Product Submittal for MVB®- Type WH Water Heaters

Models 504A-2004A

Date: _____ Job: _____ Location: _____

Equipment Tags: _____ Engineer: _____ Contractor: _____

Model: _____ Notes: _____

Prepared by: _____ Indoor ☐ Outdoor ☐ Gas Type: Natural Gas ☐ Propane ☐

85% 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 8 heaters – no external sequencer needed

Modbus RTU BMS port

CSA low-lead certified ≤ .25% lead

Maximum outlet water temperature: 200°F (93°C)

Maximum tank setpoint: 160°F (71°C)

Minimum acceptable inlet water temperature: 120°F (48°C)

Limited 20-year thermal shock warranty

Limited 5-year copper/10-year cupronickel heat exch. warranty

SCAQMD Rule 1146.2 certified, Low NOx < 20 ppm

Must be used with properly-sized storage tank for proper operation

Proudly assembled in the USA

HLW

Raypak® A Rheem® Company

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Features and Options

Heat Exchanger

- Headers bronze
- ASME HLW stamped 160 PSIG MAWP
- National board registered
- Fin tubing
  - ☐ Copper (standard)
  - ☐ A-3 cupronickel (optional)
- ASME Steel tube sheet
- Silicone high-temp. O-rings
- ASME pressure relief valve
  - ☐ 125 PSIG (standard)
  - ☐ 150 PSIG (optional)
- T&P gauge (shipped loose)
- Four-pass primary heat exchanger
- Stainless steel evaporator plate

Power

- 120V, 60Hz, 1Ø, power supply
- 120/24V, 60Hz, transformer

Control

- VERSA IC® built-in controller
- 7" color HD touchscreen display
- Raymote™ Wi-Fi remote connectivity
- Cascade up to 8 Heaters
- Cascade interstage delay settings
- Ignition module
  - ☐ 3-Try – (standard)
  - ☐ C-6 Single-try
- Remote flame sensor
- Freeze protection
- High limit, manual reset, fixed, 200°F (111°C)
- On/Off power switch
- Flow switch
- Blocked vent pressure switch
- Programmable pump time delays
- Pump outputs
  - Water heater
  - System – pilot duty
- Water temperature sensors 10KΩ (2 mtd, 1 loose, 1 well)
- Cold water protection function
  - ☐ Optional variable-speed pump
- Modbus RTU BMS port
  - ☐ B-85 Gateway – BACnet MS/TP, BACnet IP, N2 metasys or modbus TCP
  - ☐ B-86 BMS Gateway - LonWorks

Burner

- Radially-fired knitted burner
- Hot surface ignition (HSI)

Gas Train

- Dual-seat combination firing valve
- Manual shut-off valve
- Fuel
  - ☐ Natural gas
  - ☐ Propane gas (minimum grade HD-5)
- Dual-Seat combination firing valve
- Manual shut-off valve

Construction

- Indoor/outdoor construction
- Enclosed front controls
- 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 cap
  - ☐ D-11 Vent termination, outdoor
  - ☐ D-12 Barometric damper w/o thermoswitch (single acting)
  - ☐ D-15 Vent termination, sidewall (cat. III)
  - ☐ D-17 In-line air intake filter
  - ☐ D-18 Boiler vent adapter (cat. III/IV)
  - ☐ D-19 Vent termination cap adapter (cat. III/IV)
  - ☐ D-20 Vent termination vertical
  - ☐ D-23 Outdoor vent supports
  - ☐ D-37 Motorized combustion air damper

