Ajax Series • Atlas Series
Product Catalog

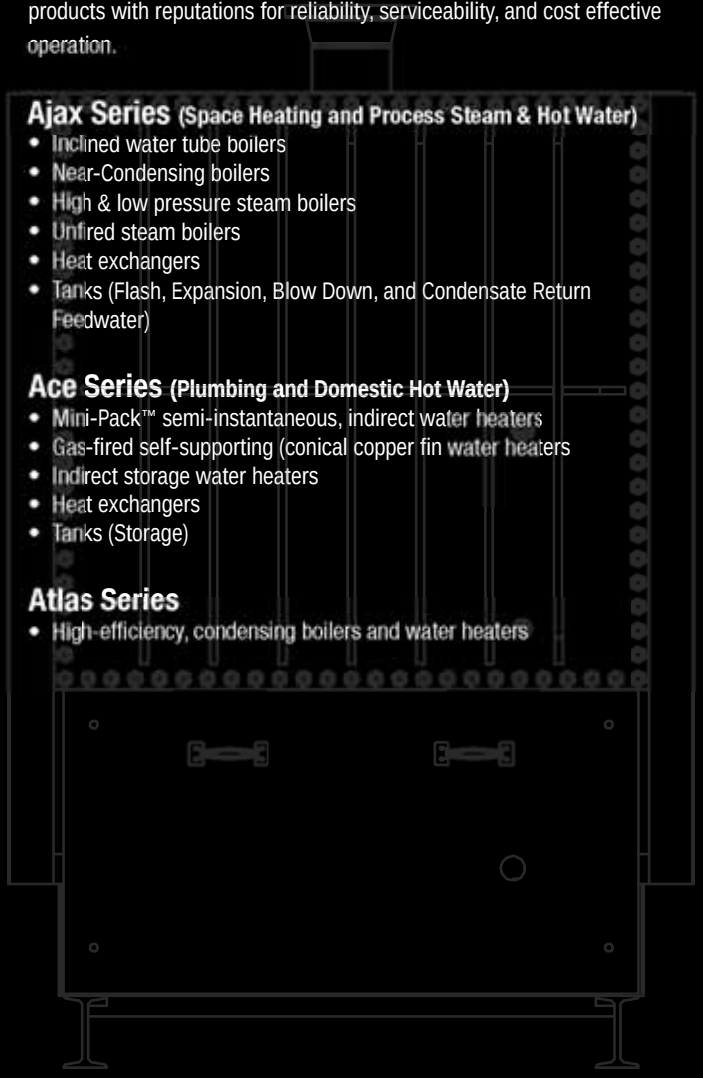
Manufactured by AJAX BOILER INC.

Inclined Water Tube Boilers • Near-Condensing • Condensing

Hybrid Systems • Heat Exchangers • Tanks

One Company... Three Great Brands

Ajax Boiler Inc. designs and manufactures a comprehensive line of boiler and commercial water heating products. With over eight decades of experience, the company offers high quality, heavy duty products with reputations for reliability, serviceability, and cost effective operation.



Ajax Series (Space Heating and Process Steam & Hot Water)
- Inclined water tube boilers
- Near-Condensing boilers
- High & low pressure steam boilers
- Unfired steam boilers
- Heat exchangers
- Tanks (Flash, Expansion, Blow Down, and Condensate Return Feedwater)

Ace Series (Plumbing and Domestic Hot Water)
- Mini-Pack™ semi-instantaneous, indirect water heaters
- Gas-fired self-supporting (conical copper fin water heaters
- Indirect storage water heaters
- Heat exchangers
- Tanks (Storage)

Atlas Series
- High-efficiency, condensing boilers and water heaters

Introduction.

AJAX BOILER INC. has been in operation since 1919 and, over the years, has developed a strong line of products that have proven their quality and reliability through many years of operating service.

Under the Atlas, Ace and Ajax Series brand names, AJAX BOILER INC. designs and manufactures a comprehensive line of ASME BOILER and COMMERCIAL WATER HEATING products. BOILER products are marketed under the Ajax Series line and WATER HEATING products are marketed under the Ace Series line and the CONDENSING BOILER is under the new Atlas Series line.

AJAX Series. ASME Section IV and Section I INCLINED WATER TUBE BOILERS for space heating or process use, low pressure steam for heating, humidification, and high pressure steam for heating, process use, sterilization, and other similar requirements.

ACE Series. ASME WATER HEATERS, Gas-Fired Commercial COPPER FIN CONE COIL Water Heaters, MINI-PACK™ Semi-Instantaneous Indirect Water Heaters, Storage Water Heaters (indirect), Hot Water Storage Tanks (lined), and Unfired Steam Boilers.

ATLAS Series. ASME CONDENSING boilers for your high efficiency needs.

Basic design features, many of them unique to the Atlas, Ace and Ajax Series, combined with advanced design concepts have set industry standards and are the basis for the wide acceptance of the Atlas, Ace and Ajax product range. Continuing product development maintains these series' positions as a market leader.

Ajax products are widely used throughout the global marketplace. With the advancement of the condensing boilers, traditional steel boilers are being paired with condensing boilers for "hybrid" systems, allowing the user to maximize efficiencies over seasonal climate changes.

Smart Boiler Control System™ takes advantage of Cloud Computing technology, bringing you global access to your equipment 24/7.

AJAX BOILER INC., situated on a twenty acre parcel in Santa Ana, CA, performs its manufacturing operations in a 120,000 square foot, high bay, heavy craneway facility to test fire boilers up to 21,000,000 BTU/hour under load conditions with calibrated test equipment that meets Underwriters Laboratory certification testing requirements.

All products are designed and engineered by our in-house engineering department, whose expertise combine the disciplines of combustion and heat transfer technology, pressure vessel design, control and systems engineering, with computer-aided design. Our on-site R&D lab has the capacity to test fire boilers up to 21,000,000 BTU/hour under load conditions with calibrated test equipment that meet all UL certifications testing requirements. Product lines are distributed by more than 70 sales representatives located in the United States and Canada. International brokers handle the export of the products to countries around the world.

AJAX BOILER INC.'s product philosophy is to design and produce heavy duty, reliable and serviceable products which provide the customer with the very best product value for purchase cost. An example of this occurred when a customer called and ordered a replacement boiler. When he was advised that the original boiler was over thirty years old, he said he was not surprised and that he would call us again in about thirty years when he needed another replacement boiler. Catalog products offer the widest selection of product sizes and performance, with the optimum values. This is because with proven design, development and tooling, costs are amortized over product life. Manufacturing can also be accomplished in larger quantities with commensurate lower costs. Computerized designs, computer developed product drawings and bills of material help to ensure the highest product quality at the lowest product cost.

Ajax Series products include direct fired BOILERS and WATER HEATERS as well as indirect fired and unfired water heaters and steam boilers. Since space heating boiler water systems are generally closed systems, that is the water is returned to the boiler and re-heated, the limited amount of air and dissolved solids in the (usually treated) boiler water do not cause harmful corrosion or coating of the boiler metal water surfaces. On the other hand, heating of CONSUMABLE POTABLE WATER requires product designs to prevent the corrosion caused by up to fifteen percent air content in water and minimize the liming of water side heating surfaces depending on the amount of dissolved solids (hardness of the water) in the water supply.

Water, low pressure and high pressure steam BOILER SYSTEMS are used to provide building space heating - using fan coil units, baseboard fin tubing, radiators, and the like, and the heating source for INDIRECT WATER HEATERS that supply consumable hot water for showers, laundries, kitchens, etc. Water boilers and low pressure steam boilers (15 psi) are commonly used in large buildings, hotels, schools and smaller hospitals. High pressure steam boilers (above 15 psi) are used in larger hospitals, college campuses, airports and large building or industrial complexes.

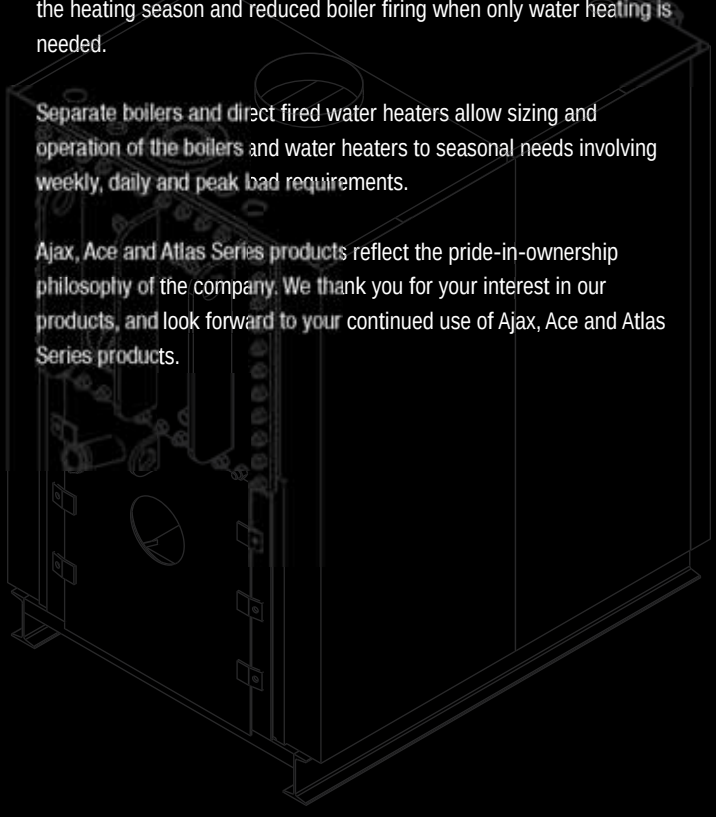
Boilers are also used to provide hot water or steam for closed heating use while direct fired water heaters are used to heat potable and wash water.

Direct fired water heaters are also used when building heating is not required or is supplied by other means.

Combination boiler and indirect water heating keeps the operation of the boiler equipment in a central location and under engineering supervision. The use of multiple boilers allows the use of all of the boilers to handle both the space heating and water heating loads during the heating season and reduced boiler firing when only water heating is needed.

Separate boilers and direct fired water heaters allow sizing and operation of the boilers and water heaters to seasonal needs involving weekly, daily and peak bad requirements.

Ajax, Ace and Atlas Series products reflect the pride-in-ownership philosophy of the company. We thank you for your interest in our products, and look forward to your continued use of Ajax, Ace and Atlas Series products.



Ajax Boiler Headquarters - Santa Ana, California
Manufacturing Facility

Contents

Technology. Fast, Simple & Easy to Use.

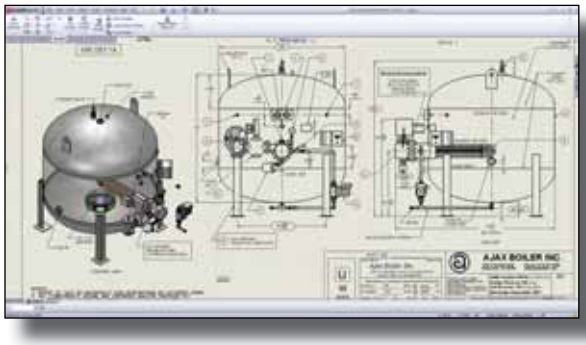
Ajax Boiler is driven by a commitment to provide solid products, great value, and outstanding customer service. Part of the commitment includes recent investments in our information systems infrastructure. By working closely with customers and end users, Ajax Boiler has developed a series of powerful, web-based tools to give you the right information, in the right format, at the right time.

Online Tools. New & Improved Content.

The Ajax Boiler information system begins with its website (www.ajaxboiler.com). As an information portal, the site is rich with product information and offers two distinct areas. The public area is for the general public and highlights our products and company. The area includes case studies, product specs, submittal & sizing tools. From the latest technical and marketing documentation to CAD drawings and diagrams, pricing and configuration tools, and our online parts database. The bottom right of the home page offers industry related links. The Ajax Boiler website is a valuable information resource for all.

STAR Sizing and Submittal Programs.

The STAR (Sales Transactions and Reporting) System offers a host of web-enabled sizing and submittal tools has been expanded with several recent developments. The fully web-enabled version offers greater functionality and more flexibility. The interface was designed with help from industry experts to provide an Ajax Boiler configuration tool that was fast, simple, and easy-to-use.



Advance SolidWorks 3D Modeling

Another innovation is the development of our computerized, online sizing program. Whether you need a semi-instantaneous water heater, a process heat exchanger, or an unfired steam generator, the new sizing program combines a powerful sizing engine with a simple user interface. In just two minutes and a couple of clicks, you can optimally configure a product that's right for your application.

Electronic Documentation.

Documentation and drawings are also available online in a variety of file formats. Visit www.ajaxboiler.com for periodic version updates.

Case Study: Stanford University

Opportunity: Nestled 90 miles south of Stanford's main campus, the Hopkins Marine Station is the oldest marine science lab on the Pacific coast; it goes as far back as the 1890's when Leyland Stanford started Stanford University. The first president Leyland hired was David Starr Jordan, who was a trained biologist from Harvard. Jordan knew Monterey Bay was a very special place for marine science and was instrumental in the founding of the Hopkins Marine Station.

When it came time to replace an old legacy boiler, it was only natural for the environmentally-conscientious project team to mandate that efficiency would be the driving force for their boiler selection. The WC near-condensing boiler fit the bill, meeting all requirements. The fact that they could get it with the Smart Boiler Control System™ made the decision a "no-brainer" for this marine biology research and teaching facility.

Proven Success. "We had the new Ajax Series WC boiler installed which was experiencing a problem of locking out on safety, with no obvious cause. Ajax set us up with their Smart Boiler Control System™. Their technicians at the factory monitored the boiler activity, and within just a couple weeks we identified some changes in the operations and solved the problem. The boiler has been working beautifully ever since. The web page I use with their Smart Boiler Control System™ is great, it gives me current reading, energy usage analysis, and many other useful graphs. I am able to check how our boiler is working from anywhere I can get online. *I have just returned from a vacation in Europe and I was able to check how the boiler was doing even from there.*" - *Bob Doudna*

These Stanford researchers frequently make news headlines and are a source of extreme pride to the community and to the Stanford home campus.

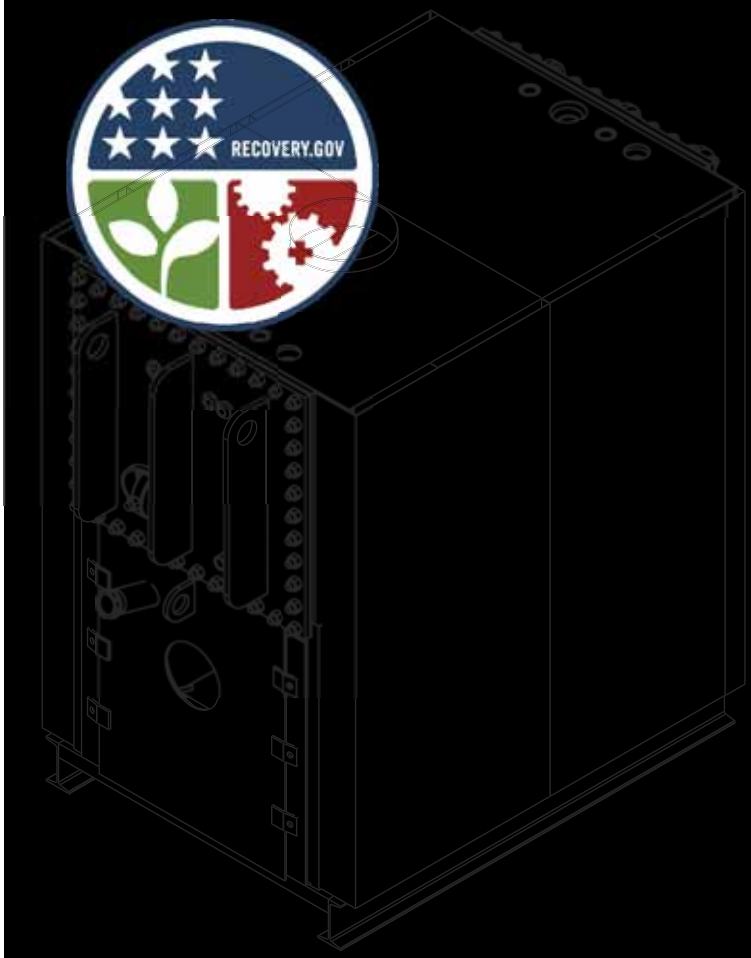
If anyone appreciates the environment, it's these folks. Ajax is proud that its WC near-condensing boiler was their first choice when they went looking for an energy efficient boiler.

American Recovery and Investment Act

Ajax Boiler Inc. product meets the requirements of the American Recovery and Reinvestment Act (ARRA). The product is manufactured in the United States, and the cost of the domestic components is greater than 50% of the costs of all components.

Ajax Boiler Inc. takes great pride in meeting the ARRA standards, in producing ASME pressure vessels and carrying the appropriate industry certifications.

Ajax Boiler Inc. is a woman-owned and family-operated small business entity located in Southern California. We have been designing and manufacturing mechanical room equipment for heat transfer applications since 1919, and have been owned by the same family since 1983.



"Quality, value, and service since 1919."

High Efficiency Near Condensing Water Boilers

Inclined Water Tube

For Space Heating and Process Use

The WCP Ajax Series high efficiency near condensing water boiler performs dependably and quietly, offering the highest efficiency solutions for space heating, and process hot water. Modular design, low emissions, advanced controls, and easy start-up make the Ajax Series the clear choice for all of your high efficiency, near condensing needs.

Features

Performance

- Up to 85% thermal efficiency
- Up to 5:1 turndown
- Consistent sub 9 ppm emissions for NO, NOx, with 3% O_2 correction
- Clean and smooth light off

Design

- CSA 4.9 Certification
- Full modulation
- Air cooled interrupted pilot with UV scanner
- Carbon steel water tube boiler construction
- Center fired design
- High efficiency tube pitch
- 7 sq.ft. of heat surface per boiler horsepower
- No refractory
- Lightweight and compact design - fits through a standard door
- Dual-fuel (Natural gas & Propane)

Advanced Controls

- Advanced boiler protection
- Anti-condensation control
- Touch screen system operator interface
- Supports BMS Protocol: Modbus, BACnet and Lonworks
- Smart Boiler Control System™ (see page 89)

Serviceability

- Removable single blower, burner, pilot and gas train assembly
- Lightweight insulation and jacketing
- Low jacket temperature during operation
- Replaceable air intake filter

Heat Exchanger & Combustion Design

- Capacities up to 3,000 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section IV stamped for 125 psig maximum allowable working pressure (MAWP) Temperature up to 250º F.
- Sealed combustion chamber for increased efficiency, reduced emissions
- Variable speed combustion blower control and speed feedback signal for assured low fire light off and high fire pre/post purge
- Honeywell air-fuel ratio valve and venturi system
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- 20 year non-prorated thermal shock warranty

Control Specification

- System operator interface color touch screen display allows advanced configuration settings, remote monitoring, fault history, diagnostics, trend analysis and lead lag sequencing control of each boiler on multiple boiler configuration system
- Flame safe guard controller with integrated operating, modulating and high limit safety controls
- Interrupted pilot with spark ignition and air cooled UV scanner for monitoring pilot & main flame
- Three single element temperature sensor for: Inlet, outdoor & DHW temperature
- Two dual element safety limit (UL 353) temperature sensor for: Outlet and stack temperature
- User interface LCD panel with 4 button display boiler status information including sequence, lockouts, alerts, setpoints, controlled temperatures and flame signal
- Dual PID load combination control system for central heat and DHW heating fluid loop
- Outdoor reset control with programmable heating curve
- Algorithm prioritization for burner demand (central heating, DHW heating fluid and condensation protection) and firing rate limit (stack and boiler delta-T)
- Programmable safety and boiler protection features for: Anti-

Model WCP

condensation, slow start, delta-T limit, stack-T limit, boiler-T limit and DHW heating fluid-T limit
- Pump control contacts for central heat, DHW heating fluid & system pumps with purge time control & condensation protection
- 4-20mA signal input for remote modulation
- Digital input for remote reset and time of day setback
- Modbus RS485 communication allows access to operating, safety and burner data
- Lockout and safety alerts history record contains up to 15 detailed snapshots of the system when lockout occurred
- Three levels of password protection for end-user, installer/service engineer and manufacturer
- Additional interlock terminals for pre-ignition, recycle and lockout interlocks

Standard Equipment

Boiler
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- 1-1/2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gasket
- Boiler legs with bolt-down lugs
- Air elimination fitting

Controls & Trim
- Standard controls are CSD-1 compliant
- Main gas valve
- Electronic ignition
- Manual gas shut off valve and leakage test cock(s)
- Probe-type low water cut-off with manual reset and test switch
- High and low gas pressure switches on model 300
- Main power and main flame indicators
- Controls and gas train mounted on the right side of the boiler
- Temp-pressure gauge and 125 psig ASME approved pressure relief valve

Optional Equipment

Boiler
- ASME approved pressure relief valves are available with 30, 45, 50, 75, 100 and 125 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of the boiler
- Handholes, headplate covers and drain connections
- Gas pressure gauge
- Seismic support
- Outdoor available without ETL listing
- Dual fuel

Heat Exchangers
- Heat exchangers may be mounted sidearm style on WCP model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Control Options (Optional)
- Auxiliary low water cut-off, pump controls and feeders
- Low fire hold with timer
- Communication gateway package
- Building automation relays
- Annunciation lamp package
- Alarm bell with silencing circuit
- Sensor package
- Smart Boiler Control System™ for 24/7 web-enabled monitoring (see page 89)

ASME

ETL Listed

ETL Canadian Listed (GAS & LPG Only)

CSA 1-3.1-77 Compliant

UL 795 Compliant

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	MOTOR VOLTAGE (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[5]
WCP-050	500,000	425,000	12.7	120/1/60	1/3	10	87	133	2,000
WCP-100	1,000,000	850,000	25.4	120/1/60	7/16	10	104	226	2,700
WCP-150	1,500,000	1,275,000	38.1	120/1/60	1	15	120	319	3,200
WCP-200	2,000,000	1,700,000	50.8	120/1/60	1 5/8	15	142	442	4,200
WCP-250	2,500,000	2,125,000	63.5	120/1/60	1 5/8	15	161	550	4,700
WCP-300	3,000,000	2,550,000	76.2	120/1/60	1 5/8	15	180	657	5,200

1. Models shown are for natural gas or propane only. For proper burner performance, a -0.01 to -0.02 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper is to be set to maintain this draft. No down draft stack conditions are permitted. Append "W" to model number to designate outdoor, add "-C" for gas/propane, "-G" for natural gas, "-P" for propane.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 85% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Estimated shipping weights. For weight-critical applications, consult factory.

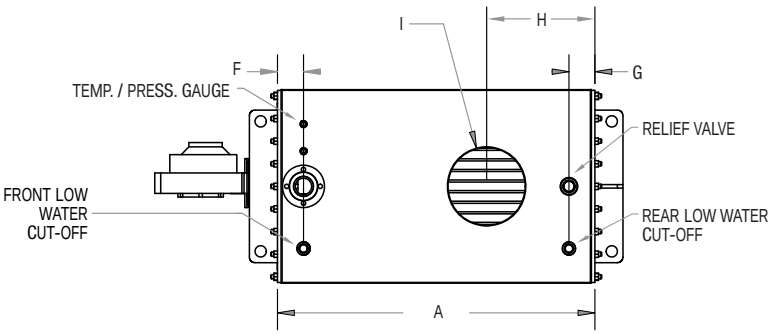
Dimensions

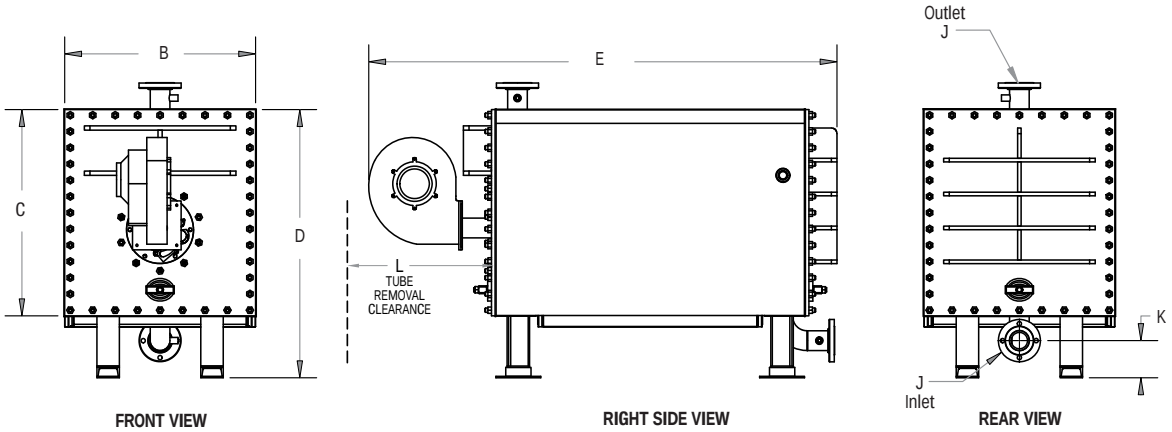
MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D O.A. HEIGHT	E O.A. LENGTH	F OUTLET LOC.	G RELIEF VALVE LOC.	H VENT LOC.	I VENT DIA.	J INLET / OUTLET SIZE[2]	K INLET LOC.	L TUBE LENGTH
WCP-050	36 1/4	34	36 1/2	44 3/4	60	3 3/4	3 3/4	17 3/4	10	1 1/2 / 1 1/2 T	4 1/2	24
WCP-100	56 1/2	34	36 1/2	47 1/2	83 1/2	4 3/4	4 3/4	19 1/4	14	3 / 3 F	6 3/4	42
WCP-150	74 1/4	34	36 1/2	47 1/2	100 1/4	4 3/4	4 3/4	23 1/4	16	3 / 3 F	6 3/4	60
WCP-200	62 3/4	34	51	64 1/2	96	5	5	23 1/4	18	3 / 3 F	7 3/4	48
WCP-250	75	34	51	64 1/2	108 1/4	5	5	25 3/4	20	3 / 3 F	7 3/4	60
WCP-300	87	34	51	64 1/2	119 1/2	5	5	23 3/8	20	3 / 3 F	7 3/4	72

Dimensions are in inches and are subject to production tolerances; subject to changes.
SHIPPING DIMENSION: Length: add 6 in. front and back; Width: add 12 in. right side and 6 in. left side of the boiler.

1. Width does not include gas train, inlet, plenum or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.

NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.





FRONT VIEW | RIGHT SIDE VIEW | REAR VIEW

ASME

ETL Listed

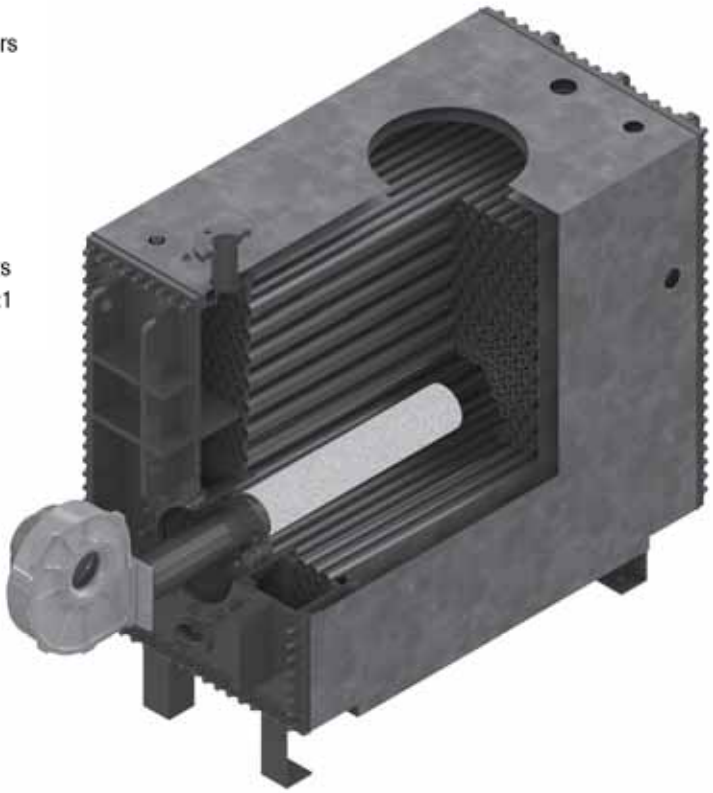
ETL Canadian Listed (GAS & LPG Only)

CSA 1-3.1-77 Compliant

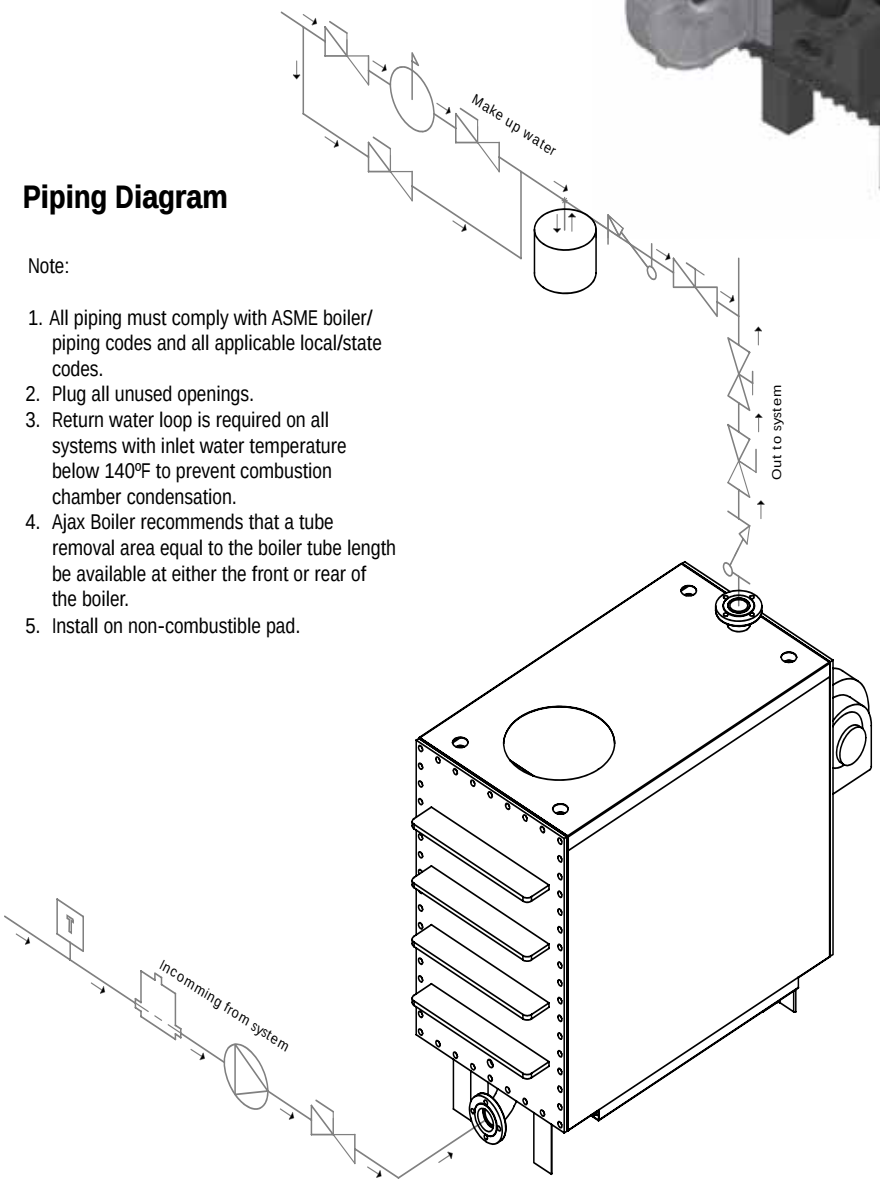
UL 795 Compliant

The Ajax Series WCP near condensing inclined tube steel boiler delivers a powerful performance with consistent <9 ppm emissions for NO, NOx, with a 3% O_2 correction. The units can be delivered with the Ajax Management System (AMS), which has the Smart Boiler Control System™ built into it, ready for remote monitoring and analysis, and optional cloud computing for global management.

These units give you the rugged "bullet-proof" quality Ajax has built its reputation on, while delivering up to 85% Thermal Efficiency with a 5:1 turndown ratio.

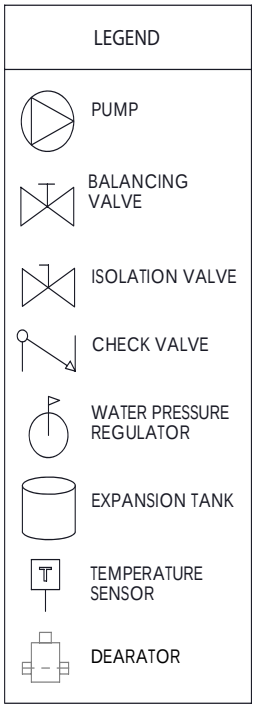


Piping Diagram



Note:

1. All piping must comply with ASME boiler/ piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.



ASME

ETL Listed

ETL Canadian Listed (GAS & LPG Only)

CSA 1-3.1-77 Compliant

UL 795 Compliant

Water Boilers

Atmospheric

Inclined Water Tube

For Space Heating and Process Use

The Ajax WRN boilers perform dependably and quietly, providing commercial, institutional, and industrial buildings with space heating and process hot water. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 21,000 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section IV stamped for 125 psig maximum allowable working pressure (MAWP) Temp up to 250º F
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- Models 150 to 14650 are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers or draft hoods
- 20 year non-prorated thermal shock warranty

Standard Equipment

Boiler

- Operating temperature controls 130 to 210º F
- High temperature 2000 ºF cast refractory, 2 to 3-1/2 in. thick
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 3/8 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gaskets
- Front headplate hand holes on models 2100 to 21000
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 3770 to 21000

Combustion System

- Ajax cast iron ported burner heads and orifices for use with natural gas
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Gas pressure regulator[1]
- Electronic ignition
- Manual gas shut-off valves and leakage test cock(s)

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Models 150 to 2500 use a 24 VAC / 60 Hz electronic primary safety control system with an intermittent pilot and on-off firing
- Models 3000 to 9500 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and high-low firing
- Models 10500 to 21000 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and three stage firing
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- High and low gas pressure switches on models 3000 to 21000
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 125 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- Low temperature manual reset high limit control
- ASME approved pressure relief valves are available with 30, 45, 50, 75, 100, and 125 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain and headplate couplings
- I-beam skids on models 150 to 3350

Combustion System

- Propane orifices and gas train

Model WRN

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- 120 VAC / 60 Hz electronic primary safety control system with microprocessor based flame safeguard control and interrupted pilot on models 150 to 2500
- High-low firing on models 150 to 2500
- Modulating firing on models 150 to 9500
- Assured low-fire start, holds unit on low fire until flame proving period is complete
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems and gas train
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Copper Tubes
- 13 gauge SB-75 copper tubes are recommended for hot water and applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header)

Heat Exchangers
- Heat exchangers may be mounted sidearm style on WR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Outdoor Models
- Outdoor models 150 to 5250 are available with ETL listing
- Outdoor models 6300 to 21000 are available without ETL listing

ASME

ETL Listed

ETL Canadian Listed (GAS & LPG Only)

Available Firing Modes

MODELS	FIRING MODES
WRN_150 to 2500	ON-OFF[1], HIGH-LOW, MODULATION
WRN_3000 to 9500	HIGH-LOW, MODULATION
WRN_10500 to 21000	THREE STAGE

1. Models 150 - 300 available in on-off only.

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]	PROPANE GAS
WRN_150 to 2500 UL CSD-1/FM, IRI	7 to 14 in. W.C.	11 to 14 in. W.C.
WRN_3000 to 4200 UL CSD-1/FM	8 to 14 in. W.C.	12 to 14 in. W.C.
WRN_3000 to 4200 IRI	8 to 28 in. W.C.	12 to 28 in. W.C.
WRN_5250 to 9500 UL CSD-1/FM, IRI	10 to 28 in. W.C.	16 to 28 in. W.C.
WRN_10500 to 21000 UL CSD-1/FM, IRI	18 to 28 in. W.C.	24 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds the maximum value.

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	AMPS	APPROX. WEIGHT (LBS.)[5]
WRN_150	150,000	121,500	3.6	758	13	21	1	900
WRN_250	250,000	202,500	6.0	1,264	16	33	1	1,100
WRN_350	350,000	283,500	8.5	1,770	19	45	1	1,300
WRN_420	420,000	340,200	10.2	2,124	33	55	1	1,500
WRN_525	525,000	425,250	13.0	2,655	36	67	1	1,600
WRN_630	630,000	510,300	15.2	3,186	40	83	1	1,700
WRN_735	735,000	595,350	18.0	3,717	44	97	1	1,900
WRN_840	840,000	680,400	20.3	4,248	47	111	1	2,000
WRN_940	940,000	761,400	23.0	4,754	63	121	1	2,500
WRN_1050	1,050,000	850,500	25.4	5,310	66	135	1	2,600
WRN_1250	1,250,000	1,012,500	30.2	6,322	73	161	1	2,900
WRN_1500	1,500,000	1,215,000	36.3	7,587	81	192	1	3,200
WRN_1750	1,750,000	1,417,500	42.4	8,851	87	215	1	3,400
WRN_2100	2,100,000	1,701,000	50.8	10,621	121	270	1	4,200
WRN_2500	2,500,000	2,025,000	60.5	12,645	135	325	1	4,600
WRN_3000	3,000,000	2,430,000	72.6	15,174	149	381	4	5,100
WRN_3350	3,350,000	2,713,500	81.1	16,944	163	436	4	5,500
WRN_3770	3,770,000	3,053,700	91.2	19,068	230	458	4	7,100
WRN_4200	4,200,000	3,402,000	101.6	21,243	243	507	4	7,500
WRN_5250	5,250,000	4,252,500	127.0	26,554	277	640	6.5	8,600
WRN_6300	6,300,000	5,103,000	152.4	31,865	309	765	6.5	9,700
WRN_7350	7,350,000	5,953,500	177.8	37,176	344	905	6.5	10,800
WRN_8400	8,400,000	6,804,000	203.3	42,487	478	1,049	6.5	10,000
WRN_9500	9,500,000	7,695,000	229.9	48,051	515	1,197	6.5	10,600
WRN_10500	10,500,000	8,505,000	254.1	53,109	545	1,312	8	11,200
WRN_11500	11,500,000	9,315,000	278.3	58,167	580	1,449	8	11,700
WRN_12600	12,600,000	10,206,000	304.9	63,731	612	1,575	8	12,300
WRN_14650	14,650,000	11,866,500	354.5	74,100	826	1,768	8	15,600
WRN_16750	16,750,000	13,567,500	405.3	84,721	889	2,015	8	16,600
WRN_19000	19,000,000	15,390,000	459.8	96,102	960	2,292	8	17,900
WRN_21000	21,000,000	17,010,000	508.1	10,6218	1,019	2,523	8	18,900

1. Models shown are for natural gas or propane only. Replace "_" with "G" for gas or "P" for propane. Add "-W" for outdoor models.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 81.0% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Estimated shipping weights. For weight-critical applications, consult factory.

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.

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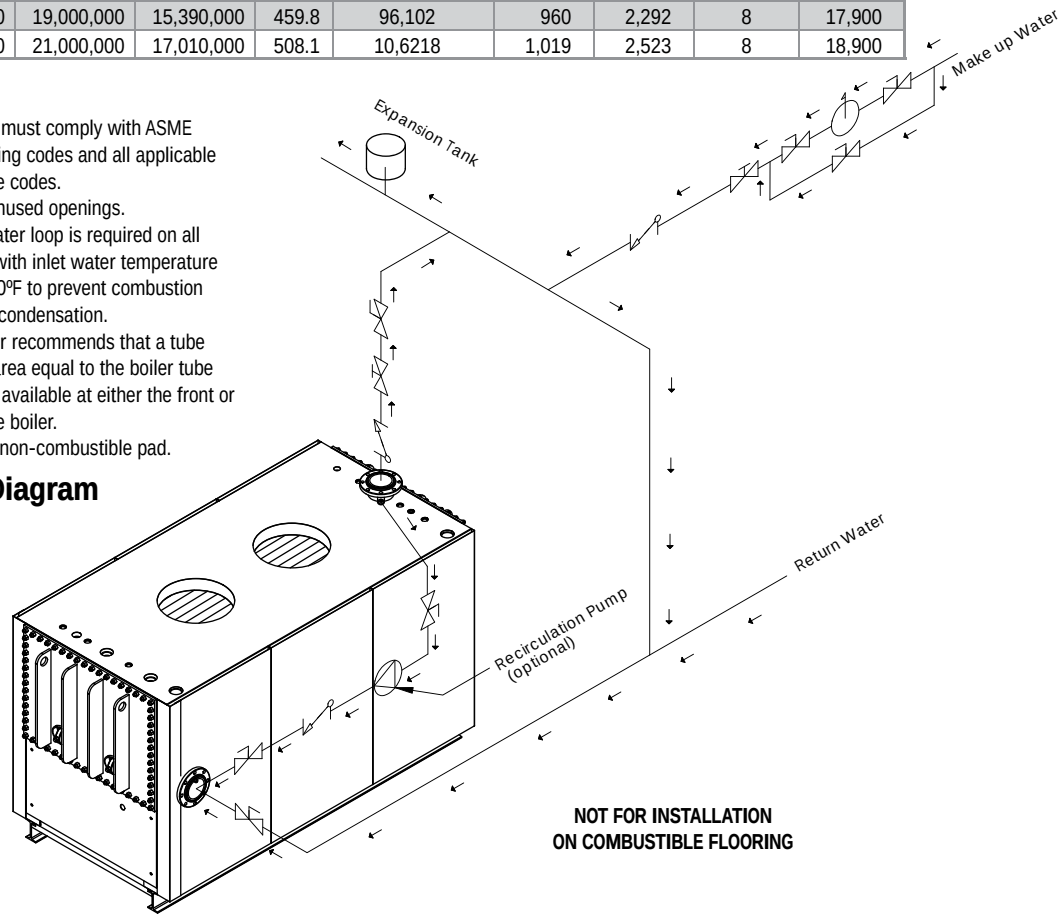
Piping Diagram



LEGEND

- PUMP
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- WATER PRESSURE REGULATOR
- EXPANSION TANK

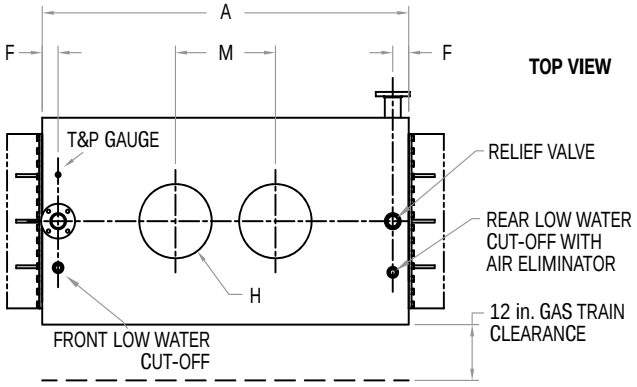
Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT DIA.[3]	H OUTDOOR VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N DRAFT HOOD CLEARANCE	N BAROMETRIC DAMPER C_L HEIGHT	RAIN CAP SIZE
WRN_150	24	29	40 3/4	1 1/2 T	2	27 1/4	5	9	3	3/4	17 3/8	C_L	13	N/A	14
WRN_250	34	29	40 3/4	1 1/2 T	2	27 1/4	7	11	3	3/4	27 3/8	C_L	13	N/A	17
WRN_350	44	29	40 3/4	1 1/2 T	2	27 1/4	8	12	3	3/4	37 3/8	C_L	13	N/A	18 1/2
WRN_420	34 1/4	34	44 1/2	1 1/2 T	3	29	9	13	3	3/4	24 3/8	C_L	17	N/A	20
WRN_525	39 1/4	34	44 1/2	1 1/2 T	3	29	10	14	3	1	29 3/8	C_L	17	N/A	21 1/2
WRN_630	46 1/4	34	44 1/2	1 1/2 T	3	29	10	14	3	1	36 3/8	C_L	17	N/A	21 1/2
WRN_735	52 1/4	34	44 1/2	1 1/2 T	3	29	12	16	3	1	42 3/8	C_L	20	N/A	24
WRN_840	58 1/4	34	44 1/2	1 1/2 T	3	29	12	16	3	1	48 3/8	C_L	20	N/A	24
WRN_940	47 3/4	37 1/2	50 3/4	3 F	3 1/4	30 1/4	12	16	3	1	36 1/2	C_L	20	N/A	24
WRN_1050	51 3/4	37 1/2	50 3/4	3 F	3 1/4	30 1/4	14	18	3	1	40 1/2	C_L	20	N/A	27
WRN_1250	59 3/4	37 1/2	50 3/4	3 F	3 1/4	30 1/4	16	20	3	1 1/4	48 1/2	C_L	20	N/A	29 1/2
WRN_1500	68 3/4	37 1/2	50 3/4	3 F	3 1/4	30 1/4	16	20	3	1 1/4	57 1/2	C_L	20	N/A	29 1/2
WRN_1750	75 3/4	37 1/2	50 3/4	3 F	3 1/4	30 1/4	18	22	3	1 1/4	64 1/2	C_L	N/A	27	32 1/2
WRN_2100	60 3/4	46 1/2	58 1/2	3 F	3 1/2	32 1/2	18	22	3	1 1/2	49 1/2	C_L	N/A	27	32 1/2
WRN_2500	70 3/4	46 1/2	58 1/2	3 F	3 1/2	32 1/2	20	24	3	1 1/2	59 1/2	C_L	N/A	30	35 1/2
WRN_3000	80 3/4	46 1/2	58 1/2	3 F	3 1/2	32 1/2	(2)16	(2)20	3	2	69 1/2	35	20	N/A	29 1/2
WRN_3350	90 3/4	46 1/2	58 1/2	3 F	3 1/2	32 1/2	(2)16	(2)20	3	2	79 1/2	35	20	N/A	29 1/2
WRN_3770	85 1/4	57	67 3/4	6 F	5 3/4	41	(2)18	(2)22	3	2	66 1/4	35	N/A	27	32 1/2
WRN_4200	92 1/4	57	67 3/4	6 F	5 3/4	41	(2)18	(2)22	3	2	73 1/4	35	N/A	27	32 1/2
WRN_5250	111 1/4	57	67 3/4	6 F	5 3/4	41	(2)20	(2)24	3	2 1/2	92 1/4	35	N/A	30	35 1/2
WRN_6300	129 1/4	57	67 3/4	6 F	5 3/4	41	(2)24	(2)26	3	2 1/2	110 1/4	40	N/A	33	38
WRN_7350	149 1/4	57	67 3/4	6 F	5 3/4	41	(2)24	(2)26	3	2 1/2	130 1/4	42	N/A	33	38
WRN_8400	125 1/2	69	73 1/4	8 F	7 7/8	45	(2)24	(2)26	3	3	100 3/4	53	N/A	CF	38
WRN_9500	139 1/2	69	73 1/4	8 F	7 7/8	45	(2)24	(2)28	3	3	114 3/4	53	N/A	CF	41
WRN_10500	150 1/2	69	73 1/4	8 F	7 7/8	45	(2)26	(2)30	3	3	125 3/4	53	N/A	CF	44
WRN_11500	163 1/2	69	73 1/4	8 F	7 7/8	45	(2)26	(2)30	3	3	138 3/4	53	N/A	CF	44
WRN_12600	175 1/2	69	73 1/4	8 F	7 7/8	45	(2)28	(2)32	3	3	150 3/4	53	N/A	CF	46 1/2
WRN_14650	146	85	80	10 F	7 7/8	45	(2)30	(2)34	3	4	116 1/4	68	N/A	CF	49 1/2
WRN_16750	162	85	80	10 F	7 7/8	45	(2)34	(2)38	3	4	132 1/4	80	N/A	CF	55
WRN_19000	180	85	80	10 F	7 7/8	45	(2)34	(2)38	3	4	150 1/4	85	N/A	CF	55
WRN_21000	195	85	80	10 F	7 7/8	45	(2)36	(2)40	3	4	165 1/4	92	N/A	CF	58

Dimensions are in inches and are subject to production tolerances, subject to changes.
SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

1. Width does not include gas train, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.
3. Models 150 to 2500 use one vent, 3000 to 21000 use two vents. For indoor, atmospheric vents 18 in. or larger use barometric dampers instead of draft hoods. For outdoor, use rain cap.
4. Gas line size is for standard gas train and firing mode.

