Breathable Compressed Air
Working safely in hazardous environments

Employers are advised by health and safety legislation to provide Respiratory Protective Equipment (RPE) in addition to Personal Protective Equipment (PPE) wherever there is the possibility of employees or site visitors inhaling hazardous substances.

Respiratory Health Problems

The inhalation of hazardous substances can cause serious health problems including:

- **Emphysema**
  Lung Disease

- **Chronic Bronchitis**
  Irritation to airways

- **Asthma**
  Attacks of coughing, wheezing and tightness of chest

- **Rhinitis**
  Nasal irritation

- **Conjunctivitis**
  Watery eyes

- **Bronchitis**
  Coughing and shortness of breath

- **Respiratory Sensitization**
  An irreversible allergic reaction

Typical Hazardous Substances

- **Biological agents** – bacteria and other micro-organisms

- **Dusts** – with high concentration levels (produced during grinding, sanding or milling)

- **Noble gases** – e.g. argon and helium (not directly hazardous but can cause oxygen deficiency)

- **Processed substances** – such as pesticides, medicines chemicals and cosmetics

- **Fumes** – often created during welding, smelting and pouring molten metals

- **Mists** – liquid droplets formed by atomization and condensation processes. Mists can be created by plating, spraying, mixing and cleaning operations

- **Asbestos** – used extensively in buildings from the 1940’s to 1960’s. Exposure to asbestos fibers can cause asbestosis, lung cancer or mesothelioma

- **Lead poisoning** – lead poisoning is likely to build up slowly over time and can pose serious risks including, brain, nerve and kidney damage

Applications, Environments and Industries

Hazardous vapors, gases and fumes can be released at various stages within manufacturing applications. Whether the risk is from noxious fumes, particulate or contamination from a compressed air system, effective respiratory protection for the user is essential.

**Application**
- Tank cleaning
- Spray painting
- Asbestos removal
- Shotblasting
- Tunnelling
- Confined spaces
- Welding
- Demolition

**Environments**
- Carbon monoxide
- Carbon dioxide
- Oil vapor & mist
- Airborne particulate & dust
- Vapors, gases & fumes
- Toxic gas & liquid
- Bio-hazards
- Nuclear
- Smoke
- Asbestos
- Biological agents

**Industries**
- Agriculture
- Aviation
- Chemical
- Construction
- Electrical Utilities
- Fire Service
- Food & Beverage Production
- Gas Utilities
- Hazmat
- Iron/Steel Production
- Manufacturing
- Marine / Shipyard
- Mining
- Nuclear
- Oil & Gas Production
- Petrochemical
- Pulp & Paper
- Pharmaceutical & Labs
- Public Works
- Water Treatment
- Welding
Breathing Air Purifiers without CO /CO₂ reduction

PURIFICATION STAGE 3
GRADE ACS
Oil Vapor Removal
Activated Carbon Filter
REDUCES:
Oil vapor and odors
down to 0.003 ppm

PURIFICATION STAGE 2
GRADE AA
High Efficiency Coalescing Filter
REDUCES:
Particulate down to 0.01 micron,
including water and oil aerosols

PURIFICATION STAGE 1
GRADE AO
General Purpose Coalescing Filter
REDUCES:
Particulate down to 1 micron,
including water and oil aerosols

WARNING: THESE PRODUCTS WILL NOT REMOVE CARBON MONOXIDE OR CARBON DIOXIDE

PARKER DOMNICK HUNTER Breathing Air Purifiers PROVIDE AIR
1,000,000 CLEANER THAN THE AIR WE NORMALLY BREATHE

Model shown BAS-3015

www.parker.com/faf
Breathing Air Purifiers without CO / CO₂ reduction

### BAF010 – BAF015
The Parker domnick hunter BAF010 and BAF015 two stage point of use breathing air filter sets combine high efficiency coalescing pre-filtration with activated carbon oil odor and vapor removal filtration. These filter sets include a pressure regulator/gauge to allow airline pressure adjustment to users’ requirements and mounting brackets for ease of installation.

