ElectroVap® CMC

Steam Humidifier

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Electrovap CMC

Contents

ElectroVap CMC

Safety information

Important

This section should be read carefully to ensure the safe and correct installation of your humidifier.

GENERAL

This manual contains all details necessary for the planning and installation of the ElectroVap CMC humidifier. In addition commissioning and maintenance details are included.
The manual is intended for use by engineers and properly trained technical personnel. Maintenance, servicing or repair work must only be carried out by suitable skilled and qualified personnel, the customer must be responsible for ensuring their suitability.
Any risks or hazards, especially when working from ladders or towers should be identified by a skilled Health and Safety representative and effective control measures put in place.
No liability will attach to the Distributor if any damage, injury or accident is attributable to inattentive, inappropriate, negligent or incorrect operation of the machinery whether or not caused deliberately.
Always disconnect all electrical and water supplies before commencing any maintenance.
Every effort has been made to ensure details contained in this manual are correct, however, in view of the wide range of conditions experienced in air handling systems, the information provided should only be used as a guide. Please contact your Agent if any doubt.

CORRECT USE

ElectroVap CMC humidifiers are ONLY intended for use with air handling systems or direct air humidification. ANY OTHER APPLICATION IS NOT CONSIDERED USE FOR THE INTENDED PURPOSE. THE MANUFACTURER CANNOT BE MADE LIABLE FOR ANY DAMAGE RESULTING FROM INCORRECT USE.

WATER

ElectroVap CMC humidifiers are designed to be used with tap water, demineralized, R/O or softened water. On no account attempt to introduce any other fluid or chemical into the system. Water supply should not exceed 6.0 bar and installation should comply with local regulations.

ELECTRICITY

All work concerned with electrical installation MUST only be performed by skilled and qualified technical personnel (eg electrician or technicians with appropriate training). The customer MUST be responsible for ensuring their suitability.
It is the duty of the installer to ensure that suitably sized electrical cables and circuit breaker protection is provided. Please observe the local regulations concerning the provision of electrical installations.

WARRANTY

Failure to specify and fit original parts and accessories will invalidate your warranty.

NOTE

Our policy is one of continuous research and development. We therefore reserve the right to amend without notice the specifications given in this document.

Electrovap CMC

Unit wall installation

Unit mounting

Unpack the CMC humdifier and check for any damage.

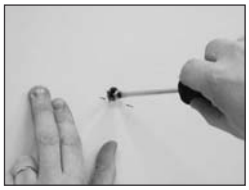
Damage to packing and/or unit must be reported by registered letter to carrier within 3 working days.

Provide free space all around the unit : 1 m. to 1.20 m. (3 to 4 ft.) from the floor to the bottom of the humidifier, 1.25 m. (4 ft.) ahead and 0.60 m. (2 ft) on the right hand side for allowing easy access for maintenance.

Mark the mounting holes.

Drill the holes.

Insert screws or bolts appropriate for support.



Screw the screws allowing about 10 mm (3/8 in.) for hanging the cabinet

Hang the cabinet. Level the cabinet with a spirit level and tighten up all the screws.

Please refer to the following pages for the water and electrical connections.

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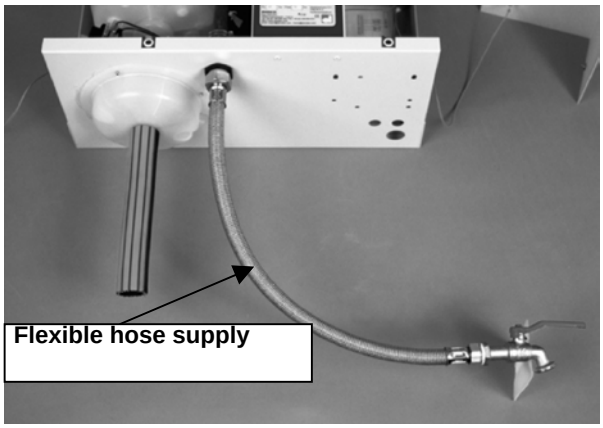
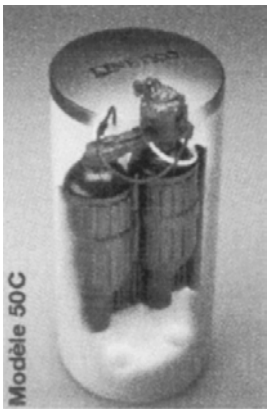
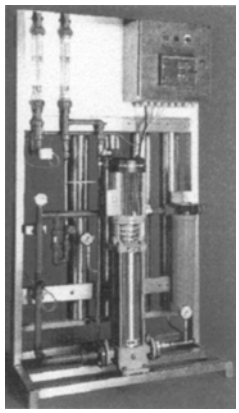
Water connection







Installation

A cold water service line should be used to supply the unit. The water supply must also satisfy the following requirements :

- Water quality: 30 to 1000 ppm
- Water Pressure: 1-6 bar (15 to 90 psi)
- Water Temp: less than 40°C (100 Deg. F.)

The water supply connection is on the bottom of the unit. All the CMC are delivered with a water inlet hose (500mm long) (20 in. long) with 3/4“ fittings for direct connection to humidifier & cold water supply.

A check valve should be located on the cold water service connection to the unit.

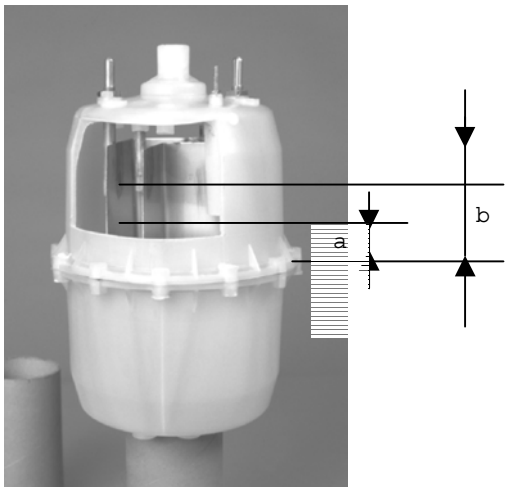
The inlet valve base has a basket filter (s.a. page n° 25). Check periodically for debris.

The Humidifier CMC can run with 3 different water qualities :

TAP WATER

For the maintenance frequency of the cylinder see the maintenance curve.

The water level must be between (a) and (b) for the maximum cylinder capacity.



SOFTENED WATER

The ElectroVap CMC humidifier may be used with softened water.
IMPORTANT : Softeners must be programmed correctly (for Europe : 0° < TH < 2°). Failure to program the softener correctly may lead to excessive salt concentration in the steam cylinder. For assistance contact the softener manufacturer.

Reverse Osmosis and Demineralized Water

The ElectroVap CMC humidifier may be used with Reverse Osmosis or Demineralised water. The minimum water quality is **30 µs**. On start-up with new steam cylinder a tea spoon of bicarbonate of soda must be added.

AUTOMATIC DRAINING

For sanitation purposes, the steam cylinder is automatically drained out in case the humidifier is not operated after a period of 72 hours. This value is factory pre-set.

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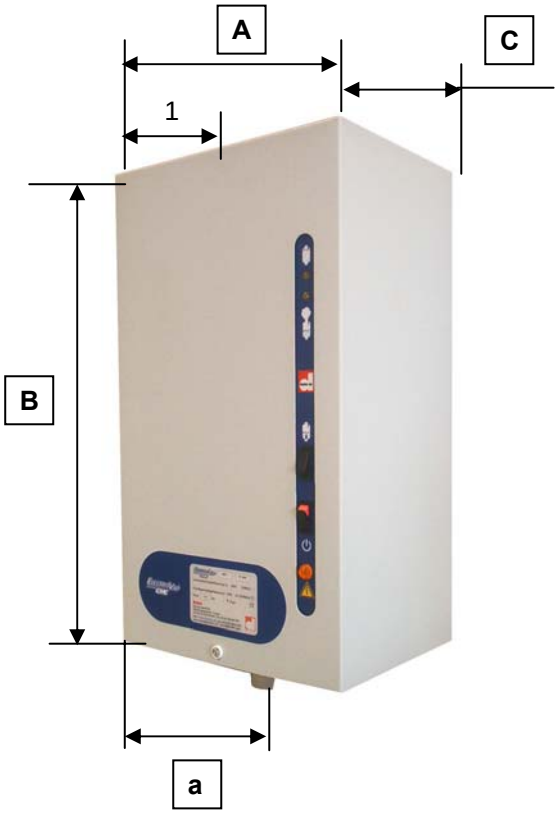
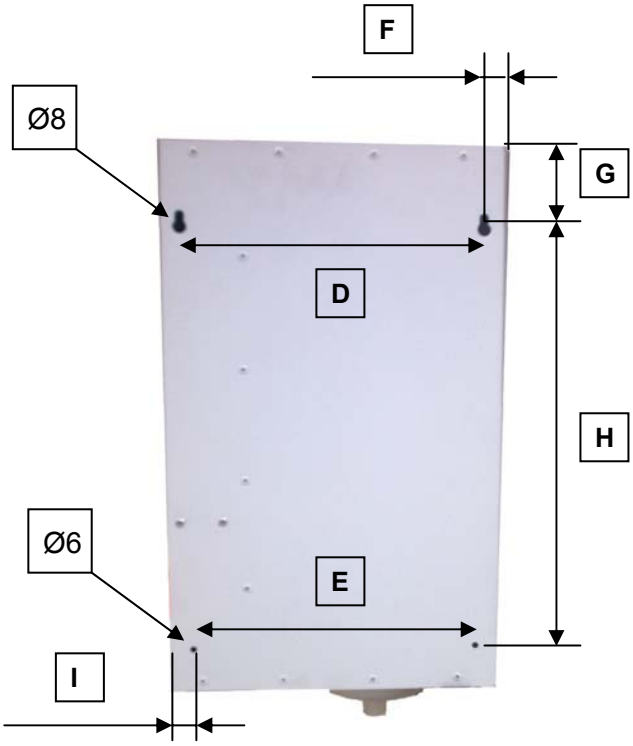
Overall dimensions

Unit installation





Dimensions mm (in.)		Steam outlet mm (in.)	Drain outlet mm (in.)	Weight (kg) (empty)	Weight (kg) (operating)
A	295 (11.61)	1 104 (0.34)	a 104 (0.34)	10 (22 lbs)	18 (39.7 lbs)
B	506 (19.92)				
C	217 (8.54)				
D	257 (10.12)				
E	257 (10.12)				
F	17 (0.67)				
G	60 (2.36)				
H	390 (15.4)				
I	17 (0.67)				

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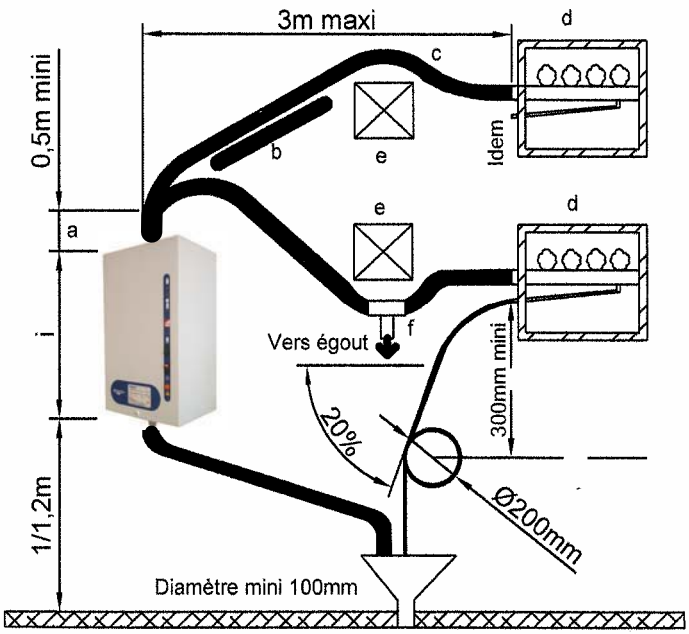
Steam outlet

Unit installation



Use only factory supplied high temperature steam hose.

