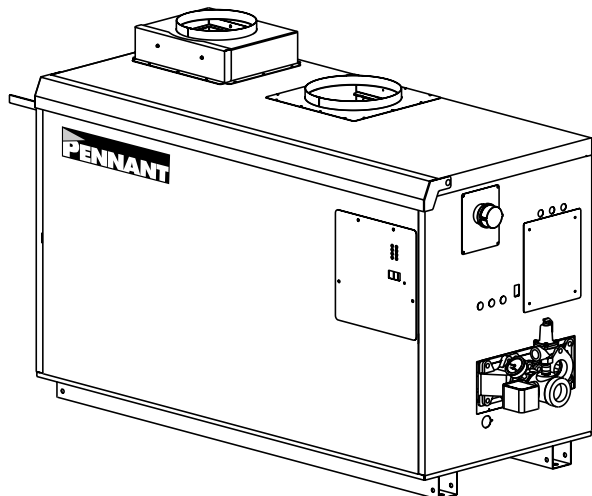


**PENNANT®**



Date:

Project #:

Engineer:

Prepared By:

Bid Date:

# Boiler & Water Heater

PNCH	Hydronic Heater
PNCV	Volume Water Heater

Indoor/Outdoor Sizes 500-2000

Submittal Data **LAARS**  
 Heating Systems Company

Project Name:

Location:

Contractor:

## Standard Equipment

- ASME 160 psi working pressure heat exchanger
- ASME "H" stamp
- Firing rates:  
 Two-stage (500-750)  
 Three-stage (1000)  
 Four-stage (1250-2000)
- 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)
- Flow switch
- Multiple operating gas valve/pressure regulators
- Temperature pressure gauge
- Manual "A" gas valve
- Intake air filter
- Multiple, removable burner trays
- Stainless steel burners
- Built-in draft fan for Category I or III vent systems
- Air pressure switch
- Burner site glass
- 24V control system
- 115/24VAC transformer
- Manual reset high limit
- Automatic reset high limit
- Electronic PID staging control with LCD and touchpad
- PC board for electrical connections
- External controller connections with selector switch
- Hot surface ignition
- On/Off toggle switch
- Pump time delay
- Diagnostic lights
- Less than 10 ppm NOx

## Boiler Data

**Model:**  
 Boiler PNCH  
 Water Heater PNCV

**Number of Units:**

**Fuel**  
 Natural  
 Propane

**Heat Exchanger**  
 Copper  
 Cupro-Nickel  
 Copper, Reversed  
 Cupro-Nickel, Reversed

**Water Trim**  
 Glass-Lined Cast Iron  
 Bronze Trim (std. on PNCV)  
 Full Bronze

**Options**  
 CSD-1  
 200°F Max Controls (std. on PNCV)  
 Low Water Cutoff  
 ASME "HLW" Stamp



## Sizing Data

Size	Input <sup>1</sup> BTU/H	Output <sup>1</sup> BTU/H	IBR Net <sup>1,3</sup> Rating BTU/H x1000	Gas Conn. Size inches <sup>2</sup>	Heater Water Conn. Size inches <sup>2</sup>	Shipping Weight lbs
500	500,000	425,000	361	1¼	2	440
750	750,000	638,000	542	1¼	2	520
1000	999,000	849,000	722	1½	2½	630
1250	1,250,000	1,062,500	903	2	2½	675
1500	1,500,000	1,275,000	1084	2	2½	775
1750	1,750,000	1,487,500	1264	2	2½	825
2000	1,999,000	1,699,000	1444	2	2½	970

Size	Input <sup>1</sup> kW	Output <sup>1</sup> kW	IBR Net <sup>1,3</sup> Rating kW	Shipping Weight kg
500	147	125	106	200
750	220	187	159	236
1000	293	249	216	286
1250	366	312	265	306
1500	440	374	318	352
1750	513	436	370	375
2000	586	498	423	440

- 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 =  $\frac{\text{Output}}{33,475}$     Radiation Surface: EDR sq. ft. =  $\frac{\text{Output}}{150}$     IBR sq. ft. =  $\frac{\text{Net IBR Rating}}{150}$