### BAS3015
The Parker domnick hunter BAS-3015 is a portable breathing air purifier housed in a compact, weatherproof, impact resistant case. Consisting of a general purpose pre-filter, a high efficiency coalescing filter and an activated carbon filter to remove oil vapor and odors, this purifier includes a pressure regulator/gauge and can facilitate up to five users simultaneously. The BAS-3015 is also available with an optional CO monitor (BAS-3015M).

### BAS2010
The Parker domnick hunter BAS-2010 is a very robust and weatherproof portable breathing air purifier. Consisting of a high efficiency coalescing filter and an activated carbon filter to remove oil vapor and odors, this purifier includes a pressure regulator/gauge, all mounted in a lightweight, stable framework.

### BAP015
To facilitate breathing air applications for three personnel, the Parker domnick hunter BAP015 is a portable breathable air purification package consisting of a high efficiency coalescing filter and an activated carbon filter to remove oil vapor and odors. These sets include a pressure regulator/gauge, all mounted in a lightweight, stable framework.

<table>
<thead>
<tr>
<th>To reduce the following contaminants</th>
<th>Solid Particles</th>
<th>Water Aerosols</th>
<th>Oil Aerosols</th>
<th>Water Vapor</th>
<th>Oil Vapor</th>
<th>Carbon Monoxide</th>
<th>Odors &amp; Fumes</th>
<th>Carbon Dioxide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>×</td>
</tr>
</tbody>
</table>

### Features

<table>
<thead>
<tr>
<th>Features</th>
<th>BAF010-BAF015</th>
<th>BAS3015</th>
<th>BAS2010</th>
<th>BAP015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purification Stages</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Integral pressure regulator</td>
<td></td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Portable</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Use with any compressed air supply</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Integrated CO Monitor (optional)</td>
<td></td>
<td></td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Wall mounted</td>
<td></td>
<td></td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>Pressure gauge</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>
Breathing Air Purifiers with CO /CO₂ reduction

International breathing air standards

<table>
<thead>
<tr>
<th>Contaminants</th>
<th>OSHA Grade D</th>
<th>CSA Z180.1</th>
<th>European Pharmacopoeia</th>
<th>Parker domnick hunter BA-DME/BAM range*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td></td>
<td>Pressure dewpoint of 41°F (5°C) below lowest system temperature</td>
<td>67 ppm ~ -49°F (~-45°C) atmospheric dewpoint</td>
<td>14 ppm ~ -72.4°F (~-58°C) atmospheric dewpoint</td>
</tr>
<tr>
<td>Oil / Lubricant</td>
<td>5 ppm</td>
<td>&lt; 1 ppm</td>
<td>0.1 ppm</td>
<td>0.003 ppm</td>
</tr>
<tr>
<td>Carbon Dioxide (CO₂)</td>
<td>&lt; 100 ppm</td>
<td>&lt; 500 ppm</td>
<td>&lt; 500 ppm</td>
<td>&lt; 500 ppm</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>&lt; 10 ppm</td>
<td>&lt; 5 ppm</td>
<td>&lt; 5 ppm</td>
<td>&lt; 5 ppm</td>
</tr>
<tr>
<td>Nitrogen Oxides (N0 + NO₂)</td>
<td></td>
<td></td>
<td>&lt; 2 ppm</td>
<td>&lt; 2 ppm</td>
</tr>
<tr>
<td>Sulphur Dioxide (SO₂)</td>
<td></td>
<td></td>
<td>&lt; 1 ppm</td>
<td>&lt; 1 ppm</td>
</tr>
</tbody>
</table>

Figures are based on compressed air inlet containing standard ambient levels of CO₂ 300 to 600ppm and CO 10ppm. At higher levels the system will provide incident protection only.

www.parker.com/faf
Breathing Air Purifiers with CO / CO₂ reduction

To reduce the following contaminants

<table>
<thead>
<tr>
<th></th>
<th>Solid Particles</th>
<th>Water Aerosols</th>
<th>Oil Aerosols</th>
<th>Water Vapor</th>
<th>Oil Vapor</th>
<th>Carbon Monoxide</th>
<th>Odors &amp; Fumes</th>
<th>Carbon Dioxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA-2010</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA-DME012-080</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAM 102 -110</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These models are recommended for hazardous applications that require an uninterrupted breathing air supply where carbon monoxide or carbon dioxide may be present.

