



# High Temperature Hot Water Boiler Section I Power Burner / Natural Gas Fired

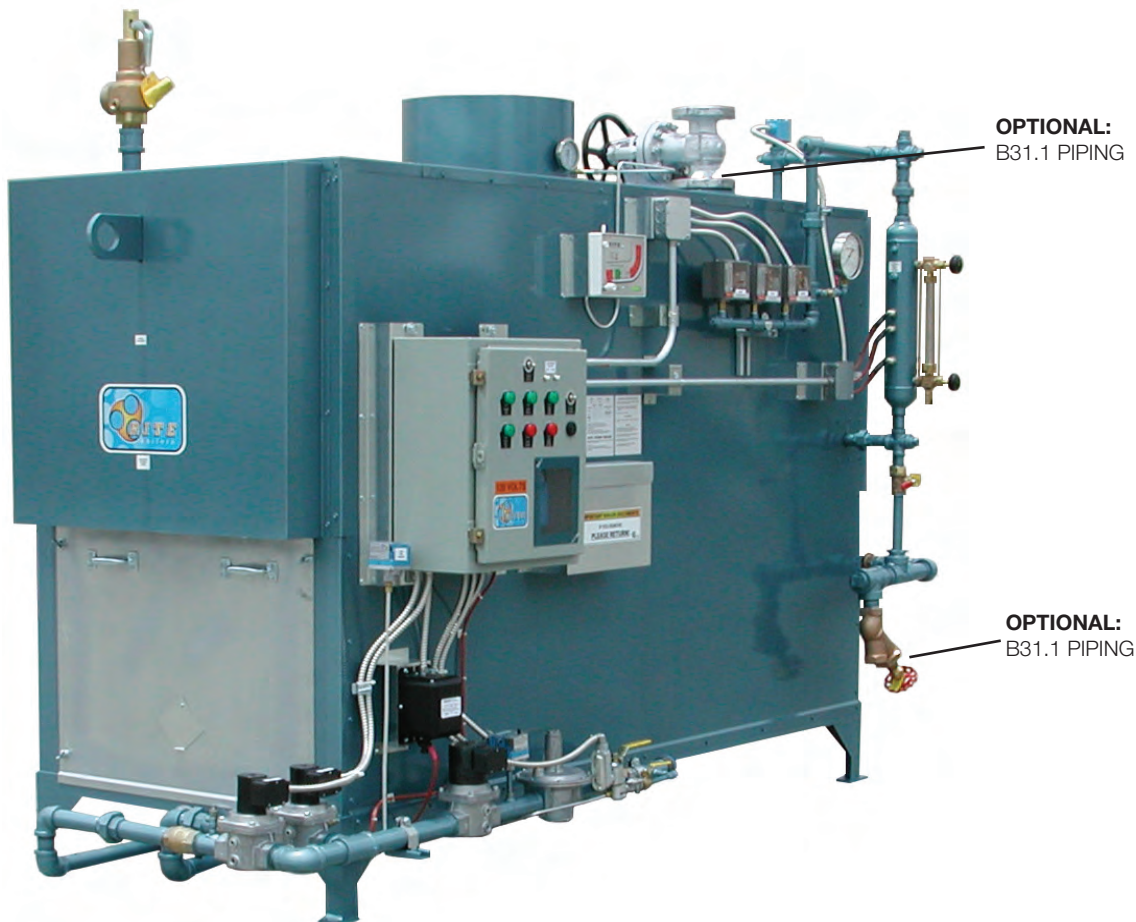
## PRODUCT DESCRIPTION

Rite has manufactured High Temperature Hot Water Boilers with safety and reliability in mind for well over forty years. From large central heating plants to a wide variety of industrial process loads, these heavy duty watertube boilers are available in 16 different models, ranging from 398 to 10,456 MBH input (9.5 - 250 Boiler Horsepower). Capable of providing 250° to 340°F water or higher, these boilers compare favorably to thermal hot oil heaters and high pressure steam boilers. High temperature water boilers have •no high cost thermal oil fluid • no coking • no environmental spill issues •superior heat transfer efficiency over thermal oil. Benefits over steam include • no auxiliary equipment such as: blowdown tanks, deaerators, water softeners, chemical treatment, feed pumps, steam traps, condensate return lines • no "open system" energy losses • less scale and corrosion.

