Technical Manual

Electrode Steam Humidifier
# Table of Contents

Safety information 3-4  
Delivery contents 5  
Dimensions & weights 6  
Humidifier component part overview 7

## Wall installation  
Installation steps 8  
Step 1 - Placing and wall attachment 9-10  
Step 2 - Water connection 12  
Step 3 - Steam pipe positioning 13 to 19  
Step 4 - Condensate outlet 20  
Step 5 - Electrical connections 21 to 28  
Step 6 - Control connection 29  
Setting up 30

## Digital Display
User information menu 31-32  
Humidifier status menu 33  
Changing configuration menu 34 to 36

## Maintenance
Cylinder maintenance guide 37  
Precaution 38

## Maintenance
Alerts 39-41  
Changing the main circuit board 42  
Steam cylinder cleaning 43  
Valve maintenance 44-45  
Spare parts list 46 to 49
**Important**

Please read and follow the enclosed safety information and the warning labels inside the humidifier before installation or maintenance.

**Warnings & safety symbols**

**Warning**: This symbol is used to designate a danger of injury or potential damage to the system.

**Caution**: High voltages are present inside the humidifier. All work concerned with the electrical installation must be carried out by skilled and qualified personnel.

**Caution**: Danger of scalding! The ElectroVap MC2 generates steam during operation and therefore surfaces and pipe-work become very hot. Be sure that equipment not withstanding high temperatures be kept away.

**Warning**: The end user should insure that any removed maintenance equipment be disposed of according to the local prevailing regulations.

**Delivery and storage**

Any loss or damage during delivery should be reported to carrier by registered letter within 3 working days to Humidity Source, LLC 90 Dayton Ave. Suite 58 Passaic, NJ 07055 Phone (973) 916-1001, FAX (973) 916-0770. It is recommended that the ElectroVap MC2 humidifier be kept in its transit packaging for as long as possible prior to installation. If the humidifier is to be put into storage prior to installation, it must be stored under cover and protected from physical damage, dust, frost, rain and humidity. More than 6 months storage is not recommended.
GENERAL

This manual contains all details necessary for the planning and installation of the ElectroVap ELMC2 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 and Health and Safety representative and effective control measure 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 isolate all electrical and water supplies before commencing any maintenance. Every effort has been made to insure 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 supplier if any doubt.

Correct use

ElectroVap MC2 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 LIABLE FOR ANY DAMAGE RESULTING FROM INCORRECT USE.

Water

ElectroVap MC humidifiers are designed to be used with demineralized, R/O, tap or softened water. On no account attempt to introduce any other fluid or chemical into the system. Water supply should not exceed 90 psi 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 nsuring their suitability. It is the duty of the installer to insure that suitable sized cables and circuit breaker protection is provided. Please observe the local regulations concerning the provision of electrical installations.

Warranty

A two year warranty term—cost and labor—is applicable to the parts of the ElectroVap MC2 to the exception of the consumable parts (valves, cylinders or parts of cylinders) provided our recommendations of use & maintenance have been adhered to. Failure to specify and fit original parts and accessories will invalidate our warranty.

Note

The manufacturer’s policy is one of continuous research and development and therefore reserves the right to amend without notice the specifications given in this document.
What is in the box:

1. One ElectroVap ELMC2 steam humidifier supplied with one, two or three disposable or cleanable cylinder(s) according to the purchased model.

2. One 500mm long (24") flexible hose with 3/4" thread (with washers) for tap water connection.
   25 mm (1'') I.D. drain hose, as follows:

3. ELMC 5 to 30 : 1 m. (39'') long
   ELMC 40 to 60 : 2 hoses of 1 m. (39'') long and 1.2 m. (47'') long respectively
   ELMC 90 : 3 hoses of 1 m. (39'') long, 1.2 m. (47'') long and 1.8 m. (71'') long

4. Hose clamps:
   ELMC 5 to 30 : 3 clamps (2 pieces for the steam hose & 1 piece for the drain hose)
   ELMC 40 to 60 : 6 clamps (4 pieces for the steam hoses & 2 pieces for the drain hoses)
   ELMC 90 : 9 clamps (6 pieces for the steam hoses & 3 pieces for the drain hoses)
### Dimensions in mm

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>Empty</th>
<th>Operating</th>
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<tbody>
<tr>
<td>ELMC 5 to 15-2</td>
<td>475</td>
<td>540</td>
<td>217</td>
<td>215</td>
<td>355</td>
<td>355</td>
<td></td>
<td></td>
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<td>23</td>
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<tr>
<td>ELMC 20 to 30</td>
<td>550</td>
<td>680</td>
<td>272</td>
<td>270</td>
<td>410</td>
<td>410</td>
<td></td>
<td></td>
<td>22</td>
<td>37</td>
</tr>
<tr>
<td>ELMC 40 to 60</td>
<td>845</td>
<td>680</td>
<td>272</td>
<td>270</td>
<td>400</td>
<td>400</td>
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<td>ELMC 90</td>
<td>1075</td>
<td>680</td>
<td>272</td>
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<td>380</td>
<td>380</td>
<td>275</td>
<td>275</td>
<td>45</td>
<td>90</td>
</tr>
</tbody>
</table>
ELMC 5-30 humidifier split view

1 Steam hose
2 Water feed hose 12x16mm
3 Hose clamp 16x25mm
4 Overflow water hose 18x22mm
5 On/off rocker switch
6 Power on board lamp
7 Grommet
8 Drain cup (upper)
9 Water inlet valve
10 LCD display board (Ref 500600/3)
11 Remote information board (option)
12 Power contactor
13 Main circuit board (Ref 500101/05)
14 Filling cup
15 Drain valve
16 Cylinder strainer
17 Steam cylinder
18 Stainless steel electrode plate
19 High water level electrode
20 High water level electrode cable
21 Electrode power cable
22 Cylinder water feed hose 18x22 mm
23 Flexible water feed hose 3/4" F
24 Hose clamp 12x22 mm
Electrical installation must be carried out by a skilled and qualified personnel.

