

EXHAUST HEAT RECOVERY

# Fume Incineration Systems



Exhaust Steam  
Generator  
Series - ESG



Heat Recovery Silencer  
Radial Series - HRSR

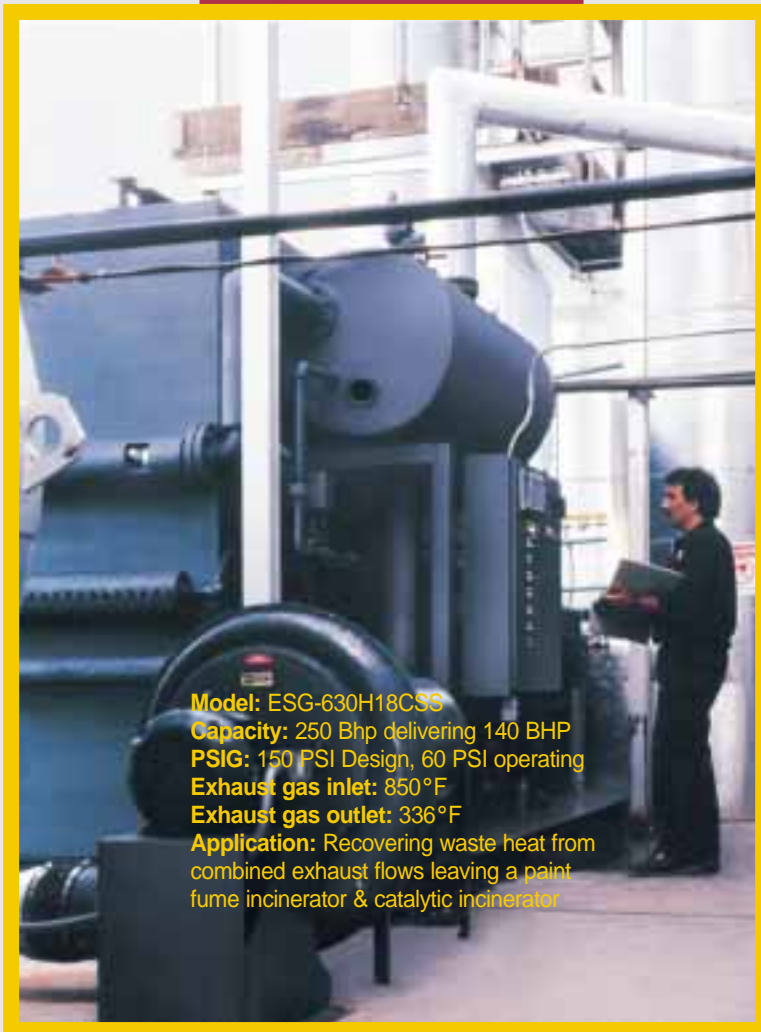


Incinerator/High Temperature  
recovery Series - ITR



U-Tube Recovery  
Series - UTR1

*"Manufacturing Waste Heat Transfer Products To Save Energy"*



**Model:** ESG-630H18CSS  
**Capacity:** 250 Bhp delivering 140 BHP  
**PSIG:** 150 PSI Design, 60 PSI operating  
**Exhaust gas inlet:** 850°F  
**Exhaust gas outlet:** 336°F  
**Application:** Recovering waste heat from combined exhaust flows leaving a paint fume incinerator & catalytic incinerator

## THE COMPLETE PACKAGE

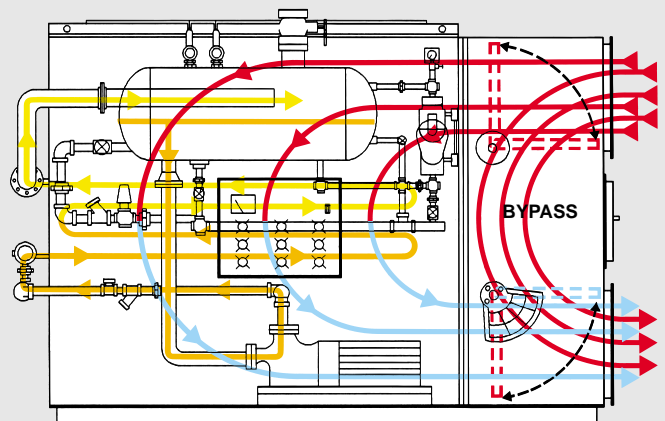
Selecting the appropriate 'waste heat boiler system' for fume incineration or cogeneration retrofit involves considerable engineering time and money. Important areas of concern have been controlling and bypassing waste heat, optimum performance selection, operating pressures, size, weight, and installation. The ESG is specifically designed to address these concerns and more, as standard design features not found with conventional waste heat boilers. The timely needs of the project engineer and customer can all be achieved accurately in a complete package.

## VARIETY OF MODELS

Cain Industries offers 40 standard models achieving performance outputs from 20 to 500 boiler horsepower and operating steam pressures ranging from 3 to 450 PSIG. A packaged forced circulation water-tube design, the ESG is manufactured and tested in accordance with the requirements of the ASME Boiler and Pressure Vessel Code and National Board.

## FUNCTIONAL

As a fully automatic steam generator, the ESG responds immediately to fluctuating exhaust flows in conjunction with steam load demand swings. This allows the ESG to easily function as a supplemental or primary steam output station. For the very large waste exhaust systems, multiple generator arrangements can easily adapt effectively, without complex central controls.



