

# Del-Monox<sup>®</sup> Breathing Air Purifiers

*DM Series*



## Del-Monox<sup>®</sup> Breathing Air Purifiers

### *Time-Proven Reliability*

In 1966, Deltech introduced the industry's first engineered, contaminant removing system to convert compressed air to safe breathing air. Over time, the designs have advanced employing the latest in filtration and dehydration technology. Today, Deltech is the most respected brand name in breathing air purification around the world.

### *The Need for Purified Compressed Air*

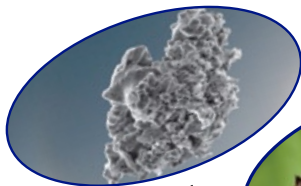


The Del-Monox air purification systems provide a highly effective means to control exposure to respiratory hazards in the work place. Industries and operations requiring use of supplied air respiratory protection include:

- Chemical processing
- Industrial manufacturing
- Medical applications
- Hazardous waste handling
- Laboratory applications
- Sandblasting
- Spray painting
- Tank cleaning
- Gas line repair
- Asbestos abatement

To achieve safe breathing levels, air must be supplied from a source utilizing a properly designed purification system. The source is generally an air compressor, however, air generated from a compressor alone does not produce breathable air. Untreated compressed air contains a variety of contaminants including dust, dirt, water, oil, and even dangerous levels of carbon monoxide.

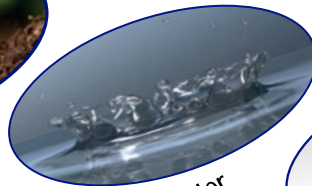
Del-Monox purifiers are designed to reduce the concentration of selected contaminants in conventional compressed air when being used for breathing. When used as directed, Del-Monox purifiers supply air that meets OSHA Grade D and Canadian Standards Association (CSA) maximum allowable contaminant levels for compressed breathing air.



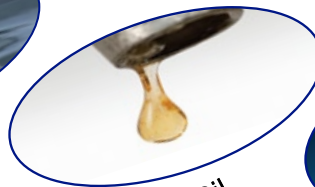
Dust



Dirt



Water



Oil



Carbon Monoxide

## Safety First



Quality of the inlet air to the compressor will affect the efficiency of breathing air purifiers. The compressor intake must be located in an environment that is not oxygen deficient or containing excessive levels of carbon monoxide. To meet the OSHA standards of 10 ppm maximum allowable concentration of CO at the system outlet, CO concentration at the inlet must not exceed 200 ppm. To achieve CSA standards of 5 ppm maximum allowable concentration of CO at the system outlet, the inlet concentration of CO must not exceed 100 ppm.

Careful application of technology is required to reduce CO concentration to safe, breathable levels. A catalytic converter lowers CO concentrations by converting CO to CO<sub>2</sub>. The conversion efficiency of the catalyst decreases when the relative humidity in the air stream increases. Del-Monox purifiers employ proven compressed air dehydration techniques to reliably protect the catalytic converter from moisture. A color change indicator provides instant verification that the relative humidity of the air is suitable for catalytic conversion.

## Purification Capabilities

Contaminant	Maximum Allowable Concentration		Purifier Outlet Rated Conditions
	OSHA <sup>1</sup>	CSA	
Carbon Monoxide (CO) ppm v/v (mL/m <sup>3</sup> )	10	5	95% Conversion <sup>5</sup>
Carbon Dioxide (CO <sub>2</sub> ) ppm v/v (mL/m <sup>3</sup> )	1000	500	2
Oil mg/m <sup>3</sup> (Condensed Hydrocarbons)	5	1	0
Oil Vapor ppm v/v (mL/m <sup>3</sup> ) (Gaseous Hydrocarbons)	N/A	N/A	< .02 <sup>3</sup>
Odor	Lack of noticeable odor		None <sup>4</sup>

- 1 The OSHA Standard references CGA (Compressed Gas Association) pamphlet G-7.1, Grade D and is generally consistent with those published by ANSI.
- 2 CO is converted to CO<sub>2</sub> by the purifier and added to the concentration of CO<sub>2</sub> already present (normal atmospheric air contains 314 ppm v/v of CO<sub>2</sub>). Although some CO<sub>2</sub> is adsorbed in the desiccant beds, high concentrations of CO in the system and / or high concentrations of CO<sub>2</sub> at the compressor intake could result in exceeding allowable CO<sub>2</sub> limits.
- 3 Will remove only those gaseous hydrocarbons normally adsorbed by activated carbon. Outlet concentration is expressed as methane equivalent. Activated carbon will not remove methane.
- 4 Will remove only those odors normally adsorbed by activated carbon.
- 5 95% Conversion example ( 200 ppm @ inlet = 10 ppm @ outlet).