Please read, and follow the enclosed information for the installation of the humidifier and the steam, water and electrical lines.

For further assistance, call Humidity Source 973-916-1001.

Failure to adhere to manufacturer’s installation recommendations will invalidate the warranty.

**Steps**

1. Mounting and wall attachment
2. Water supply connection
3. Steam distributor positioning
4. Condensate outlet
5. Electrical connection
6. Control connection
How to install the humidifier on a wall

Installation tips:

The humidifier may be operated between 5°C (40°F) and 40°C (104°F) in a room with less than 80% of humidity.

When in operation, the rear panel may become hot (60°C or 140°F). Do not install the humidifier on a heat sensitive surface.

Electrovap humidifiers have been designed to be mounted on a solid wall. Before installation, make sure that the surface material is strong enough to hold the humidifier.

For maximum efficiency the steam discharge should be as close as possible to the humidifier.

Provide free space around the humidifier to allow easy access for maintenance purposes (see drawings below).
Installation on wall

Note:
Use mounting fasteners and materials appropriate to the surface on which the unit will be mounted.

The dimensions mentioned below are for the cabinets with doors removed.

Method:
Mark and drill the mounting holes for 6 mm (1/4'') dia. screws (see drilling distance table): ELMC 5 to 60: 4 mounting screws—ELMC 90: 5 mounting screws
Insert pegs in holes and the upper screws. Allow about 10 mm for hanging the cabinet.
Hang the cabinet and level it vertically and horizontally. Tighten the upper screws first and then the lower screws.

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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</thead>
<tbody>
<tr>
<td>ELMC 5 to 15-2</td>
<td>21</td>
<td>110</td>
<td>425</td>
<td>40</td>
<td>21</td>
<td>425</td>
<td>385</td>
<td></td>
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<td>ELMC 20 to 30</td>
<td>41</td>
<td>110</td>
<td>467</td>
<td>40</td>
<td>21</td>
<td>507</td>
<td>525</td>
<td></td>
</tr>
<tr>
<td>ELMC 40 to 60</td>
<td>41</td>
<td>110</td>
<td>760</td>
<td>40</td>
<td>21</td>
<td>800</td>
<td>525</td>
<td></td>
</tr>
<tr>
<td>ELMC 90</td>
<td>41</td>
<td>110</td>
<td>455</td>
<td>40</td>
<td>21</td>
<td>1030</td>
<td>525</td>
<td></td>
</tr>
</tbody>
</table>

Drilling distances in mm

Detail of hanging hole
ELECTROVAP MC2
Installation - Step 2

**WATER CONNECTION**

**Recommendations:**

Electrode humidifiers operate by passing an electrical current through water by means of stainless steel plates called electrodes. The water is made conductive by concentrating the natural mineral salts it contains.

ElectroVap humidifiers will produce steam from almost any type of water.

**City water or raw water:** With a conductivity between 350 and 1000 µS/cm (10 to 25 gr/gal or 50 to 500 ppm) The humidifier concentrates these minerals to conduct the proper current.

**Softened water:** Water softeners remove calcium minerals and replace them with sodium minerals, which are more easily flushed down the drain. Duplex softeners are best suited to these humidifiers in this regard. If in doubt, consult the softener manufacturer.

**Reverse osmosis (R.O.) water:** Water is forced thru a membrane to remove most of the minerals. Some salt is needed to start the humidifier.

**Demineralised water:** This is water treated by running thru ion exchange resins. It is very pure. ElectroVap humidifiers require a minimum water conductivity of 30µS/cm. A teaspoon of bicarbonate of soda should be added to initiate steam production.

No chemical agent whatsoever (chlorine, disinfectant, ozone) should be added to the water. Some softened waters may generate foam that can disturb the correct functioning of the humidifier. If this occurs, please refer to Humidity Source for assistance.

**Recommendations on water connection:**

A fresh cold water service should be used to supply the unit. The water pressure should not exceed 6 bar (90 psig) and should not be less than 1 bar (15 psig) and with a temperature less than 40°C (104°F).

The water supply connection is on the bottom of the unit. All the ELMC are supplied with a 500 mm long water inlet hose with a 3/4” female connection to the cold water supply. A check valve should be located on the cold water service connection to the unit.

Any leakage may cause potential damage. If the installation is in above a hung ceiling or above prime rooms such as museums, laboratories or computer rooms, be sure that the area below the humidifier is protected with waterproof materials or drain pans to protect against any water spilling during servicing or if a leakage problem occurs.
STEAM DISTRIBUTORS

Steam from the cylinder enters the duct via a steam distributor tube. In order to obtain optimum performance of the humidifier, it is recommended that these instructions be followed as closely as possible.

There are two steam inlet diameters available, depending on the ELMC model: 25 mm and 40 mm.

Steam distributor selection table

The number of distribution pipes and the diameter depend on the humidifier model.

<table>
<thead>
<tr>
<th>ELMC Model</th>
<th>5 to 15-2</th>
<th>20 to 30</th>
<th>40 to 60</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of steam pipe(s)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Steam inlet diameter (1)</td>
<td>25mm</td>
<td>40mm</td>
<td>40mm</td>
<td>40mm</td>
</tr>
<tr>
<td>Condensate drain diameter (2)</td>
<td>8mm</td>
<td>8mm</td>
<td>8mm</td>
<td>8mm</td>
</tr>
</tbody>
</table>

To get the best steam distribution, select the longest possible distributor to fit the duct.

Standard distributors are available in either diameter, and in 110, 290, 590, 790, 1000, 1250 and 1500 mm long. (4.3”, 11.4”, 23.2”, 31.1”, 39.4”, 48.2”, 59”).
**POSITIONING OF THE STEAM DISTRIBUTOR**

**STEAM ABSORPTION DISTANCE (D)**

A minimum in-duct distance is required for the steam coming out of the steam distributor to be absorbed into the air. Within this absorption distance, the steam plume is visible and can condense on any obstructions (elbows, turning vanes, controls, transitions) within the duct. To prevent condensation, this distance should be calculated before positioning the steam distributor.

