

# CBJT

**Steam or Hot Water  
Firetube Boiler  
100 to 1,600 HP**



# Lowest Total Cost of Ownership

The total cost of owning any boiler is determined by more than the initial equipment cost. Total cost of ownership includes operating, maintenance, unplanned downtime, and years of service. When an external burner is preferred, the CBJT model offers the lowest total cost of ownership for this style burner and boiler combination.

The CBJT firetube is a completely integrated boiler and packaged burner system featuring the revolutionary EX technology. Extraordinarily efficient and capable of meeting low NOx requirements, the CBJT provides a high-value solution with next-generation engineering.

## Cornerstones

Every piece of Cleaver-Brooks equipment is developed and manufactured with these in mind.



**Safety**



**Efficiency**



**Reliability**



**Sustainability**

Through a commitment to research and development, Cleaver-Brooks is the sole provider of integrated boiler/burner/controls solutions and is a leading manufacturer of boiler room equipment across commercial, institutional, and industrial markets. Many of our components are specifically engineered, ensuring that Cleaver-Brooks high-quality products deliver superior performance.



# Packaged for Optimum Performance

The CBJT has been designed to serve a wide range of applications. Built to utilize different Cleaver-Brooks exclusive technologies, from the robust pressure vessel, to the burner and controls, the CBJT is the ideal choice when an external jet burner preferred.

## Flexible Design Configurations



Offered in two design configurations, the CBJT is a great choice for your next boiler.

### Classic

- ▶ 4-pass plain tube design
- ▶ 5 Sq foot of heating Surface Per HP
- ▶ Robust waterback construction
- ▶ Fuel flexibility
- ▶ High and Low pressure steam or hot water

### Enhanced

- ▶ 2-pass EX tube constriction
- ▶ Up to 10:1 Turndown available
- ▶ Robust waterback Construction
- ▶ High pressure steam or hot water



## Burner and Controls Package



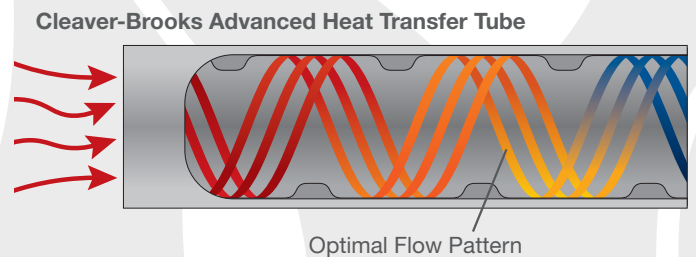
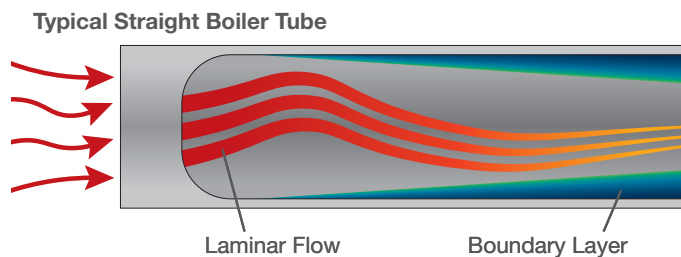
CBJT can be partnered with a number of Cleaver-Brooks designed burners to meet performance or emissions requirements for almost any project. Each burner offered has been tested with the boiler to ensure it meets the high standards of a Cleaver-Brooks product.



## Advanced Heat Transfer Tube



With the use of advanced engineering methods, Cleaver-Brooks designed the EX tube technology to increase heat transfer up to 85% over traditional boiler tubes. This allows for optimal furnace design and help produce the lowest possible emissions.



» Learn more about the revolutionary technology behind the CBJT at [cleaverbrooks.com/cbjt](http://cleaverbrooks.com/cbjt)

# Hawk Integrated Controls System

The Hawk Control, which serves as the brain of the EX system, enables you to run your boiler safely and efficiently.



