Water Purification with Energy Savings
better ROI with an upgraded humidification system

THE BENEFITS
• Provides water with TDS of less than 10 PPM to eliminate the possibility of dusting issues in air handling units where MeeFog is used.
• Designed to provide the needed capacity even at cold water temperatures.
• Storage, distribution and disinfection system integrated for seamless installation and operation.
• Energy savings enhanced with the use of variable frequency drives for RO system as well as distribution system

CHALLENGE
A building humidification upgrade required a water purification system to eliminate biological contamination or mineral dusting issues in the air handling units where the systems where installed.

SOLUTION
Mee Industries provided a reverse osmosis water purification system along with a distribution and disinfection system integrated in the humidification package.

Housing & Urban Development Humidification Upgrade
Upgrading a building humidification system from steam type to high pressure fogging systems provides dramatic energy savings. High quality purified water is needed to ensure that mineral dusting is controlled which helps eliminate the possibility of fouling and bacterial contamination of the air handling units.

REQUIREMENTS
The project required high quality water with low energy usage. Space and installation access were limited requiring a compact footprint design. Since the project investment is based on energy savings wasted energy was not acceptable.
Humidification systems are typically used during the winter months and thus the water supply is typically cold requiring a system that produces the required capacity at lower design temperatures than are standard for most RO systems. Chlorine is removed prior to the RO system and thus the treated water is free of chlorine which does not get added back in because it would cause corrosion in the air handling units. Thus the stored RO water must be sterilized by some other method to ensure the water is free of biological contaminants.

**MEE INDUSTRIES’ SOLUTION**

Mee Industries provided a packaged Reverse Osmosis system with integrated storage, distribution & UV circulation. All components where handled by a single control enclosure with a PLC capable of communicating with the Meefog control system as well as the building automation system (BAS).

RO system performance is based on many factors including temperature. A typical system is designed to provide the rated capacity at a water temperature of 77 °F (25°C) which is not realistic for humidification systems because they are used in the winter when the water temperature is colder.

The Mee Water system is designed to provide the rated capacity at a temperature as low as 50 °F (10°C). Since the required operating pressure varies for the system based on factors such as temperature, the RO system could be considered energy inefficient. However variable frequency drives were included on the motor to ensure no energy was wasted when producing the required capacity for the system. The integrated distribution pump also includes a variable speed drive to reduce energy consumption based on the humidification demand.

The UV circulation system allows the non-chlorinated water to be sterilized in the circulation loop to prevent the proliferation of biological material in the stored water. The fully integrated system ensures that the water level is monitored and circulation is carried out especially during humidification system downtimes when the water would otherwise become stagnant in the storage tank.

With all equipment coming from a single supplier the installation and commissioning was extremely simple. The water capacity and quality was exactly in line with the humidification system needs.

### RO SYSTEM SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>PERMEATE CAPACITY (GPM)</th>
<th>MEMBRANE QUANTITY</th>
<th>POWER (KW) / (FLA)</th>
<th>DRY WEIGHT LBS / KG</th>
<th>DIMENSIONS (L x W x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEERO 021002</td>
<td>2</td>
<td>2</td>
<td>5 / 7.5</td>
<td>1070 / 485</td>
<td>90&quot; x 35&quot; x 75&quot;</td>
</tr>
<tr>
<td>MEERO 031003</td>
<td>3</td>
<td>3</td>
<td>5 / 7.5</td>
<td>1090 / 494</td>
<td>90&quot; x 35&quot; x 75&quot;</td>
</tr>
<tr>
<td>MEERO 041004</td>
<td>4</td>
<td>4</td>
<td>5 / 7.5</td>
<td>1120 / 508</td>
<td>90&quot; x 35&quot; x 75&quot;</td>
</tr>
<tr>
<td>MEERO 051005</td>
<td>5</td>
<td>5</td>
<td>5 / 7.5</td>
<td>1140 / 517</td>
<td>90&quot; x 35&quot; x 75&quot;</td>
</tr>
<tr>
<td>MEERO 061006</td>
<td>6</td>
<td>6</td>
<td>9.4 / 13.7</td>
<td>1160 / 528</td>
<td>90&quot; x 35&quot; x 75&quot;</td>
</tr>
<tr>
<td>MEERO 081008</td>
<td>8.5</td>
<td>8</td>
<td>9.4 / 13.7</td>
<td>1320 / 598</td>
<td>90&quot; x 35&quot; x 75&quot;</td>
</tr>
<tr>
<td>MEERO 101010</td>
<td>10</td>
<td>10</td>
<td>9.4 / 13.7</td>
<td>1410 / 639</td>
<td>90&quot; x 35&quot; x 75&quot;</td>
</tr>
<tr>
<td>MEERO 151004</td>
<td>15</td>
<td>2</td>
<td>10.7 / 15.8</td>
<td>2434 / 1104*</td>
<td>110&quot; x 48&quot; x 80&quot;</td>
</tr>
<tr>
<td>MEERO 201006</td>
<td>20</td>
<td>4</td>
<td>10.7 / 15.8</td>
<td>2584 / 1172*</td>
<td>110&quot; x 48&quot; x 80&quot;</td>
</tr>
</tbody>
</table>

* Stand Alone RO Skid Dimensions

Choose the Right Size

Mee’s standard line of water treatment systems are designed to meet all project demands. Check the chart to select the