High quality compressed air from generation to application

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

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Parker

domnick hunter

ENGINEERING YOUR SUCCESS.

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Filtration, purification and separation is our business

Parker domnick hunter is a world leader in the filtration, purification and separation of compressed air and gases.

Parker domnick hunter specialises in purification and separation technologies where compressed air and gas purity, product quality, technological excellence and global support are paramount. It designs and manufactures compressed air treatment products, gas generators and ancillary equipment for many key industries where ease of integration, low cost of ownership and energy savings can make a real difference.

Compressed Air - The 4th Utility

Compressed air is a safe and reliable power source that is widely used throughout industry.

Approximately 90% of all companies use compressed air in some aspect of their operations, but unlike gas, water and electricity, compressed air is generated on-site, giving the user responsibility for air quality and operational costs.

However, untreated compressed air will cause major performance and reliabilty problems with any system. Almost all of these can be directly attributed to contamination.

After generation, compressed air typically contains up to 10 different contaminants as it enters the distribution system.

Modern production facilities are increasingly becoming more complex and as compressed air applications become more critical, compressed air purification is essential.

Compressed air contamination is a real problem for industry

In today's modern production facilities, the use of compressed air is often pivotal to manufacturing processes. Irrespective of whether the compressed air comes into direct contact with the product or is used to automate a process, provide motive power, packaging, or even to generate other gases on-site, a clean, dry, reliable compressed air supply is essential to maintain efficient and cost effective production.

Failure to remove or reduce contamination will cause many problems with the compressed air system, for example:

- **Corrosion within compressed air storage vessels and the air distribution system**
- **Blocked or damaged valves, cylinders, air motors and air tools**
- **Damaged production equipment**
- **Premature and unplanned desiccant changes for adsorption dryers**
- **Product contamination**

In addition to problems associated with the compressed air system itself, allowing contaminants such as particulate, oil and micro-organisms to exhaust from valves, cylinders and air tools, can lead to an unhealthy and unsafe working environment.

Compressed air contamination will ultimately lead to:

- **Inefficient production processes**
- **Spoiled, damaged or reworked products**
- **Reduced production efficiency**
- **Increased manufacturing costs**

Sources and types of contamination in a compressed air system

Understanding the sources of compressed air contamination and the types of contaminants which must be reduced or eliminated is a key factor in planning an efficient compressed air system.

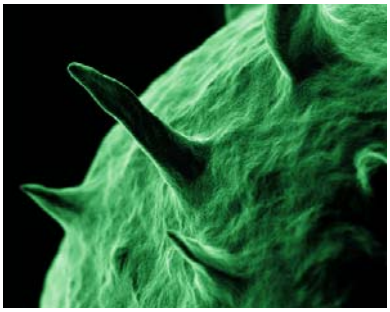
The four sources of compressed air contamination

- **The atmospheric air**
  Air compressors draw in vast volumes of air from the surrounding atmosphere which contain large concentrations of airborne contaminants.
- **The type and operation of the air compressor**
  The air compressor can also add contamination, from wear particles to coolants and degraded lubricants.
- **Air receivers and system piping**
  The air receiver and system piping stores and distributes the compressed air but will also retain the large amounts of contamination drawn into the system. Additionally, they cool the moist compressed air to cause condensation on a large scale. This will promote corrosion, poor performance and ultimately costly damage.

Particulate

Particulate contamination in a compressed air system is a combination of atmospheric dirt, micro-organisms, rust and pipescale.

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



Micro-organisms
Bacteria and viruses will also be drawn into the compressed air system through the compressor intake and warm, moist air provides an ideal environment for the growth of micro-organisms. Ambient air can typically contain around 3800 micro-organisms per cubic metre. If only a few micro-organisms were to enter a clean, sterile environment, or production process, enormous damage could be caused that not only diminishes product quality, but may even render a product entirely unfit for use and subject to costly recall.

Rust and pipescale
Water contamination will cause rust and pipescale to form in air receivers and the system piping. This eventually breaks away to cause blockage or damage to the production process or application.

Water

In a compressed air system, water exists as water vapour, condensed liquid water and water aerosols. Of the ten main contaminants found in a compressed air system, water is either directly or indirectly responsible for the majority of problems experienced by the compressed air user.

Water vapour

Large volumes of atmospheric air enter the compressed air system through the compressor intake. As the air is compressed, the temperature increases significantly, causing it to become fully saturated with water vapour. The ability of air to retain water vapour is dependent upon its temperature and pressure. The higher the temperature, the more water vapour that can be retained. The higher the pressure, the greater the amount of condensed water that will be released.

