High Efficiency Boilers & Water Heaters

Raritan

XTherm®

ULTRA HIGH EFFICIENCY

Touch Screen
VERSA IC® Control Platform

Models

1005A, 1505A, 2005A

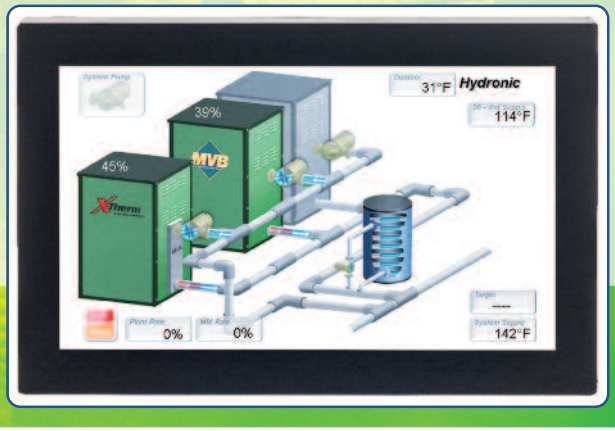
2505, 3005, 3505, 4005

Up to **99%** thermal efficiency!

Xtreme performance powered by

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 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 for all sizes of hydronic boilers at full fire. 97% efficiency on all sizes 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 its 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 operation.

With up to 12.5:1 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

- 7 models from 1,000,000 to 4,000,000 BTUH
- 96% thermal efficiency hydronic and up to 97% DHW
- CSA Certified Low Lead Compliant
- Indoor/outdoor construction
- Small footprint, less than 11 square feet (1005A thru 2005A)
- Minimum continuous inlet water temperature (50°F)
- Water heater models are equipped with all copper and bronze, or stainless waterways.
- Pump outputs - System, indirect and injector (2505-4005)
- Modulating gas valve and burner, up to 12.5:1 turndown
- Ultra Low NOx
    - 1005A-2005A -SCAQMD Certified at less than 20ppm
    - 2505-4005 - less than 30ppm.
- Whisper-quiet operation
- 7" Color touch screen display
- 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** - 1005A-2005A
  *PVC requires Max 170°F return water
- Polypropylene (D-33 Option) field install - 1005A-2005A
- Stainless steel Category IV vent, standard - All Models

Options

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

Models 1005A thru 2005A

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

2. VERSA IC® Control
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. 7" Color Touch Screen Display
Large easy to read (7") color 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. 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 up to a 12.5:1 turndown.

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. Sizes 1005A-2005A are offered with the factory-installed D-32 (PVC or CPVC) or field-installed D-33 (Polypropylene) vent options. 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 up to 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.

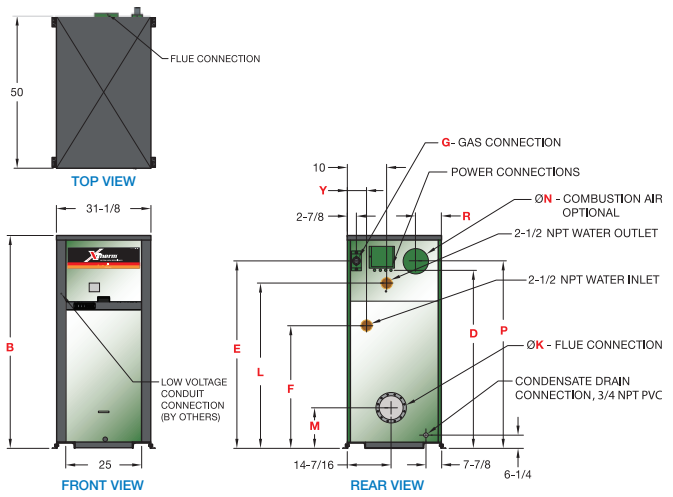
15. Vertical Non-Condensing Heat Exchanger
Cylindrical, multi-pass heat exchanger captures all radiant energy, eliminating the need for heavy refractory.

16. Drain Valve
Up to three drain valves located at the bottom of the non-condensing heat exchanger. Another 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 Small Footprint



Models 1005A thru 2005A

1005A thru 2005A Heating Boiler

PHYSICAL DATA

Model	Dimensions (inches)												H-Models Hydronic		
	B Ht.	D	E Gas	F Inlet	G NPT	K Flue Ø	L Outlet	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
2505	68-3/16	65	64-13/16	21-1/8	2-1/2	10	7-5/16	18-1/2	10	70	-	-	2656	12**	15**
3005	73-3/16	70	69-13/16	26-1/8	2-1/2	10	7-5/16	23-1/2	10	65	-	-	2775	15**	16**
3505	78-3/16	75	74-13/16	31-1/8	2-1/2	10	7-5/16	28-1/2	12	60	-	-	2925	17**	16**
4005	83-3/16	80	79-13/16	30-7/8	2-1/2	12	7-5/16	29-1/4	12	55	-	-	3058	20**	24**

*For propane gas, 1-1/4 NPT. †Separate wiring connection required for pumps. **At 240VAC.

