



# KURGANKHIMMASH

**MODULAR  
COMPRESSOR  
STATIONS**





## About us



Kurgankimmash is one of the leading Russian businesses specializing in designing and manufacturing of compressor equipment for upstream and downstream sectors of the oil and gas industry as well as for the energy sector and many other industries.

Kurgankimmash is an officially certified distributor and packager of the Ariel Corporation, the largest global manufacturer of piston compressors.

We manufacture compressors in accordance with any and all requirements of the customer. Series-produced components are used during manufacturing.

The status of an official packager allows us to supply Ariel compressors with no limitations imposed as well as provide aftermarket services, i.e. supply spare parts and provide maintenance for the equipment.

We can help you choose the most suitable equipment and will manufacture a compressor station for the given conditions.

### We can provide:

- equipment design and manufacturing;
- modernization and repairs of technological equipment;
- supervised installation and startup;
- personnel training.

### Among our regular customers are:

PJSC "Lukoil", OJSC "RITEK", PJSC "Gazprom neft", OJSC "NK "Rosneft", OJSC "NOVATEK", OJSC "Surgutneftegaz", PJSC "Gazprom", and others.

### Manufacturing capabilities of the MCS assembly area.

Facilities engaged in manufacturing of the modular compressor stations occupy a total production area of 6,000 m<sup>2</sup>. The compressor station assembly workshop is equipped with stands (benches) for X-ray analysis, hydro-testing as well as frequency inverters intended for testing compressor stations equipped with electric motors. A natural gas supply system for testing the compressor stations with gas reciprocating engines.

### Standard applications:

- disposal of oil-associated gas;
- gas piping;
- gas re-injection into the reservoirs;
- pumping gas out of the pipelines;
- pipeline pressure testing;
- industrial-scale collection and compression of natural and oil-associated gas;
- boosting of the fuel gas;
- gas processing and various applications in the petrochemical industry;
- gas lift.

Our design engineers develop compressor stations in full compliance with all the regulations, rules, and standards of the Russian Federation. The list of parts and accessories is subject to approval of the Customer in the course of implementation of the design stage.

Our service engineers are constantly improving their skills and regularly undergo training at plants engaged in manufacturing main pieces of equipment for compressor stations.



Modular compressor stations (MCS) are fully autonomous and automated stations which can be operated at temperatures between -60°C and +50°C.

Depending on the size and arrangement of the main technological equipment, the compressor stations can be manufactured as a modular container or be placed within a quickly erectable shed. The stations can be transported by any means of transport over all distances.

The stations are equipped with noise and heat insulation as well as all the necessary life support and firefighting systems, and thus are in complete compliance with the acting regulations of the Russian Federation.

The modular compressor stations (MCS) are intended for compression of various gases, e.g. oil-associated gas, flare gas, dry stripped gas, atmospheric air, nitrogen, hydrogen, etc.

The stations can be driven by an electric motor or a gas reciprocating engine.

For the purposes of gas preparation, the MCS is equipped with the following additional equipment: gas separators, ventilation chambers, filtration devices,

condensate collection reservoirs, dryers with a dew point of up to -70°C, gas cooling or heating equipment (air-cooling units, chillers, shell-and-tube and plate-type heat exchangers), etc.

Gas MCS include a gas content control system and a forced ventilation system. Equipment units which are not explosion-proof (e.g., control cabinets, etc.) are installed in a pre-provided explosion-proof section.

The structure, size and equipment of the station ensure that installation and repairs can be implemented comfortably all year round. MCS are supplied with pre-equipped life support systems, including lighting, fire fighting, gas analysis, heating, ventilation, and other systems.

All stations are developed in accordance with individual requirements of the Customer. They are constantly upgraded and modernized.

Complete automation of the MCS and related processes allows conducting pre-start operations (turnaround), starting and stopping the compressor as well as ensuring control over main parameters, emergency protection as well as light and sound alarms.





## Modular compressor stations based on piston compressors



### Piston compressor options.

Air and gas piston compressors manufactured by Ariel can be supplied in two main variants: with lubrication or with non-lubricated cylinders and seals ("dry")

### Compressor drives.

Depending on the requirements of the Customer, the compressor package can be driven by:

- an electric motor
- a gas reciprocating engine

If a gas reciprocating engine needs to be used as a drive for the compressor, Kurgankhimmash can create a fuel gas preparation system that will provide gas with parameters specified by the manufacturer of the gas reciprocating engine.

### Main ways to regulate the output of the MCS based on piston compressors:

The main ways to regulate the output of the MCS based on piston compressors are:

- changing the drive rotation speed;
- changing the dead space volume;
- using constant-volume and variable-volume output controllers
- eliminating the compression space for cylinders
- bypassing
- regulating the inlet pressure

### Engineering analysis and research.

In the course of development of compressor packages, the experts of Kurgankhimmash always perform a torsional analysis of the shaft assembly as well as a vibroacoustic analysis of the piping.

The experts of Kurgankhimmash also designed the framework of the unit. They employ the finite element analysis to calculate the rigidity and the natural vibration frequency of the frame.

