



# ClearFire<sup>®</sup>-H

High-Efficiency,  
Modular Steam Boiler

10 to 125 HP



A Clever-Brooks  
Sustainable Solution



# Unmatched Operational Efficiency and Lowest Emissions in a Fuel-Fired Steam Boiler

The ClearFire®-H modular steam firetube boiler with industry leading technology delivers high-quality steam to processes and exceptional results to owners. Its AluFer® firetube heat exchanger provides the most effective heat transfer available to deliver high-quality steam quickly and efficiently.

## **Achieves your sustainability goals in the boiler room**

- » Meets emissions-reduction goals, down to <7 ppm NOx with low CO
- » Up to 15:1 turndown with linear modulation delivers optimum control and operational efficiency from minimum-to-maximum firing
- » Meets DOE minimum efficiency standards – 85% for low-pressure steam
- » Exclusive integral economizer for 85%+ efficiency on high-pressure steam
- » Lowest overall energy use with reduced CO<sub>2</sub> production
- » Offers the lowest total cost of ownership for your steam system



ClearFire-H boilers meet the strict performance and sustainability criteria required to earn the Cleaver-Brooks Sustainability Seal

# Trailblazing Technologies Deliver Distinct Advantages

The ClearFire®-H features AluFer® tubes with extended fireside heating surface to provide maximum heat transfer and superior performance. The premix burner automatically adjusts the air/gas mixture for clean combustion, while the fully modulating burner delivers precise steam operating pressure to meet load requirements with minimal cycling.

- » **Integrated burner-boiler-controls design** is superior to third-party burners bolted on to traditional boilers
- » **Quiet operation** due to ECM variable-speed combustion-air blower modulation
- » **Full modulation and 15:1 turndown** (50 to 125 HP sizes on natural gas) offers precise load matching while minimizing short cycling
- » **Flexible fuel supply** with natural gas, propane, or a hydrogen blend; dual-fuel capable
- » **Standard low emissions** – SCAQMD Rule 1146.2b pre-certified (10 to 50 HP sizes)
- » **Built-in integrated lead-lag control** functionality for multiple boiler systems
- » **Self-regulating, fuel-air ratio control** for consistent performance with simplified controls
- » **Ease of maintenance** – hinged burner door for fireside access, no ladders or hoists required
- » **Compact footprint** – no additional space required for tube removal and replacement
- » **Ideal for modular skid package solutions**

GREATER THAN  
**85%**  
EFFICIENT

GREATER THAN  
**99%**  
STEAM QUALITY



Healthcare Facility



Campus System



Manufacturing Process



High efficiency, low pressure steam boiler installed in a college institution.

# Reliable Steam Generation Provides Peace of Mind

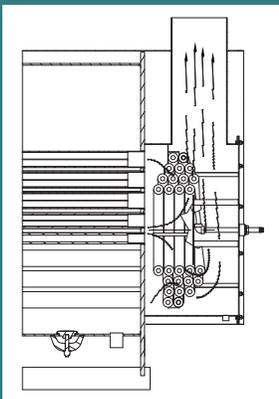
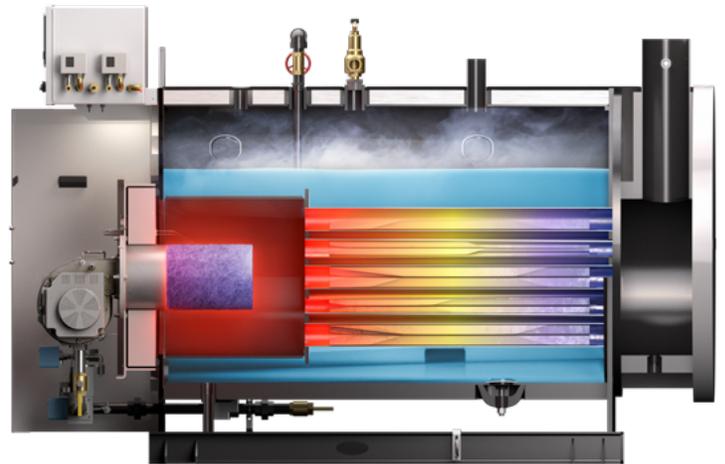
## Premix Modulating Burner Operation

The high-turndown modulating burner minimizes short cycling and enables the boiler to operate at peak efficiency while precisely matching the process load. The gas premix burner controls in the ClearFire®-H include self-regulating fuel-air ratio control with variable speed blower modulation providing safe, clean combustion with very low NOx emissions.

