Job: Kirk in the Hills boilers 1 & 2

Engineer:

Contractor: Western Mechanical Contractors

Prepared By: A. Deal Date: 12/7/12

Model: H-2005 Indoor/Outdoor: Indoor

XTherm™ - Type H

Heating Boilers
Models 1005-2005

96% Thermal Efficiency at Full Rate; Up to 99% at Part Load

100% Factory Fire Tested

Maximum Outlet Water Temperature: 225°F

Minimum Acceptable Inlet Water Temperature: 50°F

Full Safety Diagnostics with History

Footprint: Less Than 10.8 ft^2

Limited Twenty-Five-Year Thermal Shock Warranty

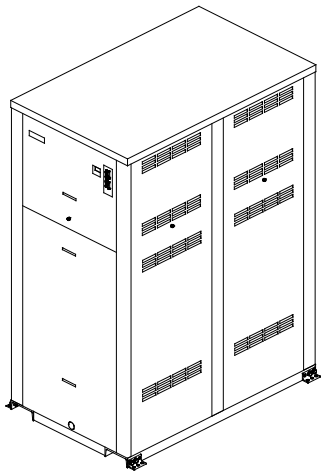
Limited Ten-Year Primary Heat Exchanger Warranty

Limited Five-Year Secondary Heat Exchanger Warranty

Full Electronic Modulation, Constant Ratio 4:1 Turndown

Modulating Controller with LCD Display

Status Display Lights



Heat Exchanger
- Headers
  - ☐ Cast Iron – Standard
  - ☒ Bronze – Option A-1
- ASME H Stamped; 160 PSIG MAWP
- National Board Listed
- Fin Tubing
  - ☒ Copper – Standard
  - ☐ Cupro Nickel – Option A-3
- ASME Powder-Coated Tube Sheet
- Silicone High Temp O-Rings
- ASME Pressure Relief Valve
  - ☒ 60 PSIG – Standard
  - ☐ 75 PSIG – Optional
- 150 PSI Air Vent, Auto
- T&P Gauge, Shipped Loose
- Stainless Steel Secondary Heat Exchanger
- Stainless Steel Evaporator Plate
- Boiler Pump: 120V, 1∅, 60Hz;
  - ☒ Cast Iron – Standard
  - ☐ Bronze – Option

Control
- 120V, 60Hz, 1Ø, Power Supply
- 120/24V 60Hz Transformer
- Ignition Module
  - ☒ 3-Try – Standard
  - ☐ Single-Try – Option C-6
- Hot Surface Ignition (HSI)
- Remote Flame Sensor
- Fixed High Limit, Manual Reset, 240°F
- On/Off Power Switch
- Flow Switch
- Blocked Vent Pressure Switch
- Combustion Air Proving Switch
- Freeze Protection

Control (cont.)
- Pump Switch
- Pump Time Delay
- Diagnostics Panel with LCD Display, 2 lines, 20 characters
- Modulating Temperature Control
- Water Temperature Sensors (3)
- Cold Water Protection
- Blocked Condensate Switch

Burner
- Ultra-Low NOx: Less than 20 PPM (Natural Gas Only)

Gas Train
- Fuel
  - ☒ Natural Gas
  - ☐ Propane
- Zero Governor Regulator
- Dual-Seat Combination Valve
- Electronic Modulating Firing Mode (H7)

Construction
- Indoor/Outdoor Construction
- Enclosed Front Controls
- PolyTuf Powder Coat Finish
- Rear Connections (Water, Gas, Vent, Electrical, Comb. Air, Cond. Drain)
- Combustion Air Filter
- Design Certified ANSI Z21.13/CSA 4.9

Venting
- Vent Termination
  - ☐ Outdoor or Indoor, Vertical – Option D-11
  - ☐ Indoor, Horizontal – Option D-15
- Extractor - Optional
  - ☐ By others
  - ☒ Not required

Multi-Boiler Digital Temp Controllers
- ☐ B-36 TempTracker Mod+, 2-4 Boilers, OA Reset
- ☐ B-37 TempTracker Mod+, 5-10 Boilers, OA Reset
- ☐ B-38 TempTracker Mod+, 11-16 Boilers, OA Reset
- ☐ B-45 Multi-Mod Platinum, 2-4 Boilers, OA Reset
- ☐ B-46 Multi-Mod Platinum EMS, 2-4 Boilers, OA Reset
- ☐ B-47 Multi-Mod Platinum BACNet, 2-4 Boilers, OA Reset
- ☐ B-48 Multi-Mod Expansion Module, 1-8 Additional Boilers

Options
- ☐ D-32 PVC Vent Adapter (Includes 200ºF Manual High Limit) Maximum return water temperature allowed 170ºF.
- ☐ F-10 Low Water Cut-Off, Remote Probe
- ☒ I-1 High Limit, Auto Reset, Adj., 100-240°F
- ☒ I-2 High Limit, Manual Reset, Adj., 100-240°F
- ☒ S-1 Low Gas Pressure Switch, Manual Reset
- ☒ S-2 High Gas Pressure Switch, Manual Reset
- ☒ Z-12 Condensate Neutralizer Kit

