

# **MSD Series**

## **Modular Membrane Air Dryers**

*Catalog 9CW-DX-233-1*



**WILKERSON®**

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**WILKERSON®**

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Compact Membrane Dryer Advantages ..... 2

How The Wilkerson MSD Membrane Dryer Functions ..... 3

Dimensional Drawings ..... 4

Flow Charts ..... 5-6

Specifications and Ordering Information ..... 7

Dryer Selection ..... 8

Offer of Sale ..... 9

**COMPACT MEMBRANE DRYER ADVANTAGES**

The Wilkerson MSD Series membrane air dryers employ an advanced molecular membrane design that can provide atmospheric dewpoints as low as -40°F (-40°C). The MSD Series membrane dryer is available in 12 different models that can deliver compressed air at flow rates up to 21 SCFM with a -4°F (-20°C) atmospheric dewpoint. Wilkerson's membrane dryers are designed for easy installation, operation and long-term reliability.

Our compact, space saving membrane dryer design is compatible with our modular 18 and 28 Series coalescing filters, using our patented modular joiner set. A clean, dry air system is readily available by simply quick connecting our high efficiency coalescing filter to the membrane air dryer. Our innovative modular design eliminates the need for extra piping, adapters and fittings. The net result is an effective, quality, clean, dry air system that will provide low cost operation and minimal maintenance.

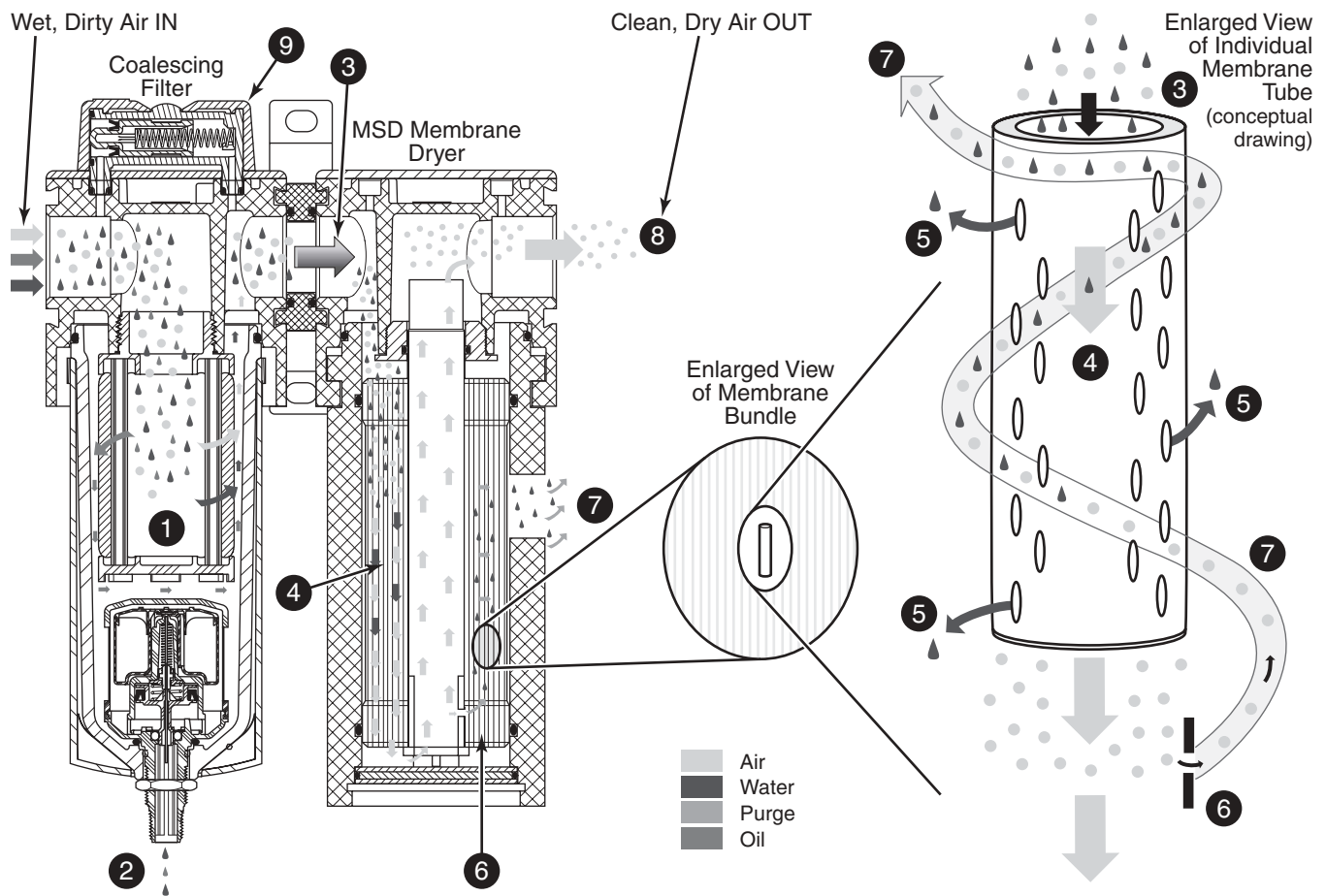
- Available in 3/8, 1/2 NPT or BSPP-G Port Sizes
- Dried Compressed Air is Immediate
- Compact Modular Design
- Simple and Space-Saving Installation
- Low Pressure Drop 