Condensed liquid water and water aerosols

After the compression stage, the now saturated air is cooled to a usable temperature by an aftercooler, causing the retained water vapour to be condensed into liquid water which is then removed by a condensate drain. The air leaving the after-cooler is now 100% saturated with water vapour and any further cooling of the 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, piping and the expansion of air in valves and cylinders. The condensed water and water aerosols cause corrosion to the storage and distribution system, reduce performance efficiency and increase maintenance costs of the application. Water in any form must be removed to enable the system to function correctly and perform efficiently.

Oil

Oil is introduced into the compressed air system either through the compressor intake as a vapour (oil in a gaseous phase), by the compressor as a liquid or as an aerosol (fine mist).

Oil vapour

Atmospheric air contains oil in the form of unburned hydrocarbons which are drawn into the compressor intake. Typical concentrations can vary between 0.05 and 0.5mg per cubic metre. Additionally, lubricants used in the compression stage of a compressor can also be vaporised and carried into the compressed air system. Once inside the compressed air system, oil vapour will cool and condense into a liquid.

Liquid oil and oil aerosols

The majority of air compressors use oil in their compression stage(s) 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. This is either as a liquid or an aerosol (typically no more than 5mg/m^3 for a well maintained screw compressor).

The main problems with oil in the compressed air system are due to the oil mixing with the water already present. At this point, the oil has lost It's lubricating properties, often becoming very acidic which causes damage to the compressed air storage and distribution system, production equipment and final product.

A dedicated solution for every application

The quality of air required throughout a typical compressed air system will vary depending upon the application for which it is used.

Treatment of the compressed air at only one point alone, for example the compressor room; is not enough. Compressed air should be treated prior to entry into the distribution system (to a quality level suitable for protecting air receivers and distribution piping) and then at the point of use, with specific attention being placed on the application and the level of air quality required. This approach to system design ensures that air is not "over treated" and provides the most cost effective solution to high quality compressed air.

The use of the ISO 8573-1:2001 Air Quality Standard provides the system engineer with a simple method of specifying the air purity required at each point in the compressed air system. Using this standard allows Parker domnick hunter to quickly and easily select products from its comprehensive range of purification products to exactly match your system requirements and to ensure that both capital and operational costs are kept to a minimum.

Critical Applications

Pharmaceutical products

Silicon wafer manufacturing

TFT / LCD Screen manufacturing

Memory device manufacturing

Optical storage devices (CD, CD/RW, DVD, DVD/RW)

Optical disk manufacturing (CD's/DVD's)

Hard disk manufacturing

Foodstuffs

Dairies

Breweries

CDA systems for electronics manufacturing

High Quality Oil-Free Air

Blow Moulding of Plastics e.g. P.E.T. Bottles

Film processing

Critical instrumentation

Advanced pneumatics

Air blast circuit breakers

Decompression chambers

Cosmetic production

Medical air

Dental air

Lasers and optics

Robotics

Spray Painting

Air bearings

Pipeline purging

Measuring equipment

Blanketing

Modified Atmosphere Packaging

Pre-treatment for on-site gas generation

General Purpose Oil-Free Air

General ring main protection

Pre-filtration to point of use adsorption air dryers

Plant automation

Air Logistics

Pneumatic tools

General instrumentation

Metal stamping

Forging

General industrial assembly (no external pipework)

Air conveying

Air motors

Workshop (Tools)

Garage (Tyre filling)

Temperature control systems

Blow guns

Gauging equipment

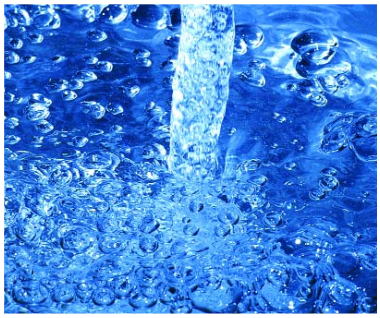
Raw material mixing

Sand / bead blasting















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Compressed air purification

A solution for every contaminant.

