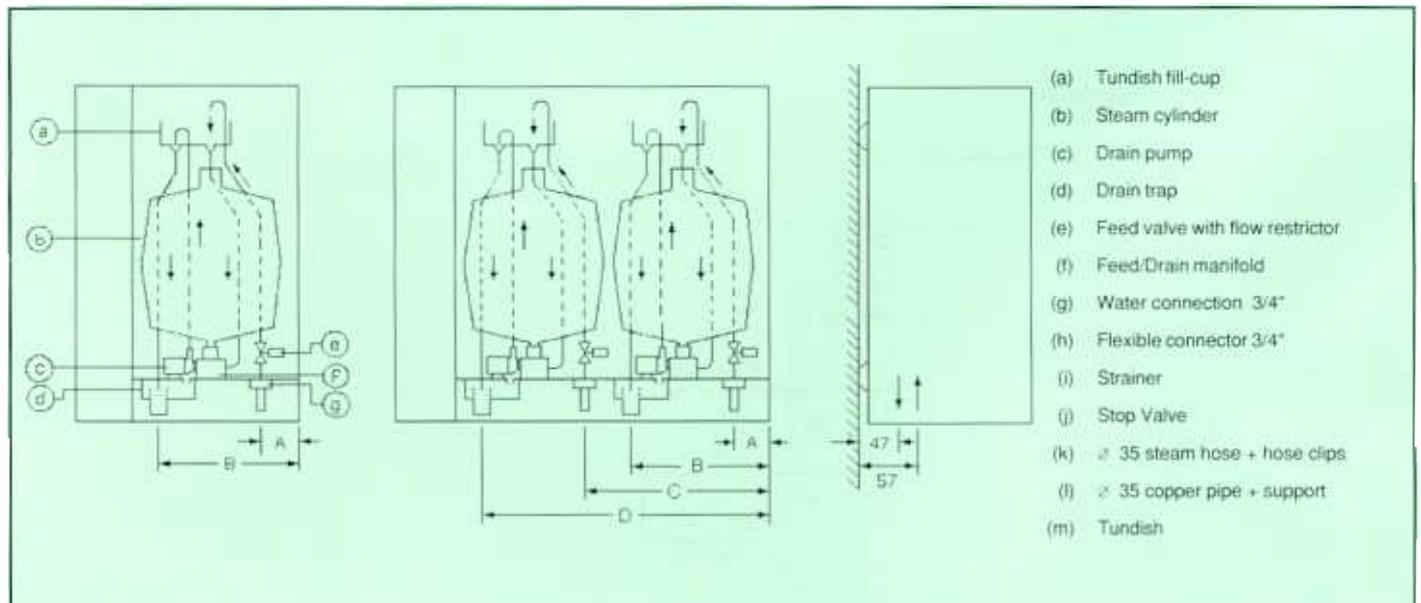
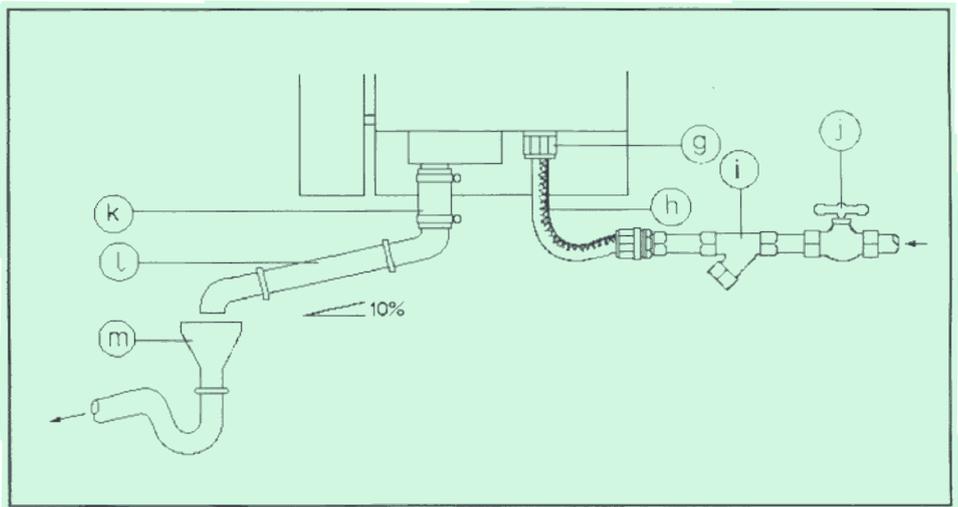
- Do use copper pipe or plastic pipe rated for 100°C (212°F).
- Do arrange to discharge drain water from the unit into a vented and trapped drain at a position where flash steam rising from the drain line vent will not pose a problem for the Vapac or other equipment.
- Do provide adequate fall for the drain pipework to allow free flow of water drained from each unit.

- Do ensure drain line pipe size will accommodate water being drained at the same time from all Vapac units which are connected to it.

### General

- Do ensure metal drain and supply water pipework is grounded electrically close to the unit (a ground/earth stud is provided on the underside of the cabinet).

Water Supply rates			
1/3 gal. / min (1,2 litres / min.)	CWL5	CPE5	
	CWL9	CPE9	
	CWL18	CPE18	
2/3 gal. / min (2,5 litres / min.)	CWL30	CPE30	CLMD5
	CWL45	CPE45	CLMD9
	CWL60	CPE60	CLMD18
1 1/3 gal. / min (5,0 litres / min.)	CWL90	CPE90	CLMD30
			CLMD45
Drain capacity per cylinder (= pump flow) max. 1 1/2 gal./min (6 litres/min)			
Water Quality: Hardness: 3-30 gr/gal. (50 - 500 ppm) Conductivity: 80 - 1000 µS/cm Water Pressure : 15-120 psig			



Dimensions in mm (inches approx.)

