HIGH EFFICIENCY COMMERCIAL BOILERS

CREST®

CONDENSING BOILER

SMART TOUCH™

WITH MODBUS PROTOCOL,
CASCADING SEQUENCER AND
FRONT-END LOADING CAPABILITY

- 7 INPUTS FROM 1.5 TO 5.0 MILLION BTU/HR
- FIRING RATE MODULATION UP TO 25:1
- DIRECT-VENT FLEXIBILITY TO 100 FEET
- FLEXIBLE FLOW RATES UP TO 350 GPM

UP TO 99% THERMAL EFFICIENCY

LOW NOx Certified
PROTECTING THE ENVIRONMENT

Lochinvar®
High Efficiency Water Heaters and Boilers

CREST®
CONDENSING BOILER

Fire Tube Innovation up to 5.0 Million BTU

Lochinvar® has taken the fire-tube concept in an innovative new direction with the CREST® modulating-condensing boiler. With sizes that range from 1.5 to 5.0 million Btu/hr, you have the opportunity to utilize Lochinvar leading-edge technology in your largest applications. With thermal efficiencies up to 99% in low water temperature applications, CREST is positioned to provide exceptional energy-saving performance.

The advanced CREST introduces a combustion system with a unique burner design with up to 25:1 turndown. The burner fires into an array of 316L stainless steel fire-tubes that transfer the heat to the surrounding water with exceptionally high efficiency.

CREST communicates seamlessly and in real time with building management systems by utilizing an on-board MODBUS protocol. The SMART TOUCH™ control has a built-in cascading component that communicates with up to eight units, providing total command without an external control or complex and expensive control logic programming by the BMS integrator.

Yes, innovative fire-tube boiler technology integrated with our SMART TOUCH™ operating control makes the CREST a genuine game-changer among commercial boilers.

Advanced Negative Regulation Technology

CREST safely and reliably operates with supply gas pressure as low as 4 inches water column. Because Negative Regulation (Neg/Reg) technology draws fuel gas into a pre-mix combustion system instead of relying on utility pressure through the gas valve, operation is steady in low gas pressure systems or when peak demands occur on supply lines. Plus, Neg/Reg automatic fan speed control fine-tunes the correct fuel/air ratio entering the burner, providing even, consistent combustion for a cleaner burning flame achieving high combustion efficiency.

Fully Modulating up to 25:1 Turndown

25:1 turndown means the burner can fire at a rate as low as 4% of its maximum input. For example, a 2 million Btu/hr CREST unit can modulate from 80,000 up to 2,000,000 Btu/hr depending on demand. High turndown greatly reduces “short cycling” when demand is low. All boiler systems are designed to provide enough heat to maintain a facility’s heat loss on the coldest days. When the system is zoned, the CREST’s high turndown works to match the actual system demand and, in return, reduces the customer’s fuel bill and provides better comfort by load matching the heat loss of the system. Greater seasonal efficiencies will be realized due to the extremely large turndown offered by CREST.

As Low As 25 GPM* to Full 350 GPM Flow Rates

CREST allows system designers tremendous flexibility to vary the flow rate through the boiler. It can service systems that operate with widely fluctuating flow rates depending on demand. CREST can be installed with primary/secondary piping or in a full-flow arrangement. Typical design techniques include full-flow systems or variable flow systems using variable frequency drives on the heating water pumps. In either case, CREST excels in these applications and allows the flow through the boiler to vary based on system demand.

** 25 GPM min. flow on FB1500-3000 models, 45 GPM on FB3500-4000 models and 50 GPM on FB5000.*

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PROTECTING THE ENVIRONMENT

The CREST Combustion System

CREST's top-mounted, single micro metal fiber burner is actually "two combustion systems in one," each with its own blower/gas valve assembly to power the combustion process from air/gas intake to driving heat energy down and through the fire-tubes to exhaust venting through the bottom of the unit.

In a 2 Million BTU/Hr CREST Boiler

The upper portion of the burner fires first and, with 5:1 turndown, modulates from 80,000 to 400,000 Btu/hr.

When demand exceeds 400,000 Btu/hr., the lower portion of the burner fires and modulates from 320,000 to 1,600,000 Btu/hr.

With the entire burner firing at capacity, the total input is 400,000 + 1,600,000 = 2,000,000 Btu/hr.

The CREST's patent-pending dual-system design is truly an industry first!

The CREST Heat Exchanger

Heat energy and combustion products flow downward into fire-tubes from the burner.

