



# AGS

The effective solutions in air  
separation field

**2021**

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# About company

AGS company is a Russian manufacture and supplier of secure gas separation systems. Our factory and offices are situated in Saint Petersburg and Novocherkassk (Rostov region). AGS team consists of top specialists and engineers with a more than 10-year experience of designing and constructing air separation and compressor stations for Russian and foreign industry. Our facilities are designed with regard to peculiarities of Russian and European standards as well as the latest technological innovations and can be adjusted to the requirements of the customer. Currently AGS facilities are being operated at many Russian manufactures of oil and military departments.

# AGS is



57 highly-qualified  
specialists and engineers



170 of completed  
projects



Our equipment is used to get 5  
technical gases: Nitrogen, Oxygen,  
Hydrogen, Argon and Carbon



Manufactures in Saint  
Petersburg, Moscow and  
Novocherkassk with a total  
area of 2500 square meters



# Advantages

We are deeply immersed into the task set by a customer and guarantee cost-effective solutions based on modern technological equipment.



## OUR OWN MANUFACTURE

AGS Company is a manufacturer of air-separation equipment and other absorption systems. The manufacture capabilities allow us to produce engineering stations according to the personal customer's task. The team of professional engineers allows us to solve the most complicated and unique tasks of air separation and industrial gases field in short time.



## EFFECTIVE SOLUTIONS

We focus on increasing the energy efficiency of our equipment by using modern components and unique technical solutions developed in our company. The most important parameter in industrial gases production is the specific energy consumption of the station. Reducing this figure results in more effective use of financial and operational resources.



## TURNKEY PROJECTS

Our competences and experience in supplies allows us to fulfill the most complicated engineering projects and lead them from designing to commissioning with a guarantee for controlled parameters of separation products. Our specialists get deeply immersed into technological process of the customer's case in order to select best ways of supplying the industrial gases.



## INNOVATIONAL EQUIPMENT

While designing and producing our equipment we rely on the results of the advanced researches in the field of air separation and production of industrial gases. The use of advanced knowledge and the extensive practical experience of our engineers guarantees the production of the best equipment at the market of air separation systems.

# We produce

reliable membrane and adsorption nitrogen and oxygen generators of any capacity from the best components on the market. Model range of manufactured products includes:



**ADSORPTION OXYGEN GENERATOR**

Oxygen purity: **up to 95,5 %**  
 Performance: **up to 15 000 nm<sup>3</sup>/h**



**ADSORPTION NITROGEN GENERATOR**

Nitrogen purity: **up to 99,9995 %**  
 Performance: **up to 15 000 nm<sup>3</sup>/h**



**ADSORPTION DEHYDRATORS**

Dew point temperature: **up to - 80° C**  
 Production capacity: **up to 5 000 m<sup>3</sup>/h**





**MEMBRANE NITROGEN GENERATOR**

Nitrogen purity: **up to 99,5% %**  
 Performance: **up to 15 000 nm3/h**

2



**ELECTROLYSIS HYDROGEN GENERATOR**

Hydrogen purity: **up to 99,9995 %**  
 Dew point temperature: **up to -70° C**

2



**CRYOGENIC AIR SEPARATION UNITS**

Gas purity: **up to 99,9999 %**  
 Performance: **up to 40 000 kg/day**



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**MODULAR NITROGEN STATION**

Nitrogen purity: **up to 99,9995 %**  
 Performance: **up to 15 000 m<sup>3</sup>/hour**



**MODULAR OXYGEN STATION**

Oxygen purity: **up to 95,5 %**  
 Performance: **up to 15 000 m<sup>3</sup>/hour**



**COMPRESSOR STATION**

Dew point temperature: **up to -70° C**  
 Performance: **up to 10 000 m<sup>3</sup>/hour**



**BLOCK-MODULAR CONSTRUCTIONS** are produced according to the individual customer's design project or are based on a 20-40 foot shipping container.



# Nitrogen Generator



AGS designs and produces adsorption nitrogen stations that are based on pressure swing adsorption.

## PERFORMANCE

up to 15 000 nm<sup>3</sup>/h

## GAS PURITY

up to 99,9995 %

## ENERGY EFFICIENCY

0,25-0,4 kW/m<sup>3</sup>

## TECHNICAL CHARACTERISTICS

Pressure of separation gas products **up to 400 bar**

life time **20 years**

Guarantee time **2 years**

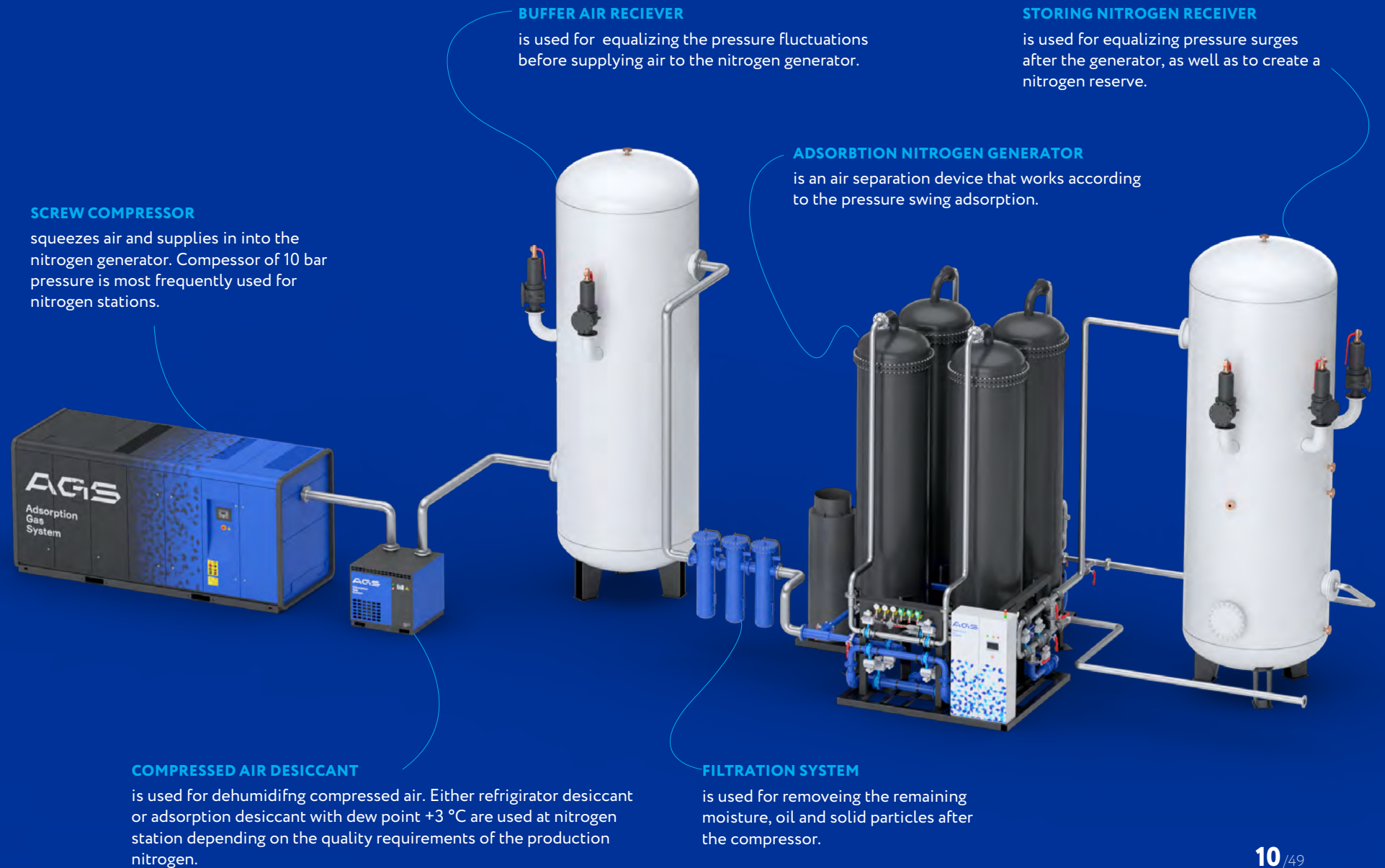
Design options **on the skids, in the container or a room**



Quick access to the mode from 15 minutes. Stepless performance control.



