

Date:

Project #:

Engineer:

Prepared By:

Bid Date:

Outdoor Sizes 150-850

Submittal Data



Project Name:

Location:

Contractor:

Standard Equipment

- Meets ANSI Z21.13-2013, section 5.26 boilers for outdoor installations
- Electronic PID modulating control with large color touchscreen display
- Password-protected parameters for installer use
- Test feature allows forced min or max firing
- Complete diagnostics for analog and digital inputs
- Displays holds, alerts and errors in clear text form
- Dry alarm contacts for ignition failure
- High condensing efficiency
- Modulation down to 20% of full fire (5:1 turndown)
- Sealed combustion chamber
- Pre-mix stainless steel burner
- Low NOx system exceeds the most stringent regulations for air quality - 10 ppm NOx
- Horizontal or vertical direct vent
- Horizontal vent and air terminals
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Built-in condensate trap
- Vent temperature cutoff feature
- Direct spark ignition system
- Indirect water heater priority
- Sensor for indirect domestic water tank
- 160 psi maximum working pressure
- Stainless steel heat exchanger with welded construction (no gaskets)
- ASME "H" stamp
- 75 psi (517 kPa) ASME rated pressure relief valve
- Water flow switch (399-850 only)
- Temperature & pressure gauge
- Drain valve
- Multiple pump control for boiler pump, system pump and indirect domestic water pump, each with delay
- Optional pump (sized to model) available for field installation (285-500 only)
- Integrated PID temperature and ignition controls
- Large user-interface and display
- Alarm output
- Accepts external 4-20mA (0-10V with optional convertor) modulation signal
- Outdoor reset with customizable reset curves, domestic hot water override and warm weather shutdown
- Outdoor air temperature sensor
- On/off toggle switch
- Manual reset high limit
- Burner site glass
- Zero clearance to combustible surfaces
- Built-in cascade function for up to eight NeoTherms
- 10-year limited warranty

Boiler Data

Number of Units:

Fuel

- ☐ Natural
☐ Propane

Pump Options

- ☐ Pump included
☐ No pump

Factory Mounted Options

- ☐ CSD-1 (covers FM & GAP) (500-850)
☐ Low water cutoff (500-850)
☐ High & Low gas pressure switches (500-850)
☐ Additional auto reset high limit
- ☐ 30 psi pressure relief valve
☐ 50 psi pressure relief valve
☐ 60 psi pressure relief valve
☐ 75 psi pressure relief valve (std)
☐ 125 psi pressure relief valve
☐ 150 psi pressure relief valve
- ☐ Bell for ignition failure



Accessories for Field Mounting

☐ Water flow switch (150-285 only)	☐ Boiler pump	☐ Condensate neutralizer kit
☐ Low water cutoff	☐ Concentric vent terminal, 3"	☐ Vari-Prime variable speed pump drive
☐ 0 - 10V convertor for modulation control	☐ Flush-mount terminal, 3"	☐ BACnet gateway
☐ High & Low gas pressure switches	☐ Flush-mount terminal, 4"	☐ LON gateway
	☐ Propane conversion kit	

Sizing Data

Model	Input		Output		AFUE	Thermal Efficiency %	Comb. Efficiency %	Gas Conn. Size inches	Water Conn. Size inches	Shipping Weight	
	BTU/h	kW	BTU/h	kW						Lbs	kg
☐ NTH 150	150,000	44.0	138,000	40.4	95.0	N/A	N/A	½ NPT	1 NPT	228	104
☐ NTH 210	210,000	61.5	194,000	61.5	95.0	N/A	N/A	½ NPT	1 NPT	270	123
☐ NTH 285	285,000	83.5	264,000	77.4	95.0	N/A	N/A	¾ NPT	1¼ NPT	299	136
☐ NTH 399	399,900	117.2	386,000	113.1	N/A	96.5	96.5	¾ NPT	1¼ NPT	364	165
☐ NTH 500	500,000	146.4	475,000	139.2	N/A	95.0	95.0	1 NPT	1½ NPT	419	190
☐ NTH 600	600,000	175.7	572,000	167.6	N/A	95.3	96.0	1 NPT	1½ NPT	426	193
☐ NTH 750	750,000	219.8	724,000	212.1	N/A	96.6	96.6	1½ NPT	2 NPT	481	218
☐ NTH 850	850,000	248.9	813,000	238.2	N/A	95.7	95.7	1½ NPT	2 NPT	503	228

NOTES:

For other boiler ratings:

Boiler Horsepower: HP = $\frac{\text{Output}}{33,475}$

Radiation Surface: EDR sq. ft. = $\frac{\text{Output}}{150}$

Clearances

Appliance Surface	Suggested Service Access Clearance	
	inches	<i>cm</i>
Left Side	12	<i>31</i>
Right Side	12	<i>31</i>
Top (for flue)	48	<i>122</i>
Back	12	<i>31</i>
Closet, Front	1	<i>2.5</i>
Alcove, Front	24	<i>61</i>
Vent	Per Vent Manufacturer	
Certified by CSA for zero clearance to combustible materials on all sides.		