Regulatory Agency Requirements
☒ CSD-1

Raypak A Rheem Company

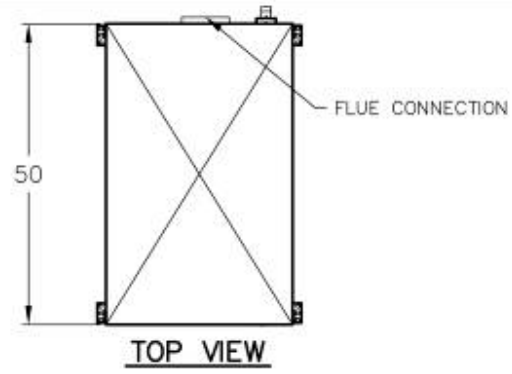
XTherm – Type H
Models 1005-2005

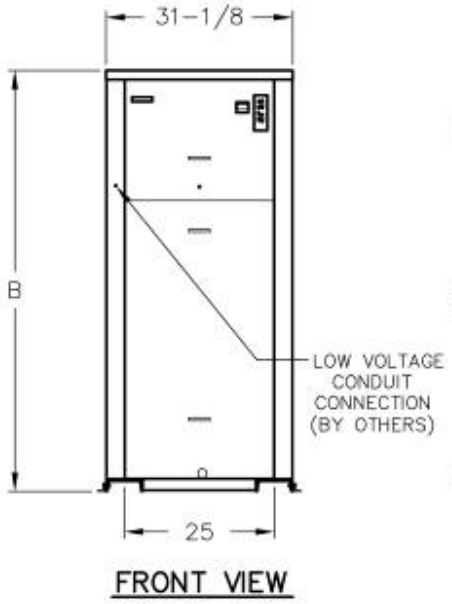
Model H-2005

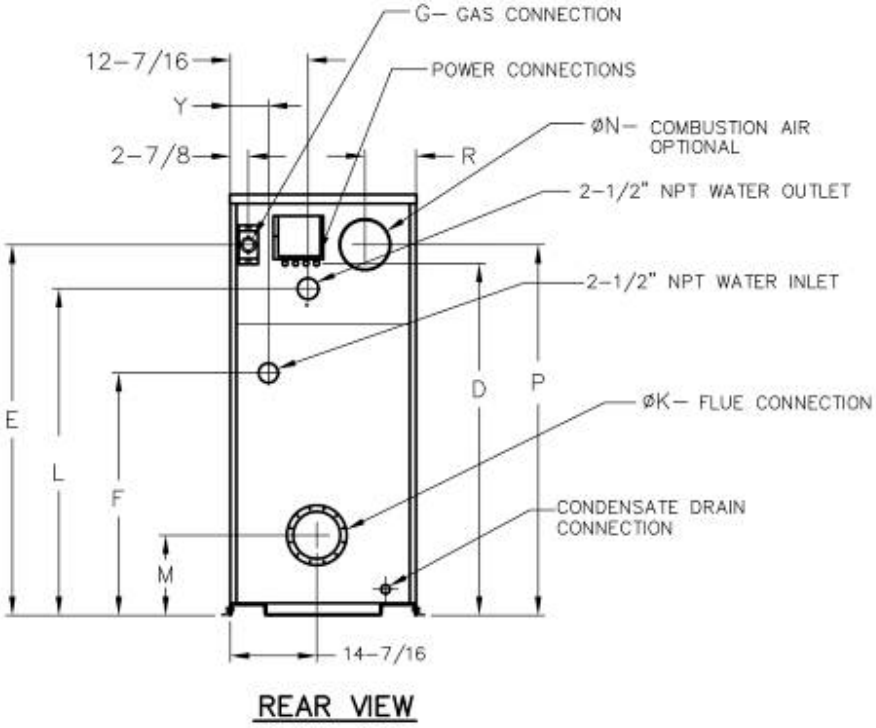
CLEARANCES (in.)

	Front	Rear	Right	Left	Top	Floor	Vent
Certified Minimum	24	12	1	1	0	0	1
Minimum Service	24	36	24	1	10	N/A	N/A

NOTE: Primary/Secondary plumbing is mandatory for proper operation.







Model (H7-)	MBTUH		Dimensions (in.)												Ship Weight (Lbs.)	Total Amps**
	Input	Output	B Height	D	E	F	G* NPT	K Flue Ø	L	M	N C/A Ø	P	R	Y		
1005	999	959	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	22
1505	1500	1440	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	26
2005	1999	1919	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	35

Note: Ratings shown are for elevations up to 4,500 feet. For installations at elevations above 4,500 feet, please consult the factory for additional instructions.

* For Propane Gas, all models are 1

** Supply breaker must have delayed trip.

Model (H7-)	Rate of Flow (GPM)			Maximum Flow		Minimum Flow*		Boiler Pump	
	20°F ΔT	30°F ΔT	40°F ΔT*	GPM	ΔT (°F)	GPM	ΔT (°F)	Hp	Amps
1005	95	63	47	113	17	47	40	1/2	7
1505	N/A	96	71	113	25	71	40	3/4	11
2005	N/A	N/A	95	116	33	95	40	1	14

* Closed systems only

Job: Kirk in the Hills boiler 3

Engineer:

Contractor: Western Mechanical Contractors

Prepared By: A. Deal Date: 12/7/12

Model: H-1505 Indoor/Outdoor: Indoor

XTherm™ - Type H

Heating Boilers
Models 1005-2005

96% Thermal Efficiency at Full Rate; Up to 99% at Part Load

100% Factory Fire Tested

Maximum Outlet Water Temperature: 225°F

Minimum Acceptable Inlet Water Temperature: 50°F

Full Safety Diagnostics with History

Footprint: Less Than 10.8 ft^2

Limited Twenty-Five-Year Thermal Shock Warranty

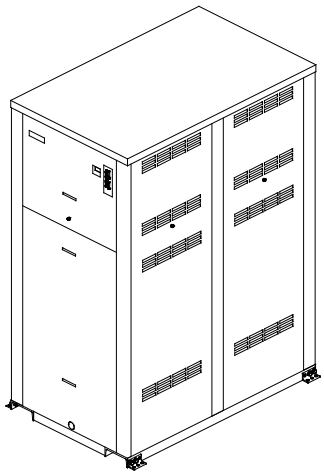
Limited Ten-Year Primary Heat Exchanger Warranty

Limited Five-Year Secondary Heat Exchanger Warranty

Full Electronic Modulation, Constant Ratio 4:1 Turndown

Modulating Controller with LCD Display

Status Display Lights



Heat Exchanger
- Headers
  - ☐ Cast Iron – Standard
  - ☒ Bronze – Option A-1
- ASME H Stamped; 160 PSIG MAWP
- National Board Listed
- Fin Tubing
  - ☒ Copper – Standard
  - ☐ Cupro Nickel – Option A-3
- ASME Powder-Coated Tube Sheet
- Silicone High Temp O-Rings
- ASME Pressure Relief Valve
  - ☒ 60 PSIG – Standard
  - ☐ 75 PSIG – Optional
- 150 PSI Air Vent, Auto
- T&P Gauge, Shipped Loose
- Stainless Steel Secondary Heat Exchanger
- Stainless Steel Evaporator Plate
- Boiler Pump: 120V, 1∅, 60Hz;
  - ☒ Cast Iron – Standard
  - ☐ Bronze – Option

Control
- 120V, 60Hz, 1Ø, Power Supply
- 120/24V 60Hz Transformer
- Ignition Module
  - ☒ 3-Try – Standard
  - ☐ Single-Try – Option C-6
- Hot Surface Ignition (HSI)
- Remote Flame Sensor
- Fixed High Limit, Manual Reset, 240°F
- On/Off Power Switch
- Flow Switch
- Blocked Vent Pressure Switch
- Combustion Air Proving Switch
- Freeze Protection

