

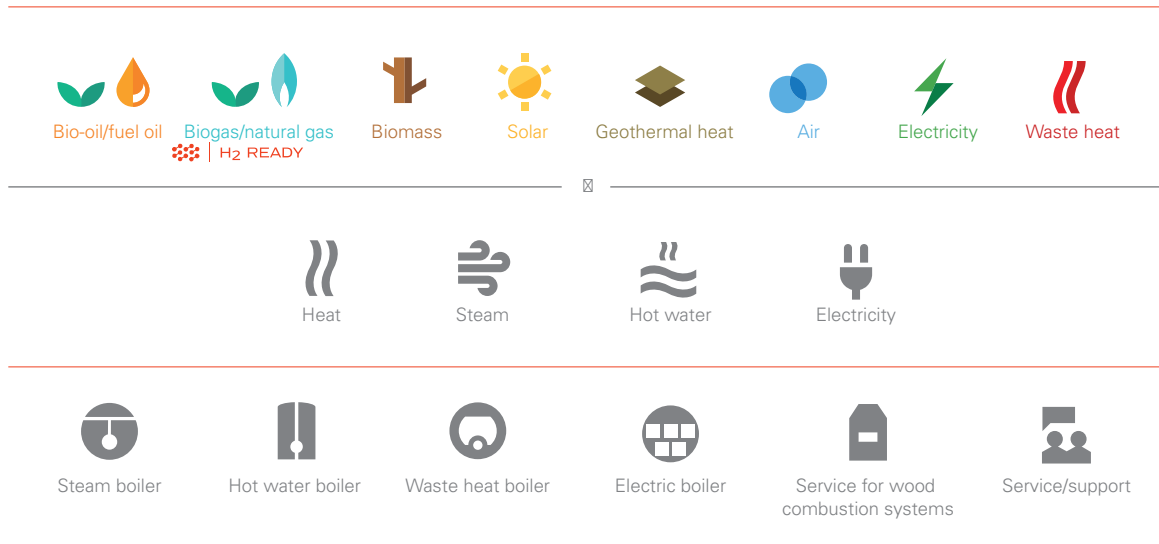
**TECHNICAL INFORMATION****VITOMAX**

Hot water and steam boilers:  
Future electrified



- Power-to-heat & power-to-steam
- 100 % electric or hybrid
- Cutting the carbon footprint in half
- Everything from a single source

# Power and process energy become one



Heat is a human need that Viessmann has been successfully serving for four generations. But social responsibility now goes far beyond this: the world is facing a major challenge to sustainably change its energy supply. Viessmann is making a substantial contribution to this with its technology by developing and producing integrated climate and energy solutions for people and businesses worldwide.

### Climate solutions for industry and commerce

In the industrial and commercial sector, the comprehensive range for process energy, i.e. steam and heat, is setting new benchmarks. With its focus on energy efficiency, Viessmann is helping to lower costs while protecting natural resources and the environment. In the industrial boiler segment, Viessmann offers its customers smart systems and tailor-made sustainable solutions that, in combination, ensure an economical steam supply of well over 100 tonnes/hour and more than 100 megawatts of heat.

### Power-to-heat/ power-to-steam

Moving from fossil fuels to renewable solutions, with a significant reduction in greenhouse gases, has a high priority in the further development of Vitomax hot water and steam boilers.

As the proportion of renewables, such as wind and solar energy, fed into the grid increases, more and more grid-friendly "green" energy is available.

With electric and hybrid boilers, surplus power can be used for grid balancing in industrial processes for heat or steam generation while reducing dependence on fossil fuel types at the same time.

In conjunction with further "green" storage or generation options, the amount of fossil fuels used is being gradually squeezed. This process, known as power-to-heat or power-to-steam, is becoming increasingly important as a form of hybrid energy storage for the



Energy centre with Vitomax boilers.  
These can already run on 100 percent hydrogen.

energy transition and is helping in a significant way to combat climate change.

### 100 % electric or hybrid?

Vitomax boilers are suitable for fully electric operation or can be used as a hybrid version in combination with a pressure-jet burner and electric flange heaters. A Vitomax electric boiler delivers an output of up to 10 tonnes/hour (steam) or 9 megawatts and 25 bar (hot water). Hybrid boilers are designed for up to 20 tonnes/hour or 14 megawatts and 25 bar.

When using electric or hybrid boilers, the normal range extends from 0 to 100 percent so that every requirement can be ideally served.

Electric boilers are especially suitable for making renewable energy sources available for industrial heat generation processes with high temperatures and high pressure. The boilers use integral electric heating cartridges, or electrodes

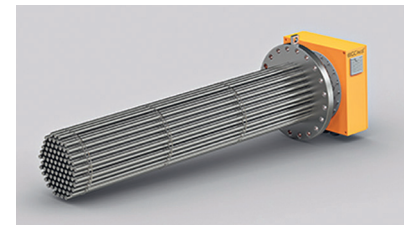
in the higher output range, to convert the electric power into nearly 100 percent heat.

