Breathable Compressed Air
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 atomisation 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 fibres 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

The problem

In compressed air fed systems, ambient air is drawn into the compressor, therefore any contaminants present in the ambient air plus those introduced by the compressor itself will be present unless removed by a purification system. Contaminants present can include:

- Carbon monoxide
- Carbon dioxide
- Water vapour
- Micro-organisms
- Atmospheric dirt
- Oil vapour
- Water aerosols
- Condensed liquid water
- Liquid oil
- Oil aerosols
- Rust
- Pipescale
Health & Safety Legislation

Compressed air used for breathing must comply with local legislation. In Europe the maximum levels of contamination permissible are outlined in EN 12021 and recommendations for selection, care and maintenance can be found in EN 529. It is essential that all items of RPE are tested for compliance at suitable intervals not exceeding one month.

Only approved equipment should be used and employers must take advice from equipment suppliers on correct use to prevent respiratory health problems.

Applications and Industries

Hazardous vapours, 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

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

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></td>
<td></td>
<td>Pressure dewpoint of 5°C below lowest system temperature</td>
<td>67 ppm (= -45°C atmospheric dewpoint)</td>
<td>14 ppm (= -58°C atmospheric dewpoint)</td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td>5 mg/m³</td>
<td>&lt; 1 mg/m³</td>
<td>0.1 mg/m³</td>
</tr>
<tr>
<td>Oil / Lubricant</td>
<td></td>
<td>&lt; 100 ppm</td>
<td>&lt; 500 ppm</td>
<td>&lt; 500 ppm</td>
</tr>
<tr>
<td>Carbon Dioxide (CO₂)</td>
<td></td>
<td>&lt; 10 ppm</td>
<td>&lt; 5 ppm</td>
<td>&lt; 5 ppm</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td></td>
<td>&lt; 5 ppm</td>
<td>&lt; 5 ppm</td>
<td>&lt; 5 ppm</td>
</tr>
<tr>
<td>Nitrogen Oxides (N₂ + NO₂)</td>
<td></td>
<td>&lt; 2 ppm</td>
<td>&lt; 2 ppm</td>
<td>&lt; 2 ppm</td>
</tr>
<tr>
<td>Sulphur Dioxide (SO₂)</td>
<td></td>
<td>&lt; 1 ppm</td>
<td>&lt; 1 ppm</td>
<td>&lt; 1 ppm</td>
</tr>
</tbody>
</table>
Breathing Air Purifiers without CO / CO₂ reduction are supplied with 12 months guaranteed air quality

<table>
<thead>
<tr>
<th>To reduce the following contaminants</th>
<th>Solid Particles</th>
<th>Water Aerosols</th>
<th>Oil Aerosols</th>
<th>Water Vapour</th>
<th>Oil Vapour</th>
<th>Carbon Monoxide</th>
<th>Odours &amp; Fumes</th>
<th>Carbon Dioxide</th>
</tr>
</thead>
</table>

### 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 odour and vapour 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.

### BAS-3015

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 vapour and odours, 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-2010

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 vapour and odours, this purifier includes a pressure regulator / gauge and can facilitate up to four users simultaneously.

### BAS-015

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 vapour and odours. These sets include a pressure regulator/gauge, all mounted in a lightweight, stable framework.

### Features

- 3 Purification stages
- Integral pressure regulator
- Portable
- Use with any compressed air supply
- Integrated CO Monitor (optional)
- Pressure gauge

### Features

- 2 Purification stages
- Integral pressure regulator
- Portable
- Use with any compressed air supply
- Pressure gauge

### Features

- 2 Purification stages
- Integral pressure regulator
- Portable
- Use with any compressed air supply
- Pressure gauge

### WARNING: THESE PRODUCTS WILL NOT REMOVE CARBON MONOXIDE OR CARBON DIOXIDE
Breathing Air Purifiers without CO2 reduction

Model shown BAS-3015

GRADE WS (OPTIONAL) Water Separator
REDUCES: Liquid water and oil in heavily contaminated compressed air systems

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

GRADE AA Coalescing Filter
REDUCES: Particulate down to 0.01 micron, including water and oil aerosols

GRADE ACS Oil Vapour Removal Activated Carbon Filter
REDUCES: Oil vapour and odours down to 0.003 mg/m³