Using a catalyst, carbon monoxide (CO) is converted, by oxidation into breathable levels of carbon dioxide (CO₂). The catalyst is kept active by using an adsorption dryer to maintain a low pressure dewpoint.

**BA-2010**

The Parker domnick hunter BA-2010 is a fully pneumatic, portable Breathing Air Purifier designed to provide complete protection for up to four personnel. Five purification stages will ensure the highest quality air that is free from particulate dusts, vapors, odors, carbon dioxide (CO₂) and carbon monoxide (CO). The flow rate is easily adjustable from a pressure regulator and monitored by inlet/outlet pressure gauges on the front facia. The BA-2010 is housed in an extremely strong and robust lockable case for total security.

**BA-DME012-080**

The Parker domnick hunter BA-DME range of Breathing Air Purifiers is ideal for point of use multiple personnel protection at medium flow rates. At the inlet, a first stage water separator removes bulk water, followed immediately by a second stage high efficiency coalescing filter to reduce oil and water content and a third stage activated carbon filter to remove oil vapor and odors. The fourth stage adsorption dryer, reduces the water vapor content of the compressed air (to -40°F (-40°C) pdp) and CO₂, NO and NO₂ levels to below the legal permissible limits. Downstream of the adsorption dryer, a catalyst converts carbon monoxide to carbon dioxide, again, to below the legal limits. A final dust filter captures any particulates carried over from the adsorption materials.

**BAM 102 -110**

The Parker domnick hunter BAM Breathing Air Purifiers consist of six purification stages mounted on a portable skid for high-capacity multiple personnel breathing air applications. At the inlet, a first stage water separator removes bulk water, followed immediately by a second stage high efficiency coalescing filter to reduce oil and water content and a third stage activated carbon filter to remove oil vapor and odors. The fourth stage adsorption dryer, reduces the water vapor content of the compressed air (to -40°F (-40°C) pdp) and CO₂, NO and NO₂ levels to below the legal permissible limits. Downstream of the adsorption dryer, a catalyst converts carbon monoxide to carbon dioxide, again, to below the legal limits. A final dust filter captures any particulates carried over from the adsorption materials.

The Parker domnick hunter BA-DME and BAM ranges comply with the European Pharmacopoeia medical air standard

<table>
<thead>
<tr>
<th>Features</th>
<th>BA-2010</th>
<th>BA-DME</th>
<th>BAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purification Stages</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Integral pressure regulator and gauge</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portable</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours run meter</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumatic Control</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use with any compressed air supply</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Intratged CO Monitor</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Electrical supply required</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>
Selecting the correct purifier

Parker domnick hunter Breathing Air Purifiers are designed to reduce the concentration of potential contaminants, identified as hazardous to the human respiratory system, to acceptable levels (detailed in published International Breathing Air Standards). Where a potential inhalation hazard exists, it is essential that a full assessment of the risk to the user is carried out. This should not only identify the risk of contamination to the breathing air supply, but also the level of contamination. In the event of being unable to either remove or control the contamination risk, it is the employers’ responsibility to introduce measures to ensure that the breathing air supply complies with the required air quality standard.

The air quality used in a breathing air system must be controlled under all operating conditions, including the possibility of a plant or process failure. In addition to conforming with the required compressed air quality, the delivered air flow rate must be sufficient to meet the foreseeable needs of the total number of users at their maximum work rate consumption.

Breathing air standards

The Parker domnick hunter Breathing Air Purifiers are designed to comply with the following international standards:

- **USA**
  - CGA G7.1-1997
  - OSHA-Grade D
- **Europe**
  - EN12021
- **Canada**
  - Z180.1-00
- **UK**
  - BS4275 : 1997
- **Australia**
  - AS/NZS 1715 : 1994
- **New Zealand**
  - AS/NZS 1715 : 1994

Typical peak inhalation rates for fit young persons at various work rates are shown below. Higher inhalation rates may be generated by less fit or heavier users or for wearers of heavy personal protective equipment.