## Water Flow Requirements

### PNCH (Boiler)

TEMPERATURE RISE IN DEGREES

Size	20°F		11°C		25°F		14°C		30°F		17°C		35°F		19°C	
	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
500	43	1.7	161	0.5	34	1.1	129	0.3	28	0.9	107	0.3	24	0.7	92	0.2
750	64	3.3	241	1.0	51	2.3	193	0.7	43	1.7	161	0.5	36	1.2	138	0.4
1000	85	5.0	321	1.5	68	3.6	257	1.1	57	3.1	214	0.9	49	2.2	184	0.7
1250	106	8.1	401	2.5	85	6.1	322	1.9	71	4.7	269	1.4	61	3.4	231	1.0
1500	128	10.0	483	3.0	102	7.2	386	2.2	85	5.5	322	1.7	73	4.2	276	1.3
1750	N/R	N/R	N/R	N/R	119	10.5	451	3.2	99	8.4	375	2.6	85	5.8	322	1.8
2000	N/R	N/R	N/R	N/R	136	12.5	515	3.8	113	10.4	429	3.2	97	8.3	368	2.5

### PNCV (Water Heater)

Size	HARD WATER				NORMAL WATER				SOFT WATER			
	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
500	90	3.5	341	1.1	68	2.3	257	0.7	45	1.8	170	0.5
750	90	6.0	341	1.8	68	3.0	257	0.9	45	2.1	170	0.6
1000	90	6.1	341	1.9	68	3.6	257	1.1	45	2.3	170	0.7
1250	90	6.3	341	1.9	68	3.8	257	1.2	68	3.8	257	1.2
1500	90	6.5	341	2.0	68	3.9	257	1.2	68	3.9	257	1.2
1750	90	6.7	341	2.0	68	4.0	257	1.2	68	4.0	257	1.2
2000	112	10.0	424	3.0	112	10.0	424	3.0	112	10.0	424	3.0

**NOTE:** Headloss shown is for the Pennant heat exchanger only.

## Recovery Data

WATER TEMPERATURE RISE IN DEGREES

Size	40°F	22°C	50°F	28°C	60°F	33°C	70°F	39°C	80°F	44°C	90°F	50°C	100°F	56°C	120°F	67°C	140°F	78°C
	GPH	L/h	GPH	L/h	GPH	L/h	GPH	L/h	GPH	L/h	GPH	L/h	GPH	L/h	GPH	L/h	GPH	L/h
500	1276	4821	1020	3857	850	3214	729	2755	638	2411	567	2143	510	1929	425	1607	364	1378
750	1913	7232	1531	5786	1276	4821	1093	4133	957	3616	850	3214	765	2893	638	2411	547	2066
1000	2548	9633	2039	7707	1699	6422	1456	5505	1274	4817	1133	4281	1019	3853	849	3211	728	2752
1250	3189	12054	2551	9643	2126	8036	1822	6888	1594	6027	1417	5357	1276	4821	1063	4018	911	3444
1500	3827	14464	3061	11571	2551	9643	2187	8265	1913	7232	1701	6429	1531	5786	1276	4821	1093	4133
1750	4464	16875	3571	13500	2976	11250	2551	9643	2232	8438	1984	7500	1786	6750	1488	5625	1276	4821
2000	5099	19276	4080	15421	3400	12851	2914	11015	2550	9638	2266	8567	2040	7710	1700	6425	1457	5507

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

## Clearances

Appliance Surface	Required Clearance From Combustible Material		Suggested Service Access Clearances		Dimensions in inches <i>cm</i>
	1	2.5	24	61	
Left Side	1	2.5	24	61	
Right Side	1	2.5	24	61	
Top	1	2.5	12	30	
Back*	1	2.5	12	30	
Front	1	2.5	36	91	
Vent	Per venting system supplier's instructions				

\*When vent and/or air is connected to the back, 36" (91cm) is suggested.

