Date: ______________________ Engineer: ______________________
Job: ______________________ Contractor: ______________________
Model #: ______________________ End User: ______________________
Representative: ______________________ Prepared By: ______________________

VALIANT-FT SERIES II

Condensing Boiler – Hydronic Heating

The Valiant-FT Series II is a condensing, commercial boiler, designed for use with a hydronic heating system at working pressures up to 160 PSI.

- ANSI Z21.13/CSA 4.9 Certified
- ASME Certified; "H" Stamp / National Board Listed
- Canadian Registration Number (CRN)
- CSD-1 Compliant
- AHRI Certified

Performance Overview:

- Capable of up to 99.4% Thermal Efficiency and up to 99.2% Combustion Efficiency.
- Available in a broad capacity range, with inputs from 400 to 850 KBtu/h.
- Fully condensing vertical cylindrical counter-flow firetube design heat exchanger, with stainless steel construction and all welded design allowing constant system return temperatures as low as 40F°.
- 10:1 gas input turn-down ratio with sustained combustion characteristics throughout the entire range.
- NOx < 9 ppm corrected to 3% oxygen (Pending Approval).
- Category II & 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.

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Heat Exchanger

- ASME Section IV Welded Stainless-Steel Heat Exchanger
- VA0400 to VA0850 – 160 PSI Operating Pressure
- 50°F to 208°F Supply Temperature Range
- Fully welded construction with stainless steel pressure vessel, tubes, tube sheets and combustion chamber
- ASME Relief Valve
- Drain valve

Combustion Features

- Direct Vent (Sealed Combustion)
- Standard Air Filter for combustion air
- Modulating Stainless Steel knitted metal fiber Premix Burner
- Venturi Air/Gas Ratio Combustion Control
- "Inherent O2 Trim" Via Air Density Response
- Low NOx (SCAQMD Pending)
- Natural Gas or Propane Fuel Operation (Field Convertible)
- Input gas pressure is 4"-14" W.C. for Natural Gas (5" W.C. min gas pressure for NG VA0500); and 8"-14" W.C. for Propane.
- 10:1 Turndown for NG (5:1 for LP)
- Category II Venting
- Category IV Venting (120' Flue & 120' Air Intake vent)
- Approved for Thermoplastic Venting (PVC, CPVC, PPE)
- Direct Ignition
- Flame Sensor
- Optional UV flame detection
- Flame view port for visual inspection of ignition and/or the boiler combustion during firing.

Standard Safeties

- Air Pressure Switch
- Blocked Flue Switch
- Water Flow Switch
- High & Low Air Pressure Switches (Blocked Air Intake & Blocked Flue Switch)
- Manual Reset High Temperature Limit
- ΔT heat exchanger protection algorithm

Standard Control Features

- Externally mounted 7" Touchscreen
- System Temperature Sensor
- Inlet & Outlet Temperature Sensors
- Flue Temperature Sensor
- Local/Remote switch for building management, remote modulation and set-point control
- Built-in audible alarm
- SOLA Controller featuring cascade controls lead lag up to 8 boilers
- Manual Reset Soft High Limit (through touchscreen)
- Outdoor Reset
- Alarm Contacts
- Pump Enable Contacts
- Air Inlet Damper (or Damper Contacts)
- PWM (pulse width modulation) signal output for modulating fan speeds.
- Native Modbus Communication
- Lead-Lag Staging
- Flame Signal Monitoring
- Error History w/ Cycle Stamp
- Manual Override of Boiler Modulation Rate

Optional Features

- CSD-1
- Motorized isolation valves
- Condensate neutralization kit
- BMS gateway – BACnet MSTP/IP, LonWorks or Metasys N2
- Outdoor installation kit (Consult Factory)
- Outdoor sensor
- Outdoor vent kit (Consult Factory)
- High & Low Gas Pressure Switch
- Optional Low Water Cut-Off w/manual reset
- Spring return air inlet damper with wire harness
- Vent adapter to Stainless Steel

Venting Options

- Category II and IV venting
- Direct venting
- Standard PVC/CPVC flue vent connection
- Room air
- Horizontal & vertical venting
- Outdoor venting (Consult Factory)

Venting Materials

- PVC
- CPVC
- 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

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Approx. Heat Exchanger Head Loss and Flow

		Model Size									
		400,000		500,000		600,000		725,000		850,000	
		GPM	ft-hd	GPM	ft-hd	GPM	ft-hd	GPM	ft-hd	GPM	ft-hd
Temperature Differential (ΔT)	20	39.00	3.50	49.00	4.80	59.00	4.40	71.00	4.90	83.00	5.70
	30	26.00	2.80	33.00	3.40	39.00	3.20	47.00	3.50	55.00	3.90
	40	20.00	2.50	24.00	2.90	29.00	2.80	35.00	3.00	41.00	3.30
	60	13.00	2.40	16.00	2.50	20.00	2.50	24.00	2.70	28.00	2.80
	80	10.00	2.30	12.00	2.40	15.00	2.30	18.00	2.60	21.00	2.60