	Contamination Removal							
Purification Equipment Technologies	Bulk Condensed Water	Water Vapour	Water Aerosols	Atmospheric Dirt & Solid Particulate	Micro-organisms	Oil Vapour	Liquid Oil & Oil Aerosols	Rust & Pipescale
Water Separators	●							
Coalescing Filters			●	●	●		●	●
Adsorption Filters						●		
Adsorption Dryers		●						
Refrigeration Dryers		●						
Dust Removal Filters				●	●			●
Microbiological Filters				●	●			

Water separators

Water separators are used to protect coalescing filters against bulk liquid contamination, where excessive cooling takes place in air receivers and distribution piping.

Using mechanical separation techniques, Parker domnick hunter water separators will remove in excess of 92% bulk liquid contamination at all flow conditions.

Coalescing filters

Coalescing filters are probably the single most important items of purification equipment in a compressed air system. They are designed to not only remove aerosols (droplets) of oil and water using mechanical filtration techniques, but also to remove solid particulate to very low levels (as small as 0.01micron in size). Installed in pairs, the first filter is a 'general purpose filter' which protects the second 'high efficiency filter' from bulk contamination. The dual filter installation from Parker domnick hunter ensures a continuous supply of high quality compressed air with the additional benefits of low operational costs and minimal maintenance.

Adsorption (Activated Carbon) filters

Oil vapour is oil in a gaseous form and will pass through a coalescing filter just as easily as the compressed air. Therefore, oil vapour removal filters must be employed as these provide a large bed of activated carbon adsorbent for the effective removal of oil vapour, providing the ultimate protection against oil contamination.

Adsorption dryers

Water vapour is removed from compressed air using an adsorption dryer. Adsorption dryers remove moisture by passing air over a regenerative desiccant material which strips the moisture from the air. This type of dryer is extremely efficient. A typical pressure dewpoint specified for an adsorption dryer is -40°C as it not only prevents corrosion, but it also inhibits the growth of micro-organisms. A pressure dewpoint of -70°C is often specified for critical applications.

Refrigeration dryers

Refrigeration dryers work by cooling the air, so are limited to positive pressure dewpoint ratings to prevent freezing of the condensed liquid. Typically used for general purpose applications, they provide pressure dewpoints of +3°C, +7°C or +10°C. Refrigeration dryers are not suitable for installations where piping is installed in ambient temperatures below the dryer dewpoint i.e. systems with external piping, or critical applications such as food, beverage or pharmaceuticals as they do not inhibit microbiological growth.

As adsorption or refrigeration dryers are designed to remove only water vapour and not water in a liquid form, they require the use of coalescing filters to work efficiently.

