VALUE THROUGH PERFORMANCE

DELTECH

DEL-MONOX®

BREATHING AIR PURIFIERS FOR COMPRESSED AIR

"Improving the quality of the air you breathe"

Del-Monox® purifiers provide built-in color change monitoring and maximum carbon monoxide conversion for a wide range of applications.

DELTECH

Which model meets your requirements?

Model	Type/ Application	Capacities (scfm)*	Maximum Operating Pressure (psig)	Options Available	Comments
G Series Del-Monox	Uses regenerative desiccant dryer For use on continuous basis	8-140 @ 100 psig	150	• cart mounted • carbon monoxide monitor • NEMA 7 • 12V control • 50 cycle	Wide range of options enables user to select a model for all applications
DM Series Del-Monox	Uses regenerative desiccant dryer Higher air flow rates than G series Del-Monox For use on continuous basis	125-920 @ 100 psig	135	• consult Deltech	Carbon monoxide monitor is standard
Disposable Cartridge Del-Monox	All filtration drying and purifying is accomplished in a single replaceable cartridge For standby, emergency or occasional use	8-20 @ 100 psig 18-46 @ 250 psig	150 250	• cart mounted	Ideal for intermittent applications that require maximum portability No purge air required
Pyramid 8000 Series Del-Monox	Uses refrigeration dryer For use on a continuous basis	25-150 @ 100 psig	150	• carbon monoxide monitor	Most economical to operate because no purge air is required; good for applications with limited compressor capacity Cannot be used if air lines are exposed to ambient temperatures below 39°F *Refer to Deltech Bulletin 299*

**For G Series and DM Series, capacities are maximum outlet air flow.*

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The Need for Purified Compressed Air

Supplied air respiratory protection is one of the most productive and reliable ways to control exposure to respiratory hazards in the work place.

Chemical processors, utilities, industrial manufacturers, nuclear generating plants and hazardous waste contractors are just a few of the industries with operations that facilitate the use of supplied air respiratory protection. Those operations include sandblasting, spray painting, tank cleaning, gas line repairs and asbestos abatement.

Supplied air respirators, hoods and masks deliver breathing air from a source independent of the surrounding atmosphere. That source is typically an air compressor. But an air compressor alone does not always create breathable air. In fact, air from an air compressor may contain a variety of contaminants, including dust, dirt, water, and oil — even dangerous levels of carbon monoxide.

In 1966, Deltech introduced the industry's first engineered, contaminant-removing system to convert compressed air to safe breathing air — the Del-Monox® purifier. Today, Del-Monox is the most recognized name in breathing air purification. While many companies have attempted to imitate our products, Deltech continues to be the leading U.S. manufacturer of purifiers for compressed air.

Varying Application Require Various Types of Purifiers

Supplied air respiratory protection in the industry isn't the only application of purified compressed breathing air. Other applications include air for diving, clean rooms and health care facilities. Hospitals utilize purified compressed air for such processes as respiratory therapy, hyperbaric oxygen therapy, life support systems and neonatal care.

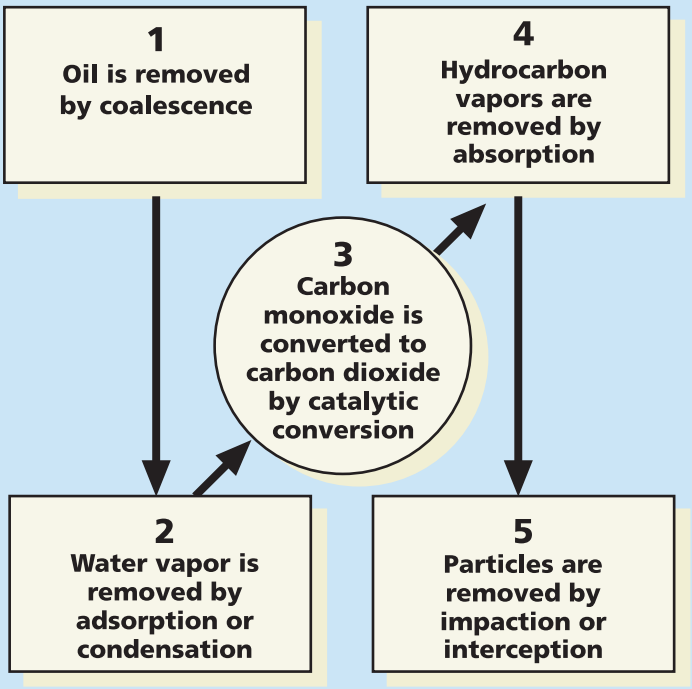
Deltech has designed and manufactured compressed air purifiers to meet the most stringent standards. Del-Monox purifiers come in a range of models: low-pressure purifiers for continuous use, low-pressure disposable cartridge units for intermittent or short-term use and high-pressure purifiers for filling cascade systems or self-contained air bottles. Since many applications require portability, cart-mounted continuous duty and disposable units are available.