MBTUH

Model	AHRI Certified			Not AHRI Certified			Minimum Input
	MBTUH Input	Boiler Output	Boiler Efficiency	MBTUH Input	Water Heaters Output	Water Heaters Efficiency	
1005A	999	959	96%	999	969	97%	140
1505A	1500	1440	96%	1500	1455	97%	210
2005A	1999	1919	96%	1999	1939	97%	280
2505	2501	2401	96%	2501	2426	97%	200
3005	3000	2880	96%	3000	2910	97%	240
3505	3500	3360	96%	3500	3395	97%	280
4005	4000	3840	96%	4000	3880	97%	560

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

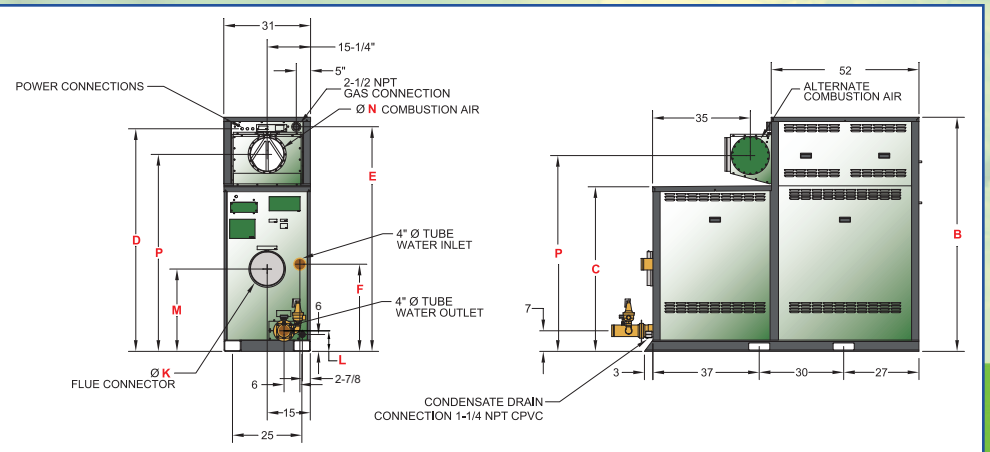
*Do not install on carpeting
Note: Local codes may require increased clearances

XTherm Model	Water Heater Power Requirements						
	Soft		Medium		Hard		External Injector Pump
	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	-
2505**	12	8	12	8	12	8	7
3005**	15	8	15	16	15	16	8
3505**	17	8	17	16	17	16	8
4005**	20	16	20	16	20	16	8

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

**At 240VAC.

Xtremely Small Footprint



Models 2505 thru 4005

Indoor configuration shown above.

TYPE WH

XTherm Model	Recovery Rates													
	Temperature Rise (°F)													
	20	30	40	50	60	70	80	90	100	110	120	130	140	150
1005A	5873	3915	2936	2349	1958	1678	1468	1305	1175	1068	979	904	839	783
1505A	8818	5879	4409	3527	2939	2519	2205	1960	1764	1603	1470	1357	1260	1176
2005A	11752	7834	5876	4701	3917	3358	2938	2611	2350	2137	1959	1808	1679	1567
2505	14703	9802	7351	5881	4901	4201	3676	3267	2941	2673	2450	2262	2100	1960
3005	17636	11758	8818	7055	5879	5039	4409	3919	3527	3207	2939	2713	2519	2352
3505	20576	13717	10288	8230	6859	5879	5144	4572	4115	3741	3429	3166	2939	2743
4005	23515	15677	11758	9406	7838	6719	5879	5226	4703	4275	3919	3618	3359	3135

