HIGH EFFICIENCY COMMERCIAL BOILERS

CREST
CONDENSING BOILER

CON·X·US® REMOTE CONNECT
MODBUS AND BACnet MSTP PROTOCOL
CASCADING SEQUENCER WITH CASCADE REDUNDANCY

5 INPUTS FROM 2.5 TO 5.0 MILLION BTU/HR
UP TO 20:1 TURNDOWN RATIO
DIRECT-VENTING UP TO 100 FEET
FLEXIBLE FLOW RATES UP TO 350 GPM
FRONT END LOADING CAPABILITY

up to 93% THERMAL EFFICIENCY

Lochinyar
HIGH EFFICIENCY BOILERS & WATER HEATERS
Lochinvar® has taken the fire-tube concept in an innovative new direction with the CREST® modulating-condensing boiler. With sizes that range from 2.5 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 20:1 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 and BACnet MSTP. The SMART TOUCH™ control with CON-X-US® 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.

With the added feature of CON-X-US remote connectivity, the CREST boiler can be monitored from anywhere even if your building does not have a Building Management System.

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 20:1 Turndown**

20:1 turndown means the burner can fire at a rate as low as 5% of its maximum input. For example, a 2.5 million Btu/hr CREST unit can modulate from 125,000 up to 2,500,000 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 system 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 FB2500-3000 models, 45 GPM on FB3500-4000 models and 50 GPM on FB5000.
**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 125,000 to 625,000 Btu/hr.

When demand exceeds 625,000 Btu/hr., the lower portion of the burner fires and modulates from 470,000 to 1,875,000 Btu/hr.

With the entire burner firing at capacity, the total input is $625,000 + 1,875,000 = 2,500,000$ 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.*

**Peace of Mind, When It Matters Most**

Cascade Redundancy provides peace of mind because it helps ensure that a CREST boiler system will always deliver reliable performance with no downtime. If the lead boiler is turned off for maintenance, Cascade Redundancy automatically shifts the lead role to the second sequenced boiler.

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 20:1 turndown means that the combined system has the potential of operating with modulation of up to 160:1 turndown. A bank of eight 2.5M Btu CRESTs would be able to provide as little as 125,000 Btu/hr and as much as 20,000,000 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.
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.

*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 FB2500-3000 models, 45 GPM on FB3500-4000 models and 50 GPM on FB5000.

CREST Boiler Efficiency

![Graph showing CREST Boiler Efficiency](image)
FBN-06 (Replaces FBN-05 7/15)

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Crest™ BOILER DIMENSIONS AND SPECIFICATIONS

SMART TOUCH™ FEATURES

CON·X·US Remote Connect
SMART TOUCH™ Touchscreen Operating Control
Full-Color 8" Touchscreen LCD Display
Built-in Cascading Sequence for up to 8 Boilers
 Built-in Redundancy
Cascade Multiple Sized Boilers
Lead/Lag Cascade
Efficiency Optimized Cascade
Front-End Loading Capability with Copper-Fin II® and Power-fin® Boilers
Building Management System Integration with 0-10 VDC Input
BACnet MSTP Communications
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 boiler loop
Downstream Gas Test Cocks
Low Water Flow Safety Control & Indication
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 Hz / 1 Phase Power Supply (FBN2500-3500)
 > 208 VAC / 60 Hz / 3 Phase Power Supply (FBN4000-5000)
 > 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 IP or LonWorks
Wireless Outdoor Temperature Sensor
Condensate Neutralization Kit
SMART TOUCH PC Software
Common Vent Kits
Dual Fuel Gas Train
Air Filter Box
Motorized Isolation Valve
Variable Speed Boiler Pump
Electrical Options (Shipped Loose):
 > 208V/3Ø/60Hz
 > 240V/3Ø/60Hz
 > 480V/3Ø/60Hz
 > 600V/3Ø/60Hz

CODES & REGISTRATIONS

ANSI Z21.13/CSA Certified
ASME certified, "H" Stamp / National Board
California Code Compliant
CSA1 / Factory Mutual / GE Gap Compliant
Canadian Registration Number (CRN)
South Coast Air Quality Management District Qualified
AHRI Certified

STANDARD FEATURES

Up to 93% Thermal Efficiency (AHRI)
Up to 99% Thermal Efficiency
In Low Temperature Applications
Modulating Burner with up to 20:1 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

Registered Under U.S. Patent #8286594

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.

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