Q90 125-200
Gas-Fired Direct Vent Condensing Hot Water Boiler

P/N# 240005688, Rev. 1.0 [10/05]

SPECIFICATIONS AND PERFORMANCE

90% AFUE Efficiency

ENERGY STAR

Available Heating Inputs of:

125 MBH through 200 MBH

Application – The Quantum 90-200 gas-fired direct vent cast aluminum hot water boiler is available in natural or propane gas with heating inputs of 125, 150, 175 and 200 MBH and an AFUE of 90% (Category IV Venting). The boilers can be used for a wide variety of applications (with or without zones) including radiant floor heating, snow melting, baseboard heating, standing cast iron radiators and coil units. All boilers are factory-assembled with controls and wiring, and tested to ensure dependable performance. The compact size allows for easy installation in a basement, a closet, or an alcove enclosure.

Benefits:
- 90% AFUE Efficiency dramatically reduced fuel consumption.
- ***Ideal for Use with Radiant Systems***: Efficiency is increased ***beyond*** 90% when used with low temperature systems.

Approvals – The cast aluminum boiler assembly is manufactured and tested in accordance with American Society of Mechanical Engineers standards (ASME), and certified by Canadian Standards Association (CSA) in the US and Canada. The Annual Fuel Utilization Efficiencies (AFUE) are based on US DOE test procedures and FTC labeling regulations. AFUE and I=B=R ratings are certified in accordance with standards set by The Hydronics Institute Division of the Gas Appliance Manufacturers Association (GAMA). The boiler has been assigned a New York City Materials and Equipment Acceptance (MEA) 218.98E.

Warranty – 15-Year Limited Heat Exchanger Warranty. All of our boilers are backed by Dunkirk's reputation for quality and service to our customers, based on over 75 years of successful hydronic experience.

FEATURES AND BENEFITS

"Mono Block" Cast Aluminum Heat Exchanger Assembly – One-piece design eliminates leaks that can occur between sections of multi-piece heat exchangers. The cast aluminum provides better heat transfer and thermal storage than similarly sized cast iron boilers which results in higher efficiency.

Benefit: One-piece heat exchanger eliminates leaks, cast aluminum for greater heat transfer, lighter weight for easier installation.

Cabinet :
- Constructed from heavy gauge steel with a baked-on finish
- Front door removable for easy access to boiler components
- Furnished with right side exhaust for gas, fresh air-in and fuel-in
- Top access for water supply and return
- Alternate openings also available for exhaust fuel-in, water supply or return

Benefit: Easy maintenance through the service door (attached with slam latches) which makes all controls easily accessible.

Gas Control Valve – The electronically controlled 24 Volt combination gas control valve is designed to meet the requirements for use with hot surface ignition systems found in the Q90. The valve is piped to the gas/air mixer and regulates the gas flow to the main burner of the appliance. It is suited for both natural and LP gas applications.

Low Water Cut Off –This unit is equipped with a Low Water Cut Off control that protects against dry firing. This control provides burner cut off if there is an unsafe water loss, which can result from a broken or leaking radiator, pipe, or boiler. A water/glycol mixture up to 50% concentration may be used with the Low Water Cut Off.

FEATURES AND BENEFITS *Continued*

Casting Temperature Safety Switch – In the event there is lack of water or too high temperatures in the boiler, the casting temperature safety switch (located on the top of the aluminum boiler section) shuts down the boiler by turning off power to the Integrated Boiler Control (IBC). To restart the boiler, verify that the boiler is properly filled with water and then manually reset the safety switch. **WARNING! NEVER RUN WATER INTO A HOT EMPTY BOILER.**

High Limit Aquastat Control – The high limit aquastat control determines the maximum boiler water temperature and also provides a means for protecting the boiler and heating system from unsafe operating conditions which could damage the boiler. The aquastat is tied in with the IBC and is factory set at 180°F (82.2°C) water temperature. The high limit set point is field adjustable and may be set anywhere between 100°F (37.8°C) and 200°F (93.3°C). The field set point adjustment for each installation depends on the heating system's requirements.

Hot Surface Igniter – The 120 Volt hot surface igniter heats up to 1,800°F (982.2°C) to initiate combustion of the gas in the burner. The igniter is mounted next to the burner through the gas/air mixer. The igniter also serves as a means for proving the main burner flame by flame rectification. In case of a lack of flame signal on three consecutive trials for ignition, the IBC will lockout.

