

XFyre™ NINETY PLUS

High Efficiency Boilers & Water Heaters

up to 99%
Efficiency!

Can be vented with PVC

300 • 500 • 850 MBTU Models



Ultra Low Emissions

Xtreme performance powered by



Xtreme Outdoor Performance

94% thermal efficiency!

Up to 99% part load!

XFyre® Condensing Modulating Boiler - The Green Choice

Raypak's new XFyre® is a natural extension of our successful XTherm® modulating vertical boiler line (1,1.5, 2 Million BTUH). Raypak offers new features not found in other mod-con style boilers and combines these desirable features into one complete boiler package. XFyre is the only condensing boiler (300 to 850MBTUH) with CSA outdoor certification. Utilizing cabinet and control technology already proven in over 250,000 Raypak pool heaters, the XFyre comes to market as a seasoned veteran of outdoor environments. Mechanical engineers, architects and building owners now have extreme installation flexibility, high efficiency, space saving footprint, zero side clearance, direct vent capability, PVC venting and full service access. Installers enjoy ease-of-commissioning, reliability, serviceability and long-term performance. Small space, no longer a problem. Raypak's vertical water connections allow the units to be installed side by side, further reducing the footprint on multi-boiler installations. Our compact design makes it possible to install 6.8 million BTUH in under 67 ft² of floor space, plus front and rear clearance. Tie them all together with the built in Cascade Control and you have a boiler system with a 40:1 turndown that operates at 94% thermal efficiency! This is an Xtreme green retrofit system.

XFyre Combustion System

Modulation is nothing new to Raypak. We have been honing our gas modulation experience for over 50 years. The Raypak XFyre will precisely track the heating load with its built-in Computer Control System and built-in outdoor reset function, eliminating costly overshooting. Utilizing the latest European technology for the combustion-components, the optimum fuel-air ratio is maintained throughout the entire range of the load-tracking operation. Our 5:1 turndown ensures efficiency is maintained throughout the firing rate and actually increases during part load, right when you want it! The XFyre automatically self-tunes to accommodate the widest range of gas supply pressures. The high quality integrated blower-gas valve is self-correcting and allows smooth operation with fluctuating gas supply pressures. The Raypak XFyre is cutting edge technology with atmospheric simplicity.

Vent Flexibility

Category IV -CSA-certified 94% efficiency at full fire for hydronic boilers and 94% for domestic hot water supply boilers (*Up to 99% at part load!*) When the job requires high efficiency, XFyre meets your needs. Combined vent length of up to 200 equivalent feet. Vent your project in PVC, CPVC or Stainless. XFyre is CSA certified for all three. The XFyre ships PVC ready with no extras to purchase!



