Job:

# MVB® - Type WH

## Water Heaters Models 504A-2004A

Engineer:

Contractor:

Prepared By:       Date:      ­­

Model:       Indoor/Outdoor:



83% to 83.3% Thermal Efficiency at full rate

100% Factory Fire-Tested

VERSA IC® Integrated Controller with 7” color touchscreen display

Raymote™ remote connectivity provided standard

On/Off Firing with Soft-Start ignition

Full Safety Diagnostics with History

Status Display Lights

Cascade up to 4 Heaters – No External Sequencer Needed

Modbus RTU BMS Port

CSA Low Lead Certified ≤.25% Lead

Maximum Outlet Water Temperature: 200°F

Maximum Tank Setpoint: 150°F

Minimum Acceptable Inlet Water Temperature: 120°F

flag%201Limited Five-Year Copper/Ten-Year Cupronickel Heat Exch. Warranty

Proudly Assembled in the USA

Ultra-Low NOx, Less than 20 PPM

#### Heat Exchanger

* Headers - Bronze
* ASME HLW Stamped  
  160 PSIG MAWP
* National Board Approved
* Fin Tubing

Copper – Standard

A-3 Cupronickel

* ASME Powder-Coated Tube Sheet
* Silicone High-Temp O-Rings
* ASME Pressure Relief Valve

125 PSIG – Standard

150 PSIG – Optional

* Temperature and Pressure Gauge,  
  Shipped Loose
* Four pass primary heat exchanger
* Stainless Steel Evaporator Plate

#### Control

* 120V, 60Hz, 1Ø, Power Supply
* 120/24V 60Hz Transformer
* VERSA IC® built-in controller
* 7” color HD touchscreen display
* Raymote Wi-Fi remote connectivity
* Cascade up to 4 Heaters
* Ignition Module

3-Try – Standard

C-6 Single-Try

* Remote Flame Sensor
* Freeze Protection
* High Limit, Manual Reset, Fixed, 200ºF
* On/Off Power Switch
* Flow Switch
* Blocked Vent Pressure Switch
* Programmable Pump Time Delays
* Pump Outputs
* Water Heater
* System – Pilot Duty

#### Control (cont.)

* Water Temperature Sensors (3)
* Cold Water Protection Function

Optional Variable-Speed Pump

* Modbus RTU BMS Port

B-85 BMS Gateway – BACnet MS/TP, BACnet IP, N2 Metasys or Modbus TCP

B-86 BMS Gateway – LonWorks

#### Burner

* Hot Surface Ignition (HSI)
* Radially-Fired Knitted Burner

#### Gas Train

* Fuel

Natural Gas

Propane (Minimum Grade HD-5)

* Dual-Seat Combination Firing Valve
* Manual Shut-Off Valve

#### Construction

* Indoor/Outdoor Construction
* Front Controls Enclosed
* PolyTuf Powder Coat Finish
* Rear Connections (Water, Electrical, Gas, Vent, Combustion Air)
* In-line Combustion Air Filter Kit
* Design Certified ANSI Z21.10.3/CSA 4.3
* CSA Low Lead Certified ≤.25% Lead

#### Venting

* Vent Termination

 D-11 Outdoor

D-15 Indoor, Horizontal

Indoor, Vertical (by others)

* Combustion Air

D-16 Air Intake Elbow

* Extractor – Optional

By others

Not required

#### Options

A-30 Air Vent, Auto, 150 PSI (loose)

F-10 Low Water Cut-Off, Remote Probe

I-1 High Limit, Auto Reset, Adj.,   
40-180°F

I-2 High Limit, Manual Reset, Adj., 100-200°F (additional)