Microvap Model	CWL5 CPE5	CWL9 CPE9	CWL18 CPE18	CWL30 CPE30	CWL45 CPE45	CWL60 CPE60	CWL90 CPE90	CLMD5 CLMD9	CLMD18	CLMD30	CLMD45
A	58 (2¼)	58 (2¼)	79 (3)	133 (5¼)	133 (5¼)	193 (7½)	118 (4¾)	67 (2)	88 (3½)	118 (4¾)	118 (4¾)
B	177 (7)	177 (7)	198 (7¾)	252 (10)	252 (10)	312 (12¼)	237 (9¼)	187 (7½)	209 (8¼)	237 (9¼)	237 (9¼)
C	-	-	-	-	-	-	468 (18½)	283 (11¼)	353 (14)	468 (18½)	468 (18½)
D	-	-	-	-	-	-	587 (23)	403 (16)	474 (18¾)	587 (23)	587 (23)



## Electrical Connections

### IMPORTANT

This unit may be wired to suit connection to alternative site Voltages.

Make the following simple checks before connecting the power supply.

Move the RED connection on the Microvap transformer primary winding circuit to the position that is marked with the supply Voltage which is to be connected between Microvap power terminals 1 and 2.

The transformer primary circuit terminal positions are clearly marked 208V, 240V, 480V, 600V.

### Microvap Internal Circuit Fusing

#### Note:

- a) 24 V a.c. Control circuit - 3.15 A 20 mm anti-surge fuse (Pt.No. 1080096) mounted on Microvap PCB (Pt.No.1150613).
- b) 8 V a.c. PCB Circuit - 500 mA 20 mm fuse (Pt No. 1080054) mounted on the Microvap PCB (Pt, No. 1150613).

## Power Supply Connection

### Electrical Connections

The wiring to the Vapac should be done by a qualified electrician and the external overcurrent protection and wiring should comply with the appropriate Regulations and Codes of Practice.

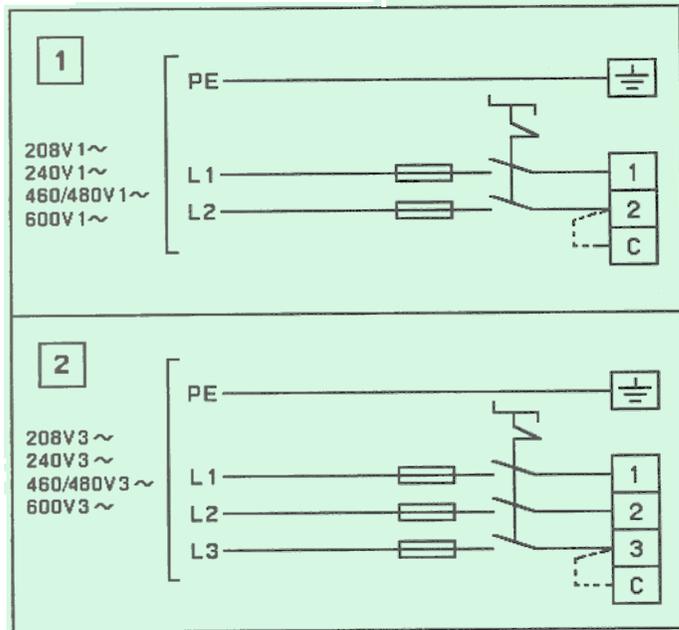
**Important:** Make sure the connection to the primary Voltage winding of the Vapac transformer matches the supply Voltage which is to be connected between Vapac terminals 1 & 2.

A fused disconnect/isolator or MCB should be used to disconnect the supply from all electrodes simultaneously. This must be sized to suit the total maximum phase/line current of the unit and should be located adjacent to the Vapac cabinet or within easy reach and readily accessible.

In Vapac Microvap units terminals 1, 2 and 3 are for the power supply connections as indicated in the diagrams below.

Connection to terminal C is only necessary when a Vapac RDU (Room Distribution Unit) is fitted.

Twin cylinder models have terminals for the connection of two power supply input circuits to allow individual external protection of each steam cylinder. Fused disconnect/isolator or MCB provision must be linked to ensure both 3 phase supply inputs are disconnected simultaneously.



### Cable Entry Provision

Cable glands must be used to ensure cables are held securely at the entry position. Smaller Vapac cabinets (sizes 1, 2 and 3) include a cable gland fitted for power supply connection. Large Vapac cabinets (sizes 4, 5 & 6) are equipped with a removable gland-plate. The installing electrician should remove this and take it to a workbench to drill for the required cable gland size.

### Vapac 24V Control Circuit Transformer

The internal control circuit of the Vapac unit is operated at 24Vac. As standard the Vapac Microvap includes a 24V transformer with alternative primary winding options 208V, 240V, 480V, 600V and requires on site adjustment to match it to the voltage connected to Vapac terminals 1 and 2.

The 24V/8V transformer provides power for the 8V circuit on the Microvap 1150613 PCB.

