



**KAZANCOMPRESSORMASH**

## COMPRESSORS AND COMPRESSOR SYSTEM SOLUTIONS FOR OIL & GAS INDUSTRY





## HMS GROUP AT A GLANCE



**HMS Group** – the leading in Russia and CIS manufacturer of pumps, compressors, modular and process equipment as well as the integrated solutions provider for oil & gas, nuclear & thermal energy, water & utilities.

Engineering of the oil & gas industry facilities, complex procurement of the process equipment and integrated projects are the strategic directions of HMS Group.

### KEY FACTS AND FIGURES

- HMS Group foundation: 1993
- Manufacturing facilities in Germany, Ukraine, Belarus, and Russia
- Over 15,000 employees
- Representative offices in Italy, Turkmenistan, Kazakhstan, Uzbekistan, and UAE

For oil & gas industry HMS Group offers a wide range of standard and customized API-compliant pumps, compressors, and oil & gas equipment for all stages of hydrocarbons production, transportation and processing.

### ENGINEERING

Engineering is performed by the own R&D centers of HMS Group located in Russia, CIS and Europe with centralized management and application of the latest 3D design software based on SolidWorks, ANSYS CFX and other CAD/CAM platforms.

### MANUFACTURING & TESTING

The process equipment for oil and gas industry is produced at contemporary manufacturing facilities of the HMS Group affiliates.

A full-cycle equipment production is arranged by the HMS Group companies equipped with up-to-date CNC machine tools and processing centers from the leading manufacturers of Germany, Great Britain, and South Korea.

The supplied equipment is tested at in-house testing facilities of the HMS Group companies in accordance with appropriate ISO standards or by specific customer-approved methods.

### STANDARDS & QUALITY

All the equipment is manufactured in compliance with specific customer requirements and international & national industry standards as ISO, API, DIN, ANSI, ASME.

The integrated Quality Management System at production facilities of the HMS Group companies is compliant with ISO 9001 standard requirements.

### SERVICE

The HMS Group customers are provided with a full range of related services including installation & commissioning supervision, maintenance, repair and overhaul, supply of original spare parts, integrated retrofit and engineering support.

### WORLDWIDE SUPPLIES

The equipment supplied by HMS Group is successfully operated within years at large upstream, midstream and downstream facilities (including offshore oil & gas production platforms) in Russia, Europe, Middle East, Americas, Africa, and Asia.

## KAZANCOMPRESSORMASH AT A GLANCE



**KAZANCOMPRESSORMASH** is a manufacturer of sophisticated compressors, gas compression systems, and complete compressor stations for oil & gas, energy, and other industries. Since 2012 Kazancompressormash is a part of HMS Group.

### INDUSTRY EXPERTISE

- Over 65 years of compressors engineering and manufacturing experience
- A wide range of compressors for any gases including hydrocarbon, corrosive, explosive, toxic and gases with variable composition
- Over 420 different types of compressors supplied to various industrial facilities in Russia and over 60 countries worldwide
- Over 2000 successful oil & projects with supply of compressor systems, packages, complex procurement and integrated solutions in Europe, Tajikistan, Uzbekistan, Turkmenistan, Iraq, China, India and other countries

### RESEARCH & DEVELOPMENT

Compressors and compressor systems as well as compressor-based integrated solutions are developed at the own leading in Russia and CIS R&D institute of compressor equipment design engineering, situated in Kazan, Russia.

Close industrial cooperation with the world leading parts and components manufacturers allow the institute's specialists to implement the most advanced and efficient compressor solutions.

### MANUFACTURING

The up-to-date production facilities of Kazancompressormash of about 420,000 square meters are located in Kazan (Russia) and capable to fabricate a wide range of standard and highly-customized compressor systems:

- Contemporary equipment including CNC machine tools and processing centers
- Own welding and foundry shops with induction furnaces of 3,000 tons annual capacity
- Highly qualified and experienced staff utilizes the latest technologies for a wide range of compressor equipment
- Europe's largest in-house testing facilities of 35 stands for 100% control of completely assembled compressor systems with up to 4,000 kW drive power

### STANDARDS & QUALITY

The equipment is manufactured in accordance with Russian national and international industry standards including API 617 of 8<sup>th</sup> edition.

