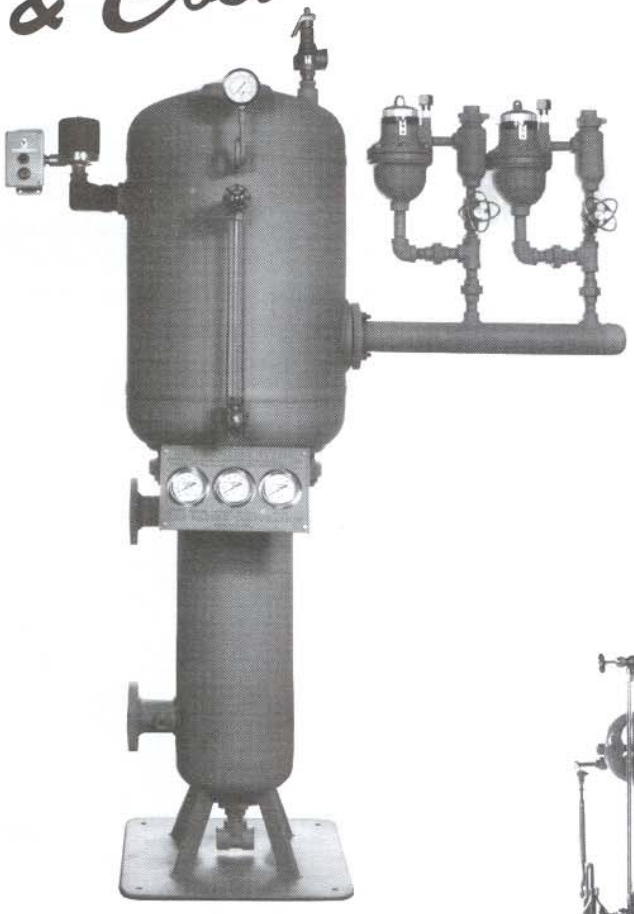
MADDEN

Continuous Boiler Blowdown

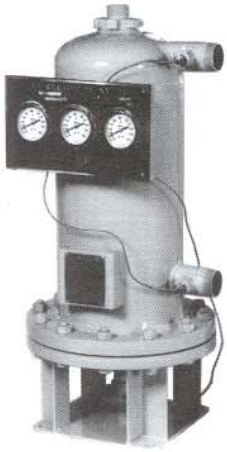
Package Heat Recovery Systems

20 Models from 1,200 pph to 50,000 pph Capacity

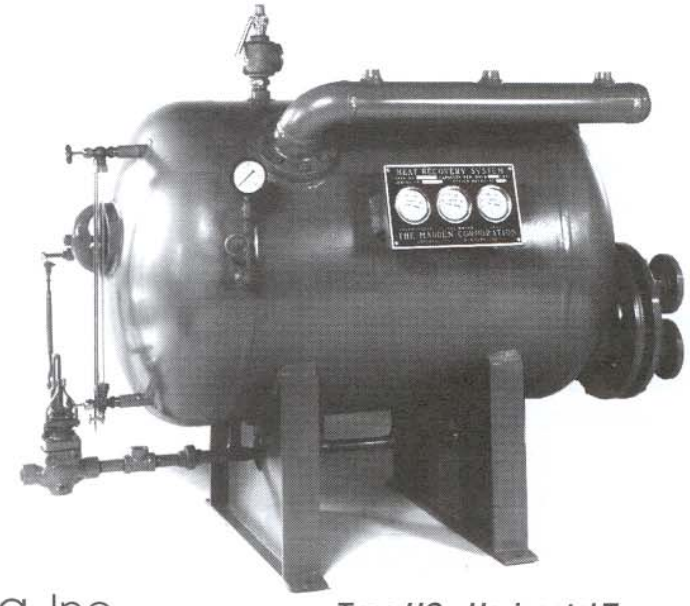
Energy Efficient & Cost Saving



Type HV - Vertical Type



Type HX - For Smaller Boiler Systems



Type HC - Horizontal Type

MADDEN Manufacturing, Inc.

Madden Benefits

Three different styles and twenty standard models are available to match a Madden blowdown Heat Recovery System to your boiler system for the best performance and the most economical return on investment. Look at these Madden results:

- *Recover 90% of the heat energy in continuous top blowdown that would be lost down the drain*
- *Reduce temperature of blowdown discharge to drain to meet statute limits*
- *Fast investment payback from fuel, cooling water and makeup water savings, Madden systems usually pay for themselves in less than 12 months*
- *Durable, time proven designs, built to take the punishment of continuous, 24 hour a day service for years.*

What is Continuous Top Blowdown?

To prevent scale buildup and to insure high steam quality and boiler operating efficiency, boiler water quality specifications must be maintained. Chemical treatment alone can't do the job, so water containing concentrated dissolved and suspended mineral solids is removed continuously through a top blowdown system. As the dirty blowdown water is removed from the boiler drum, it is replaced with fresh makeup water which improves the boiler water quality. Too much blowdown wastes heat and chemical treatment. Too little blowdown results in operation and maintenance problems. To get the full benefits of blowdown heat recovery, the blowdown flow must be continuous, not intermittent.

How does it work?

Hot, high pressure continuous blowdown water drained from the boiler contains valuable heat energy. The continuous blowdown process helps control boiler water quality and operating efficiency by removing suspended and dissolved solids from the water in the boiler drum.

Recovery of up to 50% of the BTU's available may be accomplished by generating low pressure flash steam in a flash tank. This supply of steam can be used in the boiler D/A tank or other low pressure steam applications. As the flash steam is generated, the blowdown condensate that remains is used to preheat the boiler feed water using a low pressure liquid to liquid heat exchanger. For smaller, lower pressure blowdown requirements, the HX Series heat recovery systems utilize a higher pressure liquid to liquid heat exchanger without a flash tank to do the heat recovery job. The Madden sales representative will recommend the model you need to maximize your fuel savings potential.

Madden System Features

Type HV and Type HC

- No Solids Buildup. Madden systems are self flushing, designed to use gravity flow to continuously clean itself. They operate without becoming clogged or fouled with solids contained in the dirty blowdown water.
- Low pressure heat exchangers in the Type HC and Type HV systems - this reduces stress on equipment and makes scale buildup unlikely on the cooling side of the heat exchanger tubes. This is because the temperature rise of the makeup water cooling medium will usually be no more than 20° Fahrenheit.
- Flash Tanks designed for blowdown - baffles on the blowdown inlet create water droplets and turbulence to enlarge the surface area and increase flashing. Adequate vessel volume produces clean steam without water carryover. Surface area and retention time are engineered to facilitate flashing.