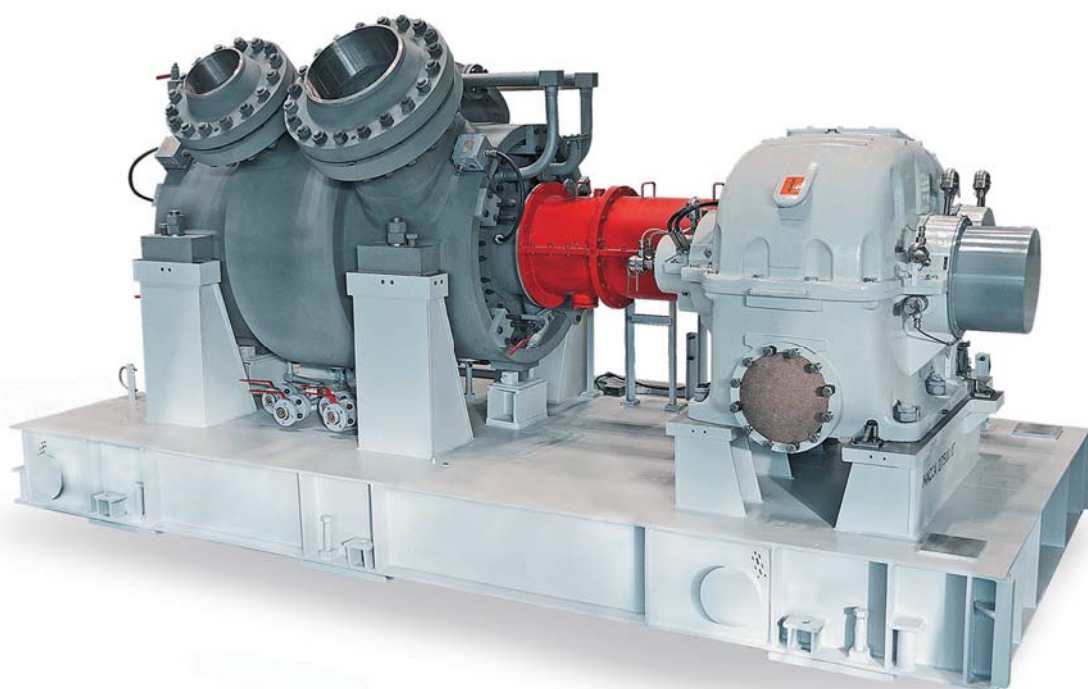




KAZANCOMPRESSORMASH

CENTRIFUGAL COMPRESSORS
API 617, 8TH EDITION



About Kazancompressormash



Kazancompressormash (Kazan Compressor-Building Plant, Russia) is a leading Russian manufacturer of compressor equipment and provider of integrated compressor-based solutions for various industries.

Key Facts and Figures

- More than 60 years of successful work in the compressor equipment market
- A wide range of sophisticated compressor systems for practically any gases including toxic, corrosive, and explosive ones
- Integrated solutions: gas compression systems and compressor stations
- Considerable experience in supply of equipment for various industries: oil & gas, energy, mining, metallurgy and others
- Engineering and manufacturing integration with the leading R&D center NIIturbokompressor
- Equipment packaging, supply of the main process and auxiliary equipment

The priority of Kazancompressormash is production of reliable and sophisticated compressor equipment by high-quality standards.

The company employs more than 1,900 high-skilled specialists.

The manufacturing facilities are well equipped for production of up-to-date compressor systems:

- **Total manufacturing area:** 420,000 m²
- **Manufacturing equipment** includes machine tools and CNC machining centers from Germany, Great Britain, Italy and Canada
- **Foundry and welding shops** equipped with induction furnaces with production capacity of 3,000 tons per year
- **Europe's largest testing facility with 35 stands** able to test the compressors systems fully assembled that provide 100% control of characteristics during the test and their subsequent confirmation on-site

The centrifugal compressors comply with standard API 617 8th Edition.

Centrifugal Compressor Systems



The centrifugal compressor systems by Kazancompressormach are distinguished by their high reliability and performance due to contemporary design and up-to-date manufacturing technologies.