Control (cont.)
- Pump Switch
- Pump Time Delay
- Diagnostics Panel with LCD Display, 2 lines, 20 characters
- Modulating Temperature Control
- Water Temperature Sensors (3)
- Cold Water Protection
- Blocked Condensate Switch

Burner
- Ultra-Low NOx: Less than 20 PPM (Natural Gas Only)

Gas Train
- Fuel
  - ☒ Natural Gas
  - ☐ Propane
- Zero Governor Regulator
- Dual-Seat Combination Valve
- Electronic Modulating Firing Mode (H7)

Construction
- Indoor/Outdoor Construction
- Enclosed Front Controls
- PolyTuf Powder Coat Finish
- Rear Connections (Water, Gas, Vent, Electrical, Comb. Air, Cond. Drain)
- Combustion Air Filter
- Design Certified ANSI Z21.13/CSA 4.9

Venting
- Vent Termination
  - ☐ Outdoor or Indoor, Vertical – Option D-11
  - ☐ Indoor, Horizontal – Option D-15
- Extractor - Optional
  - ☐ By others
  - ☒ Not required

Multi-Boiler Digital Temp Controllers
- ☐ B-36 TempTracker Mod+, 2-4 Boilers, OA Reset
- ☐ B-37 TempTracker Mod+, 5-10 Boilers, OA Reset
- ☐ B-38 TempTracker Mod+, 11-16 Boilers, OA Reset
- ☐ B-45 Multi-Mod Platinum, 2-4 Boilers, OA Reset
- ☐ B-46 Multi-Mod Platinum EMS, 2-4 Boilers, OA Reset
- ☐ B-47 Multi-Mod Platinum BACNet, 2-4 Boilers, OA Reset
- ☐ B-48 Multi-Mod Expansion Module, 1-8 Additional Boilers

Options
- ☐ D-32 PVC Vent Adapter (Includes 200ºF Manual High Limit) Maximum return water temperature allowed 170ºF.
- ☐ F-10 Low Water Cut-Off, Remote Probe
- ☒ I-1 High Limit, Auto Reset, Adj., 100-240°F
- ☒ I-2 High Limit, Manual Reset, Adj., 100-240°F
- ☒ S-1 Low Gas Pressure Switch, Manual Reset
- ☒ S-2 High Gas Pressure Switch, Manual Reset
- ☒ Z-12 Condensate Neutralizer Kit

Regulatory Agency Requirements
☒ CSD-1

Raypak A Rheem Company

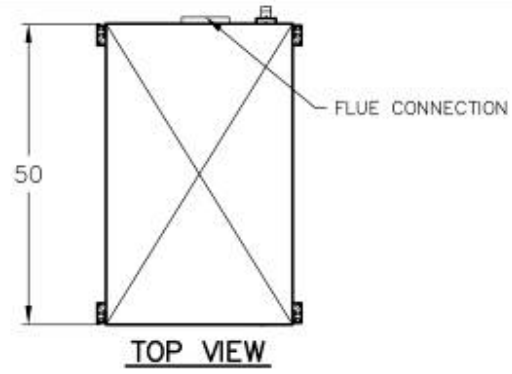
XTherm – Type H
Models 1005-2005

Model H-1505

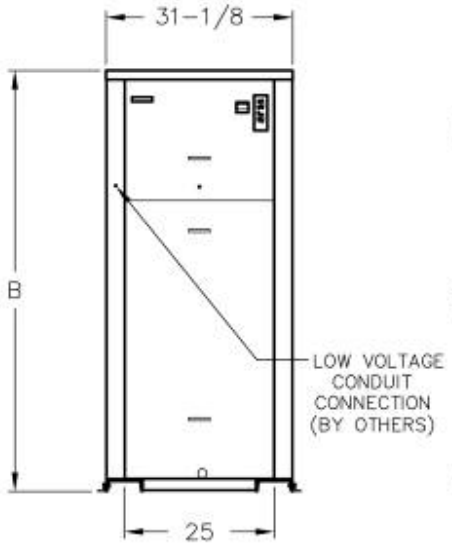
CLEARANCES (in.)

	Front	Rear	Right	Left	Top	Floor	Vent
Certified Minimum	24	12	1	1	0	0	1
Minimum Service	24	36	24	1	10	N/A	N/A

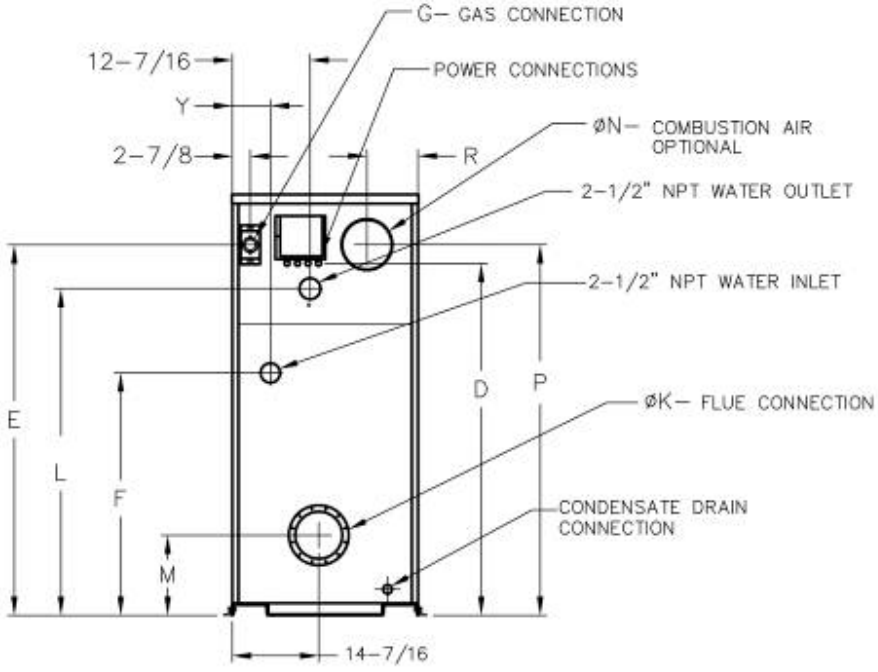
NOTE: Primary/Secondary plumbing is mandatory for proper operation.



