SEATTLE PORTLAND EUGENE SALT LAKE CITY

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ENGINEERING AND ENERGY+ARCHITECTURAL CONSULTING

Work Release Center HVAC Replacement
Substitution Request Transmittal 01

DATE:	01/23/2015
TO:	Brandon Crossley, Camber Schlag, Larry Tilford
COMPANY:	Marion County
FROM:	Galen Ohmart / Grant Bowers
CC:	Tanesha Hyde
RE:	Substitution Request - Architect/Engineer's review comments

Specified Item: 230000_2.01 High Efficiency Gas Fired Water Heater
Proposed Substitution: Hamilton EVO Model HWD1499
Submitted By: Terry Cairns, Columbia Hydronics

In proposing this substitution request, the Contractor takes responsibility for the following changes, and any other changes or additions to the project, caused by the proposed substitution:

1. Larger hole and larger vent
2. Increased gas size
3. Higher voltage and revised electrical requirements

- End of memorandum -

SECTION 01 6410

SUBSTITUTION REQUEST FORM

TO: SOLARC Engineering and Energy + Architectural Consulting
Attn: Tanesha Hyde: tanesha@solarc-ae.net
CC: Galen Ohmart: galen@solarc-ae.net
CC: Brandon Crossley: bcrossley@co.marion.or.us

PROJECT: Marion County Work Release Center HVAC Replacement
4000 Aumsville Hwy
Salem, Oregon

SPECIFIED ITEM: 223000 (Section) 2.01 (Paragraph) High efficiency gas fired water heater (Description)

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: Hamilton EVO Model HWD1499

Attached data includes product descriptions, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identification of applicable data portions.

Attached data also includes description of changes to Contract Documents and proposed substitution requires for proper installation.

The undersigned certifies following items, unless modified by attachments, are correct:

1. Proposed substitution does not affect dimensions shown on drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing, and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts available locally or readily obtainable for proposed substitution.

Undersigned further certifies function, appearance, and quality of proposed substitution are equivalent to or superior to specified item.

Submitted by: Terry Cairns	For use by Architect / Engineer for recommendation: ☐ Approved ☑ Approved as noted ☐ Not Approved ☐ Received too late
Signature: Terry Cairns	By: GSB Date: 1/22/15
Firm: Columbia Hydronics Co	Comments: * (see below)
Address: 11100 NE 34th Circle Vancouver WA 98682	For use by Marion County Project Manager for final decision: ☒ Approved ☐ Approved as noted ☐ Not Approved ☐ Received too late
Date: 1.21.15	By: BC Date: 1/29/15
Tel: 360-449-8340 Fax: 360.604.5087	Comments: See engineers (GSB) comments below
Attachments:	

* - Verify adequate gas service
- Verify efficiency at performance point
- Provide power engineering and modifications for 208V service
- Provide venting and combustion air as required for substitution
- Verify acceptability of no prior approval with Owner.

Hamilton Engineering, Inc.
Innovative Hot Water Solutions
800.968.5530 • www.hamiltonengineering.com

Hamilton EVO Submittal

Water Heater
Models HWD 1499 /1999

Model: HWD1499 Input: 1499000 Unit Tag: DHWH-1

100% Factory Fire Tested
Efficiency: Up to 99.8% (based on incoming water)
Maximum Outlet Temperature: 200°F
Thermal Shock Proof Heat Exchanger
10 Year Limited Heat Exchanger Warranty
18 Month Parts Warranty
Modulating Stainless Steel Burner
10:1 Turndown Ratio
Self Diagnostic microprocessor controls
Blocked flue/blocked condensate pressure switch

EVO™

1,499,999
1,999,999

Heat Exchanger

- ASME H Stamped
- ASME Inspected and Stamped for 160 PSIG Max Working Pressure
- National Board Registered
- 316L Stainless Construction
- Rolled & Formed in a Helical Pattern
- Headers - Welded 316L Stainless

