MD™-Series Gas Dryers

Protect Moisture-Sensitive Equipment by Selectively Drying Sample or Carrier Gas

- **Dries continuously**
- **Removes only water vapor**
- **Achieves low dew points**
- **Requires no electricity**
- **Maintenance-free operation**
- **No moving parts**
- **Excellent corrosion resistance**
- **Short residence time**

Perma Pure MD™-Series gas dryers use exclusive Nafion® selectively permeable membrane tubing to continuously remove only water vapor from gas streams. These dryers operate over a wide range of temperatures, pressures and flow rates while drying to very low dew points.

Principle of Operation

MD-Series gas dryers transfer moisture from one gas stream to a counter-flowing purge gas, much like a shell-and-tube heat exchanger transfers heat. Water molecules permeate through the Nafion tube wall, evaporating into the purge gas stream. The water concentration differential between the two gas streams drives the reaction, quickly drying the air or gas.

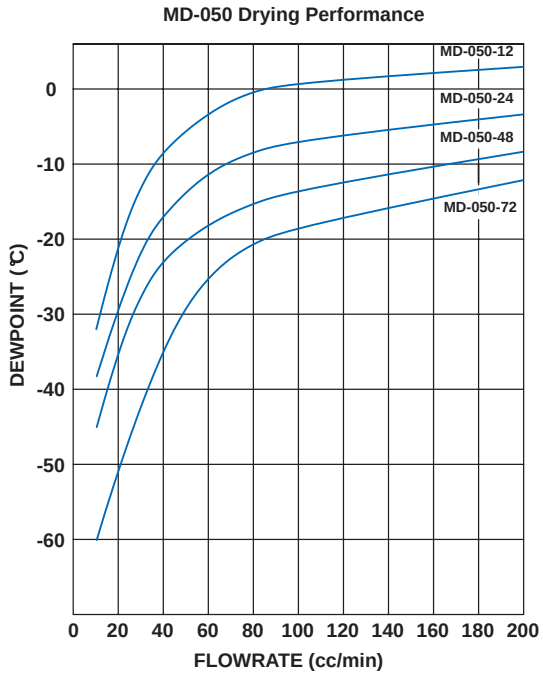
Purge gas should be instrument air or other dry gas. If no dry gas is available, a portion of the gas dried by the MD-Series dryer can act as the purge gas in a split-stream or reflux method. For more infromation about the drying process, including the use of the sample gas as the purge gas, please visit our website at www.permapure.com.

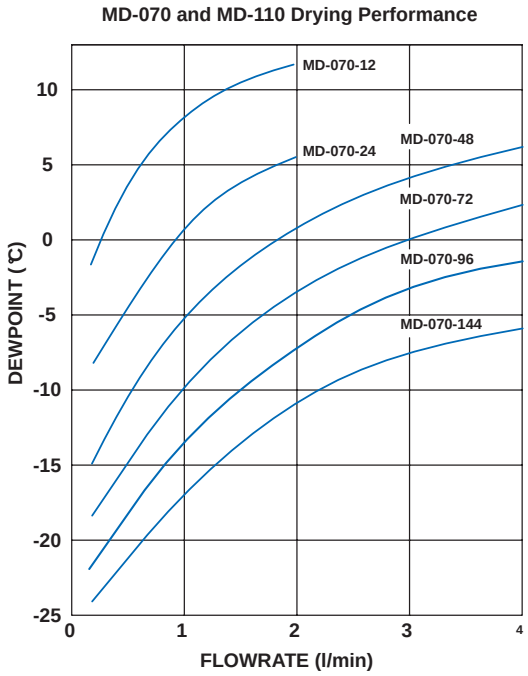
Perma Pure offers three MD-Series dryer product lines:

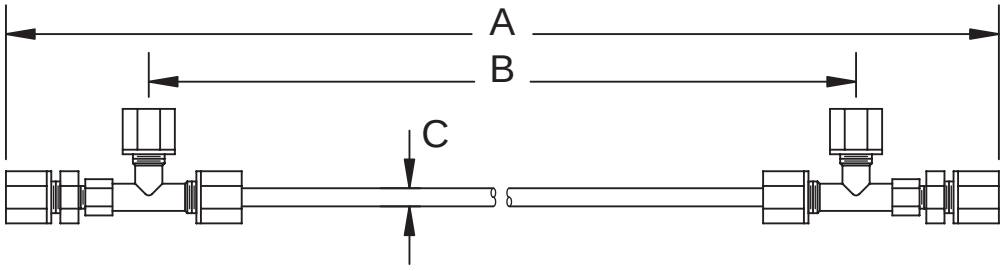
Model Number	MD-050	MD-070	MD-110
Nafion Tube O.D.	0.053"	0.072"	0.108"
Nafion Tube I.D.	0.042"	0.060"	0.086"
Available Lengths[1]	12, 24, 48, 72, 96 or 144 inches		
Housing Materials	Stainless Steel or Fluorocarbon or Polypropylene		
Maximum Flow Rate	200 cc/min.	2 liters/min. [2]	4 liters/min. [2]

[1] MD-050 Series dryers are not offered in 96 and 144-inch lengths.
[2] MD-070 and MD-110 offer approximately the same drying performance. Specify MD-110 when pressure drop is a concern, MD-070 to minimize dead volume. For higher flow rates, please see our PD-Series dryers.

PERMA PURE







Model Number	A	B	C
Single Tube of 0.050" O.D. Nafion *Fittings are 1/8" compression, optional 1/16" sample fittings are available on stainless model only*			
MD-050-12	14 ± ⅜"	11-⅛"	⅛"
MD-050-24	26 ± ⅜"	23-⅛"	⅛"
MD-050-48	50 ± ⅜"	47-⅛"	⅛"
MD-050-72	74 ± ⅜"	71-⅛"	⅛"
Single Tube of 0.070" or 0.110" O.D. Nafion *Sample fittings are 1/8" or 1/4" compression, all purge fittings are 1/4" compression*			
MD-(070 or 110) -12	14 ± ¼"	10"	¼"
MD-(070 or 110) -24	26 ± ¼"	22"	¼"
MD-(070 or 110) -48	50 ± ¼"	46"	¼"
MD-(070 or 110) -72	74 ± ¼"	70"	¼"
MD-(070 or 110) -96	98 ± ¼"	94"	¼"
MD-(070 or 110) -144	142 ± ¼"	142"	¼"

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Pressure Drop Calculations:

Δ P for MD-050 (inches of water) = Sample flow rate (lpm) x length of dryer (inches)
Δ P for MD-070 (inches of water) = Sample flow rate (lpm) x 0.14 x length of dryer (inches)
Δ P for MD-110 (inches of water) = Sample flow rate (lpm) x 0.07 x length of dryer (inches)

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