

Power Generation | **mtu** Series 500 gas generator sets | 250–550 kWe

THE SUSTAINABLE SOLUTION THAT
ALWAYS ANSWERS YOUR NEEDS



A Rolls-Royce
solution

The new **mtu** Series 500 gas generator sets

WE KEEP ON ANSWERING

We answer your specific power generation needs with sustainable solutions that use natural gas or biogas – our new **mtu** Series 500 generator sets. Equipped with an **mtu** Module Control automation system that monitors all genset activities, the units seamlessly integrate with diverse microgrid environments and directly connect you to a world of service expertise.

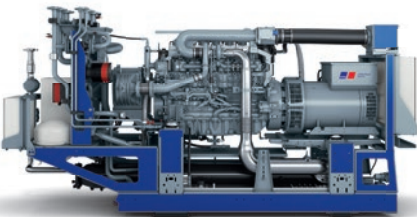
Lifecycle solutions

More than great machinery, we aim to provide excellent solutions that last. As a single-source supplier, we support you at every step over the complete product lifecycle – from the planning and specifications to the project management, commissioning, service and more.

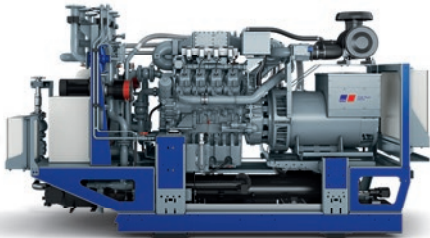
Key facts

The new **mtu** Series 500 introduces natural gas and biogas generator sets to the 250-550 kWe power range. Available in 50 Hz and 60 Hz versions, these highly efficient units feature an optimized engine designed to greatly lower fuel costs, making them an ideal fit for a broad range of utility and industrial applications.

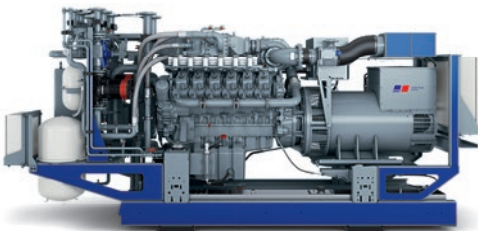
- Fuel: natural gas or biogas
- Output: 250, 360 and 550 kWe
- Frequency: 50 Hz and 60 Hz
- Compliant with industry codes and standards
- Efficiency: 3.1% more efficient than the previous Series 400 genset, best in class
- Flexibility: the **mtu** Module Control (MMC) automation system simplifies system control, integrates easily with diverse microgrids and creates a direct link to expert digital service support



