

# MH™-Series Humidifier

**Provides Consistent Humidification in a Compact, Flexible Design**

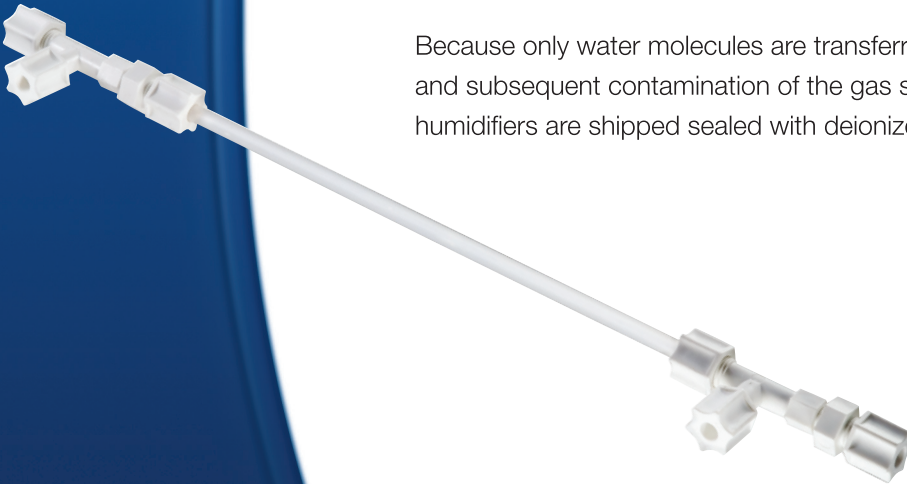
- Humidifies continuously
- Transfers only water vapor
- Self-regulating
- High level of humidification
- Maintenance-free operation
- No moving parts
- Excellent corrosion resistance
- Fast response time

Perma Pure MH™-Series humidifiers use an exclusive Nafion® selectively permeable membrane tubing and liquid water to continuously humidify gas streams. These humidifiers operate over a wide range of flow rates, and humidify up to 98% RH using deionized water as the humidification source.

## Principle of Operation

MH-Series gas humidifiers are tube-in-shell moisture exchangers that allow the transfer of heat and water vapor between a liquid water supply and a gas stream. The water permeates through the walls of the Nafion tube and then evaporates into the gas stream. This transfer is driven by the difference in water vapor pressure between the water and dry gas stream.

Because only water molecules are transferred through the tubing, bacterial growth and subsequent contamination of the gas stream cannot occur. All MH-Series humidifiers are shipped sealed with deionized water, ready for use.

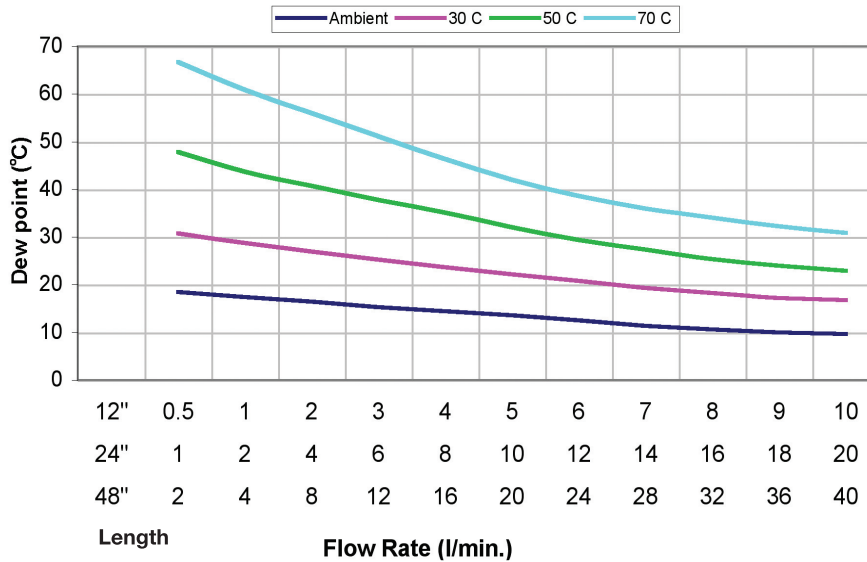


Model Number	MH-070	MH-110
Nafion Tube O.D.	0.072"	0.108"
Nafion Tube I.D.	0.060"	0.086"
Available Lengths	12, 24, or 48 inches	
Housing Materials	Stainless Steel or Fluorocarbon or Polypropylene	



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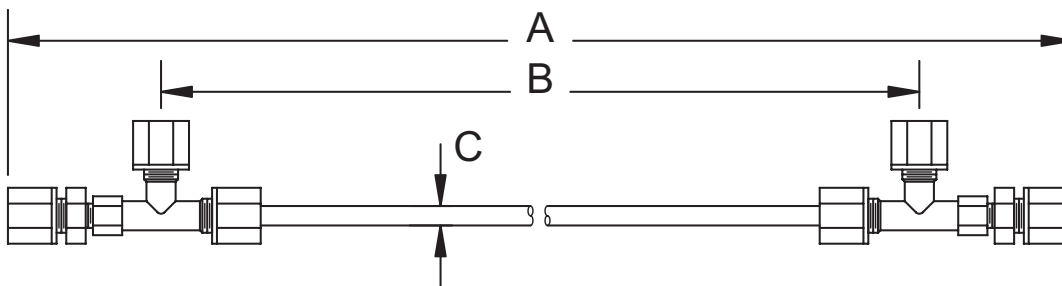
### MH-070 Humidifier Performance



The above performance curves are for the MH-070. The MH-110 gives roughly a 3 degree higher outlet dew point than the MH-070. The MH-110 should be selected when a lower pressure drop is desired.

The MH-Series humidifier performance curves were performed under the following conditions:

- Temperature-controlled water circulating in shell side of the humidifier
- The humidifier housing was insulated.
- The inlet air stream was at 24°C, <-40°C dew point and ambient pressure



Model Number	A	B	C
<b>Single Tube of 0.070" or 0.110" O.D. Nafion</b>			
<i>Sample fittings are available in 1/8" or 1/4" compression, all water fittings are 1/4" compression</i>			
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"

MH™ is a Trademark of Perma Pure LLC, Nafion® is a Registered Trademark of E.I. DuPont.

#### Pressure Drop Calculations:

$\Delta P$  for MH-070 (inches of water) = Sample flow rate (lpm) x 0.14 x length of dryer (inches)

$\Delta P$  for MH-110 (inches of water) = Sample flow rate (lpm) x 0.07 x length of dryer (inches)



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