

These instructions contain operating information and should be left with the unit.



MICROVAP V & VP

Installation & Operation Manual

(Edition 3)

Installation in countries covered by EC Directives:

This product will meet the requirements of the Low Voltage Safety Directive 73 / 23 EEC and the EMC Directive 89 / 336 EEC when installed in accordance with the instructions contained in this manual.

Failure to comply with these instructions may invalidate the manufacturer's warranty or any certificate/declaration of conformance requested to be supplied with the unit.

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Important Installation Points

The unit must be installed to comply with national regulations and/or codes of practice. A qualified electrician must carry this out.

Ensure at least 1000 mm clear side access to the electrical panel of the cabinet - left hand side of standard cabinets, right hand side of cabinets with “-R” suffix.

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 service or exchange hazardous.

Make sure steam line(s) have adequate slope (min 12%) 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

Before commissioning the unit, check that all electrical (power) connections - including those at the terminals and contactor are tight.

Check that the transformer primary winding connection is correct for the supply voltage at Vapac terminals A1 & A2.

The Vapac transformer must not be used to power other equipment.

To comply with EMC aspects see recommendations on page 6.

Use a high-limit humidistat connected to control terminals 9 & 10 to ensure positive interruption of unit operation when over-humidification is detected.

Important Maintenance Items

Only a qualified electrician should carry out maintenance.

The boiler contains hot water, and must be drained before any maintenance is carried out on the steam section. This should be done prior to isolating the power, and removing the front access panel

Installation.

Positioning the Vapac

Do's

- Do** mount the unit as close to the steam distribution pipe(s) as possible.
- Do** mount the unit at a height convenient for reading the display window.
- Do** ensure adequate side access to the electrical section (min 1000 mm).
- Do** ensure adequate service access to the front of the unit (min 1000 mm).
- Do** ensure adequate service access below the unit (min 300 mm).
- Do** ensure that the holes above the airgap between the electrical and the steam sections remain unobstructed to allow a free flow of air.
- Do** use the marking on the side of the carton as a template to mark the mounting hole positions.
- Do** remove the cylinder, if necessary, to access the mounting holes in the back of the steam section.
- Do** use M6 projecting type wall bolts or equivalent to mount the unit in position.
- Do** mount units with RDU's so that steam pipe discharge is above head height.
- Do** leave minimum 150mm between the top of an RDU and the ceiling.

Don'ts

- Don't** mount the unit close to sources of strong electromagnetic emissions e.g. variable speed lift motor drives, kVa transformers etc.
- Don't** mount the unit in an unventilated enclosure.
- Don't** mount in a position requiring ladder access to the unit.
- Don't** mount the unit behind a false ceiling or other situation where an unusual malfunction (e.g. water leak) would cause damage.
- Don't** mount the unit in an area which will be hosed down.
- Don't** install the unit where the ambient temperature can exceed 35°C.
- Don't** mount the unit inside a cold-room or other place where temperature and humidity conditions can cause condensation on electrical components.
- Don't** mount the unit where the sound of a contactor opening/closing and water flow in a pipe would be unacceptable e.g. libraries, private apartments, etc.
- Don't** position an RDU to discharge directly over expensive equipment, desks or stored materials.

Dimensions in mm and Service Weight in Kg.

Microvap model	V4 VP4	V8 VP8	V15 VP15	V30 VP30	V40 VP40	V40L VP40L	V60 VL60	V80 VP80
A	500	630	675	800	800	800	800	800
B	380	380	435	538	538	645	645	857
C	263	263	298	384	384	500	500	384
D	182	182	182	-	-	-	-	-
F	159	159	175	206	206	266	266	212
G	112	112	136	190	190	195	195	175
H	-	-	-	-	-	110	110	350
K	38	38	38	38	38	38	38	38
L	478	478	516	643	643	643	643	643
M	165	165	203	305	305	406	406	610
N	38	38	38	47	47	47	47	47
UNIT Kg.	25	25	30	55	55	90	90	97
RDU Kg.	8	8	12	-	-	-	-	-
RDU & Transformer	9.5	9.5	16.5	-	-	-	-	-

Positioning and Dimensions of the Vapac

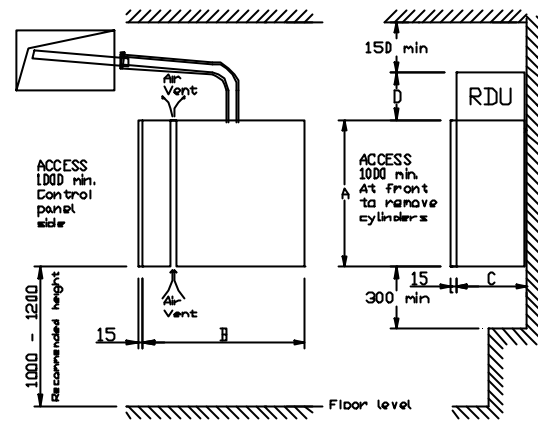


Fig 1

Mounting Hole Positions.