For distances up to 3 m. (10 ft.) steam hose alone may be used. For distances greater than 3 m. (10 ft.) use insulated rigid copper tubing. All steam lines must pitched and drained.

a - The vertical rise should be a minimum of 0.5 m (18 in.)

b - The hose should be properly supported to eliminate
c - Steam hose (radius of bend superior to 300 mm- 12 ft.)
d - Duct work.
e - Obstacle.
f - A condensate separator is needed at this point to drain condensate.
g - Steam hoseconnection
h - Condensate hose
important : fill trap with water before starting-up.

j - Height of humidifier (s.a. page 4)

Steam hose radius bend :
ø25 mm = 250 mm minimal

Number of steam outlet :
CMC 1-2-3-4 = 1 outlet ø 25 mm

Duct applications :

To get a correct functionning of the CMC humidifier in duct applications, the following conditions must be fulfilled :

- duct pressure less than 100 mm (4 in.) of water column

- in case the duct pressure is between 100 mm (4 in.) and 250 mm (10 in.) of water column, a filling cup plateform must be installed as per the left hand photo.

CMC with filling cup plateform

Photos non-contractuelles

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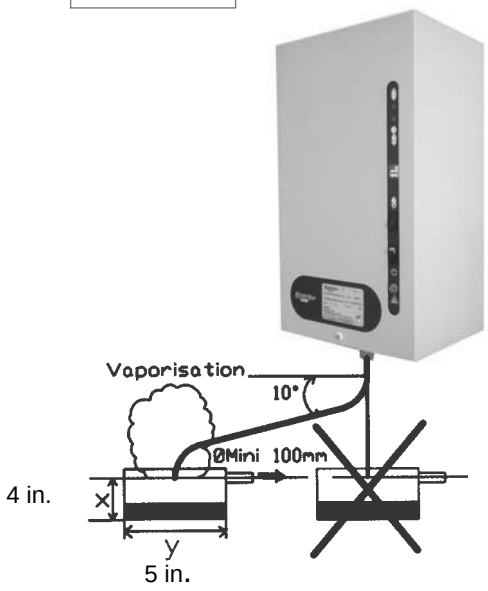
Condensate draining

Unit installation

X = 100 mm
Y = 130 mm



The following drawings show the water draining connections that should be made.

Connection to the humidifier by the supplied 25 I.D. hose

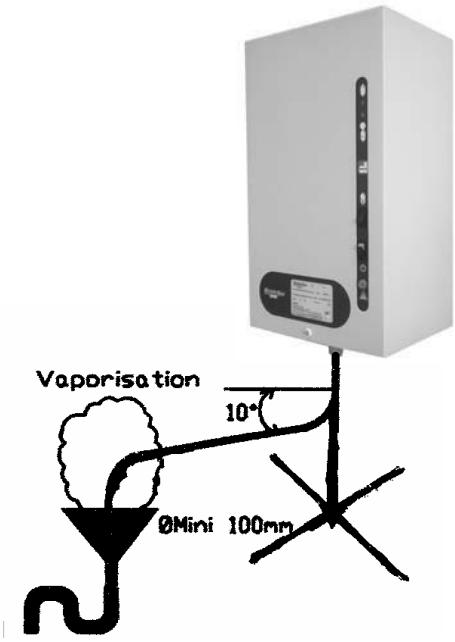
For CMC 1-2-3-4 : 1 m. long (3 ft.) steam hose with 3 hose clamps.

Minimum pitch : 10°

The devatec recommended steam hoses shoud be used for connecting the humidifier to the drain. network. Regular replacement is recommended.

If rigid piping is used, it must be heat (100°C - 212 deg. F.) and pressure resistant PVC material (copper, galvanized or stainless steel piping **prohibited).**

The drain hose must be free from any obstacle particularly when it comes to connecting several drains.



The discharged water should be offset from the underside of the unit as shown. This will prevent any steam and/or condensation from getting into the cabinet.

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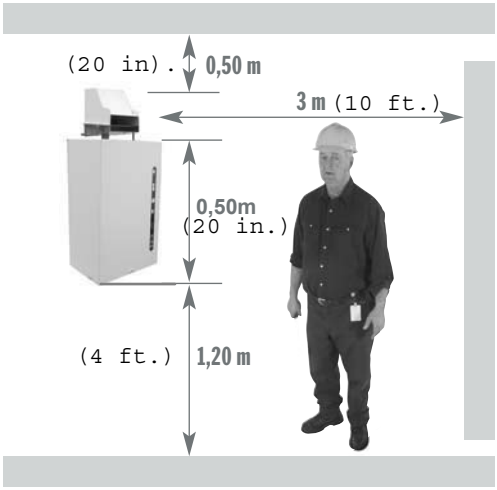
Humidifier with blower unit

Unit installation



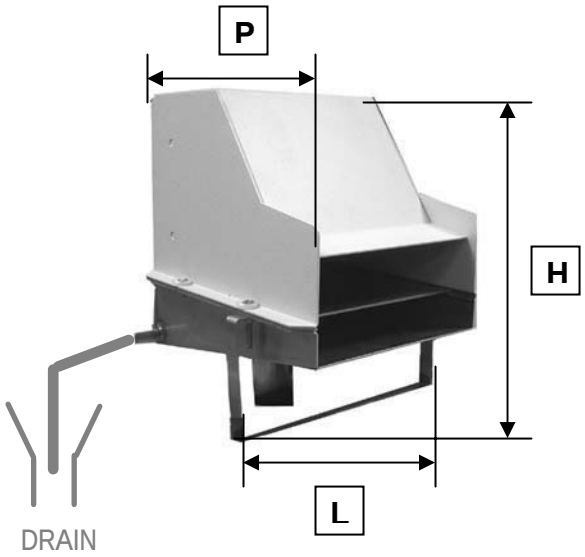
The blower unit permits the use of the CMC humidifier for in-space applications when there is no ductwork.

The ventilation unit must be set upon the humidifier top.

The electrical connection is made to terminals 3 & 4 & Ground of the humidifier (cable = 2 wires 230V + earth).

Allow a minimum of 3 m. (10 ft.) free space ahead of the ventilation unit.

Supply	Air flow	Noice (db)	Dimensions
230 V.	60 m3/h 35 cfm	44	H=210 mm, L=160 mm, D=170 mm H=8.3in., L=6.3in., D=6.7in.



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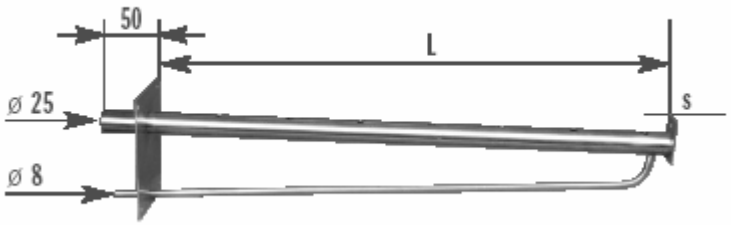
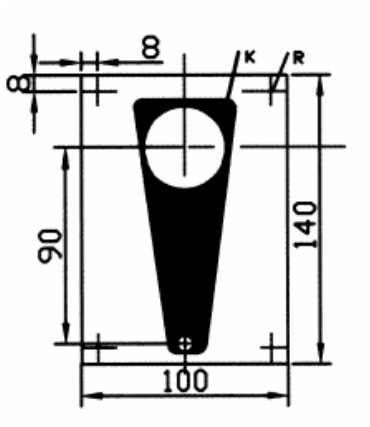
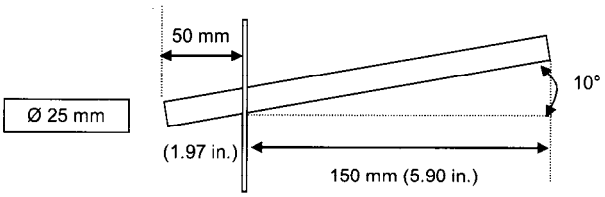
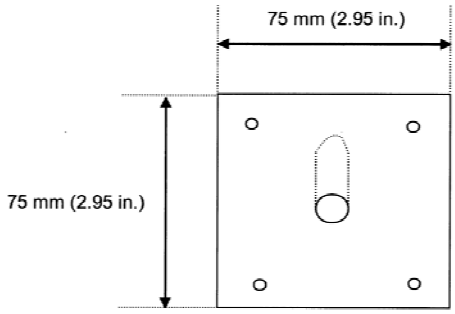
Steam distribution pipes









Installation

The steam from the cylinder enters the duct via a steam distribution pipe. In order to obtain an optimum performance of the humidifier, it is recommended that these instructions be adhered to as far as possible.

Steam distribution pipe selection

This table shows the number and the diameter of the pipe(s) per unit.

CMC	1-2-3-4
Number of pipe	1
Steam pipe - mm internal diam.	25
Condensate hose - internal dia. mm	8

For the optimum steam distribution, the longest pipe should be prefered.

For duct of width inferior to 300 mm (12in), our B110 or our special 6" steam pipes can be used.

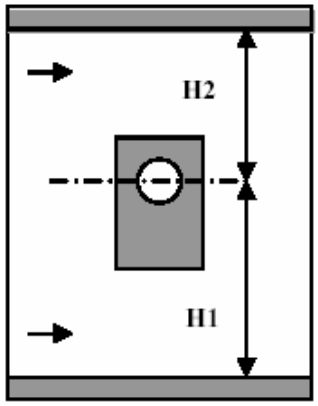
For the CMC 1-2-3-4, install the pipes as indicated below :

L = length 290 – 590 – 790 – 1000 – 1250 – 1500 mm
(11.4 – 23.23 – 31.10 – 39.37 – 49.21 – 59.05 in.)