Every Del-Monox system is a complete multifunctional system designed to provide a continuous supply of clean, safe breathing air in accordance with all applicable regulations. They increase worker comfort and safety and result in higher productivity. Del-Monox units perform effectively with lubricated or oil-less compressors and can be installed on a branch of an existing air system. Each type of Del-Monox purifier can be matched to specific needs for greatest convenience and cost effectiveness.

Del-Monox Purifiers — The High-Efficiency of Solution

The common contaminants in compressed air include oil, water, carbon monoxide, hydrocarbon vapors and particles. The removal of each contaminant requires a different filtration or purification mechanism.

Deltech has over 35 years of experience in the development of technologies related to compressed air treatment. Del-Monox systems represent an accumulation of those technologies to provide the most complete purification achievable.



Five steps of the purification process

The high efficiency of Del-Monox purifiers is unsurpassed in the industry, particularly when dealing with carbon monoxide, the most dangerous compressed air contaminant. The Del-Monox design provides 95 percent carbon monoxide conversion efficiency compared to only 90 percent or less for competitive products. This means, for example, that Del-Monox purifiers reduce a concentration of 400 ppm carbon monoxide at the purifier inlet to 20 ppm, while other products achieve only 40 ppm. And since there's always the danger of high, intermittent concentrations of carbon monoxide from ambient vehicle exhaust and other sources of air pollution, Del-Monox purifiers provide an extra degree of worker protection — and less worry about worker safety.

Early Warning Indicators are Unique

With Del-Monox purifiers, you get more than breathable air — you get peace of mind. The Del-Monox design has been selected by thousands of industrial hygienists, plant engineers, safety managers and hospital engineers for more than 25 years. One of the reasons it has been the product of choice is the built-in monitoring that helps you operate and maintain the units.

Carbon monoxide requires careful application of technology to reduce its concentration of safe levels. In the process employed by Del-Monox systems today, the conversion efficiency of the catalyst decreases if the air stream relative humidity increases.

Who Specifies Compressed Breathing Air Quality?

A number of standards and regulations exist that specify the quality of compressed air that should be used for supplied air respiratory protection. The two most important North American standards are those established by the Occupational Safety and Health Administration (OSHA) and the Canadian Standards Association (CSA).

In its published requirements [29CFR1910.134(d)(1)], OSHA states that compressed "breathing air shall meet at least the requirements of the specification for Grade D air as described in the ANSI Compressed Gas Association Commodity Specification for Air, G-7.1-1989."

In 1989, the Compressed Gas Association revised G-7.1. In the 1989 version, the allowable carbon monoxide level for Grade D air was reduced from 20 to 10 ppm. The maximum allowable contaminant levels shown in Table 1 are consistent with G.7.1-1989. You should check with your local OSHA office to verify its interpretation on this point.

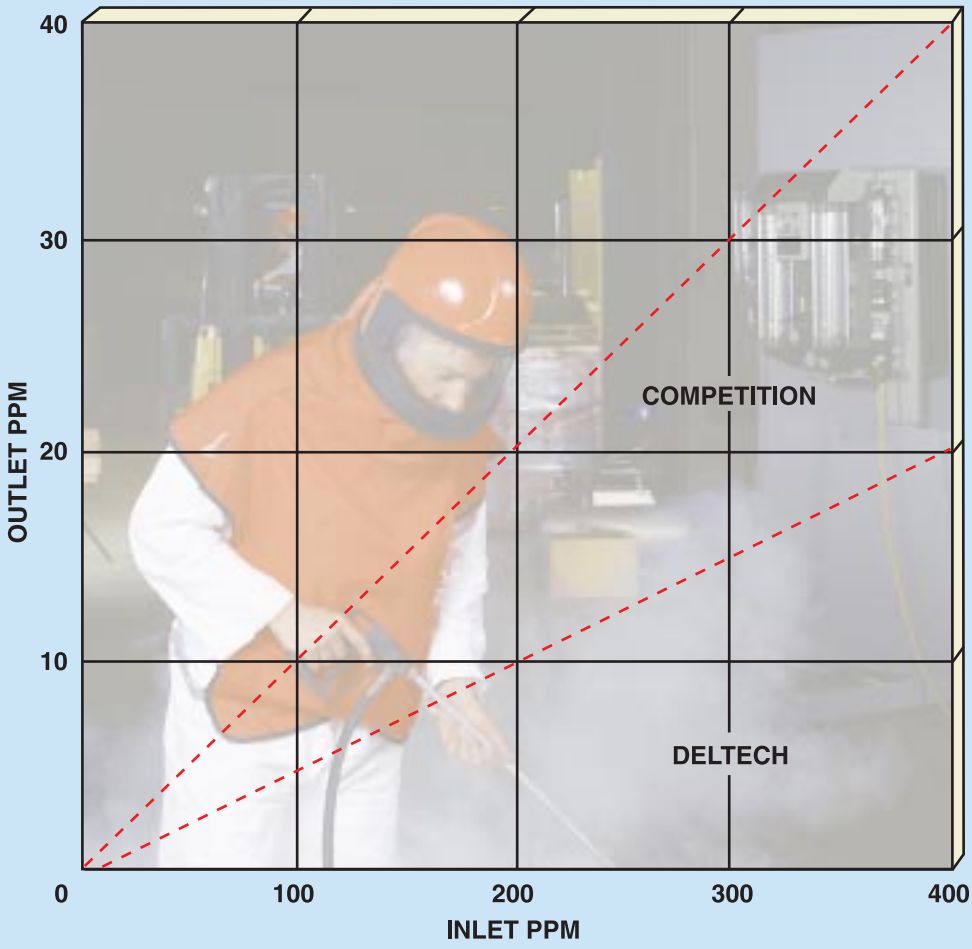
The CSA standard, Compressed Breathing Air Systems CAN3-Z180.1-00, also contains specification for the quality of compressed breathing air. Allowable contaminant concentrations listed in CAN3-Z180.1-00 are shown in Table 1.

