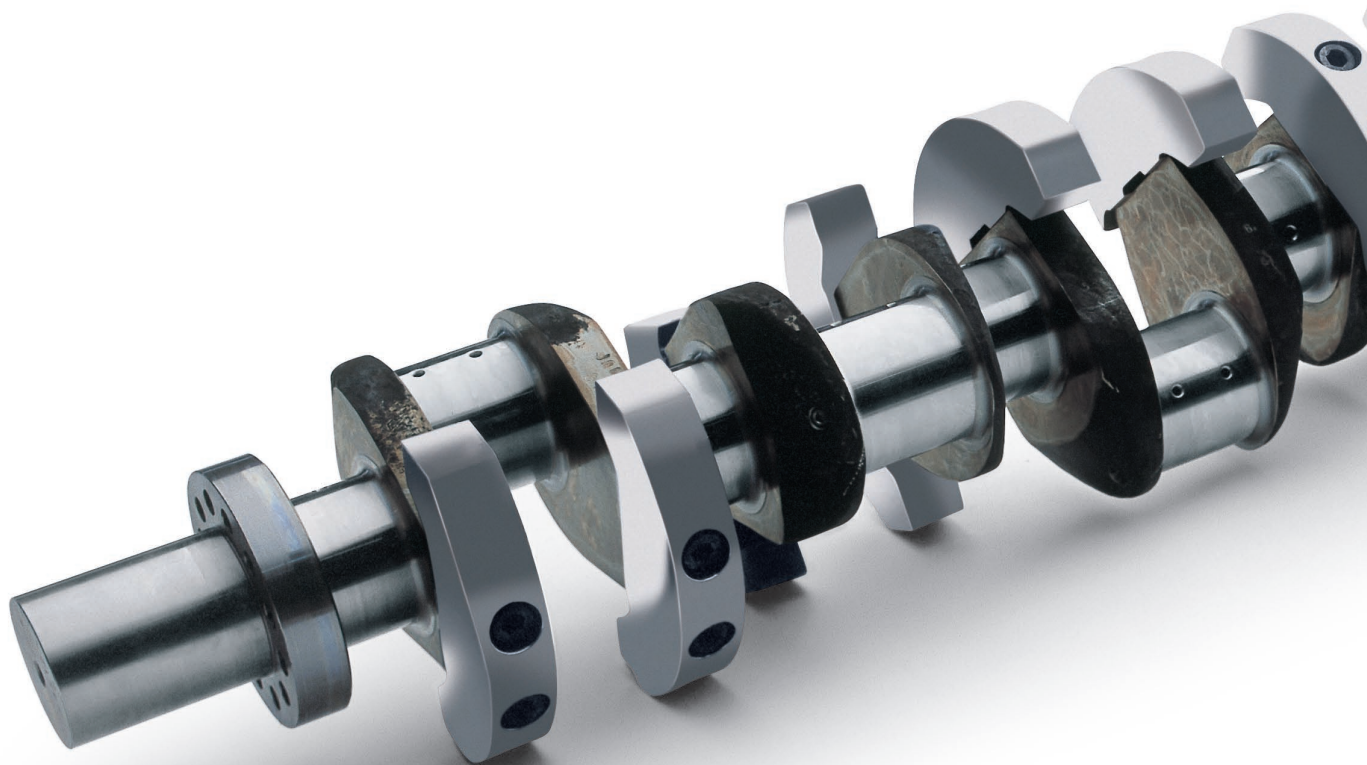


Jenbacher gas engines

one concept, four types



GE imagination at work

technology, quality and service

For about 50 years, GE's Austrian-based gas engine business has been recognized as a world leader in the development and production of gas-fueled reciprocating engines for the efficient generation of power and heat. Jenbacher engines in the power range from 0.25 to 3 MW are designed for stationary, continuous duty operation, and are characterized by particularly high efficiencies, low emissions, durability, and high reliability.

efficient

Long service intervals, maintenance-friendly engine design and low fuel consumption ensure maximum efficiency

durable

Our dedication and commitment to continuous product development ensures prolonged life time of all engine components, even when using polluted fuel gases such as landfill gas

reliable

The refined and optimally designed control and monitoring system results in ideal preventive maintenance and leads to maximum operational safety and availability