S = end of pipe hole Ø 5 mm

R = 4 holes of Ø 5 mm (0.20 in.)

H1 = 140 mm mini. (5.50in.)
H2 = 300 mm mini. (12in.) (IMPERATIVE)



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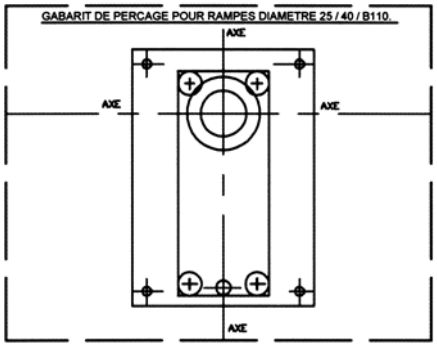
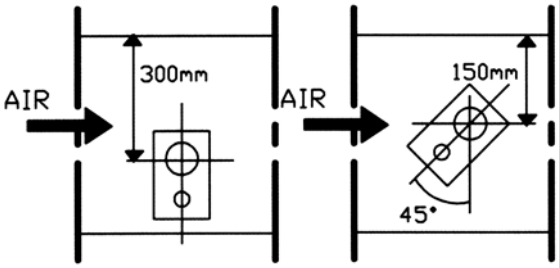
Steam pipe positioning

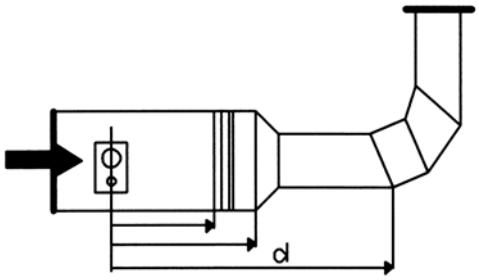
Installation



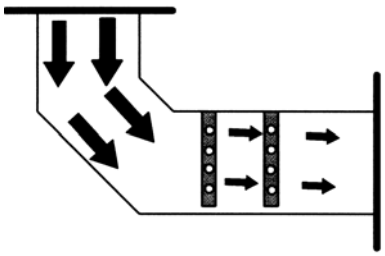
Positioning the recommended template profile for cut-out in DUCT/AHU (at the end of the brochure)



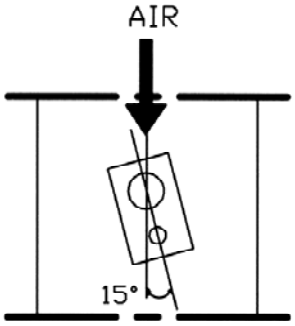
A minimum distance of 300mm (12in) between the center of the steam distribution pipe and the top of the duct should be allowed. Where the distribution pipe is installed at an angle of between 30°C and 45°C, this may be reducted to 150mm (6in).



d: Minimum distance between the steam distribution pipe and any obstacle in the duct (filter, bend, constriction. etc) should as far as possible, be no less than 2000 mm (6.50ft).



In the case where a steam pipe is installed after a bend, it should be positioned in the main air flow.



In vertical ducts where air flow is upward or downwards, the steam distribution pipe should be mounted at an angle of 15°C from vertical.

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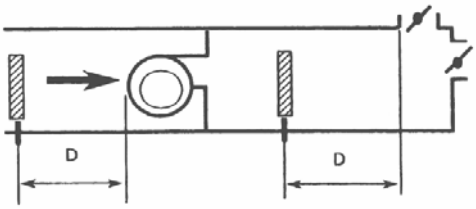
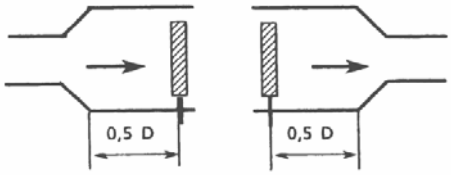
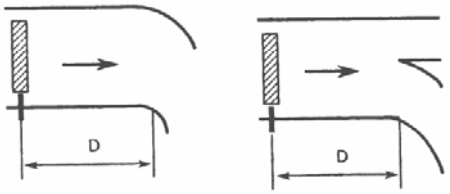
Calculation of the evaporation distance

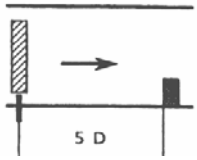


Before or after ventilation area

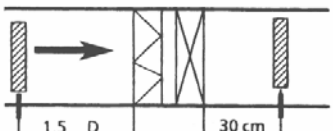


After expansion or before constriction
Vapor trail = 0.5 D





Before control sensor allow
3 – 5D for evaporation



Before / after filter depending on filter type

Installation

In order to determine the evaporation distance, the enclosed calculation table can be used with :

RH1 = relative humidity of the air before humidification

RH2 = relative humidity of the air after humidification in %

RH Max = maximum difference between RH1 & RH2

HOW TO USE THE CALCULATION TABLE

Determine the difference between the relative humidity after the humidification (RH2) and the relative humidity (RH1) before humidification. The intersection between the deducted maximum RH value and RH2 gives the evaporation distance in meters (or in inches).

The table show the D distance (in meter/inches) that should be between the steam pipe and the first obstacle (s.a. pipe positioning drawings on the left hand side).

If the required distance cannot be obtained on site, it is possible to install two pipes in parallel to have a better steam distribution.

NOTA : the evaporation distance s shown in the enclosed tables are for temperature between 10°C (50°F) and 25°C (77°F) and for an air velocity of 2.5 m/s. (8.20 ft/s).

If accurate values cannot be reached, a distance of 2 m. (78 ft) should be considered as a minimum distance between pipes & obstruction.

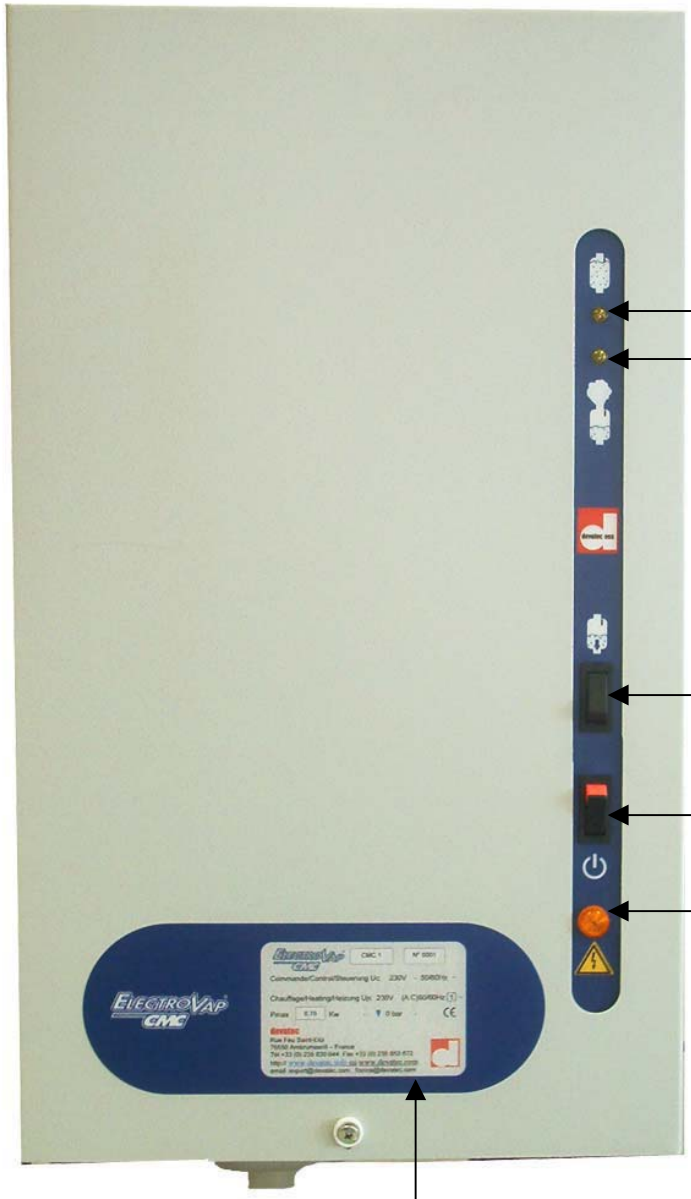
%	VAPOR TRAIL IN METER / RH MAX=RH2-RH1 in %									
Rh2	5	10	15	20	30	40	50	60	75	90
40	0.3	0.4	0.5	0.6	0.7	0.8	-	-	-	-
50	0.4	0.5	0.6	0.7	0.8	0.9	1	-	-	-
60	0.4	0.5	0.6	0.7	0.9	1	1.1	1.2	-	-
70	0.5	0.6	0.7	0.9	1	1.2	1.3	1.5	-	-
80	0.5	0.7	0.9	1	1.2	1.4	1.6	1.8	2	-
85	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.3	-
90	0.7	1	1.2	1.4	1.7	2	2.3	2.5	2.8	3
95	1	1.4	1.7	2	2.5	2.9	3.2	3.5	3.9	4.3

%	VAPOR TRAIL IN INCHES / RH MAX=RH2-RH1 in %									
Rh2	5	10	15	20	30	40	50	60	75	90
40	11.8	15.7	19.7	23.6	27.5	31.5	-	-	-	-
50	15.7	19.7	23.6	27.5	31.5	35.4	39.4	-	-	-
60	15.7	19.7	23.6	27.5	35.4	39.4	43.3	47.2	-	-
70	19.7	23.6	27.5	35.4	39.4	47.2	51.2	59	-	-
80	19.7	27.5	35.4	39.4	47.2	55.1	63	70.8	77.7	-
85	23.6	31.5	39.4	47.2	55.1	63	70.8	77.7	90.5	-
90	27.5	39.4	47.2	55.1	67	77.7	90.5	98.4	110.2	118.1
95	39.4	55.1	67	77.7	98.4	114.2	126	137.8	153.4	169.3

ElectroVap CMC

Front panel description

Unit installation



High water level indication light

Steam production indication light

Manual drain

ON/OFF switch

Power light

Identification label

Photos non-contractuelles

ElectroVap CMC

Optional temperature control system

Installation

For sanitation : this sytem holds the water in the cylinder at a temperature of 65°C (150°F) to prevent bacteria or mold from forming in the cylinder even if there is no humidity demand.