CF - Consult factory for options and information
N/A - Not Applicable



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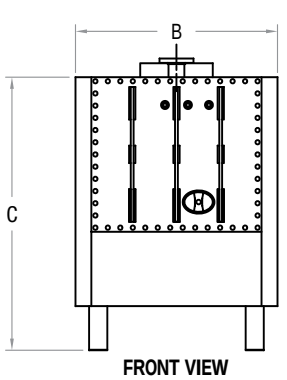
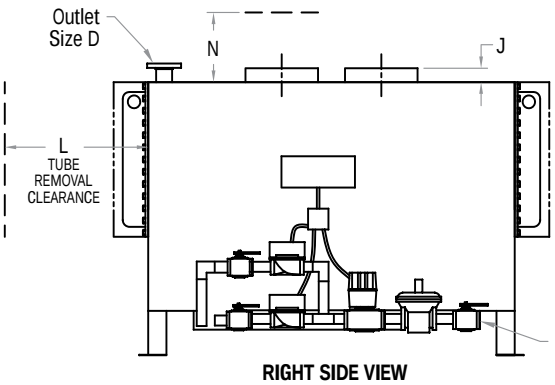
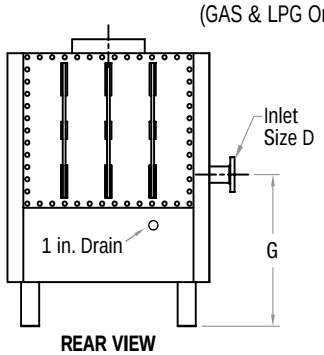


FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW

Water Boilers

Low NOx 20 ppm Premix

Inclined Water Tube

For Space Heating and Process Use

The WRPG Ajax Series Low NOx 20 ppm premix water boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989, and is committed to meeting all clean-air requirements for today and into the future.

Features

- 20 ppm NOx (at 3% O_2) based on factory high fire testing
- Pre-certified to SCAQMD rule 1146.2 (models 525 to 2000)
- Capacities up to 2,000 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section IV stamped for 125 psig maximum allowable working pressure (MAWP). Temperatures up to 250º F
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers
- 20 year non-prorated thermal shock warranty

Standard Equipment

Boiler

- Operating temperature controls 130 to 210 ºF
- High temperature 2000 ºF cast refractory, 2 to 3 in. thick
- 18 gauge galvanized steel jacket with air wall and head plate covers for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 3/8 to 3/4 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gaskets
- Front headplate hand holes on models 2000
- Boiler legs with bolt-down lugs

Combustion System

- Ajax low NOx forced draft premix burners with Ajax fuel injectors,and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulators[1], safety shut-off valve[1], main gas valve[1], pilot gas valve[1], and auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

[1]May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Model 525 uses a 120 VAC / 60 Hz electronic primary safety control system with an interrupted pilot and on-off firing
- Models 1050 to 2100 use a 120 VAC / 60 Hz electronic primary safety control systems with an interrupted pilot and on-off firing with low fire start
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- Combustion air switch
- Main power, main flame and flame fail indicators
- Electronic microprocessor based flame safeguard control
- UV scanner for flame detection
- Proven low-fire start (models 1050 to 2000), prevents unit from lighting off on high-fire
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 125 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- Low temperature manual reset high limit control
- ASME approved pressure relief valves are available with 30, 45, 50, 75, 100, and 125 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Burner plenum, gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain & headplate couplings

Model WRPG

- I-beam skids on models 525 to 2000
- Outdoor models are available with weather cover*
- High and low gas pressure switch

** Models are ETL certified for indoor operation*

Controls & Trim

- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems and gas train
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Copper Tubes

- 13 gauge SB-75 copper tubes are recommended for hot water and applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header)

Heat Exchangers

- Heat exchangers may be mounted sidearm style on WR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post- purge of the combustion chamber, pilot and main flame monitoring. A "zero governor" regulator/safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

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Hot Water Boiler - Low NOx 20 ppm Premix

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[5]
WRPG-525	500,000	410,000	12.2	2,655	36	67	1,600
WRPG-1050	1,000,000	820,000	24.5	5,310	66	135	2,600
WRPG-1500	1,500,000	1,230,000	36.7	7,587	81	192	3,200
WRPG-2100	2,100,000	1,722,000	49.0	10,621	121	271	4,200

1. Models shown are for natural gas only. Append "-W" for outdoor models.
   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 82% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Estimated shipping weights. For weight-critical applications, consult factory.

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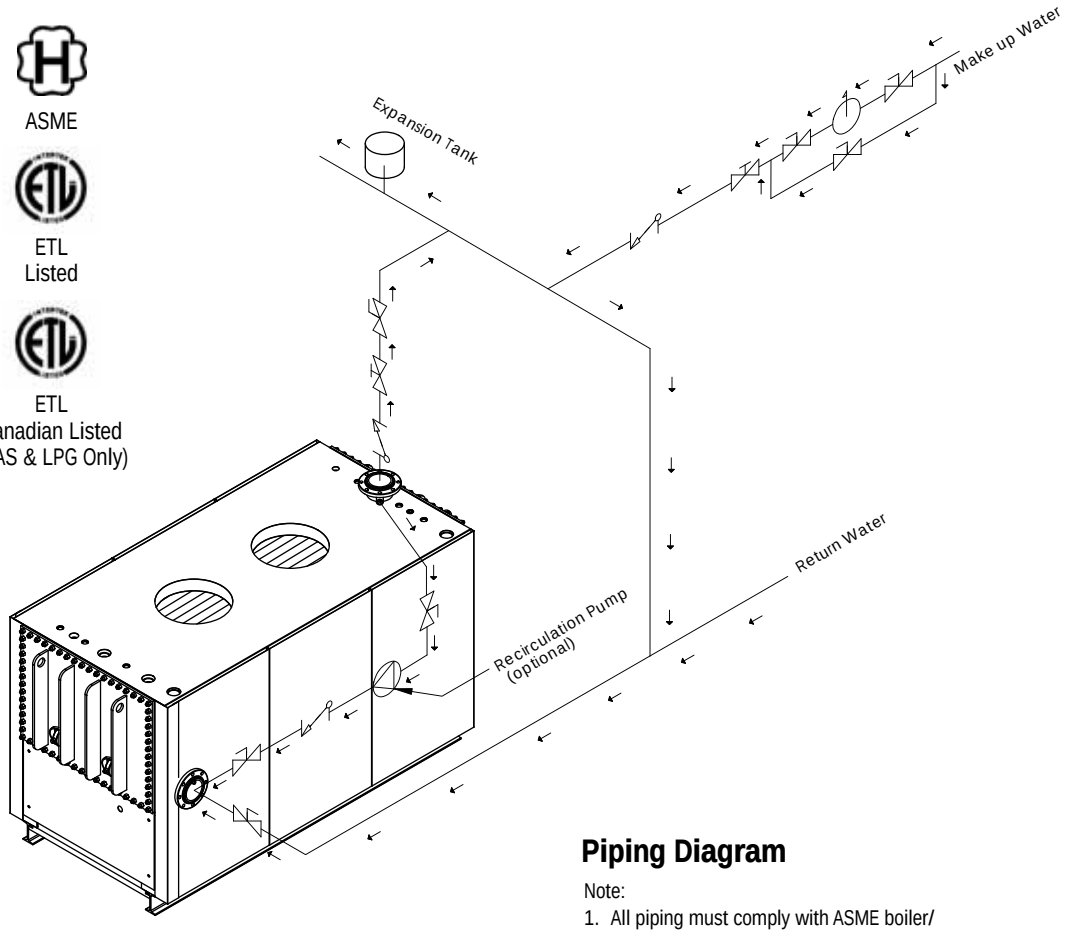

LEGEND

- PUMP
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- WATER PRESSURE REGULATOR
- EXPANSION TANK

Piping Diagram

Note:

1. All piping must comply with ASME boiler/ piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.

Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER ℄ HEIGHT	STANDARD VOLTAGE[5] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.
WRPG-525	39 1/4	34	44 1/2	1 1/2 T	3	29	10	3	1	29 3/8	℄	14	120/1/60	1/3	7.2
WRPG-1050	51 3/4	37 1/2	50 3/4	3 F	3 1/4	30 1/4	14	3	1	40 1/2	℄	21	120/1/60	1/2	9.8
WRPG-1500	68 3/4	37 1/2	50 3/4	3 F	3 1/4	30 1/4	16	3	1 1/4	57 1/2	℄	24	120/1/60	3/4	13.8
WRPG-2100	60 3/4	46 1/2	58 1/2	3 F	3 1/2	32 1/2	18	3	1 1/2	49 1/2	℄	27	120/1/60	1	16.0

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train and plenum assembly, inlet or control assemblies.
2. T = Threaded; F = Flange. Flange connections extend approximately 3 in. from jacket. 3 in. and smaller inlets are removable.
3. Sizes 525 to 2000 use one vent.
4. Gas line size is for standard gas train and firing mode.
5. Other voltages available, consult factory for options.

SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]
ON-OFF WRPG-525 UL CSD-1/FM	8 to 14 in. W.C.
ON-OFF WRPG-525 IRI	8 to 28 in. W.C.
LHO, LHL WRPG-1050 to 2100 UL CSD-1/FM	9 to 14 in. W.C.
LHO,LHL WRPG-1050 to 2100 IRI	9 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds the maximum value.

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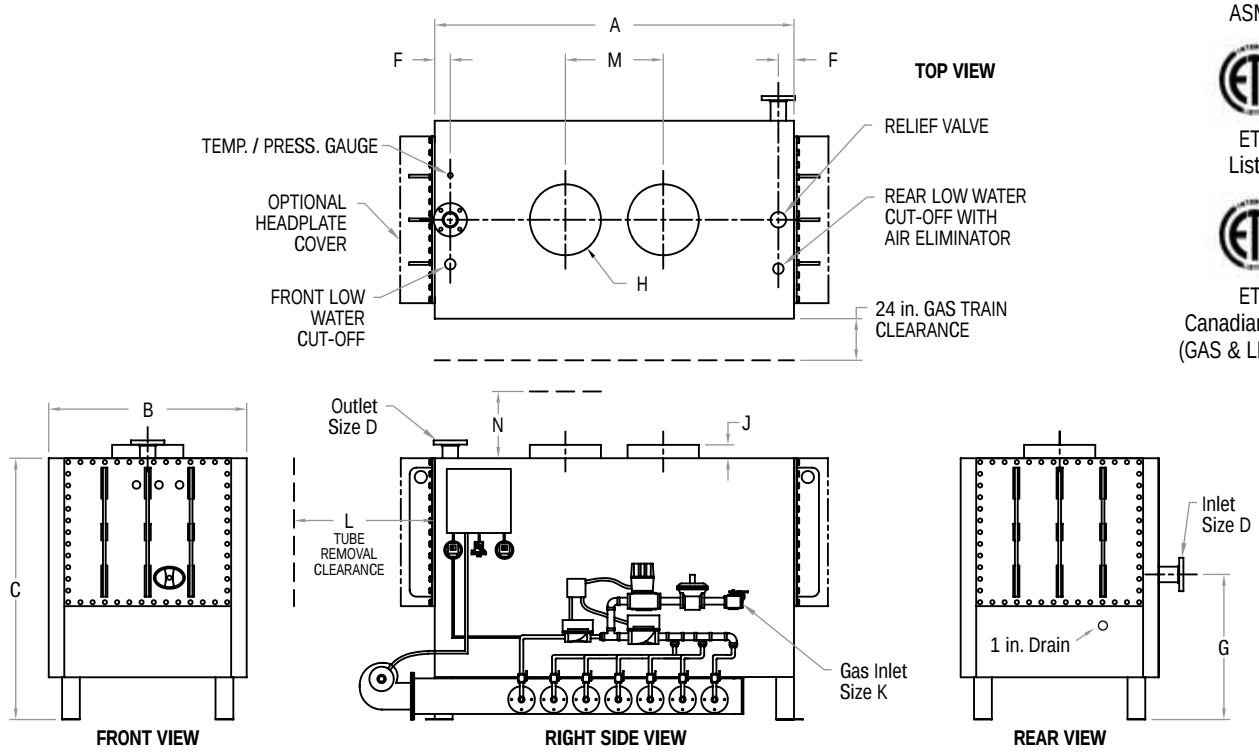

Water Boilers

Ultra Low NOx 12 ppm Premix

Inclined Water Tubes

For Space Heating and Process Use

The WRLG Ajax Series Ultra Low NOx premix water boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989, and is committed to meeting all clean-air requirements for today and into the future.

Features

- 12 ppm NOx (at 3% O_2) based on factory high fire testing
- Capacities up to 7,000 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section IV stamped for 125 psig maximum allowable working pressure (MAWP). Temps up to 250 ºF.
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers
- 20 year non-prorated thermal shock warranty

Standard Equipment

Boiler

- Operating temperature controls 130 to 210 ºF
- High temperature 2000 ºF cast refractory, 3 in. thick
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 3/8 to 3/4 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gaskets
- Front headplate hand holes on all models
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 4200 to 7350

Combustion System

- Knit metal fiber combustion surface for optimal efficiency and durability
- Fuel-air ratio valve for precise combustion control
- Ajax fuel injectors and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulator[1]
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- All models use a 120 VAC / 60 Hz electronic primary safety control system with an interrupted pilot and high-low firing with low fire start
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- Combustion air switch and high and low gas pressure switches
- Main power, main flame and flame fail indicators
- UV scanner for flame detection
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 125 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- Low temperature manual reset high limit control
- ASME approved pressure relief valves are available with 30, 45, 50, 75, 100 and 125 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Burner plenum, gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain and headplate couplings
- I-beam skids on models 2100 to 3000
- Indoor models are available with weather cover*

* Models are ETL certified for indoor operation

Model WRLG

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120VAC
- Head plate covers
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems and gas train
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Copper Tubes
- 13 gauge SB-75 copper tubes are recommended for hot water and applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header)

Heat Exchangers
- Heat exchangers may be mounted sidearm style on WR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post-purge of the combustion chamber, pilot and main flame monitoring. A "zero governor" regulator/safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

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Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[5]
WRLG-2100	2,000,000	1,640,000	49.0	10,621	121	271	3,800
WRLG-3000	3,000,000	2,460,000	73.5	15,174	149	382	4,600
WRLG-4200	4,000,000	3,280,000	98.0	21,243	243	509	6,800
WRLG-5250	5,000,000	4,100,000	122.5	26,554	277	642	7,800
WRLG-6300	6,000,000	4,920,000	147.0	31,865	309	767	8,700
WRLG-7350	7,000,000	5,740,000	171.5	37,176	344	907	9,800

1. Models shown are for natural gas only. **NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.** Add "-W" for outdoor models. For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 82.0% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Estimated shipping weights. For weight-critical applications, consult factory.

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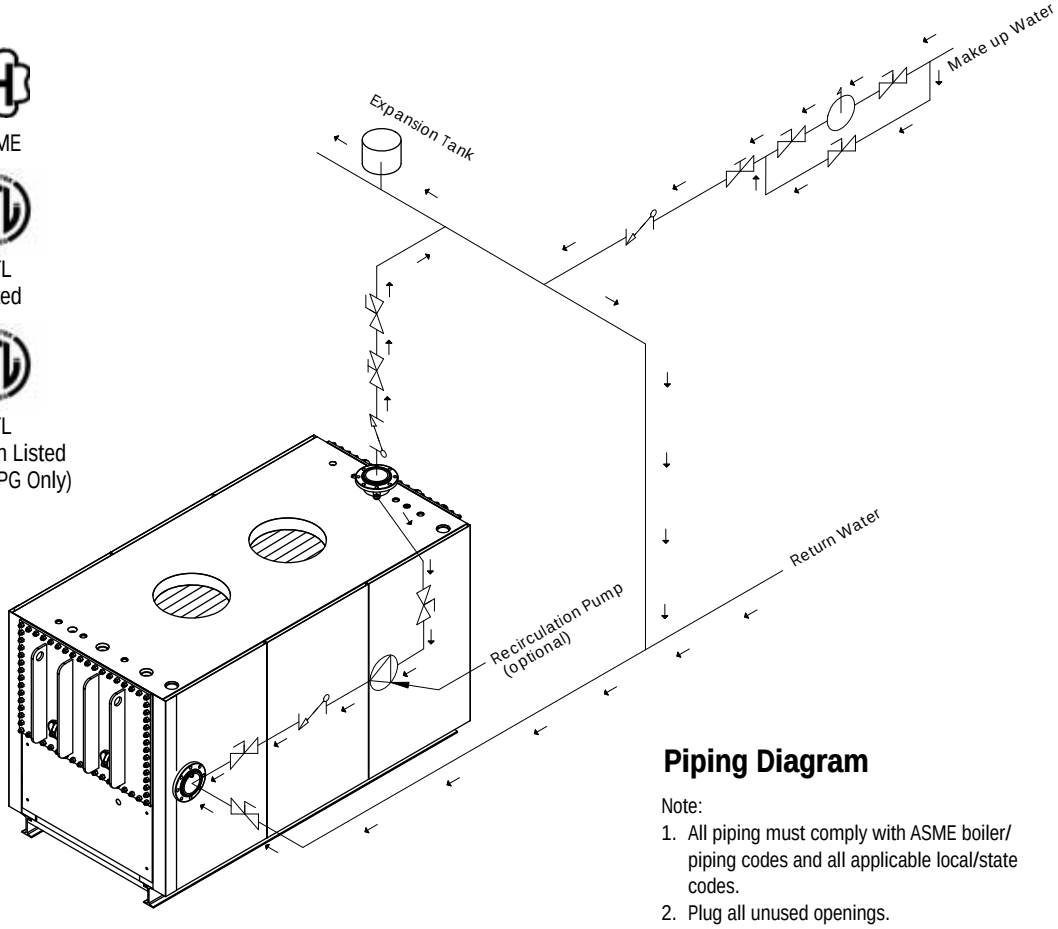

LEGEND

- PUMP
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- WATER PRESSURE REGULATOR
- EXPANSION TANK

Piping Diagram

Note:

1. All piping must comply with ASME boiler/ piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.

Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER C_L HEIGHT	MOTOR VOLTAGE[6] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.
WRLG-2100	60 3/4	45	54 1/2	3 F	3 1/2	28 1/2	18	8 1/2	1 1/2	49 1/2	C_L	27	120/1/60	1	16.0
WRLG-3000	80 3/4	45	54 1/2	3 F	3 1/2	28 1/2	20	8 1/2	1 1/2	69 1/2	C_L	30	230/3/60	1 1/2	6.0
WRLG-4200	92 1/4	54	62 1/4	6 F	5 3/4	35 1/2	(2)18	7	2	73 1/4	24[5]	27	230/3/60	2	6.8
WRLG-5250	111 1/4	54	62 1/4	6 F	5 3/4	35 1/2	(2)20	7	2 1/2	92 1/4	28[5]	30	460/3/60	3	4.8
WRLG-6300	129 1/4	54	62 1/4	6 F	5 3/4	35 1/2	(2)20	7	2 1/2	110 1/4	34	33	460/3/60	5	7.6
WRLG-7350	149 1/4	54	62 1/4	6 F	5 3/4	35 1/2	(2)22	7	2 1/2	130 1/4	42	33	460/3/60	7 1/2	11.0

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train and plenum assembly, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.
3. Models 2100 to 3000 use one vent, 4200 to 7350 use two vents.
4. Gas line size is for standard gas train and firing mode.
5. Sizes 4200-5250 outdoor vent spacing 35 in.
6. Other voltages available, consult factory for options.

SHIPPING DIMENSION: Length add 6 in. front and back; Width add 12 in. right side and 6 in. left side of the boiler.

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]
WRLG-2100 to 7350 UL CSD-1/FM	8 to 14 in. W.C.
WRLG-2100 to 7350 IRI	8 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds maximum values.

Available Firing Modes

MODELS	FIRING MODES
WRLG-2100 to 7350	LOW-HIGH-LOW/MODULATION

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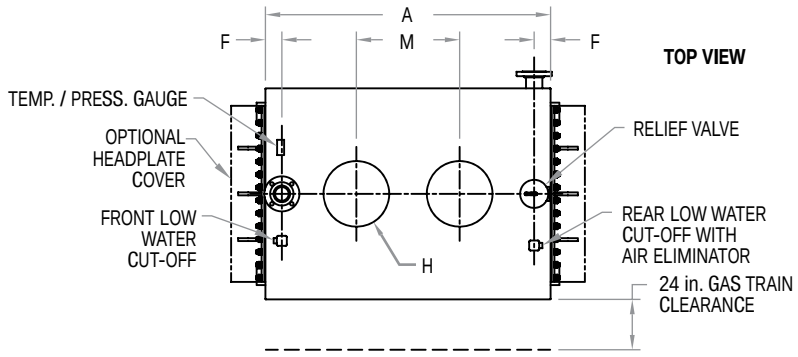
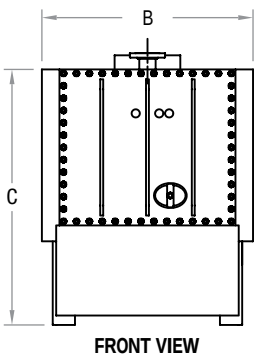
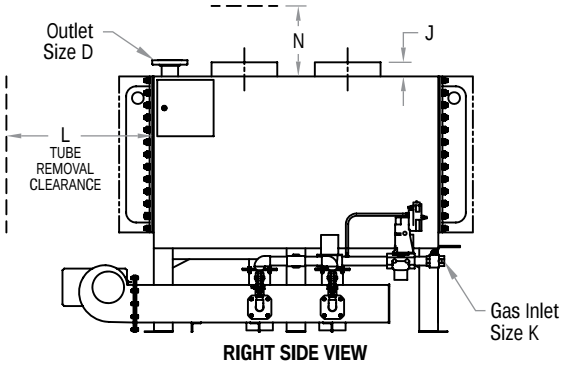
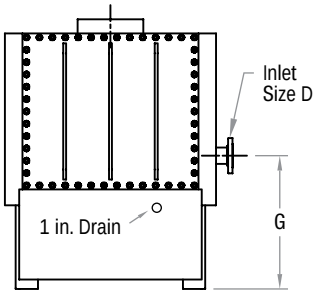








Water Boilers

Forced Draft

Inclined Water Tube

For Space Heating and Process Use

The WRF Ajax Series forced draft water boilers perform dependably and quietly, providing commercial, institutional, and industrial building with space heating and process hot water. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 21,000 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section IV stamped for 125 psig maximum allowable working pressure (MAWP). Temps up to 250 ºF.
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- Models 150 to 14650 are ETL listed to UL 795, UL 726 and CAN 1-3.1 standards for natural gas, #2 oil and combination gas / #2 oil
- Models 16750 to 21000 carry UL label on the burner only
- 20 year non-prorated thermal shock warranty

Standard Equipment

Boiler

- Operating temperature controls 130 to 210 ºF
- High temperature 2750 ºF cast refractory, 2-1/2 to 4 in. thick
- Refractory backed by minimum of 2 in. of insulating refractory and 3 in. of high temperature insulation
- Hinged burner door on models 150 to 1750
- Removable front door and manway on models 2100 to 21000
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 3/8 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gaskets
- Front headplate hand holes on models 2100 to 21000
- Boiler legs with bolt-down lugs
- I-beam skids on all models

Controls & Trim

- Standard controls are CSD-1 compliant
- ETL / UL listed packaged assemblies with Power Flame™ burners for natural gas, #2 oil and combination gas / #2 oil
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Gas pressure regulator[1]
- Electronic ignition
- Manual gas shut off valves and leakage test cock(s)
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- High and low gas pressure switches on models 3000 to 21000
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temp-pressure gauge and 125 psig ASME approved pressure relief valve

(Forced Draft Low NOx Boiler[3])

- Full modulation combustion system (Optional-see sidebar)
- Cam actuated fuel system
- Premix tube
- IFGR piping (see page 96)
- Damper motor with time delay relay

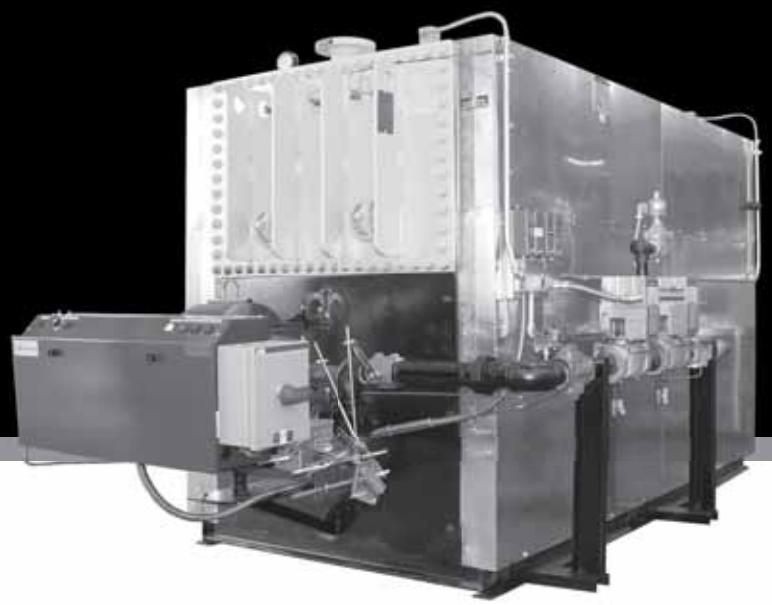
Optional Equipment

Boiler

- Low temperature manual reset high limit control
- ASME approved pressure relief valves are available with 30, 45, 50, 75, 100 and 125 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain & headplate couplings
- Dip tube for air elimination
- Indoor models are available with weather cover[2]

1. May be combined in one valve body.
2. Models are ETL certified for indoor operation
3. See page 96 for more details about the Low NOx Boilers.

Model WRF



Burners
- Power Flame™ burners standard. Consult Factory for other manufacturers.
- Sub 9 ppm, 12 and 30 ppm Low NOx system. Models 420 to 2100 pre-certified to SCAQMD Rule 1146.2
- LPG or methane (digester gas) burners
- High turndown burners (10:1 with adiabatic chamber)
- Induced flue gas recirculation (IFGR) assembly for low NOx application
- Low fire start interlock (gas only)
- Varicam characterized fuel metering system cam actuated (#2 oil or gas-oil fuel, modulation mode only)

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Microprocessor based combustion controller
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- FM/IRI compliant safety control systems.
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers
- Building automation panel with Modbus enabled communication
- Communication gateway (BACNet, Johnson N2 or Lonworks)
- Remote setpoint panel
- Remote enable/disable relay (120 or 24 VAC)
- General alarm contacts
- Boiler status contacts
- Boiler pump contacts with timer
- Low fire hold with timer
- Recirculation pump with control aquastat
- Lead lag sequence control
- Boiler display upgrade
- KY or PA code special high limit aquastat

Copper Tubes
- 13 gauge SB-75 copper tubes are recommended for hot water and other applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header). Copper tubes are not recommended for use with oil-fired burners

Heat Exchangers
- Heat exchangers may be mounted sidearm style on WR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Induced Flue Gas Recirculation 30 ppm NOx System

The Ajax Series boiler flue gas recirculation system will burn natural gas or LPG at or less than 30 ppm NOx. On oil-fired units, NOx levels are reduced by 40%. The burner combustion air fan is used to induce the proper flow of flue gas into the combustion air within the burner housing. The result is a cooler flame temperature and a reduction of NOx. A separate flue gas damper assembly is mechanically linked to the burner flue/air control system in order to maintain proper NOx control throughout the firing range.

Concurrently, Ajax has built hundreds of forced draft **flue gas recirculation packages** using the Power Flame™ "Nova" burner system which continues to meet stringent 30 ppm NOx requirements. Also available in **sub 9, 12 ppm NOx** system and high turndown burners at 10:1 with adiabatic chamber (8:1 without adiabatic chamber).

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Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[5]
WRF_350[6]	350,000	287,000	8.6	1,770	19	45	1,900
WRF_420	420,000	344,400	10.3	2,124	33	55	2,300
WRF_525	525,000	430,500	12.9	2,655	36	67	2,500
WRF_630	630,000	516,600	15.4	3,186	40	83	2,800
WRF_735	735,000	602,700	18.0	3,717	44	97	3,000
WRF_840	840,000	688,800	20.6	4,248	47	111	3,300
WRF_940	940,000	770,800	23.0	4,754	63	121	4,000
WRF_1050	1,050,000	861,000	25.7	5,310	66	135	4,300
WRF_1250	1,250,000	1,025,000	30.6	6,322	73	161	4,900
WRF_1500	1,500,000	1,230,000	36.7	7,587	81	192	5,500
WRF_1750	1,750,000	1,435,000	42.9	8,851	87	215	6,000
WRF_2100	2,100,000	1,722,000	51.4	10,621	121	270	6,500
WRF_2500	2,500,000	2,050,000	61.2	12,645	135	325	7,300
WRF_3000	3,000,000	2,460,000	73.5	15,174	149	381	8,000
WRF_3350	3,350,000	2,747,000	82.0	16,944	163	436	8,900
WRF_3770	3,770,000	3,091,400	92.3	19,068	230	458	10,300
WRF_4200	4,200,000	3,444,000	102.9	21,243	243	507	11,000
WRF_5250	5,250,000	4,305,000	128.6	26,554	277	640	12,700
WRF_6300	6,300,000	5,166,000	154.3	31,865	309	765	14,400
WRF_7350	7,350,000	6,027,000	180.0	37,176	344	905	16,300
WRF_8400	8,400,000	6,888,000	205.8	42,487	478	1,049	19,700
WRF_9500	9,500,000	7,790,000	232.7	48,051	515	1,197	21,200
WRF_10500	10,500,000	8,610,000	257.2	53,109	545	1,312	22,600
WRF_11500	11,500,000	9,430,000	281.7	58,167	580	1,449	24,100
WRF_12600	12,600,000	10,332,000	308.6	63,731	612	1,575	25,600
WRF_14650	14,650,000	12,013,000	358.9	74,100	826	1,768	29,200
WRF_16750	16,750,000	13,735,000	410.3	84,721	889	2,015	31,800
WRF_19000	19,000,000	15,580,000	465.4	96,102	960	2,292	33,200
WRF_21000	21,000,000	17,220,000	514.4	106,218	1,019	2,523	35,400

Models shown are for natural gas or propane only. Replace "_" with "G" for gas or "P" for propane. Add "-W" for outdoor models.

NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.

For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted. Combustion chamber pressure up to 1/4" WC.

1. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
2. Based upon 82% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
3. Based upon 33,480 BTU/hr output per B.H.P.
4. Estimated shipping weights. For weight-critical applications, consult factory.
5. WRF_350 model is not available in 30 ppm Low NOx. Other fuels or burners will have different pressure requirements.

Note

1. All piping must comply with ASME boiler/ piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on a non-combustible pad.

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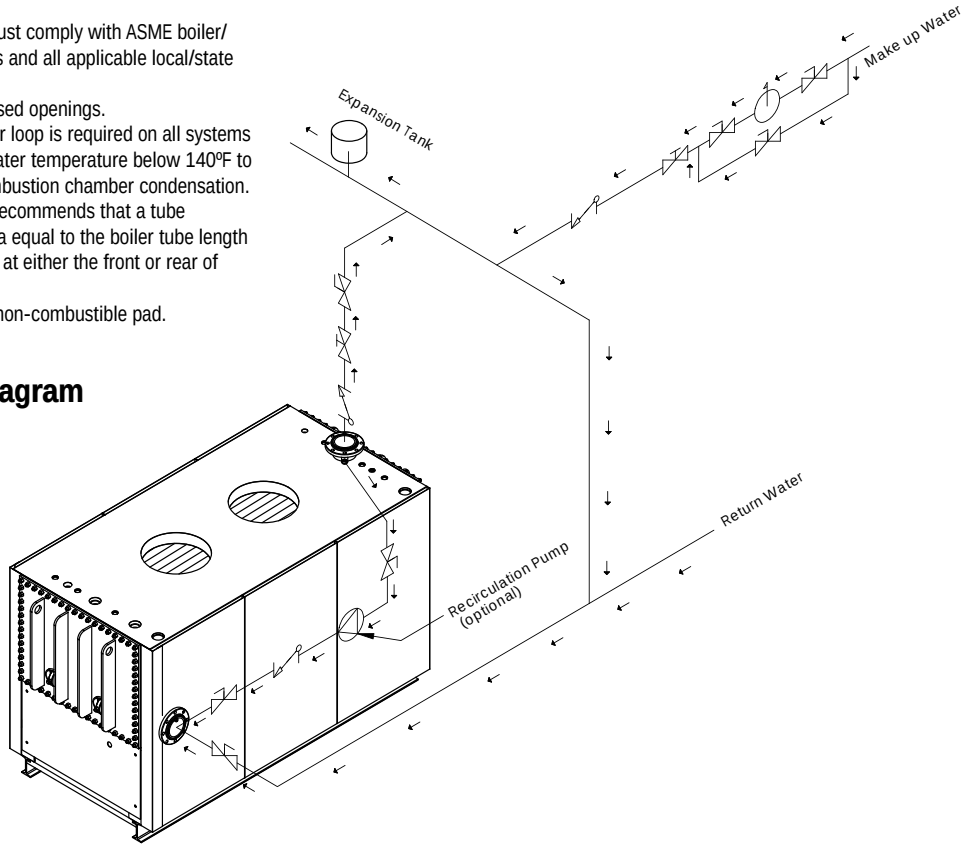
Piping Diagram



LEGEND

- PUMP
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- WATER PRESSURE REGULATOR
- EXPANSION TANK

Dimensions

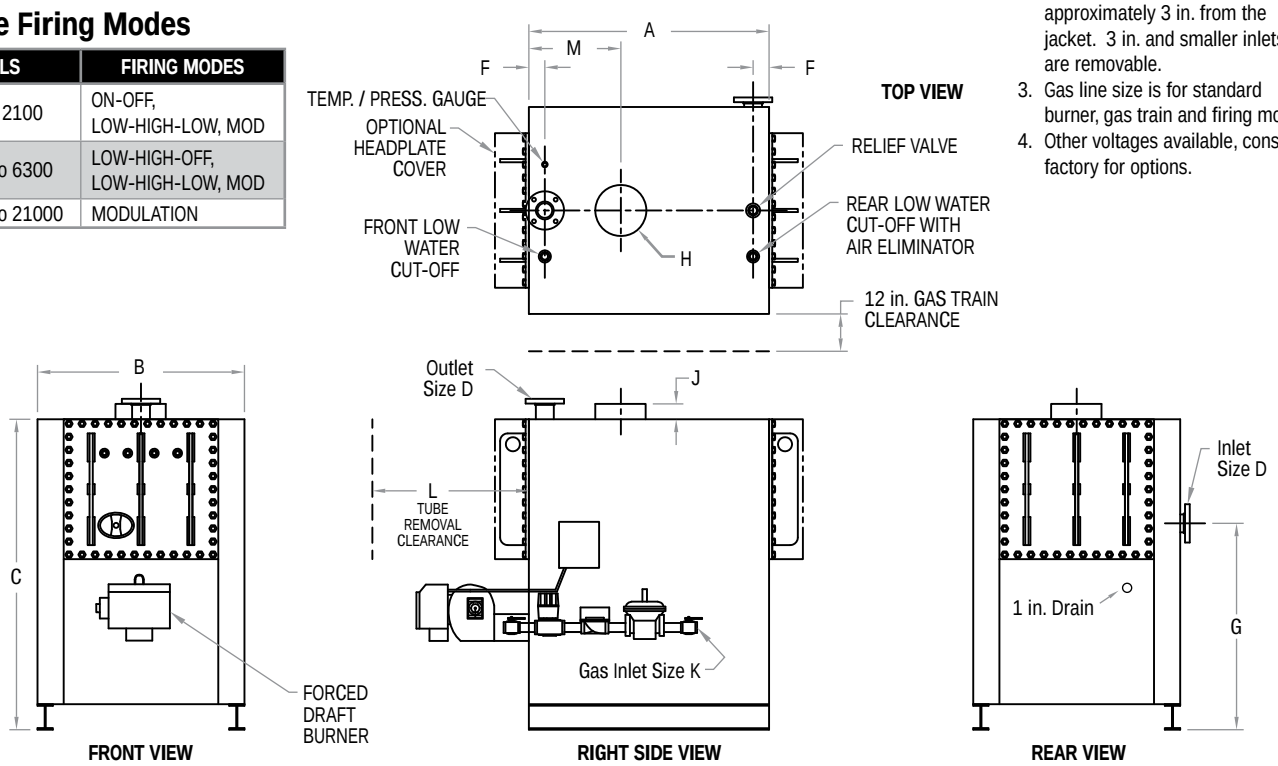
MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT	H OUTDOOR VENT	J VENT STUB HEIGHT	K GAS LINE SIZE[3]	L TUBE LENGTH	M VENT LOC.	RAIN CAP SIZE	MOTOR VOLTAGES[4] (VAC/Ph/Hz)	MOTOR H.P.	MOTOR AMPS.
WRF_350	44	32	41 3/4	1 1/2 T	2	28	6	12	3	1	37 3/8	12	18 1/2	120/1/60	1/4	2.5
WRF_420	34 1/4	37	48 1/2	1 1/2 T	3	33	6	13	3	1	24 3/8	16	20	120/1/60	1/4	2.5
WRF_525	39 1/4	37	48 1/2	1 1/2 T	3	33	8	14	3	1	29 3/8	17	21 1/2	120/1/60	1/4	2.5
WRF_630	46 1/4	37	48 1/2	1 1/2 T	3	33	8	14	3	1	36 3/8	17	21 1/2	120/1/60	1/4	2.5
WRF_735	52 1/4	37	48 1/2	1 1/2 T	3	33	8	16	3	1	42 3/8	17	24	120/1/60	1/3	3.3
WRF_840	58 1/4	37	48 1/2	1 1/2 T	3	33	8	16	3	1 1/4	48 3/8	17	24	120/1/60	1/3	3.3
WRF_940	47 3/4	40 1/2	60 3/4	3 F	3 1/4	40 1/2	10	16	3	1 1/4	36 1/2	18	24	120/1/60	1/3	3.3
WRF_1050	51 3/4	40 1/2	60 3/4	3 F	3 1/4	40 1/2	10	18	3	1 1/4	40 1/2	18	27	120/1/60	1/3	3.3
WRF_1250	59 3/4	40 1/2	60 3/4	3 F	3 1/4	40 1/2	10	20	3	1 1/2	48 1/2	18	29 1/2	120/1/60	1/3	3.3
WRF_1500	68 3/4	40 1/2	60 3/4	3 F	3 1/4	40 1/2	12	20	3	1 1/2	57 1/2	19	29 1/2	120/1/60	1/3	3.3
WRF_1750	75 3/4	40 1/2	60 3/4	3 F	3 1/4	40 1/2	12	22	3	1 1/2	64 1/2	19	32 1/2	120/1/60	1/3	3.3
WRF_2100	60 3/4	49 1/2	71	3 F	3 1/2	44 3/4	12	22	3	1 1/2	49 1/2	19	32 1/2	120/1/60	1/3	3.3
WRF_2500	70 3/4	49 1/2	71	3 F	3 1/2	44 3/4	14	24	3	2	59 1/2	20	35 1/2	230/3/60	3/4	1.9
WRF_3000	80 3/4	49 1/2	71	3 F	3 1/2	44 3/4	14	20	3	2	69 1/2	20	29 1/2	230/3/60	1	2.5
WRF_3350	90 3/4	491/2	71	3 F	3 1/2	44 3/4	16	20	3	2	79 1/2	21	29 1/2	460/3/60	1 1/2	1.9
WRF_3770	85 1/4	61 1/2	69 3/4	6 F	5 3/4	43	16	22	3	2	66 1/4	25	32 1/2	460/3/60	1 1/2	1.9
WRF_4200	92 1/4	61 1/2	69 3/4	6 F	5 3/4	43	16	22	3	2	73 1/4	26	32 1/2	460/3/60	1 1/2	1.9
WRF_5250	111 1/4	61 1/2	69 3/4	6 F	5 3/4	43	18	24	3	2 1/2	92 1/4	26	35 1/2	460/3/60	3	3.8
WRF_6300	129 1/4	61 1/2	69 3/4	6 F	5 3/4	43	20	26	3	2 1/2	110 1/4	27	38	460/3/60	3	3.8
WRF_7350	149 1/4	61 1/2	69 3/4	6 F	5 3/4	43	20	26	3	3	130 1/4	27	38	460/3/60	5	6.4
WRF_8400	125 1/2	73	81 1/2	8 F	7 7/8	53	24	26	3	3	100 3/4	32	38	460/3/60	5	6.4
WRF_9500	139 1/2	73	81 1/2	8 F	7 7/8	53	24	28	3	3	114 3/4	33	41	460/3/60	7 1/2	9.5
WRF_10500	150 1/2	73	81 1/2	8 F	7 7/8	53	26	30	3	3	125 3/4	34	44	460/3/60	7 1/2	9.5
WRF_11500	163 1/2	73	81 1/2	8 F	7 7/8	53	26	30	3	3	138 3/4	34	44	460/3/60	10	12.7
WRF_12600	175 1/2	73	81 1/2	8 F	7 7/8	53	28	32	3	3	150 3/4	35	46 1/2	460/3/60	10	12.7
WRF_14650	146	89	93	10 F	7 7/8	58	30	34	3	3	116 1/4	38	49 1/2	460/3/60	15	19.0
WRF_16750	162	89	93	10 F	7 7/8	58	32	38	3	3	132 1/4	39	55	460/3/60	15	19.0
WRF_19000	180	89	93	10 F	7 7/8	58	34	38	3	3	150 1/4	40	55	460/3/60	15	19.0
WRF_21000	195	89	93	10 F	7 7/8	58	36	40	3	3	165 1/4	41	58	460/3/60	15	19.0

Dimensions are in inches and are subject to production tolerances, subject to changes.
SHIPPING DIMENSION: Length add 6 in. front (excluding burner length which varies on model and manufacturer) and back
Width add 12 in. right side and 6 in. left side of the boiler.

1. Width does not include gas train, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.
3. Gas line size is for standard burner, gas train and firing mode.
4. Other voltages available, consult factory for options.

Available Firing Modes

MODELS	FIRING MODES
WRF_150 to 2100	ON-OFF, LOW-HIGH-LOW, MOD
WRF_2500 to 6300	LOW-HIGH-OFF, LOW-HIGH-LOW, MOD
WRF_7350 to 21000	MODULATION



High Temperature Water Boilers

Atmospheric

Inclined Water Tubes

Ideal for Residential and Commercial Buildings, Manufacturing and Process Plants

The DRN Ajax Series high temperature water boilers perform dependably and quietly, providing commercial, institutional, and industrial building with space heating and process hot water. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 12,600 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP). Temperature up to 365 ºF *
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type “B” vent and barometric dampers or draft hoods
- 20 year non-prorated thermal shock warranty

*Optional Equipment must be specified for temperatures exceeding 250º F.

Standard Equipment

Boiler

- Operating temperature controls 130 to 250 ºF
- High temperature 2000 ºF cast refractory, 2 to 3 1/2 in. thick
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 90 to 300

Combustion System

- Ajax cast iron ported burner heads and orifices for use with natural gas
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Gas pressure regulator[1]
- Electronic ignition
- Manual gas shut-off valves and leakage test cock(s)

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Models 6 to 60 use a 24 VAC / 60 Hz electronic primary safety control system with an intermittent pilot and on-off firing
- Models 70 to 225 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and high-low firing
- Models 250 to 300 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and three stage firing
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- High and low gas pressure switches on models 70 to 300
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 55, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings
- I-beam skids on models 6 to 80

Combustion System

- Propane orifices and gas train

Model DRN

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- 120 VAC / 60 Hz electronic primary safety control system with microprocessor based flame safeguard control and interrupted pilot on models 6 to 60
- High-low firing on models 6 to 60
- Modulating firing on models 6 to 225
- Assured low-fire start, holds unit on low-fire until flame proving period is complete
- Additional safety controls, indicators and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Heat Exchangers
- Heat exchangers may be mounted sidearm style on DR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Outdoor Models
- Outdoor models 6 to 125 are available with ETL listing
- Outdoor models 150 to 300 are available without ETL listing

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Available Firing Modes

MODELS	FIRING MODES
DRN_6 to 60	ON-OFF, HIGH-LOW, MODULATION
DRN_70 to 225	HIGH-LOW, MODULATION
DRN_250 to 300	THREE STAGE

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]	PROPANE GAS
DRN_6 to 60 UL CSD-1/FM, IRI	7 to 14 in. W.C.	11 to 14 in. W.C.
DRN_70 to 100 UL CSD-1/FM	8 to 14 in. W.C.	12 to 14 in. W.C.
DRN_70 to 100 IRI	8 to 28 in. W.C.	12 to 28 in. W.C.
DRN_125 to 225 UL CSD-1/FM, IRI	10 to 28 in. W.C.	16 to 28 in. W.C.
DRN_250 to 300 UL CSD-1/FM, IRI	18 to 28 in. W.C.	24 to 28 in. W.C.