- ▶ Completely integrated boiler/burner control is fully tested during development
- ▶ Automatically tunes boiler for changes in environmental conditions
- ▶ Combustion air fan vibration monitoring
- ▶ Linkageless control eliminates single-point control hysteresis
- ▶ Optional VSD control reduces fan horsepower load
- ▶ Advanced emissions controls with NOx trim option
- ▶ Unlimited options for system customization and optimization
- ▶ NFPA and UL® compliant for maximum safety
  - Return to Pilot functionality for immediate ignition
  - Hawk water level control, draft control, third fuel option
  - Integrated deaerator and Master Panel controls



## Industry Leading Interface

The Hawk is the most powerful boiler control systems available in the industry. Its user-friendly interface features:

- ▶ Highest resolution screen on the market
- ▶ Intuitive navigation
- ▶ Built in maintenance manual
- ▶ E-mail and text alerts

## Prometha® IoT-Connected Boiler Solutions

Prometha collects critical data and provides actionable insights, making boiler optimization and troubleshooting simple.

With Prometha, you can:

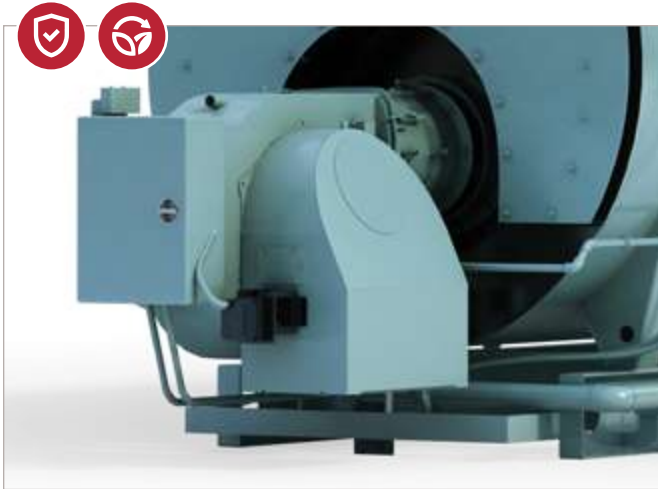
- ▶ Access boiler insights from anywhere, 24/7/365
- ▶ Increase operational efficiency
- ▶ Lower total cost of ownership
- ▶ Prevent or reduce unplanned downtime





# Cleaver-Brooks Jet Burner Solutions

Engineered by Cleaver-Brooks to be a fully compatible boiler/burner package featuring excellent fuel to steam/water efficiency, space savings, and low emissions. The versatile Cleaver-Brooks CBJT also has the flexibility to add desired options to further enhance the package.



## 100 to 1,600 HP Packaged Burner

- ▶ High efficiency
- ▶ Easy to maintain
- ▶ System matched burner
- ▶ <30 ppm NOx emissions solutions available
- ▶ Single source manufacturer

Designed and tested with each boiler, ProFire packaged burners deliver the highest levels of performance and reliability.

## Flexible Burner Options

The versatile CBJT can be easily upgraded with options during manufacture, or it can be retrofitted later.

The standard ProFire burner can be upgraded to provide maximum combustion efficiency and low NOx technology.



## Controls

- ▶ Universal controls options available



## State-of-the-Art Manufacturing Facility

Our commitment to engineering the finest, most durable components provides a robust burner built to exacting specifications and unmatched fit and finish. Maximum efficiency burners in low- or ultra-low emissions proudly built in the USA in certified manufacturing facilities.

# Waterback Configuration

The CBJT is offered in a 2-, 3- or 4-pass waterback design. It is ruggedly constructed for hot water or low and high pressure steam applications. For customers who prefer the jet burner design, the CBJT provides the highest value, with a focus on safety, ease of maintenance, lowest emissions and the flexibility to add desired options to further enhance the package.

## Waterback

- ▶ Longest service life
- ▶ Little to no refractory in rear door
- ▶ Requires front tube pull
- ▶ Fully water-cooled design reduces stress due to cycling



## Classic Design

Cleaver-Brooks set the standard in Firetube design with the 5 Sq ft of heating surface per HP and 4 pass construction. The CBJT classic design is built off of this standard and allows customers the reliability and flexibility to burn many different fuels.

## Enhanced Design

Using EX technology - the CBJT enhanced design offers 2 pass construction and a smaller footprint compared to traditional 3 and 4 pass boilers, as well as very high part load efficiencies making the CBJT 2 pass boiler a great choice for many applications.



## Reliable and Consistent Manufacturing

Being a single source expert provider, we control the manufacturing process to provide consistency and repeatability with our products. Our equipment is manufactured in state of the art facilities and under demanding quality control requirements using ISO standards.