Energy from inside fire-tubes heats water flowing through the heating vessel.

As water is heated, it flows up through the heating vessel and out into the system.

Cold water returning from the system enters the heating vessel to maximize efficiency.

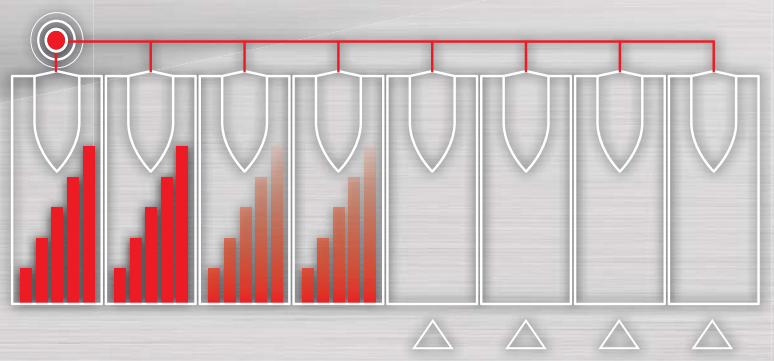
Condensate is drained into a stainless steel collector, to be piped to a suitable floor drain.

The flue outlet is located at the bottom of the unit.

Built-in Cascading Sequencer

Sequences up to an 8-boiler system using simple 2-wire daisy-chain connection, eliminating cost and uncertainty of separate "third party" sequencer. On demand, one boiler functions as the leader and modulates to capacity. Increasing load then "cascades" to additional "lag" boilers in sequence as needed. Lead-lag rotation shifts "first on" boiler role every 24 hours, distributing equal lead-lag runtimes to each unit.

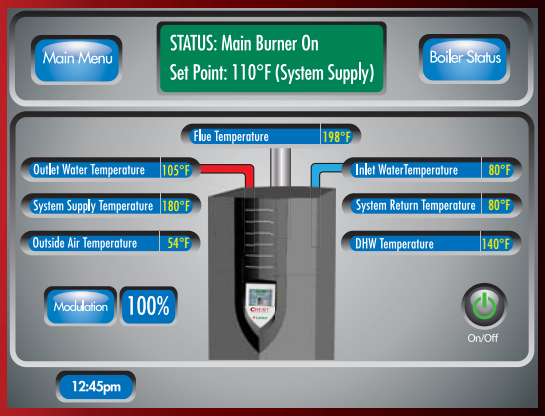
CREST's ability to sequence up to eight units that each have as much as 25:1 turndown means that the combined system has the potential of operating with modulation of up to 200:1 turndown. A bank of eight 2.0M Btu CRESTs would be able to provide as little as 80,000 Btu/hr and as much as 16,000,000 Btu/hr of heating output. In addition, the CREST Cascade can be set for "Efficiency Optimization" with each boiler firing at the same low BTU/hr input rates to receive the benefits of the highest thermal efficiency.



Unequaled Control and Monitoring Functions That Are Easy to Use

The CREST features Lochinvar's popular, all-in-one SMART TOUCH™ operating control. Amplified with an 8-inch touchscreen, the multi-color interface offers the best info-graphics and visual control content in the boiler industry today. It is smartly dressed with distinctive features and control parameters. It provides the operator with outstanding functionality, ease of operation and customized data retrieval. The CREST's SMART TOUCH control can be integrated directly into a Building Automation System via ModBus protocol and other communication protocols via a gateway device.

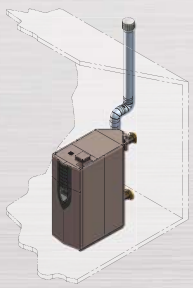
SMART TOUCH™



- MODBUS COMMUNICATION
- BUILDING MANAGEMENT SYSTEM CONTROL
- PC CONNECTION
- OUTDOOR RESET
- NIGHT TEMPERATURE SETBACK
- HOT WATER GENERATOR COMPATIBILITY
- SYSTEM AND BOILER PUMP CONTROLS
- FREEZE PROTECTION
- PRODUCT SERVICE DUE INDICATOR
- PASSWORD SECURITY

Direct-Venting up to 100 Feet

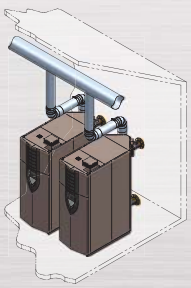
CREST offers 6 venting options and tremendous flexibility for placement of units within the building, because it permits direct-vent air intake and exhaust runs up to 100 equivalent feet using AL29-4C stainless steel (Category IV) vent pipe. Intake and exhaust runs can terminate horizontally through a sidewall or vertically through the roof. Additionally, CREST boilers installed in multiples of 2 or more can be common-vented, eliminating much of the time and material cost of venting multiple boilers individually.



