

# XTherm

ULTRA HIGH EFFICIENCY

## Commercial Pool Heaters

Models 1005A, 1505A, 2005A

**97% Thermal Efficiency**



Can be vented with PVC  
pipe - D32 Option  
or Centrotherm  
Polypropylene (D-33)

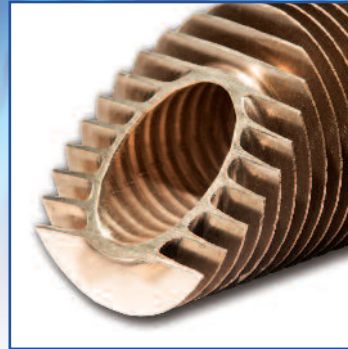
*Xtreme performance powered by*



Proudly made in the U.S.A

# Xtreme Performance

## 97% thermal efficiency!



We use commercial grade Cupro-Nickel finned tubing in the primary heat exchanger. Standard copper-based heat exchangers can not stand up to the harsh environment of commercial pool heating. Your customers expect the best and Raypak delivers with professional grade commercial pool heaters.

## Raypak' s Next Generation Condensing Heater

Time-honored technologies unite with cutting-edge advancements in Raypak's new XTherm® vertical heater. Never before has a vertical heater provided both the installer and pool builder such installation flexibility, ease-of-commissioning, reliability and long-term performance. Small space, not a problem. The XTherm has one of the smallest installed footprints of any vertical condensing heater. Our compact design makes it the perfect choice for those hard to reach retrofit projects. Raypak's XTherm is built with commercial-grade components and materials. From our steel channel base to our stainless steel flue wrapper, and condensing heat exchanger, you can tell the XTherm is built to last. It's easy to handle and install, but still user friendly to service. Now is the perfect time to take a closer look at Raypak.

## Flexibility

Industry-leading vent length allowances afford greater vent location options, thus reducing wasted space. Vent versatility is further enhanced by the self-tuning combustion system which compensates for unusual chimney and vent configurations.



Optional PVC Vent

**Category IV** - CSA-certified 97% efficiency at full fire for water heaters in pool applications. When the job requires high efficiency, XTherm meets your needs. The XTherm can use either AL29-4C stainless steel, PVC, CPVC or Polypropylene for venting. Just specify the D-32 vent option when using PVC vent or D33 vent option for polypropylene vent.

At the heart of every Raypak XTherm is a unique integral evaporator system - the first defense against condensation in the primary heat exchanger. Raypak's evaporator system collects and re-evaporates condensate which may form during initial start-up.

## Simplicity

The Raypak XTherm will precisely heat your pool. Utilizing the latest technology for the combustion-components, the optimum fuel-air ratio is maintained throughout the entire range of the load-tracking operation. The XTherm 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 XTherm is cutting edge technology with atmospheric simplicity.

## Key Features

- PVC vent capable - optional at time of order
- 3 models from 1,000,000 to 2,000,000 BTUH
- 97% thermal efficiency at full fire in pool applications
- Minimum continuous inlet water temperature (50°F)
- Small footprint, less than 11 square feet
- AB 1953 low lead certified
- On-board diagnostic center, real English, no codes
- All models indoor/outdoor construction
- Complete cabinet protects all controls and wiring
- Low NOx - Less than 20ppm
- Suitable for altitudes up to 10,000 ft. (derate above 5,000 ft.)
- Equipped with all cupro-nickel, copper, bronze and stainless steel waterways

Think Green



Think Raypak



### 1. Low Voltage Wiring Terminal

Up front and easy to get to. Makes sensor wiring and BMS wiring simple and clean.

### 2. Versa IC

The Versa IC, Integrated Control system is CSA listed and certified as a combined temperature, safety, and ignition control device. Easy front access to all field wiring. This includes outdoor sensor, DHW sensor, system alarm, Modbus BMS port and 0-10V DC input connections. Each unit comes factory-equipped with cascade control capability. Simple, quick access daisy chain of up to 4 heaters.

### 3. Control Interface

Large easy to read (3.5") LCD display. Will continuously monitor flame strength ( $\mu$ a), sensor temps, BMS signal (0-10V) set points, delta-T, all safety signals, full diagnostics and fault history for last 15 events. Simple touch pad settings. Everything you need from set-up to service is at your fingertips, all in one location.

### 4. Combustion Air Fan

Cast aluminum, non-sparking construction. The state of the art variable-speed fan works in smooth harmony with the main gas valve.