# Flexibility to Meet Any System Requirements



## Minimize Start-up Time

Cleaver-Brooks has long been committed to engineering the most advanced and reliable boiler systems. By utilizing the highest-quality components to minimize downtime, our boilers can ensure you're making the most of your steam and hot water systems which also leads to quicker start time.



## Single Source Safety and Reliability

With coordinated research and development strategies, rigid testing and performance expectations, Cleaver-Brooks is dedicated to providing a world class boiler, burner and controls solution.



## Sustainable Emissions

Our dedicated Product Development Center has engineers that develops state of the art technology to advance our products for tomorrow's boiler and burner systems. With breakthrough technology, Cleaver-Brooks has attained extremely low emissions levels such as NOx levels below 5 ppm, and CO levels below 1 ppm while maintaining 30 ppm NOx.

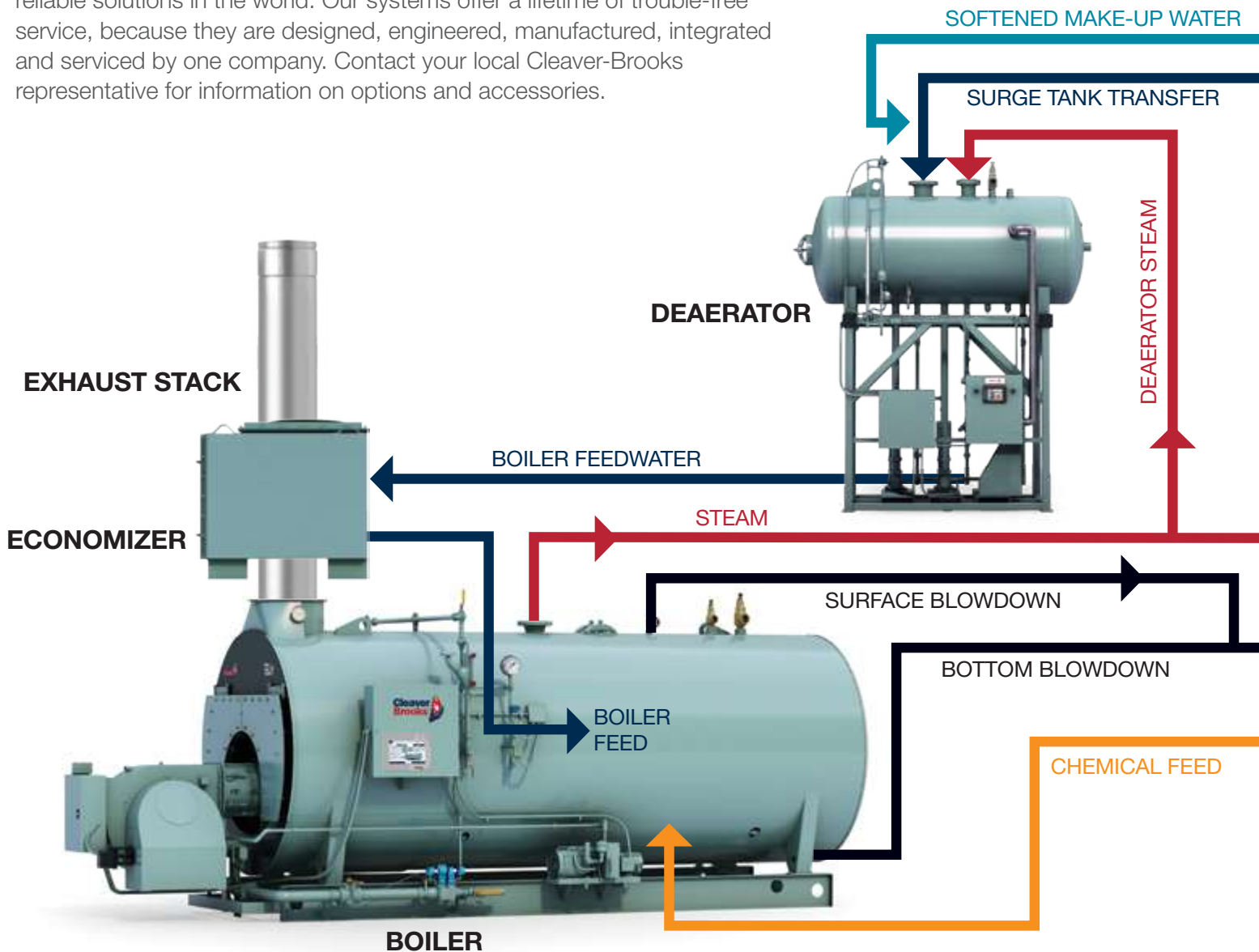


“The quality, durability and serviceability of Cleaver-Brooks is unmatched.”

