



Addendum 2
Sweeney Water Treatment Plant Boiler Replacement
May 16, 2019

BID DATE: Tuesday, May 21, 2019 at 11:00 AM (as originally advertised)

TO ALL BIDDERS:

Below are changes and or clarifications to the bid documents for this project. This Addendum forms a part of the Contract Documents and modifies the original bidding documents as noted below. Acknowledge receipt of this Addendum as required in the bid documents. Failure to do so may subject Bidder to disqualification.

QUESTIONS RECEIVED:

Q1. Where is Panel MCC1 located?

A1. That panel is on the 2nd floor of the facility. Reference notation on Sheet EP101.

Q2. Is the Bryan Boiler BFIT-1500 condensing boiler an acceptable product substitute?

A2. Yes – reference attached information.

Q3. Is the Fulton Endura condensing boiler an acceptable product substitute?

A2. Yes – reference attached information.

DRAWING REVISIONS:

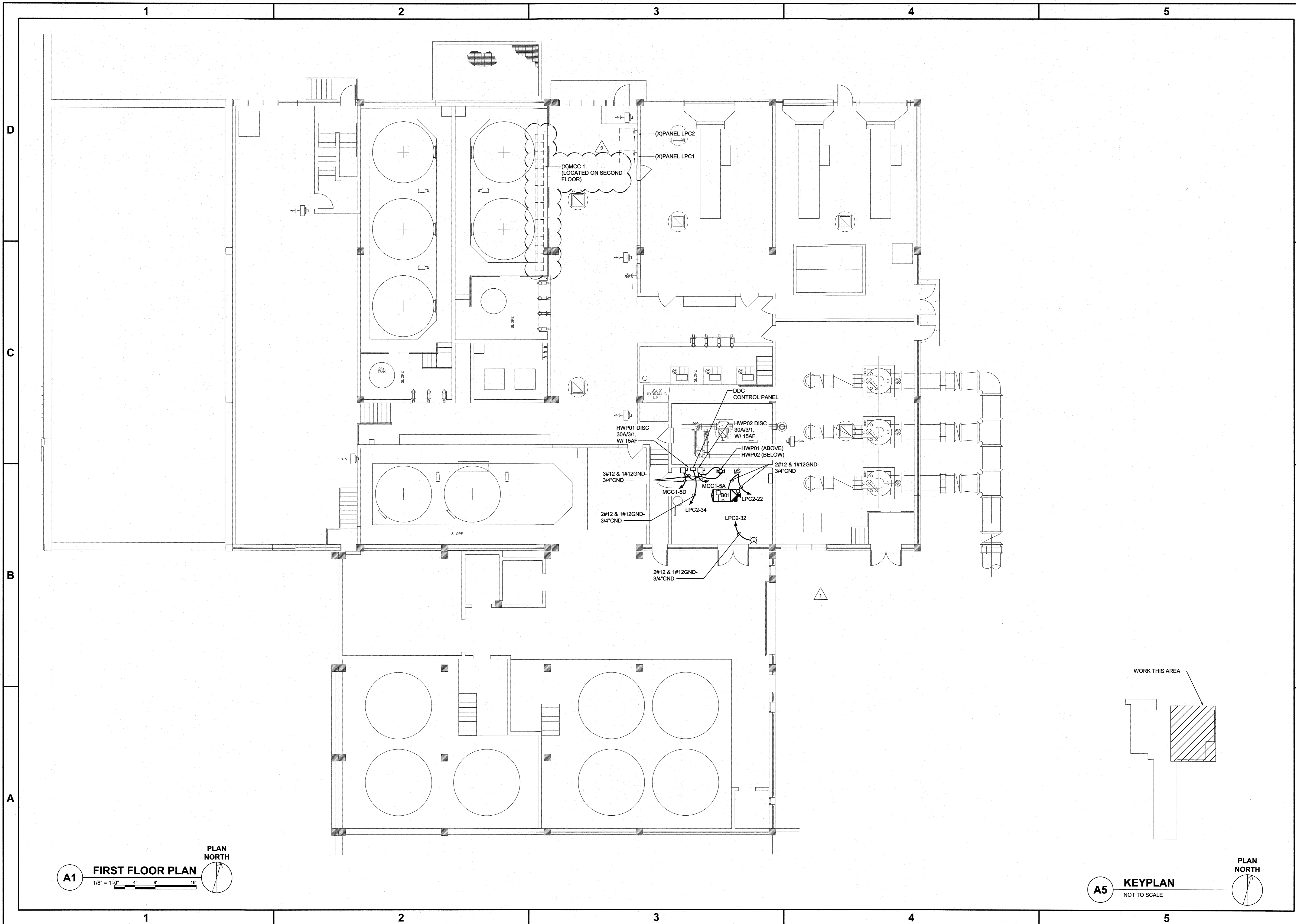
1. EP-101 – First Floor Plan Power

ACKNOWLEDGEMENT BY BIDDER. Bidder shall acknowledge receipt of this Addendum No. 2 in the space provided in the Bid Form.

All other terms & conditions remain unchanged.

Julia Faircloth
Cape Fear Public Utility Authority
Procurement Manager
End of Addendum 2

Kurt Evers
Cape Fear Public Utility Authority
Project Manager

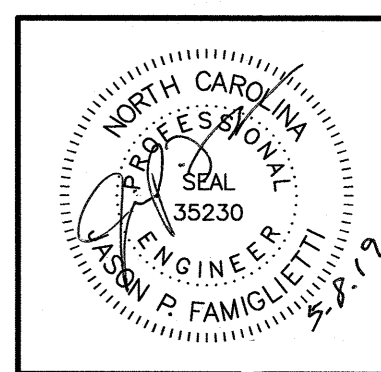


A1 FIRST FLOOR PLAN
 1/8" = 1'-0"
 1" 4" 8" 16"
 PLAN NORTH

A5 KEYPLAN
 NOT TO SCALE
 PLAN NORTH

Revision No.	Description
2	ADDED MCC TO SHEET FOR REFERENCE PER REVISION 01
1	ISSUED FOR CONSTRUCTION
0	

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 Engineers, PLLC
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 Wilmington, NC 28401



CAPE FEAR PUBLIC UTILITY AUTHORITY
SWEENEY WTP BOILER REPLACEMENT
 1833 N. 5th Avenue
 Wilmington, NC 28401
FIRST FLOOR PLAN