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) [NG]	Min Input > 2000 ft Btu/hr (kw) [NG]	Min input Btu/hr (kw) [LP]	Min Input > 2000 ft Btu/hr (kw) [LP]
VA0400	400,000 (117.2)	396,400 (116.2)	360,000 (105.5)	356,760 (104.5)	40000 (11.5)	35,676 (10.4)	80,000 (23.4)	72,000 (21.1)
VA0500	500,000 (146.5)	496,000 (145.3)	450,000 (131.9)	446,400 (130.8)	50000 (14.3)	44,640 (13.0)	100,000 (29.3)	90,000 (26.3)
VA0600	600,000 (175.8)	595,200 (174.4)	540,000 (158.2)	535,680 (157.0)	60000 (17.2)	53,568 (15.7)	120,000 (35.2)	108,000 (31.6)
VA0725	725,000 (212.4)	719,925 (211.0)	652,500 (191.2)	647,932 (189.9)	72500 (20.7)	64,793 (18.9)	145,000 (42.5)	130,500 (38.2)
VA0850	850,000 (249.1)	844,900 (247.6)	765,000 (224.1)	760,410 (222.8)	85000 (24.2)	76,041 (22.3)	170,000 (49.8)	153,000 (44.8)

Minimum Power Requirements

Model	Voltage Requirement	Maximum Over Protection
VA0400	115VAC, 60Hz, Single Phase	15
VA0500	115VAC, 60Hz, Single Phase	15
VA0600	115VAC, 60Hz, Single Phase	15
VA0725	115VAC, 60Hz, Single Phase	15
VA0850	115VAC, 60Hz, Single Phase	15

Model	Weight (lb)	Weight (kg)
VA0400	366	166.02
VA0500	387	175.54
VA0600	417	189.15
VA0725	492	223.17
VA0850	518	234.96

Minimum Service Clearance

Model	Top	Right	Left	Back	Front
VA0400	18” (46 cm)	2” (5 cm)	3” (8 cm)	1” (2.5 cm)	24” (70 cm)
VA0500	18” (46 cm)	2” (5 cm)	3” (8 cm)	1” (2.5 cm)	24” (70 cm)
VA0600	18” (46 cm)	2” (5 cm)	3” (8 cm)	1” (2.5 cm)	24” (70 cm)
VA0725	18” (46 cm)	2” (5 cm)	3” (8 cm)	1” (2.5 cm)	24” (70 cm)
VA0850	18” (46 cm)	2” (5 cm)	3” (8 cm)	1” (2.5 cm)	24” (70 cm)

*Minimum clearance of 10” recommended on right hand side of appliance for ease of filter replacement.

Clearance to Combustibles

Model	Top	Right	Left	Back	Flue Vent
All Models	1” (2.5 cm)	0” (0 cm)	0” (0 cm)	1” (2.5 cm)	1” (2.5 cm)

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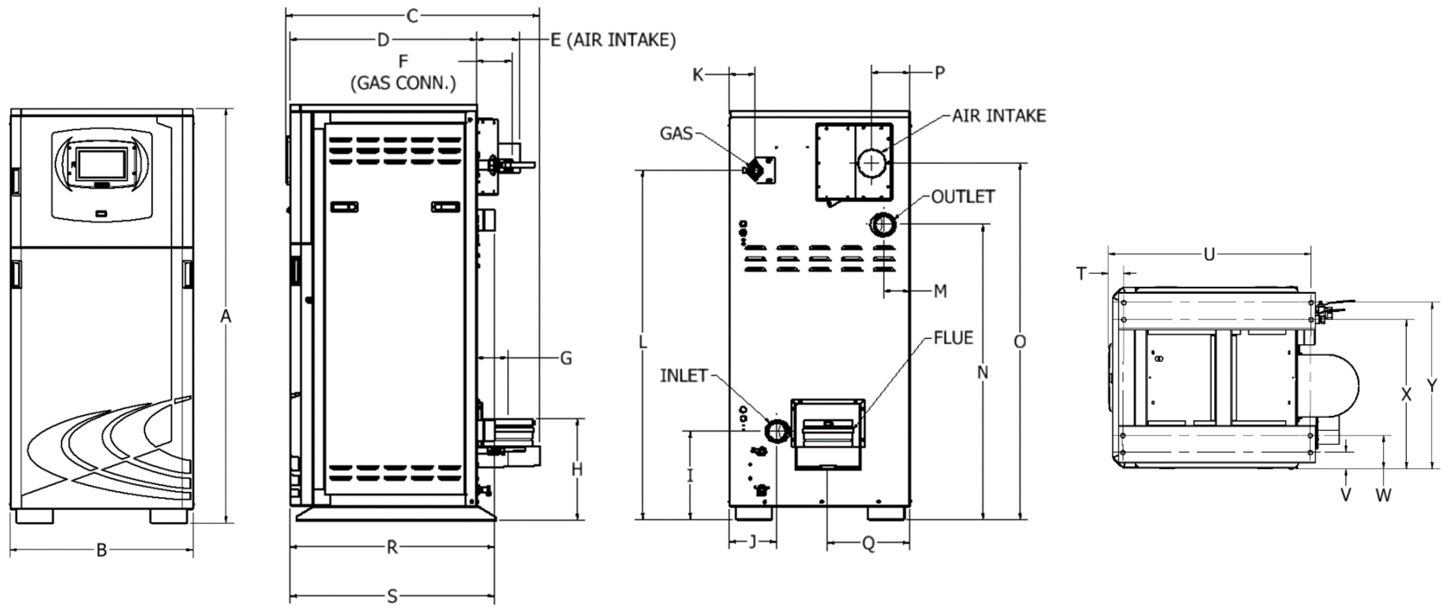

