BRYAN "FLEXIBLE WATER TUBE"

RW SERIES STEAM AND WATER BOILER

8,500,000 TO 21,000,000 BTUH

FORCED DRAFT GAS, OIL OR DUAL FUEL FIRED

Water Boiler
RW2100-W-FDGO

Steam Boiler
RW1050-S-150-FDG

BRYAN STEAM®

Originators of the "Flexible Water Tube" design

A breakthrough in an industrial water tube boiler design

- True “flexible water tube” design guaranteed shock free
- High quality steam for heat or process
- Full five (5) sq ft of heating surface per BHP
- Quality construction features
  - Water side or steam side interior accessible for cleanout and inspection, front and rear openings, upper and lower drums.
  - Boiler tube and furnace area access panels: heavy gauge steel casing with 2" high-temperature ceramic fiber insulation, bolted and tightly sealed to boiler frame.
  - Flame observation port in access door at rear of boiler.
  - Dual side access; combustion chamber, tubes and burner head are completely accessible from either side simplifying maintenance and minimizing floor space.
  - Heavy steel boiler frame, built and stamped in accordance with the appropriate ASME Boiler Code.
  - Heavy gauge steel boiler jacket with rust-resistant zinc coating and enamel finish, insulated with 1½" fiberglass to ensure exceptionally cool outer surface.
  - Bryan bent water tubes are flexible, individually replaceable without welding or rolling. Never more than two unique tube configurations.
  - Pressurized design firebox with internal water-cooled furnace with low heat release rate.
  - Steam boilers with extra large drum with high steam release area ensure stable water level and dry steam.

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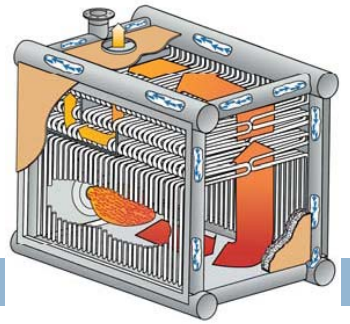
Bryan RW Series Boiler Specifications

BOILER MODEL [1]	INPUT MBH (KW)	OUTPUT @ 80% EFFICIENCY [2]		OUTPUT @ 84% EFFICIENCY [3]		STEAM OUTPUT [4]	HTG. SURFACE	APPROX. SHIP
		MBH (KW)	HP (KW)	MBH (KW)	HP (KW)	LBS/HR (KG/HR)	SQ. FT. (M^2)	LBS. (KG)
RW850-W	8,500 (2,490)	6,800 (1,992)	200 (1,992)	7,140 (2,092)	213 (2,092)	—	1,136 (106)	16,700 (7,575)
RW850-S	8,500 (2,490)	6,800 (1,992)	200 (1,992)	—	—	7,009 (3,197)	1,136 (106)	21,200 (9,616)
RW1050-W	10,500 (3,076)	8,400 (2,461)	250 (2,461)	8,820 (2,584)	263 (2,584)	—	1,288 (120)	18,540 (8,410)
RW1050-S	10,500 (3,076)	8,400 (2,461)	250 (2,461)	—	—	8,658 (3,927)	1,288 (120)	23,700 (10,750)
RW1260-W	12,600 (3,692)	10,080 (2,953)	300 (2,953)	10,584 (3,100)	316 (3,100)	—	1,552 (144)	20,770 (9,421)
RW1260-S	12,600 (3,692)	10,080 (2,953)	300 (2,953)	—	—	10,389 (4,712)	1,552 (144)	26,100 (11,838)
RW1500-W	15,000 (4,395)	12,000 (3,516)	350 (3,516)	12,600 (3,691)	376 (3,691)	—	1,818 (169)	23,070 (10,465)
RW1500-S	15,000 (4,395)	12,000 (3,516)	350 (3,516)	—	—	12,368 (5,610)	1,818 (169)	29,200 (13,245)
RW1700-W	17,000 (4,981)	13,600 (3,985)	400 (3,985)	14,280 (4,183)	427 (4,183)	—	2,087 (194)	24,910 (11,299)
RW1700-S	17,000 (4,981)	13,600 (3,985)	400 (3,985)	—	—	14,020 (6,360)	2,087 (194)	32,400 (14,697)
RW1900-W	19,000 (5,567)	15,200 (4,454)	450 (4,454)	15,960 (4,675)	477 (4,675)	—	2,347 (218)	26,950 (12,225)
RW1900-S	19,000 (5,567)	15,200 (4,454)	450 (4,454)	—	—	15,670 (7,108)	2,347 (218)	34,300 (15,559)
RW2100-W	21,000 (6,153)	16,800 (4,922)	500 (4,922)	17,640 (5,167)	527 (5,167)	—	2,612 (243)	26,800 (13,064)
RW2100-S	21,000 (6,153)	16,800 (4,922)	500 (4,922)	—	—	17,319 (7,856)	2,612 (243)	36,800 (16,693)