1. Additional "lock-up" regulator must be furnished if maximum supply pressure exceeds the maximum value.

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	AMPS	APPROX. WEIGHT (LBS.)[5]
DRN_6	250,000	206,250	6.2	1,218	44	38	1	1,800
DRN_8	350,000	288,750	8.6	1,706	48	51	1	2,000
DRN_10	420,000	346,500	10.4	2,047	52	62	1	2,100
DRN_12	525,000	433,125	12.9	2,559	56	75	1	2,400
DRN_15	630,000	519,750	15.5	3,071	62	94	1	2,600
DRN_17	735,000	606,375	18.1	3,583	68	109	1	2,800
DRN_20	840,000	693,000	20.7	4,095	72	125	1	3,000
DRN_22	940,000	775,500	23.2	4,582	100	139	1	3,300
DRN_25	1,050,000	866,250	25.9	5,119	104	154	1	3,400
DRN_30	1,250,000	1,031,250	30.8	6,094	113	184	1	3,600
DRN_35	1,500,000	1,237,500	37.0	7,312	123	218	1	4,000
DRN_40	1,750,000	1,433,750	43.1	8,531	131	244	1	4,300
DRN_50	2,100,000	1,732,500	51.8	10,237	199	304	1	5,500
DRN_60	2,500,000	2,062,500	61.6	12,188	217	366	1	5,800
DRN_70	3,000,000	2,475,000	73.9	14,625	235	427	4	6,100
DRN_80	3,350,000	2,763,750	82.6	16,331	254	489	4	6,400
DRN_90	3,770,000	3,110,250	92.9	18,379	360	549	4	10,200
DRN_100	4,200,000	3,465,000	103.5	20,475	377	607	4	10,400
DRN_125	5,250,000	4,331,250	129.4	25,594	422	765	6.5	11,100
DRN_150	6,300,000	5,197,500	155.3	30,713	464	915	6.5	11,700
DRN_175	7,350,000	6,063,750	181.1	35,832	511	1,082	6.5	12,400
DRN_200	8,400,000	6,930,000	207.0	40,951	739	1,220	6.5	17,900
DRN_225	9,500,000	7,837,500	234.1	46,314	795	1,390	6.5	18,800
DRN_250	10,500,000	8,662,500	258.8	51,189	839	1,524	8	19,500
DRN_275	11,500,000	9,487,500	283.4	56,064	891	1,683	8	20,400
DRN_300	12,600,000	10,395,000	310.5	61,427	939	1,829	8	21,200

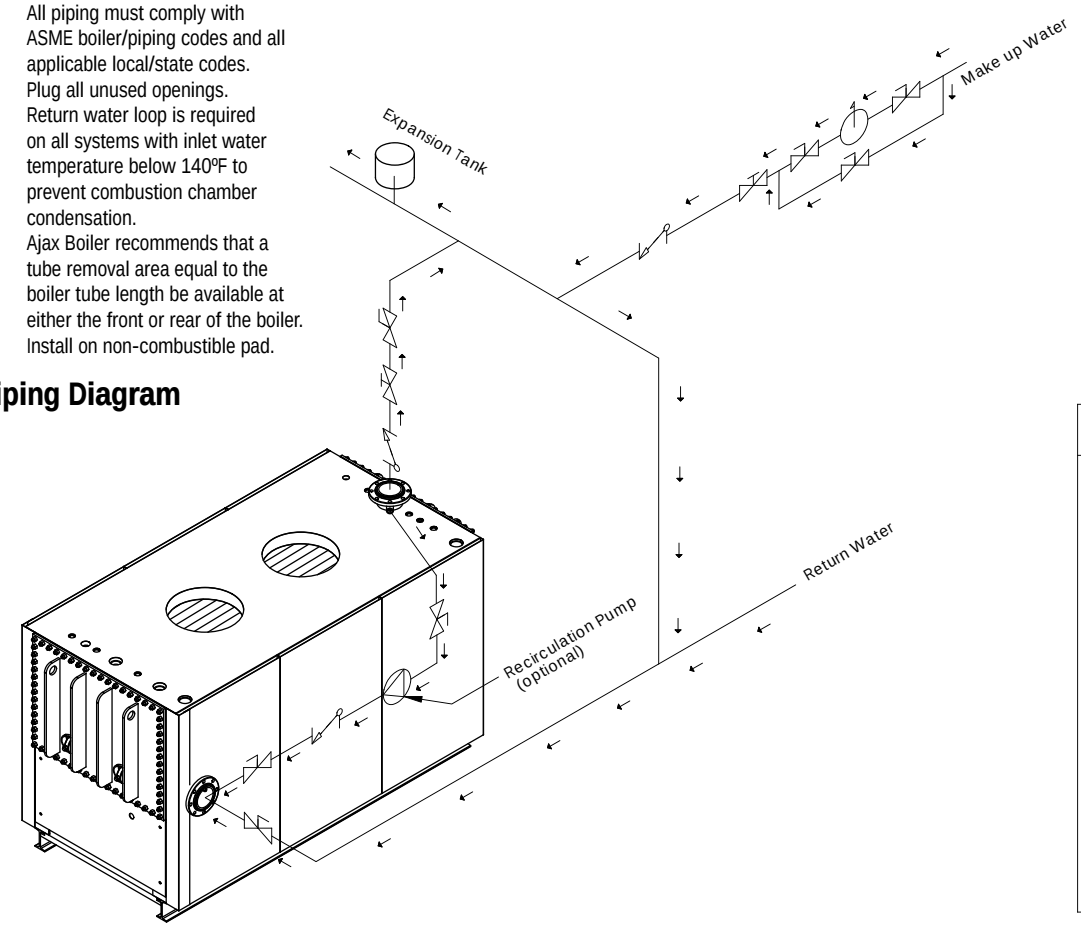
1. Models shown are for natural gas or propane only. Replace "_" with "G" for gas or "P" for propane. Add "-W" for outdoor models.

   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.

   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 82.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Estimated shipping weights. For weight-critical applications, consult factory.

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.

Piping Diagram



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LEGEND

- PUMP
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- WATER PRESSURE REGULATOR
- EXPANSION TANK

Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT DIA.[3]	H OUTDOOR VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N DRAFT HOOD CLEARANCE	N BAROMETRIC DAMPER $_{CL}$ HEIGHT	RAIN CAP SIZE
DRN_6	26 1/4	34	54	1 1/2 T	3 1/4	28 1/2	7	11	3	3/4	14 1/2	$_{CL}$	13	N/A	17
DRN_8	31 1/4	34	54	1 1/2 T	3 1/4	28 1/2	8	12	3	3/4	19 1/2	$_{CL}$	13	N/A	18 1/2
DRN_10	35 1/4	34	54	1 1/2 T	3 1/4	28 1/2	9	13	3	3/4	23 1/2	$_{CL}$	17	N/A	20
DRN_12	40 1/4	34	54	1 1/2 T	3 1/4	28 1/2	10	14	3	1	28 1/2	$_{CL}$	17	N/A	21 1/2
DRN_15	47 1/4	34	54	1 1/2 T	3 1/4	28 1/2	10	14	3	1	35 1/2	$_{CL}$	17	N/A	21 1/2
DRN_17	53 1/4	34	54	1 1/2 T	3 1/4	28 1/2	12	16	3	1	41 1/2	$_{CL}$	20	N/A	24
DRN_20	59 1/4	34	54	1 1/2 T	3 1/4	28 1/2	12	16	3	1	47 1/2	$_{CL}$	20	N/A	24
DRN_22	51 3/4	37 1/2	62	3 F	4 1/2	33 3/4	12	16	3	1	36 3/4	$_{CL}$	20	N/A	24
DRN_25	55 3/4	37 1/2	62	3 F	4 1/2	33 3/4	14	18	3	1	40 3/4	$_{CL}$	20	N/A	27
DRN_30	63 3/4	37 1/2	62	3 F	4 1/2	33 3/4	16	20	3	1 1/4	48 3/4	$_{CL}$	20	N/A	29 1/2
DRN_35	72 3/4	37 1/2	62	3 F	4 1/2	33 3/4	16	20	3	1 1/4	57 3/4	$_{CL}$	20	N/A	29 1/2
DRN_40	79 3/4	37 1/2	62	3 F	4 1/2	33 3/4	18	22	3	1 1/4	64 3/4	$_{CL}$	N/A	27	32 1/2
DRN_50	68 3/4	46 1/2	68 1/4	3 F	5 1/2	41 1/2	18	22	3	1 1/2	49 3/4	$_{CL}$	N/A	27	32 1/2
DRN_60	78 3/4	46 1/2	68 1/4	3 F	5 1/2	41 1/2	20	24	3	1 1/2	59 3/4	$_{CL}$	N/A	30	35 1/2
DRN_70	88 3/4	46 1/2	68 1/4	3 F	5 1/2	41 1/2	(2)16	(2)20	3	2	69 3/4	35	20	N/A	29 1/2
DRN_80	98 3/4	46 1/2	68 1/4	3 F	5 1/2	41 1/2	(2)16	(2)20	3	2	79 3/4	35	20	N/A	29 1/2
DRN_90	91 1/4	57	81 1/2	6 F	6 3/4	51 1/4	(2)18	(2)22	3	2	66 1/4	35	N/A	27	32 1/2
DRN_100	98 1/4	57	81 1/2	6 F	6 3/4	51 1/4	(2)18	(2)22	3	2	73 1/4	35	N/A	27	32 1/2
DRN_125	117 1/4	57	81 1/2	6 F	6 3/4	51 1/4	(2)20	(2)24	3	2 1/2	92 1/4	35	N/A	30	35 1/2
DRN_150	135 1/4	57	81 1/2	6 F	6 3/4	51 1/4	(2)24	(2)26	3	2 1/2	110 1/4	40	N/A	33	38
DRN_175	155 1/4	57	81 1/2	6 F	6 3/4	51 1/4	(2)24	(2)26	3	2 1/2	130 1/4	42	N/A	33	38
DRN_200	129 1/2	69	88 1/2	8 F	8 3/4	53	(2)24	(2)26	3	3	100 3/4	53	N/A	CF	38
DRN_225	143 1/2	69	88 1/2	8 F	8 3/4	53	(2)24	(2)28	3	3	114 3/4	59	N/A	CF	41
DRN_250	154 1/2	69	88 1/2	8 F	8 3/4	53	(2)26	(2)30	3	3	125 3/4	59	N/A	CF	44
DRN_275	167 1/2	69	88 1/2	8 F	8 3/4	53	(2)26	(2)30	3	3	138 3/4	59	N/A	CF	44
DRN_300	179 1/2	69	88 1/2	8 F	8 3/4	53	(2)28	(2)32	3	3	150 3/4	59	N/A	CF	46 1/2

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.
3. Models 6 to 60 use one vent, 70 to 300 use two vents. For indoor, atmospheric vents 18 in. or larger uses barometric dampers instead of draft hoods. For outdoor, use rain cap.
4. Gas line size is for standard gas train and firing mode.

CF - Consult factory for options and information, N/A - Not Applicable

SHIPPING DIMENSION: Length add 6 in. front and back. Width add 12 in. right side and 6 in. left side of the boiler.

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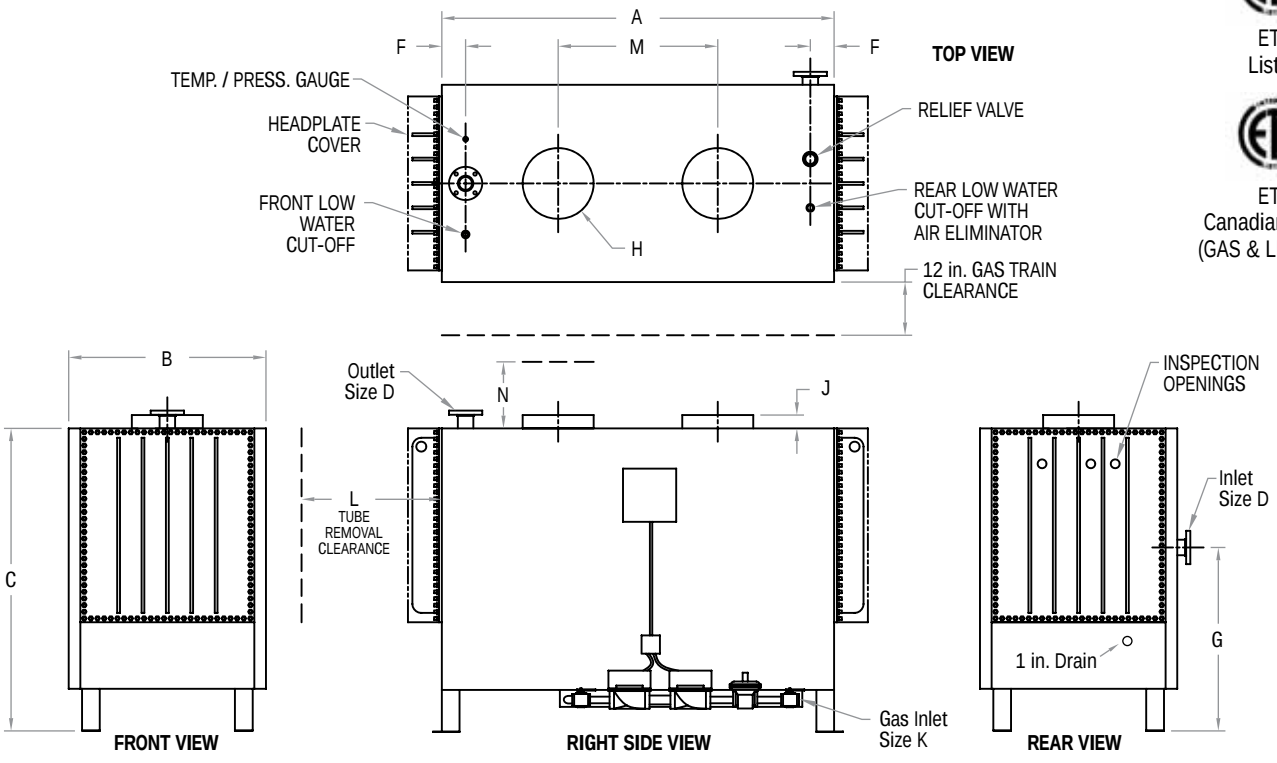

High Temperature Water Boilers

Low NOx 20 ppm Premix

Inclined Water Tubes

Ideal for Residential and Commercial Buildings, Manufacturing and Process Plants

The DRPG Ajax Series high temperature premix water boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989, and is committed to meeting all clean-air requirements for today and into the future.

Features

- 20 ppm NOx (at 3% O_2) based on factory high fire testing
- Capacities up to 2,000 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP). Temps up to 365 ºF*.
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers
- 20 year non-prorated thermal shock warranty

*Optional Equipment must be specified for temperatures exceeding 250º F.

Standard Equipment

Boiler

- Operating temperature controls from 130 to 250 ºF
- High temperature 2000 ºF cast refractory, 2 to 3 in. thick
- 18 gauge galvanized steel jacket with air wall and head plate covers for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs

Combustion System

- Ajax low NOx forced draft premix burners with Ajax fuel injectors and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulators[1]
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Model 12 uses a 120 VAC / 60 Hz electronic primary safety control system with an interrupted pilot and on-off firing
- Models 25 to 50 use a 120 VAC / 60 Hz electronic primary safety control systems with an interrupted pilot and on-off firing with low-fire start
- Digital operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- Combustion air switch
- Main power, main flame and flame fail indicators
- Electronic microprocessor based flame safeguard control
- UV scanner for flame detection
- Proven low-fire start (models 25 to 50), prevents unit from lighting off on high-fire
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 55, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Burner plenum, gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings

Model DRPG

- I-beam skids on models 12 to 50
- Indoor models are available with weather cover*
- High and low gas pressure switch

* Models are ETL certified for indoor operation

Controls & Trim

- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- High-low firing with proven low-fire start on models 25 to 50
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, float-type low water cut-offs, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Heat Exchangers

- Heat exchangers may be mounted sidearm style on DR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post-purge of the combustion chamber, pilot and main flame monitoring. A "zero governor" regulator/safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

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Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[5]
DRPG-12	500,000	417,500	12.5	2,559	56	76	2,400
DRPG-25	1,000,000	835,000	24.9	5,119	104	154	3,400
DRPG-35	1,500,000	1,252,500	37.4	7,312	123	218	4,000
DRPG-50	2,000,000	1,670,000	49.9	10,237	199	304	5,500

1. Models shown are for natural gas only. Replace "_" with "G" for gas or "P" for propane. Add "-W" for outdoor models.

   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.

   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Estimated shipping weights. For weight-critical applications, consult factory.

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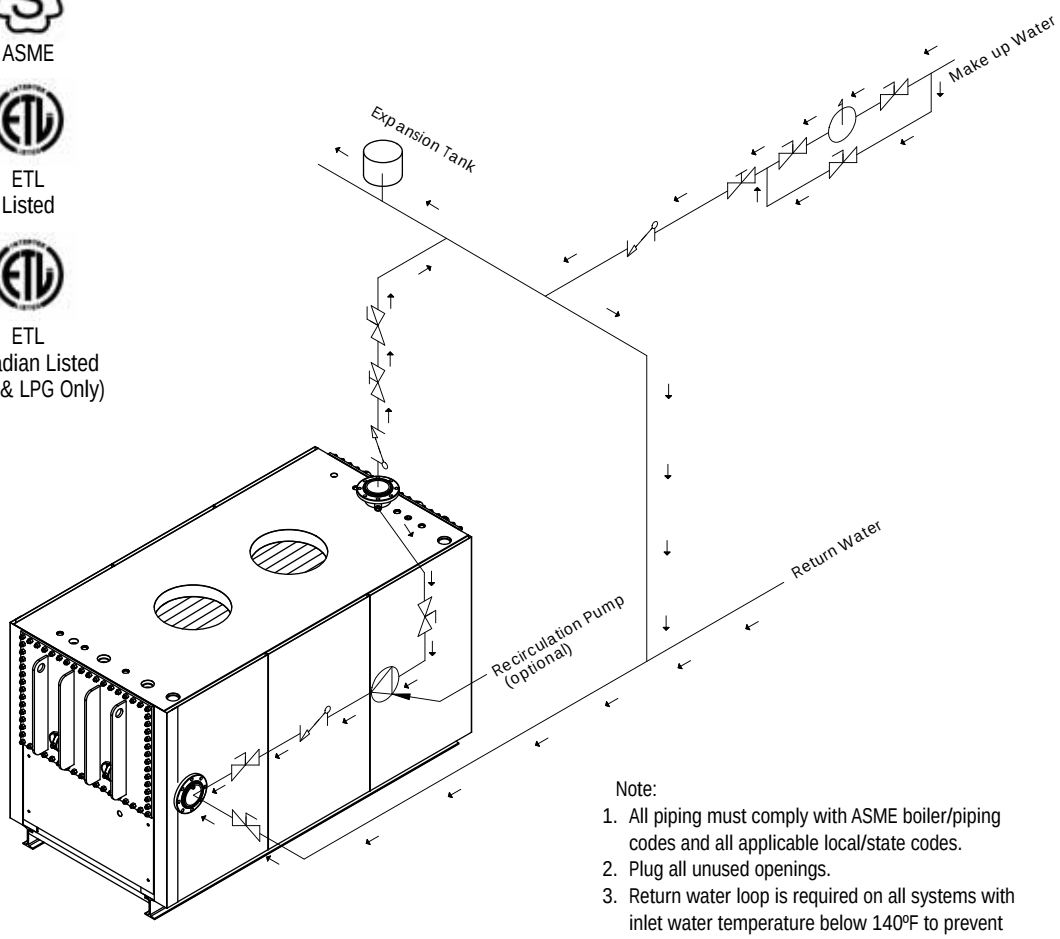

LEGEND

- PUMP
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- WATER PRESSURE REGULATOR
- EXPANSION TANK

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad

Piping Diagram

Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER $_{CL}$ HEIGHT	STANDARD VOLTAGE[5] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.
DRPG-12	40 1/4	34	54	1 1/2 T	3 1/4	28 1/2	10	3	1	28 1/2	$_{CL}$	14	120/1/60	1/3	7.2
DRPG-25	55 3/4	37 1/2	62	3 F	4 1/2	33 3/4	14	3	1	40 3/4	$_{CL}$	21	120/1/60	1/2	9.8
DRPG-35	72 3/4	37 1/2	62	3 F	4 1/2	33 3/4	16	3	1 1/4	57 3/4	$_{CL}$	24	120/1/60	3/4	13.8
DRPG-50	68 3/4	46 1/2	68 1/4	3 F	5 1/2	41 1/2	18	3	1 1/2	49 3/4	$_{CL}$	27	120/1/60	1	16.0

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, inlet, plenum or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.
3. Models 12 to 50 use one vent.
4. Gas line size is for standard gas train and firing mode.
5. Other voltages available, consult factory for options.

SHIPPING DIMENSION: Length add 6 in. front and back
Width add 12 in. right side and 6 in. left side of the boiler.

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]
ON-OFF DRPG-12 to 50 UL CSD-1/FM	8 to 14 in. W.C.
ON-OFF DRPG-12 to 50 IRI ON-OFF	8 to 28 in. W.C.
LHO, LHL DRPG-25 to 50 UL CSD-1/FM	9 to 14 in. W.C.
LHO, LHL DRPG-25 to 50 IRI	9 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds the maximum value.

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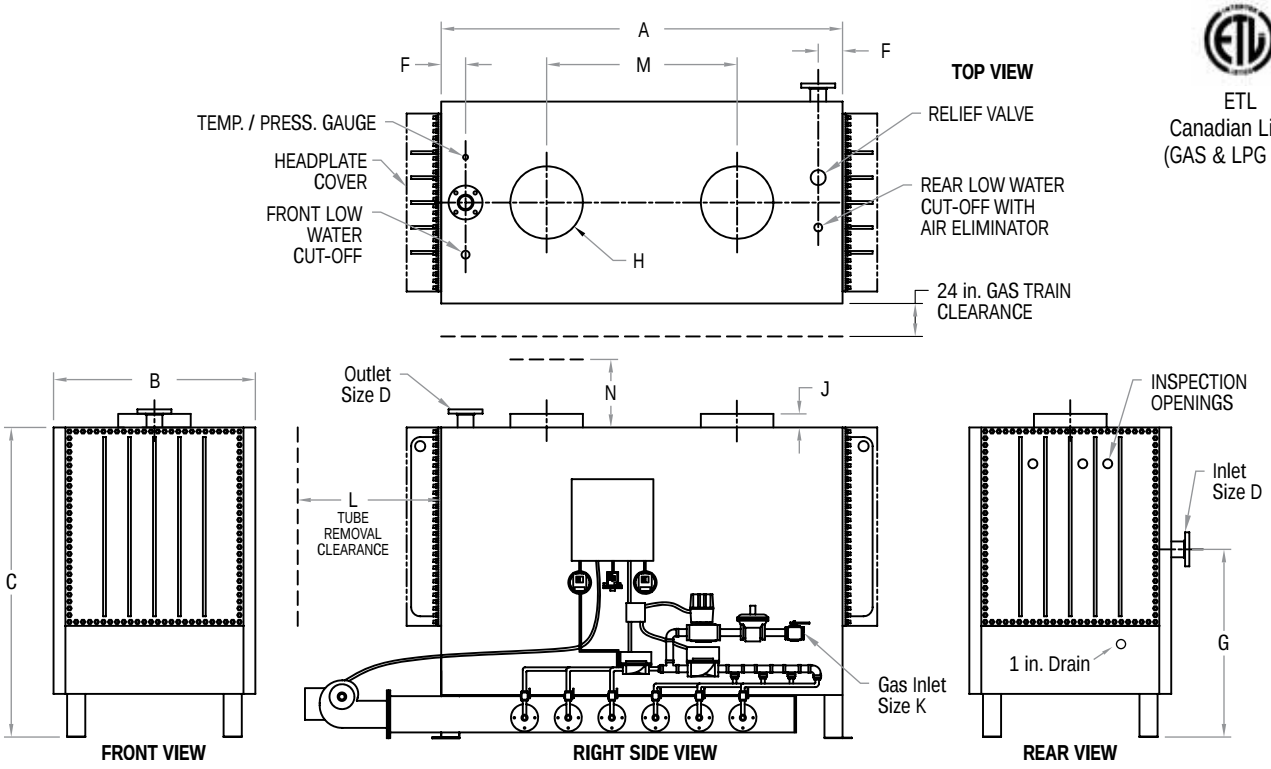

High Temperature Water Boilers

Ultra Low NOx 12 ppm Premix

Inclined Water Tubes

Ideal for Residential and Commercial Buildings, Manufacturing and Process Plants

The DRLG Ajax Series high temperature premix water boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989, and is committed to meeting all clean-air requirements for today and into the future.

Features

- 12 ppm NOx (at 3% O_2) based on factory high fire testing
- Capacities up to 7,000 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP). Temps up to 365º F*
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers
- 20 year non-prorated thermal shock warranty

*Optional Equipment must be specified for temperatures exceeding 250º F.

Standard Equipment

Boiler

- Operating temperature controls 130 to 250 ºF
- High temperature 2000 ºF cast refractory, 3 in. thick
- 18 gauge galvanized steel jacket with air wall and head plate covers for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 90 to 175

Combustion System

- Knit metal fiber combustion surface for optimal efficiency and durability
- Fuel-air ratio valve for precise combustion control
- Ajax fuel injectors and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulator[1]
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- All models use a 120 VAC / 60 Hz electronic primary safety control system with interrupted pilot and high-low firing with low-fire start
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- Combustion air switch and high and low gas pressure switches
- Main power, main flame and flame fail indicators
- UV scanner for flame detection
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 55, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Burner plenum, gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings
- I-beam skids on models 50 to 70
- Indoor models are available with weather cover*

* Models are ETL certified for indoor operation

Model DRLG

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, float-type low water cut-offs, pump controls and feeders
- IRI compliant safety control systems and gas train
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers
- Assured low-fire start, holds unit on low-fire until flame proving period is complete

Heat Exchangers
- Heat exchangers may be mounted sidearm style on DR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post- purge of the combustion chamber, pilot and main flame monitoring. A "zero governor" regulator/ safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

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Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[5]
DRLG-50	2,000,000	1,670,000	49.9	10,237	199	304	5,500
DRLG-70	3,000,000	2,505,000	74.8	14,625	235	427	6,300
DRLG-100	4,000,000	3,340,000	99.8	20,475	377	609	9,800
DRLG-125	5,000,000	4,175,000	124.7	25,594	422	768	10,800
DRLG-150	6,000,000	5,010,000	149.7	30,713	464	918	11,800
DRLG-175	7,000,000	5,845,000	174.6	35,832	511	1,084	12,800

Models shown are for natural gas only. Add "-W" to model numbers for outdoor models.

NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.

For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper is to be set to maintain this draft. No down draft stack conditions are permitted.

1. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
2. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
3. Based upon 33,480 BTU/hr output per B.H.P.
4. Estimated shipping weights. For weight-critical applications, consult factory.

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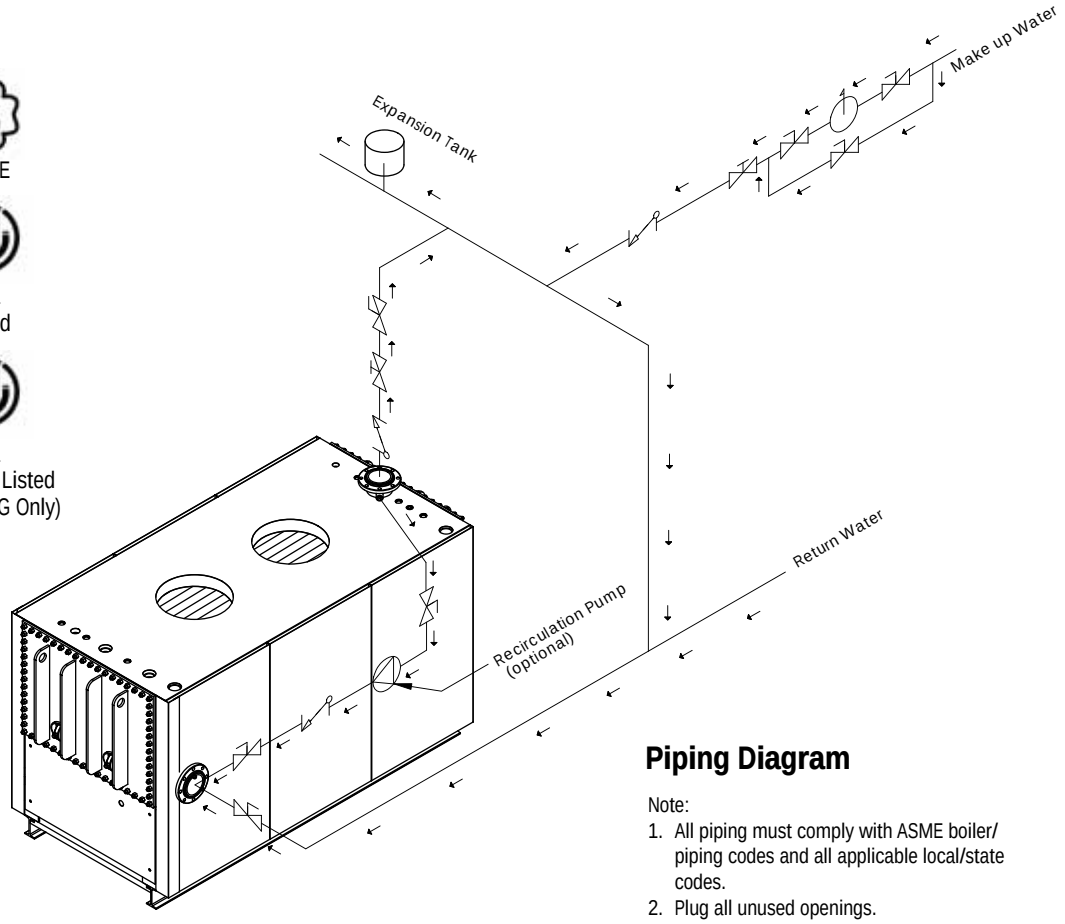
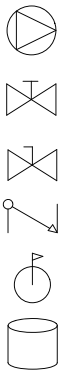


Piping Diagram

Note:

1. All piping must comply with ASME boiler/ piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on a non-combustible pad.

LEGEND



Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER C_L HEIGHT	MOTOR VOLTAGE[6] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.
DRLG-50	68 3/4	45	64 1/4	3 F	5 1/2	37 1/2	18	8 1/2	1 1/2	49 3/4	C_L	27	120/1/60	1	16.0
DRLG-70	88 3/4	45	64 1/4	3 F	5 1/2	37 1/2	20	8 1/2	1 1/2	69 3/4	C_L	30	230/3/60	1 1/2	6.0
DRLG-100	98 1/4	54	76	6 F	6 3/4	45 3/4	(2)18	7	2	73 1/4	24[5]	27	230/3/60	2	6.8
DRLG-125	117 1/4	54	76	6 F	6 3/4	45 3/4	(2)20	7	2 1/2	92 1/4	28[5]	30	460/3/60	3	4.8
DRLG-150	135 1/4	54	76	6 F	6 3/4	45 3/4	(2)20	7	2 1/2	110 1/4	34	33	460/3/60	5	7.6
DRLG-175	155 1/4	54	76	6 F	6 3/4	45 3/4	(2)22	7	2 1/2	130 1/4	42	33	460/3/60	7 1/2	11.0

Dimensions are in inches and are subject to production tolerances, subject to changes.
1. Width does not include gas train, inlet, plenum or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.
3. Models 50 to 70 use one vent, 100 to 175 use two vents.
4. Gas line size is for standard gas train and firing mode.
5. Sizes 100-125 outdoor vent spacing 35 in.
6. Other voltages available, consult factory for options.

SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]
DRLG-50 to 175 UL CSD-1/FM	8 to 14 in. W.C.
DRLG-50 to 175 IRI	8 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds maximum values.

Available Firing Modes

MODELS	FIRING MODES
DRLG-50 to 175	LOW-HIGH-LOW, MODULATION

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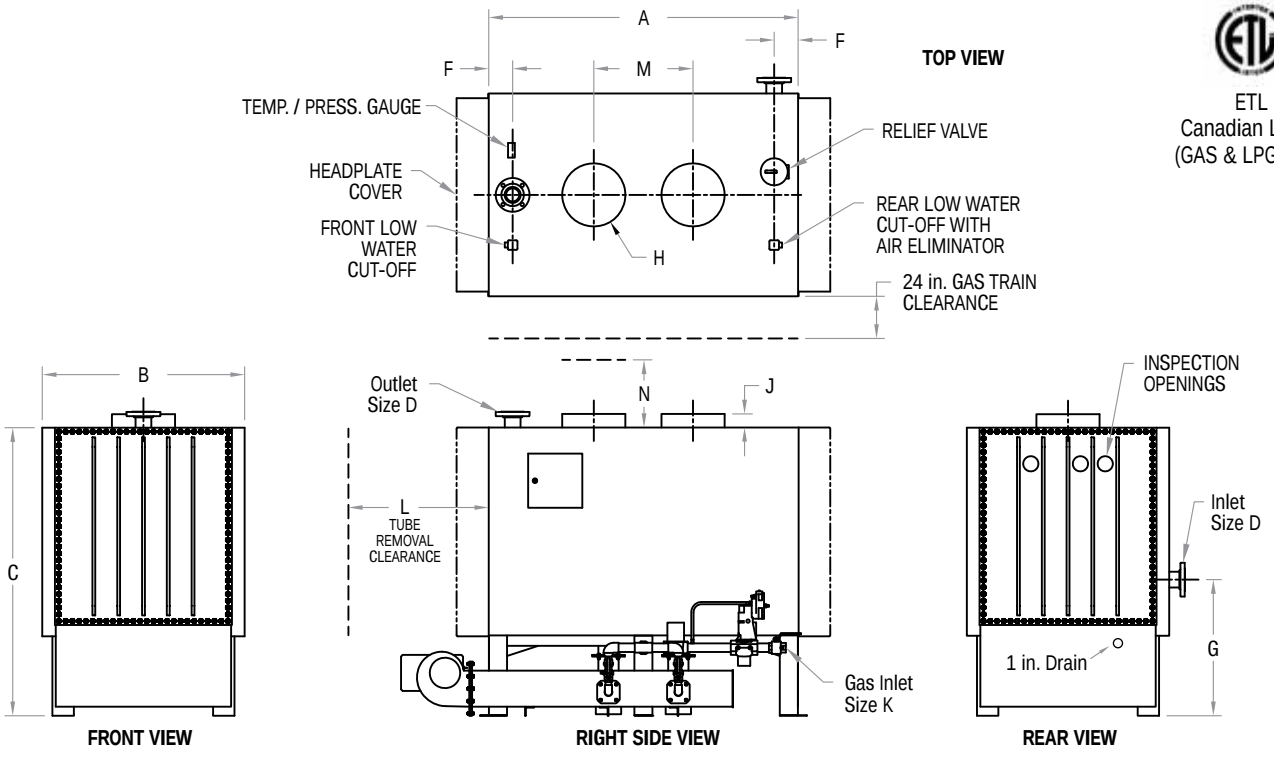

High Temperature Water Boilers

Forced Draft

Inclined Water Tubes

Ideal for Residential and Commercial Buildings, Manufacturing and Process Plants

The DRF Ajax Series high temperature forced draft water boilers perform dependably and quietly, providing commercial, institutional, and industrial building with space heating and process hot water. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 12,600 MBTU/hr
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP). Temps up to 365 ºF*.
- Full access to combustion chamber and water sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795, UL 726 and CAN 1-3.1 standards for natural gas, #2 oil and combination gas / #2 oil
- 20 year non-prorated thermal shock warranty

*Optional Equipment must be specified for temperatures exceeding 250º F.

Standard Equipment

Boiler

- Operating temperature controls 130 to 250 ºF
- High temperature 2750 ºF cast refractory, 2 1/2 to 4 in. thick
- Refractory backed by minimum of 2 in. of insulating refractory and 3 in. of high temperature insulation
- Hinged burner door on models 6 to 40
- Removable front door and left-side manway on models 50 to 300
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Water section, including tubesheets and removable headplates, is made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on all models

Controls & Trim

- Standard controls are CSD-1 compliant
- ETL / UL listed packaged assemblies with Power Flame™ burners for natural gas, #2 oil and combination gas / #2 oil
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Gas pressure regulator[1]
- Electronic ignition
- Manual gas shut off valves and leakage test cock(s)
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and test switch
- High and low gas pressure switches on models 70 to 300
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

1. May be combined in one valve body.

(Forced Draft Low NOx Boiler)

- Full modulation combustion system (Optional)
- Cam actuated fuel system
- Premix tube
- IFGR piping
- Damper motor with time delay relay

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 55, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings
- Dip tube for air elimination
- Indoor models are available with weather cover*

* Models are ETL certified for indoor operation

Model DRF

Burners
- Power Flame™ burners standard. Consult Factory for other manufacturers.
- Sub 9 ppm, 12 and 30 ppm Low NOx system. Models 10 to 50 pre-certified to SCAQMD Rule 1146.2
- LPG or methane (digester gas) burners
- High turndown burners (10:1 with adiabatic chamber)
- Induced flue gas recirculation (IFGR) assembly for low NOx application
- Low fire start interlock (gas only)
- Varicam characterized fuel metering system cam actuated (#2 oil or gas-oil fuel, modulation mode only)

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC.
- Microprocessor based combustion controller
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers
- Building automation panel with Modbus enabled communication
- Communication gateway (BACNet, Johnson N2 or Lonworks)
- Remote setpoint panel
- Remote enable/disable relay (120 or 24 VAC)
- General alarm contacts
- Boiler status contacts
- Boiler pump contacts with timer
- Low fire hold with timer
- Recirculation pump with control aquastat
- Lead lag sequence control
- Boiler display upgrade
- KY or PA code special high limit aquastat

Heat Exchangers
- Heat exchangers may be mounted sidearm style on DR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Induced Flue Gas Recirculation 30 ppm NOx System

The Ajax Series boiler flue gas recirculation system will burn natural gas or LPG at or less than 30 ppm NOx. On oil-fired units, NOx levels are reduced by 40%. The burner combustion air fan is used to induce the proper flow of flue gas into the combustion air within the burner housing. The result is a cooler flame temperature and a reduction of NOx. A separate flue gas damper assembly is mechanically linked to the burner flue/air control system in order to maintain proper NOx control throughout the firing range.

Concurrently, Ajax has built hundreds of forced draft **flue gas recirculation packages** using the Power Flame™ "Nova" burner system which continues to meet stringent 30 ppm NOx requirements. Also available in **sub 9, 12 ppm NOx** system and high turndown burners at 10:1 with adiabatic chamber (8:1 without adiabatic chamber).

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Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	20ºF TEMP RISE INLET TEMP. (GPH)	WATER VOLUME (GAL.)	HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[5]
DRF_6[6]	250,000	208,750	6.2	1,218	44	38	3,000
DRF_8[6]	350,000	292,250	8.7	1,706	48	51	3,200
DRF_10	420,000	350,700	10.5	2,047	52	62	3,300
DRF_12	525,000	438,375	13.1	2,559	56	75	3,700
DRF_15	630,000	526,050	15.7	3,071	62	94	4,100
DRF_17	735,000	613,725	18.3	3,583	68	109	4,400
DRF_20	840,000	701,400	20.9	4,095	72	125	4,700
DRF_22	940,000	784,900	23.4	4,582	100	139	5,200
DRF_25	1,050,000	876,750	26.2	5,119	104	154	5,300
DRF_30	1,250,000	1,043,750	31.2	6,094	113	184	5,600
DRF_35	1,500,000	1,252,500	37.4	7,312	123	218	6,200
DRF_40	1,750,000	1,461,250	43.6	8,531	131	244	6,600
DRF_50	2,100,000	1,753,500	52.4	10,237	199	304	8,400
DRF_60	2,500,000	2,087,500	62.4	12,188	217	366	9,000
DRF_70	3,000,000	2,505,000	74.8	14,625	235	427	9,500
DRF_80	3,350,000	2,797,250	83.6	16,331	254	489	10,000
DRF_90	3,770,000	3,147,950	94.0	18,379	360	549	15,600
DRF_100	4,200,000	3,507,000	104.8	20,475	377	607	16,000
DRF_125	5,250,000	4,383,750	131.0	25,594	422	765	17,100
DRF_150	6,300,000	5,260,500	157.1	30,713	464	915	18,100
DRF_175	7,350,000	6,137,250	183.3	35,832	511	1,082	19,300
DRF_200	8,400,000	7,014,000	209.5	40,951	739	1,220	27,500
DRF_225	9,500,000	7,932,500	237.0	46,314	795	1,390	28,900
DRF_250	10,500,000	8,767,500	261.9	51,189	839	1,524	30,000
DRF_275	11,500,000	9,602,500	286.9	56,064	891	1,683	31,400
DRF_300	12,600,000	10,521,000	314.3	61,427	939	1,829	32,600

1. Models shown are for natural gas, propane, #2 Oil or combination Gas / #2 Oil. Replace "_" with "G" for gas or "P" for propane. Add "-W" for outdoor models.

NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.

For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted. Combustion chamber pressure up to 1/4" WC.

2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Estimated shipping weights. For weight-critical applications, consult factory.
6. DRF_6 & 8 model are not available in 30 ppm Low NOx. Other fuels or burners will have different pressure requirements.

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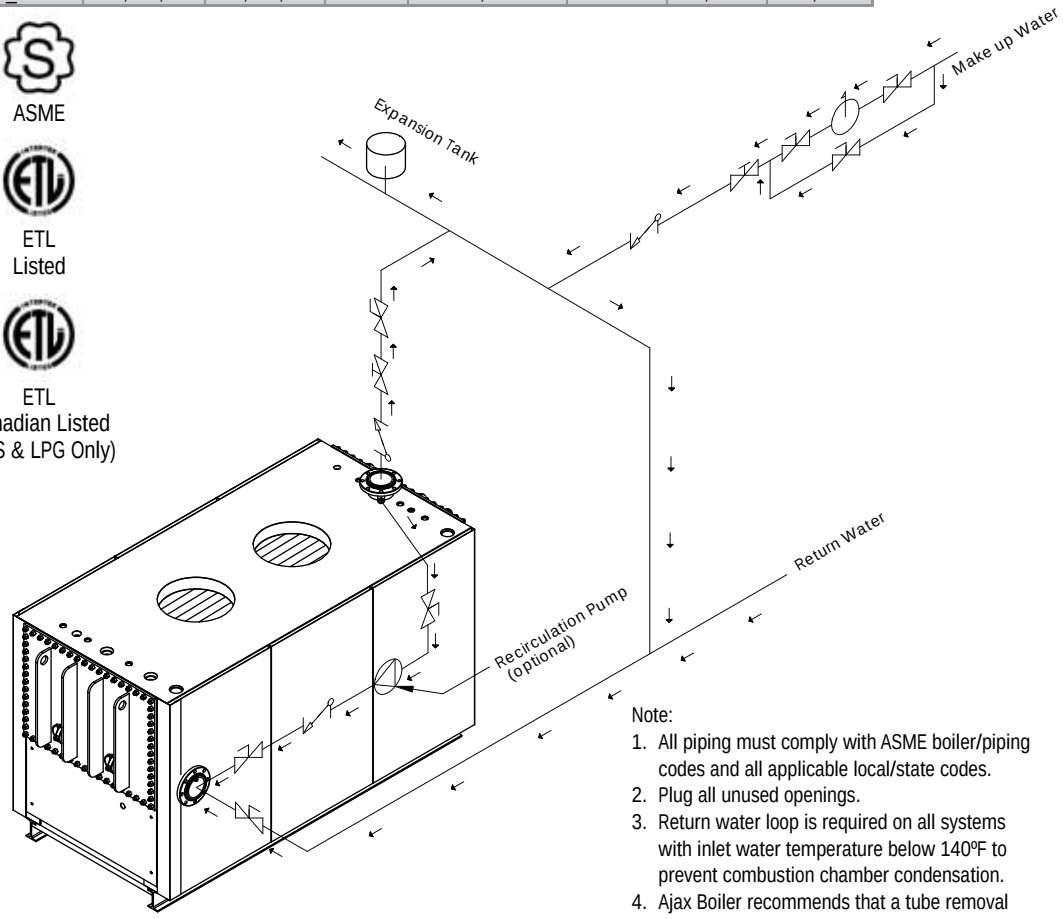
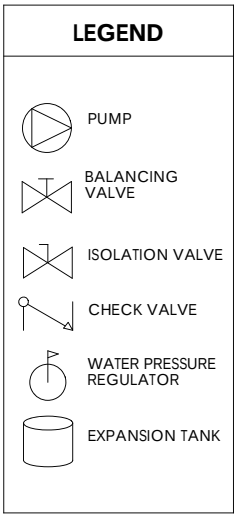


Piping Diagram

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.



Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET / OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT DIA.	H OUTDOOR VENT DIA.	J VENT STUB HEIGHT	K GAS LINE SIZE[3]	L TUBE LENGTH	M VENT LOC.	MOTOR VOLTAGES[4] (VAC/Ph/Hz)	MOTOR H.P.	MOTOR AMPS.	RAIN CAP SIZE
DRF_6	26 1/4	37	57 3/4	1 1/2 T	3 1/4	32 1/2	6	11	3	1	14 1/2	C_L	120/1/60	1/4	2.5	17
DRF_8	31 1/4	37	57 3/4	1 1/2 T	3 1/4	32 1/2	6	12	3	1	19 1/2	C_L	120/1/60	1/4	2.5	18 1/2
DRF_10	35 1/4	37	57 3/4	1 1/2 T	3 1/4	32 1/2	6	13	3	1	23 1/2	C_L	120/1/60	1/4	2.5	20
DRF_12	40 1/4	37	57 3/4	1 1/2 T	3 1/4	32 1/2	6	14	3	1	28 1/2	17 1/2	120/1/60	1/4	2.5	21 1/2
DRF_15	47 1/4	37	57 3/4	1 1/2 T	3 1/4	32 1/2	8	14	3	1	35 1/2	17 1/2	120/1/60	1/4	2.5	21 1/2
DRF_17	53 1/4	37	57 3/4	1 1/2 T	3 1/4	32 1/2	8	16	3	1	41 1/2	18 1/2	120/1/60	1/3	3.3	24
DRF_20	59 1/4	37	57 3/4	1 1/2 T	3 1/4	32 1/2	8	16	3	1	47 1/2	18 1/2	120/1/60	1/3	3.3	24
DRF_22	51 3/4	40 1/2	72 1/4	3 F	4 1/2	43 3/4	8	16	3	1	36 3/4	20 1/2	120/1/60	1/3	3.3	24
DRF_25	55 3/4	40 1/2	72 1/4	3 F	4 1/2	43 3/4	10	18	3	1	40 3/4	20 1/2	120/1/60	1/3	3.3	27
DRF_30	63 3/4	40 1/2	72 1/4	3 F	4 1/2	43 3/4	10	20	3	1	48 3/4	20 1/2	120/1/60	1/3	3.3	29 1/2
DRF_35	72 3/4	40 1/2	72 1/4	3 F	4 1/2	43 3/4	10	20	3	1 1/4	57 3/4	21 1/2	120/1/60	1/3	3.3	29 1/2
DRF_40	79 3/4	40 1/2	72 1/4	3 F	4 1/2	43 3/4	12	22	3	1 1/2	64 3/4	21 1/2	120/1/60	1/3	3.3	32 1/2
DRF_50	68 3/4	49 1/2	80 3/4	3 F	5 1/2	53 3/4	12	22	3	1 1/2	49 3/4	24 1/2	120/1/60	1/3	3.3	32 1/2
DRF_60	78 3/4	49 1/2	80 3/4	3 F	5 1/2	53 3/4	12	24	3	1 1/2	59 3/4	24 1/2	230/3/60	3/4	1.9	35 1/2
DRF_70	88 3/4	49 1/2	80 3/4	3 F	5 1/2	53 3/4	14	20	3	2	69 3/4	25 1/2	230/3/60	1	2.5	29 1/2
DRF_80	98 3/4	49 1/2	80 3/4	3 F	5 1/2	53 3/4	14	20	3	2	79 3/4	25 1/2	460/3/60	1 1/2	1.9	29 1/2
DRF_90	91 1/4	61 1/2	83 1/2	6 F	6 3/4	53 3/4	16	22	3	2	66 1/4	30	460/3/60	1 1/2	1.9	32 1/2
DRF_100	98 1/4	61 1/2	83 1/2	6 F	6 3/4	53 3/4	16	22	3	2	73 1/4	30	460/3/60	1 1/2	1.9	32 1/2
DRF_125	117 1/4	61 1/2	83 1/2	6 F	6 3/4	53 3/4	18	24	3	2	92 1/4	31	460/3/60	3	3.8	35 1/2
DRF_150	135 1/4	61 1/2	83 1/2	6 F	6 3/4	53 3/4	18	26	3	2 1/2	110 1/4	31	460/3/60	3	3.8	38
DRF_175	155 1/4	61 1/2	83 1/2	6 F	6 3/4	53 3/4	20	26	3	2 1/2	130 1/4	32	460/3/60	5	6.4	38
DRF_200	129 1/2	73	96 1/2	8 F	8 3/4	61 1/4	20	26	3	3	100 3/4	35	460/3/60	5	6.4	38
DRF_225	143 1/2	73	96 1/2	8 F	8 3/4	61 1/4	24	28	3	3	114 3/4	36	460/3/60	5	6.4	41
DRF_250	154 1/2	73	96 1/2	8 F	8 3/4	61 1/4	24	30	3	3	125 3/4	37	460/3/60	5	6.4	44
DRF_275	167 1/2	73	96 1/2	8 F	8 3/4	61 1/4	26	30	3	3	138 3/4	38	460/3/60	10	12.7	44
DRF_300	179 1/2	73	96 1/2	8 F	8 3/4	61 1/4	26	32	3	3	150 3/4	38	460/3/60	10	12.7	46 1/2

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket. 3 in. and smaller inlets are removable.
3. Gas line size is for standard burner, gas train and firing mode.
4. Other voltages available, consult factory for options.

