

aerospace  
climate control  
electromechanical  
**filtration**  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



## Breathable Compressed Air



ENGINEERING YOUR SUCCESS.

# Working safely in hazardous environments

Employers are obliged under 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 Sensitisation**  
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 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

## Applications, Environments 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

### Environments

- Carbon monoxide
- Carbon dioxide
- Oil vapour & mist
- Airborne particulate & dust
- Vapours, 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

# 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.



# The problem

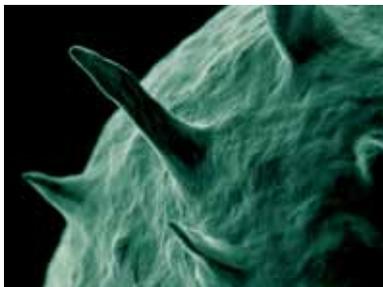
In compressed air fed systems, ambient air is drawn into the compressor, therefore any contaminants present in the ambient air plus those introduced by the compressor itself will be present unless removed by a purification system. Contaminants present can include:

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



## Atmospheric dirt

Atmospheric air in industrial and urban environments will typically contain 140 - 150 million dirt particles in every cubic metre. As 80% of these particles are less than 2 microns in size, they are too small to be captured by the compressor air intake filter and will therefore travel unrestricted into the compressed air system.



## Micro-organisms

Atmospheric air can contain up to 100 million micro-organisms per cubic metre. Bacteria, viruses, fungi and spores are drawn into the compressor air intake and due to their size; will pass directly through the compressor intake filters and into the compressed air system. The warm, moist compressed air provides an ideal environment for their growth.



## Rust and pipescale

Rust and pipescale is usually found in air receivers and distribution piping and can be directly attributed to the presence of water in the compressed air system. Over time, the rust and pipescale breaks away to cause damage or blockage in production equipment which can also contaminate final product and processes. Even after the installation of dryers into older piping systems which were previously operated with inadequate or no purification equipment, rust and pipescale problems often increase for a period of time.



### Water vapour

Water enters the compressed air system through the compressor intake as a vapour (or gas). The ability of air to hold water vapour is dependent upon its pressure and temperature. The higher the temperature, the more water vapour that can be held by the air, the higher the pressure, a greater amount of water vapour is squeezed out. As large volumes of air are drawn into the compressor and compressed, the temperature of the air increases significantly. This allows the heated air to easily retain the water vapour present in the atmospheric air.



### Condensed liquid water and water aerosols

After compression, compressed air is normally cooled to a usable temperature by an after-cooler. This cooling reduces the air's ability to retain water vapour, resulting in a proportion of the water vapour being condensed into liquid water. The liquid water is then removed by a condensate drain fitted to the after-cooler water separator.

The air leaving the after-cooler and entering the compressed air system is now 100% saturated with water vapour. Any further cooling of the compressed air will result in more water vapour condensing into liquid water. Condensation occurs at various stages throughout the system as the air is cooled further by the air receiver, the distribution piping and the expansion of air in valves, cylinders, tools and machinery.



### Oil vapour

Atmospheric air also contains oil in a gaseous form (oil vapour) which comes from inefficient industrial processes and vehicle exhausts. As with other contaminants, oil vapour is drawn into the compressor intake and passes through the intake filter. Typically, concentrations can vary between 0.05 and 0.5mg per cubic metre, but these can increase significantly should the compressor be sited near highways and heavy traffic. Additionally, lubricants used in the compression stage of a compressor can also be vaporised and carried into the compressed air system. This oil vapour will then cool and condense into a liquid. Oil vapour can also taint products and packaging with an oily smell and / or make workers feel unwell.



