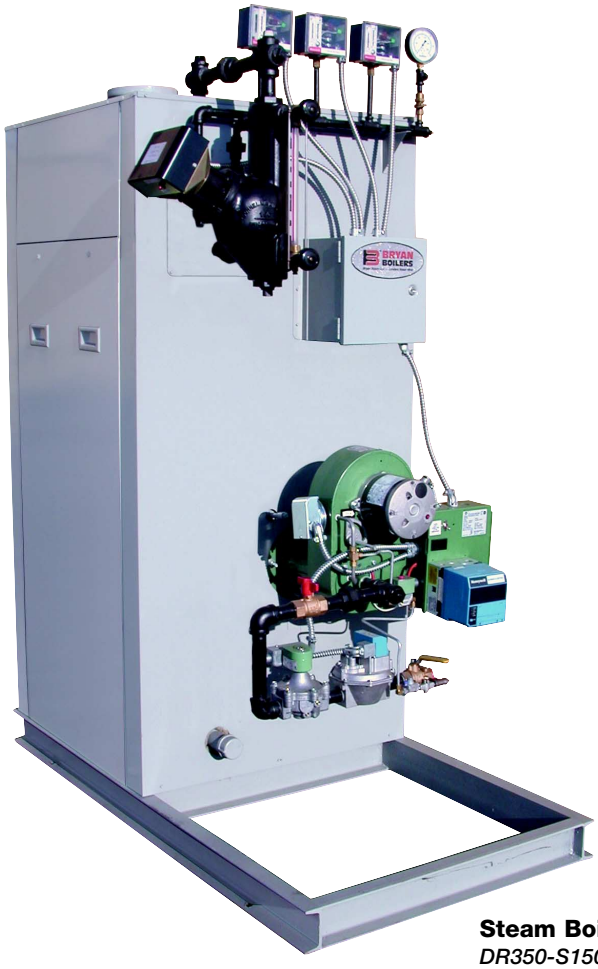
Form No. 3710
(2/02)

Bryan "Flexible Water Tube"

DR Series
Steam & Water Boilers

250,000 to 850,000 BTUH
Forced draft gas, oil or dual fuel fired



Steam Boiler
DR350-S150-FDG

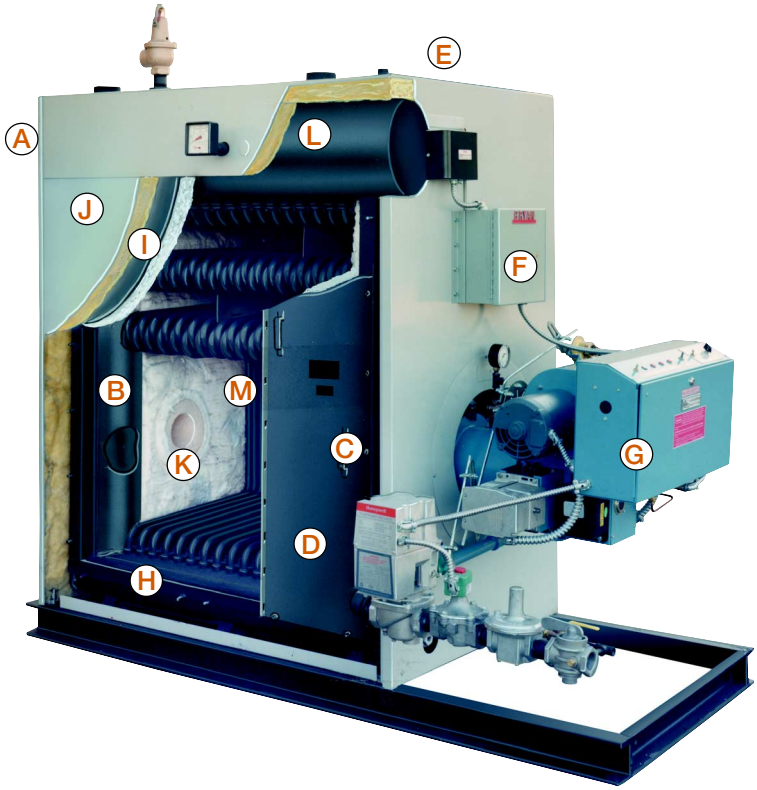
Water Boiler
DR850-W-FDGO

BRYAN BOILERS

Originators of the "Flexible Water Tube" design

Low initial cost, high operating efficiency deliver substantial return on investment

- **True "flexible water tube" design**
- **High quality steam for heat or process**
- **Pressurized firing for high efficiency**



A. Water side or steam side interior accessible for cleanout and inspection, front and rear openings, upper and lower drums.

