

Brute® XTR



Volume Water Heater

BNT2V | Volume Water Heater

Indoor Sizes 399-1500



Date:

Project #:

Engineer:

Prepared By:

Bid Date:

Submittal Data

Project Name:

Location:

Contractor:

Standard Features

- High condensing efficiency
- Stainless steel heat exchanger with welded construction
- ASME 160psi (1104Pa) working pressure heat exchanger
- ASME "HLW" stamp
- 125psi (862kPa) ASME rated pressure relief valve
- Modulation down to 10% of full fire (10:1 turndown)
- Low NOx system exceeds the most stringent regulations for air quality
Meets NSF/ANSI-372 Low Lead Content Certification
- Indoor construction with optional outdoor kit
- Optional pump (sized to model) included for field installation
- Top water and gas connections
- Sealed combustion chamber
- Pre-mix stainless steel burner
- Sophisticated air/gas system allows for consistent combustion control
- Horizontal or vertical direct vent
- Certified for Category II & IV vent
- Category IV vent & air pipe lengths of up to 150 equivalent feet (each)
- Electronic PID modulating control with large touch screen user interface and color display
- Controller cascades with up to eight Brute XTR units
- Modbus RTU & BACnet MSTP on board
- DHW pump control, with delay
- Direct spark ignition
- Indirect water heater priority
- DHW sensor
- Alarm output
- Accepts external (4-20mA or 0-10VDC) modulation signal
- On/Off toggle switch
- Top and rear service panels
- Built-in condensate trap
- Water flow switch
- Vent temperature cutoff
- Air filter
- Temperature & pressure gauge
- Drain valve
- Auto reset high limit
- Manual reset high limit
- Burner sight glass
- Zero clearance to combustibles
- 5-year limited hx warranty

Boiler Data

Number of Units

Fuel

 Natural Gas

Construction

- Standard
 ASME CSD-1

Options

- Pump (5-12 gpg)
 Pump (12-15 gpg)
 Low Water Cutoff

Alternate PRVs

- 125 psi pressure relief valve (std)
 60 psi pressure relief valve
 150 psi pressure relief valve



**Accessories
for Field
Mounting**

- Outdoor kit
 - Outdoor pump housing kit
 - CSD-1 kit (includes LWCO, gas pressure switches, display, control)
 - Pump (5-12 gpg)
 - Pump (12-15 gpg)
 - Pump contactor
 - Low water cut-off
 - High & low gas pressure switches
 - Additional auto & manual reset high limits
 - Gateway for BACnet IP
 - Gateway for LonWorks
 - Alarm bell with silence switch
 - Condensate neutralizer
 - Condensate neutralizer with pump
- For 399-500 models:
- Flush-mount vent terminal, 4"
 - PVC concentric termination kit
 - CPVC concentric termination kit

Sizing Data

Model	Min Input Rate		Max Input Rate		Min Output Rate		Max Ouput Rate		AHRI Certified
	MBH	kW	MBH	kW	MBH	kW	MBH	kW	Thermal Efficiency
	%								
<input type="checkbox"/> 399	39.9	11.7	399	117	39.1	11.5	391	115	98%
<input type="checkbox"/> 500	50.0	14.7	500	147	49.0	14.4	490	144	98%
<input type="checkbox"/> 650	65.0	19.0	650	191	63.1	18.5	631	185	97%
<input type="checkbox"/> 800	80.0	23.4	800	235	77.6	22.7	776	227	97%
<input type="checkbox"/> 999	99.9	29.3	999	293	96.9	28.4	969	284	97%
<input type="checkbox"/> 1500	150.0	44.0	1500	440	148.5	43.5	1485	435	99%

Model	Product Weight		Operating Weight		Shipping Weight		Water Content	
	lbs	kg	lbs	kg	lbs	kg	gal	l
399	391	178	427	194	508	231	4.4	16.5
500	401	182	441	200	518	235	4.8	18.1
650	471	214	525	238	597	271	6.4	24.4
800	492	224	554	252	618	281	7.4	28.2
999	542	246	616	280	679	309	8.9	33.9
1500	620	282	714	325	757	344	11.3	43.0

Clearances

	Clearance to Combustibles		Suggested Service Clearance	
	Inches	cm	Inches	cm
Front	0	0	24	61
Back	0	0	24	61
Left	0	0	0	0
Right	0	0	0	0
Top	0	0	24	61

Water Flow Requirements

Model	Water Hardness 5 - 12 gpg			Water Hardness 12 - 15 gpg		
	Flow gpm	H/L ft	Delta-T °F	Flow gpm	H/L ft	Delta-T °F
399	31	7.0	25	41	12.3	20
500	37	7.0	25	49	12.6	20
650	49	7.5	25	66	13.4	20
800	61	8.5	25	82	15.1	20
999	74	8.9	25	98	15.7	20
1500	80	10.8	36	106	19.2	27

