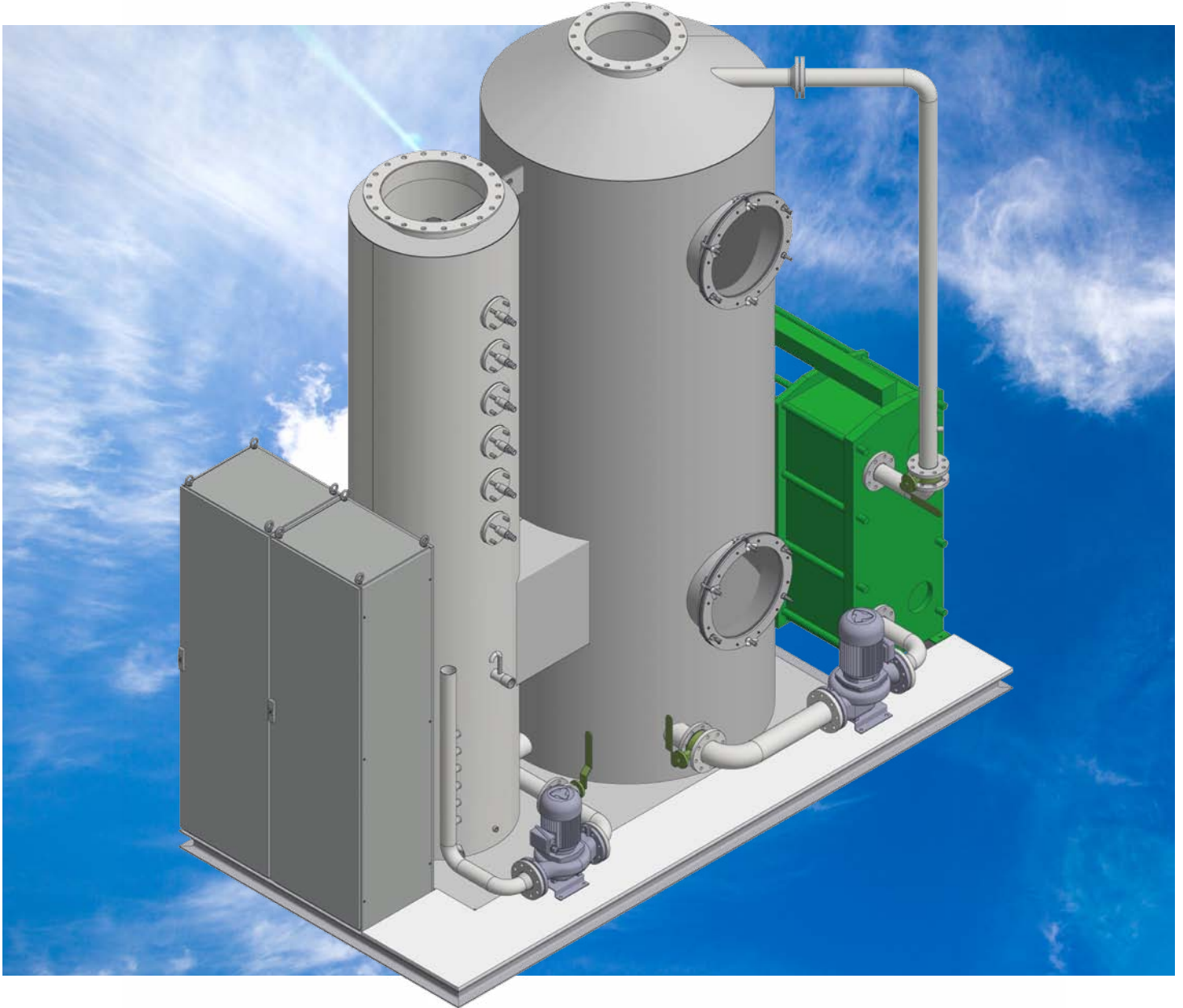




CALIGO

C L E A N E F F I C I E N C Y



Caligo *CSSX – Piccolo*

Introducing:

Caligo CSSX Piccolo

– *small but mighty*

Despite modern and efficient plant technologies a remarkable amount of heat is still being lost into the atmosphere at bioenergy plants. Larger heat plants produce a lot of waste heat and condensate and are ideal for Caligo's heat pump technology whereas the smaller 1–4 MW plants need a smaller scale solution to match their demands. Caligo CSSX Piccolo is designed to be an economical basic scrubber solution for the smaller boiler size, and it is also upgradable.