Del-Monox purifiers are designed to reduce the concentration of selected contaminants in conventional compressed air used for breathing. When used as directed, Del-Monox purifiers supply air that meets OSHA Grade D and CSA maximum allowable contaminants for compressed breathing air. Whether the maximum allowable carbon monoxide concentration is 5, 10, or 20 ppm, the Del-Monox system will successfully handle an inlet contamination concentration that's twice the maximum claimed by most competitors.

For this reason, the relative humidity of the air must be kept to a minimum. Del-Monox purifiers employ the most reliable, proven techniques in air-drying and constantly protect the catalytic converter from moisture.

Color change monitoring is used to indicate desiccant dryness on the G Series and DM Series Del-Monox purifiers, providing instant verification that the relative humidity of the air is suitable for catalytic conversion.

In these Deltech units, the color change indicators are located in the desiccant towers. In competitive designs, the moisture indicator, if used, is on the dryer outlet. If moisture is present at this point, the catalyst may have already been rendered ineffective. Color change monitoring is also designed into the prefilter on the G Series Del-Monox line. A carbon monoxide monitor is optional on the G Series and standard on the DM Series.



High-Efficiency Del-Monox purifiers provide 95% carbon monoxide conversion efficiency, compared to only 90% for competitive products.

Contaminant	OSHA	CSA
Oxygen	19.5-23.5%	20-22%
Carbon Monoxide, ppm v/v	10	≤5m L/m³
Carbon Dioxide, ppm v/v	1,000	500m L/m³
Oil (Condensed Hydrocarbons), mg/m³	5	1mg/m³
Odor	"lack of noticeable odor"	"free of any detectable odor"

Table1: Contaminant and maximum allowable limit required by OSHA in the U.S. and CSA in Canada.

Important:

Del-Monox purifiers are designed to reduce the concentration of selected contaminants in conventional compressed air 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.

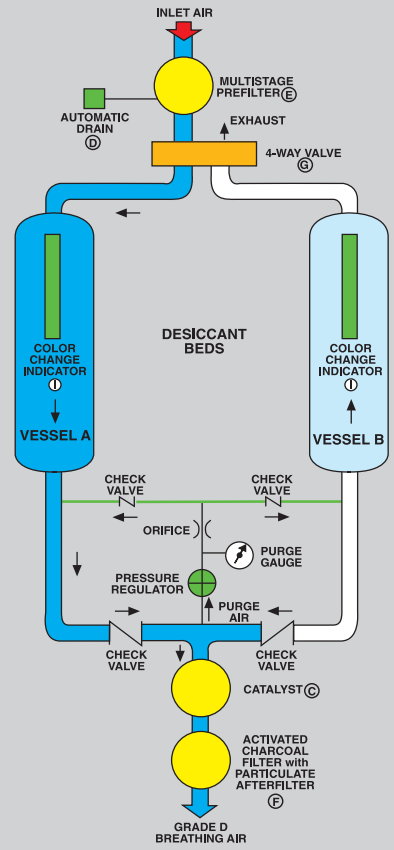
Gross contamination of the inlet air to the compressor will affect the efficiency of the purifiers. Air entering the purifier must not be oxygen deficient. The compressor intake must be located in a clean air environment so that the inlet air to the compressor contains the oxygen concentration normally present in atmospheric air. The purifier will efficiently convert concentrations of carbon monoxide up to 600 ppm at the purifier inlet. However, in order to meet OSHA standards, carbon monoxide concentration at the inlet must not exceed 200 ppm, and to meet CSA standards, it must not exceed 100 ppm.