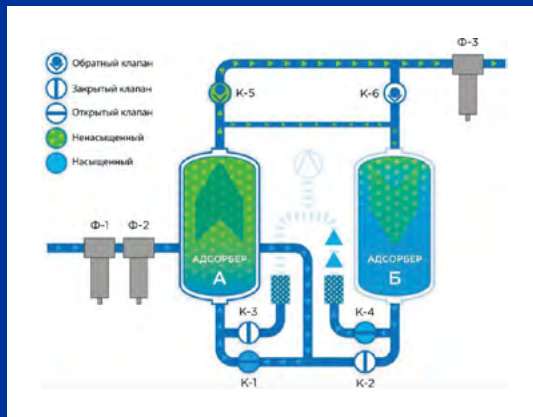
# Nitrogen Station Complectation





# Operation principles of PSA Nitrogen generators

Pressure swing adsorption is a technology of air separation based on using Molecular Carbon Sieves (MCS) or synthetic zeolite. MSC is a granule with a special porous structure



When compressed air passes through the MCS under a certain pressure, due to the difference in the size of oxygen and nitrogen molecules, the adsorbent retains oxygen and water vapor molecules on its surface, allowing nitrogen to pass further.

## DYNAMIC PRELOAD SYSTEM

to prevent attrition of the adsorbent and prevent the appearance of adsorption dust

## ADSORBERS

manufactured specifically for the use under cyclic loads. The internal structure of the adsorbers is designed to improve the characteristics of the station

## SILENCER

for adsorbate discharge and noise reduction

## VALVE BLOCK WITH PNEUMATIC CONTROL

is designed for high cyclic load, with more than 2 million actuation cycles

## CONTROL AND AUTOMATION SYSTEM

is built on the basis of Siemens controllers with a local Touch-screen operator panel.

## CONCENTRATION SET MODULE

to prevent the ingress of substandard nitrogen to the consumer

AGS



# Oxygen generator



AGS designs and develops Oxygen Adsorption Stations based on pressure swing adsorption.

## PERFORMANCE

up to 15 000 nm<sup>3</sup>/h

## GAS PURITY

up to 95,5 %

## ENERGY EFFICIENCY

0,6-1,1 kW/m<sup>3</sup>

## TECHNICAL CHARACTERISTICS

Pressure of separation gas products **up to 200 bar**

life time **20 years**

Guarantee ime **2 years**

Design options **on the skida, in the container or a room**

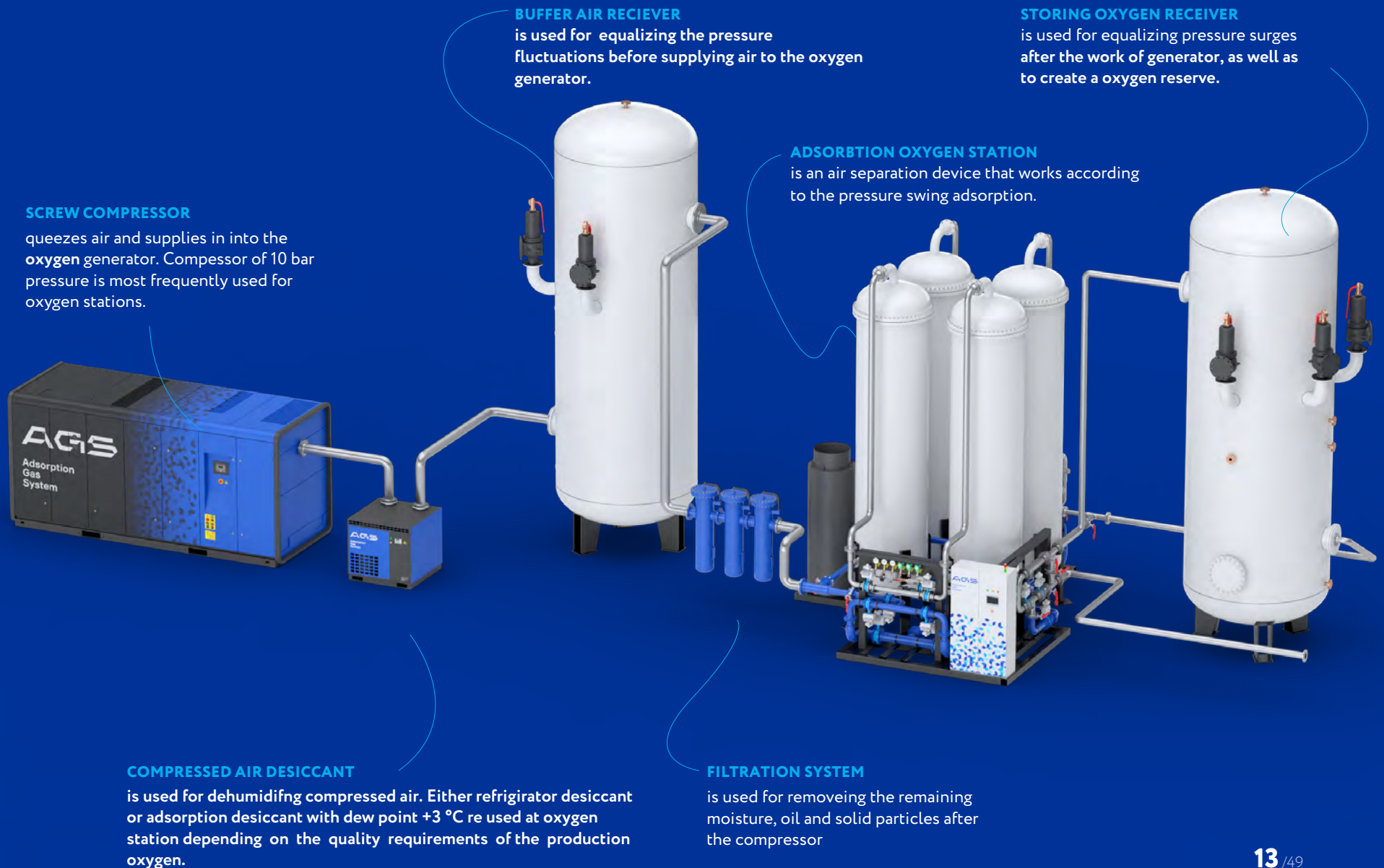


Quick access to the mode from 15 minutes. Stepless performance control.



# Oxygen Station Complectation

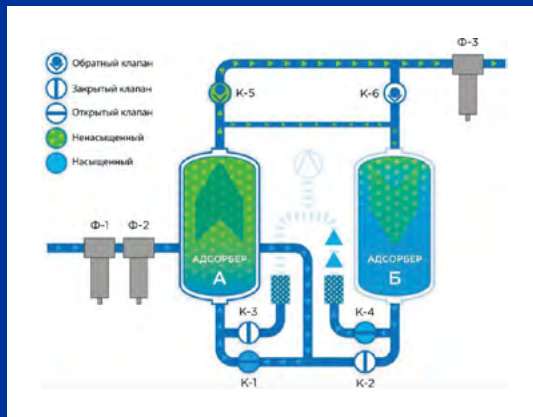
AGS





# Operation principles of SCA Oxygen generators

Pressure swing adsorption is a technology of air separation based on using synthetic zeolite. Zeolite is a granule with a special porous structure. Granular zeolite of special porous structure is used to produce oxygen gas.



When compressed air passes through the zeolite under a certain pressure, due to the difference in the size of oxygen and nitrogen molecules, the adsorbent retains nitrogen and water vapor molecules on its surface, allowing oxygen to pass further. Thus the compressed air after passing the adsorbent layer gets saturated with oxygen of a maximum 95,5 % concentration.

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## DYNAMIC PRELOAD SYSTEM

to prevent attrition of the adsorbent and prevent the appearance of adsorption dust

## ADSORBERS

manufactured specifically for the use under cyclic loads. The internal structure of the adsorbers is designed to improve the characteristics of the station

## SILENCER

for adsorbate discharge and noise reduction

## VALVE BLOCK WITH PNEUMATIC CONTROL

is designed for high cyclic load, with more than 2 million actuation cycles

## CONTROL AND AUTOMATION SYSTEM

is built on the basis of Siemens controllers with a local Touch-screen operator panel.

## CONCENTRATION SET MODULE

to prevent the ingress of substandard nitrogen to the consumer



# Advantages of AGS Adsorption Devices



## ENERGY EFFICIENCY

We focus on improving the energy efficiency of our adsorption plants through the use of modern adsorbents and unique technical solutions developed in our company. The specific energy consumption of 0.26 kWh / m<sup>3</sup> of nitrogen gas at a concentration of 99.5% is achieved through the use of such technologies as improved loading of the adsorption layer, designed strapping and deep automation of the adsorption process.



## ADSORBENT LOADING TECHNOLOGY

The technology of loading the adsorbent affects the laying density and, as a result, further shrinkage during the operation of the station. The loading density of the adsorption layer is an important indicator that can significantly affect the service life of the entire installation during operation. In our installations, we use a specialized device for loading and preloading the adsorption layer, which prevents shrinkage and abrasion during operation – this allows us to preserve the integrity of the adsorbent and prevent the appearance of abrasive dust.