SHIPPING DIMENSION: Length add 6 in. front (excluding burner length which varies on model and manufacturer) and back, Width add 12 in. right side and 6 in. left side of the boiler.

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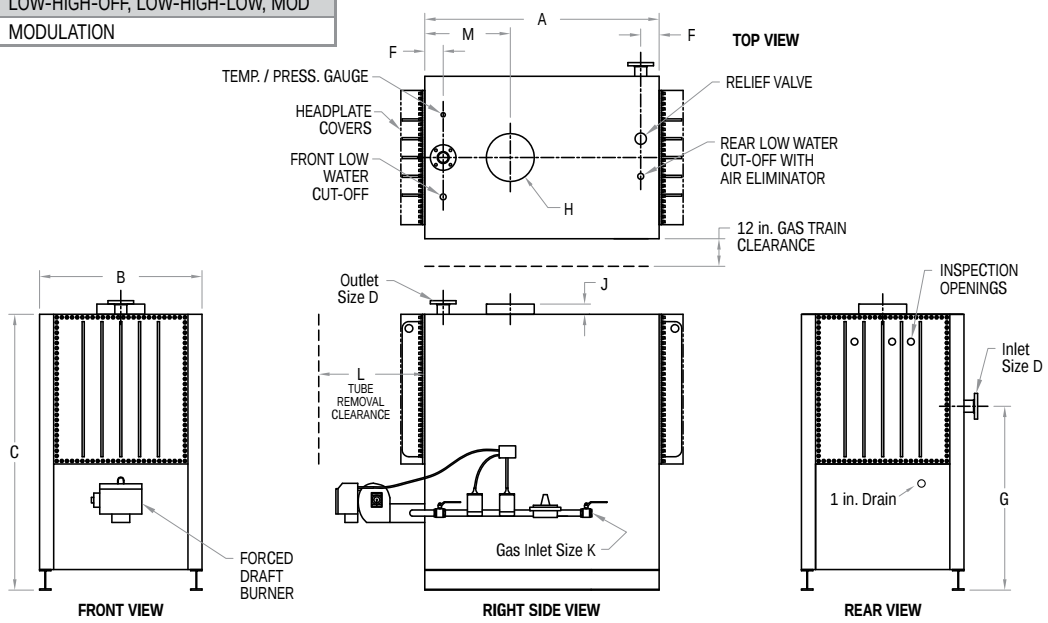
Available Firing Modes

MODELS	FIRING MODES
DRF_6 to 50	ON-OFF, LOW-HIGH-LOW, MOD
DRF_60 to 150	LOW-HIGH-OFF, LOW-HIGH-LOW, MOD
DRF_175 to 300	MODULATION



Low Pressure Steam Boilers

Atmospheric

Inclined Water Tubes

For Space Heating and Process Use

The HRN AJAX Series low pressure steam boilers perform dependably and quietly, providing commercial, institutional, and industrial building with space heating and process steam. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 12,600 MBTU/hr (301.1 B.H.P.)
- ASME Boiler and Pressure Vessel Code Section IV stamped for 15 psig maximum allowable working pressure (MAWP). Temps up to 250 ºF.
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using readily available straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers or draft hoods

Standard Equipment

Boiler

- High temperature 2000 ºF cast refractory, 2 to 3 in. thick
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Steam and water sections, including tubesheets and removable headplates, are made from pressure vessel quality steel, from 3/8 to 3/4 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gaskets
- Front headplate hand holes on models 50 to 300
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 90 to 300

Combustion System

- Ajax cast iron ported burner heads and orifices for use with natural gas
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Gas pressure regulator[1]
- Electronic ignition
- Manual gas shut-off valves and leakage test cock(s)

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Models 6 to 60 use a 24 VAC / 60 Hz electronic primary safety control system with an intermittent pilot and on-off firing
- Models 70 to 225 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and high-low firing
- Models 250 to 300 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and three stage firing
- Mechanical operating control and manual reset high limit control
- Probe type low water cut-off with manual reset and water gauge glass
- High and low gas pressure switches on models 70 to 300
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 15 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain and headplate couplings
- I-beam skids on models 6 to 80

Combustion System

- Propane orifices and gas train

Model HRN

The "H" series boiler is an adaptation of the Ajax Series "W" design, providing drum construction for additional steam or water storage.

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- 120 VAC / 60 Hz electronic primary safety control system with microprocessor based flame safeguard control and interrupted pilot on models 6 to 60
- High-low firing on models 6 to 60
- Modulating firing on models 6 to 225
- Assured low-fire start, holds unit on low-fire until flame proving period is complete
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Copper Tubes
- 13 gauge SB-75 copper tubes are recommended for hot water, and other applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header)

Heat Exchangers
- Heat exchangers may be mounted sidearm style on HR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Outdoor Models
- Outdoor models 6 to 125 are available with ETL listing
- Outdoor models 150 to 300 are available without ETL listing

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Available Firing Models

MODELS	FIRING MODES
HRN_6 to 60	ON-OFF / HIGH-LOW / MODULATION
HRN_70 to 275	HIGH-LOW / MODULATION
HRN_250 to 300	THREE STAGE

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]	PROPANE GAS
HRN_6 to 60 UL CSD-1/FM, IRI	7 to 14 in. W.C.	11 to 14 in. W.C.
HRN_70 to 100 UL CSD-1/FM	8 to 14 in. W.C.	12 to 14 in. W.C.
HRN_70 to 100 IRI	8 to 28 in. W.C.	12 to 28 in. W.C.
HRN_125 to 225 UL CSD-1/FM, IRI	10 to 28 in. W.C.	16 to 28 in. W.C.
HRN_250 to 300 UL CSD-1/FM, IRI	18 to 28 in. W.C.	24 to 28 in. W.C.

1. Additional "lock-up" regulator must be furnished if maximum supply pressure exceeds the maximum value.

Specifications

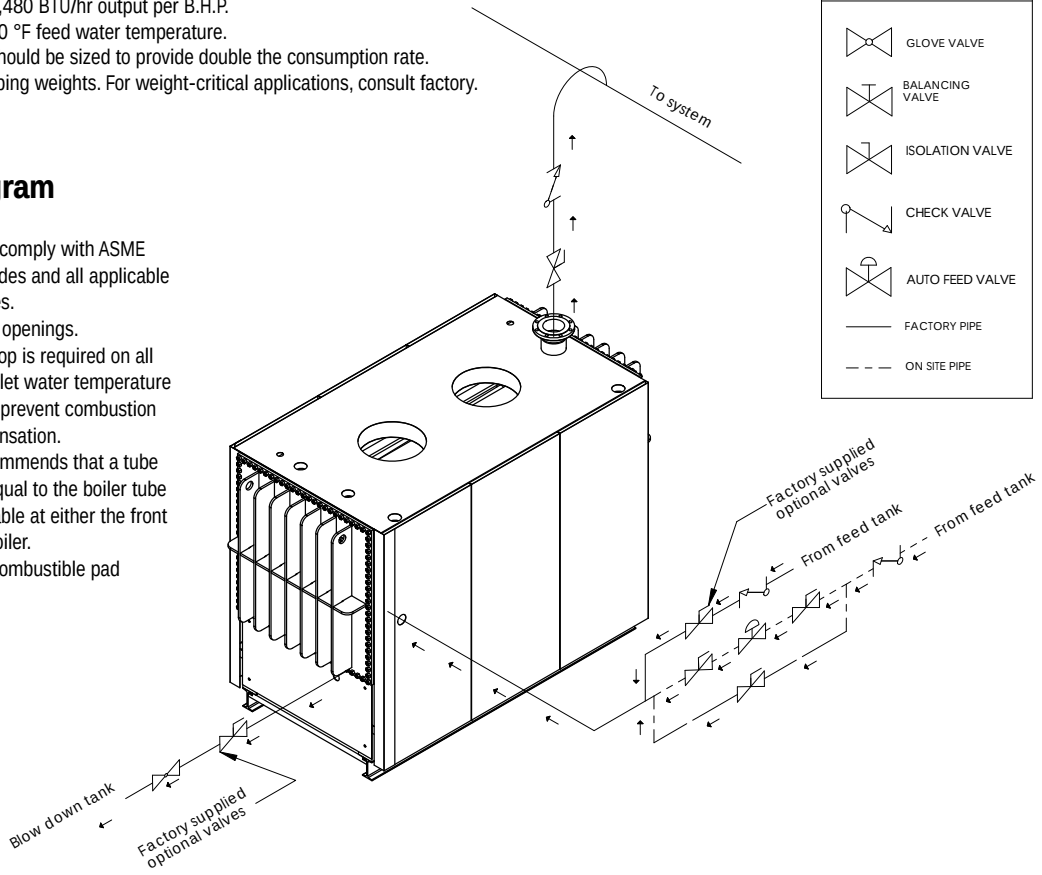
MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUTPUT (LBS./HR AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	AMPS	APPROX. WEIGHT (LBS.)[7]	BOTTOM BLOW DOWN SIZE	RAIN CAP SIZE
						WORKING (GAL.)	FLOODED (GAL.)					
HRN_6	250,000	206,250	6.2	203	25	25	44	38	1	1,700	1	17
HRN_8	350,000	288,750	8.6	285	36	28	48	51	1	1,900	1	18 1/2
HRN_10	420,000	346,500	10.3	341	43	30	52	62	1	2,000	1	20
HRN_12	525,000	433,125	12.9	427	53	32	56	75	1	2,200	1	21 1/2
HRN_15	630,000	519,750	15.5	512	64	36	62	94	1	2,500	1	21 1/2
HRN_17	735,000	606,375	18.1	597	75	39	68	109	1	2,700	1	24
HRN_20	840,000	693,000	20.7	683	85	42	72	125	1	2,900	1	24
HRN_22	940,000	775,500	23.2	764	96	62	100	139	1	3,100	1	24
HRN_25	1,050,000	866,250	25.9	854	107	65	104	154	1	3,300	1	27
HRN_30	1,250,000	1,031,250	30.8	1,016	127	71	113	184	1	3,500	1	29 1/2
HRN_35	1,500,000	1,237,500	37.0	1,219	152	78	123	218	1	3,700	1 1/4	29 1/2
HRN_40	1,750,000	1,433,750	43.1	1,423	178	83	131	244	1	3,900	1 1/4	32 1/2
HRN_50	2,100,000	1,732,500	51.8	1,707	213	141	201	304	1	5,400	1 1/4	32 1/2
HRN_60	2,500,000	2,062,500	61.6	2,032	254	153	219	366	1	5,700	1 1/4	35 1/2
HRN_70	3,000,000	2,475,000	73.9	2,439	305	166	238	427	4	6,000	1 1/2	29 1/2
HRN_80	3,350,000	2,763,750	82.6	2,683	335	179	256	489	4	6,300	1 1/2	29 1/2
HRN_90	3,770,000	3,110,250	92.9	3,065	383	261	363	549	4	9,300	1 1/2	32 1/2
HRN_100	4,200,000	3,465,000	103.5	3,414	427	273	379	607	4	9,900	1 1/2	32 1/2
HRN_125	5,250,000	4,331,250	129.4	4,268	534	307	424	766	6.5	10,900	1 1/2	35 1/2
HRN_150	6,300,000	5,197,500	155.3	5,121	640	339	467	916	6.5	11,600	1 1/2	38
HRN_175	7,350,000	6,063,750	181.1	5,975	747	375	514	1,082	6.5	11,800	1 1/2	38
HRN_200	8,400,000	6,930,000	207.0	6,828	854	506	739	1,220	6.5	17,100	2	38
HRN_225	9,500,000	7,837,500	234.1	7,722	966	545	795	1,390	6.5	17,900	2	41
HRN_250	10,500,000	8,662,500	258.8	8,535	1,067	575	839	1,524	8	18,600	2	44
HRN_275	11,500,000	9,487,500	283.4	9,348	1,169	610	891	1,683	8	19,400	2	44
HRN_300	12,600,000	10,395,000	310.5	10,242	1,281	643	939	1,829	8	20,200	2	46 1/2

1. Models shown are for natural gas or propane only. Replace "_" with "G" for gas or "P" for propane. Add "-W" for outdoor models.
   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 82.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.

Piping Diagram

Note:

1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad



LEGEND

- GLOVE VALVE
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- AUTO FEED VALVE
- FACTORY PIPE
- ON SITE PIPE

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Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT DIA.[3]	H OUTDOOR VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N DRAFT HOOD CLEARANCE	N BAROMETRIC DAMPER C_L HEIGHT
HRN_6	26 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	7	11	3	3/4	14 1/2	C_L	13	N/A
HRN_8	31 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	8	12	3	3/4	19 1/2	C_L	13	N/A
HRN_10	35 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	9	13	3	3/4	23 1/2	C_L	17	N/A
HRN_12	40 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	10	14	3	1	28 1/2	C_L	17	N/A
HRN_15	47 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	10	14	3	1	35 1/2	C_L	17	N/A
HRN_17	53 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	12	16	3	1	41 1/2	C_L	20	N/A
HRN_20	59 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	12	16	3	1	47 1/2	C_L	20	N/A
HRN_22	51 1/2	37 1/2	61 3/4	1 1/2 T	4 F	4 1/4	33 1/4	12	16	3	1	36 3/4	C_L	20	N/A
HRN_25	55 1/2	37 1/2	61 3/4	1 1/2 T	4 F	4 1/4	33 1/4	14	18	3	1	40 3/4	C_L	20	N/A
HRN_30	63 1/2	37 1/2	61 3/4	1 1/2 T	4 F	4 1/4	33 1/4	16	20	3	1 1/4	48 3/4	C_L	20	N/A
HRN_35	72 1/2	37 1/2	61 3/4	1 1/2 T	4 F	4 1/4	33 1/4	16	20	3	1 1/4	57 3/4	C_L	20	N/A
HRN_40	79 1/2	37 1/2	61 3/4	1 1/2 T	4 F	4 1/4	33 1/4	18	22	3	1 1/4	64 3/4	C_L	N/A	27
HRN_50	68 1/2	46 1/2	68	1 1/2 T	6 F	5 1/4	40 3/4	18	22	3	1 1/2	49 3/4	C_L	N/A	27
HRN_60	78 1/2	46 1/2	68	1 1/2 T	6 F	5 1/4	40 3/4	20	24	3	1 1/2	59 3/4	C_L	N/A	30
HRN_70	88 1/2	46 1/2	68	1 1/2 T	6 F	5 1/4	40 3/4	(2)16	(2)20	3	2	69 3/4	35	20	N/A
HRN_80	98 1/2	46 1/2	68	1 1/2 T	6 F	5 1/4	40 3/4	(2)16	(2)20	3	2	79 3/4	35	20	N/A
HRN_90	91 1/4	57	80 3/4	2 T	8 F	6 3/4	50 1/2	(2)18	(2)22	3	2	66 1/4	35	N/A	27
HRN_100	98 1/4	57	80 3/4	2 T	8 F	6 3/4	50 1/2	(2)18	(2)22	3	2	73 1/4	35	N/A	27
HRN_125	117 1/4	57	80 3/4	2 T	8 F	6 3/4	50 1/2	(2)20	(2)24	3	2 1/2	92 1/4	35	N/A	30
HRN_150	135 1/4	57	80 3/4	2 T	8 F	6 3/4	50 1/2	(2)24	(2)26	3	2 1/2	110 1/4	40	N/A	33
HRN_175	155 1/4	57	80 3/4	2 T	8 F	6 3/4	50 1/2	(2)24	(2)26	3	2 1/2	130 1/4	42	N/A	33
HRN_200	129 1/4	69	88 1/4	2 T	10 F	8 3/4	53	(2)24	(2)26	3	3	100 3/4	53	N/A	CF
HRN_225	143 1/4	69	88 1/4	2 T	10 F	8 3/4	53	(2)24	(2)28	3	3	114 3/4	53	N/A	CF
HRN_250	154 1/4	69	88 1/4	2 T	12 F	8 3/4	53	(2)26	(2)30	3	3	125 3/4	53	N/A	CF
HRN_275	167 1/4	69	88 1/4	2 T	12 F	8 3/4	53	(2)26	(2)30	3	3	138 3/4	53	N/A	CF
HRN_300	179 1/4	69	88 1/4	2 T	12 F	8 3/4	53	(2)28	(2)32	3	3	150 3/4	53	N/A	CF

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Models 6 to 60 use one vent, 70 to 300 use two vents. For indoor, atmospheric vents 18 in. or larger uses barometric dampers instead of draft hoods. For outdoor, use rain cap.
4. Gas line size is for standard gas train and firing mode.

CF - Consult factory for options and information, N/A - Not Applicable

SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

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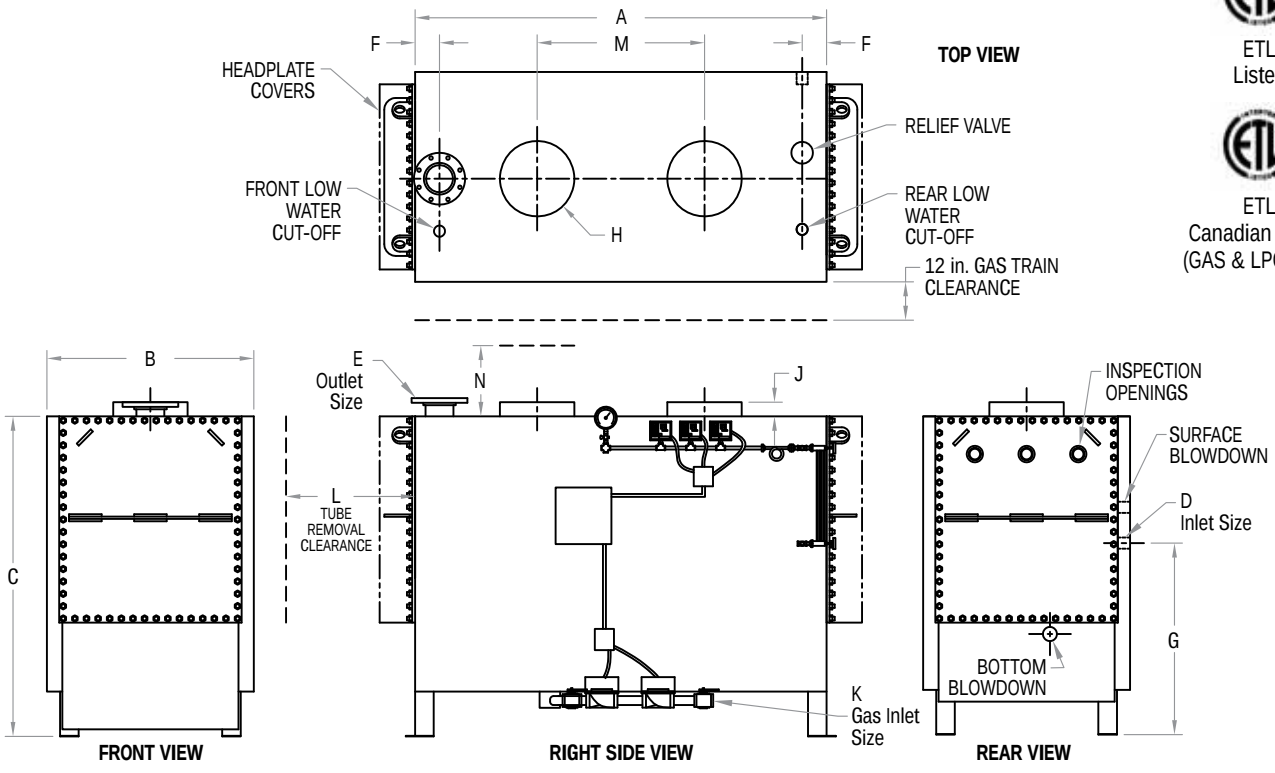

Low Pressure Steam Boilers

Low NOx 20 ppm Premix

Inclined Water Tubes

For Space Heating and Process Use

The HRPG AJAX Series low pressure premix steam boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989, and is committed to meeting all clean-air requirements for today and into the future.

Features

- 20 ppm NOx (at 3% O_2) based on factory high fire testing
- Pre-certified to SCAQMD rule 1146.2 (models 12 to 50)
- Capacities up to 2,000 MBTU/hr (47.8 B.H.P.)
- ASME Boiler and Pressure Vessel Code Section IV stamped for 15 psig maximum allowable working pressure (MAWP). Temps up to 250 ºF.
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers

Standard Equipment

Boiler

- High temperature 2000 ºF cast refractory, 2 to 3 in. thick
- 18 gauge galvanized steel jacket with air wall and head plate covers for low jacket temperatures
- Steam and water sections, including tubesheets and removable headplates, are made from pressure vessel quality steel, from 3/8 to 3/4 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gaskets
- Front headplate hand holes on models 50
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs

Combustion System

- Ajax low NOx forced draft premix burners with Ajax fuel injectors and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulators[1] and safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Model 12 uses a 120 VAC / 60 Hz electronic primary safety control system with an interrupted pilot and on-off firing
- Models 25 to 50 use a 120 VAC / 60 Hz electronic primary safety control systems with an interrupted pilot and on-off firing with low fire start
- Mechanical operating control and manual reset high limit control
- Dual probe-type low water cut-off / pump control with automatic reset
- Auxiliary low water cut-off with manual reset and water gauge glass
- Combustion air switch
- Main power, main flame and flame fail indicators
- Electronic microprocessor based flame safeguard control
- UV scanner for flame detection
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, gas train and controls may be mounted on the left side of boiler
- Pressure gauge and 15 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain and couplings.
- I-beam skids on models 12 to 50
- High and low gas pressure switch
- Outdoor models are available with weather cover*

* Models are ETL certified for indoor operation

Model HRPG

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, float-type low water cut-offs, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Copper Tubes
- 13 gauge SB-75 copper tubes are recommended for hot water, and other applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header)

Heat Exchangers
- Heat exchangers may be mounted sidearm style on HR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post- purge of the combustion chamber, pilot and main flame monitoring. A “zero governor” regulator/ safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

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Low Pressure Steam Boiler - Low NOx 20 ppm Premix

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUTPUT (LBS./HR AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[7]
						WORKING (GAL.)	FLOODED (GAL.)		
HRPG-12	500,000	417,500	12.5	406	51	32	56	76	2,200
HRPG-25	1,000,000	835,000	24.9	813	102	65	104	151	3,300
HRPG-35	1,500,000	1,252,500	37.4	1,219	152	78	123	215	3,700
HRPG-50	2,000,000	1,670,000	49.9	1,626	203	141	201	300	5,400

1. Models shown are for natural gas only. Append "-W" for outdoor models.
   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.

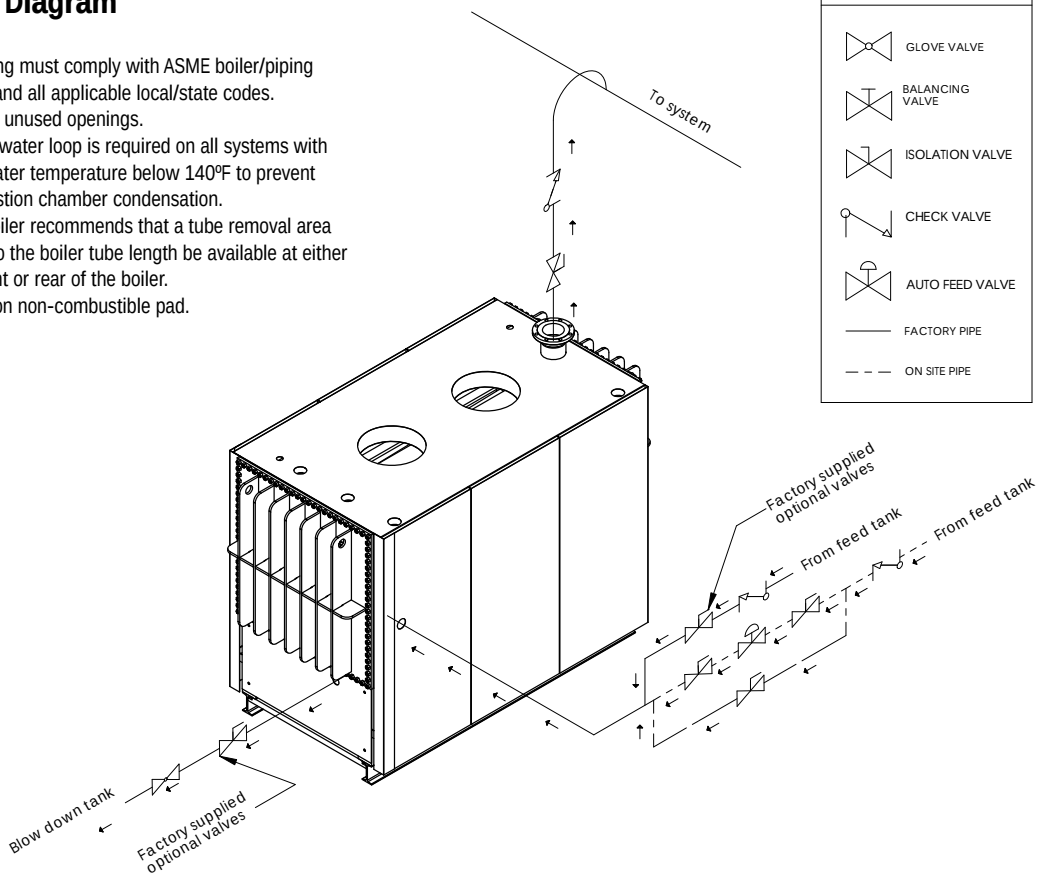
Fuel Pressure Requirements

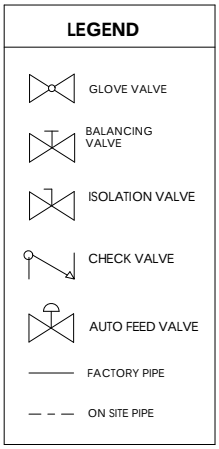
MODELS ALL FIRING MODES	NATURAL GAS[1]
ON-OFF HRPG-12 to 50 UL CSD-1/FM	8 to 14 in. W.C.
ON-OFF HRPG-12 to 50 IRI	8 to 28 in. W.C.
LHO, LHL HRPG-25 to 50 UL CSD-1/FM	9 to 14 in. W.C.
LHO, LHL HRPG-25 to 50 IRI	9 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds maximum value.

Piping Diagram

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.





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Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER C_L HEIGHT	BOTTOM BLOW DOWN SIZE
HRPG-12	40 1/4	34	53 3/4	1 T	3 F	3 1/4	28 1/4	10	3	1	28 1/2	C_L	14	1
HRPG-25	55 1/2	37 1/2	61 3/4	1 1/2 T	4 F	4 1/4	33 1/4	14	3	1	40 3/4	C_L	21	1
HRPG-35	72 1/2	37 1/2	61 3/4	1 1/2 T	4 F	4 1/4	33 1/4	16	3	1 1/4	57 3/4	C_L	24	1 1/4
HRPG-50	68 1/2	46 1/2	68	1 1/2 T	6 F	5 1/4	40 3/4	18	3	1 1/2	49 3/4	C_L	27	1 1/4

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, plenum or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Models 12 to 50 use one vent.
4. Gas line size is for standard gas train and firing mode.

SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

MODEL	STANDARD VOLTAGES[5] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.
HRPG-12	120/1/60	1/3	7.2
HRPG-25	120/1/60	1/2	9.8
HRPG-35	120/1/60	3/4	13.8
HRPG-50	120/1/60	1	16.0

5. Other voltages available, consult factory for options.

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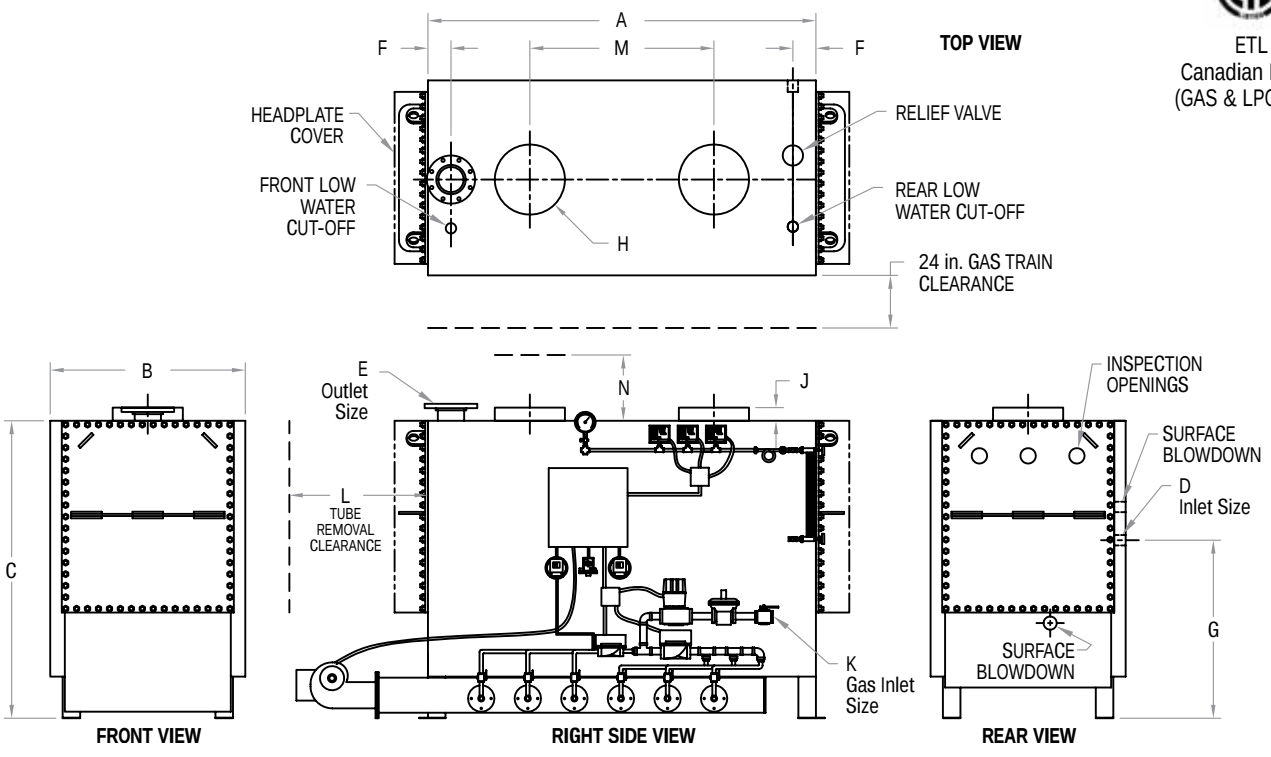

Low Pressure Steam Boilers

Ultra Low NOx 12 ppm Premix

Inclined Water Tubes

For Space Heating and Process Use

The HRLG AJAX Series low pressure premix steam boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989, and is committed to meeting all clean-air requirements for today and into the future.

Features

- 12 ppm NOx (at 3% O2) based on factory high fire testing
- Capacities up to 7,000 MBTU/hr (167.3 B.H.P.)
- ASME Boiler and Pressure Vessel Code Section IV stamped for 15 psig maximum allowable working pressure (MAWP). Temperatures up to 250 ºF.
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type "B" vent and barometric dampers

Standard Equipment

Boiler

- High temperature 2000 ºF cast refractory, 3 in. thick
- 18 gauge galvanized steel jacket with air wall and head plate covers for low jacket temperatures
- Steam and water sections, including tubesheets and removable headplates, are made from pressure vessel quality steel, from 3/8 to 3/4 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gasket
- Front headplate hand holes on all models
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 100 to 175

Combustion System

- Knit metal fiber combustion surface for optimal efficiency and durability
- Fuel-air ratio valve for precise combustion control
- Ajax fuel injectors and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulator[1], safety shut-off valve[1], main gas valve[1], pilot gas valve[1], and auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- All models use a 120 VAC / 60 Hz electronic primary safety control system with an interrupted pilot and high-low firing with low fire start
- Mechanical operating control and manual reset high limit control
- Dual probe-type low water cut-off / pump control with automatic reset
- Auxiliary low water cut-off with manual reset, water gauge glass
- Combustion air switch and high and low gas pressure switches
- Main power, main flame and flame fail indicators
- Electronic microprocessor based flame safeguard control
- UV scanner for flame detection
- Proven low-fire start, prevents unit from lighting off on high-fire
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, controls and gas train mounted on right side of the boiler
- Pressure gauge and 15 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- Mirror finish stainless steel jacket or painted jacket
- Burner plenum, gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain and headplate couplings
- I-beam skids on models 50 to 70
- Outdoor models are available with weather cover*

* Models are ETL certified for indoor operation

Model HRLG

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, float-type low water cut-offs, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Copper Tubes
- 13 gauge SB-75 copper tubes are recommended for hot water, and other applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header)

Heat Exchangers
- Heat exchangers may be mounted sidearm style on HR model boilers for indirect heating of water for shower, swimming pool, laundry, dishwashing, snow removal and other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post- purge of the combustion chamber, pilot and main flame monitoring. A "zero governor" regulator/safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

ASME

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ETL Canadian Listed (GAS & LPG Only)

Low Pressure Steam Boiler - Ultra Low NOx 12 ppm Premix

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUTPUT (LBS./HR AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR.)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[7]
						WORKING (GAL.)	FLOODED (GAL.)		
HRLG-50	2,000,000	1,670,000	49.9	1,626	203	141	201	300	4,800
HRLG-70	3,000,000	2,505,000	74.8	2,439	305	166	238	423	5,500
HRLG-100	4,000,000	3,340,000	99.8	3,252	407	273	379	609	8,000
HRLG-125	5,000,000	4,175,000	124.7	4,064	508	307	424	768	9,000
HRLG-150	6,000,000	5,010,000	149.7	4,877	610	339	467	918	10,000
HRLG-175	7,000,000	5,845,000	174.6	5,690	711	375	514	1,084	11,000

1. Models shown are for natural gas only. Append "-W" for outdoor models.
   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]
HRLG-50 to 175 UL CSD-1/FM	8 to 14 in. W.C.
HRLG-50 to 175 IRI	8 to 28 in. W.C.

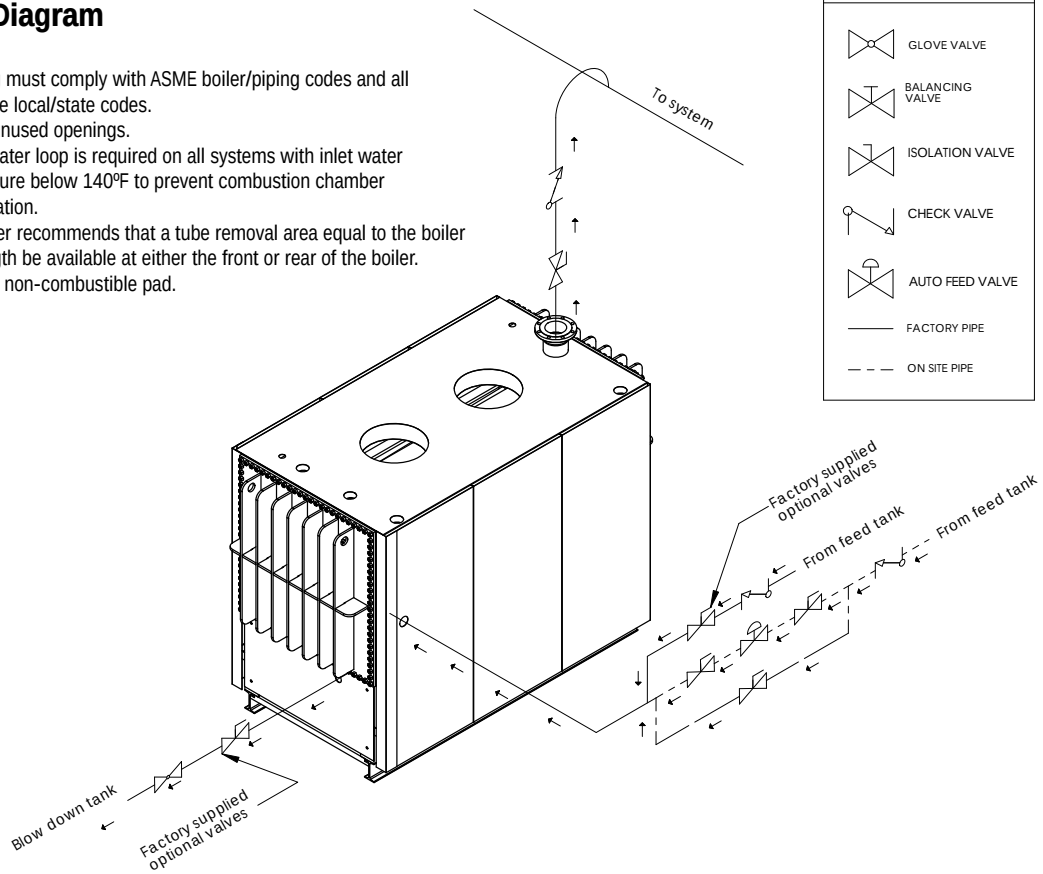
1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds maximum value.

Available Firing Modes

MODELS	FIRING MODES
HRLG-50 to 175	LOW-HIGH-LOW, MODULATION

Piping Diagram

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.



LEGEND
- GLOVE VALVE
- BALANCING VALVE
- ISOLATION VALVE
- CHECK VALVE
- AUTO FEED VALVE
- FACTORY PIPE
- ON SITE PIPE

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ETL Canadian Listed (GAS & LPG Only)

Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER C_L HEIGHT	BOTTOM BLOW DOWN SIZE
HRLG-50	68 1/2	46	68 5/8	1 1/2 T	6 F	5 1/4	36 3/4	18	8 1/2	1 1/2	49 3/4	C_L	27	1 1/4
HRLG-70	88 1/2	46	68 5/8	1 1/2 T	6 F	5 1/4	36 3/4	20	8 1/2	1 1/2	69 3/4	C_L	30	1 1/2
HRLG-100	98 1/4	55	81 7/8	2 T	8 F	6 3/4	45	(2)18	7	2	73 1/4	24	27	1 1/2
HRLG-125	117 1/4	55	81 7/8	2 T	8 F	6 3/4	45	(2)20	7	2 1/2	92 1/4	28	30	1 1/2
HRLG-150	135 1/4	55	81 7/8	2 T	8 F	6 3/4	45	(2)20	7	2 1/2	110 1/4	34	33	1 1/2
HRLG-175	155 1/4	55	81 7/8	2 T	8 F	6 3/4	45	(2)22	7	2 1/2	130 1/4	42	33	1 1/2

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, plenum or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Models 50 to 70 use one vent, 100 to 175 use two vents.
4. Gas line size is for standard gas train and firing mode.

SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

MODEL	STANDARD VOLTAGES[5] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.
HRLG-50	120/1/60	1	16
HRLG-70	230/3/60	1 1/2	6.0
HRLG-100	230/3/60	2	6.8
HRLG-125	460/3/60	3	4.8
HRLG-150	460/3/60	5	7.6
HRLG-175	460/3/60	7 1/2	11.0

5 Other voltages available, consult factory for options.

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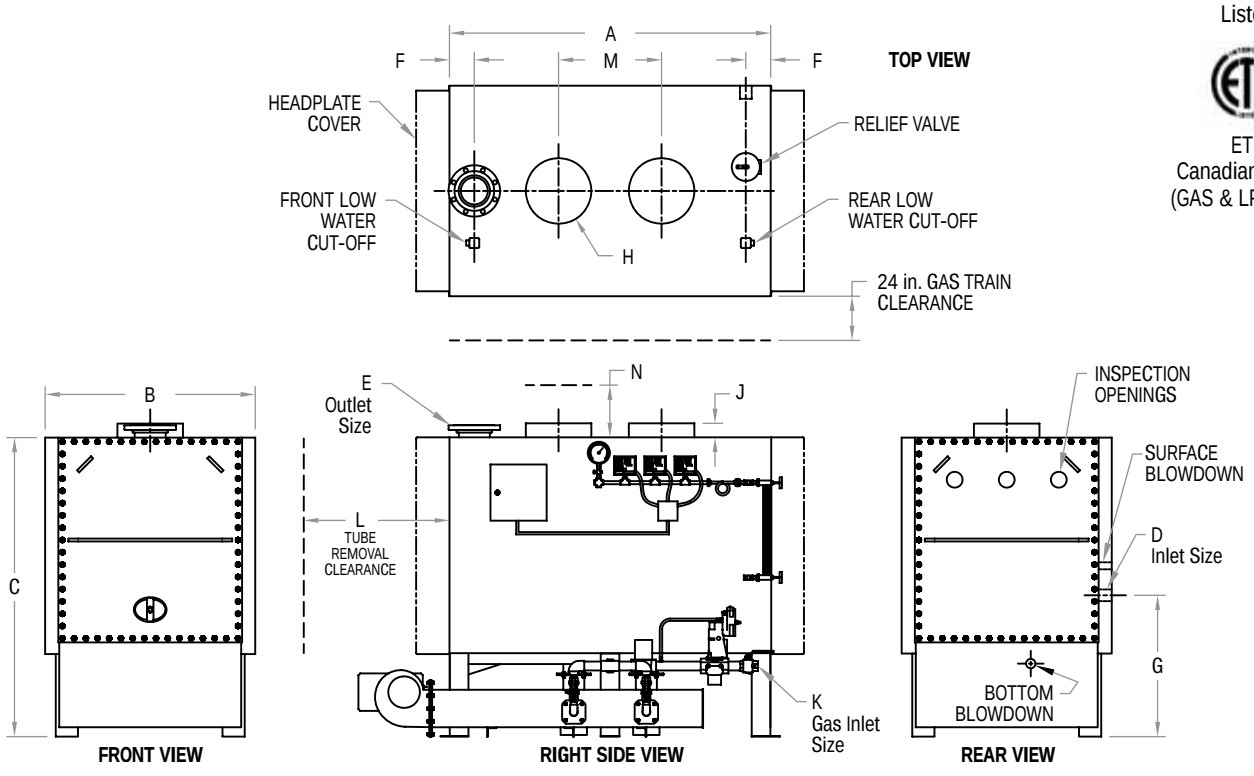

Low Pressure Steam Boilers

Forced Draft

Inclined Water Tubes

For Space Heating and Process Use

The HRF AJAX Series low pressure boilers perform dependably and quietly, providing commercial, institutional, and industrial building with space heating and process steam. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 12,600 MBTU/hr (301.1 B.H.P)
- ASME Boiler and Pressure Vessel Code Section IV stamped for 15 psig maximum allowable working pressure (MAWP). Temperatures up to 250 ºF.
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795, UL 726 and CAN 1-3.1 standards for natural gas, #2 oil and combination gas / #2 oil

Standard Equipment

Boiler

- High temperature 2750 ºF cast refractory, 2 1/2 to 4 in. thick
- Refractory backed by minimum of 2 in. of insulating refractory and 3 in. of high temperature insulation
- Hinged burner door on models 6 to 40
- Removable front door and left-side manway on models 50 to 300
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Steam and water sections, including tubesheets and removable headplates, are made from pressure vessel quality steel, from 3/8 to 3/4 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face headplate gasket
- 2 in. inspection ports in rear headplate
- Front headplate hand holes on models 50 to 300
- Boiler legs with bolt-down lugs
- I-beam skids on all models

Controls & Trim

- Standard controls are CSD-1 compliant
- ETL / UL listed packaged assemblies with Power Flame™ burners for natural gas, #2 oil and combination gas / #2 oil
- All forced draft burners receive a factory fire test
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Gas pressure regulator[1]
- Electronic ignition
- Manual gas shut off valves and leakage test cock(s)
- Mechanical operating control and manual reset high limit control
- Probe type low water cut-off with manual reset and water gauge glass
- High and low gas pressure switches on models 70 to 300.
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 15 psig ASME approved pressure relief valve

1. May be combined in one valve body.

Optional Equipment

Boiler

- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Additional handholes, front headplate drain and headplate couplings
- Outdoor models are available with weather cover*

* Models are ETL certified for indoor operation

Burners

- Power Flame™ burners standard. Consult Factory for other manufacturers.
- Sub 9 ppm, 12 and 30 ppm Low NOx system. Models 10 to 50 pre-certified to SCAQMD Rule 1146.2
- LPG or methane (digester gas) burners
- High turndown burners (10:1 with adiabatic chamber)
- Induced flue gas recirculation (IFGR) assembly for low NOx application
- Low fire start interlock (gas only)
- Varicam characterized fuel metering system cam actuated (#2 oil or gas-oil fuel, modulation mode only)

Model HRF

Controls & Trim

- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Microprocessor based combustion controller
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- FM/IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers
- Building automation panel with Modbus enabled communication
- Communication gateway (BACNet, Johnson N2 or Lonworks)
- Remote setpoint panel
- Remote enable/disable relay (120 or 24 VAC)
- General alarm contacts
- Boiler status contacts
- Boiler pump contacts with timer
- Low fire hold with timer
- Recirculation pump with control aquastat
- Lead lag sequence control
- Boiler display upgrade
- KY or PA code special high limit aquastat

Copper Tubes

- 13 gauge SB-75 copper tubes are recommended for hot water, and other applications where raw make-up water is anticipated. Copper tube boilers are supplied with anode rods (minimum of two in each header)

Heat Exchangers

- Heat exchangers may be mounted sidearm style on HR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Induced Flue Gas Recirculation 30 ppm NOx System

The Ajax Series boiler flue gas recirculation system will burn natural gas or LPG at or less than 30 ppm NOx. On oil-fired units, NOx levels are reduced by 40%. The burner combustion air fan is used to induce the proper flow of flue gas into the combustion air within the burner housing. The result is a cooler flame temperature and a reduction of NOx. A separate flue gas damper assembly is mechanically linked to the burner flue/air control system in order to maintain proper NOx control throughout the firing range.

