Fulton TECHNICAL DATA SHEET

ENDURA XE (EXE) SERIES:
EXE-1000, EXE-1500, EXE-2000, EXE-2500, EXE-3000

1,000,000 to 3,000,000 BTU/HR:
Stainless Steel Firetube Condensing Boilers

Fulton's Endura XE (EXE) line of condensing boilers are a durable inline one-pass stainless steel firetube. The packaged boiler features an ultra-compact footprint that fits through a standard doorway, reliable quiet operation, and simplified service & maintenance. The highly-engineered robust construction is built to last with low heat exchanger stress, higher-strength materials, and a premium fit and finish reflecting Fulton's paramount quality. High-turndown Flame-by-Wire™ technology utilizes the surgical precision of independent air and gas motors and continuously tunes the air/fuel ratio for ideal excess O_2 levels to automatically adjust for seasonality. This maximizes condensing potential, and outperforms all conventional platforms in durability, reliability and repeatability.

STANDARD FEATURES:

- Factory Packaged and Test Fired Boiler Assembly
- Stainless Steel Firetube Heat Exchanger
- Fully Condensing Ultra-High Efficiency Operation
- Designed for Variable Primary Flow Arrangements
- Fully Modulating Burner; Up to 15:1 Turndown
- Low NOx Emissions <20 ppm; <12 ppm Capable
- Flame-by-Wire™ Electronic Combustion Control
- Real-Time O_2 Compensation™; Feed Forward
- Variable Speed Combustion Blower
- Direct Spark Ignition System
- 160 PSIG Maximum Allowable Working Pressure
- 210°F Maximum Allowable Working Temperature
- Maximum Setpoint Temperature of 185°F
- UL-353 Certified Operating and High Limit
- Low Water Cut Off Probe with Manual Reset
- Manifold Air Intake Switch
- Ventless Gas Train
- Low and High Gas Pressure Switches
- Emergency Stop (E-Stop) Contact

PURE CONTROL™ CAPABILITIES:

- Color Touchscreen Display
- Integrated Lead-Lag of 2 to 10 Boilers
- Universal Data over Ethernet/IP; No Master Boiler Req.
- BAS Integration; Modbus Communication Protocol
- Flue Gas Exhaust Temperature Monitoring
- Inlet and Outlet Water Temperature Sensors
- Combustion Air Temperature Sensor
- Outdoor Air Temperature Reset with Plant Cutoff
- Setback Modes via Internal Clock
- Accept 4-20mA Remote Setpoint Signal
- Safety Interlock Contact for External Device(s)
- General Alarm Contact
- Remote Boiler Enable/Disable Contact
- Pump or Motorized Isolation Valve Start/Stop Contact
- Variable Speed Boiler (Primary) Pump Control
- System (Secondary) Pump Start/Stop Contact
- Domestic Hot Water Pump Start/Stop Contact
- Domestic Hot Water Priority
- Two-Stage Freeze Protection

PROJECT DETAILS:

Project Name		City, State (Province)	
Date Submitted		Engineer of Record	
Fulton Representative		Contractor	

LISTINGS & COMPLIANCE:

- cETLus Listed and Labeled to UL-795
- ASME Section IV Pressure Vessel, "H" Stamp
- CSD-1 and CSA Compliant Controls and Fuel Train
- AXA XL Compliant; Supersedes IRI
- AHRI Certified to AHRI-1500
- Low NOx Emissions Compliant

TRIM KIT ITEMS:

- ASME Safety Relief Valve ☐ 60, ☐ 100, ☐ 125, or ☑ 160 PSIG
- Pressure & Temperature Gauge
- Installation, Operation and Maintenance Manual

OPTIONAL ACCESSORIES: PARTS SHIP LOOSE FOR FIELD INSTALLATION

- ☐ BACnet Protonode with Remote Cloud Access *2-45-001058*
- ☐ Lead/Lag IP Switch (16 Port, 120VAC) *2-45-315010*
- ☐ Lead/Lag IP Switch (5 Port, DIN Mount, 24VDC) *2-45-315044*
- ☐ Second (Auxiliary) Low Water Cut Off Kit *4-30-420330*
- ☐ Multiple Boiler Condensate Drain Trap (12MM Max) *4-57-000440*
- ☐ Individual Boiler Condensate Drain Trap (6MM Max) *4-57-005500*
- ☐ Flue Gas Condensate pH Neutralization (12MM Max) *4-50-000008*
- ☐ Supply Header Temperature Sensor *4-30-000405*
- ☐ Outdoor Air Temperature Sensor *4-30-000520*
- ☐ Return Header Temperature Sensor *4-30-000405*
- ☐ Domestic Hot Water Temperature Sensor *4-30-420500*
- ☐ 3-Inch Butterfly Valve with 120VAC 2-Position Actuator *2-30-001383*
- ☐ 4-Inch Butterfly Valve with 120VAC 2-Position Actuator *2-30-001385*
- ☐ Dedicated Boiler Circulator Pump 20°F ΔT *Consult Factory*
- ☐ Dedicated Boiler Circulator Pump 40°F ΔT *Consult Factory*
- ☐ Closed-Loop Wideband Oxygen Sensor Kit *Consult Factory*
- ☐ Combustion Air Filter Kit *Consult Factory*
- ☐ EXE-1000/1500 6" FasNSeal Vent Adapter *Consult Factory*
- ☐ EXE-2000/2500/3000 8" FasNSeal Vent Adapter *Consult Factory*
- ☐ Fused External Disconnect Switch (UL Only) *Consult Factory*
- ☐ _____
- ☐ _____

