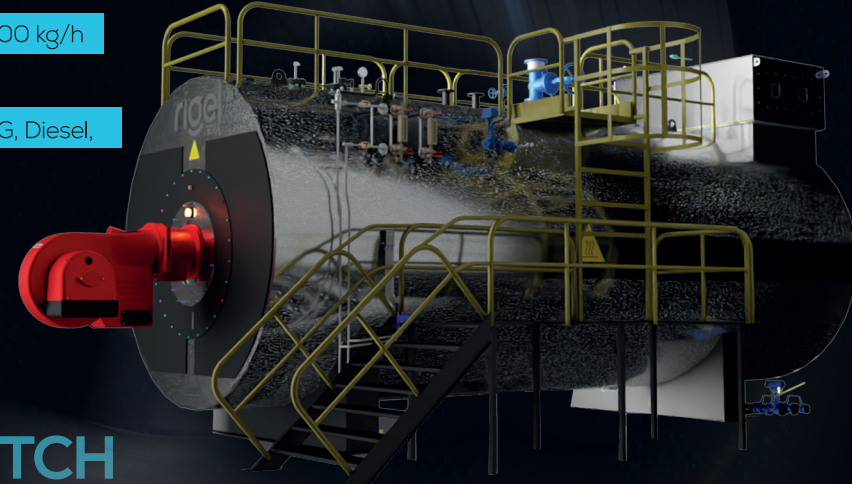


Steam Output Capacity: 1,000 – 20,000 kg/h

Operating Pressure: Up to 25 Bar

Multi-Fuel Operation: Natural Gas, LPG, Diesel,

Fuel Oil, LNG, LBG, Biogas & Biofuels



RIGEL EPC SCOTCH TYPE STEAM BOILER

The Rigel EPC Scotch Type Steam Boiler is a steam generation system redesigned with a modern engineering approach based on classic Scotch boiler technology, developed to meet the high-capacity, continuous, and reliable steam demands of industrial facilities. Its cylindrical shell structure with a high water volume ensures stable steam production, allowing industrial processes to operate safely and without interruption.

Operating on the principle of passing flame and flue gases through fire tubes located within the boiler shell, the Scotch-type design provides high combustion efficiency and balanced heat distribution thanks to its large heat transfer surface. This structure delivers stable steam output even under sudden load changes, making it an ideal solution for long-term and heavy-duty applications.

The combustion chamber and tube arrangement optimized through Rigel EPC engineering ensure maximum utilization of fuel energy. Thanks to the advanced thermal insulation system, surface heat losses are minimized, overall system efficiency is increased, and operating costs are reduced. The system can operate with natural gas, LPG, fuel oil, and optional alternative fuels, offering flexible solutions for diverse industrial requirements.

Equipped with advanced pressure, temperature, and water level control systems, the Rigel EPC Scotch Type Steam Boiler is designed in compliance with international safety standards. Safety valves, automatic and

continuous blowdown systems, level electrodes, and multi-stage protection equipment ensure a high level of safety under all operating conditions.

The accessible shell structure, designed with maintenance and service convenience in mind, simplifies internal cleaning, periodic inspections, and servicing operations. Its robust construction, high-quality material selection, and controlled manufacturing processes provide long service life and reliable operation. Low failure rates and extended maintenance intervals offer significant operational advantages for industrial users.

The Rigel EPC Scotch Type Steam Boiler is widely preferred in food, textile, chemical, pharmaceutical, energy production, hospital, hotel, and heavy industry facilities. Rigel EPC approaches Scotch type steam boilers not merely as equipment, but as complete, project-based engineering solutions. All stages—including design, manufacturing, installation, commissioning, and after-sales support—are carried out with Rigel EPC's experience and engineering expertise.

With its durable structure, high efficiency, and reliable operating characteristics, the Rigel EPC Scotch Type Steam Boiler provides a powerful, sustainable, and cost-effective steam solution for industrial operations.

Rigel Scotch Type Steam Boiler	Criteria	Old (Conventional) Scotch Type Steam Boiler
Modern engineering, optimized shell and tube design	Design Structure	Classic design, old engineering approach
High-efficiency combustion chamber and maximum heat transfer	Combustion & Heat Transfer	Standard tubes, low-turbulence flue gas flow
High combustion and heat transfer efficiency	Efficiency	Low efficiency, high fuel consumption
Optimized, lower fuel consumption	Fuel Consumption	Higher fuel consumption
Advanced safety equipment and control systems	Safety	Limited safety equipment
PLC / digital automation compatible	Control System	Manual or semi-automatic control
Easy maintenance, accessible design	Maintenance & Operation	Difficult maintenance, long downtime periods



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Steam Generation Capacity: 500 kg/h – 4,000 kg/h

Operating Pressure Range: 0.5 Bar – 10 Bar

Fuel Options: Natural Gas, LPG



RIGEL ONESTEAM STEAM GENERATOR

Next-Generation High-Efficiency Steam Technology

Steam Type	Pressure	Temperature	Operating Status
Saturated Steam	10 bar	184 °C	Stable operation
Superheated Steam	10 bar	200 °C	Stable operation
Superheated Steam	10 bar	230 °C	Achievable but unstable operation

The Rigel OneSteam Steam Generator is a next-generation steam production system designed to provide safe, efficient, and long-lasting steam solutions for industrial facilities. With a capacity range of 500 kg/h to 3000 kg/h and a maximum operating pressure of 16 barg, OneSteam offers flexible performance for various process requirements. OneSteam is equipped with an integrated deaerator (degasser) system. By removing dissolved oxygen and non-condensable gases from the feedwater, the deaerator significantly reduces corrosion in the boiler body, piping, and system components. This results in extended equipment lifetime, reduced maintenance costs, and improved operational safety.

