

Job: \_\_\_\_\_  
 Engineer: \_\_\_\_\_  
 Contractor: \_\_\_\_\_  
 Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Model: \_\_\_\_\_ Input: \_\_\_\_\_ Unit Tag: \_\_\_\_\_



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

## Hamilton EVO Submittal

**Hot Water Boiler**

Models HWH 299 / 399 / 599

### 100% Factory Fire Tested

**Efficiency: Up to 99.8% (based on incoming water)**

**Maximum Outlet Temperature: 210°F**

**Thermal Shock Proof Heat Exchanger**

**15 Year Limited Heat Exchanger Warranty**

**18 Month Parts Warranty**

**Modulating Stainless Steel Burner**

**5:1 Turndown Ratio**

**Self Diagnostic microprocessor controls**

**Blocked flue/blocked condensate pressure switch**

**Common venting on multiple units**



**EVO™**

300,000

399,999

630,000

### 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

- ☐ 50 PSI standard
- ☐ \_\_\_\_\_ PSI Special applications, not to exceed 150 PSI

### CSA Design Certified – ETL Listed

- ☐ Hot Water 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
  - ☐ 212° 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

### Gas Train

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

### Burner

- 316L Stainless Steel Premix
- Ultra-Low NO<sub>x</sub>: Less than 13 PPM, adjusted for 3% O<sub>2</sub>

### Construction

- Indoor Construction
- Front Controls
- Stainless Steel Front Cover
- Top Exhaust & Inlet Air Connections
- Bottom Water, Electrical, Gas and Drain Connections
- Air Vent

### Venting System Information

- Vent Termination
  - ☐ PVC
  - ☐ CPVC
  - ☐ Stainless Steel
- Direction of Termination
  - ☐ Vertical  
Estimated Vertical Height: \_\_\_\_\_ ft
  - ☐ Horizontal

### Certified Seismic Rated Mounting Rack

- ☐ Free Standing
- ☐ Wall Standing

### Optional Controls

- ☐ Cascade Boards (required on common vented systems)
- ☐ Low Water Cut Off
- ☐ Open Therm Communication

- ☐ Gateway Communication-BMS
  - ☐ LON
  - ☐ BACnet
  - ☐ Modbus
- ☐ CSD-1 (599 only)

### Options

- ☐ Certified System - UL 795  
Model Number \_\_\_\_\_  
(includes all items listed below plus Certified Seismic Rated Mounting Rack)

- ☐ Cast Iron Bronze-fitted Boiler Pump Package \_\_\_\_\_, 220V, 1Φ, 60Hz  
*Note: pumps are sized and supplied by factory as standard, providing 15% additional head for system connection piping.*

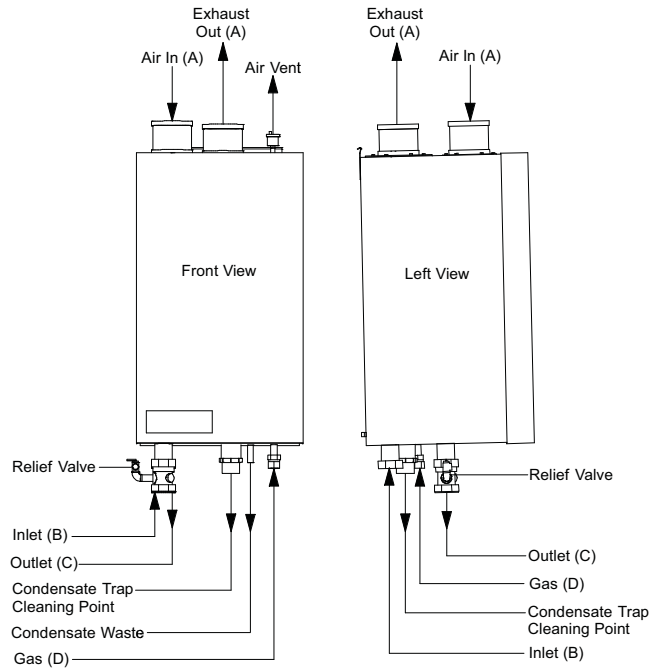
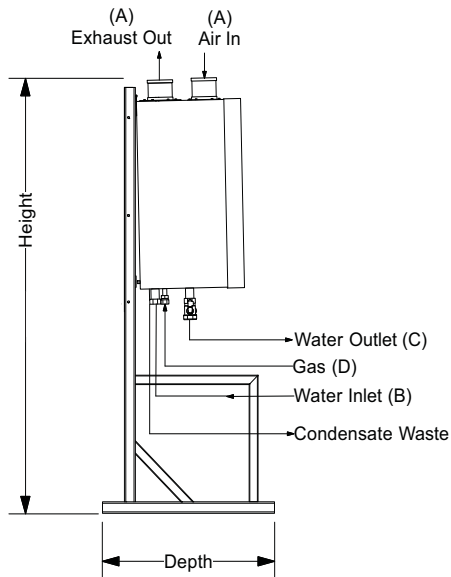
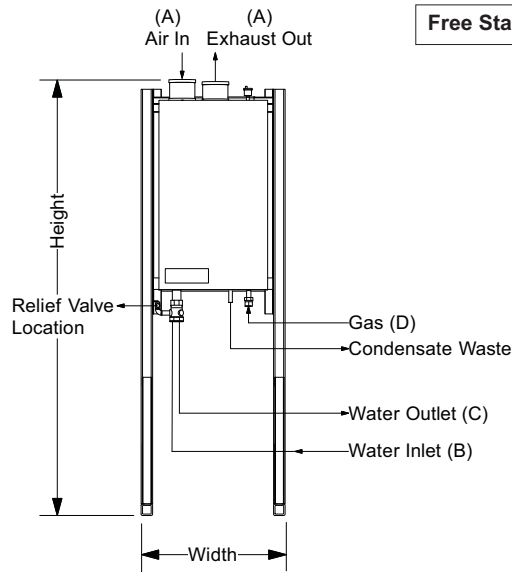