### Liquid oil and oil aerosols

The majority of air compressors in use today still use oil in their compression stage for sealing, lubrication and cooling. The oil is in direct contact with the air as it is compressed, however due to the efficiency of modern air / oil separators built into the compressor, only a small proportion of this lubricating oil is carried over into the compressed air system as a liquid, an aerosol (typically no more than 5mg/m<sup>3</sup> for a well maintained screw compressor) or as oil vapour. Liquid and aerosols mix with water in the system to form a thick, acidic condensate. Compressor condensate causes damage to the compressed air storage and distribution system, production equipment, products and packaging.



### Carbon dioxide

Carbon dioxide is a colourless, odourless gas occurring naturally in the atmosphere and is formed by respiration. In large concentrations, it is an asphyxiant.

### Carbon monoxide

Carbon monoxide is a colourless, odourless toxic gas formed by the incomplete burning of carbon, e.g. exhaust fumes from power plant and internal combustion engines.

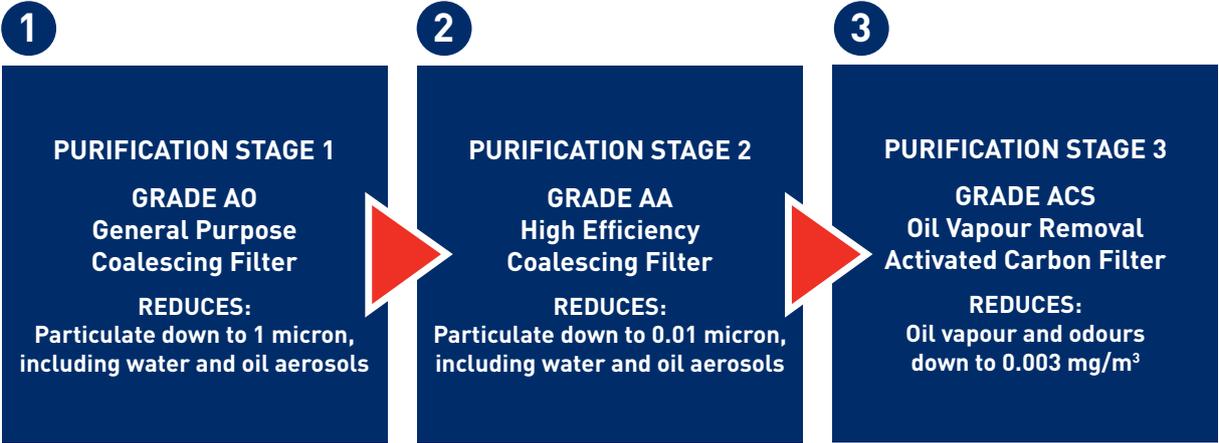
Known as the 'silent killer', this gas, if inhaled, will be absorbed into the bloodstream very easily.

# Breathing Air Purifiers without CO /CO<sub>2</sub> reduction



**WATER SEPARATOR  
(Optional)**  
REDUCES:  
Liquid water and oil  
in heavily contaminate  
compressed air systems

Model shown BAS-3015



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

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

# Breathing Air Purifiers without CO / CO<sub>2</sub> reduction

To reduce the following contaminants	Solid Particles	✓	Water Aerosols	✓
	Oil Aerosols	✓	Water Vapour	×
	Oil Vapour	✓	Carbon Monoxide	×
	Odours & Fumes	✓	Carbon Dioxide	×