High-Efficiency G Series Del-Monox Has Multiple Early Warning Indicators

Used on a continuous basis, G Series Del-Monox compressed air purifiers have outlet capacities ranging from 8 scfm to 140 scfm at 100 psig.

An early warning, color change indicator — a key feature of the Del-Monox purifiers — indicates desiccant dryness. Calibrated color change strips in the desiccant beds turn from green to yellow to warn against possible moisture contamination of the catalyst. The multistage prefilter changes color to signal element replacement.

Options include a carbon monoxide monitor and 12VDC Control. Also, G Series Del-Monox purifiers can be cart-mounted and manufactured to meet NEMA 7 (Class I, Division II, Group D) standards. Other options include a special high-efficiency prefilter for use with oil-flooded rotary screw compressors (or where heavy oil loading or slugging may occur) and an electronic automatic drain valve.



How It Works

Inlet air enters a proprietary, three-in-one prefilter E where solid particles, liquid oil and water are removed. The prefilter changes color to signal element replacement. An automatic drain D continually discharges the separated contaminants.

Filtered air enters one of two desiccant towers via a four-way valve G. The twin desiccant towers remove water vapor. Calibrated color change strips I indicate relative humidity and monitor dryer performance. An electric timer (110V/75W NEMA Type I) switches air flow from vessel A to vessel B on a timed cycle. A small portion of the dried air (purge air) is used to regenerate the offstream vessel.

A catalyst C converts carbon monoxide to carbon dioxide. (A carbon monoxide monitor and alarm are available as an option.) An activated charcoal filter F removes objectionable tastes and odors. An afterfilter removes any remaining particulates. Grade D breathing air is then supplied to the system.

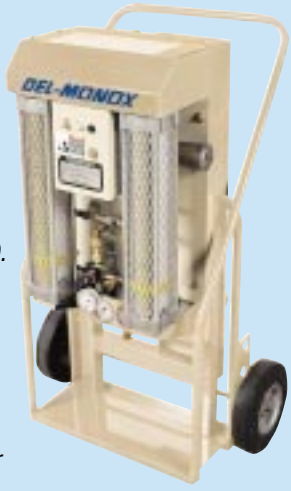
How To Select Your G Series Purifier

To select a continuous-duty G Series purifier, first determine the air pressure at the purifier inlet and the maximum breathing air flow required at a given time. Size the purifier according to the following example.

In a sandblasting operation, three workers require 6 scfm each for their Type CE respirators. The air system pressure is 100 psig.

The maximum required breathing air flow rate is 3 x 6 or 18 scfm. From the Model Selection Chart, using 100 psig operating pressure as a guide, select a purifier with an outlet flow that equals or exceeds 18 scfm. Select model 3H10. Additional air must be supplied at the purifier inlet for operation of the dryer.

To estimate the required inlet air flow, divide the maximum outlet air flow by 0.75. In this example, the required inlet flow is 24 scfm. To estimate required air flow for inlet pressures other than 100 psig, consult Deltech.