mtu 6R500 GS

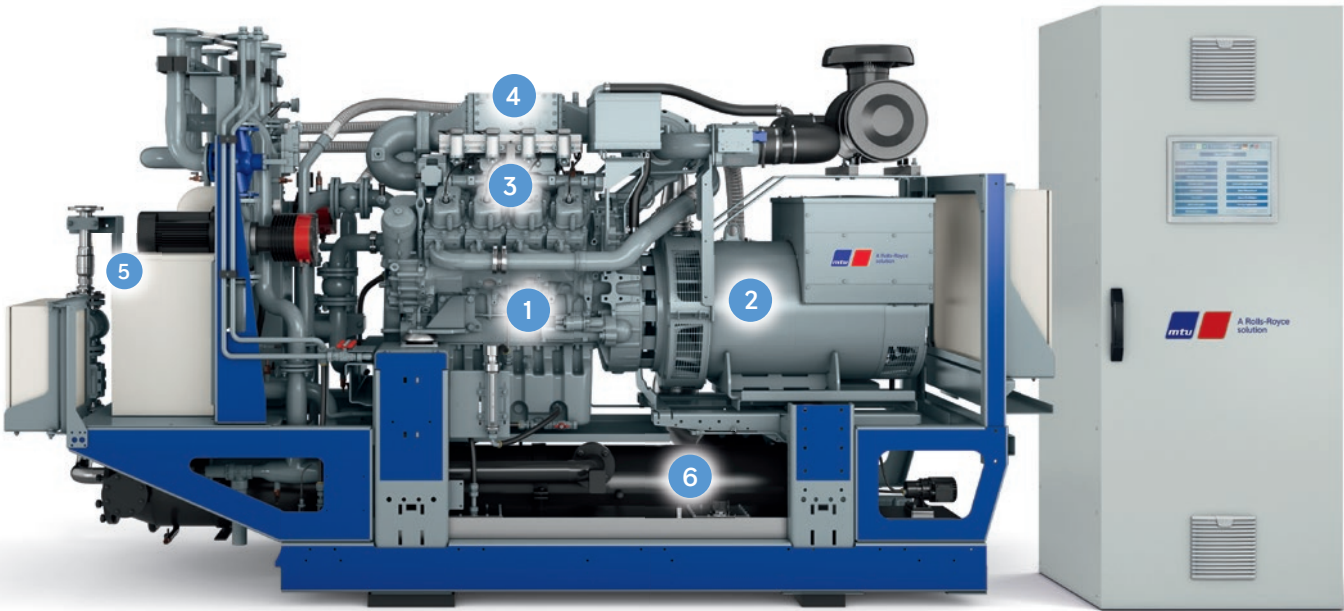


mtu 8V500 GS



mtu 12V500 GS

Depicted here are **mtu** Series 500 gensets with the extended scope of supply – flexible heat recovery unit (GR configuration) and exhaust gas recirculation (GC configuration).



The standard scope of supply (GB configuration) comprises the engine, generator, base frame, fuel gas train and **mtu** Module Control automation system.

Depicted here is an **mtu** 8V500 genset in GC configuration with MMC.

- 1 Gas engine**
Improved combustion technology increases engine efficiency and lowers fuel costs.
- 2 Generator**
Optimally tailored to the engine, the generator provides best-in-class reliability and efficiency.
- 3 Ignition system**
A microprocessor-controlled ignition system optimally adjusts the ignition time and ignition energy to the quality of the gas.
- 4 Mixture cooler**
The two-stage mixture cooler improves engine performance and heat utilization.

- Expanded scope of supply**
- 5 Flexible heat recovery unit (GR configuration)**
This unit ensures highest thermal efficiencies for the jacket water, lube oil and coolant mixture.
 - 6 Exhaust heat recovery (GC configuration)**
The exhaust heat recovery system with exhaust heat exchanger achieves highest thermal efficiencies in CHP systems. With the **mtu** 12V500 GS version, the exhaust heat exchanger is supplied separately.

Module control

SYSTEM MONITORING – CONTINUOUSLY

If the gas engine is the heart of the genset, then the **mtu** Module Control (MMC) is the brain. Housed in a separate panel next to the genset, the MMC automation system handles all important functions needed for continuously monitoring and controlling the entire system.

**mtu Module Control (MMC)**

The **mtu** Module Control covers all important functions needed for controlling the whole system. It acts as the tireless oversight center, closely monitoring and recording all key system activities.

Digital connectivity

The system can be equipped with a data logger providing access to our digital solutions, including remote monitoring, fast and reliable service support and, soon, features such as predictive failure prevention and operational optimization.

Key features:

- Industrial PC with colour touchscreen
- Monitors all processes
- Logs all activities
- Seamlessly integrates with existing environments
- Multi-module system networking
- Supports numerous protocols
- Optional remote diagnosis via DSL or ISDN
- Optional integration of SMS/email client (fault notification, daily reporting of all meter readings)

**Benefits:****Flexibility**

The highly flexible **mtu** Module Control (MMC) automation solution enables simple integration, even with complex systems such as microgrids.

**Global service support**

All units are fully integrated with the **mtu** service landscape and the support of our global service network.

**Integration expertise**

Intelligent system integration with microgrids and complex plants to maximize operating cost savings is our specialty.

**Modularity**

The modular nature of our products and individualized scope of delivery enables us to offer clients tailored solutions for all types of power generation applications (from pure gensets to complex combined heat and power plants).

**Low OPEX**

Significantly higher power efficiency allows for significantly lower operating costs. 42.6% efficiency is "best in class" for this power segment.

**Low emissions**

Highly efficient combustion technology results in consistently low emissions.

Reliable and environmentally friendly

MULTIPLE APPLICATIONS

From industrial factories to wastewater treatment plants and power stations, the global demand for energy continues to rise. The new *mtu* Series 500 is suitable for all types of power generation applications, from pure gensets to complex combined heat and power plants. It combines reliable and environmentally friendly power generation with reduced operating costs, high availability and digital connectivity to our global service network.