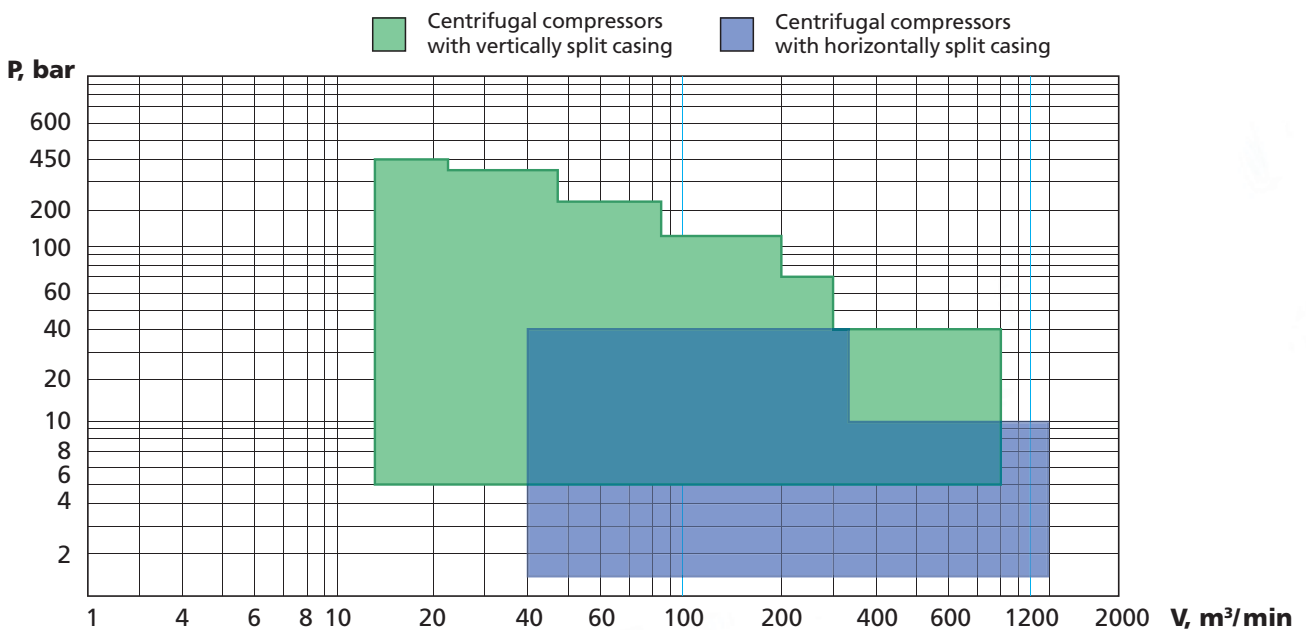
The compressor systems meet the requirements of the standard API 617 8th Edition and also available in highly-customized versions fully compliant with specific customer requirements and on-site operation conditions.