**How to calculate the absorption distance (D)**

In order to determine the absorption distance, use this table. Enter:
- Relative humidity of inlet air before humidification in %.
- Relative humidity of outlet air after humidification in % RH

Find: \( D = \) minimum absorption distance in meters (m). (25.4 mm = 1”)

<table>
<thead>
<tr>
<th>RH % of the inlet air</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH % of outlet air</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>0.9</td>
<td>0.8</td>
<td>0.7</td>
<td>0.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>50</td>
<td>1.1</td>
<td>1.0</td>
<td>0.9</td>
<td>0.8</td>
<td>0.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>60</td>
<td>1.4</td>
<td>1.3</td>
<td>1.2</td>
<td>1.0</td>
<td>0.8</td>
<td>0.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>70</td>
<td>1.8</td>
<td>1.7</td>
<td>1.5</td>
<td>1.4</td>
<td>1.2</td>
<td>1.0</td>
<td>0.7</td>
<td>-</td>
</tr>
<tr>
<td>80</td>
<td>2.3</td>
<td>2.2</td>
<td>2.1</td>
<td>1.9</td>
<td>1.7</td>
<td>1.5</td>
<td>1.2</td>
<td>0.8</td>
</tr>
<tr>
<td>90</td>
<td>3.5</td>
<td>3.4</td>
<td>3.2</td>
<td>2.9</td>
<td>2.7</td>
<td>2.4</td>
<td>2.1</td>
<td>1.7</td>
</tr>
</tbody>
</table>

For temperatures between 10 and 25 °C (50 and 80°F).

- **Before / after fan**
- **Before / after heater**

\[ 2.5 \times D \text{ before thin particle filter} \]
A high limit humidistat may be installed in the duct to stop the humidifier if the level of humidity exceeds a preset value.

In case the recommended distances cannot be met, contact Humidity Source for a multi-tube steam distribution panel.

If accurate values cannot be reached, a distance of 2 m. (6 ft) should be used as a minimum distance between distributors & obstructions, and 3 to 4 m. (10 to 12 ft) before a sensor or humidistat.
STEAM DISTRIBUTOR POSITIONING

Use the following dimensions and spacing according to your duct conditions.

- **H1 = 4.33"** = Minimum height between the duct floor and the center of the steam pipe.
- **H2 = 5.5"** = Minimum distance between two pipes.
- **H3 = 6.3"** = Minimum height between the duct top and the center of the steam pipe.

The H3 distance can be 3" min. if the steam pipe is installed at an angle of 30 to 45°. The arrow shows the direction of the air flow.
STEAM DISTRIBUTOR POSITIONING

In vertical ducts where the air flow is upward or downward, the steam distribution pipe(s) must be tilted by 15° sideways.

In duct with limited height, the distribution pipe(s) can be tilted by 30 or 45° to get the 80 mm minimum height.

\[ \text{d} = \text{Duct diameter} \]

\[ \text{D} = \text{Humidification distance} \]
**INSTALLATION**

To insure the best steam distribution possible, we recommend installation of the steam pipes as per the two methods described shown.

**How to install on a duct**

Steam distributors must be screwed to the duct thru the mounting plate with sheet metal screws. The length of the screws should be according to the thickness of the duct.

**How to attach the pipe end inside the duct.**

The end of the steam pipe should be attached to the duct with a 5 mm (3/16”) threaded rod from the hole in the plate to the outside of the duct, and attached by a couple of screws (method 1). A rail attached to the inner side of the duct can also be used - a 3/16” screw is used to attach the pipe to the rail (method 2).

The steam pipe must be installed level.
STEAM OUTPUT

1. Use high quality steam hose. When the humidifier is started for the first time, a smell of rubber may be noticed. This is normal and will eventually disappear.

2. Steam hose selection: (25mm ID hose = 1” hose) (40mm ID hose = 1.5” hose)

<table>
<thead>
<tr>
<th>Model ELMC</th>
<th>5 to 15-2</th>
<th>20 to 30</th>
<th>40 to 60</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of steam outlets</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Steam outlet dia.</td>
<td>25mm</td>
<td>40mm</td>
<td>40mm</td>
<td>40mm</td>
</tr>
</tbody>
</table>

3. The ELMC humidifier can be used with duct pressures (P) having the following characteristics:
   - If P is less than 150mm (6”) water column (WC)
   - If P is between 150mm (6”) and 300mm (12”) WC, our optional filling cup platform must be used.

Please adhere to the recommendations given below for the installation of the steam hose according to one of the shown examples most suited to your installation. A set of hose clamps are supplied for insuring a correct installation.

The humidifier should be located within 3 m. (10 ft) of the steam distributor. If the distance is greater than 3 m, insulated copper tube of a slightly larger diameter must be used.

Radius of bend for steam hose:
- 25 mm hose = 10” minimum radius
- 40 mm hose = 16” minimum radius

Example A

Example B
Room ventilation unit

Three ventilation packs permit the use of the humidifier in direct in-space applications where there is no ductwork.

The CV2 and EHF3 ventilation packs cannot be set on the top of the humidifier. The distance between the humidifier and the ventilation pack(s) should not exceed 10 ft.

The connection of the steam hose between the humidifier and the ventilation packs is made by an adaptor for units ranging from 44 lb/hr & up:
- CV2 = 40/25mm adaptor
- EHF3 = 40/50mm adaptor

The connection of the 25 mm steam hose to the CVMC1 ventilation unit doesn’t require any adaptor.
When in combination with the ELMC 40 or the ELMC 60, two EHF3 ventilation packs should be used with equal lengths of steam hose for each. (X1=X2)

The electrical connection of the ventilation packs to the humidifier is via terminal block 3 & 4 on the DIN rail. A relay is required for CV-2 and EHF3.