Room Air Vertical

Room Air Sidewall

Direct-Vent Sidewall



Common-Vent*

Direct-Vent Vertical

Vertical w/Sidewall Air

**Contact Lochinvar for information on common venting of CREST boilers.*

The Industry's First Wave™ Fire-Tube Boiler Is Also the Industry's Best

Through an extensive research and design program, Lochinvar has taken fire-tube boiler technology to a new level. The CREST® boiler features the Wave™ 316L stainless steel fire-tube. Each CREST Fire Tube has a larger input capacity than other industry fire-tubes, which means fewer tubes and welds. This exclusive, new design provides superior heat transfer in every fire-tube.

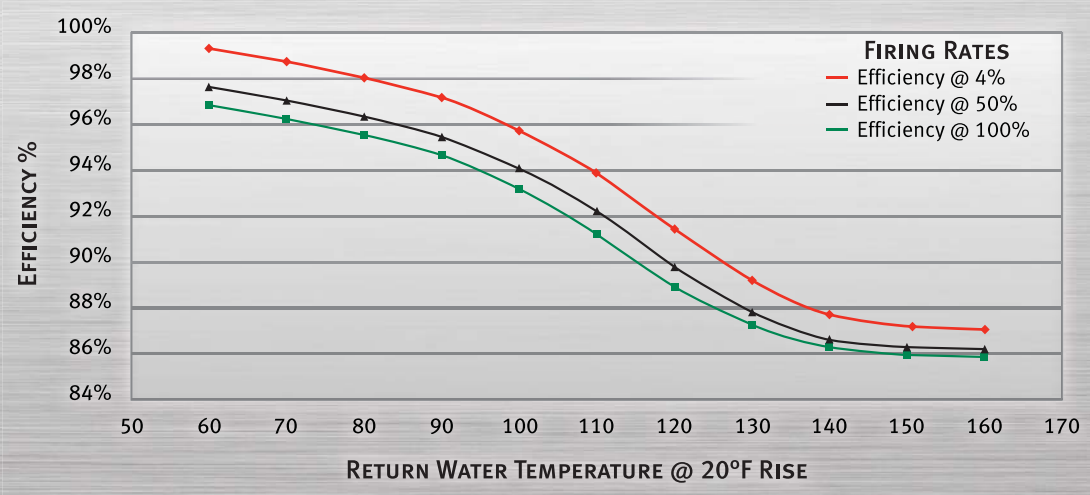
The Wave™ fire-tube employs a unique wave pattern that creates turbulence as the flue gas products flow down the tube, scrubbing the energy from the flue products. The Wave™ design also enhances the life of the heat exchanger by allowing the fire-tubes to flex, operating stress-free with none of the adverse effects suffered by traditional fire-tube boilers.

Each fire-tube is welded into the heat exchanger vessel and surrounded by water. The heat transfer process is enhanced by the water's counterflow. As the water flows up inside the vessel, the super-heated flue products flow down the fire-tube. With one pass, the heat is effectively captured from the flue products reaching condensing temperatures. At the top of the vessel, the combustion chamber is also water-backed for additional heat transfer.

