The swift, reliable, and efficient solution

SIGENTICS industrial generators for maximum power yield

siemens.com/industrial-generators
SIGENTICS industrial generators
Reliable power for each and every application

Whether it’s on board a ship or oil platform, in an industrial plant, for an emergency power system, or a hydroelectric, diesel, gas, or steam power plant: SIGENTICS industrial generators are the perfect solution wherever power has to be generated quickly, reliably, at high efficiency, and with a positive impact on your return on investment.

A higher yield, achieved faster
SIGENTICS industrial generators are convincing thanks to their time-saving concept – so you can execute projects faster, from the initial planning to plant integration. This doesn't just power your competitive capability, it also speeds up your return on investment.

Based on their exceptional reliability and high efficiency, we can also guarantee the highest plant availability as well as maximum power yield – regardless of the location. Whether they’re installed in closed machine rooms or outdoors, or are subject to tropical heat, arctic cold, extreme humidity, or salt-laden sea air: Our SIGENTICS industrial generators are the optimal solution for every application and every environment.

Extensive portfolio
Our range of SIGENTICS industrial generators includes high- and low-voltage generators for diesel generator sets, small hydroelectric power plants, and turbine applications. The portfolio seamlessly covers a power range that extends from 0.3 up to 70 MVA – frequently with an efficiency rate exceeding 98 percent. Certified quality, outstanding material, and leading-edge techniques and processes – in conjunction with the extensive experience of our production personnel – result in unique, rugged industrial generators.

World-class power and performance
Benefit from synergies with other Siemens electrical machinery with high power ratings: for example, over 45,000 wind turbine generators that are operating reliably around the globe.

With SIGENTICS industrial generators, we continue to fulfill our role as a technological pacesetter – and we remain the undisputed No. 1 when it comes to large electric machinery. What's more, our generator design results in extremely low inspection and maintenance costs.

SIGENTICS industrial generator applications:
- Oil and gas, including drilling platforms
- Shipbuilding
- Decentralized diesel power plants (onshore and offshore)
- Emergency generators for industry and infrastructure projects
- Hydroelectric power plants with low and medium power ratings
- Gas-fired power plants
- Steam power plants
- Industrial plants and systems for the chemical and petrochemical industries, pulp and paper, sugar, and ethanol

Your advantages at a glance
- Highest degree of flexibility for planning and engineering
- Seamless range extending from 300 kVA to over 70 MVA
- Highest degree of reliability, even under extreme conditions
- Designed to have a service life of over 40 years thanks to an extremely long winding lifespan based on our well-proven Micalastic® insulation system
- Maximized power generation, high efficiency
- Short delivery time, fast commissioning
- Fast and easy plant integration, straightforward interface engineering, and space-saving design
- Quiet operation, minimum costs for noise reduction measures
- 3D simulation for optimal vibration levels
- Low maintenance and service-friendly
- Global service and support network
- Accelerated amortization, higher return on investment

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SIGENTICS HV
S-modyn series
Compact and flexible generators up to 70 MVA for industrial turbines

Typical efficiency at or above 98.5%
Wide range of options to optimally adapt the generators to the specific application
Generator service life of over 40 years
Whether it’s for a steam or gas turbine drive: The SIGENTICS HV S-modyn series offers comprehensive generator solutions for all turbine applications in the power range from 25 to 70 MVA. Predefined modules optimally adapt the generator to address specific project requirements.

Made to last
The SIGENTICS HV S-modyn series has a design service life of 40 years. This in itself emphasizes the quality and endurance of these generators, which incorporates windings with an extremely long service life thanks to the Micalastic insulation system.

The outstanding quality of the materials and components used also results in extraordinary mechanical strength and reliability.