NOTES:
(1) W = Water / S = Steam
(2) Output and horsepower based on boiler industry standard of 80% of input.
(3) Output and horsepower based on an average natural gas combustion efficiency of 84% for hot water boiler. Actual combustion efficiencies for oil will be higher.
(4) Lbs. steam per hour from and at 212°F.

BRYAN® STEAM

Guaranteed efficiency and easy maintenance assure low cost operation



- All Bryan RW Series boilers offer these operating and performance features
  - Guaranteed efficiency
    - The breakthrough in water tube boiler design that produced the RW Series provides operating efficiency so reliable, we guarantee it to be 84% for hot water boilers and 82% - 15 psi / 80% - 150 psi or better for steam boilers.
  - The Bryan Flexible Tube
    - Bryan's exclusive "Flexible Tube" design eliminates the possibility of damage from so-called "thermal shock." Tubes are easily removable and replaceable, without welding or rolling, eliminating long, expensive downtime should repairs ever be required.
  - Water cooled furnace
    - The configuration of the water tubes provides a water cooled combustion chamber. A high percentage of the heating surface is exposed to direct radiant heat, increasing water velocities and heat transfer.
  - Large steam drum
    - The steam drum has generous water volume and steam release area. This design, along with effective drum internal functions, results in a stable water level and produces extremely dry steam at all load conditions.
  - Accessibility of furnace and tube area
    - Inner panel provides easy and complete access to boiler tube area. All panels are heavily insulated and sealed to boiler frame.

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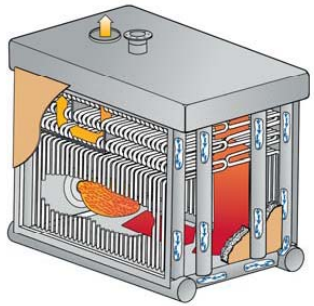
Guaranteed efficiency and easy maintenance assure low cost operation



- All Bryan RW Series boilers offer these operating and performance features
  - Accessibility of furnace and tube area
    - Inner panel provides easy and complete access to boiler tube area. All panels are heavily insulated and sealed to boiler frame.
  - Compact design, minimum floor space
    - With our compact water tube design, the overall size of the unit is less than most other types of boilers, yet maintains a full five square feet of heating surface area per HP. Needing only 32" for tube removal, on each side of the boiler, the RW Series boiler occupies very little space in the boiler room. This can result in considerable savings in building costs.
  - Multi-pass flue gas travel
    - High velocity five-pass flue gas travel is obtained by a unique baffling system. This contributes to maximum fire side heat transfer and overall high boiler efficiencies.
  - Thermal blend water return
    - Bryan's unique "thermal blend" return mixes cooler return water with warmer boiler water abridging it to design operating temperatures. The "mixed" water flow keeps the lower header and heating surfaces at a temperature above possible condensing conditions. This reduces the possibility of "cold spots" and damage from corrosive condensation.
  - Positive internal circulation
    - Each pass of the Bryan water tube slopes upward. This configuration, along with the large volume downcomer water legs, provides the extremely rapid natural thermal internal circulation, promoting both high efficiency of heat transfer and uniform temperature throughout the boiler. Eliminating stress damage caused by unequal temperature distribution is especially important for heating systems, particularly where intermittent or continuous low temperature water returns may be encountered.