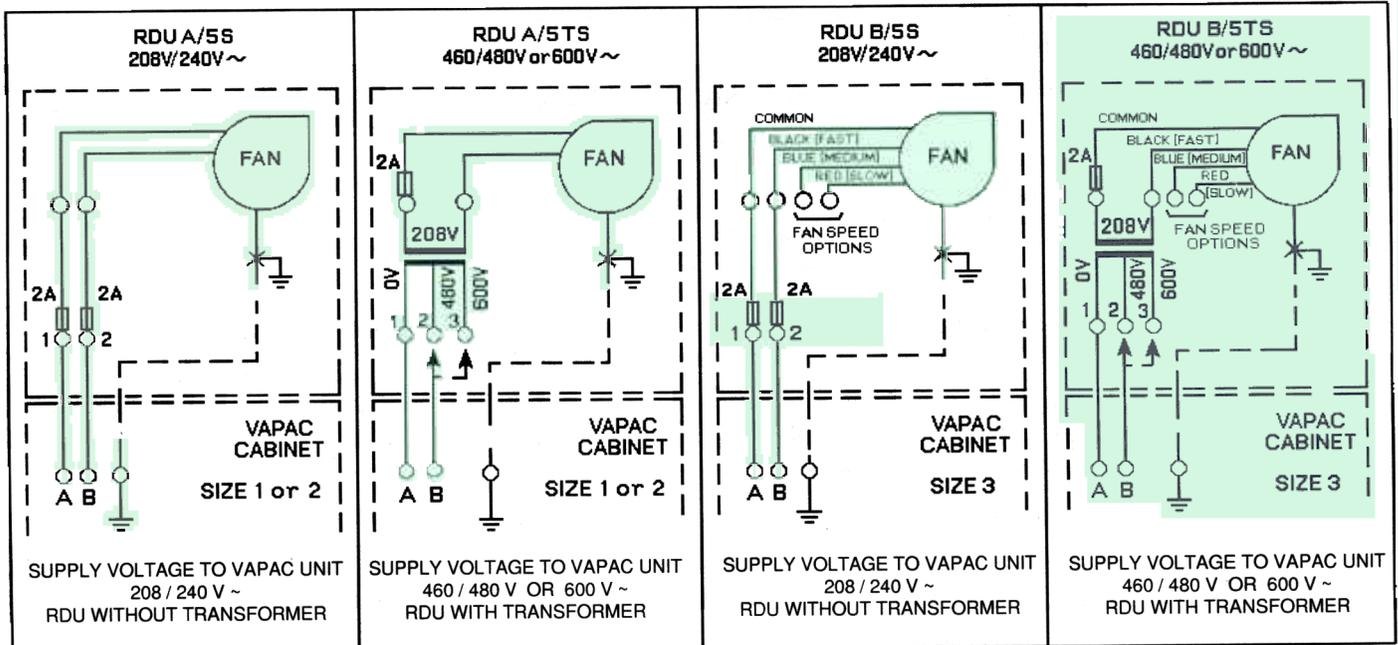
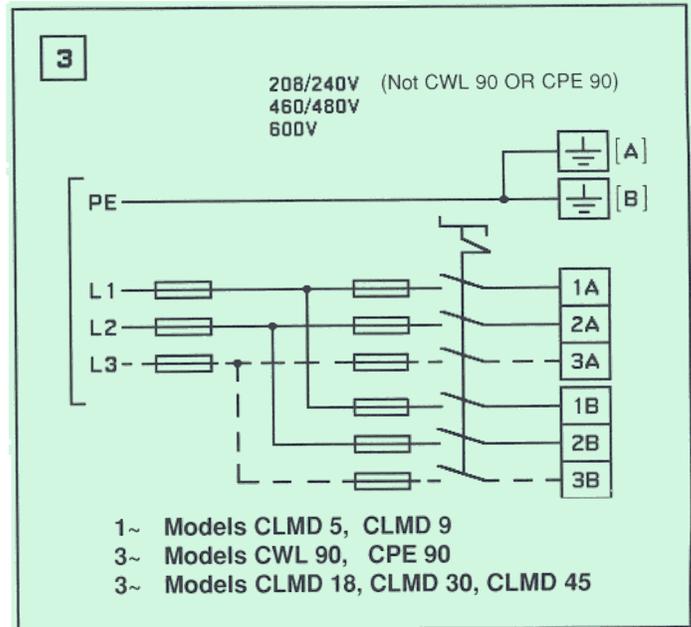
**Important:** The Vapac transformer must **NOT** be used to power other equipment or the warranty will be invalidated.

### RDU Connection

Vapac terminals A and B are included to provide 208V or 240Vac electrical supply for the fan motor in the RDU (Room Distribution Unit).

Note:

The 208V or 240Vac at terminals A and B is derived from the incoming electrical supply to the Vapac. If the local supply is 480V or 600V, it will be necessary for a transformer to be fitted for the RDU fan motor supply.





## Control Circuit Connections

### Control Circuit Wiring

Use a dedicated, earthed metal conduit for both the control signal cable and the security circuit cables; sharing the same conduit if practicable.

Use screened cable for all control and security circuit connections to minimise risk of electrical interference. The screen should be grounded at the Microvap end only.

### Proportional Control

The microvap models WL, PE and LMD can all be operated by either a potentiometric signal or by one of 6 standard proprietary DC analogue signals.

Microvap Response:

- WL Models 20-100%
- PE Models 8-100%
- LMD Models 8-100% with required output maintained while one cylinder is draining.

### Control Signal Selection

Selection of the control signal is done as part of the initial set-up procedure using the keypad display. For confirmation that the signal has been selected, view the information window.

### On/Off Control

The Microvap Model WL can be operated by a single step humidistat which has Volt-free contacts - select control option POT.

### Security Circuit

The terminals 9 & 10 provided by Vapac for connection of high limit humidistat, airflow switch and/or fan interlock carry the 24V internal control Voltage for the Vapac unit. The wires and components connected to these terminals must not produce any appreciable reduction in the Vapac 24V supply.