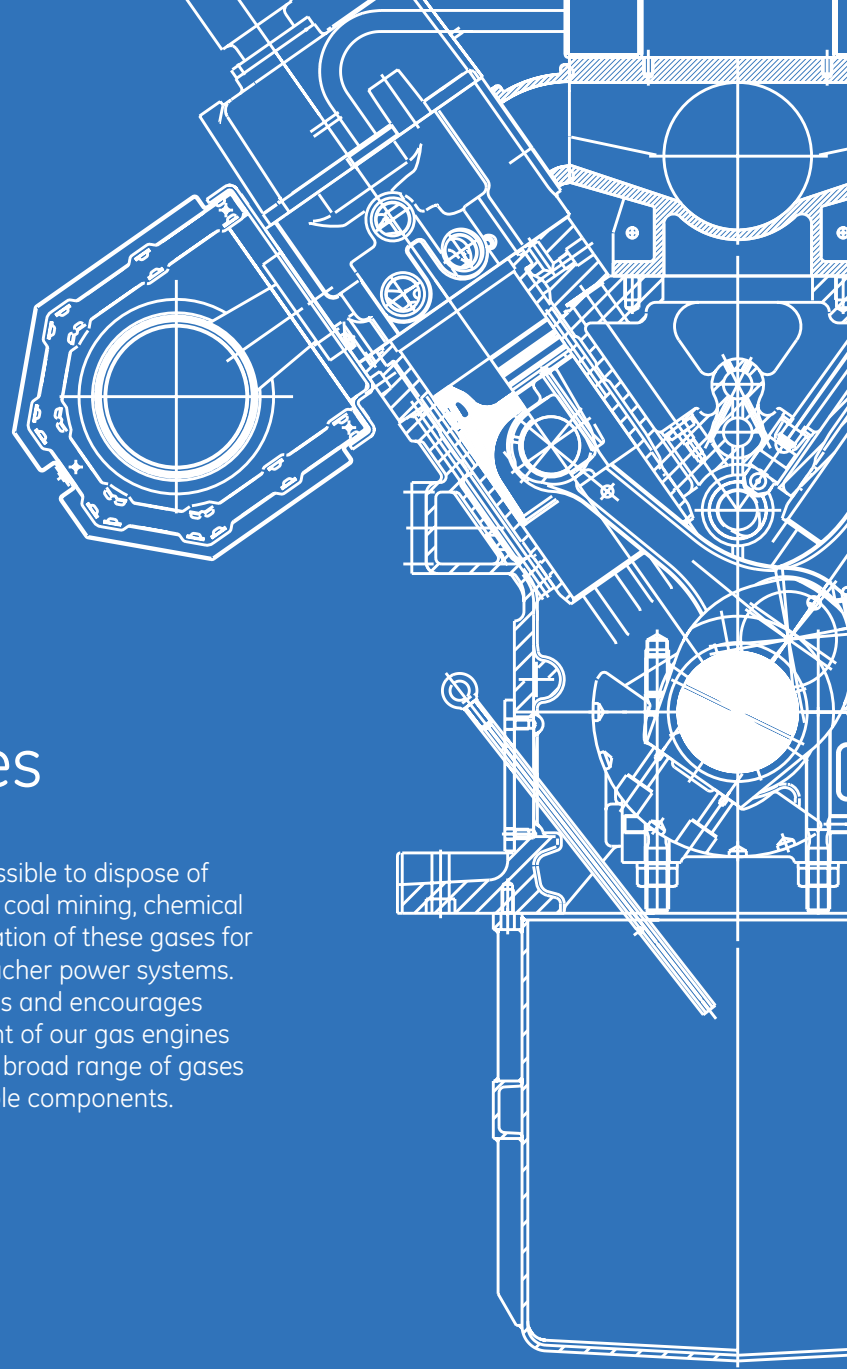
GE's Jenbacher product team custom designs service agreements tailored to the individual needs of our customers. Our service centers, strategically located in more than 30 countries, offer unparalleled product support, including in-depth customer training provided by our expert staff.

tailor-made power solutions

Jenbacher products are highly-developed and tested, and well matched to each customer's specific requirements. Our scope of delivery comprises generator sets for on-site power generation and cogeneration systems for decentralized power and heat supply. Both power systems are also available as fully containerized plants for maximum flexibility. A wide range of engine heat sources – from engine cooling water, oil and air/fuel gas mixture to exhaust gas – is configured to maximize the benefit to each individual customer.