B. Large volume water leg downcomers promote rapid internal circulation, temperature equalization and efficient heat transfer.

C. Boiler tube and furnace area access panel: heavy gauge steel-lined with high temperature ceramic fiber and insulation, bolted and tightly sealed to boiler frame.

D. Single side access; combustion chamber, tubes and burner head are completely accessible from one side simplifying maintenance and minimizing floor space.

E. Minimum sized flue vent.

F. Control panel: all controls installed with connections to terminal strip.

G. Forced draft, flame retention head type burner. Efficient combustion of oil or gas, quiet operation.

H. Heavy steel boiler frame, built and stamped in accordance with the appropriate ASME Boiler Code.

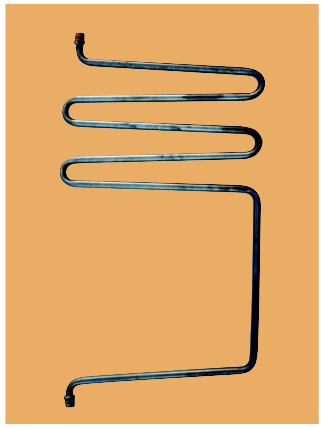
I. Heavy gauge steel boiler jacket with rust-resistant zinc coating and enamel finish, insulated with fiberglass to insure exceptionally cool outer surface.

J. Bryan bent water tubes are flexible, individually replaceable without welding or rolling. Never more than two tube configurations.

K. Internal water-cooled furnace with low heat release rate.

L. Steam boilers with extra large drum with high steam release area ensure stable water level and dry steam.

M. Pressurized design: inner fireside casing constructed of heavy gauge steel, completely sealed, lined with high temperature insulation and refractory.



Bryan DR Series Boiler Specifications

BOILER MODEL	INPUT MBH (KW)	NOMINAL OUTPUT		STEAM OUTPUT LBS/HR**	HEATING SURFACE SQ. FT. (M^2)	APPROX. SHIP WT. LBS. (KG)
		MBH (KW)*	BHP *			
DR250	250 (73)	200 (58)	6	206	66 (6.13)	1,150 (522)
DR350	350 (102)	280 (82)	8	288	66 (6.13)	1,150 (522)
DR450	450 (131)	360 (105)	10	371	66 (6.13)	1,150 (522)
DR650	650 (190)	520 (152)	15	536	103 (9.56)	1,650 (748)
DR850	850 (249)	680 (199)	20	701	103 (9.56)	1,650 (748)

NOTES: * Nominal output based on boiler industry standard of 80% of input. Actual combustion efficiencies will be higher and fuel dependent.
** Lbs. steam per hour from and at 212°F.

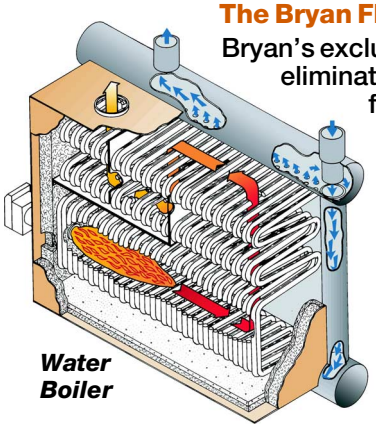
Guaranteed high efficiency performance and easy maintenance insure low cost operation

All Bryan DR Series boilers offer these operating and performance features

Guaranteed efficiency

The breakthrough in water tube boiler design that produced the DR Series provides operating efficiency so reliable, we guarantee it to be 83% for hot water boilers and 82%* for steam boilers, or better.

The Bryan Flexible Tube



Water Boiler

Bryan's exclusive "Flexible Tube" design eliminates the possibility of damage from so-called "thermal shock." Tubes area 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 furnace and boiler tube area, as well as to burner head. All panels are heavily insulated and sealed to boiler frame. All access is from only one side.

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. Needing only 24" for tube removal, and on only one side of the boiler, the DR Series boiler occupies very little space in the boiler room. This can result in considerable savings in building costs. Pressurized firing permits minimum sized breaching and vent.

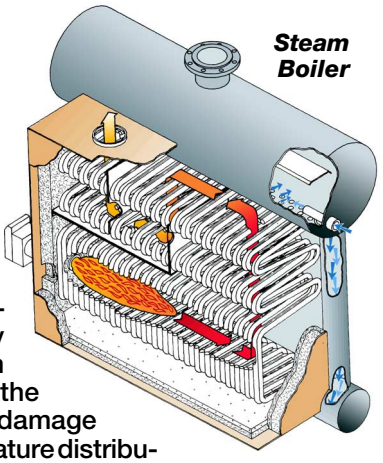
Multi-pass flue gas travel

High velocity four-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 blends cold or cooler return water with warmer boiler water abridging it to design operating temperatures. An injector tube directs the "mixed" water flow through the downcomer to 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



Steam Boiler

Each pass of the Bryan water tube slopes upward. This configuration, along with the large volume down-comer 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.

