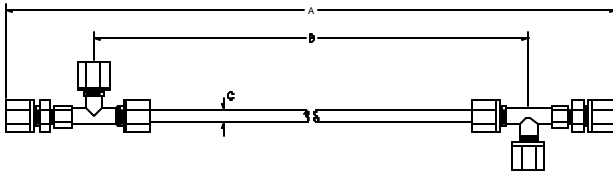


PRINCIPLE OF OPERATION

MH™-Series Humidifiers are shell and tube moisture exchangers that allow the transfer of water vapor between a liquid water supply and a flowing gas stream. Water is absorbed into the walls of the Nafion® tube and transferred to the dry gas stream. This transfer is driven by the difference in partial pressures of water vapor on opposing sides.

MH HUMIDIFIER SPECIFICATIONS



Model Number	A	B	C
Single Tube of 0.070" or 0.110" O.D. Nafion			
Sample fittings available in 1/8" or 1/4", purge fittings are 1/4" compression			
MH-(070 or 110)-12	14+/-1/4"	10"	1/4"
MH-(070 or 110)-24	26+/-1/4"	22"	1/4"
MH-(070 or 110)-48	50+/-1/4"	46"	1/4"

INSTALLATION SPECIFICATIONS

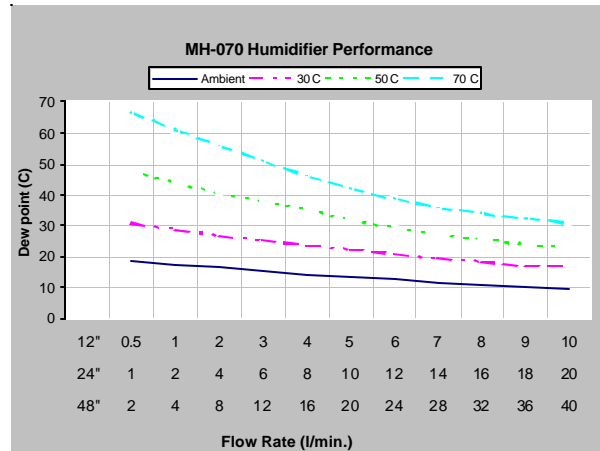
Warning!

Do not allow Nafion tube to dry out. Nafion will shrink up to 125% and pull out of the end fittings or break. Should the element dry, soak it in DI water for 5 minutes before re-assembly.

1. Use only de-ionized water.
2. Controlled temperature water.
3. Do not allow unit to dry out. If element dries completely, soak in DI water for 1 hour.

PERFORMANCE

MH-070 humidifier's performance is shown in the chart below. The MH-110 which has a slightly larger ID shows about a 3 degree higher outlet dew point. MH-110 should be chosen when a lower pressure drop is desired.



MH-070 Performance Chart

Nafion® is a registered trademark of DuPont.
MH™ is a trademark of Perma Pure LLC.

Bulletin# 206

MH™ - Series Humidifier

User Manual



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e-mail: info@permapure.com
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SIPHON FEED METHOD

In the Siphon feed setup (shown in Figure 1), temperature at which the air will be fully saturated (“dew point”) must be determined. The humidifier must be heated or insulated to this temperature and kept constant. A reservoir of de-ionized water is pulled through to fill the shell side and cap off at the outlet. A positive pressure sample gas is pushed through the inner tubes and is humidified.

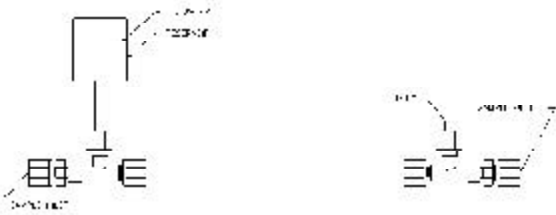


Figure 1

CIRCULATION FEED METHOD

The circulation method (shown in Figure 2) requires heated water to be continuously circulated. The flow with greater pressure needs to be flowing inside the tubes to prevent tubing collapse.

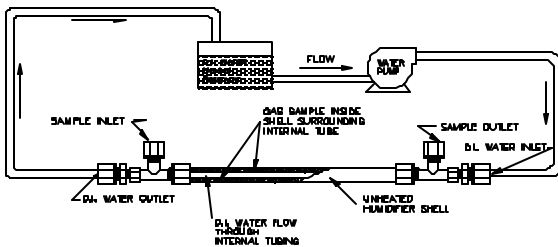


Figure 2

ROTATE TEE FITTINGS

Tools Needed:

- Two wrenches- 5/8 and 7/16
- Tweezers

1. Hold tee fitting with 5/8 wrench and loosen union connector fitting with 7/16 wrench (refer to Figure 3).
2. Remove fitting.
3. Rotate dryer element 10 degrees each way with tweezers or fingertips.
4. With two wrenches, loosen inside nut connecting tee fitting to shell tube.
5. Rotate tee fitting to desired location and tighten into place.
6. Install union into tee fitting while making sure element is not pushed back out of o-ring seal. **Take caution to ensure element does not rotate inside shell.**
7. Tighten union fitting by hand and then tighten 1/4 turn with wrench.

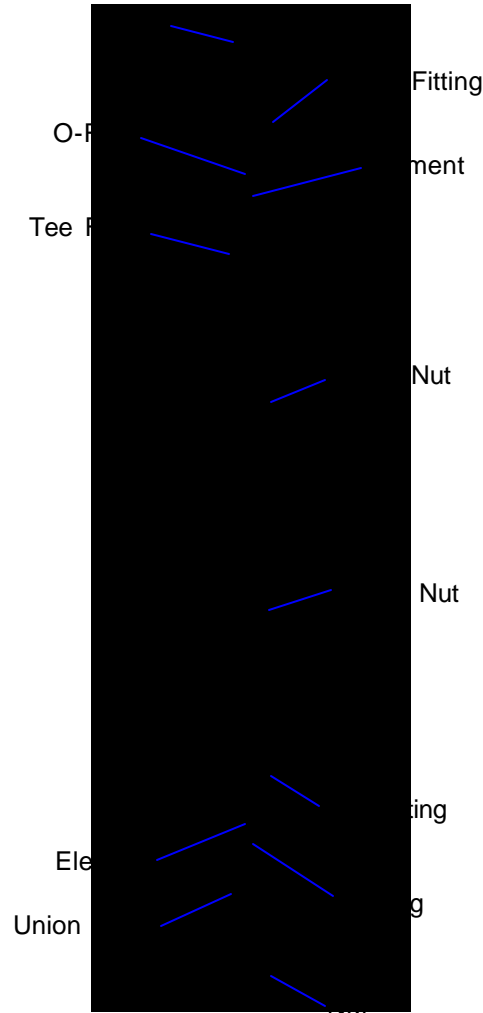


Figure 3

DISASSEMBLING

Tools Needed:

- Two wrenches - 5/8 and 7/16
- Pair of lightweight gloves

1. Repeat steps 1-4 for other end.
2. Put on lightweight gloves to protect membrane tubing (skin oils can contaminate surface).
3. Gently push one end of element out of o-ring while pulling other end out of tee fitting.
4. Gently pull element out of housing from opposite end.
5. Reverse for reassembly.
6. Element ends should extend equally from each end of shell housing before installing union fittings. Soak element for 5 minutes in DI water if it is too short.