

Date:

NTH Hydronic Boiler

Indoor Sizes 285-850

Submittal Data **LAARS**
Heating Systems Company

Project Name:

Standard Equipment

- Large LCD display with touchpad user-interface
- Menus for login, display setup, quick start, advanced setup, test and diagnostics
- Password-protected parameters for installer use
- Customizable homescreen and LCD contrast
- Quick start feature for simple, single boiler installations
- Test feature allows forced min or max firing
- Complete diagnostics for analog and digital inputs
- Displays holds, alerts and errors in clear text form
- Dray 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
- Cascades with other NeoTherms
- 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
- Electronic PID modulating control
- Large user-interface and display
- Alarm output
- Accepts external (4-20mA or 0-10V) modulation control
- 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
- 10-year limited warranty

Boiler Data

Number of Units:

Fuel

- Natural
- Propane

Pump Options

- Pump-included (285-500 only)
- 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
- Bell for ignition failure
- 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



Sizing Data

Model	Input		Output		AFUE	Thermal Efficiency %	Comb. Efficiency %	Gas Conn. Size inches	Water Conn. Size inches
	BTU/h	kW	BTU/h	kW					
<input type="checkbox"/> NTH 285	285,000	83.5	256,500	75.1	90%	N/A	N/A	¾ NPT	1¼ NPT
<input type="checkbox"/> NTH 399	399,000	116.9	385,035	112.7	N/A	96.5	96.5	¾ NPT	1¼ NPT
<input type="checkbox"/> NTH 500	500,000	146.5	475,000	138.4	N/A	95.0	95.0	1 NPT	1½ NPT
<input type="checkbox"/> NTH 600	600,000	175.8	576,000	167.0	N/A	95.3	96.0	1 NPT	1½ NPT
<input type="checkbox"/> NTH 750	750,000	219.8	723,000	208.9	N/A	96.6	96.6	1½ NPT	2 NPT
<input type="checkbox"/> NTH 850	850,000	249.1	810,000	236.7	N/A	95.7	95.7	1½ NPT	2 NPT

NOTES:

For other boiler ratings:

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

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

Accessories for Field Mounting

- Water flow switch (285 only)
- Low water cutoff
- High & Low gas pressure switches
- Additional auto reset high limit

Clearances

Appliance Surface	Suggested Service Access Clearance	
	inches	cm
Left Side	1	2.5
Right Side	12	31
Top	24	61
Back	6	15
Closet, Front	6	15
Alcove, Front	24	61
Vent	–	–

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	
285–850 No Pump	120	Single	2*	115V – Maximum 1HP or 7.4A max
285–500 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*	
285	3"	3"	20 ft	6 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.

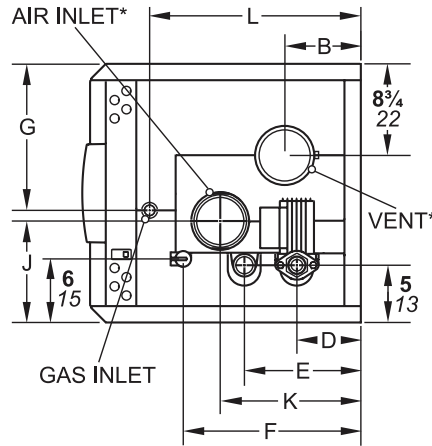
** Allowed only if the vent pipe is no more than 20 equivalent feet longer than the air pipe.

Water Flow Requirements

Size	Temperature Rise in °F									
	20°F		25°F		30°F		35°F		40°F	
	Flow	H/L	Flow	H/L	Flow	H/L	Flow	H/L	Flow	H/L
285	27	25.5	22	17.5	18	14	15	10.5	13	8
399	38	28	31	20	25	14.5	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

Size	Temperature Rise in °C									
	11°C		14°C		17°C		19°C		22°C	
	Flow	H/L	Flow	H/L	Flow	H/L	Flow	H/L	Flow	H/L
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
285-500**

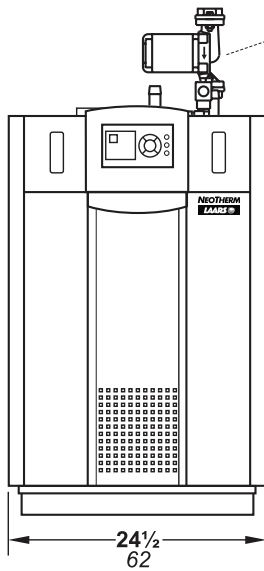


* NeoTherm is shipped with adapters for the air and vent that accept standard pipe of the proper size and type.