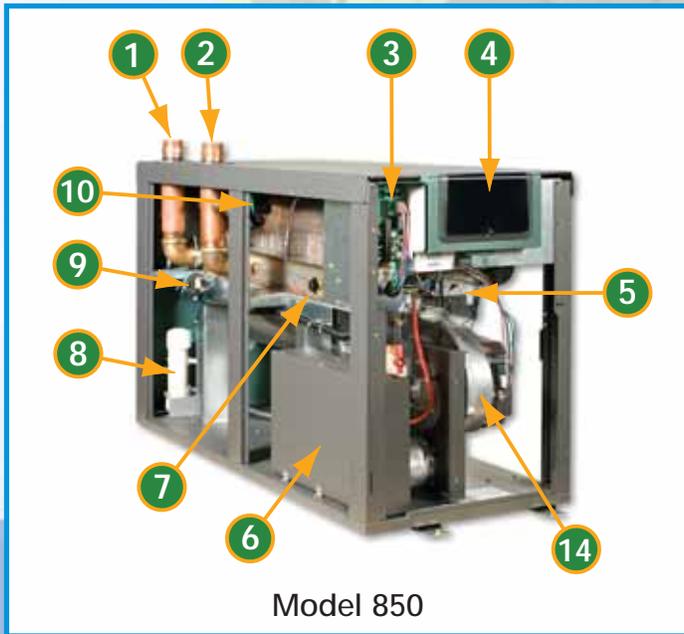
Key Features

- 3 models from 300,000 to 850,000 BTUH
- 94% thermal efficiency hydronic and 94% domestic hot water
- AB-1953 Low Lead Compliant
- All models CSA indoor/outdoor certified
- Small footprint, less than 9-1/2 square feet
- Top side water connections - allows side by side installation
- All models are equipped with 316L welded stainless steel heat exchanger and copper plumbing. ASME Section IV constructed and stamped. National Board registered.
- Multiple pump outputs - Boiler Pump, System Pump, Indirect Pump
- Dual flame sensing - Flame sensor and spark ignition rod
- Modulating gas valve and burner, up to 5:1 turndown
- Meets all current Low NOx regulations, including the new (<20ppm) SCAQMD revisions
- Whisper quiet operation
- On-board diagnostic center, real English, no codes.
- 0-10 VDC BMS Interface (setpoint or direct drive)
- Built-in cascade function for up to 8 boilers
- Built-in outdoor reset functionality
- Complete cabinet protects all controls and wiring
- Tough rust-resistant powder coat finish
- Easy to service - removable air filter
- PVC-CPVC-Stainless vent certified
- Suitable for altitudes up to 10,000 ft. (derate may apply)

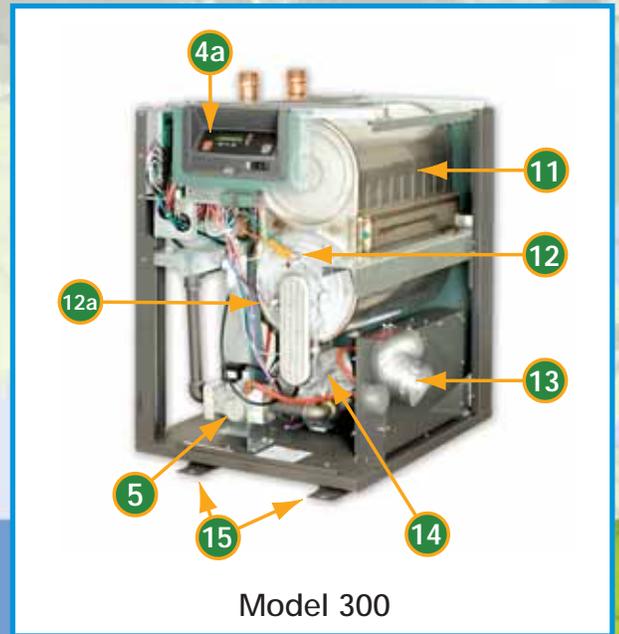
Options

- Outdoor air sensor (B-32)
- Indirect sensor
- TruSeal® direct vent kit (D-21 factory installed, D-22 Loose)
- PC interface cable
- Condensate neutralizer (Z-12)





Model 850



Model 300

1. Water Inlet

As low as 50°F entering. All copper and brass factory installed vertical plumbing connections. Vertical plumbing allows boilers to be installed side by side or in tight places if need be. Male NPT connections.

2. Water Outlet

All copper and brass factory installed vertical plumbing connections. Male NPT connections.

3. Low Voltage Wiring Board

Allows easy front access to thermostat connections, Outdoor sensor, DHW sensor, Alarm contacts and BMS input signal (0-10VDC). Built-in cascade control using CAT 3 or CAT 5 computer network cables to connect with the communication bus between boilers. Every unit comes factory equipped with Cascade control. Simply remove the front door for quick access and daisy chain the boilers together.

4. Control Cover

Helps prevent sun damage to the LCD display and protects the control panel from dust, dirt and water.

4a. Control Interface

Easy to use microprocessor control with a 2x20 LCD scrolling display. Monitor flame strength (μA), fan speed (RPM), BMS input signal (0-10V), sensor temps and setpoints. Built-in outdoor reset feature saves energy- requires optional outdoor air sensor. Control also provides indirect priority function. Full diagnostic control constantly monitoring 18 events. Fault code history records the last 10 fault events and can be recalled to help with troubleshooting. Well thought out ergonomic control pad gives tactile feedback to the user. No need to second guess your actions, wondering if you have engaged the buttons or not. The user is reassured with a tactile pop every time a button is successfully toggled. Everything you need from set-up to service is at your fingertips, and all in one location.

5. Air Fuel Ratio Gas Valve

XFyre uses a German, precision manufactured, main gas valve considered by most to be second to none. This high tech gas valve works in perfect unison with the combustion air blower. The result is smooth and quiet light-offs while delivering a 5:1 turn down.

850:170MBTU • 500:100MBTU • 300:60MBTU

With this much flexibility, XFyre is the right boiler for almost any size job.

6. Intake Air Filter

Every XFyre comes standard with a front access, removable media, combustion air filter.