## Standard Safety Regulations

When operating at rated capacity and operating conditions, Del-Monox breathing air purifiers meet the following standards:

**OSHA:** CFR1910.134 (Occupational Safety and Health Association)

**CSA:** Z180.1-00 (Canadian Standards Association)

**CGA:** Pamphlet G-7 (Compressed Gas Association)

**ANSI:** Z88.2-1080 (American National Standards Institute)



Asbestos Abatement



Spray Painting



Sandblasting



Welding



Laboratory

## Premium Performance



### *Filtration & Monitoring*

- Coalescing filters with automatic drain and  $\Delta P$  gauges
- Particulate afterfilter with  $\Delta P$  gauge
- CO catalyst converter
- Activated carbon filter
- Air sample ports for analyzer options

### *Instrumentation*

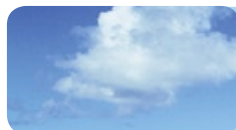
- Pressure Gauges
- Left / right tower
  - Inlet / outlet
  - Purge pressure
  - Color change moisture indicator

### *Standard Controls*

- NEMA 4/4X with LED indicators
- Soft on / off switch with two power recovery modes
- Switching failure alarm
- Adjustable service indications
- Tower / valve status LEDs
- Voltage free common alarm contacts
- RS-232 communications port

### *Other Available Options*

- Nema 7 electrical rating
- Copper, brass or stainless steel instrument tubing & fittings
- SSPC-SP10 sandblast & epoxy paint
- Breathing air analyzers
- CompuSave EMS (optional Controls)



*Del-Monox: Delivering Excellence*

# CompuSaveEMS Delivers Energy Savings

## Optional CompuSaveEMS



Deltech's CompuSaveEMS energy saving purge system, mirrors plant air demands to deliver calculated energy savings. When operating at reduced capacity, the on-line drying tower remains active longer, until its full drying capacity is utilized. Desiccant bed temperature readings are constantly monitored to manage drying times and minimize purge air consumption.

CompuSaveEMS detects the rise in desiccant bed temperatures (heat of adsorption) that result during the drying phase. Advanced microprocessor based controls continuously re-calculate available drying time to manage how long a tower stays active. During the regeneration phase, the stored heat of adsorption is released to improve energy efficiency and prepare the inactive tower for the next cycle.

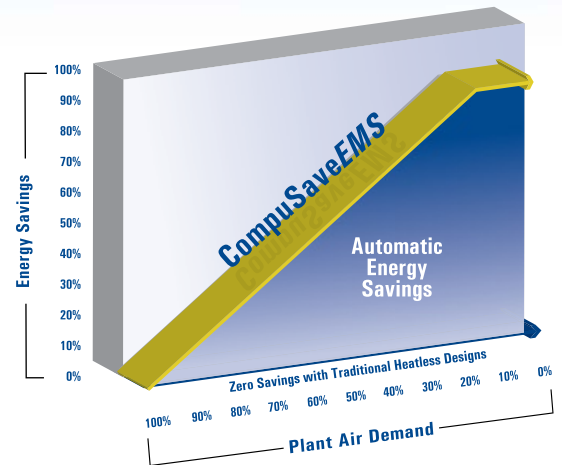
## Make the Right Choice

It is important breathing air systems are monitored for proper operation. The Series 1000 continuously measures and displays the concentration of carbon monoxide in the air and provides visual and audible alarms if levels exceeds predetermined set points.

Deltech's Series 1000 carbon monoxide monitor can be used as a stand-alone device or installed on a Del-Monox purifier as an option. The monitor, which has a 0-200 ppm carbon monoxide range, is designed for simple, trouble-free use and maintenance.