**Note:** Use of the 24V supply of the Microvap unit to power other items of equipment will invalidate the Vapac warranty.

### Remote Indication

Ancillary item FVKIT-96 is available to provide a remote indication of 'unit-on' signal and a fault warning. Both the 'unit-on' indication and the fault warning have the option of either normally-open or normally-closed Volt-free contacts.

The Microvap provides the fault warning as either:

- a) a continuous signal for low-output condition with an adjustable time-delay, max. 240 minutes (normal setting).
- b) an immediate 'flashing' signal for unit 'Stop' condition.

**Note:** For computerised building management systems, using the keypad, the 'flashing' signal can be changed to continuous to avoid unwanted print-outs.

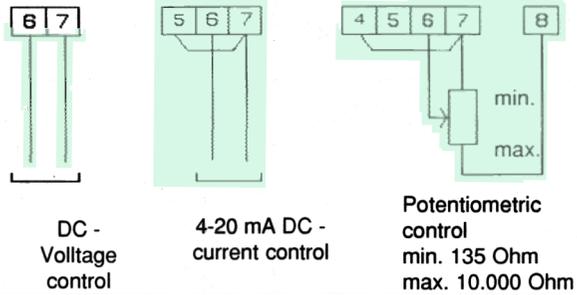
### Master/Slave System

For larger duties, Microvap PE & WL units can be interconnected and arranged to operate from one proportional signal by the Master/Slave system. The system allows up to 7 cylinders to be linked in this way. The slave units will all be type WL units. The master unit, to which the proportional signal is connected will be a type PE unit with Varivap control.

### Master/Slave Connection Options:

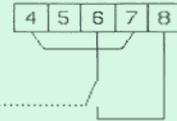
1. If any two units are installed more than 3m (10ft) apart then ancillary item **FVKIT-83** (includes PCB 1150607) is required for **each** unit involved - see diagram opposite.
2. If any two of the units are installed less than 3m (10ft) apart the interconnection can be made using a local link **M540176** only instead of 2 x FVKIT-83.

### Proportional control



### On/Off control

Hygrostat with Volt-free contacts  
(max. resistance of external connection 100 Ohm)



### Security circuit (only)

Fan interlock.....

Airflow switch.....

High-limit hygrostat.....

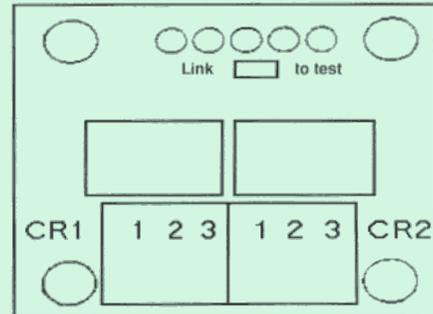


### important:

1. With security circuit components connected between terminals 9 & 10, there must be no effective Voltage drop across these terminals.
2. Never use Vapac terminals 9 & 10 as part of the normal system to control the operation of the unit. Reason: repeated switching of connection 9 & 10 will cause the cylinder to be emptied.

### Remote Indication

- Unit On / Alarm Relay PCB 1150614 (FVKIT-96)



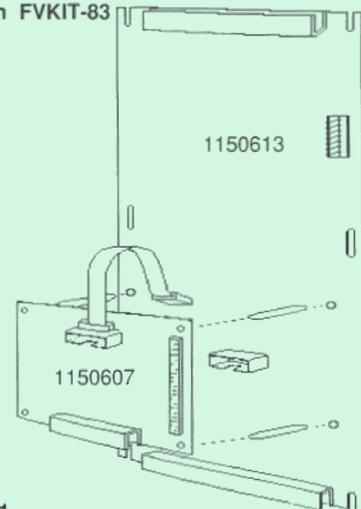
### Master/Slave-System

M540176

Microvap PCB 1150613  
with FVKIT-83



2.



1.

## Microvap 1150613 PCB as an RH controller

### Vapac Sensing Head SH2

Wall mounted FVKit-107  
Duct mounted FVKit-108

PCB 1150613 with Version 2 or later software installed can function as an RH controller with Vapac Sensing Head SH2 connected.

Version 2 or later systems are identifiable by the presence in the Set-Up procedure of this window :-



(Note: Key position 1 of this window is not used - it relates to Vapac Sensing Head SH1 which has been discontinued.)