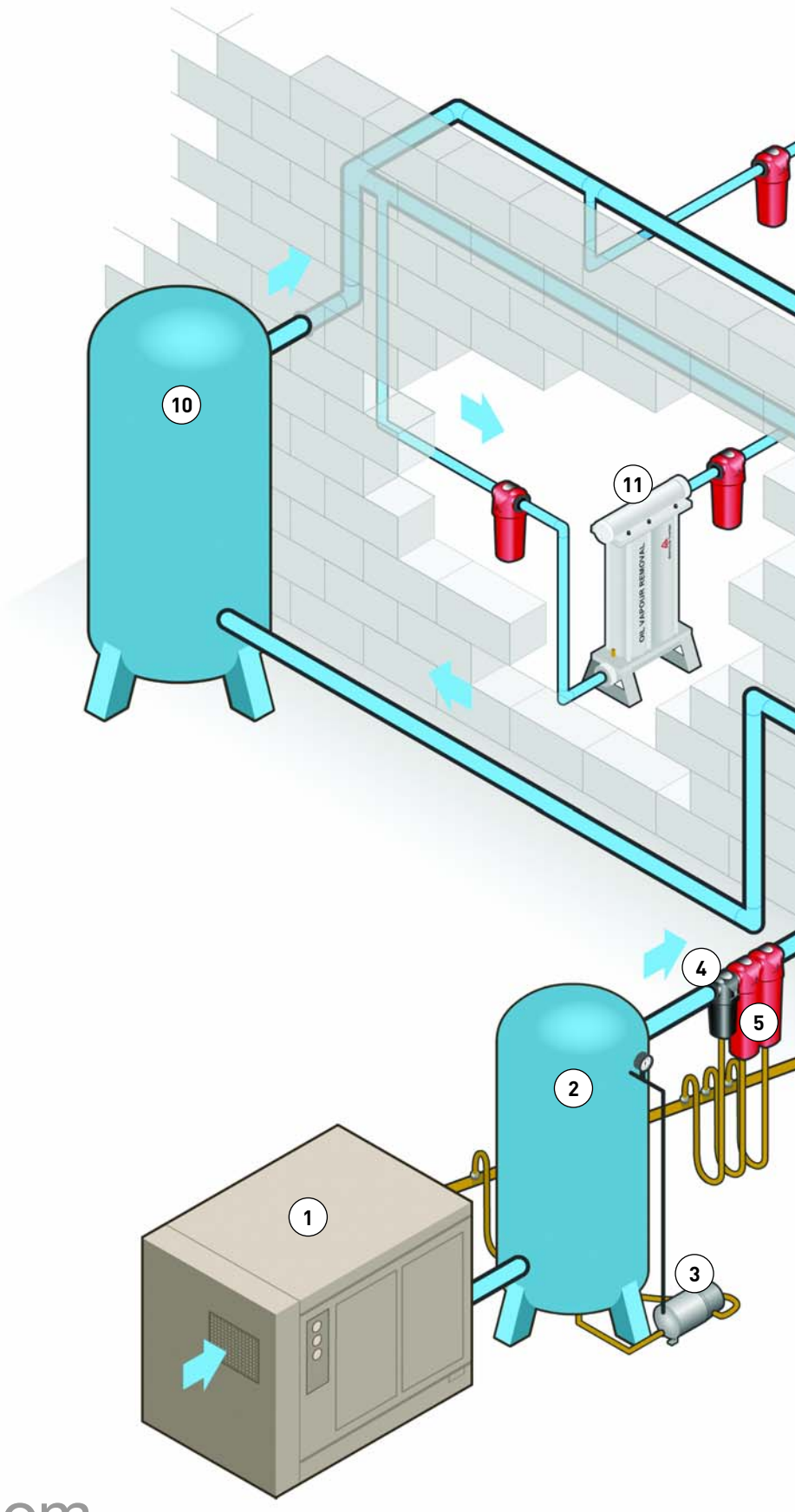
Dust removal filters

Dust removal filters are used for the removal of dry particulates. They provide identical particulate removal performance to the equivalent coalescing filter and use the same mechanical filtration techniques to provide up to 99.9999% particle removal efficiency.

Sterile filters

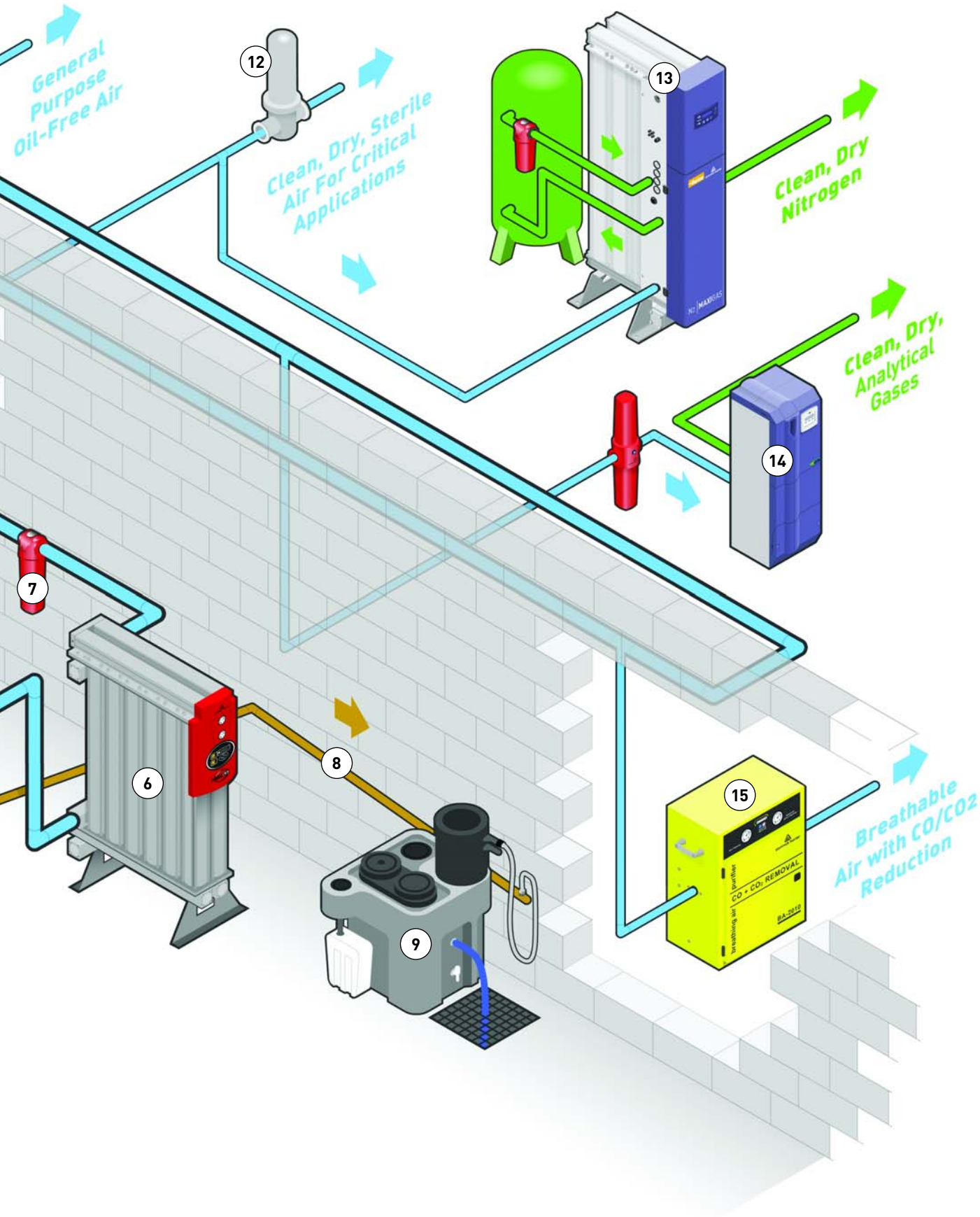
Absolute removal of solid particulates and micro-organisms is performed by a sieve retention or membrane filter. They are often referred to as sterile air filters as they also provide sterilised compressed air. Filter housings are manufactured from stainless steel to allow for in-situ steam sterilisation of both the filter housing and element. It is important to note that the piping between the sterile filter and the application must also be cleaned and sterilised on a regular basis.

