



SMART Helix Water

Selective Cleaning of Convective Heating Surfaces
Using Water in Boilers Fired With Waste,
Biomass and RDF





The Challenge: Strong Deposit Build-Up

The Situation

Fuels with the most variable heating values and chemical compositions are used in incinerators and biomass boilers. Due to their tendency to develop complex deposits, waste, refuse derived fuels and biomass are seen as challenging energy sources.

Incinerators and biomass boilers often have low steam parameters for the sootblowers so intensive cleaning is not possible. The strong deposit build-up in the convective area can also mean that conventional steam sootblowers will not work effectively. Consequently, the fouling will continue to increase, causing unplanned downtimes and reduced boiler availability.

Our solution

SMART Helix Water is a fully automatic cleaning system using water as the cleaning medium. It consists of a retractable sootblower and a media supply unit with modules for the pump, for water inlet, water outlet and an automation unit.

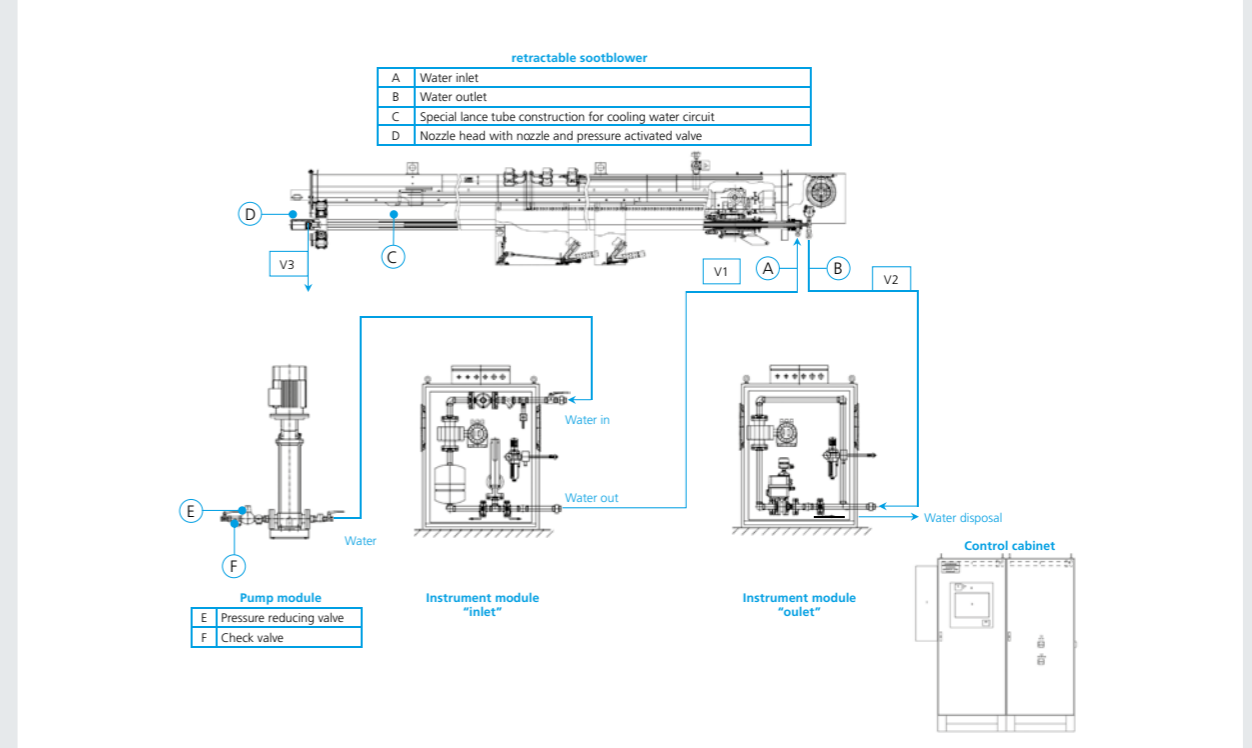
SMART Helix Water employs two gear motors, one for the axial and one for the rotational movements. This enables the cleaning system to precisely position the water jet in the gaps between the heat exchanger tubes and perform the cleaning rotating without axial speed. This so-called "Go-Stop-Clean-Go" mode avoids metal

surfaces being hit by water and therefore thermal load. Sophisticated control of the water circuit ensures that the water jet will only be applied for cleaning and interrupted on the spot by a pressure-active nozzle. If no cleaning is performed, the nozzle stays closed so that the water cools the retractable sootblower in a closed cooling circuit.

🔧 Your Benefits:

- Removal of complex deposits in convective heating surfaces
- Cleaning with water without thermal loading of heat exchanger pipes ("Go-Stop-Clean-Go" mode)
- On the spot starting and stopping of the water jet for cleaning minimises the amount of water poured into the boiler
- Even narrow passes are cleaned reliably
- Flue gas temperature remains in the rated range
- Extension of boiler availability
- More flexibility as to the fuel mix since cleaning intensity can be adjusted to the actual deposit situation at any time
- No steam required for cleaning