## ADSORPTION LAYER

The internal structure of the column consists of a device for preloading, filtering and distributing the compressed air flow at the inlet of the adsorber. In the adsorption plants, we use a two-layer adsorbent loading, consisting of the main adsorption layer (carbon-molecular sieve) and the protective (drying) layer. The protective layer acts as an additional desiccant and protects against the ingress of droplet moisture, which negatively affects the molecular sieve and destroys it.



## EFFECTIVE ADSORBENT OF HIGH QUALITY

We use only proven adsorbents in our Nitrogen units. The adsorbents get proven on the test stands of our company. Our test stand allows to identify different characteristics of adsorbent of each party and gives us the opportunity to adjust the algorithms of the station's operation. Currently we are using the adsorbent of such brands as Kurarey, CarboTech, UOP.

# Advantages of AGS Adsorbtion Devices



## GUARANTEE OF GAS CONCENTRATION

Every Nitrogen and Oxygen station produced by our company are obligatory to pass full or partial factory tests. Test stands allow to accurately measure the quality of the resulting technical gases, their concentration and impurities. The control and measuring devices of the stand are certified by the VM register and undergo regular verification.



## TECHNOLOGY SAFETY

The adsorption stations operate under a pressure not exceeding 13 atm. To ensure the safety of operation, the vessels (adsorbers) are designed for a service time of 20 years, taking into account the cyclical pressure set, and have safety devices keeping them against pressure increase. Today, the technology of air separation by the adsorption method is one of the safest methods compared to cryogenic stations, gasifiers and supplies in cylinders.



## PROTECTION AGAINST THE INGRESS OF SUBSTANDARD GAS TO THE CONSUMER

The adsorption stations have a small inertia before entering the operating mode from 10 to 90 minutes, depending on the required concentration of the product. Therefore, all stations are equipped by default with a measuring and switching valve block to prevent non-standard product from entering the consumer's network. The automation system allows you to manually or automatically control the supply of technical gases to the consumer or to the discharge.



## ADSORBTION TECHNOLOGY

The technology of adsorbtion stations operation we use in our units is constantly improving and gets tested on our test stand. AGS Adsorbtion Devices operate according to the PSA technology with the use of a direct countercurrent mode of pressure set and countercurrent discharge of the adsorbate. The technology allows the most efficient use of the useful volume of the adsorption layer.



# Membrane Nitrogen Generator



AGS designs and produces Membrane Nitrogen Stations.

## PERFORMANCE

up to 5 000 nm<sup>3</sup>/h

## ENERGY EFFICIENCY

0,25-0,4 kW/m<sup>3</sup>

## GAS PURITY

up to 99,5 %

## TECHNICAL CHARACTERISTICS

Pressure of separation gas products	<b>up to 400 bar</b>
Nitrogen dew temperature point	<b>-70°C</b>
Operating temperature	<b>up to 55°C</b>
Life time	<b>10 years</b>
Guarantee time	<b>2 years</b>
Design options	<b>on the skida, in the container or a room</b>



# Nitrogen Membrane Station basic complectation

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## SCREW COMPRESSOR

squeezes air and supplies in into the membrane modules. Compressor of 25 bar operating pressure is most frequently used for nitrogen membrane stations.

## MEMBRANE MODULES

are designed to separate nitrogen from atmospheric air due to the selectivity property of the membrane fiber material.

## FILTRATION SYSTEM

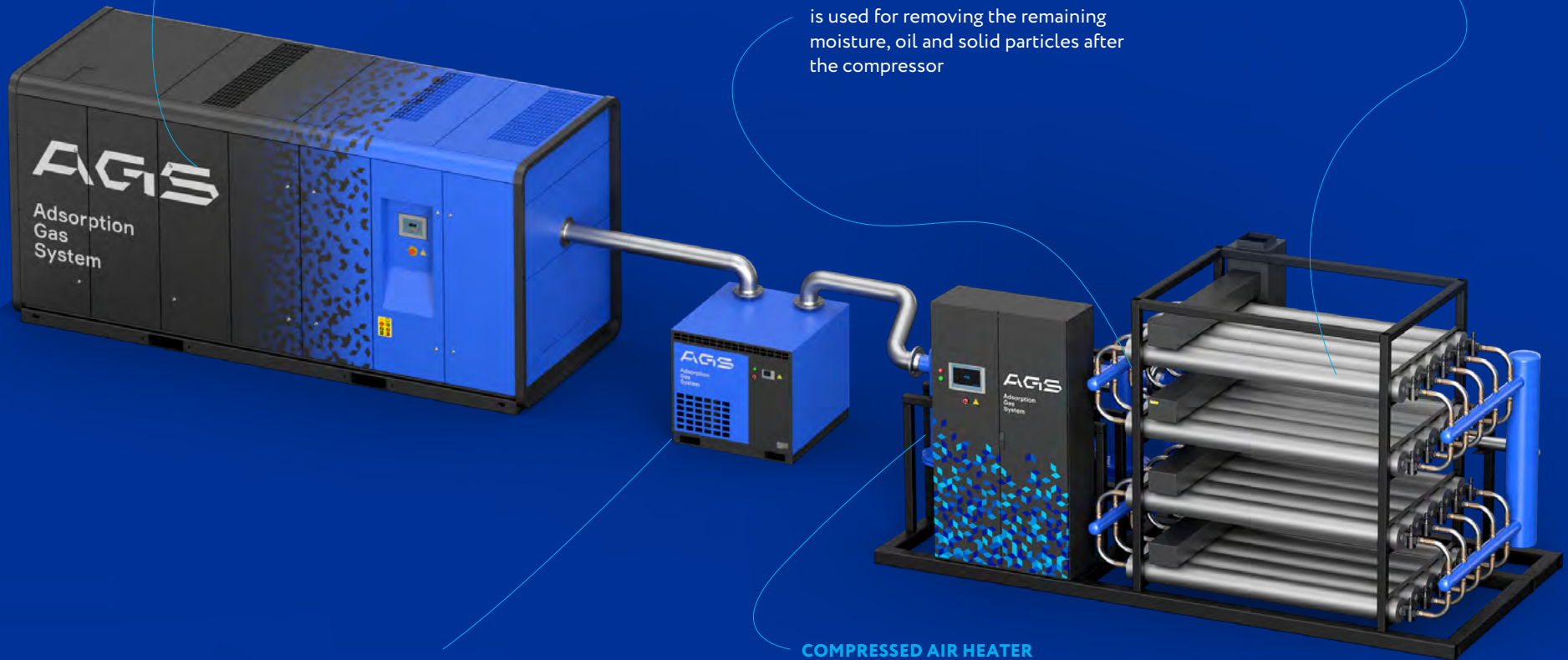
is used for removing the remaining moisture, oil and solid particles after the compressor

## COMPRESSED AIR HEATER

when heated compressed air is supplied, the gas permeability of the membrane fibers increases, that is, the amount of production nitrogen increases.

## COMPRESSED AIR DESICCANT

is used for dehumidifng compressed air. Either refrigerator desiccant with dew point of +3°C or adsorption desiccant with dew point of -70 °C are used at nitrogen station depending on the quality requirements of the production nitrogen.



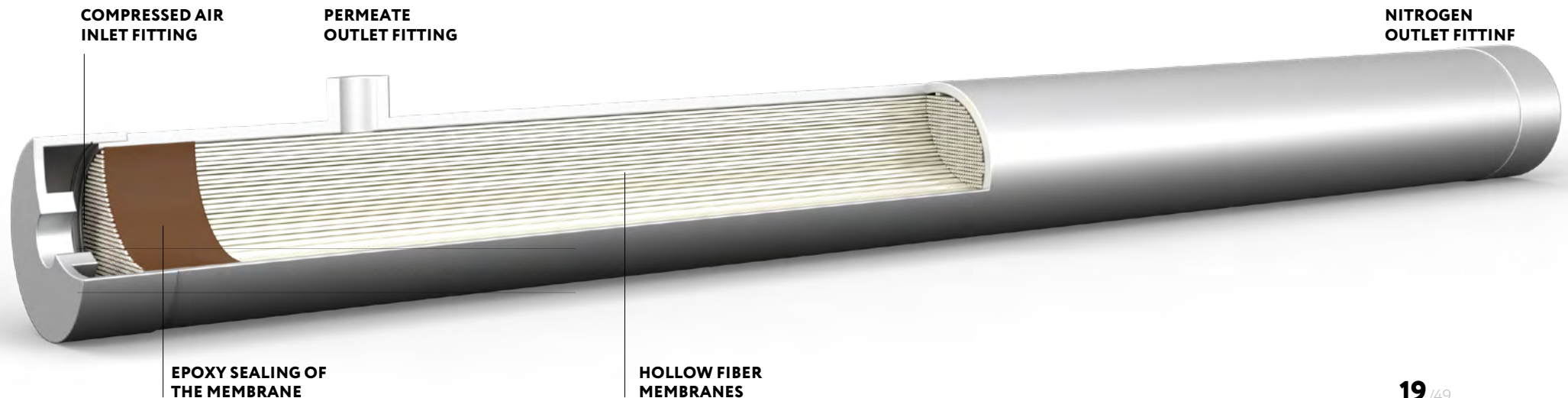
# Membrane module construction

The membrane consists of a " bundle " of selectively permeable hollow fibers. The separation of nitrogen from atmospheric air is based on the principle of selective penetration through the membrane wall. The fibers are stacked in bundles and at the ends are filled with epoxy resin so that the ends of the fibers remain open, then the ends are treated and the resulting membrane is mounted in the housing the membrane module.