### Cooling systems.

Gas intercooling and aftercooling can be implemented by means of using an air-cooling unit or shell-and-tube heat exchangers.

Modern high-speed cylinders manufactured by Ariel do not require water cooling, which was necessary for past-generation cylinders.

Absence of the water cooling jackets allows increasing the size of gas ducts, reducing pressure losses, increasing efficiency of the cylinders as well as facilitating the processes of manufacturing and operating the compressors.

### Advantages of the ARIEL compressors:

- no water cooling required;
- easy maintenance;
- can compress gases with high hydrogen sulfide content;
- a rigid frame;
- high-strength bolted joints;
- durable pistons.

# Modular compressor stations based on piston compressors



Supply pressure: up to 53.8MPa  
Power: up to 6 MW

## Bases for Ariel piston compressors

Type (series) of the base	Name [model] of the base. The number of rows is specified in the denominator					
	Rated power		Rated rotation speed			
<b>KBB and KBV Series</b> Cylinders with a max. allowable operating pressure of 6700 psi (462 bar)	<b>KBB/4</b> 6667 HP 4972 KW 900 RPM	<b>KBB/6</b> 10000 HP 7427 KW 900 RPM	<b>KBV/4</b> 6667 HP 4972 KW 750 RPM	<b>KBV/6</b> 10000 HP 7427 KW 750 RPM		
<b>KBZ and KBU Series</b> Cylinders with a max. allowable operating pressure of 7800 psi (538 bar)	<b>KBZ/2</b> 2600 HP 1939 KW 1000 RPM	<b>KBZ/4</b> 5200 HP 3878 KW 1000 RPM	<b>KBZ/6</b> 7800 HP 5817 KW 1000 RPM	<b>KBU/2</b> 2600 HP 1939 KW 1200 RPM	<b>KBU/4</b> 5200 HP 3878 KW 1200 RPM	<b>KBU/6</b> 7800 HP 5817 KW 1200 RPM
<b>JGF Series</b> Cylinders with a max. allowable operating pressure of 7800 psi (538 bar)	<b>JGF/2</b> 2070 HP 1544 KW 1200 RPM	<b>JGF/4</b> 4140 HP 3087 KW 1400 RPM	<b>JGF/6</b> 6210 HP 4631 KW 1400 RPM			
<b>JGC and JGD Series</b> Cylinders with a max. allowable operating pressure of 7800 psi (538 bar)	<b>JGC/2</b> 2070 HP 1544 KW 1000 RPM	<b>JGC/4</b> 4140 HP 3087 KW 1000 RPM	<b>JGC/6</b> 6210 HP 4631 KW 1000 RPM	<b>JGD/2</b> 2070 HP 1544 KW 1200 RPM	<b>JGD/4</b> 4140 HP 3087 KW 1200 RPM	<b>JGD/6</b> 6210 HP 4631 KW 1200 RPM
<b>JGK and JGT Series</b> Cylinders with a max. allowable operating pressure of 7800 psi (538 bar)	<b>JGK/2</b> 1270 HP 947 KW 1200 RPM	<b>JGK/4</b> 2540 HP 1894 KW 1200 RPM	<b>JGK/6</b> 3810 HP 2841 KW 1200 RPM	<b>JGT/2</b> 1300 HP 969 KW 1500 RPM	<b>JGT/4</b> 2600 HP 1939 KW 1500 RPM	<b>JGT/6</b> 3900 HP 2908 KW 1500 RPM
<b>JGR and JGJ Series</b> Cylinders with a max. allowable operating pressure of 6100 psi (421 bar)	<b>JGR/2</b> 430 HP 321 KW 1200 RPM	<b>JGR/4</b> 860 HP 641 KW 1200 RPM	<b>JGJ/2</b> 620 HP 462 KW 1800 RPM	<b>JGJ/4</b> 1240 HP 925 KW 1800 RPM	<b>JGJ/6</b> 1860 HP 1387 KW 1800 RPM	
<b>JG and JGA Series</b> Cylinders with a max. allowable operating pressure of 6100 psi (421 bar)	<b>JG/2</b> 252 HP 188 KW 1500 RPM	<b>JG/4</b> 504 HP 376 KW 1500 RPM	<b>JGA/2</b> 280 HP 209 KW 1800 RPM	<b>JGA/4</b> 560 HP 418 KW 1800 RPM	<b>JGA/6</b> 840 HP 626 KW 1800 RPM	
<b>JGN and JGQ Series</b> Cylinders with a max. allowable operating pressure of 6100 psi (421 bar)	<b>JGN/1</b> 126 HP 94 KW 1500 RPM	<b>JGN/2</b> 252 HP 188 KW 1500 RPM	<b>JGQ/1</b> 140 HP 104 KW 1800 RPM	<b>JGQ/2</b> 280 HP 209 KW 1800 RPM		
<b>JGM and JGP Series</b> Cylinders with a max. allowable operating pressure of 6100 psi (421 bar)	<b>JGM/1</b> 84 HP 63 KW 1500 RPM	<b>JGM/2</b> 167 HP 125 KW 1500 RPM	<b>JGP/1</b> 85 HP 63 KW 1800 RPM	<b>JGP/2</b> 170 HP 127 KW 1800 RPM		



## Modular compressor stations based on screw (threaded) compressor packages



Screw MCS are supplied as a modular container equipped with life support systems (heating, gas analysis, firefighting, lighting, and ventilation).