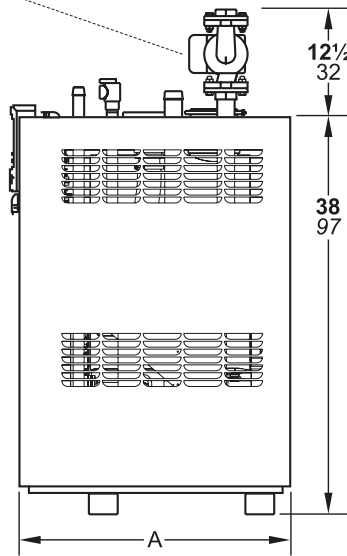
Dimensions shown in **inches cm.**

TOP VIEW

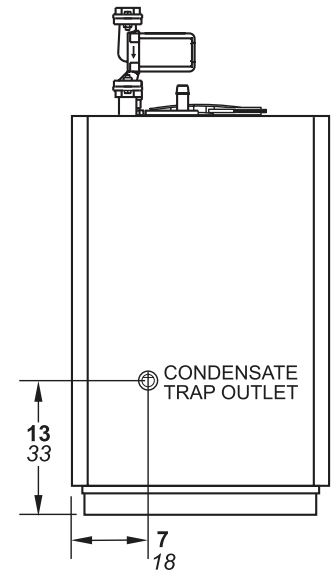
Optional Pump Location
(field-mounted)



FRONT VIEW



RIGHT SIDE VIEW

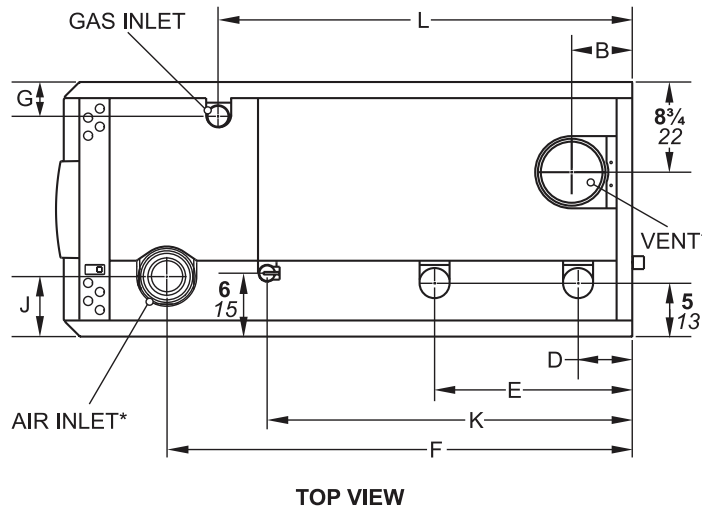


BACK VIEW

NTH Size	A in	B in	D in	E in	F in	G in	J in	K in	L in	AIR INLET* in	VENT* in
285	26	7	6	11	17	14	9 1/4	13 1/4	20 1/4	4 1/2	4 1/2
399	31	5	4 1/4	14 1/2	21 1/2	19 1/4	8 1/4	18 1/2	25	4 1/2	4 1/2
500	37	5	4 1/4	15	26	20 1/2	5 3/4	20	27 1/4	4 1/2	4 1/2
	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm
285	66	18	15	28	43	36	25	34	51	11	11
399	79	13	11	37	55	49	21	47	64	11	11
500	94	13	11	38	66	52	15	51	69	11	11

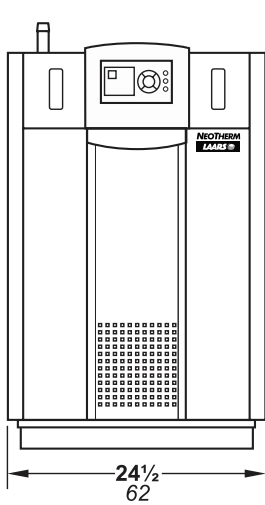
Dimensions are nominal.

**Dimensional
Data, Sizes
600-850**

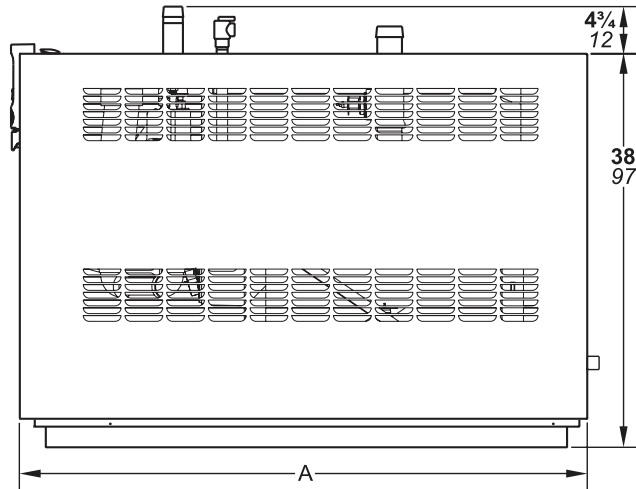


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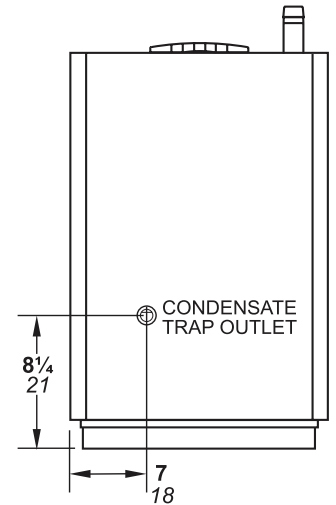
Dimensions shown in **inches cm**.