Model	Water Hardness 5 - 12 gpg			Water Hardness 12 - 15 gpg		
	Flow lpm	H/L m	Delta-T °C	Flow lpm	H/L m	Delta-T °C
399	116	2.1	14	155	3.7	11
500	139	2.1	14	186	3.8	11
650	186	2.3	14	248	4.1	11
800	232	2.6	14	310	4.6	11
999	279	2.7	14	372	4.8	11
1500	302	3.3	20	403	5.9	15

Venting System

Model	Air Intake			Vent			
	Diameter (in)	Min. Equivalent* Length (ft)	Max. Equivalent* Length (ft)	Category IV Diameter (in)	Category IV Min. Equivalent* Length (ft)	Category IV Max. Equivalent* Length (ft)	Typical** Category II Diameter (in)
399	4	0	150	4	10	150	12
500	4	0	150	4	10	150	12
650	6	0	150	6	10	150	12
800	6	0	150	6	10	150	12
999	6	0	150	6	10	150	12
1500	8	0	150	8	10	150	12

*Equivalent Length: Add 5 feet for each 90° elbow up to the first 6. If more than 6 are needed in either the vent or air intake, or any 45° elbows are required, see the table below for the additional length to be added.

**Category II vent pipe size may vary. Draft must remain between -0.10" and -0.001" w.c.

Diameter (in)	Elbow Equivalent Lengths (ft)					
	Air Intake			Vent		
	90° Elbows (up to 6)	90° Elbows (after first 6)	45° Elbows	90° Elbows (up to 6)	90° Elbows (after first 6)	45° Elbows
4	5	5	3	5	5	3
6	5	10	5	5	10	5
8	5	15	8	5	15	8

Recovery

Model	Required Water Temperature Rise (°F)								
	40	50	60	70	80	90	100	120	140
	gph	gph	gph	gph	gph	gph	gph	gph	gph
399	1149	919	766	657	575	511	460	383	328
500	1440	1152	960	823	720	640	576	480	411
650	1872	1498	1248	1070	936	832	749	624	535
800	2304	1843	1536	1317	1152	1024	922	768	658
999	2877	2302	1918	1644	1439	1279	1151	959	822
1500	4320	3456	2880	2469	2160	1920	1728	1440	1234

Model	Required Water Temperature Rise (°C)								
	22	28	33	39	44	50	56	67	78
	lph	lph	lph	lph	lph	lph	lph	lph	lph
399	4350	3480	2900	2486	2175	1933	1740	1450	1243
500	5451	4361	3634	3115	2725	2423	2180	1817	1557
650	7086	5669	4724	4049	3543	3149	2835	2362	2025
800	8722	6977	5814	4984	4361	3876	3489	2907	2492
999	10891	8713	7261	6223	5446	4840	4356	3630	3112
1500	16353	13082	10902	9345	8176	7268	6541	5451	4672

Electrical Data

Water Heater Only				
Model	Voltage	FLA	MCA	MOP
399	120	2.8	3.5	15
500	120	3.1	3.9	15
650	120	3.1	3.9	15
800	120	3.2	4.0	15
999	120	4.2	5.3	15
1500	120	5.4	6.8	15