- No CFC's/FC's 
- Suitable For Hazardous Areas
- No Moving Parts
- No Electrical Connection Necessary 
- No User Purge Adjustment
- Compatible With 18/28 Series Modular Product Line

**Wilkerson MSD Series**

**HOW THE WILKERSON MSD MEMBRANE DRYER FUNCTIONS**



To achieve optimum performance and high quality compressed air for your application, it is imperative to install a Wilkerson coalescing filter with automatic drain. The coalescing filter prevents dirt particles and oil and water aerosols from contaminating the membrane. This drawing illustrates a typical clean, dry air system.

**HOW IT WORKS**

Dirty saturated air enters the Wilkerson coalescing filter (1) where solid particles, liquids and aerosol contaminants are efficiently trapped. The coalesced oil and water is then discharged through the float-type automatic drain. (2)

The clean, saturated compressed air now enters the dryer (3) and goes into the module (4) that consists of a densely packed bundle of hollow fiber membranes. As the compressed air flows through the membranes, the water vapor diffuses through the walls of the membrane. (5) A portion of the dried air from the outlet of the cartridge (6) diverted and expanded to atmospheric pressure for use as purge air. The purge air can be piped away using the optional exhaust pipe-away kit.

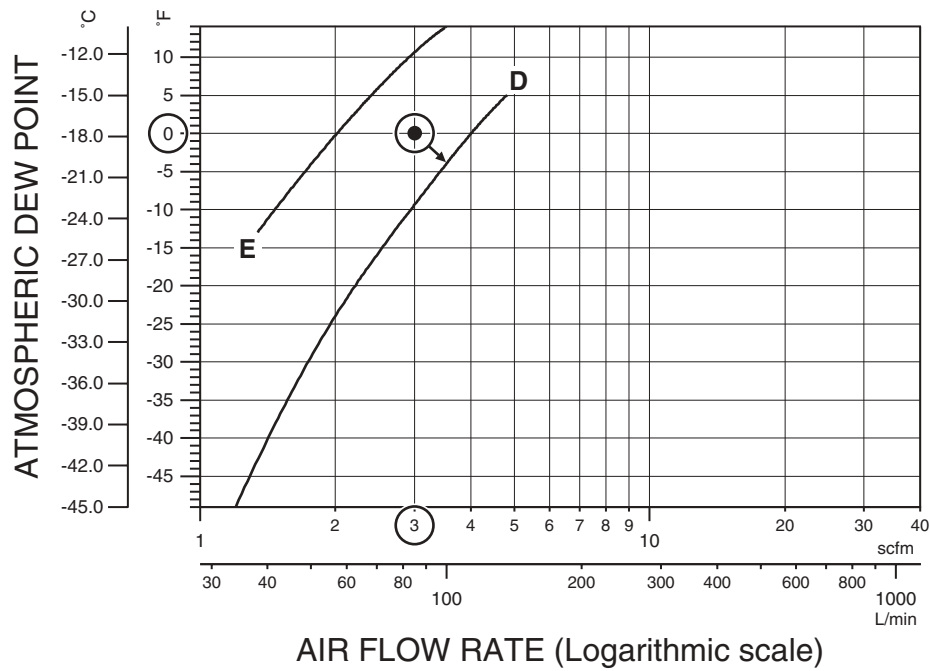
The counter flow purge air then sweeps over the outer surface of the hollow membrane fibers, removing the water molecules, where they are vented to atmosphere. (7) Clean, dry air is now supplied to the application. (8)

The principle of membrane dryer operation is very elementary. Saturated air has a higher partial vapor pressure than dry air. As a result, there is a constant migration of water molecules through the membrane (5) walls from inside the hollow fiber membrane, where you have wet compressed air, to outside, into the lower partial vapor pressure of the purge air stream.