KEY:	
1	Air Compressor
2	Wet Air Receiver
3	Condensate Drain
4	Water Separator
5	Coalescing Filters
6	Modular Adsorption Dryer
7	Dust Filter
8	Condensate Drainage
9	Oil / Water Separator
10	Dry Air Receiver
11	Oil Vapour Removal
12	Sterile Air Filter
13	On-site Nitrogen Gas Generator
14	Analytical Gas Generator
15	Breathing Air Purifier



Compressor room

Typical applications




bar
psi
WIKA
ECO
OK
C
R

Are all compressed air filters and dryers the same?

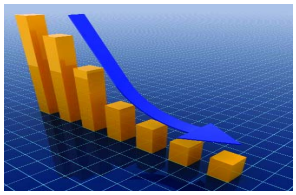
Compressed air purification equipment is essential to all modern production facilities. It must deliver uncompromising performance and reliability whilst providing the right balance of air quality with the lowest cost of operation. Many manufacturers offer products for the filtration and purification of contaminated compressed air, which are often selected only upon their initial purchase cost, with little or no regard for the air quality they provide, the cost of operation throughout their life or their environmental impact. When selecting purification equipment, the required air quality, the overall cost of ownership and the equipment's environmental impact must always be considered.

The Parker domnick hunter design philosophy

Parker domnick hunter has been supplying industry with high efficiency filtration and purification products since 1963. Our philosophy "Designed for Air Quality & Energy Efficiency" ensures products that not only provide the user with clean, high quality compressed air, but also with low lifetime costs and reduced carbon dioxide (CO_2) emissions.

Air Quality
Parker domnick hunter has been instrumental in the development of both ISO 8573 and ISO 12500, the international standards for compressed air quality and compressed air filter testing respectively. All Parker domnick hunter products are designed to provide air quality in accordance with ISO 8573-1:2001, the latest revision of this air quality standard.

Energy Efficiency
In these times of increasing energy costs, an efficient and cost effective manufacturing process is a major factor in maintaining the profitability and growth of your business. All Parker domnick hunter products are designed to not only minimise the use of compressed air and electricity in their operation, but also to significantly reduce the operational costs of the compressor by minimising pressure loss.



Low Lifetime Costs
Equipment with a low purchase cost may turn out to be a poor investment in the long term. By guaranteeing air quality and ensuring energy consumption is kept to a minimum, Parker domnick hunter purification products can reduce the total cost of ownership and help improve profitability through improved manufacturing efficiencies.