NOTE: Information provided in this document is based on standard boiler configurations only. Alternate configurations may result in deviations.

CAPACITIES: **STANDARD NATURAL GAS; REFER TO PERFORMANCE DATA FOR CAPACITY AT HIGH ELEVATION**

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Rated Input at High Fire	**BTU/hr**	**1,000,000**	**1,500,000**	**2,000,000**	**2,500,000**	**3,000,000**
	kW	*293*	*439*	*586*	*732*	*879*
Minimum Input at Low Fire	**BTU/hr**	**67,000**	**100,000**	**133,000**	**167,000**	**200,000**
	kW	*20*	*29*	*39*	*49*	*59*
Rated Output (at AHRI-1500)	**BTU/hr**	**978,000**	**1,464,000**	**1,950,000**	**2,432,500**	**2,916,000**
	Boiler HP	29	43	58	72	87
	kW	*287*	*429*	*571*	*713*	*855*
Thermal Efficiency (at AHRI-1500)	**%**	**97.8**	**97.6**	**97.5**	**97.3**	**97.2**
Burner Turndown	**-**	**15:1**	**15:1**	**15:1**	**15:1**	**15:1**

NOTES:

- Burner turndown is 6:1 when operating on propane.

CONNECTION SIZES:

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Boiler Supply Water Outlet (ANSI 150# FLG)	**inches**	**3**	**3**	**4**	**4**	**4**
	mm	*76*	*76*	*102*	*102*	*102*
Boiler Return Water Inlet (ANSI 150# FLG)	**inches**	**3**	**3**	**4**	**4**	**4**
	mm	*76*	*76*	*102*	*102*	*102*
Flue Gas Condensate Drain (NPT)	**inches**	**1**	**1**	**1**	**1**	**1**
	mm	*25*	*25*	*25*	*25*	*25*
Natural Gas Train Inlet (NPT)	**inches**	**1-1/2**	**1-1/2**	**1-1/2**	**1-1/2**	**1-1/2**
	mm	*38*	*38*	*38*	*38*	*38*
Combustion Air Inlet (ID)	**inches**	**8**	**8**	**8**	**8**	**10**
	mm	*203*	*203*	*203*	*203*	*254*
Minimum Flue Gas Exhaust Vent (ID) *(Adapter Required)*	**inches**	**6**	**6**	**8**	**8**	**8**
	mm	*152*	*152*	*203*	*203*	*203*
Boiler Exhaust Outlet (OD)	**inches**	**6**	**6**	**8**	**8**	**8**
	mm	*152*	*152*	*203*	*203*	*203*

FUEL REQUIREMENTS: STANDARD NATURAL GAS AT 1,020 BTU/SCF (9,082 KCAL/M³)

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Fuel Usage at Rated Input	**SCFH**	**980**	**1,471**	**1,961**	**2,451**	**2,941**
	m³/hr	*27.8*	*41.7*	*55.5*	*69.4*	*83.3*
Minimum Gas Pressure *(Req. at High Fire)*	**in W.C.**	**4**	**4**	**4**	**4**	**4**
	kPa	*1*	*1*	*1*	*1*	*1*
Maximum Gas Pressure	**in W.C.**	**14**	**14**	**14**	**14**	**14**
	kPa	*3.5*	*3.5*	*3.5*	*3.5*	*3.5*

FUEL REQUIREMENTS: STANDARD HD5 PROPANE AT 2,500 BTU/SCF (22,260 KCAL/M3)

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Fuel Usage at Rated Input	**SCFH**	**400**	**600**	**800**	**1,000**	**1,200**
	m³/hr	*11.3*	*17.0*	*22.7*	*28.3*	*34.0*
Minimum Gas Pressure *(Req. at High Fire)*	**in W.C.**	**8**	**8**	**8**	**8**	**8**
	kPa	*2*	*2*	*2*	*2*	*2*
Maximum Gas Pressure	**in W.C.**	**14**	**14**	**14**	**14**	**14**
	kPa	*3.5*	*3.5*	*3.5*	*3.5*	*3.5*

NOTES:
- Field conversion during commissioning is required by an authorized service technician.
- Propane-fired operation is suitable for use with HD5 (standard commercial) grade Liquid Petroleum Gases conforming to ASTM D1835-82.