Compressor System Types

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

Application

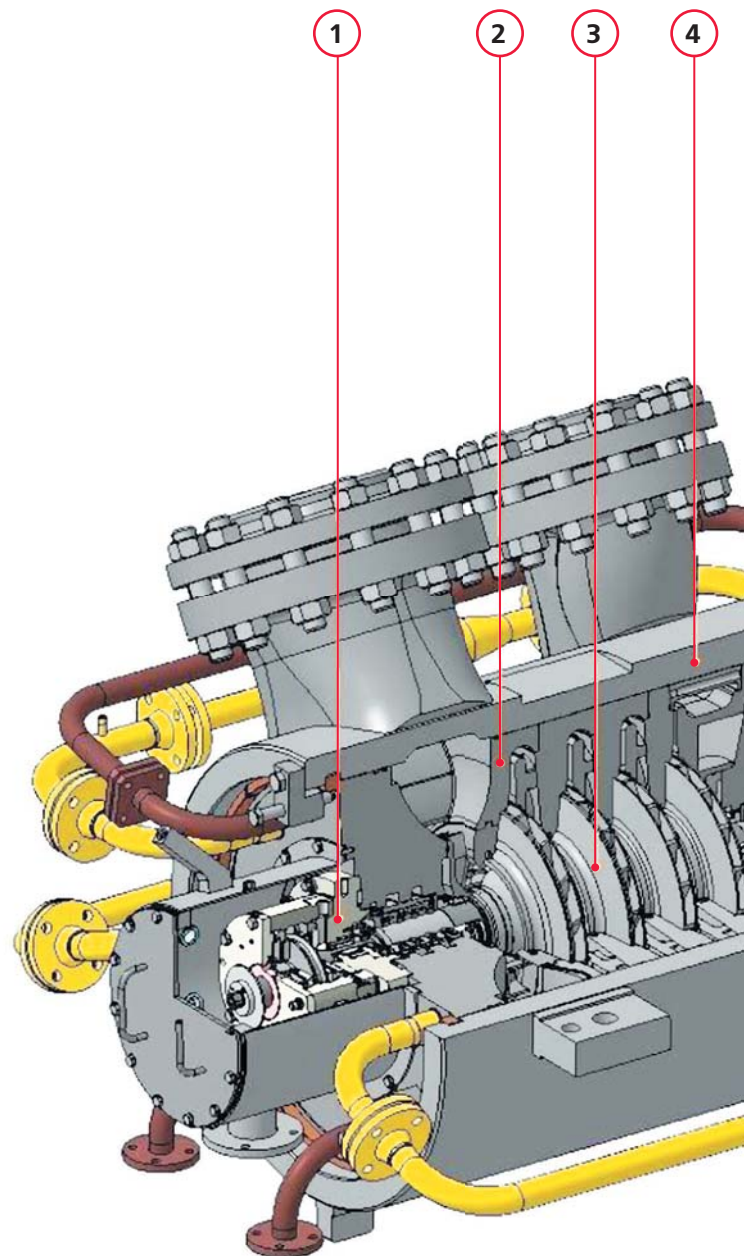
- Oil refining and petroleum chemistry:
 - catalyst crackers
 - vacuum gasoil units
 - hydrocracking units
 - hydrotreaters
 - delayed coking units
- Gas gathering & transportation
- Gas processing: crude gas units, gas recovery systems
- Offshore production platforms
- General industry applications



Design Features & Advantages



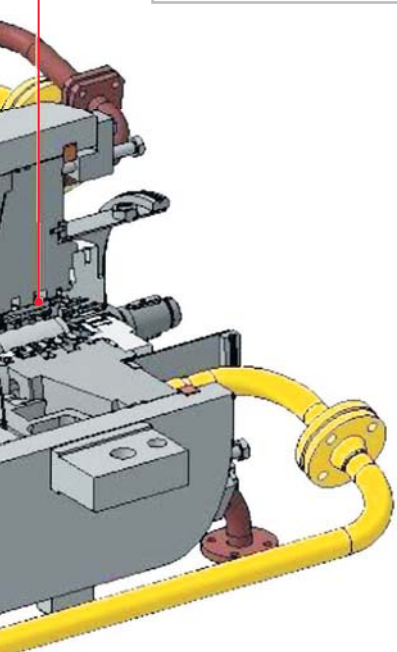
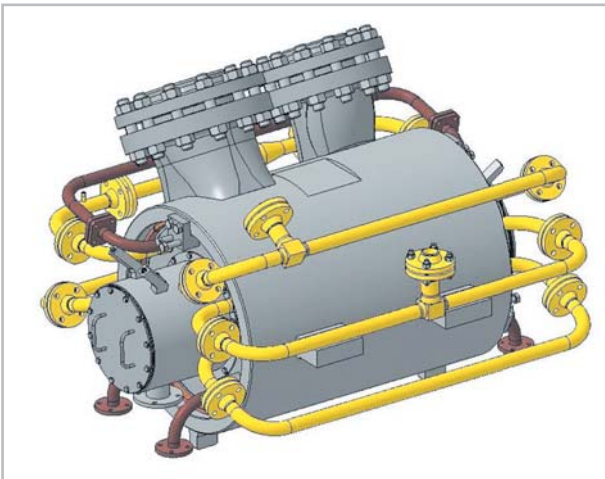
1. Oiled slide bearings with self-positioning pads are resistible to high dynamic and static load
The magnetic bearings for increased compressor reliability are available upon request
2. High-efficient flow path ensures required characteristics in a wide range of operational parameters. Application of the unified pressure stages significantly reduces the lead time for compressor design and manufacturing
3. The rotor is dynamically balanced during and after assembling. The final balancing is performed at operational rotation speed of the compressor system
4. The cast nozzles are welded to the forged cylinder casing.
A casing version without nozzles is available for high-pressure compressors
5. The shaft end seals prevent leaks of the working gas. The available seals range includes dry mechanical seals, dry groove seals, and oil seals





