cain industries
heat recovery systems

Exhaust Heat Recovery Systems

Boiler Economizer Systems • Gas & Diesel Cogeneration Systems • Fume Incineration Systems • Finned Tubing

The Cain Industries Family of Heat Recovery Systems

DESIGNED, ENGINEERED & HAND BUILT IN THE USA

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"Manufacturing Waste Heat Transfer Products to Save Energy"

www.cainind.com

030717

Cain Industries Overview

Cain Industries is the leading designer and manufacturer of exhaust waste heat recovery systems for the following markets: **gas & diesel cogeneration systems, boiler exhaust stack economizer systems, and fume incineration systems**.

Cain Industries has developed **over 3,450 industrial heat transfer models** within its **16 product lines**. These products integrate seamlessly into any boiler exhaust, cogeneration exhaust, or incineration exhaust system.

Cain Industries, Inc.
Headquarters
Germantown, WI
USA

Cain Industries Product Markets

Boiler Economizer Systems

An extensive line of boiler exhaust economizers designed to recover exhaust waste heat (BTU) typically lost through the stack to preheat boiler feedwater, makeup water, process water, etc. for boilers ranging from 200,000 BTU input - 150,000 PPH steam.

Gas & Diesel Cogeneration Systems

Exhaust heat recovery for gas and diesel engines, gas turbines, and micro turbine generator retrofit applications from 30Kw-7Mw.

Fume Incineration Systems

Packaged fully automatic exhaust steam generators recovering large volumes of clean exhaust combustion from 600ºF-1600ºF, producing primary and/or secondary steam source.

Finned Tubing

An abundant range of custom-fabricated, industrial grade finned tubing, manufactured to meet stringent customer requirements.

Boiler Economizer Systems Facts

Without Cain Economizer:

- Most boilers have a combustion efficiency of 78-82%.
- Boiler exhaust temperatures exiting into the atmosphere: 350º-600º F.
- Stack energy loss is typically 18-22%.

With Cain Economizer:

- Efficiency is increased, reducing fuel costs. **Average efficiency increase is 4-10%** (30-50% of the available energy lost).
- A portion of the stack loss is recovered and the energy (BTU) is returned to the systems preheated water. **Exhaust temperatures exiting to the atmosphere are reduced to 150º-300º F.**
- Economizers operate with virtually **no risk or maintenance.**
- **Average total turnkey payback: 12-24 months** (annual Return on Investment (ROI): 50-100%).