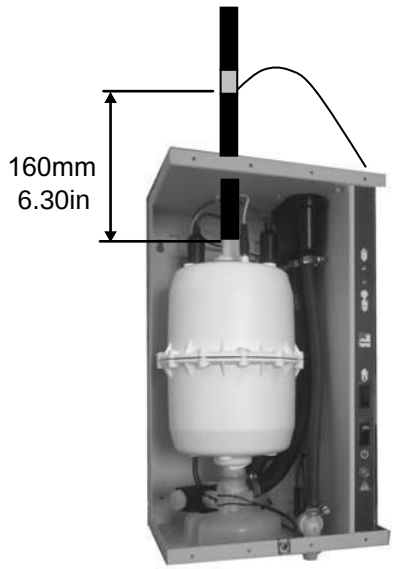
For fast boiling : When there is a demand for humidity, the water boils more quickly than with cold water. This produces a faster response to the humidistat and more accurate control.

For freeze protection : Can prevent freeze-up if the humidifer is subject to cold environments. (Additional protection required for the water feed and drain lines).

The optional temperature control system overrides the automatic factory pre-set draining time where the cylinder(s) is (are) drained by the system after x hours of stop (s.a. page 3).

Note : the humidifier must be switched on for this system to operate.

Installation



The electrical wiring of the temperature sensor is made on terminals 15 and 16 of the X4 connector of the main circuit board réf : 500101/04

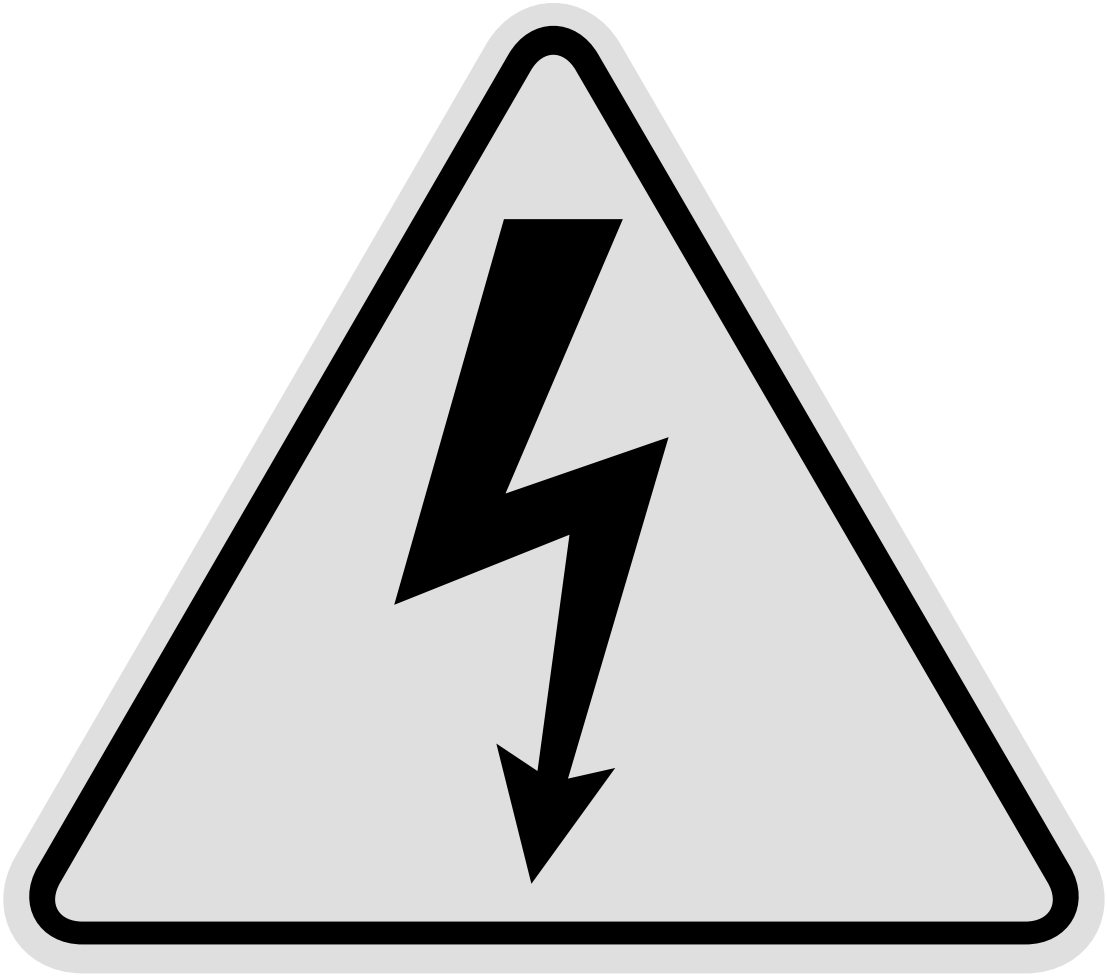
(s.a. the right hand side drawing)

Supplied kit to install :
T° sensor, X4 connector, Ø25mm steel tube and fixing clamps

Photos non-contractuelles

ElectroVap CMC

Electrical installation



Recommandations:

All electrical installation works must be carried out by a skilled and qualified personnel (eg electrician with appropriate training).
Observe local regulations concerning the provision of electrical installations.

After about 50 hours of operation, all the screws of the power terminals must be retightened.

Take care : the CMC electronic components are very sensitive to electrostatic shocks. Appropriate steps must be taken before any operation.

ElectroVap CMC

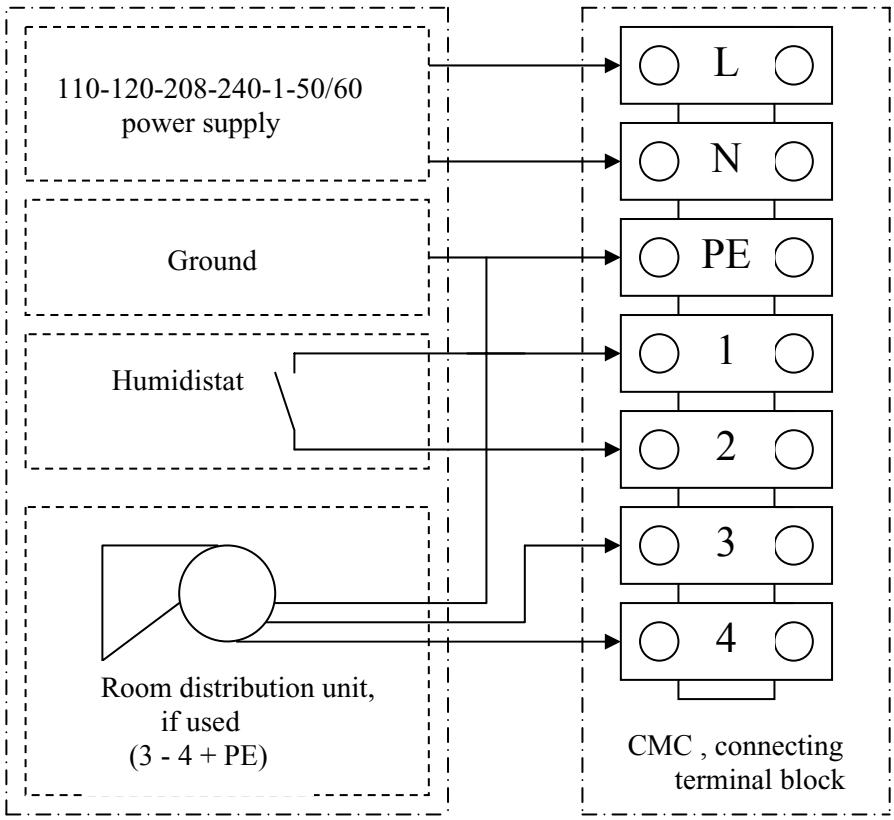
Electrical characteristics

Electrical installation

Model	Capacity (Kg/St/H)	Power (Kw)	Current (A)	External protection (A)	Electrical power
1	1 (2.2 lbs)	0,75	3.3	10	230/1/50-60
1.5	1.5 (3.3 lbs)	1.13	9.81	20	115/1/50-60
2	2 (4.4 lbs)	1.5	6.5	15	230/1/50-60
2.5	2.5 (5.5 lbs)	1.88	16.35	40	115/1/50-60
3	3 (6.6 lbs)	2.3	9.8	20	230/1/50-60
4	4 (8.8 lbs)	3	13.11	25	230/1/50-60

External wiring

The humidifier must be Grounded (Terminal PE)

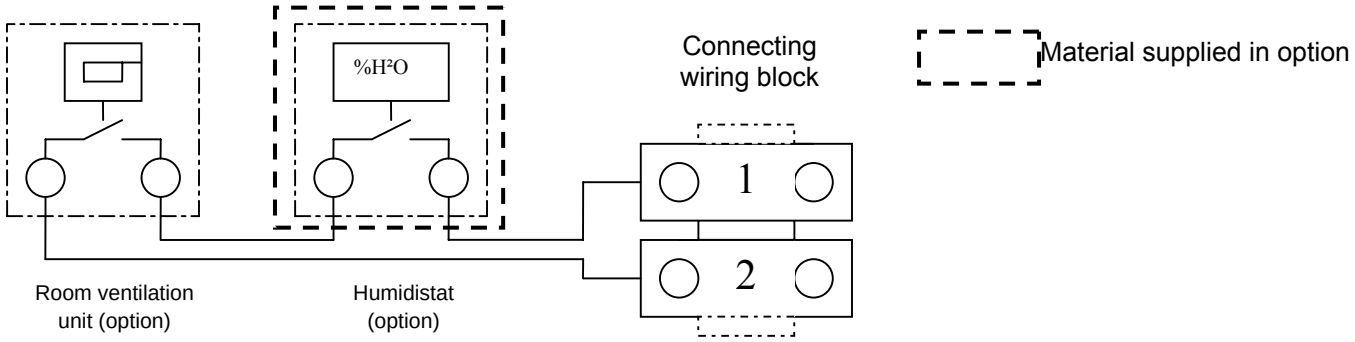


ElectroVap CMC

Regulation signal wiring scheme

Electrical installation

CMC ON-OFF control (standard)