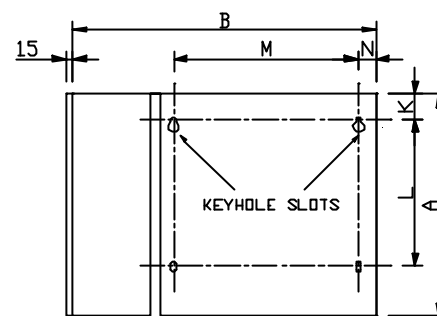


Fig 2

Steam Outlet Positions

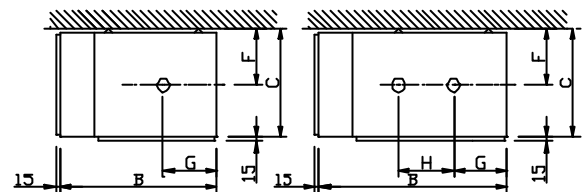


Fig 3

Key :-

- 1 Insulated Steam Pipe
- 2 Steam Distribution Pipe
- 3 Hose clip
- 4 Condensate Separator

Z = 250 minimum Radius for 35 Ø pipe,
500 minimum Radius for 54 Ø pipe.

Notes Can't :-

- 4 Vertical mounted steam pipe must discharge horizontally facing upstream airflow.
- 5 If the total pressure within the duct air flow exceeds 2000 Pa and the static pressure is below 2000 Pa then the probe may face horizontally at right angles to the air stream.

Notes:-

- 1 Steam pipe to have a minimum slope from the horizontal of 7° or 12% to allow the condensate to drain back to cylinder or trap.
NO HORIZONTAL RUNS.
NO 90° ELBOWS.
- 2 Water condensate to slope at 10° or 18% from horizontal for condensate to drain back to drain point.
- 3 Steam pipes horizontal mounted must discharge vertically upward.

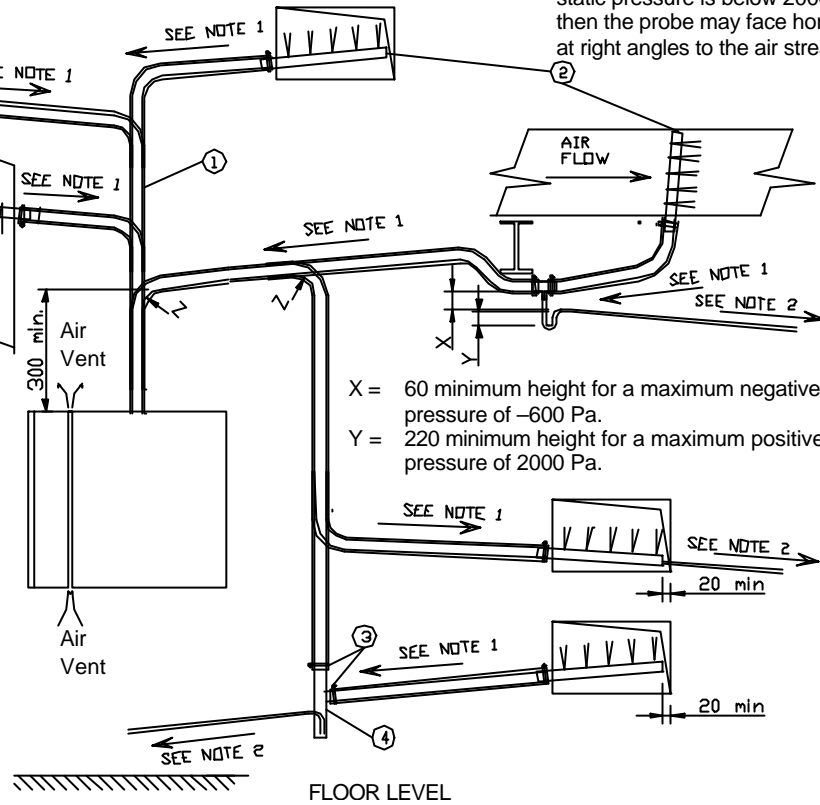


Fig 4

* Ø 35mm steam pipe : non-standard pipe required which has reverse slope and end outlet Ø15mm.