JOB NO.:	18134
DRAWN:	MDM
DESIGNED:	MDM
CHECKED:	JFF
DRAWING NO.:	EP101
REVISION:	2

Sweeney WTP Boiler Replacement

Request for Fulton Endura
Condensing Boiler Approval

Section 23 52 16

May 9, 2019



Max Way

336-269-0838

max.way@wwdclt.com



ENDURA

ULTRA HIGH EFFICIENCY
CONDENSING BOILERS

750 K – 2.0 MM BTU/HR



GREATER THAN THE SUM OF ITS PARTS

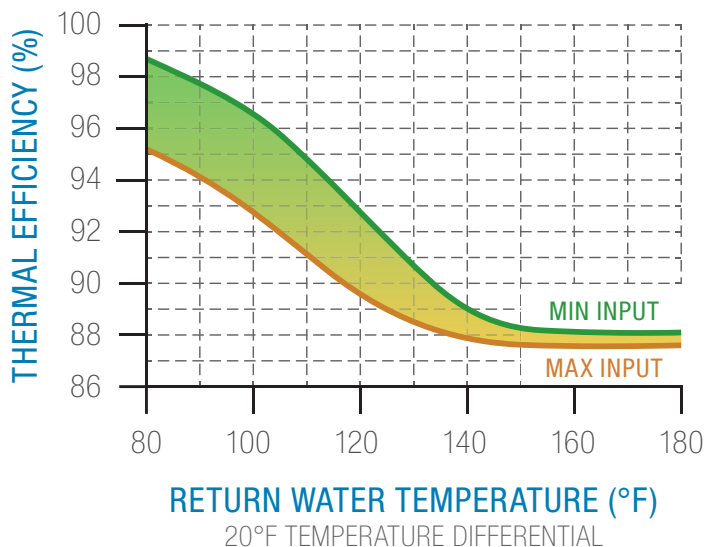
Designed for variable primary flow hydronic heating, Endura™ condensing boilers provide quiet and reliable operation in a compact vertical firetube platform.

The highly-engineered construction is built to last with thicker, higher-strength materials, and a premium fit and finish reflecting Fulton's paramount quality.

INDUSTRY LEADING SPECIFICATIONS

- ▶ **ULTRA-HIGH EFFICIENCIES UP TO 99%**
- ▶ **QUIET OPERATION OF <71 DBA AT 5 FT**
- ▶ **LOW NOX EMISSIONS OF <20 PPM**
- ▶ **TEN YEAR HEAT EXCHANGER WARRANTY**
- ▶ **FIVE YEAR BURNER WARRANTY**

THERMAL EFFICIENCY VS. RETURN WATER TEMPERATURE



▶ Three Endura boilers are integrated directly into a primary-only variable flow installation to provide building heat.

▶ ROBUST DESIGN, COMPACT FOOTPRINT

Our compact design enables Endura boilers to fit through a standard door and requires only one-inch of side clearance between boilers.

▶ SIMPLE TO INSTALL AND MAINTAIN

Latched cabinet panels detach in seconds, providing easy access for commissioning and maintenance; complete service can be performed through the front, top, and rear.

▶ APPLICATION FLEXIBILITY

With no minimum water temperatures, flexible venting capabilities and full capacity with only 4"WC gas pressure, Endura boilers are a perfect choice for both new and retrofit building heat applications.

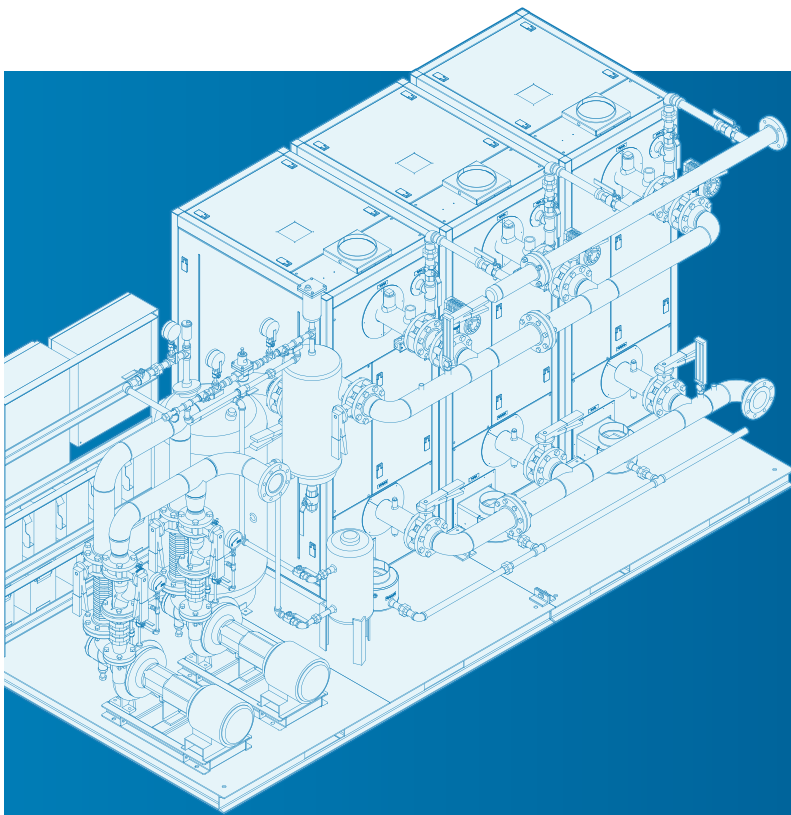
▶ INTUITIVE TOUCHSCREEN CONTROL

Integrated lead/lag for up to 8 boilers optimizes energy savings with parallel modulation and outdoor air temperature reset. Extensive control capabilities also includes pump control, trending data, and BMS integration through Modbus; BACnet or LonWorks configurable.

BETTER BY DESIGN

Endura boilers are built on a proven heat exchanger platform engineered and manufactured by Fulton. The design features rugged welded construction and a high-mass pressure vessel.

- ▶ **Fully Duplex Stainless Steel heat exchanger** has 19% greater strength and a 23% reduction in thermal expansion compared to conventional 316L used by the competition.
- ▶ Fully wetted three-pass firetube design operates with lower stresses and therefore greater durability.
- ▶ Corrugated flue pipes increase surface area and turbulence, enhancing fuel-saving efficiencies.
- ▶ The high water volume counter-flow design is exceptionally tolerant of varying and sometime unpredictable applications; **a zero flow condition will not harm the boiler.**

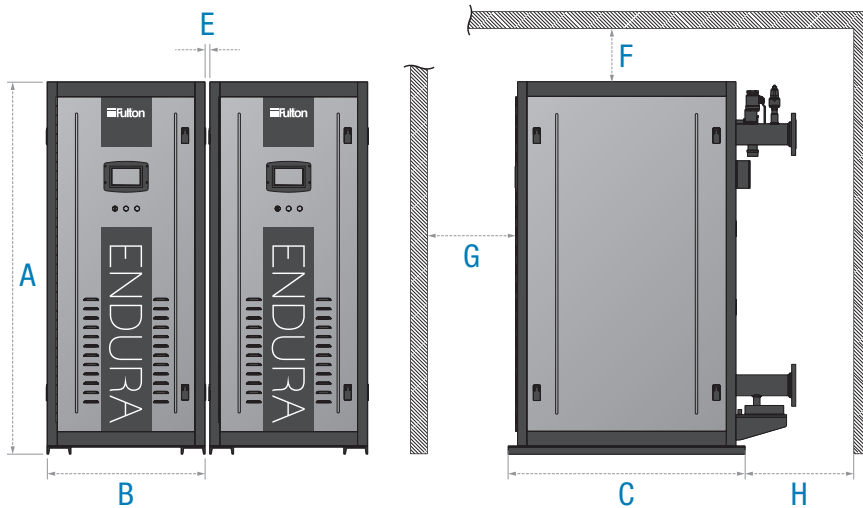


DESIGNED FOR VARIABLE PRIMARY FLOW

Variable primary flow is a simplified piping method which enhances temperature control, reduces design complexity, and maximizes efficiencies by delivering the lowest temperature water directly to the boiler with no blending.