- ☐ Common Venting Manifold (only with all appliances providing same load)  
Diameter: \_\_\_\_\_"
- ☐ Condensate Neutralizer / Drain (highly recommended for all systems)
- ☐ Electrical Panel w/ Service Disconnects
- ☐ Common Gas Manifold
- ☐ Pre-Plumbed Piping Manifold
- ☐ Expansion Tank \_\_\_\_\_ - \_\_\_\_\_ PSI



All models comply with A S M E boiler code





Boiler Mounted On Rack								Boiler Only							
Model	Width	Height	Depth	A	B	C	D	Model	Width	Height	Depth	A	B	C	D
299	25"	74"	28.625"	4"	1.5"	1.5"	0.75"	299	19"	33"	19"	4"	1.5"	1.5"	0.75"
399	25"	74"	28.625"	4"	2"	2"	0.75"	399	19"	33"	19"	4"	2"	2"	0.75"
599	25"	74"	34.5"	5"	2"	2"	1"	599	19"	35"	26.5"	5"	2"	2"	1"

Model	Input BTU/hr	Boiler** Output BTU/hr	GPH Recovery @ 100°FΔT	GPH Recovery @ 80°FΔT	GPH Recovery @ 60°FΔT	Water Flow Rate & Pressure Drop (Heating)	Shipping Weight
HWH 299	300,000	up to 285,000	360	450	600	11.0@9.3'	111 lbs.
HWH 399	399,999	up to 379,999	466	582	776	17.6@8.5'	194 lbs.
HWH 599	630,000	up to 598,500	734	917	1223	26.4@9.4'	234 lbs.

• Rates shown are for natural or propane gas, and 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

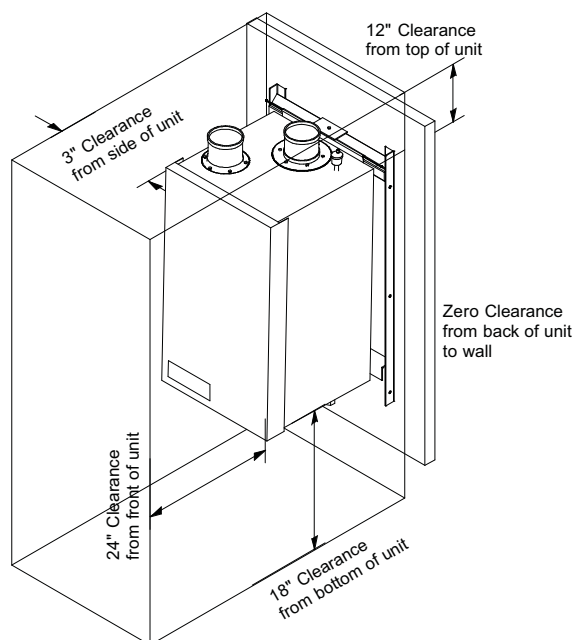
\*\* At 95% thermal efficiency with 140°F incoming water to heat exchanger

• 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 6.3 amps

## RECOMMENDED SERVICE CLEARANCES



The EVO is rated at zero clearance to combustibles.