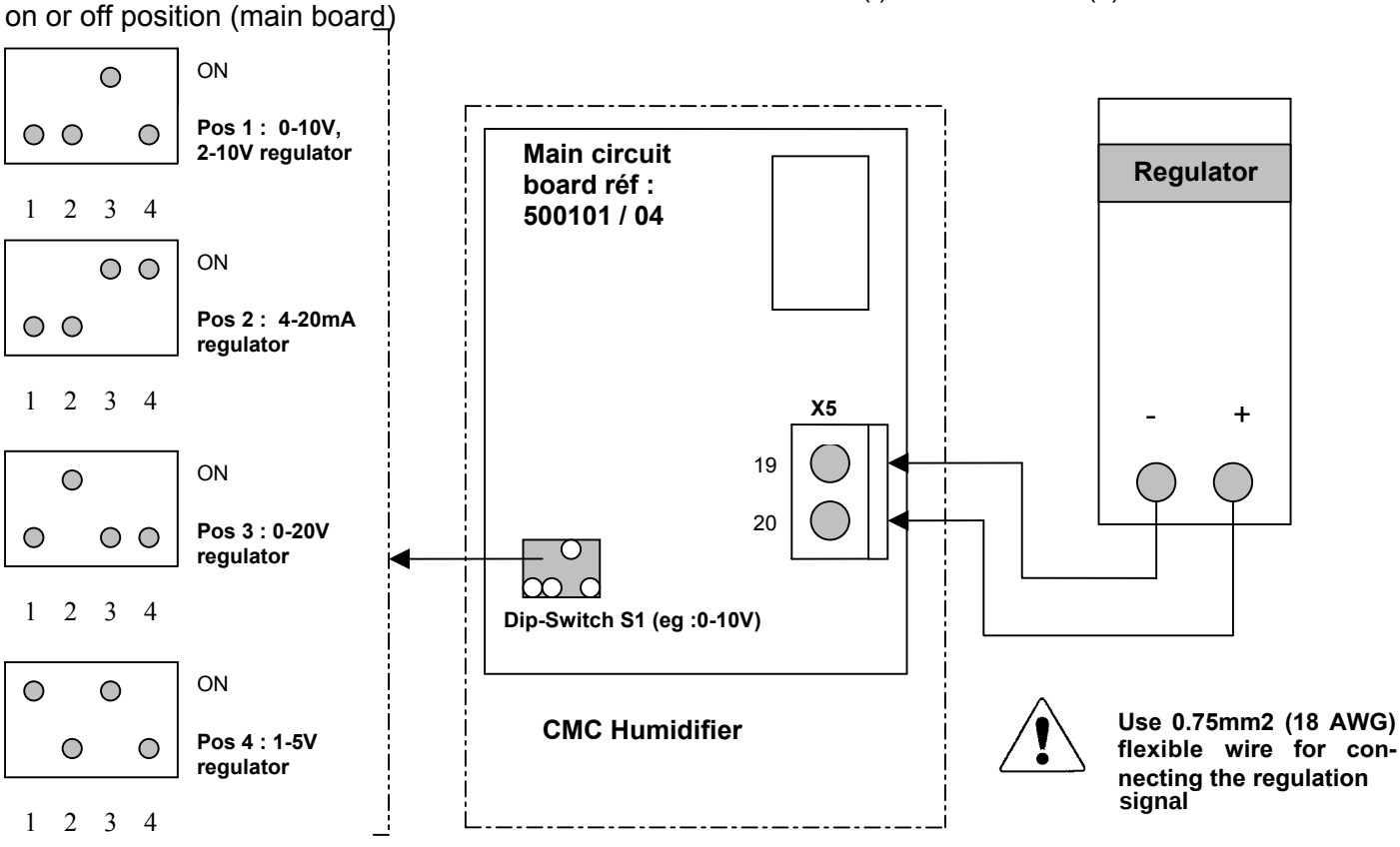


Wiring schemes for connecting a room ventilation unit with an on/off humidistat to the humidifier. If no equiment, terminals 1 & 2 must be bridged.

CMC PROPORTIONAL CONTROL (option)

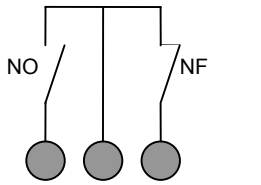
This selector switch enables to select the desired control signal :
Switch the Dip Switch S1 on on or off position (main board)

Connect the on/off control signal (s.a. above) or bridge and connect the outside regulator onto connector X5 of the main board - terminal 19 (-) & terminal 20 (+).



Remote information board (option)

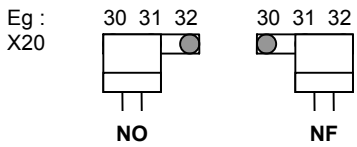
The contact can be modified in NO or NF in changing the position of the selector switch



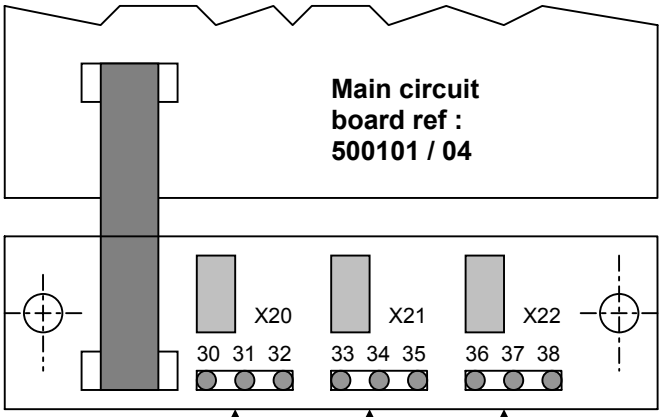
30 31 32 X20

33 34 35 X21

36 37 38 X22



This board ref. 500400 allows the remote information of three dry contacts. It should be connected on to connector X18 of the main circuit board.



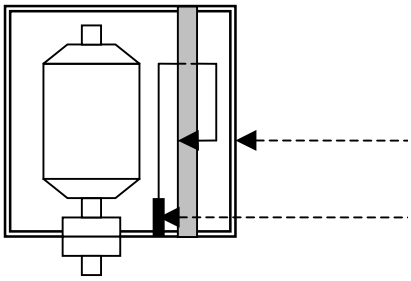
Cylinder maintenance remote dry contact.

General fault remote dry contact.

Steam production remote information contact

Use 0.75mm2 (18 AWG) flexible cable for connecting the remote dry contacts.

Leakage detection device (option)

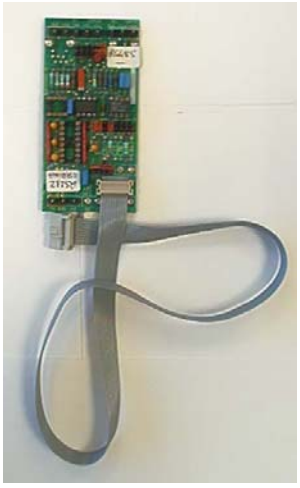


This is a small electronic circuit board to be stuck within the humidity part and to connect to connector A12 of the main circuit board.

End to connect to connector A12

Sensor to stuck vertically onto one of the walls of the humidity compartment.

RS485 data link (option)



CHARACTERISTICS :
RS 485 : 2 wires half duplex (+GND) Max. length = 1200 meters (4,000 ft).
Biais : 620 Ohm pull up & Pull Down (Selection by switch)
Terminaison : 120 Ohm (selection by switch)

Protocol : JBUS or MODBUS. (asynchrone data of 8 bits, without parity bit, 1 stop bit, CRC)
Speed : 1200, 2400, 4800, 9600 bauds.

Dimensions : 95 x 50 mm.

The connecting cable is to be plugged onto connector X13 of the main board ref : 500101/ 04.

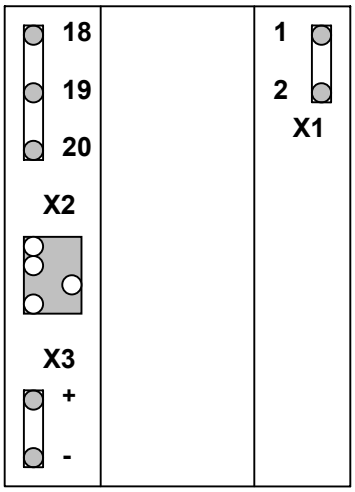
Galvanic insolation (option)

This feature permits a galvanic isolation of the regulation signal from the humidifier : the circuits are separated by an optical device.

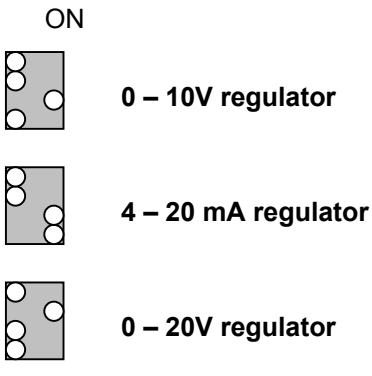
This module is to be installed on a Din rail outside the humidifier.

X2: 0-10V outlet vto CMC humidifier (the humidifier must be commissioned in 0-10v regulation)

X3: Regulator inlet signal (0-10V / 0-20V / 4-20mA)
Configurate the above mentioned dip switch.



