

FIN COIL RECOVERY SERIES

The FCR is a custom-designed heat exchanger which can be applied in confined areas and is offered in stainless steel, carbon steel, or AL-FUSE™ finned tubing. Design flexibility allows specific engineering requirements to be met such as fin spacing for fouling conditions and low gas pressure drops.

COMBUSTION SOURCES

Steam boilers, hot water boilers, hot oil heaters, combustion sources with round stack diameters 4"-36" and a maximum liquid flow rate of 50 gpm.

FEATURES

- Internal thermal expansion design
- Cylindrical heat transfer coil(s) design
- Mounting flanges for bolting to mating flanges
- Quick release tension latches
- Stainless steel internal bypass
- Condensate drain catch ring assembly
- Hinged stainless steel access door panels

Custom designed
to meet space and
performance
demands



FCR shown with optional
sootblower assembly

OPTIONAL EQUIPMENT

- Exclusive manual or timed automatic ring-type sootblower assembly
- Stack corrosion control assembly including temperature-regulated modulating exhaust gas bypass and remote indicators
- Circulating pump kit to maintain desired liquid flow rate
- Vertical pressurized storage tank, to create a "bulge" or temporary heat sink in the event of no-water-flow conditions
- Liquid temperature control assembly including temperature-regulated modulating exhaust gas bypass and remote indicators



Waste Water Treatment Plant, Fond du Lac, Wisconsin
 (2) FCR-1J2D25ALS each recovering Btu from (2) 150 BHP steam boilers;
 Reducing 700°F @ 1603 SCFM to 246°F; Raising 18 gpm boiler
 feedwater entering at 100°F to 201°F.

BOILER EXHAUST APPLICATION

- Capacity: 40 – 500 BHP (50 – 10,000 SCFM)
- Entering gas temps: to 800°F
- Heat sink types: Boiler feedwater, process water, thermal fluids, run-around systems

FCR: SPECIFICATION

A general specification, shown as a guide for design & construction.
 (see Engineering Sales Manual for detailed specification data sheets)

1.0 General Design:

- 1.1 Furnish and install economizers on each of the combustion sources (boilers, hot water heaters, hot oil heater, etc.) as designed and manufactured by Cain Industries, Inc.
- 1.2 The Economizer shall be a light weight design for easy installation, cylindrical with counterflow heat transfer design manufactured and tested in accordance with the requirements of Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code, and is stamped to a minimum 250 PSIG design pressure.
- 1.3 Each Economizer shall be designed to include as standard, a stainless steel, internal, Flue Gas Bypass Diverter to provide for full emergency by-pass, requiring no additional ductwork for controlling: 1. Stack corrosion, 2. Turn down performance, 3. Back pressure.
- 1.4 Each Economizer shall have continuous hinged, gas-tight, stainless steel inspection panels, which provide for complete access to the entire heating surface for inspection and/or cleaning. The inspection panels shall be secured by adjustable, quick release tension latches and no tools shall be required for the opening of the inspection panels.
- 1.5 Heat Recovery unit shall be either a single, multiple, or parallel coil design and must be completely drainable when mounted vertically.
- 1.6 Header manifolds, where used, shall be SA53 GrB schedule 80 or SA105, connections shall be threaded or flanged as specified.
- 1.7 Exterior surfaces other than stainless steel shall be primed and painted with a high temperature metallic paint rated for 1000°F.

2.0 Construction:

- 2.1 Design Pressure (water side): 250 PSIG @650°F.; Test Pressure: 375 PSIG; Max. Flue Gas Inlet Temperature: (see below); Design Pressure (exhaust side): 3" water column
- 2.2 Tube & Fin Designs:
 - SA178GrA ERW x 1.0" OD x .083" wall thks with carbon steel .030 Fin thks x .50 Hgt Nickel Brazed/welded to the tube. (Max. Flue Gas Inlet Temperature: 800°F)
 - TP316L x 1.0" OD x .065" wall thks. with aluminum .020 fin thks x .50 hgt AL-FUSE™ bonded to the tube. (Max. Flue Gas Inlet Temperature: 750°F)
 - TP316L x 1.0" OD x .065" wall thks. with 304 stainless steel .020 Fin thks x .50 Hgt Nickel Brazed/welded to the tube. (Max. Flue Gas Inlet Temperature: 800°F)

- 2.3 Headers: thickness: Sch 80; material: SA53 GrA and/or 2000# Forged Steel

3.0 Optional System Component Equipment:

(see Engineering Sales Manual for optional equipment specifications or contact Cain Industries)