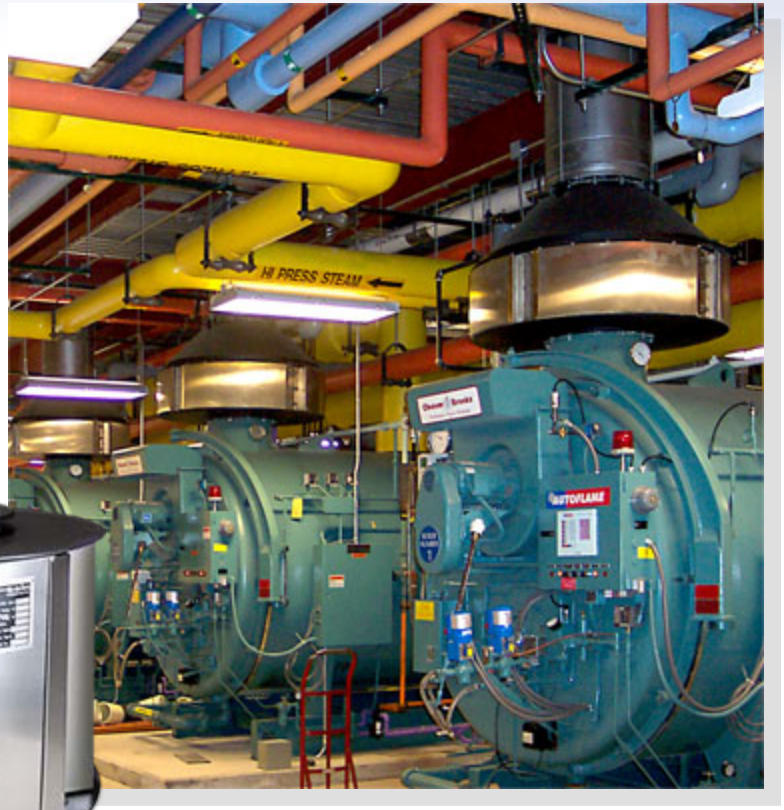
Cain Boiler Economizer Advantages

- **Stainless steel internal exhaust bypass**
  Provides for full emergency bypass, requiring no additional ductwork for controlling stack corrosion, turn-down performance, and back pressure.
- **Alfuse finned tubing**
  316L stainless steel tube with aluminum fins bonded to the tube. The thermal conductivity of these fins is 3.4 times greater than carbon steel fins and 9.8 times greater than 304 stainless steel fins.
- **Individually removable finned tubes**
  No bulky/heavy tube rack (lightweight construction for ease of replacement).
