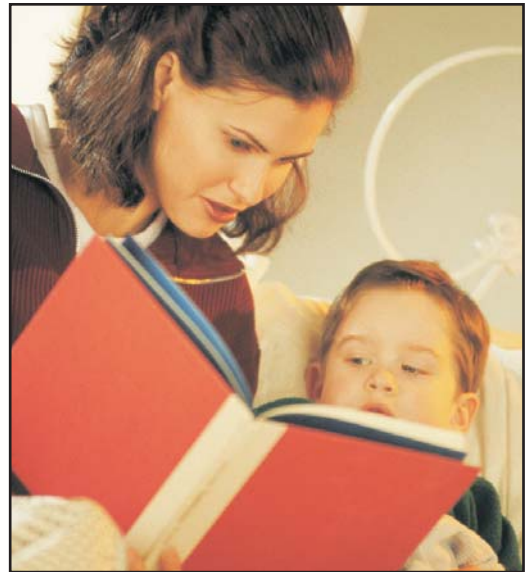


LAARS[®]
PENNANT[®]

Residential and Light Commercial
Boiler/Volume Water Heater



LAARS[®] 
Heating Systems Company
A subsidiary of **BRADFORD WHITE[®]** Corporation

LAARS® PENNANT

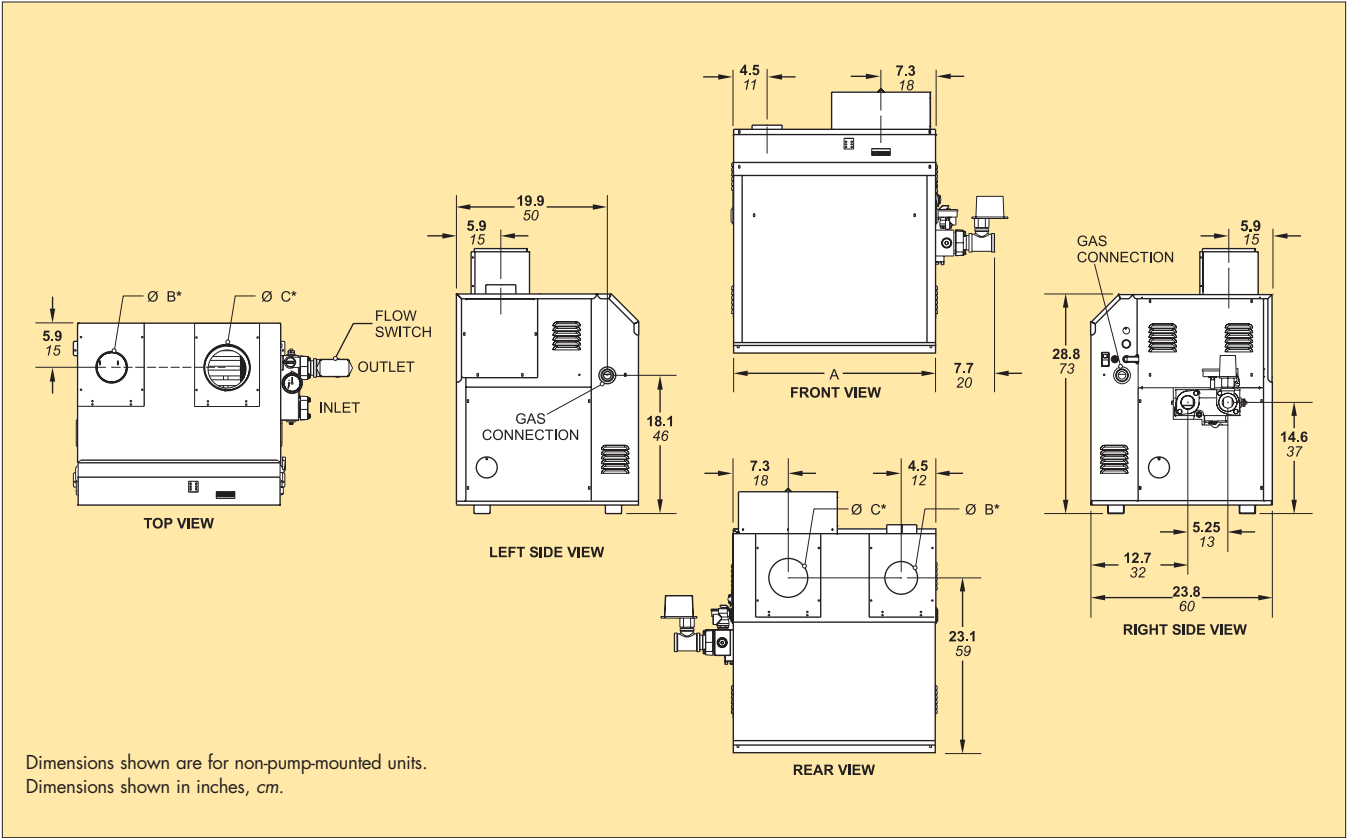
200, 300, 400

The Pennant 200-400 series is available in 200, 300 and 400 MBH sizes with two-stage firing, low NOx and fan-induced design. Pennant boilers and water heaters operate at 85% thermal efficiency. The compact, modular design allows for ease of installation and long-term maintenance. Pennant systems can be installed either indoors or outdoors. The Pennant 200-400 series include an additional, remote temperature sensor that can be placed in a heating system loop or domestic hot water tank to control the system based on the loop or tank temperature. The tilt-down front access panel with diagnostic indicator lights makes for ease of use. The 200-400 series offer hot surface ignition, optional two-stage firing, an ASME 160 psi working pressure heat exchanger, flanged water connections, glass-lined headers with external header gaskets, stainless steel burners with removable burner tray, and a built-in fan for Category I or III vent systems.