Draft Inducer – (blower) draws in the outside combustion air to mix with gas, which flows into the pre-mix burner and combusts. The fan then forces the resulting flue gases from the boiler unit and providing a positive removal of the flue gases discharged through the vent piping to the outdoors.

Benefits:

- Cooled flue gas can be safely vented through easy to install economical CPVC and PVC.
- Sealed Combustion, Premix Gas Burner, and Low Flame Temperature which drastically reduces CO and NOx emissions, and contributes to a cleaner and healthier environment.
- Combustion Air is drawn directly from the outdoors (sealed combustion, "direct vent") and does not compete with building occupants for fresh air.

Differential Pressure Air Proving Switch – The diaphragm type differential pressure switches are connected by vinyl tubing to the gas valve and the air inlet connection on the negative side and the sight glass adapter on the positive side. The pressure switches monitor air flow by sensing the differential pressure measured in inches of water (" w.c.). The factory settings on these switches are 0.5" w.c. on the normally open switch and 3.5" w.c. for the normally closed switch. The contacts are normally open, but close when the draft inducer is running which causes the differential pressure at the switch to exceed the setting. The closed switch proves there is appropriate air flow for combustion. The pressure switch shuts off the main burner if the differential pressure is inadequate due to a blocked vent pipe, a blocked air intake, blocked boiler sections or a blocked draft inducer. After five (5) minutes of lack of the adequate differential pressure, the IBC will lockout. The "PURGE" indicator light will blink, indicating a failure to prove adequate combustion air flow or flue gas flow.

Integrated Boiler Control (IBC) – The Integrated Boiler Control operates the combustion air blower, the circulator pump and the hot surface igniter/flame sensor. The IBC contains four diagnostic indicator lights. For system operation and troubleshooting process.

Benefit: Simplified Controls with high limit and low water cut-off for operation safety and maximum reliability.

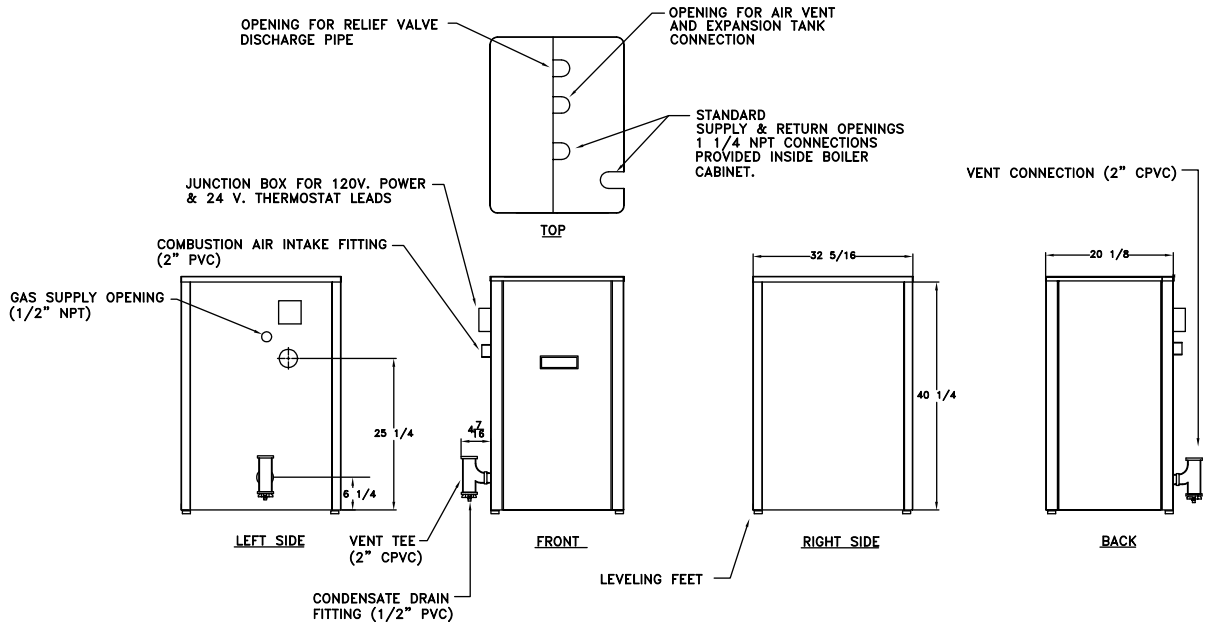
Circulator Pump – The water lubricated maintenance-free pump and isolation valves are furnished with a carton inside the boiler cabinet, and can be installed at the installer's preferred location. The isolation ball valves on the inlet and outlet of the pump eliminate the need to drain the heating system if pump servicing is required.