- **High quality, dual ferrule compression fittings**
  Connects each tube to the inlet and outlet header. Tube replacement requires no welding.
- **Hinged access door**
  Allows viewing access to all finned tubes for replacement or cleaning. No special equipment is needed to lift the door away from the economizer.

Cain Economizer Product Lines

Cain Cylindrical Economizers:

- Compact
- Lightweight, providing ease of installation
- Hinged stainless steel access doors
- Stainless steel internal exhaust gas bypass



Cain Economizer Product Lines

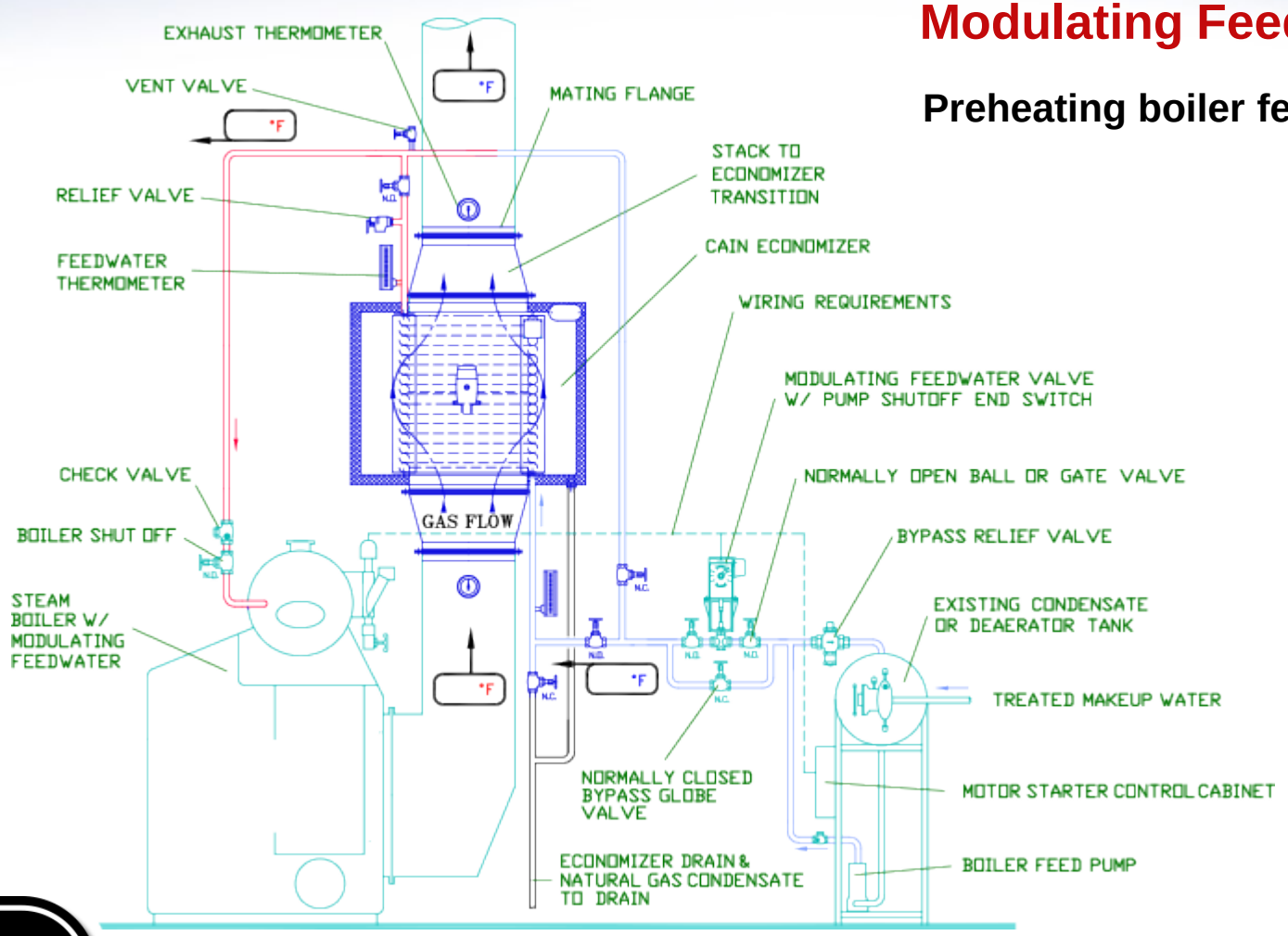
Cain Rectangular Economizers:

- Individually removable fin tubes
- Stainless steel interior shell
- Hinged full face access door
- Stainless steel internal exhaust gas bypass
- 10 gauge carbon steel, seal-welded exterior

Boiler Economizer Applications

Steam Boiler with Continuous Modulating Feedwater

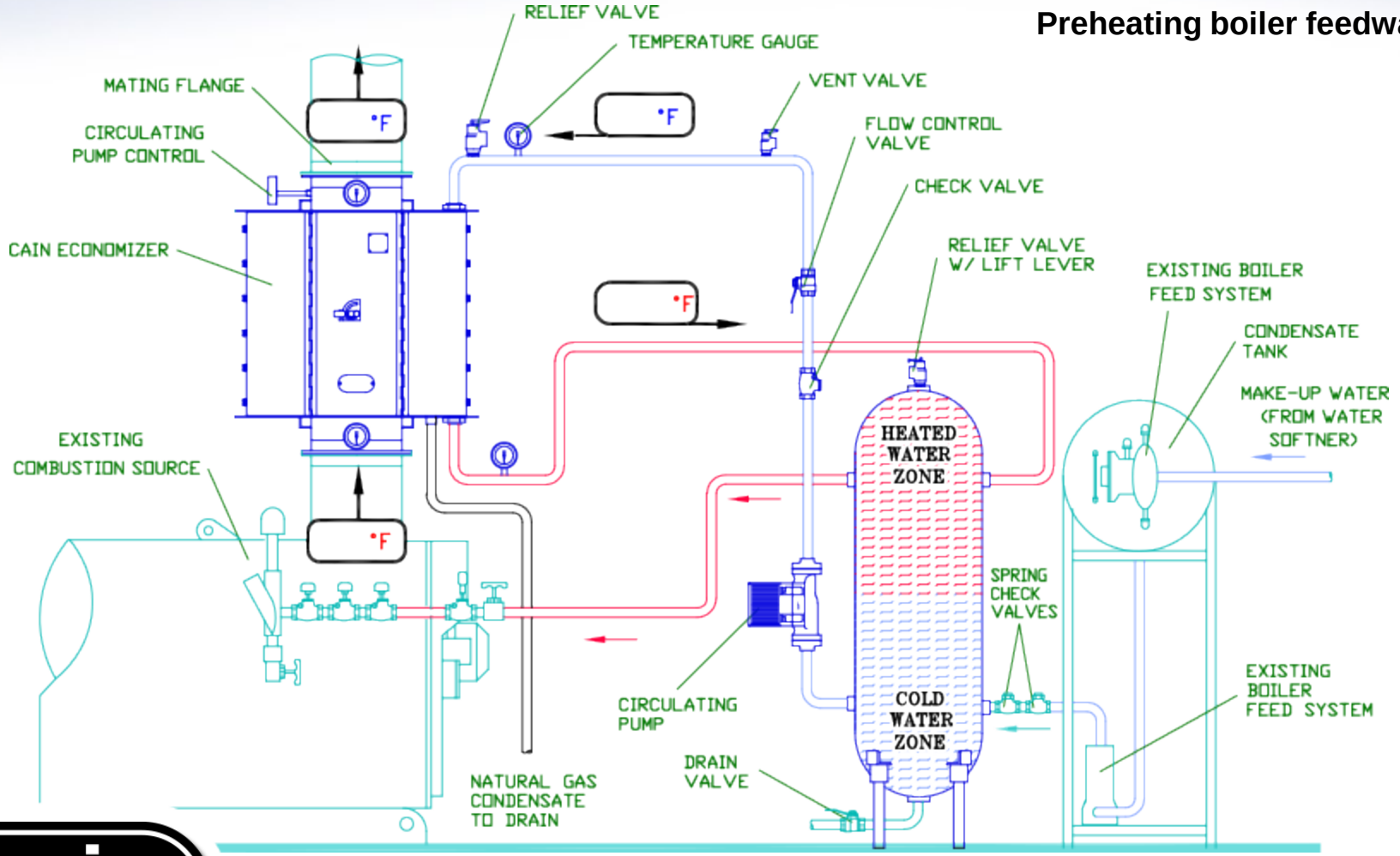
Preheating boiler feedwater



Boiler Economizer Applications

Steam Boiler with On/Off Feedwater

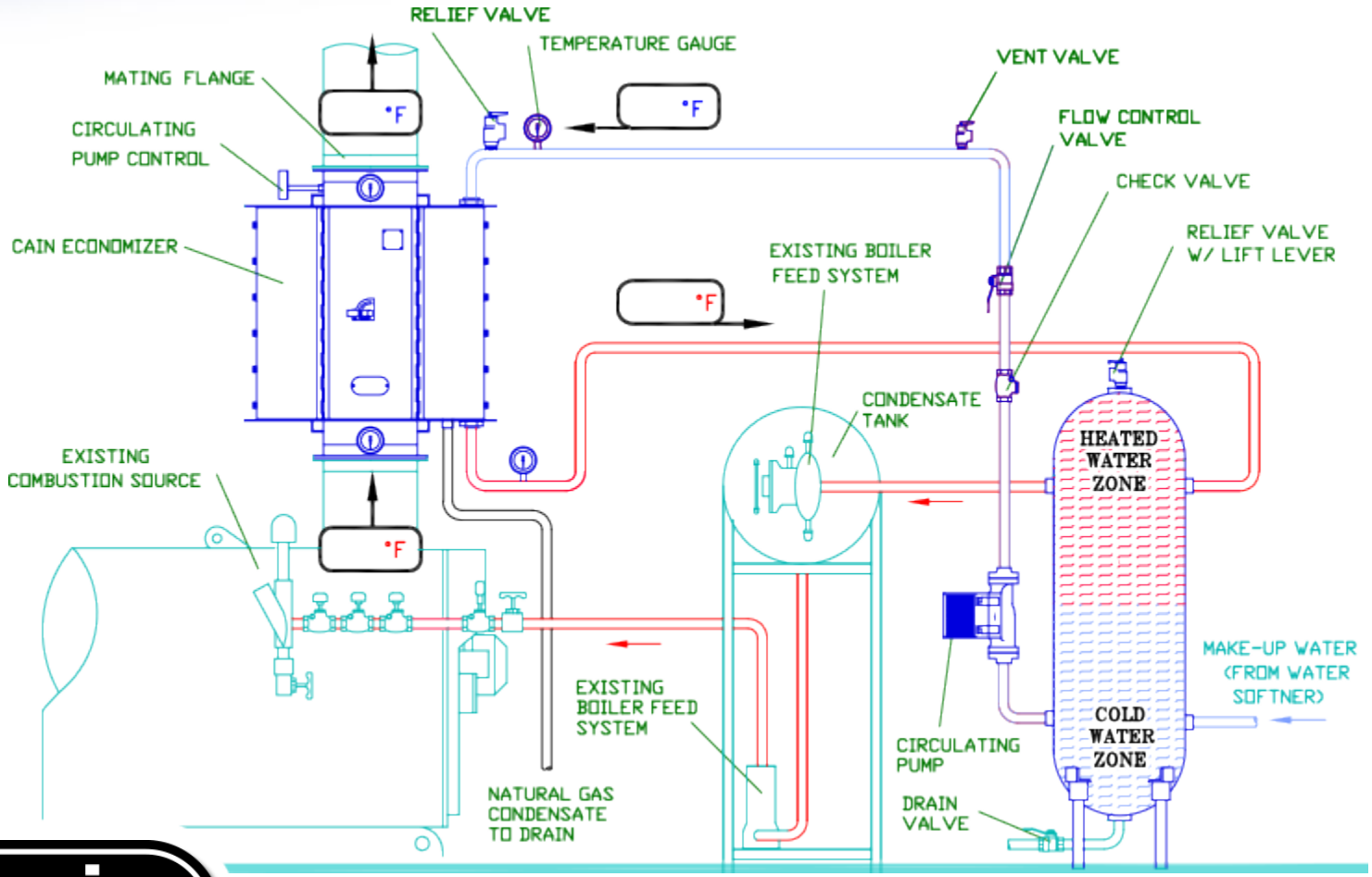
Preheating boiler feedwater



Boiler Economizer Applications

Steam Boiler with 50% or More Make-up Water