Application areas for the SIGENTICS HV S-modyn series

- Combined gas and steam power plants
- Thermal power plants (solar, biomass, geothermal)
- Offshore platforms and FPSOs
- Railways
- Gasification plants
- Thermal recovery in industries such as chemical, pulp & paper, sugar and ethanol

Flexible power
These four-pole high-voltage synchronous generators with salient pole rotors for steam and gas turbines feature a modular design – which means that the SIGENTICS HV S-modyn series can address a wide range of applications, from onshore and offshore operation to island mode and grid operation. Regardless of the application, this generator series stands out as a thanks to its minimum downtimes, long service intervals, and especially its high yield, thanks to a typical efficiency rate at or above 98.5 percent.

The SIGENTICS HV S-modyn series covers the complete power range with just one shaft height. This simplifies integrating the generator into plants and systems, and the high level of standardization – even for high power ratings – ensures a short delivery time and a high on-time delivery performance.

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- Railways
- Gasification plants
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Your advantages at a glance

- High overload capability
- Can be quickly and easily engineered and integrated into plants and systems
- Customer-friendly interface concept
- Compact design to fit on-site of the driven plant
- Rugged mechanical design
- Maximum start-up speeds, comprehensive monitoring systems
- Resistant to dirt, humidity, salt, and chemicals
- Minimum failure rate due to the high-quality components used
- Windings with outstanding service-life thanks to the well-proven Micalastic insulation system
- Busbar design for minimum maintenance costs
- Controllable short-circuit power
- Selectable maintenance intervals for an extended device service life
- Design measures that prevents oil leaks
SIGENTICS Diesel Genset series
Flexible, reliable power that you can depend on

High efficiency of about 98%
Destined for operation on the high seas, thanks to the rugged design
Country and sector-specific certificates mean that the units can be used universally

Your advantages at a glance

- Customizable to meet specific requirements
- Long service life thanks to the optimal cooling
- Simplified electrical design
- High efficiency of about 98%
- Swift and simplified electrical design
- 3D simulation for ideal vibrational behavior
- Cost-saving and environmentally friendly
- Quiet operation
- Compact design with high power density
- Low maintenance, even when installed
- Lower diesel fuel consumption as a result of the lower diesel fuel consumption
- Full load to continuous operation
- Long service life thanks to the optimal cooling
- Add to this the fact that the SIGENTICS series has been calibrated through comprehensive testing, including startup and control
- The SIGENTICS Diesel Genset series stands for the highest degree of efficiency, reliability, and flexibility.

The SIGENTICS Diesel Genset series is the new generation of high-performance engines for shipboard and offshore platforms.

These generators have been specifically designed for use in shipboard and offshore applications (1 to 25 MVA), ensuring that you have the right equipment for the job.

High seas and extreme conditions:

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Today SIGENTICS high-voltage and low-voltage diesel generator sets are the benchmark – both technically and in terms of cost-efficiency – for decentralized power plants, emergency generators, and powering ships and offshore platforms.

Convincing solutions
The SIGENTICS Diesel Genset series offers optimal performance under severe exterior conditions; for example, humid tropical climates and salt-laden sea air. The modular design means that these generators can be precisely adapted to the specific application. Not only that, the series complies with all the relevant international standards and certificates, facilitating global use in the widest range of applications.

Add to this the fact that the SIGENTICS series has been designed and built so that it’s especially reliable. In addition, the service windows that enable easy access, and the weather bridge installed at the non-drive end facilitate ease of maintenance, even when space is restricted.

Type 1FC2 new generator for traction solution
• At the heart of the high power generation: the diesel-electric locomotive is a generator that contains Siemens generator coupled to a diesel engine.
• Developed specifically for this field of operations, with especially flexible rotor construction.
• Primarily used for retrofitting old locomotives.
• The new generator 1FC2 replaced the old DC generator with a brushless AC generator.