* 15 PSI Steam

Bryan DR Series Boilers Standard and Optional Equipment

STANDARD EQUIPMENT FURNISHED

Water Boiler

Combination thermometer and altitude gauge, ASME Code rated boiler relief valve, water temperature control (240°F max std.), high limit control, probe LWCO.

Steam Boiler

Combination low water cutoff and pump control, auxiliary low water cutoff, high limit pressure control, ASME-rated safety valve, water glass set.

Straight gas fired unit

Electronic combustion safety control, automatic operating gas valve, safety gas valve, pilot solenoid valve, pilot ignition assembly, main manual gas shut-off valve, pilot cock, pilot and main gas pressure regulators, air safety switch, control panel, all controls installed and wired.

Straight oil fired unit

Electronic combustion safety control, oil valve, oil ignition transformer, two-stage fuel unit, gas pilot, oil nozzle assembly, control panel, all controls installed and wired.

Combination gas-oil unit

Electronic combustion safety control, automatic operating gas valve, safety gas valve, pilot solenoid valve, pilot ignition assembly, main manual gas shut-off valve, pilot cock, pilot and main gas pressure regulators, air safety switch, manual fuel selector switch, oil valve, oil ignition transformer, two-stage fuel unit, oil ignition and nozzle assembly, control panel, all controls installed and wired.

OPTIONAL EQUIPMENT, EXTRA COST

1. Manual reset high limit control
2. Manual reset low water cutoff
3. Auxiliary low water cutoff
4. Combination low water cutoff and feeder
5. Alarm bells or horns
6. CSD-1, FM, IRI or other insurance approved control systems
7. Indicating lights, as desired
8. Lead-lag systems for two or more boilers with or without outdoor reset control
9. Draft control system

OPTIONAL CONSTRUCTION:

Steam boiler

Optional construction to ASME Power Boiler Code requirements for pressure exceeding 150 psi to maximum of 300 psi design pressure.

Hot water boiler

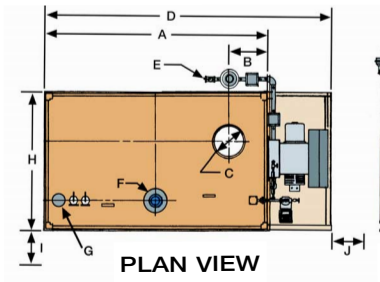
Optional construction to ASME Power Boiler Code requirements for temperatures exceeding 240° F and/or pressure exceeding 160 psi to maximum of 285° F operating and 300° F design temperature and 250 psi.

When ordering, please specify:

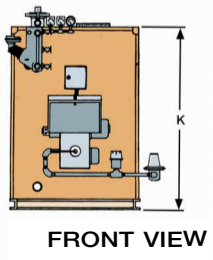
1. Boiler size
2. Supply and return temperatures required
3. Boiler relief valve setting
4. Type of fuel: natural, LP, or other gas and/or No. 2 oil
5. If gas, type, BTU content, specific gravity and pressure available
6. Electric power voltage, phase and frequency
7. Optional extra equipment or construction
8. Special approvals required (UL, CSD-1, FM, or IRI)
9. Altitude

Bryan DR Series Steam & Hot Water Boilers

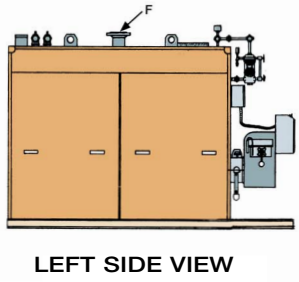
Steam Heating/ Processing Boilers



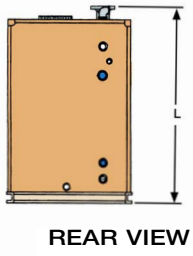
PLAN VIEW



FRONT VIEW



LEFT SIDE VIEW



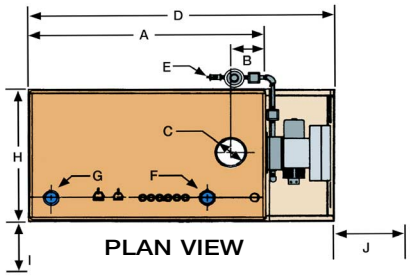
REAR VIEW

DIMENSIONS in inches (cm)