X1 : 230 Vac 50-60Hz. supply

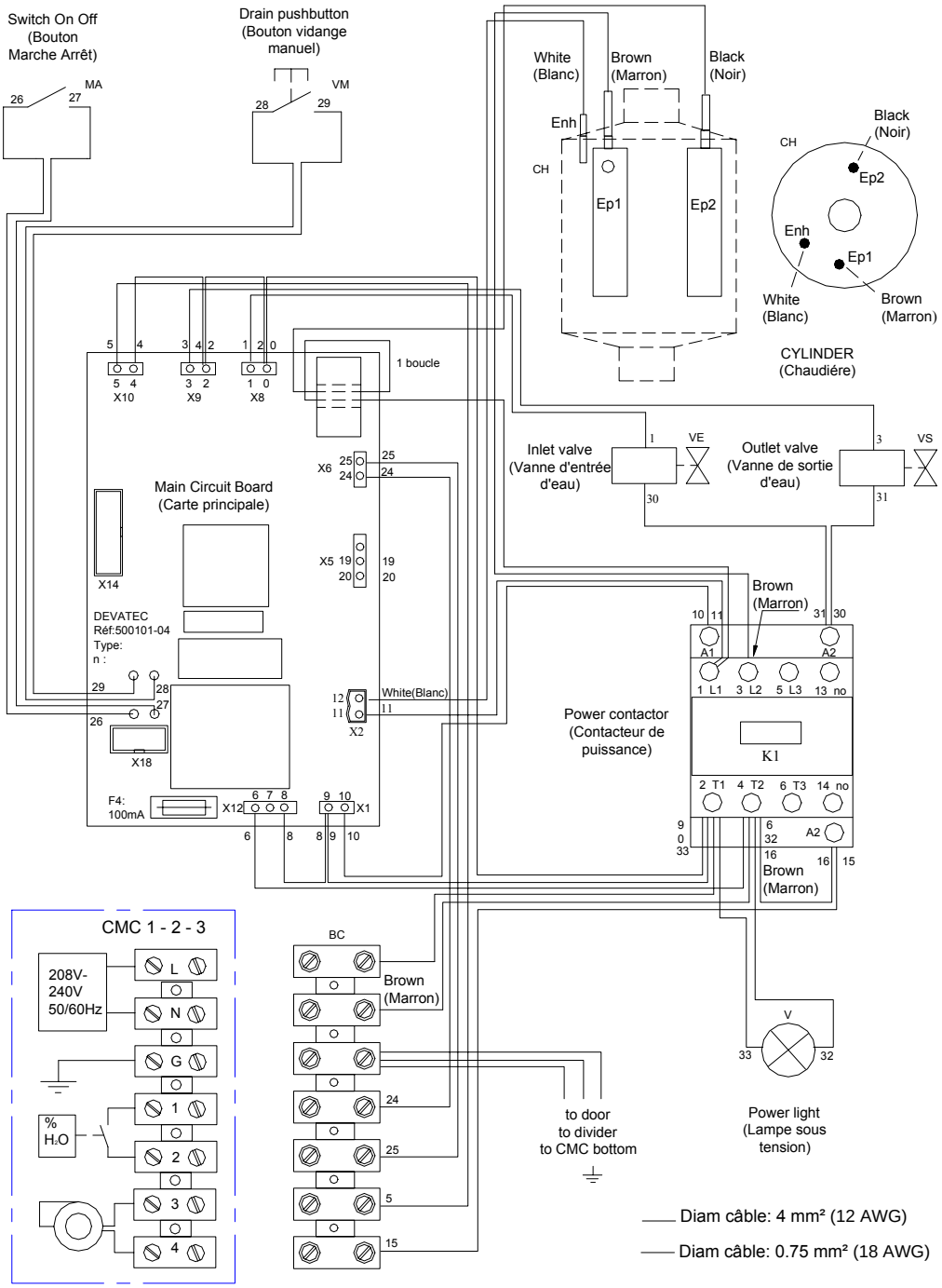


ElectroVap CMC

Wiring scheme

Electrical installation

CMC 1-2 internal wiring

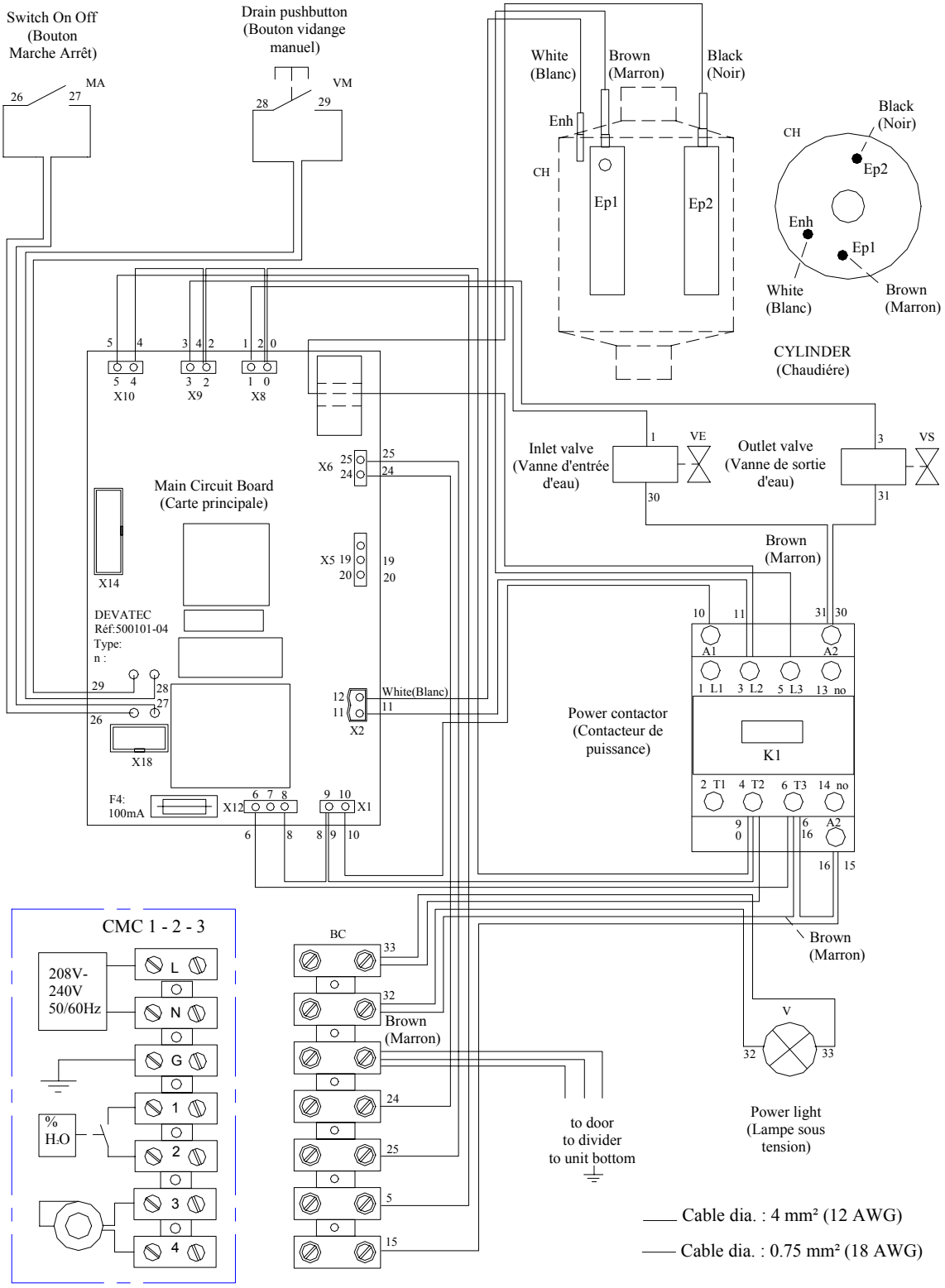


ElectroVap CMC

Wiring scheme

Electrical installation

CMC 3-4 internal wiring

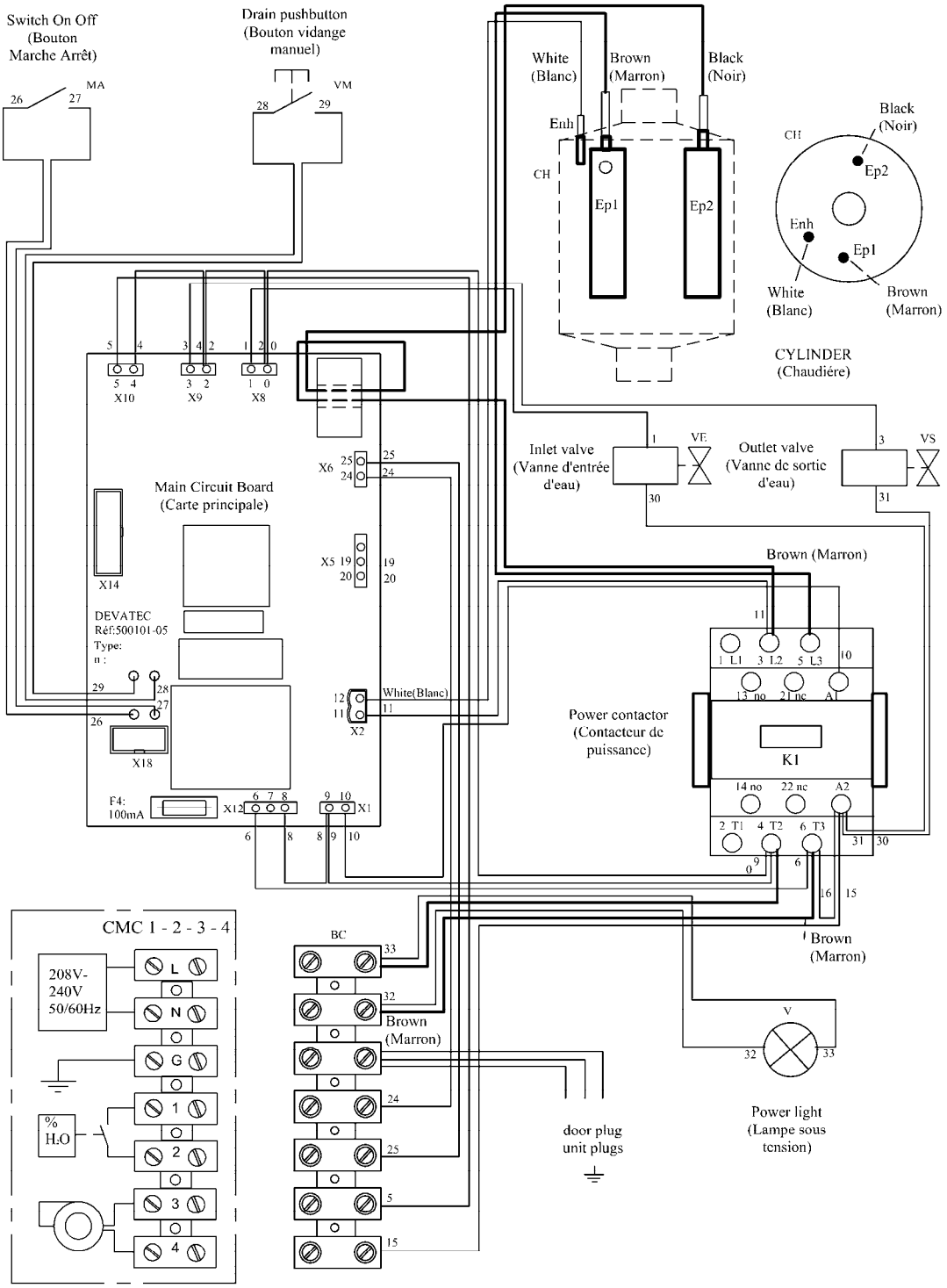


ElectroVap CMC

Special US wiring scheme

Electrical installation

ELMC 1 - 2 internal wiring

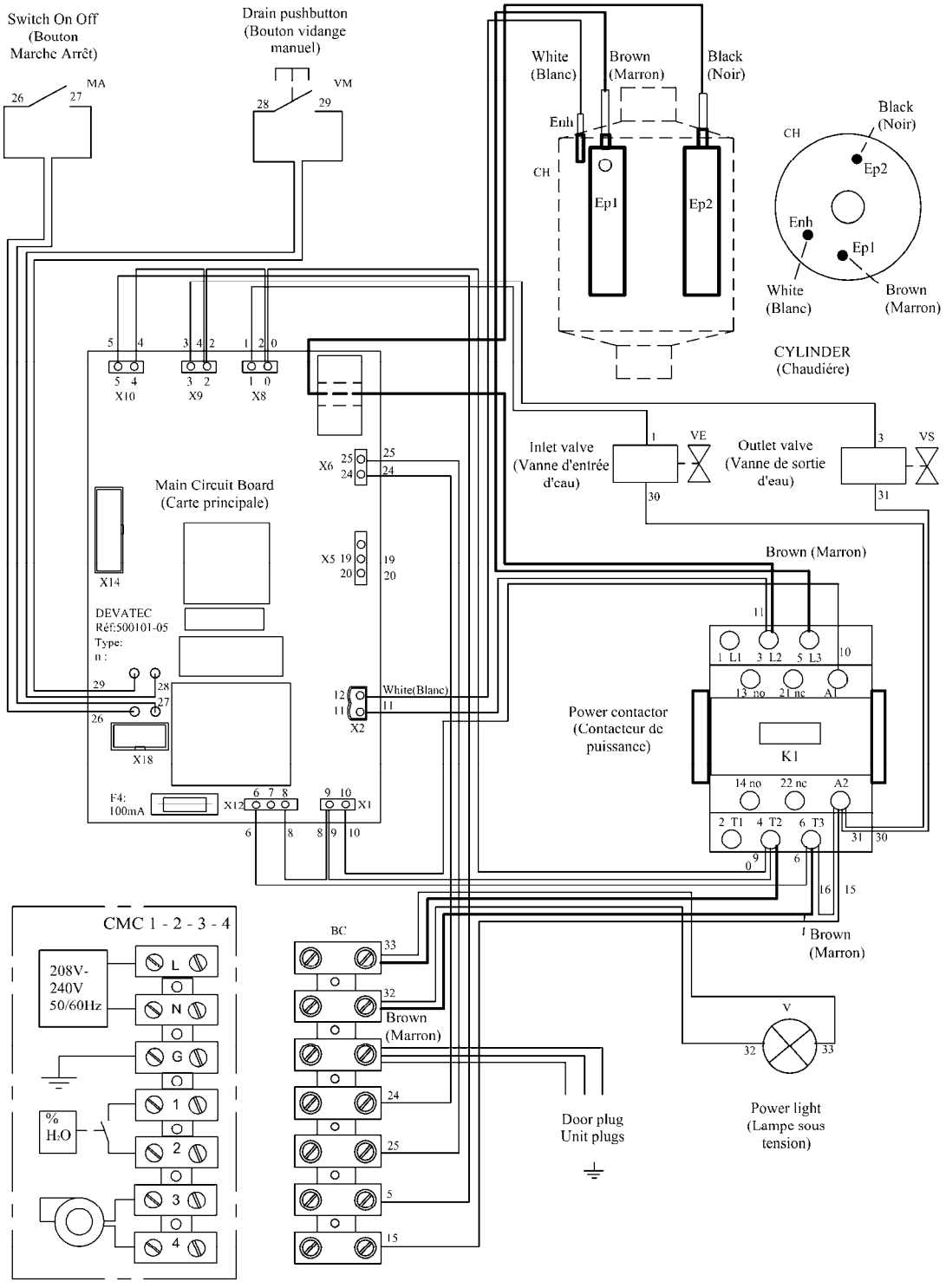


ElectroVap CMC

Special US wiring scheme

Electrical installation

ELMC 3 – 4 internal wiring

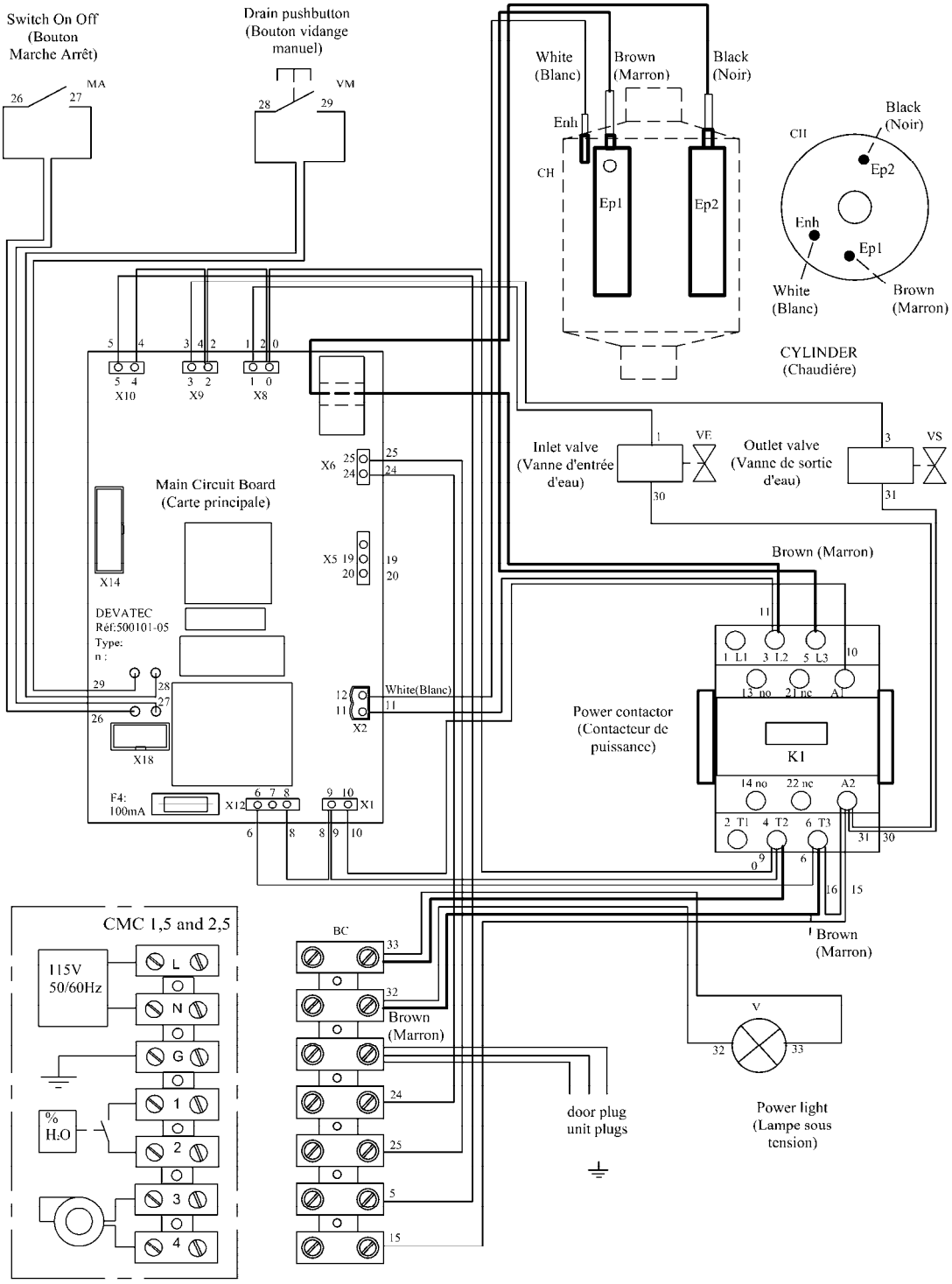


ElectroVap CMC

Special US wiring scheme

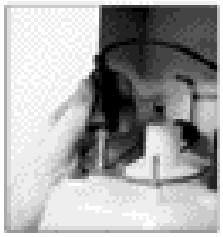
Electrical installation

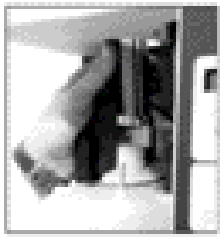
ELMC 1.5 - 2.5 internal wiring

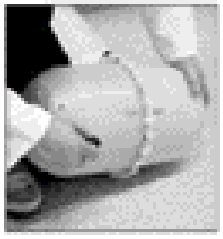


ElectroVap CMC

Inspection maintenance







Maintenance

The ElectroVap CMC is supplied with a disposable cylinder as standard. However, it can be changed for cleanable one without any modification, at users' preference. Drain the steam cylinder using the manual drain button. When the cylinder is fully drained, switch off the unit and isolate the power. **The steam cylinder may be very hot. Allow it to cool down before removing.** Remove front panel from the humidifier to access the cylinder compartment. Disconnect the steam hose from the top of the steam cylinder. Remove power and high water level electrodes from top of the steam cylinder.

Lift the cylinder upwards until it is clear of the drain valve. Insure the retaining ring remains in the drain valve. The disposable cylinder will be merely replaced by a new one.

Cleanable cylinder :
Mark the edge of the cylinder halves so they can be matched up when reassembled.

Note :
The constant heating and cooling of the cylinder may cause distortion. Consequently the cylinder halves must be assembled in the same relative position. Remove nuts and bolts around the centre of the cylinder. Open up cylinder. It is important that the strainer in the bottom half of the cylinder is also cleaned.