So simple to maintain and operate, Rite High Temperature Hot Water Boilers feature complete waterside access so that virutally all scale and mud deposits can be seen and mechanically cleaned during a single scheduled maintenance shutdown. The result - Better fuel-to-water efficiency and lower operating cost over the life of your boiler investment. Consider a few of our other standard features: •Rite's floating heads that eliminate pressure vessel cracks and broken welds caused by thermal stress and cycling (backed by our 35 Year Thermal Shock Warranty) •Tubesheets up to 1-3/4" thick that virtually eliminates tube loosening or weeping- and you have a better boiler by design.

## RITE ATMOSPHERIC BURNER FEATURES

Rite Power Burner Fired high Temperature Water Boilers must be specified when: Low NOx emissions are required or fuels other than natural gas or propane will be used. While Power Burners are more expensive and use more electrical power than atmospheric, they do have one substantial advantage: by controlling the amount of air they use for combustion, Power Burners achieve higher combustion efficiencies than atmospheric - especially at less than full fire rate.





# High Temperature Hot Water Boiler Section I

## Atmospheric / Natural Gas Fired

### STACK / DRAFT REQUIREMENTS

- UL listed for use with Type B Vent when power burner is for natural or L.P. gas fired only.
- Type 304 or 316 stainless steel lined stack is required when equipped with #2 oil or combination gas & #2 oil burner.
- Minimum stack height for natural or L.P. gas fired burners is 10 feet. Minimum height for #2 oil or combination gas & #2 oil fired boilers is 15 feet.
- The stack should be supported independently of the boiler and an adjustable length section of stack should be installed after the barometric damper to allow for servicing. All Rite Boilers have internal stack supports to handle the weight of the stack during installation.
- Power Burner fired boilers are supplied with a barometric damper (shipped loose) and a draft gauge (installed) to help set and maintain a draft between  $-.05"$  to  $-.09"$  w.c.. for all fuels and firing rates.

### COMBUSTION / VENTILATION AIR

- Provide at least 1/2 square feet of *free* air opening from outside for every 1000 MBTUH input for combustion air. Louvers can significantly reduce effective free air opening so be sure to compensate accordingly.
- Provide the same size free opening at a high point in the room for ventilation.
- If additional ventilation is required it is better to force air into the room. Avoid exhaust fans whenever possible.
- Motorized fresh air dampers must be interlocked with boiler controls to prevent firing unless fully open.
- Check local codes for exceptions and additional requirements to the above.

### B.T.U. FORMULA

- BTU output @ 0-2000' elevation =  $60 \times 8.3 \times \Delta T \times \text{G.P.M}$

### ELECTRICAL REQUIREMENTS

- We need to know the exact voltage, phase and cycles (hertz) you **want to use ahead of time**. Choose from 120, 208-240, 440-460 and 575 VAC. If the blower motor voltage is greater than 120 VAC, then a control stepdown transformer must be specified or separate 120 VAC power supply **must** be brought to the burner. All power supply is AC (alternating current) and assumed to be 60 cycles. Note that 50 cycles will reduce burner capacity and require 50 cycle rated valves and controls.

### FUEL REQUIREMENTS

- The type of gas (natural, propane, digester) and the supply gas pressure are required ahead of time. Specific gravity and BTU content are required for elevations above 2000' and on all digester gas jobs. Digester gas must be scrubbed and dried. Propane gas lines should use vaporizers to prevent freezing. All gas supply lines require a dirt/drip leg at the boiler. Do not use teflon tape on pipe threads.
- #2 oil (Diesel) supply pressure to burner oil pump: minimum gravity flow to maximum 3 psi.