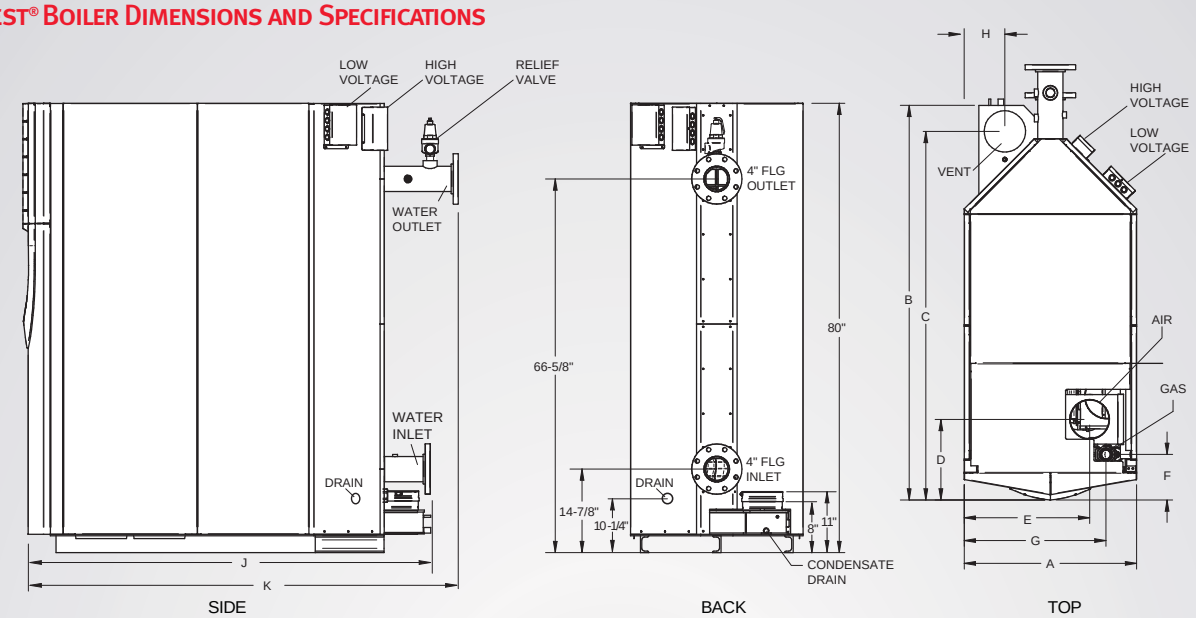
Finally, the CREST heat exchanger can operate with flow rates from as low as 25 GPM* to 350 GPM, comfortably suited to a wide variety of boiler system designs.

** 25 GPM min. flow on FB1500-3000 models, 45 GPM on FB3500-4000 models and 50 GPM on FB5000.*

CREST Boiler Efficiency



Crest® Boiler Dimensions and Specifications



Crest Heating Boiler

Dimensions and Specifications

Model Number	Input MBH Min.	Input MBH Max.	AHRI Thermal %	Output MBH	NET I=B=R MBH	Turndown*	A	B	C	D	E	F	G	H	J	K	Gas Conn.	Air Inlet	Vent Size	Operating Wt. (lbs.)	Shipping Wt. (lbs.)
FBN1500	60	1,500	92.0%	1,380	1,200	25:1	30-3/4"	71-1/2"	65-3/4"	14-3/8"	22-3/8"	8-1/2"	25-1/4"	8-1/8"	72-5/8"	77-5/8"	1-1/2"	7	7	2,496	1,900
FBN2000	80	2,000	92.0%	1,840	1,600	25:1	30-3/4"	71-1/8"	65-1/8"	14-7/8"	22-3/8"	8-1/4"	25-3/8"	9-5/8"	71-7/8"	76-7/8"	1-1/2"	8	8	3,054	2,150
FBN2500	125	2,500	92.0%	2,300	2,000	20:1	34-1/4"	76-3/8"	70-1/4"	17-3/4"	26-1/8"	9-3/4"	27-3/8"	11-3/8"	78"	83"	2"	8	9	3,652	2,560
FBN3000	150	3,000	92.0%	2,760	2,400	20:1	40-1/2"	83-5/8"	76-3/8"	17-3/8"	31-3/8"	9-7/8"	34-3/4"	11-1/2"	82-1/8"	87-1/8"	2"	10	10	4,126	2,920
FBN3500	200	3,500	92.0%	3,220	2,800	18:1	40-1/2"	83-1/4"	75-5/8"	17-1/4"	31-3/8"	9-7/8"	34-3/4"	12-7/8"	81-1/8"	86-1/8"	2"	10	10	4,744	3,225
FBN4000	335	4,000	93.0%	3,720	3,235	12:1	53-1/2"	109"	100-3/4"	31-1/4"	40-3/4"	14-1/2"	45-3/4"	12-3/4"	109-1/4"	108-1/4"	2-1/2"	12	12	6,900	4,750
FBN5000	500	5,000	93.0%	4,650	4,043	10:1	53-1/2"	109"	100-3/4"	28"	40-3/4"	11"	45-1/2"	12-3/4"	109-1/4"	108-1/4"	2-1/2"	14	14	8,000	5,550

Notes: *Indoor installation only. All information subject to change. Change "N" to "L" for LP gas models and to "D" for dual fuel models. For Low NOx on FB2500 - FB5000 models, consult factory. *Turndown rate reduced on LP gas models.*