## DESIGN

The ESG is a compact design including three basic sections: the fin-tube heating surface, steam flash drum assembly, and a modulating full port exhaust bypass, prepiped and wired for ease of installation and minimal customer connections. An integral circulating pump continually circulates water to the heat transfer section recovering BTU's from the exhaust, and back to the steam drum assembly, where superheated water flashes to steam.

## MINIMAL CUSTOMER CONNECTIONS

- 4" 250 lb. RF Flange Steam Outlet
- 1/4" x 2" x 2" Exhaust Flange Inlet & Outlet
- Main Power & Boiler Feed Connection
- 1-1/2" NPT Main Blowdown
- 1-1/4" NPT Feedwater Inlet
- 1/2" NPT Control Air
- 1/2" NPT Cooling Water Inlet & Outlet

## DESIGN FEATURES

Modulating Feedwater Valve Actuator

Thermocouple Sensor (typ)

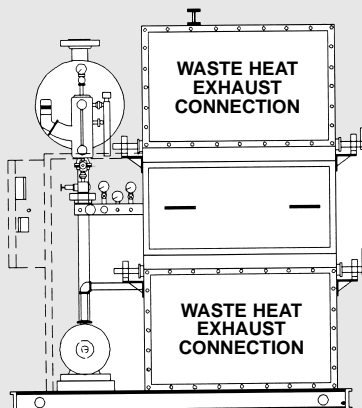
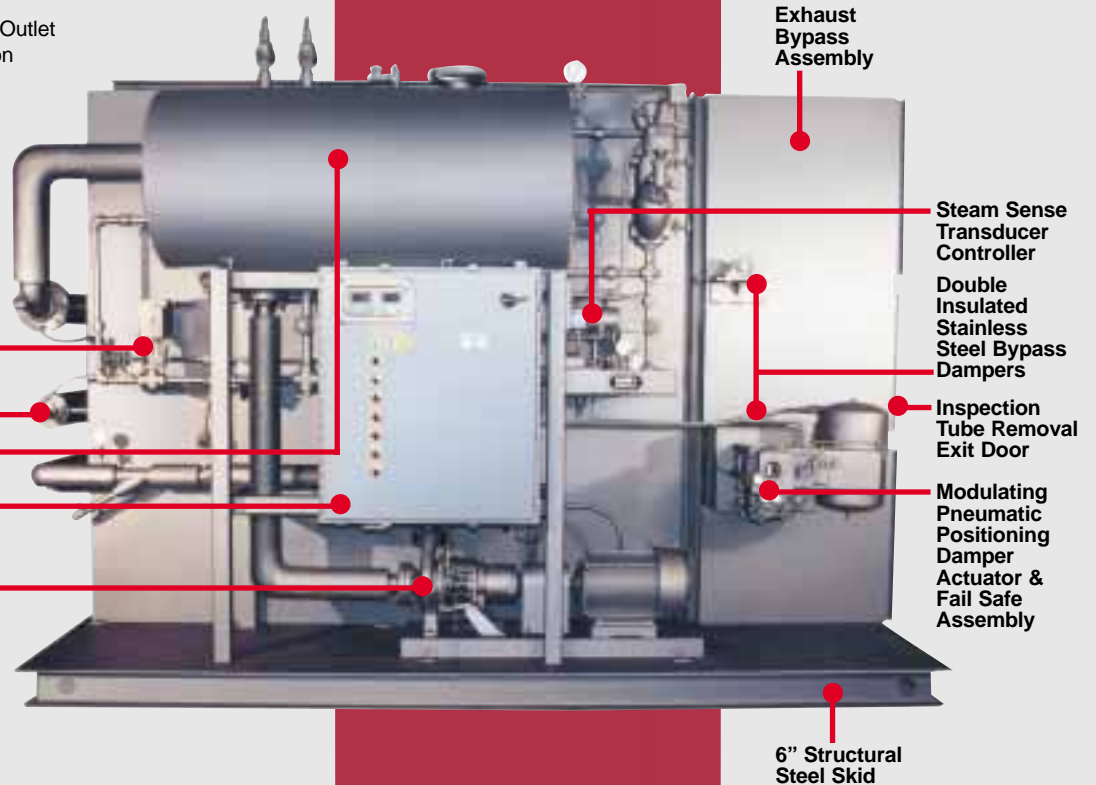
Steam Flash Drum Assembly

NEMA 4-Control Cabinet Assembly

Circulating Pump Assembly

## OPTIONAL BOILER ROOM ACCESSORIES

- Boiler Blowdown Systems
- Boiler Feedwater Economizer
- Boiler Feed Condensate Return Systems



## ESG vs. CONVENTIONAL FIRETUBE BOILERS

- 1/3 - 1/2 the weight, size, & floor space
- 99% dry steam
- 100% turndown capacity
- 5-10 minute startup to full output
- Integrated full exhaust modulating bypass
- 'Explosion proof' heat transfer exchanger
- Low friction loss for minimum static exhaust back pressure
- High circulating flow minimizes scale buildup
- No thermal expansion problems: accepting cold water boiler feedwater
- Lowest 'pinch point' (final leaving exhaust temperature minus-operating steam temperature) offering greater thermal efficiency

YOUR AUTHORIZED CAIN REPRESENTATIVE



## ESG DESIGN MODIFICATIONS

- Liquid Phase Oil Heaters
- Hot Water Boilers
- Steam Superheaters



## APPLICATION DATA

- Source of Exhaust Gas
- Temperature of Exhaust Gas
- SCFM or LBS/hr. of Exhaust Gas
- Operating Steam Pressure
- Desired Performance Output, either:
  - PPH Steam
  - BTU/hr. Transfer
  - Leaving Exhaust Temperature