technical features

feature	description	advantages
Uncooled exhaust gas manifold	Enables maximum energy supply to the exhaust gas turbocharger	<ul style="list-style-type: none">- High specific output- Increased electrical efficiency
Crossflow cylinder head	Utilizes the crossflow principle of gases through individual cylinder heads	<ul style="list-style-type: none">- Separation of cold mixture side and hot exhaust gas side- Long cylinder head service life of up to 30,000 operating hours- Exhaust gas manifold easily accessible- Individual cylinder heads increase ease of maintenance
Scraper ring	Integrated into the cylinder liner to prevent carbon deposit on the piston crown	<ul style="list-style-type: none">- Stabilized oil consumption- Reduced risk of piston seizing- Reduced wear- Perfect partial load behaviour
Gas mixer	Works according to the equal-pressure principle and has been steadily optimized to meet the requirements of modern gas engines	<ul style="list-style-type: none">- Optimized geometry and short floating times- Low pressure losses and high degree of efficiency at full load- Strict adherence to NOx emission values- Trouble-free operation with alternative gas types (2-gas operation)- High degree of mixing efficiency- Reliable starting behaviour- Simple adaptation in case of special gases with large calorific value differences
High-performance spark plug	Continuously developed and optimized electrode alloys and geometry	<ul style="list-style-type: none">- Long adjustment cycles- Service life of up to 15,000 operating hours- Outstanding reliability of operation, even at low emission levels
Turbocharger bypass	Electronically controlled valve installed behind the compressor enables fast output control in the upper load range	<ul style="list-style-type: none">- High dynamism in the output control over the entire control range- High degree of control over the system when in isolated operation, increased reserve for adding and/or shedding load- Optimal adaptation to varying ambient conditions (intake temperature, altitude)
DIA.NE® XT	Our latest engine management system that comprises powerful central industrial controls that handle master control and feedback control for the engine-plant, as well as visualization	<ul style="list-style-type: none">- Control of all systems relevant to the module (closed-loop LEANOX®, speed, output, knocking and isolated operation control system, ignition system)- 8 additional controllers available- Clear visualization of the systems and display of all relevant data- Graphical online trends and alarm management
LEANOX®	Our worldwide, patented lean mixture combustion control ensures the correct air/gas ratio under all operating conditions to minimize exhaust gas emissions while maintaining stable engine operation	<ul style="list-style-type: none">- Sensors used in non-critical measurement ranges- Permanent monitoring of emission limit values using stable sensor technology- Controlled combustion resulting in longer service life of the components surrounding the combustion chamber such as cylinder head, valves, spark plugs, pistons, ...- Compensation for deviating gas characteristics
Electronic ignition system	The microprocessor-controlled ignition system is connected to DIA.NE® XT via CAN (Controlled Area Network) bus	<ul style="list-style-type: none">- Firing point can be varied depending on operating conditions and/or type of fuel gas used
Knock control system	Standard for all our gas engines	<ul style="list-style-type: none">- The resulting control of firing point, output and mixture temperature protects the engine from inadmissible loads- Increased reliability and availability
TecJet™ gas dosing valve	Electronically controlled gas dosing valve with high degree of control accuracy	<ul style="list-style-type: none">- Very quick response time- Rapid adjustment of air/gas ratio- Large adjustable calorific value range
Air/fuel mixture charging	Fuel gas and combustion air are mixed at low pressure before entering the turbocharger	<ul style="list-style-type: none">- Main gas supply with low gas pressure- Mixture homogenized in the turbocharger
Miller valve timing	Camshaft with special inlet cam profile to extend intake stroke (late inlet valve closing)	<ul style="list-style-type: none">- Reduced maximum compression temperature and increased safety margin to knocking limits- High efficiency through optimized ignition timing



broad range of gas types

Along with natural gas operation, our technology makes it possible to dispose of environmentally offensive gases (e.g., from landfills, agriculture, coal mining, chemical plants, and other industries). The simultaneous energetic utilization of these gases for generating power ensures the economic viability of our Jenbacher power systems. The combustion of alternative gases helps to reduce emissions and encourages efficient use of natural resources. The continuous development of our gas engines and our focus on special gas applications enable the use of a broad range of gases with different calorific values and a variety of main combustible components.

benefits of cogeneration (chp)

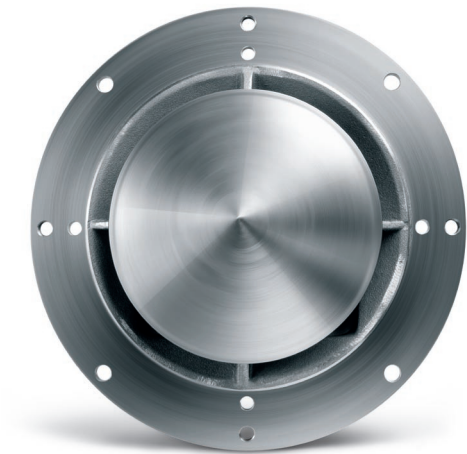
The power generated is utilized to cover the consumption of the individual facilities (e.g., hospitals) and/or fed into the public power grid. The thermal energy can be used for both generating heating water for local or district heating systems and steam production, as well as for various types of process heat. Our Jenbacher gas engine cogeneration systems are also used for CO₂ fertilization in greenhouses and trigeneration systems (combined generation of heat, cooling and power).

GE's Jenbacher gas engine division is one of the world's leading manufacturers of gas-fueled reciprocating engines, packaged generator sets and cogeneration units for power generation. It is one of the only companies in the world focusing exclusively on gas engine technology.

GE's Jenbacher gas engines range in power from 0.25 to 3 MW and run on either natural gas or a variety of other gases (e.g., biogas, landfill gas, coal mine gas, sewage gas, combustible industrial waste gases).

A broad range of commercial, industrial, and municipal customers use Jenbacher products for on-site generation of power, heat, and cooling. Patented combustion systems, engine controls, and monitoring enable its power generation plants to meet stringent emission standards, while offering high levels of efficiency, durability, and reliability.

GE's Jenbacher product team has its headquarters, production facilities, and 1,200 of its more than 1,500 worldwide employees in Jenbach, Austria.



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