TOP VIEW



FRONT VIEW



REAR VIEW

Model (H7-)	MBTUH		Dimensions (in.)												Ship Weight (Lbs.)	Total Amps**
	Input	Output	B Height	D	E	F	G* NPT	K Flue Ø	L	M	N C/A Ø	P	R	Y		
1005	999	959	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	22
1505	1500	1440	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	26
2005	1999	1919	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	35

Note: Ratings shown are for elevations up to 4,500 feet. For installations at elevations above 4,500 feet, please consult the factory for additional instructions.

* For Propane Gas, all models are 1

** Supply breaker must have delayed trip.

Model (H7-)	Rate of Flow (GPM)			Maximum Flow		Minimum Flow*		Boiler Pump	
	20°F ΔT	30°F ΔT	40°F ΔT*	GPM	ΔT (°F)	GPM	ΔT (°F)	Hp	Amps
1005	95	63	47	113	17	47	40	1/2	7
1505	N/A	96	71	113	25	71	40	3/4	11
2005	N/A	N/A	95	116	33	95	40	1	14

* Closed systems only

Performance Engineering Group B-1 | Priority S1 P1 P2 P3

Raypak X-Therm Start-Up Form

Job Name	Job Location	Date
Kirk in the Hills	1340 W. Long Lake RD Bloomfield hills, MI	6-21-13

Installer	Contact Person	Phone Number
western Mech	John Hamby	586-854-6198
Start –up Contractor	**Contact Person**	**Phone Number**
P.E.G.	Scott S	734-266-5300

Equipment Manufacturer	Model Number	Serial Number	Boiler Control Type	Application of Boiler
Ray Pak	H7-2005	1212350084	TPC	HTG

Condition of Equipment / Installation	What Type of Environment is Equipment In?	Is the Equipment Serviceable?
OK	Boiler Room	Yes

Voltage Test Hot to neutral | 123.8 | Hot to Ground | 123.9 | Neutral to Ground | 53 mv

Make-up Air Size Available: Common Duct — Location: Wall — Are motorized dampers present? Yes ☐ No ☐

Mfg's Specs: ____ — Are Mfg's Specs met? Yes ☐ No ☐ — Has an end switch been installed? Yes ☐ No ☐

CONTROL SETTINGS

Auto Reset High Limit: 220 — Manual Reset High Limit: 240 — Tankstat Setpoint: NA — Heating Control Setpoint: TPC

GAS TYPE: Nat ☑ LP ☐ Other: ____

PRESSURE RELIEF VALVE: PSI 60 — Drip Leg Installed: yes — System Working Pressure: 40

BOILER OPERATION: Light ☐ Moderate ☐ Heavy ☑ Sudden Loads ☐

PRESSURE SETTINGS: Nat 10.5" max, Pro 13.0" max

Supply Gas (Static): 10.4 "wc — Mfg's Spec: >4" min "wc — Manifold Pressure: 1.85 "wc — Mfg's Spec: +/- .2 "wc — Blower Tracking Pressure: -.51 "wc

Supply Gas (Dynamic): 8.0 "wc — Dirt Leg: yes — Blower Fan Pressure: -4.45 "wc — Blower Amps: 7.60 Amps to Fan

SAFETY CONTROL TESTS (Check all that apply & NOTE SETTING)

Flow Switch ☑ | Ignition Control Lockout ☑ | Auto High Limit ☑ | Manual Reset High Limit ☑ | Low Gas Pressure Switch ☑ | High Gas Pressure Switch ☑

VENTING

Type: Metal Fab — Draft Inducer Model #: NA — If Used, Approximate Height: 23'+Elbows — Is Vent Pipe Reduced: Yes ☐ No ☑ — Size: 8"

Is the boiler gas train vented properly? Yes ☑ No ☐ — What is the location of the vent termination? wall — Type of Vent Cap: angle cut

BOILER TEMPERATURE RISE

ΔT at Full Fire: 29 — Comments: Draft Reading -.048 (-.03 to -.09)

Does condensate line have neutralizer? Yes ☑ No ☐ — Has condensate line off of secondary heat exchanger been run to drain? Yes ☑ No ☐

EMISSION: (Analyzer readings)

CO_2	8.8 %	Mfg's Spec	8.5-9.0 (N) 9.5-10.0 (P) %	CO	50 PPM	Mfg's Spec	Less 100 PPM
Excess Air	33 %	Mfg's Spec	%	O_2	5.3 %	Mfg's Spec	%
NOx	PPM	Mfg's Spec	PPM	Flue Temperature	114 °F	Mfg's Spec	°F

BOILER PUMP

Manufacturer: ____ — HP: ____ — Amp Draw: 13.2 — Location: (Inlet) Outlet

Model: ____ — Voltage: 110 — Mfg. Amp Spec: 14.0 — (1Phase) 3Phase

INJECTION PUMP

Manufacturer: ____ — HP: ____ — Amp Draw: ____ — Location: Inlet Outlet

Model: ____ — Voltage: ____ — Mfg. Amp Spec: ____ — 1Phase 3Phase

SYSTEM PUMP

Manufacturer: ____ — HP: ____ — Amp Draw: ____ — Location: Inlet Outlet

Model: ____ — Voltage: ____ — Mfg. Amp Spec: ____ — 1Phase 3Phase

MISCELLANEOUS

Was a service manual present on the job site? Yes ☑ No ☐ — Was an owner representative present on startup? Yes ☑ No ☐ — Name: ____

Temp-tracker Settings Mode 8 — Blr Target ____ — DHW Target ____ — DHW Diff ____ — Blr Max ____ — Blr Min ____ — Dly 3:00 — Mass 1

Diff ____ — Mod Dly ____ — Pump Dly 3:00 — Degree (F°)

This equipment has been properly started and is operating satisfactorily at this time. Yes ☐ No ☐

