Del-Monox® Breathing Air Purifiers
DM Series
Del-Monox® 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 workplace. 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.
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\textsubscript{2}. 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

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Maximum Allowable Concentration</th>
<th>Purifier Outlet Rated Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide (CO) ppm v/v (mL/m\textsuperscript{3})</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Carbon Dioxide (CO\textsubscript{2}) ppm v/v (mL/m\textsuperscript{3})</td>
<td>1000</td>
<td>500</td>
</tr>
<tr>
<td>Oil mg/m\textsuperscript{3} (Condensed Hydrocarbons)</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Oil Vapor ppm v/v (mL/m\textsuperscript{3}) (Gaseous Hydrocarbons)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Odor</td>
<td>Lack of noticeable odor</td>
<td>None \textsuperscript{4}</td>
</tr>
</tbody>
</table>

\textsuperscript{1} The OSHA Standard references CGA (Compressed Gas Association) pamphlet G-7.1, Grade D and is generally consistent with those published by ANSI.

\textsuperscript{2} CO is converted to CO\textsubscript{2} by the purifier and added to the concentration of CO\textsubscript{2} already present (normal atmospheric air contains 314 ppm v/v of CO\textsubscript{2}). Although some CO\textsubscript{2} is adsorbed in the desiccant beds, high concentrations of CO in the system and/or high concentrations of CO\textsubscript{2} at the compressor intake could result in exceeding allowable CO\textsubscript{2} limits.

\textsuperscript{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.

\textsuperscript{4} Will remove only those odors normally adsorbed by activated carbon.

\textsuperscript{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)
Premium Performance

Filtration & Monitoring
- Coalescing filters with automatic drain and ΔP gauges
- Particulate afterfilter with ΔP 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.

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 Nm³/hr) to 940 scfm (1597 Nm³/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 CO₂

Stage 5 DF Series Grade Y
Particulate removal afterfilter removes contaminants one micron and larger from the air stream

Stage 6 DF Series Grade Z
Activated carbon filter removes oil vapor and undesirable odors

*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 m³/h) per hood, helmet or suits as calculated in the sizing table.

**Models**

<table>
<thead>
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<tbody>
<tr>
<td>Minimum Capacity</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td>14</td>
<td>20</td>
<td>25</td>
<td>42</td>
<td>52</td>
<td>63</td>
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<tr>
<td>Maximum Capacity</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>13</td>
<td>16</td>
<td>23</td>
<td>34</td>
<td>51</td>
<td>63</td>
<td>104</td>
<td>129</td>
<td>157</td>
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</tbody>
</table>

* Contact hood manufacturer for actual capacity before sizing purifier.

**Model Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Inlet Flow</th>
<th>Outlet Flow</th>
<th>Power Supply</th>
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<tbody>
<tr>
<td></td>
<td>scfm¹</td>
<td>Nm³/h</td>
<td>scfm²</td>
</tr>
<tr>
<td>DM 15</td>
<td>18</td>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>DM 25</td>
<td>30</td>
<td>51</td>
<td>25</td>
</tr>
<tr>
<td>DM 35</td>
<td>42</td>
<td>71</td>
<td>35</td>
</tr>
<tr>
<td>DM 50</td>
<td>60</td>
<td>102</td>
<td>50</td>
</tr>
<tr>
<td>DM 75</td>
<td>90</td>
<td>153</td>
<td>75</td>
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<td>DM 95</td>
<td>114</td>
<td>194</td>
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<tr>
<td>DM 135</td>
<td>162</td>
<td>275</td>
<td>135</td>
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<tr>
<td>DM 205</td>
<td>246</td>
<td>418</td>
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<td>DM 305</td>
<td>366</td>
<td>622</td>
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<td>DM 375</td>
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<td>DM 490</td>
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<td>DM 625</td>
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<td>DM 775</td>
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<tr>
<td>DM 940</td>
<td>1,130</td>
<td>1,920</td>
<td>940</td>
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</tbody>
</table>

¹ Flow capacity rated at CAGI conditions (100 psig / 7 m³/h and 100 ºF saturated inlet)
² Operating range of inlet supply air is 60 - 150 psig (4.2 - 10.5 kg/cm²) and 35º - 140º F (1.7º - 60º C)

**Capacity Correction Factors**

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>100°F psig</th>
<th>48°C kg/cm²</th>
<th>105°F psig</th>
<th>46°C kg/cm²</th>
<th>110°F psig</th>
<th>43°C kg/cm²</th>
<th>115°F psig</th>
<th>48°C kg/cm²</th>
<th>120°F psig</th>
<th>45°C kg/cm²</th>
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<tr>
<td>60</td>
<td>4.2</td>
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<td>0.64</td>
<td>0.62</td>
<td>0.60</td>
<td>0.58</td>
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<td>80</td>
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<tr>
<td>110</td>
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<td>1.02</td>
<td>1.00</td>
<td>0.97</td>
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<td>130</td>
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<td>1.04</td>
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<td>140</td>
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<tr>
<td>150</td>
<td>10.5</td>
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<td>1.18</td>
<td>1.15</td>
<td>1.12</td>
<td>1.07</td>
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</tbody>
</table>

**Replacement Filter Elements**

**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 understanding the requirements of our customers. As a result, the compressed air solutions we develop enable end 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.