Your advantages at a glance
• Low maintenance, even when installed at locations with extreme conditions
• Long service life thanks to the optimal cooling
• Optimized for a service life of over 40 years
• Compact design with high power density
• For traction use: diesel-electric locomotives
• Swift and simplified electrical design
• Cost-friendly and environmentally friendly
• Low engine and maintenance costs
• Reduced diesel fuel consumption
• Quiet operation
• Simplified spare parts inventory

BDEW certification
In 2016, Siemens conducted a generator-family component certification process according to German BDEW guidelines that covered salient and non-salient pole machines in a power range of 1 to 10 MW. Component certification involves building a generator and AVR model that is calibrated through comprehensive testing, including reactive-power step response and fault ride-through tests.

The tests were conducted at the test field at Siemens Dyronwerke Berlin.

Although the certification process is presently mandatory only in Germany, the component model offers a good foundation for examining unit performance according to other grid codes, such as NORS. The main customer benefit is that expensive FRT tests during the commissioning of the generating unit are no longer needed.

Application areas for the SIGENTICS series for high and low voltage
• Decentralized power plants
• Main generators for ships and oil platforms
• Mobile power plants
• Emergency generators
SIGENTICS M series
Boost your energy yield

Faster project implementation, earlier return on investment: SIGENTICS M offers decisive benefits in terms of project implementation. In addition, the well-designed and extremely rugged frame offers advantages in terms of standardization – and the machine’s superior performance is another outstanding quality of this modular generator series.

Engineering expertise meets generator excellence
The SIGENTICS M series is the new generation of high-performance synchronous alternators from Siemens. Their construction is based on a proven and tested design that is powering a multitude of applications worldwide. You benefit from one-and-a-half centuries of experience and tradition in building rotating electric machines, which enables us to maintain our leadership in energy efficiency and operational reliability.

Our goals: To support you in becoming even more competitive, and to enable you focus on your core competencies.

Faster project execution with higher energy output and better eco-sustainability
Top-of-the-range efficiency of up to 98.4%
New modular frame with a wide variety of options, even for challenging applications
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Technical details at a glance
- Rated voltage: 0.4 / 0.45 / 0.69 / 3.3 / 4.16 / 6.3 / 6.6 / 11 / 13.8 kV
- Rated frequency: 50 / 60 Hz
- Pole numbers: 4 / 6 / 8 / 10 / 12 / 14
- Shaft height: 710 mm, 800 mm
- Type of construction: Horizontal IM 100_, IM 110_
- Excitation system (brushless): AREP (auxiliary winding), PMG (permanent magnet)
- AVR: BASLER DECS, SIEMENS DIGIREG, F&S TIBS
- Inclinations: Up to 25°
- Type of protection/Cooling type: IP 44/IP 54/IP 55/IC 81W
- IC 01/IC 611/IC 616

Your advantages at a glance
- Customizable to meet specific requirements
- Fast planning, fast delivery, fast integration
- Superior performance and efficiency up to 98.4%
- Lowest noise and vibration levels
- Lower weight and compact design to save space and resources
- Outstanding technical reliability and product lifespan
- Comprehensive program of monitoring services

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SIGENTICS Small Hydro series
Rugged and long-lasting for hydroelectric power plants up to 25 MVA

Superior efficiency for highly efficient and sustainable power generation

Designed specifically for hydroelectric power plants with extremely fast response to load fluctuations

Low maintenance requirement makes these generators the ideal choice for use in river dams and tidal power plants

Siemens Hardware
Small and medium-sized hydro-electric power plants up to 25 MVA need especially efficient generators that combine sustainability, ruggedness, and a long service life with low maintenance.

Application-optimized design
The SIGENTICS Small Hydro series distinguishes itself not only with our modular frame design, but also with a range of different cooling methods. It has already proven itself in many hydropower plants – and is also certified by the BDWI (Bundesverband der Energie- und Wasserwirtschaft: the German Association for the Power and Water Industries). These generators have an optimized power and performance profile that includes a fast response to load fluctuations.

They also feature a high insulation class and a rugged design that ensures a long service life and makes them insensitive to constant moisture and even saltwater. And thanks to their compact design, they are ideally suited for installation in all types of dams and weirs.