Pipe in-duct length 300mm – Pt No. M520115, 450mm – Pt. No. M520116, 600mm – Pt. No. M520117, 750mm – Pt. No. M520118, 900mm – Pt. No. M520119, 1050 mm – Pt. No. M520120.

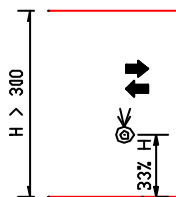
* Ø 54mm steam pipe : non-standard pipe required which has reverse slope and end outlet Ø15mm.

Pipe in-duct length 650mm - Pt No. M520078

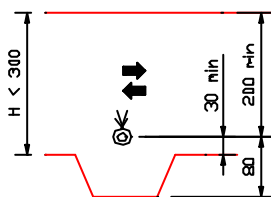
Pipe in-duct length 900mm - Pt. No. M520079

Pipe in-duct length 1400mm - Pt.No. M520080

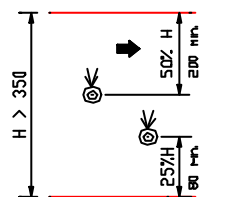
35 Ø 1 Steam Pipe



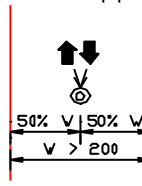
35 Ø 1 Steam Pipe



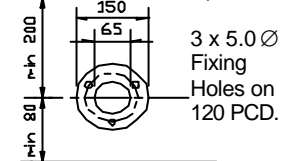
35 Ø 2 Steam Pipes



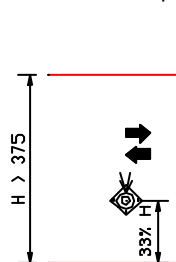
35 Ø or 54 Ø
1 Steam pipe



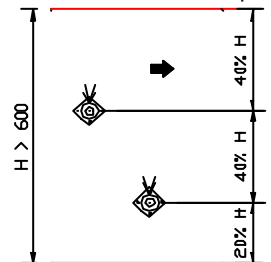
DUCT MOUNTING DETAIL
FOR 35 Ø Steam Pipe



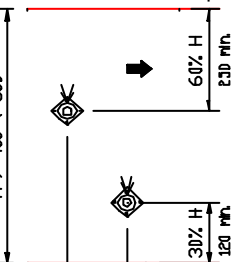
54 Ø 1 Steam Pipe



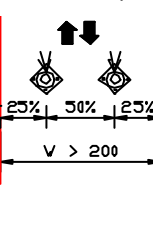
54 Ø 2 Steam Pipes



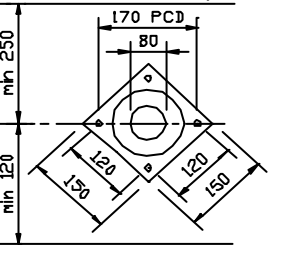
54 Ø 2 Steam Pipe



35 Ø or 54 Ø
2 Steam Pipes



DUCT MOUNTING DETAILS
FOR 54 Ø Steam Pipe



4 x 6.4 Ø Fixing Holes on
170 PCD.

Fig 5

Positioning the steam pipes

General

Steam pipes should be positioned as shown below, allowing a minimum rate of fall back to the unit of 12% to allow the free flow of condensate back to the unit. If the above fall is not possible, then condensate separators must be fitted as shown in figure 1.

The position of the steam pipe or multipipe in a air-conditioning system relative to other items such as bends, filters, heat exchangers, etc., is critical. The steam pipe must not be located closer to such item, than the entrainment distance, 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 pipe has been specified requiring rotation of pipe in its socket before installation.
- Do** use bracket/lug on the end of Ø54mm 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 for max efficiency).
- Do** arrange to have a vertical rise immediately over the unit of 300mm.
- Do** use the full height available between the 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
 - or b) support straight lengths on cable trays or in heat resistant plastic pipe.
- 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) 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.

* For systems with a duct pressure over +1000 Pa. 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.