**Scott Roman**  
HVAC Engineer  
Rockville General Hospital

# Take Optimization to the Limit

Cleaver-Brooks complete system integration produces the most efficient, reliable solutions in the world. Our systems offer a lifetime of trouble-free service, because they are designed, engineered, manufactured, integrated and serviced by one company. Contact your local Cleaver-Brooks representative for information on options and accessories.



## Advanced Controls

- ▶ Hawk boiler controls
- ▶ Prometha IoT Solutions
- ▶ Advanced deaerator controls
- ▶ Master panel

## Exhaust Solutions

- ▶ Draft calculations and design
- ▶ Single-source solution
- ▶ UL-listed products

## Stack Economizers

- ▶ Non-condensing
- ▶ C2X-HE – 94% efficient
- ▶ Condensing

## High-Pressure Condensate Systems

- ▶ Improves overall system efficiency
- ▶ Integrated controls for high-pressure operation

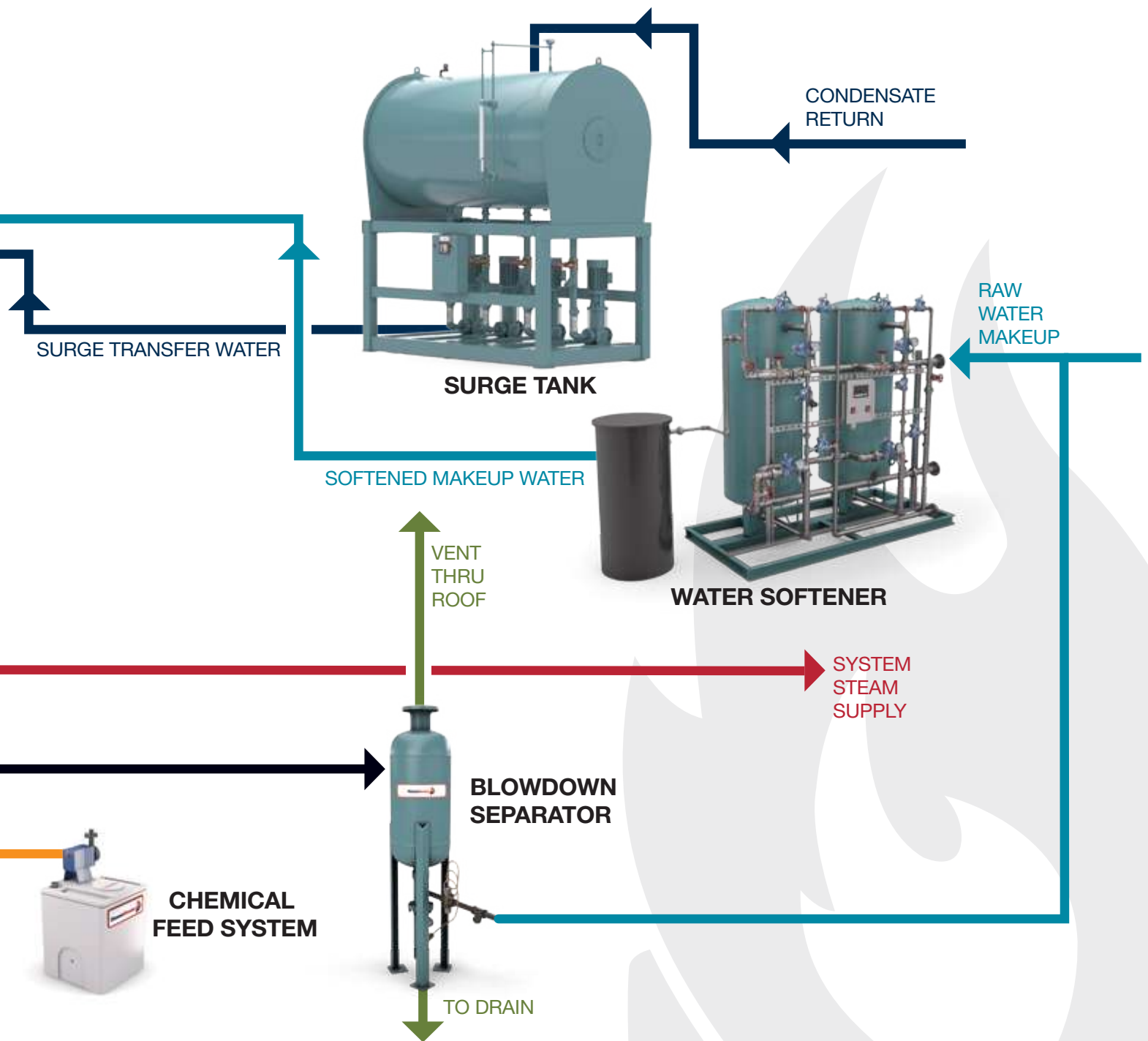
## Deaerators

- ▶ Pre-heats boiler feedwater
- ▶ Removes dissolved gases
- ▶ Improves lifespan and efficiency of boilers

## Surge Tanks

- ▶ Collects and stores condensate
- ▶ Reduces makeup water and chemical usage





### Chemical Feed Systems

- ▶ Chemicals treat the boiler system to maintain peak efficiency and reliability
- ▶ Variety of options available depending on system specifics

### Duo Tank Systems

- ▶ Combines spray-type deaerator and surge tank
- ▶ Simplifies installation

### Water Softeners

- ▶ Removes minerals that will create scale within boilers
- ▶ Ensures long equipment life

### Blowdown Separators and Tanks

- ▶ Cools blowdown water to safe temperature for discharge to drain
- ▶ Required by code for most steam systems