## WATER PIPING MANIFOLD FOR EVO PRODUCTS

Model	Minimum Manifold Pipe Size			
	Single	Double	Triple	Quad
HWH 299	1.5"	1.5"	2"	2"
HWH 399	1.5"	2"	2"	2.5"
HWH 599	1.5"	2"	2.5"	3"

## 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
HWH 299	4"	Plastic	Stainless	6" + (2) 90° elbows	225'
HWH 399	4"	Plastic	Stainless	6" + (2) 90° elbows	180'
HWH 599	5"	Stainless	Plastic - 6"*	6" + (2) 90° elbows	200'

*\*The use of 6" PVC will require the purchase of a special adapter from Hamilton Engineering, Inc.*

*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

208 Volt Power Supply			
Model	Amps/unit	Boiler Pump	Total amps Boiler
HWH 299	1.15	.89	2.04
HWH 399	1.15	1.19	2.34
HWH 599	1.15	1.89	3.04

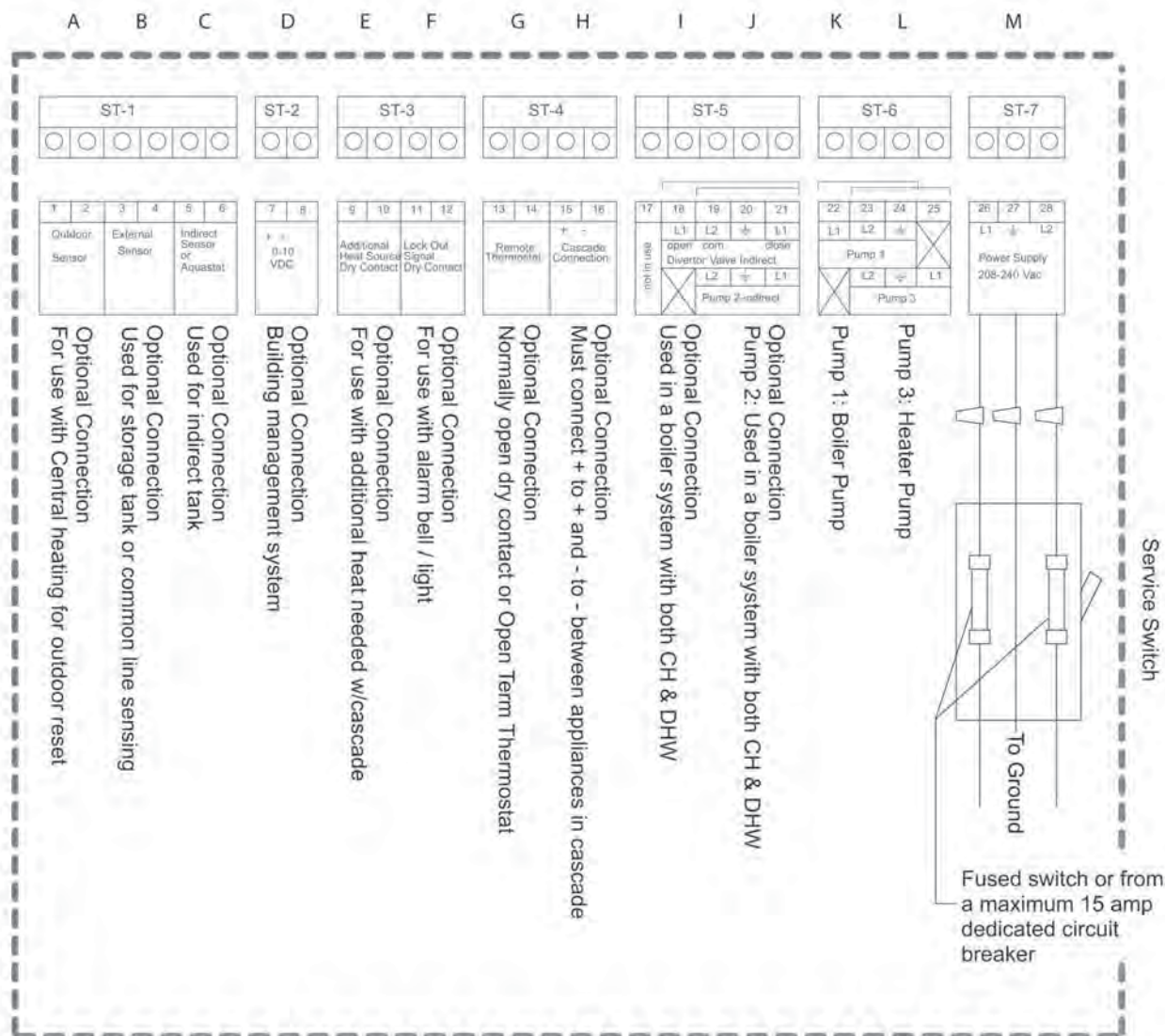
240 Volt Power Supply			
Model	Amps/unit	Boiler Pump	Total amps Boiler
HWH 299	1.0	.77	1.77
HWH 399	1.0	1.03	2.03
HWH 599	1.0	1.63	2.63