The integrated management system of Kazancompressormash is certified for compliance with standards ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007.

### SERVICES

A service division of Kazancompressormash provides a full range of warranty and after-sales services for compressors, gas compression systems and complete compressor stations of any complexity level.

## CENTRIFUGAL COMPRESSORS FOR OIL & GAS



Compressor with vertically split casing



Compressor with horizontally split casing

Kazancompressormash offers up-to-date and sophisticated centrifugal compressors for oil & gas industry companies:

- Compressors with horizontally split casing
- Compressors with vertically split barrel casing

The centrifugal compressors and compressor systems are engineered and manufactured in compliance with requirements of the API 617 standard of the 8<sup>th</sup> edition.

The equipment passes a full cycle of stringent tests (including witness test) in accordance with applicable standards or specific customer requirements.

The range of compressor equipment is available in standard or highly-customized versions in compliance with site operation conditions.

### OIL & GAS INDUSTRY APPLICATIONS

#### Upstream

- Onshore/offshore drilling services
- Gas injection into formation
- Gas lift enhanced oil recovery
- Natural gas gathering & treatment
- Fuel gas handling at production fields

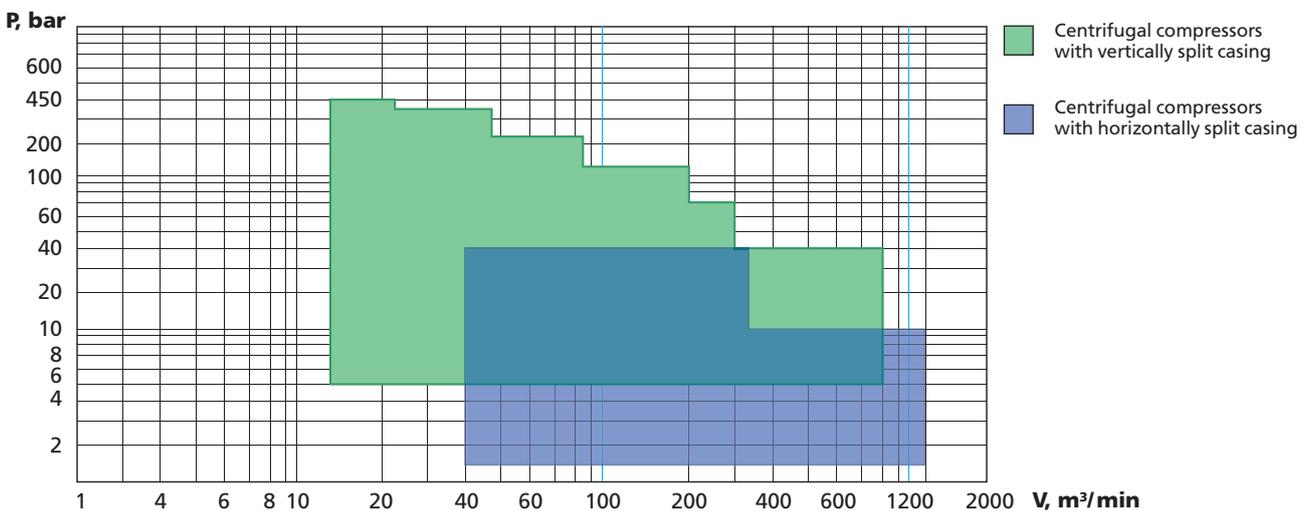
#### Midstream

- Gas transmission via trunk pipelines
- Gas storage injection/withdrawal
- Liquefied natural gas production