As far as the EHF-3 is concerned, please revert to the recommendations given on the EHF-3 information sheet.

Never connect the CV-2 or EHF-3 units directly to terminals 3 & 4 of the humidifier. A separate power supply is required.

Allow a 10 ft. distance in front of the ventilation pack for a free diffusion of steam.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Weight Kg</th>
<th>dB</th>
<th>Kg/h max output</th>
<th>m3/h</th>
<th>Compatible with</th>
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<tbody>
<tr>
<td>CVMC1</td>
<td>400mm</td>
<td>195mm</td>
<td>165mm</td>
<td>330mm</td>
<td>35mm</td>
<td>35mm</td>
<td>4.6</td>
<td>35</td>
<td>10</td>
<td>150</td>
<td>ELMC2 5 to 10</td>
</tr>
<tr>
<td>CV2</td>
<td>520mm</td>
<td>260mm</td>
<td>350mm</td>
<td>360mm</td>
<td>80mm</td>
<td>35mm</td>
<td>12</td>
<td>38</td>
<td>20</td>
<td>300</td>
<td>ELMC2 15-2 &amp; 20</td>
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<tr>
<td>EHF3</td>
<td>495mm</td>
<td>356mm</td>
<td>406mm</td>
<td>406mm</td>
<td>44mm</td>
<td>51mm</td>
<td>15</td>
<td>48</td>
<td>55</td>
<td>780</td>
<td>ELMC2 30 to 50</td>
</tr>
</tbody>
</table>
CONDENSATE DRAINING

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

1. Steam quality hose should be used:
   - **ELMC 5 to 30**: 1m × 25mm hose with 1 hose clamp (supplied).
   - **ELMC 40 to 60**: 1m + 1.2m × 25mm hose with 2 clamps (supplied).
   - **ELMC 90**: 1m + 1.2m + 1.8m × 25mm hose with 3 clamps (supplied).
   These hoses are designed to be connected to the draining system. Regular replacement is recommended.

2. If rigid drain piping is used, it must be heat (100°C) and pressure resistant PVC material and have a 60 mm wide diameter.

3. The discharge hose must be free from any obstacle. It is recommended that each steam cylinder has its own drain hose and tank arrangement.

4. Use water tanks with a lid that has water collecting facilities (see pictures 1, 2 and 3).

5. A funnel can also be used (see picture 4), but it should be offset from the underside of the unit to prevent any steam and/or condensation from getting into the cabinet. The installation of a siphon (as per the draining hose) is recommended and arrangements for holding water spilling should also be made.

6. **CAUTION**: keep a minimum pitch of 10° for both the draining hose of the humidifier and for general drain pipe (see pictures 1, 2, 3 and 4).
ELECTRICAL TABLES (Units with V2_16 software)

ELMC Steam Humidifier 230 - 1 - 50/60 Hz

<table>
<thead>
<tr>
<th>ELMC</th>
<th>Steam Production (lb/hr)</th>
<th>Amps (A)</th>
<th>Max A (A)</th>
<th>KW (KW)</th>
<th>Cylinder Size</th>
<th>Steam Outlet Dia. (mm)</th>
<th>Torroidal Transformer Wiring</th>
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<td>5</td>
<td>11</td>
<td>16.3</td>
<td>17.6</td>
<td>4.05</td>
<td>Small</td>
<td>25</td>
<td>Straight through</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>32.7</td>
<td>34.8</td>
<td>8.00</td>
<td>Large</td>
<td>25</td>
<td>Split</td>
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</table>

ELMC Steam Humidifier 230 - 3 - 50/60 Hz

<table>
<thead>
<tr>
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<th>Steam Production (lb/hr)</th>
<th>Amps (A)</th>
<th>Max A (A)</th>
<th>KW (KW)</th>
<th>Cylinder Size</th>
<th>Steam Outlet Dia. (mm)</th>
<th>Torroidal Transformer Wiring</th>
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<td>4.13</td>
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<td>25</td>
<td>Straight through</td>
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<td>8</td>
<td>18</td>
<td>15.3</td>
<td>16.5</td>
<td>6.49</td>
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<td>25</td>
<td>Straight through</td>
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<td>Straight through</td>
</tr>
<tr>
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ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL.
ELMC Steam Humidifier 208 - 3 - 50/60 Hz with V2_16 software

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<tr>
<th>ELMC</th>
<th>Steam production (lb/hr)</th>
<th>Amps (A)</th>
<th>Max A (A)</th>
<th>KW (KW)</th>
<th>Cylinder Size</th>
<th>Steam Outlet Dia. (mm)</th>
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ELMC Steam Humidifier 460- 3 - 50/60 Hz with V2_16 software

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ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL
ELMC Steam Humidifier 600-3 - 50/60 Hz with V2_16 software

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ELECTROVAP MC2
Installation - Step 5

ELECTRICAL CONNECTIONS

On-Off Models

**NOTE:** Connect the tagged power cable to the electrode next to the water level sensor.

**IMPORTANT!**
Connect jumpers to terminals N and L to power the control circuit. 
*Not required on 460 v units.*

**Connections For Proportional Models**

- Air Flow Switch and/or High Limit Humidistat (Or install jumper if not used)
- Control Signal
- 0-10 VDC
ELMC 5 WIRING SCHEME (1x220-230V)

### Fuse Table

<table>
<thead>
<tr>
<th>Fuse</th>
<th>Amp</th>
<th>Fuse function</th>
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<tr>
<td>F1</td>
<td>2A</td>
<td>Protection of the power contactor coil</td>
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<tr>
<td>F2</td>
<td>2A</td>
<td>Protection of the inlet valve coil</td>
</tr>
<tr>
<td>F3</td>
<td>2A</td>
<td>Protection of the drain valve coil</td>
</tr>
<tr>
<td>F4</td>
<td>100mA</td>
<td>Protection of the electronic boards</td>
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</table>