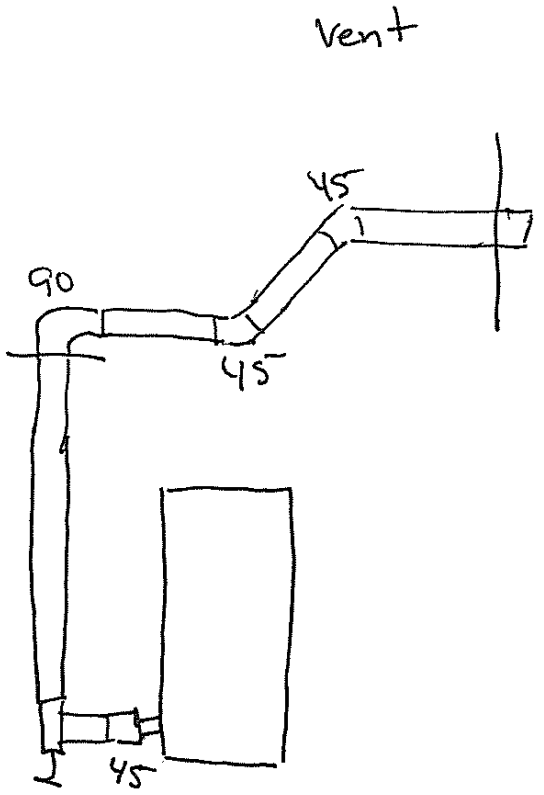
Technician's Signature X Scott Stevens — Date 6-21-13 — Owner/Rep's Signature X ____ — Date ____

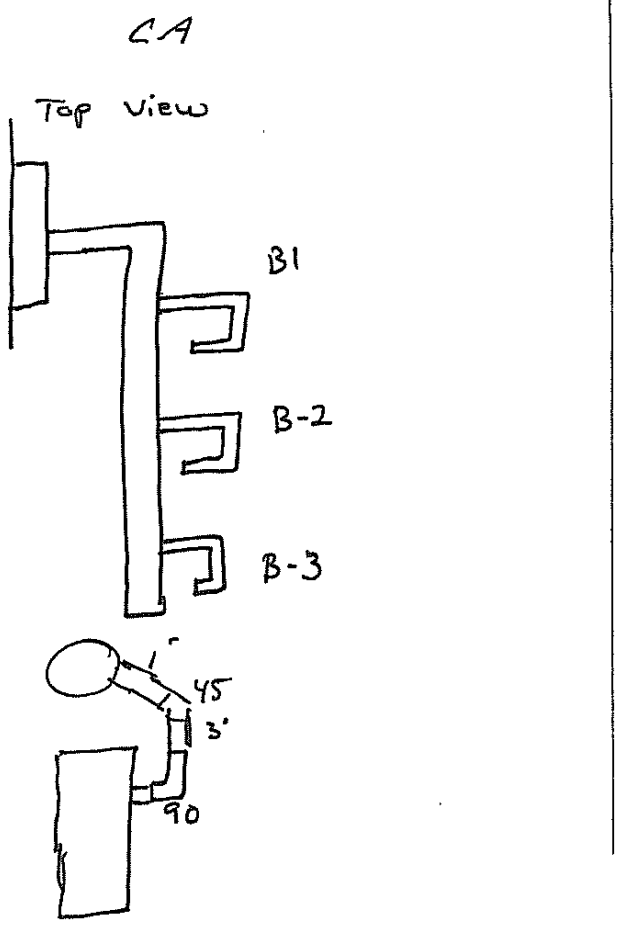
B-1

Performance Engineering Group
Raypak X-Therm Start-Up Form

HOW IS BOILER VENTED?

PLEASE SKETCH BOILER'S INSTALLED VENTING SYSTEM. ALSO, DOCUMENT VENT SIZE, VENT LENGTH INCLUDING ALL 45'S AND 90'S. PLEASE NOTE ALL TERMINATION POINTS WITH CLEARANCES (INTAKE FROM EXHAUST, AND ALL OTHER CODE/MFG REQUIREMENTS).





Comments:

PLEASE NOTE ANYTHING & EVERYTHING WHICH DOES NOT MEET MANUFACTURER'S SPECIFICATIONS:

Issue with flow from New pumps? Turned off New Section and ran old Section pumps OK Now. gas pressure at High End with regulator turned all the way down. vent Termenations ? Bird screen is in

Technician Scott Stevens Date 6-21-13 Customer Sam Mickoff Date

Start-Up will not be done, IF there is any major issue with Water Flow, Gas Supply or Venting

B-2

Performance Engineering Group

Priority S1 P1 P2 P3

Raypak X-Therm Start-Up Form

Job Name	Job Location	Date
Kirk in the Hills	1340 W. Long Lake RD Bloomfield hills, MI	6-21-13

Installer	Contact Person	Phone Number
western Mech	John Hamby	586-854-6198
Start-up Contractor	**Contact Person**	**Phone Number**
P.E.G.	Scott S	734-266-5300

Equipment Manufacturer	Model Number	Serial Number	Boiler Control Type	Application of Boiler
Ray Pak	H7-2005	1212350085	TPC	HTG

Condition of Equipment / Installation	What Type of Environment is Equipment in?	Is the Equipment Serviceable?
OK	Boiler Room	yes

Voltage Test Hot to neutral 123.8 | Hot to Ground 123.8 | Neutral to Ground 36 mv

Make-up Air Size Available: Ducted (Common) Location: Wall Are motorized dampers present? Yes ☐ No ☐

Mfg's Specs: Are Mfg's Specs met? Yes ☐ No ☐ Has an end switch been installed? Yes ☐ No ☐

CONTROL SETTINGS

Auto Reset High Limit: 220 Manual Reset High Limit: 240 Tankstat Setpoint: Heating Control Setpoint: TPC

GAS TYPE Nat ☑ LP ☐ Other:

PRESSURE RELIEF VALVE PSI: 60 Drip Leg Installed: yes System Working Pressure:

BOILER OPERATION Light ☐ Moderate ☐ Heavy ☑ Sudden Loads ☐

PRESSURE SETTINGS: Nat 10.5" max, Pro 13.0" max

Supply Gas (Static): 10.5 "w.c. Mfg's Spec: >4" min "w.c. Manifold Pressure: -1.7 "w.c. Mfg's Spec: +/- .2 "w.c. Blower Tracking Pressure: .57 "w.c.