<table>
<thead>
<tr>
<th>Work Rate</th>
<th>Peak Inhalation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cfm</td>
</tr>
<tr>
<td>Low</td>
<td>3.6</td>
</tr>
<tr>
<td>Medium</td>
<td>5.3</td>
</tr>
<tr>
<td>High</td>
<td>7.1</td>
</tr>
<tr>
<td>Very High</td>
<td>8.9</td>
</tr>
</tbody>
</table>


All peak inhalation rates are given as a guide only, the actual breathing air requirement should be calculated, where possible from the total requirement of the personal protection equipment, i.e. mask/hood/suit.

In order to ensure that a suitably selected breathing air purifier is reliably operated and maintained, it is essential that correct training and supervision is provided to the user.

Parker domnick hunter Breathing Air Purifiers provide the following levels of protection when using a general compressed air supply:

<table>
<thead>
<tr>
<th></th>
<th>Solid Particles</th>
<th>Oil Vapor</th>
<th>Oil Odors</th>
<th>Pressure Dewpoint</th>
<th>CO</th>
<th>CO₂</th>
<th>NO + NO₂</th>
<th>SO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purifiers without CO/CO₂ reduction</td>
<td>0.01ppm</td>
<td>0.003ppm</td>
<td>None present</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Purifiers with CO/CO₂ reduction</td>
<td>0.01ppm</td>
<td>0.003ppm</td>
<td>None present</td>
<td>-40°F (-40°C)</td>
<td>&lt;5ppm</td>
<td>&lt;500ppm</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Note:

Parker domnick hunter CO & CO₂ reduction purifiers provide breathable air that meets all International Respiratory Air Standards, purifiers without CO & CO₂ reduction stages should not be used in an environment where CO or CO₂ has been identified as a potential inhalation risk.
### Technical Specifications

<table>
<thead>
<tr>
<th>Product code</th>
<th>Connections</th>
<th>Flowrate @ 100 psi g (7 bar g)</th>
<th>Dimensions</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inlet (NPT)</td>
<td>Outlet (NPT)</td>
<td>Inlet</td>
<td>Height</td>
</tr>
<tr>
<td>BAF010</td>
<td>1/4</td>
<td>3/8</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>BAF015</td>
<td>3/8</td>
<td>3/8</td>
<td>27</td>
<td>17.2</td>
</tr>
<tr>
<td>BAS2010*</td>
<td>1/2 x 1/4</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>BAS3015*</td>
<td>1/2 x 1/4</td>
<td>5</td>
<td>42</td>
<td>20</td>
</tr>
<tr>
<td>BAP015*</td>
<td>1/2 x 1/4</td>
<td>3</td>
<td>42</td>
<td>20</td>
</tr>
</tbody>
</table>

---

### For flow rates at other pressures, apply the factor shown

<table>
<thead>
<tr>
<th>Line Pressure</th>
<th>psi g</th>
<th>bar g</th>
<th>Correction Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>58</td>
<td>4</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>73</td>
<td>5</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>6</td>
<td>1.14</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>7</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>116</td>
<td>8</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>131</td>
<td>9</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>145</td>
<td>10</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>160</td>
<td>11</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>174</td>
<td>12</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>189</td>
<td>13</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>203</td>
<td>14</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>218</td>
<td>15</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>232</td>
<td>16</td>
<td>0.50</td>
</tr>
</tbody>
</table>

---

### Operation Pressure

<table>
<thead>
<tr>
<th>Product code</th>
<th>Connections</th>
<th>Flowrate @ 100 psi g (7 bar g)</th>
<th>Dimensions</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inlet (NPT)</td>
<td>Outlet (NPT)</td>
<td>Inlet</td>
<td>Height</td>
</tr>
<tr>
<td>BAF010</td>
<td>1/4</td>
<td>3/8</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>BAF015</td>
<td>3/8</td>
<td>3/8</td>
<td>27</td>
<td>17.2</td>
</tr>
<tr>
<td>BAS2010*</td>
<td>1/2 x 1/4</td>
<td>2</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>BAS3015*</td>
<td>1/2 x 1/4</td>
<td>5</td>
<td>42</td>
<td>20</td>
</tr>
<tr>
<td>BAP015*</td>
<td>1/2 x 1/4</td>
<td>3</td>
<td>42</td>
<td>20</td>
</tr>
</tbody>
</table>

---

### Recommended Operating Temperature

- Maximum: 86°F (30°C)
- Minimum: 35°F (1.5°C)
How clean is your breathing air?