**All works concerned with electrical installation must be carried out by skilled and qualified personnel**
ELMC 5 to 25 WIRING SCHEME - 3 x 208 - 230 V
ELMC 5 to 30 WIRING SCHEME - 3 X 460 to 600 V

F1: 2A Protection of the power contactor coil
F2: 2A Protection of the inlet valve coil
F3: 2A Protection of the drain valve coil
F4: 100mA Protection of the electronic boards

ALL WORKS CONCERNED WITH ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY SKILLED AND QUALIFIED PERSONNEL
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ELECTROVAP MC2
Installation - Step 6

ON/OFF CONTROL

ON/OFF Humidistat
Air Flow Switch and/or High Limit

STEP CONTROL

Multi-stage Humidistat

PROPORTIONAL CONTROL

Proportional Humidistat
Air Flow Switch and/or High Limit or Jumper

NOTE!
Set Dip Switch S1 On Main Board According To Control Signal

0-10V 2-10V 0-20V 4-20V 1-5V 4-20mA
Before putting this humidifier in operation, please make sure that the installation is in conformity with the manufacturer's technical specifications.

- Open the water valve of the main water line.
- Switch on the power supply disconnect switch.
- The power-on light should now be illuminated.
- Switch the I/O (on/off) rocker switch to I (on).
- The display will default to show the rate of steam being produced. You are in the User Information menu.
- As soon as the humidifier is prompted by the humidity sensor or the humidistat, the contactor pulls in, the heating begins and the steam production LED (the steam cloud icon) is illuminated.
- 90 seconds after the humidifier is switched on, the inlet valve opens and the cylinder begins to fill with water. The electrode plates then heat the water and after about 10 minutes (the heating time depends on the model of humidifier and the water conductivity), the humidifier begins to generate steam.
- Initially the water has low conductivity, so the amperage draw and steam production will be low also. As the minerals are concentrated, these will gradually rise to the humidifiers full rated values.
- Concentration usually takes anywhere from 1/2 hour to a day. A half-teaspoon of salt dissolved in a small amount of water may be added to the cylinder to speed up the process, if necessary.
ATTENTION:

- Press button (1) to shift from menu to menu.
- Use the up (2) and down (3) keys to scroll menu

HUMIDIFIER STATUS

STEAM HUMIDIFIER
ELMC ---- ---- V

STEAM PRODUCED
---- KG/H

ACTUAL CURRENT
---- A

SERVO CONTROL
(1-2) OPEN

Indicates that the contact between terminals 1 & 2 is open (see paragraph concerning the control wiring).

NO DEMAND
PROP. SIGNAL = 0

Indicates that the control signal equals 0 (check control signal wiring).

Internal proportional controller

External proportional sensor & controller

If other types of control

SET POINT: ---- %HR
MEASURED RH: ---- %

Shows the humidity set point and the measured humidity level by the sensor when a complete integrated control signal is connected to the humidifier

EXTERNAL CONTROL SIGNAL ---- V

Shows the control signal in case of proportional control system.

STEAM DEMAND ---- %

Shows the steam demand in the system within 20% to 100%.
"End of season" drain enabled after 24 up to 168 hours of inactivity.

This shows the number of kg of steam still available before the next service is due. Use as a maintenance planning tool.

This shows the number of operating hours still available before service. Use as a maintenance planning tool.

This shows the working time in hours between two maintenance periods.

This shows the number of working hours of the humidifier between two maintenance periods.

Home menu
ATTENTION:

- Press button (1) allows you to shift from menu to menu
- Use the up (2) and down (3) keys to scroll menu

**HUMIDIFIER CONFIGURATION**

**CONTROL SIGNAL IN**

**TOTAL STEAM PRODUCED KG**

**TOTAL HOUR RUN**

**WATER QUALITY**

**CYLINDER USED**

**POWER SUPPLY**

**MAXIMUM POWER INSTALL**

Shows the quantity of steam produced by the humidifier since it has been set up.

Shows the number of hours of operation of the humidifier since it has been set up.
ATTENTION:

- Press button (1) to shift to “changing configuration” menu.
- Then scroll display using the up (2) or down (3) keys.
- The selected parameter will flash. Press “Enter” key (1) for recording.

With the humidifier switched on, press the down (1) key and the first digit will flash. Press the up (2) key to increase or down (3) key to decrease the first figure to enter of the access code. Press down (1) to confirm. The next digit will start to flash. Repeat for a second and third digit of the access code.

This setting allows you to select the type of control signal. A humidifier originally supplied in on/off control can be upgraded with an optional control upgrading kit.

This allows you to limit the humidifiers maximum steam capacity from 100% down to 20% of maximum.

If proportional control with 0-10V internal humidity controller option

This allows you to set the set point of the desired humidity percentage.

This allows you to adjust precisely the proportional control signal.
This allows you to adjust the estimated steam production in kg or of operating hours before a digital display notice is made. If a cylinder maintenance needs to be done, please refer to the cylinder maintenance pages of this manual. If not, this parameter can be adjusted for a higher value (factory default time: 300h).

This setting allows you to adjust the time of the small drain that takes place whenever the humidifier takes in water. This time can be increased when foam is seen inside the cylinder (particularly when using softened water).

This allows you to shut down the contactor(s) during drain cycles to prevent current leakage.

This allows you to select how the unit reduces its output: either by "boil-down" (required for R.O. & demineralized water) or by draining.

This allows you to input the type of cylinder being used.

This allows each unit to be given a reference number when it is connected to a communication bus. (HUM-1, etc)

This allows you to synchronize the speed data with the ELMC communication bus.
This enables the function of keeping water temperature of the cylinder at 150°F when the unit is stopped. This function requires that the optional kit be installed.

This allows the time for the above to be selected (adjustable from 24 to 168 h.)