Supply Gas (Dynamic): 9.1 "w.c. Dirt Leg: Y Blower Fan Pressure: -4.4 "w.c. Blower Amps: 7.58 Amps Hi Fire

SAFETY CONTROL TESTS (Check all that apply & NOTE SETTING)

Flow Switch ☑ Ignition Control Lockout ☑ Auto High Limit ☑ Manual Reset High Limit ☑ Low Gas Pressure Switch ☑ High Gas Pressure Switch ☑

VENTING

Type: Metal Fab Draft Inducer Model #: NA If Used, Approximate Height: 23' + Elbows Is Vent Pipe Reduced Yes ☐ No ☑ Size: 8"

Is the boiler gas train vented properly? Yes ☑ No ☐ What is the location of the vent termination? wall Type of Vent Cap: Angle cut

BOILER TEMPERATURE RISE

ΔT at Full Fire: 28 Comments: Draft Reading -0.4 (-.03 to -.09)

Does condensate line have neutralizer? Yes ☑ No ☐ Has condensate line off of secondary heat exchanger been run to drain? Yes ☑ No ☐

EMISSION: (Analyzer readings)

CO_2	9.0 %	Mfg's Spec	8.5-9.0 (N) 9.5-10.0 (P) %	CO	54 PPM	Mfg's Spec	Less 100 PPM
Excess Air	31 %	Mfg's Spec	%	O_2	5.0 %	Mfg's Spec	%
NOx	PPM	Mfg's Spec	PPM	Flue Temperature	111 °F	Mfg's Spec	°F

BOILER PUMP

Manufacturer: HP: Amp Draw: 13.19 Location: (Inlet) Outlet

Model: Voltage: 110 Mfg. Amp Spec: 14.0 (1Phase) 3Phase

INJECTION PUMP

Manufacturer: HP: Amp Draw: Location: Inlet Outlet

Model: Voltage: Mfg. Amp Spec: 1Phase 3Phase

SYSTEM PUMP

Manufacturer: HP: Amp Draw: Location: Inlet Outlet

Model: Voltage: Mfg. Amp Spec: 1Phase 3Phase

MISCELLANEOUS

Was a service manual present on the job site? Yes ☑ No ☐ Was an owner representative present on startup? Yes ☑ No ☐ Name:

Temp-tracker Settings Mode 8 Blr Target: DHW Target: DHW Diff: Blr Max: Blr Min: Dly 0.00 Mass 1

Diff: Mod Dly: Pump Dly 3:00 Degree (F°)

This equipment has been properly started and is operating satisfactorily at this time. Yes ☐ No ☐

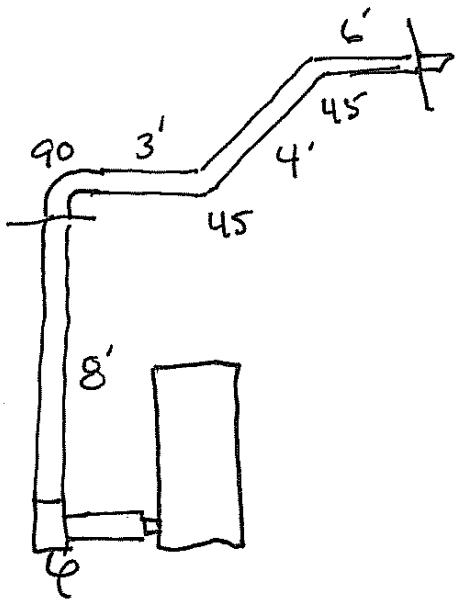
Technician's Signature X Date Owner/Rep's Signature X Date

B-2

Performance Engineering Group
Raypak X-Therm Start-Up Form

HOW IS BOILER VENTED?

PLEASE SKETCH BOILER'S INSTALLED VENTING SYSTEM. ALSO, DOCUMENT VENT SIZE, VENT LENGTH INCLUDING ALL 45'S AND 90'S.
PLEASE NOTE ALL TERMINATION POINTS WITH CLEARANCES (INTAKE FROM EXHAUST, AND ALL OTHER CODE/MFG REQUIREMENTS).



CA
SEE B-1

Comments:

PLEASE NOTE ANYTHING & EVERYTHING WHICH DOES NOT MEET MANUFACTURER'S SPECIFICATIONS:

gas pressure at High end with reg backed all the way out. advised that spring should be changed to get Lower then 10"wc

Technician Scott Stevens Date 6-21-13 Customer Sean Mitchell Date

Start-Up will not be done, IF there is any major issue with Water Flow, Gas Supply or Venting.

TPI709

Date : 21/063
Time : 07:28

Fuel : Natural Gas

------- Report -------

CO(ppm) :	54
O2(%) :	5.0
CO2(%) :	9.0
Ratio(CO/CO2) :	0.0006
CO Air Free(ppm):	70
Excess Air(%) :	31
Net_Effi(%) :	99.4
Temp_CH1(F) :	111
Temp_CH2(F) :	Open

Smoke : 1 2 3 4 5

Customer : Kirk in the Hills

Address : B-2

Reading Accepted by :

07:29, 21/06/13

TPI709

Date : 21/06/13
Time : 06:56

Fuel : Natural Gas

------- Report -------

CO(ppm) :	50
O2(%) :	5.3
CO2(%) :	8.8
Ratio(CO/CO2) :	0.0005
CO Air Free(ppm):	67
Excess Air(%) :	33
Net_Effi(%) :	99.3
Temp_CH1(F) :	114
Temp_CH2(F) :	Open

Smoke : 1 2 3 4 5

Customer : Kirk in The Hills

Address : B-1

Reading Accepted by :

06:57, 21/06/13

TPI709

Date : 21/06/13
Time : 09:52

Fuel : Natural Gas

------- Report -------

CO(ppm) :	46
O2(%) :	5.5
CO2(%) :	8.7
Ratio(CO/CO2) :	0.0005
CO Air Free(ppm):	62
Excess Air(%) :	35
Net_Effi(%) :	98.6
Temp_CH1(F) :	138
Temp_CH2(F) :	Open

Smoke : 1 2 3 4 5

Customer : Kirk in The Hills

Address : B-3

Reading Accepted by :

09:53, 21/06/13

PERFORMANCE engineering group

Raypak • Ruud • thaw:PAK

Your Hot Water Supply Resource

June 25, 2013

Mr. John Hamby
Western Mechanical Contractors
jhamby@westernmech.com

Dear Mr. Hamby,

The start-up of the Raypak boilers and control system at the following location has been completed:

Kirk in the Hills Church – 1340 W. Long Lake Road – Bloomfield Hills, MI 48302

Model Number: H7-2005
Serial Number: 1212350084 & 1212350085

The following areas were tested and reviewed:

Boiler installation

Venting

- ☒ Complies with manufacturer's installation instructions
- ☐ Requires the following modifications:
  - ☐ Too small; required size is
  - ☐ Exceeds recommended length; correct size for this length is inches
  - ☐ Exceeds allowable number of elbows; maximum amount is
  - ☐ Requires Barometric Damper
  - ☐ Improper vent termination
  - ☐ Requires inducer/extractor
  - ☒ Other: **Engineered Venting System by Partlan-Labodie.**

Make-up Air

- ☒ Complies with manufacturer's installation instructions
- ☐ Requires the following modifications:
  - ☐ Undersized; the minimum required size is
  - ☐ Damper interlock not functioning
  - ☐ Obstructed inlet
  - ☒ Other: **FYI: Direct Vent Fresh Air to a Common Box Assembly**

Gas Piping/Pressure

- ☒ Complies with manufacturer's installation instructions
- ☐ Requires the following modifications:
  - ☐ Gas pipe undersized; the minimum required size is
  - ☐ Gas pressure too low; the minimum pressure is
  - ☐ Gas pressure too high, the maximum pressure is
  - ☐ Gas vent lines not terminated outside building
  - ☐ Gas vent lines too small; correct size should be
  - ☐ Gas vent line/bleed lines combined – not allowed by fuel gas code
  - ☒ Other: FYI: Pressure a little high to start. Spring corrected and adjusted.

