özak
Gas Technologies

NITROGEN GENERATORS

PSA NITROGEN GENERATORS

ÖZAK PSA-type Nitrogen Generator has been developed through extensive R&D and engineering expertise. Using the proven PSA (Pressure Swing Adsorption) process, it produces nitrogen with up to 99.999% purity continuously and at low cost. Its high efficiency typically allows for a return on investment in less than one year. Tested under demanding industrial conditions, it offers long-lasting performance with low operating and maintenance costs.

ÖZAK PSA-type nitrogen generators have several unique features, described below, which provide significant benefits to users:

FEATURES	BENEFITS
Proprietary design	High efficiency (high nitrogen to air ratio), which means low nitrogen cost
Simple operatör interface	Easy to use — no unnecessary electronics
Optimum instrumentation	Requires minimal maintenance and allows for easy servicing.
High quality robus components	Years of uninterrupted service with very few service calls

We offer different generator series tailored to various applications:

Standard Series:
Designed for nitrogen demands of 4 Nm^3/h and more.
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Mini Series:
Designed for nitrogen demand of 0.25–2 Nm^3/h. It is small, lightweight, and portable but has all features of Standard Series.

LAB Series.
This is basically Mini Series complete with all necessary equipment and accessories such as air compressor, air dryer, etc., mounted on a skid with wheels. It is small, lightweight, silent and easily transportable. It is a very popular series.

NITROGEN GENERATOR SELECTION

ÖZAK PSA Type nitrogen generator produces nitrogen from compressed air. Nitrogen molecules, which constitute 78% of air, are separated from oxygen and argon molecules by a material called carbon molecular sieve (CMS).

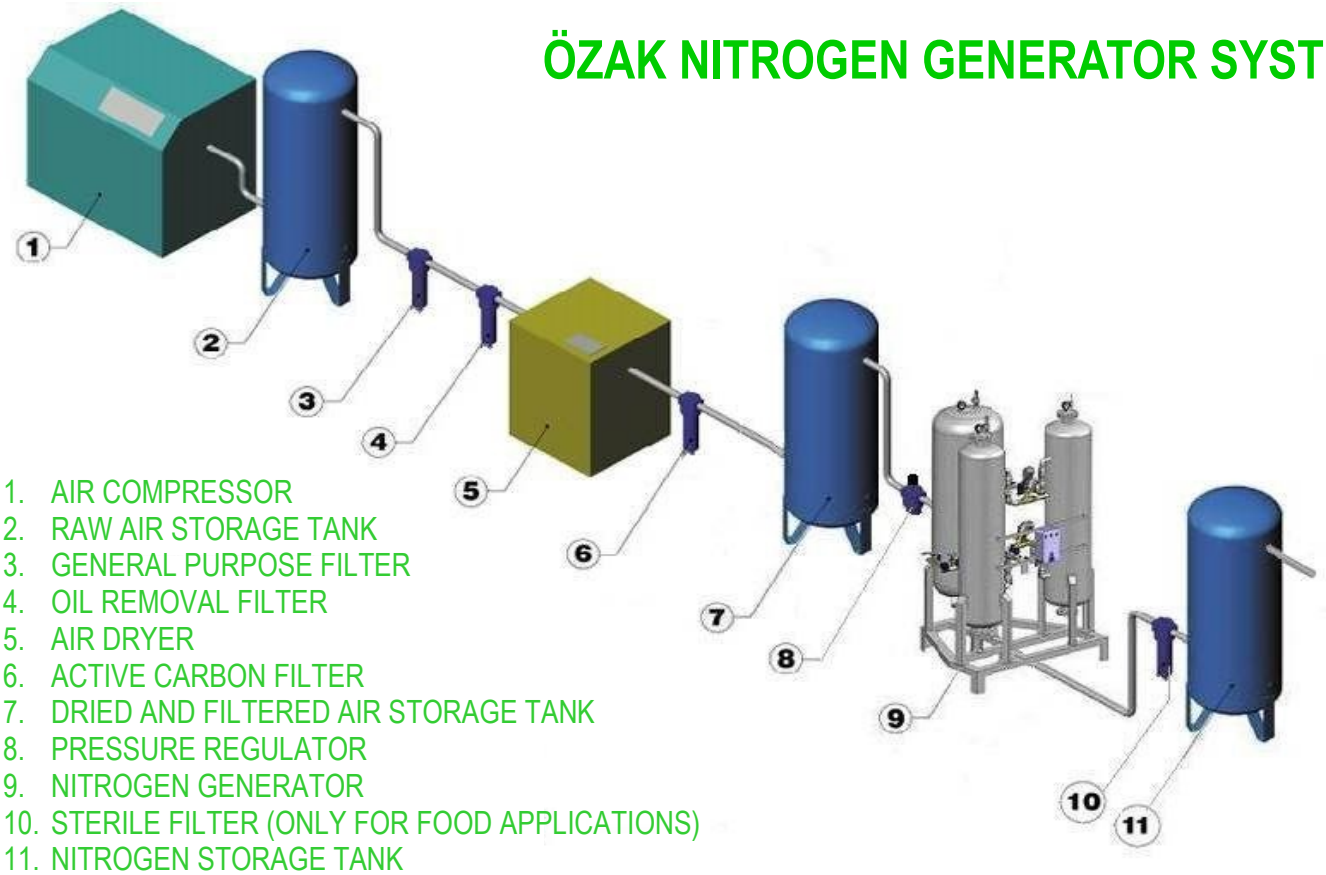
The same nitrogen generator can produce nitrogen of various purities, but its production capacity and efficiency (nitrogen/air ratio) are inversely proportional to purity. As purity goes up, production capacity goes down and specific air consumption goes up. For this reason, it is very important to correctly determine the purity you really need, as this will affect your investment and operating cost directly.

