

Working principle: PSA and membrane technology



Oxygen and nitrogen are used by manufacturers for many purposes. Compared with natural gas transmission, on-site gas production will be more economical and efficient.

In order to achieve the appropriate nitrogen purity level, the nitrogen generator (nitrogen generator) works by membrane technology or pressure swing adsorption (PSA); However, oxygen production is completely dependent on PSA technology.

What is the difference between PSA technology and membrane technology?

Adsorption is a physical process in which one substance is completely combined with another substance. Pressure swing adsorption (PSA) technology aims to separate gas molecules from each other by using the concept of adsorption. The adsorption process includes the temporary adhesion of molecules to the surface of some materials in contact with them.

PSA nitrogen and oxygen generator - process flow

PSA nitrogen generator usually consists of at least two towers. These towers contain carbon molecular sieves. Carbon molecular sieve is a kind of adsorption material.

Pressure swing adsorption system for nitrogen generation

When compressed air is pressed into the tower, the tower will be pressurized. Once pressurized, oxygen molecules are trapped in carbon molecular sieves. With the release of pressure, nitrogen molecules are collected into a tank; At the same time, oxygen is released back to the atmosphere through the vent. Once unwanted gas molecules are released into the atmosphere, they quickly switch back to environmental conditions.

Companies that often use PSA system for nitrogen production include:

Plastic molding

packaging

electronics

food

Drinks

Metallurgy

Fruit storage

PSA oxygen generation system

The working principle of oxygen generator using PSA technology is very similar to that of nitrogen generator, but zeolite is used to separate oxygen molecules; Therefore, they are separated from other molecules in the compressed air. Oxygen generation system is very

suitable for wastewater treatment plant, ozone production and application and fish culture; In addition, the portable oxygen generator provided by the on-site gas system is very suitable for use in the medical field.

Nitrogen production membrane technology

The nitrogen film generator is used to remove nitrogen from the atmosphere. This is achieved by pushing compressed air through a group of polymer fibers. When compressed air passes through the membrane, nitrogen molecules separate from other molecules. The tiny pores on the membrane fibers allow oxygen to pass through and return to the atmosphere as waste gas: nitrogen molecules are too large to pass through the pores; Therefore, N₂ molecule is captured at the other end.

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