# CBJT Dimensions and Ratings

## Classic Design: 100 to 800 HP

Boiler Output (HP)	100	125	150	200	250	300	350
Boiler Output (pph @ 212 °F)	3,450	4,313	5,175	6,900	8,625	10,350	12,075
Overall Length (30 PPM System)	176"	200"	189.6"	223.6"	229.6"	253.6"	250"
Overall Width	85"	85"	92"	92"	103"	103"	110"
Overall Height	87"	87"	92.63"	92.63"	106"	106"	115"
Steam Outlet (125 psig OP, 300# fig.)	4"	4"	4"	4"	6"	6"	6"
SRV Outlet (150 psig)	1@ 1.5"	1@1.25", 1@1.5"	1@1.25", 1@1.5"	2@1.5"	1@1.5", 1@2"	1@1.5", 1@2"	2@2"
Flue Outlet	16"	16"	16"	16"	20"	20"	24"
Shipping Weight (lbs)	11,320	12,920	13,980	16,620	21,620	23,970	26,850
Operating Weight (lbs)	17,190	20,210	21,605	26,615	34,210	38,820	42,875
Flooded Weight (lbs)	6,890	8,580	8,870	11,600	14,760	17,380	19,220
Normal Water Weight (lbs)	5,870	7,310	7,625	9,995	12,590	14,850	16,025

## Classic Design: 800 to 1600 HP

Boiler Output (HP)	800	900	1000	1100	1200	1300	1400
Boiler Output (pph @ 212 °F)	27,600	31,050	34,500	37,950	41,400	44,850	48,300
Overall Length	367"	394"	386"	411"	434"	387"	406"
Overall Width	144"	144"	156"	156"	156"	168"	168"
Overall Height	149"	149"	161"	161"	161"	168.125"	168.125"
Steam Outlet (125 psig OP, 300# fig.)	8"	10"	10"	10"	10"	10"	12"
SRV Outlet (150 psig)	1@3", 1@4"	1@3", 1@4"	2@4"	2@4"	2@4"	2@3", 1@4"	1@3", 2@4"
Flue Outlet	32"	32"	36"	36"	36"	42"	42"
Shipping Weight (lbs)	65,000	71,000	79,600	85,300	90,900	97,300	102,600
Operating Weight (lbs)	108,800	120,400	128,900	139,300	150,900	158,300	168,600
Flooded Weight (lbs)	54,500	61,300	65,300	71,900	78,300	83,000	89,000
Normal Water Weight (lbs)	43,800	49,400	49,300	54,000	60,000	61,000	66,000