Technical Specifications

<table>
<thead>
<tr>
<th>Product code</th>
<th>Connections</th>
<th>Flowrate @ 7 bar g (100 psi g)</th>
<th>Dimensions</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inlet</td>
<td>Outlet</td>
<td>l/s</td>
<td>cfm</td>
</tr>
<tr>
<td>BAF010</td>
<td>1/4</td>
<td>3/8</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>BAF015</td>
<td>3/8</td>
<td>3/8</td>
<td>13</td>
<td>27</td>
</tr>
<tr>
<td>BAS2010*</td>
<td>1/2&quot; Hose safety coupler</td>
<td>4x G3/4</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>BAS3015*</td>
<td>1/2&quot; Hose safety coupler</td>
<td>5x G1/2</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>BAP015*</td>
<td>1/2&quot; Hose safety coupler</td>
<td>3x 3/8</td>
<td>20</td>
<td>42</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Line Pressure</th>
<th>bar g</th>
<th>psi g</th>
<th>Correction Factor</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>58.8</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>73.5</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>87.5</td>
<td>1.14</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>100.0</td>
<td>1.0</td>
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<tr>
<td></td>
<td>8</td>
<td>116.0</td>
<td>0.89</td>
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<tr>
<td></td>
<td>9</td>
<td>131.0</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>145.0</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Operation Pressure

Maximum 10 bar g (145 psi g)
Minimum 4 bar g (58 psi g)

Recommended Operating Temperature

Maximum 30°C (86°F)
Minimum 1.5°C (35°F)

GRADE ACS
Oil Vapour Removal Activated Carbon Filter
REDUCES: Oil vapour and odours down to 0.003 mg/m³
Breathing Air Purifiers with CO / CO₂ reduction

To reduce the following contaminants

<table>
<thead>
<tr>
<th>Solid Particles</th>
<th>Water Aerosols</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Oil Aerosols</td>
<td>Water Vapour</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Oil Vapour</td>
<td>Carbon Monoxide</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Odours &amp; Fumes</td>
<td>Carbon Dioxide</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

BA-DME012-080E

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 General Purpose Filter removes particles, dirt and aerosols, 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 vapour and odours. The fourth stage adsorption dryer, reduces the water vapour content of the compressed air (to -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.

Features

• 6 Purification stages
• Use with any compressed air supply

BAC-4015

The Parker domnick hunter BAC-4015 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, vapours, odours, 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 BAC-4015 is housed in an extremely strong and robust lockable case for total security.

Features

• 5 Purification stages
• Integral pressure regulator
• Portable
• Hours run meter
• Pneumatic control
• Use with any compressed air supply

Technical Specifications

<table>
<thead>
<tr>
<th>Operation Pressure</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 bar g (145 psi g)</td>
<td>4 bar g (58 psi g)</td>
</tr>
<tr>
<td>Recommended Operating Temperature</td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td></td>
<td>30°C (86°F)</td>
<td>1.5°C (35°F)</td>
</tr>
</tbody>
</table>

For flow rates at other pressures, apply the factor shown

<table>
<thead>
<tr>
<th>MODELS BAC-4015</th>
<th>MODELS BA-DME012 - 080E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODELS 012E - 040E only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODELS 012E - 040E only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Flowrate at 7 bar g (100 psi g)

<table>
<thead>
<tr>
<th>Connections</th>
<th>Flowrate @ 7 bar g (100 psi g)</th>
<th>Dimensions</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet</td>
<td>Outlet</td>
<td>Height</td>
<td>Width</td>
</tr>
<tr>
<td>G1</td>
<td>G1/2</td>
<td>11</td>
<td>24</td>
</tr>
<tr>
<td>BA-DME025E</td>
<td>G1/2</td>
<td>15</td>
<td>32</td>
</tr>
<tr>
<td>BA-DME030E</td>
<td>G1/2</td>
<td>25</td>
<td>53</td>
</tr>
<tr>
<td>BA-DME035E</td>
<td>G1/2</td>
<td>31</td>
<td>65</td>
</tr>
<tr>
<td>BA-DME040E</td>
<td>G1/2</td>
<td>42</td>
<td>88</td>
</tr>
<tr>
<td>BA-DME050E</td>
<td>G1/G1</td>
<td>50</td>
<td>106</td>
</tr>
<tr>
<td>BA-DME060E</td>
<td>G1/G1</td>
<td>61</td>
<td>130</td>
</tr>
<tr>
<td>BA-DME080E</td>
<td>G1/G1</td>
<td>83</td>
<td>176</td>
</tr>
<tr>
<td>BAC-4015</td>
<td>G1/G1</td>
<td>11</td>
<td>24</td>
</tr>
</tbody>
</table>