- Natural gas**
- Public utility companies/municipalities, e.g. connection and feed-in to district heating networks
 - Hospitals
 - Industrial applications in general
 - Hotels

- Biogas**
- Commercial farming (digester application)
 - Wastewater treatment
 - Landfill



In this way, energy costs can be reduced by 42 percent. Scan the QR code and find out how this can be done.



Microgrid applications

SECTORS, CONFIGURATIONS AND BENEFITS

Grid & utility service provider

Examples: grid system operators, utilities, independent power producers



Microgrid solutions can eliminate the need for significant investments in grid infrastructures, for example, when scaling up electric vehicle charging stations. They enhance solar and wind power reliability and distribution. When combined with a battery energy storage system (BESS), they enable gas and diesel power plants to operate more efficiently.

Typical configuration:



Community

Examples: urban and remote communities, towns



Microgrids help urban areas become more energy self-sufficient and provide reliable backup power in the event of a grid failure. In remote areas without access to a public grid, they help ensure high-quality power supply and allow for the integration of renewable energy resources, reducing the carbon footprint and saving fuel.

Typical configuration:



Industry

Examples: agriculture, manufacturing, mining, commodities



They enable remote industrial operations without grid access using fossil fuels to reduce their consumption and more easily meet environmental standards. If grid access is provided, gas-powered CHPs and renewables can be integrated to lower draw charges and offset energy costs. Highly flexible, microgrids can be easily scaled to meet changing electricity demands.

Typical configuration:



Commercial

Examples: offices, retail & warehouses, data centers, infrastructure & transport, hotels & restaurants



For commercial facilities connected to a public grid, microgrids can achieve significant energy cost savings. Through their ability to integrate diverse energy sources, take advantage of time-of-day electricity tariffs and by providing immediate backup power when needed, they can greatly increase self-sufficiency.

Typical configuration:



Public sector

Examples: military bases, healthcare, institutional & educational facilities



Microgrid solutions help to enhance power supply security and quality – a crucial factor for public sector facilities requiring greater grid aexample, from batteries, or by integrating solar arrays to reduce fuel consumption. Solar power self-consumption enables additional grid power savings.

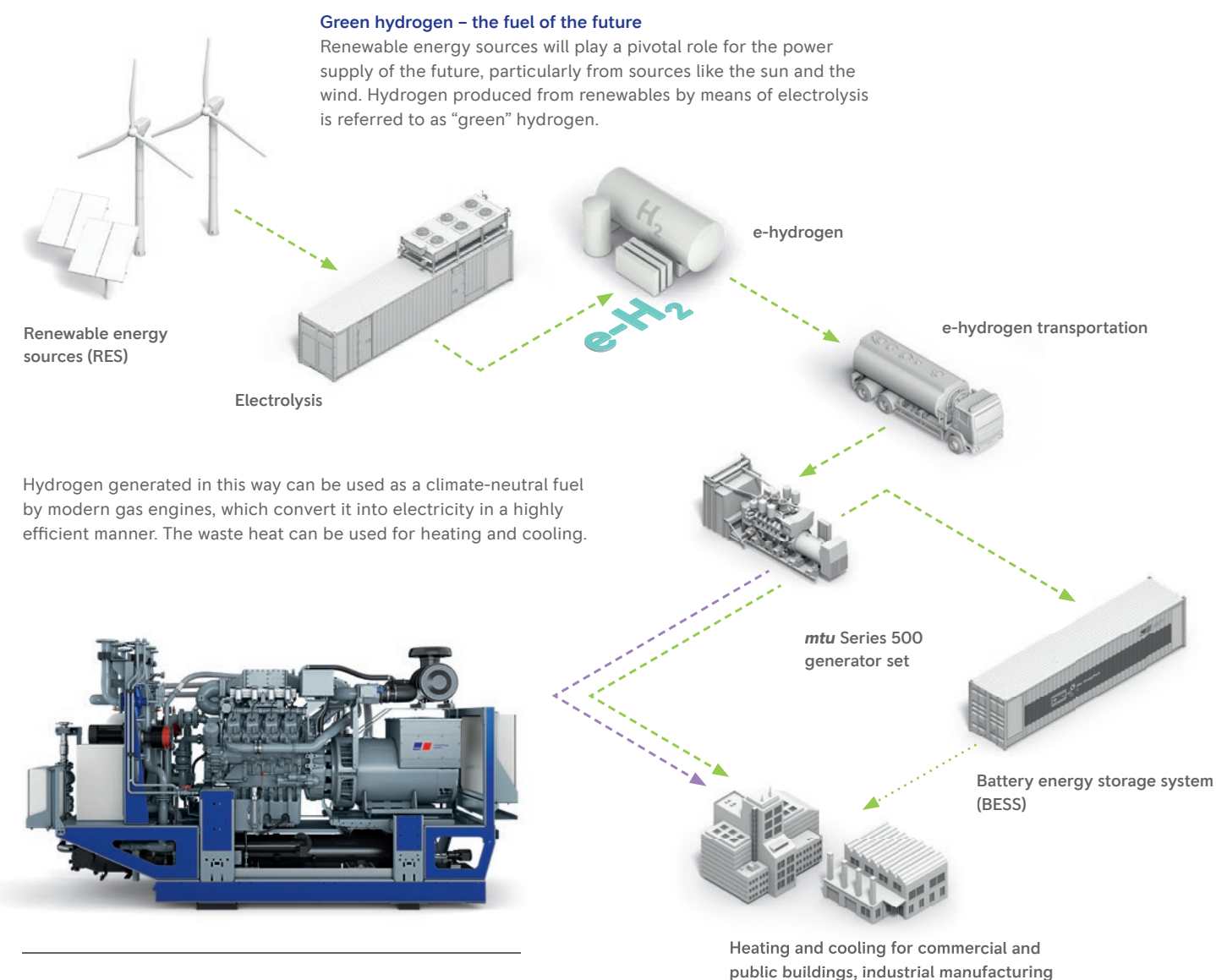
Typical configuration:



Decarbonized solutions

BE READY FOR CO₂-NEUTRAL ENERGY

Hydrogen, which can be produced from diverse renewable resources, offers the potential for an energy future with near-zero greenhouse gas emissions. Hydrogen can be used to generate clean electricity, with water vapor and warm air as the only discharge – for example, by advanced gas gensets like our **mtu** Series 500.



Our new **mtu** Series 500 natural gas systems can be upgraded to run on green hydrogen.



Flexible, available, resilient, economical.

THE NEW *mtu* SERIES 500 GENERATOR SETS

Performance/efficiency (Natural gas⁵⁾)

Configuration		50 Hz			60 Hz		
		6R	8V	12V	6R	8V	12V
Genset type		<i>mtu</i> 6R500 GS	<i>mtu</i> 8V500 GS	<i>mtu</i> 12V500 GS	<i>mtu</i> 6R500 GS	<i>mtu</i> 8V500 GS	<i>mtu</i> 12V500 GS
Engine type		6R500	8V500	12V500	6R500	8V500	12V500
Output							
Electrical output ¹	kWe	250	360	550	250	360	550
Thermal output							
Engine heat ²	kWth (kBTU/hr)	131	188	287	143 (488)	189 (645)	304 (1037)
Exhaust heat (20°C/ 248°F) ^{2, 3}	kWth (kBTU/hr)	129	193	290	143 (491)	211 (720)	325 (1109)
Low temperature mixture heat (40°C/ 104°F) ²	kWth (kBTU/hr)	26	31	51	21 (72)	33 (113)	51 (174)
Input							
Energy input ⁴	kWth (kBTU/hr)	598	846	1290	618 (2109)	882 (3010)	1358 (4637)
Efficiency							
Electrical efficiency ⁵	%	41.8	42.6	42.6	40.5	40.8	40.5
Total efficiency	%	85.2	87.6	87.4	86.7	86.2	86.8

Technical data – 50 Hz (60 Hz)

Configuration GR ^a and GC ^b		6R500	8V500	12V500
Bore/Stroke	mm (inch)	130/150 (5.1/5.9)	130/157 (5.1/6.2)	130/157 (5.1/6.2)
Rated speed	rpm	1500 (1800)	1500 (1800)	1500 (1800)
Length	mm (inch)	4700 (185)	4900 (193)	5100 (201)
Width	mm (inch)	1400 (55)	1600 (63)	1400 (55)
Heigh	mm (inch)	2200 (86)	2400 (94)	2400 (94)
Dry weight	kg (lb)	4600 (10140)	6200 (13670)	6800 (15000)