Concurrently, Ajax has built hundreds of forced draft flue gas recirculation packages using the Power Flame™ "Nova" burner system which continues to meet stringent 30 ppm NOx requirements. Also available in sub 9, 12 ppm NOx system and high turndown burners at 10:1 with adiabatic chamber (8:1 without adiabatic chamber).

Available Firing Modes

MODELS	FIRING MODES
HRF_6 to 50	ON-OFF / LOW-HIGH-LOW / MOD
HRF_60 to 150	LOW-HIGH-OFF / LOW-HIGH-LOW / MOD
HRF_175 to 300	MODULATION

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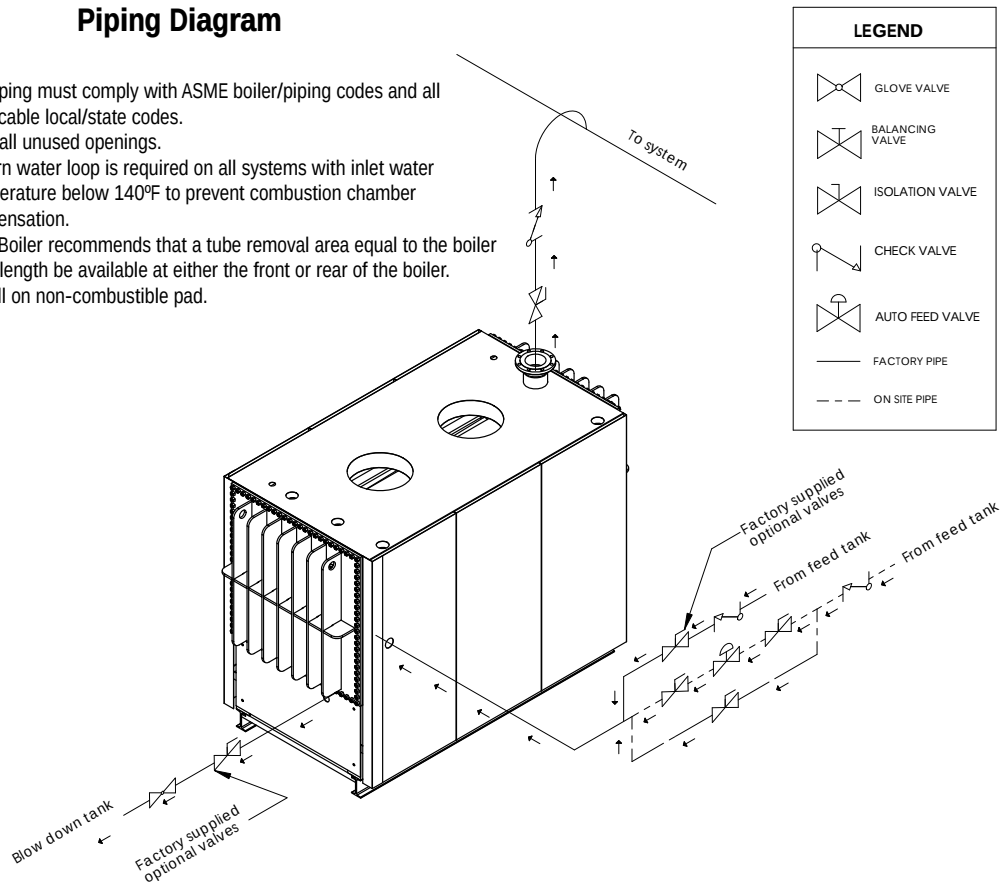
Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUTPUT (LBS./HR. AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[7]
						WORKING (GAL.)	FLOODED (GAL.)		
HRF_6[8]	250,000	208,750	6.2	203	25	25	44	38	2,700
HRF_8[8]	350,000	292,250	8.7	285	36	28	48	51	3,000
HRF_10	420,000	350,700	10.5	341	43	30	52	62	3,300
HRF_12	525,000	438,375	13.1	427	53	32	56	75	3,700
HRF_15	630,000	526,050	15.7	512	64	36	62	94	4,100
HRF_17	735,000	613,725	18.3	597	75	39	68	109	4,400
HRF_20	840,000	701,400	21.0	683	85	42	72	125	4,700
HRF_22	940,000	784,900	23.4	764	96	62	100	139	5,100
HRF_25	1,050,000	876,750	26.2	854	107	65	104	154	5,300
HRF_30	1,250,000	1,043,750	31.2	1,016	127	71	113	184	5,600
HRF_35	1,500,000	1,252,500	37.4	1,219	152	78	123	218	6,100
HRF_40	1,750,000	1,461,250	43.6	1,423	178	83	131	244	6,600
HRF_50	2,100,000	1,753,500	52.4	1,707	213	141	201	304	8,400
HRF_60	2,500,000	2,087,500	62.4	2,032	254	153	219	366	9,000
HRF_70	3,000,000	2,505,000	74.8	2,439	305	166	238	427	9,500
HRF_80	3,350,000	2,797,250	83.6	2,683	335	179	256	489	10,000
HRF_90	3,770,000	3,147,950	94.0	3,065	383	261	363	549	14,900
HRF_100	4,200,000	3,507,000	104.8	3,414	427	273	379	607	16,000
HRF_125	5,250,000	4,383,750	131.0	4,268	534	307	424	766	17,100
HRF_150	6,300,000	5,260,500	157.1	5,121	640	339	467	916	18,100
HRF_175	7,350,000	6,137,250	183.3	5,975	747	375	514	1,082	19,500
HRF_200	8,400,000	7,014,000	209.5	6,828	854	506	739	1,220	27,000
HRF_225	9,500,000	7,932,500	237.0	7,722	966	545	795	1,390	28,400
HRF_250	10,500,000	8,767,500	261.9	8,535	1,067	575	839	1,524	29,400
HRF_275	11,500,000	9,602,500	286.9	9,348	1,169	610	891	1,683	30,800
HRF_300	12,600,000	10,521,000	314.3	10,242	1,281	643	939	1,829	32,000

1. Models shown are for natural gas or propane only. Replace "_" with "G" for gas, "C" for gas/#2 oil combo, or "P" for propane. Add "-W" for outdoor models.
   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted. Combustion Chamber up to 1/4" WC.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.
8. HRF_6 & 8 models are not available in 30 ppm Low NOx.

Piping Diagram

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.



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Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT DIA.	H OUTDOOR VENT DIA.	J VENT STUB HEIGHT	K GAS LINE SIZE[3]	L TUBE LENGTH	M VENT LOC.	BOTTOM BLOW DOWN SIZE	RAIN CAP SIZE
HRF_6	26 1/4	37	57 3/4	1 T	3 F	3 1/4	32 1/4	6	11	3	1	14 1/2	C_L	1	17
HRF_8	31 1/4	37	57 3/4	1 T	3 F	3 1/4	32 1/4	6	12	3	1	19 1/2	C_L	1	18 1/2
HRF_10	35 1/4	37	57 3/4	1 T	3 F	3 1/4	32 1/4	6	13	3	1	23 1/2	C_L	1	20
HRF_12	40 1/4	37	57 3/4	1 T	3 F	3 1/4	32 1/4	6	14	3	1	28 1/2	17 1/2	1	21 1/2
HRF_15	47 1/4	37	57 3/4	1 T	3 F	3 1/4	32 1/4	8	14	3	1	35 1/2	17 1/2	1	21 1/2
HRF_17	53 1/4	37	57 3/4	1 T	3 F	3 1/4	32 1/4	8	16	3	1	41 1/2	18 1/2	1	24
HRF_20	59 1/4	37	57 3/4	1 T	3 F	3 1/4	32 1/4	8	16	3	1	47 1/2	18 1/2	1	24
HRF_22	51 1/2	40 1/2	72	1 1/2 T	4 F	4 1/4	43 1/4	8	16	3	1	36 3/4	20 1/2	1	24
HRF_25	55 1/2	40 1/2	72	1 1/2 T	4 F	4 1/4	43 1/4	10	18	3	1	40 3/4	20 1/2	1	27
HRF_30	63 1/2	40 1/2	72	1 1/2 T	4 F	4 1/4	43 1/4	10	20	3	1	48 3/4	20 1/2	1	29 1/2
HRF_35	72 1/2	40 1/2	72	1 1/2 T	4 F	4 1/4	43 1/4	10	20	3	1 1/4	57 3/4	21 1/2	1 1/4	29 1/2
HRF_40	79 1/2	40 1/2	72	1 1/2 T	4 F	4 1/4	43 1/4	12	22	3	1 1/2	64 3/4	21 1/2	1 1/4	32 1/2
HRF_50	68 1/2	49 1/2	80 1/4	1 1/2 T	6 F	5 1/4	53	12	22	3	1 1/2	49 3/4	24 1/2	1 1/4	32 1/2
HRF_60	78 1/2	49 1/2	80 1/4	1 1/2 T	6 F	5 1/4	53	12	24	3	1 1/2	59 3/4	24 1/2	1 1/4	35 1/2
HRF_70	88 1/2	49 1/2	80 1/4	1 1/2 T	6 F	5 1/4	53	14	20	3	2	69 3/4	25 1/2	1 1/2	29 1/2
HRF_80	98 1/2	49 1/2	80 1/4	1 1/2 T	6 F	5 1/4	53	14	20	3	2	79 3/4	25 1/2	1 1/2	29 1/2
HRF_90	91 1/4	61 1/2	83	2 T	8 F	6 3/4	52 1/2	16	22	3	2	66 1/4	30	1 1/2	32 1/2
HRF_100	98 1/4	61 1/2	83	2 T	8 F	6 3/4	52 1/2	16	22	3	2	73 1/4	30	1 1/2	32 1/2
HRF_125	117 1/4	61 1/2	83	2 T	8 F	6 3/4	52 1/2	18	24	3	2	92 1/4	31	1 1/2	35 1/2
HRF_150	135 1/4	61 1/2	83	2 T	8 F	6 3/4	52 1/2	18	26	3	2 1/2	110 1/4	31	1 1/2	38
HRF_175	155 1/4	61 1/2	83	2 T	8 F	6 3/4	52 1/2	20	26	3	2 1/2	130 1/4	32	1 1/2	38
HRF_200	129 1/2	73	96 1/2	2 T	10 F	8 3/4	61	20	26	3	3	100 3/4	35	2	38
HRF_225	143 1/2	73	96 1/2	2 T	10 F	8 3/4	61	24	28	3	3	114 3/4	36	2	41
HRF_250	154 1/2	73	96 1/2	2 T	10 F	8 3/4	61	24	30	3	3	125 3/4	37	2	44
HRF_275	167 1/2	73	96 1/2	2 T	10 F	8 3/4	61	26	30	3	3	138 3/4	38	2	44
HRF_300	179 1/2	73	96 1/2	2 T	10 F	8 3/4	61	26	32	3	3	150 3/4	38	2	46 1/2

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Gas line size is for standard burner, gas train and firing mode.

SHIPPING DIMENSION: Length add 6 in. front (excluding burner length which varies on model and manufacturer) and back, Width add 12 in. right side and 6 in. left side of the boiler.

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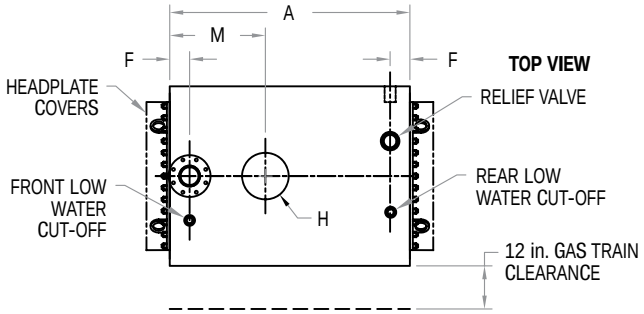
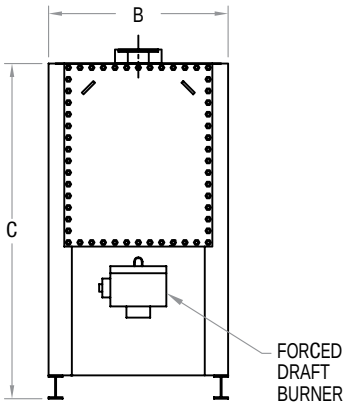
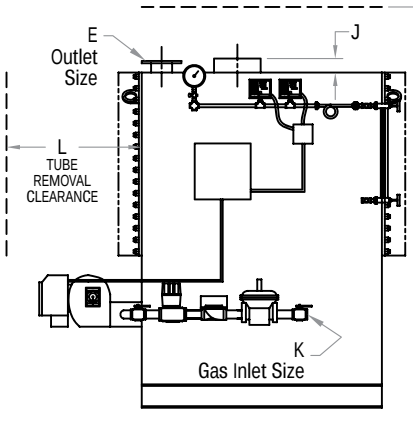
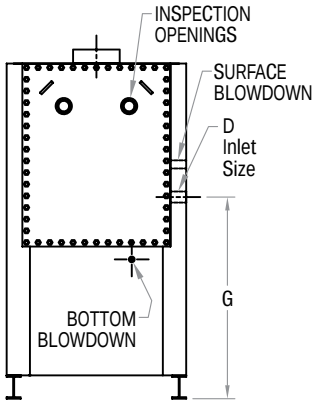




FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW

High Pressure Steam Boilers

Atmospheric

Inclined Water Tubes

Ideal for hospitals, laundries, manufacturing and process plants

The SRN AJAX Series high pressure steam boilers perform dependably and quietly, providing commercial, institutional, and industrial building with space heating and process steam. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 12,600 MBTU/hr (301.1 B.H.P.)
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP) Temp up to 365 ºF
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type “B” vent and barometric dampers or draft hoods

Standard Equipment

Boiler

- High temperature 2000 ºF cast refractory, 2 to 3 in. thick
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Steam and water sections, including tubesheets and removable headplates, are made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 90 to 300

Combustion System

- Ajax cast iron ported burner heads and orifices for use with natural gas
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut-off valves and leakage test cock(s)
- Main gas pressure regulator[1]

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Models 6 to 60 use a 24 VAC / 60 Hz electronic primary safety control system with an intermittent pilot and on-off firing
- Models 70 to 225 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and high-low firing
- Models 250 to 300 use a 120 VAC / 60 Hz electronic primary safety control system with a microprocessor based flame safeguard control, an interrupted pilot and three stage firing
- Mechanical operating control and manual reset high limit control
- Probe type low water cut-off with manual reset and water gauge glass
- High and low gas pressure switches on models 70 to 300
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 50, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings
- I-beam skids on models 6 to 80

Combustion System

- Propane orifices and gas train

Controls & Trim

- Smart Boiler Control System™ (see page 89)
- 120 VAC / 60 Hz electronic primary safety control system with microprocessor based flame safeguard control and interrupted pilot on models 6 to 60
- High-low firing on models 6 to 60

Model SRN

- Modulating firing on models 6 to 225
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Heat Exchangers

- Heat exchangers may be mounted sidearm style on SR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Outdoor Models

- Outdoor models 6 to 125 are available with ETL listing
- Outdoor models 150 to 300 are available without ETL listing

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Available Firing Modes

MODELS	FIRING MODES
SRN_6 to 60	ON-OFF, HIGH-LOW, MODULATION
SRN_70 to 225	HIGH-LOW, MODULATION
SRN_250 to 300	3 STAGE

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]	PROPANE GAS
SRN_6 to 60 UL CSD-1/FM, IRI	7 to 14 in. W.C.	11 to 14" W.C.
SRN_70 to 100 UL CSD-1/FM	8 to 14 in. W.C.	12 to 14" W.C.
SRN_70 to 100 IRI	8 to 28 in. W.C.	12 to 28" W.C.
SRN_125 to 225 UL CSD-1/FM, IRI	10 to 28 in. W.C.	16 to 28 in. W.C.
SRN_250 to 300 UL CSD-1/FM, IRI	18 to 28 in. W.C.	24 to 28 in. W.C.

1. Additional "lock-up" regulator must be furnished if maximum supply pressure exceeds the maximum value.

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUTPUT (LBS./HR AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	AMPS	APPROX. WEIGHT (LBS.)[7]	BOTTOM BLOW DOWN SIZE	RAIN CAP SIZE
						WORKING (GAL.)	FLOODED (GAL.)					
SRN_6	250,000	206,250	6.2	197	25	25	44	38	1	1,800	1	17
SRN_8	350,000	288,750	8.6	275	34	28	48	51	1	2,000	1	18 1/2
SRN_10*	420,000	346,500	10.4	330	41	30	52	62	1	2,100	1	20
SRN_12	525,000	433,125	12.9	413	52	32	56	75	1	2,400	1	21 1/2
SRN_15	630,000	519,750	15.5	496	62	36	62	94	1	2,600	1	21 1/2
SRN_17	735,000	606,375	18.1	578	72	39	68	109	1	2,800	1	24
SRN_20	840,000	693,000	20.7	661	83	42	72	125	1	3,000	1	24
SRN_22	940,000	775,500	23.2	739	92	62	100	139	1	3,300	1	24
SRN_25	1,050,000	866,250	25.9	826	103	65	104	154	1	3,400	1	27
SRN_30	1,250,000	1,031,250	30.8	983	123	71	113	184	1	3,600	1	29 1/2
SRN_35	1,500,000	1,237,500	37.0	1,180	148	78	123	218	1	4,000	1	29 1/2
SRN_40	1,750,000	1,433,750	43.1	1,377	172	83	131	244	1	4,300	1 1/4	32 1/2
SRN_50	2,100,000	1,732,500	51.8	1,652	207	139	199	304	1	5,500	1 1/4	32 1/2
SRN_60	2,500,000	2,062,500	61.6	1,967	246	152	217	366	1	5,800	1 1/4	35 1/2
SRN_70	3,000,000	2,475,000	73.9	2,360	295	165	235	427	4	6,100	1 1/2	29 1/2
SRN_80	3,350,000	2,763,750	82.6	2,596	325	177	254	489	4	6,400	1 1/2	29 1/2
SRN_90	3,770,000	3,110,250	92.9	2,966	371	260	360	549	4	10,200	1 1/2	32 1/2
SRN_100	4,200,000	3,465,000	103.5	3,304	413	273	377	607	4	10,400	1 1/2	32 1/2
SRN_125	5,250,000	4,331,250	129.4	4,130	516	307	422	765	6.5	11,100	1 1/2	35 1/2
SRN_150	6,300,000	5,197,500	155.3	4,956	620	339	464	915	6.5	11,700	1 1/2	38
SRN_175	7,350,000	6,063,750	181.1	5,782	723	374	511	1,082	6.5	12,400	1 1/2	38
SRN_200	8,400,000	6,930,000	207.0	6,608	826	506	739	1,220	6.5	17,900	2	38
SRN_225	9,500,000	7,837,500	234.1	7,474	934	545	795	1,390	6.5	18,800	2	41
SRN_250	10,500,000	8,662,500	258.8	8,260	1,033	575	839	1,524	8	19,500	2	44
SRN_275	11,500,000	9,487,500	283.4	9,047	1,131	610	891	1,683	8	20,400	2	44
SRN_300	12,600,000	10,395,000	310.5	9,912	1,239	643	939	1,829	8	21,200	2	46 1/2

1. Models shown are for natural gas or propane only. Replace "_" with "G" for gas or "P" for propane. Add "-W" for outdoor model. **NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.** For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 82.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.

* 9.5 B.H.P. "California Special" version available with 399,000 BTU/hr input and 100 psig MAWP.

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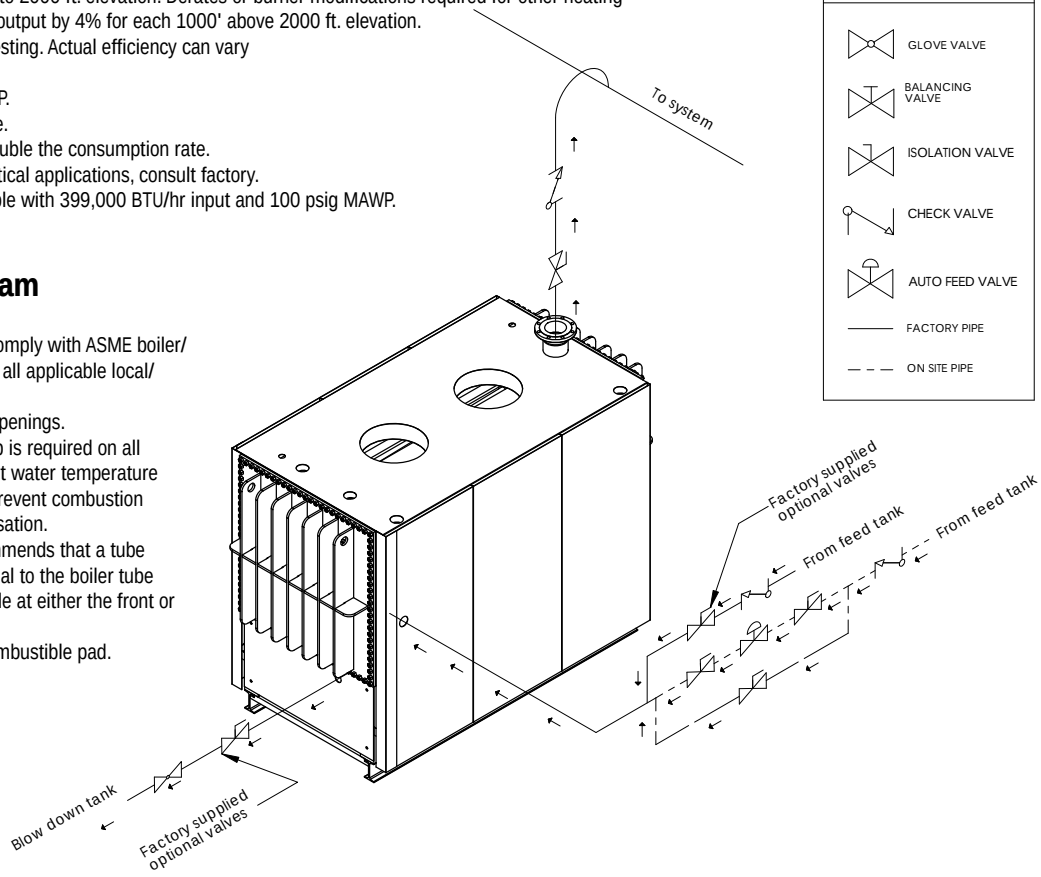
ETL Canadian Listed (GAS & LPG Only)

Piping Diagram

Note:

1. All piping must comply with ASME boiler/ piping codes and all applicable local/ state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.



Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT DIA.[3]	H OUTDOOR VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N DRAFT HOOD CLEARANCE	N BAROMETRIC DAMPER C_L HEIGHT
SRN_6	26 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	7	11	3	3/4	14 1/2	C_L	13	N/A
SRN_8	31 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	8	12	3	3/4	19 1/2	C_L	13	N/A
SRN_10	35 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	9	13	3	3/4	23 1/2	C_L	17	N/A
SRN_12	40 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	10	14	3	1	28 1/2	C_L	17	N/A
SRN_15	47 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	10	14	3	1	35 1/2	C_L	17	N/A
SRN_17	53 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	12	16	3	1	41 1/2	C_L	20	N/A
SRN_20	59 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	12	16	3	1	47 1/2	C_L	20	N/A
SRN_22	51 3/4	37 1/2	62	1 T	2 1/2 T	4 1/2	33 3/4	12	16	3	1	36 3/4	C_L	20	N/A
SRN_25	55 3/4	37 1/2	62	1 T	2 1/2 T	4 1/2	33 3/4	14	18	3	1	40 3/4	C_L	20	N/A
SRN_30	63 3/4	37 1/2	62	1 T	2 1/2 T	4 1/2	33 3/4	16	20	3	1 1/4	48 3/4	C_L	20	N/A
SRN_35	72 3/4	37 1/2	62	1 T	2 1/2 T	4 1/2	33 3/4	16	20	3	1 1/4	57 3/4	C_L	20	N/A
SRN_40	79 3/4	37 1/2	62	1 T	2 1/2 T	4 1/2	33 3/4	18	22	3	1 1/4	64 3/4	C_L	N/A	27
SRN_50	68 3/4	46 1/2	68 1/4	1 1/2 T	4 F	5 1/2	41 1/2	18	22	3	1 1/2	49 3/4	C_L	N/A	27
SRN_60	78 3/4	46 1/2	68 1/4	1 1/2 T	4 F	5 1/2	41 1/2	20	24	3	1 1/2	59 3/4	C_L	N/A	30
SRN_70	88 3/4	46 1/2	68 1/4	1 1/2 T	4 F	5 1/2	41 1/2	(2)16	(2)20	3	2	69 3/4	35	20	N/A
SRN_80	98 3/4	46 1/2	68 1/4	1 1/2 T	4 F	5 1/2	41 1/2	(2)16	(2)20	3	2	79 3/4	35	20	N/A
SRN_90	91 1/4	57	81 1/2	2 T	6 F	6 3/4	51 1/4	(2)18	(2)22	3	2	66 1/4	35	N/A	27
SRN_100	98 1/4	57	81 1/2	2 T	6 F	6 3/4	51 1/4	(2)18	(2)22	3	2	73 1/4	35	N/A	27
SRN_125	117 1/4	57	81 1/2	2 T	6 F	6 3/4	51 1/4	(2)20	(2)24	3	2 1/2	92 1/4	35	N/A	30
SRN_150	135 1/4	57	81 1/2	2 T	6 F	6 3/4	51 1/4	(2)24	(2)26	3	2 1/2	110 1/4	40	N/A	33
SRN_175	155 1/4	57	81 1/2	2 T	6 F	6 3/4	51 1/4	(2)24	(2)26	3	2 1/2	130 1/4	42	N/A	33
SRN_200	129 1/2	69	88 1/2	2 T	6 F	8 3/4	53	(2)24	(2)26	3	3	100 3/4	53	N/A	CF
SRN_225	143 1/2	69	88 1/2	2 T	6 F	8 3/4	53	(2)24	(2)28	3	3	114 3/4	53	N/A	CF
SRN_250	154 1/2	69	88 1/2	2 T	6 F	8 3/4	53	(2)26	(2)30	3	3	125 3/4	53	N/A	CF
SRN_275	167 1/2	69	88 1/2	2 T	8 F	8 3/4	53	(2)26	(2)30	3	3	138 3/4	53	N/A	CF
SRN_300	179 1/2	69	88 1/2	2 T	8 F	8 3/4	53	(2)28	(2)32	3	3	150 3/4	53	N/A	CF

Dimensions are in inches and are subject to production tolerances; subject to change.

1. Width does not include gas train, inlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Models 6 to 60 use one vent, 70 to 300 use two vents. For indoor, atmospheric vents 18 in. or larger uses barometric dampers instead of draft hoods. For outdoor, use rain cap.
4. Gas line size is for standard gas train and firing mode.

CF - Consult factory for options and information, N/A - Not Applicable

SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

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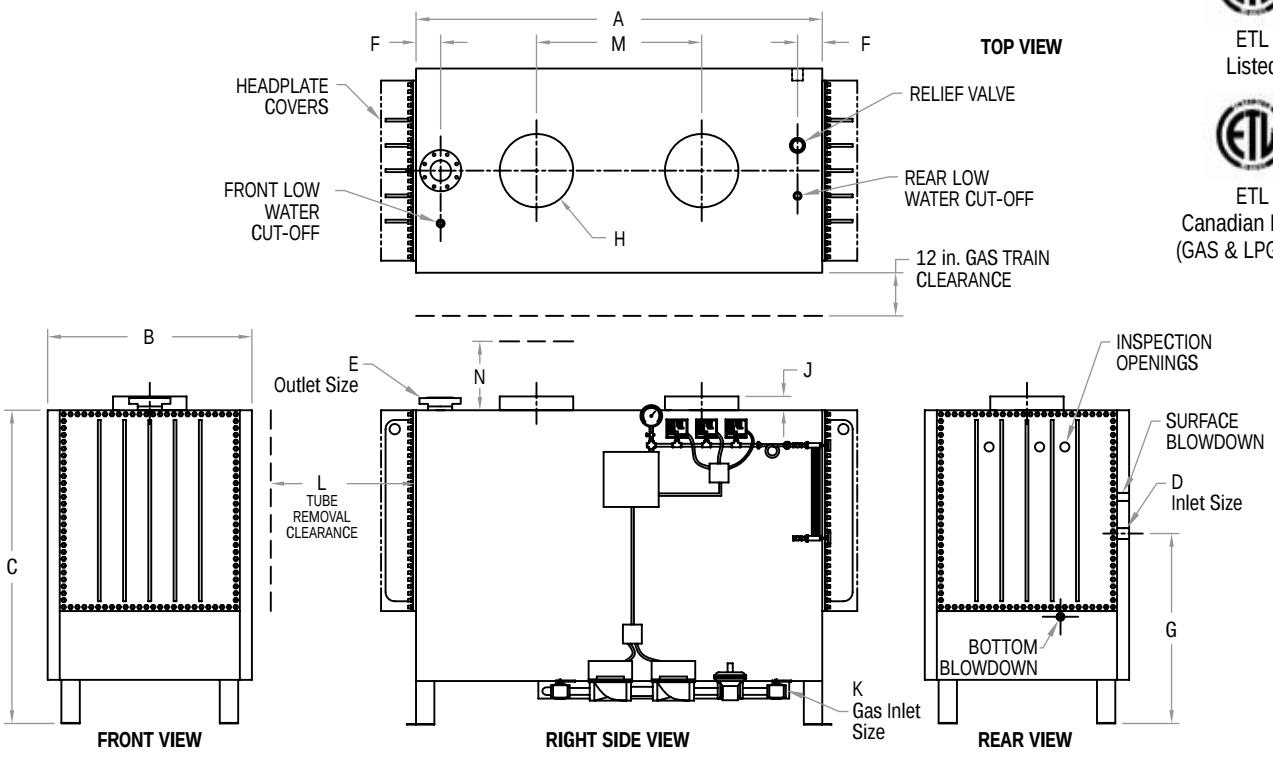

High Pressure Steam Boilers

Low NOx 20 ppm Premix

Inclined Water Tubes

Ideal for hospitals, laundries, manufacturing and process plants

The SRPG AJAX Series high pressure premix steam boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989, and is committed to meeting all clean-air requirements for today and into the future.

Features

- 20 ppm NOx (at 3% O_2) based on factory high fire testing
- Pre-certified to SCAQMD rule 1146.2 (models 12 to 50).
- Capacities up to 2,000 MBTU/hr (47.8 B.H.P.)
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP). Temperatures up to 365 ºF.
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards
- Negative vent stub pressure allows the use of type “B” vent and barometric dampers

Standard Equipment

Boiler

- High temperature 2000 ºF cast refractory, 2 to 3 in. thick
- 18 gauge galvanized steel jacket with air wall and head plate covers for low jacket temperatures
- Steam and water sections, including tubesheets and removable headplates, are made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs

Combustion System

- Ajax low NOx forced draft premix burners with Ajax fuel injectors and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulators[1], safety shut-off valve[1], main gas valve[1], pilot gas valve[1], auxiliary gas valve[1], and electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- Model 12 uses a 120 VAC / 60 Hz electronic primary safety control system with an interrupted pilot and on-off firing
- Models 25 to 50 use a 120 VAC / 60 Hz electronic primary safety control systems with an interrupted pilot and on-off firing with low-fire start
- Mechanical operating control and manual reset high limit control
- Dual probe-type low water cut-off / pump control with automatic reset
- Auxiliary low water cut-off with manual reset, water gauge glass
- Combustion air switch
- Main power, main flame and pilot fail indicators
- Electronic microprocessor based flame safeguard control
- UV scanner for flame detection
- Proven low-fire start (models 25 to 50), prevents unit from lighting of on high-fire
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 50, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Burner plenum, gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings
- I-beam skids on models 12 to 50

Model SRPG

- Outdoor models are available with weather cover*
- High and low gas pressure switch

  * Models are ETL certified for indoor operation

Controls & Trim

- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Additional safety controls, indicators, and gauges
- IRI compliant safety control systems
- Auxiliary low water cut-off, float-type low water cut-offs, pump controls and feeders
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Heat Exchangers

- Heat exchangers may be mounted sidearm style on SR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post- purge of the combustion chamber, pilot and main flame monitoring. A "zero governor" regulator/safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

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Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUTPUT (LBS./HR AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[7]
						WORKING (GAL.)	FLOODED (GAL.)		
SRPG-12	500,000	417,500	12.5	393	49	32	56	76	2,400
SRPG-25	1,000,000	835,000	24.9	787	98	65	104	154	3,400
SRPG-35	1,500,000	1,252,500	37.4	1,180	148	78	123	218	4,000
SRPG-50	2,000,000	1,670,000	49.9	1,573	197	139	199	304	5,500

1. Models shown are for natural gas only. Add "-W" for outdoor models.
   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.

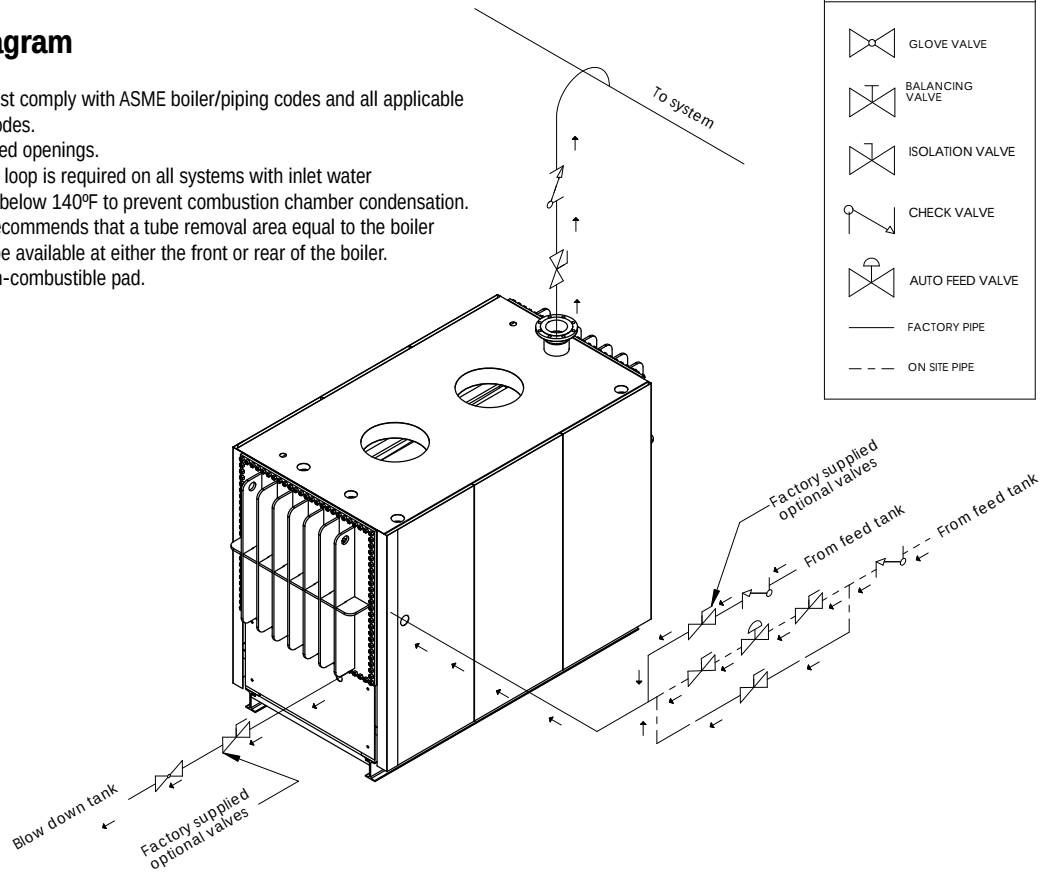
Fuel Pressure Requirements

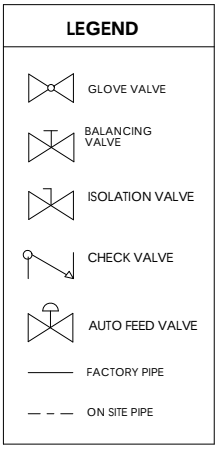
MODELS ALL FIRING MODES	NATURAL GAS[1]
ON-OFF SRPG-12 to 50 UL CSD-1/FM	8 to 14 in. W.C.
ON-OFF SRPG-12 to 50 IRI	8 to 28 in. W.C.
LHO, LHL SRPG-25 to 50 UL CSD-1/FM	9 to 14 in. W.C.
LHO, LHL SRPG-25 to 50 IRI	9 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished by others if maximum supply pressure exceeds maximum values.

Piping Diagram

Note:
1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.





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Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER C_L HEIGHT	BOTTOM BLOW DOWN SIZE
SRPG-12	40 1/4	34	54	1 T	1 1/2 T	3 1/4	28 1/2	10	3	1	28 1/2	C_L	14	1
SRPG-25	55 3/4	37 1/2	62	1 T	2 1/2 T	4 1/2	33 3/4	14	3	1	40 3/4	C_L	21	1
SRPG-35	72 3/4	37 1/2	62	1 T	2 1/2 T	4 1/2	33 3/4	16	3	1 1/4	57 3/4	C_L	24	1
SRPG-50	68 3/4	46 1/2	68 1/4	1 1/2 T	4 F	5 1/2	41 1/2	18	3	1 1/2	49 3/4	C_L	27	1 1/4

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, plenum or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Sizes 12 to 50 use one vent.
4. Gas line size is for standard gas train and firing mode.

SHIPPING DIMENSION: Length add 6 in. front and back
Width add 12 in. right side and 6 in. left side of the boiler.

MODEL	STANDARD VOLTAGES[5] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS.
SRPG-12	120/1/60	1/3	7.2
SRPG-25	120/1/60	1/2	9.8
SRPG-35	120/1/60	3/4	13.8
SRPG-50	120/1/60	1	16

5. Other voltages available, consult factory for options.

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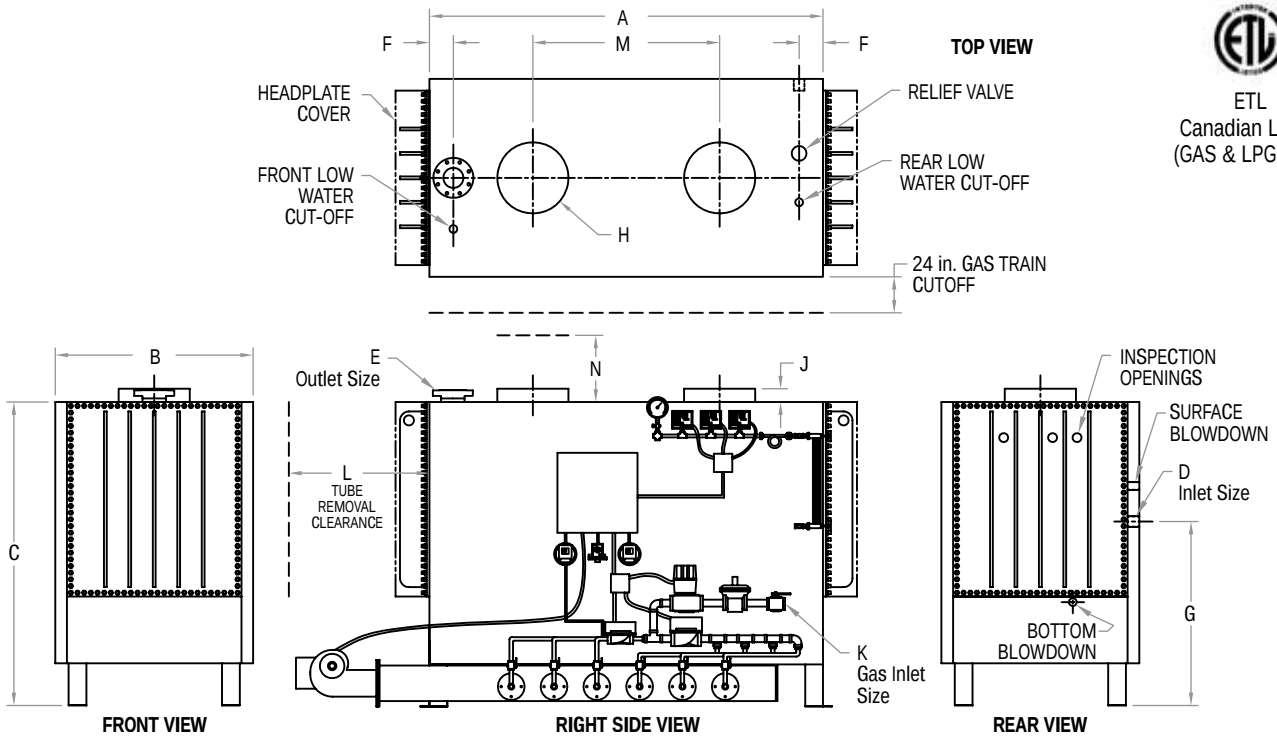

High Pressure Steam Boilers

Ultra Low NOx 12 ppm Premix

Inclined Water Tubes

Ideal for hospitals, laundries, manufacturing and process plants

The SRLG AJAX Series high pressure premix steam boilers boast the same advantages as other Ajax boilers: dependability, quiet operation and long life, while adding the environmental benefits of low NOx operation. Ajax has been a market leader in premix combustion since 1989 and is committed to meeting all clean-air requirements for today and into the future.

Features

- 12 ppm NOx (at 3% O2) based on factory high fire testing
- Capacities up to 7,000 MBTU/hr (167.3 B.H.P.)
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP) Temp up to 365 ºF
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795 and CAN 1-3.1 standards.
- Negative vent stub pressure allows the use of type “B” vent and barometric dampers

Standard Equipment

Boiler

- High temperature 2000 ºF cast refractory, 3 in. thick
- 18 gauge galvanized steel jacket with air wall and head plate covers for low jacket temperatures
- Steam and water sections, including tubesheets & headplates, are made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on boiler models 100 to 175

Combustion System

- Knit metal fiber combustion surface for optimal efficiency and durability
- Fuel-air ratio valve for precise combustion control
- Ajax fuel injectors and gasless plenum
- Low pressure blower
- Air control damper and air inlet filter
- Gas pressure regulator[1]
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Electronic ignition
- Manual gas shut off valves for each burner and leakage test cock(s)
- Premix boilers receive a full factory fire test

1. May be combined in one valve body.

Controls & Trim

- Standard controls are CSD-1 compliant
- All models use a 120 VAC / 60 Hz electronic primary safety control system with interrupted pilot and high-low firing with low-fire start
- Mechanical operating control and manual reset high limit control
- Dual probe-type low water cut-off / pump control with automatic reset
- Auxiliary low water cut-off with manual reset, water gauge glass
- Combustion air switch and high and low gas pressure switches
- Main power, main flame and flame fail indicators
- UV scanner for flame detection
- Standard blower motors are single phase 120/230 VAC to 1 HP, three phase 230 or 460 VAC for 1-1/2 HP and above. Motor starter provided with all three phase motors
- Burner plenum, controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 50, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings
- I-beam skids on models 50 to 70
- Outdoor models are available with weather cover*

* Models are ETL certified for indoor operation

Model SRLG

Controls & Trim
- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Additional safety controls, indicators and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers

Heat Exchangers
- Heat exchangers may be mounted sidearm style on SR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Premix 12 and 20 ppm NOx Systems

In 1989 Ajax contracted with AGA Research Laboratory to evaluate advanced Low NOx burner designs. Since then, Ajax has provided Low NOx boilers in California, Texas, Nevada, Utah and Washington State in increasing numbers. During the last several years, Ajax has developed its advanced Premix 12 and 20 ppm NOx burner design specifically for Low NOx Ajax Series boilers. The design is simple and has proven reliable over several years of service.

In the Ajax Series premix system, the design goal of NOx reduction to 20 ppm is accomplished by using a perforated burner plate, a gas injector and a low energy gas-air mixing section in a clean manifold design. Our Pod design provides for proper mixing and combustion to achieve **below 20 or 12 ppm NOx.**

The flame safeguard system includes pre- and post- purge of the combustion chamber, pilot and main flame monitoring. A "zero governor" regulator/safety shut-off valve adjusts fuel input on our 12 ppm NOx burner design according to a factory set air/fuel ratio. The unit has the ability to compensate for pressure disturbances in the combustion chamber through a range of stack conditions. An air switch is provided to shut the boiler down if there is an electrical or blower interruption.

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High Pressure Steam Boiler - Ultra Low NOx 12 ppm Premix

Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUTPUT (LBS./HR AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[7]
						WORKING (GAL.)	FLOODED (GAL.)		
SRLG-50	2,000,000	1,670,000	49.9	1,573	197	139	199	304	5,500
SRLG-70	3,000,000	2,505,000	74.8	2,360	295	165	235	427	6,300
SRLG-100	4,000,000	3,340,000	99.8	3,147	393	273	377	609	9,800
SRLG-125	5,000,000	4,175,000	124.7	3,934	492	307	422	768	10,800
SRLG-150	6,000,000	5,010,000	149.7	4,720	590	339	464	918	11,800
SRLG-175	7,000,000	5,845,000	174.6	5,507	689	374	511	1,084	12,800

1. Models shown are for natural gas only. Add "-W" for outdoor model.
   NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.
   For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted.
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.

Fuel Pressure Requirements

MODELS ALL FIRING MODES	NATURAL GAS[1]
SRLG-50 to 175 UL CSD-1/FM	8 to 14 in. W.C.
SRLG-50 to 175 IRI	8 to 28 in. W.C.

