

Provide Breathing Quality Air from Your Compressed Air System

Removes carbon monoxide Meets OSHA and CSA requirements

Hankison® Catalite® purifiers offer a way to use your compressed air system as a source for breathing quality air. Air purified by a Catalite can be safely used by supplied-air breathing devices such as masks, hoods, and helmets. A complete purification system, Catalites remove excessive moisture, solid particles (dust and dirt), oil aerosols and mists, carbon monoxide, and hydrocarbon vapors commonly present in compressed air.

Maintain Worker Health and Safety, Improve Productivity

- Compressed air contaminants contribute to respiratory ailments and excessive absenteeism.
- Low concentrations of carbon monoxide detrimentally affect bodily coordination, reaction time, and visual acuity causing accidents; higher concentrations can lead to permanent impairment or death.
- The oily odor in compressed air causes nausea and breathing discomfort.
- Filter panels and powered air respirators do not remove CO. If CO is detected, production must stop or expensive bottled air supplied.
- Water, oil, and solid particles, if not removed, can damage critical components, cause regulators to clog and in outdoor applications cause airlines to freeze.

Economical

Hankison Catalite purifiers allow you to utilize your compressed air supply (even if supplied by lubricated compressors) for breathing. It is an economical alternative to costly high pressure air cylinders or a separate breathing air system.

Meets OSHA and CSA standards for breathing quality air

There are a number of standards that describe breathing air quality. In the United States the most common is OSHA (Occupational Safety and Health Administration) standard 29 CFR1910.134 and in Canada CSA (Canadian Standards Association) standard CAN3-Z180.1-M85.

Catalite purifiers will reduce the concentration of contaminants normally found in compressed air to levels acceptable for breathing. However, air that is oxygen deficient or grossly contaminated cannot be purified to acceptable levels. Locate the compressor intake in a clean environment with sufficient oxygen.



HANKISON



CATALITE®

CONTINUOUS

FLOW

BREATHING AIR

PURIFIERS

Operation

Catalite purifiers are completely engineered, packaged systems consisting of five filter/purification stages.

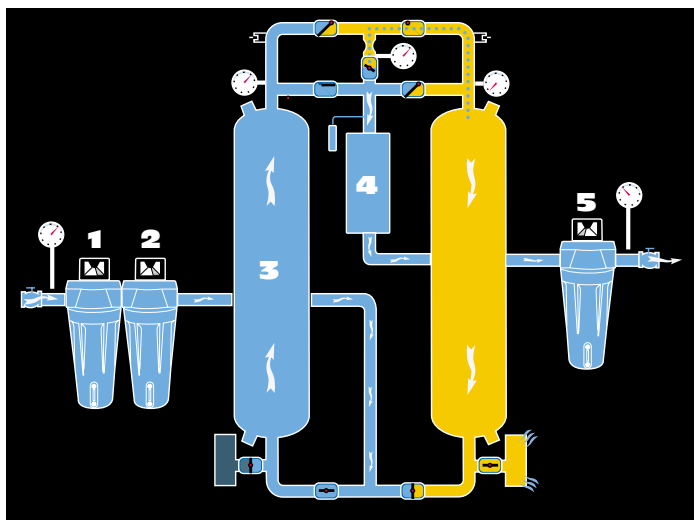
Stage 1 A Hankison one micron coalescing filter removes gross solid and liquid contaminants.

Stage 2 A Hankison 0.01 micron ultra high efficiency coalescing type oil removal filter removes virtually all liquid oil aerosols (mist).

Stage 3 A Hankison pressure-swing regenerative desiccant dryer dependably reduces the moisture content to a level that ensures the effectiveness of the catalyst bed.

Stage 4 A catalyst bed lowers CO concentrations by converting CO to CO₂.

Stage 5 A Hankison activated carbon filter removes oil vapor (and other gases normally adsorbable by activated carbon) and the undesirable odor it imparts to the air. A final layer of media prevents solid particles 0.01 microns and larger from passing downstream.



Highly Visible Warning of Unsafe Operating Conditions

The humidity content of the air must be kept below a certain level by the desiccant dryer to maintain the effectiveness of the catalyst bed. This level is monitored by bleeding a small sample of dried air through a color change moisture indicator. The indicator, located ahead of the catalyst bed, quickly responds to adverse operating conditions (overloading, improper operation, or valve malfunction) and signals in advance of declining capability to remove CO and the need for system maintenance.