Electrical Data

Sizes	Boiler			Pump Connections Ratings (System Pump and DHW Pump Connections)
	Volts	Phase	Amps	
No Pump	120	Single	2*	115V – Maximum 1HP or 7.4A max
With Pump	120	Single	Less than 6*	115V – Maximum 1HP or 7.4A max

* Minimum 15A circuit required

Vent System

Size	Intake (Air) Pipe	Exhaust (Vent) Pipe	Maximum Allowable Equivalent Length*	
150	3"	3"	100 ft	30 m
210	3"	3"	100 ft	30 m
285	3"	3"	20 ft	6.1 m
	4"	4"	100 ft	30 m
399	4"	4"	100 ft	30 m
500	4"	4"	** 100 ft	** 30 m
600	4"	4"	40 ft	12 m
	6"***	6"***	100 ft **	30 m **
750	4"	4"	40 ft	12 m
	6"	6"	100 ft	30 m
850	4"	4"	40 ft	12 m
	6"	6"	100 ft	30 m

Installations in the U.S. require exhaust vent pipe that is a combination of PVC & CPVC complying with ANSI/ASTM D1785 F441, polypropylene pipe that complies with ULC S636, or stainless steel complying with UL1738. Installations in Canada require exhaust vent pipe that is certified to ULC S636.

Intake (air) pipe may be ABS, PVC, CPVC or galvanized material.

Installer must comply fully with manufacturer's installation instructions, including use of minimum exhaust length CPVC, to maintain ANSI Z21.13 safety certification.

Closet and alcove installations do not allow the use of PVC under any circumstances

* To calculate max equivalent length, measure the linear feet of the pipe, and add 5 feet (1.5m) for each elbow used.

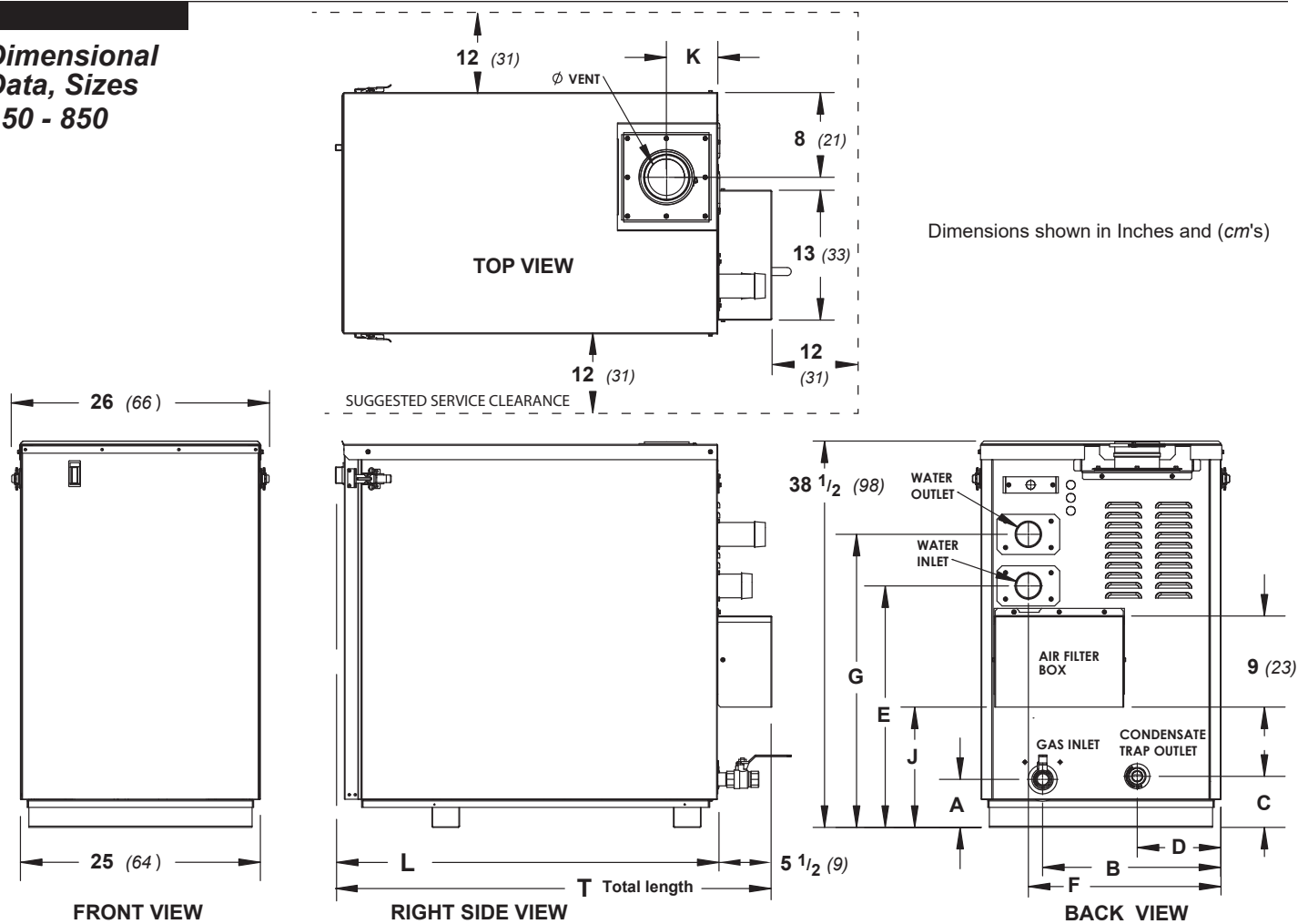
** Allowed only if the vent pipe is no more than 20 equivalent feet longer than the air pipe.