ELECTRICAL REQUIREMENTS: APPLIES TO <20 PPM NOx STANDARD BLOWER AND CONTROL OPTIONS

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Electrical Supply	**Volts**	**120**	**120**	**120**	**240**	**240**
	ø	1	1	1	1	1
	Hz	*60*	*60*	*60*	*60*	*60*
Operating Amps at Low Fire (Typical)	**Amps**	**1.3**	**4.0**	**3.4**	**2.2**	**2.1**
Operating Amps at High Fire (Typical)	**Amps**	**7.5**	**20.4**	**20.2**	**12.8**	**20.3**
Full Load Amps (FLA)	**Amps**	**9**	**25**	**25**	**14**	**22**
Minimum Current Ampacity (MCA)	**Amps**	**15**	**30**	**30**	**20**	**30**
SCCR	**Amps**	**10,000**	**10,000**	**10,000**	**10,000**	**10,000**

NOTES:
- Operating Amps are typical and will vary based on site specific factors and operating parameters.
- Models EXE-2500 and EXE-3000 may be operated at 208/1, a derate may apply to adhere to FLA rating.
- When commissioned for <12 ppm NOx operation, operating amps and FLA will increase up to 25%. Consult your Fulton Representative for revised nameplates.
- SCCR compliance of 100,000 Amps when equipped with the field installed fused external disconnect switch option incorporating Class J fuses.
- Provide separate power supplies for external devices. Do not power external devices through the boiler control circuits.

WATER AND FLOW REQUIREMENTS: **SPECIFICATIONS APPLY TO 100% WATER SYSTEMS; SEE IOM FOR GLYCOL SYSTEMS**

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Typical Flow Rate at Rated Output 20°F ΔT	**GPM**	**96**	**145**	**193**	**240**	**286**
	LPM	*364*	*549*	*729*	*910*	*1,080*
Typical Flow Rate at Rated Output 40°F ΔT	**GPM**	**48**	**73**	**96**	**120**	**143**
	LPM	*182*	*274*	*364*	*455*	*540*
Water Pressure Drop at Rated Output 20°F ΔT	**PSI**	**1.2**	**2.8**	**2.3**	**1.7**	**2.5**
	kPa	*8.3*	*19.3*	*15.9*	*11.7*	*17.2*
Water Pressure Drop at Rated Output 40°F ΔT	**PSI**	**0.4**	**0.7**	**0.6**	**0.4**	**0.6**
	kPa	*2.8*	*4.8*	*4.1*	*2.8*	*4.1*
Low Fire Variable Water Flow Rate	**GPM**	**10 to 250**	**10 to 250**	**16 to 350**	**20 to 450**	**20 to 450**
	LPM	*38 to 946*	*38 to 946*	*61 to 1,325*	*76 to 1,703*	*76 to 1,703*
High Fire Variable Water Flow Rate	**GPM**	**40 to 250**	**60 to 250**	**80 to 350**	**100 to 450**	**120 to 450**
	LPM	*152 to 946*	*227 to 946*	*303 to 1,325*	*379 to 1,703*	*454 to 1,703*

NOTES:

- Flow rates specified are for water systems, minimum flow parameter will increase for glycol systems. Review Application Guide for details.
- The system will require proper design flow for the given conditions to heat the building and prevent nuisance high limit manual reset lockouts at the boiler.
- Refer to the Installation, Operation, and Maintenance Manual for the water pressure drop at flow rates not listed above.

WEIGHTS AND VOLUMES:

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Dry Weight	**lbs**	**1,094**	**1,118**	**1,425**	**1,614**	**1,614**
	kg	*496*	*507*	*646*	*732*	*732*
Operating Weight	**lbs**	**1,301**	**1,325**	**1,779**	**2,072**	**2,072**
	kg	*590*	*601*	*807*	*940*	*940*
Approximate Shipping Weight	**lbs**	**1,255**	**1,280**	**1,590**	**1,780**	**1,780**
	kg	*570*	*581*	*721*	*807*	*807*
Pressure Vessel Water Volume	**Gallons**	**24.8**	**24.8**	**42.4**	**54.9**	**54.9**
	Liters	*93.9*	*93.9*	*160.5*	*207.8*	*207.8*

VENTING REQUIREMENTS:

