

Increased Energy Efficiency through Flue Gas Condensation

- ❖ High Efficiency
- ❖ Low Pressure loss on Flue Gas pass
- ❖ Low Pressure Drop on Water Circuit
- ❖ Low Footprint/Height Requirements
- ❖ Corrosion Resistant
- ❖ Easy Installation and Operation
- ❖ Simple Integration with Absorption Heat Pump or Heat Exchanger for Preheating of Boiler Water

SEG High Efficiency Flue Gas Scrubbers

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SEG FGS 01 & SEG FGS 02

Increased Efficiency through Flue Gas Condensation

In commercial heating plants, optimized energy efficiency can be achieved through condensation and cooling of flue gasses from biomass fired burners.

The re-claimed energy can be used for pre-heating of boiler water for district heating plants.

At SEG A/S we have developed and installed a range of flue gas scrubbers that out-perform other solutions on the market with respect to cost, efficiency, footprint and cost of operation.

Design

The SEG scrubber is designed with an aim to achieve the highest possible efficiency with the lowest possible pressure drop on the water and flue gas circuit, thus reducing energy consumption and pump sizes to a minimum.

The SEG scrubbers are designed with minimum space requirements, as box-designs.

Corrosion Resistant

The scrubber is available in both stainless steel and GRP (Glassfibre Reinforced Plastic) versions for optimum resistance against corrosion and wear in a challenging environment.

In the GRP version the scrubber comes fully insulated, capable of standing as well inside as outside the building.

Low Pressure Drop

Through an innovative design of the nozzle and cooling elements, SEG A/S scrubbers operate with a pressure drop of down to 25-50 kPa on the water circuit (excluding heat exchanger). This enables very high flow rates at very low energy cost.

Typical Applications

Typically, there are two steps to achieve state-of-the art energy efficiency:

Step 1: SEG FGS 01 – Cooling of Flue Gas from fired boilers with direct heat exchanger

- Scrubber 1 in combination with a heat exchanger
- Preheating of boiler water through a heat exchanger
- Cooling of flue gas to e.g. 43 °C
- Increased boiler efficiency

Step 2: SEG FGS 02 – Cooling of Flue Gas from fired boilers with and Absorption Heat Pump

- Scrubber 2 in combination with an Absorption Heat Pump
- Preheating of boiler water
- Cooling of flue gas to <25 °C
- Increased boiler efficiency

Customized Solutions

SEG scrubbers are designed to the requirements of each specific capacity and temperature case, using our extensive knowledge and experience from our installed base.

As a result, you will get a solution that is ideally matched to your specific requirements and ensures easy installation and run-in of the scrubber solution.

The SEG A/S Partnership

Our aim is to be the preferred partner within Flue Gas Scrubber solutions.

Throughout the design, delivery and installation process, SEG technicians and engineers will support you along every step to ensure the best possible solution for your unique application.

Key Figures

Output Power range	200 – 3000 KW
Pressure Drop Water Circuit	25-50 kPa
Pressure Drop Flue Gas	50-100 pa

SEG FGS 01

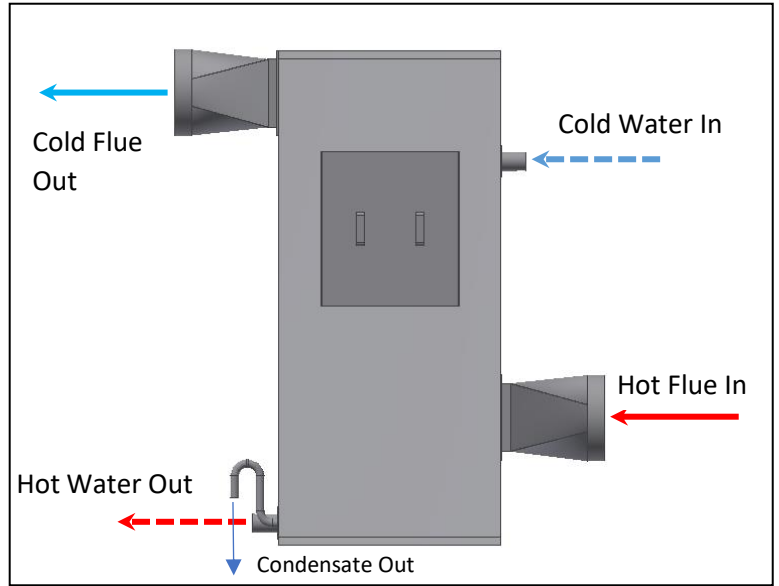
Typical Flue Gas Inlet Temperature	60°C / 140°C*
Typical Flue Gas Outlet	43 °C
Typical Water Outlet Temperature	47 °C