It is very important that the air at the entrance to the membrane module is clean and dry. Otherwise the fibers will quickly become clogged, which will lead to a loss of membrane station productivity. It is necessary to install a highly efficient air treatment system, which will ensure the removal of droplet moisture, oil vapors and solid particles. This system extends the life time of the membrane modules.



We produce membrane generators based on membrane modules:





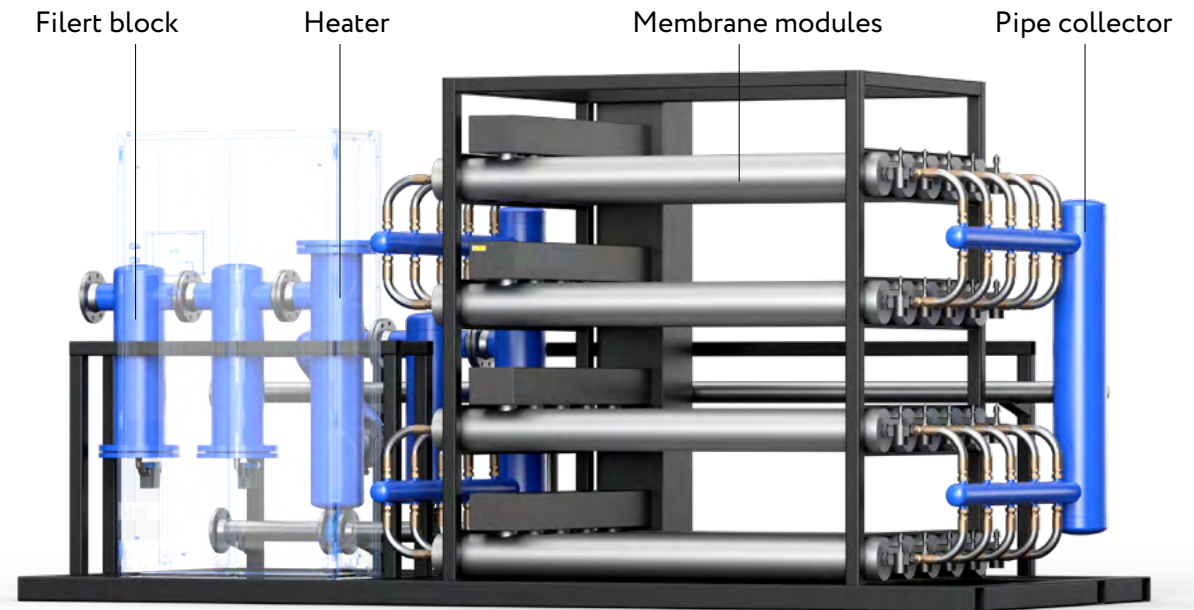
# Operation principles of membrane generator

To separate the nitrogen, the purified and dried compressed air is fed into the membrane gas separation unit. The size of the oxygen molecules is smaller than that of nitrogen, causing oxygen to pass through the membrane fibers faster than the nitrogen molecules. This results in enriching the nitrogen to the required purity inside the hollow fibers, while the air flow enriched with oxygen (permeate) is discharged outside the membrane module. The purity of the production nitrogen can be regulated by setting the working conditions - nitrogen purity increases with decreasing nitrogen flow rate and vice versa. The control is carried out by means of the flow / purity control valve installed after the flow meter and the nitrogen analyzer at the outlet of the membrane module, which allows for the final control of both the flow and the purity of nitrogen. The use of membrane air separation technology is energy efficient in industrial enterprises where there is a need for low nitrogen concentration of 93% -99%.

## DIAGRAM OF THE MEMBRANE GENERATOR OPERATION



## MEMBRANE GENERATOR COMPONENTS



## THE GENERATOR ALSO INCLUDES

- Control unit based on Siemens controllers
- Nitrogen flow meter
- Gas analyzer
- Valve and generator control unit

# Advantages of AGS Membrane Devices



## ENERGY EFFICIENCY

We focus on improving the energy efficiency of our nitrogen membrane plants through the use of state-of-the-art membrane modules and unique technical solutions developed in our company. The specific energy consumption of 0.25 kWh / m<sup>3</sup> of nitrogen gas at a concentration of 99.5% is achieved through the use of technologies: improved loading of the adsorption layer, designed strapping and deep automation of the air separation process.



## PROTECTION AGAINST THE INGRESS OF SUBSTANDARD GAS TO THE CONSUMER

The membrane nitrogen stations have a small inertia before entering the operating mode from 5 to 20 minutes, depending on the required concentration of the product. Therefore, all stations are equipped by default with a measuring and switching valve block to prevent non-standard product from entering the consumer's network. The automation system allows you to manually or automatically control the supply of technical gases to the consumer or to the discharge.



## GUARANTEED NITROGEN CONCENTRATION

All nitrogen stations produced in our company must pass full or partial factory tests. The test bench allows you to accurately measure the quality of the resulting technical gases, their concentration and impurities. The control and measuring devices of the stand are certified by the VM register and undergo regular verification.



## FULL AUTOMATION

The control and automation system of the membrane nitrogen stations allows you to monitor all important process parameters and prevent abnormal situations during operation. The automation cabinet has standard communication interfaces for transmitting signals to the upper level of the ACS via MODBUS TCP/RTU and other protocols.

# Cryogenic Air Separation Units

AGS Engineering designs and manufactures cryogenic air separation plants operating on a low pressure cycle