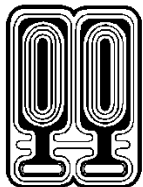
## ELECTRICAL REQUIREMENTS AND CONNECTIONS

The electrical requirements are for standard 208-240 volts, 50/60 hz 15 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 heater.

- A. Outdoor Sensor - outdoor air sensor, set point will adjust based on outdoor air temperature (not needed if 0-10 VDC output is connected)
- B. External sensor connection - system temperature sensor, senses water temp in a heating loop.
- C. Indirect Tank Sensor - Sensor for indirect DHW. An aquastat may also be connected here.
- D. 0-10 VDC - connect a 0-10 VDC output here to vary set point temperature.
- E. Additional Heat Source - dry contacts that will close a thermostat on an extra boiler if the cascade system is at 100% of capacity.
- F. Lock Out Signal - alarm bell or light may be connected here to indicate that the boiler is a hard lockout.
- G. Remote Thermostat - normally jumped. A room thermostat may be connected here to enable/disable the boiler.
- H. Cascade Connection - communication cables get connected here and "daisy chained" to all boilers in a cascade. This is polarity sensitive.
- I. 3- Way Diverter Valve - Used in a boiler system with both Heating and Indirect Hot Water.
- J. P2 - Pump for indirect. Used in a boiler system with both Heating and Indirect Hot Water.
- K. P1 - Wire to primary pump for boilers.
- L. P3 - Wire to system pump for boilers.
- M. Power Supply - connect 208 - 240 VAC single phase power supply here.





SINCE 1908  
**wessels**  
company

SUBMITTAL

**NLA-SERIES**

HYDRONIC EXPANSION TANKS

Models: NLA- 35 thru NLA-800L

Submittal Sheet No. A-1010A

Date: 2/12

Job Name _____	Submitted By _____	Date _____
Location _____	Approved By _____	Date _____
_____	Order No. _____	Date _____
Engineer _____	Notes _____	
Contractor _____	_____	
Sales Rep. _____	_____	

### Description

Wessels NLA Tanks are ASME removable bladder type pre-charged expansion tanks. They are designed to absorb the expansion forces and control the pressure in heating/cooling systems. The system's expanded water (fully compatible with water/glycol mixtures) is contained in a full acceptance heavy-duty butyl bladder that prevents tank corrosion and waterlogging problems. All NLA expansion tanks can be installed vertically or horizontally.

### Construction

Shell: Carbon Steel  
Bladder: Heavy Duty Butyl  
System Connection: Carbon Steel