### 5. Dungs Gas Valve

The XTherm uses a state-of-the-art main gas valve manufactured in Germany. This precision gas valve works in perfect unison with the combustion air fan. The result is silky smooth light-offs.

### 6. Flow Switch

Monitors water flow and provides safe shut down if water flow drops below the minimum required.

### 7. Vent Pressure Switch

Monitors vent pressure and provides safe shut down if back pressure is excessive.

### 8. Gas Inlet

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

### 9. Water Outlet



### 10. Heater Pump

Sometimes referred to as the primary pump. This fixed speed pump keeps flow constant through the primary heat exchanger.

### 11. Water Inlet

The XTherm can accept 50°F continuous inlet water temperature.

### 12. Cold Water Run Pump

The XTherm comes factory equipped with a built-in Cold Water Run system. This advanced water control system keeps the inlet water temperature to the primary heat exchanger above 120°F, regardless of the incoming water temperature. It constantly self adjusts and regulates the incoming water flow while still maintaining a constant  $\Delta T$  in the heat exchanger.

### 13. Flue Outlet

The stainless steel flue outlet is compatible with CAT IV stainless steel. PVC or CPVC vent material may be used in conjunction with the D-32 vent option on the XTherm. Also available with option D-33 Polypropylene vent material. Dramatically cut your installation costs by using these non-metallic vent materials.

### 14. Stainless Steel Condensing Heat Exchanger

Recovers waste heat to boost efficiency up to 97%. The XTherm utilizes a separate high-grade stainless steel condensing heat exchanger. This allows the corrosive combustion condensate to be collected safely without damaging the heater. There is a condensate disposal connection on the rear of the heater. The XTherm is also equipped with a condensate switch that will sense a blocked condensate drain, which protects the heater.



### 15. Vertical Primary Heat Exchanger

Cylindrical, multi-pass heat exchanger captures all radiant energy, eliminating the need for heavy refractory.

### 16. Drain Valve

One of two drain valves located at the bottom of the heat exchanger. A third drain valve is located on the condensing heat exchanger. This allows for complete winterizing and drainage of the heater.

### 17. Viewing Port

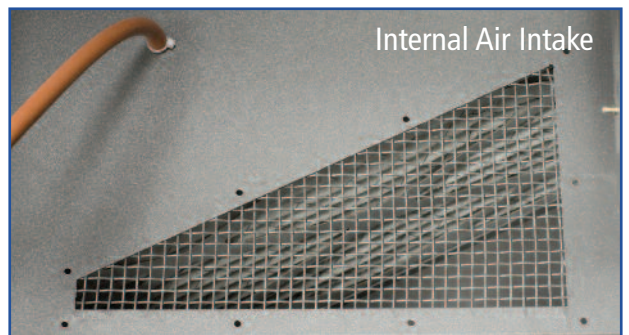
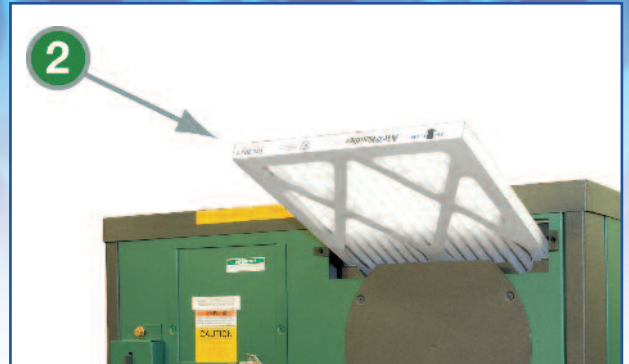
Allows for easy burner inspection.

### 18. Weather-Proof Jacket

Heavy gauge galvanized steel with a UV-resistant Polytuf powder coat is impervious to weather and corrosion. The Polytuf coating passes the 1000 hour salt spray test (ASTM B117).

# Xtreme Versatility

Can be installed indoor or outdoors!



**1. High Voltage Wiring Box**  
120VAC connections.

**2. Removable Air Filter**  
Provides easy access and is easily removable for inspection and replacement. 12"x20" high capacity filter is rated MERV 8 (95% - 98% arrestance.)

**3. Direct Vent Capability**  
Every XTherm is direct vent capable. By installing the optional vent pipe adapter (D-18) and air plenum plug, your XTherm is ready for direct vent. This makes it ideal for storage of pool chemicals in the same room as the XTherm. Damaging chemicals are not in contact with the heat exchanger or combustion chamber.