The stations are intended for outdoor operation in an open area with ambient temperature between  $-60^{\circ}\text{C}$  and  $+45^{\circ}\text{C}$ .

### The compressor module includes:

- the compressor unit;
- the bearing framework;
- a drive;
- a coupling;
- an oil system;
- heat exchange equipment;
- oil separation system and piping.

## Screw (threaded) gas blocks

Important advantages of Kurgankhimmash LLC are experience in working with moist gases, heavy gases, and gases with high  $\text{H}_2\text{S}$  (hydrogen sulfide) content as well as experience of application of modular compressor stations based on oil-filled compressor units in severe climatic conditions.

Personnel training is an integral part of equipment supplies.

Moreover, the company provides a possibility to undergo training at the plant where the MCS was manufactured.

### Main applications of the screw compressors:

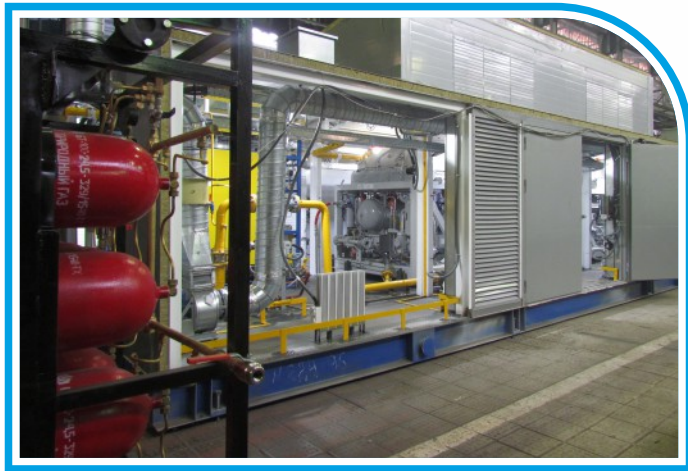
- disposal of oil-associated gas;
- gas fuel installations for gas-fueled turbines;
- petrochemical industry;
- air compression in drilling, railroad, and other industries.

### Distinctive features of the screw blocks:

- stepless output regulation in a wide range;
- low loads on the bearings;
- high-strength star rotor seals;
- low vibration level.



- screw gas block single capacity range: 15 kW to 1.5 MW;
- supply pressure range:  $3 \text{ kgf/cm}^2$  to  $34 \text{ kgf/cm}^2$ ;
- compression of various explosive gases;
- output regulation capability



## Automobile gas-filling compressor stations



As of now, automobile gas-filling compressor stations (AGFCS) are the only viable alternative to liquid-fuel automobile filling stations. Several thousand AGFCS have already been set globally. About 200 of those are located in Russia.

Range of AGFCS manufactured by Kurgankhimmash includes block-type modular compressor stations (MCS), which have all the components necessary to ensure the correct functioning of an automobile gas-filling

compressor stations (an inlet valve section, a gas preparation section, a compressor unit, an adsorption dehumidifier for gas, a priority filling section intended for implementation of the "quick filling" system, and a filling station).

Vast experience of Kurgankhimmash in designing and manufacturing of non-standard MCS allows our employees to configure an AGFCS model in a way that satisfy your demand for compressed natural gas.

## Service



Kurgankhimmash Service Centre can offer technical support, maintenance, and repairs of various pieces of equipment: compressors as well as instrumentation and control systems, air-cooling units, gas reciprocating engines, and auxiliary devices.

Prompt and high-quality maintenance allows minimizing risks of emergencies, and, as a result, reduce costly downtime. Experts of the Service Centre, who have undergone training at the manufacturer's facility, develop regulations and work schedules (plans) in cooperation with the customer, while

taking into account the specifics of operation.

In case of emergency, service engineers are promptly deployed to the emergency site, tasked with localizing the emergency, conducting diagnostics and high-quality repair of the installation.

When conducting maintenance and repairs of compressor equipment, we use spare parts supplied from our own warehouse.

We are ready to solve all your problems related to faultless equipment operation.



\* The management system used at Kurgankhimmash is in compliance with the requirements of ISO 9001:2008 and STO Gazprom 9001-2012. The company has a Certificate of Compliance with the Technical Regulations of the Customs Union for modular compressor stations.

**LLC «Kurgankhimmash»**

16 Khimmashevskaya str., Kurgan, 640007, Russia  
Phone: + 7 (3522) 25-58-33 (general director office)  
e-mail: office@khm.zaural.ru

**Russian sales:**

Limited Liability Company «Trade House «Kurgankhimmash»  
Phone/fax: +7 (495) 651-67-20  
e-mail: zakaz@td-khm.ru

**Export sales:**

CIS & Overseas Project Department (Kurgan)  
Phone/fax: +7 (3522) 47-75-94, 47-75-92  
e-mail: export@khm.zaural.ru, zakaz@khm-msk.ru