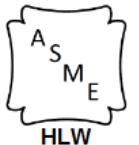




### Job Name

<b>Boiler</b>	<b>Location</b>	
	<b>Engineer</b>	
	<b>Tag</b>	
	<b>Model</b>	
	<b>Input (KBtu/h)</b>	
	<b>Output (KBtu/h)</b>	
	<b>Fuel</b>	
	<b>Voltage</b>	
<b>Notes</b>		



The **Valiant FT** is a condensing, forced draft appliance, designed for use with a hydronic heating system at working pressures up to 80 PSI. The boiler will automatically modulate to provide heat outputs between 100% and down to 10% of maximum design. Modulation rate is determined by the built-in digital control according to current load demands. The control also offers setpoint control with adjustable hysteresis, outdoor reset supply, temperature scheduling, cascade management (including lead-lag operation and automatic lead boiler rotation for up to 64 units), control for the boiler, system and DHW circulators, and integration with a Building Automation System (BAS).

The **Valiant FT** utilizes premix combustion, providing a homogeneous air and gas mixture to a radial burner incorporating a knitted metal fiber mesh of stainless steel alloy construction. Fuel input is controlled by a one-to-one air/gas ratio gas valve. The operation of the blower generates a pressure change that varies according to the current fan speed and combustion air density. The gas control valve uses this pressure change to modulate the fuel side input, ensuring air and gas are metered in precise proportion (1:1 ratio) across the entire range of modulation. This allows the combustion characteristics which determine efficiency to stay within ideal operational parameters, automatically adjusting to changes in combustion air density due to seasonal temperature differences or altitude, providing an “inherent O2 trim” correction, to maintain the desired combustion settings.

**Performance Overview:**

- Capable of up to 95% AFUE for models VA0080 to VA0299 and up to 97% combustion and thermal efficiency for model VA0399.
- Available in a broad capacity range, with inputs from 80 to 399 KBtu/h.
- Fully condensing vertical cylindrical counter-flow firetube design heat exchanger, with 439 grade stainless steel construction and all welded design with constant allowable system return temperatures of 40F.
- Cylindrical Heat exchangers encompassing 36 tubes (VA0080 – VA0110), 56 tubes (VA0155), 91 tubes (VA0199 – VA0250), 126 tubes (VA0299), and 147 tubes (VA0399).

- 7:1 (VA0080) and 10:1 (VA0110 -VA0399) gas input turn-down ratio with sustained combustion characteristics throughout the entire range.
- NOx < 20 ppm corrected to 3% oxygen (Pending Approval).
- Category IV venting.
- Fully factory fire-tested to obtain optimum combustion characteristics and to establish certified gas input rates.
- Safety and operating devices and controls fully configured, calibrated and factory tested.
- Complies with the energy efficiency requirements of the latest edition of the ASHRAE 90.1 Standard.
- Certified By CSA to the Requirements of ANSI Z21.13, And CSA 4.9.
- Wall or Floor Mount Option on Every Appliance.

**Heat Exchanger**

- ASME Section IV Welded Stainless Steel Heat Exchanger
- VA0080 to VA0150 - 30PSI Operating Pressure
- VA0199 to VA0399 - 80PSI Operating Pressure
- 50°F to 200°F Supply Temperature Range
- The heat exchanger shall be manufactured of SA240-S43932

**Combustion Features**

- Sealed Combustion
- Modulating Stainless Steel knitted metal fiber Premix Burner
- Venturi Air/Gas Ratio Combustion Control
- “Inherent O2 Trim” Via Air Density Response
- Low NOx
- Natural Gas or Propane Fuel Operation (Field Convertible)
- Input gas pressure is 4.0”-10.5” W.C. for Natural Gas and 8”-13” W.C. for Propane.
- Up to 10:1 Turndown (Natural Gas)
- 5:1 Turndown (Propane)
- Category IV Venting (up to 200’ Combined Flue & Air Intake)
- Approved for Thermoplastic Venting (PVC, CPVC, PPE)
- Direct Vent (Sealed Combustion)
- Direct Ignition
- Flame Sensor
- Flame view port for visual inspection of ignition and/or the boiler combustion during firing.

