Xtreme Outdoor Performance

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 95% for domestic water heaters *(Up to 99% at part load!)* When the job requires high efficiency, XFyre meets your needs. Combined vent and combustion air duct 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!
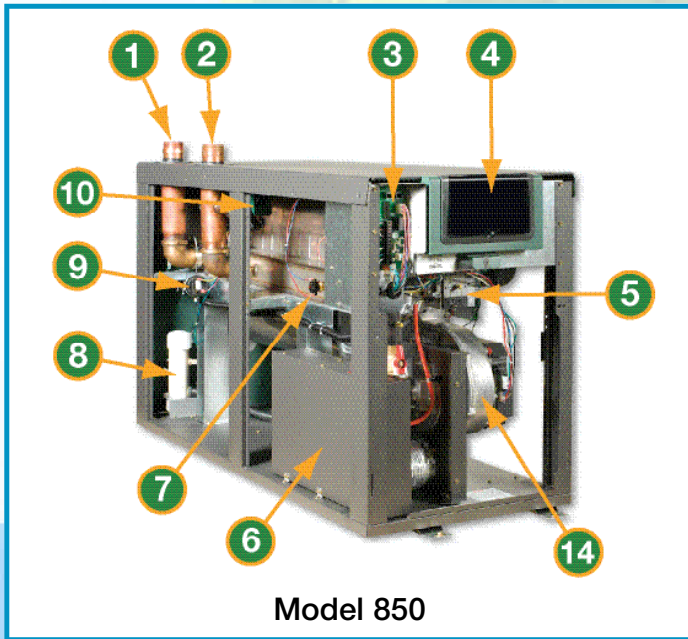

Key Features

- 5 models from 300,000 to 850,000 BTUH
- 94% thermal efficiency hydronic and 95% water heaters
- AB-1953 Low Lead Verified
- 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
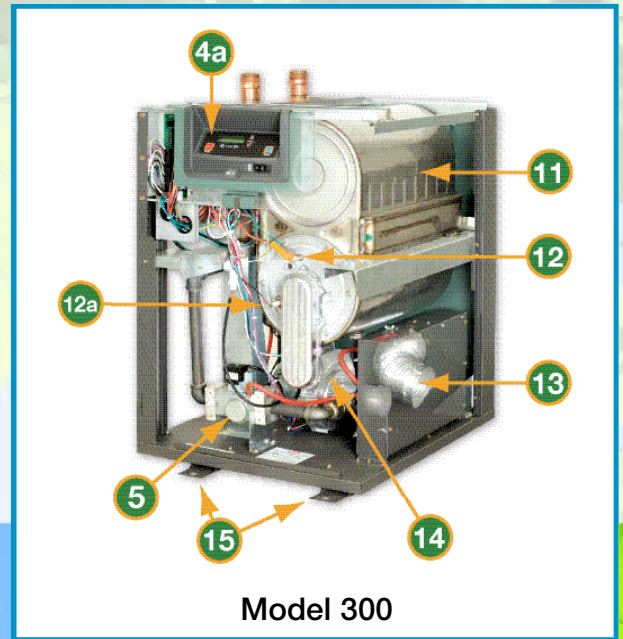- Suitable for altitudes up to 10,000 ft. (derate may apply)

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. 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 Merv 8 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 overfill 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 seperate 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.
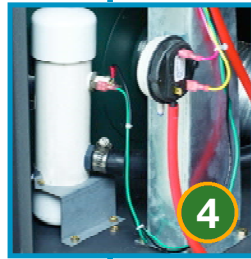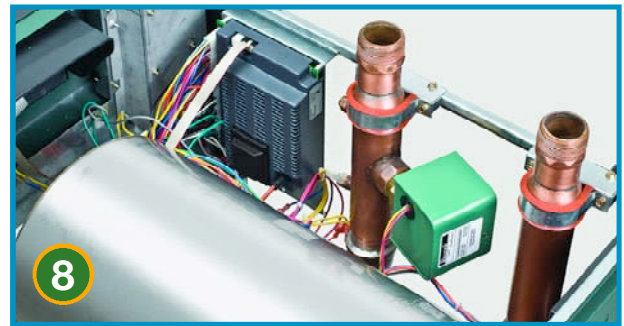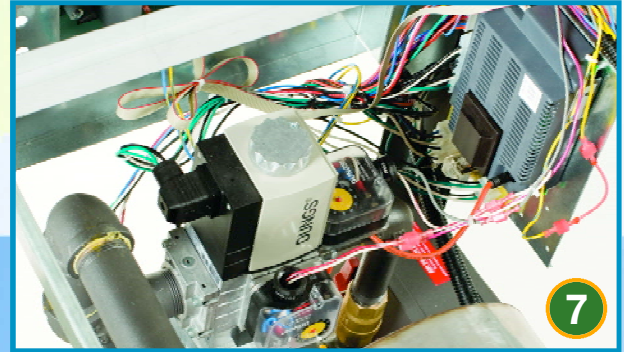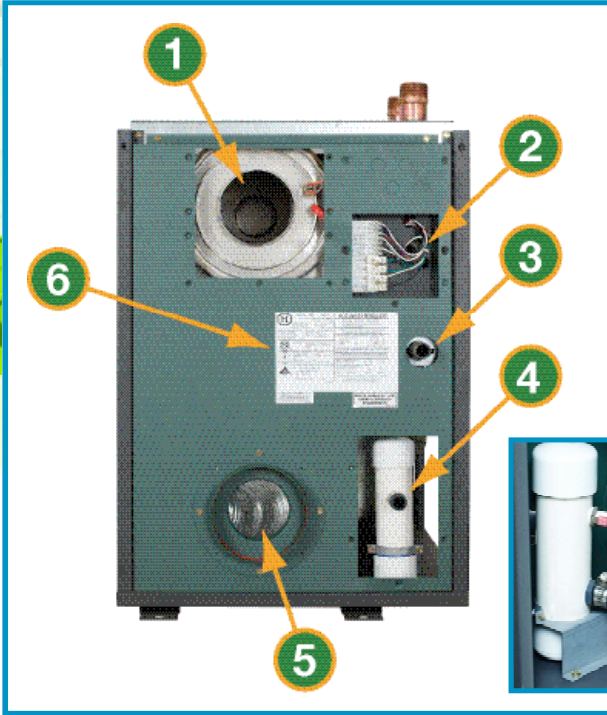
Think Green   **Think Raypak**

