High Efficiency Boilers & Water Heaters

XTherm®
ULTRA HIGH EFFICIENCY

New VERSA IC® Control Platform

Models
1005A, 1505A, 2005A

Up to **99%** thermal efficiency!

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

Xtreme performance powered by

Raypak®
A Rheem® Company

Proudly made in the U.S.A
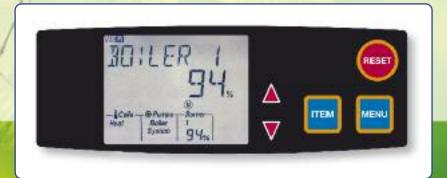
Xtreme Performance

Up to **99%** thermal efficiency!

Raypak's Next Generation Condensing Modulating Heater

Time-honored technologies unite with cutting-edge advancements in Raypak's new XTherm® modulating vertical heater. Never before has a vertical heater provided both the installer and building owner 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 structural 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.

Category IV -CSA-certified 96% efficiency at full fire for hydronic boilers and 97% for domestic hot water heaters *(Up to 99% at part load!)* When the job requires high efficiency, XTherm meets your needs.

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

True Modulation

Modulation is nothing new to Raypak we have honed our gas modulation experience for over 60 years. The Raypak XTherm will precisely track the heating load with it's built-in VERSA IC® Integrated Control platform, eliminating costly overshooting. Utilizing the latest technology for the combustion components, the optimum fuel-air ratio is maintained throughout the entire range of the load-tracking opera-

tion. With up to 7:1 turndown, maximum efficiency is maintained throughout the firing rate and actually increases during part load, right when you want it! 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
- 3 models from 1,000,000 to 2,000,000 BTUH
- 96% thermal efficiency hydronic and 97% domestic hot water
- CSA Certified Low Lead Compliant
- All models CSA indoor/outdoor construction
- Small footprint, less than 11 square feet
- Minimum continuous inlet water temperature (50°F)
- Water heater models are equipped with all copper and bronze waterways.
- Pump outputs - System and indirect
- Modulating gas valve and burner, 7:1turndown
- Meets all current Low NOx regulations, less than 20ppm
- 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 4 boilers
- Complete cabinet protects all controls and wiring
- Tough rust-resistant powder coat finish
- Easy to service - air filter
- Suitable for altitudes up to 10,000 ft.
- Modbus BMS port

Vent with:
- PVC* (D-32 Option) factory mounted only
        *PVC requires Max 170°F return water
- Polypropylene (D-33 Option) field install
- Stainless steel Catergory IV vent, standard

Options
- Outdoor air sensor (B-32)
- Indirect sensor
- Condensate neutralizer (Z-12)

1. Low Voltage Wiring Terminal
Up front and easy to get to. Makes sensor wiring and BMS wiring simple and clean.

2. VERSA IC® Board
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 boilers, link to Raypak Temp Tracker Mod+ Hybrid Master control for up to 16.

3. Control Interface
Large easy to read (3.5") LCD display. Will continuously monitor flame strength (µa) 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 Blower
Cast-aluminum, non-sparking construction. The state-of-the-art variable-speed blower is controlled by the VERSA IC® integrated controller and 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 blower. The result is silky smooth light-offs and a 7:1 turn down.

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
With PRV and T & P gauge installed.

10. Boiler Pump
Sometimes referred to as the primary pump. This pump keeps flow through the heat exchanger

11. Water Inlet
The XTherm can accept 50°F continuous inlet water temperature and as low as 32°F during system start-up.

12. Cold Water Run Pumps
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 non-condensing 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. 316L Stainless Steel Condensing Heat Exchanger
Recovers waste heat to boost efficiency into 96%+ range. The XTherm utilizes a high-grade stainless steel 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 Non-Condensing 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 non-condensing 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
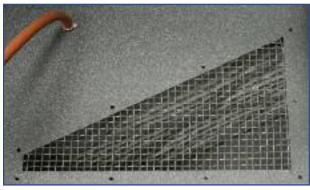Heavy gauge galvanized steel with a UV-resistant Polytuf powder coat finish is impervious to weather and corrosion.

Xtreme Versatility

Can be installed indoor or outdoors!