Reduced CO_2 Emissions
Many countries worldwide are looking closely at their manufacturing industries in an effort to reduce the amount of harmful greenhouse gases released into the atmosphere. The use of electricity has a direct impact on the generation and release of CO_2. By significantly reducing the energy consumption of its products, Parker domnick hunter can help you to reduce your carbon footprint and protect the environment.

After sales service

Compressed air equipment users demand much more than the supply of high quality products in order to maintain a competitive edge.

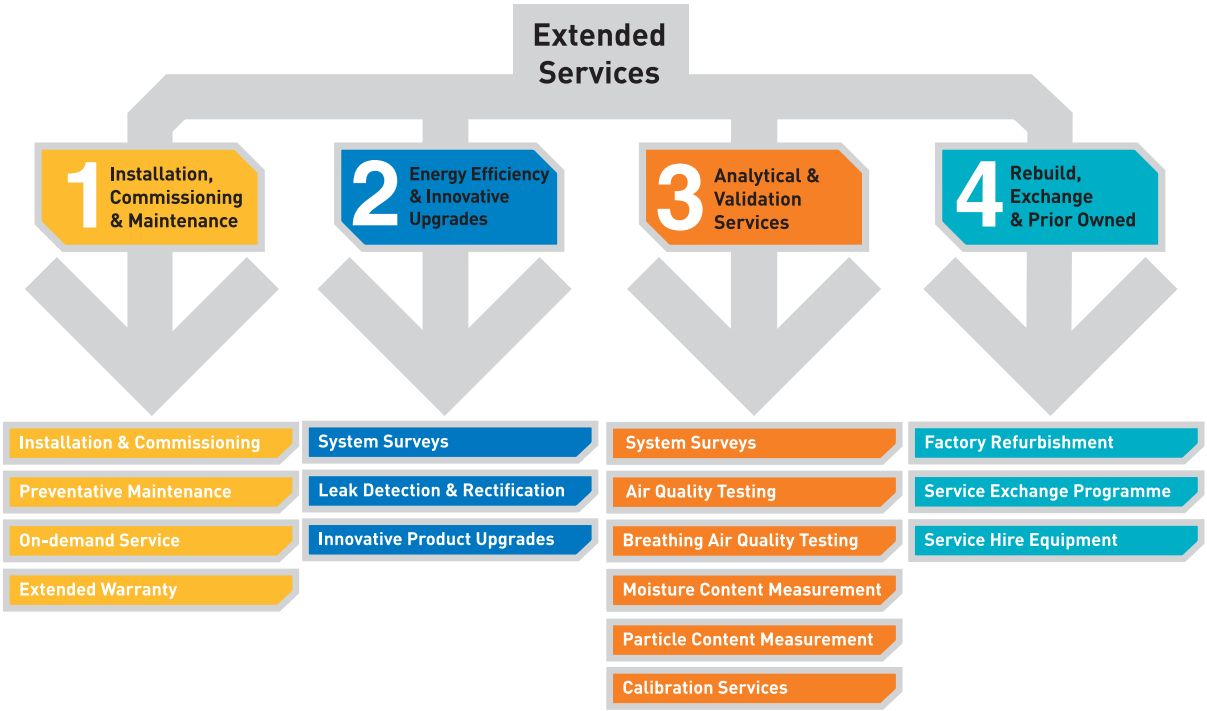
Modern production technology is increasingly demanding the provision of a higher purity and more reliable compressed air supply. Products and solutions that are manufactured by Parker domnick hunter are designed to provide air quality that meets with and often exceeds international standards.

As well as the requirement for air purity and reliability, there are additional factors to consider when choosing the right service provider for your compressed air and gas purification system. For example, knowledge of the many regulations regarding the management of industrial waste, energy efficiency improvement programs and consideration of any environmental impact. It is anticipated that future legislations will demand further in-depth technical and knowledge based support from service providers.

Our commitment to industry does not stop with the supply of high quality products. We are also committed to ensuring that our equipment provides high performance by providing a trouble-free service from a bespoke maintenance and verification package – all tailored to your own specific requirements.

We offer a wide range of valuable services that will impact positively on your drive towards improved production efficiency and product quality with reduced production rejections and operational costs.

From initial selection to installation, commissioning, preventative maintenance and extended services, Parker domnick hunter is redefining customer service.



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INTERNATIONAL APPROVALS

ASME VIII National Board

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