Think Green

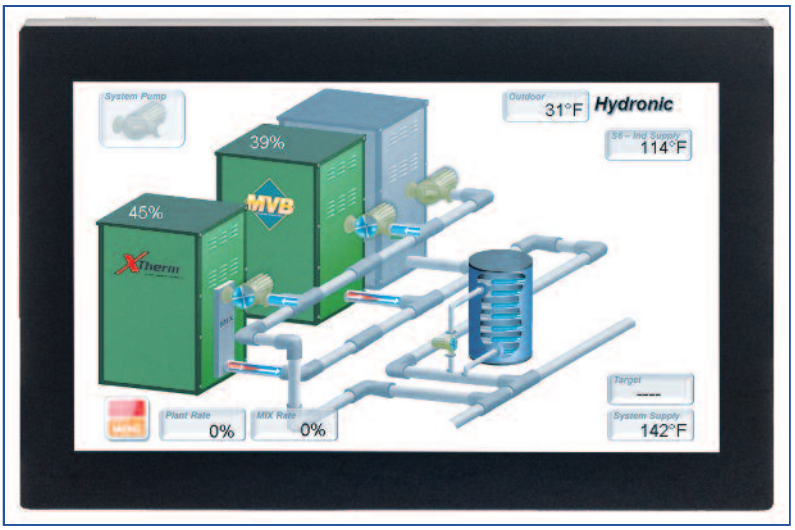
Think Raypak

Xtreme Pumping

Cold Water Run System

The XTherm 1005A-2005A come 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.

VERSA IC®



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 7" color touch screen. The entire package is CSA certified, and listed for each individual function.

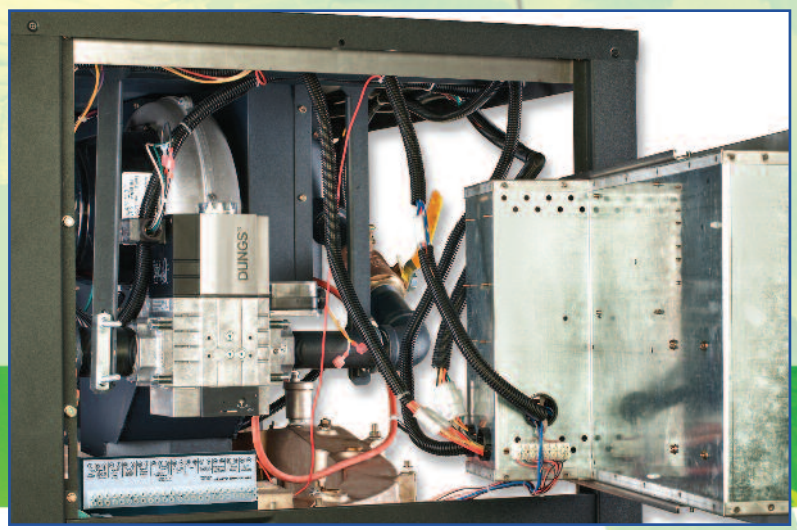
Inlet and outlet sensors factory installed in boiler. Remote sensor for system included. BMS all point diagnostics transmission port. 0-10V DC set point input standard. Also can drive and monitor external motorized auxiliaries such as extractors and louvers. Additional connections for auxiliary functions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

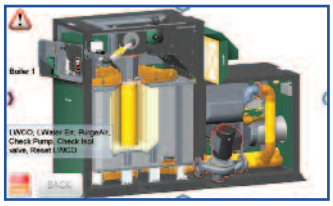
XTherm® ULTRA HIGH EFFICIENCY

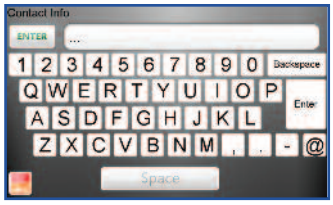
Xtreme Control

Raypak Leadership in Boiler Management

The modulating 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
- Mix Lock

Optional Gateways

- Cascade up to 4 boilers
- All faults and interlocks monitored and reported in real 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)

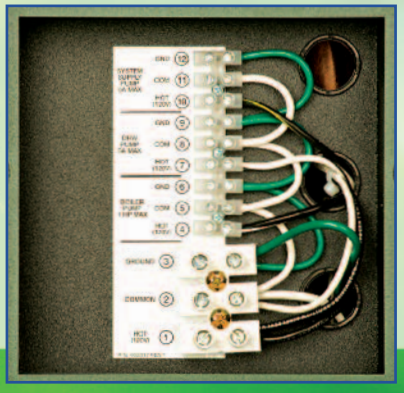
Xtremely Easy to Wire

Xtremely Easy to Wire Front Control Plugs For System Connections

XTherm has a front mounted wiring center with plug connections for all low voltage control systems and sensor connections. The VERSA IC® will allow cascading of up to four boilers, or DHW direct system, or if required a priority based indirect DHW system. If additional boilers are needed it may be linked through its Modbus port to Raypak's Temp Tracker Mod+ Hybrid Master Control, to sequence up to 10 boilers. Also accepts 0-10VDC from BMS.