ASME Pressure Relief Valve

☐ 125 PSI standard
☐ _____ PSI Special applications, not to exceed 150 PSI
- Rear Water Connections
- Rear Exhaust & Inlet Air Connections
- Internal Automatic Air Vent

CSA Design Certified – ETL Listed

☐ Gas Water Heaters Volume III
ANSI Z21.10.3 / CSA 4.1-2004

☐ Hot Water Supply Boiler
ANSI Z21.13 / Z21.13A / CSA 4.9-2004

Controls

- 208-240V, 1ϕ Power Supply 50/60 Cycle
- Direct Spark Ignition w/ Integrated Flame Sensor
- Modulating Digital Control System
- High Limit Control, Manual Reset
  - ☐ 198° F - Standard
  - ☐ 155° F - Low Temp
  - ☐ 210° F - High Temp
- Front Mounted On/Off Power Switch
- Flow Switch
- Blocked Vent/Condensate Pressure Switch
- Exact Elevation Match To 9,000 Feet with No De-Rate
- Cascade Control Board and software

Gas Train

- Manual Gas Shut-Off Valve(s)
- Negative Pressure Gas Valve(s)
- Fuel – Field Adjustable w/ No Parts
  - ☐ Natural Gas
  - ☐ Propane Gas
- CSD-1

Burner

- 316L Stainless Steel Premix
- Ultra-Low NO_x: Less than 13 PPM, adjusted for 3% O_2

Construction

- Indoor Construction
- Front Controls
- Modular Cabinet
- Rear Water Connections
- Rear Exhaust & Inlet Air Connections
- Automatic Air Vent

Venting System Information

- Vent Termination
  - ☐ PVC
  - ☐ CPVC
  - ☐ Stainless Steel
- Direction of Termination
  - ☐ Vertical
    Estimated Vertical Height: ____ft
  - ☐ Horizontal

Certified Seismic Rated Mounting Legs

Optional Controls

☐ Low Water Cut Off
☐ Open Therm Communication
☐ Gateway Communication-BMS
  - ☐ LON
  - ☐ BACnet
  - ☐ Modbus

Options

☐ Certified System - UL 795
Model Number_____
(includes all items listed below)

☐ Stainless Pump _____,
220V, 1ϕ, 60Hz
Note: pumps are sized and supplied by factory as standard, providing 15% additional head for system connection piping.

☐ Condensate Neutralizer / Drain
(highly recommended for all systems)