FRONT VIEW



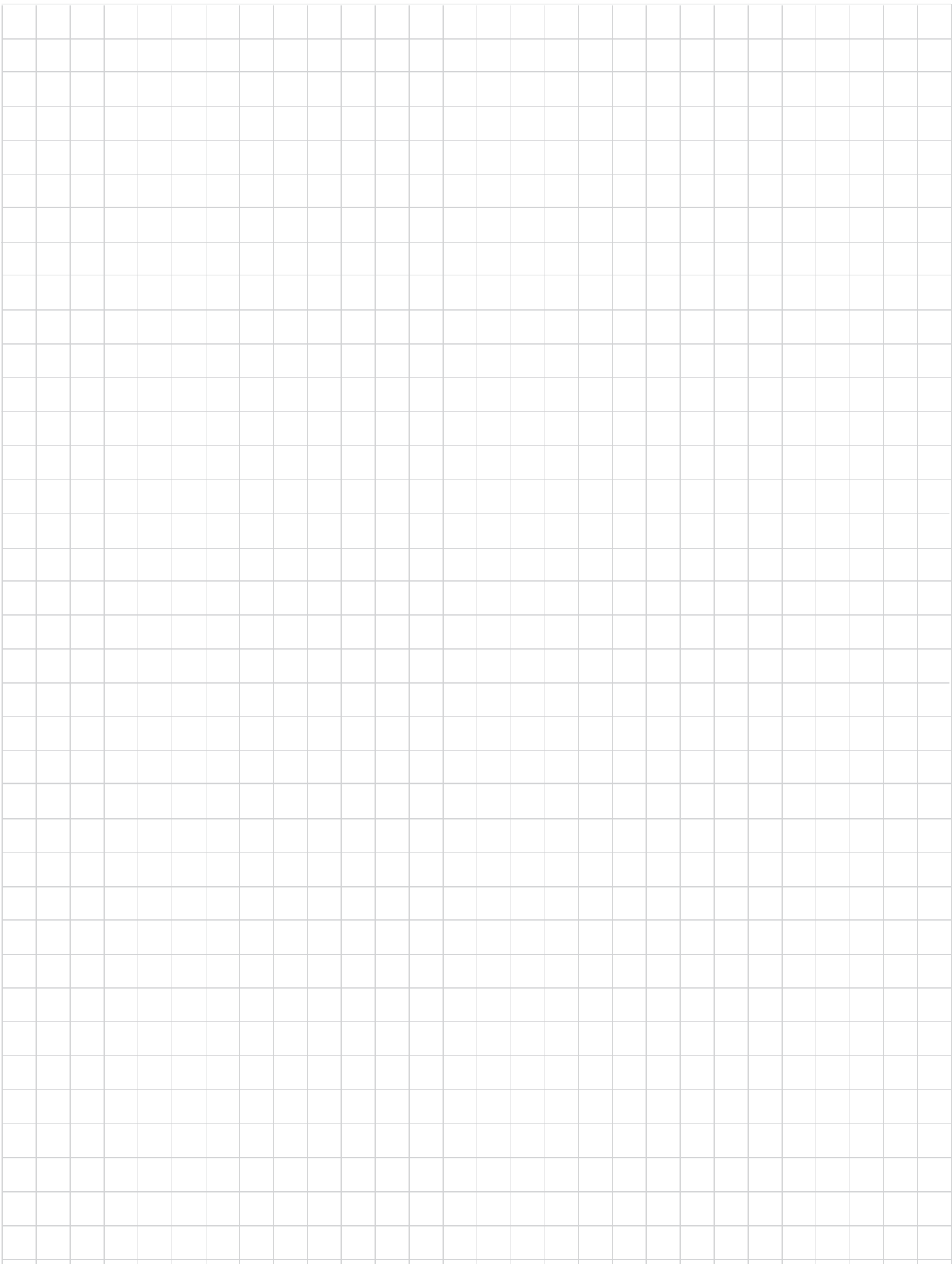
RIGHT SIDE VIEW



BACK VIEW

NTH	A	B	D	E	F	G	J	K	L	AIR INLET*	VENT*
Size	in	in	in	in	in	in	in	in	in	in	in
600	38	5	4 ¹ / ₄	15	20	3	5 ³ / ₄	26	29 ³ / ₄	4 ¹ / ₂	4 ¹ / ₂
750	51	5	5	19	40 ¹ / ₂	3 ¹ / ₄	5 ³ / ₄	30 ¹ / ₂	35 ¹ / ₂	4 ¹ / ₂	6 ¹ / ₂
850	55	5	5	19	44 ¹ / ₂	3 ¹ / ₂	5 ³ / ₄	35	39 ³ / ₄	4 ¹ / ₂	6 ¹ / ₂
	cm	cm	cm	cm	cm	cm	cm	cm	cm	cc	cm
600	97	13	11	38	51	8	15	66	76	11	11
750	130	13	13	48	103	8	15	77	90	11	17
850	140	13	13	48	113	9	15	89	101	11	17

Dimensions are nominal.



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



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