The resulting products in liquid and gaseous state

**NITROGEN**

**N<sub>2</sub>**

**CONCENTRATION**

up to 99,99995 %

**PERFORMANCE**

up to 200 000 nm<sup>3</sup>/h

**OXYGEN**

**O<sub>2</sub>**

**CONCENTRATION**

up to 99,9 %

**PERFORMANCE**

up to 65 000 nm<sup>3</sup>/h

**ARGON**

**Ar**

**CONCENTRATION**

up to 99,99995 %

**PERFORMANCE**

up to 4 000 nm<sup>3</sup>/h

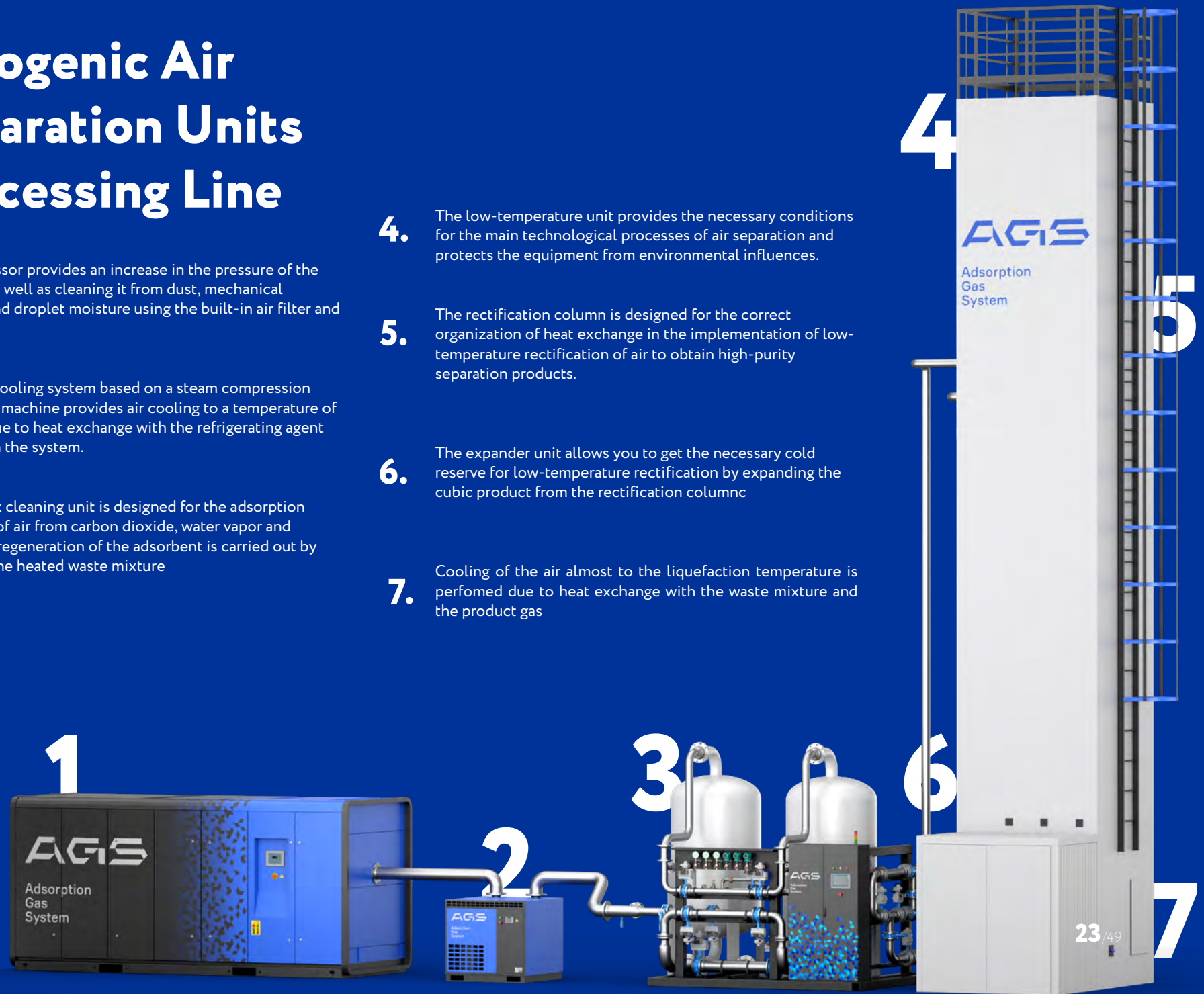




# Cryogenic Air Separation Units Processing Line

- 1.** The compressor provides an increase in the pressure of the source air, as well as cleaning it from dust, mechanical impurities and droplet moisture using the built-in air filter and separator.
- 2.** The air pre-cooling system based on a steam compression refrigeration machine provides air cooling to a temperature of +3 - +7 °C due to heat exchange with the refrigerating agent circulating in the system.
- 3.** The complex cleaning unit is designed for the adsorption purification of air from carbon dioxide, water vapor and carbon. The regeneration of the adsorbent is carried out by the flow of the heated waste mixture

- 4.** The low-temperature unit provides the necessary conditions for the main technological processes of air separation and protects the equipment from environmental influences.
- 5.** The rectification column is designed for the correct organization of heat exchange in the implementation of low-temperature rectification of air to obtain high-purity separation products.
- 6.** The expander unit allows you to get the necessary cold reserve for low-temperature rectification by expanding the cubic product from the rectification column
- 7.** Cooling of the air almost to the liquefaction temperature is performed due to heat exchange with the waste mixture and the product gas



# Electrolysis Hydrogen Generators



AGS Engineering designs and manufactures hydrogen electrolysis stations

## PERFORMANCE

200 nm<sup>3</sup>/h

## ENERGY EFFICIENCY

from 0,2 kW/m<sup>3</sup> of the product



Low power consumption - 5,1 kWh/ Nm<sup>3</sup>



Load control from 0% to 100% - Fully automated control system



Quick start (within 10-20 seconds)



Corrosion-proof pipelines and designs



# Electrolysis Hydrogen Generators

AGS



## WIDE RANGE OF HYDROGEN GENERATORS IN PERFORMANCE

0,66 – 170 nm<sup>3</sup>/h Allows you to choose the optimal solution for production without overpaying for excess cubic meters of gas



## HYDROGEN CONCENTRATION UP TO 99,9998%

The electrochemical method allows to obtain high purity hydrogen up to 99.9%, then, to achieve a hydrogen concentration of 99.9998%, small oxygen impurities are removed by catalytic afterburning on a palladium catalyst in a DEOXO column.



## HYDROGEN PRESSURE UP TO 30 BAR

The design features of hydrogen generators and the flexibility of the process make it possible to produce hydrogen directly under pressure from 4 to 30 bar, without the use of expensive booster units.



## HYDROGEN DEW POINT TEMPERATURE UP TO -75°C

The drying system integrated in the technological unit, consisting of two columns, in which the alternating process of drying and regeneration takes place, allows to obtain a hydrogen dew point up to -60°C or optionally up to -75°C.



# ADSORPTION DESICCANTS



“AGS Engineering” designs and manufactures adsorption compressed air desiccants using short-cycle adsorption technology.

## PERFORMANCE

up to 500 m<sup>3</sup>/min



### SERVICE LIFE > 5 YEARS

In our dehumidifiers, we use only high-quality and proven CarboTech adsorbents.



### DEW POINT SENSOR

An integrated dew point sensor allows you to control adsorption cycles in a more economical mode.



### VALVE HARNESS

The valve strapping is implemented on the basis of pneumatic valves SMC and FESTO, designed for 2 million cycles of operation.



### MODULAR CONSTRUCTIONS

The dehumidifiers are compact in size and modular in design, so commissioning will take no more than two hours.



### ADAPTIVE MANAGEMENT

The intelligent control system allows significant savings in compressed air for regeneration.

## DEW POINT TEMPERATURE

from -20  
to -70 °C





# The lineup of desiccants

AGS

In the GA series adsorption desiccants, only high-quality European components with extended service life and increased reliability are used



**GA 5-16**

Performance – 0,3-1 m<sup>3</sup>/min,  
cold regeneration



**GA 20-84**

Performance – 1-5 m<sup>3</sup>/min,  
cold regeneration

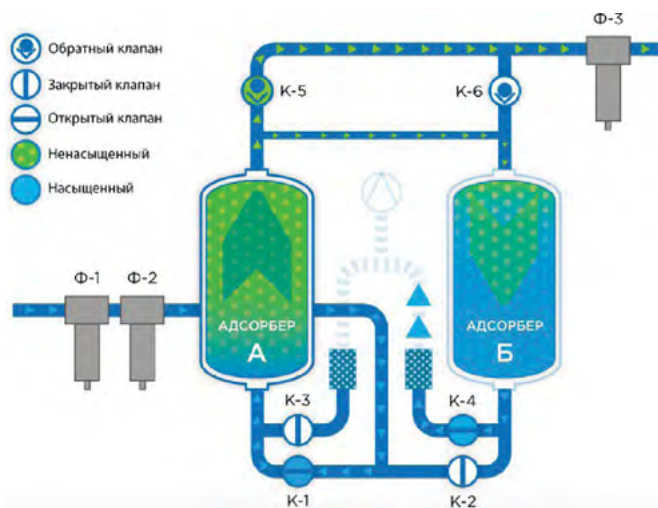


**GA 100-15**

Performance – 6-90 m<sup>3</sup>/min,  
cold regeneration

# Operation principle of the adsorption desiccant

The principle of operation of the adsorption desiccant is based on the absorption of moisture vapor by the solid surface of the adsorbent (active aluminum oxide): The source air from the compressor is supplied to the dryer through a filter (F-1 and F-2), which cleans it of oil and drip moisture. Next, air enters the column "A", where moisture is absorbed using a layer of active alumina, and then through the dust filter (F-3) to the consumer. During the drying stage in the column "A", the process of absorption of moisture occurs, and in the column "B" - the regeneration stage. "Cold" regeneration - The adsorption process is an equilibrium process in which the adsorption time is equal to the desorption time.



## HIGHLY EFFICIENT ADSORBENT

In our generators we use only high-quality and proven adsorbents.

## ADSORBENTS

Made of aluminum pipe with a polished surface and air distribution devices over the cross section.

## BUILT-IN FILTERS ВСТРОЕННЫЕ ФИЛЬТРЫ

All dehumidifiers are supplied with filters installed at the inlet and outlet.

## DEW POINT SENSOR

At the outlet of the dryer, a dew point converter is installed to control the cycles when the adsorbent is saturated.