- ▶ NO DEDICATED BOILER PUMP REQUIRED
- ▶ SMALLER PLANT FOOTPRINTS
- ▶ REDUCED COST OF INSTALLATION

MODEL:	EDR	750	1000	1500	2000
SPECIFICATIONS					
Input Capacity	MMBTU/Hr	0.75	1	1.5	2
Water Content	Gal	50	50	104	102
Pressure Drop at 20°F ΔT	PSI	.04	.08	.08	1.5
Operating Weight	LBS	1,848	1,848	3,128	3,210
AHRI Thermal Efficiency	%	97.1	95.3	93.5	93.7
DIMENSIONS					
(A) Overall Boiler Height	IN	67.75	67.75	80	80
(B) Overall Boiler Width	IN	28	28	33.9	33.9
(C) Overall Boiler Depth	IN	49.75	49.75	50.1	60.6



CLEARANCES		
(E) Side	IN	1
(F) Top	IN	18
(G) Front	IN	36
(H) Rear	IN	24

NOTE: All specifications and dimensions are approximate and for reference only. Fulton practices continuous product improvement and reserves the right to change specifications and/or dimensions without notice. Graphics contained in this brochure may not be representative of actual product.

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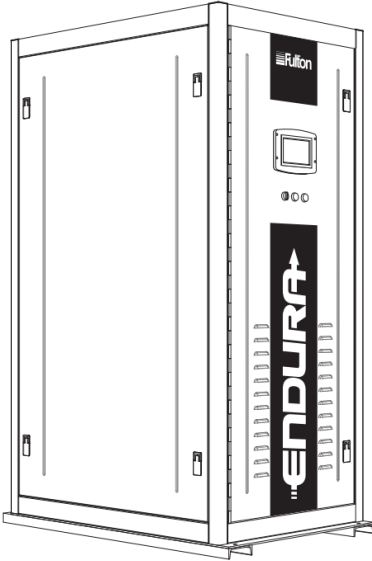


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Printed in the U.S.A
ENDURA_BRO_2018-1003

Learn more about Fulton products and services online at:
www.fulton.com



Standard Features and Devices

- Duplex Stainless Steel Firetube Heat Exchanger
- Fully Condensing Ultra-High Efficiency Design
- Suitable for Variable Primary Arrangements
- 160 PSIG Maximum Allowable Working Pressure
- 210°F Maximum Allowable Working Temperature
- Factory Recommended Maximum Setpoint 190°F
- Fully Modulating Natural Gas Operation
- Direct Spark Ignition
- Dual Element Supply Water Temperature Sensor
- Return Water Temperature Sensor
- Low Water Cut Off Probe with Manual Reset
- NEMA 1 Enclosure Electrical Control Panel
- Low NOx Emissions <20 ppm
- Combustion Air Intake Filter
- Integral Lock Up Type Regulator
- Ventless Gas Train Utilizing Vent Limiters
- Safety Interlock Contacts for External Device
- Monitoring Dry Contacts (Status, Demand, Alarm)
- Remote Boiler Enable Contacts
- Emergency Stop (E-Stop) Contacts

Control Capabilities

- Fulton SOLA Flame Safeguard, Temperature and Lead/Lag Controller
- Large 7" HD Color Touch-Screen Display
- Integrated Cascade Up to 8 Boilers
- Modbus Communication Protocol
- Outdoor Air Temperature Reset with Automatic Warm Weather Shutdown (Requires OAT Sensor Kit)
- Accept 4-20 mA Remote Setpoint Signal
- Motorized Isolation Valve Control for Variable Primary Systems
- DHW Pump Start/Stop Signal
- Boiler Pump Start/Stop Signal
- Flue Gas Exhaust Temperature Monitoring
- Indirect Domestic Hot Water Priority (Requires Indirect DHW Sensor)
- Frost Protection

Listings & Compliance

- ASME Section IV Code, "H" Stamp
- ETL Approved to the UL-795 Standard
- CSD-1 & CSA Controls and Fuel Train
- XL GAPS Compliant, Supersedes IRI
- FM Compliant Fuel Train Components
- AHRI Certified to BTS-2000
- SCAQMD Certified
- TCEQ Compliant
- Control Panel Wired in a UL 508 Facility

Trim Kit Items (Loose)

- ASME Safety Relief Valve (60, 100, 125, 160 PSIG Options)
- Pressure & Temperature Gauge
- Installation and Operation Manual
- Touch Up Spray Paint

Field Installed Optional Devices

- | | | |
|---|---|--|
| <input type="checkbox"/> 0-10VDC to 4-20mA Signal Converter | <input type="checkbox"/> Supply Water Header Temperature Sensor | <input type="checkbox"/> Multiple Boiler Condensate Drain Trap |
| <input type="checkbox"/> BACnet Integration Gateway | <input type="checkbox"/> Outdoor Air Temperature (OAT) Sensor Kit | <input type="checkbox"/> Single Boiler Condensate Drain Trap |
| <input type="checkbox"/> LonWorks Integration Gateway | <input type="checkbox"/> Indirect Domestic Hot Water (DHW) Sensor | <input type="checkbox"/> Condensate pH Neutralization Kit |
| <input type="checkbox"/> Second Low Water Cut Off Probe | <input type="checkbox"/> Mechanical Aquastat (Auxiliary High Limit) | <input type="checkbox"/> PVC/CPVC Exhaust Adapter Kit |
| <input type="checkbox"/> Fused External Disconnect | <input type="checkbox"/> Outdoor Installation Kit | |

Information provided in this document is based on standard boiler configurations. Alternate or custom configurations may result in deviations. Due to continuous product improvement, Fulton reserves the right to change specifications and/or dimensions without notice.