Performance/efficiency (Biogas⁵⁾)

Configuration		50 Hz			60 Hz		
		6R	8V	12V	6R	8V	12V
Genset type		<i>mtu</i> 6R500 GS	<i>mtu</i> 8V500 GS	<i>mtu</i> 12V500 GS	<i>mtu</i> 6R500 GS	<i>mtu</i> 8V500 GS	<i>mtu</i> 12V500 GS
Engine type		6R500	8V500	12V500	6R500	8V500	12V500
Output							
Electrical output ¹	kWe	250	360	550	250	360	550
Thermal output							
Engine heat ²	kWth (kBTU/hr)	154	199	309	119 (406)	143 (488)	233 (795)
Exhaust heat (180°C/ 356°F) ^{2, 3}	kWth (kBTU/hr)	92	146	217	117 (399)	194 (662)	299 (1020)
Low temperature mixture heat (40°C/ 104°F) ²	kWth (kBTU/hr)	24	29	45	19 (65)	36 (123)	49 (167)
Input							
Energy input ⁴	kWth (kBTU/hr)	590	846	1293	607 (2071)	882 (3010)	1359 (4637)
Efficiency							
Electrical efficiency ⁵	%	42.4	42.5	42.5	41.2	40.8	40.5
Total efficiency	%	84.0	83.3	83.2	84.1	84.4	85.0

- a) GR: Includes standard configuraton (engine, generator, ase frame, gas train, MMC-*mtu* Module Control) with flexible heat recovery unit
- b) GC: Includes GR configuration with exhaust heat recovery

Values refer to: 50Hz NOx < 500mg/mn³ @5% O2 dry
60Hz NOx < 1g/bhp-hr @5% O2 dry
1) cos-phi = 1.0
2) heating values with tolerance ± 8%
3) Exhaust cooling s to 120°C/248°F (natural gas)
Exhaust cooling to 180°C/356°F (Biogas)
4) Input data according to ISO 3046-1 (+5% tolerance)
5) Natural gas: Methane number ≥ 80
Biogas: Methane number ≥ 135

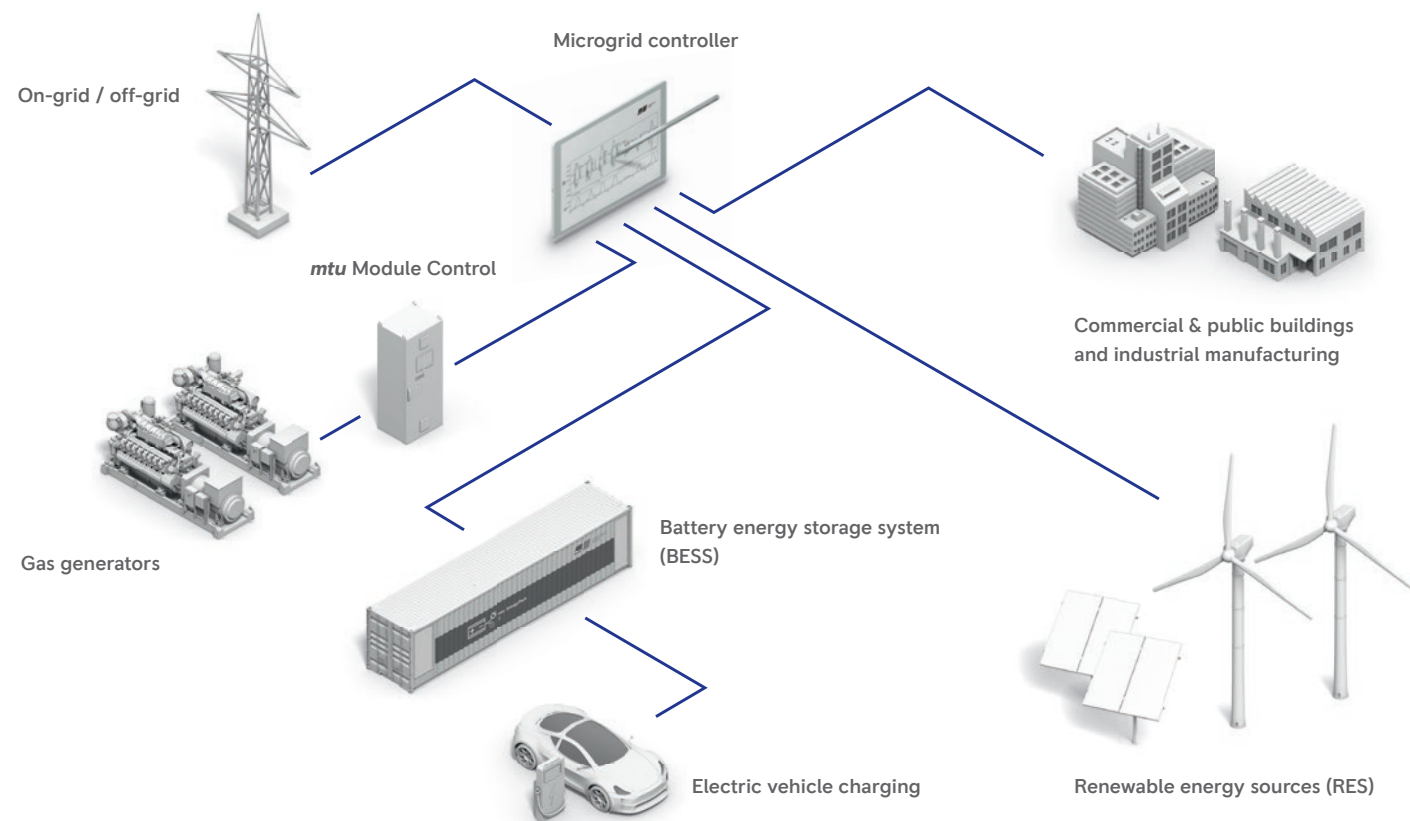
Any specifications, descriptions, values, data or other information related to dimensions, power or other technical performance criteria of the goods as provided in this general product information are to be understood as non-binding and may be subject to further changes such as, but not limited to, technical evolution at any time.