### ELEVATION

Ratings are for elevations up to 2000 feet above sea level. Over 2000' ratings should be reduced at the rate of 4% for every 1000 feet **above** 2000 feet.

### OVERPRESSURE REQUIREMENTS

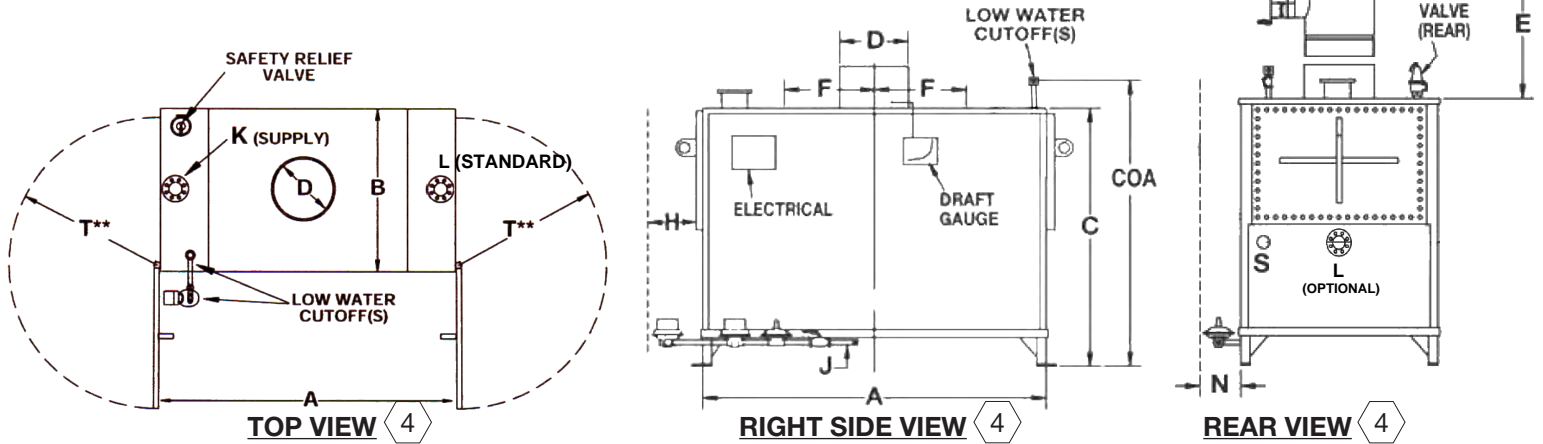
To prevent high temperature hot water from flashing to steam, a certain amount of overpressure is required. Look up the maximum operating temperature you want in the steam tables and find the corresponding pressure (i.e., 331°F = 90 psi steam). Add 20 psi and an additional 1 psi for every 1000' Elevation to determine safe operating pressure. E.g., 331°F water at 5000' would require 115 psi operating pressure.

BOILER MODEL	Input MBH	Nominal Output		Heating Surface Sq. Ft.	Water Content Gallons	G.P.M. @ 20°F Rise	Furnace Volume Cubic Feet	Nominal Shipping Weight (lbs)
		MBH	Boiler Horsepower					
PW9.5 *	398	318	9.5	65	35	30	10	2230
PW10 *	419	335	10	65	35	32	10	2230
PW15 *	628	502	15	85	40	48	14	2460
PW20 *	838	670	20	105	45	65	16	2690
PW25 *	1046	837	25	115	65	80	18	3540
PW35 *	1465	1172	35	156	85	115	27	4020
PW48 *	1950	1560	48	214	100	152	39	4630
PW50 *	2093	1674	50	214	100	165	39	4630
PW75 *	3139	2511	75	349	150	245	69	8500
PW100 *	4185	3348	100	460	175	330	92	9700
PW125 *	5230	4184	125	571	195	415	118	11300
PW150 *	6276	5021	150	733	280	495	137	16200
PW175 *	7323	5858	175	851	320	580	157	17800
PW200 *	8369	6695	200	969	360	650	185	19200
PW225 *	9425	7540	225	1020	390	750	208	20300
PW250 *	10456	8365	250	1125	420	830	223	21500

\* Add suffix "G" for natural gas or propane, "O" for #2 oil, "GO" for combination gas & #2 oil or "GG" for dual gas fuels (i.e. Natural & Digester). Add prefix "W" in front of model number for weatherproof (outdoor trim).