☐ Electrical Panel w/ Service Disconnects

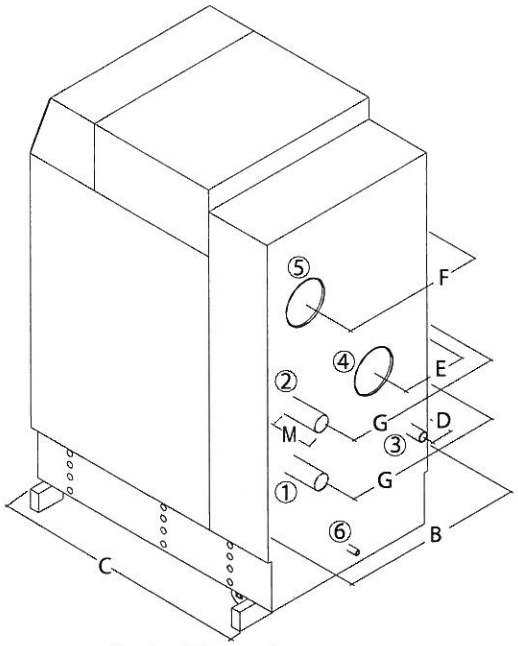
☐ Common Gas Manifold

☐ Pre-Plumbed Piping Manifold

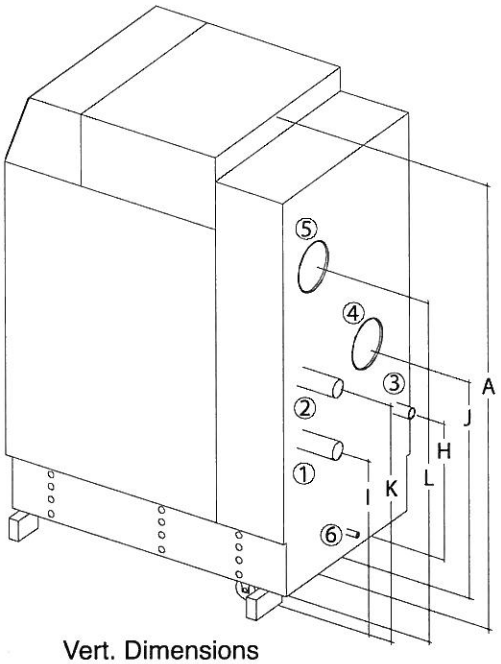
☐ Expansion Tank _____ - _____PSI

All models comply with A S M E boiler code

Hamilton EVO
Models 1499 / 1999



Horiz. Dimensions



Vert. Dimensions

Model	A	B	C	D	E	F	G	H	I	J	K	L	M
1499	66"	29"	43"	3.75"	10.5"	18.5"	25"	22"	27.25"	32"	37"	47.5"	6.25"
1999	66"	29"	43"	3.75"	10.5"	18.5"	25"	22"	27.25"	32"	37"	47.5"	6.25"

1. Inlet water connection - 2.5" MPT
2. Outlet water connection - 2.5" MPT
3. Gas inlet - 1.5" MPT - HW 1499, 2" MPT - HW 1999
4. Exhaust - 7"
5. Inlet air - 7"
6. Condensate outlet - 3/4" hose

Model	Input BTU/hr	Water Heater* Output BTU/hr	Boiler** Output BTU/hr	GPH Recovery @ 100 FΔT	GPH Recovery @ 80 FΔT	GPH Recovery @ 60 FΔT	Water Flow Rate & Pressure Drop DHW†	Heating††	Shipping Weight
HWD 1499	1,500,000	up to 1,455,000	up to 1,425,000	1,748	2,183	2,911	92.5@22'	61.6@8.6'	900 lbs.
HWD 1999	1,999,999	up to 1,940,000	up to 1,900,000	2,328	2,912	3,880	123.2@22'	82.2@8.6'	1100 lbs.

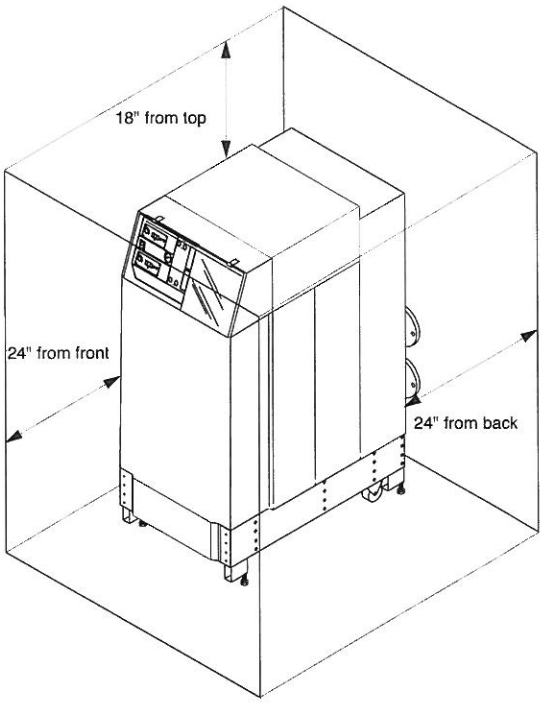
• Rates shown are for natural or propane gas, elevations up to 9,000 feet