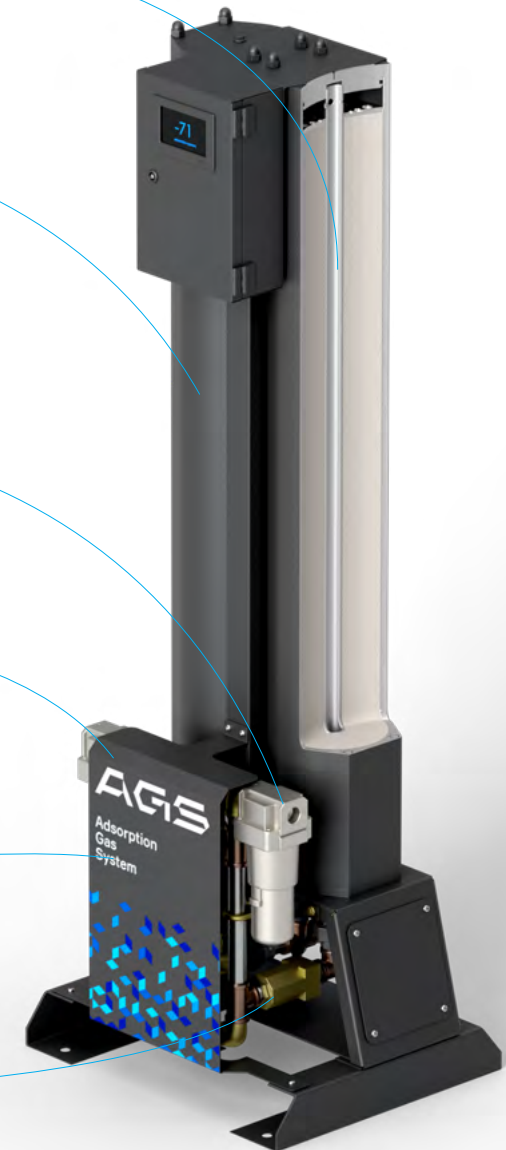
## TWO TYPES OF REGENERATORS Д

GA series dehumidifiers can be supplied with two regeneration methods: Cold and Hot Vacuum.

## PNEUMATIC VALVES П

Pneumatic piping is designed for 2 million cycles of unloading load.

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# Compressor Units



Our company manufactures and supplies compressor stations on the "skida" and in a block-modular design.

## PERFORMANCE

up to  $250 \text{ nm}^3/\text{min}$

## PRESSURE

up to 400 bar

## DEW POINT TEMPERATURE

up to  $-80 \text{ }^\circ\text{C}$

## STATION COMPLECTATION INCLUDES:



Filtration systems and removal of droplet moisture



Complex systems of automation and distribution of compressor loading



AGS drying and cleaning units



Compressor equipment of AGS and partner manufacturers



# Block-modular constructions

AGS

AGS Block-modular stations can be designed according to the personal customer's requirements and can be based on a 20 or 40 ft shipping container.



Modular Nitrogen stations are equipped with adsorption and membrane nitrogen generators, oxygen adsorption generators produced by AGS, as well as compressor equipment of Atlas Copco, Alup, Remeza, Kaeser, Sauer etc.



# Technical advantages



Block-modular nitrogen stations of AGS are delivered in full factory readiness and are equipped with engineering systems necessary for round-the-clock autonomous operation in any climatic conditions.



## FULL AUTOMATION OF THE TECHNOLOGICAL PROCESS

Equipment control, temperature control, ventilation, recovery, fire extinguishing, automatic reserve input, data transmission and security systems are installed in the container.



## THE CAPACITY OF ONE UNIT IS 750 M3 / H

We have worked out the structural part of the container in such a way that all the equipment installed inside works in compliance with the temperature regime and the required ventilation.



## OPERATION OF STATIONS FROM -50 °C TO +50 °C

The container's thermal control system, combined with the insulation materials and design solutions used, allows the equipment to be operated continuously for 24 hours a day.



## FULL FACTORY READINESS

The equipment installed inside the block box is fully ready for operation and tested at our company. If the installation site is ready, the time to start the station is reduced to a minimum.



# Nitrogen station complectation

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LED lighting



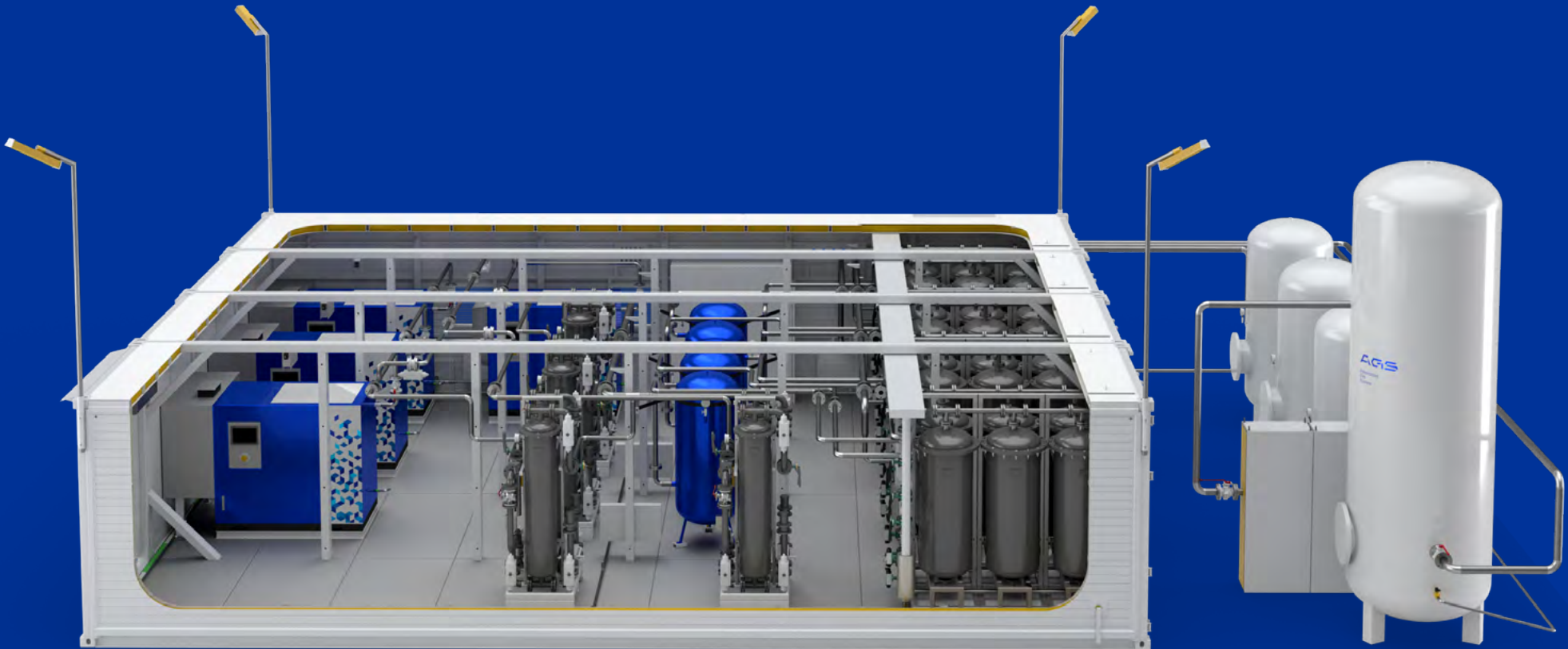
The ventilation and recuperation system is based on BELIMO drives



Fire alarm and powder extinguishing system



High-quality 100 mm eco-friendly, non-flammable insulation



Heating system



Automation system  
Siemens, Omron, Phoenix  
Contact, Oven



Aviation enamel (service  
life up to 25 years)



Air conditioning system

# Main components and assemblies of the block-modular station



## CLIMATE VERSION

Operating temperature from -50 to +50 °C The insulation of the container is made of non-flammable sandwich panels with a thickness of 50-100 mm. The design of the block container is selected individually in accordance with State Standard GOST 15150 69 and the customer's requirements.



## HEATING

Wall-mounted convectors and thermal curtains, the temperature regime is regulated by temperature sensors of the unified automated control system of the modular station.



## MANAGEMENT SYSTEM

The control system is a separate dust-and moisture-proof cabinet, with a protection class of at least IP54. The automated control system is made on the basis of a Siemens PLC as standard, but it can also be made to meet the individual requirements of the customer. The system provides fully automated operation of the station, and also allows remote control from the automated control station.



## VENTILATION AND HEAT RECOVERY SYSTEM

It is equipped with industrial fans and air valves with electric drives, controlled by the general automated control system of the station in accordance with the set parameters of the microclimate and the signals of the gas-air environment sensor inside the container. It is also possible to install an air conditioning system.



## FIRE AND SECURITY ALARM SYSTEM

As standard, the block container is equipped with a fire alarm system, and it is also possible to install powder fire extinguishing. Automatic transmission is designed to detect and extinguish a fire, issue a signal from the AT system in the customer's personal control system.



## INPUT AND DISTRIBUTION DEVICE

The package of delivery of the block-modular station includes a ASU cabinet with 1 or 2 power inputs and automatic switching by means of an ASU. Installation and laying of cable in boxes and branches in a metal jacket in Polyvinyl chloride insulation. The UPS is also included in the delivery package, which allows you to monitor the parameters and control the shut-off valves in the event of power outages and emergency stops.

# Completed projects



PG "Fosforit", Kingisepp

## The shipping of Blok- Modular Nitrogen station GB-1500

### THE TASK SET

Design, manufacture and put into operation a block-modular nitrogen station for the degassing of ammonia railway tanks. Place the unit directly in the liquid ammonia warehouse, taking into account the aggressiveness of the operating environment. Calculate and install a nitrogen gas heater up to 140 °C.