## 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.



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



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



## BAS3015

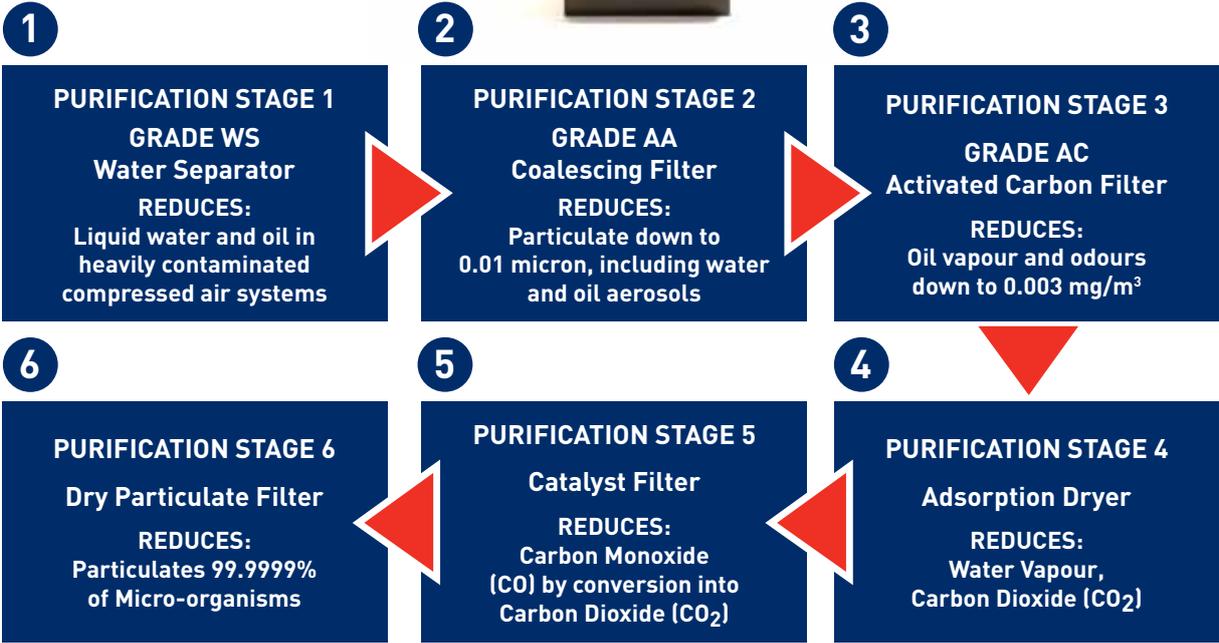
The Parker domnick hunter BAS-3015 is a portable breathing air purifier housed in a compact, weatherproof, impact resistant case. Consisting of a general purpose pre-filter, a high efficiency coalescing filter and an activated carbon filter to remove oil vapour and odours, this purifier includes a pressure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

Features	BAF010-BAF015	BAS3015	BAS2010	BAP015
Purification Stages	2	3	2	2
Integral pressure regulator		•	•	•
Portable	•	•	•	•
Use with any compressed air supply	•	•	•	•
Integrated CO Monitor (optional)		•		
Wall mounted	•			
Pressure gauge	•	•	•	•

# Breathing Air Purifiers with CO /CO<sub>2</sub> reduction



Model shown BA-DME012



## International breathing air standards

Contaminants	OSHA Grade D	CSA Z180.1	European Pharmacopoeia	Parker domnick hunter BA-DME/BAM range*
Water		Pressure dewpoint of 5°C below lowest system temperature	67 ppm (= -45°C atmospheric dewpoint)	14 ppm (= -58°C atmospheric dewpoint)
Oil / Lubricant	5 mg/m <sup>3</sup>	< 1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>
Carbon Dioxide (CO <sub>2</sub> )	< 100 ppm	< 500 ppm	< 500 ppm	< 500 ppm
Carbon Monoxide (CO)	< 10 ppm	< 5 ppm	< 5 ppm	< 5 ppm
Nitrogen Oxides (NO + NO <sub>2</sub> )			< 2 ppm	< 2 ppm
Sulphur Dioxide (SO <sub>2</sub> )			< 1 ppm	< 1 ppm

\*Independently tested for Parker domnick hunter by



Figures are based on compressed air inlet containing standard ambient levels of CO<sub>2</sub> 300 to 600ppm and CO 10ppm. At higher levels the system will provide incident protection only.