The MSD membrane air dryer is designed to operate continuously — 24 hours per day, 7 days per week. The only maintenance required is changing the coalescing filter element when the standard pressure differential indicator (9) shows red. Due to our innovative quick disconnect bowl design, element change out is less than five minutes.



**DEWPOINT AT VARIOUS FLOW RATES**



**MSD-03-KA1D**  
**MSD-03-KA1E**

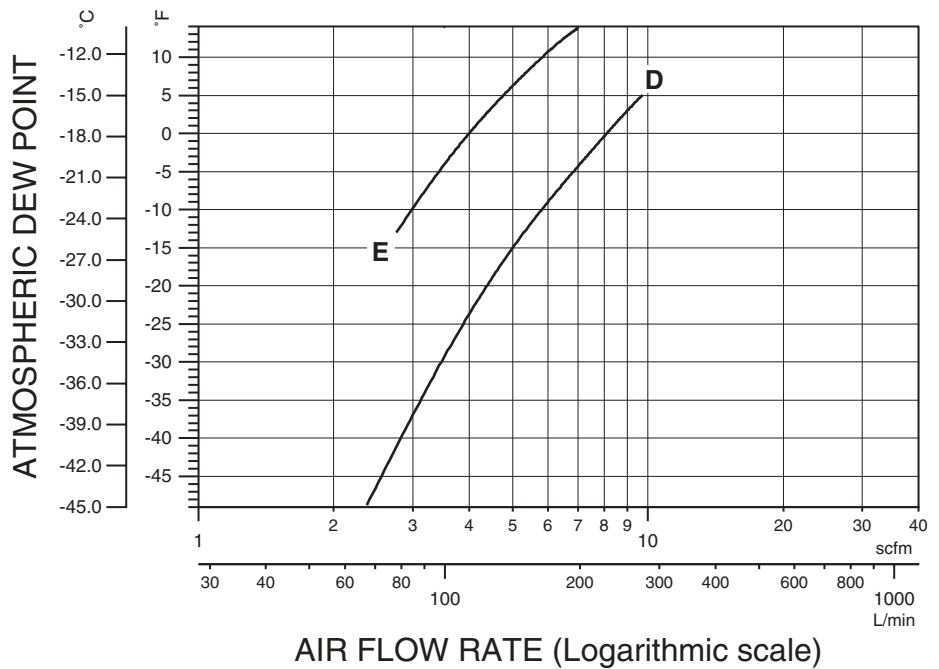


**To Read This Graph:**

Plot actual application point (dewpoint and adjusted flow rate) on chart.  
 Closest curve DOWN and RIGHT of point is correct model for application.