Microgrid integration

MICROGRID SERVICES, SYSTEM
INTEGRATION AND SMART CONTROL

Our microgrid systems offer a wide variety of solutions and services. Each one can be individually designed to serve specific needs.

Special microgrid services we offer include consulting, planning, the single-source supply of hardware and software as well as installation and maintenance. Apart from the efficiency of our **mtu** Series 500 gensets, our experts can show you ways to achieve even more substantial savings – for example, when these are embedded into the microgrid together with various energy sources and storage solutions.



Project planning and engineering

TEAMING UP FOR
YOUR SUCCESS

Our support for your individual project

As a rule, every power generation project is different. Knowing this, we place great value on working closely with clients in planning and engineering the best possible solution for their individual requirements. Our commitment to teaming up to find optimal solutions covers every step of the lifecycle – from simulation to the client-specific solution, commissioning, digital aftersales, repowering and remanufacturing.

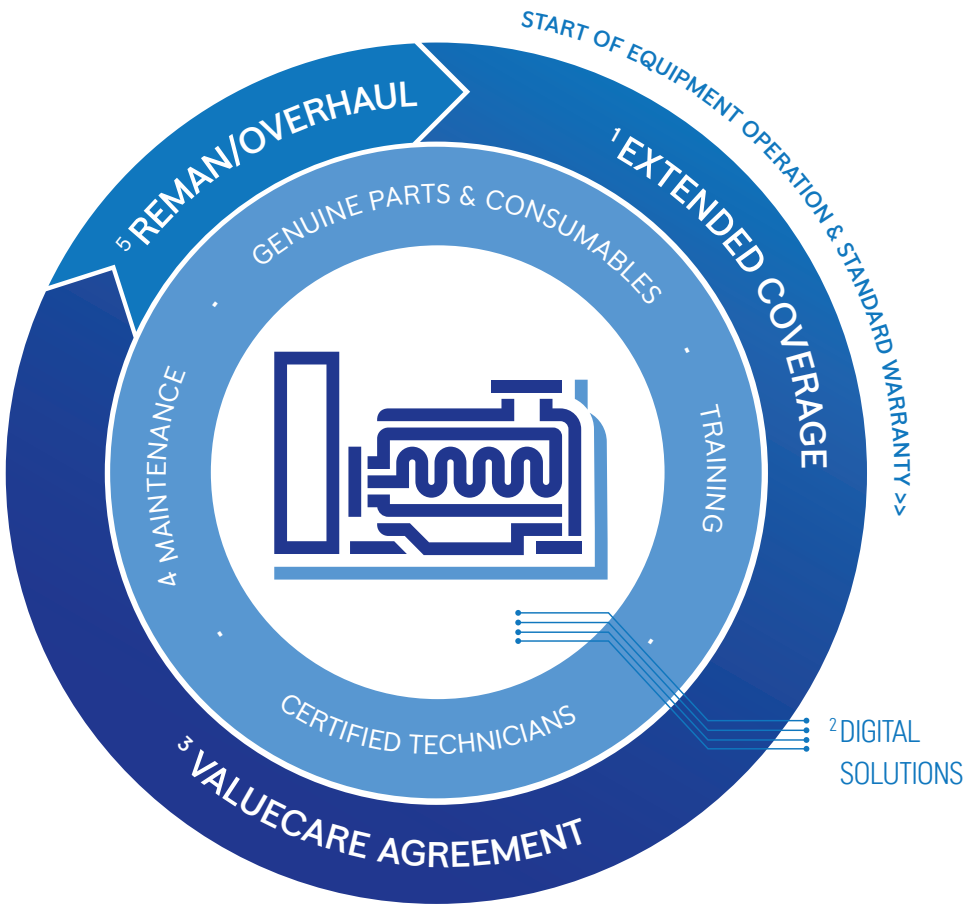
- Help with planning your new power generation solution
- Expertise to help you incorporate it into your application
- Detailed engine, system and component explanations
- Planning stage budget proposal and fixed implementation price
- Design and planning of peripheral systems
- Advice on service solutions
- Help with legal questions (e.g. German Renewable Energy Act levy, formaldehyde bonus)



How complete lifecycle solutions help

ENSURE A LONG, RELIABLE LIFE

As your equipment ages, its needs – and yours – change. Our full portfolio of service solutions wrap around your investment, providing 360 degrees of customized support, for optimal value at every stage of life.



- 1 Avoid the unexpected with added protection beyond the standard warranty.
- 2 Make better decisions faster with digitally-enhanced tools.
- 3 Maximize availability and optimize lifecycle costs with a ValueCare Agreement.
- 4 Improve system performance and extend equipment life with on-demand support.
- 5 Keep a good thing going with factory reman/overhaul solutions.

ValueCare Agreements

FOCUS ON YOUR OPERATIONS.