After



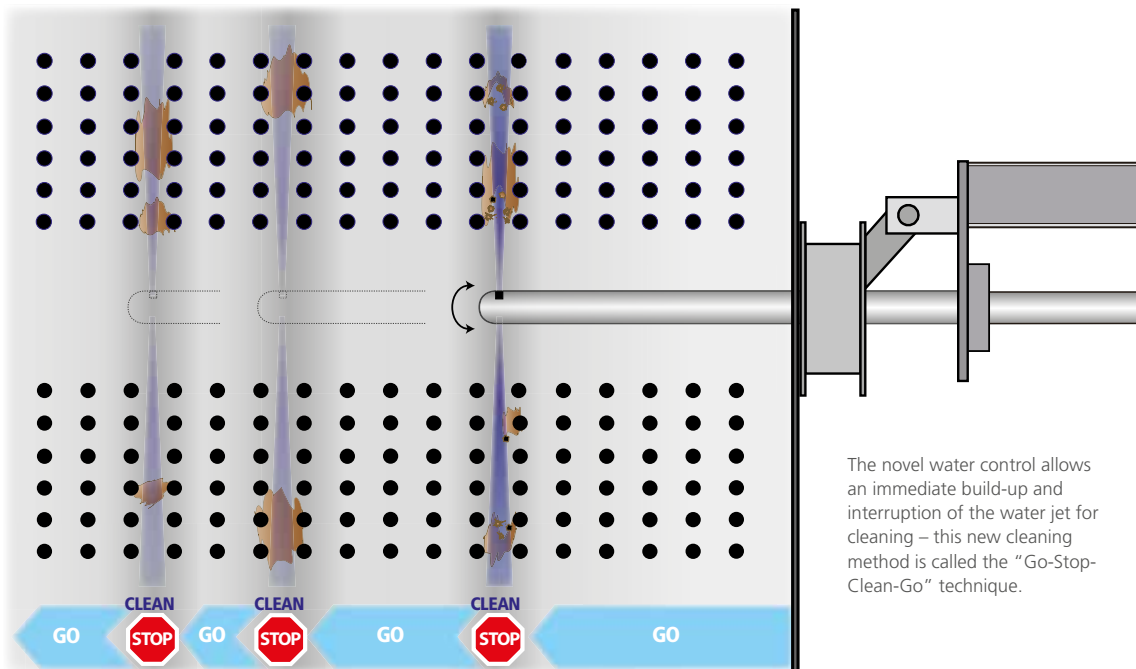
The Solution: Selective Cleaning With Water

The SMART Helix Water Cleaning System

The graphic above shows the SMART Helix Water cleaning system with all its components. The long retractable sootblower is completed by an automation unit and a media supply station, consisting of modules for the pump, the water inlet and water outlet. Up to four SMART Helix Water retractable sootblowers can be served by only one media supply station.

The Interplay of the Components

- Pump Module:
It sets the water to a constant pressure.
- Water Inlet Module:
Water throughput is measured and controlled.
- SMART Helix Water Retractable Sootblower:
Water flows in a closed cooling circuit along the lance tube and the inner tube. The water jet is released by the nozzle for cleaning only.
- Water Outlet Module:
During cooling mode, the water passes the water outlet module where the water throughput is measured and controlled again. Energetically optimised, the heated water can be directed through an heat exchanger and reused.
- During cleaning mode, the water inlet quantity V1 is divided into two flows:
cooling circuit flow V2 and cleaning flow V3. The water is released by the pressure-active nozzle for cleaning only.



SMART Helix Water: Powerful, Where Steam Blowers Reach Their Limits

Intensive Cleaning Effect of Water Applied Gently

Water as the cleaning medium is capable of producing the required intensive cleaning effect. To perform the cleaning as gently as possible on the heat exchanger pipes, specially designed hardware and software components and two gear motors with high-resolution rotary position sensors ensure that the SMART Helix Water moves precisely to the cleaning position within the space between the heat exchanger tubes. Water is released for cleaning only. This new cleaning method is also called the “Go-Stop-Clean-Go” technique.

Novel water jet controls guarantee an instant build-up and interruption of the water outlet from the pressure-active nozzle. If no cleaning is performed, the entire water flow is used for cooling the retractable sootblower in a closed cooling circuit.

All of these new technical developments in their entirety enable SMART Helix Water to clean the convective area effectively. Only the deposit surfaces are hit by the water and this is solely done at the time of cleaning. Heat exchanger pipes are not thermally loaded and the amount of water poured into the boiler is reduced to a necessary minimum.

Technical Data	
Retractable Sootblower	
Travel	0.5 - 8 m
Blowing medium	water
Blowing pressure	customer-specific
Blowing arc	0 - 360 °
Water jet length	up to 3.5 m
Water throughput	customer-specific, dependent from blowing pressure and nozzle diameter (e.g.: 3 bar blowing pressure and 3 mm nozzle diameter result in a water throughput of 0.12 l/s; 3 bar blowing pressure and 4 mm nozzle diameter result in a water throughput of 0.24 l/s)
Gear motor	1 gear motor axial (1.1 kW) & 1 gear motor rotation (0.25 kW); multi grade voltage 230/400 V
Lance tube diameter	101.6 mm
Number of nozzles	1
Ambient air temperature range	+5 °C - +55 °C
Pump Module	
Performance	customer-specific
Minimum pressure before pump	1 bar
Water temperature	up to 25 °C
Water Inlet/Water Outlet Module	
Dimension	800 x 1000 x 600 mm
Performance	up to four SMART Helix Water retractable sootblowers can be connected
Control	
Frequency converter pump	yes
Frequency converter SMART Helix Water	yes
	modular, intelligent control concept – suited for central and decentral installation; supply voltage 690V/400V; Siemens Simatic hardware; WinCC visualisation; control system integration by means of communication bus



Clyde Bergemann GmbH

Schillwiese 20
D-46485 Wesel

T: +49 281 815 0
F: +49 281 5 37 68

Internet: www.cbpg.com
eMail: info@de.cbpg.com