An air sample connection is provided at the outlet for sampling or monitoring CO levels. CO monitors are a recommended option.

Long Service Life - Low Operating Costs

Hankison® Catalite® purifiers are designed to provide long, efficient service...offering a low cost per cubic foot of breathing air

Stage 1- One micron coalescing filter includes two stage in-depth media for removal of heavy contaminant loads-ensures long life of other filter/drying/purifying stages

Stage 2- Ultra-high efficiency oil removal filter removes 99.999+% of oil aerosols (remaining condensed hydrocarbon content: 0.001 mg/m³).

Large effective surface area improves the capture rate ensuring high efficiencies while large open area minimizes pressure drop. Removes oil by coalescence-media is not consumed in the process of removing oil.

Stage 3- Regenerative desiccant dryer (Dries air to a -40°F, -40°C pressure dew point)

- Optimally sized towers contain sufficient desiccant to ensure adequate moisture removal while saving the heat of adsorption to minimize purge air usage
- Slow and complete tower pressurization plus reduced air velocities prevent bed movement, preserving desiccant life
- Solid state controller and reliable air control valves ensure dependable operation
 - Purge valves are normally closed, protecting the unit from outside contamination when the unit is shutdown
 - Inlet valves are normally open - allows flow to continue if a power interruption occurs
- Purge exhaust mufflers for quiet operation
- ASME code constructed pressure vessels; desiccant towers include relief valves

Stage 4- Catalyst beds are sized to allow for the efficient conversion of high concentrations of carbon monoxide (CO) to carbon dioxide (CO₂)

Stage 5- The oil vapor removal filter contains two stages of finely divided carbon particles, maximizing its adsorptive capacity (vapor content after filtration: 0.003 ppm w/w); in-depth media layers capture carbon fines and a coated, closed cell foam sleeve prevents fiber migration.



Ease of Installation and Operation

All purifiers are supplied completely packaged on a common frame, wired and piped, charged with desiccant, and with filter/purifying elements installed. Only utility and air system connections are needed for start-up.

Designed for operator convenience. The purifier operates automatically and continuously after start-up. Prefilters include automatic drains.

Instruments and Controls

Standard instrumentation includes:

- Inlet and outlet air pressure gauges
- Left and right tower pressure gauges
- Purge flow indicator
- Moisture color change indicator- gives advance warning of need for purifier maintenance
- Prefilters equipped with differential pressure gauges- indicate the need for element replacement



Control panel is supplied with:

- On/off switch
- Tower status lights
- Switching failure alarm
- All instruments and controls are front mounted for easy visibility and use

Ease of service

Filter and purifier vessels allow for easy media replacement and desiccant towers are supplied with separate fill and drain ports. Isolation valves make servicing convenient. The controller on the desiccant dryer includes a diagnostic mode which permits manual sequencing of valves to verify operation.

Operating conditions

- A. Maximum operating pressure: 150 psig (10.5 kgf/cm²)
- B. Minimum operating pressure: 70 psig (4.9 kgf/cm²)
- C. Maximum operating temperature: 120°F (49°C)
- D. Pressure drop: Initial pressure drop is 6 psi.
- E. Maximum inlet liquid load: 2000 ppm_{w/w}⁽¹⁾
- F. Maximum inlet CO concentration:
per OSHA: 700 ppm_{v/v}⁽²⁾
per CSA: 200 mL/m³⁽²⁾

- (1) If higher liquid loads exist, install a separator to remove bulk liquid upstream of the purifier.
- (2) CO is converted to CO₂ by the purifier. Although some CO₂ is adsorbed in the desiccant beds, the upper CO₂ limit is based on adding the CO₂ produced in the dryer to the 300 ppm (mL/m³) of CO₂ normally present in atmospheric air and remaining under the CO₂ limit specified (1000 ppm per OSHA; 500 mL/m³ per CSA). Note: Inlet CO concentrations above the rated inlet of 135 ppm (resulting in 10 ppm out per OSHA) or 100 ppm (resulting in 5 ppm out per CSA) can be reduced to the desired outlet concentration by reducing the rated inlet flow. Refer to Flow Capacity section.