Example Purity Applications:
Blanketing applications: %98 – %99
Blanketing applications: %99,5 – %99,9
Laser cutting: %99,9 – %99,99

If you ask for a purity higher than what you really need, you will get a bigger generator with higher cost, and the nitrogen it produces will cost more since it will use more air.

A typical nitrogen production system comprises some auxiliary equipment and accessories, as shown below:

ÖZAK NITROGEN GENERATOR SYSTEM



1. AIR COMPRESSOR
2. RAW AIR STORAGE TANK
3. GENERAL PURPOSE FILTER
4. OIL REMOVAL FILTER
5. AIR DRYER
6. ACTIVE CARBON FILTER
7. DRIED AND FILTERED AIR STORAGE TANK
8. PRESSURE REGULATOR
9. NITROGEN GENERATOR
10. STERILE FILTER (ONLY FOR FOOD APPLICATIONS)
11. NITROGEN STORAGE TANK

We can supply either only the generator or the complete system, depending on your preference.

We will be happy to provide technical support in the selection of the generator and complementary equipment.

OPERATING PRINCIPLE OF ÖZAK NITROGEN GENERATOR

ÖZAK Nitrogen Generator operates on the proven PSA (Pressure Swing Adsorption) technique. In this technique, nitrogen production is realized basically in two adsorption tanks. These tanks are filled with carbon granules called CMS (Carbon Molecular Sieve). CMS separates nitrogen from air with the help of the difference in sizes of oxygen and nitrogen molecules. It has microscopic pores on its surface which are large enough to hold oxygen molecules but small enough not to hold nitrogen molecules. When compressed air gets in contact with CMS, oxygen molecules are adsorbed (held) by CMS and nitrogen molecules stay free.

Dried and filtered compressed air is introduced into one of these tanks from the bottom. During its travel upwards, oxygen molecules are held by CMS, and nitrogen molecules reach the top. This pure nitrogen is taken out from the top of the tank and sent first to a buffer tank, then to a storage tank or directly to the process.

At the same time, the other tank is blown into the atmosphere from the bottom and purged with a small portion of the nitrogen produced in the first tank, so that its CMS is regenerated and ready to hold oxygen again (Figure 1).

After some time, the CMS in the first tank becomes saturated with oxygen, and the CMS in the other tank becomes completely regenerated (Figure 2).

This time, compressed air is fed into the second tank, and the first tank is blown into the atmosphere for regeneration (Figure 3). These steps are repeated continuously so that a continuous production of nitrogen is obtained.