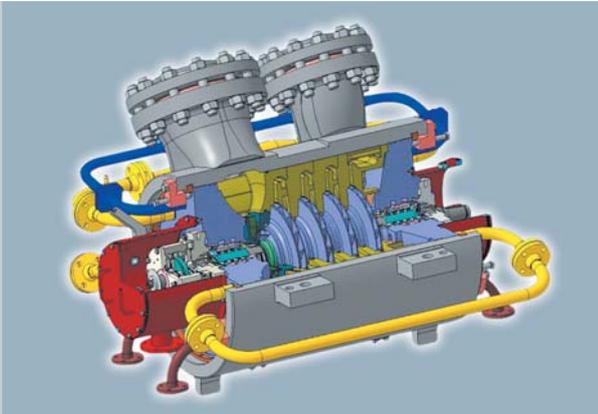
#### Downstream

- Oil refineries and gas processing plants
- Petroleum/gas chemistry facilities

### PERFORMANCE RANGE



## VERTICALLY SPLIT COMPRESSORS



### TECHNICAL DATA

- **Capacity:** up to 900 m<sup>3</sup>/min
- **Discharge pressure:** up to 450 bar
- **Drive power:** up to 32,000 kW
- **Efficiency:** up to 85%

### COMPRESSIBLE GASES

Nitrogen, chlorine, air, natural gas, associated petroleum gas, fuel gas, hydrocarbon process gas, flare gas, hydrogen-bearing gas and other gases.

### DESIGN FEATURES & ADVANTAGES

- A vertically split casing allows fabrication of high-pressure compressors for explosive gases
- Flow path with high-performance compression stages
- Special locks securing solid forged caps at the ends of the steel cylinder, provide quick and easy maintenance of compressor
- Dry gas seals to provide complete purity of compressed gas and prevent its leakage into compressor shop
- Active magnetic bearings
- Intercooling of compressed gas between sections in the two-stage casings
- Microprocessor-based automation system
- Many years of operation in real conditions have proven high reliability and efficiency

### INSTALLATION

- Version for compressor stations (placement inside the permanent building)
- Containerized version with all engineering systems (easily construction buildings)
- Block-container version with all engineering systems
- Marine version including offshore platforms
- Version for installation in open air areas

### CONSTRUCTION MATERIALS

- Ductile cast iron
- Carbon steel
- Stainless steel
- Titanium

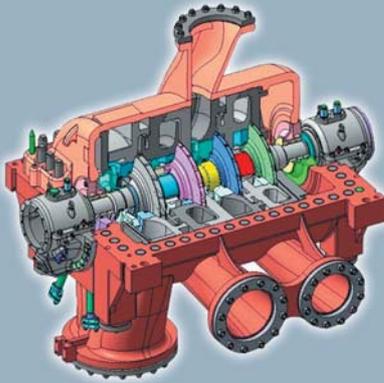
### DRIVE TYPES

- Electric motor
- Gas turbine
- Steam turbine

### SCOPE OF SUPPLY

- Compression system (compressor, multiplier, base frame, couplings, piping)
- Electric motor (gas turbine drive, gas piston drive, steam turbine)
- Lubricating oil systems and seals
- Anti-surge protection system
- Automatic control system

## HORIZONTALLY SPLIT COMPRESSORS



### TECHNICAL DATA

- **Capacity:** up to 1,400 m<sup>3</sup>/min
- **Discharge pressure:** up to 45 bar
- **Drive power:** up to 6,300 kW
- **Efficiency:** up to 85%

### COMPRESSIBLE GASES

Nitrogen, oxygen, chlorine, air, associated petroleum gas, fuel gas, hydrocarbon process gas, flare gas, hydrogen-bearing gas.

### DESIGN FEATURES & ADVANTAGES

- Horizontally split casing in a combination with embedded parts in the flow path allow fabrication of the complex machines for compression of inflammable gases (oxygen) and gases tending to form various sediments
- Maintenance of bearings and seals without disassembling of the casing
- Low cost of routine maintenance due to access to the rotor and embedded parts through the upper casing half
- Special design and materials requirements for compression of inflammable gases
- Many years of operation in real condition have proven high reliability and efficiency
- Available in customized versions in accordance with customer requirements

### INSTALLATION

- Version for indoor installation inside of a building (enclosure) of a compressor station
- Containerized version (prefabricated building) including all main & auxiliary systems
- Version for installation in open air areas