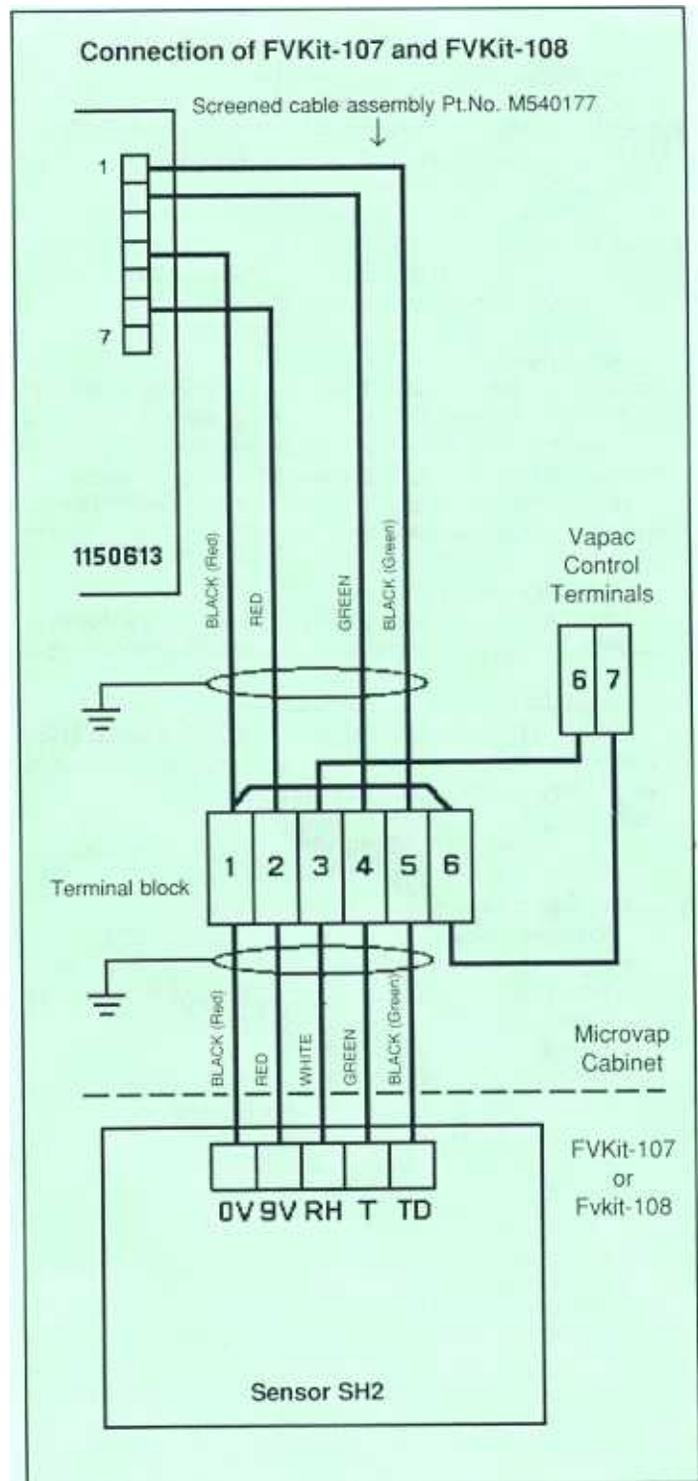
**Select 2** when Vapac sensing Head SH2 is connected.

**Select 4** when PCB 1150613 is not being used as a humidity controller i.e. when another make of humidity controller is being used.

When 2 is selected this window is displayed:



The display will then scroll the standard signal options - select **0-5V for SH2 sensor**.



### Microvap 1150613 PCB as an RH controller working with other makes of Sensing Head

The 1150613 PCB can also be used as a humidity controller with transmitters/sensors made by other companies provided:

- their control signal is either 0-5V, 0-10V, 0-20V, 2-10V, 1-18V, or 4-20mA
- their power source is completely independent of the Microvap.
- the PCB is fitted with the "Version 2" or later system showing the Set-Up window identified above for SH2.

**Select 2** when "SELECT CONTROL" window shows and then select one of the options listed in a).

Vapac Control Terminals



Signal from proprietary make of transmitter/sensor

### Start-up check list

**a) Water Supply and Drain Connections:**

These should be connected as indicated under Plumbing and in accordance with the relevant local regulations. An isolation valve should be adjacent to the unit. The connecting metal plumbing must be grounded close to the unit.

**b) Steam Line:**

This must be connected according to the installation instructions with adequate slope and support.

**c) Power supply:**

Wiring to the Microvap unit should be by a qualified electrician and comply with the relevant regulations using appropriately sized cable and cable glands, with disconnect and fuses to suit the maximum fuse rating of the unit at the supply Voltage. The disconnect/fuses should be adjacent to the unit or within easy reach and readily accessible.

**d) Control Connections:**

Ensure the control signal and security circuit are correctly connected according to the relevant instructions/diagrams.

**e) Microvap 24V Control Circuit Transformer:**

The standard 24V transformer used in the units has primary winding for 208V, 240V, 480V & 600V 50/60Hz connection derived from the local electrical supply.

**Note:** 50Hz connection must be specified with order as 24V 50Hz pump is required for units above 16 kg/h (35lb/h) output.

**f) Output Setting:**

The maximum output & kW of a WL, PE or LMD unit is determined by the current set plug (CSP) mounted on the Microvap controller. The CSP covers a band of Voltages and adjustment in the CSP value is made automatically when the Voltage is selected in the Set-Up procedure.

CSPs for Voltage band 208-240V have a white label.

CSPs for the Voltage band 460V / 480V have a blue label.

CSPs for Voltage band 600V have a red label.

Marking on the label will relate to the unit model reference and to the number of electrodes (red caps) in the cylinder.

**Example:**

For a CWL18 at 460V or 480V the CSP will have a blue label marked 18/3. (The CSP labels for a CWL & CPE 90 will carry marking 45/6.) Where a unit is designed for connection to either of two Voltage bands e.g. 208/240V 1 phase or 460/480V 1 phase there will be a CSP with a white label for the Voltage band 208-240V and a CSP with a blue label for the Voltage band 460-480V (or a red label in the case of the 600V band).

**Important:** Ensure the Voltage band of the CSP matches the Voltage which is selected in the Set-Up procedure.

**g) Output adjustment:**

An output reduction window for adjustment from 100% down to 50% is available in the Adjust menu of the keypad display once the Set-up procedure is complete.

**Note:** If a maximum kW has been strictly specified which is less than the maximum in the Electrical data, then an alternative CSP will be needed and this should be checked before connecting power to the unit.