P-   Pump:      HP, 120V, 1∅, 60Hz

Water Hardness:       GPG

Bronze

Loose  Mounted

P-   Cold Water Run

S-1 Low Gas Pressure Switch,   
Manual Reset

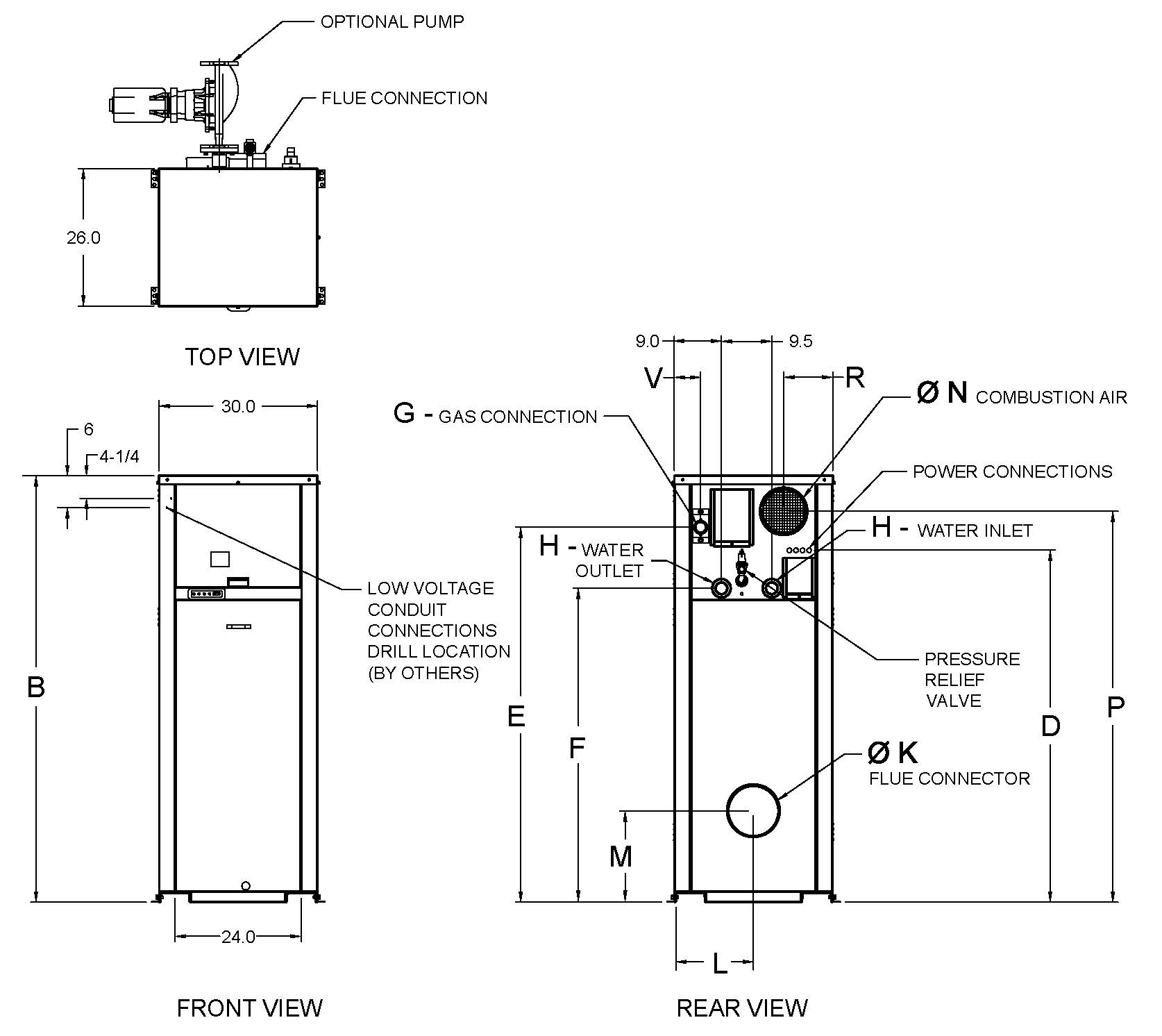
S-2 High Gas Pressure Switch, Manual Reset

Z-12 Condensate Treatment Kit

#### Additional Options or Accessories

MVB – Type WH

Models 504A-2004A Model



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model (WH1-)** | **MBTUH** | |  | **Dimensions (in.)** | | | | | | | | | | | | **Ship Weight**  **(Lbs.)** | **Foot- print**  **(Ft2)** | **Amps\*\*** |
| **B** | **D** | **E** | **F** | **G\*** | **H** | **K** | **L** | **M** | **N** | **P** | **R** | **V** |
| **Input** | **Output** | **Height** |  |  |  | **NPT** | **NPT** | **Flue Ø** |  |  | **C/A Ø** |  |  |  |
| 504A | 500 | 415 | 43 | 30 | 35 | 23-3/4 | 1 | 2 | 8 | 13-3/4 | 14-1/8 | 6 | 36 | 8 | 2 | 600 | 5.4 | 12 |
| 754A  Raypak, Inc. ▪ 2151 Eastman Avenue, Oxnard, CA 93030 ▪ (805) 278-5300 ▪ Fax (800) 872-9725 ▪ www.raypak.com | 750 | 623 | 49 | 36 | 41 | 29-3/4 | 1 | 2 | 10 | 13-1/2 | 16 | 6 | 42 | 8 | 2 | 670 | 5.4 | 12 |
| 1104A | 1045 | 870 | 55 | 43 | 47 | 35-3/4 | 1-1/4 | 2-1/2 | 10 | 13-1/2 | 16 | 6 | 49 | 8 | 2 | 720 | 5.4 | 12 |
| 1504A | 1425 | 1187 | 61 | 50 | 53 | 41-3/4 | 1-1/4 | 2-1/2 | 12 | 13-3/4 | 18-1/8 | 8 | 53 | 8 | 2 | 780 | 5.4 | 12 |
| 2004A | 1900 | 1583 | 75 | 61 | 65 | 53-3/4 | 2 | 2-1/2 | 14 | 13-1/2 | 20-1/8 | 8 | 69 | 9 | 5 | 940 | 5.4 | 18 |