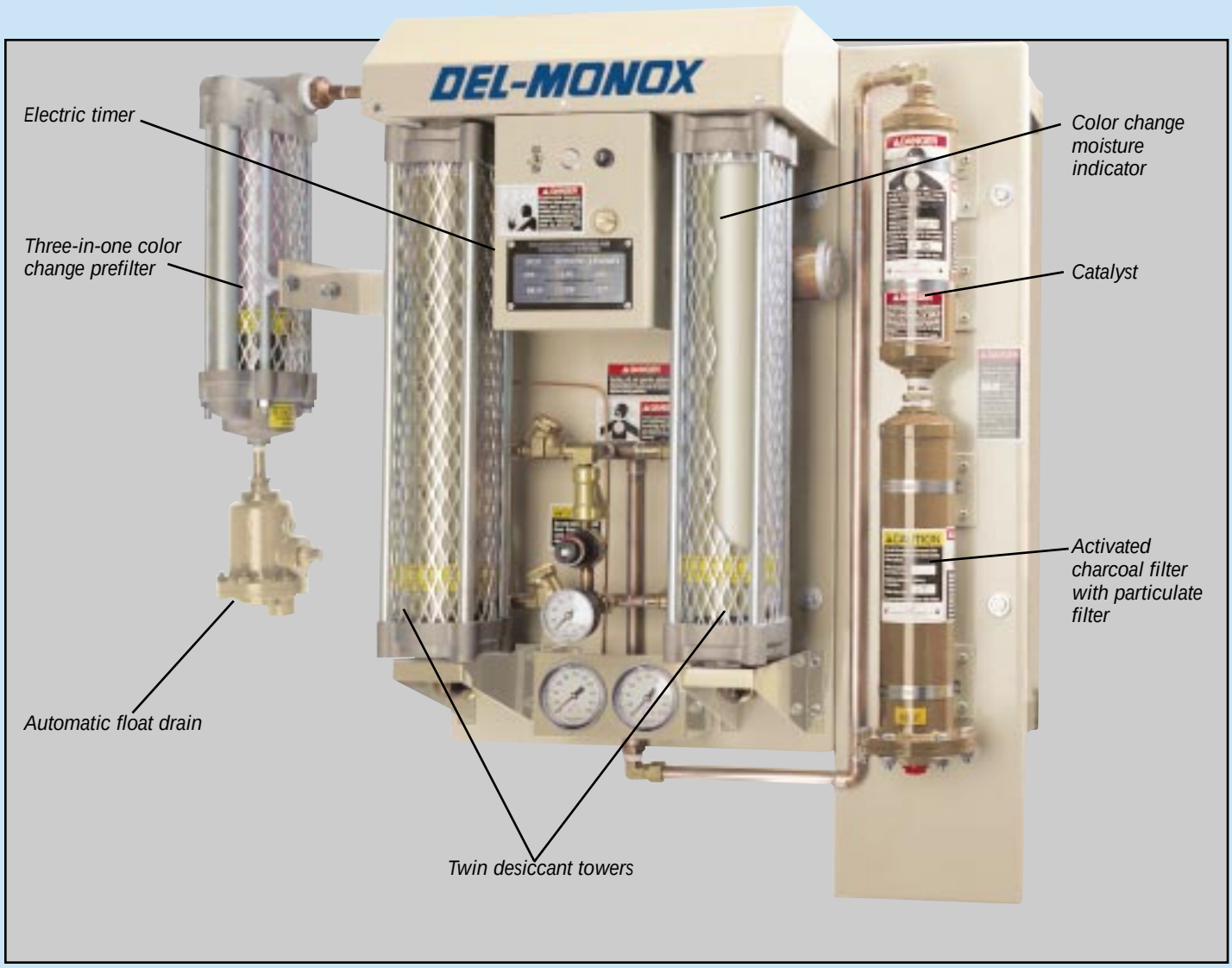
G Series purifiers are available cart-mounted for portability.

Model Selection Chart

Model[a]	Inlet Air Pressure (psig)					
	80	90	100	110	125	150
	Maximum Outlet air Flow (scfm)[b]					
1C10	6	7	8	9	10	11
3F10	10	11	12	13	14	17
3H10	15	16	18	19	22	26
3K11	20	22	24	26	29	34
3L11	26	29	32	34	39	46
5N12	40	44	48	52	58	68
5R12	66	73	80	86	97	114
5S13	86	95	104	112	126	149
5W13	105	117	128	138	156	183
7W13	115	128	140	151	169	200

[a] *Including equivalent portable models with suffix C.*

[b] *Based on saturated 100° F inlet air, 100° F ambient air. Capacity will be reduced with saturated inlet air at higher temperatures; consult Deltech. Maximum recommended inlet air temperature, 120° F; minimum, 65° F. Maximum operating pressure, 150 psig; minimum, 75 psig.*



Specifications

Standard Systems

Model[a]	Approximate Dimensions (inches) H	W	D	Approx. Ship Wt. (lbs.)
1C10	38.5	29.5	12.75	140
3F10	38.5	31.5	12.75	175
3H10	38.5	33.5	14.5	205
3K11	44.5	33.5	14.5	230
3L11	66.5	38.5	36.0	305
5N12	66.5	42.5	36.0	425
5R12	66.5	47.5	36.0	465
5S13	72.5	50.75	36.0	585
5W13	72.5	50.75	36.0	665
7W13	72.5	59.5	36.0	790

[a] *Models 1C10 through 3K11 are designed for wall mounting; larger models are furnished with floor stands.*

Portable Systems

Model	Approximate Dimensions (inches) H	W	D	Approx. Ship Wt. (lbs.)
1C10C	48.0	25.0	20.0	175
3F10C	48.0	25.0	20.0	210
3H10C	48.0	27.5	22.0	240
3K11C	48.0	27.5	22.0	270
3L11C	48.0	27.5	25.0	350
5N12C	48.0	27.5	25.0	500
5R12C	48.0	33.0	28.0	540
5S13C[a]	65.0	58.0	42.0	735
5W13C[a]	75.0	68.0	42.0	795
7W13C[a]	75.0	68.0	42.0	920

[a] *Mounted on 4-wheel carts. All others are mounted on 2- wheel carts*

Air Connections[a] (inches NPT) In	Out
1/2	3/4
1	3/4
1	3/4
1	3/4
1	1 1/4
1 1/2	1 1/4
1 1/2	1 1/4
1 1/2	1 1/4
1 1/2	1 1/2
2	1 1/2

[a] *For inlet/outlet reference dimensions, request certified drawings.*

DM Series Del-Monox Purifiers Serve High-Capacity Applications

Del-Monox DM Series compressed air purifiers can be used on a continuous duty basis in high-capacity applications. Outlet capacities range from 125 scfm to 920 scfm at 100 psig.