**3a. Outdoor Cover**  
If your job requires outdoor installation, an optional air

vent plug easily screws on to cover the direct vent air intake. The combustion air will then be drawn from inside the heater through screened plenum openings. See photo above right.

**4. Gas Inlet**  
The XTherm will operate at 100% full rate with gas pressures as low as 4.0" w.c.

**5. Water Outlet**

**6. Water Inlet**  
The XTherm can accept as low as 50°F continuous inlet water temperature without damage to the primary heat exchanger.

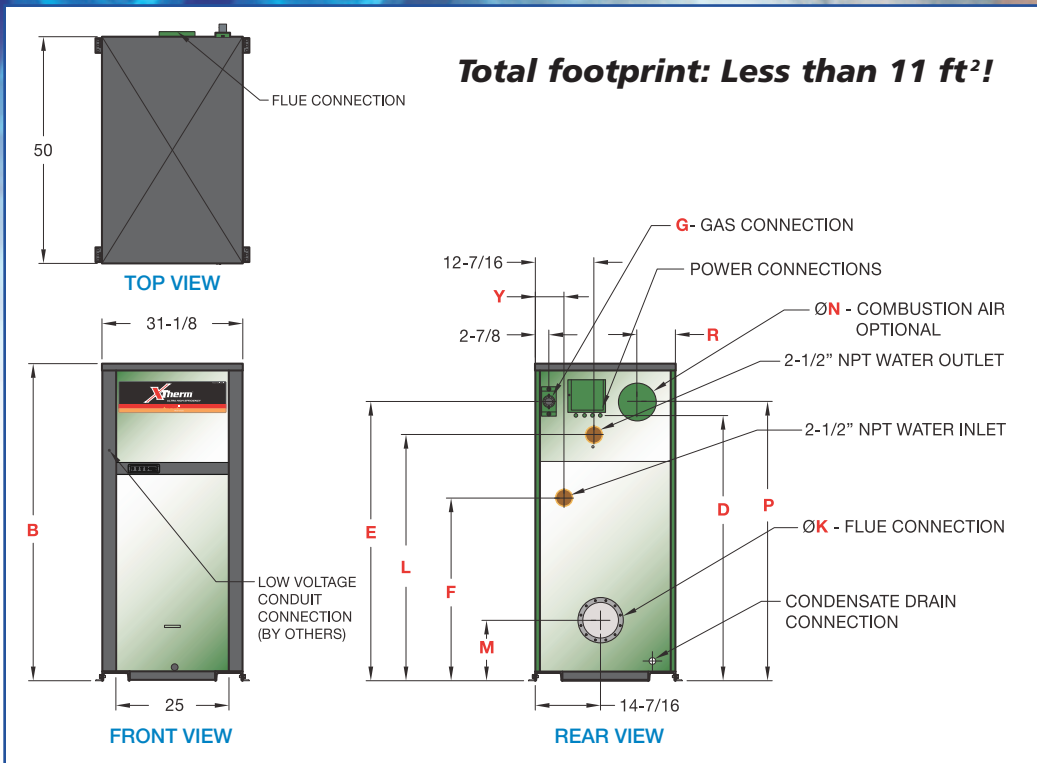
**7. Access Panel to Cold Run Pump**  
Easily removable access panel even when unit is

plumbed in place. Provides full access to inspect and service the Cold Run Pump system and condensate drain switch.

**8. Flue Outlet**  
The stainless steel flue outlet is compatible with CAT IV stainless steel. For a dramatic cost reduction over Category IV stainless steel, PVC or CPVC vent material may be used in conjunction with the D-32 vent option. Also available with optional D-33 Polypropylene vent material.

**9. Condensate Drain**  
3/4" NPT PVC connection for condensate removal. Raypak offers optional condensate neutralizer kits (Z-12) that can be plumbed between the heater and the drain.

# Xtremely Small Footprint



PHYSICAL DATA	Model	Dimensions (inches)										P-Models				
		B Ht.	D	E	F	G* NPT	K Flue Ø	L	M	N C/A Ø	P	R	Y	Weight (lbs.)	Heater Amps	Pump Amps <sup>†</sup>
	1005A	55-1/8	45	47-1/8	36-1/2	1-1/4	6	40-1/16	11-1/2	6	47-1/8	8-1/16	6-1/16	1065	12	10
	1505A	67-1/8	57	59-1/16	38-1/2	1-1/4	8	52-1/16	12-5/8	8	59-1/8	8-3/16	6-1/16	1234	12	14
	2005A	81-1/8	71	71-3/16	38-1/2	2	8	64-1/16	12-5/8	8	73-1/8	8-3/16	6-1/4	1461	18	17

\*For propane gas, all models are 1-1/4" NPT.