**Example:** 3 scfm @ 0°F ADP, Model MSD-03-KA1D is correct. (Refer to Dryer Selection instructions on page 8.)

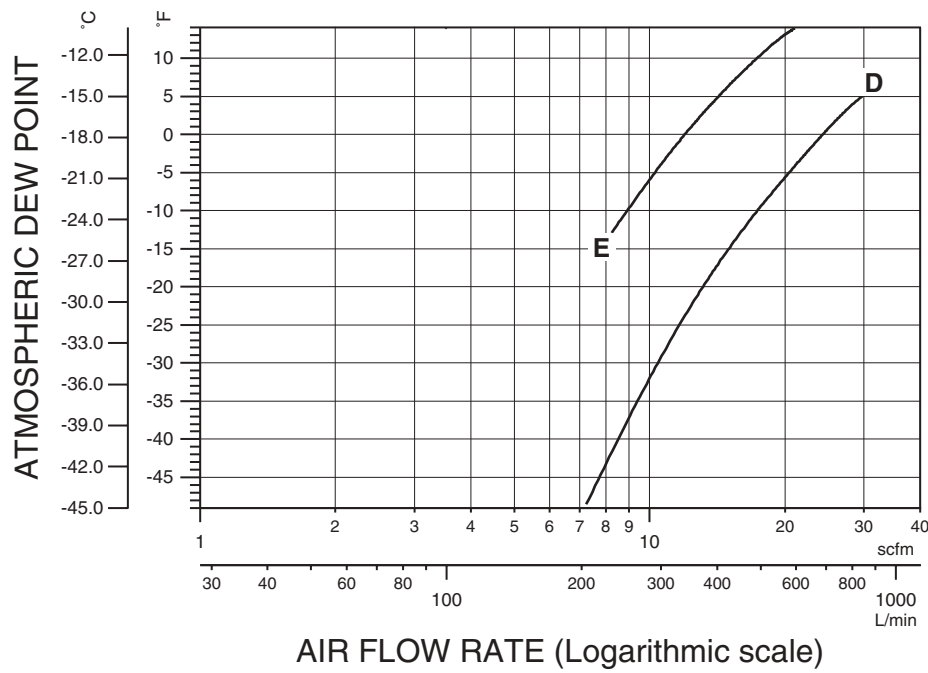
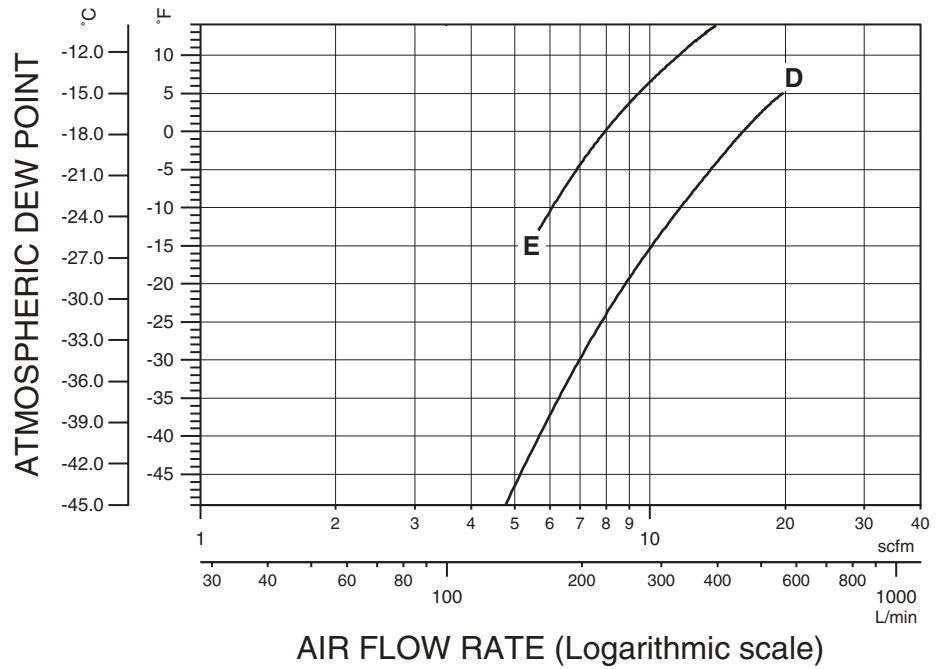
**MSD-03-KA2D**  
**MSD-03-KA2E**



Tested according to ANSI/CAGI Standard ADF 700, ~ Membrane Compressed Air Dryers — Methods for Testing and Rating

**DEWPOINT AT VARIOUS FLOW RATES**

**MSD-03-KB1D**  
**MSD-03-KB1E**



**MSD-03-KB2D**  
**MSD-03-KB2E**





**MEMBRANE DRYER SPECIFICATIONS**

**ALL MODELS**

Min./Max. Inlet Air Temp.	40°F (5°C) to 125°F (51°C)
Ambient Temp. Range	40°F (5°C) to 125°F (51°C)
Min/Max. Inlet Pressure	60 psig (4.1 bar) - 150 psig (10.3 bar)
Compressed Air Requirement (@ dryer inlet)	ISO Class 1, — , 1* (0.01 micron coalescing)
Inlet/Outlet Size (NPT, BSPP-G)	3/8, 1/2
Materials of Construction	Body - Zinc Bowl - Aluminum Seals - Nitrile