† Individual appliance piping pressure drop used in the tables is based on 20 feet of straight pipe, 6 elbows, 2 tees, 2 full port ball valves and 2 unions
†† Heating flows should only be used if there is certainty that the water/system is clean

* At 97% thermal efficiency with 86°F incoming water to heat exchanger
** At 95% thermal efficiency with 140°F incoming water to heat exchanger

All recovery rates based on domestic water heating
Dimensions are approximate. Please consult the factory before installation
Maximum amperage draw at 230 volts single phase is less than 15 amps

RECOMMENDED SERVICE CLEARANCES



The EVO is rated at zero clearance to combustibles.

WATER PIPING MANIFOLD FOR EVO PRODUCTS

Water Heater				
Model	Single	Double	Triple	Quad
1499	3"	4"	6"	6"
1999	3"	6"	6"	8"

VENTING THE EVO

Please note: You MUST confirm local codes as related to venting materials, required markings, etc. Parts of Canada have very specific vent material requirements.

Model	Vent Diameter	Standard Vent Type	Optional Vent Type	Minimum Combined Vent Length	Maximum Combined Length*
HWD 1499	7"	Stainless	Plastic	6" + (2) 90° elbows	130'
HWD 1999	7"	Stainless	Plastic	6" + (2) 90° elbows	40'

**after supplied tee and elbow*

Note: For concrete construction or to meet certain fire codes, exhaust and inlet piping at the wall penetration to the EVO must be CPVC Schedule 40 or 80 or Stainless. The balance from the penetrated wall to the outside may be PVC Schedule 40 or 80.

ELECTRICAL CHARACTERISTICS FOR EVO PRODUCTS

240 Volt Power Supply			
Model	Amps/unit	Water Heater Pump	Total amps Water Heater
HWD 1499	3.42	5.96	9.38
HWD 1999	3.42	10.1	13.52

ELECTRICAL REQUIREMENTS AND CONNECTIONS

The electrical requirements are for standard 208-240 volts, 50/60 hz 30 amp service. This unit is wired with #18 awg and internally fused for no more than 3.15 amps.

The standard supplied pumps are all 208-240 volt, 60 cycle and are wired to terminals on the appliance, specific to boiler (P1) or heater (P3).

A. Connect main power supply here - 208-240 volts, single phase, 20 amp.

B. Connect pump here - Switched output maximum 1 HP, 208 - 240 volt.

C. Connect indirect hot water pump, pump relay, or three way valve here - Output 208 - 240 volts, maximum 550 watts, maximum connected load.

D. Connect output to heat distribution pumps here - allows for priority when utilizing "C" above for indirect hot water, maximum 550 watts maximum *total connected load.*

E. 118-119 - Connect optional low water cut off to terminals
120-121 - Standard water flow switch, factory connected to terminals

F. 26-27 - Connection of the outdoor sensor used with outdoor reset, 10K ohm.
28-29 - Connection of a 10K ohm sensor that will be located in the storage tank, common piping, or low loss header *(required for proper temperature sensing and accurate control - lead only)*
30-31 - Connect external building management system control with 0 -10 VDC output

G. 57-58 - Connection of an external heat enabled thermostat or switch (jumper from factory)
59-60 - Connect 10K ohm sensor for sensing indirect tank water temperature (optional connection of an aquastat with loss of modulation).
61-62 - Connect cascade wiring if 2 or more units are providing common heat load (shielded cable, polarity sensitive).

H. 91-92 - Low voltage power supply to be switched through terminals 93-96, *upper burner only.*
93-94 - Switched power in the event of cascade being 100% of capacity (used to bring on additional heat source).
95-96 - Switched power in the event of any hard lockout

I. 122-123 - Low voltage power supply to be switched through terminals 124-127, *lower burner only.*
124-125 - Switched power in the event of cascade being at 100% of capacity (used to bring on additional heat source).
126-127 - Switched power in the event of any hard lockout