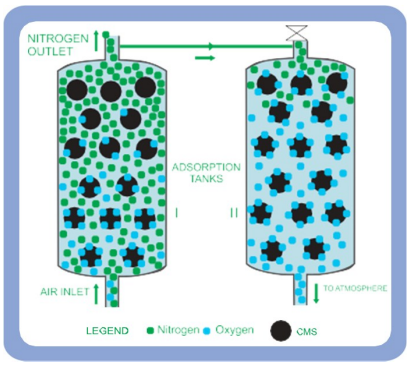


Figure 1

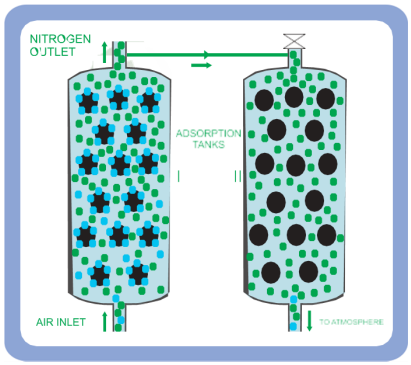


Figure 2

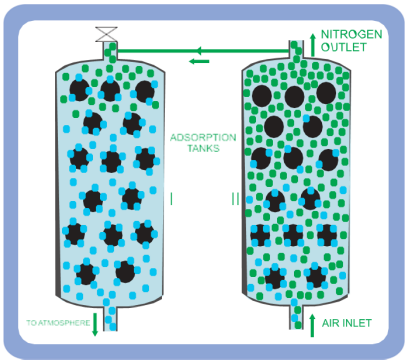


Figure 3

Technical Data

Air separation principle	: Pressure Swing Adsorption
Nitrogen supply pressure	: About 1.5 bar less than air supply pressure (Max. 7 bar)
Power requirement	: 220 VAC ((other voltages optional)
Power consumption	:Negligible (less than 300 W)
Operating environment	: Should be installed in a covered and well-ventilated area.
Operating temperature	: +5 °C … +40 °C

Feed Air Requirement

Min. pressure	: 8,5 bar (It can work at pressures down to 6.5 bar, but with lower capacity)
Max. Temperature	: 30 °C
Oil	: ≤ 0,003 mg/m³
Particulate	: ≤ 0,01 mikron
Dew Point	: ≤ 3 °C

Standard Instrumentation

- Oxygen level is automatically adjusted, continuously measured and displayed.

- If the oxygen content is higher than a user-programmable preset value, the generated nitrogen is diverted to waste so that the product does not get contaminated.

- The generator stops automatically when the nitrogen storage tank pressure rises to a preset value. It will start automatically when the pressure drops. .

- Nitrogen purity can be adjusted by the user.

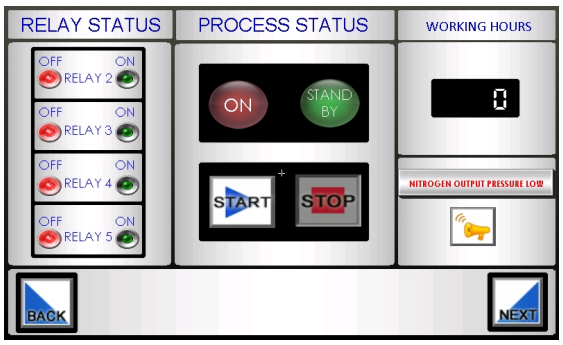
- Displays warning message for changing the element of the activated carbon filter.

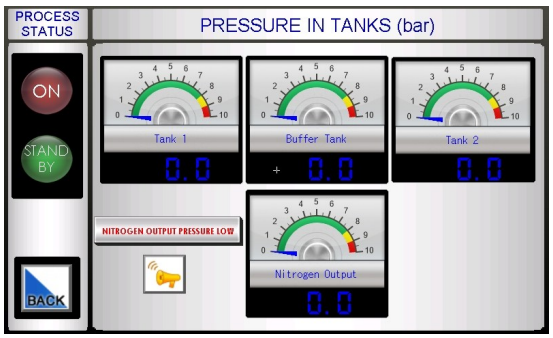
- Displays

- % Oxygen
- Operating hours
- On/Off indicator
- Stand-by indicator
- Three pressure gauges (two for adsorption tanks and one for the nitrogen buffer tank)

Optional Instrumentation and Accessories

Any other features and components that are technically feasible or possible (e.g., touchpad color operator panel, remote access and control, recording of measured parameters etc.) can be provided. Please advise us of any additional requirements you may have. .