Water Piping/Pumping

☒ Complies with manufacturer's installation instructions
☐ Requires the following modifications:
- ☐ Pipe size too small; proper pipe size is
- ☐ Improper pump location; relocate to
- ☐ Improper piping arrangement; see attached drawing
- ☐ Other:

Equipment Access

☒ Complies with manufacturer's installation instructions
☐ Requires the following modifications:
- ☐ Improper clearance to combustibles
- ☐ Improper service access; minimum access required is inches
  - ☐ Front ☐ Right side ☐ Left Side ☐ Rear
- ☐ Other:

Electrical

☒ Complies with manufacturer's installation instructions
☐ Requires the following modifications:
- ☐ Inadequate voltage supply, proper voltage is
- ☐ Improper ground
- ☐ Inadequate circuit size, minimum circuit is amps
- ☐ Other:

Controls

☒ Complies with manufacturer's installation instructions
☐ Requires the following modifications:
- ☐ Improper sensor location
- ☐ Improper sensor wire used; correct wire is
- ☒ Other: FYI: TPC Control System

Enclosed you will find a copy of the startup form. Please forward a copy to the owner/engineer as required.

Respectfully,

James I. Turnquist
Performance Engineering Group, Inc.

Performance Engineering Group

Priority S1 P1 P2 P3

Raypak X-Therm Start-Up Form B-3

Job Name	Job Location	Date
Kirk in the Hills	1340 W. Long Lake RD Bloomfield hills, MI	6-21-13

Installer	Contact Person	Phone Number
western Mech	John Hamby	586-854-6198
Start-up Contractor	**Contact Person**	**Phone Number**
P.E.G.	Scott S	734-266-5300

Equipment Manufacturer	Model Number	Serial Number	Boiler Control Type	Application of Boiler
Ray Pak	H7-1505	12123500833	TPC	HTG

Condition of Equipment / Installation	What Type of Environment is Equipment In?	Is the Equipment Serviceable?
OK	Boiler Room	yes

Voltage Test
Hot to neutral | 123 | Hot to Ground | 123 | Neutral to Ground | 49mv

Make-up Air Size Available: Common Ducted — Location: wall — Are motorized dampers present? Yes ☐ No ☑

Mfg's Specs: ____ — Are Mfg's Specs met? Yes ☐ No ☐ — Has an end switch been installed? Yes ☐ No ☑

CONTROL SETTINGS
Auto Reset High Limit: 220 — Manual Reset High Limit: 240 — Tankstat Setpoint: NA — Heating Control Setpoint: TPC

GAS TYPE: Nat ☑ LP ☐ Other: ____

PRESSURE RELIEF VALVE: PSI 60 — Drip Leg Installed: yes — System Working Pressure: 40

BOILER OPERATION: Light ☐ Moderate ☐ Heavy ☑ Sudden Loads ☐

PRESSURE SETTINGS: Nat 10.5" max, Pro 13.0" max

Supply Gas (Static)	9.0 w.c.	Mfg's Spec	>4" min w.c.	Manifold Pressure	-1.4 w.c.	Mfg's Spec	+/- .2 w.c.
Supply Gas (Dynamic)	6.5 w.c.	Dirt Leg	yes	Blower Fan Pressure	-3.4 w.c.	Blower Amps	4.1 Amps Hi Fire

Blower Tracking Pressure: -.57 w.c.

SAFETY CONTROL TESTS (Check all that apply & NOTE SETTING)
Flow Switch ☑ — Ignition Control Lockout ☑ — Auto High Limit ☐ — Manual Reset High Limit ☑ — Low Gas Pressure Switch ☑ — High Gas Pressure Switch ☑

VENTING
Type: Metal Fab — Draft Inducer Model #: NA — If Used, Approximate Height: 23' + Elbows — Is Vent Pipe Reduced: Yes ☐ No ☑ — Size: 8"

Is the boiler gas train vented properly? Yes ☑ No ☐ — What is the location of the vent termination? wall — Type of Vent Cap: Angle cut

BOILER TEMPERATURE RISE
ΔT at Full Fire: 26 — Comments: Draft Reading -.048 (-.03 to -.09)

Does condensate line have neutralizer? Yes ☑ No ☐ — Has condensate line off of secondary heat exchanger been run to drain? Yes ☑ No ☐

EMISSION: (Analyzer readings)

CO_2	8.7 %	Mfg's Spec	8.5-9.0 (N) 9.5-10.0 (P) %	CO	46 PPM	Mfg's Spec	Less 100 PPM
Excess Air	35 %	Mfg's Spec	%	O_2	5.5 %	Mfg's Spec	%
NOx	PPM	Mfg's Spec	PPM	Flue Temperature	138 °F	Mfg's Spec	°F

BOILER PUMP

Manufacturer		HP		Amp Draw	6.63
Model		Voltage	110	Mfg. Amp Spec	7.0

Location: (Inlet) Outlet — (1Phase) 3Phase

INJECTION PUMP

Manufacturer		HP		Amp Draw	
Model		Voltage		Mfg. Amp Spec	

Location: Inlet Outlet — 1Phase 3Phase

SYSTEM PUMP

Manufacturer	Paco	HP		Amp Draw	
Model		Voltage		Mfg. Amp Spec	

Location: Inlet Outlet — 1Phase 3Phase

MISCELLANEOUS
Was a service manual present on the job site? Yes ☐ No ☐ — Was an owner representative present on startup? Yes ☐ No ☐ — Name: ____