Thanks to its integrated heat exchange technology, OneSteam utilizes a direct-flow, multi-stage heat transfer structure to maximize energy efficiency. The optimized water-steam separation ensures stable, continuous, and high-quality steam production. The fully premixed, water-cooled combustion technology delivers high combustion efficiency, enhanced safety, and long service life. This design minimizes flame instability and backfire risks, allowing stable operation across a 25-100% load range, while

maintaining low NOx and CO emissions for environmentally responsible operation.

OneSteam provides adjustable steam humidity and the ability to produce slightly superheated steam, adapting to specific process demands. Steam temperatures of up to 230°C increase thermal enthalpy and overall process efficiency.

The PLC-based PID intelligent control system fully automates water, gas, and electrical management. Stepless capacity control and 24/7 continuous operation ensure uninterrupted and reliable performance.

With its dual-channel economizer system, residual flue gas heat is efficiently recovered, reducing flue gas outlet temperatures to below 50°C and achieving high system efficiency. Working in combination with the integrated deaerator, it ensures consistent feedwater quality and long-term system protection. OneSteam is an ideal steam generator solution for modern industrial plants, offering low operating costs, extended service life, high energy efficiency, and an integrated deaerator system.

OneSteam Steam Generator vs. / Conventional Steam Boilers

101.21%	Thermal Efficiency	90% ~ 95%
75 m ³ /hour	Gas Consumption per Ton of Steam	Above 85 m ³ /hour
Steam generation in 25 seconds	Start-up Time	More than 30 minutes of preheating required
Water-cooled, fully premixed burner	Burner	Conventional: FGR combustion system
100% dry steam quality	Steam Dryness	Conventional: 96% steam dryness
Flue gas temperature below 60°C	Flue Gas Temperature	>140°C, high heat losses
Fully automatic, push-button operation, no operator required	Operating System	Boiler operator required, labor cost increases
Can be installed close to the point of consumption	Installation	Strict boiler room requirements apply
Heat loss reduced by 2% ~ 5%	Installation	Strict boiler room requirements apply
No Explosion Risk	Safety	Operates under pressure, explosion risk exists
< 50 liters	Water Volume	> 1000 liters
Ultra-low NOx emissions < 30 mg/m ³	Environmental Protection	Excessive NOx emissions in flue gas

Steam Generation Capacity: 500 kg/h – 3,000 kg/h

Operating Pressure Range: 0.5 Bar – 16 Bar

Power Source: Electricity



RPOWER ELECTRIC STEAM BOILER

Powerful Steam with
Clean Energy

The RPower Electric Steam Boiler is a steam generation system designed to meet the needs of modern production facilities, operating entirely on electrical energy. Thanks to its combustion-free structure, it eliminates the use of fossil fuels and does not require additional infrastructure such as chimneys, gas lines, or combustion air systems. This significantly simplifies installation while offering an environmentally friendly solution for industrial operations.

Using electric heating element technology, water is converted into steam in a controlled and balanced manner. The system reaches operating pressure in a short time, enabling rapid start-up and minimizing waiting times in production processes. It delivers stable performance even in applications where steam demand changes suddenly.

With its compact and modular design, the RPower Electric Steam Boiler can be easily installed in limited spaces. It integrates seamlessly into existing facility infrastructures without the need for additional construction or complex

installation. Its quiet operating characteristic provides a major advantage, especially in hospitals, laboratories, and indoor applications.

The advanced electronic control system allows precise monitoring and management of steam pressure, temperature, and capacity. Automatic water level control and multi-stage safety systems ensure safe and uninterrupted operation. Low maintenance requirements and a simplified mechanical structure help reduce long-term operating costs.

By combining high efficiency, operational safety, and an environmentally responsible approach, the RPower Electric Steam Boiler stands out as a reliable alternative for industrial steam applications.