7. Manual Reset High Limit

8. Condensate Trap

The XFyre has a built-in condensate trap located at the rear of the unit. The trap and the overflow condensate sensor are accessible through their own access panel.

9. Vent Switch

Senses possible obstructions in the flue vent pipe.

10. Flow Switch

The XFyre keeps its flow switch safe and dry inside the cabinet, which protects it during shipping and in the boiler room.

11. "Duo" Style Heat Exchanger

The XFyre uses a combined 316L stainless steel primary and secondary heat exchanger. Weld-sealed technology eliminates gaskets and o-rings. Special glycol is not required for hydronic applications. ASME Section IV constructed and stamped. National Board registered.

12. Direct Spark Ignition

XFyre's state-of-the-art combustion control system utilizes the finest dual electrode igniter to start the combustion cycle. After ignition, the spark rod also acts as a second flame sensor.

12a. Flame Sense Electrode

After a call for heat, a separate flame electrode monitors flame rectification. This helps to ensure proper carry over while also constantly monitoring the flame over 50 times every second.

13. Internal Tru-Seal® Connection

Allows the XFyre to be direct vented up to 200 combined equivalent feet (vent and air intake) in a horizontal or vertical vent system.

14. Smart Blower Technology

Utilizing a whisper quiet, all metal, technologically advanced combustion blower. Air and fuel are mixed precisely by the computer control center.

15. Mounting Feet

Built-in mounting feet located right under the center of gravity allows for quick and easy Tapcon® anchoring.

16. Weather-Proof Jacket

Heavy gauge galvanized steel with a UV-resistant Polytuf powder coat finish is impervious to weather and corrosion. Raypak has one of the finest, top-of-the-line powder coat systems on the west coast regardless of industry. We laugh at a 1000 hour salt spray test. Independent test documentation available upon request.

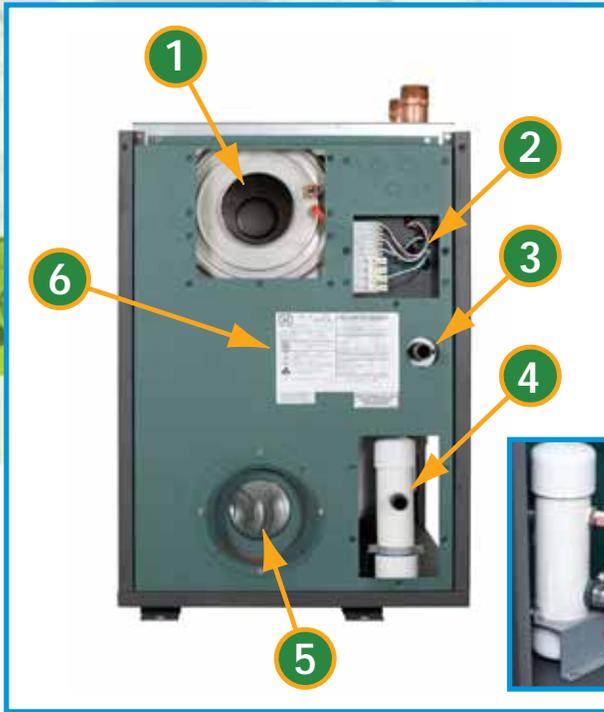
Think Green



Think Raypak

Xtreme Access

The XFire is purpose built for the contractor and service professional.



Completely serviceable from the front, top and both sides!

1. Flue Outlet

Category IV- PVC, CPVC and Stainless steel certified. The XFire ships PVC ready, no extras to purchase!

2. High Voltage Wiring Box

120VAC main incoming power connections. Boiler pump wiring and DHW pump wiring. Alarm power out.

3. Gas Inlet

The XFire will operate at 100% full rate with gas pressures as low as 4.0" w.c.

4. Condensate Drain and Trap

3/4" -NPT PVC connection for condensate removal. Inset photo shows condensate trap, overflow sensor and pressure switch for the flue. Raypak offers optional condensate neutralizer kits (option Z-12) that can be plumbed between the heater and the drain.

5. Direct Vent Capability

Every XFire is direct vent capable. By installing an optional combustion air pipe adapter, your XFire is ready for direct vent. For factory installation, order (option D-21) TruSeal® at time of order.

6. Rating Plate Location

7. Gas Valve and Boiler Control

Raypak uses German-made, high quality Dungs gas valves, considered the finest modulating gas valves produced today. To the right of the gas valve is the boiler computer control center, which always keeps the blower, gas valve, direct spark ignition and flame supervision in perfect harmony.