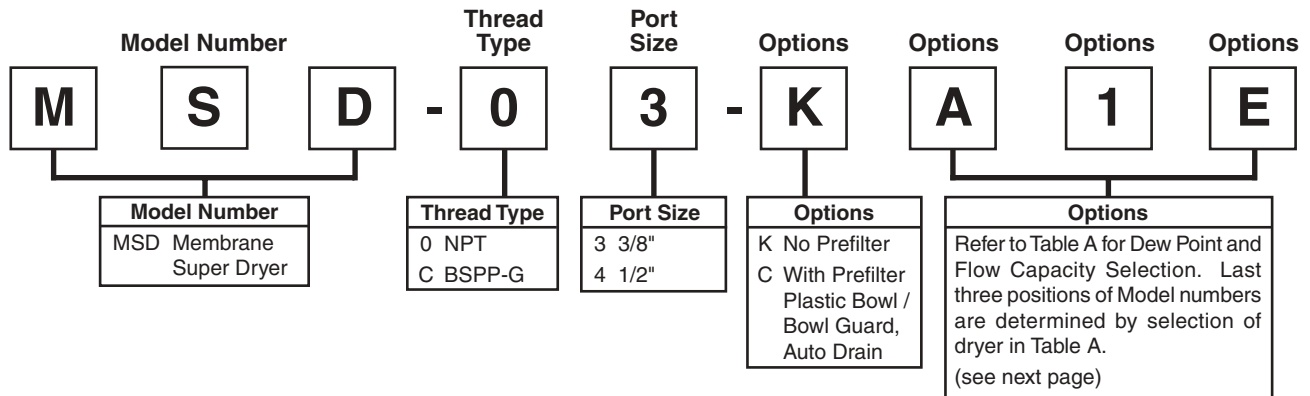
**PRODUCT SPECIFIC**

Model Number	MSD-XX-KA1E	MSD-XX-KA2E	MSD-XX-KB1E	MSD-XX-KB2E
Max. Pressure Drop**	1.45 psi (0.099 bar)	1.45 psi (0.099 bar)	3.9 psi (0.269 bar)	4.35 psi (0.299 bar)
Shipping Weight lbs. (kg)	3.1 (1.4)	3.5 (1.6)	4.2 (1.9)	5.3 (2.4)

\* ISO Standard 8573-1: 1991 (E), pertaining to maximum particle size and concentration of solid contaminants, and maximum oil content.

\*\* Note: Refer to catalog 9EM-TK-190 for performance curves of the M-Series Filters.

**HOW TO SELECT YOUR MEMBRANE DRYER KIT**



**DRYER SELECTION**

**Table A: MEMBRANE DRYER FLOW CAPACITIES**

Model Number	ADP <sup>1</sup> °F (°C)	Maximum Outlet Air Flow <sup>2</sup> scfm (L/min)	Purge Flow scfm (L/min)	Inlet Flow <sup>3</sup> scfm (L/min)
MSD-03-KA1E	-4 (-20)	1.8 (50)	0.3 (8)	2.1 (58)
MSD-03-KA2E	-4 (-20)	3.5 (100)	0.5 (14)	4.0 (114)
MSD-03-KB1E	-4 (-20)	7.1 (200)	1.1 (30)	8.8 (230)
MSD-03-KB2E	-4 (-20)	10.6 (300)	1.6 (44)	12.2 (344)
MSD-03-KA1D	-4 (-20)	3.5 (100)	0.9 (25)	4.4 (125)
MSD-03-KA2D	-4 (-20)	7.1 (200)	1.8 (50)	8.9 (250)
MSD-03-KB1D	-4 (-20)	14.1 (400)	3.5 (100)	17.6 (500)
MSD-03-KB2D	-4 (-20)	21.2 (600)	5.3 (150)	26.5 (750)
MSD-03-KA1D	-40 (-40)	1.4 (40)	0.9 (25)	2.3 (65)
MSD-03-KA2D	-40 (-40)	2.8 (80)	1.8 (50)	4.6 (130)
MSD-03-KB1D	-40 (-40)	5.7 (160)	3.5 (100)	9.2 (260)
MSD-03-KB2D	-40 (-40)	8.5 (240)	5.3 (150)	13.8 (390)

<sup>1</sup> Atmospheric Dew Point

<sup>2</sup> Flow rates based on: 100 psig (6.9 bar) inlet, 77°F (25°C) inlet air temperature, and 77°F (25°C) ambient temperature. Tested according to ANSI/CAGI Standard ADF 700