### Performance Limitations

Maximum Design Temperature: 240°F  
Maximum Design Pressure: 125 PSIG\*

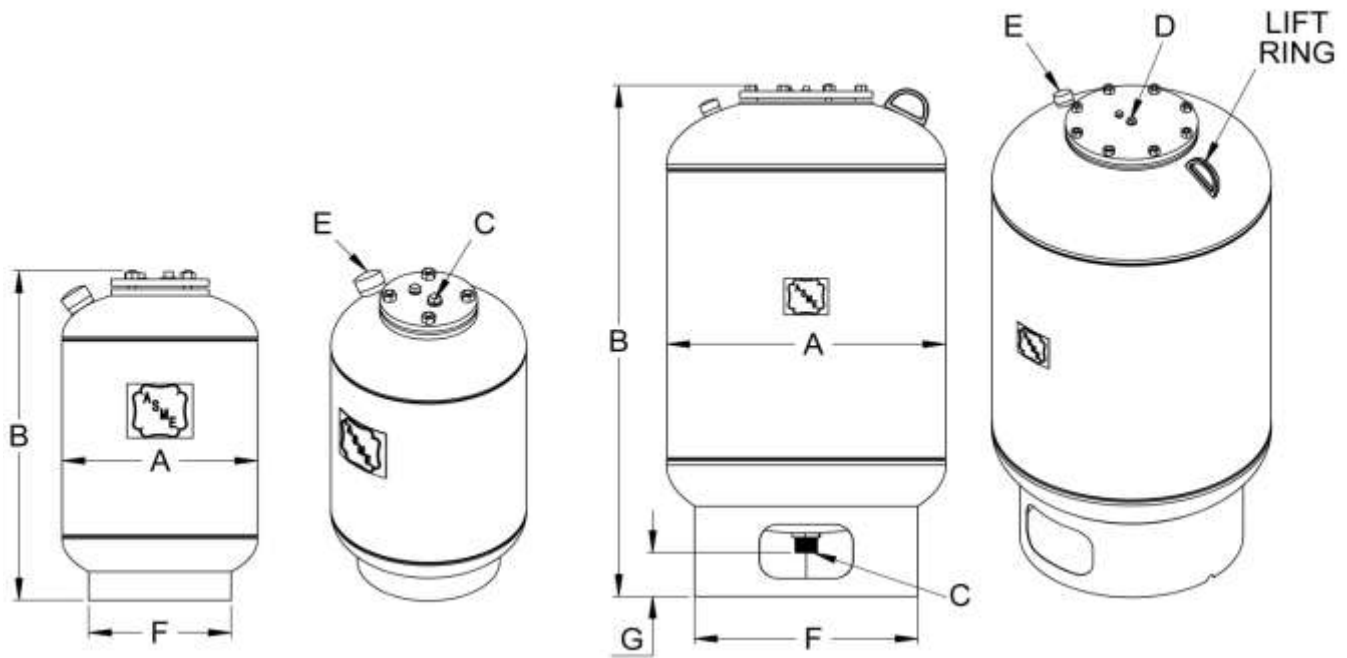
\*200 & 250 PSIG available

Model Number	Part Number	Tank Volume (Gallons)	Tagging Information	Quantity
NLA-35	22010035	10		
NLA-50	22010050	13		
NLA-85	22010085	23		
NLA-130	22010130	35		
NLA-200	22010200	53		
NLA-300	22010300	79		
NLA-400	22010400	106		
NLA-500	22010500	132		
NLA-600	22010500	158		
NLA-800L	22010805	211		

### Typical Specification

Furnish and install, as shown on plans, a \_\_\_\_\_ gallon \_\_\_\_\_" diameter X \_\_\_\_\_" (high) pre-charged steel expansion tank with heavy-duty butyl bladder. The tank shall have NPT system connections and a 0.302"-32 charging valve connection (standard tire valve) to facilitate the on-site charging of the tank to meet system requirements. The tank must be constructed in accordance with most recent addendum of Section VIII Division 1 of the ASME Boiler and Pressure Vessel Code.

Each tank shall be Wessels model number NLA-\_\_\_\_\_ or approved equal.



NLA-35 and NLA-50

NLA-85 thru NLA-800L

### Dimensions & Weights

Model Number	Dimensions in Inches							Approx. Ship Wt. (lbs)	
	A	B	System Connection		Charging Valve	F	G		
			C	D	E				
NLA-35	12	23 1/2	3/4	-	0.302" - 32NC	10	-	40	
NLA-50	14	24		-		10	-	50	
NLA-85	16	37	1	1/2		12	5 1/2	90	
NLA-130	20					16		125	
NLA-200	24	43	1 1/2	3/4		20	5 1/4	210	
NLA-300		55						225	
NLA-400	30	49				24		300	
NLA-500		57							335
NLA-600		65							360
NLA-800L	32	76							28

### Notes

- Tanks are factory pre-charged at 12 psi and field adjustable.
- California code-sight glass is available upon request.
- Both top and bottom connections (C and D) access the bladder.
- Available with mounting clips.