Technical Data

Endura Hydronic Condensing Boilers

Models: EDR-750, EDR-1000, EDR-1500, EDR-2000

(Applies to elevations up to 2,000 ft)

Capacities

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Rated Input at High Fire	BTU/hr	750,000	1,000,000	1,500,000	2,000,000
	kW	220	293	440	586
Minimum Input at Low Fire	BTU/hr	150,000	200,000	300,000	400,000
	kW	44	59	88	117
Rated Output (BTS-2000)	BTU/hr	728,250	953,000	1,402,500	1,874,000
	Boiler HP	21.8	28.5	41.9	56.0
	kW	213	279	411	549
AHRI Thermal Efficiency	%	97.1	95.3	93.5	93.7

(Reference End Assembly Drawing for Connection Type)

Connection Sizes

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Boiler Supply Water Outlet	inches	2	2	4	4
	mm	50.8	50.8	101.6	101.6
Boiler Return Water Inlet	inches	2	2	4	4
	mm	50.8	50.8	101.6	101.6
Flue Gas Condensate Drain	inches	1	1	1	1
	mm	25.4	25.4	25.4	25.4
Boiler Pressure Vessel Drain	inches	1	1	3/4	3/4
	mm	25.4	25.4	19.1	19.1
Gas Train Inlet	inches	1	1	1-1/2	1-1/2
	mm	25.4	25.4	38.1	38.1
Combustion Air Inlet (ID)	inches	6	6	8	8
	mm	152.4	152.4	203.2	203.2
Flue Gas Exhaust (ID)	inches	6	6	6	8
	mm	152.4	152.4	152.4	203.2



Technical Data

Endura Hydronic Condensing Boilers

Models: EDR-750, EDR-1000, EDR-1500, EDR-2000

Fuel Requirements
(At rated input, *Canada 14"WC Max)

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Natural Gas Consumption (1,000 BTU/FT ³)	SCFH	750	1,000	1,500	2,000
	M ³ /hr	21.2	28.3	42.5	56.7
Minimum Natural Gas Pressure	in W.C.	4	4	4	4
	kPa	1	1	1	1
Maximum Natural Gas Pressure*	in W.C.	28	28	28	28
	kPa	7	7	7	7

Fuel Requirements
(At rated input, *Canada 14"WC Max)

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Propane Consumption (2,500 BTU/FT ³)	SCFH	300	400	600	800
	M ³ /hr	8.5	11.3	17.0	22.7
Minimum Propane Pressure	in W.C.	7	7	7	7
	kPa	1.74	1.74	1.74	1.74
Maximum Propane Pressure*	in W.C.	28	28	28	28
	kPa	7	7	7	7

- Notes:**
- Endura boilers are factory tested on Natural Gas. Field configured to Propane during commissioning by an authorized service provider.
 - Burner turndown ratio of 4:1 for Propane operation.
 - Propane-fired operation is suitable for use with HD5 grade Liquid Petroleum Gases conforming to ASTM D1835-82 only.



Technical Data

Endura Hydronic Condensing Boilers

Models: EDR-750, EDR-1000, EDR-1500, EDR-2000

Electrical Requirements
(Applies to standard configuration)

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Electrical Supply	volts	120	120	120	120
	Ø	1	1	1	1
	Hz	60	60	60	60
Full Load Amps (FLA)	Amps	10	10	20	20
Minimum Circuit Size (MCA)	Amps	20	20	25	25
SCCR	Amps	5,000	5,000	5,000	5,000

Weights and Volume
(Typical for standard equipment)

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Dry Weight	lbs	1,430	1,430	2,260	2,360
	kg	649	649	1,025	1,070
Operating Weight	lbs	1,848	1,848	3,128	3,210
	kg	838	838	1,419	1,456
Shipping Weight	lbs	1,660	1,660	2,600	2,700
	kg	753	753	1,179	1,225
Pressure Vessel Water Volume	Gallons	50	50	104	102
	Liters	189	189	394	386



Technical Data

Endura Hydronic Condensing Boilers

Models: EDR-750, EDR-1000, EDR-1500, EDR-2000

Water/Flow Requirements
(Specifications apply to 100% water systems)

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Typical Flow Rate at Rated Output 20°F ΔT	GPM	73	95	140	187
	LPM	276	360	530	708
Water Side Pressure Drop at Rated Output 20°F ΔT	PSI	0.5	0.7	0.8	1.5
	kPa	3.5	4.8	5.5	10.3
Maximum Delta-T	°F	100	100	100	100
	°C	44.4	44.4	44.4	44.4
Minimum Flow Rate (See Note)	GPM	N/A	N/A	N/A	N/A
	LPM	N/A	N/A	N/A	N/A
Maximum Flow Rate (See Note)	GPM	N/A	N/A	N/A	N/A
	LPM	N/A	N/A	N/A	N/A

Note: A low or zero flow situation will not harm the heat exchanger or pressure vessel, however the system will require proper flow to heat the building and prevent nuisance high limit trips at the boiler.

Venting Requirements

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Combustion Air Intake Flow Rate	SCFM	153	203	305	407
Flue Gas Exhaust Flow Rate	SCFM	165	220	330	440
	ACFM	203	271	407	543
Minimum Allowable Draft Pressure	in WC	-0.04	-0.04	-0.04	-0.04
	kPa	-0.025	-0.025	-0.025	-0.025
Maximum Allowable Draft Pressure	in WC	+1.50	+1.50	+1.50	+1.50
	kPa	+0.374	+0.374	+0.374	+0.374

Note: Reference the Installation and Operation Manual for complete venting requirements including certifications, temperatures, materials, common combustion air intake, and common flue gas exhaust requirements. Data based on Natural Gas operation.



Technical Data

Endura Hydronic Condensing Boilers

Models: EDR-750, EDR-1000, EDR-1500, EDR-2000

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000	
Emissions	NO_x ppm	< 20	< 20	< 20	< 20	
	CO₂ %	8.0 - 10	8.0 - 10	8.0 - 10	8.0 - 10	
	Volatile Organic Compounds (VOCs)	lb/hr	0.0041	0.0055	0.0083	0.0110
		kg/hr	0.0019	0.0025	0.0038	0.0050
	CO ppm	< 50	< 50	< 50	< 50	

Notes:

- NO_x and CO are stated at a 3% O₂ correction.
- Will vary based on site specific factors and operating parameters.
- Calculations based on EPA PM10 AP42 standard.
- Emissions data is typical for standard natural gas operation. Emissions are not guaranteed on fuels other than standard natural gas.
- Site specific conditions will determine the appropriate CO₂ settings for each application.
- Jacket losses: 0.2% of output at maximum capacity, IAW ASHRAE Standard 103-2007.