**IMPORTANT NOTICE**

The units have a factory default maintenance time of 300 hours that suits most cases. The exact maintenance frequency is variable and depends on water quality, hours of run and level of demand for humidification. New installations should be inspected or serviced frequently to enable a suitable maintenance routine to be established.

For hard or very hard waters, the use of a cleanable cylinder is recommended. A cleanable cylinder maintenance guide can be found on the next page. This should be seen as a help only and not be considered binding information.
Estimated cylinder maintenance curve

Example given: It is recommended to maintain (if cleanable type) or change (if disposable type) the steam cylinder every 800 to 900 hours of operation for a humidifier running at full capacity and using water of 10 gr / gal. Adjust this schedule for the particular application.

Length of the stainless steel electrode plates

<table>
<thead>
<tr>
<th>Model</th>
<th>ELMC 5 to 15-2</th>
<th>ELMC 10 single phase</th>
<th>ELMC 20 to 90</th>
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</thead>
<tbody>
<tr>
<td>Length (mm)</td>
<td>160</td>
<td>270</td>
<td>250</td>
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</table>

During cylinder maintenance, it is recommended that you measure the length of the electrode plates. They should be replaced when the length is shorter than 1/3 or 1/2 of the original length.
ROUTINE SERVICE

- After the humidifier has run for about one hour, check for any water leakage at the cylinder gasket and at the drain valve.
- The cylinder should be inspected after about 50 hours of run. Make sure there is no arcing or sparking between the electrodes when the unit is in operation. Also, when switched off, all the contactor screws and the steam, drain and internal hose clamps should be retightened.
- A complete inspection of all the humidifier hoses should be made after one year of operation. Any faulty or damaged hose must be replaced to prevent leakage.

WARNINGS

When the humidifier is used for a long time or operates with a very conductive water, solid deposits built-up on the electrode plates which can make the water even more conductive.

If electrical arcs can be seen inside the steam cylinder, the humidifier doesn’t operate properly. Switch off the humidifier immediately. This arcing involves:

- Excessive heat on the plastic shells that can eventually make the material melt and make a hole from where scalding water can escape.
- Circuit breaking caused by excessive intensity.
- Faster corrosion of the electrode plates.
- Burning of the electrode power cables.

Points to check in case of arcing

- If the humidifier works with softened water, insure that the softener does not supply salt water to the humidifier.
- Insure that the drain valve works properly and clean as directed on page 46.
- Insure that the F3 drain valve fuse is still in order (Part No. 500101/05).

CAUTION

Always disconnect all electrical and water supplies to the humidifier before commencing any maintenance and refer to the instructions given in this manual.

The ELMC humidifier includes live electrical components and the steam cylinder contains boiling water. All maintenance must only be carried out by skilled and qualified personnel.
INSPECTION DUE
50 H - SEE MANUAL

SERVICE DUE
SEE MANUAL

SERVICE OVERDUE
SYSTEM OFF

DRAINING CYCLE OVER

REPLACE CONTACTORS 10,000 HR RUN

Press button (1) to rotate between the menus and press the up or down buttons to enter the desired menu.

50 HOURS AFTER SWITCHING ON
- A 1st inspection (see manual) warning message is shown on the Digital display window.
- The unit is on.
- The remote maintenance contact is triggered on.
- The remote general failure contact is off.
- To reset the warning message, press key 3 for over 5 seconds
- This 50 hours timer cannot be suppressed or modified.

SERVICE TIME ELAPSED (service message)
- A cylinder maintenance-(see tech manual) service message is shown.
- The unit work is on.
- The remote maintenance contact is triggered on.
- The remote general failure contact is off.
- This service message is removed only when the manual draining is completed. The (DRAINING CYCLE OVER ) service message is then displayed.
- This timer (300 H factory preset) can be adjusted (access code 2.3.4) :
  ( MAINTENANCE FREQUENCY (HR) ) but not removed.

SERVICE TIME OVERDUE (service message)
- If the previous alert has not been cleared, a new alert (SERVICE OVERDUE / SYSTEM OFF ) is shown 100 hours thereafter.
- The humidifier goes on a halt.
- The remote maintenance contact is triggered on.
- The remote general fault alert is triggered on.
- This alert message is removed only when the manual draining is completed. A ( DRAINING CYCLE OVER ) message is then shown on the display
- This 100 H timer cannot be suppressed or modified.

DRAINING CYCLE OVER (service message)
- The ( DRAINING CYCLE OVER ) means that :
  - the humidifier is ready for a new service,
  - the service (Hrs & KG) counters have been reset.

CONTACTOR TO REPLACE (service message)
- (10,000 H REPLACE CONTACTOR) is shown after the humidifier has been running for 10,000 hours. This means that the contactor(s) has/have been cycled on and off for 10,000 hours and that its/their replacement is/are highly recommended.
- The unit is on.
- The remote maintenance contact is triggered on.
- The remote general fault contact is triggered on.
- To reset this alert message, press key 3 for over 5 seconds
- This 10,000 H timer cannot be suppressed or modified.
Press button (1) to rotate between the menus and press the up or down buttons to enter the desired menu.

**CONTACTOR COIL FAILURE P1**

- When the alert CONTACTOR COIL FAILURE P1 is shown, the humidifier is stopped and the remote general fault contact is triggered on (the remote maintenance contact is kept off).
- Check: F1 (2A) fuse, contactor coil(s), connection of wires at terminals 13 & 14 and attachment of X4 connector onto the main board.
- The only way to remove the alert is to trace the cause of the failure and solve the problem (check contactor(s) order). Switching off the humidifier will clear the window only but will not remove the failure message which will be shown again 4 min after the humidifier redetects the failure.
- This fault can be disabled inside the menu (access code 0.6.9). This will suppress the detection.
- Simulation: disconnect connector X4 from main board while the contactor is activated. The failure is detected 4 min afterwards.

**CONTACTOR BLOCKED P2 ALERT**

- When a CONTACTOR BLOCKED P2 information is shown, this means that the cylinder power electrodes are still supplied although the humidifier is on a halt.