**Standard Safeties**

- High & Low Gas Pressure Switch (Optional)
- High & Low Air Pressure Switches (Blocked Air Intake & Blocked Flue Switch)
- High Temperature Limit

**Standard Control Features**

- Externally mounted 7” Touchscreen for user control and an internally mounted Digital Screen for start-up and service.
- Graphic representation of firing rate.
- System Temperature Sensor
- Outlet Temperature Sensor
- Flue Temperature Sensor
- Enable/Disable Relay
- High Gas Pressure Switch (Included in CSD-1)
- Manual Reset High Limit (Included in CSD-1)
- Outdoor Reset Sensor
- Manual Reset Low Water Cut-off (Included in CSD-1)
- Alarm Contacts
- Pump Enable Contacts
- Air Inlet Damper (or Damper Contacts)
- BAS Gateway
  - BACnet MS/TP or BACnet IP
  - LonWorks
  - Metasys N2

- PWM (pulse width modulation) signal output for modulating fan speeds.
- 0-10VDC Analog Setpoint Demand
- 0-10VDC Modulation Rate Control
- Native Modbus Communication
- Cascade Management for up to 64 Boilers
- Lead-Lag Staging and Auto-Lead Rotation
- Inlet/Outlet/System Temperature Control
- Flame Signal Monitoring
- ΔT Heat Exchanger Protection Algorithm
- Available Domestic Tank Sensor
- Adjustable; Target Temp; Inter-stage Differential; Inter-stage Delay; Anti-Short Cycle
- Display Run Hours
- Flame Failure Signal.
- Molex Connectors for Ease of Service.
- Error Message Display In Text
- Error History w/ Cycle Stamp
- Manual Override Of Boiler Modulation Rate

**Pressure Relief Valve (Select One)**

- 30 PSI
- 45 PSI
- 50 PSI
- 60 PSI
- 75 PSI
- 80 PSI

**Venting Options**

- PVC for low temperature applications
- CPVC
- Duravent PPE
- AL29-4C Stainless Steel

The following guideline shall be used to determine the suitability of vent material:

Vent Material	Maximum Flue Temperature (°F)
PVC	149
CPVC	194
Polypropylene	230
AL29-4C	300+, limited only by rating of seals
316L Stainless Steel	300+, limited only by rating of seals

**Voltage**

- 120VAC/1PH



# Valiant-FT® Series

Engineering Submittal Sheet  
Hydronic Heating Boiler: VA(H)0080 to VA(H)0399

## Approx. Heat Exchanger Head Loss and Flow

		Model Size													
		80,000		110,000		155,000		199,000		250,000		299,000		399,000	
		GPM	ft-hd	GPM	ft-hd	GPM	ft-hd	GPM	ft-hd	GPM	ft-hd	GPM	ft-hd	GPM	ft-hd
Temperature Differential (ΔT)	10	15.19	4.69	20.88	8.26	29.43	18.25	37.78	9.45	47.46	14.60	56.76	11.14	75.75	17.90
	15	10.13	2.41	13.92	4.03	19.62	8.44	25.19	4.44	31.64	7.06	37.84	5.56	50.50	8.26
	20	7.59	1.66	10.44	2.56	14.71	4.99	18.89	2.69	23.73	4.32	28.38	3.23	37.87	4.91
	25	6.08	1.27	8.35	1.69	11.77	3.27	15.11	1.85	18.98	2.98	22.71	2.39	30.30	3.29
	30	5.06	0.98	6.96	1.44	9.81	2.45	12.59	1.45	15.82	2.30	18.92	1.62	25.25	2.45
	35	4.34	0.86	5.97	1.19	8.41	1.99	10.79	1.15	13.56	1.86	16.22	1.32	21.64	1.95
	40	3.80	0.64	5.22	0.94	7.36	1.70	9.44	1.00	11.87	1.55	14.19	1.13	18.94	1.60
	45	3.38	0.62	4.64	0.79	6.54	1.44	8.40	0.84	10.55	1.38	12.61	0.98	16.83	1.35
	50	3.04	0.60	4.18	0.80	5.89	1.21	7.56	0.70	9.49	1.28	11.35	0.90	15.15	1.16
	55	2.76	0.58	3.80	0.64	5.35	1.06	6.87	0.67	8.63	1.19	10.32	0.81	13.77	1.00
	60	2.53	0.57	3.48	0.63	4.90	0.94	6.30	0.64	7.91	1.06	9.46	0.77	12.62	0.97
	65	2.34		3.21	0.59	4.53	0.87	5.81	0.60	7.30	1.01	8.73	0.72	11.65	0.89
	70	2.17		2.98	0.57	4.20	0.79	5.40	0.58	6.78	0.93	8.11	0.68	10.82	0.83
	75	2.03		2.78	0.52	3.92	0.73	5.04	0.54	6.33	0.91	7.57	0.65	10.10	0.77
80	1.90		2.61	0.51	3.68	0.69	4.72	0.53	5.93	0.87	7.10	0.62	9.47	0.73	