Drain Valve – The ¾" (19mm) drain valve is furnished on the front of the boiler. Any piping installed below the elevation of this drain valve will require additional drain valves to be installed at low points in the piping system in order to drain the entire system.

Relief Valve – The relief valve is furnished as standard on top of the boiler and provides for pressure relief of the heating system in case of abnormal operating conditions. The valve opens at 30 psig (201 kPa) and is ASME approved.

DIMENSIONS, STANDARD EQUIPMENT, CONNECTIONS & CLEARANCES

Ratings shown are for sea level applications. The boiler automatically derates input as altitude increases. No alterations to boiler are required for altitudes above sea level.



QUANTUM 90-200 STANDARD EQUIPMENT	
Aluminum Boiler with Painted Jacket.	**Completely installed and wired safety control system with burner consisting of:** • Microprocessor Based Integrated Boiler Control • Stainless Steel Premix Burner • Automatic Gas Valve • Hot Surface Igniter • Casting Temperature Safety Switch • Air Flow Proving Switches (2) • Forced Draft Blower
Hi Limit Aquastat	
Transformer	
1-1/4" Taco (or Grundfos) Circulator with Isolation Ball Valves	
Low Water Cut-Off	
Temperature and Pressure Gauge	
30 psi ASME Relief Valve	
Air Vent	
Service Switch	

CONNECTIONS
120 Volts AC, 60 Hertz, 1 Phase, Less Then 12 Amps
Vent Pipe & Air Intake Pipe: • Vent Pipe - First 5' is Schedule 40 2" CPVC (Provided), Then Schedule 40 3" PVC
• Air Intake - Schedule 40 3" PVC, Vent Length: - 6' Minimum - 60" Maximum
Water In/Out ..... 1-1/4" NPT
Gas In ..... 1/2" NPT
Condensate Drain ..... 1/2" NPT

BOILER CLEARANCES		
Unit	**Combustible Clearance**	**Accessibility, Cleaning, and Servicing**
Top	1"	8"
Left Side	8"	24"
Right Side	1"	-
Base	1"	-
Front	0"	24"
Back	1"	-
Intake/Vent Piping	0"	-
Near Boiler Hot Water Piping	1"	-

All distances measured from the cabinet of the boiler.

QUANTUM 90-200 BOILER RATINGS & CAPACITIES

Table #1 SEA LEVEL RATINGS (NATURAL AND PROPANE GASES)								
Model	Input (MBH)[1]	Heating Capacity (MBH)[1][2]	Net I=B=R Rating (MBH)[1]	Shipping Weight (lbs.)	AFUE [2]	Flue Diameter	Venting Length 3 in. Pipe	
							Minimum	Maximum
125	125	112.5	98	284	90	2" CPVC & 3" PVC	6 ft. in length plus four (4) 90° elbows	60 ft. in length plus four (4) 90° elbows
150	150	135	117	284	90	2" CPVC & 3" PVC		
175	175	157.5	137	284	90	2" CPVC & 3" PVC		
200	200	180	157	284	90	2" CPVC & 3" PVC		

[1] 1 MBH = 1,000 Btuh (British Thermal Units Per Hour)
[2] AFUE (Annual Fuel Utilization Efficiency) and Heating Capacity is based on Department of Energy test procedure.

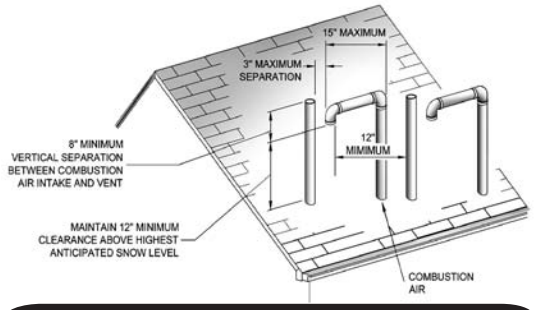
Ratings shown are for sea level application. The boiler automatically de-rates input as altitude increases. No alterations to boiler are required for altitudes above sea level.