Options

- ☐ A-30 Air vent, auto, 150 PSI (loose)
- ☐ B-31 Tankstat well (TEKMAR control)
- ☐ E-5 Boiler alarm with 4" bell
- ☐ E-15 Boiler alarm with buzzer
- ☐ F-10 Low water cut-off, remote prober
- ☐ I-5 Manual reset high limit 200°F (93°C) max
- ☐ I-13 Auto reset high limit 200°F (93°C) max
- ☐ I-14 Auto reset high limit 180°F (82°C) max
- ☐ I-20 Manual reset high limit 180°F (82°C) max
- ☐ M-1 Safety valve, motorized
- ☐ M-10 Safety valve, solenoid
- ☐ M-15 Safety valve, vent (requires M-1 or M-10)
- ☐ P__ Pump:_____HP, 120V, 1Ø, 60Hz
  Water Hardness: _____ GPG
  - ☐ Bronze
  - ☐ Mounted ☐ Loose
- ☐ P-42 CWR controls, loose (with wire harness assy)
- ☐ P-43 CWR controls, loose (w/o wire harness assy)
- ☐ P-45/P-46 Injector pumps
- ☐ S-1 Low gas pressure switch, manual
- ☐ S-2 High gas pressure switch, manual
- ☐ Z-4 T & P relief valve
- ☐ Z-9 Thermometer

Additional options or accessories

☐ _____

Regulatory agency requirements

☐ G-15 CSD-1 field upgrade

TempTracker Mod+ Hybrid Multi-Unit Controller

- ☐ B-36 2-4 units
- ☐ B-37 5-10 units
- ☐ B-38 Controller multiple modulation (temp tracker mod+ hybrid) (11 to 16 units)
- ☐ B-39 EMS 4-20 mA remote setpoint interface*
- ☐ B-62 BACNET interface module* (*requires B-36 - B-38)

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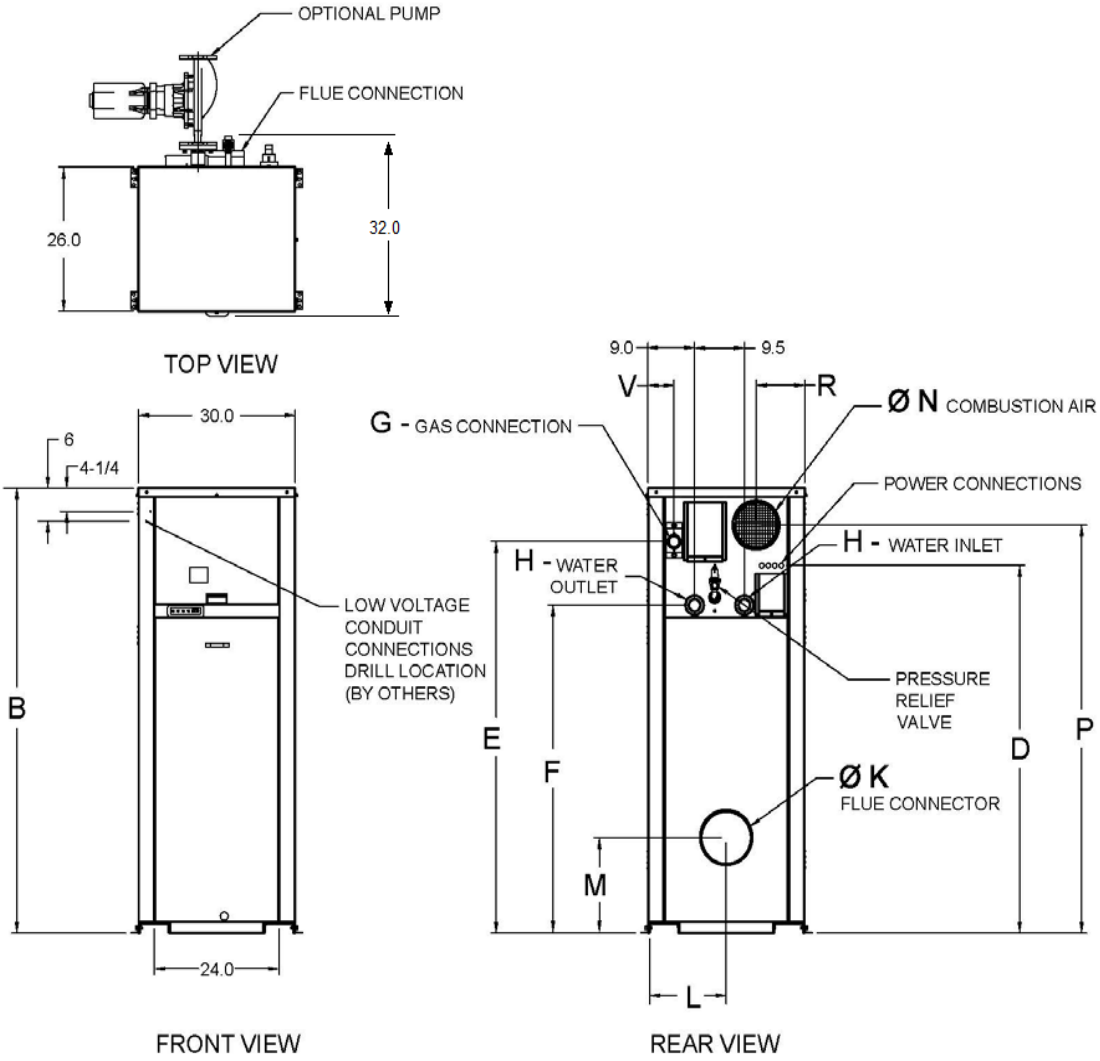