<sup>3</sup> Required inlet flow is combined outlet flow plus purge flow

**Table B:**

**Pressure Correction Factors**  
(all models)

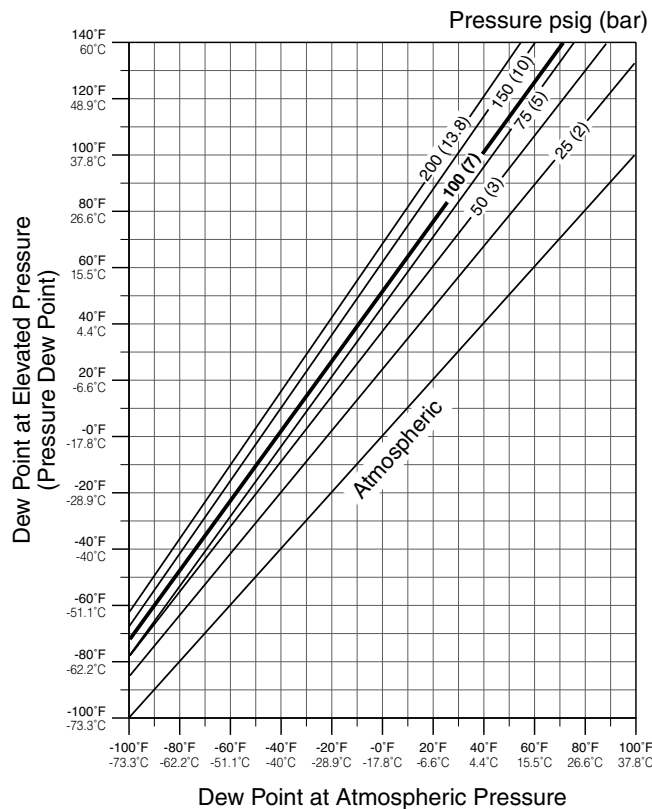
Inlet Pressure psig (bar)	Multiply outlet flow by:
60 (4.1)	0.55
80 (5.5)	0.75
100 (6.9)	1.00
120 (8.3)	1.20
140 (9.6)	1.35
160 (11.0)	1.50

**Table C:**

**Inlet Air Temperature  
Correction Factors**

Inlet Temp °F (°C)	-40°F (-40°C) ADP	-4°F (-20°C) ADP
	Multiply outlet flow by:	
41 (5)	1.28	—
59 (15)	1.10	—
77 (25)	1.00	1.00
95 (35)	0.90	0.85
113 (45)	0.81	0.75
122 (50)	0.80	0.70

**DEW POINT  
CONVERSION CHART**



**TO SELECT A DRYER FOR YOUR APPLICATION**

The outlet flows in Table A are based on 100 psig (6.9 bar) inlet pressure, and 77°F (25°C) inlet air temperature. For proper model selection in your specific application, you must adjust the outlet air flow requirement for the actual inlet air temperature and pressure where the dryer will be installed. This is accomplished by using the correction factors found in Tables B and C (above).

**FOR EXAMPLE:** If an application which requires a -4°F atmospheric dew point, 8 scfm (226L/min) of air (this would be dryer outlet flow), system pressure (dryer inlet pressure) at 140 psig (9.6 bar), and inlet air temperature of 95°F (35°C). **TO ADJUST FOR PRESSURE:** Take the 8 scfm (226L/min) air flow, and from Table B, **MULTIPLY** by 1.35, which equals 10.8 scfm (306L/min). **THEN, TO ADJUST FOR TEMPERATURE:** Take the 10.8 scfm (306L/min) and from Table C, **MULTIPLY** by 0.85, which equals 9.18 scfm (275 L/min), which is the **ADJUSTED OUTLET AIR FLOW REQUIREMENT FOR THE APPLICATION**. From Table A, the model which would be best suited for this application is the MSD-03-KB2E, which has an outlet air flow of 10.6 scfm (300L/min). On the same line, you will see the purge at rated flow is 1.6 scfm (44L/min), and the **TOTAL INLET FLOW REQUIRED** (outlet + purge) is 12.2 scfm (344L/min) for this model.

Please contact Applications Engineering if your application cannot be adjusted using these tables.

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