Caligo CSSX Piccolo Basic scrubber includes all the essential functions and the thermodynamic heat recovering capacity of the CSX series adjusted to a smaller nominal boiler size range of 1–4 MW. Typically in this boiler range the condensate amount stays under 1 m³/h with a basic scrubber. It is still cost efficient to lead the condensate straight to a sewer*.

In a case where sewer is not an option the CSSX can be upgraded with the Caligo water treatment unit WTXB (see separate brochure) to produce clear condensate with max 10 mg/L of solids.

A Caligo CSSX Piccolo standard model includes:

- ▶ Typical heat recovery values 15–25% of the nominal boiler output
- ▶ Particle filtering up to 150 mg/nm³, can be upgraded with additional functionalities
- ▶ Over 95 % SO₂ precipitation degree
- ▶ Automatic pH control and lye addition
- ▶ Automatic operation and performance adjustment
- ▶ Stainless AISI 316 steel structure
- ▶ One heat recovery area with stainless AISI 316 steel tower packings

Caligo CSSX Piccolo – *technical data*

Materials

- ▶ Washing tower: EN 1.4404
- ▶ Condensing tower: EN 1.4404
- ▶ Platform: steel S355 (painted)

Automation

- ▶ Logic: Siemens S7 (local panel)
- ▶ Automation SW: Caligo SW v.2.04 software
- ▶ I/O's: app. 20 pcs
- ▶ Communication: Profibus, Profinet

Connections

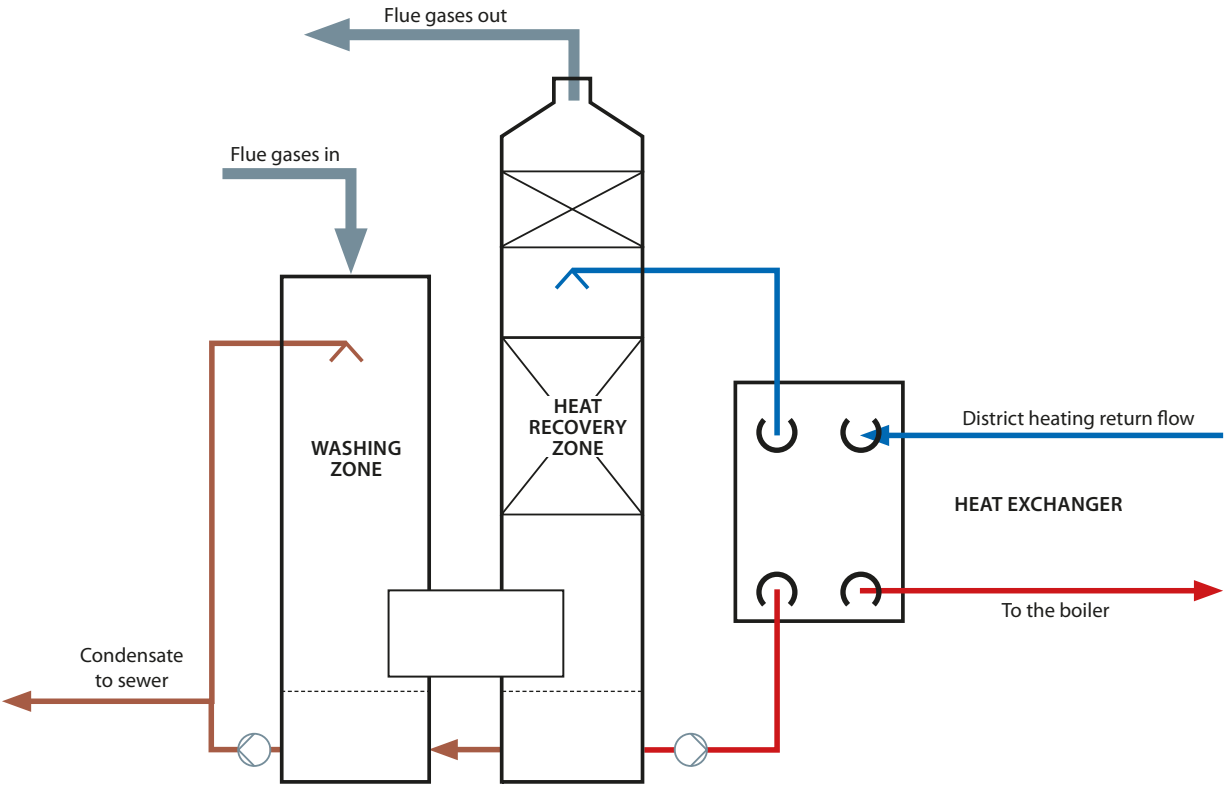
- ▶ District heating: Heat exchanger flanges 2 pcs, DN100–DN250
- ▶ Flue gas channels: Flanges 3 pcs, DN200–DN1000
- ▶ Power supply: Scrubber 5–20 kW,
- ▶ Pressured air: Instrument air 6 bar (g)
- ▶ Raw water: Flanges DN15–32
- ▶ Lye feeding: 8–12 mm pipe connection
- ▶ Condensate out: DN25–DN65
- ▶ Sludge out: DN25–DN50