SEG FGS 02

Typical Flue Gas Inlet Temperature	43 °C
Typical Flue Gas Outlet	<25 °C
Typical Water Outlet Temperature	31°C / 52°C**

* Temperature before/after quench

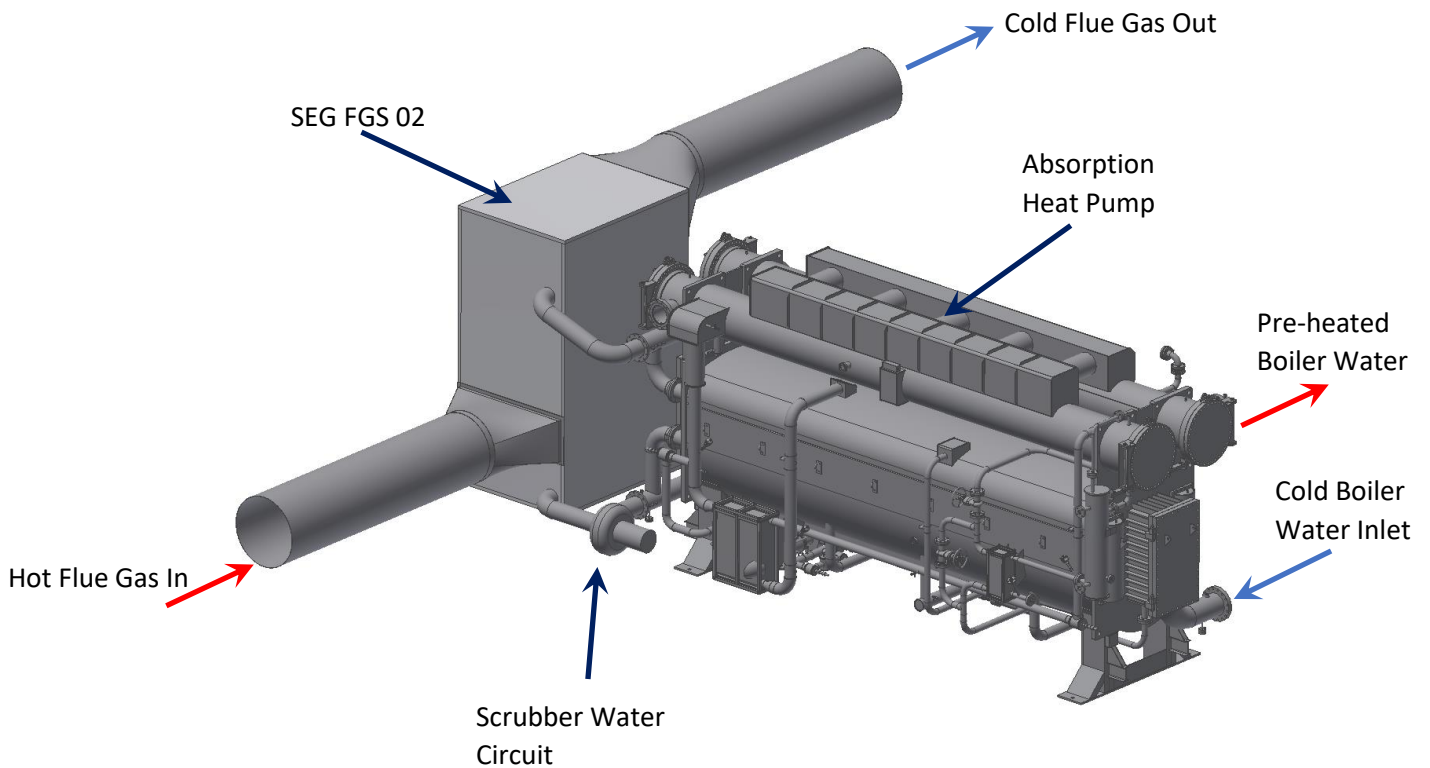
** Temperature before/after absorption heat pump



Example 1 – SEG FGS 02 in combination with an Absorption Heat Pump

In this particular case, the SEG FGS 02 brings the temperature in the flue gas down to 20 °C.

The Absorption Heat Pump is driven by hot water from the boiler, and deliver pre-heated boiler water in return, in this case increasing the overall boiler efficiency by approximately 6-10%.



Example 2 – SEG FGS 01 & SEG FGS in serial connection

In this particular case, two FGS in combination bring the flue gas temperature from 150 °C to approximately 20 °C, achieving optimum reclaim of any excess heat from the burners.

- ❖ The FGS 01 is coupled with a plate heat exchanger for preheating of the boiler water.
- ❖ The FGS 02 is coupled with a AHP for preheating of the boiler water

The Absorption Heat Pump is driven by hot water from the boiler, delivering pre-heated boiler water in return.