Minimized lifecycle costs
The rugged mechanical design of the SIGENTICS Small Hydro series generators makes them exceptionally reliable. They also stand out due to their especially low lifecycle costs.

Maximum availability, a long service life, a short payback period, and low operating costs are crucial for small and medium-size hydro systems.

Application areas for the SIGENTICS Small Hydro series:
• River weirs
• Dams
• Pump-storage hydro power plants
• Tidal power stations

Your advantages at a glance
Certified by the BDWI, Bundesverband der Energie- und Wasserwirtschaft (German Association of the Power and Water Industries)
• Resistant to dirt, humidity, and saltwater
• Space-saving design for easy integration: for example, in dams and weirs
• Long service life of over 40 years, high return on investment
• Minimalized downtime, extremely high reliability
• 3D simulation for outstanding vibrational behavior
• Warranty period of up to five years
• Simple spare parts inventory
• High degree of flexibility in the electrical design
• Fast and simple commissioning
• Quality management according to DIN EN ISO 9001

Faster project execution with higher energy output and better eco-sustainability
Top-of-the-range efficiency of up to 98.4%
New modular frame with a wide variety of options, even for challenging applications

SIGENTICS
Small Hydro series
Rugged and long-lasting for hydroelectric power plants up to 25 MVA
SIGENTICS Turbine Driven series

Maximum quality, efficiency, and flexibility
For steam and gas turbine applications – suitable for indoor and outdoor installation – the SIGENTICS Turbine Driven series provides you with power ratings up to 25 MVA and efficiency levels over 98 percent, resulting in a high degree of cost-effectiveness.

Greatest possible levels of efficiency, reliability, and flexibility
Quickly and precisely adapting to fluctuating supply grids and loads is a challenge for turbine-driven generators, in addition to a rugged service life and high thermal endurance. As a result, the SIGENTICS Turbine Driven series is the ideal power source for extremely cost-effective and energy-efficient power generation. Other features include the highest possible plant and system availability and reliability – which leads directly to low lifecycle costs.

The SIGENTICS Turbine Driven generator series provides outstanding performance under the most extreme conditions thanks to their thermal endurance and mechanical strength. This means that they take heat, humidity, chemicals, and salt laden sea air in their stride. And as a result of their compact modular design, the Turbine Driven series can be quickly and precisely adapted to and integrated in every plant or system – including the generators’ electrical parameters.

Application areas for the SIGENTICS Turbine Driven series:
- Gas turbines
- Combined cycle plants
- Oil platforms
- Mobile power plants
- Refineries
- Steam turbines
- Generation plants
- Thermal recovery in industries including pulp and paper, chemical and petrochemical, sugar, and ethanol.
- Geothermal systems
- Refrigeration

Your advantages at a glance
- Can be flexibly adapted to your particular plant or system
- Insensitive to dirt, humidity, and saltwater
- Very rugged design, high thermal resistance
- Highest reliability, maximum plant/system availability
- 3D simulation for outstanding vibrational behavior
- Can be quickly and easily commissioned
- Simplified spare parts inventory
- Space-saving design simplifies integration into plants and systems
- Can be quickly and easily engineered and commissioned
- High efficiency even in partial outputs

SIGENTICS Turbine Driven series
Maximum quality, efficiency, and flexibility

Powerful and cost-effective
The excellent efficiency and corresponding high power ratings of the SIGENTICS Turbine Driven series are the result of some extremely cost-effective and energy-efficient power generation. Other features include the highest possible plant and system availability and reliability – which leads directly to low lifecycle costs.

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Steam turbine driven SIGENTICS generator for
Precheza chemical site at Přerov, Czech Republic
The objectives to be met in this challenge: Optimizing
the efficiency and reliability of a production site for
inorganic pigments with a steam turbine driven generator.
This is where our Turbine Driven SIGENTICS HV series
came into play. The results: outstanding efficiency of
more than 98 percent – and true investment security.