Dry gas dynamic seal

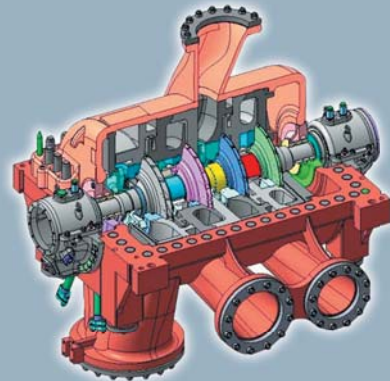
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The centrifugal compressors by Kazancompressormash apply the advanced technical solutions such as dry gas dynamic seals, redundant automation and control systems, vibration control and diagnostics systems and many other features to realize the following advantages:

- High reliability
- Long nonstop runs between overhauls
- Low cost of installation
- High-efficient automation and control system for operational safety including unmanned operation mode
- Energy-efficient flow path with high performance
- Stable operation within a wide range of variable parameters and composition of the gas being compressed
- Better serviceability due to contemporary compressor design with easy access to components for fast and simple maintenance
- Optimal price/quality ratio
- Short manufacturing and delivery lead time

Centrifugal Compressors with Horizontally Split Casing



Technical Data

- Capacity: up to 1,400 m³/min (up to 120,000 Nm³/h)
- Discharge pressure: up to 45 bar (45.8 kgf/cm²)
- 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, Coke Oven 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 along the flow path
- 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 of the construction components
- Available in customized versions in accordance with customer requirements

Installation

- Version for indoor installation inside of a building (enclosure) of a compressor station
- Hangar version (prefabricated building) including all engineering systems
- Version for outdoor installation in open air areas

Construction Materials

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

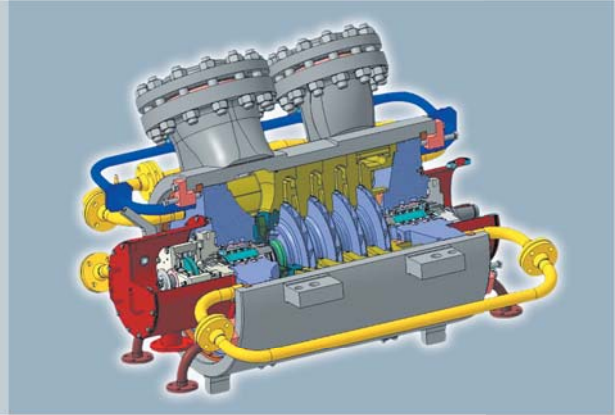
Drive Types

- 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

Centrifugal Compressors with Vertically Split Casing



Technical Data

- Capacity: up to 900 m³/min (up to 220,000 Nm³/h)
- Discharge pressure: up to 450 bar (458.8 kgf/cm²)
- 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, Coke Oven Gas, 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 that cover the ends of the steel cylinder, provide quick and easy maintenance and repair of the compressor
- Dry gas seals to provide complete purity of compressed gas and prevent its leakage into compressor room
- Active magnetic bearings for the rotor suspension
- Intercooling of compressed gas between sections in the two-stage casings
- Automation system based on microprocessor controller
- Many years of operation in real conditions have proven high reliability and efficiency of the construction components

Installation

- Version for compressor stations (placement inside the permanent building)
- Hangar version with all engineering systems (easily construction buildings)
- Block-container version with all engineering systems
- Marine version including offshore platforms
- Version for outdoor 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

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The manufacturer of centrifugal compressor systems is Kazancompressormash (Kazan, Russia).

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