## Heat Exchanger and Burner

The ClearFire-H boiler is built to ASME standards (“H” and “S” stamps) in a single-pass design with steel combustion chamber and AluFer® firetubes. The horizontal firetube water-back arrangement ensures maximum heat exchanger effectiveness with a large steam disengaging area delivering exceptional dry-quality steam for the process.

- » Thermal-shock resistant
- » Greater than 99% steam quality, down to as low as 6 psig
- » Guaranteed fuel-to-steam efficiency
- » Lowest electrical energy consumption with ECM variable-speed combustion air blower
- » Highest operational efficiency for steam systems, up to 86% (non-condensing)
- » 99%+ high-quality steam – pure steam delivered to your process without carryover



Integral CFH Economizer



External Economizer

## Achieve up to 87% efficiency with an economizer

An ECF economizer will maximize efficiency for your process. The economizer's stainless steel coil tube arrangement has extended heating surface fins to enhance heat transfer and preheat feedwater. Up to 87% efficiency can be achieved in non-condensing applications. Plus, the ECF exclusive integral economizer does not take up additional space in the boiler room.

# Modular Steam Skid Solutions

## Single-Source Skid

Cleaver-Brooks offers pre-engineered ClearFire®-H skid-mounted packages. The package includes the steam boiler, feed system and blowdown separator with optional chemical feed system and water softener. This complete package saves you time installing the system since it only requires single-point power, fuel, steam, and water connections.



## Features and Benefits

- » Single-source responsibility
- » Complete system to ensure peace of mind
- » Plug and play to reduce time and installation costs
- » Standard and customized offerings to meet your needs
- » Eliminates field piping and wiring errors



# Simple Design to Match System Requirements



## Standard Features & Options

### Standard Trim

- » Falcon microprocessor-based boiler control with color touchscreen interface
- » Safety controls in accordance with cULus listing and ASME CSD-1
- » High limit pressure control — manual reset
- » Operating limit pressure control
- » Combustion air proving switch
- » Primary low water cutoff and pump control
- » Auxiliary low water cutoff – manual reset
- » ASME safety relief valve (15 psig or 150 psig)
- » High turndown modulating burner
- » Reusable combustion air filter
- » Hinged burner door for ease of access

### Standard Gas Train

Gas train is factory-piped and wired on the burner. Standard components meet the requirements of cULus, ASME CSD-1, XL-GAP.

- » Low gas pressure switch
- » High gas pressure switch
- » Dual-safety shutoff valve
- » CSD-1 leak test provisions
- » Self-regulating fuel-air ratio gas valve-venturi system

### ClearFire®-H Options

- » Blowdown and feedwater valve assemblies
- » ASME-mounted valve and piping package
- » Larger steam nozzle size for lower-pressure application
- » Dual-fuel option (natural gas and propane)
- » Modulating feedwater control
- » Surface blowoff controls
- » Feedwater integral economizer
- » Gas pressure regulator
- » Falcon lead-lag steam header pressure transmitter
- » Direct vent combustion air provision for reduced make-up air requirement
- » Flue-draft damper controls
- » Building EMS communication interface solutions

## Controls and Accessories

- » Falcon control includes built-in Lead-Lag boiler sequencing and modulation
- » Expandable up to an 8-boiler Lead-Lag network