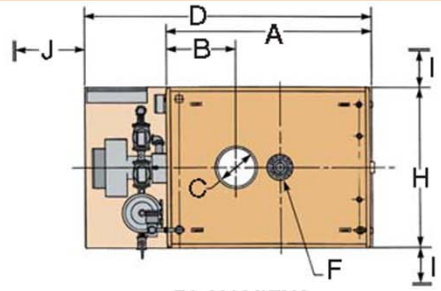
BRYAN® STEAM

Guaranteed efficiency and easy maintenance assure low cost operation

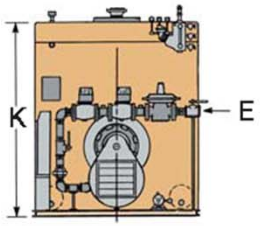
- All Bryan RW Series boilers offer enhanced burner controls and performance options
  - Low NOx
    - Bryan type LX boilers combine the inherent efficiency of the Bryan flexible tube boiler concept with the latest burner technologies to reduce nitrogen oxide emissions. The flexible water tubes assure maximum heat transfer and optimized performance so that the combustion process generates minimum emissions.
    - NOx requirements of 30, 20, 15, 12, and 9 PPM on natural gas available with reduced NOx on other gas fuels or oil.
  - Linkageless Burner Air Fuel Ratio Control Systems
    - Require minimal adjustments unlike mechanically linked systems resulting in maximum combustion efficiency.
    - Independent fuel curves on dual fuel boilers for maximum efficiency on both fuels.
    - Offers increased turndown to prevent short cycling and maximum fuel efficiency.
    - Can combine with VFD blower motor control option to maximize energy savings.
  - Enhanced Communications To Building Management Systems
    - The Bryan Universal Communications Gateway (UCG) provides the protocol interface between the boiler/burner package and the building management system. UCG and boilers are preconfigured at the factory for the specified protocol.
    - Supports Modbus RTU, BACnet MSTP, BACnet IP, Metasys N2 Modbus TCP and LonWorks protocols.

BRYAN® STEAM

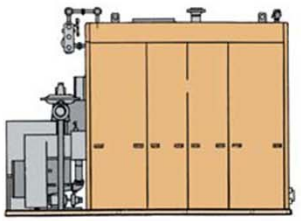
Steam Boiler Dimensions & Data

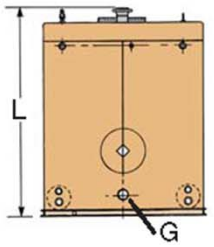


PLAN VIEW



FRONT VIEW


SIDE VIEW



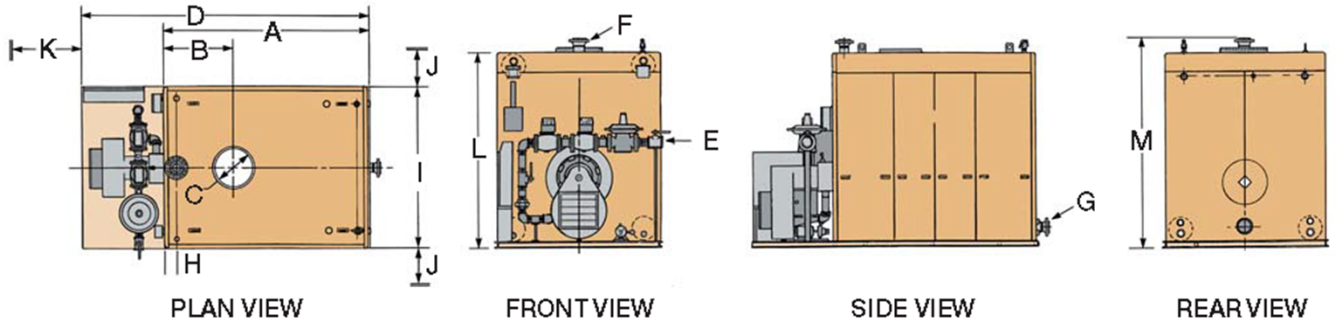
REAR VIEW

STEAM HEATING/PROCESSING BOILER DIMENSIONS in inches (cm)