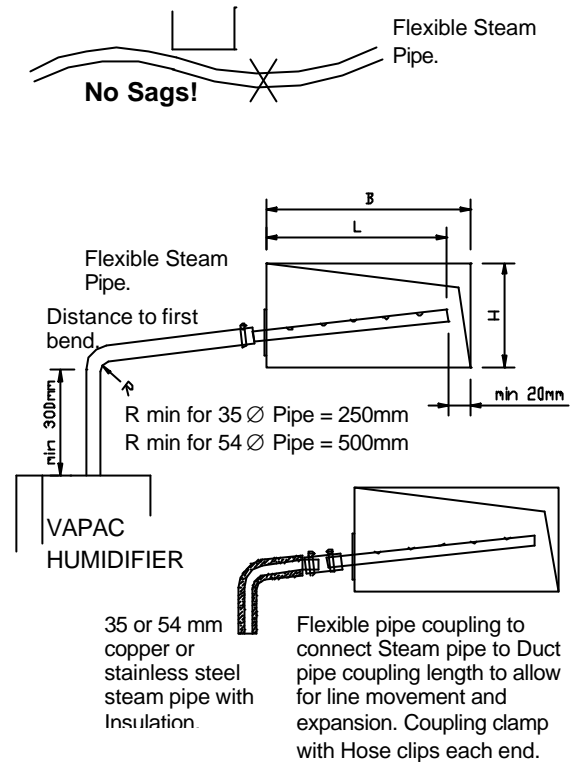


Fig 6

35mm Ø Pipe Selection		54mm Ø Pipe Selection	
Duct width B mm	In-duct Length L mm	Duct width B mm	In-duct Length L mm
320-470	300		(Kg)
470-620	450		
620-770	600		
770-920	750	700-950	650 (1.8)
920-1070	900	950-1450	900 (2.2)
1070-1200	1050	1450+	1400 (3.2)

Steam Distribution Pipe requirement			
Microvap Model	V4 V8 V15 VP4 VP8 VP15	V30 V40 VP30 VP40	V60 V80 VP60 VP80
35mm Ø Pipe No.	1	-	-
54mm Ø. Pipe No.	-	1	2
* Duct Pressure Pa.	+1000 -600	+2000 -600	

Cold water supply.

General

The Electrode Boiler range of units is capable of operating with a range of water quality raw mains. The water supply should be within the following limits :-

Hardness 50 –500 ppm
Conductivity 80 – 1000 mS/cm
Silica 0
Pressure of between 1 - 8 bar.

Water Supply rates

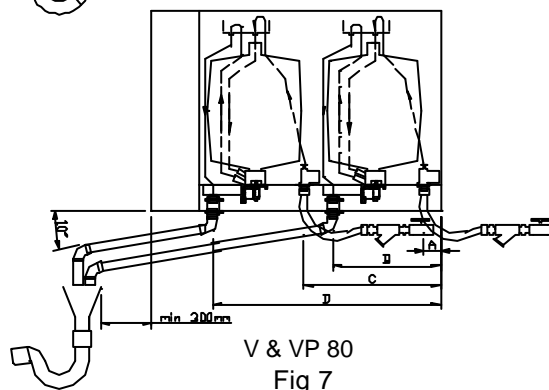
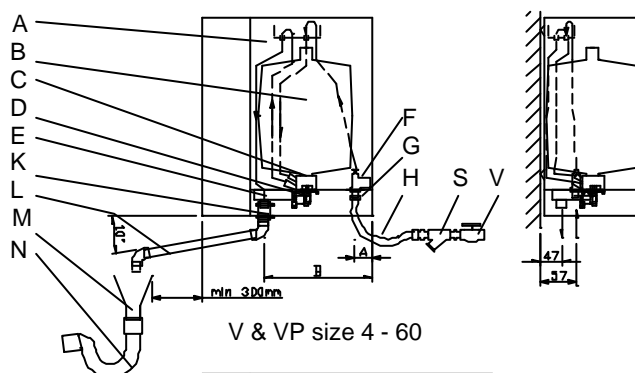
1.2 l/min	V4 V8 V15	VP4 VP8 VP15
2.5 l/min	V40 V30 V60	VP40 VP30 VP60
5.0 l/min	V80	VP80

Do's

- 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.