DM Series purifiers feature a simple design with few moving parts. Standard features include electronic automatic drain valves, a carbon monoxide monitor, a failure-to-switch alarm, tower pressure gauges and ASME-code desiccant vessels. Color change indicators in the desiccant beds warn against possible moisture contamination of the catalyst. Unlike competitive units, in which a moisture indicator is located at the outlet of the dryer, the DM Series color change indicators provide the earliest possible warning of a potential problem.

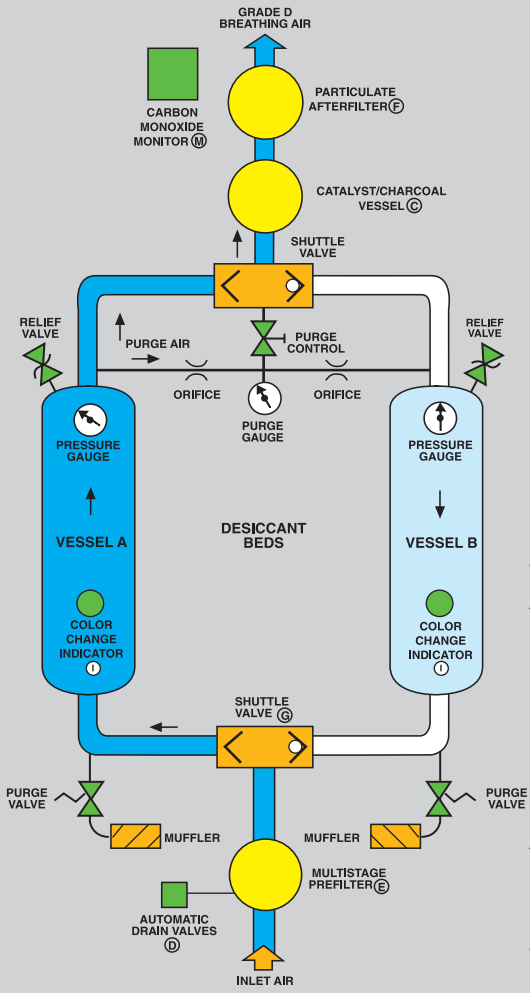
How To Select Your DM Series Purifier

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. Size the purifier according to the following example.

In a shipyard, 50 workers require 6 scfm each for the Type CE respirators and 13 workers require 25 scfm each for their full-suit air line respirators. The air system pressure is 100 psig.

The maximum required breathing air flow rate is (50 x 6) + (13 x 25) or 625 scfm. From the Model Selection Chart, using 100 psig operating pressure as a guide, select a purifier with an outlet flow that equals or exceeds 625 scfm. Select model DM640. Additional air must be supplied to the purifier inlet for operation of the dryer.

To estimate the required inlet air flow, divide the required outlet air flow by 0.83. In this example the required inlet flow is 753 scfm. To estimate the required inlet air flow for inlet pressures other than 100 psig, consult Deltech.



How It Works

Inlet air enters a multistage high-efficiency prefilter E *where liquid oil and water, as well as particulate contaminants, are removed. Electronic drain valves* D *automatically discharge the separated contaminants.*

Filtered air enters one of the two desiccant towers via a shuttle valve G*. The twin desiccant vessels remove water vapor. A small portion of the dried air (purge air) is used to regenerate the offstream vessel. Color change indicators* I *indicate relative humidity and monitor dryer performance.*

A catalyst/charcoal vessel C *converts carbon monoxide to carbon dioxide and removes odor and taste causing hydrocarbon vapors. An afterfilter* F *removes desiccant dust and other fine particles.*

A carbon monoxide monitor M *measures the level of carbon monoxide in the outlet air and provides an alarm if that level exceeds a predetermined set point. Finally, Grade D breathing air is supplied to the system.*

Model Selection Chart

Model	Inlet Air Pressure (psig)					
	80	90	100	110	125	135
	Maximum Outlet air Flow (scfm)[a]					
DM125	103	114	125	136	152	163
DM170	137	155	170	192	220	238
DM260	202	229	260	272	294	307
DM300	242	275	300	339	388	420
DM400	320	363	400	430	464	486
DM640	507	575	640	681	735	769
DM920	727	824	920	976	1054	1102

