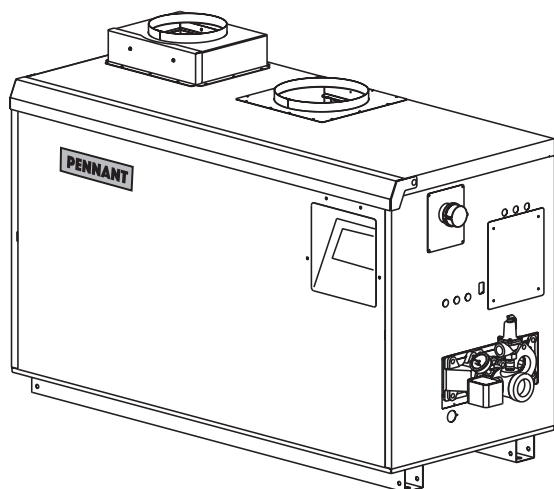


PENNANT®



Boiler & Water Heater

PNCH | Hydronic Heater

PNCV | Volume Water Heater

Indoor/Outdoor Sizes 500-2000



Submittal Data

Date:

Project #:

Engineer:

Prepared By:

Bid Date:

Project Name:

Location:

Contractor:

Standard Equipment

- ASME 160 psi working pressure heat exchanger
- ASME "H" stamp
- Meets NSF/ANSI-372 Low Lead Content Certification (PNCV)
- Electronic staging & ignition control with LCD touchscreen
- Cascades up to 8 boilers with redundancy options
- Multiple pump control (system, boiler and indirect water heater), each with time delay
- BACnet MSTP and Modbus (optional BACnet IP, Metasys, or LonWorks)
- Accepts external 0-10VDC or 4-20mA for remote control of temperature or stages
- Displays messages in clear text form
- Complete diagnostics for analog and digital inputs
- Password protected parameters
- Quick start configuration
- Hot surface ignition
- 24V control system
- On/off toggle switch
- 115/24VAC transformer
- Boiler, system, DHW, and outdoor temperature sensors
- Manual reset high limit
- Automatic reset high limit
- Dry run and alarm contacts
- Anti-frost mode
- Anti-short-cycle mode
- Pump, mounted and wired (when ordered as pump-mounted unit)
- Flanged water connections
- Glass-lined headers
- External header gaskets
- 75 psi (517kPa) ASME rated pressure relief valve
- Water flow switch
- Temperature/pressure gauge
- Multiple operating gas valve/pressure regulators
- Manual "A" gas valve
- Multiple removable burner trays
- Stainless steel burners
- Built-in draft fan for Category I or III vent systems
- Intake air filter
- Air pressure switch
- Burner site glass

Boiler Data

Model:

- ☐ Boiler PNCH
☐ Water Heater PNCV

Fuel

- ☐ Natural
☐ Propane

Number of Units:

Heat Exchanger

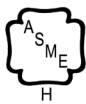
- ☐ Copper (std. on PNCH, N/A on PNCV)
☐ Cupro-Nickel (std. on PNCV)
☐ Copper, Reversed (N/A on PNCV)
☐ Cupro-Nickel, Reversed

Water Trim

- ☐ Glass-Lined Cast Iron
☐ Bronze Trim (std. on PNCV)

Options

- ☐ CSD-1 (LWCO Not Included)
☐ Low Water Cutoff
☐ ASME "HLW" Stamp (PNCV only)
☐ Additional manual reset high limit
☐ Additional automatic reset high limit
☐ Alternate display orientation for top unit in stacked system.



Sizing Data

	Size	Input ¹ MBH	Input ¹ kW	Output ¹ MBH	Output ¹ kW	Gas Conn. Size inches ²	Water Conn Size inches ²	Shipping Weight lbs	kg
	500	500.0	147	425	125	1¼	2	640	290
	750	750.0	220	638	187	1¼	2	735	333
	1000	999.0	293	849	249	1½	2½	830	376
	1250	1250.0	366	1064	312	2	2½	925	420
	1500	1500.0	440	1266	371	2	2½	1020	463
	1750	1750.0	513	1489	436	2	2½	1115	506
	PNCH 2000	1999.0	586	1701	498	2	2½	1210	549
	PNCV 2000	2000.0	586	1701	498	2	2½	1210	549

	Size	PNCH Combustion Efficiency%	PNCH Thermal Efficiency%	PNCV Thermal Efficiency%
	500	85.0	85.0	85
	750	85.0	85.0	85
	1000	85.0	85.0	85
	1250	85.1	85.2	85
	1500	85.1	85.2	85
	1750	85.1	85.2	85
	2000	85.1	85.2	85

- 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. Shipping weight is approximate based on previous units shipped and can be effected by several variables including the green or dry wood used in the crate.