# High Temperature Hot Water Boilers / Atmospheric / Natural Gas Fired



- DIMENSIONS ARE IN INCHES - SUBJECT TO PRODUCTION TOLERANCES AND CHANGE WITHOUT NOTICE. CERTIFIED DIMENSIONS AVAILABLE UPON REQUEST.
- BOILERS APPROVED FOR INSTALLATION ON NON-COMBUSTIBLE FLOORS ONLY.

- ① Draft Diverters are supplied standard on Models P9.5 - P25 only. Barometric Dampers will be shipped one size smaller than D dimension for stacks up to 25 feet of vertical height (as shown below in column E), full size (same as D dimension) for stacks 25 to 50 feet tall and one size larger for stacks over 50 feet tall. Barometric Damper Tee by others.
- ② May vary - sizes shown are for UL gas trains at standard supply pressures. Gas connections are male NPT pipe thread. All other threaded connections are female NPT.
- ③ 3", 4" and 6" flanges are ANSI 300 lb. SA-105 raised face. Flanged outlets may be reduced upon special request and/or supplied ANSI 150 lb SA-105 raised face.
- ④ Standard right hand construction shown illustrated above. Left hand construction available at no extra charge. "T" dimension required only when hinged headplates are optionally supplied.

BOILER MODEL	A	B	C	COA	D	E①	F	H	J②	K③	L	N	S	T④
	Length Jacket	Width Jacket	Height Flush	Height Overall	Stack Dia.	Draft Control (Space Req'd.)	Twin Stacks	Tube Maint.	Gas Conn.	Steam Supply	Feed Water	Side Space	Blow Down	Head Swing
P9.5	44	31	65	74	9	9 D.D. (33)	-	37	3/4	1 1/2	1	10	1	24
P10	44	31	65	74	9	9 D.D. (33)	-	37	3/4	1 1/2	1	10	1	24
P15	54	31	65	74	10	10 D.D. (34)	-	47	1	1 1/2	1	12	1	24
P20	64	31	65	74	12	12 D.D. (36)	-	57	1	1 1/2	1	12	1	24
P25	56	39	66	75	14	14 D.D. (38)	-	46	1	2 1/2	1	12	1 1/2	32
P35	70	39	66	75	16	14 BARO	-	60	1 1/4	2 1/2	1	12	1 1/2	32
P48	90	39	66	75	18	16 BARO	-	80	1 1/2	2 1/2	1	14	1 1/2	32
P50	90	39	66	75	18	16 BARO	-	80	1 1/2	2 1/2	1	14	1 1/2	32
P75	89	53	71	80	20	18 BARO	-	75	2	4 FL	1 1/2	14	1 1/2	25
P100	111	53	71	80	22	20 BARO	-	97	2	4 FL	1 1/2	14	1 1/2	25
P125	133	53	71	80	24	20 BARO	-	119	2 1/2	4 FL	1 1/2	16	1 1/2	25
P150	124	75	75	84	28	24 BARO	-	109	2 1/2	6 FL	1 1/2	16	2	40
P175	139	75	75	84	30	28 BARO	-	124	2 1/2	6 FL	1 1/2	16	2	40
P200	154	75	75	84	2-24	(2) 20 BARO	30	139	2 1/2	6 FL	1 1/2	18	2	40
P225	165	75	75	84	2-24	(2) 20 BARO	32	150	2 1/2	6 FL	1 1/2	18	2	40
P250	176	75	75	84	2-26	(2) 24 BARO	35	161	2 1/2	6 FL	1 1/2	18	2	40