## Start-Up Instructions

**First check:**

**Transformer connection matches supply Voltage.**

**Security circuit is closed for unit operation.**

Replace the electrical access panel.

Turn on the water supply to the unit.

Close disconnect/circuit breaker feeding supply to the unit.

Close the On/Off switch.

The display will now show the Set-Up Procedure.

Press a key to start the Set-Up Procedure.

Follow the procedure by:

- selecting: the preferred language,
- indicating: if the unit is an LMD model, or a single cylinder unit, or a Master/Slave combination of units,
- nominating: the number of electrodes,
- nominating: the control signal (or Vapac sensor when being used),
- nominating: the supply Voltage.

When the Voltage has been nominated, the Set-Up will be entered into the memory. The set-Up can then be checked by reading the Information menu. If an error has been made, it will be necessary to go to the Adjust menu and use the "Revise Set-Up" window.

### Commissioning/Start-Up

Once the set-Up procedure has been completed, the unit is available to operate according to the requirements of the control signal.

When starting with an empty cylinder, the Microvap programme feeds water in stages until the output current is reached or the water reaches the water level electrode. In this case the current flowing between the electrodes will heat the water to produce steam and more water will progressively be added bringing in more minerals until the electrical conductivity required for the output is reached.

Thereafter the Microvap system will continuously monitor and control the conductivity by adjusting the amount of water drained and fed into the cylinder.

### Features of Microvap WL, PE and LMD operation

The Microvap system of control is designed to adjust the function to keep the unit operating in the face of changing water quality in the cylinder and changing electrode condition even if, in an adverse operational circumstance, this results in some reduction in output while the situation exists.

#### Foaming protection

In particular, the Microvap is designed to detect the onset of foaming and to introduce corrective drainages to combat it and keep the unit working.

#### Overcurrent protection

As protection against overcurrent the Microvap has two levels of response. When the current level 110% is reached, water is drained until the current level is 100%. Above 110% there is a second level of response which introduces corrective drainages. If the current level remains high the unit will be switched-off automatically.

#### Automatic switch-off

The Microvap PCB will stop operating in response to extreme fault conditions identified as:

High Overcurrent STOP

Drain Fault STOP (no drain function)

Feed Fault STOP (water not reaching cylinder)

In each case the display will show the STOP condition and a Help Message, the red lamp on the fascia will flash and this warning signal will be available for remote indication. The STOP condition of a Microvap PCB will be cleared by switching the unit off and on.

#### End of Cylinder Life

The steam cylinder needs to be exchanged for a new one when the output of the unit is excessively reduced by the build-up of scale deposits. This condition will be indicated by the red lamp on the fascia and a display message.

## Earth Leakage Protection

The standard programme for models **WL** and **PE** disconnects power from the electrodes when the unit is draining, both for normal operational drainage and "fault correction" drainage. During these drain cycles, steam generation is interrupted and this could cause humidity levels to be affected. If this is a problem, as an alternative and subject to on-site agreement / leakage-breaker provision / regulations, the engineer has the option in the Set-Up Procedure to limit power disconnection to the "fault correction" drainage only.

## The LMD Option

If the normal dilution drainage is likely to disrupt the space RH, then the **Microvap LMD** model should be considered, especially in critical close control and high moisture difference applications. In this connection, where a single cylinder PE model has been supplied, an LMD equivalent can be achieved by adding a second PE unit of the same size and linking the two with two Microvap communication kits FVKIT-83. The Set-Up in this case would involve switching on both units and following the procedure outlined for an LMD model.

### **Explanatory Note:- Drainage of an LMD system.**

*In normal operation, when one LMD cylinder is draining, the demand on the other cylinder is increased to compensate and so maintain the output. The second cylinder is then not allowed to drain until the first one has recovered to the 100% current level. However, a fault correction drainage must be allowed to take place, even if the other cylinder is already in a drainage cycle.*

## Alpha-Numeric Keypad Display

The alpha-numeric keypad display of a Microvap model WL, PE or LMD provides the means for the initial setting-up of the units. The display also provides system operating information and enables certain parameters to be changed to suit specific requirements. The initial display sequence covers the set-Up Procedure for the unit or the number of units on the system.

For further information refer to the microvap Alpha-Numeric Display Operating Instructions supplied with each unit.



## Preliminary Information Required

Before commencing the Set-Up Procedure, the user needs to know the following details about the installation:

Is the unit an LMD-Model?.....

Yes / No

If NO, is it a single cylinder unit?.....

Yes / No

If NO, how many cylinders on the system?...

Master / Slave system maximum is 7 cylinders.

Are there any Twin Cylinder units?.....

i.e. models CWL90-H or CPE90-H

How many power electrodes in each cylinder? .....

CWL / CPE / CLMD 5.....	2 per Cylinder
CWL / CPE / CLMD 9.....	2 per Cylinder
CWL / CPE / CLMD 18.....	3 per Cylinder
CWL 30-H.....	3 per Cylinder
CWL / CPE / CLMD 45-H.....	6 per Cylinder
CWL / CPE 60-H.....	6 per Cylinder
CWL / CPE 90-H.....	6 per Cylinder
CWL / CPE / CLMD 30-L.....	6 per Cylinder
CWL / CPE 60-L.....	12 per Cylinder

Is the control by a Vapac Sensing Head?.....

For SH2 supplied as FVKIT-107 or FVKIT-108 press 2 (0-5V)

If NO, which of these control signals is being used?.....

0-5V, 0-10V, 0-20V, 2-10V, 1-18V, 4-20mA  
Potentiometer (min.135 Ohms, max. 10000 Ohms)

What is the electrical supply Voltage?.....