1. Additional "Lock-up" regulator must be furnished if maximum supply pressure exceeds maximum value.

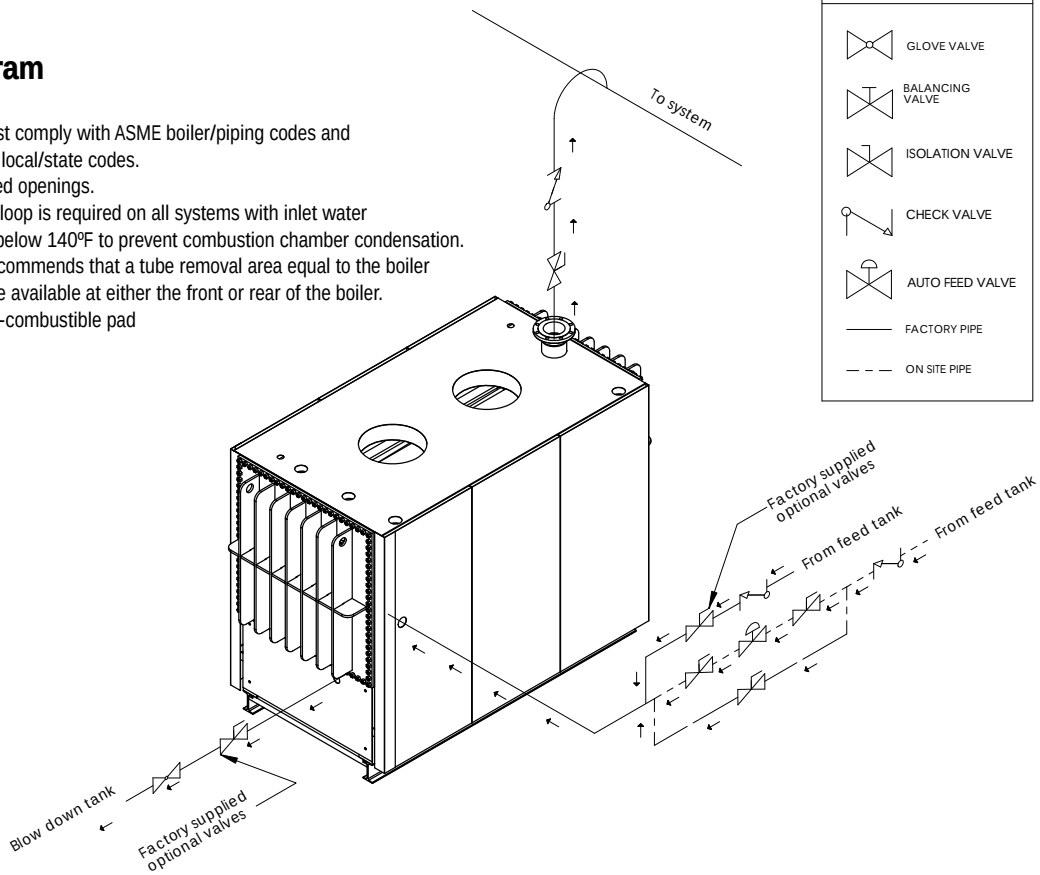
Available Firing Modes

MODELS	FIRING MODES
SRLG-50 to 175	LOW-HIGH-LOW, MODULATION

Piping Diagram

Note:

1. All piping must comply with ASME boiler/piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad



ASME

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Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H VENT DIA.[3]	J VENT STUB HEIGHT	K GAS LINE SIZE[4]	L TUBE LENGTH	M VENT LOC.	N BAROMETRIC DAMPER C_L HEIGHT	BOTTOM BLOW DOWN SIZE
SRLG-50	68 3/4	45	64 1/4	1 1/2 T	4 F	5 1/2	37 1/2	18	8 1/2	1 1/2	49 3/4	C_L	27	1 1/4
SRLG-70	88 3/4	45	64 1/4	1 1/2 T	4 F	5 1/2	37 1/2	20	8 1/2	1 1/2	69 3/4	C_L	30	1 1/2
SRLG-100	98 1/4	54	76	2 T	6 F	6 3/4	45 3/4	(2)18	7	2	73 1/4	24	27	1 1/2
SRLG-125	117 1/4	54	76	2 T	6 F	6 3/4	45 3/4	(2)20	7	2 1/2	92 1/4	28	30	1 1/2
SRLG-150	135 1/4	54	76	2 T	6 F	6 3/4	45 3/4	(2)20	7	2 1/2	110 1/4	34	33	1 1/2
SRLG-175	155 1/4	54	76	2 T	6 F	6 3/4	45 3/4	(2)22	7	2 1/2	130 1/4	42	33	1 1/2

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, plenum or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Model 50 to 70 use one vent, 100 to 175 use two vents.
4. Gas line size is for standard gas train and firing mode.

SHIPPING DIMENSION: Length add 6 in. front and back, Width add 12 in. right side and 6 in. left side of the boiler.

MODEL	STANDARD VOLTAGES[5] (VAC/Ph/Hz)	BLOWER MOTOR H.P.	BLOWER MOTOR AMPS
SRLG-50	120/1/60	1	16
SRLG-70	230/3/60	1 1/2	6.0
SRLG-100	230/3/60	2	6.8
SRLG-125	460/3/60	3	4.8
SRLG-150	460/3/60	5	7.6
SRLG-175	460/3/60	7 1/2	11

5. Other voltages available, consult factory for options.

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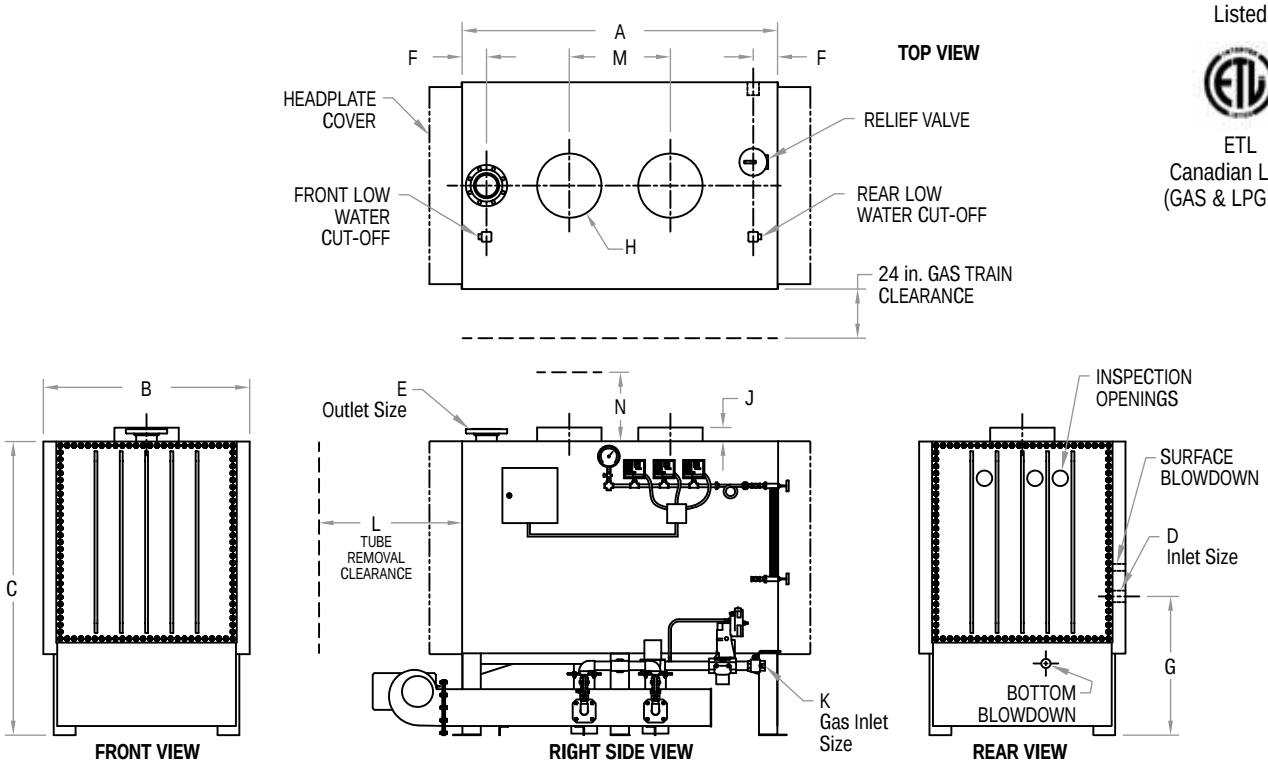

High Pressure Steam Boilers

Forced Draft

Inclined Water Tubes

Ideal for hospitals, laundries, manufacturing and process plants

The SRF AJAX Series high pressure steam boilers perform dependably and quietly, providing commercial, institutional, and industrial building with space heating and process steam. Inclined tubes provide uniform heat transfer, resulting in high fuel economy and long boiler life.

Features

- Capacities up to 12,600 MBTU/hr (301.1 B.H.P.)
- ASME Boiler and Pressure Vessel Code Section I stamped for 150 psig maximum allowable working pressure (MAWP). Temperatures up to 365 ºF
- Full access to combustion chamber, water and steam sections
- Floating head design eliminates thermal shock
- Tubes are easily replaced using common straight boiler tubing
- Completely factory assembled and wired
- All models are ETL listed to UL 795, UL 726 and CAN 1-3.1 standards for natural gas, #2 oil, and combination gas / #2 oil

Standard Equipment

Boiler

- High temperature 2750 ºF cast refractory, 2 1/2 to 4 in. thick
- Refractory backed by minimum of 2 in. of insulating refractory and 3 in. of high temperature insulation
- Hinged burner door on models 6 to 40
- Removable front door and left-side manway on models 50 to 300.
- 18 gauge galvanized steel jacket with air wall for low jacket temperatures
- Steam and water sections, including tubesheets and removable headplates, are made from pressure vessel quality steel, from 1/2 to 1 in. thick
- 2 in. O.D. SA-178 grade-A steel tubes
- Full face rubber headplate gaskets
- 2 in. inspection ports in rear headplate
- Boiler legs with bolt-down lugs
- I-beam skids on all models (90 to 300)

Controls & Trim

- Standard controls are CSD-1 compliant
- ETL / UL listed packaged assemblies with Power Flame™ burners for natural gas, #2 oil, and combination gas / #2 oil
- Safety shut-off valve[1]
- Main gas valve[1]
- Pilot gas valve[1]
- Auxiliary gas valve[1]
- Gas pressure regulator[1]
- Electronic ignition
- Manual gas shut off valves and leakage test cock(s)
- Mechanical operating control and manual reset high limit control
- Probe-type low water cut-off with manual reset and water gauge glass
- High and low gas pressure switches on models 70 to 300
- Main power and main flame indicators
- Controls and gas train mounted on right side of the boiler
- Temperature-pressure gauge and 150 psig ASME approved pressure relief valve

1. May be combined in one valve body.

Optional Equipment

Boiler

- ASME approved pressure relief valves are available with 50, 75, 100, 125 and 150 psig set pressures
- Mirror finish stainless steel jacket or painted jacket
- Gas train and controls may be mounted on the left side of boiler
- Front headplate drain and headplate couplings
- Outdoor models are available with weather cover*

* Models are ETL certified for indoor operation

Burners

- Power Flame™ burners standard. Consult Factory for other manufacturers.
- Sub 9 ppm, 12 and 30 ppm Low NOx system. Models 10 to 50 pre-certified to SCAQMD Rule 1146.2
- LPG or methane (digester gas) burners
- High turndown burners (10:1 with adiabatic chamber)
- Induced flue gas recirculation (IFGR) assembly for low NOx application
- Low fire start interlock (gas only)
- Varicam characterized fuel metering system cam actuated (#2 oil or gas-oil fuel, modulation mode only)

Model SRF

Controls

- Smart Boiler Control System™ (see page 89)
- Various motor voltages for foreign and domestic use
- Control circuit transformer for stepdown from 230/460 VAC to 120 VAC
- Microprocessor based combustion controller
- Additional safety controls, indicators, and gauges
- Auxiliary low water cut-off, pump controls and feeders
- IRI compliant safety control systems
- Industrial control package for process heating
- Multiple communications options, multi-stage controller interfaces, advanced combustion controllers and PID firing rate controllers
- Building automation panel with Modbus enabled communication
- Communication gateway (BACNet, Johnson N2 or Lonworks)
- Remote setpoint panel
- Remote enable/disable relay (120 or 24 VAC)
- General alarm contacts
- Boiler status contacts
- Boiler pump contacts with timer
- Low fire hold with timer
- Recirculation pump with control aquastat
- Lead lag sequence control
- Boiler display upgrade
- KY or PA code special high limit aquastat

Heat Exchangers

- Heat exchangers may be mounted sidearm style on SR model boilers for indirect heating of water for shower, laundry, dishwashing, swimming pool, snow removal and many other applications
- Exchangers are available in capacities up to and including full capacity of the boiler with 150 psig working pressure design

Available Firing Modes

MODELS	FIRING MODES
SRF_6 to 50	ON-OFF / LOW-HIGH-LOW / MOD
SRF_60 to 150	LOW-HIGH-OFF / LOW-HIGH-LOW / MOD
SRF_175 to 300	MODULATION

Induced Flue Gas Recirculation 30 ppm NOx System

The Ajax Series boiler flue gas recirculation system will burn natural gas or LPG at or less than 30 ppm NOx. On oil-fired units, NOx levels are reduced by 40%. The burner combustion air fan is used to induce the proper flow of flue gas into the combustion air within the burner housing. The result is a cooler flame temperature and a reduction of NOx. A separate flue gas damper assembly is mechanically linked to the burner flue/air control system in order to maintain proper NOx control throughout the firing range.

Concurrently, Ajax has built hundreds of forced draft flue gas recirculation packages using the Power Flame™ "Nova" burner system which continues to meet stringent 30 ppm NOx requirements. Also available in sub 9, 12 ppm NOx system and high turndown burners at 10:1 with adiabatic chamber (8:1 without adiabatic chamber).

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Specifications

MODEL[1]	INPUT (BTU/HR)[2]	OUTPUT (BTU/HR)[3]	B.H.P.[4]	STEAM OUPUT (LBS./HR. AT MAWP)[5]	FEED WATER CONSUMPTION (GAL./HR)[6]	WATER VOLUME		HEATING SURFACE (SQ.FT.)	APPROX. WEIGHT (LBS.)[7]
						WORKING (GAL.)	FLOODED (GAL.)		
SRF_6[8]	250,000	208,750	6.2	197	25	25	44	38	3,000
SRF_8[8]	350,000	292,250	8.7	275	34	28	48	51	3,200
SRF_10*	420,000	350,700	10.5	330	41	30	52	62	3,300
SRF_12	525,000	438,375	13.1	413	52	32	56	75	3,700
SRF_15	630,000	526,050	15.7	496	62	36	62	94	4,100
SRF_17	735,000	613,725	18.3	578	72	39	68	109	4,400
SRF_20	840,000	701,400	20.9	661	83	42	72	125	4,700
SRF_22	940,000	784,900	23.4	739	92	62	100	139	5,200
SRF_25	1,050,000	876,750	26.2	826	103	65	104	154	5,300
SRF_30	1,250,000	1,043,750	31.2	983	123	71	113	184	5,600
SRF_35	1,500,000	1,252,500	37.4	1,180	148	78	123	218	6,200
SRF_40	1,750,000	1,461,250	43.6	1,377	172	83	131	244	6,600
SRF_50	2,100,000	1,753,500	52.4	1,652	207	139	199	304	8,400
SRF_60	2,500,000	2,087,500	62.4	1,967	246	152	217	366	9,000
SRF_70	3,000,000	2,505,000	74.8	2,360	295	165	235	427	9,500
SRF_80	3,350,000	2,797,250	83.6	2,596	325	177	254	489	10,000
SRF_90	3,770,000	3,147,950	94.0	2,966	371	260	360	549	15,600
SRF_100	4,200,000	3,507,000	104.8	3,304	413	273	377	607	16,000
SRF_125	5,250,000	4,383,750	131.0	4,130	516	307	422	765	17,100
SRF_150	6,300,000	5,260,500	157.1	4,956	620	339	464	915	18,100
SRF_175	7,350,000	6,137,250	183.3	5,782	723	374	511	1,082	19,300
SRF_200	8,400,000	7,014,000	209.5	6,608	826	506	739	1,220	27,500
SRF_225	9,500,000	7,932,500	237.0	7,474	934	545	795	1,390	28,900
SRF_250	10,500,000	8,767,500	261.9	8,260	1,033	575	839	1,524	30,000
SRF_275	11,500,000	9,602,500	286.9	9,047	1,131	610	891	1,683	31,400
SRF_300	12,600,000	10,521,000	314.3	9,912	1,239	643	939	1,829	32,600

1. Models shown are for natural gas or propane only. Replace "_" with "G" for gas, "O" for #2 oil, or "C" for combination gas/#2 oil.

NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.

For proper burner performance, a -0.02 to -0.04 in. W.C. stack draft is required (as measured 4 to 6 in. above the top of the boiler); the barometric damper (if provided) is to be set to maintain this draft. No down draft stack conditions are permitted. Combustion chamber pressure up to 1/4" WC.

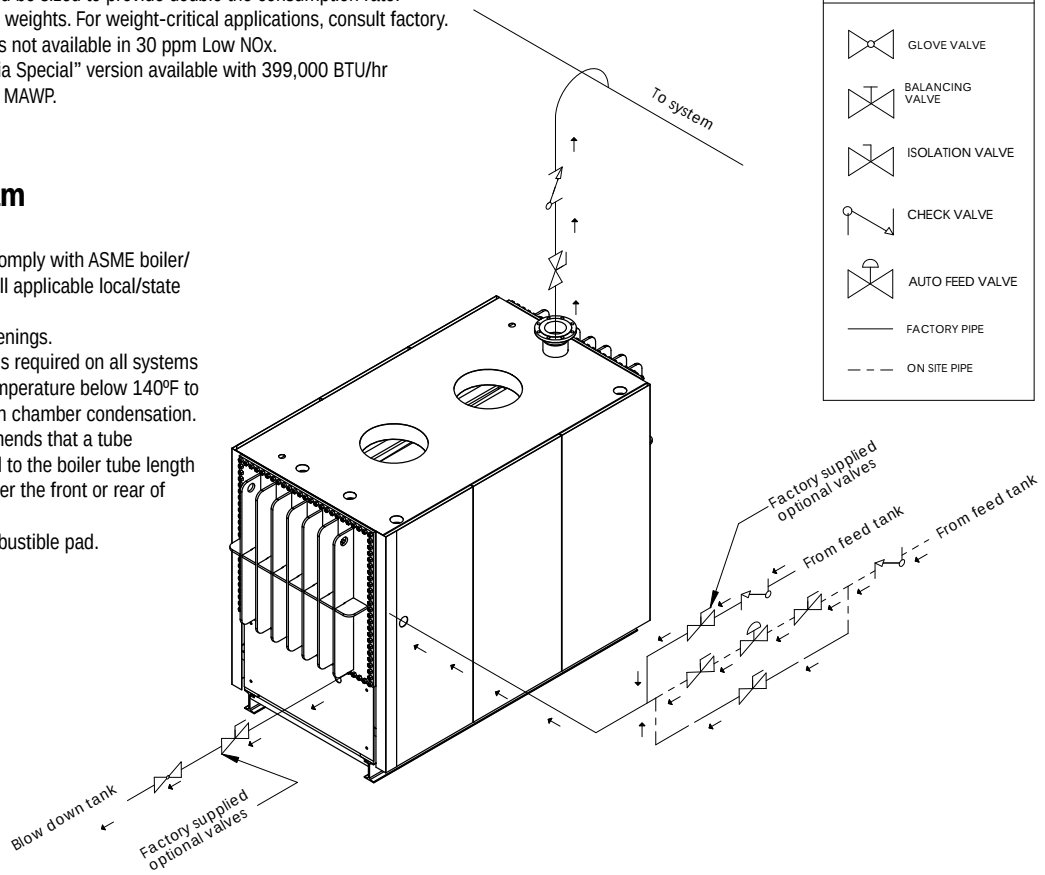
2. Based upon 1,000 BTU/ft³ natural gas at 0 to 2000 ft. elevation. Derates or burner modifications required for other heating values or higher elevations. Derate heater output by 4% for each 1000' above 2000 ft. elevation.
3. Based upon 83.5% efficiency per factory testing. Actual efficiency can vary depending upon operating conditions.
4. Based upon 33,480 BTU/hr output per B.H.P.
5. Based upon 200 °F feed water temperature.
6. Feeder pump should be sized to provide double the consumption rate.
7. Estimated shipping weights. For weight-critical applications, consult factory.
8. HRF_6 & 8 model is not available in 30 ppm Low NOx.

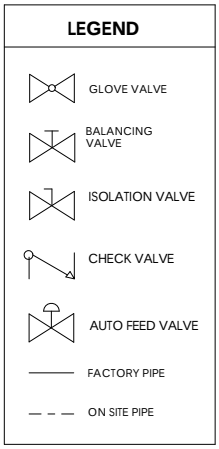
* 9.5 B.H.P. "California Special" version available with 399,000 BTU/hr input and 100 psig MAWP.

Piping Diagram

Note:

1. 1.All piping must comply with ASME boiler/ piping codes and all applicable local/state codes.
2. Plug all unused openings.
3. Return water loop is required on all systems with inlet water temperature below 140ºF to prevent combustion chamber condensation.
4. Ajax Boiler recommends that a tube removal area equal to the boiler tube length be available at either the front or rear of the boiler.
5. Install on non-combustible pad.





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Dimensions

MODEL	A LENGTH	B WIDTH[1]	C HEIGHT	D INLET SIZE[2]	E OUTLET SIZE[2]	F INLET / OUTLET LOC.	G INLET HEIGHT	H INDOOR VENT DIA.	H OUTDOOR VENT DIA.	J VENT STUB HEIGHT	K GAS LINE SIZE[3]	L TUBE LENGTH	M VENT LOC.	BOTTOM BLOW DOWN SIZE	RAIN CAP SIZE
SRF_6	26 1/4	37	57 3/4	1 T	1 1/2 T	3 1/4	32 1/2	6	11	3	1	14 1/2	C_L	1	17
SRF_8	31 1/4	37	57 3/4	1 T	1 1/2 T	3 1/4	32 1/2	6	12	3	1	19 1/2	C_L	1	18 1/2
SRF_10	35 1/4	37	57 3/4	1 T	1 1/2 T	3 1/4	32 1/2	6	13	3	1	23 1/2	C_L	1	20
SRF_12	40 1/4	37	57 3/4	1 T	1 1/2 T	3 1/4	32 1/2	6	14	3	1	28 1/2	17 1/2	1	21 1/2
SRF_15	47 1/4	37	57 3/4	1 T	1 1/2 T	3 1/4	32 1/2	8	14	3	1	35 1/2	17 1/2	1	21 1/2
SRF_17	53 1/4	37	57 3/4	1 T	1 1/2 T	3 1/4	32 1/2	8	16	3	1	41 1/2	18 1/2	1	24
SRF_20	59 1/4	37	57 3/4	1 T	1 1/2 T	3 1/4	32 1/2	8	16	3	1	47 1/2	18 1/2	1	24
SRF_22	51 3/4	40 1/2	72 1/4	1 T	2 1/2 T	4 1/2	43 3/4	8	16	3	1	36 3/4	20 1/2	1	24
SRF_25	55 3/4	40 1/2	72 1/4	1 T	2 1/2 T	4 1/2	43 3/4	10	18	3	1	40 3/4	20 1/2	1	27
SRF_30	63 3/4	40 1/2	72 1/4	1 T	2 1/2 T	4 1/2	43 3/4	10	20	3	1	48 3/4	20 1/2	1	29 1/2
SRF_35	72 3/4	40 1/2	72 1/4	1 T	2 1/2 T	4 1/2	43 3/4	10	20	3	1 1/4	57 3/4	21 1/2	1	29 1/2
SRF_40	79 3/4	40 1/2	72 1/4	1 T	2 1/2 T	4 1/2	43 3/4	12	22	3	1 1/2	64 3/4	21 1/2	1 1/4	32 1/2
SRF_50	68 3/4	49 1/2	80 3/4	1 1/2 T	4 F	5 1/2	53 3/4	12	22	3	1 1/2	49 3/4	24 1/2	1 1/4	32 1/2
SRF_60	78 3/4	49 1/2	80 3/4	1 1/2 T	4 F	5 1/2	53 3/4	12	24	3	1 1/2	59 3/4	24 1/2	1 1/4	35 1/2
SRF_70	88 3/4	49 1/2	80 3/4	1 1/2 T	4 F	5 1/2	53 3/4	14	20	3	2	69 3/4	25 1/2	1 1/2	29 1/2
SRF_80	98 3/4	49 1/2	80 3/4	1 1/2 T	4 F	5 1/2	53 3/4	14	20	3	2	79 3/4	25 1/2	1 1/2	29 1/2
SRF_90	91 1/4	61 1/2	83 1/2	2 T	6 F	6 3/4	53 1/4	16	22	3	2	66 1/4	30	1 1/2	32 1/2
SRF_100	98 1/4	61 1/2	83 1/2	2 T	6 F	6 3/4	53 1/4	16	22	3	2	73 1/4	30	1 1/2	32 1/2
SRF_125	117 1/4	61 1/2	83 1/2	2 T	6 F	6 3/4	53 1/4	18	24	3	2	92 1/4	31	1 1/2	35 1/2
SRF_150	135 1/4	61 1/2	83 1/2	2 T	6 F	6 3/4	53 1/4	18	26	3	2 1/2	110 1/4	31	1 1/2	38
SRF_175	155 1/4	61 1/2	83 1/2	2 T	6 F	6 3/4	53 1/4	20	26	3	2 1/2	130 1/4	32	1 1/2	38
SRF_200	129 1/2	73	96 1/2	2 T	6 F	8 3/4	61 1/4	20	26	3	3	100 3/4	35	2	38
SRF_225	143 1/2	73	96 1/2	2 T	6 F	8 3/4	61 1/4	24	28	3	3	114 3/4	36	2	41
SRF_250	154 1/2	73	96 1/2	2 T	6 F	8 3/4	61 1/4	24	30	3	3	125 3/4	37	2	44
SRF_275	167 1/2	73	96 1/2	2 T	8 F	8 3/4	61 1/4	26	30	3	3	138 3/4	38	2	44
SRF_300	179 1/2	73	96 1/2	2 T	8 F	8 3/4	61 1/4	26	32	3	3	150 3/4	38	2	46 1/2

Dimensions are in inches and are subject to production tolerances, subject to changes.

1. Width does not include gas train, outlet or control assemblies.
2. T = Threaded, F = Flanged. Flanged connections extend approximately 3 in. from the jacket.
3. Gas line size is for standard burner, gas train and firing mode.

SHIPPING DIMENSION: Length add 6 in. front (excluding burner length which varies on model and manufacturer) and back
Width add 12 in. right side and 6 in. left side of the boiler.

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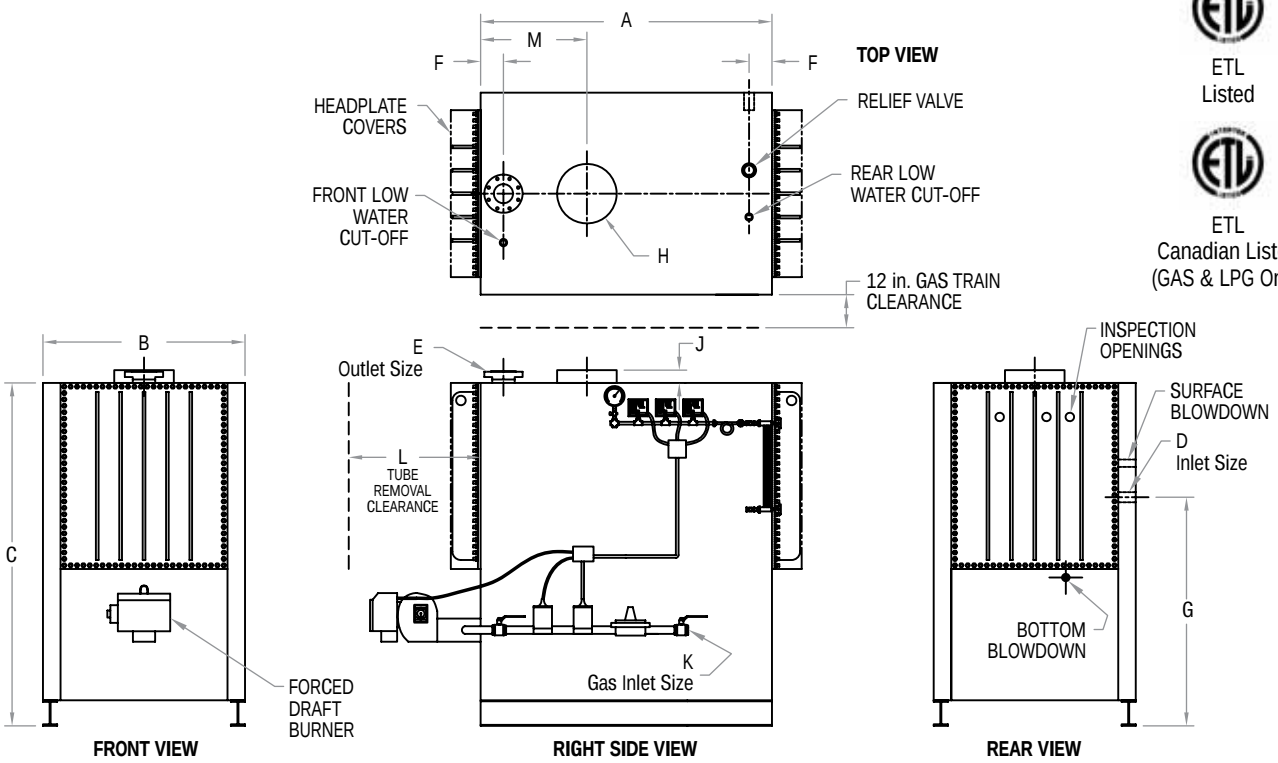


Unfired Steam Boilers

Process Steam • Clean Steam • Pure Steam

For Industrial processing, laboratory and bio-medical research facilities, hospitals, universities, office buildings and building complexes, sterilization facilities, semi-conductor facilities, paper and pulp factories, laundries or applications with special steam requirements and also point-of-use steam needs.

AJAX Series unfired steam boilers perform dependably and quietly, engineered to meet specific steam needs for industrial, institutional and commercial facilities. Quality U-tube bundles provide uniform heat transfer, resulting in high thermal efficiency and long boiler life.

Features

- Properly sized, with horizontal, vertical, and compact Mini-Pack™ style boiler choice
- Moisture separator for dry steam
- Independent bolting for easy inspection and maintenance
- Quality components for high performance and best value
- Wide range of options available

Standard Equipment

ASME Tank

- A.S.M.E. Section VIII Div I vessel
- National Board registered
- 50 psig design working pressure
- Horizontal, carbon steel construction with internal steam separator
- 12"x 16" manway on 42" diameter and larger tanks; inspection openings for below 42"
- Lifting lugs
- Process steam application

Tube Bundle

- 150 psig design working pressure
- SB-75 seamless copper U-tube
- Single wall tubing
- Removable bundle
- Steel cap and tubesheet
- Lifting straps or lugs

Support

- Skid mounted horizontal tank with saddles

Controls

- Pilot operated steam control valve
- ASME pressure relief valve
- Main T&P steam trap
- Pressure gauge panel with high limit switch
- Steam cap pressure gauge
- Conductivity type feed water and level control

Insulation & Jacketing

- Mirror finish stainless steel jacket
- 2" insulation

Optional Equipment

Tank

- 150 psig design working pressure
- Vertical & compact Mini-Pack™ style models available
- Clean or Pure steam application with stainless steel construction

Tube Bundle

- Copper, cupro-nickel (90/10) or 304/316 stainless steel tubing

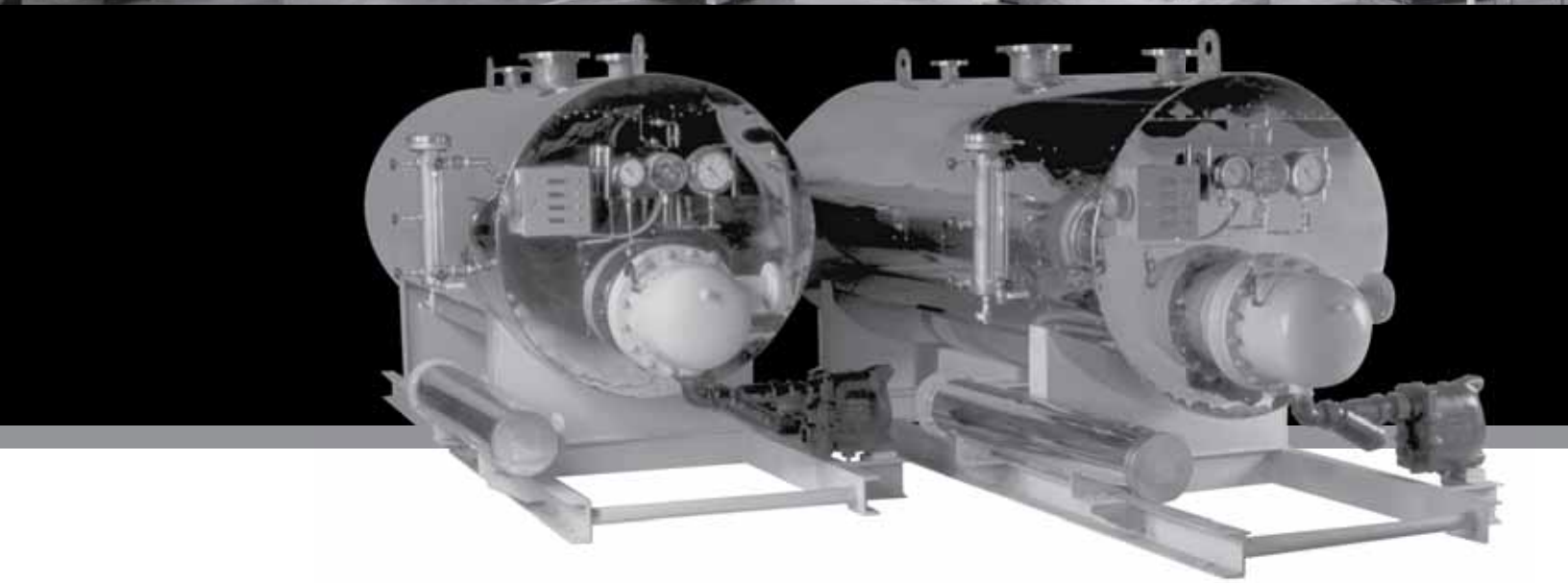
Support

- Vertical: skid mounted with pipe legs
- Mini-Pack™ style: steel stand
- Seismic support

Insulation & Jacketing

- 3” insulation

AJAX Series



Controls

- Pneumatic, or electric control valve
- Feed water solenoid valve
- By-pass for feed water
- Auxillary high water probe alarm
- Bottom blow down system
- Surface blow down system
  - Solenoid assembly with clock
  - TDS or conductivity blow down system
- Relay contacts for BMS
- 4-20mA transmission
- ModBus capability
- Secondary low water cut-off

Process Steam

Unfired steam boilers are used to protect fired boilers from harmful chemicals in the return condensate, such as in pulp and paper processing. Unfired steam boiler tube bundles and/or drum can be fabricated using materials that will be cost effective for the process steam condition. These can range from copper tube bundles and pressure vessel quality steel to tube bundles made from cupro-nickel or stainless steel tubing and drums fabricated with stainless steel.

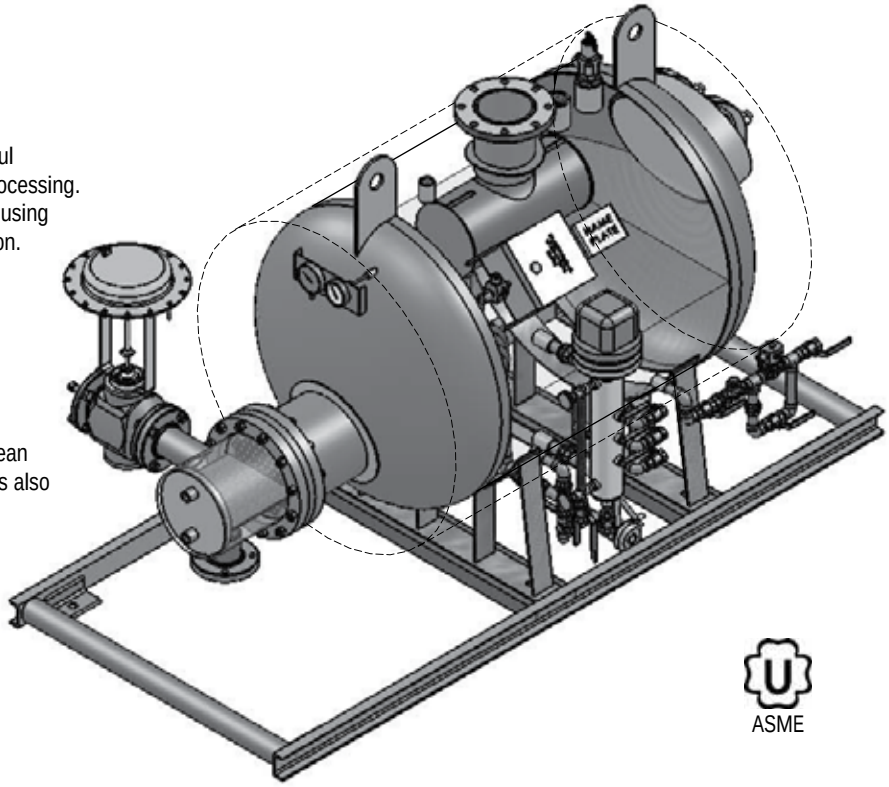
Clean Steam

Clean steam unfired steam boilers provide clean steam by using feed water that is free from boiler water treatment chemicals. Clean steam is used by the food industry for cooking and cleaning and is also used for many sterilization and humidification applications.

Pure Steam

More and more applications are requiring ultra pure steam for sterilization in Bio-science research, pharmaceutical research and/or processing, medical sterilization and high-tech clean room humidity control.

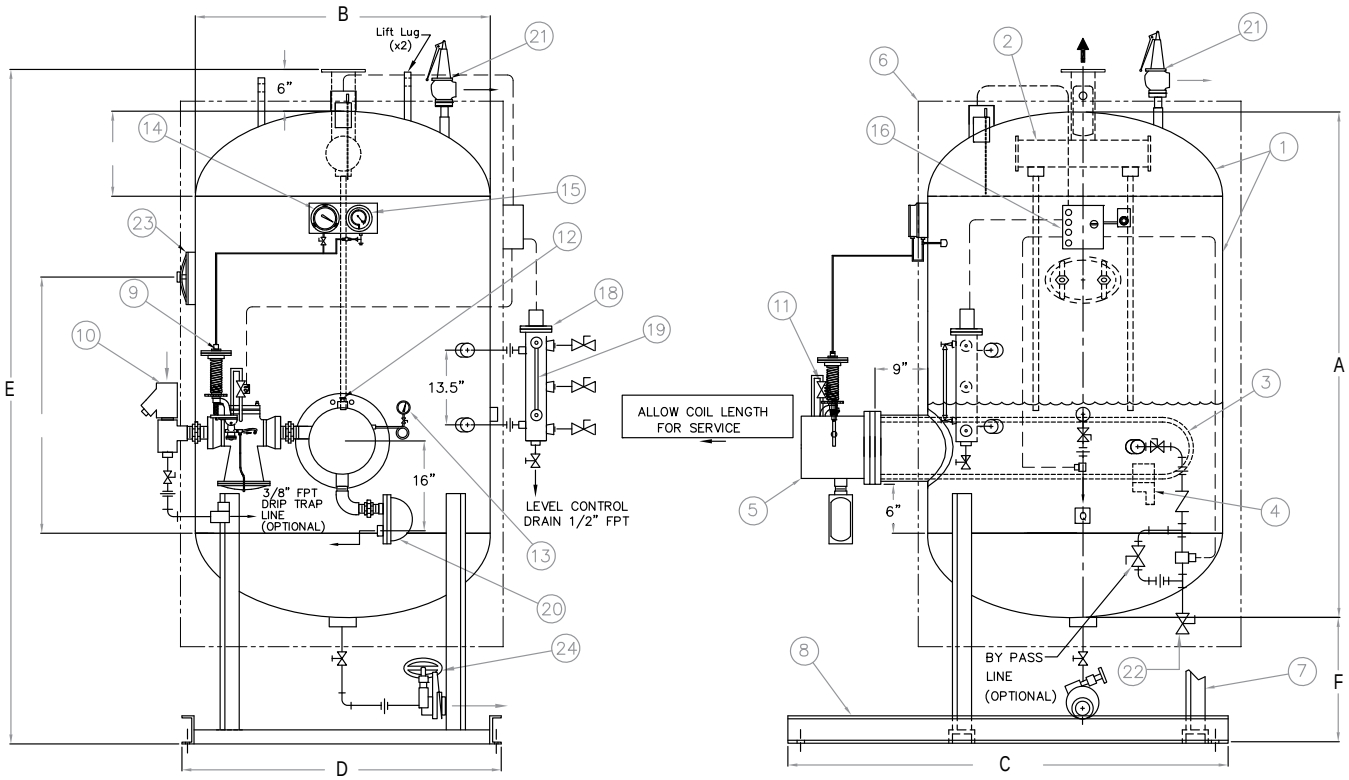
Pure steam boilers are normally fabricated with special high quality stainless steel pressure vessel material and components to handle the aggressive feedwater used in these applications.



U
ASME

Description of Items

1. Shell
2. Steam Separator & Outlet
3. Tube Bundle
4. Coil Support
5. Channel Cap
6. Insulation and Jacket
7. Supports
8. Steel Skid
9. Control Valve
10. Strainer
11. Safety Solenoid Valve
12. Vacuum Breaker
13. Pressure Gauge - Cap
14. Pressure Gauge - Shell
15. Pressure Activated Switch
16. Control Box
17. IP Transducer (Pneumatic)
18. Level Control
19. Sight Glass Assembly
20. Condensate Steam Trap
21. Relief Valve
22. Feed Water Connection
23. Manway
24. Bottom Blowdown



For Process Steam, Clean Steam and Pure Steam. 5 to 50,000 pounds per hour using steam, high temperature water or thermal fluids.

Each unit is completely assembled and ready to be installed and it includes the following standard features:

(for HTW) high temperature water control valve with pneumatic operated pressure control, inlet air regulator and filter, and inlet strainer.

(for Steam) steam control valve with pneumatic operated pressure control, inlet air regulator and filter, inlet steam strainer, condensate trap and downstream vacuum breaker.

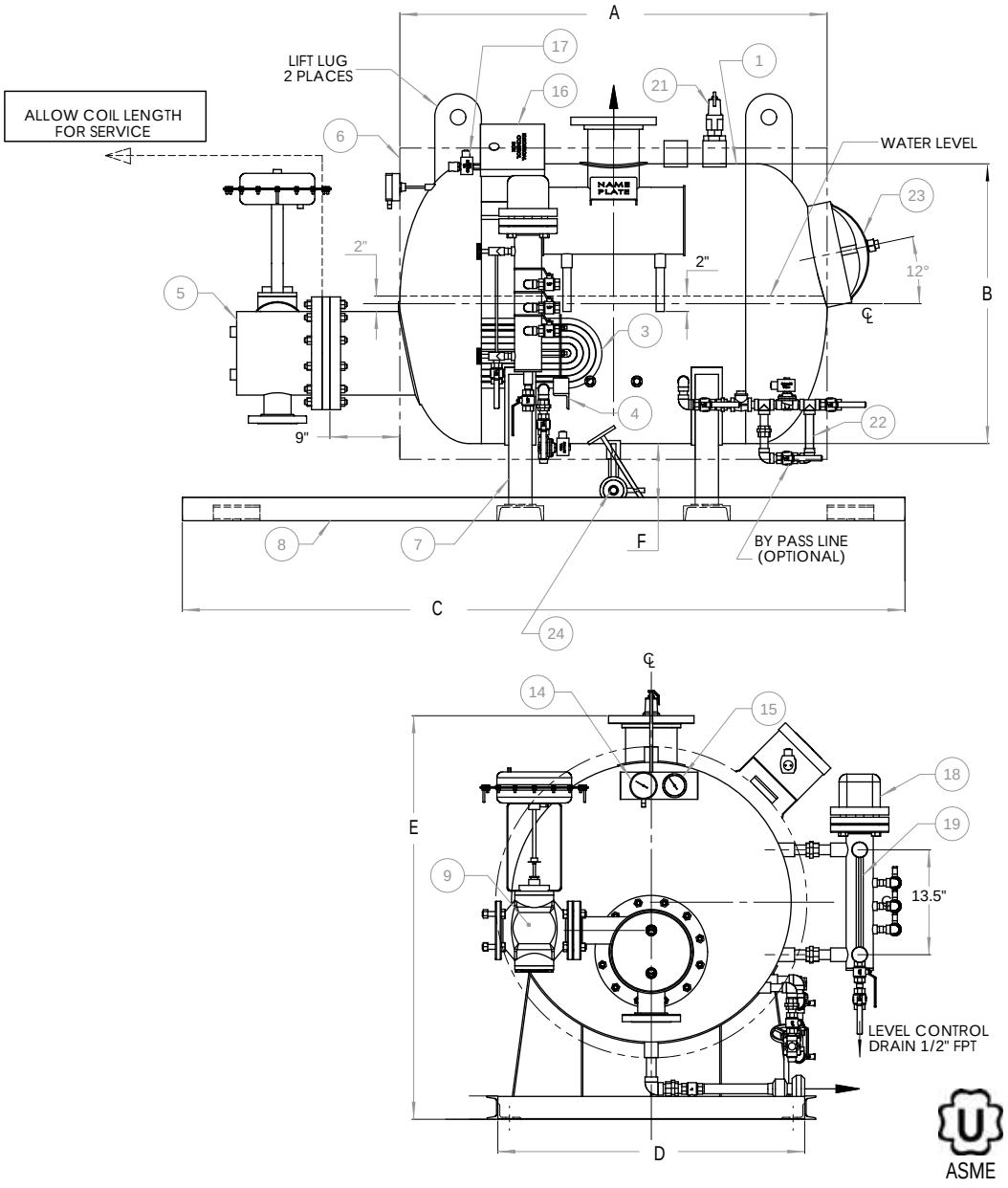
A safety solenoid valve will be used to shut the air supply to the control valve off on low water or high pressure conditions, power loss or manual shut off. Float type feed water and low water cutoff controller with level glass assembly and tri-cocks. A pressure controller with high-pressure safety shut off feature.

TANK MODEL	A OAL	B DIA	C LENGTH	D WIDTH	E HEIGHT	F SUPPORT HEIGHT
2403	51	24	60	31	71.5	11.5
2404	63	24	60	31	83.5	11.5
2407	99	24	60	31	119.5	11.5
2408	111	24	60	31	131.5	11.5
3604	69	36	77	43	92	14
3605	81	36	77	43	104	14
3606	93	36	77	43	116	14
3607	105	36	77	43	128	14

Sample sizing only. Sizes and steam output may change depending on heating steam pressure or thermal fluid temperature. For exact sizing and specification please contact your Ajax Boiler Representative.

Description of Items

1. Shell
2. Steam Separator & Outlet
3. Tube Bundle
4. Coil Support
5. Channel Cap
6. Insulation and Jacket
7. Saddle Support
8. Steel Skid
9. Control Valve
10. Strainer
11. Safety Solenoid Valve
12. Vacuum Breaker
13. Pressure Gauge - Cap
14. Pressure Gauge - Shell
15. Pressure Activated Switch
16. Control Box
17. IP Transducer (Pneumatic)
18. Level Control
19. Sight Glass Assembly
20. Condensate Steam Trap
21. Relief Valve
22. Feed Water Connection
23. Manway
24. Bottom Blowdown



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(for Steam) steam control valve with pneumatic operated pressure control, inlet air regulator and filter, inlet steam strainer, condensate trap and downstream vacuum breaker.

A safety solenoid valve will be used to shut the air supply to the control valve off on low water or high pressure conditions, power loss or manual shut off. Float type feed water and low water cutoff controller with level glass assembly and tri-cocks. A pressure controller with high-pressure safety shut off feature.