Minimum Clearances
 (Local codes may supersede Fulton requirements)

Endura Model		EDR-750	EDR-1000	EDR-1500	EDR-2000
Front	inches	36	36	36	36
	mm	914	914	914	914
Rear	inches	24	24	24	24
	mm	610	610	610	610
Top	inches	18	18	18	18
	mm	457	457	457	457
Sides	inches	1	1	1	1
	mm	25	25	25	25



Boiler As-Equal Summary

Equipment ID:	B01
---------------	-----

	As-Specified	Proposed Alternate	Notes:
Manufacturer:	Lochinvar	Bryan	
Model:	Crest FBN-1501	BFIT-1500	
Fuel(s) Fired:	Natural gas	Natural gas	
Turn Down:	25:1	5:1	
Input:	1500 MBH	1500 MBH	
Output:	1443 MBH	1455 MBH	
Efficiency:	96.2%	97.0%	
Electrical:	120/60/1	120/60/1	
Piping System Compatible?:	Yes	Yes	
Length:	68"	65"	
Width:	30"	35"	
Height:	78"	36.5"	
Installed Footprint:	14.2 sq. ft.	15.8 sq. ft.	
Minimum/Service Clearances:	Top-24", Front-30", Sides-24", Rear-24"	Top-20", Front-22", Sides-24", Rear-6"	
Warranty:	10-year limited heat exchanger warranty. See attached.	10-year limited heat exchanger warranty. See attached.	
Controls:	Smart Touch boiler control	Concert boiler control	

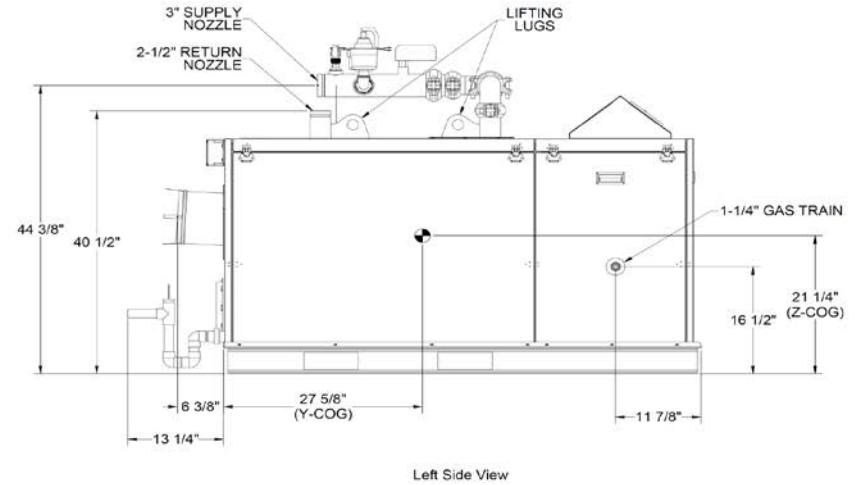
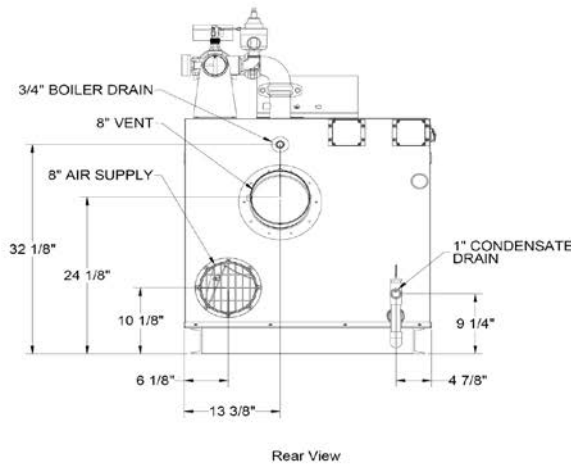
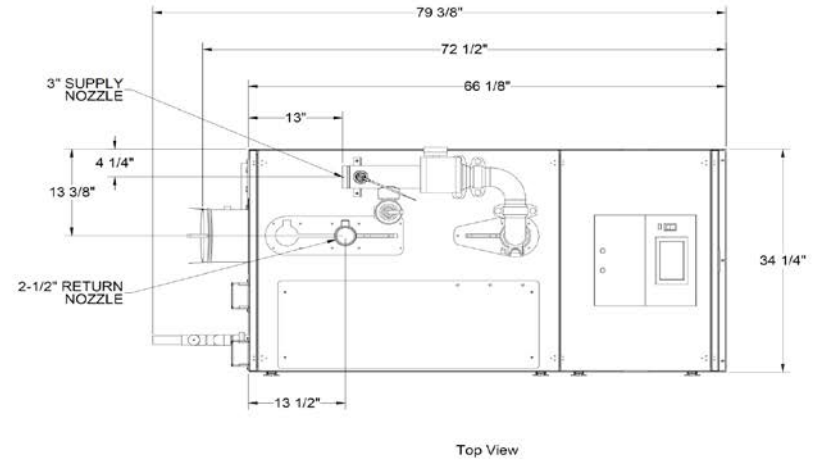
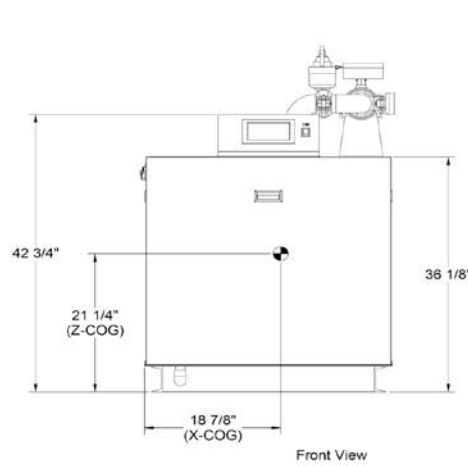
BFIT CONDENSING BOILERS - SUBMITTAL DATA SHEET

RATINGS AND CAPACITIES		
Input - Low Fire	300,000	BTU/HR
Input - High Fire	1,500,000	BTU/HR
Output - High Fire	1,455,000	BTU/HR
Boiler Horsepower	43.5	BHP
Thermal Efficiency	97.0%	
Low Fire Thermal Efficiency	Up to 99%	
Heating Surface	109.8	Sq.Ft.
Water Content	13.0	Gallons
Fuel	Natural Gas	
Firing Rate	Full Modulation	
Burner Turndown	5:1	
Low NOx Emissions	< 10 ppm	
Inlet Gas Pressure (NG)	4" wc	Min.
	14" wc	Max.
Shipping Weight, Approximate	1,050	lbs

ASME Section IV (Max 160 PSIG / 210°F)	
ETL Certified to UL 795 and CAN 3.1.1	

DIMENSIONS / CONNECTIONS	
- Height	42-3/4"
- Width	34-1/4"
- Length	66-1/8"
- Supply Connection	3" Grooved
- Return Connection	2-1/2" Grooved
- Vent / Air Intake Connections	8"
- Gas Connection	1-1/4" NPT