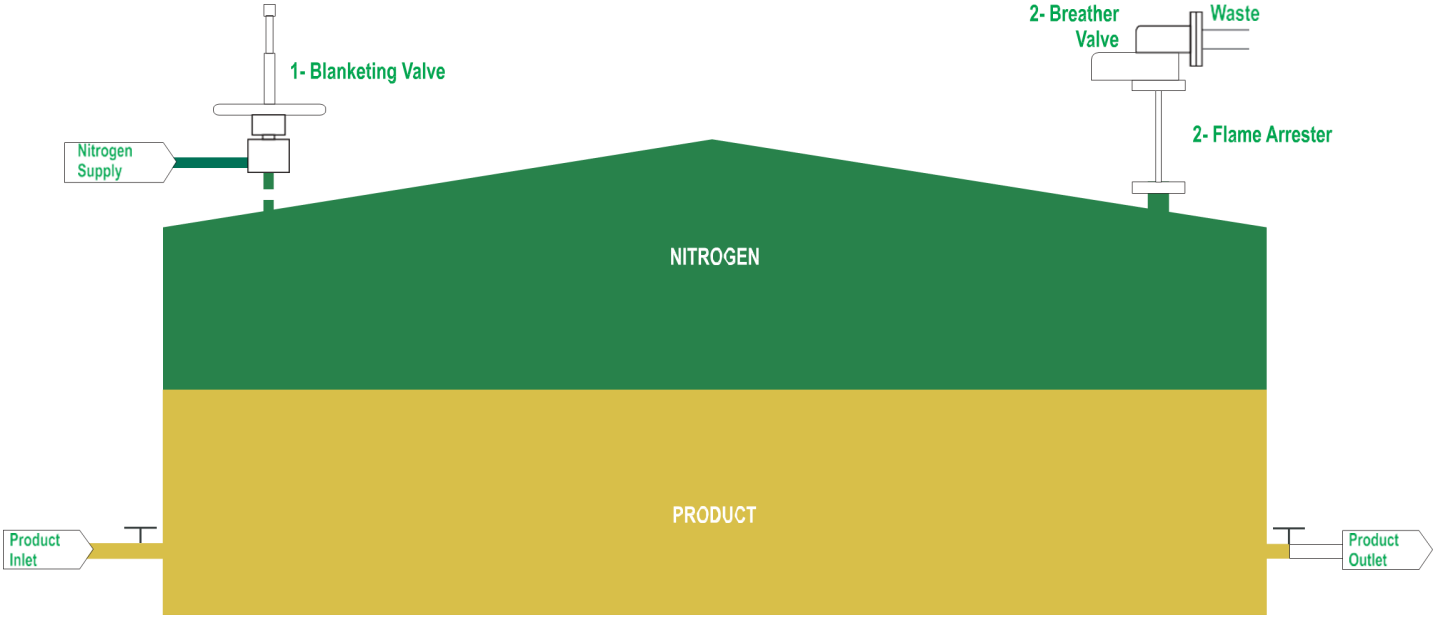


NITROGEN BLANKETING SYSTEMS

In cases where the liquid stored in tanks is not desired to come into contact with the oxygen and humidity in the air, the space above the liquid is filled with an inert gas, usually nitrogen. This is called blanketing.

Tanks where blanketing is applied are atmospheric or low-pressure tanks; nitrogen pressure must be controlled precisely in order to minimize product loss and nitrogen consumption, and also to protect the tank against excessive high or low pressures. This requires precise equipment.

A TYPICAL NITROGEN BLANKETING SYSTEM:



Storage Tank

1. Blanketing Valve (Regulator):

Reduces the pressure of the nitrogen coming from the nitrogen supply (generator, cylinder, liquid nitrogen tank, etc.) to a very low value, on the order of millibars. When the blanket pressure drops below the set value (due to emptying the tank, cooling, etc.), it feeds nitrogen into the tank to restore the pressure.

2. Breather (Pressure/vacuum) Valve:

Protects the tank against excessive high and low pressures. When, for some reason, the blanket pressure rises above the set value (filling the tank, heating, etc.), the pressure pallet opens to relieve the excess pressure.

3. Flame Arrester :

This equipment is used if the liquid in the tank is flammable. It is installed between the tank and the breather valve and prevents flames from entering the tank in case of fire.