† Amp load does not include primary heater pump; a separate 120 VAC electrical connection must be supplied for the primary pump.

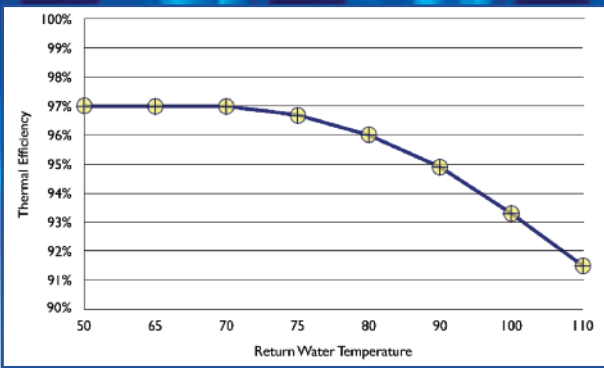
MBTUH	Model	MBTUH Input	Pool Heater	
			Output	Efficiency
	1005A	999	969	97%
	1505A	1500	1455	97%
	2005A	1999	1939	97%

CLEARANCES	Heater Side		From Combustible Surfaces (min.)	For Service (Minimum)
	Indoor	Outdoor	Unobstructed	Unobstructed
Floor*			0	N/A
Rear			12	36
Right Side			1	24
Left Side			1	1
Front			24	24
Top	Indoor	Outdoor	0	10
Vent Stack	Indoor		1	N/A
Vent Cap	Outdoor		12	12

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

**Salt Water Chlorination**  
 The XTherm can be used with pools that are sanitized via Salt Water Chlorination; up to 3000 PPM.  
 As with all Raypak heaters, please feel free to contact your local Raypak representative or our Applications Department for assistance with planning your next installation.

# Xtreme Pumping



25 meters X 25 meters X 1-1/2 meters deep				
BTUH	Annual Fuel Usage			
	Efficiencies			
	68%	78%	82%	97%
2,000,000	\$26,243	\$22,039	\$20,712	\$16,898

Using one 2,000,000 BTUH Heaters

50 meters X 25 meters X 2 meters deep				
BTUH	Annual Fuel Usage			
	Efficiencies			
	68%	78%	82%	97%
4,000,000	\$80,653	\$66,424	\$62,047	\$49,756

Using two 2,000,000 BTUH Heaters

The annual fuel usage is based on maintaining an indoor swimming pool at 80°F for 6 months of the year and using a fuel cost of \$1.00 per therm.

### How to use the table below:

1. Select the desired temperature of the pool water.
2. Determine the mean (average) temperature of the month in which the pool will be used.
3. Subtract the mean temperature from the desired swimming temperature. The difference is the temperature rise.
4. Calculate the surface area of the pool in square feet.
5. Under the column headed by the temperature rise, determined in Step 3, find the number closest to, but not less than, the pool surface area from Step 4. The left-hand column will give you the correct model heater.

### Sizing Formula

BTUH INPUT REQUIRED = (Pool Surface Area square feet) X (Temperature Rise) X (15)  
 This formula is based upon a 1° to 1-1/4° F temperature rise per hour and an average 3-1/2 MPH wind velocity.

Where high-wind conditions exist, select one size larger than determined by the formula.

### Rapid Heating

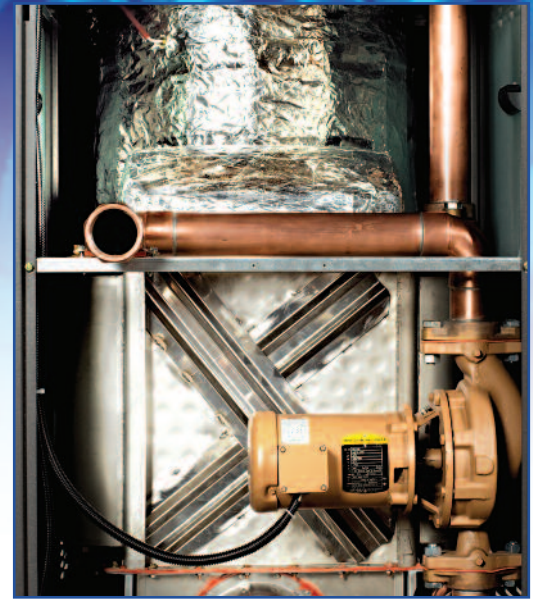
For 1-1/2°F rise per hour: Increase BTUH input by 50%.