## Input / Output / High altitude

Model	Max Input Btu/hr (kw)	Max Output Btu/hr (kw)	Max Input > 2000 ft Btu/hr (kw)	Max Output > 2000 ft Btu/hr (kw)	Min input Btu/hr (kw)	Min Input > 2000 ft Btu/hr (kw)
VA0080	80,000 (23.4)	76,000 (22.2)	72,000 (21.1)	68,400 (20.0)	11,000 (3.2)	9,900 (2.9)
VA0110	110,000 (32.2)	104,500 (30.6)	99,000 (29.0)	94,050 (27.5)	11,000 (3.2)	9,900 (2.9)
VA0155	155,000 (45.4)	147,250 (43.1)	139,500 (40.8)	132,525 (38.8)	15,500 (4.54)	13,950 (4.0)
VA0199	199,000 (58.3)	189,050 (55.4)	179,100 (52.4)	170,145 (49.8)	19,900 (5.8)	17,910 (5.2)
VA0250	250,000 (73.2)	237,500 (69.6)	225,000 (65.9)	213,750 (62.6)	25,000 (7.3)	22,500 (6.5)
VA0299	299,000 (87.6)	284,050 (83.2)	269,100 (78.8)	255,645 (74.9)	29,900 (8.7)	26,910 (7.8)
VA0399	399,000 (116.9)	379,050 (111.0)	359,100 (105.2)	341,145 (99.9)	39,900 (11.6)	35,910 (10.5)