Falcon Controls



System Integration Accessories



Remote Monitoring Solutions

# Dimensions and Ratings



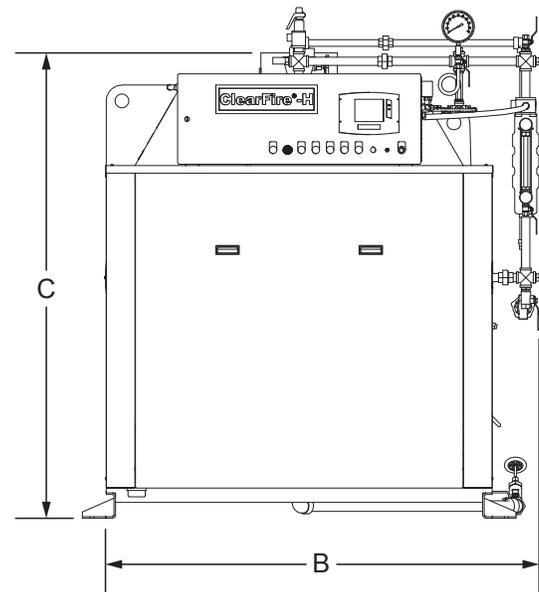
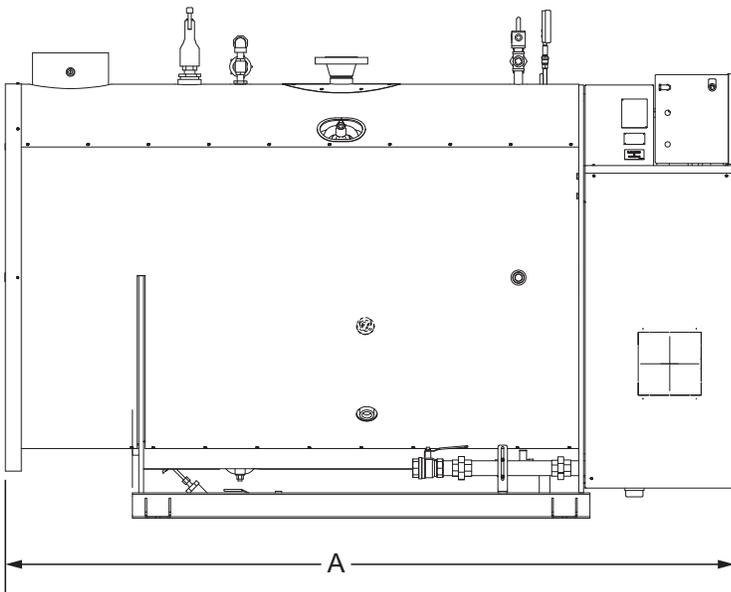
## ClearFire®-H



	10	15	20	25	30	40	50	60	70	80	100	125
Overall Length (Dimension "A")	86"	86"	87"	87"	91.5"	99"	110"	110"	115"	115"	146"	146"
Overall Width (Dimension "B")	44.5"	44.5"	48"	48"	56"	56"	61"	61"	68.5"	68.5"	68.5"	68.5"
Overall Height (Dimension "C")	54"	54"	57"	57"	65.5"	65.5"	69.5"	69.5"	76.5"	76.5"	76.5"	76.5"
Shipping Weight – 150# Design (lbs)	2,450	2,450	2,750	2,750	3,200	3,700	5,600	5,600	6,970	7,290	8,200	8,500
Operating Weight – 150# Design (lbs)	3,460	3,460	4,000	4,000	5,050	5,850	8,110	8,110	10,790	11,010	13,150	13,400
Flooded Weight – 150# Design (lbs)	3,700	3,700	4,170	4,170	5,370	6,210	8,620	8,620	11,640	11,860	14,450	14,700
Steam Outlet Connection (150# Design, 125# operating)	2"	2"	2"	2"	3" <sup>B</sup>	4" <sup>B</sup>	4" <sup>B</sup>					
Steam Outlet Connection (15# Design) <sup>A</sup>	4"	4"	4"	4"	4"	6"	6"	6"	6"	6"	8"	8"
Flue Outlet Connection	6"	6"	6"	6"	8"	8"	10"	10"	12"	12"	14"	14"

A) Connections are 150# F.F. Flanged

B) Connections are 300# R.F. Flanged





## The power of total integration.

The **Power of Total Integration** is how Cleaver-Brooks delivers the world's broadest range of integrated, sustainable boiler plant solutions. In addition to our products, this includes our global representative and service network, training resources, and trusted expertise that add significant value to your Cleaver-Brooks investment.



Click or scan the QR code to access ClearFire®-H resources.

