What is a compressed air dryer?

Dry air compressors are essential for most industrial and residential applications. Operators therefore rely on compressed air dryer systems to achieve optimum operation. This article reveals how these systems can fully create functional dry compressed air.

What is a compressed air dryer?

Compressed air always contains water vapour and other forms of moisture that are harmful to your pipes， tools and equipment. They can lead to corrosion， control failures and ultimately equipment failure. Compressed air dryers prevent this by removing the water vapour and moisture content from compressed air before it enters moisture sensitive components and processes.

How do air dryers work?

Each type of compressed air dryer system has its own principle of operation; however，the general function of each is to remove most or all of the water vapour content from the compressed air. The resulting dew point of the compressed air is used as a measure of how dry the air is: the lower the dew point， the lower the moisture content and vice versa.

In this article， we will look at the various types of compressed air dryers and how they work.

Benefits of compressed air dryers

The use of compressed air dryers has its benefits. They include.

Effective removal of particles， water vapour and other moisture content from compressed air

Prevention of equipment corrosion

Extending the life of pipes， tools and equipment

Save on equipment maintenance costs

Types of compressed air dryers

The following outlines the four main types of compressed air dryers that can be used for most industrial applications.

Refrigerated dryers

Desiccant dryers

Chemical dryers

Membrane dryers

Refrigerated Dryers

The working principle of the freeze air dryer consists in causing water vapour to condense by cooling the compressed air. The system then collects this condensed water vapour with the aid of an internal moisture separator and sends it down the drain. The dryer achieves this cooling with the aid of a liquid refrigerant.

Some industry players are aware of the high efficiency and low purchase and maintenance costs of refrigerated compressed air dryers. They can remove more than 75% of the water content of the air， which is acceptable for general air compression applications.

Desiccant Dryers

Desiccant type air dryers work by adsorbing moisture from the compressed air stream onto a desiccant material. These materials are in compartments and effective drying occurs by pushing compressed air through them.

There are two types of desiccant air dryers: heated and non-thermal regenerative desiccant air dryers. Each has two compartments: a drying tower for adsorbed desiccant and a regeneration tower， which helps to remove the adsorbed moisture from the desiccant. However， the heat source makes them different: the former requires an external heat source， while the latter does not.

They can achieve moisture removal rates of up to 99.99%. This high efficacy makes them ideal for critical applications. However， they are more likely to have higher purchasing， operating and maintenance costs.

Contact our team today to purchase a compressed air dryer or get a quote for desiccant air dryer procurement!

Chemical dryers

Chemical dryers use chemicals such as calcium chloride and lithium chloride to strip the water vapour content from compressed air. They saturate the air with moisture by allowing the compressed air to pass through these chemical beds to reach a dew point of 15°C. A high efficiency coalescing filter is usually installed upstream of the dryer to prevent damage and a particle removal filter is installed downstream to avoid output of compressed air containing chemicals.

Membrane dryers