[a] *Based on saturated 100° F ambient air. Capacity will be reduced with saturated inlet air at higher temperatures; consult Deltech. Maximum recommended inlet air temperature, 120° F; minimum, 65° F. Maximum operating pressure, 135 psig; for operating pressures below 80 psig, consult Deltech.*

Specifications

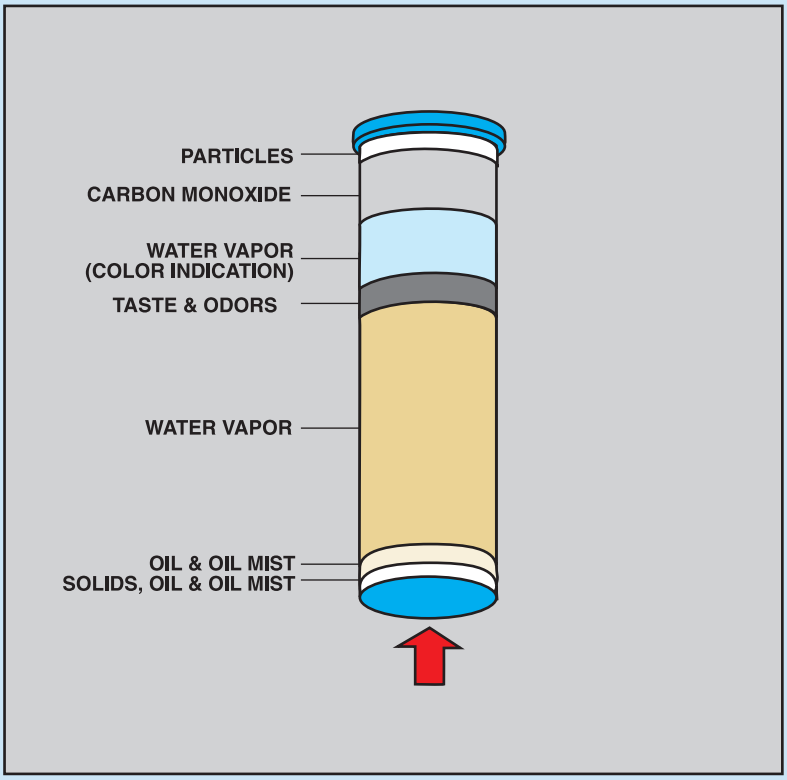
Model	Air Connections (inches NPT) In	Out	Approximate Dimensions (inches) H	W	D	Approx. Ship Wt. (lbs.)
DM125	1	1	70.5	27.0	37.0	800
DM170	1 1/2	1 1/2	70.5	30.0	57.0	1350
DM260	2	2	74.0	34.5	43.5	2150
DM300	2	2	76.0	40.0	68.5	2400
DM400	3	2	81.5	39.0	47.0	2900
DM640	3	3	92.0	50.5	53.5	4550
DM920	4'' FLG	3	100.0	62.0	69.5	6800

Disposable Cartridge Purifiers Are Ideal For Intermittent Use

Designed for standby, emergency or occasional use on a short-term basis, Del-Monox disposable cartridge purifiers remove particulates, oil, moisture, tastes, odors and carbon monoxide in a single, replaceable cartridge.

These compact, self-contained units feature a built-in color change indicator, which tells when the cartridge must be replaced. Air connections are in-line for easy installation.

Disposable cartridge purifiers can be cart-mounted for maximum portability. Portable models include inlet/outlet check valves, an outlet manifold with pressure regulator and an automatic mechanical drain valve.



How To Select Your Disposable Cartridge Purifier

Deltech manufactures four models of disposable cartridge purifiers. To select the right model, determine the inlet air pressure to the purifier. Then determine the total required air flow. Finally, select the model that equals or exceeds this flow at the inlet pressure.

Model Selection Chart

Model[a]	Inlet Air Pressure (psig)																			
	30	40	50	60	70	80	90	100	110	120	130	140	150	175	200	210	220	230	240	250
	Maximum Air Flow (scfm)[b]																			
130B	3.1	3.8	4.5	5.2	5.9	6.6	7.3	8.0	8.7	9.4	10.1	10.8	12.0	—	—	—	—	—	—	—
150B	7.8	9.5	11.3	13.0	14.7	16.5	18.2	20.0	21.7	23.5	25.2	26.9	30.0	—	—	—	—	—	—	—
230F[c]	—	—	—	—	—	—	—	—	—	—	—	—	12.0	13.2	15.0	15.7	16.4	17.0	17.8	18.5
250F[c]	—	—	—	—	—	—	—	—	—	—	—	—	30.0	33.0	37.4	39.1	40.9	42.7	44.4	46.1