Water Flow Requirements

Temperature Rise in °F										
Size	20°F		25°F		30°F		35°F		40°F	
	Flow gpm	H/L feet	Flow gpm	H/L feet	Flow gpm	H/L feet	Flow gpm	H/L feet	Flow gpm	H/L feet
150	14	29	11	19	10	14	8	11	7	9
210	20	24	16	17	13	12	11	9	10	7
285	27	26	22	18	18	14	15	11	13	8
399	38	28	31	20	25	15	22	11	19	9
500	48	24	38	16	32	12	27	9	24	8
600	58	44	46	31	38	22	33	18	29	15
750	72	37	58	23	48	17	41	13	36	10
850	81	33	65	22	54	15	46	10	41	8

Temperature Rise in °C										
Size	11°C		14°C		17°C		19°C		22°C	
	Flow lpm	H/L m	Flow lpm	H/L m	Flow lpm	H/L m	Flow lpm	H/L m	Flow lpm	H/L m
150	54	8.7	43	5.8	36	4.1	31	3.4	27	2.1
210	76	7.3	61	5.1	51	3.5	43	2.7	37	2.4
285	102	7.8	81	5.3	68	4.3	58	3.2	51	2.4
399	144	8.5	116	6.1	96	4.4	83	3.4	72	2.7
500	180	7.3	144	4.9	120	3.7	103	2.7	90	2.4
600	218	13.4	174	9.4	145	6.7	125	5.5	109	4.6
750	274	11.3	219	7.0	182	5.2	156	4.0	137	3.0
850	307	10.1	246	6.7	205	4.6	175	3.0	154	2.4

Dimensional Data, Sizes 150 - 850



SIZE	A		B		C		D		E	
	in	cm	in	cm	in	cm	in	cm	in	cm
150	6-1/4"	16	11"	28	13"	33	17-1/4"	43.8	23-1/2"	60
199 / 210	6-1/4"	16	11"	28	13"	33	17-1/4"	43.8	23-1/2"	60
285	6"	15.5	11"	28	5"	13	17-1/4"	43.8	24"	61
399	8"	15.5	19-1/2"	50	7-3/4"	20	17-1/4"	43.8	24"	61
500	5"	13	17-3/4"	45	5"	13	8-1/4"	21	24"	61
600	33-1/2"	85	3.0"	8	5"	13	8-1/4"	21	24"	61
750	32-3/4"	83.2	3.0"	8	5-1/4"	13.4	17-1/4"	43.8	24"	61
850	32-3/4"	83.2	3.0"	8	5-1/4"	13.4	17-1/4"	43.8	24"	61

The 'BACK VIEW' shown is of a 500 MBH model. All other units will be similar, yet different.

All models are shipped with adapters for the air and vent that accept standard pipe of the proper size and type.

SIZE	F		G		J		K		L (Length)		T (Total Length)		VENT Ø	
	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm
150	18"	45.7	27"	69	23-1/2"	60	5-1/4"	13	20"	60	25-1/2"	65	3	7.6
199 / 210	18"	45.7	27"	69	24-1/2"	60	5-1/4"	13	27"	68.6	32-1/2"	82.5	3	7.6
285	19"	48	28-1/4"	72	12"	30.5	7-1/4"	18.4	27"	68.6	32-1/2"	82.5	4	11
399	19"	48	28-1/4"	72	12"	30.5	6"	15.2	31-1/4"	80.5	37-3/4"	96	4	11
500	19"	48	29-1/4"	74	12"	30.5	5.5"	14	38"	96.5	43-1/2"	110.5	4	11
600	19"	48	29-1/4"	74	12"	30.5	5-3/4"	14.6	38"	96.5	43-1/2"	110.5	4	11
750	19"	48	29-1/4"	74	12"	30.5	5-3/4"	14.6	51-1/4"	130	57-3/4"	146.7	6	17
850	19"	48	29-1/4"	74	12"	30.5	5-3/4"	14.6	55-3/4"	141.5	61-1/4"	155.5	6	17

Laars Heating Systems Company reserves the right to change specifications, components, features, or to discontinue products without notice.