### Flexible control characteristics and plug & run solution

Viessmann offers its electric and hybrid boilers with flange heaters for heat generation. These are matched to the respective boiler output and consist of multiple individual heating rods controlled via power cabinets.

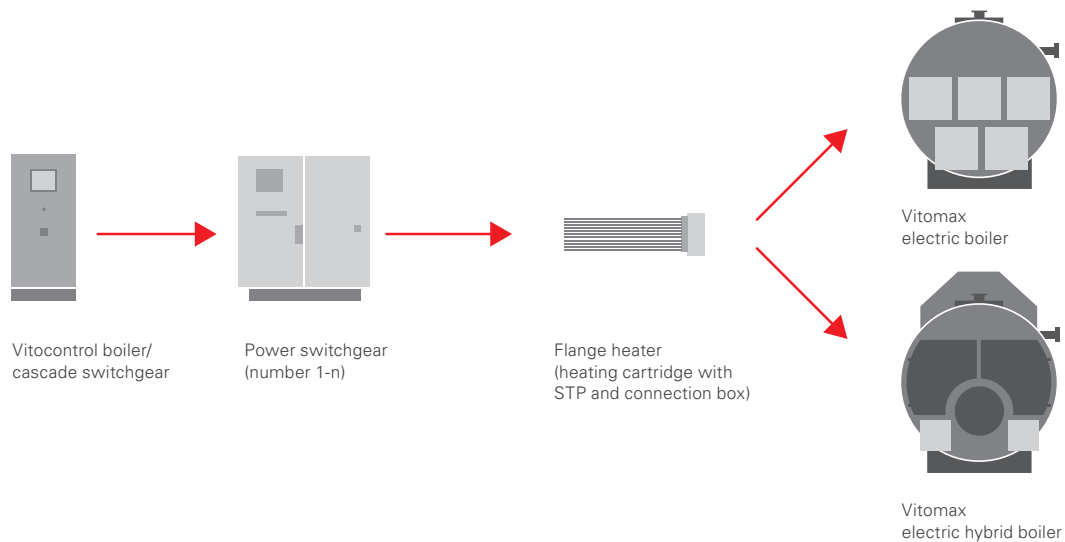
Continuous operation is enabled by the combination of thyristors and relays. If multiple heating cartridges are installed in the boiler, the flange heaters can be used in cyclic alternation as an option – an already familiar process from the control of multi boiler systems.

Full power can be immediately applied to electric boilers from a cold state, which means they are ready for operation much faster. They make ideal peak load and redundancy boilers.



The heating cartridge consists of a bundle of heating rods.

## PROVEN CONTROL OF ELECTRIC AND ELECTRIC HYBRID BOILERS WITH VITOCONTROL



One additional benefit of electric boilers is not to be underestimated: complex installation and maintenance work for the fuel supply, combustion and flue gas routing is completely eliminated and instead replaced with an electrical connection thanks to the use of a low-upkeep flange heater.

While hybrid boilers leave the factory as a pre-assembled unit (optional), electric boilers are supplied in an already operational state and can be started up in next to no time. The flange heaters and safety equipment are always installed. Switchgear can be supplied separately.

### Cutting the carbon footprint of the boiler system in half

CO<sub>2</sub> emissions are significantly reduced through the use of "green" electricity. By deploying an electric hybrid boiler, a pet food manufacturer halved its CO<sub>2</sub>

emissions in one year compared with a conventionally fired steam boiler\* (12 tonnes/hour of saturated steam in total, including 2 tonnes/hour electrical).

In addition to reduced fuel use and CO<sub>2</sub> emissions, savings of around 235,000 euros were achieved through self-generated power\*. If solely an electric boiler was used, the emissions would be zero.

### Everything from a single source

From the quotation to commissioning and maintenance, Viessmann supports its customers throughout the entire system service life. Spare part availability is a matter of course, along with continuous optimisation of the system and operation. Remote maintenance is an option that can help to lower running costs.

\* Figures may vary depending on the load profile and the price of electricity and natural gas.

### STANDARD DELIVERY FOR ELECTRIC AND ELECTRIC HYBRID BOILERS

- Boiler
- Flange heaters with connection boxes
- Safety equipment and control technology
- Power cabinets with thyristor control and relays
- Wiring between flange heaters and power switchgear
- System controller for boiler and optional auxiliary systems

## Direct comparison of Vitomax industrial boilers



	Electric boiler	Electric hybrid boiler	Gas boiler
Start-up process ("cold start")	✓✓✓	✓✓	✓
Running costs	✓	✓✓	✓✓
Capital investment	✓	✓✓	✓✓
Electrical grid balancing during peak loads	✓✓✓	✓✓	—
Normal range	✓✓✓	✓✓✓	✓✓
Efficiency	✓✓✓	✓✓	✓
Flue gas emissions	✓✓✓	✓✓	✓
Availability from standby mode	✓✓✓	✓✓	✓✓
Security of supply if fuel or power failure occurs	✓	✓✓	✓✓
Standby	✓✓✓	✓✓✓	✓
Image (sustainable and eco-friendly)	✓✓✓	✓✓✓	✓✓



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