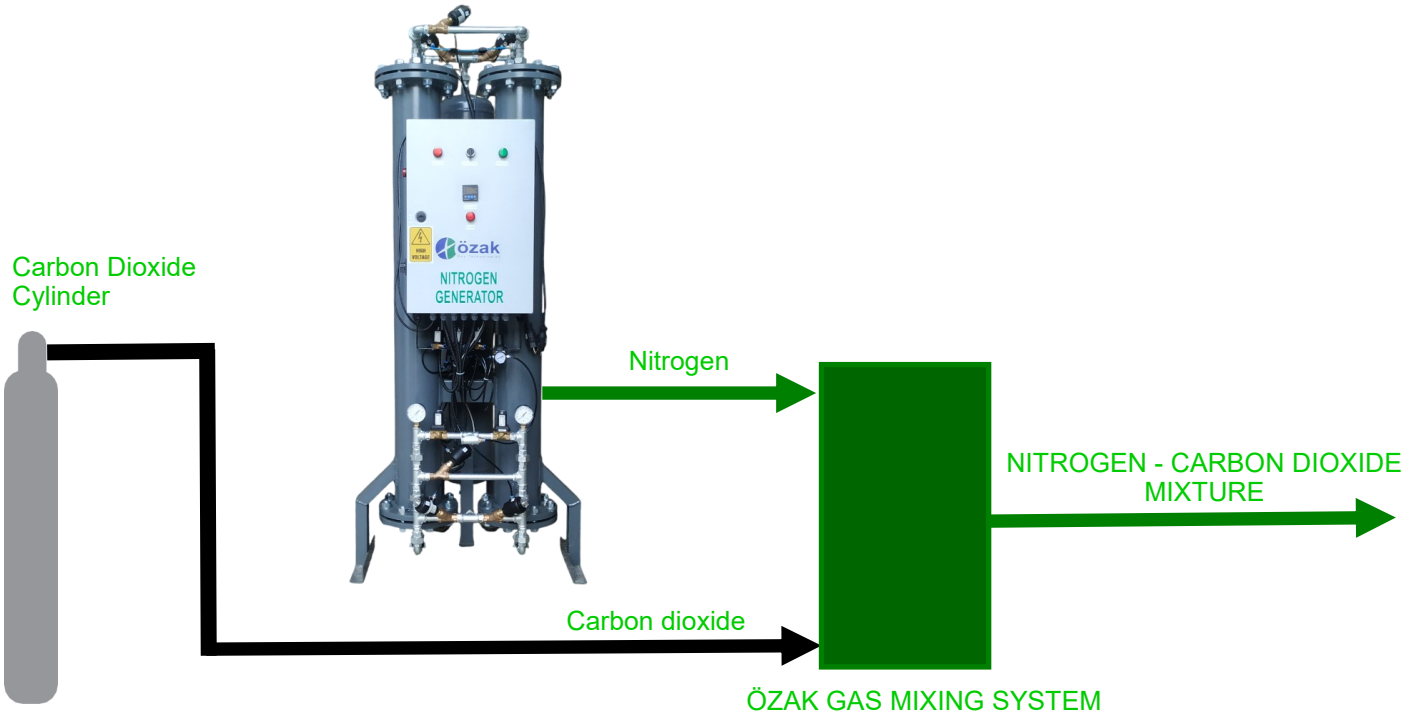
Other equipment may also be used depending on the application. We provide all phases of a blanketing system installation, such as design, equipment selection and supply, and implementation.

In our blanketing systems, we use the best quality equipment available in the world.

GAS MIXING SYSTEMS

If you use a nitrogen–carbon dioxide mixture, we have a very economical solution for you, which is:

- You can produce the nitrogen you need with an Özak Nitrogen Generator.
- Carbon dioxide is a low-cost gas that can be found easily almost everywhere. You can obtain it from your local gas supplier.
- You can mix the two gases with an Özak Gas Mixture System in any proportion you need.



ABOUT US

ÖZAK Gas Technologies was established in 1993 to meet gas demand of industrial and medical enterprises and individuals safely, in compliance with the relevant standards and with optimum prices. Our company, which has progressed continuously since the first day of its establishment thanks to its customer-oriented, innovative and quality-wise non-compromising activities, has always targeted to be "the best" and succeeded in this to a great extent.

Our philosophy of continuous progress has transformed us into a technological company expert in on-site gas production, and we are proud of this.In this context, we developed the ÖZAK Nitrogen Generator, our own design, after hard and careful work.

ÖZAK Nitrogen Generator has ceased nitrogen being an expensive gas and made it easily and economically available to everyone like compressed air.

ÖZAK Nitrogen Generator has proved its quality by being the choice of many users, both domestic and abroad.

TAILOR MADE DESIGN AND PRODUCTION

Every user is unique and deserves special attention. If same products are offered to different users, then some things will be missing. We handle each case specially, work like a tailor, and offer the best solution for that case. Almost all of the generators we manufacture are unique, not identical to any other one.

With our experienced and competent team of engineers, we would like to realize your projects and solve your problems related to gases.

We continuously work on developing our products and ourselves; please follow up with us.

özak
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ÖZAK GAS TECHNOLOGIES

Kiremithane Mahallesi Dr. Cemalettin Tanrıöver Sokak Müzeyyen
Boro İş Merkezi Kat:4 Daire No:26 Akdeniz, MERSİN, TURKİYE
Phone: +90.324.616 0036 E-Mail: info@ozakgaz.com.tr
www.ozakgaz.com.tr