SIGENTICS generator for hydro-electric power station
Tri Chaloupky, Czech Republic
Find the key to higher efficiency and reliability for a nearly
70-year-old hydro-electrical power station and its outdated
generator: this was the challenge at our generator project
on the Elbe River in Tri Chaloupky.
We replaced the system with a 1.7 MW SIGENTICS HV
Small Hydro generator with a capacity of 7.4 GW of
eco-friendly energy per year. This solution is as robust
as it is efficient and delivers the highest possible plant
and system availability.

SIGENTICS generator for Brno University of Technology,
Czech Republic
How do you go about equipping an outstanding high-
current test laboratory with a very powerful and robust
electrical source? To be more precise: How can you build
a test stand with extreme electrical and mechanical
strength for technical research on switchers? This was
the challenge at Brno University’s research center.
The solution: A test stand with remarkable strength based
on a Siemens 16-MVA synchronous generator with 6.3 kV
and packed with advantages. The SINAMICS frequency
converter chipped in with great testing flexibility, and
digital analysis and condition monitoring provided valuable
research results.

Our references
SIGENTICS generators in action
Benefit from our extensive experience

We see ourselves as industry’s expert partner. Our in-depth expertise in all areas of power generation and transmission helps you operate your generators to obtain the maximum yield.

Always at your side
With our global sales network, production facilities, and regional offices, we’re always close-by to provide you with support. This means that you have a knowledgeable partner that you can depend on, that knows your systems and challenges, and can support you in every area. You’ll also benefit from significantly shorter delivery times so that you can start to generate power sooner. What’s more, our generators are designed to be very rapidly commissioned.

Global service network
And when we say global, we really mean it. In an emergency, you can reach our worldwide service organization via a hotline that’s available 24/7 and that can quickly and flexibly support you in 190 countries. Benefit from our extensive experience acquired from more than 150 years in the area of electrical engineering and power generation – which is what allows us to be your supportive and dependable partner.

High investment security
With a design service life of 40 years, our industrial generators ensure that your investment pays off. The high system availability and the low-maintenance design of these generators play a crucial role in achieving this extended lifespan. And their high performance and power rating and excellent efficiency ensure a fast payback.