TANK MODEL	A OAL	B DIA	C LENGTH	D WIDTH	E HEIGHT	F SUPPORT HEIGHT
2403	51	24	83	26	41	8
2404	63	24	95	26	41	8
2407	99	24	131	26	41	8
2408	111	24	143	26	41	8
3604	69	36	106	39	53	8
3605	81	36	118	39	53	8
3606	93	36	130	39	53	8
3607	105	36	142	39	53	8

Sample sizing only. Sizes and steam output may change depending on heating steam pressure or thermal fluid temperature. For exact sizing and specification please contact your Ajax Boiler Representative.

ASME Tanks

Condensate Return & Boiler Feed System
Blow Down Tanks
Expansion Tanks
Flash Tanks

AJAX Series tanks are designed and manufactured using only the highest quality materials for all boiler applications for over 40 years. All fabrication, welding, and testing are performed in strict accordance with ASME codes.

Condensate Return and Boiler Feed Systems

Features

- Standard storage capacities 49 to 325 Gallons
- Designed and sized for steam boilers 150 psig
- Turbine or Centrifugal Pumps
- Simplex or Duplex Systems available

Standard Equipment

- Quality carbon steel horizontal non-code storage tank
- Simplex pump system
- Close-coupled, bronze-fitted turbine for high pressure system; centrifugal pump on low pressure system
- Internal copper float-operated feed water assembly
- Site glass assembly with brass gauge valves
- Temperature gauges
- Suction and return piping with strainer and valves
- Painted cape cod grey
- Isolation valves
- Water tight conduit
- Vent connection on top of tank for atmospheric venting
- Sturdy angle/channel base and stand
- Lifting straps or lugs

Optional Equipment

- Duplex or Triplex pump systems
- Storage capacities up to 1,000 Gallons
- 4"x 6" handhole
- Pressure gauge on pump outlet
- Steam sparge system with temperature control valve.
- Sparge tube
- Low water cut-off
- Control panel, with hand-off auto switches, signal light, and magnetic motor starters
- Low control alarm system, with alarm bells, feed tank low water alarm (probe type), low water light, and lead lag selection on multi-pump units

Ajax Series horizontal boiler feed tanks & systems are available in stainless steel or carbon steel, simplex, duplex, and triplex configurations with siphon or non-siphon make-up inlets, 15 to 300 boiler horsepower. All of Ajax Series' horizontal tanks and systems have the following features:

Superior NPSH. Elevated tanks on tall rugged stands help to give pumps long, dependable life under demanding conditions.

Ergonomic Design. All piping is easily accessible from the sides of the tank. Sight gauge and thermometer are standard and are mounted on the front of the tank for high visibility.

Piping. All pump suction piping includes a strainer and isolation valve, as well as a union for ease of pump service.

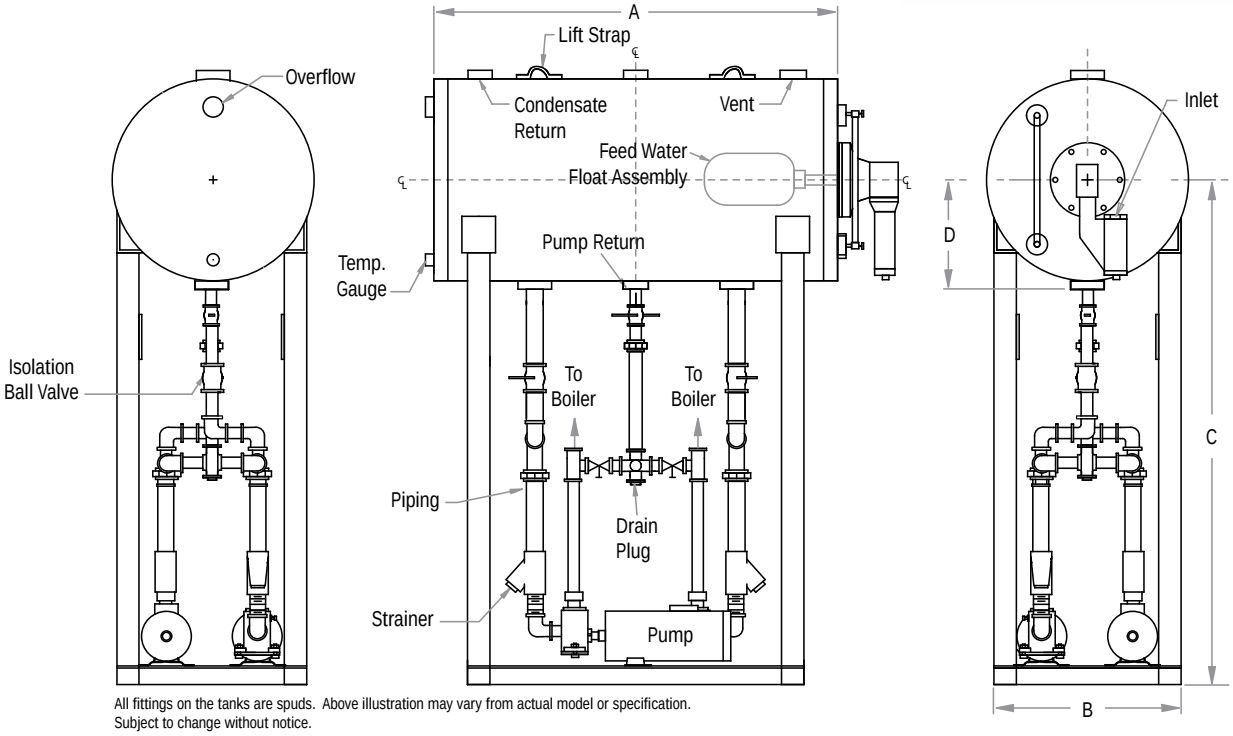
Optional Control Panel. Available for duplex and triplex units, automatically alternates pumps every cycle for even pump wear, or shut down one pump for service.

Stainless Steel Systems. Tanks are made of 12 gauge up to 100 Gallons, then 10 gauge for 150 Gallons and above. Stand is painted carbon steel.

Carbon Steel Systems. Tanks are made of 11 gauge up to 100 gallons, then 3/16" for 150 Gallons and above. Strainer is cast iron with a stainless steel screen. Make-up valve and sight glass are bronze.

Condensate Return and Boiler Feed System: Duplex

Completely Packaged For Trouble-Free Installation



All fittings on the tanks are spuds. Above illustration may vary from actual model or specification. Subject to change without notice.

DUPLEX MODEL	MAX. BOILER H.P.	NOMINAL GALLON CAPACITY	A LENGTH	B WIDTH	C HEIGHT	D	TANK O.D.	APPROX. WEIGHT (LBS.)
ADF-010-060U-125	10	60	36	27 1/2	52 1/8	13	23	540
ADF-025-060U-125	25	60	36	27 1/2	52 1/8	13	23	540
ADF-050-100U-125	50	100	48	30 1/4	59	14 3/8	25 3/4	810
ADF-070-100U-125	70	100	48	30 1/4	59	14 3/8	25 3/4	810
ADF-080-100U-125	80	100	48	30 1/4	59	14 3/8	25 3/4	810
ADF-100-150U-125	100	150	48	35 1/4	61 5/8	16 7/8	30 3/4	1020
ADF-125-150U-125	125	150	48	35 1/4	61 5/8	16 7/8	30 3/4	1020
ADF-150-200U-125	150	200	60	38 1/2	69	17 1/2	32	1,150

ASME

The last three digits of the model # will be 150 on high pressure steam.

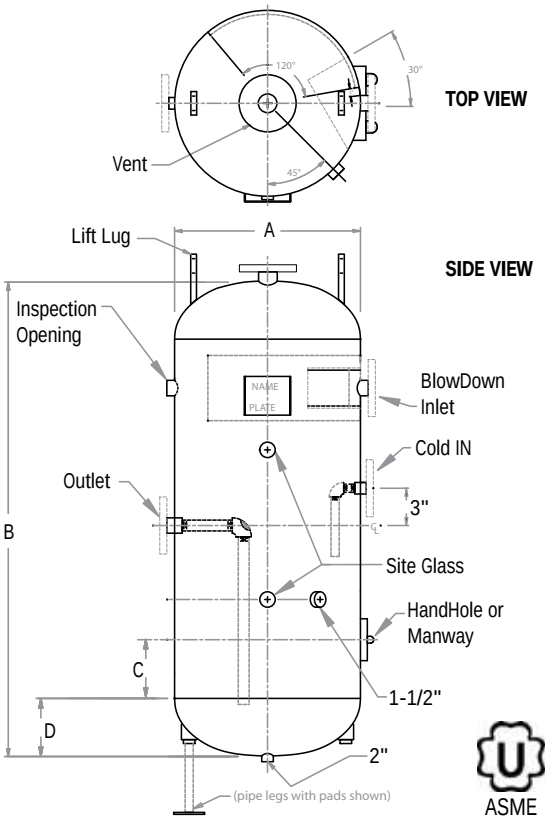
Blow Down Tanks

Standard Equipment

- ASME coded, quality carbon steel vertical tank 150 psig
- 18" to 36" diameter tanks available
- Tank openings:
  - Blow down inlet with wear plate.
  - Cold water inlet
  - Vent
  - Clean out
  - Tank drain
- 4" x 6" handhole and inspection opening for tank diameter 18" to 30"; 12" x 16" manway for tank diameter 36"
- Lift strap or lugs
- Unlined interior, shop primered exterior
- 3 or 4 pipe legs couplings

Optional Equipment

- Sight glass
- Angle legs support
- Pipe legs support



Dimensions & Capacity

MODEL	CAPACITY (GAL.)	WEIGHT (LBS.)	A DIA.	B O.A. LENGTH	C INSPECT. OPENING LOC.	D HEAD DEPTH
SB1803	49	315	18"	48"	6"	6"
SB1804	62	380		60"		
SB1805	75	445		72"		
SB2404	117	585	24"	63"	6"	7 1/2"
SB2405	140	680		75"		
SB2406	163	775		87"		
SB3004	190	785	30"	66"	6"	9"
SB3005	225	905		78"		
SB3006	260	1,025		90"		
SB3604	275	985	36"	69"	12"	10 1/2"
SB3605	325	1,130		81"		
SB3606	375	1,275		93"		

FITTINGS			
TANK Ø	INLET	OUTLET	VENT
18"	1"	1 1/2"	2 1/2" FLG
24"	1 1/4"	2"	3" FLG
30"	1 1/2"	2 1/2" FLG	4" FLG
36"	2"	3" FLG	5" FLG

Note:
Blow Down tank diameters 18" thru 30" have 4" x 6" handhole and inspection opening.

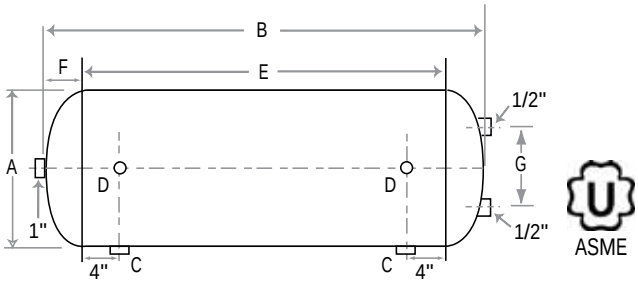
Blow Down tank diameters 36" have 12" x 16" Manway.

Pick combination per row.

Expansion Tanks 125 PSIG

Standard Equipment

- ASME coded, quality carbon steel horizontal tank 125 psig at 390 ºF
- 18" to 36" diameter tanks available
- Site glass ready fittings
- Unlined interior, shop primered exterior



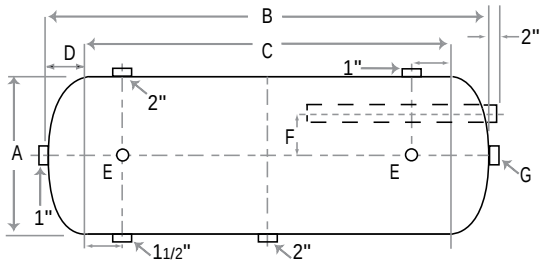
Dimensions & Capacity

MODEL	NOMINAL CAPACITY (GAL.)	WEIGHT (LBS.)	A DIA. (OD)	B OAL	C INLET / AIR	D INSP. OPENING	E SHELL	F HEAD	G GAUGE GLASS
SX1803	49	125	18	48	3/4	1 1/2	36	6	11 1/2
SX1804	62	150	18	60	3/4	1 1/2	48	6	11 1/2
SX1805	75	175	18	72	3/4	1 1/2	60	6	11 1/2
SX2403	94	180	24	51	1	2	36	7 1/2	15 1/2
SX2404	117	215	24	63	1	2	48	7 1/2	15 1/2
SX2405	140	250	24	75	1	2	60	7 1/2	15 1/2
SX3004	190	335	30	66	1 1/2	2	48	9	21 1/2
SX3005	225	385	30	78	1 1/2	2	60	9	21 1/2
SX3006	260	435	30	90	1 1/2	2	72	9	21 1/2
SX3604	275	462	36	69	2	2	48	10 1/2	25 1/2
SX3605	325	536	36	81	2	2	60	10 1/2	25 1/2
SX3606	375	610	36	93	2	2	72	10 1/2	25 1/2

Flash Tanks 125 PSIG

Standard Equipment

- ASME coded, quality carbon steel horizontal tank 125 psig at 390 ºF
- Perforated pipe
- 18" to 36" diameter tanks available
- Inspection openings for tank diameter 18" to 30"; 12" x 16" manway for tank diameter 36"
- Unlined interior, shop primered exterior

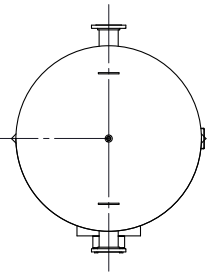


ASME

Dimensions & Capacity

MODEL	NOMINAL CAPACITY (GAL.)	WEIGHT (LBS.)	A DIA. (OD)	B OAL	C SHELL	D HEAD	E INSP. OPENING	F	G STEAM INLET
ST1803	49	128	18	48	36	6	1 1/2	3	2
ST1804	62	153	18	60	48	6	1 1/2	3	2
ST1805	75	178	18	72	60	6	1 1/2	3	2
ST2403	94	183	24	51	36	7 1/2	2	3	2
ST2404	117	218	24	63	48	7 1/2	2	3	2
ST2405	140	253	24	75	60	7 1/2	2	3	2
ST3004	190	338	30	66	48	9	2	3	2
ST3005	225	388	30	78	60	9	2	3	2
ST3006	260	438	30	90	72	9	2	3	2
ST3604	275	465	36	69	48	10 1/2	2	3	2
ST3605	325	539	36	81	60	10 1/2	2	3	2
ST3606	375	613	36	93	72	10 1/2	2	3	2

Note: ST1803 to ST1805: 1" ø perforated pipe. SCH. 40 12" LG with 4 slots, 3/16" wide, 2" apart. Close inside end. Thread outside end. ST2403 to ST3606: 2" ø perforated pipe. SCH. 40 20" LG with 7 slots, 3/16" wide, 2" apart. Close inside end. Thread outside end.



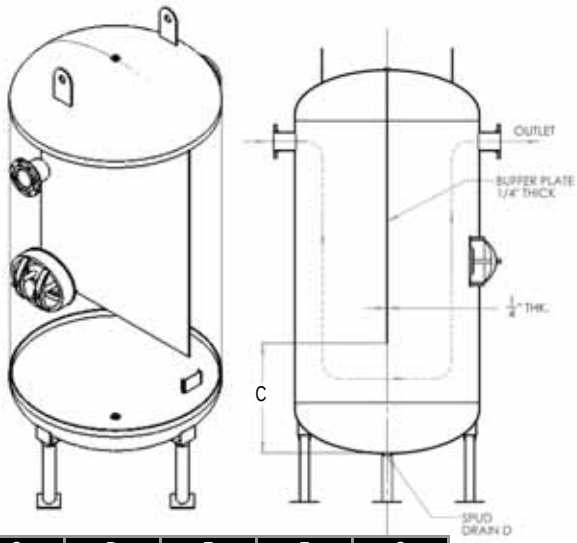
ASME

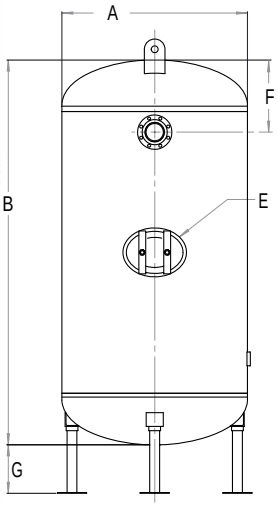
TOP VIEW

Buffer Tanks 125 PSIG

Standard Equipment

- ASME coded, quality carbon steel vertical tank 125 psig at 390 ºF
- 1/4" buffer plate
- 24" to 54" diameter tanks available
- Manway inspection opening
- Unlined interior, shop primered exterior





SIDE VIEW

Dimensions & Capacity

TANK SIZE	CAPACITY (GAL.)	A TANK DIA. (OD)	B OVER ALL LENGTH	C	D DRAIN SIZE	E INSP. OPENING	F INLET / OUTLET LOC.	G
SE2404	117	24	63	20	1	11 X 15	12	8
SE3005	225	30	78	24	1	11 X 15	14	8
SE3605	325	36	81	24	1	11 X15	16	8
SE3607	425	36	105	24	1	11X 15	16	8
SE4206	530	42	96	30	1.5	12 X 16	18	8
SE4805	605	48	87	32	1.5	12 X 16	20	8
SE4806	700	48	99	32	1.5	12 X 16	20	8
SE5406	860	54	103	32	1.5	12 X 16	22	8
SE5407	980	54	115	32	1.5	12 X 16	22	8

ASME Heat Exchangers

Steam-to-Water or Water-to-Water Application

The Ajaxs Series heat exchangers perform dependably and quietly, offering a variety of water heating solutions. Quality U-tube bundles provide uniform heat transfer, resulting in high thermal efficiency and long exchanger life.

Heat Exchanger Design

- Optimized design for best heat transfer performance in steam, water and HTW exchanger type heaters
- Wide variety of models to suit your specific need:
  - Single wall or double wall tube bundle
  - 150, 250, 300, or 400 psig working pressure design
  - Copper, cupro-nickel (90/10), or stainless steel tubing
  - Coil sizes from 5" up to 18" on selected models
  - Carbon steel or stainless steel tubesheet and cap

Standard Equipment

Shell

- ASME Section VIII Div I vessel
- National Board registered
- 150 psig design working pressure
- Horizontal, carbon steel construction

Tube Bundle

- 150 psig design working pressure
- SB-75 seamless copper U-tube
- Single wall tubing
- Steel cap and tubesheet

Optional Equipment

Shell

- 250, 300 or 400 psig working pressure design
- 304 stainless steel shell

Tube Bundle

- 250, 300 or 400 psig working pressure design
- HTW applications
- 0.049" wall copper, cupro-nickel (90/10), 304, or 316L tubes
- Double wall tubing
- 304 stainless steel tube sheet and cap flange

Support

- Saddles
- Rack mount for multiple units
- Seismic support

The Ajax Series heavy duty heat exchangers are designed and constructed to ASME Unfired Pressure Vessel code Section VIII. These heavy duty heat exchangers will give years of trouble-free service.

Heat exchangers are instantaneous type water heaters that do not store hot water. As an instantaneous water heater, the heat exchanger must be sized to handle the maximum peak hot water demand load. Temperature control valves, either steam or water, will modulate the “heating” steam or water input thereby controlling the outlet water temperature during reduced output load conditions. If short duration hot water demand loads exist or if high volume peak load demands are involved then the heat exchanger should be used in conjunction with a hot water storage or accumulator tank. In addition to providing an immediate supply of hot water for high draw loads a storage tank will smooth out the operation of the heat exchanger, reduce cycling of the control valve and reduce surge loads on the boiler.

Usage. Heat exchangers are typically used when a central boiler plant supplies - boiler water, low or high pressure steam or high temperature water - for multiple uses and/or for distribution throughout large building complexes.

Applications. Heat exchangers can be used in a wide variety of applications. Some of the most common applications are as follows:

1. To heat domestic water for washing, cooking, etc.
2. As boosters to heat water to higher temperatures for special uses - such as sanitizing wash water, boiler feed water heaters, etc.
3. To heat process water for anodizing, filing processing, and a wide variety of commercial, industrial and petro-chemical applications where hot water or steam is required.

4. Waste heat recovery units can extract heat from hot waste, was or process water before it is dumped.
5. Cool condensate water; recover and use the heat to preheat boiler makeup water or domestic water.
6. Heating glycol for snow melting applications or to protect water tanks from freezing conditions.
7. To heat water for hydronic and radiation heating applications.

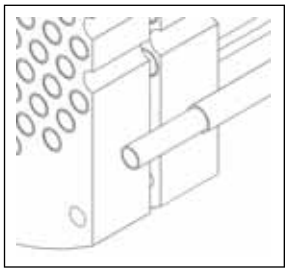
Double Wall Tube Bundle

Meets Uniform Plumbing Code requirements for heating potable water. Prevents cross-contamination. **Tested and certified by the City of Los Angeles Testing Laboratory.**

- Easy Inspections and low maintenance
- Fully visible, 360º vented leak detection between tubesheets.
- Bolting and gaskets for potable water and heating medium are completely Independent.
- Individual tube access for easy maintenance.
- Optional: Tubesheet contacting potable water is solid 304 stainless steel.
- Used to upgrade present single-wall tube bundles.
- Available in storage semi-instantaneous water heaters and exchangers with copper or cupro-nickel tubes and carbon steel or stainless steel tube sheets (Up to 400 PSIG with cupro-nickel tubes)

Double-Wall Protection Performance

Tube failure can be caused by corrosion, erosion, and vibration, and can result in the contamination of the domestic water system to be contaminated by a heating medium such as steam, hydronic water, glycol solution, etc. There is no practical way to have the heating medium sterile or free from harmful treatment compounds or corrosion by-products. A low pressure heating medium circuit does not ensure contamination protection of indirect, single-wall water heaters. Whether they are shell and tube, shell and coil, plate and frame, or any other type, all consist of relatively thin wall heat transfer surface separating the heating medium from the domestic water system. Therefore, the potential for cross contamination is real and in some instances contamination has occurred. Several states and cities are now insisting on double-wall vented construction in all direct type domestic water heaters. Plumbing codes have also been re-written to include double-wall protection. Ajax Boiler has developed the most practical, "state-of-the-art" double tube wall heaters to preclude any possibility of contaminating the domestic water system.



The Ace Series double-wall is the most positive form of double tube wall construction available, with no sacrifice in water heater effeciency or performance over a single tube wall heater.

The heat transfer surface is 5/8" O.D. x 0.042" thick inner wall and 3/4" O.D. x .042" outer wall SB-75 copper tubing. The 0.042" dimensions are actual net tube wall thicknesses which equal 0.084" thickness of total wall separation. This is more than twice the thickness of many single wall water heater products. Both inside and outside tube surfaces are smooth (prime) with no fins or surface irregularities to promote scale formation or corrosion attack.

Double-wall tubing has a similar overall heat conductivity as a single wall tube of equivalent wall thickness. The heat transfer capabilities were determined by actual tests conducted at the Ajax Boiler facilities. Each tube has multiple parallel and continuous vent paths.

ASME

Model SU - Service Water in Tubes with Steam in Shell

NOMINAL COIL SIZE	DIMENSION COMMON TO 2, 4, & 6 PASS						2-PASS		4-PASS		6-PASS	
	A	F	G	K	L	M	C	D	C	D	C	D
*5	5 9/16	8	1	3	2	1	1 1/4	1 3/8	1 1/4	1 3/8	-	-
6	6 5/8	8	1	3	2 1/2	1	1 1/2	1 5/8	1 1/2	1 5/8	1	1
8	8 5/8	9	1 1/4	3 1/2	4 F	1 1/4	2 1/2	2 1/8	2	2 1/8	1 1/2	1 3/8
10	10 3/4	11	1 1/2	4 7/8	4 F	1 1/2	3	2 3/4	2 1/2	2 3/4	2	1 5/8
12	12 3/4	15	2	4 1/8	5 F	2	4	3 1/4	3	3 1/4	2 1/2	2
14	14	17	2	4 3/8	6 F	2	4	3 1/2	3	3 1/2	2 1/2	2 1/4
16	16	19	2 1/2	4 15/16	6 F	2 1/2	5	4	4	4	3	2 1/2

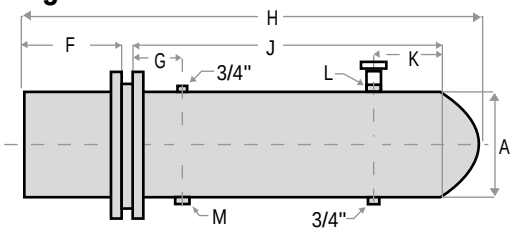
Drawing shows rough dimensions only.
Contact factory for specific information.

NOMINAL COIL SIZE	H Single-Wall	J
*SU_0502__	39	29 3/4
*SU_0503__	51	41 3/4
*SU_0504__	63	53 3/4
*SU_0505__	75	65 3/4
*SU_0506__	87	77 3/4
*SU_0507__	99	89 3/4
SU_0602__	41 1/4	28 1/2
SU_0603__	53 1/4	40 1/2
SU_0604__	65 1/4	52 1/2
SU_0605__	77 1/4	64 1/2
SU_0606__	89 1/4	76 1/2
SU_0607__	101 1/4	88 1/2
SU_0802__	56 1/2	42 1/2
SU_0803__	67 1/2	53 1/2
SU_0804__	79 1/2	65 1/2
SU_0804__	92 1/2	78 1/2
SU_0806__	103 1/2	89 1/2
SU_0807__	115 1/2	101 1/2
SU_1002__	60 3/4	43 1/2
SU_1003__	72 3/4	55 1/2
SU_1004__	84 3/4	67 1/2
SU_1005__	96 3/4	79 1/2
SU_1006__	108 3/4	91 1/2
SU_1007__	120 3/4	103 1/2
SU_1202__	76 3/4	55 1/4
SU_1203__	88 3/4	67 1/4
SU_1204__	100 3/4	79 1/4
SU_1205__	112 3/4	91 1/4
SU_1206__	124 3/4	103 1/4
SU_1207__	136 3/4	115 1/4
SU_1402__	81 1/4	57 1/4
SU_1403__	93 1/4	69 1/4
SU_1404__	105 1/4	81 1/4
SU_1405__	117 1/4	93 1/4
SU_1406__	129 1/4	105 1/4
SU_1407__	141 1/4	117 1/4
SU_1602__	86	59 1/4
SU_1603__	98	71 1/4
SU_1604__	110	83 1/4
SU_1605__	122	95 1/4
SU_1606__	134	107 1/4
SU_1607__	146	119 1/4

NOMINAL COIL SIZE	H Double-Wall	J
*SU_0502__	40	29 3/4
*SU_0503__	52	41 3/4
*SU_0504__	64	53 3/4
*SU_0505__	76	65 3/4
*SU_0506__	88	77 3/4
*SU_0507__	100	89 3/4
SU_0602__	42 1/4	28 1/2
SU_0603__	54 1/4	40 1/2
SU_0604__	66 1/4	52 1/2
SU_0605__	78 1/4	64 1/2
SU_0606__	90 1/4	76 1/2
SU_0607__	102 1/4	88 1/2
SU_0802__	57 3/4	42 1/2
SU_0803__	68 3/4	53 1/2
SU_0804__	80 3/4	65 1/2
SU_0804__	93 3/4	78 1/2
SU_0806__	104 3/4	89 1/2
SU_0807__	116 3/4	101 1/2
SU_1002__	62 1/4	43 1/2
SU_1003__	74 1/4	55 1/2
SU_1004__	86 1/4	67 1/2
SU_1005__	98 1/4	79 1/2
SU_1006__	110 1/4	91 1/2
SU_1007__	122 1/4	103 1/2
SU_1202__	78 1/4	55 1/4
SU_1203__	90 1/4	67 1/4
SU_1204__	102 1/4	79 1/4
SU_1205__	114 1/4	91 1/4
SU_1206__	126 1/4	103 1/4
SU_1207__	138 1/4	115 1/4
SU_1402__	83	57 1/4
SU_1403__	95	69 1/4
SU_1404__	107	81 1/4
SU_1405__	119	93 1/4
SU_1406__	131	105 1/4
SU_1407__	143	117 1/4
SU_1602__	88	59 1/4
SU_1603__	100	71 1/4
SU_1604__	112	83 1/4
SU_1605__	124	95 1/4
SU_1606__	136	107 1/4
SU_1607__	148	119 1/4

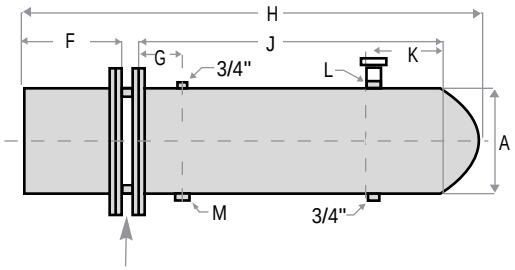
* 5" heat exchangers are equipped with flat heads instead of SE heads

Single-Wall



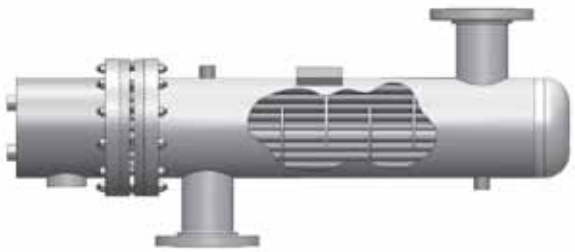
NOTE: "H" dimension is approximate. "C", "D", "L" & "M" are standard sizes, however, they should be sized to particular flow requirements. For longer or shorter models, consult factory.

Double-Wall

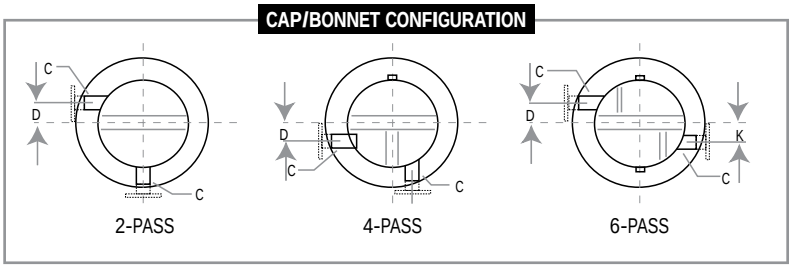


DOUBLE-WALL TUBE LEAK DETECTION AREA

NOTE: "H" dimension is approximate. "C", "D", "L" & "M" are standard sizes, however, they should be sized to particular flow requirements. For longer or shorter models, consult factory.



CAP/BONNET CONFIGURATION

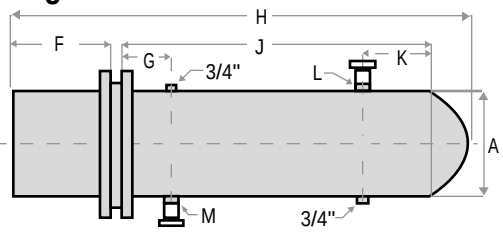


Model WU - Service Water in Tubes with Water in Shell

NOMINAL COIL SIZE	DIMENSION COMMON TO 2, 4, & 6 PASS						2-PASS		4-PASS		6-PASS	
	A	F	G	K	L	M	C	D	C	D	C	D
*5	5 9/16	8	3	3 5/8	2	2	1 1/4	1 3/8	1 1/4	1 3/8	-	-
6	6 5/8	8	3	3 15/16	2 1/2	2 1/2	1 1/2	1 5/8	1 1/2	1 5/8	1	1
8	8 5/8	9	5 1/2	4 5/8	4F	4F	2 1/2	2 1/8	2	2 1/8	1 1/2	1 3/8
10	10 3/4	11	5 1/2	4 7/8	4F	4F	3	2 3/4	2 1/2	2 3/4	2	1 5/8
12	12 3/4	15	6	5 1/2	5F	5F	4	3 1/4	3	3 1/4	2 1/2	2
14	14	17	7	6 3/16	6F	6F	4	3 1/2	3	3 1/2	2 1/2	2 1/4
16	16	19	7	6 7/16	6F	6F	5	4	4	4	3	2 1/2

Drawing shows rough dimensions only. Contact factory for specific information.

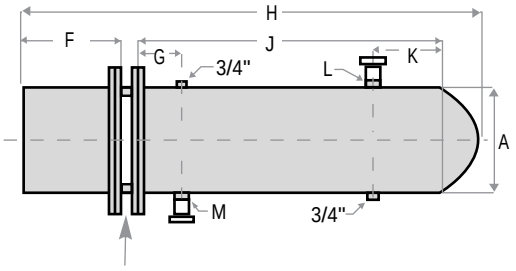
Single-Wall



NOTE: "H" dimension is approximate. "C", "D", "L" & "M" are standard sizes, however, they should be sized to particular flow requirements. For longer or shorter models, consult factory.

NOMINAL COIL SIZE	H Single-Wall	J
*WU_0502__	34 1/2	25 1/4
*WU_0503__	46 1/2	37 1/4
*WU_0504__	58 1/2	49 1/4
*WU_0505__	70 1/2	61 1/4
*WU_0506__	82 1/2	73 1/4
*WU_0507__	94 1/2	85 1/4
WU_0602__	35 3/4	23
WU_0603__	47 3/4	35
WU_0604__	59 3/4	47
WU_0605__	71 3/4	59
WU_0606__	83 3/4	71
WU_0607__	95 3/4	83
WU_0802__	48	34
WU_0803__	60	46
WU_0804__	72	58
WU_0804__	84	70
WU_0806__	96	82
WU_0807__	108	94
WU_1002__	51 1/4	34
WU_1003__	63 1/4	46
WU_1004__	75 1/4	58
WU_1005__	87 1/4	70
WU_1006__	99 1/4	82
WU_1007__	111 1/4	94
WU_1202__	66 1/2	45
WU_1203__	78 1/2	57
WU_1204__	90 1/2	69
WU_1205__	102 1/2	81
WU_1206__	114 1/2	93
WU_1207__	126 1/2	105
WU_1402__	69	45
WU_1403__	81	57
WU_1404__	93	69
WU_1405__	105	81
WU_1406__	117	93
WU_1407__	129	105
WU_1602__	70 3/4	44
WU_1603__	82 3/4	56
WU_1604__	94 3/4	68
WU_1605__	106 3/4	80
WU_1606__	118 3/4	92
WU_1607__	130 3/4	104

Double-Wall



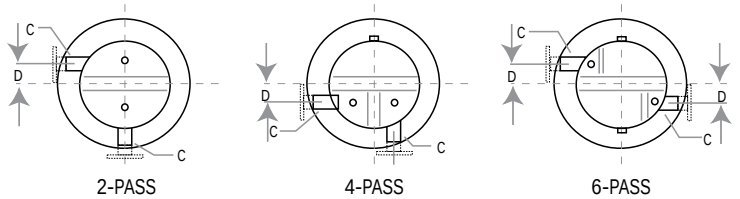
DOUBLE-WALL TUBE LEAK DETECTION AREA

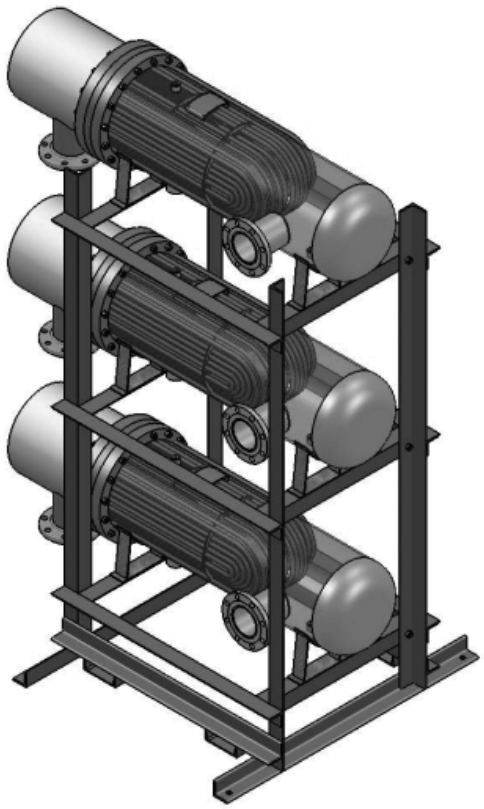
NOTE: "H" dimension is approximate. "C", "D", "L" & "M" are standard sizes, however, they should be sized to particular flow requirements. For longer or shorter models, consult factory.

NOMINAL COIL SIZE	H Double-Wall	J
*WU_0502__	35 1/2	25 1/4
*WU_0503__	47 1/2	37 1/4
*WU_0504__	59 1/2	49 1/4
*WU_0505__	71 1/2	61 1/4
*WU_0506__	83 1/2	73 1/4
*WU_0507__	95 1/2	85 1/4
WU_0602__	36 3/4	23
WU_0603__	48 3/4	35
WU_0604__	60 3/4	47
WU_0605__	72 3/4	59
WU_0606__	84 3/4	71
WU_0607__	96 3/4	83
WU_0802__	49 1/4	34
WU_0803__	61 1/4	46
WU_0804__	73 1/4	58
WU_0804__	85 1/4	70
WU_0806__	97 1/4	82
WU_0807__	109 1/4	94
WU_1002__	52 3/4	34
WU_1003__	64 3/4	46
WU_1004__	76 3/4	58
WU_1005__	88 3/4	70
WU_1006__	100 3/4	82
WU_1007__	112 3/4	94
WU_1202__	68	45
WU_1203__	80	57
WU_1204__	92	69
WU_1205__	104	81
WU_1206__	116	93
WU_1207__	128	105
WU_1402__	70 3/4	45
WU_1403__	82 3/4	57
WU_1404__	94 3/4	69
WU_1405__	106 3/4	81
WU_1406__	118 3/4	93
WU_1407__	130 3/4	105
WU_1602__	72 3/4	44
WU_1603__	84 3/4	56
WU_1604__	96 3/4	68
WU_1605__	108 3/4	80
WU_1606__	120 3/4	92
WU_1607__	132 3/4	104

* 5" heat exchangers are equipped with flat heads instead of SE heads

CAP/BONNET CONFIGURATION





Non-standard horizontal rack mount design.

High Efficiency ASME Condensing Boiler

The Atlas Series condensing boilers perform dependably and quietly, offering the highest efficiency solutions for space heating, domestic and process hot water, low temperature applications such as snow melting, pool heating and low temp building loops. Modular design, low emmissions, advanced controls, and easy start-up make the Atlas Series the clear choice for all your high efficiency needs.

Heat Exchanger & Combustion Design

- All copper and bronze piping
- ASME Section IV H or HLW rated to 160 psig, 250º F / 210ºF
- Front removable heat exchanger
- Variable speed combustion blower control and speed feedback signal for assured low fire light off and high fire pre and post purge
- Sealed combustion chamber for increased efficiency, reduced emissions and multiple venting configurations
- Low NOx, high efficiency knit metal fiber burner
- Powerful blower allows up to 100 feet of equivalent vertical exhaust venting without adjustments (1 elbow = 10ft)
- Honeywell Air-Fuel Ratio Valve and Venturi
- Replaceable Air Intake Filter

Control Specification

- Flame Safe Guard Controller with integrated operating, modulating & high limit safety controls
- Touchscreen operator interface panel to monitor boiler status, lockouts, alerts, flame signal, and control temperatures as well as configure boiler settings
- 4 to 20mA signal input for remote modulation
- Digital input for remote reset and time of day setback
- Modbus RS485 communication allows access to operating, safety and burner data
- Lockout and safety alerts history record contains up to 15 detailed snapshots of the system when lockout occurred
- Dual PID Load Combination control system for Central Heat and DHW loop
- Interrupted pilot with spark ignition & air cooled UV scanner for monitoring pilot & main flame
- Three single element temperature sensors for: Inlet, Outdoor & DHW temperature
- Two dual element safety limit (UL 353) temperature sensors for: Outlet and Stack temperature
- Outdoor Reset Control with programmable heating curve
- Algorithm prioritization for burner demand (Central Heating, DHW and Frost Protection) and firing rate limit (Stack and Boiler Delta-T)
- Programmable safety and boiler protection features for: Frost protection, Slow Start, Delta-T Limit, Stack T Limit, Boiler T Limit, and DHW T Limit
- Pump control contacts for Central Heat, DHW & System Pumps w/ purge time control & frost protection (pump included as additional option)
- Three levels of password protection for end user, installer/service engineer and manufacturer
- Additional interlock terminals for Pre-Ignition, Recycle and Lockout Interlocks

Operator Interface *(Optional)*

- System Operator Interface color touch screen display allows advanced configuration settings, remote monitoring, fault history, diagnostics, trend analysis and lead lag sequencing control of each boiler on multiple boiler configuration system

Control Options *(Optional)*

- Communication Gateway Package
- Annunciation Lamp Package
- Sensor Package
- Alarm Bell with Silencing Circuit
- Building Automation Relay
- Smart Boiler Control System™

Jacketing and Installation

- Standard stainless steel indoor
- Hinged front and top access panels
- Easy installation with just a pallet jack
- Stainless steel or galvanized outdoor *(Optional)*
- Red powder-coat with brushed aluminum door on A200-A300 only *(Optional)*

Optional red powder jacket and brushed aluminum door

SPECIFICATIONS	A050	A075	A100	A150	A200	A250	A300
Input (BTU/hr)	500,000	750,000	1,000,000	1,500,000	2,000,000	2,500,000	3,000,000
Output (BTU/hr) @ 50ºF Input	470,000	705,000	940,000	1,410,000	1,880,000	2,350,000	2,820,000
Dimension (W x D x H)	29" x 34"x 54"	29" x 34" x 54"	29" x 34" x 54"	29" x 34" x 69"	34½" x 39" x 70"	34½" x 39" x 79"	34½" x 39" x 87"
Footprint (Sq.ft.)	6.85	6.85	6.85	6.85	9.35	9.35	9.35
Recommended Flow Rate	50 gpm	50 gpm	50 gpm	50 gpm	100 gpm	100 gpm	100 gpm
Pressure Drop	9 feet	12.5 feet	14 feet	15 feet	15 feet	17 feet	18 feet
Turndown	3.5:1	5:1	7:1	7.5:1	6.5:1	7:1	7.5:1
NOx Emissions @ 3% 0_2	<9 ppm						
Min. Inlet Water Temp. Req.	NONE						
Max. Equivalent Exhaust Venting	100ft.						
Mountable on Combustible Flooring	YES						
Sealed Combustion Chamber	YES						
Pre-mix Combustion	YES						
Vent Size (Intake / Exhaust)	4" / 6"	4" / 6"	6" / 8"	6" / 8"	8" / 10"	10" / 12"	10" / 12"
Gas Connection Size	1"	1"	1"	1¼"	1¼"	1¼"	1¼"
Water Connection Size	2"	2"	2"	2"	2½"	2½"	2½"
Gas Pressure Required	5-14" WC						
Firing Mode	Full Modulation						
Condensing	YES						
Water Volume (Gal.)	2.9	4.2	5.5	7.6	10.4	12.9	15.4
Max. Thermal Efficiency (25%)	98%[1]	98%[1]	98%[1]	98%[1]	98%[2]	98%[2]	98%[2]
Max. Thermal Efficiency (100%)	94%[1]	94%[1]	94%[1]	94%[1]	94%[2]	94%[2]	94%[2]
Electrical Requirements	120V 60Hz 1Ph						
Amperage (Without / With pump)	10A / 18 A	10A / 18A	10A / 18A	15A / 23A	15A /23A	15A / 23A	15A / 23A
Minimum Circuit Ampacity	6	6	6	11	15	15	15
Maximum Over Protection	10	10	10	15	20	20	20
Shipping Weight (lbs.)	875	915	1000	1125	1550	1692	1945

1. Based on 50ºF inlet water at 50GPM. Actual efficiency may vary with operating conditions.
2. Based on 50ºF inlet water at 100GPM. Actual efficiency may vary with operating conditions.

All dimensions are inches are approximate and subject to change. All weights are approximate. For weight critical applications, consult factory.

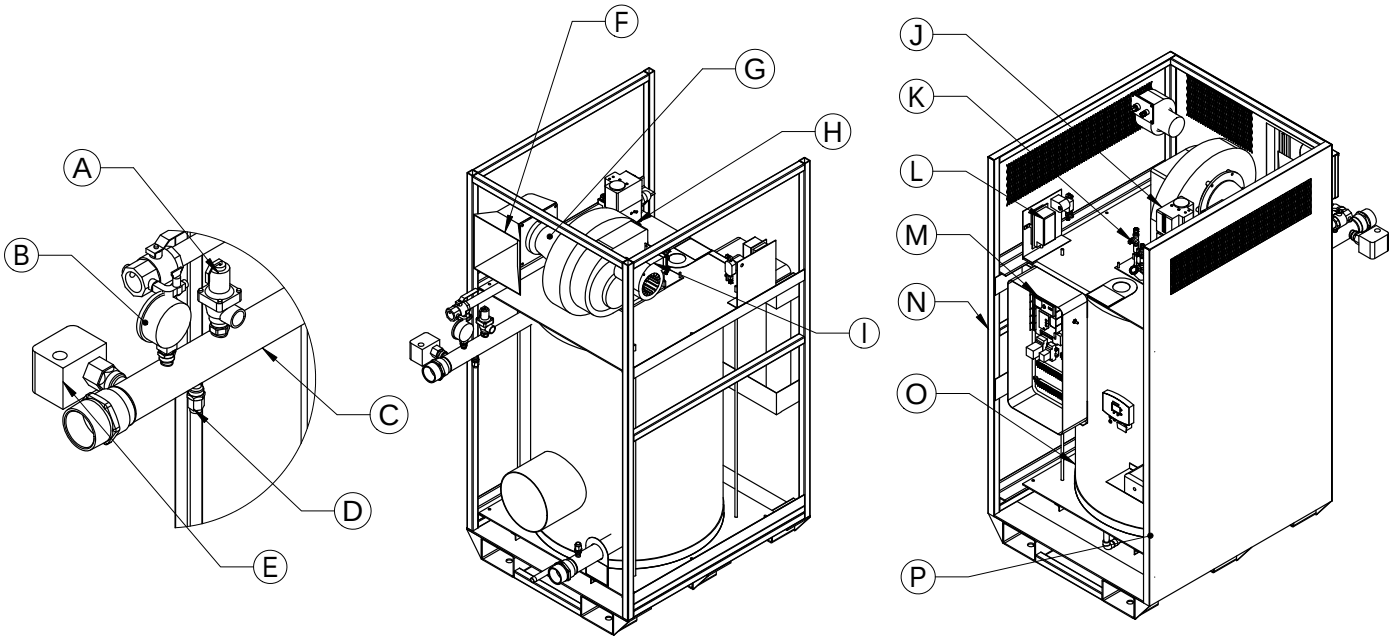
- Up to 98% Thermal Efficiency
- Seven models from 0.5 to 3.0 MBTU input
- Up to 7.5:1 turndown (see Turndowns, page 91)
- Single pass copper finned heat exchanger
- Full modulation, consistent emissions with NOx <9 ppm and clean light off
- Small footprint

The Atlas line of condensing boilers features Honeywell's advanced SOLA controls. SOLA provides the user with full control of boiler settings from a single, user friendly interface. By integrating numerous functions into a single compact device, SOLA offers an increased range of programming functionality while reducing the need for excessive wiring and cutting installation time. The unit offers central heating and domestic hot water modes, both with demand prioritization. Among the many programmable features are flame safeguard, pump control, central heating / domestic hot water high limits, PID load control and operating controls. SOLA's advanced capabilities and numerous programming options allow you to increase efficiency, lower your fuel costs and emissions, and reduce your environmental impact.