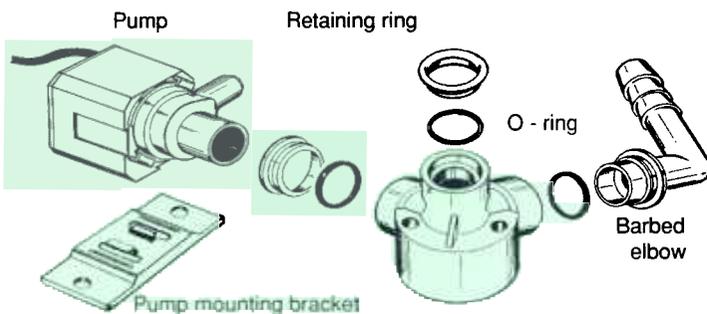
Exact measured Voltage can be entered.

## Cylinder Life

The water hardness and the humidity demand at site will determine the effective life of a steam cylinder. Units located in areas with naturally soft waters will experience the longer cylinder life, possibly upwards of 12 months in calendar terms. With hard waters, a more frequent cylinder exchange must be expected and cylinder exchange 2 or 3 times a year can be the average situation. The normal scaling up of the Vapac steam cylinder is outside the Vapac warranty.

## Procedure for Cylinder Exchange

- With power connected to the unit and the Vapac On/Off switch in the off position, operate the Manual Drain switch and empty the steam cylinder.
  - Disconnect the Vapac from the incoming electrical supply by means of the external disconnect switch.
  - Remove the lockable door to the cylinder chamber and carefully ease off the red electrode caps and the white electrode cap.
  - Loosen the hose clip and disconnect the hose from the top of the steam cylinder.
  - Using a twisting movement, lift the cylinder clear of its seating in the feed/drain manifold and carefully remove the used cylinder from the unit.
  - Inspect the feed/drain manifold to ensure this is clear of sediment.
  - The small drain pump can be removed for inspection/cleaning, by applying steady hand pressure on its inlet housing to ease it back on its mounting and to release it from its 'O' ring connection in the side of the feed/drain manifold.
- The diagram shows the assembly arrangement of the feed/drain manifold and pump. The pump motor body is a sliding fit onto its mounting plate.



- With the pump back in position after cleaning, insert the cylinder into the feed / drain manifold, pushing it down firmly, and reconnect the steam hose.
- The electrode caps must be reconnected in the same sequence in accordance with the details on the collar supplied with the new cylinder.
- The Vapac unit is supplied with electrode cables routed to avoid contact with the removable door. After a cylinder exchange, it is important to replace the cables as close as possible to their original route.

## Vapac Cleanable cylinders

Cleanable versions of the Vapac cylinders are available which can be opened to allow removal of loose scale deposit. The cylinder designs are the same but instead of a welded joint, the two parts are brought together by a seal and two clamping rings with quick-release fasteners.

To order the equivalent cleanable cylinder use the same code but substitute the letters **CC** instead of **CM** or **CD**.

When servicing a cleanable cylinder take it to a service area where it is convenient to open it and to dispose of the contents. When cleaning out loose material also remove any build-up on the end of the short "cylinderfull" electrode. Make sure the slotted strainer is clean, intact and in place. When re-assembling use a new seal and make sure mating surfaces are free of scale particles as they will prevent perfect sealing and cause leaks.

## Service and Maintenance

As the operation of the Vapac is entirely automatic, it normally requires no attention on a day-to-day basis. General cleaning and maintenance of the component parts of the Vapac are recommended at intervals of about one year, but this is largely dependent upon the frequency of its use and the quality of the water supply. Where the Vapac is part of an air-conditioning system being serviced regularly, the Vapac should be inspected at the same time.

## Steam and Condensate Hoses

The hoses used with and in the Vapac should be inspected at the normal service visits as part of normal maintenance. At the first signs of deterioration, a hose should be removed and replaced.

## Feed Valve with Strainer

The nylon bodied solenoid valve incorporates a small nylon strainer which is a push fit in the 3/4" inlet of the valve. With a new plumbing installation, residual loose solid material in the pipework could partially block the strainer after start-up. If for this or any other reason a restriction of the water flow is suspected (outside of supply pressure considerations), it would be possible to clean the strainer as follows:-

Turn off the water supply to the Unit.  
Undo the nylon nut connecting the flexible connection to the valve inlet.

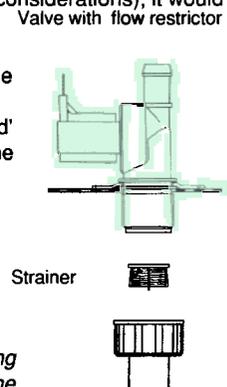
The strainer can be removed using 'long-nosed' pliers to grip the centre flange provided on the strainer for this purpose.

Withdraw the strainer.

Wash and replace it.

Reconnect and turn on water supply.

Reconnect electrical supply to allow unit to operate.