	A	B	C	D	E	F		G	H	I	J	K	L
Boiler Model Number	Length of Jacket	Flue Location	Flue Size	Overall Length	Gas Train Connection	Supply Nozzle 15 psi	Supply Nozzle 150 psi	Return Conn.	Width Outside Jacket	Min. Tube Removal Clearance	Clearance for Servicing Burner	Height Over Jacket	Floor to Flow Nozzle
RW850-S	124 (315.0)	36 (91.4)	20 (50.8)	163¾ (415.8)	2½ NPT (6.4)	10 (25.4)	6 (15.2)	2 (5.08)	89½ (227.3)	32 (81.3)	48 (121.9)	107½ (273.1)	113 (287)
RW1050-S	134 (340.4)	36 (91.4)	20 (50.8)	176⅝ (448.6)	3 NPT (7.6)	10 (25.4)	6 (15.2)	2 (5.08)	89½ (227.3)	32 (81.3)	48 (121.9)	107½ (273.1)	113 (287)
RW1260-S	156½ (397.5)	37 (94.0)	22 (55.9)	199¼ (506.1)	3 NPT (7.6)	12 (30.5)	6 (15.2)	2 (5.08)	89½ (227.3)	32 (81.3)	48 (121.9)	107½ (273.1)	113 (287)
RW1500-S	179 (454.7)	37 (94.0)	22 (55.9)	221¾ (563.2)	3 NPT (7.6)	12 (30.5)	8 (20.3)	2 (5.08)	89½ (227.3)	32 (81.3)	48 (121.9)	107½ (273.1)	113 (287)
RW1700-S	201½ (511.8)	38 (96.5)	24 (61.0)	224¼ (620.4)	3 NPT (7.6)	12 (30.5)	8 (20.3)	2 (5.08)	89½ (227.3)	32 (81.3)	48 (121.9)	107½ (273.1)	113 (287)
RW1900-S	224 (569.0)	39 (99.1)	26 (66.0)	266¾ (677.5)	4 NPT (10.2)	12 (30.5)	8 (20.3)	2 (5.08)	89½ (227.3)	32 (81.3)	48 (121.9)	107½ (273.1)	113 (287)
RW2100-S	246½ (626.1)	40 (101.6)	28 (71.1)	289½ (735.3)	4 NPT (10.2)	12 (30.5)	8 (20.3)	2 (5.08)	89½ (227.3)	32 (81.3)	48 (121.9)	107½ (273.1)	113 (287)

BRYAN® STEAM

Water Boiler Dimensions & Data



HOT WATER HEATING BOILER DIMENSIONS in inches (cm)