### SOLUTION

We have implemented a technical solution based on two units: a "Nitrogen" block box- implemented on two AGS GN-750 nitrogen generators with a capacity of 750 m<sup>3</sup> / h each, mounted in one block box with compressed air receivers.

"Compressor" block-box – it is equipped with two Atlas Copco GA 160+ compressors, one of which is frequency-controlled. The automation system is implemented on the basis of the Siemens s7-1200 controller with a local operator panel 9" Toch Screen. The automation system allows you to operate the station completely in automatic mode without the presence of an operator. The station's preset parameters are maintained completely automatically.

#### PERFORMANCE

1 500 nm<sup>3</sup>/h

#### GAS CONCENTRATION

97 %

#### PRESSURE

7 bar



# PG «Fosforit»

AGS





"Testpribor", Kazan

# Block-modular Nitrogen and Hydrogen station

## THE TASK SET

Design, manufacture and supply a plant for the production of industrial nitrogen and hydrogen gases with a concentration of 5 ppm of residual oxygen. The station must be located in a single container and be fully automated to operate without the presence of an operator.

## SOLUTION

The block-modular nitrogen-hydrogen station is designed and manufactured for the simultaneous production of: nitrogen: 99.9995% with a capacity of 30 m<sup>3</sup> / h at a pressure of 7 atm; hydrogen: 99.9995% with a capacity of 16 m<sup>3</sup> / h at a pressure of 5 atm. The station has an automated control system based on a Siemens controller and a 15-inch operator panel. The entire process of production of technical gases is fully automatic and does not require the presence of an operator for a long time. The package includes: AGS nitrogen generator; EreDue Hydrogen generator; EreDue; Система подготовки сжатого воздуха Alup(Atlas Copco) Compressed Air Preparation System; AGS Unit module; AGS automation system; AGS water treatment system.

### PERFORMANCE

16 m<sup>3</sup>/h

### GAS CONCENTRATION

99.9995%

### PRESSURE

5 bar



# «Testpribor»

AGS





PJSC "Lukoil", Omsk

«Lukoil»

**THE TASK SET**

Design and manufacture an oxygen adsorption unit for filling standard 40L cylinders up to 150 Bar.

**SOLUTION**

We have made the installation in a block-modular design and in full factory readiness. All equipment is mounted in a 9-meter container with an insulated ramp for filling oxygen cylinders up to 150 Bar with a concentration of 95%.

**PERFORMNACE**

24 m<sup>3</sup>/h

**GAS CONCENTRATION**

95 %

**PRESSURE**

150 bar





**THE TASK SET**

Drying of compressed air in the volume of 700 m<sup>3</sup> / min to the dew point of -60 C

**SOLUTION**

Specialists of LLC "AGS" designed and produced a block-modular station for drying compressed air, consisting of three non-standard, custom-made block containers combined in a common machine room. In the common room there is a compressed air filtration system, three adsorption dehumidifiers with hot regeneration, as well as auxiliary equipment. The operating mode of the unit is continuous, fully automatic.

**PERFORMNACE**

540 m<sup>3</sup>/min

**GAS HUMIDITY**

-40°C

**PRESSURE**

10 bar



«URAL-PROM» Shelekhov





«SyPly»  
Syktyvkar

**PERFORMNACE**

12000 m<sup>3</sup>/h

**GAS HUMIDITY**

-40°C

**PRESSURE**

10 bar

**THE TASK SET**

AGS was tasked with developing and manufacturing a 12,000 m<sup>3</sup>/h hot-regenerated compressed air desiccant with the use of steam as a heat source for heating the regenerated air. Decision

**SOLUTION**

Our specialists have calculated the main parameters of the adsorption desiccant with the operating parameters that are necessary for the customer. As the main heat source, we used a plate heat exchanger in which steam is supplied to one cavity and regeneration air to the other. As a reserve, the dehumidifier is equipped with an electric heater. The regeneration air source is a high-pressure blower.



# «SyPly» Syktyvkar





**«COMEXI»  
Uzbekistan**

**PERFORMNACE**

**180 m<sup>3</sup>/h**

**GAS CONCENTRATION**

**99.998 %**

**PRESSURE**

**7 bar**



**THE TASK SET**

Delivery of a turnkey nitrogen station for the printing equipment of the newly created production in the Republic of Uzbekistan. The unit must be installed indoors and provide a flow of nitrogen gas with a concentration of 99.998%. Decision

**SOLUTION**

Our specialists have developed and produced the ABC-600A nitrogen adsorption generator. As a source of compressed air, we selected the Alup oil-filled screw compressor. The produced station allows you to work 24 hours a day in fully automatic mode.



# «COMEXI» Uzbekistan



# Design



Specialists of the design department of AGS LLC have high qualifications and many years of experience in designing and developing design documentation for the construction of air separation plants, reconstruction of industrial facilities, and technical re-equipment of hazardous production facilities. LLC "AGS" has all the necessary competencies, as well as licenses and permits to perform the following works:

- 1 Development of a feasibility study for the implementation of the project
- 2 Development of project documentation
- 3 Development of documentation for technical re-equipment of a hazardous production facility
- 4 Working and design documentation developments
- 5 Passing the examination of industrial safety documentation for technical re-equipment, conservation and liquidation of a hazardous production facility
- 6 Registration (re-registration) of hazardous production facilities in the State Register of Hazardous Production Facilities
- 7 Passing the examination of industrial safety of technical devices at the hazardous production facilities



# Our offer



## POST-WARRANTY SERVICE OF THE EQUIPMENT

The team of service engineers of AKS LLC performs diagnostics, commissioning, and maintenance of air separation units, compressor equipment, both of its own production and of the production of other companies. Service engineers have licenses and certificates for warranty and post-warranty maintenance of compressor equipment from a number of world manufacturers.



## INSTALLATION AND COMMISSIONING

The team of service engineers of AKS LLC carries out installation and commissioning of equipment of any complexity, including work on the piping of pipelines, bringing the equipment to the design capacity, instructing the customer's personnel.

# Our customers

AGS



GAZPROM



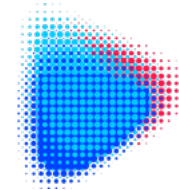
ROSATOM



TESTPRIBOR



EUROCHEM



NOVATEK



LUKOIL



ROSNEFT



BASHNEFT



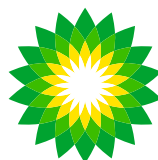
SIBUR



RUSAL



PETON



BP



TATNEFT



YANOS



SLAVNEFT

# Geography of shipping



- A** Almaty
- V** Volgograd  
Voronezh
- D** Darkhan  
Derbent  
Dushanbe
- Y** Yerevan

- Z** Zernograd
- K** Kazan  
Kaliningrad  
Kaluga  
Kizlyar  
Kingisepp  
Kostroma  
Krasnodar  
Crimea

- L** Lipezk  
Liski
- M** Maycop  
Moscow
- N** Novosibirsk
- C** Orel

- P** Perm
- R** Rostov-on-Don
- S** Saint Petersburg  
Sakhalin
- T** Tambov  
Tbilisi  
Tyumen

- X** Khabarovsk  
Khujand
- Ш** Shchelkovo
- Э** Elektrogorsk
- Я** Yakutsk

# Interaction process



- Customer's request
- Technical specification



- Technical specification analysis
- Engineer's visit
- Pneumoaudit
- Engineering and technical analysis
- Exchange of information with the customer, clarification of information



- Designing
  - Equipment selection
  - System engineering
  - Modernization
  - Set of design documentation
  - Passing tests
  - Engineering and technical conclusion and justification
  - Equipment shipment
  - Construction and installation works
  - Commissioning works



