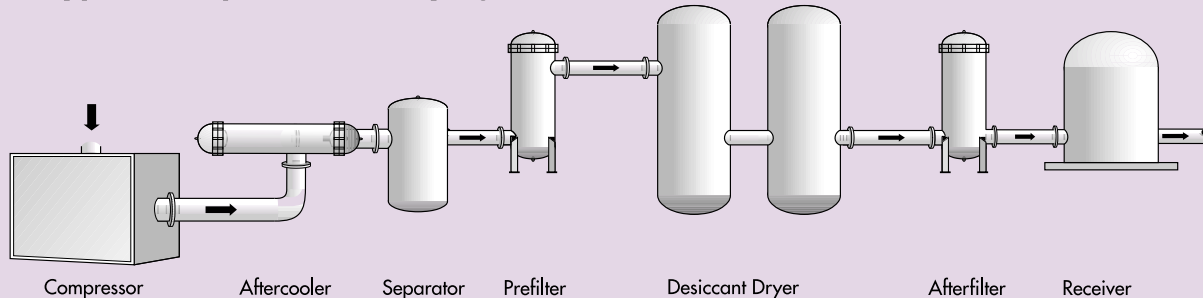


Filters for Compressed Air Dryers

ISSUE 1

Typical Compressed Air Drying Process



The Process

Clean, dry compressed air plays an essential role in industry with many applications, and is often considered a "fourth utility" at most facilities. It is used to move conveyors, transport products, power pneumatic tools, automate equipment, operate critical instrumentation, packaging, and for process operations.

The compressed air drying process includes many equipment components including filters. Their performance has an affect on the degree of dryness and cleanliness of the compressed air.

- **Compressor:** Atmospheric air is compressed to a desired discharge pressure level for downstream use.
- **Aftercooler:** Water or air cooled heat exchanger cools the high temperature of the air resulting from the heat of compression. A significant amount of entrained moisture condenses into liquids.
- **Separator:** Uses centrifugal action, vanes, baffles, or wire mesh pads to remove entrained liquids that are condensed by the aftercooler.
- **Prefilter:** A coalescer designed to remove fine oil and water mist aerosols still remaining to prevent the fouling of the desiccant bed in the dryer. Common prefilter ratings are 0.3 to 1 micron.
- **Dryer:** Desiccant or refrigerated dryers are common designs to remove the remaining water vapor from compressed air. A dual tower desiccant dryer provides the most effective moisture reduction. Dryness is achieved by dew point suppression and reduces further potential for moisture condensation in downstream piping.
- **Afterfilter:** A particulate filter to remove desiccant dust that may carry over from the dryer. Usually rated for 1 to 3 micron particulates removal.
- **Receiver:** Provides storage capacity to meet peak air demand and dampen compressor pulsations.

The Problem

Compressed Air Quality. A major problem in compressed air systems is the presence of water, oil, and solid contaminants which can adversely affect air quality and lead to rust, scaling, instruments clogging, valves sticking, frozen lines, and process contamination. Water vapor is naturally present in air and condenses as it is compressed and cooled. Oils are introduced by lubricated air compressors. Solid particles can be in the form of scale, rust, desiccant from a dryer, and atmospheric dust from a compressor intake.

Four compressed air quality levels exist which are defined by application. Most industrial applications use one of the first three levels.

Quality Level	Application
Plant Air	Pneumatic tools, general plant air uses
Instrument Air	Painting, coating, control instruments
Process Air	Industrial, food, pharmaceutical, electronics
Breathing Air	Hospitals, diving tanks, respirators.

The quality level is often affected by two criteria; the dryness level required and contaminant removal allowed by end use applications.

- **Dryness:** The dryer type can affect the dryness level. Twin tower desiccant dryers are most common for water vapor removal with industrial applications because they are rated at a pressure dewpoint of -40°F . Activated alumina, silica gel, or molecular sieve are common desiccants used for water vapor adsorption.
- **Contaminant Removal:** A prefilter and afterfilter play a vital role in removing condensate, oil lubricants, and solid particulates.

Oil & Water: A coalescer is used as a prefilter to remove oil and water aerosols to prevent fouling of a dryer's desiccant bed. A prefilter is installed upstream of a desiccant dryer to protect it, enhance its effectiveness, and increase its life.

Desiccant Dust: As a desiccant dryer cycles between drying and regeneration, desiccant "fines" can be carried over. An afterfilter is installed downstream of a desiccant dryer to remove this dust and to prevent plugging of valves, regulators, instruments, and potential process contamination.