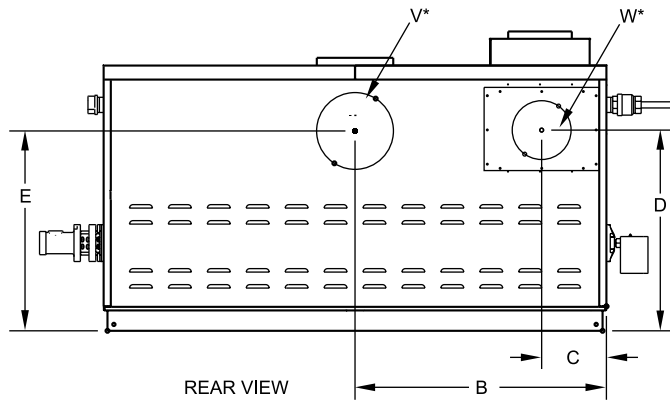
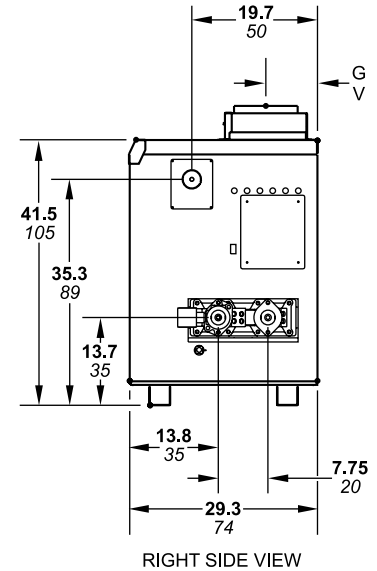
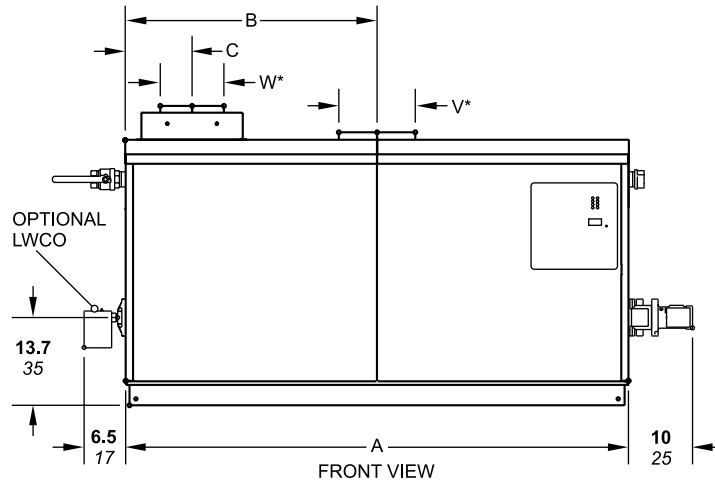
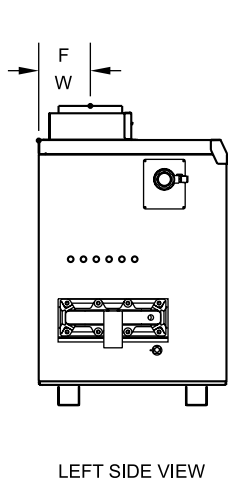
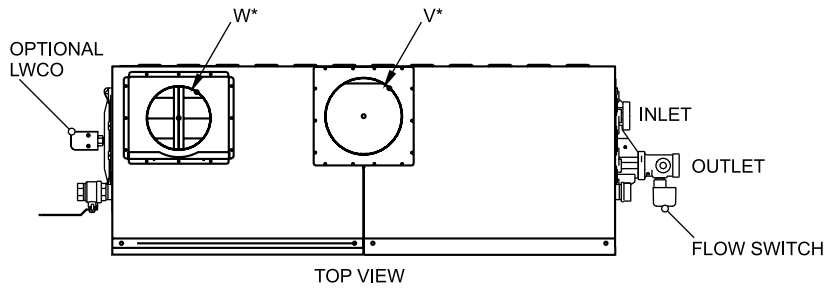
## Electrical Data

Model	Boiler / Heater			Pump Delay Connection Rating			Blower(s)
	Volts	Phase	Amps	Volts	Phase	Amps	
PNCH, PNCV non-pump mounted 500-2000	115	Single	Less than 12	Pilot Duty 24V	Single	Up to 25VA	Included in Pennant connection

## Accessories

- Outdoor reset sensor/housing
- Side-wall vent terminal for indoor unit with horizontal venting
- Vent terminal for outdoor unit
- Side-wall combustion air terminal for indoor unit with horizontal ducted air
- Air terminal for outdoor unit

# Dimensional Data



Dimensions shown in inches *cm*

Size	A		B		C		D		E		F		G		Air Conn. W*	Vent Conn. V*	Horiz Vent Pipe			
500	33½	85	15¾	40	5¾	15	29¾	76	32¾	83	7¾	20	8¾	22	6	15	8	20	6	15
750	45½	116	21¾	55	5¾	15	29¾	76	32¾	83	7¾	20	8¾	22	6	15	10	25	8	20
1000	57½	146	28¾	73	5¾	15	29¾	76	32¾	83	7¾	20	7	18	8	20	10	25	8	20
1250	68	172	34	86	10⅞	26	30¾	78	29½	75	8¾	22	8¾	22	8	20	12	30	8	20
1500	78½	199	39¾	101	10⅞	26	30¾	78	29½	75	8¾	22	8¾	22	8	20	12	30	8	20
1750	89	226	44½	113	10⅞	26	30¾	78	29½	75	8¾	22	8¾	22	8	20	14	36	8	20
2000	99½	253	49¾	126	10⅞	26	30¾	78	29½	75	8¾	22	8¾	22	12	30	14	36	12	30

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

Dimensions shown in inches *cm*.

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