For 2°F rise per hour: Increase BTUH input by 100%.

Always select a heater equal to or larger than the requirement. Over-sizing generally reduces fuel costs.

Model	Input	Output	Desired Temperature Rise (Degrees F)				
			20°	25°	30°	35°	40°
1005A	999,000	969,030	4,153	3,322	2,769	2,373	2,076
1505A	1,500,000	1,455,000	6,236	4,989	4,157	3,563	3,118
2005A	1,999,000	1,939,030	8,310	6,648	5,540	4,749	4,155

Number in box indicates surface area of pool (sq. ft.)

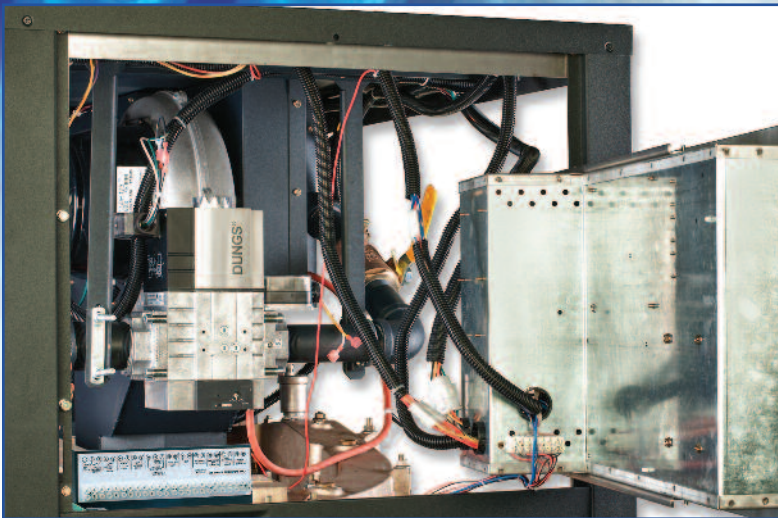


## Cold Water Run System

The XTherm comes standard with a state-of-the-art Cold Water Run system factory mounted and plumbed. Raypak's Cold Water Run system provides constant protection against condensation in the primary heat exchanger. The system utilizes a variable speed pump to inject just the right amount of water from the main system loop into the heater to maintain the optimum inlet temperature. This allows the full capacity of the heater to be utilized to meet the system load, while at the same time continuously maintaining the optimum inlet water temperature to prevent condensation in the primary heat exchanger. All of this keeps the condensate where it belongs, in the stainless steel condensing heat exchanger.



# Xtreme Control

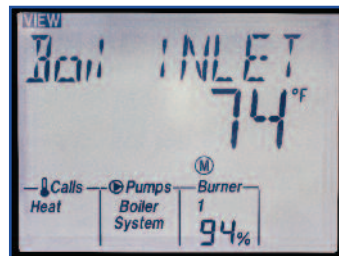
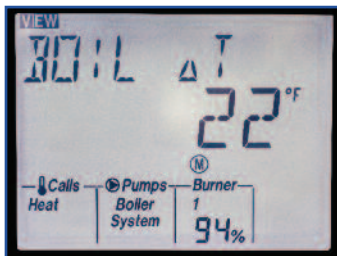


## Cascade up to 4 Heaters

The XTherm comes standard with a built-in Cascading Heater Control. No other controls to buy, just daisy chain the units together with 2-wire shielded cable (not supplied) that connect to the front mounted low voltage wiring board. Designate a Cascade Master Heater and set all the other heaters as Followers. It's that simple! The XTherm has built-in equal run-time rotation. This allows rotation of the starting heater so all heaters in the system remain active and the run times remain equal on each unit.

## Raypak Leadership in Heater Management

The new modulating or stage fire VERSA IC™ fully integrates temperature control, ignition, safety, temperature safety and individual fault monitoring as well as the internal cold water protection for the non-condensing exchanger for complete heater control. A Modbus communications port is standard for continuous monitoring, trending, and trouble shooting.