ALL Dimensions in mm

Microvap Model	V4 VP4	V8 VP8	V15 VP15	V30 VP30	V40 VP40	V40-L VP40-L	V60 VP60	V80 VP80
A	58	58	79	133	133	193	193	118
B	200	200	198	248	248	312	312	237
C	-	-	-	-	-	-	-	468
D	-	-	-	-	-	-	-	587



KEY: -

- A Tundish Fill-cup
- B Steam Cylinder
- C Feed Drain Manifold
- D Drain Pump
- E Drain Trap Dish
- F Feed Solenoid Valve
- G Water Connection —" BSP.
- H Flexible hose —" BSP.
- K 35Ø Steam Hose coupling and Hose Clips.
- L 35Ø copper or plastic Drain for 110°C Water with supports.
- M Tundish
- N U-trap side exit.
- S Optional Strainer
- V Isolation stop cock

Don'ts

Don't use a wrench or other tool to tighten the water supply connection - the nylon nut and rubber washer provided, should only require tightening by hand to effect a seal. If water seepage occurs, undo the nut to wipe the washer clean and re-seat it.

Drain connection.

General

Do's

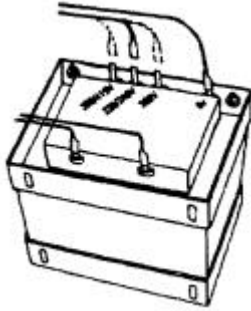
Do ensure metal drain and supply water pipework is grounded electrically close to the unit (a ground/earth stud is positioned on the underside of the cabinet).

Drain capacity per cylinder
= pump discharge rate of max 16.8 l/min at 50 Hz.
Power supply 17.2 l/min at 60 Hz.

Do's

- Do** use copper or plastic pipe rated for 100 °C.
- Do** arrange to discharge drain water from the unit into a trapped and vented 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 the Vapac units which are connected to it.

Electrical Connections



Important Power Connection Information

Vapac 24V secondary Transformer Primary supply connections:
Vapac units are wired to allow 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 marked with the supply Voltage that is to be connected between Microvap power terminals A1 and A2.
The transformer primary circuit terminal positions are clearly marked:- 200V, 230V, 380, 415 & 440V. For sites where the actual (measured) voltage is 400V the preferred transformer tapping is 380V.

Note:

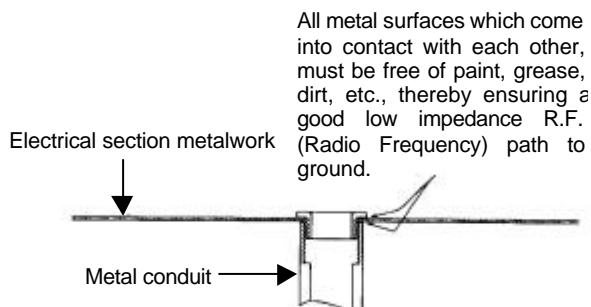
- | | | |
|---|---|---|
| 24 V a.c. Control circuit | - | 3.15 A 20 mm (F - Quick blow) fuse (Pt.No. 1080096) mounted on Terminal rail F3 for master control and F4 for slave unit control. |
| Transformer Primary Circuit
And RDU. | - | Two fuses protect the control circuit on Single cylinder units F1 2.0A (slow blow) (Pt. No. 1080095) mounted in fuse-terminal holder protects Primary transformer and RDU unit if fitted. F2 500 mA 20 mm (F - Quick blow) fuse (Pt No. 1080054) mounted in fuse-terminal holder protects Transformer Primary and Pump or both pumps if two pumps are fitted. Twin cylinder units F5 2.0A (slow blow) (Pt. No. 1080095) mounted in fuse-terminal holder protects second RDU unit if fitted. |
| 230V ac Pump Supply. | - | The pump or pumps on twin cylinder units are feed from the main transformer via a 230 volt auto winding. The pumps are protected by fuse F1 and F2 above feeding the transformer primary. |