STANDARD EQUIPMENT	
- ASME Stainless Steel Heat Exchanger	
- Stainless Steel Pre-Mix Burner	
- Variable Speed Combustion Blower	
- Concert Boiler Control™ (24v)	
- High Limit Temperature Control, Auto Reset	
- High Limit Temperature Control, Manual Reset	
- Water Flow Switch	
- Low Water Cutoff, Manual Reset	
- Condensate Trap	
- Blocked Condensate Switch	
- ASME Pressure Relief Valve	
- Pressure / Temperature Gauge	
- Supply & Return Temperature Sensors	
- Flue Gas Temperature Sensor	
- Air Vent Valve	
- Modulating Gas Valve	
- Direct Spark Ignition and UV Scanner	
- High/Low Gas Pressure Switches, Manual Reset	
- Combustion Air Switch	
- Blocked Vent Switch	
- 120/1/60 Line Voltage (< 11 amps)	
- 208-240v/1ph/60hz Line Voltage (< 5.5 amps)	
- Category IV Individual Venting	
- Category II Common Venting with Engineered Vent System	
- CPVC, Polypropylene & Stainless Steel Acceptable *Material	
- Sealed or Room Combustion Air Intake	
- Up to 200 ft equivalent venting / air intake	



NOTES: 1. Dimensions shown are for reference only

FLOWS AND PRESSURE DROPS		
Delta T	Flow (GPM)	Δ P (Ft. Hd)
20°F Δ T	146	17.0
25°F Δ T	116	10.5
30°F Δ T	97	8.4
35°F Δ T	83	6.0
40°F Δ T	73	5.0
45°F Δ T	65	4.2
50°F Δ T	60	3.4
55°F Δ T	53	3.0

BFIT-1500

PROPERTY OF



783 N Chili Ave | Peru, IN 46970

Boiler Technology Leadership Since 1916

www.bryanboilers.com

* Flue system material shall be capable of continuous operation at 210°F or higher and shall be certified to UL 1738 – venting system for gas-burning appliances cat II, III and IV.



LIMITED WARRANTY FOR BFIT COMMERCIAL CONDENSING BOILERS

Stainless Steel Heat Exchangers and Parts/Accessories

Subject to the terms and conditions set forth below, Bryan in Peru, Indiana hereby extends the following limited warranties to the original owner of a commercial grade water boiler or Bryan supplied parts and/or accessories manufactured and shipped on or after January 1, 2018:

ONE YEAR LIMITED WARRANTY ON COMMERCIAL BOILERS AND PARTS / ACCESSORIES SUPPLIED BY BRYAN Bryan warrants to the original owner that its commercial grade stainless steel water boilers and parts/accessories comply at the time of manufacture with recognized hydronic industry standards and requirements then in effect and will be free of defects in material and workmanship under normal usage for a period of one year from the date of original installation. If any part of a commercial grade boiler or any part or accessory provided by Bryan is found to be defective in material or workmanship during this one year period, Bryan will, at its option, repair or replace the defective part (not including labor).

HEAT EXCHANGER WARRANTIES

Bryan warrants to the original owner that the heat exchanger of its commercial grade stainless steel boilers will remain free from defects in material and workmanship under normal usage for the time period specified in the chart below to the original owner at the original place of installation. If a claim is made under this warranty during the "No Charge" period from the date of original installation, Bryan will, at its option, repair or replace the heat exchanger (not including labor). If a claim is made under this warranty after the expiration of the "No Charge" period from the date of original installation, Bryan will, at its option and upon payment of the pro-rated service charge set forth below, repair or replace the heat exchanger. The service charge applicable to a heat exchanger warranty claim is based upon the number of years the heat exchanger has been in service and will be determined as a percentage of the retail price of the heat exchanger model involved at the time the warranty claim is made as follows:

NOTE: If the heat exchanger involved is no longer available due to product obsolescence or redesign, the value used to establish the retail price will be the published price as set forth in Bryan Repair Parts Pricing where the heat exchanger last appeared or the current retail price of the then nearest equivalent heat exchanger, whichever is greater.

Service Charge as a % of Retail Price										
Years of Service	1	2	3	4	5	6	7	8	9	10+
Stainless Steel	NO CHARGE					20	40	60	80	100

ADDITIONAL TERMS AND CONDITIONS

1. Applicability: The limited warranties set forth above are extended only to the original owner at the original place of installation within the United States and Canada. These warranties are applicable only to boilers, parts, or accessories designated as commercial grade by Bryan and installed and used exclusively for purposes of commercial space heating or domestic hot water generation through a heat exchanger (or a combination for such purposes) and do not apply to residential grade products or industrial uses.
2. Components Manufactured by Others: Upon expiration of the one year limited warranty on commercial grade boilers, all boiler components other than heat exchangers manufactured by others but furnished by Bryan (such as circulator and controls) will be subject only to the manufacturer's warranty, if any.
3. Proper Installation: The warranties extended by Bryan are conditioned upon the installation of the commercial grade boiler, parts, and accessories in strict compliance with Bryan installation instructions. Bryan specifically disclaims liability of any kind caused by or relating to improper installation.
4. Proper Use and Maintenance: The warranties extended by Bryan conditioned upon the use of the commercial grade boiler, parts, and accessories for its intended purposes and its maintenance accordance with Bryan recommendations and hydronics industry standards. For proper installation, use and maintenance, see all applicable sections of the Installation and Operating, and Service Instructions Manual furnished with the unit.
5. This warranty does not cover the following:
 - a. Expenses for removal or reinstallation. The owner will be responsible for the cost of removing and reinstalling the alleged defective part or its replacement and all labor and material connected therewith, and transportation to and from Bryan.
 - b. Components that are part of the heating system but were not furnished by Bryan as part of the commercial boiler.
 - c. Improper burner set-up or adjustment, control settings, care or maintenance.
 - d. This warranty cannot be considered as a guarantee of workmanship of an installer connected with the installation of the Bryan boiler, or as imposing on Bryan liability of any nature for unsatisfactory performance as a result of faulty workmanship in the installation, which liability is expressly disclaimed.
 - e. Boilers, parts, or accessories installed outside the 48 contiguous United States, the State of Alaska and Canada.
 - f. Damage to the boiler and/or property due to installation or operation of the boiler that is not in accordance with the boiler installation and operating instruction manual.
 - g. Any damage or failure of the boiler resulting from hard water, scale buildup or corrosion the heat exchanger. Any damage caused by improper fuels, fuel additives or contaminated combustion air that may cause fireside corrosion and/or c logging of the burner or heat exchanger.
 - h. Any damage resulting from combustion air contaminated with particulate which cause clogging of the burner or combustion chamber including but not limited to sheetrock or plasterboard particles, dirt, and dust particulate. Any damage, defects or malfunctions resulting from improper operation, maintenance, misuse, abuse, accident, negligence including but not limited to operation with insufficient water flow, improper water level, improper water chemistry, or damage from freezing.
 - i. Any damage caused by water side clogging due to dirty systems, corrosion products from the system, or improperly maintained water conditions.