## Minimum Power Requirements

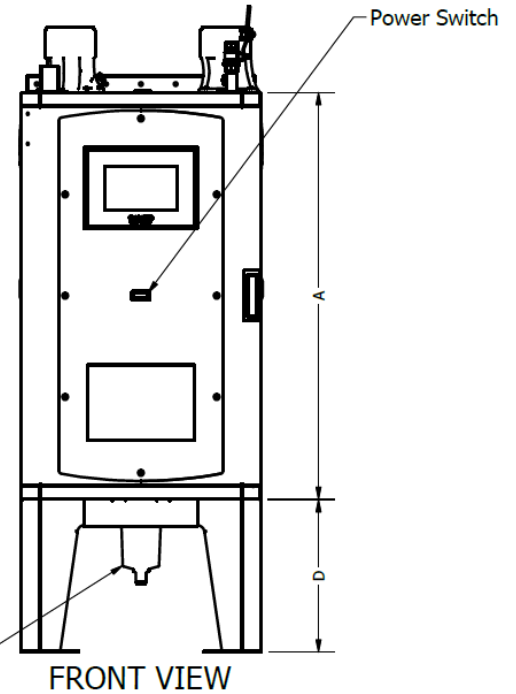
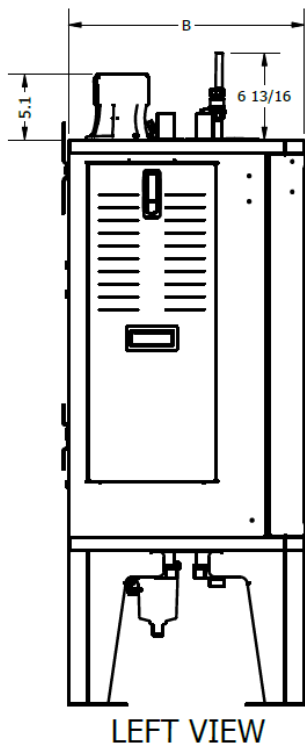
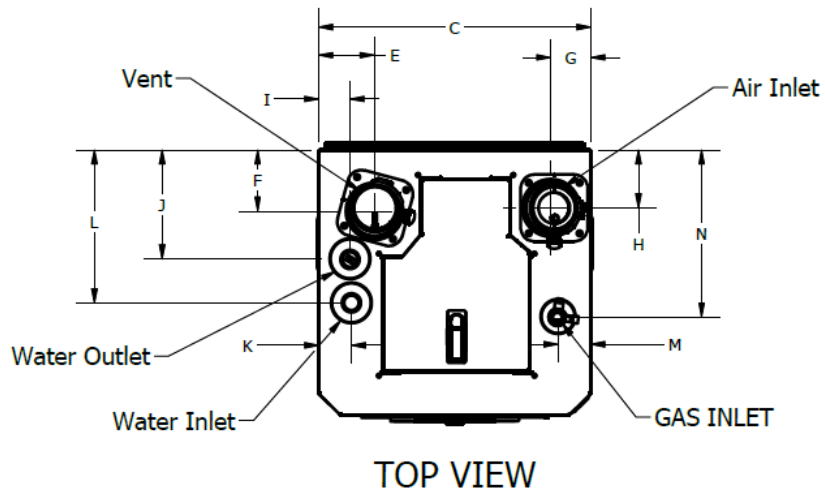
Model	Voltage Requirement	Full Load Amps	Maximum Over Protection
VA0080	115VAC, 60Hz, Single Phase	4	15
VA0110	115VAC, 60Hz, Single Phase	4	15
VA0155	115VAC, 60Hz, Single Phase	4	15
VA0199	115VAC, 60Hz, Single Phase	4	15
VA0250	115VAC, 60Hz, Single Phase	4	15
VA0299	115VAC, 60Hz, Single Phase	4	15
VA0399	115VAC, 60Hz, Single Phase	4	15

**Approx. Shipping Weights**

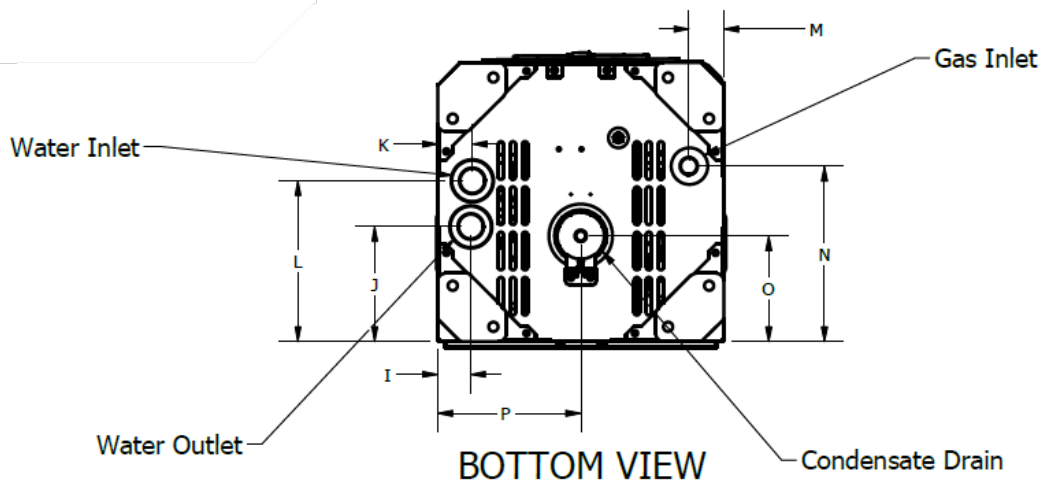
Model	Weight lb. (kg)
VA0080	130 (60)
VA0110	130 (60)
VA0155	170 (77)
VA0199	200 (90)
VA0250	200 (90)
VA0299	240 (109)
VA0399	250 (113)