## Diagnostic Information

### Control Faults

- Low 24VAC
- Control Setup
- ID Card Fail
- Device Lost
- Device Error
- PIM Error

### Ignition Control Faults

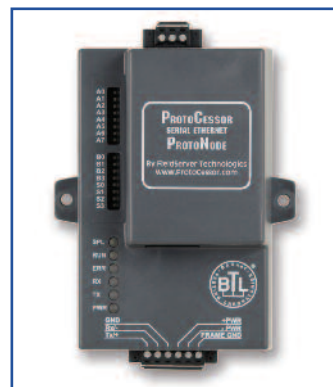
- Ignition Lockout
- False Flame
- Ignition Failure
- Low HSI Current
- Blower Speed

### Safety Faults

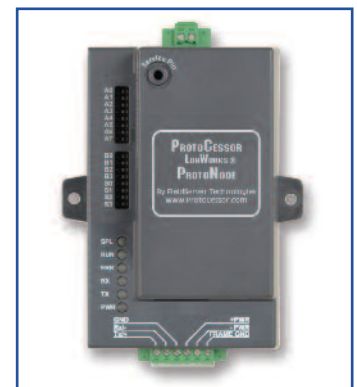
- Sensor Failure - 6
- Condensate Full
- Vent Temp (PVC and Poly)
- Vent Block
- Manual Limit
- Auto Limit
- Water Flow
- Delta-T Fault
- Low Water
- Low Gas
- High Gas
- Extra 1
- Options

## Optional Gateways

- Cascade up to 4 heaters
- Modbus RTU comm port standard
- All faults and interlocks monitored and reported in plain English
- Building Management System integration via optional gateways:
  - BACnet MS/TP, BACnet IP, N2 Metasys or Modbus TCP
  - LONworks



**BACnet®, Metasys®  
Modbus®**  
gateway module (optional)



**LONworks®**  
gateway module  
(optional)

<b>HEAT EXCHANGER</b>	ASME, National Board Registered, 160 PSI	• HLW Stamp	●
	Heat Exchanger Tubes	• Cupro Nickel	●
	Bronze Headers		●
	Stainless Steel Condensing Heat Exchanger	• U Stamp	●
	Pressure Relief Valve (Mounted on Outlet)	• 125 PSI	●
	Temperature & Pressure Gauge		●
	Pump - Primary	• 120V, Single-Phase	●

<b>JACKET</b>	Indoor/Outdoor Construction		●
	Vent Terminal	• Outdoor • Through-the-Wall	○ ○
	Fully-Enclosed Controls		●
	Combustible Floor Rated		●

<b>OPERATING CONTROLS</b>	120V Power Supply with 120V/24V Transformer		●
	On/Off Switch		●
	Programmable Pump Time Delay, Single-Phase	• Included in Versa IC	●
	Terminal Block Connections (Front mounted)	• Enable / Disable • External Interlocks • 0-10 VDC Setpoint/Direct Drive Input	● ● ●
	LCD diagnostic display with 15-Event History (3.5" LCD reads in plain English)		●
	Status Display Lights (4)		●
	Temperature Controller with 3 Water Sensors	• Versa IC	●
	Multiple Heater Controller	• Cascade up to 4 heaters	●

<b>SAFETIES</b>	Hot Surface Ignition System	• 1-try • 3-try	○ ●
	High/Low Gas Pressure Switches		○
	Blocked Vent and Air Pressure Switches		●
	High Limit Switch	• Manual Reset, Fixed • Manual Reset, Adjustable • Automatic Reset, Adjustable (Shipped Loose)	● ○ ●
	Low Water Cut-Off, 24V	• With Manual Reset and Test Buttons	○
	Flow Switch		●

<b>GAS TRAIN</b>	Combination Gas Valve		●
	Combustion Air Blower		●
	Additional Safety Valve	• Motorized (externally mounted) • Solenoid (externally mounted)	○ ○

<b>OTHER</b>	CSA-Certified Efficiency	• 97% at Full Fire	●
	Air Filter		●
	TruSeal Direct-Vent Ready		●
	Vent Adapter - PVC Option D-32 (Factory installed only) or Polypro Option D-33 (Field installed)		○
	Alarm System		○
	CSD-1 / GE GAP Control System		○
	Low NOx	• Less than 20ppm	●
	Cold Water Run - Variable Speed Pump	• Prevents condensation in primary heat exchanger	●

● = Standard    ○ = Optional