CREST[®]

CONDENSING BOILER

Codes & Registrations

ANSI Z21.13/CSA Certified

ASME Certified, "H" Stamp / National Board

California Code Compliant

Canadian Registration Number (CRN)

CSD1 / Factory Mutual / GE Gap Compliant

South Coast Air Quality Management District
Qualified (FB 0751-2001)

Smart Touch™ Features

CON-X-US Remote Connect

SMART TOUCH Touchscreen Operating Control

Full-Color 8" Touchscreen LCD Display

Built-in Cascading Sequencer 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 Communication

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
- › Modulation Factor Control

Three Pump Control

- › System Pump
- › Boiler Pump
- › Domestic Hot Water Pump



High-Voltage Terminal Strip

- › 120 VAC / 60 Hertz / 1 Phase Power Supply (FB 0751-2001)
- › 208 VAC / 60 Hertz / 3 Phase Power Supply (FB 2501-3501)
- › 480 VAC / 60 Hertz / 3 Phase Power Supply (FB 4001-6001)
- › 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
- › 0-10 VDC Variable Speed Boiler Pump Control Contact

Standard Features

Proof of Closure Valve (FB 6001)

Modulating Burner with up to 25:1 Turndown

Direct-Spark Ignition

Low NOx Operation

Sealed Combustion

Air Inlet Filter

Low Gas Pressure Operation

Vertical and Horizontal Direct Venting

- › Direct Vent up to 100 Feet
- › PVC, CPVC, Polypropylene or AL29-4C (FB 0751-3501)
- › AL29-4C (FB 0751-6001)

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

High Altitude Models Available

10-Year Limited Warranty (See Warranty for Details)

1-Year Warranty on Parts (See Warranty for Details)

Optional Equipment

Alarm Bell

BMS Gateway - BACnet IP or LonWorks

Condensate Neutralization Kit

Common Vent Kits Damper

Motorized Isolation Valve

Variable Speed Boiler Pump

Wireless Outdoor Temperature Sensor

75 psi ASME Relief Valve

100 psi ASME Relief Valve

125 psi ASME Relief Valve

150 psi ASME Relief Valve

Electrical Options (Shipped Loose):

› FB 0751-2001

208V/ 3Ø/60 Hz → 120V/ 1Ø/60Hz

480V/ 3Ø/60 Hz → 120V/ 1Ø/60Hz

600V/ 3Ø/60 Hz → 120V/ 1Ø/60Hz

› FB 2501-3501

480V/ 3Ø/60 Hz → 208V/ 3Ø/60Hz

600V/ 3Ø/60 Hz → 208V/ 3Ø/60Hz

› FB 4001-6001

208V/ 3Ø/60Hz → 480V/ 3Ø/60 Hz

600V/ 3Ø/60 Hz → 480V/ 3Ø/60Hz



Lochinvar, LLC
300 Maddox Simpson Parkway
Lebanon, Tennessee 37090
P: 615.889.8900 / F: 615.547.1000
Lochinvar.com

CREST COMMERCIAL CONDENSING BOILER

Submittal Sheet



Lochinvar®

HIGH EFFICIENCY BOILERS & WATER HEATERS

MODELS
FB 0751 - FB 6001



FBN-Sub-09

Job Name: _____

Location: _____

Contractor: _____

Type Gas: _____

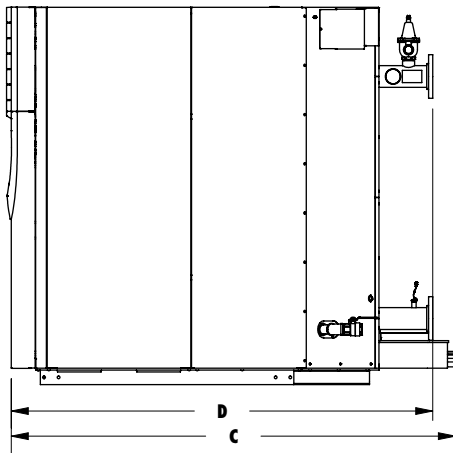
Engineer: _____

Model #: _____

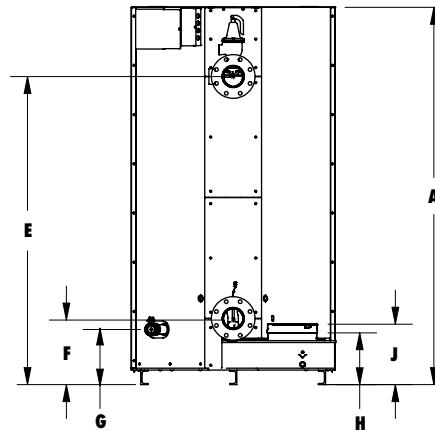
Agent/Wholesaler: _____

Equipment Tag(s): _____

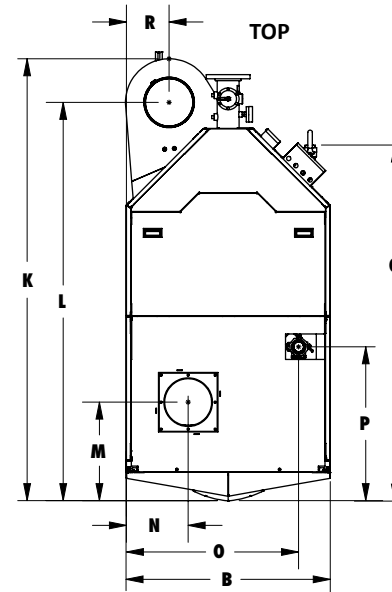
SIDE



BACK



TOP



JOB NOTES:

Notes:

- * Insert "N" for natural gas, "L" for LP gas models and "D" for dual fuel.
- Indoor installation only. Information subject to change without notice.
- Low NOx Operation.
- Lochinvar should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc.
- The ratings have been determined under the provisions governing forced draft burners.
- The Net AHRI water ratings shown are based on a piping and pickup allowance of 1.15.