### CONSTRUCTION MATERIALS

- Ductile cast iron
- Carbon steel
- Stainless steel
- Titanium

### DRIVE TYPES

- Electric motor
- Gas turbine
- Steam turbine

### SCOPE OF SUPPLY

- Compressor system (compressor, multiplier, base frame, couplings, piping)
- Electric motor (gas turbine drive, gas piston drive, steam turbine)
- Lubrication systems and seals
- Anti-surge protection system
- Automatic control system

## GAS COMPRESSION SYSTEMS & STATIONS



Kazancompressormash has over 65 years industry expertise in engineering, manufacturing and supply of compressor-based complete system solutions: electric motor driven centrifugal compressors, gas compression systems, and complete compressor stations.

### TECHNICAL DATA

- **Max capacity:** up to 1,400 m<sup>3</sup>/min (single unit)
- **Max discharge pressure:** up to 450 bar
- **Max drive power:** up to 32,000 kW

### COMPRESSIBLE GASES

- Natural gas
- Associated petroleum gas

### APPLICATION

- Pipeline transmission of natural gas
- Handling of associated petroleum gas
- Gas injection into formation
- Underground gas storage injection/withdrawal
- Gas-lift enhanced oil recovery
- Associated petroleum and flare gas utilization

### DESIGN FEATURES

- Specially designed flow paths allow application of any available drives to obtain high polytropic efficiency within standard pressure values of 55, 74.5, 83.5, 98 bar and pressure ratio 1.36, 1.44, 1.5, 1.7, 2.0, 2.2, 3.0, 4.0, etc.
- Impellers with spatial vanes in a combination with a vaneless diffuser provide up to 85% polytropic efficiency in the best efficiency point and a wide effective operation range

### SYSTEM SOLUTIONS ADVANTAGES

- Engineering, manufacturing, procurement in accordance with customer requirements
- Equipment supply in containerized skids and quickly erectable modular structures with modular design of all systems
- All units and subsystems are factory pre-assembled & tested to reduce on-site installation expenses
- Complex procurement of the main and auxiliary systems for compressor stations
- Single-source responsibility at all project stages including guarantee of equipment required parameters

## SELECTED PROJECTS (1/10)



6GC2-380/10-37



4GC2-194/12-112

### SHURTAN FIELD BOOSTER COMPRESSOR STATION, UZBEKISTAN

Customer	Uzbekneftegaz
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Turbine driven compressor systems based on centrifugal compressor (5 units)
Application	Compression of natural gas with variable pressure from 14 to 6 bar
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 380 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 37 bar</li> <li>▪ Suction pressure: 6 - 14 bar</li> <li>▪ Gas turbine drive power: 18 MW</li> </ul>
Features	Each system is designed to meet changing parameters (pressure and capacity) within years of operation using the same flow path
Commissioning	2016

### EASTERN AREA OF ORENBURG FIELD, RUSSIA

Customer	Gazprom
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Turbine driven compressor systems 4GC2-194/12-112 (5 units)
Application	Compression of associated petroleum gas after separation stage
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 194 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 110 bar</li> <li>▪ Suction pressure: 12 - 16 bar</li> <li>▪ Gas turbine drive power: 18 MW</li> </ul>
Features	Waste heat recovery unit for efficient fuel gas utilization Impellers of titanium with back-to-back arrangement for low dynamic loads
Year of supply	2016

## SELECTED PROJECTS (2/10)



7GC2-660/56-76



NC-16 PHG.0000-000

### ZAVOLZHSKAYA COMPRESSOR STATION, RUSSIA

Customer	Gazprom
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor 7GC2-660/56-76 (1 unit)
Application	Operation as a part of natural gas compression system
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 660 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 74.5 bar</li> <li>▪ Suction pressure: 54 bar</li> <li>▪ Gas turbine drive power: 25 MW</li> </ul>
Features	Each system consists of two compression stages Dry gas dynamic seals and magnetic bearings
Year of supply	2016