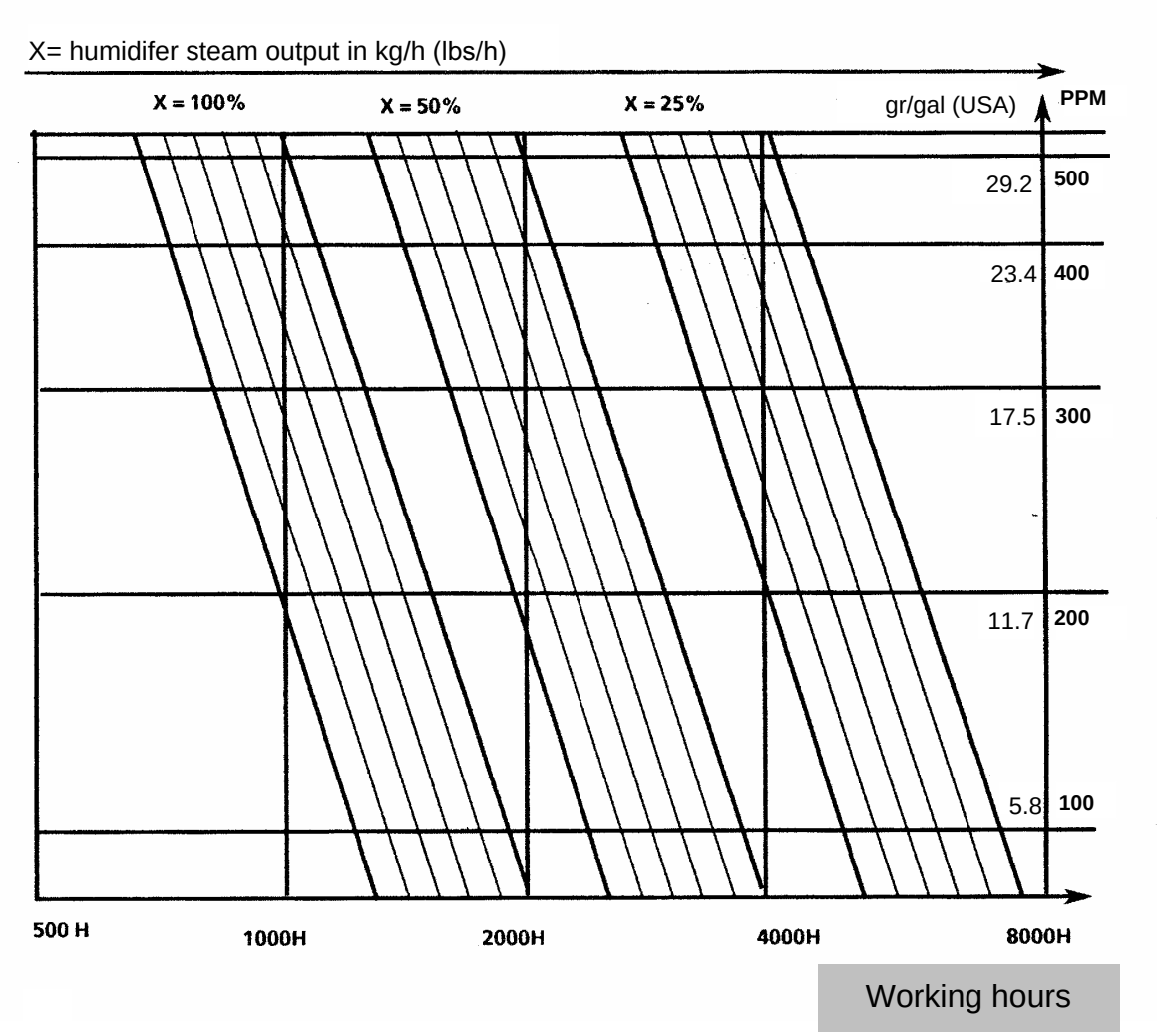
Clean the electrodes by scraping off the mineral deposits. Alternatively, this can be done using weak descaling solution. Rinse the electrodes and the body of the cylinder. IT IS IMPORTANT TO AVOID DISTORTION THE CYLINDER IN ATTEMPTING TO REMOVE ANY MINERAL DEPOSITS FROM IT. Relocate the strainer in the cylinder base. Replace the cylinder gasket on the rim of the bottom half of the cylinder and then locate the upper half of the cylinder on the gasket, TAKING CARE THAT THE MARKS ARE ALIGNED. Refit the nuts and bolts. Clean the O-ring on the drain valve and if necessary, change it. (every 2-3 cylinder cleanings). Locate the steam outlet of the cylinder in the retaining clip. Position the base of the cylinder over the drain valve and push downwards. Reconnect the power cables.

General :
The humidifier requires regular maintenance to insure efficient operation and to prevent breakdown.
The exact maintenance frequency is variable and will depend on water quality, hours run and level of demand for humidification.
New installations should be inspected / serviced every 2 to 4 weeks. This may be too frequent, but it will enable a suitable maintenance routine to be established.

Routine inspection :
The following is a guide to work that should be undertaken in a routine inspection.

1 - Inspect water and steam installation for leaks and damage.
2 - Inspect electrical installation for any loose cables and or damaged components.
3 - Inspect the steam cylinder for scale deposits. If the scale in the cylinder is half way up the stainer in the lower half of the cylinder it should be replaced / cleaned (see changing steam cylinder).
4 - Inspect the inlet valve. The drain valve may become blocked with scale from the steam cylinder. This will cause water to continually run to drain.

Maintenance guide of the cleanable cylinder for tap or hard waters



- The water hardness is mentioned in US grade, the said value is the water hydrotimetric content (th).
- The water quality is to be mentioned on your request so that to fit the most appropriate steam cylinder for the best working of the humidifier.

Length of the genuine stainless steel electrodes :

Type	CMC 1-2-3-4
Length	135 mm - 5.3 in.

During cylinder maintenance, it is recommended to measure the length of the electrodes. The latter should be replaced when the length is shorter than 1/3 or 1/2 of the original length (s.a. above table).

ElectroVap CMC

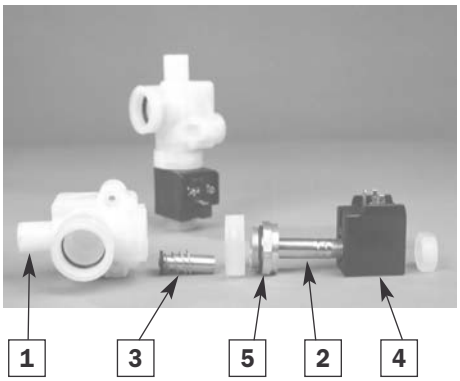
Valve maintenance

Drain valve maintenance

To be made at each cylinder maintenance

Drain out the cylinder, switch off the unit, turn off the the water supply and remove the cylinder.

- Remove coil **4**
- Unscrew and remove the valve stem **5**
- Clean up the valve body with fresh water **1**
- Clean up the valve seat **3** and rince the stem **2**



- Reassemble in reverse order. Take care to put back the spring, the seat and the cap.
- Take care not to tighten too much : watertightness is made by "O" ring
- Quater turn back the assembly to insert it into the valve body

Inlet valve and filter maintenance

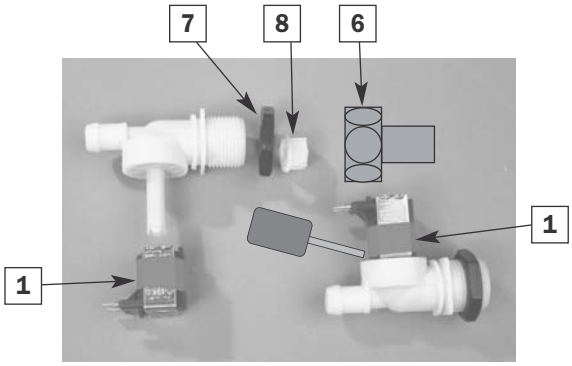
To be made every six months

FILTER :

- Turn off water supply
- Unscrew water feed hose **6**
- Unscrew screw **7**
- Remove filter **8** with a pair of pliers and rince it with water
- Clean the washer of the water feed hose **6**

INLET VALVE :

- Turn off water supply
- Remove coil 1 by pushing in A
- Flush the valve body with water by turning water on to rince out the deposit.



- Replace valve if necessary
- Reassemble

Photos non-contractuelles

Electrovap CMC

MAINTENANCE LIST

Maintenance

TYPE : CMC _____

DETAILED MAINTENANCE WORK	DATE	NEXT DATE ON

Electrovap CMC

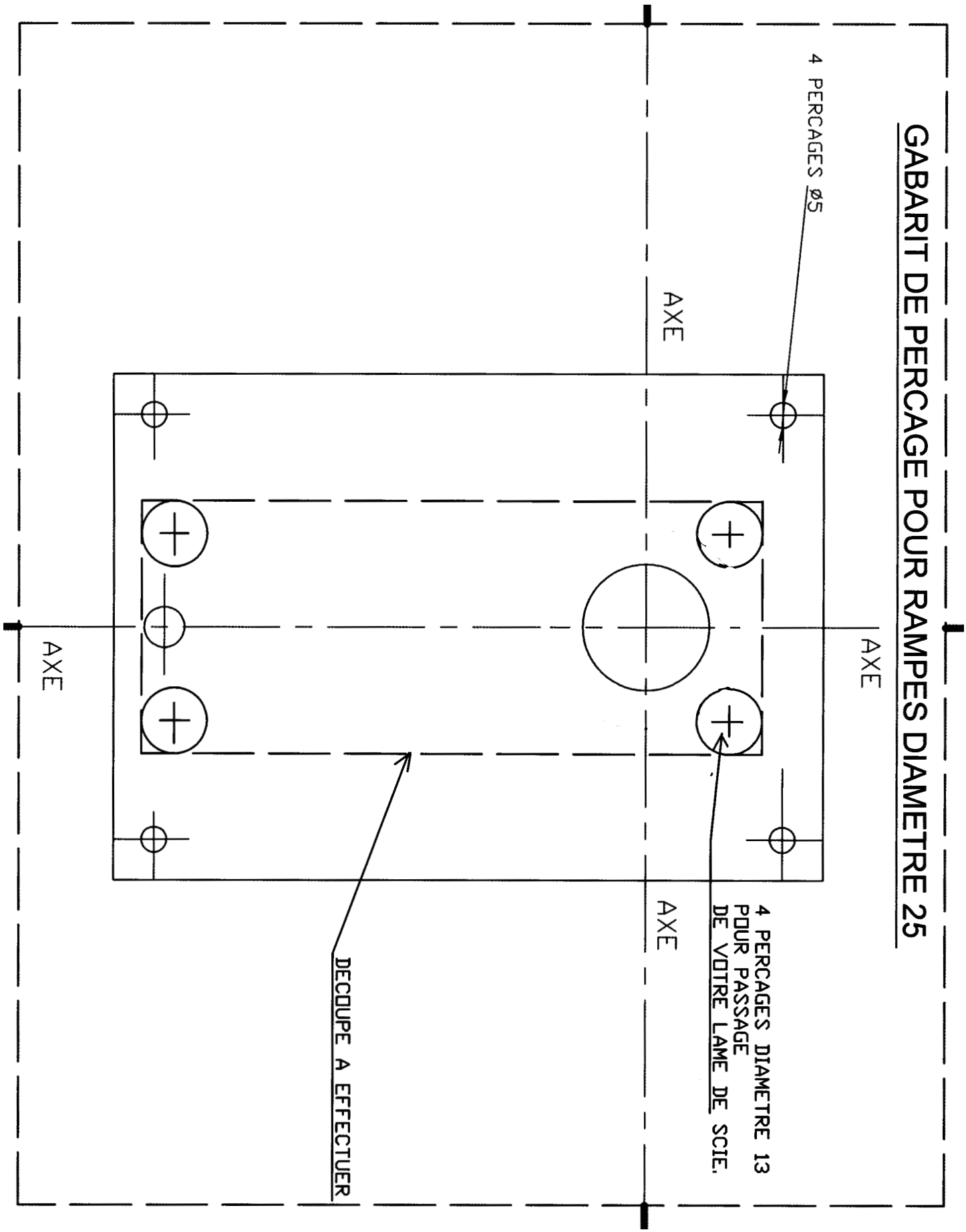
MAINTENANCE LIST

TYPE : CMC _____

DETAILED MAINTENANCE WORK	DATE	NEXT DATE ON

ElectroVap CMC

Drilling template for steam pipe



devatec

International certification

Our units ***ELMC*** *or* ***FogSystem*** *are listed or in conformity with:*

Canada: CSA

USA : UL

Europe : C.E

CE

C SA US
LR 94104-2

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