(mb air systems ltd)

mb air systems ltd
**Breathing Air Purifiers with CO / CO₂ reduction**

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

**GRADE AA**
Coalescing Filter
- REDUCES: Particulate down to 0.01 micron, including water and oil aerosols

**GRADE AC**
Activated Carbon Filter
- REDUCES: Oil vapour and odours down to 0.003 mg/m³

**Dry Particulate Filter**
- REDUCES: Particulates 99.9999% of Micro-organisms

**Catalyst Filter**
- REDUCES: Carbon Monoxide (CO) by conversion into Carbon Dioxide (CO₂)

**Adsorption Dryer**
- REDUCES: Water Vapour, Carbon Dioxide (CO₂)

Model shown BA-DME015-E

mb air systems ltd
BAM 10 - 70
How it works

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 stage 1, a water separator is used to remove bulk liquids (water and oil), followed by general purpose and high efficiency coalescing filters at stage 2 & 3 which reduce aerosols (oil and water) and solid contaminants (atmospheric particulate, rust, pipescale & microorganisms). Stage 4 is an adsorption dryer which reduces the water vapour content of the compressed air to -40°C PDP (to protect the catalyst) and also reduces the CO2, NO and NO\textsubscript{2} levels below the legal permissible limits. Stage 5 is downstream of the adsorption dryer consists of a combined activated carbon & catalyst filter which reduces the levels of oil vapour and converts carbon monoxide to carbon dioxide (keeping both below the legal limits). Stage 6 is a high efficiency dry particulate filter captures any particulates carried over from the adsorption materials.
Special Features

**Guaranteed reliability**
Built to exaction standards, the BAM series is engineered to exceed breathing air certified standards. As standard the BAM series are fitted with a CO monitor meaning that there are no high-priced additional expenses or delays to arrange external monitor fitting.

**Certified air quality**
The air quality produced by BAM series has been certified by a 3rd party independent authority test house. The air quality delivered by the BAM series is better than the European Pharmacopoeia standard, assuring guaranteed performance and reliability at all times.

**Compact operation**
The BAM series has a modular space saving footprint making it one of the most compact product series on the market. The BAM series has an energy management system fitted as standard, offering additional savings for running costs.

**Simple maintenance and servicing**
The BAM series has been designed with cartridges for the catalyst separation. This will ensure longer maintenance intervals which ultimately save time and servicing costs.

**Ease of installation**
The BAM series can be used with a general compressed air supply, and with most suitably rated compressors.
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.

Peak Inhalation Rate

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, ie. 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.

<table>
<thead>
<tr>
<th>Work Rate</th>
<th>Peak Inhalation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>100</td>
</tr>
<tr>
<td>Medium</td>
<td>150</td>
</tr>
<tr>
<td>High</td>
<td>200</td>
</tr>
<tr>
<td>Very High</td>
<td>250</td>
</tr>
</tbody>
</table>

Breathable Air Purity Test Kit
How clean is your breathing air?
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 vapour 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 analyser, 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 analysing 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 Vapour
- 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 10 bar g (145psi g)
- Factory set for use with ‘Gastec Ltd’ detection tubes
Company Directory:

149 Glasgow Road
Wishaw
Lanarkshire
ML2 7QJ
Tel 01698 355711
Fax 01698 359299

Wellheads Road
Farburn Industrial Estate
Dyce, Aberdeen
AB21 7HG
Tel 01224 723434
Fax 01224 723545

Fleming Close
Segensworth East
Fareham
Hampshire
PO15 5SB
Tel 01489 588398
Fax 01489 588381

8 Burford Way
Boldon Business Park
Boldon
Tyne & Wear
NE35 9PZ
Tel 0191 519 5500
Fax 0191 537 1105

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www.airwinch.co.uk

mb air systems ltd

engineering solutions
compressed air
design
pneumatics & tools
product finishing
service
offshore lifting