Breathable Air Purity Test Kit
Air quality testing for compressed air systems

The Parker domnick hunter Breathing Air Purity Test Kit (APTK1) allows for a convenient ‘on the spot’ indication of compressed air quality. This comprehensive test kit is compact and easy to use, to indicate the level of contamination, both upstream and downstream of purification equipment.

The APTK1 is supplied complete with oil aerosol, water vapor CO and CO2 test tubes to allow immediate multiple testing.

In addition to the detection of compressed air contaminants listed below, the Parker domnick hunter APTK1 also features an oxygen analyzer, allowing for constant real-time display of the oxygen content within the compressed air system.

The Parker domnick hunter APTK1 is not only suitable for industrial compressed air testing but also, the additional O2 analyzing feature enables compressed air lines that supply Breathing Air / Respiratory Protection Equipment (RPE) to be tested to the latest national and international standards.

Air Content Measurables
- Oxygen
- CO
- CO2
- Water Vapor
- Mineral Oil

Features / Benefits
- Lightweight and portable test kit in a robust carry case
- Digital oxygen content monitoring
- Allows simultaneous testing of upstream and downstream air purity
- Testing quality of breathing air to national and international standards
- Can be used at compressed air pressures up to 145 psi g (10 bar g)
- Factory set for use with ‘Gastec Ltd’ detection tubes
Technical Specification

Air Purity Test Kit

| Maximum inlet pressure:     | 145 psi g (10 bar g) |
| Analysis operating pressure: | 43.5 psi g (3 bar g) - Factory set |
| Maximum inlet temperature:  | 104˚F (40˚C) |
| Minimum inlet temperature:  | 59˚F (15˚C) |
| Flow accuracy:              | ±4% outlet |
| Air flow rate range at outlet: | 30 - 2500 cc/min |
| Hose connections:           | 6mm - 1/4 " push in adaptor |
| Approved detector tubes:    | Calibrated for: Gastec Ltd detector tubes |

Air Contaminant / Content Analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Measurable</th>
<th>Sample rate</th>
<th>Test Duration</th>
<th>Total Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>APTK1 [60 603 5050]</td>
<td>CO</td>
<td>100 cfm</td>
<td>1.5 minutes</td>
<td>150 ml</td>
</tr>
<tr>
<td></td>
<td>CO₂</td>
<td>100 cfm</td>
<td>3 minutes</td>
<td>300 ml</td>
</tr>
<tr>
<td></td>
<td>Water Vapor</td>
<td>100 cfm</td>
<td>10 minutes</td>
<td>1 liter</td>
</tr>
<tr>
<td></td>
<td>Oil Mist (Mineral)</td>
<td>1000 cfm</td>
<td>60 minutes</td>
<td>60 liters</td>
</tr>
<tr>
<td></td>
<td>Oxygen</td>
<td>50 cfm</td>
<td>Real-time Display</td>
<td>n/a</td>
</tr>
</tbody>
</table>

NB. All flow rates are factory set to allow immediate testing.

Consumable Parts

<table>
<thead>
<tr>
<th>Replacement Gas Detection Tubes / O₂ Analyser</th>
<th>Contaminant</th>
<th>Kit Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carbon Monoxide (CO)</td>
<td>668200465</td>
</tr>
<tr>
<td></td>
<td>Carbon Dioxide (CO₂)</td>
<td>668200464</td>
</tr>
<tr>
<td></td>
<td>Water Vapor (H₂O)</td>
<td>668200462</td>
</tr>
<tr>
<td></td>
<td>Oil Mist</td>
<td>668200463</td>
</tr>
<tr>
<td></td>
<td>O₂ Analyser</td>
<td>666035300</td>
</tr>
</tbody>
</table>

The Parker domnick hunter Air Purity Test Kit (APTK1) is supplied complete with oil aerosol, water vapor, CO and CO₂ test tubes (in packs of 10) to allow immediate multiple testing.