## Enhanced Design: 100 to 1200 HP

Boiler Output (HP)	100	125	150	200	250	300	350
Boiler Output (pph @ 212 °F)	3,450	4,313	5,175	6,900	8,625	10,350	12,075
Overall Length (60 PPM System)	179.5"	184.5"	190"	213"	232"	238"	238.5"
Overall Width	81"	81"	86"	86"	94"	94"	105"
Overall Height	81"	81"	87"	87"	94.5"	94.5"	108"
Steam Outlet (125 psig OP, 300# fig.)	4"	4"	4"	4"	6"	6"	6"
SRV Outlet (150 psig)	1.5"	1@1.5", 1@1.25"	1@1.5", 1@1.25"	2@1.5"	1@2", 1@1.5"	1@2", 1@1.5"	2@2"
Flue Outlet	16"	16"	16"	16"	20"	20"	24"
Shipping Weight (lbs)	9,710	10,480	11,750	13,250	15,670	16,090	19,650
Operating Weight (lbs)	15,970	17,020	19,170	22,080	25,780	26,640	35,470
Flooded Weight (lbs)	6,870	7,175	8,445	10,045	11,990	12,490	18,425
Normal Water Weight (lbs)	6,260	6,540	7,420	8,830	10,110	10,550	15,820

400	500	600	700	800
13,800	17,250	20,700	24,150	27,600
270.6"	276.6"	311.6"	304"	304"
110"	123"	123"	133"	133"
115"	126"	126"	135.6"	135.6"
6"	8"	8"	8"	8"
1@2.5", 1@2"	1@2.5", 1@2"	2@2.5"	2@2.5", 1@2"	2@2.5", 1@2"
24"	24"	24"	24"	24"
29,650	36,190	39,560	46,290	50,830
47,600	57,240	64,910	74,990	74,990
21,520	26,260	31,580	35,900	35,900
17,950	21,050	25,350	28,700	28,700

1500	1600
51,750	55,200
425"	387"
168"	168"
168.125"	168.125"
12"	12"
1@3", 2@4"	2@3", 1@4"
42"	42"
108,200	97,300
179,200	158,300
96,000	83,000
71,000	61,000



400	500	600	700	800	900	1000	1100	1200
13,800	17,250	20,700	24,150	27,600	31,050	34,500	37,950	41,400
258.5"	261"	267"	287"	287"	354"	354"	364"	364"
105"	112"	112"	119"	119"	130.5"	130.5"	130.5"	130.5"
108"	114.5"	114.5"	122.5"	122.5"	138"	138"	138"	138"
6"	8"	8"	8"	8"	8"	8"	10"	10"
1@2.5", 1@2"	1@2.5", 1@2"	2@2.5"	2@2.5", 1@2"	2@2.5", 1@2"	3@2.5"	3@2.5", 1@2"	3@2.5", 1@2"	4@ 2.5"
24"	24"	24"	24"	24"	32"	32"	32"	32"
21,050	24,600	26,000	32,100	32,250	47,000	47,000	49,000	49,000
37,350	41,200	43,110	52,100	52,250	81430	81430	81670	81670
19,035	20,675	21,330	25,380	25,380	43170	43170	42665	42665
16,300	16,600	17,110	20,000	20,000	34,430	34,430	32,670	32,670



# The power of total integration.

- Boilers
- Burners
- Controls
- Heat Recovery
- Water Systems
- Exhaust
- Rental Boilers
- Modular Skids
- Remote Monitoring
- Preventive Maintenance
- Field Service and Projects
- Installation
- Spare Parts Programs
- Commissioning
- Service Agreements
- E-commerce
- Retrofit and Renewal
- Risk Management
- Operational Optimization
- Education and Training
- Design, Application Assistance
- Webinars, Virtual Learning
- Thought Leadership
- Data/Analysis/Insights
- Engineering Support
- Best Practices
- Certified Sales, Service Professionals

Cleaver-Brooks is the only company able to deliver integrated equipment, full lifecycle services, and expert consultation to all our customers. These three competencies work together as one integrated solution, the sum of which is greater than its parts.

To find a Cleaver-Brooks representative near you, visit [cleaverbrooks.com/rebs](http://cleaverbrooks.com/rebs).



221 Law Street | Thomasville, GA 31792 USA | 1-800-296-4110  
[info@cleaverbrooks.com](mailto:info@cleaverbrooks.com) | [cleaverbrooks.com](http://cleaverbrooks.com)