SPECIFICATIONS																		
Model	MBTUH (Kw)		Dimensions in (mm)													Ship Weight lbs. (Kg)	Foot-print ft² (m²)	Amps[2]
	Input	Output	B Height	D	E	F	G[1] NPT	H NPT	K Flue Ø	L	M	N C/A Ø	P	R	V			
☐ 504A	500 (147)	415 (122)	43 1/2 (1105)	30-3/4 (781)	35 (889)	23-3/4 (603)	1 (25)	2 (51)	8 (203)	13-3/4 (349)	14-1/4 (362)	6 (152)	36-3/4 (933)	8-1/4 (210)	2 (51)	600 (272.1)	5.4 (1)	12
☐ 754A	750 (220)	623 (183)	49 (1245)	36-3/4 (933)	40-3/4 (1035)	29-1/2 (749)	1 (25)	2 (51)	10 (254)	13-1/2 (343)	14-1/4 (362)	6 (152)	42-1/2 (1080)	8-1/4 (210)	2 (51)	670 (303.9)	5.4 (1)	12
☐ 1104A	1045 (306)	870 (255)	55 (1397)	43-3/4 (1111)	46-3/4 (1187)	35-1/2 (902)	1 1/4 (32)	2-1/2 (64)	10 (254)	13-1/2 (343)	14-1/4 (362)	6 (152)	48-1/2 (1232)	8-1/4 (210)	2 (51)	720 (326.5)	5.4 (1)	12
☐ 1504A	1425 (418)	1187 (348)	61 (1549)	50-3/4 (1289)	53 (1346)	41-3/4 (1060)	1 1/4 (32)	2-1/2 (64)	12 (305)	13-3/4 (349)	17-1/4 (438)	8 (203)	54-3/4 (1391)	8-1/4 (210)	2 (51)	780 (353.7)	5.4 (1)	12
☐ 2004A	1900 (557)	1583 (464)	75 (1905)	61 (1549)	65 (1651)	53-3/4 (1365)	2 (51)	2-1/2 (64)	14 (356)	13-1/2 (343)	20 (508)	8 (203)	68-1/2 (1740)	9-1/4 (235)	5 (127)	940 (426.3)	5.4 (1)	18

(1) For natural gas. For propane, all sizes are 1" NPT.
(2) Current draw is for heater only. (Supply breaker must have delayed trip).
- Ratings shown are for elevations up to 4,500 ft. De-rated above 4,500 ft; consult factory. No hardware changes required below 10,000 ft.
NOTE: Must be used with properly-sized storage tank for proper operation.