Internal Air Intake

1. High Voltage Wiring Box
120VAC connections.

2. Removable Air Filter
Easy access and easily removable for inspection and replacement. 12"x20"high capacity filter is rated MERV 8.

3. Direct Vent Capability
Every XTherm is direct vent capable. By removing the air intake rear cover and screen, then installing the internal air plenum plug, your XTherm is ready for direct vent.

3a. Outdoor Cover
The outdoor intake air cover is standard. The combustion is drawn from inside the heater through the 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 non-condensing heat exchanger.

7. Access Panel to Cold Run Pumps
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 condensate neutralizer kits that can be plumbed between the heater and the drain.

Xtremely Small Footprint

TOP VIEW • FRONT VIEW • REAR VIEW

Labels: FLUE CONNECTION; G- GAS CONNECTION; POWER CONNECTIONS; ØN - COMBUSTION AIR OPTIONAL; 2-1/2" NPT WATER OUTLET; 2-1/2" NPT WATER INLET; ØK - FLUE CONNECTION; CONDENSATE DRAIN CONNECTION; LOW VOLTAGE CONDUIT CONNECTION (BY OTHERS)

PHYSICAL DATA	Model	Dimensions (inches)											H-Models Hydronic		
		B Ht.	D	E	F	G* NPT	K Flue Ø	L	M	N C/A Ø	P	R	Y	Weight (lbs.)	Boiler Amps	Pump Amps†
	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.
†Separate wiring connection required for pumps.

MBTUH	Model	AHRI Certified			Not AHRI Certified			Minimum Input
		MBTUH Input	Boiler		MBTUH Input	Water Heaters		
			Output	Efficiency		Output	Efficiency	
	1005A	999	959	96%	999	969	97%	143
	1505A	1500	1440	96%	1500	1455	97%	214
	2005A	1999	1919	96%	1999	1939	97%	286

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

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

XTherm Model	Water Heater Power Requirements					
	Soft		Medium		Hard	
	Heater	Pumps	Heater	Pumps	Heater	Pumps
1005A	12	10	12	10	12	14
1505A	12	10	12	14	12	17
2005A	18	17	18	17	N/A	N/A

Water hardness grains per gallon
Soft = 3-4 • Medium = 5-15 • Hard = 16-25

Xtreme Pumping

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 non-condensing heat exchanger. The system utilizes one or two variable speed pumps, depending on model size and type, 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 non-condensing heat exchanger. For models using the twin pump design, each pump acts independently giving the heater up to a 10:1 flow turndown. All of this keeps the condensate where it belongs, in the stainless steel condensing heat exchanger.
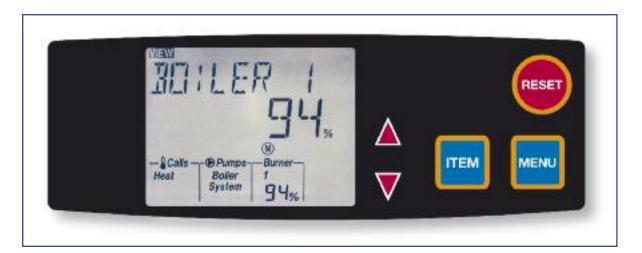
TYPE WH	XTherm Model	Recovery Rates													
		Temperature Rise (°F)													
		20	30	40	50	60	70	80	90	100	110	120	130	140	150
	1005A	5,817	3,878	2,908	2,327	1,939	1,662	1,454	1,293	1,163	1,058	969	895	831	776
	1505A	8,733	5,822	4,367	3,493	2,911	2,495	2,183	1,941	1,747	1,588	1,456	1,344	1,248	1,164
	2005A	11,639	7,759	5,813	4,656	3,880	3,325	2,910	2,586	2,328	2,116	1,940	1,791	1,663	1,552

VERSA IC® Boiler Control and On-Board Diagnostic Center

VERSA IC® merges safety, ignition and temperature control, outdoor reset and freeze protection, plus system monitoring, alarm and diagnostics, and BMS transmission all in one Integrated Control Platform. Easy front access to read, set up and trouble shoot on a 3.5″ LCD screen. The entire package is CSA certified, and listed for each individual function.