Electrics

Standard voltages: 120V/1ph/60Hz, 110V/1ph/50Hz or 240V/1ph/60Hz, 220V/1ph/50Hz

Protection class: NEMA 4/4X

Options:

- Dew point alarms and monitors
- Carbon monoxide alarm and monitor

Flow Capacity

1. Rated capacity- Rated capacities shown in Table 1 are established at inlet conditions of 100 psig (7 kgf/cm²) and 80°F (27°C). At rated flow, inlet concentrations of 200 ppmv/v are reduced to 20 ppmv/v, 135 ppmv/v to 10 ppmv/v, 100 ppmv/v to 5 ppmv/v.
2. To determine inlet capacities at other conditions:
Step 1: Inlet temperature and pressure adjustment: Multiply inlet flow from Table 1 by the factor from Table 2 that matches your operating conditions. Example: model 1912 has a capacity of 54.6 scfm at 120 psig and 100°F (47.9 scfm x 1.14 = 54.6 scfm).
Step 2: Inlet/Outlet CO concentration adjustment: multiply flow from Step 1 by the factor from Table 3 for the maximum CO concentration expected at the purifier inlet and the desired CO concentration at the purifier outlet. Example: With a maximum CO concentration of 135 ppmv/v at the inlet and a desired concentration at the outlet of 5 ppmv/v, the adjusted flow from Step 1 becomes 50.2 scfm (54.6 scfm x 0.92= 50.2 scfm).
3. To determine outlet flow: subtract purge flow from Table 1 for the model under consideration from the corrected inlet flow. Example: 50.2 – 7.9 = 42.3 scfm available at the outlet.

Table 1 Rated Flow Capacity (scfm)

Model	1910	1911	1912	1913	1914	1915	1916
Inlet Flow	14.4	27.5	47.9	70	121	192	275
Purge Flow	2.4	4.5	7.9	11	20	31	45
Outlet Flow (a)	12	23	40	59	101	161	230

Model	1917	1918	1919	1920	1921	1922
Inlet Flow	335	443	568	700	860	1030
Purge Flow	51	68	95	113	142	168
Outlet Flow (a)	284	375	473	587	718	862

(a) Outlet flow is the minimum amount of air available during the 3.9 minutes the purge valve is open during the 5 minute regeneration stage. If sufficient volume (receiver tank, etc) is available downstream, the air used for purging and repressurization can be averaged over 5 minutes resulting in more air available to supply breathing apparatus. Contact factory representative for details.

Table 2 Capacity adjustment factors for inlet pressure and temperature

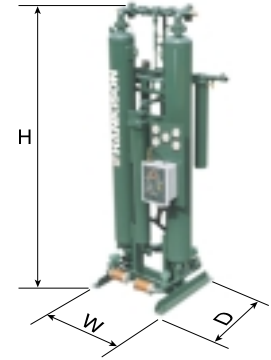
Inlet Pressure psig (kgf/cm ²) or below	Inlet temperature								
	80°F (27°C)	85°F (30°C)	90°F (32°C)	95°F (35°C)	100°F (38°C)	105°F (41°C)	110°F (43°C)	115°F (46°C)	120°F (49°C)
150 (10.5)	1.48	1.47	1.45	1.44	1.42	1.42	1.41	1.39	1.38
140 (9.8)	1.38	1.37	1.35	1.34	1.32	1.32	1.31	1.30	1.28
130 (9.1)	1.29	1.28	1.26	1.25	1.24	1.24	1.23	1.21	1.20
120 (8.4)	1.19	1.18	1.17	1.15	1.14	1.14	1.13	1.12	1.11
110 (7.7)	1.10	1.09	1.08	1.07	1.06	1.06	1.05	1.03	1.02
100 (7.0)	1.00	0.99	0.98	0.97	0.96	0.96	0.95	0.94	0.93
90 (6.3)	0.90	0.89	0.88	0.87	0.86	0.86	0.86	0.85	0.84
80 (5.6)	0.81	0.80	0.79	0.79	0.78	0.78	0.77	0.76	0.75
70 (4.9)	0.71	0.70	0.70	0.69	0.68	0.68	0.67	0.67	0.66