Model Number	Input MBH		Thermal %	Gross Output MBH	Net AHRI Rating MBH	Turn-down	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	Gas Conn.	Water Inlet/Outlet	Air Intake	Vent Size	Oper. Weight (with water)	Ship. Weight (lbs.)
	Min	Max																											
FB*0751	50	750	96.2%	722	628	15:1	78"	30"	55-1/2"	57-5/8"	66-1/8"	11-7/8"	11-3/8"	11-1/4"	12-1/2"	55"	51"	13"	8-3/4"	26-3/4"	23-3/4"	49-1/2"	7-3/8"	1-1/4"	3"	6"	6"	1,768	1,560
FB*1001	50	999	96.2%	962	837	20:1	78"	30"	56-1/2"	57-5/8"	66-1/8"	11-7/8"	11-3/8"	11-1/4"	12-1/2"	56"	51"	13"	8-3/4"	26-3/4"	23-1/8"	49-1/2"	6-1/2"	1-1/4"	3"	6"	6"	1,838	1,596
FB*1251	63	1,250	96.2%	1,203	1,046	20:1	78"	30"	56-1/2"	57-3/4"	66-1/8"	11-7/8"	11-3/8"	11-1/4"	12-1/2"	56"	51-3/8"	13"	8-3/4"	26-3/4"	21-5/8"	49-1/2"	6-1/2"	1-1/4"	3"	6"	8"	1,975	1,648
FB*1501	60	1,500	96.2%	1,443	1,255	25:1	78"	30"	67-3/4"	68"	65-3/8"	12-3/8"	11-3/8"	11-1/4"	12-1/2"	67-1/4"	62-3/8"	15-7/8"	9"	26-7/8"	27-7/8"	59-1/4"	5-1/8"	1-1/2"	4"	8"	8"	2,307	1,961
FB*1751	70	1,750	96.2%	1,684	1,464	25:1	78"	30"	66-1/4"	68"	65-3/8"	12-3/8"	11-3/8"	11-1/4"	12-1/2"	65-3/4"	61-1/2"	15-7/8"	9"	27"	27-1/8"	58-3/4"	5-1/8"	1-1/2"	4"	8"	8"	2,458	2,017
FB*2001	80	1,999	96.2%	1,924	1,673	25:1	78"	30"	66-1/2"	68"	65-3/8"	12-3/8"	11-3/8"	11-1/4"	12-1/2"	66"	61-1/2"	15-7/8"	9"	27"	26-3/4"	58-3/4"	5-1/8"	1-1/2"	4"	8"	8"	2,570	2,087
FB*2501	125	2,500	96%	2,400	2,087	20:1	77-3/4"	35"	83-3/4"	83-3/4"	63-3/4"	13-1/2"	11-1/4"	10-1/2"	12-1/4"	83-1/4"	76-1/4"	19-3/4"	9-1/4"	28-3/4"	32"	71"	7-1/4"	2"	4"	8"	9"	3,600	2,577
FB*3001	150	3,000	96%	2,883	2,507	20:1	77-3/4"	35"	83-3/4"	83-3/4"	63-3/4"	13-1/2"	11-1/4"	10-1/2"	12-1/4"	83-1/4"	76-1/4"	19-3/4"	9-1/4"	28-3/4"	32"	71"	7-1/4"	2"	4"	10"	10"	3,900	2,881
FB*3501	175	3,500	96%	3,364	2,925	20:1	77-3/4"	42"	91-1/2"	86-3/4"	63-1/2"	13-1/4"	11-1/2"	10-3/4"	12-1/2"	91"	82"	20-1/4"	12-3/4"	35-1/2"	31-3/4"	73-1/4"	8-3/4"	2"	4"	10"	10"	4,600	3,218
FB*4001	333	3,999	96%	3,843	3,342	12:1	77-3/4"	45-1/2"	103-1/2"	99"	63-1/2"	13-3/4"	11-1/2"	10-3/4"	12-1/2"	103"	94"	24-3/4"	13-1/2"	39-1/2"	42-1/4"	85-1/4"	10-1/2"	2-1/2"	4"	12"	12"	5,200	3,805
FB*5001	500	4,999	96%	4,804	4,177	10:1	77-3/4"	46-1/2"	102-1/4"	99-1/2"	63-1/2"	15"	11-1/2"	10-3/4"	12-1/2"	101-3/4"	92-1/2"	22"	14"	39-3/4"	39-1/2"	84"	9"	2-1/2"	6"	12"	14"	5,900	4,101
FB*6001	600	6,000	96%	5,766	5,014	10:1	77-3/4"	50"	102-3/4"	99-3/4"	63-1/4"	14-3/4"	11-1/2"	10-3/4"	12-1/2"	102-1/2"	93-1/4"	20"	15-3/4"	43-1/2"	36-1/2"	83-3/4"	9-1/4"	2-1/2"	6"	14"	14"	6,900	4,711

COMMERCIAL BOILER



10 YEAR LIMITED WARRANTY

EFFECTIVE:

For 10 Years, Lochinvar warrants this product against defects in materials or workmanship and failure due to thermal shock as described in this document, if installed within the United States or Canada, and provided the product remains at its original place of installation.

Warranty coverage begins on the date of installation OR the date of manufacture if installation cannot be verified. *Note: The date of manufacture can be determined using the Serial Number, located on the silver rating label.*

WHAT IS COVERED:

Subject to these terms, in the event of a defect in materials or workmanship appearing during the first year, Lochinvar will repair, or at our discretion, replace any part of the product covered under this warranty.

After 1 year, Lochinvar will repair or, at our discretion, replace the defective heat exchanger, for a period of **9 more years**. **You are responsible for all labor, shipping, delivery, installation, and handling costs.**

Unless authorized in writing, all products must be returned to the factory for warranty determination, at the owner's expense.

Any replacement part or product will be warranted only for the unexpired portion of the original product's limited warranty period.

If an identical model is no longer available due to a change in law, regulation, or standard, Lochinvar will replace the product with one having at least the same capacity and of equal input. In these instances, you will have the option of paying the difference between what you paid for the original model and the new model with the additional features, or receiving a refund of the portion of the purchase price allocable, on a pro-rata basis, to the unexpired portion of the warranty period.

OWNER'S RESPONSIBILITIES:

Owners are responsible for selecting a qualified service provider. Visit www.Lochinvar.com for a list of service providers in your area.

- Follow all instructions enclosed with the product.
- Retain all bills of sale or receipts for proof of installation.
- Provide copies of all service and maintenance records.
- Contact your installer or dealer as soon as any problem or defect is noticed.

FOR SERVICE OR WARRANTY INQUIRIES:

Call your local installer or dealer. Be ready to provide the following information: your name, address and telephone number; the model and serial number of your Lochinvar product; proof of installation; and a clear description of the problem.

WHAT IS NOT COVERED, PROBLEMS CAUSED BY:

- Problems caused by improper: gas supply line sizing, gas type, venting, connections, combustion air, voltage, wiring, or fusing
- Improper installation, sizing, delivery, or maintenance
- Failure to follow printed instructions enclosed with the product
- Abuse, misuse, accident, fire, flood, Acts of God
- Improper venting and air intake materials, length, construction, or operations
- Claims related to rust, excessive noise, smell, or taste of water
- Failure to conduct authorized factory start up as required
- Failure to properly perform maintenance, as outlined in the instruction manuals provided by the manufacturer
- Damages due to a failure to allow for thermal expansion
- Alterations that change the intended or certified use of the product
- Failure to follow applicable codes
- Improper chemical addition
- Service trips to explain proper installation, use, or maintenance of the product/unit or to describe compliance requirements under applicable codes and regulations
- Charges related to accessing the product including but not limited to door/wall removal, equipment rental, etc.
- Replacement parts after expiration of this warranty
- Premium associated with after hours or overtime labor

LIMITATIONS:

NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, THIS IS YOUR SOLE AND EXCLUSIVE WARRANTY. ALL OTHER WARRANTIES, INCLUDING A WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES. TOTAL LIABILITY ARISING AT ANY TIME SHALL NOT EXCEED THE PURCHASE PRICE PAID WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER LEGAL THEORY.