**CAUTION:** switch the humidifier off before any handling!

Status: unit off—remote general fault alert initiated—remote maintenance alert off.
- Items to check: contactor(s) order.
- The only way to remove the alert is to trace the cause of the failure and solve the problem (check contactor(s) order). Switching off the humidifier will clear the window only but will not remove the failure message which will be shown again 2 min after the humidifier redetects the failure.
- This fault can be disabled inside the menu (access code 0.6.9). This will suppress the detection.
Simulation: jump connector X4 of the main board when the unit is stopped (demand = 0%) - The failure is detected and a message is displayed after 2 min.

**LEAKAGE : INLET WATER VALVE P3**

- When this alert is shown, the remote general fault alert contact is activated. The humidifier goes on working. The remote maintenance contact is kept off.
- Item to check: water at the base of the cylinder
- Switching off and on will clear the message only for a short while from display but will not remove the alert. It will reappear after the humidifier detects the fault again 20 min afterwards.
- This fault can be disabled inside the menu (access code 0.6.9). This will suppress the detection.
- Simulation: constantly supply the inlet valve in 230 V.
**NO INLET WATER P4 ALERT**

- A NO INLET WATER P4 display is shown when the cylinder is not correctly filled. In this case, the humidifier is stopped and the remote general fault alert is initiated. The remote maintenance alert is kept off.
- Items to check: F2 inlet valve fuse, drain valve (could be clogged by pieces of mineral) - steam hose (pockets of water) - power voltage—TI voltage reading (condition of the torroidal of intensity—power wire passing through TI hole).
- Reset: switching off and on the humidifier will clear the display but will not remove the message which will be shown again after a while. 
- This fault can be disabled inside the menu (access code 0.6.9). This will suppress the detection.
- Simulation: Turn off the manual water supply. Time before detection: about 8 min.

**SEE DRAIN CIRCUIT P5 ALERT**

- This alert is shown when the draining is incorrectly operated. In this case, the humidifier is stopped and the remote general fault alert is initiated. The remote maintenance alert is kept off.
- Items to check: F3 fuse (if found faulty, replace fuse and drain valve solenoid), correct water draining by pressing manual drain button. If no drain, clean cylinder and draining circuit.
- Reset: switching off and on the humidifier will clear the display but will not remove the message which will be shown again after a while.
- This fault can be disabled inside the menu (access code 0.6.9). This will suppress the detection.
- Simulation: disconnect the solenoid coil of the drain valve. Time before detection: several hours.

**WATER LEAKAGE DETECTION P6 ALERT**

- REMINDER: to enable this function, the optional water leakage detection board should be installed first.
- When the alert message is shown, the remote general fault alert is initiated, the cylinder is drained fully and the humidifier is brought to a halt. The remote maintenance alert contact is kept off.
- Items to check: water at the water sensor in the humidifier humidity compartment.
- Switching off and on the humidifier will clear the message only for a while but will not remove the alert which will be shown again 15 seconds after the humidifier detects it again.
- This fault can be disabled inside the menu (access code 0.6.9). This will suppress the detection.
- Simulation: drop a water drop on the water sensor.

**CLEAN CYLINDER + DRAIN VALVE P8 ALERT**

- This alert is shown when the drain cannot be operated. In this case, the humidifier is stopped and the remote general fault contact is triggered on. The remote maintenance contact is kept off.
- Items to check: F3 fuse (if found faulty, replace it and replace drain valve solenoid coil); operate a manual draining to check correct water flowing. If incorrect, check or replace cylinder and water piping.
- Switching off and on will clear the message only for a while from the display but will not remove the alert which will be detected and displayed again some minutes after.
- This fault can be disabled inside the menu (access code 0.6.9). This will suppress the detection.
- Simulation: generate over currents.
When the board or a power cable is replaced, it is essential for correct operation to use the method of wiring appropriate to your exact model of humidifier. For humidifiers with multiple cylinders, wire up each corresponding Torroidal Transformer with relevant the method, as shown below.

**TORROIDAL TRANSFORMER WIRING METHOD**

<table>
<thead>
<tr>
<th>ElectroVap MC2 from 208V to 230V</th>
<th>ElectroVap MC2 from 460V to 690V</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of phases</td>
<td>No of phases</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
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<td>1</td>
<td>3</td>
</tr>
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<td>Method 1</td>
<td>Method 1</td>
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<tr>
<td>X</td>
<td>X</td>
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<td>Method 2</td>
<td>Method 2</td>
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<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Method 3</td>
<td>Method 3</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**CONNECTING THE TI POWER CABLE INTO THE CONTACTOR**

**Method 1**

The power cable is run once through the torroidal transformer, then into the contactor.

**Method 2**

The power cable is once run through and looped over the torroidal transformer and back through the transformer hole. Fix the cable into the contactor.

**Method 3**

Use the specialized split power cable. Run one of the power cable cores once through the torroidal transformer then into the contactor. Run the second power cable core directly to the contactor.

*The power cable identified with a brown sticker must be connected into the T1 terminal of the contactor.*
The ELMC humidifiers are currently fitted with disposable cylinder(s). The latter can however be easily substituted for cleanable type at customer’s choice.

**REPLACING THE STEAM CYLINDER**

Drain the steam cylinder fully using the manual drain button. When the cylinder is drained fully, cut the power both at the disconnect switch and at the humidifier (rocker power switch).

The steam cylinder(s) may be very hot. Allow it to cool down before removing.

Remove the left front door from the humidifier to access the cylinder compartment. Remove power and high water level electrode cables from top of the cylinder. (picture 1).

Disconnect the steam hose(s) from the top of the cylinder(s) (picture 2).

Lift the cylinder upwards until it is clear of the drain valve. Insure that the o-ring gasket remains in the drain valve (picture 3).

Lower the cylinder to release the top of the cylinder from the retaining clip and pull the cylinder out and downward. (picture 4).