# Breathing Air Purifiers with CO / CO<sub>2</sub> reduction

To reduce the following contaminants	Solid Particles	✓	Water Aerosols	✓
	Oil Aerosols	✓	Water Vapour	✓
	Oil Vapour	✓	Carbon Monoxide	✓
	Odours & Fumes	✓	Carbon Dioxide	✓

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 (CO<sub>2</sub>).

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, vapours, odours, carbon dioxide (CO<sub>2</sub>) 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 vapour and odours. The fourth stage adsorption dryer, reduces the water vapour content of the compressed air (to -40°C pdp) and CO<sub>2</sub>, NO and NO<sub>2</sub> 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 vapour and odours. The fourth stage adsorption dryer, reduces the water vapour content of the compressed air (to -40°C pdp) and CO<sub>2</sub>, NO and NO<sub>2</sub> 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

Features	BA-2010	BA-DME	BAM
Purification Stages	5	6	6
Integral pressure regulator and gauge	•		
Portable	•		
Hours run meter	•		
Pneumatic Control	•		
Use with any compressed air supply	•	•	•
Intragted CO Monitor			•
Electrical supply required		•	•

# 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;

- |                 |                               |                      |                    |
|-----------------|-------------------------------|----------------------|--------------------|
| • <b>Europe</b> | EN12021                       | • <b>Canada</b>      | Z180.1-00          |
| • <b>UK</b>     | BS4275 : 1997                 | • <b>Australia</b>   | AS/NZS 1715 : 1994 |
| • <b>USA</b>    | CGA G7.1-1997<br>OSHA-Grade D | • <b>New Zealand</b> | 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.

Work Rate	Peak Inhalation Rate	
	l/min	cfm
Low	100	3.6
Medium	150	5.3
High	200	7.1
Very High	250	8.9

Source BS4275 : 1997.

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.

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

	Solid Particles	Oil Vapour	Oil Odours	Pressure Dewpoint	CO	CO <sub>2</sub>	NO+NO <sub>2</sub>	SO <sub>2</sub>
<b>Purifiers without CO/CO<sub>2</sub> reduction</b>	0.01mg/m <sup>3</sup>	0.003mg/m <sup>3</sup>	None present	N/A	N/A	N/A	N/A	N/A
<b>Purifiers with CO/CO<sub>2</sub> reduction</b>	0.01mg/m <sup>3</sup>	0.003mg/m <sup>3</sup>	None present	-40°C	<5ppm	<500ppm	N/A	N/A

### NOTE:

Parker domnick hunter CO & CO<sub>2</sub> reduction purifiers provide breathable air that meets all International Respiratory Air Standards, purifiers without CO & CO<sub>2</sub> reduction stages should not be used in an environment where CO or CO<sub>2</sub> has been identified as a potential inhalation risk.

# Technical Specifications

		BAF010, BAF015, BAS3015, BAS2010, BAP015	BA-DME012 - 40	BA-DME050 - 080	BAM102 - 110
Operation Pressure	Maximum	10 bar g (145 psi g)	16 bar g (232 psi g)	13 bar g (189 psi g)	10.5 bar g (152 psi g)
	Minimum	4 bar g (58 psi g)	4 bar g (58 psi g)	4 bar g (58 psi g)	4 bar g (58 psi g)
Recommended Operating Temperature	Maximum	30°C (86°F)			
	Minimum	1.5°C (35°F)			

For flow rates at other pressures, apply the factor shown

Line Pressure	bar g	4	5	6	7	8	9	10	11	12	13	14	15	16
	psi g	58	73	87	100	116	131	145	160	174	189	203	218	232
Correction Factor		1.60	1.33	1.14	1	0.89	0.80	0.73	0.67	0.62	0.57	0.54	0.5	0.47