### PUNGINSKOE UNDERGROUND GAS STORAGE FACILITY, RUSSIA

Customer	Gazprom
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor NC-16 PHG.0000-000 (4 units)
Application	Natural gas injection into underground storage
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 208 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 81 bar</li> <li>▪ Suction pressure: 37 bar</li> <li>▪ Gas turbine drive power: 16 MW</li> </ul>
Features	Each system consists of six compression stages Dry gas dynamic seals and oil bearings
Commissioning	2015

## SELECTED PROJECTS (3/10)



NC16-76/1.35



6GC2-322/58-76

## EKATERINOVKA, BUBNOVKA, PISAREVKA COMPRESSOR STATIONS, RUSSIA

Customer	Gazprom
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Natural gas charge compressors: <ul style="list-style-type: none"> <li>▪ NC16-76/1.35 (4 units)    ▪ NC16-76/1.44 (6 units)    ▪ NC16-101/1.7 (7 units)</li> </ul>
Application	Operation as a part of natural gas compression system
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: up to 457 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: up to 99 bar</li> <li>▪ Suction pressure: up to 60 bar</li> <li>▪ Electric drive power: up to 16 MW</li> </ul>
Features	Each system consists of two, three or four compression stages Dry gas dynamic seals and oil bearings Oil lubricated bearings
Commissioning	2015

## BALASHOV COMPRESSOR STATION, RUSSIA

Customer	Gazprom
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor 6GC2-322/58-76 (5 units)
Application	Operation in a compression system for natural gas trunk pipelines
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 322 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 74.6 bar</li> <li>▪ Suction pressure: 55.2 bar</li> <li>▪ Gas turbine drive power: 16 MW</li> </ul>
Features	Each system consists of two compression stages Dry gas dynamic seals and oil bearings
Year of supply	2015

## SELECTED PROJECTS (4/10)



5GC2-310/0.66-5M3.1



4GC2-218/3-18

## PRIRAZLOMNAYA OFFSHORE STATIONARY PLATFORM, RUSSIA

Customer	Gazprom
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Complete compressor systems: <ul style="list-style-type: none"> <li>▪ 32GC2-52/2-29M3.1 (1 unit)</li> <li>▪ 5GC2-310/0.66-5M3.1 (1 unit)</li> <li>▪ 3GC2-46/6-35M3.1 (1 unit)</li> </ul>
Application	<ul style="list-style-type: none"> <li>▪ Supply of associated petroleum gas to the gas turbine</li> <li>▪ Supply of absorbing hydrocarbon gas to the stripping column</li> </ul>
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: up to 310 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: up to 35 bar</li> <li>▪ Suction pressure: up to 6 bar</li> <li>▪ Drive power: up to 2.5 MW</li> </ul>
Features	Detachable integrated lube oil system placed inside the base frame Elastic dampers for vibration and noise protection Supplied as completely prefabricated ready-for-use units with all necessary systems
Commissioning	2014

## SURGUT CONDENSATE STABILIZATION PLANT, RUSSIA

Customer	Gazprom
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor systems 4GC2-218/3-18 (2 units)
Application	Compression of low pressure waste gas
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 208 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 81 bar</li> <li>▪ Suction pressure: 37 bar</li> <li>▪ Gas turbine drive power: 16 MW</li> </ul>
Features	Supplied as completely prefabricated ready-for-use units with all necessary systems Automation system based on microprocessor controller Dry gas dynamic seals
Commissioning	2013

## SELECTED PROJECTS (5/10)



42GC2-275/1.9-18



4GC2-75/30-83 GTU

## SYZRAN OIL REFINERY, RUSSIA

Customer	Rosneft
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Complete compressor systems: <ul style="list-style-type: none"> <li>42GC2-275/1.9-18 compressor driven by electric motor (1 unit)</li> <li>5GC2-216/14-26 compressor driven by steam turbine (1 unit)</li> </ul>
Application	Compression of process hydrocarbon and hydrogen-containing gases
Technical data	<ul style="list-style-type: none"> <li>Capacity: up to 275 m<sup>3</sup>/min</li> <li>Discharge pressure: 1 up to 26 bar</li> <li>Suction pressure: up to 14 bar</li> <li>Drive power: up to 4.5 MW</li> </ul>
Features	High-efficient compression stages Increased strength of structural elements with proven reliability Minimum footprint of the compressor systems due to compact design
Commissioning	2015