# CompuSaveEMS

ENERGY SAVING PURGE SYSTEM



Maximize your return-on-investment automatically. DM Series with CompuSaveEMS, delivers energy savings in direct proportion to plant air demands, making it the "Auditor's Choice."

### Recommended Option:

#### Series 1000 Carbon Monoxide (CO) Monitor

- Digital readout of CO concentration
- Visual and audible alarm
- Adjustable high & low alarms with indication
- Contacts for remote alarm
- Push-to-test button
- Alarm silence switch
- Simple calibration



### Additional Option:

#### Multiple Alarm Monitor

- Multiple alarm capabilities
- CO & oxygen
- CO & dew point
- CO, oxygen & dew point



## How It Works

Del-Monox breathing air purifiers are designed to provide safe breathing air on a continuous duty basis for outlet air capacities ranging 15 scfm (25 Nm<sup>3</sup>/hr) to 940 scfm (1597 Nm<sup>3</sup>/hr). The engineered system employs six stages of purification to achieve specified breathing air quality levels.

### Stages of Operation

#### Stage ① DF Series Grade C

One micron general purpose coalescing filter removes solid and liquid contaminants

#### Stage ② DF Series Grade A

0.01 micron ultra high efficiency coalescing type oil removal filter removes virtually all liquid oil aerosols

#### Stage ③ Deltech Pressure-Swing Regenerative Desiccant Dryer

Dependably reduces the moisture content to a level that ensures the effectiveness of the catalyst bed

#### Stage ④ Catalytic Converter

Lowers CO concentrations by converting CO to CO<sub>2</sub>

#### Stage ⑤ DF Series Grade Z

Activated carbon filter removes oil vapor and undesirable odors

#### Stage ⑥ DF Series Grade Y

Particulate removal afterfilter removes contaminants one micron and larger from the air stream



\*For illustration purposes only, actual filtration is contained within the skid.



# DM Series Specifications

## Optimizing Capacity



Breathing air produced by the Del-Monox system can supply various levels of use. To select a DM Series purifier, first determine the air pressure at the purifier inlet and the maximum breathing air flow required at a given time. The chart below illustrates an example of DM Series estimated capacities based on 6-15 scfm (10-25 m<sup>3</sup>/h) per hood, helmet or suits as calculated in the sizing table.

Models	DM15	DM25	DM35	DM50	DM75	DM95	DM135	DM205	DM305	DM375	DM625	DM775	DM940
Minimum Capacity	1	2	2	3	5	6	9	14	20	25	42	52	63
Maximum Capacity	2	4	6	8	13	16	23	34	51	63	104	129	157

\* Contact hood manufacturer for actual capacity before sizing purifier.

## Model Specifications

Model	Inlet Flow		Outlet Flow		Power Supply	In/Out Connections		Height		Width		Depth		Weight	
	scfm <sup>1</sup>	Nm <sup>3</sup> /h	scfm <sup>2</sup>	Nm <sup>3</sup> /h		in	mm	in	mm	in	mm	in	mm	lbs	kg
DM 15	18	31	15	26	VAC 85-264/1/147-53hZ DC 11.5-28V DC	1/2 NPT	12.7	49	1,245	35	889	35	889	440	200
DM 25	30	51	25	42		1/2 NPT	12.7	49	1,245	35	889	35	889	450	204
DM 35	42	71	35	59		3/4 NPT	19.1	49	1,245	35	889	35	889	455	206
DM 50	60	102	50	85		1 NPT	25.4	64	1,626	35	889	35	889	560	254
DM 75	90	153	75	127		1 NPT	25.4	79	2,007	37	940	35	889	700	318
DM 95	114	194	95	161		1 NPT	25.4	57	1,448	50	1,270	41	1,041	820	372
DM 135	162	275	135	229		1 NPT	25.4	57	1,448	50	1,270	41	1,041	820	372
DM 205	246	418	205	348		1 1/2 NPT	26.7	75	1,905	56	1,422	43	1,092	1,190	540
DM 305	366	622	305	518		2 NPT	50.8	65	1,651	62	1,575	51	1,295	1,405	637
DM 375	450	765	375	637		2 NPT	50.8	73	1,854	66	1,676	51	1,295	1,560	708
DM 490	590	1,002	490	833		Consult Deltech									
DM 625	750	1,274	625	1,062											
DM 775	930	1,580	775	1,317											
DM 940	1,130	1,920	940	1,597											