An overview of SIGENTICS industrial generators

### Technology

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<tr>
<th>HV S-modyn series</th>
<th>Diesel Genset series</th>
<th>Small Hydro series</th>
<th>Turbine Driven series</th>
<th>SIGENTICS M</th>
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</thead>
<tbody>
<tr>
<td>Technology</td>
<td>Synchronous generators</td>
<td>Synchronous generators</td>
<td>Synchronous generators</td>
<td>Synchronous generators</td>
</tr>
<tr>
<td>Rotor design</td>
<td>Salient pole rotor – rugged design (solid rotor)</td>
<td>Cylindrical rotor or salient pole rotor</td>
<td>Cylindrical rotor or salient pole rotor</td>
<td>Cylindrical rotor or salient pole rotor</td>
</tr>
<tr>
<td>Power range</td>
<td>25 – 70 MVA</td>
<td>0.29 – 25 MVA</td>
<td>0.5 – 25 MVA</td>
<td>Up to 20.1 MVA</td>
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<tr>
<td>Voltage class</td>
<td>6.0 – 15.75 kV</td>
<td>380 V – 15 kV</td>
<td>380 V – 15 kV</td>
<td>380 V – 13.8 kV</td>
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<tr>
<td>Number of poles</td>
<td>4 poles</td>
<td>4 – 14 poles</td>
<td>4 – 14 poles</td>
<td>4 poles</td>
</tr>
<tr>
<td>Shaft height</td>
<td>1,120 mm</td>
<td>400 – 1,120 mm</td>
<td>400 – 1,120 mm</td>
<td>400 – 1,340 mm</td>
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<td>Type of construction</td>
<td>Horizontal foot mounting (IM1005, IM100x as an option)</td>
<td>Horizontal or vertical foot mounting</td>
<td>Horizontal foot mounting</td>
<td>Horizontal foot mounting</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Steel</td>
<td>Steel</td>
<td>Steel</td>
<td>Steel</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 Hz/60 Hz</td>
<td>50 Hz/60 Hz</td>
<td>50 Hz/60 Hz</td>
<td>50 Hz/60 Hz</td>
</tr>
<tr>
<td>Efficiency</td>
<td>98.5% and above</td>
<td>Up to 98%</td>
<td>Up to 98%</td>
<td>Up to 98.3%</td>
</tr>
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<td>Thermal class</td>
<td>155 (F) utilized to 130 (F)</td>
<td>155 (F), 180 (H) for LV</td>
<td>155 (F), 180 (H) for LV</td>
<td>155 (F), 180 (H)</td>
</tr>
<tr>
<td>Cooling method</td>
<td>IC B1 W, IC 31, IC 616 (additional cooling methods on request)</td>
<td>IC 01, IC 31, IC 81 W</td>
<td>IC 01, IC 31, IC 81 W, IC 616, IC 611</td>
<td>IC 01, IC 611, IC 616, IC 81 W</td>
</tr>
<tr>
<td>Ex protection</td>
<td>Ex p, Ex n</td>
<td>–</td>
<td>Zone 2 (1): Ex p2, Zone 2: Ex nA</td>
<td>Optional Ex n or Ex p</td>
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<tr>
<td>Standards</td>
<td>IEC60034, NEMA MG-1, Additional standards (IEE611, IAE646, ANSI, industry, customer specifications on request)</td>
<td>IEC60034, Marine certificates (DNV-GL, ABS, BV, LR, CCS, RINA, NRS, …)</td>
<td>IEC60034</td>
<td>IEC60034, Marine certificates (DNV-GL, ABS, BV, LR, CCS, RINA, NRS, …)</td>
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<tr>
<td>Primary applications</td>
<td>Gas turbines, steam turbines, chemical and petrochemical, oil and gas, geothermal energy</td>
<td>Power generation, shipbuilding, oil and gas, emergency generators, decentralized power stations</td>
<td>Weirs, pump-storage, power plants, dams, tidal power plants</td>
<td>Steam turbines, gas turbines, oil and gas, pulp and paper, chemical and petrochemical, sugar and ethanol, shipbuilding</td>
</tr>
</tbody>
</table>

### An overview of SIGENTICS industrial generators
A tradition of outstanding quality
More than 100 years of Siemens generators

When Werner von Siemens discovered the dynamo-electrical principle in 1866, he laid the foundation for electricity to be used as a source of power and inspired the disruptive development of innovations in power engineering that has been the company’s hallmark ever since.

Dynamowerk Berlin
Founded in 1906, Dynamowerk is the oldest factory in the Siemensstadt quarter of Berlin. It continues to be an important economic driver for the city, employing more than 650 specialists in industrial generators and motors. Dynamowerk manufactures special machines with an output of 100 MW/650 t for applications in all industries. Today more than 750 employees continuously implement innovative ideas for developing better engines and generators. The product portfolio comprises SIGENTICS HV S-modyn industrial generators (20 MVA to 75 MVA), SIMOTICS H-modyn high-voltage motors (2 MW to 40 MW), and specialized ring motors, marine propulsion, rolling and conveyor high-voltage motors (up to 80 MW), and groundbreaking innovations like the SIMOTICS active magnetic bearing technology.

Siemens Electric Machines s.r.o.
The generator factory at Drásov in the Czech Republic was founded in 1913. On a floor space of 18,000 m², approximately 700 employees develop, engineer, manufacture and service generators up to 25 MVA for the shipbuilding industry, offshore oil platforms, turbines, and railway generators. The product portfolio also includes asynchronous (A-modyn) and synchronous motors up to 20 MW for special applications, as well as components such as coils and stators for other Siemens plants.