## NOVY URENGOY LICENSE AREA, RUSSIA

Customer	ROSPAN INTERNATIONAL (Rosneft)
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Complete turbine driven compressor systems 4GC2-75/30-83 (5 units)
Application	Compression and supply of low pressure hydrocarbon gases into the trunk pipeline
Technical data	<ul style="list-style-type: none"> <li>Capacity: 75 m<sup>3</sup>/min</li> <li>Discharge pressure: 84 bar</li> <li>Suction pressure: 28 bar</li> <li>Gas turbine drive power: 8.2 MW</li> </ul>
Features	Complex procurement of compressor systems in hangar versions Minimal installation works due to supply as ready-to-use modules Common lubrication system of gas turbine and compressor Dry gas dynamic seals and oil lubricated bearings
Year of supply	2015 (1 <sup>st</sup> batch); 2016 - 2017 (2 <sup>nd</sup> batch)

## SELECTED PROJECTS (6/10)



4GC2-242/12-80 GTU



4GC2-124/14-79 GTU

### YUZHNO-BALIKSKY GAS PROCESSING PLANT, RUSSIA (SUPPLY PROJECT 2)

Customer	SIBUR
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Complete gas compression system 4GC2-242/12-80 GTU
Application	Compression of dry stripped gas and its supply to low temperature condensation and rectification unit
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 242 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 80 bar</li> <li>▪ Suction pressure: 12 bar</li> <li>▪ Gas turbine drive power: 18 MW</li> </ul>
Features	Dry gas dynamic seals Duplicated lube oil coolers and bypass valve installed inside a compressor enclosure Factory witness testing
Year of supply	2016

### YUZHNO-BALIKSKY GAS PROCESSING PLANT, RUSSIA (SUPPLY PROJECT 1)

Customer	SIBUR
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor station with complete gas compression systems 4GC2-124/14-79 GTU (2 units)
Application	Compression of dry stripped gas and its supply to the trunk gas pipeline
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 124 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 77 bar</li> <li>▪ Suction pressure: 14 bar</li> <li>▪ Gas turbine drive power: 8 MW</li> </ul>
Features and advantages	Dry gas dynamic seals Magnetic bearings Two-stage casing with intersection gas cooler
Commissioning	2010

## SELECTED PROJECTS (7/10)



### NIZHNEVARTOVSK GAS PROCESSING PLANT, RUSSIA

Customer	SIBUR
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor station with complete gas compression systems 66GC-1162/1.3-38 GTU (2 units)
Application	Compression of low pressure associated petroleum gas and gaseous mixture after oil separation up to 37 bar pressure for further processing
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 1162 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 37 bar</li> <li>▪ Suction pressure: 1 bar</li> <li>▪ Gas turbine drive power: 16 MW</li> </ul>
Features	Each system consists of two compression stages Dry groove seals with floating carbon rings
Commissioning	2012

### VYNGAPUR GAS PROCESSING PLANT, RUSSIA

Customer	SIBUR
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor station with complete gas compression system 6GC2-375/4-77 GTU
Application	Compression of low-pressure associated petroleum gas
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 364 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 76 bar</li> <li>▪ Suction pressure: 4 bar</li> <li>▪ Gas turbine engine power: 18 MW</li> </ul>
Features	High-efficient flow path in a single casing Dry gas dynamic seals Built-in exhaust heat recovery unit with regulated capacity Bypass valves with advanced anti-surge system Minimal installation works due to supply as ready-to-use modules
Commissioning	2012

## SELECTED PROJECTS (8/10)



4GC2-65/18-101



53GC-188/10-87

### YARUDEYSKOYE FIELD, RUSSIA

Customer	NOVATEK
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Gas turbine driven compressor systems: <ul style="list-style-type: none"> <li>▪ High-pressure compressor 4GC2-65/18-101 (2 units)</li> <li>▪ Low-pressure compressor 6GC2-384/4-49 (2 units)</li> </ul>
Application	Compression of stripped/non stripped associated petroleum gas
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: up to 384 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: up to 99 bar</li> <li>▪ Suction pressure: up to 18 bar</li> <li>▪ Gas turbine drive power: up to 16 MW</li> </ul>
Features	Supplied as completely prefabricated ready-for-use units with all necessary systems
Commissioning	2016