	A	B	C	D	E	F & G	H	I	J	K	L	M
Boiler Model Number	Length of Jacket	Flue Location	Flue Size	Overall Length	Gas Train Connection	Supply & Return Nozzle	Supply Location	Width Outside Jacket	Min. Tube Removal Clearance	Clearance for Servicing Burner	Height Over Jacket	Floor to Flow Nozzle
RW850-W	124 (315.0)	36 (91.4)	20 (50.8)	163¾ (415.8)	2½ NPT (6.4)	8 (20.3)	9⅜ (23.8)	89½ (227.3)	32 (81.3)	48 (121.9)	104 (264.2)	110 (279.4)
RW1050-W	134 (340.4)	36 (91.4)	20 (50.8)	176⅝ (448.6)	3 NPT (7.6)	8 (20.3)	9⅜ (23.8)	89½ (227.3)	32 (81.3)	48 (121.9)	104 (264.2)	110 (279.4)
RW1260-W	156½ (397.5)	37 (94.0)	22 (55.9)	199¼ (506.1)	3 NPT (7.6)	8 (20.3)	9⅜ (23.8)	89½ (227.3)	32 (81.3)	48 (121.9)	104 (264.2)	110 (279.4)
RW1500-W	179 (454.7)	37 (94.0)	22 (55.9)	221¾ (563.2)	3 NPT (7.6)	8 (20.3)	9⅜ (23.8)	89½ (227.3)	32 (81.3)	48 (121.9)	104 (264.2)	110 (279.4)
RW1700-W	201½ (511.8)	38 (96.5)	24 (61.0)	244¼ (620.4)	3 NPT (7.6)	8 (20.3)	9⅜ (23.8)	89½ (227.3)	32 (81.3)	48 (121.9)	104 (264.2)	110 (279.4)
RW1900-W	224 (569.0)	39 (99.1)	26 (66.0)	266¾ (677.5)	4 NPT (10.2)	10 (25.4)	9⅜ (23.8)	89½ (227.3)	32 (81.3)	48 (121.9)	104 (264.2)	110 (279.4)
RW2100-W	246½ (626.1)	40 (101.6)	28 (71.1)	289½ (735.3)	4 NPT (10.2)	10 (25.4)	9⅜ (23.8)	89½ (227.3)	32 (81.3)	48 (121.9)	104 (264.2)	110 (279.4)

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Steam Boiler Vessel Pictures

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Water Boiler Vessel Pictures

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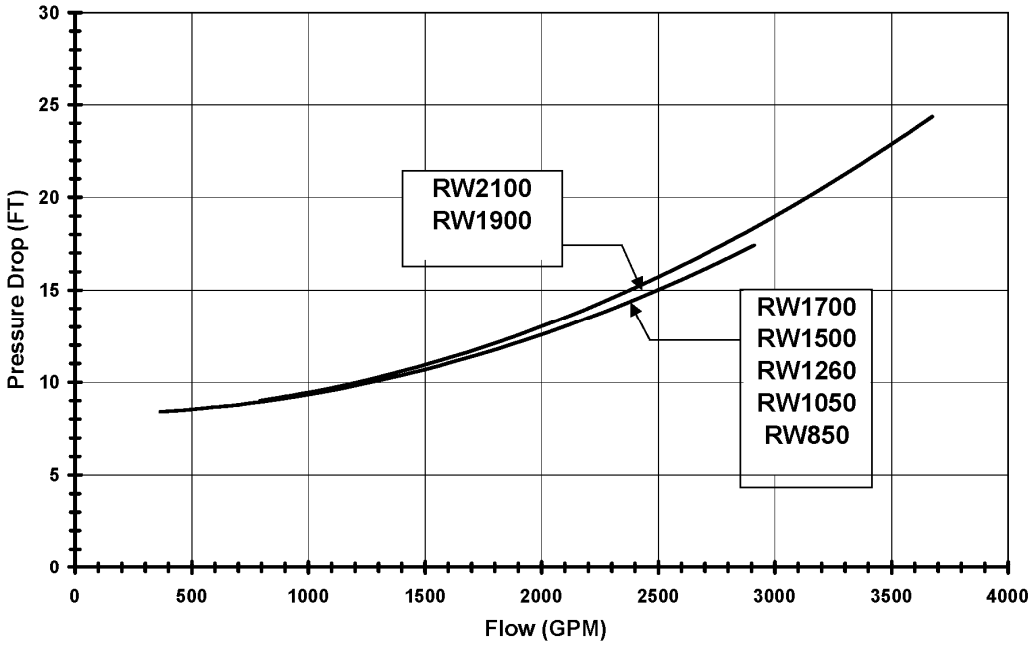
RW Pressure Drop Data

Bryan Steam, LLC
Engineering Section

RW Series
Pressure Drop Curves

Form 2265
1/14/2005



Note: GPM = Boiler Output / (500 x delta T)

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