Inlet and outlet sensors factory installed in boiler. Remote sensor for system included. BMS all point diagnostics transmission port. 0-10V DC set point input standard. Also can drive and monitor external motorized auxiliaries such as extractors and louvers. Additional connections for auxiliary functions such as indirect DHW, and dry contact remote alarm relay are provided.
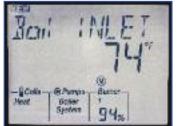
Xtreme Control

Cascade up to 4 Boilers

The XTherm comes standard with a built-in Cascading Boiler 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 Boiler and set all the other boilers as Followers. It's that simple! The XTherm has built-in equal run-time rotation. This allows rotation of the starting boiler so all boilers in the system remain active and the run times remain equal on each unit.
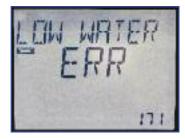

Raypak Leadership in Boiler Management

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 boiler control. A Modbus communications port is standard for continuous monitoring, trending, and troubleshooting.

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

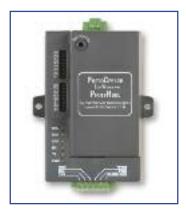## Optional Gateways

• **Cascade up to 4 boilers**
• **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)*

Raypak XTherm — ULTRA HIGH EFFICIENCY

HEAT EXCHANGER		Water Heaters (Type WH)	Boilers (Type H)
ASME, National Board Registered, 160 PSI	• HLW Stamp	●	N/A
Non Condensing Heat Exchanger	• H Stamp	N/A	●
Heat Exchanger Tubes (Non Condensing)	• Copper	●	●
	• Cupro Nickel	○	○
Bronze Headers		●	○
Cast Iron Headers		N/A	●
Stainless Steel Condensing Heat Exchanger	• U Stamp	●	●
Pressure Relief Valve (mounted on outlet)	• 60 PSI	○	●
	• 125 PSI	●	○
	• 30, 45, 75, 150 PSI	○	○
Temperature & Pressure Gauge		●	●
Pump	• 120V, Single-Phase	●	●

JACKET		Water Heaters (Type WH)	Boilers (Type H)
Indoor/Outdoor Certified		●	●
Vent Terminal	• Outdoor	○	○
	• Through-the-Wall	○	○
Fully-Enclosed Controls		●	●
Combustible Floor Rated		●	●

OPERATING CONTROLS		Water Heaters (Type WH)	Boilers (Type H)
120V Power Supply with 120V/24V Transformer		●	●
On/Off Switch		●	●
Programmable Pump Time Delay, Single-Phase	• Included in	●	●
Terminal Block Connections (Front mounted)	• Enable / Disable	●	●
	• External Interlocks	●	●
	• 0-10 VDC Setpoint/Direct Drive Input dry contacts	●	●
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® (7:1 Turndown)	●	●
	• Outdoor Reset Sensor	N/A	○
Multiple Boiler Controller	• VERSA IC®, up to 4 boilers	○	○
	• TempTracker Mod+, up to 16 boilers		

SAFETIES		Water Heaters (Type WH)	Boilers (Type H)
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	○	○
Low Water Cut-Off, 24V	• With Manual Reset and Test Buttons	○	○
Flow Switch		●	●

GAS TRAIN		Water Heaters (Type WH)	Boilers (Type H)
Modulating Combination Gas Valve		●	●
Combustion Air Blower		●	●
Additional Safety Valve	• Motorized (externally mounted)	○	○
	• Solenoid (externally mounted)	○	○

OTHER		Water Heaters (Type WH)	Boilers (Type H)
CSA-Certified Efficiency	• 96% at Full Fire	N/A	●
	• 97% at Full Fire	●	N/A
Air Filter		●	●
TruSeal Direct-Vent Ready		●	●
Alarm System		○	○
CSD-1 / GE GAP Control System		○	○
Low NOx	• Less than 20ppm	●	●
Cold Water Run	• Prevents condensation in non-condensing heat exchanger	●	●

● ● = Standard   ○ ○ = Optional

CSA - LLC   H   HLW   AHRI CERTIFIED — www.ahridirectory.org   Heating Boilers Only