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>OXYGEN</th>
<th>CARBON DIOXIDE</th>
<th>CARBON MONOXIDE</th>
<th>OIL MIST / Vapor</th>
<th>Odor / TASTE</th>
<th>WATER (LIQUID)</th>
<th>WATER (Vapor)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19.5% - 23.5%</td>
<td>NOT MORE THAN 1000ppm</td>
<td>NOT MORE THAN 10ppm</td>
<td>NOT MORE THAN 5ppm</td>
<td>WITHOUT SIGNIFICANT Odor OR TASTE</td>
<td>THERE SHOULD BE NO FREE WATER</td>
<td>39°F (4°C) pdp @ 50 psig (3.4 barg)</td>
</tr>
</tbody>
</table>
|           | 20% - 22% BY VOLUME (DRY AIR) | NOT MORE THAN 500ppm | NOT MORE THAN 5ppm | NOT MORE THAN 15ppm | WITHOUT SIGNIFICANT Odor OR TASTE | THERE SHOULD BE NO FREE WATER | The pressure dewpoint of the compressed breathing air shall be at least 9°F (5°C) below the lowest temperature to which any part of the compressed breathing air pipeline or the accepted respirator maybe exposed at any season of the year.
|           | 21% (+/-1%) | NOT MORE THAN 500ppm | NOT MORE THAN 800ppm | NOT MORE THAN 10ppm | WITHOUT SIGNIFICANT Odor OR TASTE | THERE SHOULD BE NO FREE WATER | "Air for compressed air line breathing apparatus shall have a dewpoint sufficiently low to prevent condensation & freezing.
Where apparatus is used and stored at a known temperature pressure dewpoint shall be at least 9°F (5°C) below the likely lowest temperature. Where conditions of usage and storage of the air is not known the pressure dewpoint shall not exceed 12.2°F (-11°C). Airline pressure dewpoint should be at least 9°F (5°C) below the lowest known temperature or 12.2°F (-11°C) if the lowest temperature is not known. |

COMPRESSED AIR FOR BREATHING - WORLD STANDARDS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
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</tr>
<tr>
<td>CARBON DIOXIDE</td>
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<td>NOT MORE THAN 800ppm</td>
</tr>
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<td>CARBON MONOXIDE</td>
<td>NOT MORE THAN 10ppm</td>
<td>NOT MORE THAN 5ppm</td>
<td>NOT MORE THAN 15ppm</td>
<td>NOT MORE THAN 10ppm</td>
</tr>
<tr>
<td>OIL MIST / Vapor</td>
<td>NOT MORE THAN 5ppm</td>
<td>NOT MORE THAN 1ppm</td>
<td>NOT MORE THAN 0.5ppm</td>
<td>NOT MORE THAN 1ppm</td>
</tr>
<tr>
<td>Odor / TASTE</td>
<td>WITHOUT SIGNIFICANT Odor OR TASTE</td>
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Aerospace

Key Markets
- Aftermarket services
- Commercial transports
- Engines
- General & business aviation
- Helicopters
- Launch vehicles
- Military aircraft
- Missiles
- Power generation
- Regional transports
- Unmanned aerial vehicles

Key Products
- Control systems & actuator products
  - Engine systems & components
  - Fluid conveyance systems & components
  - Fuel systems & components
  - Fuel tank systems
  - Hydraulic systems & components
  - Thermal management
  - Wheels & brakes

Climate Control

Key Markets
- Agriculture
- Air conditioning
- Construction machinery
- Factory automation
- Industrial machinery
- Life sciences
- Mining
- Mobile equipment
- Oil & gas
- Precision cooling
- Process refrigeration
- Transportation

Key Products
- Accumulators
- Advanced actuators
- CO2 controls
- Electronic controllers
- Filter dryer
- Hand shut-off valves
- Heat exchangers
- Hose & fittings
- Pressure regulating valves
- Refrigeration distributors
- Safety relief valves
- Smart pumps
- Solenoid valves
- Thermostatic expansion valves