Honeywell SOLA Components

Description of Items

A. Relief Valve
B. Temp and Press Gauge
C. Manifold
D. Temperature Sensor
E. Flow Switch
F. Air Intake
G. Venturi
H. Blower
I. Pilot Blower
J. Fuel-Air Ratio Valve
K. Pilot Assembly
L. Air Flow Switch
M. Control Box
N. Steel Frame
O. Heat Exchanger Jacket
P. Outside Jacket



- All copper and bronze construction
- ASME Section IV (H-Stamped or HLW-Stamped) rated to 160 psig, 250º F / 210º F
- Front removable heat exchanger
- Honeywell air-fuel ration valve and venturi
- Seal combustion chamber
- Replaceable air intake filter
- Variable speed combustion blower motor
- Ceramic coated heat exchanger
- Low NOx, high efficiency knit metal fiber burner
- Available in natural gas, LP gas or combination

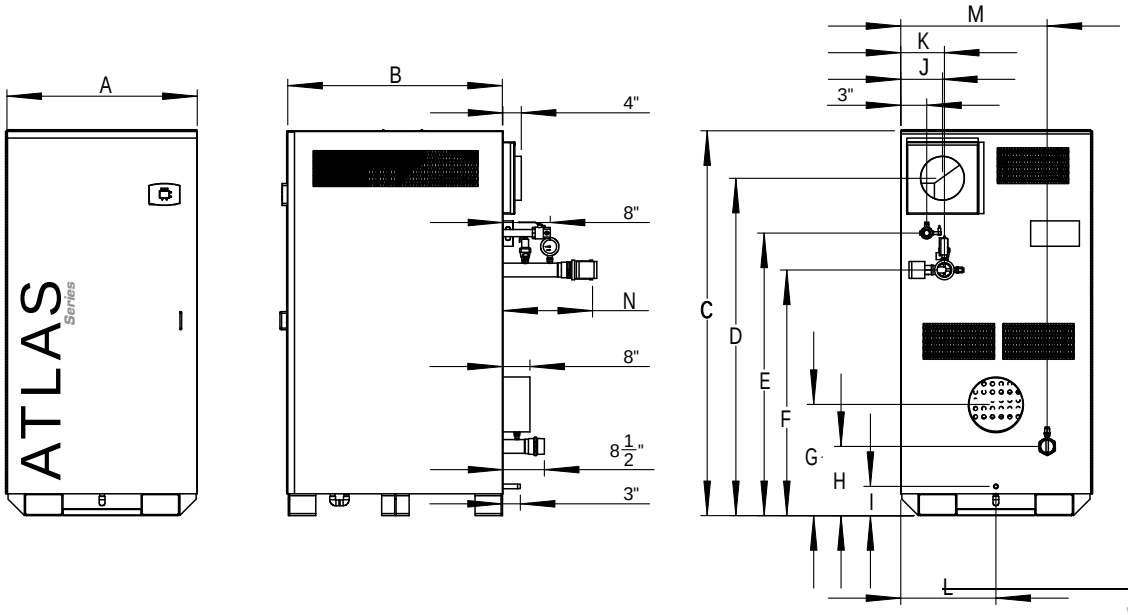
The burner surface is made from a special iron-chromium alloy knitted metal fiber material. The three-dimensional knitted structure increases heat transfer while maintaining a low surface temperature. It is elastic and highly flexible, which reduces stress and increases its resistance to thermal expansion. The structure also has relatively large pores that prevent it from becoming clogged by contaminants. The result is a robust and reliable burner that will last the life of the boiler.

MODEL[1]	A WIDTH	B DEPTH	C WIDTH	D AIR INTAKE	E GAS INLET	F HOT OUT	G EXHAUST VENT	H COLD IN	I COND DRAIN	J AIR INTAKE	K HOT OUT	L DRAIN / EXHAUST	M COLD IN	N HOT OUT
A050	29	34	54	48	41	36	29	24	18	6 1/2	8	14 1/2	21	13 1/2
A075	29	34	54	48	41	36	22	18	11	6 1/2	8	14 1/2	21	13 1/2
A100	29	34	54	48	41	36	17	11	5	6 1/2	8	14 1/2	21	13 1/2
A150	29	34	69	57	53	46	17	11	5	6 1/2	8	14 1/2	21	13 1/2
A200	34 1/2	39	70	58	52	45	20	13	5	7 1/2	8	17 1/4	27	15 1/2
A250	34 1/2	39	79	70	60	53	20	13	5	7 1/2	8	17 1/4	27	15 1/2
A300	34 1/2	39	87	79	69	62	20	13	5	7 1/2	8	17 1/4	27	15 1/2

1. Dimension for stainless steel or galvanized jacket. All dimensions are in inches, are approximate and subject to change. For critical dimensions, consult factory.

MODEL[2]	A WIDTH	B DEPTH	C WIDTH	D AIR INTAKE	E GAS INLET	F HOT OUT	G EXHAUST VENT	H COLD IN	I COND DRAIN	J AIR INTAKE	K HOT OUT	L DRAIN / EXHAUST	M COLD IN	N HOT OUT
A200	34 1/2	42	70	58	52	45	20	13	5	7 1/2	8	17 1/2	27	15 1/2
A250	34 1/2	42	79	70	60	53	20	13	5	7 1/2	8	17 1/2	27	15 1/2
A300	34 1/2	42	87	79	69	62	20	13	5	7 1/2	8	17 1/4	27	15 1/2

2. Dimension for red powder-coat and brushed aluminum door. All dimensions are in inches, are approximate and subject to change. For critical dimensions, consult factory.



ASME

ASME

ETL Listed

ETL Canadian Listed (GAS & LPG Only)

CSA CAN1-3.1-77 Compliant

UL 795 Compliant

Smart **Boiler Control System**™

for HVAC Professional

Smart Boiler Control System™ developed by Ajax Boiler is a factory supplied monitoring system that allows easy monitoring of boilers and heaters using a web-based system. The system allows users or operators to access a wealth of real time information about the status of their boilers. It instantly alerts the operator in the event of a fault. All system features are accessed through our user-friendly website that makes it easy to locate and track your information. The Smart Boiler Control System™ offers users the level of functionality typically associated with advanced building automation systems (BAS), which can be a major benefit for those who simply want to remotely monitor and analyze their system in a manner that does not require the cost and complexity of installing BAS systems.

User Interface and Features

The Smart Boiler Control System™ can be easily accessed at any time and in any place there is an internet connection through a standard web-browser. The system does not require special software to be installed on the operator's computer. Simply browse to the Ajax Smart Boiler Control System™ website and login. The intuitive user interface is password-protected and provides the user with a customizable interface to access multiple accounts with in a single login session.

The Smart Boiler Control System™ provides remote access to a large number of real time operating parameters. Data is uploaded to the system every 15 seconds and is refreshed on the Smart Boiler Control System™ website in 200 seconds intervals. The system currently has an uptime of 99% so you have instantaneous access to it at all times. The available data points are:

- Inlet Temperature
- Outlet temperature
- DHW Temperature
- Outdoor / Header Temperature
- Stack Temperature
- Safety Limit Input
- Interlock Input
- STAT Input
- TOD Input
- Main Valve Output
- Alarm Output
- Pilot Valve
- Pump Contacts
- Demand Source
- Cutoff Switch Status
- High / Low Gas Pressure Switch Status
- Blocked Drain Switch Status
- Water Flow Switch Status
- Air Flow Switch Status
- Lockout Message
- Setback Setpoint
- Active Setpoint
- On/Off Hysteresis
- Cycle Count
- Runtime
- Firing Rate
- Flame Signal
- FSG Status
- Demand Status
- Lockout Message

Ajax Smart Boiler Control System™ makes everything you want to know about your boiler system as easy as browsing a webpage. The website can be accessed anytime and anywhere from a computer or web-capable smart phone. Check the status and settings of your boilers in real-time.

A quick glance at the home page provides you with an overview of your vital system statistics. Detailed system information and analysis is only a click away.

System Infrastructure

The Smart Boiler Control System™ is a client-server based system designed around Cloud Computing Technology. Ajax equipment communicates with the SBCS™ server over the internet using the AMS100 communication hardware developed by Ajax Boiler. The AMS100 is factory mounted and pre-wired on the equipment. The AMS100 can communicate with up to 8 individual units using a daisy chain network. Installation is easy and efficient: just connect the unit to the internet using a standard CAT5 cable or connect to a wireless network using a Wi-Fi Ethernet Bridge - no additional controllers, dedicated servers, integration by third party contractors or dedicated workstations are required.

Real Time 24/7 E-Mail and Text Message Alert System

With the Smart Boiler Control System™, protecting your investment and keeping your boiler running in top condition could not be easier. In the event of a fault or lockout, the system will instantly send a message to the operator or supervisor. Users can choose to be alerted via e-mail, text message or both based on their preference. The alert message provides the user defined account name, the lockout message, troubleshooting steps and a link to the Smart Boiler Control System™ lockout history log. The SBCS™ website maintains a history log of alerts and service calls. The system can provide any of the following alerts:

- Internal Hardware Fault
- Sensor Fault
- Interlock On/Off
- Outlet High Limit
- FSG Lockout Alert
- DHW High Limit
- Delta-T Limit
- Flame Failure Alert
- Cycle Count Alert
- Data Connection Alert **and more...**
- Runtime Alert
- Stack High Limit
- Flame Detected Out of Sequence
- Flame Lost in Run
- Blower Proving Failed
- Invalid FSG Setting Fault
- Ignition Failed
- Outlet High Limit

Energy Monitoring Capability

The Smart Boiler Control System™ allows you to monitor and trend energy usage for the whole system, for individual boilers within the system or by application. The energy analysis and trending tool can be a powerful tool to help you adjust system parameters to provide the most efficient and economical energy consumption. Reports can be generated in monthly, daily or hourly intervals, according to the user's preference.

Energy Monitoring Tools:

- Internal Hardware Fault
- Peak Load Analysis
- System Analysis
- Estimated BTU Usage
- Output Loading Analysis

Trending Data Points:

- Inlet Temperature
- Outlet Temperature
- DHW Temperature
- Header / Outdoor Temp.
- Stack Temperature
- Delta-T Temperature
- Service History
- Cycle Count
- Runtime
- Firing Rate
- Flame Signal
- Estimated BTU Usage
- Lockout History
- Data Connection Rate

Turndowns on Condensing Units

Objectivity (or lack thereof):

The first critical point is that most equipment manufacturers are good marketers, therefore some are less than totally objective. Specifiers should look beyond the claims being made and ask the tough questions about how this equipment will actually perform in the environment the equipment is going to live and operate in.

Like most hot topics, there is usually a good explanation for things, if one would only take the time to look for them.

High Turndowns and Condensing Boilers

Most manufacturers make (sometimes extravagant) claims about the advantages of their proprietary turndown capabilities. Perhaps it is appropriate to discuss high turndowns and condensing boilers in terms of plain old chemistry and physics. We'll include relevant charts here to help you see how combustion efficiency directly impacts the game when it comes to condensing boilers and their ability to maintain a high efficiency level. We need to be sure to include Water Vapor Dew Points in this discussion, because that is the "elephant-in-the-room", as they say.

Our setup

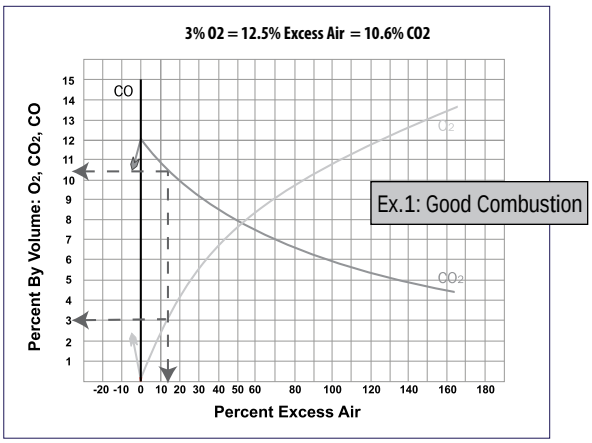
Example 1: You have really good combustion when you have a 3% Oxygen level. Looking at the Good Combustion graph, you can see that the Volume Percent of O_2, CO_2, and CO levels are measured on the y-axis, and the Percent of Excess Air is measured on the x-axis. Following the green dotted lines, we see that with a 3% O_2 level we have approximately 12.5% Excess Air, and approximately 10.6% CO_2.

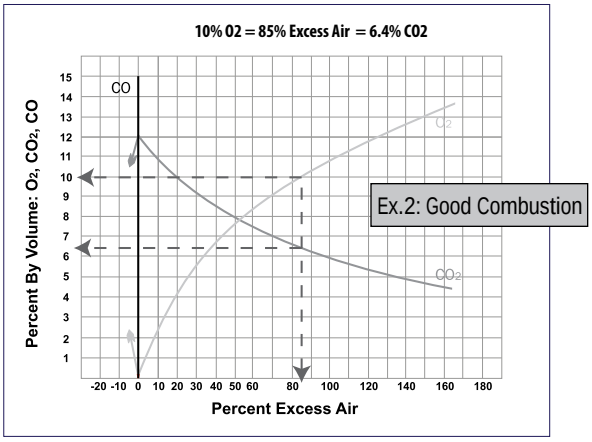
Example 2: Here you have inefficient or bad combustion that has 10% Oxygen. Using the same methodology as above, we look at the Bad Combustion graph where we have redrawn our green lines to correlate with the 10% O_2, and we find that we have ~ 85% Excess Air and ~ 6.4% CO_2.

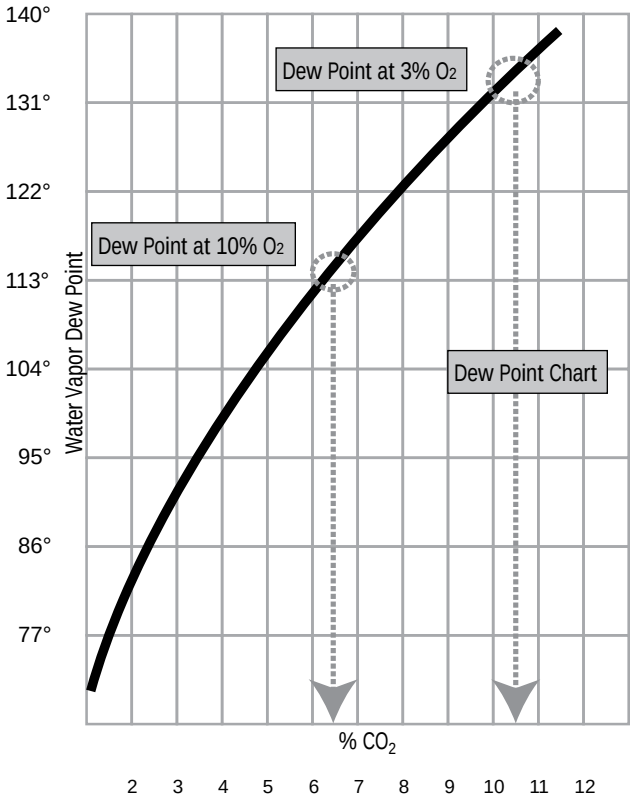
Dew point - the crux of it all

Looking at the Dew Point Chart for example 1 (good combustion), we see that 10.6% CO_2 has a dew point of ~133°. That is the temperature we begin to condense water vapor out of the flue gas. In example 2, with the bad combustion, we saw combustion with 6.4% CO_2, and looking at the Dew Point Chart, we see this has its dew point at ~114° before condensation can begin. I am willing to bet that your building's water comes in below 133° more often than it comes in below 114°, so your opportunity to condense is much greater with the higher combustion efficiencies.

It's important to remember that commercial boiler manufacturers achieve high turndown by adding lots and lots of excess air as you modulate to low fire. As the charts show us, the more excess air, the lower the dew point. It's the amount of excess air they have to add to get to the really low firing rates that creates the problem.







Caveats

The units we are discussing here, condensing type boilers, have high turndowns that don't come about by magic. They add excess air -- and lots of it -- to get the burner down that low. And that's the heart of the problem. High excess air equals low dew point and that equals less condensing hours in a heating season.

Now if you get the water cold enough, it doesn't matter how bad your combustion is. But most of the time, the heating system won't have water in it that's cool enough to cause condensation when the excess air levels are so high at lower firing rates.
Don't get us wrong, we do know reasonable turndowns are desirable to avoid excessive cycling (which will also reduce your efficiencies). For most of these units, a turndown in the range of 5:1 is more than adequate yet attainable without sacrificing for higher excess oxygen levels. This is the "sweet spot" range for peak performance.

Industrial sized boilers have industrial burners that manage the higher turndowns without the high levels of excess oxygen – but those industrial units are beyond this scope of discussion. Here, our focus is on the smaller (0.5 – 6M BTUs) condensing units built for commercial applications.

Extremely High Turndowns

Now that we have established the correlation between dew points and combustion efficiencies, let's wrap this up by seeing what happens with extremely high turndowns. Generally speaking, at high turndowns, the low fire combustion efficiency is poor, so the dew point will be lower than the water temperature. Extremely high turndowns will not let your condensing boiler condense, simply because the dew point will be too low. Operating a condensing boiler at high turndowns causes you to lose your opportunities to condense.

How to win when specifying or buying a condensing boiler

You maximize efficiency by getting the highest dew points for the greatest percentage of condensing hours possible. The dew point chart for natural gas is your reality check - there is a direct relationship between dew point and combustion efficiency: the higher the dew point, the higher the number of hours you will have in any given season where your boiler can condense. Ask your sales representative about combustion efficiencies (your O_2 levels) at specific turndown rates, and see where your dew point will be.

Most manufacturers list their efficiency levels at a specified turndown ratio. This information is normally listed in their Operations Manual, not in their sales brochure. We suggest you ask for it before you decide which manufacturer you should specify. This simple question will get you the answer you need to make an intelligent choice: "What is the efficiency of your condensing boiler at an "X" to 1 turndown"?

An effective condensing boiler application will include excellent heat transfer, with good combustion performance throughout the firing range and an achievable turndown ratio of 5:1 or greater. Any good manufacturer sales rep will provide you with the documentation you require. From there, you can determine the best course of action for your condensing applications.

FACTORY LIMITED WARRANTY POLICY. The Ajax Boiler Factory limited warranty provides assurance that all products are free from manufactures defects at the time of shipment and meet specifications and performance described in the product literature. It is important to understand the difference between a factory warranty and an installed warranty. There are many factors that can occur to the products after they are shipped that the company has no control over and cannot fully verify. These include:

1. Hidden damage during the shipping
2. Handling damage
3. Damage during storage
4. Installation conditions
5. Other unknown variables in the system design, operations, maintenance, pulsation and vibrations.

The installed warranty is the responsibility of the architect, specifying engineer, contractor and or owner who jointly have control over the application, installation, location, operating and maintenance conditions. The AJAX BOILER INC. warranty excludes extended liabilities. Extended liability typically occurs when products are installed without proper drainage, flooding containment or when safety devices are not tested and repaired or replaced when needed. Product problems are often caused by the condition of the water, the lack of water treatment and or the improper treatment of the water, insufficient combustion air, improper draft conditions, bolts not re-tightened, pipes not flushed and cleaned of oil, metal chips, rags, vibration and pulsation etc. These are installation, operating and/or maintenance conditions that are beyond the seller's responsibility and are not covered by the factory warranty, but may be covered by the installer's warranty. The factory warranty covering company products is based upon extensive product development and testing. Combustion products under go certification testing and approvals to Underwriters Laboratory standards. Auditing of the production of combustion products is conducted by a nationally recognized testing laboratory. Pressure vessel products are designed and manufactured to American Society of Mechanical Engineering (A.S.M.E.) and National Board (NB) Design standards. Design reviews, factory product manufacturing quality inspections and testing are carried out by a third party National Board authorized inspection agency. AJAX BOILER INC. products have proven themselves in service for over 85 years which indicates that the company products perform exceedingly well when normal installation, operating and maintenance conditions exist. The following is a review from the terms and conditions of sale. Also included in paragraph two, below, is the AJAX BOILER INC. non-conformance policy.

1. AJAX BOILER INC. warrants its products against defective material and/or workmanship only. The warranty does not apply to operational failures, electrical failures, gasket leaks, and or other malfunctions caused by improper application, installation and or maintenance.
2. It is the buyer's responsibility to inspect and accept the product, when received, as conforming to their purchase order, specifications and approved drawings. All claims for non-conformance, errors, shortages, etc. must be made within 10 days after receipt of the shipment.
3. AJAX BOILER INC. do not provide a warranty or guarantee, express or implied, in any manner, form, usage of trade, merchant-ability or fitness which extend beyond the product description and quotation.
4. AJAX BOILER INC. liability is limited to the factory repair or replacement of warranty failures, or non-conformance, upon the return of the product to the factory.
5. AJAX BOILER INC. is not liable for any direct or consequential damages.
6. The AJAX BOILER INC. warranty is based upon section 23161(2) of the uniform commercial code and is printed in the terms and conditions of sale which is referenced in every quotation, on the back of sales order acknowledgements and invoices. It is legally correct and is an industry standard policy.

THERMAL SHOCK. In addition to our standard one (1) year warranty against defective parts and workmanship, AJAX BOILER INC. provides the following guarantee with all commercial hot water, forced circulation, space heating boilers: AJAX BOILER INC. guarantees this new boiler pressure vessel for twenty (20) years after date of installation from damage due to thermal shock. Thermal shock occurs when cold makeup water, up to 150°F less than the boiler water outlet temperature, is added directly into the boiler while the boiler is operating within the normal temperature range from 140°F to 250°F with a temperature rise from 20°F to 40°F. This guarantee shall cover damage to the boiler tubes, tube headers, and tube sheets when such damage is attributed to unequal expansion, poor circulation and/or other causes quite often described as "thermal shock." This guarantee does not cover damage or failures that can be attributed to corrosion, condensation, scale, boiler treatment chemicals, dirt accumulation, low water conditions, or any other abnormal operating conditions. The liability of AJAX BOILER INC. is limited solely to the replacement of the complete pressure vessel, with tubes, if found by our inspection to be damaged by thermal shock. In no event shall AJAX BOILER INC. be held liable for replacement labor charges or for freight or handling charges.

LIMITED WARRANTY

AJAX BOILER INC. provides a limited warranty on its products against defective material and/or workmanship only. This limited warranty is not applicable to operational failures, electrical failures, gasket leaks, wear or malfunctions caused by improper application, installation, and/or maintenance.

The following Limited Warranty periods are from date of shipment:
Boiler Pressure Vessels: One year.
Carbon Steel Tank and Heat Exchanger Pressure Vessels: One year.
Stainless Steel Tanks: Three years.
Boiler Copper Fin Coils: Three years.
Single-Wall or Double-Wall Tank/Exchanger Coils: One year.
Single-Wall or Double-Wall Mini-Packs: One year.
Atlas Series Condensing Boiler: One Year.
Linings: (Pro-Rated Warranty)
Section VIII Tanks: Glass 36" dia. and above (five years).
Glass 30" dia. and under (one year).
Cement (five years).
Prekrete (ten years).
In Section IV Tanks: Glass (one year).
Controls: Components manufactured by other than AJAX BOILER INC. such as controls, instruments, forced draft burner, etc., provided with the boilers and packaged products are not covered by the AJAX BOILER INC. Warranty. However, AJAX BOILER INC. extends to the customer the same warranty provided by the manufacturer to AJAX BOILER INC. The customer shall receive the full benefits of adjustments made to AJAX BOILER INC. by the manufacturer.

5 YEAR PRO-RATED WARRANTY ON ACE GLASS, AND ATAHCO CEMENT LINED SECTION VIII TANKS. 1 year warranty on Glass-lined Section IV tanks. **10 YEAR PRO-RATED ON PRE-KRETE LINED SECTION VIII TANKS.** The Company sells its products under warranty furnished with the products against any defect in workmanship and for materials provided said products are operated in accordance with and maintained under conditions normal to the coded standards and requirements for which they are manufactured and intended. Warranty not applicable if electrolysis condition or abnormal water condition exists. ACE requires paid receipts to show maintenance of anodes in Glass lined tanks. In the event of any required adjustment ACE will replace or repair, without charge, any defective part or material during the warranty period as it may deem necessary for the efficient operation of the equipment. F.O.B. factory. Warranty does not include any gasketed areas. All gaskets require jobsite inspection prior to installation plus bolt tightening during start and heat up as well as continuing maintenance. This warranty does not cover the cost of installation, removal, or installation of the warranted item during the warranty period. The Company does not agree to furnish labor without charges. Nothing in the warranty set out hereinabove is to be interpreted as extending liability of the Company beyond replacement of parts and materials and no liability shall be incurred by the Company for injury to person or property or economic loss by reason hereof.

Any claim for adjustment under this limited warranty must be made within the warranty period. AJAX BOILER INC.'s liability shall be limited to factory repair or, at AJAX BOILER INC.'s option, replacement of all parts which, upon test and examination by AJAX BOILER INC., prove to be defective material and or workmanship and within the above limited warranty. If required by AJAX BOILER INC., parts which are claimed to be defective must be promptly delivered to the AJAX BOILER INC. facility, transportation charges prepaid. This warranty does not cover the cost of labor, removal, or installation of the warranted item during the limited period. This warranty is limited to the above and applies only for the period set forth. AJAX BOILER INC. will not be liable for any loss damage, direct, incidental or consequential damages of any kind, whether based upon warranty, contract, negligence or strict liability and arising in connection with the sale, use or repair of the products. AJAX BOILER INC.'s maximum liability shall not exceed the contract price for the products or component claimed to be defective or unsuitable. AJAX BOILER INC. does not warrant the product's merchantability or fitness for any particular purpose and in no event shall be held responsible for any consequential damages.

For complete Limited Warranty conditions see Section G and H under terms and conditions of sale.

ATLAS WARRANTY

Ajax Boiler Inc. warrants the original owner that all parts of this unit which are manufactured by Ajax Boiler Inc. will be free from failure under normal use and service for the specified warranty periods and subject to the conditions set forth in this warranty. Labor charges and other costs associated with the removal or installation, shipping, and transportation are not covered by this warranty.

The Atlas Series heat exchanger shall carry a standard 1 year warranty from installation or 18 month warranty from ship date, which ever comes first. This unit is warranted against any failure due to material defects or workmanship. The Atlas Series also carries a standard 20 year warranty against thermal shock.

The Atlas Series must be started up in accordance with the O&M manual and a combustion test must be done at start-up and repeated yearly with adjustments being made to match the range of the original factory settings. In the event of a failure, these documents must be available to validate the warranty. In addition, all necessary service of the unit as outlined in the manual must be performed as specified.

Components manufactured by other than Ajax Boiler Inc. such as controls, instruments, forced draft burner, etc., provided with the boilers and packaged products are not covered by the Ajax Boiler Inc. Warranty. However, Ajax Boiler Inc. extends to the customer the same warranty provided by the manufacturer to Ajax Boiler Inc. The customer shall receive the full benefits of adjustments made to Ajax Boiler Inc. by the manufacturer. In addition, any alterations done to the nameplate or heat exchanger will void the warranty. Ajax Boiler Inc. will repair, rebuild or exchange the heat exchanger once the heat exchanger is sent back to the factory for inspection.

This warranty is limited to the above and applies only for the period set forth. Ajax Boiler Inc. will not be liable for any loss damage, direct, incidental or consequential damages of any kind, whether based upon warranty, contract, negligence or strict liability and arising in connection with the sale, use or repair of the products. Ajax Boiler Inc.'s maximum liability shall exceed the contract price for the product's merchantability or fitness for any particular purpose and in no event shall be held responsible for any consequential damages.

An extended 7-year heat exchanger warranty to the customer follows the same conditions as stated above and will be as follows:

Year	Discount
1-5	100%
6	50%
7	25%

MINI-PACK WARRANTY

EXTENDED WARRANTY 10 OR 10/20 (TUBE/SHELL)

This warranty provides an optional supplement to the standard Ajax Boiler Inc. warranty and incorporates standard Ajax Boiler Inc. conditions for warranty consideration.

Ajax Boiler Inc. warrants the following components of the ACE Mini-Pack for a period of 10 or 10/20 years from date of invoice / shipment. Scope of warranty is as listed.

1. The ASME pressure vessel shell against leakage due to failure of welded shell assembly caused by defective materials and/or workmanship.
2. The tube bundle against leakage due to thermal shock or mechanical failure. Failure caused by corrosion, erosion or water hammer is excluded.
3. Control system parts manufactured by Ajax Boiler Inc. against mechanical defect and workmanship failure.
4. Excluded are any failures caused by alterations of the equipment or by improper installation, or abnormal operating conditions.

The above 10-year non-prorated warranty covers only material that is manufactured by Ajax Boiler Inc. directly. All items/parts not manufactured by Ajax Boiler Inc. are warranted for twelve (12) months from date of shipment.

In the even of a failure of any item during the warranty period, and the item meets the above-mentioned criteria, Ajax Boiler Inc. will, after receipt of the defective part for inspection, furnish a replacement item at no charge, F.O.B. Ajax Plant. Labor for installation of the replacement part is not included.

TERMS AND CONDITIONS OF SALE

A. Contract with Buyer.
   1. Orders from Buyer for Ajax Boiler Inc. / Ace Boiler Inc., d.b.a. (hereinafter referred to as "Ajax"), products are subject to acceptance by Ajax Boiler at its main office. No terms or condition in the Buyer's order are contrary to Ajax Boiler terms or conditions shall be binding on Ajax Boiler, unless specifically agreed to in writing.
   2. The Buyer may modify or cancel this order only upon written notice and payment to Ajax Boiler of reasonable charges. Non-cancelable items are those requiring special engineering, special machining and/or special handling, including non-stock Ajax Boiler catalog items.
   3. Buyer's orders are accepted by Ajax Boiler subject to credit investigation and approval.

B. Presupposed Conditions and Escalation:
   1. Ajax Boiler's quotation(s) is contingent upon exception taken by Ajax Boiler to specifications, delivery, price escalation and other variances to Buyer's requirements. The price terms, conditions and delivery quotations of some Ajax Boiler's suppliers vary on a day to day basis. Ajax Boiler reserves the right therefore to escalate the price and delivery of this quotation prior to award and acceptance of an order from Buyer. Ajax Boiler's price and delivery quotations are expressly made subject to the condition that Ajax Boiler has assumed no obligations for delay in delivery or non-delivery, in whole or in part, by Ajax Boiler or by Ajax Boiler's vendors or if performance as agreed has been made impractical by the occurrence of a contingency, the non-occurrence which was a basis assumption on which the contract was made within the meaning of Section 2615 of the Uniform Commercial Code.

C. Terms of Payments:
   1. All Credit orders are invoiced once the units are ready for shipping and the requested date is met.
   2. All Will Call orders are invoiced once the units are ready for shipping.
   3. Terms are, from date of invoice, 1% 10-Net 30 days, 0.5% 25-Net 30days. Interest at 1.5% per month will be charged on all past due accounts.
   4. There is a minimum order charge of $50.00 on parts.
   5. If, in Ajax Boiler's judgement, the Buyer's financial condition at any time does not justify the terms specified, Ajax Boiler may, in advance of shipment, require full or partial payment as a condition to commencing or continuing manufacturing, or if shipment has been made, recover equipment from the carrier.
   6. Ajax Boiler reserves the right to assign to any bank or financial institution, any contract, payment or monies due from any and all contracts by and between Buyer and Ajax Boiler.

D. Transportation:
   1. All Ajax Boiler products are inspected prior to shipment and are shipped F.O.B. point of shipment. Upon receipt all shipments should be examined carefully before acceptance. If carrier tenders delivery of goods in bad order, or if packages delivered do not check with number specified on freight bill and/or packing list, Buyer should request carrier's agent to make notation of conditions or shortages on delivery receipt (this will enable Buyer to obtain prompt payment of claim which must be filed by Buyer for damaged or lost material). Equipment must be inspected to confirm that the products received conform to the items purchased. Any non-operational warranty claims must be made within 30 days of receipt of equipment.
   2. Delivery to the initial carrier shall constitute delivery to Buyer. Ajax Boiler's responsibility ceases upon delivery in good order to such carrier and all equipment is shipped at Buyer's risk. It is the Buyer's responsibility to inspect and accept Ajax Boiler products as conforming to purchase order, specification and approved drawings. All claims for non-conformance must be made within 10 days after receipt of the material. Ajax Boiler will assume no liability for the labor charges or schedule delays.

E. Freight Policy:
   1. Standard Freight charges shall apply to the common carrier delivery point. Orders for shipment to remote locations that involve a Freight Forwarding charges will be charged the additional Freight Forwarding charges. Standard Freight charges do not apply if items are of configuration requiring special rates, or trailer, or permits.
   2. Freight charges on these items will be invoiced at actual freight costs incurred.

F. Law:

1. Any contract which may be finalized as a result of this quotation(s) shall be deemed to have accepted in the State of California and governed by the laws of the State of California and the Uniform Commercial Code.

G. Warranties:

1. WITHIN THE MEANING OF SECTION 2316(2) OF THE UNIFORM COMMERCIAL CODE THERE ARE NO WARRANTIES OR GUARANTEES, EXPRESSED OR IMPLIED IN ANY MANNER, FORM, USAGE OF TRADE, MERCHANT ABILITY OR FITNESS WHICH EXTEND BEYOND THE DESCRIPTIONS AND QUOTATIONS SUPPLIED.
2. LIMITATIONS: THE LIABILITY TO BUYER, IF ANY, AND THE REMEDIES OF BUYER AGAINST SELLER, IF ANY, INCLUDING DIRECT AND CONSEQUENTIAL DAMAGES, SHALL BE LIMITED TO THE RETURN OF THE GOODS, AT THE EXPENSE OF THE BUYER, TO AJAX BOILER INC. AT 2701 SOUTH HARBOR BLVD., SANTA ANA, CA 92704 WITHIN ONE (1) YEAR AND THE REPAIR OR REPLACEMENT OF NON-CONFORMING GOODS, OR PARTS, BY THE SELLER OTHERWISE SELLER SHALL NOT BE LIABLE FOR ANY DIRECT OR CONSEQUENTIAL DAMAGES TO THE BUYER.
3. INSPECTION AND ACCEPTANCE: AJAX BOILER'S QUOTATION(S) IS EXPRESSLY SUBJECT TO THE CONDITION THAT INSPECTION AND ACCEPTANCE OF ALL DELIVERABLE ITEMS SHALL BE AT AJAX BOILER PLANT AT 2701 SOUTH HARBOR BLVD., SANTA ANA, CALIFORNIA

H. Limited Warranty: (see catalog warranty section for further details)

1. AJAX BOILER WARRANTS ITS PRODUCTS AGAINST DEFECTIVE MATERIAL AND/OR WORKMANSHIP ONLY. THIS WARRANTY IS NOT APPLICABLE TO OPERATIONAL FAILURES, ELECTRICAL FAILURES, GASKET LEAKS, CORROSION AND OTHER MALFUNCTIONS CAUSED BY IMPROPER APPLICATION, INSTALLATION AND/OR MAINTENANCE. THE LIMITED WARRANTY PERIODS APPLY FROM DATE OF SHIPMENT.
2. ANY CLAIM FOR ADJUSTMENT UNDER THIS LIMITED WARRANTY MUST BE MADE WITHIN THE WARRANTY PERIOD. AJAX BOILER'S LIABILITY SHALL BE LIMITED TO REPAIR OR, AT AJAX BOILER'S OPTION, REPLACEMENT OF ALL PARTS WHICH, UPON TEST AND EXAMINATION BY AJAX BOILER, PROVE TO BE DEFECTIVE MATERIAL AND/OR WORKMANSHIP AND WITHIN THE ABOVE LIMITED WARRANTY PERIOD, IF REQUIRED BY AJAX BOILER, PARTS WHICH ARE CLAIMED TO BE DEFECTIVE MUST BE PROMPTLY DELIVERED TO THE AJAX BOILER FACILITY, TRANSPORTATION CHARGES PREPAID, THIS WARRANTY DOES NOT COVER THE COST OF LABOR, REMOVAL, OR INSTALLATION OF THE WARRANTED ITEM DURING THE LIMITED PERIOD.
3. THIS WARRANTY IS LIMITED SOLELY TO THE ABOVE AND APPLIES ONLY FOR THE PERIOD SET FORTH. AJAX BOILER WILL NOT BE LIABLE FOR ANY LOSS, DAMAGE, DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE OR STRICT LIABILITY ARISING IN CONNECTION WITH THE SALE, USE OR REPAIR OF THE PRODUCTS. AJAX BOILER'S MAXIMUM LIABILITY SHALL NOT IN ANY CASE EXCEED THE CONTRACT PRICE FOR THE PRODUCT OR COMPONENT CLAIMED TO BE DEFECTIVE OR UNSUITABLE.
4. AJAX BOILER RESERVES THE RIGHT TO RECOVER ALL EXPENSES WHICH MAY BE INCURRED IN THE DEFENSE OF CLAIMS MADE AGAINST AJAX BOILER.

PRICING POLICY

1. Price lists, quotations, terms and conditions of sale are subject to change without notice. All order received are subject to acceptance only at the general office of Ajax Boiler.
2. No merchandise may be returned without factory authorization. A 25% restocking fee charge will apply to authorized return goods shipped prepaid.
3. On the effective date of a price increase all new quotations and orders shall be at the new prices.
4. Orders from quotations made prior to the price increase date will be accepted at the latest prices in effect just prior to the increase, provided that the order is received within seven (7) days and then is released for production within three (3) weeks from the effective date of the price increase. Prices on all orders that are not released or are not scheduled for immediate production will be adjusted to the current price that is in effect at the time the order is released for immediate production.
5. There is a minimum order charge of $50.00 on parts.
6. All quotes and freight quotes are good for thirty (30) days.

The brand and product names contained within are trademarks or registered of their respective holders. Performance, dimensions, specifications are effective with date of issue and are subject to change without prior notice. AJAX BOILER INC. maintains a policy of continuous improvements and therefore reserves the right to change specification without notice. AJAX BOILER INC. cannot be responsible for errors in typography or photography.

PRODUCT SAFETY NOTICE

AJAX BOILER AND WATER HEATER PRODUCTS OPERATE AT HIGH TEMPERATURE AND PRESSURES AND NOT FOR INSTALLATION ON COMBUSTIBLE FLOORING.

- Before using this product, read and understand instructions. Save these instructions for future use.
- Before servicing, to prevent serious burns or injury, the boiler and water heater products must be cooled to less than 80°F (27°C) and the pressure must be 0 psi (0 bar).
- Turn off the electrical power before making electrical connections to prevent electrical shock.
- These products must be placed in a controlled location where untrained or unqualified personnel cannot access the operating or safety controls, must not be able to come in contact with high temperature or high pressure parts and must not perform maintenance or demolition work.
- All work performed must be by qualified properly equipped personnel trained in the proper application, installation, and maintenance or demolition of plumbing, steam, and electrical equipment and/or systems in accordance with all applicable codes and ordinances.
- Ajax Boilers and Water Heaters are complete package units with safety and operating controls and are constructed with non ASBESTOS materials. Any replacement gaskets, refractory, insulation, etc used must not contain Asbestos.
- No additional insulation is required on the Boilers and Water Heaters.
- Additions or replacement of insulation on any connecting pipes or accessories to the Boilers and/or Water Heaters must be of "NON-ASBESTOS" and contain only non-hazardous materials.
- Crystalline Silica, a material known to cause cancer, may be encapsulated in some refractory or insulation materials and must be handled only by authorized trained personnel. Crystalline Silica as used is encapsulated and is not harm full in this form. Care must be taken during removal or replacement of refractory or insulation to remove it in bulk form and avoid generation or inhalation of dust. Removal must be properly performed by trained, qualified and equipped personnel. This is also true of Asbestos not contained in Ajax products but may be otherwise contained in replacement materials or parts, in connecting piping or other nearby products.
- All safety and operating controls must be set within the specified operating limits and tested periodically to assure proper operation. All limit and operating controls must be installed in series on the boiler.
- Connect drain pipes to a safe drain to prevent serious personal injury from relief valve discharge and or from boiler blow down discharge.
- After installation, check for proper operation of all limit and operating controls before leaving the site.
- Perform scheduled and annual inspections including checking controls for proper calibration and performance.

Failure to follow these warnings, to allow access by unauthorized persons and the use of non-properly trained and equipped personnel in the operation, service, modification, removal or demolition of these products or replacement of parts with non-authorized factory non-asbestos materials could cause damage, personal injury or death.

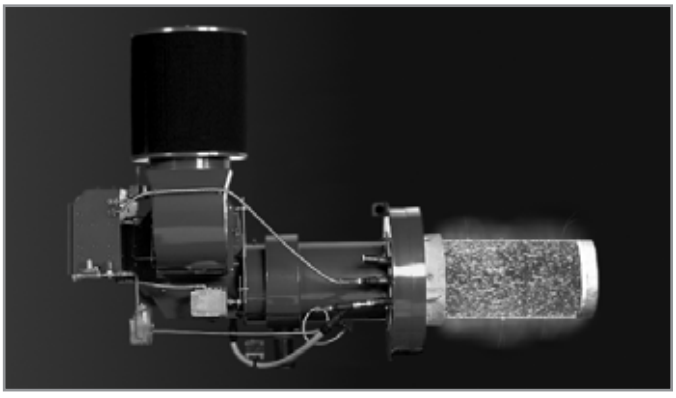
Induced Flue Gas Recirculation 30 ppm NOx System

The Ajax Series boiler flue gas recirculation system will burn natural gas or LPG at or less than 30 ppm NOx. On oil-fired units, NOx levels are reduced by 40%. The burner combustion air fan is used to induce the proper flow of flue gas into the combustion air within the burner housing. The result is a cooler flame temperature and a reduction of NOx. A separate flue gas damper assembly is mechanically linked to the burner flue/air control system in order to maintain proper NOx control throughout the firing range.

Concurrently, Ajax has built hundreds of forced draft flue gas recirculation packages using the Power Flame™ "Nova" burner system which continues to meet stringent 30 ppm NOx requirements. Also available in sub 9, 12 ppm NOx system and high turndown burners at 10:1 with adiabatic chamber (8:1 without adiabatic chamber).

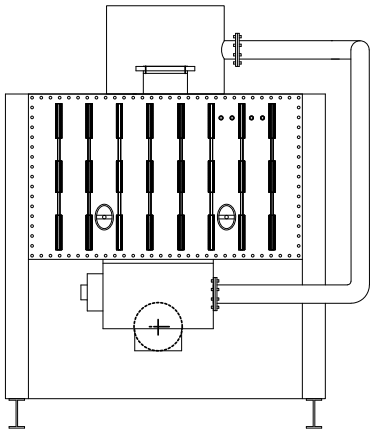
The **Power Flame NOVA Plus™** Combustion System employs a patented, fully premixed, surface stabilized combustion technology to provide proven ultra-low NOx solutions - Sub 9 to 12 PPM - for commercial, industrial, and process applications. Premixing fuel and air assures complete combustion with minimal levels of CO and unburned hydrocarbons. The all metallic firing head guarantees reliable and consistent performance at the operating conditions necessary to provide single digit NOx emissions. The NOVA Plus is a simple, cost effective, field proven system designed to meet today's most stringent emissions requirements.

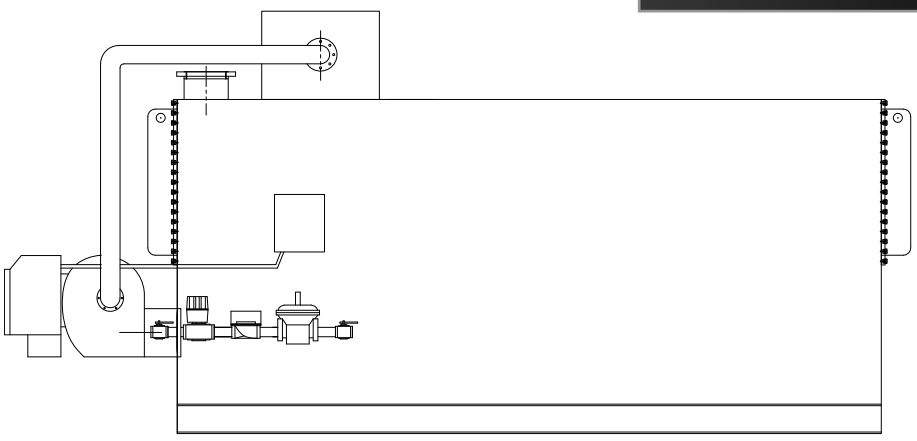
Power Flame™ provides a U.L. listed, factory tested package tailored to your job specific requirements. The NOVA Plus™ is suitable for use on watertube boiler applications. The NOVA Plus™ is fitted with a state of the art control system and integral panel. The self-compensating combustion control safety operates the burner and minimizes the start-up time.



Ajax Series Meets SCAQMD NOx Levels

For appropriate dimensions of all Low NOx Boilers, please refer to applicable tables of standard forced draft boilers.
Slight variance for IFGR piping - consult factory

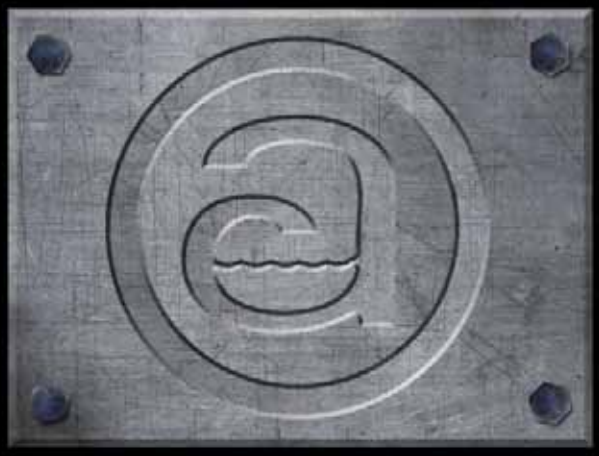




Anaheim Convention Center

The Anaheim Convention Center, home of the 2004 AHR Expo, recently celebrated the completion of a multi-year, $177 million redesign and expansion. The expansion increased the size of the convention center by 40% to 1.7 million sq.ft. With glass walls in the main lobby soaring an impressive 190 feet, the facility offers more than 800,000 sq.ft. of exhibit space, 200,000 sq.ft. of pre-function space, and 130,000 sq.ft. of meeting space. As part of the redesign, facility engineers needed new boilers to handle the facility's expanded space heating requirements.

Solution. Ajax Boiler supplied three Ajax Series WFG-11500 boilers (11.5 MMBTU/hr per unit). The facility manager uses the three boilers in a lead/lag configuration which gives the convention center the ability to turn boilers on and off to meet varying heat load requirements. Additional benefits include a substantial savings on gas expenses and the ability to shut down a single boiler for service without any interruption in heat for convention center attendees.



Efficiency and Endurance by Design.

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