<sup>1</sup> Flow capacity rated at CAGI conditions (100 psig / 7 m<sup>3</sup>/h and 100 °F saturated inlet)  
<sup>2</sup> Operating range of inlet supply air is 60 - 150 psig (4.2 - 10.5 kg/cm<sup>2</sup>) and 35° - 140° F (1.7° - 60° C)

## Capacity Correction Factors

Inlet Pressure		100°F	105°F	110°F	115°F	120°F
psig	kg/cm <sup>2</sup>	38°C	40°C	43°C	46°C	49°C
60	4.2	0.65	0.64	0.62	0.60	0.58
70	4.9	0.74	0.73	0.71	0.69	0.66
80	5.6	0.83	0.81	0.80	0.77	0.74
90	6.3	0.91	0.89	0.87	0.85	0.81
100	7	1.00	0.98	0.96	0.93	0.89
110	7.7	1.04	1.02	1.00	0.97	0.93
120	8.4	1.08	1.06	1.04	1.00	0.96
130	9.1	1.12	1.10	1.08	1.04	1.00
140	9.8	1.16	1.14	1.11	1.08	1.03
150	10.5	1.20	1.18	1.15	1.12	1.07

### Capacity Correction Factors

To adjust Del-Monox capacity for conditions other than rated, use the correction factors (multipliers) for inlet air temperature and pressure shown below.  
 Example: What is the capacity of a 205 scfm model when the compressed air at the inlet is 130 psig (9.1 kg/cm<sup>2</sup>) and 110°F (43°C)?  
 Answer: 205 scfm [14.4 kg/cm<sup>2</sup>] (rated flow from Product Specifications Table) x 1.08 (correction factor for inlet air temperature and pressure) = 221 scfm [15.5 kg/cm<sup>2</sup>].

## Replacement Filter Elements

Prefilter 1	Prefilter 2	Catalyst Cartridge	Afterfilter 1	Afterfilter 2
FE20-C	FE20-A	CC0	FE20-Z	FE20-Y
FE35-C	FE35-A	CC0	FE35-Z	FE35-Y
FE60-C	FE60-A	CC0	FE60-Z	FE60-Y
FE60-C	FE60-A	CC1	FE60-Z	FE60-Y
FE100-C	FE100-A	CC1	FE100-Z	FE100-Y
FE170-C	FE170-A	CC2	FE170-Z	FE170-Y
FE170-C	FE170-A	CC2	FE170-Z	FE170-Y
FE250-C	FE250-A	CC3	FE250-Z	FE250-Y
FE375-C	FE375-A	CC4	FE375-Z	FE375-Y
FE485-C	FE485-A	CC5	FE485-Z	FE485-Y
FE625-C	FE625-A	CC6(R)	FE625-Z	FE625-Y
FE780-C	FE780-A	CC7(R)	FE780-Z	FE780-Y
FE1000-C (2)	FE1000-A (2)	CC8(R)	FE1000-Z (2)	FE1000-Y (2)
FE625-WV-C (2)	FE625-WV-A (2)	CC9(R)	FE625-WV-Z (2)	FE625-WV-Y (2)

### Recommended Replacement Intervals:

To maintain breathing air quality and ensure safe operation, Deltech Del-Monox Purifiers require regularly scheduled maintenance. Recommended service/replacement intervals will vary. Contact an authorized Deltech representative for assistance in determining the optimum schedule.



## The Deltech Commitment

Deltech sets the standard of excellence in technology for today's growing industries.

We build relationships by commitment to understanding the processes and requirements of our customers. As a result, the compressed air solutions we develop enable users of Deltech products to meet their objectives of improved productivity and optimized efficiency. We will continue to dedicate our research and development resources in providing new and innovative air treatment products inspired by our valued customers.



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