High Voltage Wiring Center

The XTherm high voltage 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.



High Voltage Wiring Center (rear of boiler)

Xtreme Firing Rates

Cascade up to 4 Boilers

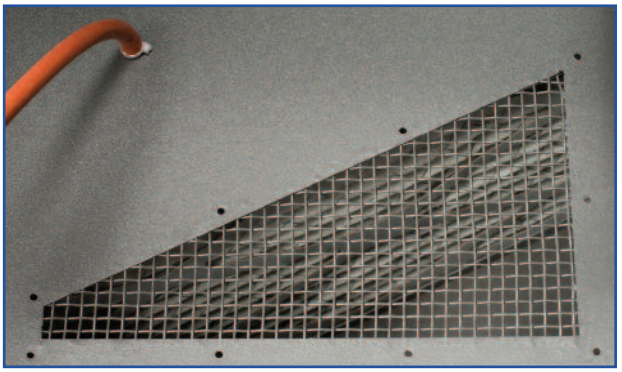
Deliver up to 14 Million BTU at a 50:1 turndown rate! Or 16MMBTU at 28:1

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.

ISO 9001
Registered Quality Management System

Xtreme Versatility

Can be installed indoor or outdoors!



Internal Air Intake

1. High Voltage Wiring Box
120VAC (1005A-2005A) and 240VAC (2505-4005) connections.

2. Removable Air Filter
Easy access and easily removable for inspection and replacement. 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.*

* Models 1005A-2005A only

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
PVC connection for condensate removal. Raypak offers condensate treatment kits (option Z-12) that can be plumbed between the heater and the drain.

Raypak A Rheem Company

XTherm ULTRA HIGH EFFICIENCY

		Water Heaters (Type WH)	Boilers (Type H)
HEAT EXCHANGER			
ASME, National Board Registered, 160 PSI	• HLW Stamp	●	N/A
Non Condensing Heat Exchanger	• H Stamp	N/A	●
Heat Exchanger Tubes	• Copper	●	●
(Non Condensing)	• Cupro Nickel	○	○
Bronze Headers		●	○
Cast Iron Headers		N/A	●
Stainless Steel Condensing Heat Exchanger	• U Stamp	●	●
Pressure Relief Valve	• 60 PSI	○	●
(mounted on outlet)	• 125 PSI	●	○
	• 30, 45, 75, 150 PSI	○	○
Temperature & Pressure Gauge		●	●
Pump	• 120V, Single-Phase on 1005A-2005A	●	●
	• 240V, Single-Phase on 2505-4005	●	●
JACKET			
Indoor/Outdoor Construction		●	●
Vent Terminal	• Outdoor	○	○
	• Through-the-Wall	○	○
Fully-Enclosed Controls		●	●
Combustible Floor Rated		●	●
OPERATING CONTROLS			
120VAC Power Supply (1005A-2005A); 240VAC 1Ø Power Supply (2505-4005)		●	●
On/Off Switch		●	●
Programmable Pump Time Delay, Single-Phase	• Included in	●	●
Terminal Block Connections	• Enable / Disable	●	●
(Front mounted)	• External Interlocks	●	●
	• 0-10 VDC Setpoint/Direct Drive Input dry contacts	●	●
Color Touchscreen		●	●
Status Display Lights (4)		●	●
Temperature Controller with 3 Water Sensors	• VERSA IC (Up to 12.5:1 Turndown)	●	●
	• Outdoor Reset Sensor	N/A	○
Multiple Boiler Controller	• VERSA IC , up to 4 boilers	○	○
	• TempTracker Mod+, up to 16 boilers		
SAFETIES			
Hot Surface Ignition System	• 1-try	○	○
	• 3-try	●	●
High/Low Gas Pressure Switches (HGPS Standard on 2505-4005)		○	○
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			
Modulating Combination Gas Valve		●	●
Combustion Air Blower		●	●
Additional Safety Valve	• Motorized (externally mounted)	○	○
	• Solenoid (externally mounted)	○	○
OTHER			
CSA-Certified Efficiency	• Up to 96% at Full Fire	N/A	●
	• Up to 97% at Full Fire	●	N/A
Air Filter		●	●
TruSeal Direct-Vent Ready		●	●
Alarm System		○	○
CSD-1 / GE GAP Control System		○	○
Low NOx	• Certified Less than 20ppm (1005A-2005A)	●	●
Cold Water Run	• Prevents condensation in non-condensing heat exchanger	●	●

● ● = Standard ○ ○ = Optional

AHRI CERTIFIED www.ahridirectory.org

Heating Boilers Only

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