Electromechanical

Key Markets
- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastic machinery & converting
- Primary metals
- Semiconductors & electronics
- Textile
- Wire & cable

Key Products
- AC/DC drives & systems
- Electric actuators, gantry robots & slides
- Electrohydraulic actuation systems
- Electromechanical actuation systems
- Human machine interface
- Linear motors
- Shaper motions, servo motors, drives & controls
- Structural extrusions

Filtration

Key Markets
- Aerospace
- Food & beverage
- Industrial plant & equipment
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation & renewable energy
- Process
- Transportation
- Water Purification

Key Products
- Analytical gas generators
- Compressed air filters & dryers
- Engine air, coolant, fuel & oil filtration systems
- Fluid condition monitoring systems
- Hydraulic & lubrication filters
- Hydrogen, nitrogen & noble gas generators
- Instrumentation filters
- Membrane &iber filters
- Microfiltration
- Sterile air filtration
- Water deionization & purification filters & systems

Fluid & Gas Handling

Key Markets
- Aircraft
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Life sciences
- Maritime
- Mining
- Mobile
- Oil & gas
- Renewable energy
- Transportation

Key Products
- Check valves
- Connectors for low pressure
- Fluid conveyance
- Deep sea umbilicals
- Diagnostics equipment
- Hose couplings
- Industrial hose
- Mining systems & power cables
- PTFE hose & tubing
- Quick couplings
- Rubber & thermoplastic hose
- Tube fittings & adapters
- Tubing & plastic fittings

Hydraulics

Key Markets
- Aircraft
- Agriculture
- Alternative energy
- Construction machinery
- Factory automation
- Life science & medical
- Marine
- Material handling
- Mining
- Oil & gas
- Power generation
- Refuse vehicles
- Renewable energy
- Truck hydraulic power
- Turf equipment

Key Products
- Accumulators
- Cartridge valves
- Electrohydraulic actuators
- Human machine interfaces
- Hybrid drives
- Hydraulic cylinders
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Hydraulic steering
- Integrated hydraulic circuits
- Power take-offs
- Power units
- Rotary actuators
- Sensors

Pneumatics

Key Markets
- Aerospace
- Conveyer & material handling
- Factory automation
- Factory automation
- Life science & medical machine tools
- Packaging machinery
- Transportation & automotive

Key Products
- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, cups & sensors

Process Control

Key Markets
- Alternative fuels
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Machine & robotics
- Medical & dental
- Microelectronics
- Nuclear Power
- Offshore oil exploration
- Oil & gas
- Pharmaceuticals
- Power generation
- Pulver & paper
- Steel
- Water/wastewater

Key Products
- Analytical Instruments
- Analytical sample conditioning products & systems
- Chemical injection fittings & valves
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery
- High pressure
- Regulators & controls
- Digital flow controllers
- Industrial mass flow meters/controllers
- Permanent no-weld tube fittings
- Precision industrial regulators & flow controllers
- Process control controller
- Block & bleed
- Process control fittings, valves, regulators & manifolds

Sealing & Shielding

Key Markets
- Aerospace
- Chemical processing
- Consumer
- Fluid power
- General industrial
- Information technology
- Life sciences
- Microelectronics
- Military
- Oil & gas
- Power generation
- Renewable energy
- Telecommunications
- Transportation

Key Products
- Dynamic seals
- Elastomeric O-rings
- Electro-medical instrument design & assembly
- EMI shielding
- Exfoliated & precision cut, fabricated elastomeric seals
- High temperature metal seals
- Homogeneous & interlaced elastomeric shapes
- Medical device fabrication & assembly
- Metal & plastic retained composite seals
- Shielded optical windows
- Silicone tubing & extrusions
- Thermal management
- Vibration dampening

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www.parker.com/rfde

Hydraulic Filtration
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Parker Kittiwake
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Asia Pacific
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Parkers Hannifin Corporation
Finite Airtek Filtration Division
4087 Walden Avenue
Lancaster, NY 14086
phone 716 686 6400
www.parker.com/faf