Important E.M.C. Considerations

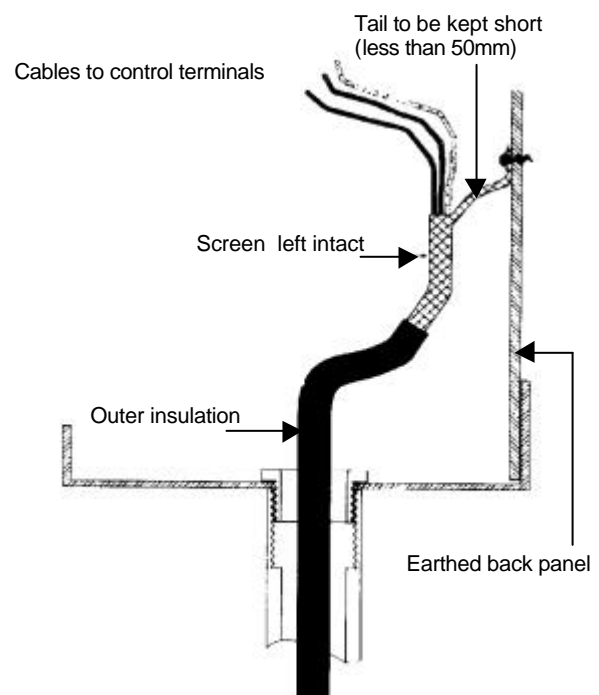
Use a dedicated, earthed metal conduit for both the control signal cable and the security circuit cables along their entire length - they may share the same conduit where practicable. The earth must be made by "metal-to-metal" contact and should be a good RF (Radio Frequency) earth.

The control and security circuit connections should be run in screened cable with the screen grounded at the Microvap end (onto the electrical section back panel). The screen should be maintained as close as possible to the cable ends and any tail between the screen and the earth point must be kept short (50 mm maximum).

Control Cable / Security Circuit Conduit Entry Arrangement



Control Cable / Security Circuit Screening Arrangement



Power Supply Connection

Electrical Connections

The wiring to the Vapac should be done by a qualified electrician. 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 A1 & A2.

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.

Twin cylinder models and single cylinder size 40L and 60L have terminals for the connection of two power supply input circuits. On twin cylinder units this 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. All Vapac

cabinets (sizes 1, 2, 3, 4, 5, 6, 7 & 8) are equipped with a removable gland-plate. The installing electrician should remove this and take it to a work-bench to drill for the required cable gland size.

Vapac Control Circuit Transformer

The internal control circuit of the Vapac unit is operated at 24Vac - To offset possible Voltage drop in any external circuit connection, two optional relays are available. One for the security circuit which connects across terminals 9 & 10 Pt. No. 1150618 the other is for remote auto stop start signal which brakes the control signal to terminal 7. Both relays can be fitted into the microvap unit at any time and prevent external volt drop interfering with the 1150601 PCB. Control. As standard the Vapac Microvap includes a transformer with alternative primary winding options 200V, 230, 380, 415, and 440V and requires on site adjustment to match it to the Voltage connected to Vapac terminals A1 and A2.

The transformer 8V secondary supply is not used.

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

RDU Connection

Vapac terminals 25 & 26 and 27 & 28 are included to provide a 230Vac electrical supply for the fan motor in the RDU (Room Distribution Unit).

Note: The 230Vac at terminals is derived from the incoming electrical supply to the Vapac. If the local supply cannot provide 230Vac (example 400V No Neutral supply) it will be necessary for a transformer to be fitted in the RDU as indicated below.

Notes:-

1. All units must have a PE earth connection connected to the units terminal.
2. Unit with N.A. in the following tables means NOT AVAILABLE there is not a unit available to run at the voltage and phases shown. Please check that the correct model reference is ordered and installed, for the low or high voltage required, and at the desired steam output.
3. These tables give the maximum capacities for each unit at the different voltages. Lower outputs can be provided using "Output Reduction in the Adjust Menu.
4. Standard design is for 50 Hz. Supplies. Design for 60 Hz. Also available - 60 Hz. Supply must be specified with order as standard pump is only 50Hz.
5. If a maximum KW has been strictly specified which is less than the maximum in the Electrical Data, this must be specified with order as an alternative Current Set Plug (CSP) will be needed. This is subject to the agreement of the manufacturer.
6. For other Voltage electrical supplies, contact the Vapac distributor.

FOR FULL ELECTRO-MAGNETIC COMPATIBILITY A NEUTRAL CONNECTION IS REQUIRED FOR ALL VP UNITS AS INDICATED IN THE CONNECTION DIAGRAMS ON THE FOLLOWING PAGES.

RDU Connection

The three type's of RDU are for various voltages and phase without neutrals connections that can be made to the Microvap unit. Please refer to the Microvap connection diagram on the following two pages as to which type of unit is required. On twin cylinder units two fan circuits as shown below one for each cylinder will be in the RDU unit.

200 – 250 V 1Ph. N + earth

200 – 250 V 2Ph. + earth

380 – 440 V 2Ph. + earth

TRANSFORMER
PRIMARY
380 – 440 V
SECONDARY
210 – 250 V