* Table #2 - NATURAL GAS								
Nominal Input	200,000		175,000		150,000		125,000	
	Vent Lengths		Vent Lengths		Vent Lengths		Vent Lengths	
Altitude	Min	Max	Min	Max	Min	Max	Min	Max
0	200,000	200,000	175,000	175,000	150,000	150,000	125,000	125,000
1,000	197,000	196,500	172,400	172,200	147,800	147,400	123,500	123,000
2,000	194,000	193,000	169,800	169,400	145,600	144,800	122,000	121,000
3,000	191,000	189,500	167,200	166,600	143,400	142,200	120,500	119,000
4,000	188,000	186,000	164,600	163,800	141,200	139,600	119,000	117,000
5,000	185,000	182,500	162,000	161,000	139,000	137,000	117,500	115,000
6,000	182,000	179,000	159,400	158,200	136,800	134,400	116,000	113,000
7,000	179,000	175,500	156,800	155,400	134,600	131,800	114,500	111,000
8,000	176,000	172,000	154,200	152,600	132,400	129,200	113,000	109,000
9,000	173,000	168,500	151,600	149,800	130,200	126,600	111,500	107,000
10,000	170,000	165,000	149,000	147,000	128,000	124,000	110,000	105,000

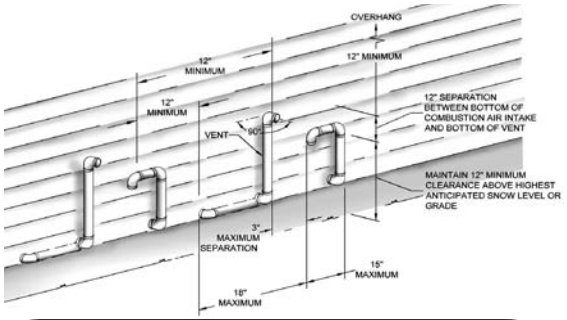
* Table #3 - LP GAS								
Nominal Input	200,000		175,000		150,000		125,000	
	Vent Lengths		Vent Lengths		Vent Lengths		Vent Lengths	
Altitude	Min	Max	Min	Max	Min	Max	Min	Max
0	200,000	200,000	175,000	175,000	150,000	150,000	125,000	125,000
1,000	195,900	195,750	171,900	171,200	146,900	146,700	123,050	122,250
2,000	191,800	191,500	168,800	167,400	143,800	143,400	121,100	119,500
3,000	187,700	187,250	165,700	163,600	140,700	140,100	119,150	116,750
4,000	183,600	183,000	162,600	159,800	137,600	136,800	117,200	114,000
5,000	179,500	178,750	159,500	156,000	134,500	133,500	115,250	111,250
6,000	175,400	174,500	156,400	152,200	131,400	130,200	113,300	108,500
7,000	171,300	170,250	153,300	148,400	128,300	126,900	111,350	105,750
8,000	167,200	166,000	150,200	144,600	125,200	123,600	109,400	103,000
9,000	163,100	161,750	147,100	140,800	122,100	120,300	107,450	100,250
10,000	159,000	157,500	144,000	137,000	119,000	117,000	105,500	97,500

** Refer to **Table #1** for minimum/maximum vent pipe lengths.*

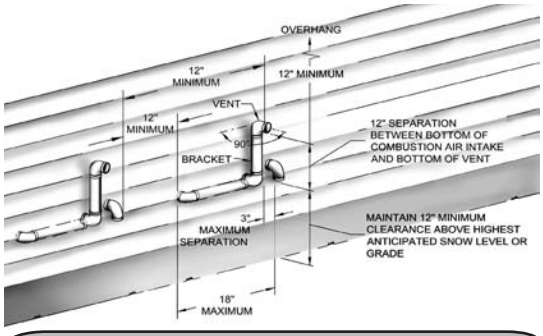
Roof Vent / Intake Terminations



Sidewall Vent / Intake Terminations



Less Than 12" Clearance



12" Or More Clearance

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