**Recommended Service Clearance**

Model	Top	Right	Left	Back	Front
VA0080	12" (30cm)	None	None	None	24" (70cm)
VA0110	12" (30cm)	None	None	None	24" (70cm)
VA0155	12" (30cm)	None	None	None	24" (70cm)
VA0199	12" (30cm)	None	None	None	24" (70cm)
VA0250	12" (30cm)	None	None	None	24" (70cm)
VA0299	12" (30cm)	None	None	None	24" (70cm)
VA0399	12" (30cm)	None	None </td <td>None</td> <td>24" (70cm)</td>	None	24" (70cm)



Condensate Drain



Model	80	110	155	199	250	299	399
"A" in. (mm)	32 (813)	32 (813)	32 (813)	33 1/2 (851)	33 1/2 (851)	35 1/2 (902)	35 1/2 (902)
"B" in. (mm)	18 1/2 (470)	18 1/2 (470)	18 1/2 (470)	18 1/2 (470)	18 1/2 (470)	21 (533)	21 (533)
"C" in. (mm)	19 (483)	19 (483)	19 (483)	21 (533)	21 (533)	23 (584)	23 (584)
"D" in. (mm)	12 (305)	12 (305)	12 (305)	12 (305)	12 (305)	12 (305)	12 (305)
"E" in. (mm)	3 7/8 (98)	3 7/8 (98)	3 15/16 (100)	4 1/4 (108)	4 1/4 (108)	4 15/16 (125)	4 15/16 (125)
"F" in. (mm)	4 1/4 (108)	4 1/4 (108)	2 1/2 (63)	2 7/8 (73)	2 7/8 (73)	4 7/16 (113)	4 7/16 (113)
"G" in. (mm)	2 13/16 (71)	2 13/16 (71)	2 11/16 (68)	2 7/16 (62)	2 7/16 (62)	3 5/16 (84)	3 5/16 (84)
"H" in. (mm)	4 1/16 (103)	4 1/16 (103)	4 1/16 (103)	3 1/16 (78)	3 1/16 (78)	2 3/4 (70)	2 3/4 (70)
"I" in. (mm)	2 3/16 (56)	2 3/16 (56)	1 15/16 (49)	2 3/8 (60)	2 3/8 (60)	2 15/16 (75)	2 15/16 (75)
"J" in. (mm)	7 5/8 (194)	7 5/8 (194)	7 5/8 (194)	7 1/2 (190)	7 1/2 (190)	9 1/6 (233)	9 1/6 (233)
"K" in. (mm)	2 5/16 (59)	2 5/16 (59)	2 3/16 (56)	2 3/8 (60)	2 3/8 (60)	2 15/16 (59)	2 15/16 (59)
"L" in. (mm)	10 11/16 (271)	10 11/16 (271)	10 3/4 (273)	11 3/16 (284)	11 3/16 (284)	13 5/16 (338)	13 5/16 (338)
"M" in. (mm)	2 5/16 (59)	2 5/16 (59)	2 3/16 (56)	2 (51)	2 (51)	3 9/16 (90)	3 9/16 (90)
"N" in. (mm)	11 11/16 (297)	11 11/16 (297)	11 9/16 (294)	12 1/8 (308)	12 1/8 (308)	14 5/8 (371)	14 5/8 (371)
"O" in. (mm)	7 (178)	7 (178)	7 (178)	7 9/16 (192)	7 9/16 (192)	9 1/16 (230)	9 1/16 (230)
"P" in. (mm)	9 1/2 (241)	9 1/2 (241)	9 1/2 (241)	11 1/2 (292)	11 1/2 (292)	13 1/2 (343)	13 1/2 (343)
Water Conn. in. NPT	1	1	1	1 1/4	1 1/4	1 1/2	1 1/2
Gas Conn. in. NPT	1/2	1/2	1/2	1/2	3/4	3/4	3/4

Model No.: \_\_\_\_\_ No. of Units: \_\_\_\_\_ Type of Gas: \_\_\_\_\_  
 Total Input: \_\_\_\_\_ BTU/hr Total Output: \_\_\_\_\_ BTU/hr  
 Flow: \_\_\_\_\_ USGPM @ Allowable Pressure Drop \_\_\_\_\_ ft.  
 Optional Accessories: \_\_\_\_\_