- Delivery-acceptance by the customer



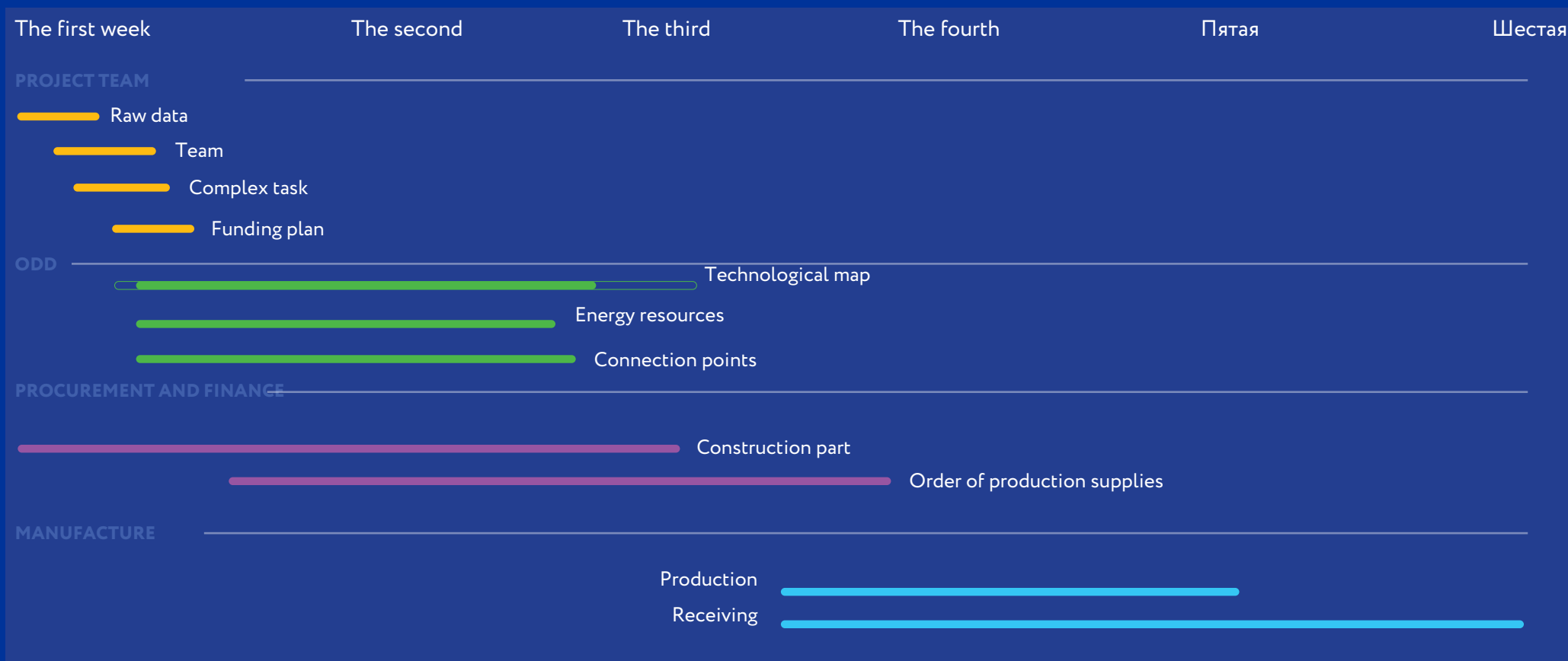
- Remote monitoring and monitoring of equipment
- Maintenance services
- Engineering support
- Guarantees



# PROJECTS MANAGEMENT



AGS has implemented modern solutions in the field of project management. The system allows you to accurately predict the timing of the project and timely notify of possible delays. The AGS project management system allows you to provide secure access to the system for the customer's specialists, thereby allowing you to monitor the project implementation process.



# Our manufacture

**AGS**

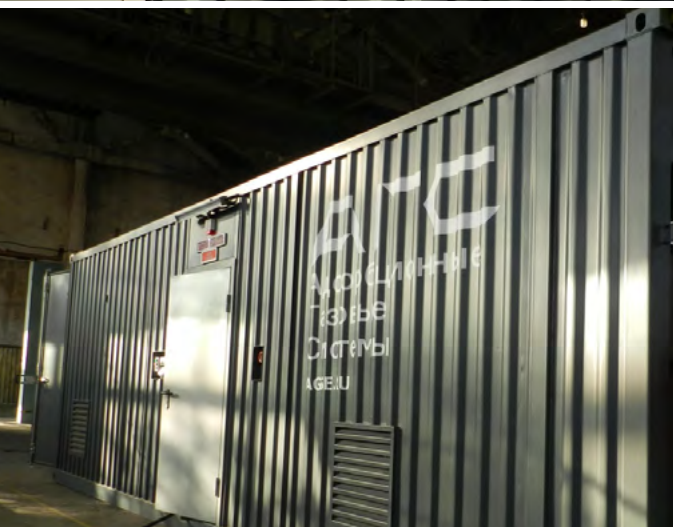
AGS is a manufacturer of air separation equipment and other adsorption systems. The availability of production facilities makes it possible to produce engineering stations according to the individual task of the customer. The presence of a professional team of engineers allows you to solve the most complex unique problems in the field of air separation and technical gases in the shortest possible time.

2 500 m<sup>2</sup>

**TOTAL MANUFACTURE  
AREA**

40

**SPECIALISTS**

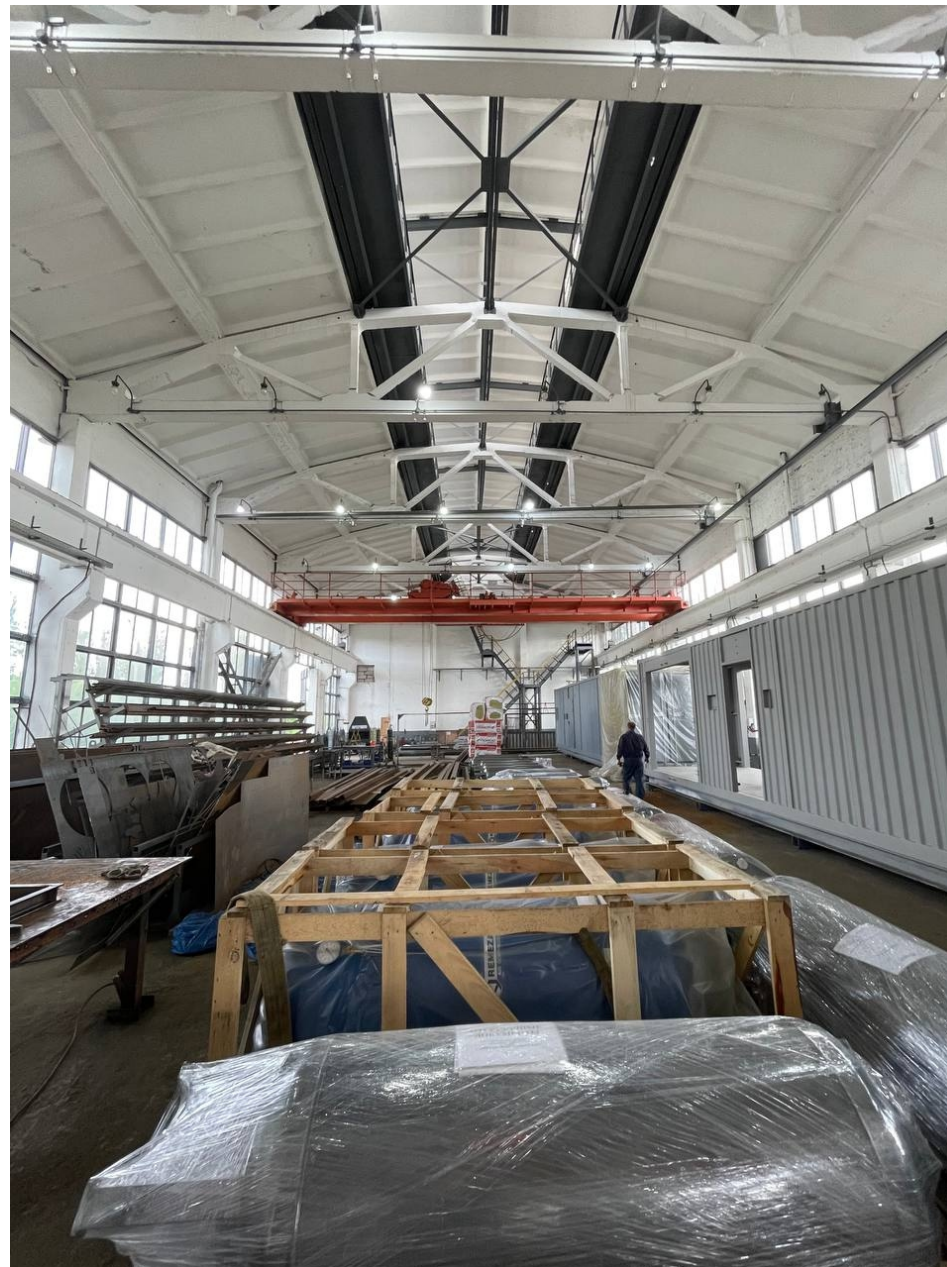




Assembly of serial generators



Equipment acceptance and welding shop



# Our production capabilities

Production of more than 25 pieces of equipment of various complexity at the same time



Equipment manufacturing cycle from 2 months



Factory tests of all commercially produced adsorption generators



Extensive inventory of components, including adsorbent



Production of modular structures according to the individual task of the customer



Production of adsorption generators according to individual technical specifications



# Contacts



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WE INVITE YOU TO VISIT OUR MAIN MANUFACTURE AND OUR OFFICE

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Thank you for your attention

# AGS Adsorption Gas System

This presentation is intended for a brief introduction to our company. Some equipment may differ in color and shape depending on the technical characteristics and equipment configuration.

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