Optional modules

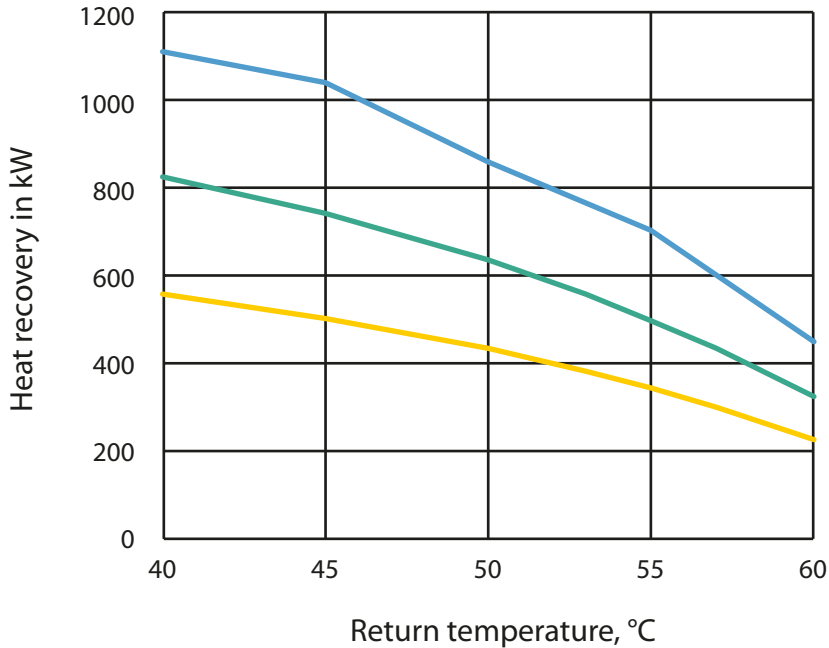
- ▶ WTXB Condensate treatment unit (see separate brochure)
- ▶ HeatPac series heat pump, manufacturer Johnson Controls
- ▶ ES Enhanced scrubbing
- ▶ SB Sludge bagging (SSX)
- ▶ CC Condensate cooling (CC)
- ▶ Boosted sludge circulation (HSCX)

**Regional restrictions may vary. Always consult local authorities about the current waste water regulations and limitations.*

Caligo CSSX Piccolo



Basic Scrubber Heat Recovery



Typical values
 — Boiler output 4 MW
 — Boiler output 3 MW
 — Boiler output 2 MW

Fuel: wood chips with 50% moisture content by weight
 Residual O₂: 5% vol. in dry flue gases

All performance values are indicative. In return temperatures above 57°C, recirculation of clarified condensate is recommended.

Clean efficiency

We develop and supply flue gas treatment and heat recovery solutions for the energy and process industries worldwide.

All our solutions are delivered as factory-assembled and tested products. Caligo solutions have been extensively productized. Expensive field installation projects are no longer needed.

Our offices are located in Turku and Jyväskylä, Finland. Please, do not hesitate to contact us to tell us about your specific challenges. Our highly skilled experts will choose the best solution from our product range to meet your demands.



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