8. Inlet and Outlet Connections and Flow Switch

The vertical inlet and outlet connections are all copper and brass fitted with male pipe thread connections. The flow switch is fully contained within the cabinet, protecting it from the elements and boiler room mishaps. Servicing of the Flow switch can be done from the top or left side.

9. Removable Air Filter

Simple front access; just remove the front door. The filter just slides right out for quick and easy inspection and replacement. The high capacity filter is rated MERV 8.



Remove Front Door

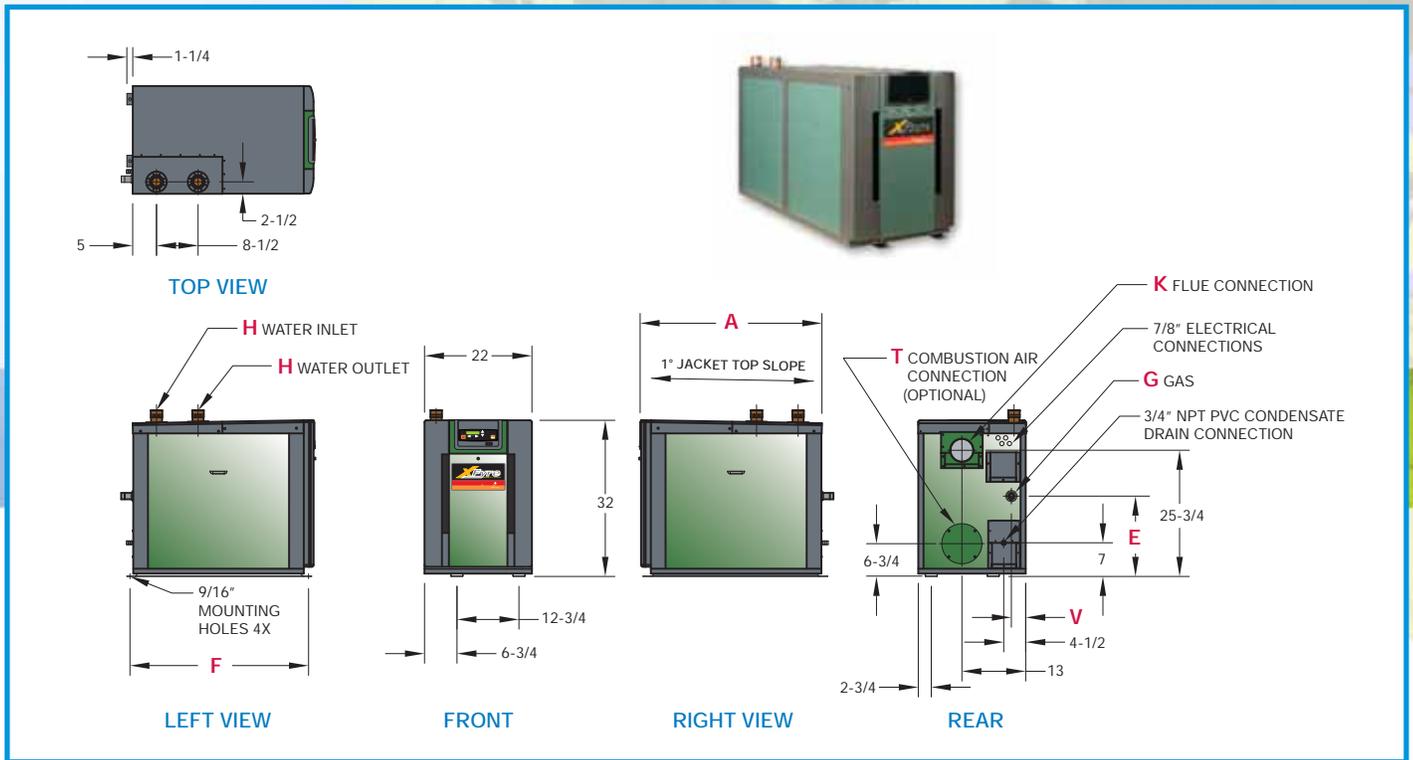
Loosen wing-nuts

Pullout filter media

FRONT ACCESS INTAKE AIR FILTER



Xtremely Small Footprint



PHYSICAL DATA	Model	Dimensions (in.)								Ship Weight (lbs.)	Foot-Print (ft ²)	Amps*
		A Length	E	F Mounting	G NPT	H NPT	K Flue Ø	T C/A Ø	V			
	300	28 - 1/4	16 - 1/2	27 - 9/16	3/4	1 - 1/2	4	4	3	410	6.6	3
	500	37 - 1/4	16 - 1/2	36 - 1/4	1	1 - 1/2	4	4	3	505	7.9	4
	850	54 - 1/4	28	53 - 9/16	1 - 1/4	2	6	6	19 - 3/8	580	9.5	5

Ratings shown are for elevations up to 10,000 feet. For installations at elevations above 2,000 feet, derate may apply, please consult the factory for additional instructions.