*Note: Always replace the strainer after cleaning as it is required to prevent material lodging in the valve seat or blocking the small flow control restrictor which is fitted in the valve.*

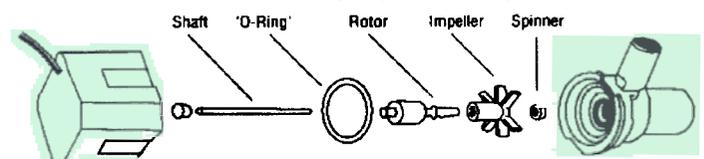
3/4 Nylon nut with washer as part of flexible connector

## Drain Pump

**The pump should be inspected and cleaned regularly.** It is recommended that this be done at each cylinder exchange especially in hard water areas. **Failure to keep the pump clear and operational will result in reduced cylinder life.**

To remove the pump for maintenance purposes proceed as follows:

- Depress and hold the manual drain switch to empty the cylinder. The pump 'sound' changes distinctly once the cylinder is empty. When this occurs release the switch.
- Disconnect unit electrical supply and follow the cylinder exchange procedure.
- If, due to an electrical or mechanical fault, the cylinder cannot be emptied by the pump, it will be possible to drain most of the water into a bucket by disconnecting and lowering the top end of the tube which feeds cold water to the cylinder from the fill-cup. The remaining cold water will run into the base tray when the pump is withdrawn from its 'O' ring connection and/or the cylinder is lifted out.
- Ease the pump free of the feed/drain manifold 'O' ring connection, slide it fully off its base plate and release the connecting tube.
- To dismantle and re-assemble pump refer to diagram below.



- In operation the stainless steel shaft remains stationary while the rotor and impeller rotate on it. Remove all scale build-up on the shaft so that the impeller can rotate freely.
- Ensure that the 'O' ring seal is correctly positioned when fitting the inlet housing to the main pump motor body. **When re-assembling, make sure the brass spinner is replaced on the shaft in front of the impeller.** A smear of multipurpose grease should be applied to the 'O' ring so that the impeller housing can be rotated into position without distorting the 'O' ring underneath it and so maintain the water seal.

# Trouble-shooting Check List

Preliminary

- Use manual drain option to check pump operation

## Check/Cause/Remedy



### Symptom

Power-On Neon -Off

Symbol-LED - Off

Display - Blank

- Check main power is connected and switched on.
- Check power supply fuses.

Power-On Neon -On

Symbol-LED - Red (Green for earlier units)

Display - Blank

- If unit is a CWL5, CWL9, CPE5, CPE9, CLMD5 or CLMD9 and power supply is 208/240V, check that transformer connection has been moved from 460/480V to the 208/240V position.

- Check security circuit is open circuit.

- Check 24V 3.15A fuse mounted at top of Microvap controller PCB 1150613

Power-On Neon - On

Symbol-LED - Red

Display - Low Output Message

- Slow start-up with a new cylinder. Red LED comes on after an initial delay and remains on until unit reaches 60% of current rating.

- Low conductivity (soft) water. Add Alka Seltzer or similar to boost conductivity level.

If above action is not successful, an alternative lower resistance cylinder may be necessary.

Power-On Neon - On

Symbol-LED - Red

Display - Cylinder Change Message

- Indicates cylinder has dropped below 60% output and cylinder change reference period has lapsed.

- Remove cylinder for rinsing out and re-use or fit a new replacement.

## AutomaticSTOP - Feed Fault indicated on the Display



### Possibilities

Water is not connected

Water connected but not reaching cylinder

Water in cylinder and overflowing but no power to the electrodes

Water in cylinder and overflowing with power to the electrodes

### Checks

- check water stop valve is open.
- check internal Vapac hose connections for a leak.
- check contactor function.
- check if Microvap PCB is switching contactor.
- check water level sensing components/circuit connections:

1. Water level electrode in the cylinder
2. White electrode cap
3. Level Sense Isolator PCB 1150594
4. Connections to the Level Sense Isolator
5. Connections onto the Microvap controller PCB 1150613
6. Microvap Controller PCB

## Automatic STOP - Overcurrent or drain Fault indicated on the display

### Possibilities

Water has become too overconcentrated

Salt-treated water connected

Drain pump function impaired

### Check

- Drain cylinder to remove overconcentrated water and re-start.
- Fully salt-treated water should not be used. Use normal town supply or try a blend of town supply and the salt-treated water.
- If pump will not function, empty cylinder by disconnecting at the tundish fill-cup the water supply hose to cylinder and draining water into a bucket. Remove, dismantle and clean pump.



### Important

Equipment needed

Procedure

### Specialised check of the Solid State Relay

- The following check should be carried out by a competent electrician.
- An AC Voltmeter, multi-meter set to full AC line voltage or suitable voltage test instrument.
- Remove access panels from both steam cylinder and electrical compartments.
- Ensure humidifier has an operational level of water in the cylinder. Switch unit on and check that the display indicates "Vapac on line".
- Apply the voltmeter, set to the full line Voltage, across the output terminals of the SSR being tested (i.e. to the two terminals carrying the cabling to the electrodes).

Correct Voltmeter Response - oscillating between full and near zero Voltage.

If Voltmeter reads a constant near zero Volts, check:

- (a) that the unit is not feeding water - if it is, wait until the feed valve closes and then re-check. (reason: the SSR will hold closed while the feed valve is open.)
  - (b) that the control PCB is giving the correct pulsed D.C. signal (approx. 5 V D.C.) to the SSR control input terminals.
- A faulty SSR should be replaced with an SSR of the same (or higher) Voltage and Amperage rating.
  - Disconnect unit from the electrical supply.
  - Disconnect the SSR and undo the mounting screws.
  - The SSR is bedded on a thermal gasket to assist heat transfer. This must be reused or replaced when the replacement SSR is secured in position.
  - Reconnect the SSR, reconnect the electrical supply and check the SSR function as above before replacing the access panels.

**Note:** Use a proprietary thread locking compound on line voltage terminals of the SSR's.

SSR Replacement



*Vapac Humidity Control Limited reserve the right to change the design or specification of the equipment described in this manual without prior notice.*