### YURKHAROVSKOYE FIELD, RUSSIA

Customer	NOVATEK
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor systems 53GC2-188/10-87 with replaceable flow path (3 units)
Application	A part of gas compression system GPA-16 NK-03N «Ural»
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 188 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 110 bar</li> <li>▪ Suction pressure: 12 - 16 bar</li> <li>▪ Gas turbine drive power: 18 MW</li> </ul>
Features	Each system consists of two compression stages with side-by-side casings and multiplier Oil lubricated sleeve bearings Dry gas dynamic seals
Commissioning	2016

## SELECTED PROJECTS (9/10)



5GC2-287/15-57 GTU



4GC2-70/17-62 GTU

### STAVROLEN PETROCHEMICAL FACILITIES, RUSSIA

Customer	LUKOIL
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Complete gas compression system 5GC2-287/15-57 GTU
Application	Compression of dry stripped APG and its supply to the trunk pipeline Generation of steam with temperature +310 °C and pressure 39 bar
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 287 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 57 bar</li> <li>▪ Suction pressure: 15 bar</li> <li>▪ Gas turbine drive power: 25 MW</li> </ul>
Features	<p>Operation with two fuel gases: dry associated petroleum and dry stripped gas</p> <p>On-the-run switching between fuel gas types</p> <p>Rotor and diffuser are made in horizontally split diaphragms</p> <p>Easy access to bearings and seals for installation and maintenance</p>
Commissioning	2016

### LUKOIL-PERMNEFTEORGSINTEZ PETROCHEMICAL FACILITIES, RUSSIA

Customer	LUKOIL
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Complete turbine driven gas compression systems 4GC2-70/17-62 GTU (3 units)
Application	Compression and supply of dry stripped gas into the trunk pipeline
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 70 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 62 bar</li> <li>▪ Suction pressure: 17 bar</li> <li>▪ Gas turbine drive power: 6 MW</li> </ul>
Features	<p>Automatic control system provides even load distribution between compressors and maintenance of required discharge parameters</p> <p>Supply with anti-surge and firefighting systems</p> <p>Compressors installation in easily constructed enclosures</p>
Commissioning	2014

## SELECTED PROJECTS (10/10)



### KHARYAGINSKOYE FIELD AND USINSK GAS PROCESSING PLANT, RUSSIA

Customer	LUKOIL
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Two compressor stations with complete gas compression systems 6GC2-260/2-38 GTU (5 units)
Application	Compression of low pressure associated petroleum gas from production fields
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 260 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 38 bar</li> <li>▪ Suction pressure: 2 bar</li> <li>▪ Gas turbine drive power: 6.3 MW</li> </ul>
Features	<p>High-efficient flow path in a single casing with dry gas dynamic seals</p> <p>Built-in exhaust heat recovery unit with regulated capacity</p> <p>Bypass valves with advanced anti-surge system</p> <p>Minimal installation works due to supply as ready-to-use modules</p>
Commissioning	2015 - 2017

### PANJIN ZHENA O BUTYL RUBBER PLANT, CHINA

Customer	Panjin Zhenao Chemical Co. Ltd
Scope of work	Engineering, manufacturing, supply, installation supervision and commissioning
Equipment	Compressor system 5GC1-387/12
Application	Compression of chloromethyl-containing gas in butyl rubber production
Technical data	<ul style="list-style-type: none"> <li>▪ Capacity: 387 m<sup>3</sup>/min</li> <li>▪ Discharge pressure: 12 bar</li> <li>▪ Suction pressure: 1 bar</li> <li>▪ Gas turbine drive power: 4 MW</li> </ul>
Features	<p>Single stage compression casing</p> <p>Integrated baseplate for casing and multiplier</p> <p>Compliance with stringent requirements on explosion protection</p>
Commissioning	2011



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