*Current Draw is for heater only. (Supply breaker must have delayed trip.)

MBTUH	Model	MBTUH Input	Boiler		MBTUH Input	Water Heaters		Minimum Input
			Output	Efficiency		Output	Efficiency	
	300	300	282	94%	300	282	94%	60
	500	500	470	94%	500	470	94%	100
	850	850	799	94%	850	799	94%	170



CLEARANCES	Heater Side	Certified Minimum	Service Minimum
		Front	24"
Rear	24"	24"	
Right	0"	0"	
Left	0"	0"	
Top	12"	24"	
Floor	0"	---	
Vent	1"	---	

*Do not install on carpeting
 Note: Local codes may require increased clearances

XFyre Model	Water Heater Pump Sizes					
	Soft		Medium		Hard	
	HP	Amps	HP	Amps	HP	Amps
300	1/8	1.3	1/4	5.7	Do not use when hardness exceeds 15 grains per gallon	
500	1/8	1.3	1/2	6.9		
850	1/2	6.9	1	14.0		

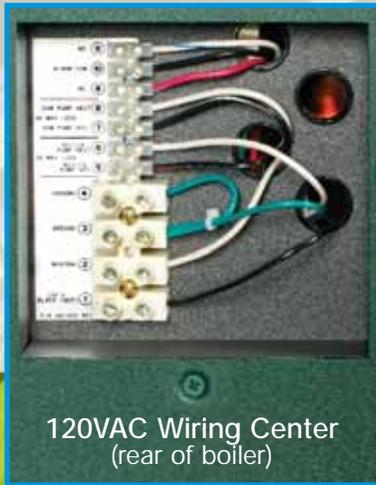
Note: Current draw (Amps) is for pump only

Water hardness grains per gallon
 Soft = 0-4 • Medium = 5-15 • Hard = 16-25

Water above 15gpg requires water softener.



Xtremely Easy to Wire



120VAC Wiring Center
(rear of boiler)

120VAC Wiring Center

The XFyre's 120VAC wiring center is located on the rear of the boiler. All incoming line voltage and pump wiring are contained away from the 24v control wiring. Wiring the boiler is simple and straight forward.

Low Voltage Wiring Center

Just like its big brother the XTherm, the XFyre has a separate front mounted wiring center for all of the low voltage connections. This makes thermostat, water sensor, 0-10VDC BMS, and alarm contacts a breeze to set up. No more guessing where the contact points are buried in the boiler. Built-in cascade control using CAT 3 or CAT 5 computer network patch cables to connect with the communication bus between boilers. Simply remove the front door for quick access.



Low Voltage
Wiring Center

Hydronic Boiler

TYPE H	XFyre Model	Rates Of Flow And Pressure Drops											
		20°F		30°F		40°F		Minimum Flow*			Maximum Flow		
		GPM	ΔP	GPM	ΔP	GPM	ΔP	GPM	ΔP	ΔT	GPM	ΔP	ΔT
300	28	17	19	8	14	5	14	5	40	36	27	17	
500	47	16	31	7	24	4	24	4	40	56	24	18	
850	80	40	53	17	40	10	40	10	40	80	40	20	

*Closed systems only

Hot Water Supply Boiler - DHW

TYPE W	XFyre Model	Water Hardness													
		Soft (0-4 Grains Per Gallon)					Medium (5-15 Grains Per Gallon)					Hard (16-25 Grains Per Gallon)			
		ΔT	GPM	ΔP	MTS	SHL	ΔT	GPM	ΔP	MTS	SHL	ΔT	GPM	ΔP	MTS
300	30	19	8	1.5	9	23	25	14	1.5	15	Do not use when hardness exceeds 15 grains per gallon				
500	30	31	7	2	9	20	47	16	2	20					
850	31	51	16	2	20	24	67	28	2	36					

MTS = Minimum Tube Size, inch.

