EBULLIENT STEAM GENERATORS FROM ENGINE JACKET WATER

The Exhaust Cooling Steam Generator (ECSG) as designed to produce low pressure steam (15 PSIG and under) from engine jacket water via natural circulation. They are available in a variety of tank sizes for horizontal or vertical installations. Standard design includes: ASME stamped steam flash tank built in accordance with Sec.VIII Div.I; shipped as a packaged unit including continuous water level feed control with low water cutoff, auxiliary low water cutoff, excess steam pressure switch, gauge glass assembly, surface and main blowdown assembly, vent valve, steam safety valve, steam pressure gauge, wall or floor mount. Basic customer connections for ease of installation include: 150# steam outlet, 150# water outlet, 150# water/steam inlet, NPT Blowdown, & NPT Boiler feedwater. The unit shall be pre-piped and wired for a single 120v 1ph 60hz customer power connection.

BOILER FEEDWATER TANK ASSEMBLY

Cain Boiler feedwater systems are available in a variety of tank sizes, feedwater pump configurations, and optional water treatment assemblies. Packaged assemblies include: heavy wall tank as mounted on a 5' high rectangular tube structural steel stand with water level controls and low water cutout, gauge glass and thermometer, magnesium anode; (2) 2" NPT vents; 2" NPT condensate return; 1" NPT drain with shut off valve; Duplex or Triplex Boiler Feedwater Pump System; electrical control panel fully pre-wired with fused disconnect switches, magnetic starters, manual start-stop switches and indicating run lights for feedwater pumps and alarms; all interconnecting wiring from electrical control panel to each component, optional chemical feed system, and/or automatic water softening system; all interconnecting bypass piping, valves, gauges, fittings, etc. Primed, painted, and tested package is a complete, properly functioning assembly, ready for the customer's primary connections of water, condensate return, and electricity.

OUR UNIQUELY DESIGNED EXHAUST GAS BYPASS VALVES

Cain Industries offers total exhaust gas control with high temperature modulating bypass and shut off valves. The valve assemblies offer precise exhaust temperature control and/or the design capability for exhaust isolation. Sizes ranging from 4" to 40" diameter are available in carbon steel and stainless steel for all engine temperatures. All valves are available with either electric or pneumatic control actuation, and emergency fail safe features.

COMPONENTS FOR COMPLETE SYSTEMS:

Cain Industries' engineering team is available to propose the proper system components at competitive pricing. Upon review of your application, you can expect our proposal within 24 hours. It will include professionally engineered details showing equipment costs, savings analysis, computer generated economizer performance, CAD dimensional drawings, flow schematics, warranty, and a performance guarantee.

No matter how small the micro-turbine or how large the engine, Cain Industries has the heat transfer equipment, optional components, and years of experience to provide the best solution.

- Remote digital indicators and control packages
- Pre-piped skid mounted circulation pump system packages
- Boiler blowdown assemblies
- Valves: shut off, relief, vent, drain, check
- Steam stop and check valves
- Pressure or temperature control valves
- Bi-metallic or mercury thermometers
- Expansion joints
- Explosion hatch relief ports
- Tanks: storage or expansion
- Bypass damper actuators: pneumatic or electric, on/off or modulating, air or spring failsafe return

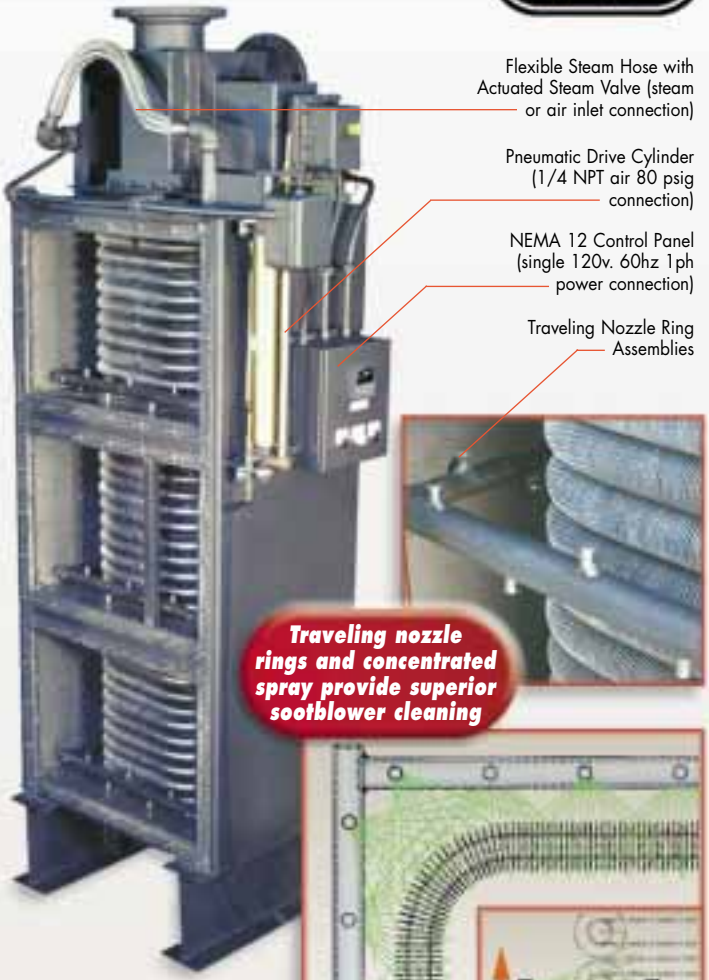
TIMED AUTOMATIC SOOTBLOWER (optional)

The exclusive Cain Industries Timed Automatic Sootblower design is applied to combustion sources where the sulphur content is high and/or combustion efficiency is poor. When a soot layer accumulates on the heating surface to a thickness of 1⁄8", fuel consumption is increased by 8.5%. The sootblower is also applied when it is not cost-effective to open inspection doors and clean the exchanger by other means. The sootblower system will continually keep the heating surface at a high performance level and eliminate the day-to-day operator expense and engine down time.

The blowdown sequence occurs while the engine is in full operation and is fully adjustable. The special flood-jet type nozzles achieve maximum cleaning velocity using steam or air as discharged through an electric control valve (included). Together they form a `continuous knife edge concentrated spray pattern' surrounding the heating surface. This `ring nozzle assembly' as attached to a manifolded flexible steel hose assembly, is powered up and down by a pneumatic drive cylinder. Dual timing relays allow complete control for 30 second cycle duration and intervals specific to each application. Final results are controlled double cleaning action, insuring that the maximum Btu recovery and anticipated savings are achieved.

LIQUID TEMPERATURE CONTROL (optional)

Operating Sequence: During a cold startup the exhaust bypass will be powered to the normal operating position. As the liquid temperature rises and approaches a preset point, the exhaust bypass damper will begin to move to the temperature control position. When the desired temperature is completely satisfied the damper actuator will move to the maximum open position, bypassing 99% of the exhaust flow (100% bypass cannot be attained due to some leakage and residual heat in contact with the fin tubing). Included is a 4-20 mA output controller, thermocouple, thermocouple weld and wire, and modulating bypass actuator installed, wired, and tested, for a single 120 volt, 1ph, 60hz power connection.



Flood jet nozzles together form a unique high velocity knifing action to allow full penetration of the complete heating surface.