Xtreme Access

The XFyre 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 XFyre 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 XFyre 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, overfill 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 XFyre is direct vent capable. By installing an optional combustion air pipe adapter, your XFyre 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.
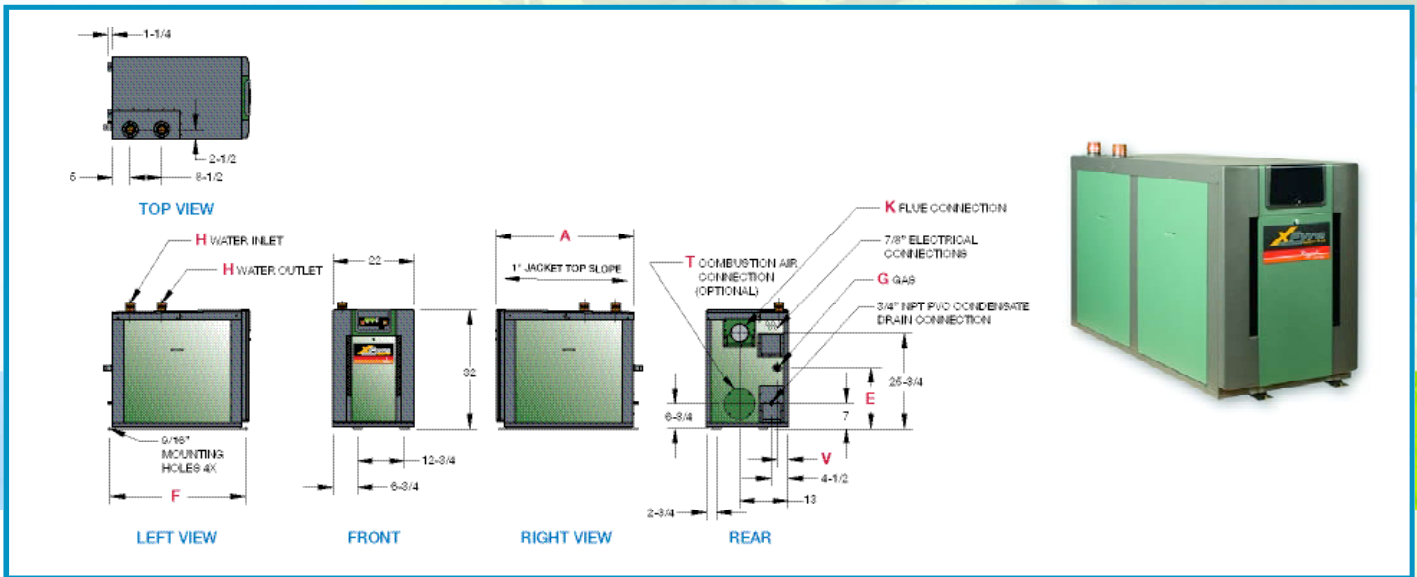

Remove Front Door   Loosen wing-nuts   Pullout filter media

FRONT ACCESS INTAKE AIR FILTER

4

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	4.3	3
400	30 - 3/4	16 - 1/2	29 - 3/4	1	2	4	4	3	465	4.7	4
500	37 - 1/4	16 - 1/2	36 - 1/4	1	2	4	4	3	505	5.7	4
700	47 - 3/4	28	47 - 1/16	1 - 1/4	2	6	6	19 - 3/8	550	7.3	5
850	54 - 1/4	28	53 - 9/16	1 - 1/4	2	6	6	19 - 3/8	580	8.3	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	285	95%	60
400	399	375	94%	399	379	95%	80
500	500	470	94%	500	475	95%	100
700	700	658	94%	700	665	95%	140
850	850	799	94%	850	808	95%	170