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Water Hardness															
Model	☐ Soft					☐ Medium					☐ Hard(1)				
	3-4 Grains Per Gallon					5-15 Grains Per Gallon					16-25 Grains Per Gallon				
	ΔT °F (°C)	GPM (L/min)	ΔP (FT WC)	MTS in (mm)	SHL (FT WC)	ΔT °F (°C)	GPM (L/min)	ΔP (FT WC)	MTS in (mm)	SHL (FT WC)	ΔT °F (°C)	GPM (L/min)	ΔP (FT WC)	MTS in (mm)	SHL (FT WC)
☐ 504A	17 (9.4)	50 (190)	3.6	2 (51)	8.3	17 (9.4)	50 (190)	3.6	2 (51)	8.3	9 (5.0)	95 (360)	10.4	2 (51)	25.7
☐ 754A	26 (14.4)	50 (190)	4.0	2 (51)	8.7	17 (9.4)	73 (277)	7.8	2 (51)	17.3	14 (7.7)	90 (341)	11.4	2 (51)	25.3
☐ 1104A	21 (11.6)	85 (322)	11.5	2-1/2 (64)	16.2	21 (11.6)	85 (322)	11.5	2-1/2 (64)	16.2	15 (8.3)	116 (440)	19.6	2-1/2 (64)	27.8
☐ 1504A	29 (16.1)	94 (356)	18.4	2-1/2 (64)	24	24 (13.3)	105 (398)	22.5	2-1/2 (64)	29.3	22 (12.2)	115 (436)	26.5	2-1/2 (64)	34.6
☐ 2004A	29 (16.1)	117 (443)	32.6	2-1/2 (64)	40.9	29 (16.1)	117.2 (444)	32.6	2-1/2 (64)	40.9	29 (16.1)	117 (443)	32.6	2-1/2 (64)	40.9

SHL= System head loss, ft (based on heater and tank connections of no more than 100 eq. ft. of tubing) includes 50ft of tubing each way (total 100 ft.).

Caution: For scale free operation with "Hard Water" (16-25 grains per gallon of total hardness), the operating control must NOT be set higher than 130°F. For higher than 130°F operation, a water softener/treatment system must be utilized.
(1) Must use optional cupronickel heat exchanger.
(2) If over 25 GPG, a water softener MUST be used.
Care should be given to prevent over-softening of the water as over-softened water can become aggressive. Cupronickel tubes are recommended for water softened below 5 grains per gallon.

Model	Recovery Rates GPH (L/H)									
	Temperature Rise									
	20°F	30°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F
☐ 504A	2515 (9520)	1677 (6348)	1258 (4762)	1006 (3808)	838 (3172)	719 (2722)	629 (2381)	559 (2116)	503 (1904)	457 (1730)
☐ 754A	3773 (14282)	2515 (9520)	1886 (7139)	1509 (5712)	1258 (4762)	1078 (4081)	943 (3570)	838 (3172)	755 (2858)	686 (2597)
☐ 1104A	5226 (19783)	3517 (13313)	2638 (9986)	2110 (7987)	1759 (6659)	1507 (5705)	1319 (4993)	1172 (4437)	1055 (3994)	959 (3630)
☐ 1504A	7194 (27232)	4796 (18155)	3597 (13616)	2878 (10894)	2398 (9077)	2055 (7779)	1799 (6810)	1599 (6053)	1439 (5447)	1308 (4951)
☐ 2004A	9592 (36310)	6395 (24208)	4796 (18155)	3837 (14525)	3197 (12102)	2741 (10376)	2398 (9077)	2132 (8070)	1918 (7260)	1744 (6602)

CLEARANCES in. (mm)		
Heater Side	Minimum Clearances from Combustible Surfaces in. (mm)	Minimum Service Clearance in. (mm)
Front	Open	24 (610)
Rear	12 (305)	24 (610)
Right Side	1 (25)	1 (25)
Left Side	1 (25)	1 (25)
Top	Unobstructed	10 (254)
Floor	0	0
Vent	1 (25)	1 (25)

PUMP HP – AMPS*			
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	3/4 – 11	1 – 14	1 – 14