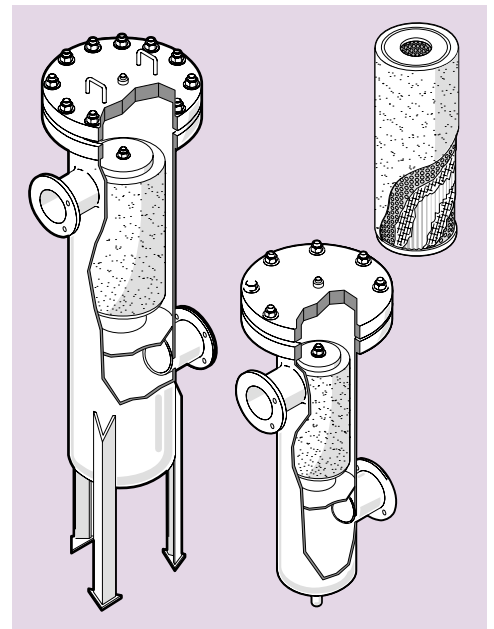
AGS Series Coalescer/Prefilter

How it Works:

The Consler brand AGS Series is a coalescer located upstream of the dryer and works as a prefilter to protect the dryer's desiccant bed from fouling by removing oil and water aerosols. Compressed air enters the housing, flowing from the inside of the coalescing element outwards. Oil or water aerosols enter the element interior, are intercepted by a microglass filter media, extracted from the air, and agglomerate into increasingly larger droplets as they are driven to the outside of the cartridge by the velocity of the air. These larger droplets once formed, drain off the element exterior and fall by gravity into the housing sump.

Features:

- Coalescing elements rated for removal of oil and water aerosols and solid particles, 0.3 micron and up at a 99% minimum removal efficiency. Most dryer systems will typically require a prefilter be rated for 0.3 to 1 micron.
- Utilizes a pleated, multilayered microglass coalescing media to offer more filter surface area and a longer life.
- Offers a lower pressure drop. Most prefilters are sized for an initial clean pressure drop of less than 1 psid.
- Housing design pressure ratings from 150 to 5000 psig.
- Housing connection sizes from 1/2" to 24".



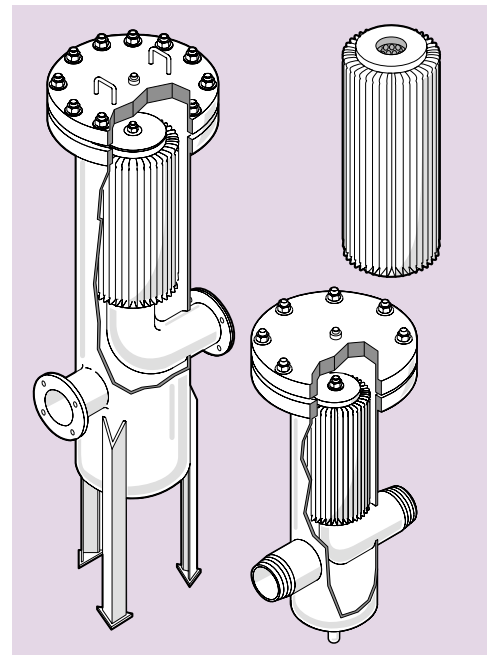
CP Series Afterfilters

How it Works:

The Consler brand CP Series is a solids particulate removal filter designed to provide positive protection of sensitive downstream controls, meters, regulators, and valves by removing desiccant dust carried over from the dryer. The gas stream enters the housing and flows from the outside of the element inwards with solid particles being intercepted on the filter element exterior.

Features:

- Filtration of desiccant dust particles from 0.3 to 25 micron. The most common afterfilter rating being specified for dryer systems is usually 1 to 3 microns.
- Pleated, "radial fin" filter elements with high surface area for longer service life and higher dust holding capacity.
- Utilizes a replaceable, cleanable, and reusable filter element. Most designs employ a single element.
- Offers a very low pressure drop. Most afterfilters are sized for an initial clean pressure drop of 0.5 to 1 psid.
- Many filter media options including polyester, polypropylene, cotton, fiberglass, Nomex, and paper. Polyester is frequently used for compressed air up to 300 F. Fiberglass is common for higher temperatures up to 700 F.
- Housing design pressure ratings from 150 to 5000 psig.
- Inline housing connection sizes from 1/2" to 24".



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