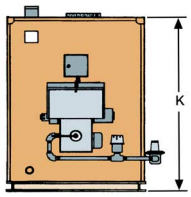
Boiler Model Number	A Length of Jacket	B Flue Location	C Flue Size	D Overall Length	E Gas Train Connection (Approx.)	F Supply Nozzle 15 psi	F Supply Nozzle 150 psi	G Return Conn.	H Width Outside Jacket	I Min. Tube Removal Clearance	J Clearance for Servicing Burner	K Height Over Jacket	L Floor to Flow Nozzle
DR250*	32 3/8 (82.23)	12 13/16 (32.54)	6 (15.24)	62 1/8 (157.80)	1 (2.54)	NA**	3 (7.62)	2 (5.08)	33 13/16 (85.88)	24 (60.96)	30 (76.20)	71 3/4 (182.25)	74 5/8 (189.54)
DR350	32 3/8 (82.23)	12 13/16 (32.54)	6 (15.24)	62 1/8 (157.80)	1 (2.54)	3 (7.62)	3 (7.62)	2 (5.08)	33 13/16 (85.88)	24 (60.96)	30 (76.20)	71 3/4 (182.25)	74 5/8 (189.54)
DR450	32 3/8 (82.23)	12 13/16 (32.54)	6 (15.24)	62 1/8 (157.80)	1 (2.54)	3 (7.62)	3 (7.62)	2 (5.08)	33 13/16 (85.88)	24 (60.96)	30 (76.20)	71 3/4 (182.25)	74 5/8 (189.54)
DR650	43 3/4 (111.13)	12 13/16 (32.54)	8 (20.32)	73 1/2 (186.69)	1 (2.54)	4 (10.16)	4 (10.16)	2 (5.08)	33 13/16 (85.88)	24 (60.96)	30 (76.20)	71 3/4 (182.25)	74 5/8 (189.54)
DR850	43 3/4 (111.13)	12 13/16 (32.54)	8 (20.32)	73 1/2 (186.69)	1 (2.54)	4 (10.16)	4 (10.16)	2 (5.08)	33 13/16 (85.88)	24 (60.96)	30 (76.20)	71 3/4 (182.25)	74 5/8 (189.54)

NOTE: Dimensions subject to change without notice. Consult factory for certified dimensions.
* Not intended for use as a principal heating source for the living space of an individual residence.
** Not available in 15 psi construction.

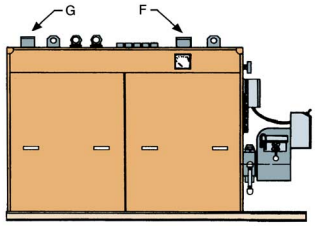
Hot Water Heating Boilers



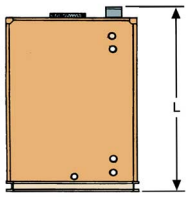
PLAN VIEW



FRONT VIEW



LEFT SIDE VIEW



REAR VIEW

DIMENSIONS in inches (cm)

Boiler Model Number	A Length of Jacket	B Flue Location	C Flue Size	D Overall Length	E Gas Train Connection	F Supply Nozzle	G Return Nozzle	H Width Outside Jacket	I Min. Tube Removal Clearance	J Clearance for Servicing Burner	K Height Over Jacket	L Floor to Flow Nozzle
DR350	32 3/8 (82.23)	12 13/16 (32.54)	6 (15.24)	62 1/8 (157.80)	1 (2.54)	2 (5.08)	2 (5.08)	32 1/8 (81.60)	24 (60.96)	30 (76.20)	66 3/8 (168.59)	67 7/8 (172.40)
DR450	32 3/8 (82.23)	12 13/16 (32.54)	6 (15.24)	62 1/8 (157.80)	1 (2.54)	2 (5.08)	2 (5.08)	32 1/8 (81.60)	24 (60.96)	30 (76.20)	66 3/8 (168.59)	67 7/8 (172.40)
DR650	43 3/4 (111.13)	12 13/16 (32.54)	8 (20.32)	73 1/2 (186.69)	1 (2.54)	2 (5.08)	2 (5.08)	32 1/8 (81.60)	24 (60.96)	30 (76.20)	66 3/8 (168.59)	67 7/8 (172.40)
DR850	43 3/4 (111.13)	12 13/16 (32.54)	8 (20.32)	73 1/2 (186.69)	1 (2.54)	2 (5.08)	2 (5.08)	32 1/8 (81.60)	24 (60.96)	30 (76.20)	66 3/8 (168.59)	67 7/8 (172.40)

Specifications subject to change without notice. Consult factory to consult on other boiler options.

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