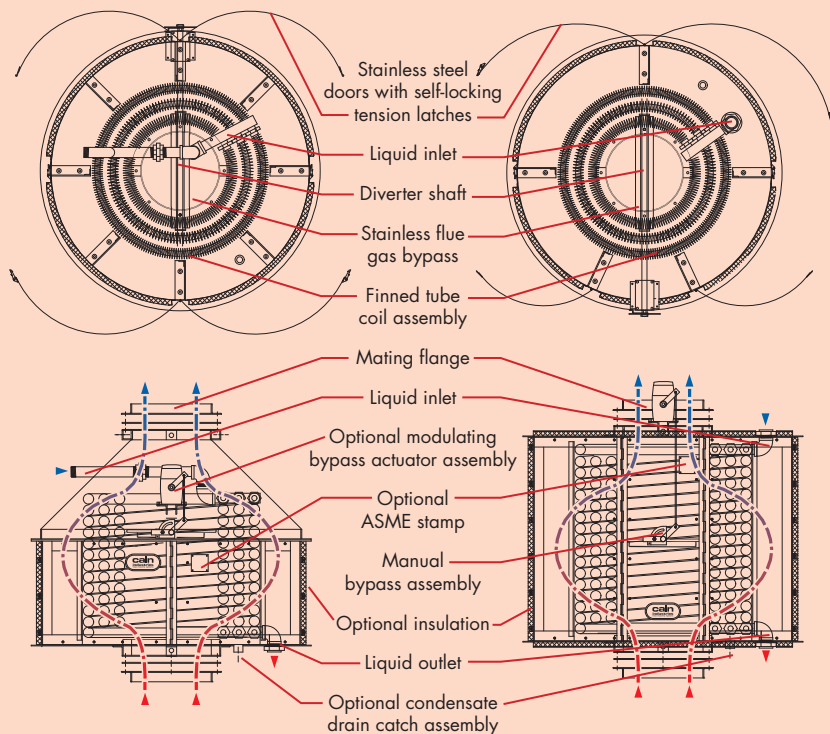


FCR: FIN COIL RECOVERY SERIES



SINGLE PASS

DOUBLE PASS



Printing Facility, Lomira, Wisconsin
 (2) Model: FCR-112C16ALS each Recovering Btu from a 500 BHP steam boiler; Reducing 400°F @ 4205 SCFM to 252; Raising 34.5 gpm boiler feedwater entering at 120°F to 164°F.

BEFORE AND AFTER

A Cain Industries FCR boiler economizer can often be installed in-line with your existing stack, resulting in a relatively quick and cost-efficient installation process with minimal retrofitting, labor, materials, and down time. Generally, because of their lighter weight and smaller size, the FCR requires little, if any, additional support (usually suspended from the ceiling). In applications where additional support is required, Cain Industries can offer a structural support stand. Economical in-line installation - another Cain Advantage.



B SERIES

The B Series boiler economizer is comprised of 14 standard models. An "off the shelf" unit, it is designed primarily for boilers with round stacks and a combustion capacity of 40 to 800 BHP with entering gas temperatures between 300° and 700°F. The standard stack connections can be easily modified to fit specific boiler stacks with 10" to 34" diameters, alleviating the cost of stack adapters. The units come standard either with 4 or 6 fins per inch (fpi) spacings for operation with No. 2 fuel oil and/or natural gas and depending on the efficiency of the combustion. With its lightweight design and exclusive AL-FUSE™ heat transfer surface, installation is fast and costs are kept to a minimum. Use the chart on the next page to select the B Series unit that is best suited to your application.

COMBUSTION SOURCES

Steam boilers and hot water boilers

FEATURES

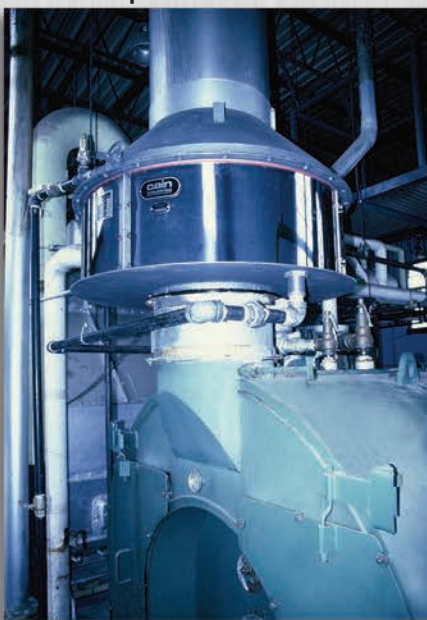
- Hinged stainless steel access door panels
- Internal thermal expansion design
- Mounting flanges for bolting to mating flanges or adapters
- Stainless steel internal exhaust bypass assembly
- Quick release tension latches for doors
- Optional sootblower assembly

- **Minimum cost**
- **Easy Installation**
- **Maximum savings**



B Series single-pass unit with stack adapter cone

With the variety of boiler room sizes, coupled with limited space, horizontal or vertical installations, can be accommodated with the cylindrical B Series or FCR economizer product lines.



BOILER EXHAUST APPLICATION

- Capacity: 40 – 800 BHP
- Entering gas temps: 300°F – 700°F
- Heat sink types: Boiler feedwater, hot water return, hot water storage tank, condensate tank, process water

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