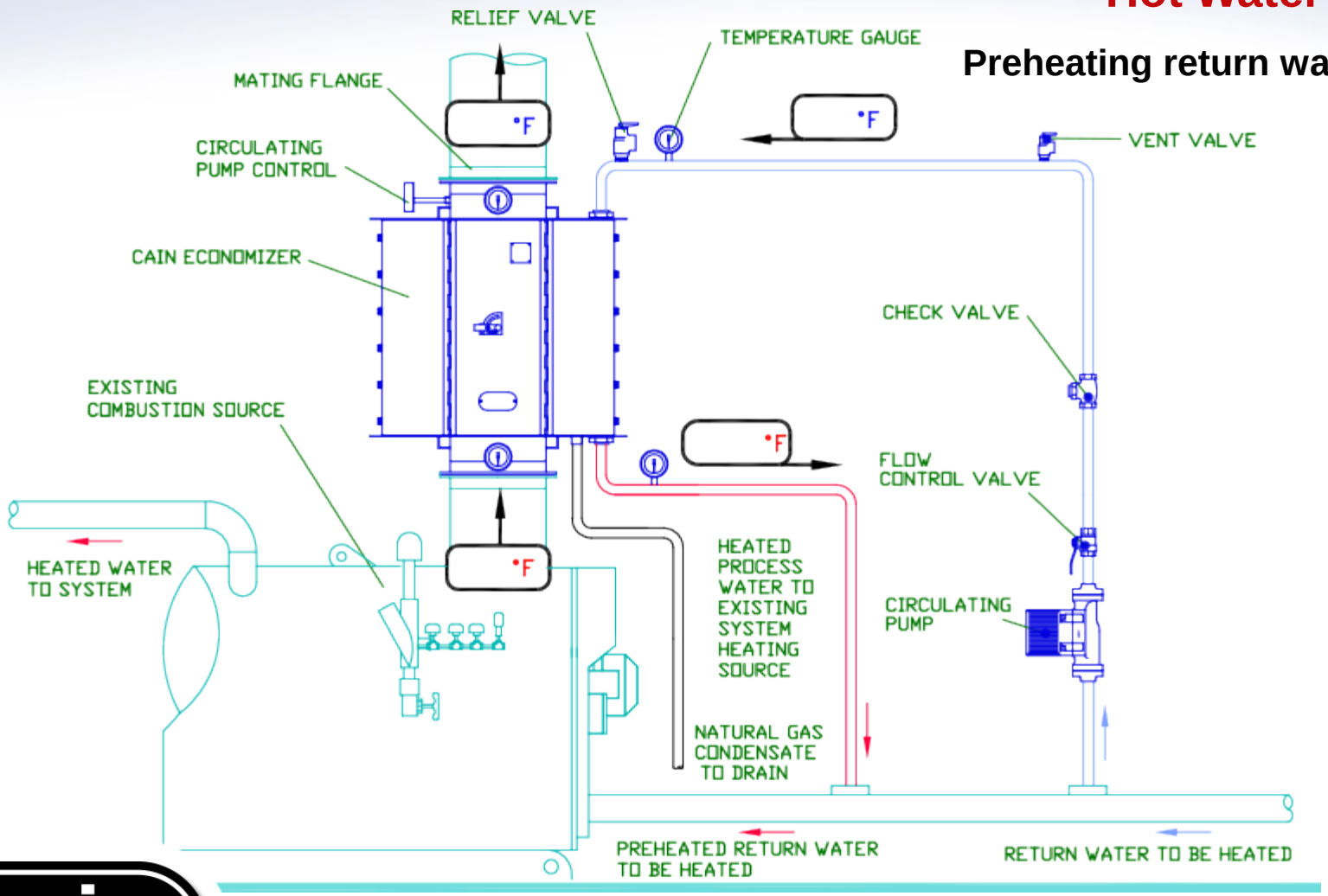
Preheating make-up water



Boiler Economizer Applications

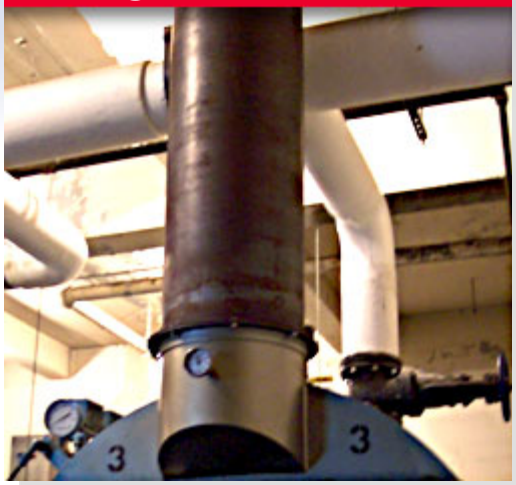
Hot Water Boiler

Preheating return water loop



Installation Before & After

BEFORE



AFTER

BEFORE

AFTER

Case Study: Oconomowoc Hospital

Boiler: 300 HP Steam Boiler

Exhaust gas temp *before* economizer: 425º F

Exhaust gas temp *after* economizer: 302º F

BTU transferred into boiler feedwater: 408 MBTU/hr

Total cost installed: $24,200

Annual savings: $18,150

Simple payback: 18 months

Life expectancy savings: $317,625 (15-20 years)

Cylindrical Economizer Installations

PRINTING FACILITY

INDUSTRIAL LAUNDRY

Cylindrical Economizer Installations

WASTEWATER TREATMENT PLANT

MANUFACTURING COMPANY

Case Study: Dreyers Ice Cream Plant

Boiler: 500 HP Steam Boiler

Exhaust gas temp *before* economizer: 430º F

Exhaust gas temp *after* economizer: 305º F

BTU transferred into boiler feedwater: 631 MBTU/hr

Total cost installed: $23,280

Annual savings: $22,650

Simple payback: 12.5 months

Life expectancy savings: $396,375 (15-20 years)