|  |  |
| --- | --- |
| * 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. NO hardware changes required under 10,000 ft.   \* For Natural Gas. For Propane, all Sizes 1 NPT.  \*\* Current draw is for heater only. (Supply breaker must have delayed trip.) |  |

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Models 504A-2004A Model

**PUMP HP – AMPS\* CLEARANCES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Model (WH-1)** | **Water Hardness** | | |
| **Soft** | **Medium** | **Hard** |
| 504A | 1/4 – 6 | 1/4 – 6 | 3/4 - 11 |
| 754A | 1/4 – 6 | 1/2 – 7 | 3/4 - 11 |
| 1104A | 1/4 – 6 | 1/2 – 7 | 1 - 14 |
| 1504A | 1/2 – 7 | 1 - 14 | 1 - 14 |
| 2004A | 1 – 14 | 1 1/2 - 16 | 1 1/2 - 16 |

|  |  |  |
| --- | --- | --- |
|  | Certified Minimum | Recommended Service |
|  |
| Front | 24” | 24” |
| Rear | 12” | 24” |
| Right | 1” | 1” |
| Left | 1” | 1” |
| Top | 0” | 10” |
| Floor | 0” | 0” |
| Vent | 1” | 1” |

\*Current draw is for pump only

SHL includes 50ft of tubing each way (total 100 ft.).

\* Must use optional cupronickel heat exchanger.

\*\* If over 25 GPG, a water softener MUST be used.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Water Hardness** | | | | | | | | | | | | | | |
| **Soft** | | | | | **Medium** | | | | | **Hard\*** | | | | |
| **3-4 Grains Per Gallon** | | | | | **5-15 Grains Per Gallon** | | | | | **16-25 Grains Per Gallon\*\*** | | | | |
| **Model** | **ΔT**  **(ºF)** | **GPM** | **ΔP**  **(ft wc)** | **MTS**  **(in)** | **SHL**  **(ft wc)** | **ΔT**  **(ºF)** | **GPM** | **ΔP**  **(ft wc)** | **MTS**  **(in)** | **SHL**  **(ft wc)** | **ΔT**  **(ºF)** | **GPM** | **ΔP**  **(ft wc)** | **MTS**  **(in)** | **SHL**  **(ft wc)** |
| 504A | 17 | 50 | 3.6 | 2 | 8.3 | 17 | 50 | 3.6 | 2 | 8.3 | 9 | 95 | 10.4 | 2 | 25.7 |
| 754A | 25 | 50 | 4.0 | 2 | 8.7 | 17 | 73 | 7.8 | 2 | 17.3 | 14 | 90 | 11.4 | 2 | 25.3 |
| 1104A | 20 | 85 | 11.5 | 2-1/2 | 16.2 | 20 | 85 | 11.5 | 2-1/2 | 16.2 | 15 | 116 | 19.6 | 2-1/2 | 27.8 |
| 1504A | 25 | 94 | 18.4 | 2-1/2 | 24.0 | 23 | 105 | 22.5 | 2-1/2 | 29.3 | 21 | 115 | 26.5 | 2-1/2 | 34.6 |
| 2004A | 29 | 109 | 28.6 | 2-1/2 | 36.0 | 29 | 109 | 28.6 | 2-1/2 | 36.0 | 29 | 109 | 28.6 | 2-1/2 | 36.0 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Recovery Rates** | | | | | | | | | |
|  | **Temperature Rise (°F)** | | | | | | | | | |
|  | **20** | **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **110** |
| 504A | 2515 | 1677 | 1258 | 1006 | 838 | 719 | 629 | 559 | 503 | 457 |
| 754A | 3773 | 2515 | 1886 | 1509 | 1258 | 1078 | 943 | 838 | 755 | 686 |
| 1104A | 5226 | 3517 | 2638 | 2110 | 1759 | 1507 | 1319 | 1172 | 1055 | 959 |
| 1504A | 7194 | 4796 | 3597 | 2878 | 2398 | 2055 | 1799 | 1599 | 1439 | 1308 |
| 2004A | 9592 | 6395 | 4796 | 3837 | 3197 | 2741 | 2398 | 2132 | 1918 | 1744 |

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