STANDARD EQUIPMENT

- ASME 160 psi working pressure heat exchanger
- ASME "H" stamp
- Flanged water connections
- Glass-lined headers
- External header gaskets
- 75 psi (517 kPa) ASME rated pressure relief valve (PNCH)
- 125 psi (861 kPa) ASME rated pressure relief valve (PNCV)
- Multiple operating gas valve/pressure regulators
- Temperature pressure gauge
- Manual "A" gas valve
- Intake air filter
- Removable burner tray(s)
- Stainless steel burners
- Built-in fan for Category I or III vent systems
- Air pressure switch
- Blocked vent switch
- Burner site glass
- 24V control system
- 115/24V transformer
- Flow switch
- Manual reset high limit
- Fusible link (size 200)
- Electronic staging control
- Two-stage firing
- Certified for indoor or outdoor use
- Hot surface ignition
- On/off toggle switch
- Pump time delay
- Diagnostic lights
- Less than 30ppm NOx

SIZING DATA



Size	Input		Output		IBR Net Rating		Gas Conn. Size Inches	Water Conn. Size Inches	Shipping Weight	
	MBTU/h	kW	MBTU/h	kW	MBTU/h	kW	MBTU/h	MBTU/h	lbs.	kg
200	199.9	58.6	169.9	49.8	144.4	42.3	3/4 NPT	1 1/2 NPT	270	123
300	300.0	87.9	255.0	74.7	216.7	63.6	3/4 NPT	1 1/2 NPT	300	136
400	399.9	117.2	339.9	99.6	288.9	84.6	3/4 NPT	1 1/2 NPT	330	150

- NOTES:**
1. Input and output must be derated 4% per 1000 feet above sea level when installed above 2000 feet altitude.
 2. Dimensions are nominal.
 3. For other boiler ratings:
Boiler Horsepower: HP = Output/33,475
Radiation Surface: EDR sq. ft. = Output/150
IBR sq. ft. = Net IBR/150
 4. Add 20 lbs. (9kg) to shipping weight for pump-mounted units.

Size	A		Air Conn. B*		Vent Conn. C*		Horiz Vent Pipe	
	in.	cm	in.	cm	in.	cm	in.	cm
200	20 1/2	52	4	10	5	13	4	10
300	26 1/2	67	4	10	6	15	5	13
400	33 1/2	85	6	15	7	18	6	15

*Air and vent connections may be on top or back of the Pennant, and are field convertible.



Water Flow Requirements

Temp Rise:	20°F		11°C		25°F		14°C		30°F		17°C		35°F		19°C	
Size	Flow gpm	H/L feet	Flow lpm	H/L m	Flow gpm	H/L feet	Flow lpm	H/L m	Flow gpm	H/L feet	Flow lpm	H/L m	Flow gpm	H/L feet	Flow lpm	H/L m
200	17	1.6	64	0.5	14	1.0	53	0.3	11	0.7	42	0.2	10	0.5	38	0.2
300	26	3.5	97	1.1	20	2.3	76	0.7	17	1.6	64	0.5	15	1.2	57	0.4
400	34	6.3	129	1.9	27	4.0	102	1.2	23	2.8	87	0.9	19	2.1	72	0.6

	HARD WATER						NORMAL WATER						SOFT WATER					
Size	Flow gpm	H/L feet	Temp Rise °F	Flow lpm	H/L m	Temp Rise °C	Flow gpm	H/L feet	Temp Rise °F	Flow lpm	H/L m	Temp Rise °C	Flow gpm	H/L feet	Temp Rise °F	Flow lpm	H/L m	Temp Rise °C
200	45	7.3	8	170	2.2	4	35	4.4	10	133	1.3	6	23	1.9	15	87	0.6	8
300	45	7.4	11	170	2.3	6	35	4.5	15	133	1.4	8	23	2.0	22	87	0.6	12
400	45	7.4	15	170	2.3	8	35	4.5	19	133	1.4	11	23	2.0	30	87	0.6	17

NOTE: gpm = gallons per minute, lpm = liters per minute

Recovery Data

Size	40°F GPH	22°C L/h	50°F GPH	28°C L/h	60°F GPH	33°C L/h	70°F GPH	39°C L/h	80°F GPH	44°C L/h	90°F GPH	50°C L/h	100°F GPH	56°C L/h	120°F GPH	67°C L/h	140°F GPH	78°C L/h
200	510	1928	408	1542	340	1285	291	1100	255	964	227	858	204	771	170	643	146	552
300	765	2892	612	2313	510	1928	437	1652	383	1448	340	1285	306	1157	255	964	219	828
400	1020	3856	816	3084	680	2570	583	2204	510	1928	453	1712	408	1542	340	1285	291	1100

NOTE: GPH = gallons per hour, L/h = Liters per hour

Minimum Clearances from Adjacent Construction

Appliance Surface	Required Clearance from Combustible Material		Suggested Service Access Clearance	
	inches	cm	inches	cm
Left Side	1	2.54	24	61.0
Right Side	1	2.54	24	61.0
Top	1	2.54	12	30.5
Back*	1	2.54	12	30.5
Front	1	2.54	36	91.4
Vertical Vent** (Category 1)	6	15.2		
Horizontal Vent (Category 3)	per UL1738 venting system supplier's instructions			

* When vent and/or combustion air connects to the back, recommended clearance is 36" 91cm.

** 1" when b-vent is used.



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