[a] *Including equivalent portable models with suffix C.*

[b] *Based on saturated 100° F ambient air. Capacity will be reduced with saturated inlet air at higher temperatures; consult Deltech. Maximum recommended inlet air temperature, 120° F; minimum, 65° F.*

[c] *Equipped with metal tubes and sight ports.*

Specifications

Standard Systems

Model	Approximate Dimensions (inches) H	W	D	Approx. Ship Wt. (lbs.)
130B	32.5	5.0	6.5	24
150B	37.0	7.75	10.0	60
230F	32.5	5.0	6.5	42
250F	37.0	7.75	10.0	98

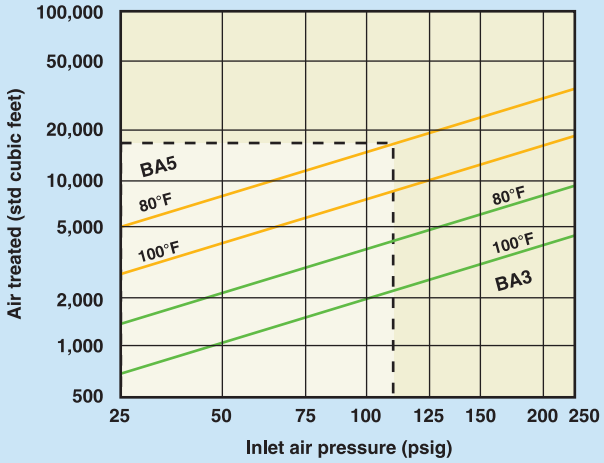
Cart-Mounted Models

Model	Approximate Dimensions (inches) H	W	D	Approx. Ship Wt. (lbs.)
130BC	47.0	17.75	19.25	60
150BC	47.0	19.5	19.25	95
230FC	47.0	17.75	19.25	77
250FC	47.0	19.5	19.25	133

Max. Press (psig)	Cartridge Type	Air Connections (inches NPT) In	Out
150	BA3	1	1
150	BA5	1 1/2	1 1/2
250	BA3	1	1
250	BA5	1 1/2	1 1/2

For inlet/outlet reference dimensions, request certified drawings.

Cartridge Life Graph



Calculating Cartridge Life

The temperature and pressure of the inlet air to the purifier will affect cartridge life. The moisture holding capacity of air increases with increasing temperature or decreasing pressure. Therefore, at a given pressure, lower inlet temperatures result in longer cartridge life.

For example, a Model 150B purifier supplies 10 scfm Grade D breathing air for a tank cleaning operation. The air to the purifier is 80° F and 110 psig. How many hours of operation can be expected from the disposable cartridge?

According to the cartridge life graph above, a BA5 cartridge can purify 15,000 standard cubic feet of air at these inlet air conditions. Cartridge life, in hours, is:

$$\frac{15{,}000 \text{ scfm}}{10 \text{ scfm} \times 60 \text{ min/hr}} = 25 \text{ hours of use}$$

Pyramid 8000® Offers Reduced Operating Costs

Deltech also manufactures unique continuous-duty purifiers that use refrigeration cooling to purify inlet air. Pyramid 8000® purifiers are complete, full-capacity units that perform effectively with lubricated or oil-less compressors. These purifiers are suited for hospitals, electric utilities and a broad range of manufacturing and construction industries. They offer significant savings in operating costs because they supply 100 percent of the inlet air as Grade D air.

For more information, request Deltech Bulletin 299.

Pyramid 8000®

Series 1000
Carbon Monoxide Monitor Is Reliable and Easy to Use

To provide maximum assurance that you are providing purified compressed air, Deltech offers the Series 1000 carbon monoxide monitor as standard equipment on DM Series and optional equipment on Del-Monox G Series. The Series 1000 continuously measures and displays the level of carbon monoxide in air and provides visual and audible alarms if that level 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.

The easy-to-calibrate monitor features a digital display, two adjustable alarm set points with indicators and an audible alarm with a silence switch. Other features include a NEMA 4 enclosure and an alarm push-to-test switch. The monitor's sensor, a unique gel-type fuel cell, is easily replaceable, will not leak and is unaffected by most background gases.

The carbon monoxide monitor comes ready to use; there is no assembly required. Turn it on and it is fully operational within five seconds.

How It Works

A compressed air line feeds air through a restrictor, which limits the air flow and reduces the pressure. The air then passes through a four-way valve, a flowmeter and into the monitor.

Inside the monitor, the air is analyzed by a sensor that produces a small voltage proportional to the amount of carbon monoxide in the sample gas. An analyzer circuit board amplifies, filters and electronically conditions the voltage. The resulting signal is then shown on an LED display and compared with the two adjustable alarms. The alarms are triggered if the signal reaches the predetermined set points.

For more information, request Deltech Bulletin 245.

ISO 9001

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