SHL = System Head Loss, ft (based on heater and tank placed no more than 5 ft apart).

ΔT = Temperature rise, °F

ΔP = Pressure drop through heat exchanger, ft

TYPE W	XFyre Model	Recovery Rates								
		Temperature Rise (°F)								
		20	30	40	50	60	70	80	90	100
300	1693	1128	846	677	564	484	423	376	339	
500	2821	1881	1411	1128	940	806	705	627	564	
850	4796	3197	2398	1918	1599	1370	1199	1066	959	

Xtreme Control

Boiler Control and On-Board Diagnostic Center

Raypak's XFyre comes equipped with a microprocessor control center that displays its information on a 2x20 character LCD display in plain English. All set-up and programming is done at this interface. Control monitors boiler system status including safeties, ignition faults and also stores up to 10 reported faults. The diagnostic center even monitors and reports the flame strength signal in microamps. Monitor blower speed, BMS input and all water and air sensors. A normally-open and normally-closed dry contact alarm relay is provided.



Outdoor Proven

Raypak is no stranger to the outdoor environment. Our touchpad is 100% waterproof and has been proven and perfected on our pool products. No guesswork here, just one tough boiler ready to take on jobs that others have to walk away from.

Diagnostic Information

Safety Faults

- Condensate Full
- Outdoor Sensor
- Line Voltage
- Blocked Vent
- Low Water Level
- 24 Volt Low

- Low Water Flow
- Temper Blocking
- High Temperature
- Flue/Gas Pressure
- Supply Thermistor
- Return Thermistor
- Supply High

Ignition Control Faults

- No Flame
- Flame Failure
- Flame When Off
- Fan Speed Error

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IGNITION FAILURE F09  
LOCK OUT           3 45P
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Example Diagnostic Fault Report

Xtreme Firing Rates



Cascade up to 8 Boilers

Deliver up to 6.8 Million BTU at a 40:1 turndown rate!

The XFyre comes standard with a built-in Cascading Boiler Control. No other controls to buy, just daisy chain the units together with CAT 3 or CAT 5 computer network cables (*not supplied*) that plug into the front mounted communication bus on each unit (*see low voltage wiring box opposite page*). Designate a Cascade Master Boiler and set all the other boilers as Followers. It's that simple! The XFyre has built-in Lead-Lag control. This allows rotation of the starting boiler so all boilers in the system remain active and the run times remain equal on each unit. Rotation can even be programmed based on time, ensuring equal run times per unit.



Hot Water
Supply Boilers
(Type W)

Boilers
(Type H)

		Hot Water Supply Boilers (Type W)	Boilers (Type H)
HEAT EXCHANGER	ASME Section IV, National Board Registered, 160 PSI • H Stamp	●	●
	Heat Exchanger Tubes	●	●
	Stainless Steel	●	●
	Pressure Relief Valve (loose)	○ ● ○	● ○ ○
	Temperature & Pressure Gauge (Loose)	●	●
	Pump	○	○
JACKET	Indoor/Outdoor Certified	●	●
	Vent Terminal	○ ○	○ ○
	Fully-Enclosed Controls	●	●
	Combustible Floor Rated	●	●
OPERATING CONTROLS	120V Power Supply	●	●
	On/Off Switch	●	●
	Programmable Pump Time Delay, Single-Phase	●	●
	Terminal Block Connections (Front mounted)	● ●	● ●
	LCD diagnostic display with 10-Event History (2x20 character display, reads in plain English)	●	●
	Temperature Controller with 3 Water Sensors	● N/A	● ○
	Multiple Boiler Controller	○	○
SAFETIES	Direct Spark Ignition System	○ ●	○ ●
	High/Low Gas Pressure Switches	○	○
	Blocked Vent and Air Pressure Switches	●	●
	High Limit Switch	● ●	● ●
	Low Water Cut-Off, 24V	○	○
	Flow Switch	●	●
	GAS TRAIN	Modulating Combination Gas Valve	●
Combustion Air Blower		●	●
Additional Safety Valve		○ ○	○ ○
CSA-Certified Efficiency		● ●	● ●
OTHER	Air Filter	●	●
	TruSeal Direct-Vent	○	○
	Alarm Contacts	●	●
	CSD-1 / GE GAP Control System	○	○
	Low NOx	●	●
	Condensate Drain and Trap	●	●
	Condensate Neutralizer	○	○

● ● = Standard ○ ○ = Optional