Product code	Connections		Flowrate @ 7 bar g (100 psi g)				Dimensions						Weight (approx.)	
	Inlet	Outlet	Inlet		Height		Width		Depth		kg	lbs		
			l/s	cfm	mm	ins	mm	ins	mm	ins				
BAF010	1/4	3/8	6	13	343	13.5	207	8.15	136	5.35	1.4	3.1		
BAF015	3/8	3/8	13	27	436	17.2	224	8.82	144	5.67	1.9	4.2		
BAS2010*	1/2" Hose safety coupler	4x G1/4	10	21	410	16.2	460	18.1	246	9.7	8	18		
BAS3015*	1/2" Hose safety coupler	5x G1/4	20	42	470	18.5	600	11.8	300	23.6	10	22		
BAP015*	1/2" Hose safety coupler	3x 3/8	20	42	380	15	380	15	272	10.7	5.45	12		

Product code	Connections		Flowrate @ 7 bar g (100 psi g)				Dimensions						Weight (approx.)	
	Inlet	Outlet	Inlet		Outlet		Height		Width		Depth		kg	lbs
			l/s	cfm	l/s	cfm	mm	ins	mm	ins	mm	ins		
BA-2010	G1/2	3x G1/4	11	24	9	19	610	24.0	450	17.7	270	10.6	37	82
BAP-2010	G1/2	3x G1/4	11	24	9	19	947	37.3	416	16.4	460	18.1	50	110
BA-DME012	G1/2	G3/8	11	24	9	19	952	37.5	476	18.7	302	11.9	38	84
BA-DME015	G1/2	G3/4	15	32	12	25	1211	47.7	490	19.3	302	11.9	43	95
BA-DME020	G1/2	G3/4	20	42	15	33	1376	54.2	490	19.3	302	11.9	48	106
BA-DME025	G1/2	G3/4	25	53	20	42	1541	60.7	490	19.3	302	11.9	53	117
BA-DME030	G1/2	G3/4	31	65	24	52	1707	67.2	521	20.5	302	11.9	58	128
BA-DME040	G3/4	G3/4	42	88	33	70	1960	77.2	732	28.8	447	17.6	74	164
BA-DME050	G1	G1	50	106	40	84	1750	68.9	400	15.8	1200	47.2	211	466
BA-DME060	G1	G1	61	130	49	104	1916	75.4	400	15.8	1200	47.2	224	494
BA-DME080	G1	G1	83	176	66	140	2076	81.7	745	29.3	1200	47.2	279	615
BAM102	G1 1/2	G2	76	160	63	134	1780	70.1	912	35.9	1352	53.2	444	979
BAM103	G1 1/2	G2	113	240	95	202	1780	70.1	912	35.9	1352	53.2	489	1078
BAM104	G2	G2	151	320	127	269	1780	70.1	912	35.9	1462	57.6	561	1237
BAM105	G2	G2	189	400	159	337	1780	70.1	912	35.9	1562	61.5	598	1319
BAM106	G2	G2 1/2	227	480	190	404	1780	70.1	912	35.9	1800	70.9	689	1519
BAM107	G2	G2 1/2	264	560	222	471	1780	70.1	912	35.9	1900	74.8	746	1645
BAM108	G2	G2 1/2	302	640	254	539	1780	70.1	912	35.9	2000	78.7	829	1828
BAM110	G2 1/2	G2 1/2	378	800	318	674	1780	70.1	912	35.9	2200	86.6	1009	2225

# 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 vapour CO and CO<sub>2</sub> 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 O<sub>2</sub> 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
- CO<sub>2</sub>
- Water Vapour
- Mineral Oil

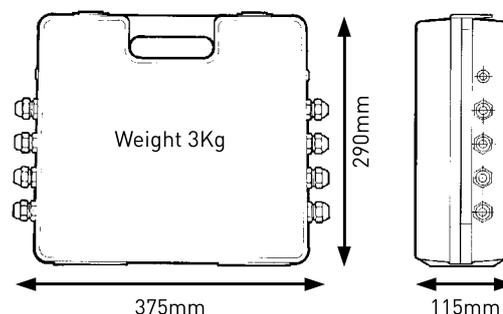
### Features / Benefits

- 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

# Technical Specification

## Air Purity Test Kit

Maximum inlet pressure:	10 bar g (145 psi g)
Analysis operating pressure:	3 bar g (43.5 psi g) - Factory set
Maximum inlet temperature:	40°C (104°F)
Minimum inlet temperature:	15°C (59°F)
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