Dimensions (Inches)

Model	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"
400	57 1/2	22 1/8	31 3/8	23 3/8	6	5 7/8	4 3/8	14	12 1/8	4 3/4	2 1/2	47 1/2
500	57 1/2	22 1/8	31 3/8	23 3/8	6	5 7/8	4 3/8	14	12 1/8	4 3/4	2 1/2	47 1/2
600	57 1/2	25 1/4	31 3/8	23 3/8	6 5/8	5 3/8	4 3/8	14	12 1/8	7 5/8	2	48 1/2
725	57 1/2	25 1/4	35	25 7/8	5 7/8	4 7/8	4 1/4	14	12 1/2	6 5/8	3 5/8	49 1/8
850	57 1/2	25 1/4	35	25 7/8	5 7/8	4 7/8	4 1/4	14	12 1/2	6 5/8	3 5/8	49 1/8

Dimensions (Inches)

Model	"M"	"N"	"O"	"P"	"Q"	"R"	"S"	"T"	"U"	"V"	"W"	"X"	"Y"
400	2 7/8	41 1/2	49 7/8	5 1/2	10 5/8	27 1/4	27 1/4	2 1/8	25 5/8	2 1/8	4 1/2	17 5/8	20
500	2 7/8	41 1/2	49 7/8	5 1/2	10 5/8	27 1/4	27 1/4	2 1/8	25 5/8	2 1/8	4 1/2	17 5/8	20
600	3 1/4	41 1/2	49 5/8	5 1/8	10 7/8	27 1/4	27 1/4	2 1/8	25 5/8	2 1/4	4 5/8	20 5/8	23
725	3 5/8	41 1/2	50 1/8	5 3/8	11 1/2	28 7/8	28 7/8	2 1/8	28 1/4	2 1/4	4 5/8	20 7/8	23 1/4
850	3 5/8	41 1/2	50 1/8	5 3/8	11 1/2	28 7/8	28 7/8	2 1/8	28 1/4	2 1/4	4 5/8	20 7/8	23 1/4

Dimensions (Inches)

Model	Water Inlet NPT	Water Outlet NPT	Gas Conn.	Air Intake Ø	Flue Vent Ø
400	2	2	1	4	4
500	2	2	1	4	4
600	2	2	1	5	6
725	2 1/2	2 1/2	1	5	6
850	2 1/2	2 1/2	1	5	6

Dimensions (Millimeters)

Model	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"
400	1460.5	562.0	796.9	593.7	152.4	149.2	111.1	355.6	308.0	120.7	63.5	1206.5
500	1460.5	562.0	796.9	593.7	152.4	149.2	111.1	355.6	308.0	120.7	63.5	1206.5
600	1460.5	641.4	796.9	593.7	168.3	136.5	111.1	355.6	308.0	193.7	50.8	1231.9
725	1460.5	641.4	889.0	657.2	149.2	123.8	108.0	355.6	317.5	168.3	92.1	1247.8
850	1460.5	641.4	889.0	657.2	149.2	123.8	108.0	355.6	317.5	168.3	92.1	1247.8

Dimensions (Millimeters)

Model	"M"	"N"	"O"	"P"	"Q"	"R"	"S"	"T"	"U"	"V"	"W"	"X"	"Y"
400	73.0	1054.1	1266.8	139.7	269.9	692.2	692.2	54.0	650.9	54.0	114.3	447.7	508.0
500	73.0	1054.1	1266.8	139.7	269.9	692.2	692.2	54.0	650.9	54.0	114.3	447.7	508.0
600	82.6	1054.1	1260.5	130.2	276.2	692.2	692.2	54.0	650.9	57.2	117.5	523.9	584.2
725	92.1	1054.1	1273.2	136.5	292.1	733.4	733.4	54.0	717.6	57.2	117.5	530.2	590.6
850	92.1	1054.1	1273.2	136.5	292.1	733.4	733.4	54.0	717.6	57.2	117.5	530.2	590.6

Dimensions (Millimeters)

Model	Water Inlet NPT	Water Outlet NPT	Gas Conn.	Air Intake Ø	Flue Vent Ø
400	50.8	50.8	25.4	101.6	101.6
500	50.8	50.8	25.4	101.6	101.6
600	50.8	50.8	25.4	101.6	152.4
725	63.5	63.5	25.4	127	152.4
850	63.5	63.5	25.4	127	152.4