Temp-tracker Settings Mode 2 — Blr Target ____ — DHW Target ____ — DHW Diff ____ — Blr Max ____ — Blr Min ____ — Dly 0:00 — Mass 1
Diff ____ — Mod Dly ____ — Pump Dly 3:00 — Degree (F°)

This equipment has been properly started and is operating satisfactorily at this time. Yes ☐ No ☐

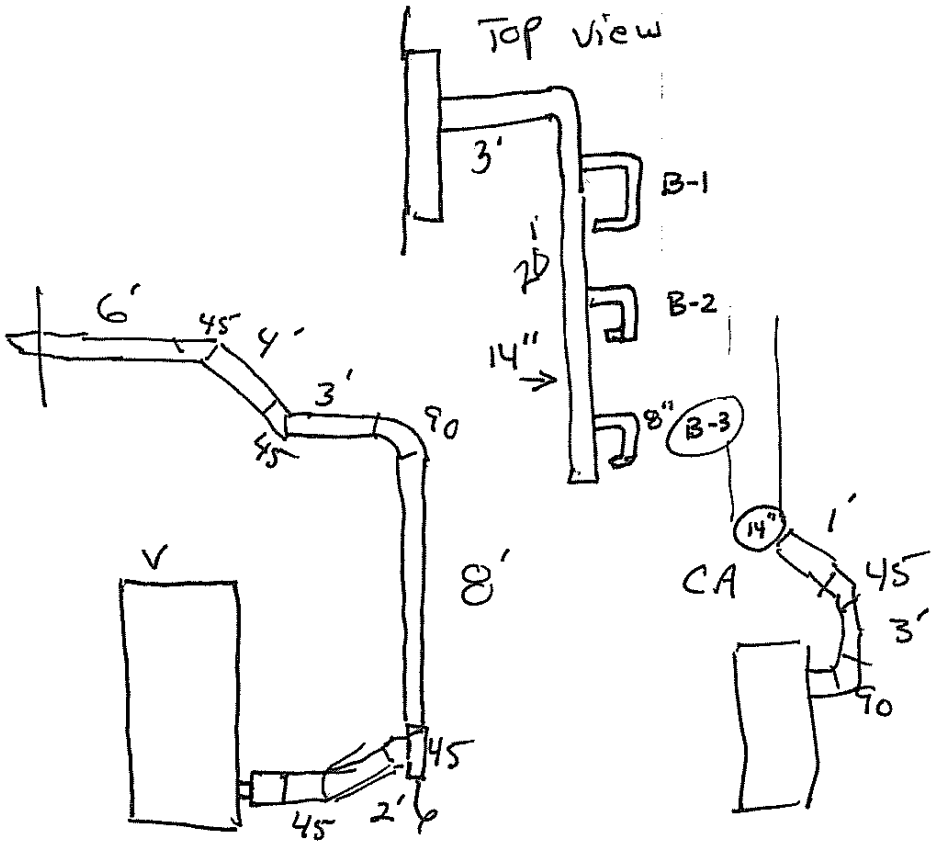
Technician's Signature X — Date — Owner/Rep's Signature X — Date

B-3

Performance Engineering Group
Raypak X-Therm Start-Up Form

HOW IS BOILER VENTED?

PLEASE SKETCH BOILER'S INSTALLED VENTING SYSTEM. ALSO, DOCUMENT VENT SIZE, VENT LENGTH INCLUDING ALL 45'S AND 90'S.
PLEASE NOTE ALL TERMINATION POINTS WITH CLEARANCES (INTAKE FROM EXHAUST, AND ALL OTHER CODE/MFG REQUIREMENTS).



Comments:

PLEASE NOTE ANYTHING & EVERYTHING WHICH DOES NOT MEET MANUFACTURER'S SPECIFICATIONS:

gas pressure 13.8 Reg all the way out. will have to change out spring. changed spring and set at 9.0.

Technician Scott Stevens Date 6-21-13 Customer [signature] Date

Start-Up will not be done, IF there is any major issue with Water Flow, Gas Supply or Venting.

TPI709

Date : 21/063
Time : 07:28

Fuel : Natural Gas

------- Report -------

CO(ppm) :	54
O2(%) :	5.0
CO2(%) :	9.0
Ratio(CO/CO2) :	0.0006
CO Air Free(ppm):	70
Excess Air(%) :	31
Net_Effi(%) :	99.4
Temp_CH1(F) :	111
Temp_CH2(F) :	Open

Smoke : 1 2 3 4 5

Customer : Kirkin the Hills

Address : B-2

Reading Accepted by :

07:29, 21/06/13

TPI709

Date : 21/06/13
Time : 06:56

Fuel : Natural Gas

------- Report -------

CO(ppm) :	50
O2(%) :	5.3
CO2(%) :	8.8
Ratio(CO/CO2) :	0.0005
CO Air Free(ppm):	67
Excess Air(%) :	33
Net_Effi(%) :	99.3
Temp_CH1(F) :	114
Temp_CH2(F) :	Open

Smoke : 1 2 3 4 5

Customer : Kirkin The Hills

Address : B-1

Reading Accepted by :

06:57, 21/06/13

TPI709

Date : 21/06/13
Time : 09:52

Fuel : Natural Gas

------- Report -------

CO(ppm) :	46
O2(%) :	5.5
CO2(%) :	8.7
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Smoke : 1 2 3 4 5

Customer : Kirkin The Hills

Address : B-3

Reading Accepted by :

09:53, 21/06/13

PERFORMANCE engineering group

Raypak • Ruud • thaw:PAK

Your Hot Water Supply Resource

June 25, 2013

Mr. John Hamby
Western Mechanical Contractors
jhamby@westernmech.com

Dear Mr. Hamby,

The start-up of the Raypak boilers and control system at the following location has been completed:

Kirk in the Hills Church – 1340 W. Long Lake Road – Bloomfield Hills, MI 48302

Model Number: H7-1505
Serial Number: 1212350083

The following areas were tested and reviewed:

Boiler installation

Venting

- ☒ Complies with manufacturer's installation instructions
- ☐ Requires the following modifications:
  - ☐ Too small; required size is
  - ☐ Exceeds recommended length; correct size for this length is inches
  - ☐ Exceeds allowable number of elbows; maximum amount is
  - ☐ Requires Barometric Damper
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  - ☒ **Other: Engineered Venting System by Partlan-Labodie.**

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Equipment Access

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Respectfully,

James I. Turnquist
Performance Engineering Group, Inc.