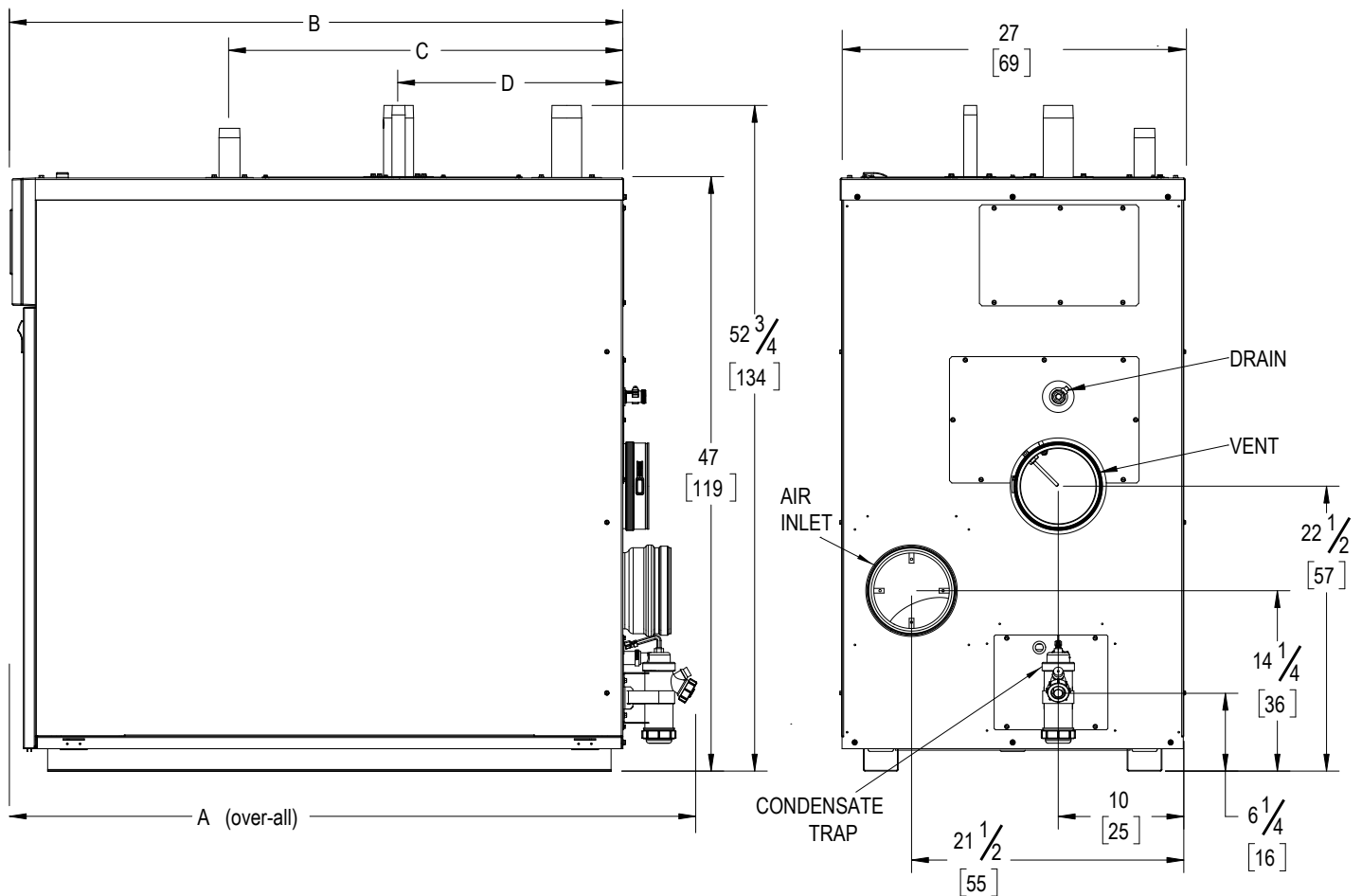
Water Heater and Pump								
Model	5 - 12 gpg Pump				12 - 15 gpg Pump			
	Voltage	FLA	MCA	MOP	Voltage	FLA	MCA	MOP
399	120	4.7	5.9	15	120	6.4	8.0	15
500	120	5.0	6.3	15	120	8.0	10.0	15
650	120	6.7	8.4	15	120	8.0	10.0	15
800	120	6.8	8.5	15	120	12.0	15.0	20
999	120	10.3	12.9	20	120	-	-	-
1500*	120	-	-	-	120	-	-	-

Pump Only								
Model	5 - 12 gpg Pump				12 - 15 gpg Pump			
	Voltage	FLA	MCA	MOP	Voltage	FLA	MCA	MOP
399	120	1.9	2.4	15	120	3.6	4.5	15
500	120	1.9	2.4	15	120	4.9	6.1	15
650	120	3.6	4.5	15	120	4.9	6.1	15
800	120	3.6	4.5	15	120	8.8	11.0	15
999	120	6.1	7.6	15	120	12.4	15.5	20
1500	120	8.8	11.0	15	120	12.4	15.5	20

**Dimensional
Data**

Model	Dimensions (Inches)								
	A	B	C	D	E	Gas Conn.	Water Conn.	Air Inlet	Vent
399	47-1/4	41-1/2	23-1/4	12	5	1	2	4	4
500	47-1/4	41-1/2	24-1/2	13-1/2	5	1	2	4	4
650	54-1/4	48-1/2	31-1/4	17-3/4	3-1/4	1-1/4	2	6	6
800	54-1/4	48-1/2	34	20-3/4	3-1/4	1-1/4	2	6	6
999	57-3/4	52	35	25-1/2	4	1-1/2	2-1/2	6	6
1500	66-3/4	61	42-1/2	33	4	1-1/2	2-1/2	8	8