Model	Measurable	Sample rate	Test Duration	Total Volume
APTK1 (60 603 5050)	CO	100ml/min	1.5 minutes	150ml
	CO <sub>2</sub>	100ml/min	3 minutes	300ml
	Water Vapour	100ml/min	10 minutes	1 litre
	Oil Mist (Mineral)	1000ml/min	60 minutes	60 litres
	Oxygen	50ml/min	Real-time Display	n/a

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

## Consumable Parts

Replacement Gas Detection Tubes / O <sub>2</sub> Analyser	
Contaminant	Kit Part No.
Carbon Monoxide (CO)	608200465
Carbon Dioxide (CO <sub>2</sub> )	608200464
Water Vapour (H <sub>2</sub> O)	608200462
Oil Mist	608200463
O <sub>2</sub> Analyser	606035300

The Parker domnick hunter Air Purity Test Kit (APTK1) is supplied complete with oil aerosol, water vapour, CO and CO<sub>2</sub> test tubes (in packs of 10) to allow immediate multiple testing.

		COMPRESSED AIR FOR BREATHING - WORLD STANDARDS			
		EUROPE BS EN12021	USA 29 CFR 1910.134	CANADA CSA Z180.1-00	AUSTRALIA AS/NZS 1715 : 1994
<b>SUBSTANCE</b>	<b>OXYGEN</b>	21% (+/-1%)	19.5% - 23.5%	20% - 22% BY VOLUME (DRY AIR)	19.5% - 22%
	<b>CARBON DIOXIDE</b>	NOT MORE THAN 500ppm	NOT MORE THAN 1000ppm	NOT MORE THAN 500ppm	NOT MORE THAN 800ppm
	<b>CARBON MONOXIDE</b>	NOT MORE THAN 15ppm	NOT MORE THAN 10ppm	NOT MORE THAN 5ppm	NOT MORE THAN 10ppm
	<b>OIL MIST / VAPOUR</b>	NOT MORE THAN 0.5mg/m <sup>3</sup>	NOT MORE THAN 5ppm	NOT MORE THAN 1mg/m <sup>3</sup>	NOT MORE THAN 1mg/m <sup>3</sup>
	<b>ODOUR / TASTE</b>	WITHOUT SIGNIFICANT ODOUR OR TASTE	WITHOUT SIGNIFICANT ODOUR OR TASTE	WITHOUT SIGNIFICANT ODOUR OR TASTE	WITHOUT SIGNIFICANT ODOUR OR TASTE
	<b>WATER (LIQUID)</b>	THERE SHOULD BE NO FREE WATER	THERE SHOULD BE NO FREE WATER	THERE SHOULD BE NO FREE WATER	THERE SHOULD BE NO FREE WATER
	<b>WATER (VAPOUR)</b>	"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 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 -11°C.	4°C (39°F) pdp @ 50psig	The pressure dewpoint of the compressed breathing air shall be at least 5°C (9°F) 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.	Airline pressure dewpoint should be at least 5°C below the lowest know temperature or -11°C if the lowest temperature is not known.