LEAVE THE REST TO US.

You’ve got a tough job. With us as your partner, you’ll get the power, performance and peace of mind to get it done right. Our digitally connected power systems and ValueCare Agreements make it easy to keep your business running smoothly and reduce total cost of ownership by maximizing uptime, optimizing lifecycle costs and helping you avoid equipment-related business disruptions through preventive maintenance.

Service solutions designed around your priorities
ValueCare Agreements make it easy to optimize lifecycle costs, maximize uptime and devote more time and resources to your core business, with tailored solutions to move your business forward.

Gold			
Maximize operational uptime			
Bronze	Silver	<ul style="list-style-type: none">– Operational uptime commitment to meet or exceed your availability targets– Regular supervision by local service partner (e.g. monitoring of parts stock, improvements)– 24/7 emergency assistance with on-site support– Monthly reports, including availability and average repair times– Asset health monitoring– Annual performance meetings and trend analysis with us to address technical updates, engine fleet data, operational optimization and more <p>Gold also includes all benefits of Silver & Bronze levels</p>	
	Eliminate unexpected maintenance costs		
Ensure parts availability and price stability	<ul style="list-style-type: none">– Proactive maintenance planning, troubleshooting and remote engine health monitoring– Fixed pricing per operating hour for maintenance and repairs– Key corrective maintenance components always in-stock at our main warehouses– 24/7 standby service with remote technical support– Quarterly reports, including reliability analysis (mean time between failure) <p>Silver also includes all benefits of Bronze level</p>		
<ul style="list-style-type: none">– Digital connectivity (<i>mtu</i> Go Connect) and access to <i>mtu</i> Go platform– Automated delivery of parts (preventive) at a predefined rate based on operating hours– Preventive maintenance labor options to fit your business needs– Our dedicated support for technical issues– Quarterly reporting of completed and upcoming maintenance and costs– Annual on-site engine health check by our technician			



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