ISO 9001
Registered Quality Management System

CLEARANCES

Heater Side	Certified Minimum	Service Minimum
Front	24"	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		
400	1/8	1.3	1/2	6.9	Do not use when hardness exceeds 15 grains per gallon	
500	1/4	5.7	1/2	6.9		
700	1/2	6.9	1	14.0		
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.
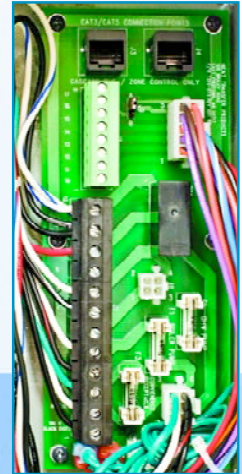
Xtremely Easy to Wire

120VAC Wiring Center

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.

120VAC Wiring Center
(rear of boiler)

Low Voltage
Wiring Center

Hydronic Boiler

	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
TYPE H	300	28	17	19	8	14	5	14	5	40	36	28	16
	400	38	18	25	7	19	4	19	4	40	47	29	16
	500	47	16	31	7	24	4	24	4	40	56	23	17
	700	66	30	44	13	33	7	33	7	40	70	34	19
	850	80	40	53	17	40	9	40	9	40	80	40	20

*Closed systems only

Water Heater

	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	SHL
TYPE WH	300	30	19	8	1.5	10	24	24	17	1.5	19					
	400	30	25	7	2	8	20	38	18	2	21	Do not use when hardness exceeds 15 grains per gallon				
	500	30	31	7	2	8	20	47	16	2	20					
	700	30	44	13	2	17	20	66	30	2	38					
	850	32	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

	XFyre Model	Recovery Rates								
		Temperature Rise (°F)								
		20	30	40	50	60	70	80	90	100
TYPE WH	300	1711	1140	855	684	570	489	428	380	342
	400	2275	1517	1138	910	758	650	569	506	455
	500	2851	1901	1426	1140	950	815	713	634	570
	700	3992	2661	1996	1597	1331	1140	998	887	798
	850	4847	3231	2423	1939	1616	1385	1212	1077	969

*X*treme 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

*X*treme 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.

		Water Heaters (Type WH)	Boilers (Type H)
HEAT EXCHANGER			
ASME Section IV, National Board Registered, 160 PSI	• H Stamp	●	●
Heat Exchanger Tubes	• 316L Stainless Steel	●	●
Stainless Steel	• CSA Verified AB-1953 CA low lead compliant	●	●
Pressure Relief Valve (loose)	• 60 PSI	○	●
	• 125 PSI	●	○
	• 30, 45, 75, 150 PSI	○	○
Temperature & Pressure Gauge (Loose)		●	●
Pump	• 120V, Single-Phase	○	○
JACKET			
Indoor/Outdoor Certified		●	●
Vent Terminal	• Outdoor	○	○
	• Through-the-Wall	○	○
Fully-Enclosed Controls		●	●
Combustible Floor Rated		●	●
OPERATING CONTROLS			
120V Power Supply		●	●
On/Off Switch		●	●
Programmable Pump Time Delay, Single-Phase	• Included in Controller	●	●
Terminal Block Connections (Front mounted)	• Enable / Disable	●	●
	• 0-10 VDC Setpoint/Direct Drive Input	●	●
LCD diagnostic display with 10-Event History (2x20 character display, reads in plain English)		●	●
Temperature Controller with 3 Water Sensors	• (up to 5:1 Turndown)	●	●
	• Outdoor Reset Sensor	N/A	○
Multiple Boiler Controller	• TempTracker Mod+ Hybrid, up to 16 boilers/groups	○	○
SAFETIES			
Direct Spark Ignition System	• 1-try	○	○
	• 4-try	●	●
High/Low Gas Pressure Switches		○	○
Blocked Vent Switch		●	●
High Limit Switch	• Manual Reset, Fixed	●	●
	• Automatic Reset, Fixed	○	○
Low Water Cut-Off, 24V	• With Manual Reset and Test Buttons	○	○
Flow Switch		●	●
GAS TRAIN			
Modulating Combination Gas Valve		●	●
Combustion Air Blower		●	●
Additional Safety Valve	• Motorized (externally mounted)	○	○
	• Solenoid (externally mounted)	○	○
OTHER			
CSA-Certified Efficiency	• 94% at Full Fire	N/A	●
	• 95% at Full Fire	●	N/A
	• 99% at Part Load	●	●
Air Filter		●	●
TruSeal Direct-Vent		○	○
Alarm Contacts		●	●
CSD-1 / GE GAP Control System		○	○
Low NOx	• Meets all current requirements	●	●
Condensate Drain and Trap		●	●
Condensate Neutralizer		○	○

● ● = Standard   ○ ○ = Optional