# Market and application guide

APPLICATIONS																																				
INDUSTRIES	Silo Storage	Grain Transport	Manure Storage	Fuel Tank Entry	Confined Space Entry	Hot Work	Coal Storage	Refueling	Salvage & Clean Up	HAZMAT	Cold Storage	Pipeline Construction	Meter Pits	Engine Maintenance	Shipping Fertilizer	Coke Ovens/Blast Furnace	Soaking Pits	Picking & Plating	Aluminium Smelting	Emissions Testing	Ore Processing	Collection of Waste Water	Discharge Holes	Exploration & Drilling	Production	Transport, Storage & Distribution	Refining	Acid, Hydrocarbon & Chemical production	Drug Manufacturing	Chlorine Production & Bleach Storage	Digesters					
Agriculture	X	X	X																																	
Aviation				X																																
Chemical					X	X																														
Construction					X																															
Electrical Utilities					X	X	X																													
Fire Service					X				X	X																										
Food & Beverage		X			X						X																									
Gas Utilities					X							X	X																							
Iron / Steel Production					X											X	X	X	X																	
Marine / Shipyards					X									X	X																					
Mining						X														X	X															
Nuclear					X		X																													
Oil & Gas																							X	X	X	X										
Petrochemical					X															X																
Pulp & Paper																															X	X				
Pharmaceutical					X																										X					
Water Treatment																						X	X													



# Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374



## 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 & actuation products  
Engine systems & components  
Fluid conveyance systems & components  
Fluid metering, delivery & atomization devices  
Fuel systems & components  
Fuel tank inerting systems  
Hydraulic systems & components  
Thermal management  
Wheels & brakes



## Climate Control

### Key Markets

Agriculture  
Air conditioning  
Construction Machinery  
Food & beverage  
Industrial machinery  
Life sciences  
Oil & gas  
Precision cooling  
Process  
Refrigeration  
Transportation

### Key Products

Accumulators  
Advanced actuators  
CO<sub>2</sub> controls  
Electronic controllers  
Filter driers  
Hand shut-off valves  
Heat exchangers  
Hose & fittings  
Pressure regulating valves  
Refrigerant 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  
Plastics machinery & converting  
Primary metals  
Semiconductor & 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  
Stepper motors, 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 & zero air generators  
Stepper motors, servo motors, drives & controls  
Instrumentation filters  
Membrane & fiber filters  
Microfiltration  
Sterile air filtration  
Water desalination & purification filters & systems



## Fluid & Gas Handling

### Key Markets

Aerial lift  
Agriculture  
Bulk chemical handling  
Construction machinery  
Food & beverage  
Fuel & gas delivery  
Industrial machinery  
Life sciences  
Marine  
Mining  
Mobile  
Oil & gas  
Renewable energy  
Transportation

### Key Products

Check valves  
Connectors for low pressure fluid conveyance  
Deep sea umbilicals  
Diagnostic equipment  
Hose couplings  
Industrial hose  
Mooring systems & power cables  
PTFE hose & tubing  
Quick couplings  
Rubber & thermoplastic hose  
Tube fittings & adapters  
Tubing & plastic fittings



## Hydraulics

### Key Markets

Aerial lift  
Agriculture  
Alternative energy  
Construction machinery  
Forestry  
Industrial machinery  
Machine tools  
Marine  
Material handling  
Mining  
Oil & gas  
Power generation  
Refuse vehicles  
Renewable energy  
Truck hydraulics  
Turf equipment

### Key Products

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



## Pneumatics

### Key Markets

Aerospace  
Conveyor & material handling  
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  
Marine & shipbuilding  
Medical & dental  
Microelectronics  
Nuclear Power  
Offshore oil exploration  
Oil & gas  
Pharmaceuticals  
Power generation  
Pulp & 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 fittings, valves, regulators & digital flow controllers  
Industrial mass flow meters/controllers  
Permanent no-weld tube fittings  
Precision industrial regulators & flow controllers  
Process control double block & bleeds  
Process control fittings, valves, regulators & manifold valves



## 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  
Extruded & precision-cut, fabricated elastomeric seals  
High temperature metal seals  
Homogeneous & inserted elastomeric shapes  
Medical device fabrication & assembly  
Metal & plastic retained composite seals  
Shielded optical windows  
Silicone tubing & extrusions  
Thermal management  
Vibration dampening

ENGINEERING YOUR SUCCESS.