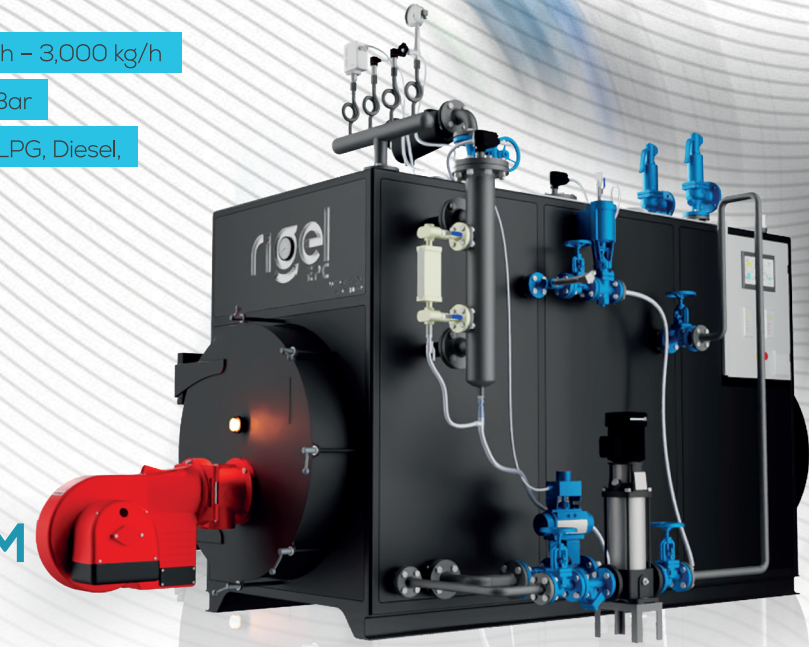
Electric Steam Boiler	Criteria	Conventional Steam Boiler
Steam is generated by directly heating water with electric heating elements	Operating Principle	Water is heated by flame and flue gases produced by fuel combustion
Very fast, instant steam	Steam Generation Speed	Long start-up time
No chimney, zero emissions	Chimney & Emissions	Chimney required, emissions occur
High safety due to absence of combustion	Safety	Combustion and gas-related risks exist
High electricity cost, advantageous at small capacities	Energy & Operating Cost	More economical at large capacities
Compact structure, minimal space requirement	Space Requirement	Larger space and auxiliary equipment required
Easy maintenance, no burner or chimney	Maintenance & Operation	More maintenance and periodic inspections required
Quiet operation	Noise & Vibration	Noise may occur due to burner and fan
Hospitals, laboratories, food industry, small-medium facilities	Application Areas	Industrial plants with continuous high steam demand
Clean, fast and low-maintenance solution	Overall Evaluation	High-capacity and classic solution

Steam Generation Capacity: 500 kg/h – 3,000 kg/h

Operating Pressure Range: 0.5 – 16 Bar

Compatible Fuel Types: Natural Gas, LPG, Diesel,

Fuel Oil, LNG, LBG, Biogas, Biofuels



FIRE-TUBE STEAM GENERATOR

The Rigel EPC Fire-Tube Steam Generator is a modern steam generation system designed to meet the safe, efficient, and uninterrupted steam demands of industrial facilities. Thanks to its fire-tube operating principle, fuel energy is utilized effectively, operating costs are reduced, and high steam efficiency is achieved. By passing the hot flue gases generated during combustion through specially designed tubes, maximum heat transfer to the water is ensured. This structure enables stable and high-quality steam production in a short time, while homogeneous heat distribution reduces thermal stresses on the boiler and extends the service life of the equipment.

With its compact and packaged design, the Rigel EPC Fire-Tube Steam Generator can be easily installed in limited spaces. Its rapid start-up capability prevents time losses in production processes. The optimized combustion structure and advanced insulation system minimize fuel consumption and energy losses, providing an environmentally friendly and economical solution. Equipped with advanced pressure, temperature, and

water level control systems, the generator ensures a high level of safety under all operating conditions. Thanks to its maintenance-friendly design, downtime is reduced, allowing the system to operate reliably for many years. The Rigel EPC Fire-Tube Steam Generator is widely preferred as a reliable steam source in food, textile, chemical, pharmaceutical, hospital, hotel, and various industrial process applications. Developed with Rigel EPC engineering expertise, this system offers a long-lasting, efficient, and sustainable steam solution for industrial operations.

Rigel EPC approaches steam generators not merely as equipment, but as complete engineering solutions. All stages including design, manufacturing, installation, and after-sales support are carried out with Rigel EPC's engineering expertise and experience. With its durable structure, high efficiency, and reliable operating characteristics, the Fire-Tube Steam Generator delivers a powerful and sustainable steam solution for industrial facilities.

Fire-Tube Steam Generator	Criteria	Conventional Steam Boiler
Flame and flue gases pass through tubes; effective heat transfer to the tubes is achieved thanks to turbulators.	Operating Principle	Flame and flue gases circulate in a large boiler shell, heating a high water volume
Fast steam generation, short start-up time	Steam Generation Speed	Slow steam generation, long warm-up time
Lower water volume	Water Volume	High water volume
More controlled and safer operation	Safety	Higher risk level due to high water volume
Suitable for low and medium pressure applications	Operating Pressure	Generally medium and high pressure systems
More effective heat transfer, higher efficiency	Efficiency	Efficiency may decrease at partial loads
More compact structure	Space Requirement	Larger space and boiler room required
Easier maintenance, lower blowdown and chemical demand	Maintenance & Operation	Higher maintenance, blowdown and chemical demand
Faster response to sudden steam demand	Response to Load Changes	Slow response to load changes
Industrial processes, production lines	Application Areas	Heating systems and constant steam demand
Modern, efficient and compact solution	Overall Evaluation	Classic, heavy and traditional solution