Water Flow Requirements

PNCH (Boiler)

TEMPERATURE RISE IN DEGREES

	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
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)

	HARD WATER				NORMAL WATER				SOFT WATER			
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
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 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	
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			

Dimensions in **inches** *cm*

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

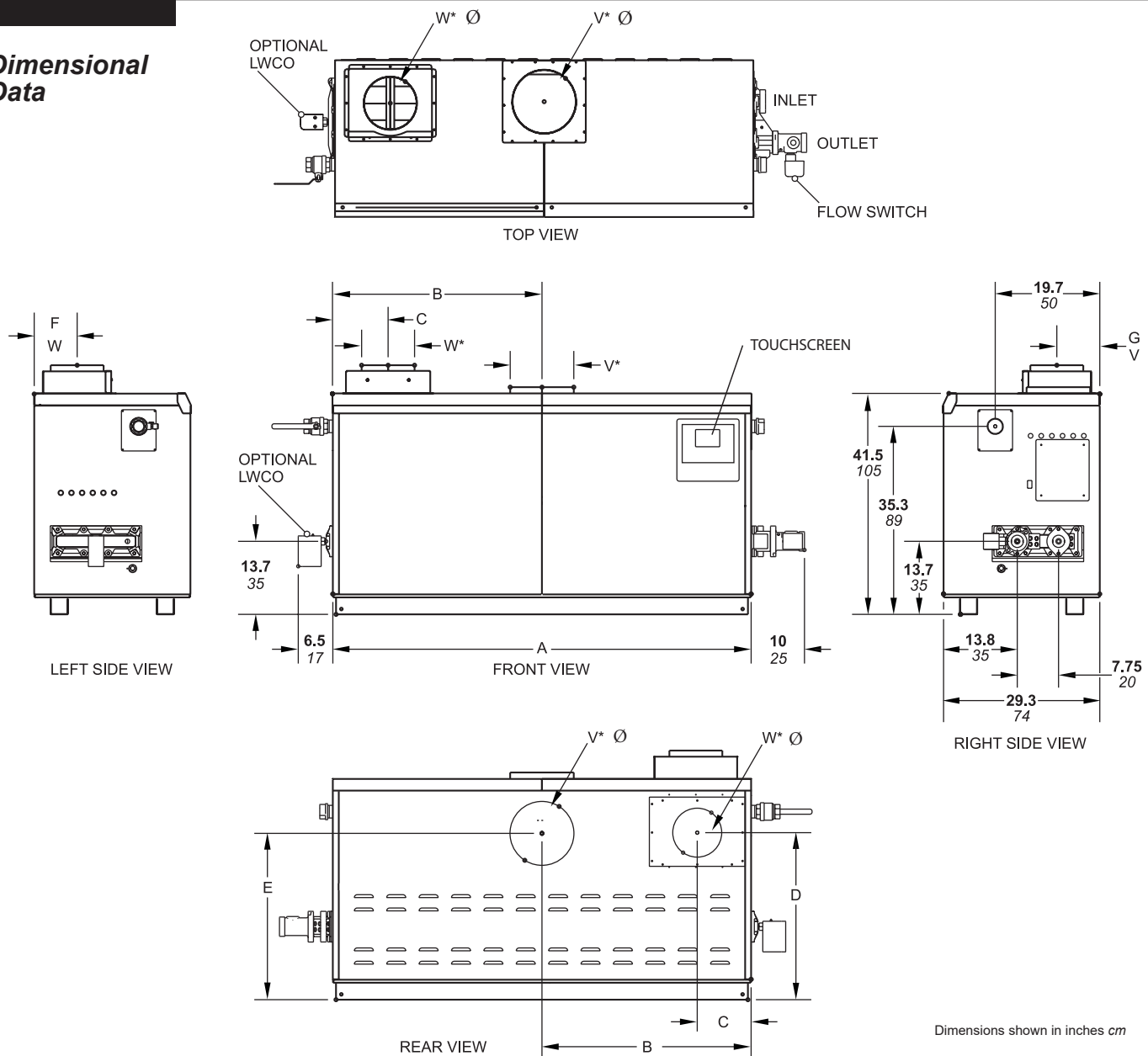
Electrical Data

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

- ☐ Side-wall vent terminal for indoor unit with horizontal venting
- ☐ Vent terminal for outdoor unit
- ☐ Air terminal for outdoor unit
- ☐ Side-wall combustion air terminal for indoor unit with horizontal ducted air

Dimensional Data



Size	A		B		C		D		E		F		G		H		Air Conn. W*		Vent Conn. V*		Horiz. Vent Pipe	
500	33½	85	15¾	40	5¾	15	29¾	76	33¾	86	7¾	20	8¾	22	46	117	6	15	8	20	6	15
750	45½	116	21¾	55	5¾	15	29¾	76	33¾	86	7¾	20	8¾	22	58	147	8	20	10	25	8	20
1000	57½	146	28¾	73	5¾	15	29¾	76	33¾	86	7¾	20	7	18	70	178	8	20	10	25	8	20
1250	68	172	34	86	10⅞	26	30¾	78	31⅞	79	8¾	22	8¾	22	80	203	12	30	12	30	10	25
1500	78½	199	39¾	101	10⅞	26	30¾	78	31⅞	79	8¾	22	8¾	22	91	231	12	30	12	30	10	25
1750	89	226	44½	113	10⅞	26	30¾	78	31⅞	79	8¾	22	8¾	22	101	256	12	30	14	36	12	30
2000	99½	253	49¾	126	10⅞	26	30¾	78	31⅞	79	8¾	22	8¾	22	112	284	12	30	14	36	12	30

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

Dimensions in inches cm

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