Table 3 Capacity Adjustment Factors for Inlet and Outlet CO concentration

CO Concentration at Inlet of Purifier (ppm v/v)	CO Concentration at Outlet of Purifier (ppm v/v)		
	5	10	20
700	0.66	0.71	0.80
500	0.72	0.78	0.86
300	0.78	0.84	0.93
200	0.85	0.91	1.00
135	0.92	1.00	1.00
100	1.00	1.00	1.00

Dimensions, Connections and Weights

Model	In/Out Connections	Height		Width		Depth		Weight	
		in	mm	in	mm	in	mm	lb	kg
1910	1/2" NPT	75-1/4	1912	24	610	29-1/8	740	290	132
1911	1/2" NPT	75-1/4	1912	24	610	29-1/8	740	298	135
1912	3/4" NPT	75-13/16	1927	24	610	38	966	369	167
1913	1" NPT	82-3/16	2087	30	762	39-1/4	997	601	273
1914	1" NPT	86-7/8	2207	30	762	40-13/16	1037	646	293
1915	1-1/2" NPT	89-7/16	2271	38	1067	50-1/4	1277	1396	635
1916	1-1/2" NPT	88-3/4	2254	38	1067	49-3/4	1264	1901	862
1917	2" NPT	90-7/8	2308	42	1067	74-3/16	1884	2655	1205
1918	3" NPT	94	2388	48	1219	76	1930	2832	1285
1919	3" NPT	97-1/4	2470	48	1219	76-5/8	1946	3400	1542
1920	3" NPT	103-5/8	2632	53	2632	84-3/4	2143	4200	1909
1921	3" NPT	103-5/8	2632	59	2632	84-3/4	2143	6000	2666
1922	4" NPT	108-3/4	2762	59	2762	95	2413	6932	3144



Hankison® Catalite® breathing air purifiers help meet standards for breathing quality air

The table at right shows a comparison of the maximum allowable concentrations of contaminants allowed by OSHA (Occupational Safety and Health Administration) standard 1910.134 (revision effective April 1998) and CSA (Canadian Standards Association) standard CAN3-Z180.1-M85 and the levels of impurities after purification.

CAUTION: Air that is grossly contaminated or oxygen deficient cannot be purified to levels acceptable for breathing. Oxygen content: per OSHA: 19.5 to 23.5%; per CSA: 19.5 to 22.5%

Contaminant	Maximum Allowable Concentration		Outlet concentration at rated conditions
	OSHA(1)	CSA(2)	
Carbon Monoxide (CO) ppm or mL/m ³ (by volume)	10	5	10 with a max. inlet concentration of 135; 5 with a max. inlet concentration of 100
Carbon Dioxide (CO ₂) ppm or mL/m ³ (by volume)	1000	500	(3)
Condensed Hydrocarbons mg/m ³	5	1	0
Odor	Lack of noticeable	Not detectable	None (4)
Moisture Content dew point temperature	10 F° (5.6 C°) below ambient temperature (at 1 atm. pressure)	9 F° (5 C°) below the min. temperature breathing air is exposed to (at line pressure)	-40°F (-40°C) at line pressure, -71°F (-57°C) when purified @ 100 psig and reduced to 1 atm. pressure

- (1) The OSHA standard also states that compressed breathing air shall meet at least the requirements for Type 1-Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air ANSI/CGA G-7.1-1989.
- (2) The CSA standard lists levels for a number of additional contaminants (methane, non-methane hydrocarbons, nitrogen dioxide, nitrous oxide, halogenated hydrocarbons) and includes by reference contaminants documented by the ACGIH for chemical substances and physical agents in the workroom environment. The purifier will remove only those gaseous contaminants normally adsorbable by activated carbon.
- (3) CO is converted to CO₂ by the purifier. Although some CO₂ is adsorbed in the desiccant beds, high concentrations of CO₂ at the compressor intake, in addition to the CO₂ produced in the purifier could result in exceeding CO₂ limits.
- (4) The purifier will remove only those gaseous contaminants normally adsorbable by activated carbon.

Hankison International has a tradition of continuous improvement. Specifications and designs are subject to change without notice or obligation.

MEMBER OF



MEETING GLOBAL STANDARDS



PBA-200-NA



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