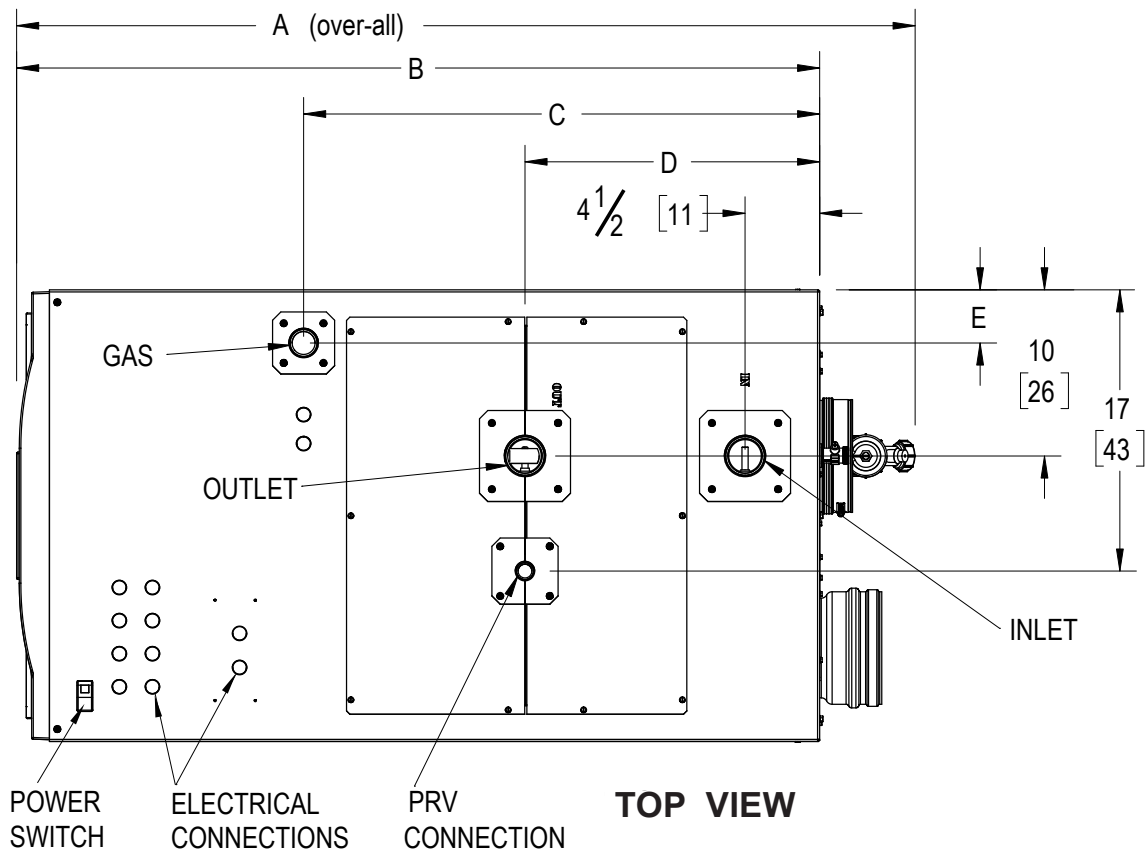
Model	Dimensions (cm)				
	A	B	C	D	E
399	120	105	59	31	13
500	120	105	62	34	13
650	138	123	79	45	8
800	138	123	86	53	8
999	147	132	89	65	10
1500	169	155	108	84	10



RIGHT SIDE VIEW

BACK VIEW

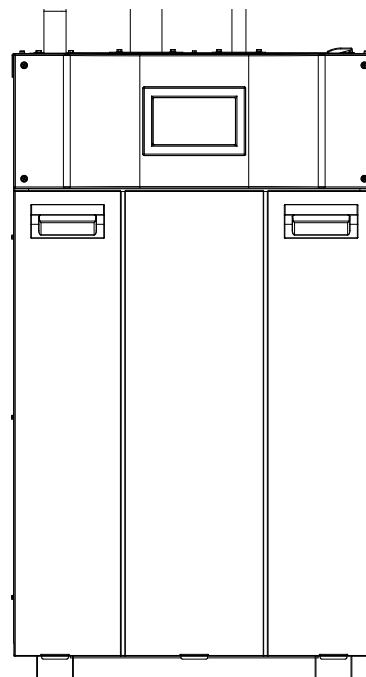
Dimensional Data (continued)



FLA = Full Load Amperage
MCA = Minimum Circuit Ampacity
MOP = Maximum Over-current Protection

*On 1500 models with factory supplied pumps, it is necessary to use two circuits; one to supply power for the boiler or water heater and another to power the pump.

FRONT VIEW



Bradford White Corporation reserves the right to change specifications, components, features, or to discontinue products without notice.