The disposable cylinder(s) will be merely replaced by new ones either disposable or cleanable.

**CLEANING THE CLEANABLE STEAM CYLINDER**

This method is intended for use with the cleanable cylinder only.
- Mark the edge of the cylinder halves so that they can be matched up when reassembled (picture 5).
  Remove the maintaining nuts and bolts, split the cylinder halves and remove the gasket and the strainer that must be cleaned (picture 6).
- Scrape mineral deposits off the electrode plates and the shells (a weak descaling solution can also be used) (pictures 7, 8 & 9).
- Rinse the electrodes, the cylinder shells and the divider. It is important that the strainer at the cylinder bottom be also cleaned.

Take care: never hit or bank the shells to dislodge the deposits.

Relocate the strainer into the cylinder bottom. Replace the cylinder gasket, and fit it inside the groove of the lower shell and attach the upper shell with the electrodes.

**When re-assembling, take care to align both shells.** Refit the bolts and nuts. Retighten them gently (while the cylinder is still cold). Rinse the drain valve ‘o’ ring and grease it or replace it if needed.

**Important**

At this stage, the drain valve should be inspected.

Refit the cylinder to the humidifier once the drain valve is cleaned or replaced.
The drain valve should be serviced whenever the steam cylinder is cleaned or changed.

Once the steam cylinder has been pulled out (please refer to the cleaning of the steam cylinder page), disconnect the drain valve supply wires.

Unscrew the solenoid retaining nut and remove the washer. Put them on the cylinder compartment tray.

Remove the coil from the valve stem.

Unscrew and remove the valve stem and the filling hose from the valve body.

Important: Apply some soap on the O-ring and the cylinder draining outlet

Remove the O-ring and the drain valve collar. Remove any pieces of calcium, rinse the stem and the body with fresh water.

Assemble in reverse order.

Replacing the new or cleaned steam cylinder: Insert the top of the cylinder thru the retaining spring, push up, then insert the drain outlet into the drain valve and push the cylinder downward. Reconnect the power cables. Make sure that the power cable with the brown identification mark is connected to the electrode post identified with a brown spot. If the brown spot is missing, the correct electrode post is the one closest to the high water level probe. Refit the steam hose and fasten the clamp.

Insure that all the clamps are properly tightened whenever the humidifier is maintained.
ELECTROVAP MC2
Maintenance - Valves

INLET VALVE MAINTENANCE

The inlet valve should be inspected every 6 months.

Disconnect electrical power from the humidifier.
Shut off the water supply and remove the water supply hose from the valve.

Disconnect the electrical wires from the coil.

Untighten the collar clamp and remove the water feed hose.
Unscrew the black nut 1 and lay it on the cylinder compartment tray.

Take the valve out and remove the basket filter from the base of the valve with a pair of long nose pliers.

Pop the coil off the valve stem with a flat screw driver, if replacement is needed.
Wash the basket filter under clean water to remove any dirt and debris.
Replace whole valve if cleaning is not practical or replace the coil only if necessary.
Assemble in reverse order taking care to replace collar clamp if necessary.
Insure that everything is correctly assembled and switch the humidifier on.

Ensure that all the clamps are properly tightened whenever the humidifier is maintained.

Ensure that all the clamps are properly tightened whenever the humidifier is maintained.
<table>
<thead>
<tr>
<th>No.</th>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>930058</td>
<td>Filling cup with hoses for ELMC 5 to 15-2</td>
</tr>
<tr>
<td></td>
<td>930059</td>
<td>Filling cup with hoses for ELMC 10 single phase to 30</td>
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<tr>
<td></td>
<td>930060</td>
<td>Filling cup with hoses for ELMC 40 to 60</td>
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<tr>
<td></td>
<td>930061</td>
<td>Filling cup with hoses for ELMC 90 (left hand side)</td>
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<tr>
<td></td>
<td>930062</td>
<td>Filling cup with hoses for ELMC 90 (right hand side)</td>
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<tr>
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<td>930301</td>
<td>Hose clamp Ø25x40mm</td>
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<td></td>
<td>930302</td>
<td>Hose clamp Ø40x60mm</td>
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<td>930085</td>
<td>Power cable kit n° 1 (3 single cables with sockets and boots)</td>
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<tr>
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<td>930086</td>
<td>Power cable kit n° 2 (2 single cables + 1 split cable with sockets and boots)</td>
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<tr>
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<td>930087</td>
<td>Power cable kit n° 3 (3 single cables + 1 split cable with sockets and boots)</td>
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<td>930079</td>
<td>Cylinder retaining clip ELMC 5 to 15-2</td>
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<td>930080</td>
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<td>5</td>
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<td>High water level electrode cable ELMC 5 to 30</td>
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<tr>
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<td>930089</td>
<td>High water level electrode cable ELMC 40 to 60</td>
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<td>930090</td>
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<td>Overflow hose Ø18/22mm</td>
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<td>7</td>
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<td>930153</td>
<td>230V complete drain valve</td>
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<td>930074</td>
<td>Drain cup upper half ELMC 40 to 60 right hand side</td>
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<td>930075</td>
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<td>930078</td>
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<td>Hose clamp Ø16x27mm</td>
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<td>Water feed hose Ø12/16mm</td>
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<tr>
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<td>21</td>
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<td>23</td>
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</table>
- In standard production, the humidifiers are fitted with disposable cylinders.
- EA= Softened water

<table>
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<td>930020</td>
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<td>930037</td>
<td>Cleanable cylinder EA ELMC 5 to 15-2</td>
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<td>ELMC digital display (réf: 500600/03)</td>
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<td>Auxiliary board ELMC 90 (réf: 500301/05-3TI)</td>
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<td>930283</td>
<td>Power contactor DPE32P7</td>
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<td>930100</td>
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<td>930099</td>
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<td>930103</td>
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<td>930106</td>
<td>ELMC remote board (réf: 500400/02)</td>
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