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Combustion Air Intake Flow Rate	**SCFM**	**203**	**305**	**407**	**540**	**650**
Flue Gas Exhaust Flow Rate	**SCFM**	**220**	**330**	**440**	**581**	**697**
	ACFM	*271*	*407*	*543*	*717*	*861*
Minimum Allowable Draft Pressure	**in W.C.**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**-0.2**
	kPa	*-0.02*	*-0.05*	*-0.05*	*-0.05*	*-0.05*
Maximum Allowable Draft Pressure	**in W.C.**	**+1.0**	**+1.0**	**+1.0**	**+1.0**	**+1.0**
	kPa	*+0.25*	*+0.25*	*+0.25*	*+0.25*	*+0.25*

NOTES:
- Maximum draft pressure is the total sum of the venting system and is inclusive of both the flue gas vent and combustion air intake frictional pressure losses.
- Refer to the Installation, Operation, and Maintenance Manual for complete venting guidelines including certifications, materials, common venting requirements.

EMISSIONS: STANDARD NATURAL GAS AT 1,020 BTU/SCF (9,082 KCAL/M^3)

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
NOx	**ppm**	**< 20**	**< 20**	**< 20**	**< 20**	**< 20**
CO_2	**%**	**8.8**	**8.6**	**8.7**	**8.6**	**8.6**
CO	**ppm**	**< 150**	**< 150**	**< 150**	**< 150**	**< 150**
	lbs/hr	0.1095	0.1642	0.2190	0.2737	0.3285
	g/hr	*49.67*	*74.48*	*99.34*	*124.1*	*149.0*
SOx	**lbs/hr**	**0.0006**	**0.0009**	**0.0012**	**0.0015**	**0.0018**
	g/hr	*0.2722*	*0.4082*	*0.5443*	*0.6804*	*0.8165*
Total Particulates (PM)	**lbs/hr**	**0.0075**	**0.0112**	**0.0149**	**0.0186**	**0.0224**
	g/hr	*3.402*	*5.080*	*6.759*	*8.437*	*10.16*
Total Organics (TOC)	**lbs/hr**	**0.0108**	**0.0162**	**0.0216**	**0.0270**	**0.0324**
	g/hr	*4.899*	*7.348*	*9.798*	*12.25*	*14.70*
Lead	**lbs/hr**	**0.5×10^{-6}**	**0.7×10^{-6}**	**1.0×10^{-6}**	**1.2×10^{-6}**	**1.5×10^{-6}**
	g/hr	*2.3×10^{-4}*	*3.2×10^{-4}*	*4.5×10^{-4}*	*5.4×10^{-4}*	*6.8×10^{-4}*
Volatile Organic Compounds (VOC)	**lbs/hr**	**0.0054**	**0.0081**	**0.0108**	**0.0135**	**0.0162**
	g/hr	*2.449*	*3.674*	*4.899*	*6.123*	*7.348*

NOTES:
- NOx and CO are stated at a 3% O_2 correction.
- <12 ppm NOx operation may require an input derate at high fire; determined at commissioning based on site conditions.
- When commissioned for <12 ppm NOx operation, operating amps and FLA will increase up to 25%. Consult your Fulton Representative for revised nameplates.
- Emissions data is typical for standard natural gas operation at maximum rated burner input.
- Emissions will vary based on site specific factors and operating parameters.
- CO_2 is stated at rated high fire capacity. Site specific conditions and emissions requirements will determine the appropriate CO_2 settings for each application.
- VOC, SOx, PM, TOC and Lead are achieved through calculation using the AP 42 method as published by the US EPA, and are stated at rated input.
- AP 42, Fifth Edition, Vol 1, Ch 1, Table 1.4-2 determines the emissions components that cannot be measured with a combustion analyzer.
- Jacket losses: 0.2% of output at maximum capacity, IAW ASHRAE Standard 103-2007.

MINIMUM CLEARANCES:

Endura XE Model		EXE-1000	EXE-1500	EXE-2000	EXE-2500	EXE-3000
Front	**inches**	**30**	**30**	**32**	**32**	**32**
	mm	*762*	*762*	*813*	*813*	*813*
Rear	**inches**	**24**	**24**	**24**	**24**	**24**
	mm	*610*	*610*	*610*	*610*	*610*
Top	**inches**	**12**	**12**	**12**	**12**	**12**
	mm	*305*	*305*	*305*	*305*	*305*
Sides	**inches**	**0**	**0**	**0**	**0**	**0**
	mm	*0*	*0*	*0*	*0*	*0*

NOTES:

- Local codes may supersede Fulton requirements, the more stringent of the two shall prevail.

DIMENSIONS:

Refer to the 7-91 type Product Data Submittal End Assembly Drawing for dimensions.