Smart Touch™ Features

- **SMART TOUCH™ Touchscreen Operating Control**
- **Full-Color 8" Touchscreen LCD Display**
- **Built-in Cascading Sequencer for up to 8 Boilers**
- Cascade Multiple Sized Boilers
- Lead/Lag Cascade
- Efficiency Optimized Cascade
- **Front-End Loading Capability with CopperFin II and Powerfin Boilers**
- **Building Management System Integration with 0-10 VDC Input**
- **Modbus Communications**
- **Outdoor Reset Control with Outdoor Air Sensor**
- **Password Security**
- **Domestic Hot Water Prioritization**
  - DHW tank piped with priority in the boiler loop
  - DHW tank piped as a zone in the system with the pumps controlled by the Smart System
  - DHW Modulation Limiting
  - Separately Adjustable SH/DHW Switching Times
- Low Water Flow Safety Control & Indication
- Inlet & Outlet Temperature Readout
- Freeze Protection
- Service Reminder
- Time Clock
- **Data Logging**
  - Hours Running, Space Heating
  - Hours Running, Domestic Hot Water
  - Hours Running, Modulation Rate
  - Ignition Attempts
  - Last 10 Lockouts
- **Programmable System Efficiency Optimizers**
  - Night Setback
  - Anti-Cycling
  - Outdoor Air Reset Curve
  - Ramp Delay
  - Boost Temperature & Time
- **Three Pump Control**
  - System Pump
  - Boiler Pump
  - Domestic Hot Water Pump
- **High-Voltage Terminal Strip**
  - 120 VAC / 60 Hertz / 1 Phase Power Supply (FB1500-3500)
  - 208 VAC / 60 Hertz / 3 Phase Power Supply (FB4000-5000)
  - System Pump, Boiler Pump and DHW Pump Power
- **Low-Voltage Terminal Strip**
  - 24 VAC Auxiliary Device Relay
  - Auxiliary Proving Switch Contacts
  - Alarm on Any Failure Contacts
  - Runtime Contacts
  - DHW Thermostat Contacts
  - Unit Enable/Disable Contacts
  - System Sensor Contacts
  - DHW Tank Sensor Contacts
  - Outdoor Air Sensor Contacts
  - Cascade Contacts
  - 0-10 VDC BMS External Control Contact

Optional Equipment

- Alarm Bell
- BMS Gateway - BACnet or LonWorks
- Condensate Neutralization Kit
- SMART TOUCH PC Software
- Common Vent Kits
- Dual Fuel Gas Train
- Electrical Options (Shipped Loose):
  - 208V/3Ø/60Hz (Models FB1500-3500 only)
  - 480V/3Ø/60Hz
  - 600V/3Ø/60Hz

Codes & Registrations

- ANSI Z21.13/CSA Certified
- ASME certified, "H" Stamp / National Board
- California Code Compliant
- CSD1 / Factory Mutual / GE Gap Compliant
- South Coast Air Quality Management District Qualified
- Canadian Registration Number (CRN)
- AHRI Certified

Standard Features

- Up to 93% Thermal Efficiency (AHRI)
- Up to 99% Thermal Efficiency in Low Temperature Applications
- Modulating Burner with up to 25:1 Turndown
- Direct-Spark Ignition
- Low-NOx Operation
- Sealed Combustion
- Low Gas Pressure Operation
- Vertical or Horizontal Venting
- Category IV Venting up to 100 Feet
- ASME "H" Stamped Heat Exchanger
- 316L Stainless Steel Fire Tubes
- 160 psi Working Pressure
- On/Off Switch
- Adjustable High Limit with Manual Reset
- Low Water Cutoff with Manual Reset & Test
- High & Low Gas Pressure Switches w/Manual Reset
- Low Air Pressure Switches
- Condensate Trap w/ Blocked Drain Switch
- Drain Valve
- System Sensor
- Outdoor Air Sensor
- Inlet & Outlet Temperature Sensors
- High Voltage Terminal Strip
- Low Voltage Terminal Strip
- Downstream Gas Test Cocks
- 50 psi ASME Relief Valve
- Temperature & Pressure Gauge
- Zero Clearances to Combustible Materials
- 10-Year Limited Warranty (See Warranty for Details)
- 1-Year Warranty on Parts (See Warranty for Details)

Registered Under U.S. Patent #8286594

Lochinvar® High Efficiency Water Heaters, Boilers and Pool Heaters

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