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■ Humidifiers ■ HVAC Controls ■ Electric Heaters ■ Electric Actuators ■ Actuated Valves

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## Resistive vs. Electrode Humidifiers, Part 2: Comparing costs

In last month's article we compared functionality, serviceability, controllability, and maintenance requirements of resistive and electrode humidifiers. This month we break down of the total cost of ownership of each technology, with a focus on:

- Installation costs
- Maintenance costs
- Operation cost and water quality

### **Installation cost:**

The initial cost of the Neptronic SKE4 electric resistive humidifiers is competitive with electrode boiler humidifiers of comparable capacity. Similarly, the installation cost is roughly the same. A key benefit of the Neptronic SKE4 is a built-in disconnect switch, included on all models, which eliminates the need to install a separate, wall mounted, disconnect switch. This feature can reduce the installation cost and saves space.

### **Maintenance cost:**

**Resistive humidifiers** have a permanent stainless-steel tank that requires periodic cleaning. This consists of removing the evaporation chamber, cleaning out the accumulated scale and then re-installing the chamber. With the Neptronic SKE4, this task is accomplished [quickly, easily and completely tool-free](#).

When using RO/DI water, maintenance of the chamber is almost always eliminated.

**Electrode humidifiers** use a disposable, one-time use, plastic tank that must be discarded and replaced at a substantial cost to the owner. Single use plastics have become a global environmental hazard. Many municipalities and governments are considering or adopting regulations limiting their use.

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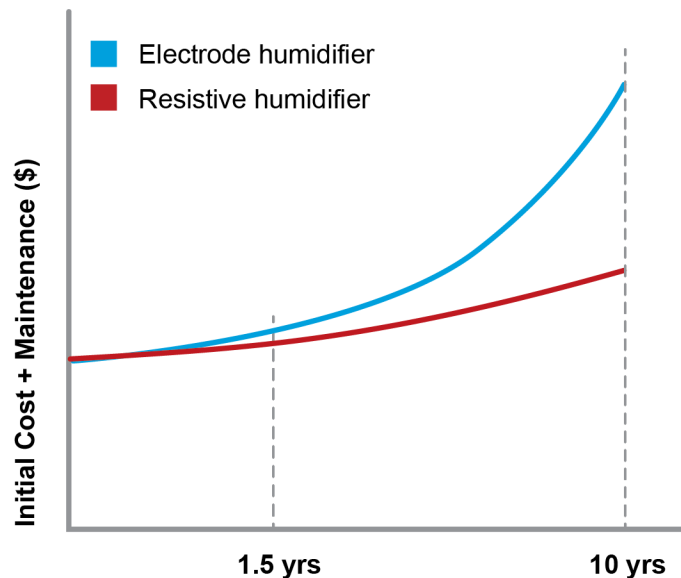
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For electrode humidifiers, cylinder replacement varies according to water quality and usage. This results in an average of 1-3 plastic cylinder changes per season. Below is an example of the relative cost of an electrode vs resistive humidifier, with an averaged number of cylinder changes per season.

<b>Humidifier Steam Capacity</b>	150 lb/hr
<b># of plastic cylinders per humidifier</b>	2
<b>Cylinder changes per season</b>	2
<b>Period</b>	10 years



Overall, the total cost of ownership of an electrode boiler humidifier is significantly higher than an equivalent SKE4 due to the high cost of replacement plastic cylinders.

### ***Operation and water quality:***

Resistive humidifiers do not require pre-filtration and they may operate using any water type (potable, softened, reverse osmosis, de-ionized).

On the contrary, electrode humidifiers require a particulate pre-filter and will only work in potable water with a conductivity range between 125 to 1250  $\mu\text{S}/\text{cm}$ . The quality of the water greatly impacts the response time and efficiency of the humidifier. This can prevent their use in critical applications. If the conductivity of the water used is below 125  $\mu\text{S}/\text{cm}$ , ions in the form of salt must be added to the water to raise the conductivity.

Manufacturers of resistive humidifiers may recommend the use of a pure water feed (RO or DI) in order to reduce or eliminate the service and increase the efficiency. Our competitors require a different water level detection system for pure water applications. This is not the case for Neptronic humidifiers. The accuracy of the Neptronic patent-pending water level detection system does not depend on the conductivity of the water. As such, Neptronic humidifiers will work in any water feed (potable, softened, RO or DI) without factory or field modification.

**Performance and how it all adds up**

Resistive humidifiers	Electrode humidifiers
<ul style="list-style-type: none"> <li>• Can use any type of water - maintenance is significantly reduced or eliminated when using pure water (DI or RO)</li> <li>• Removable, cleanable, evaporation chamber is eco-friendly, doesn't create plastic waste</li> <li>• Accurate humidity control of up to +/-1% (depending on water type) beneficial for critical applications</li> <li>• Steam output of resistive humidifiers is not affected by water conductivity or build-up of scale</li> </ul>	<ul style="list-style-type: none"> <li>• Limited to the use of conductive potable water only</li> <li>• Higher ownership cost over time</li> <li>• Disposable plastic cylinders are convenient, but not eco-friendly and add plastic waste to landfill</li> <li>• Humidity control of +/-5% more suitable for non-critical applications</li> </ul>

As we can see, an electrode boiler is not only less capable than a SKE4 Neptronic resistive humidifier, it also has a higher total cost of ownership.



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 Technical Support - Humidifiers

## Neptronic TechTime - Humidifiers

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### About Neptronic

Founded in 1976, Neptronic is a private corporation that designs, manufactures and distributes products for the HVAC industry. The Neptronic product line includes intelligent controllers, electronic actuators, actuated valves, humidifiers and electric duct heaters.

Products are designed and manufactured by over 200 dedicated employees in an 80,000 ft<sup>2</sup> (7,500 m<sup>2</sup>) state-of-the-art facility located in Montreal, Canada. Using a vertically integrated plant model, all R&D and manufacturing capabilities are located under one roof; from software and hardware development, to SMT circuit board assembly, to sheet metal fabrication, to product testing.

Neptronic is committed to research and development, provides innovative products and technologies and exports over 75% of its sales through an exclusive distribution network for the HVAC industry worldwide

For more information visit the Neptronic website at [neptronic.com](http://neptronic.com)

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