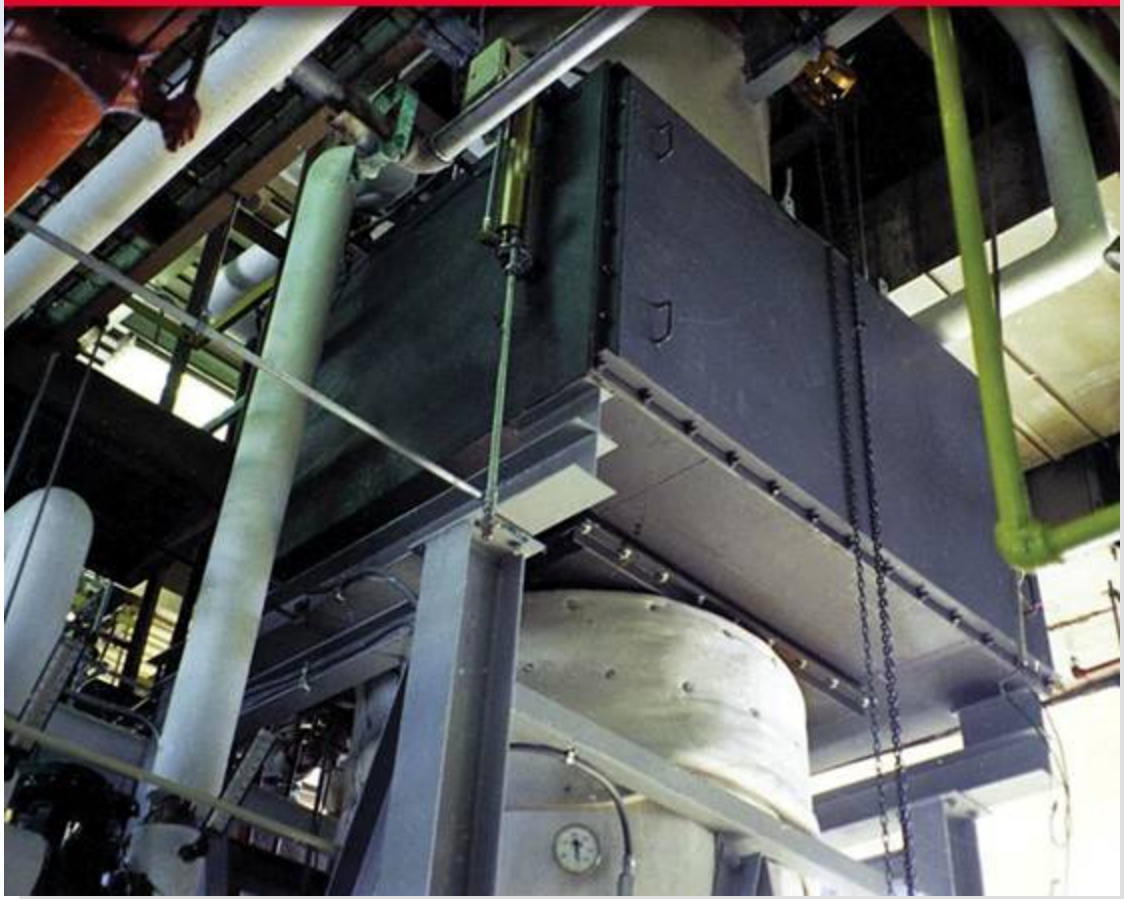
Rectangular Economizer Installations

ETHANOL PLANT

PHARMACEUTICAL COMPANY

Rectangular Economizer Installations

UNIVERSITY



BREWERY

Economizer Proposal Process

Savings Analysis Study

1. Gather Data:

Minimum input criteria required for fuel savings boiler economizer application:

- **Stack Temperature**
  i.e. 350º F
- **Hours of Operation**
  i.e. 8 hrs/day
  5 days/week
  50 weeks/year
  (2000 hours)
- **Fuel Cost**
  i.e. $ .45/therm

2. Complete Form:

Easy Application Data Form available at www.cainind.com:

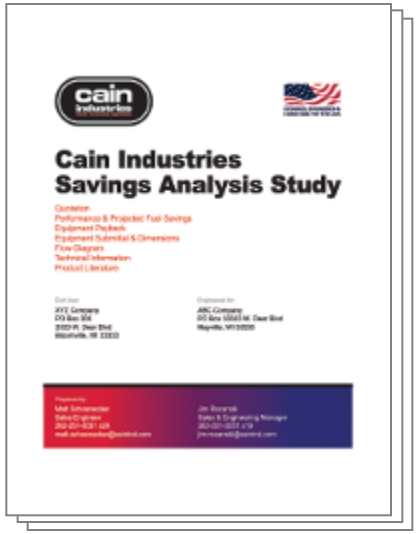
Complete basic information:

- Boiler type and size
- Fuel type
- Exhaust gas data
- Exhaust stack dimensions
- Inlet water temperature

3. Receive Proposal:

Within 48 hours, includes:

- Quotation
- Performance & projected fuel savings
- Equipment payback
- Economizer submittal & dimensions
- Flow diagram
- Technical information
- Product literature



Summary - Boiler Economizer Systems

- Economizers reduce energy costs by recovering valuable BTU exhausted out the stack.
- Typical Economizer applications: preheating boiler feedwater, make-up water, hot water return loop.
- Average total turnkey payback: 12-18 months (annual ROI: 75-100%).

Cain Industries Family of Boiler Economizers

Receive a free Savings Analysis Study:

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C-WEP
Cain Web Engineering Program

800-558-8690

sales@cainind.com

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