



Q90 50-100 Gas-Fired Direct Vent Condensing Hot Water Boiler

P/N# 240005687, Rev. 1.0 [10/05]

SPECIFICATIONS AND PERFORMANCE



**90% AFUE
Efficiency**



Available Heating Inputs of:

50 MBH through 100 MBH

▲ **Application** – The Quantum 90 gas fired hot water boiler is available in natural or propane gas with heating inputs of 50, 75, and 100 MBH (14.7, 22.0, and 29.3 KW) and an AFUE of 90%. 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 International Approval Services (IAS) 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

▲ **Cast Aluminum Boiler Assembly** – The boiler sections and push nipples are constructed out of long life cast aluminum. When the boiler is heated, the sections and push nipples expand and contract in the same proportion, because they are constructed of like material, providing a positive watertight seal.

Benefit: Revolutionary Cast Aluminum Heat Exchanger transfers heat three times faster with greater thermal conductivity than conventional cast iron. It produces enormous gains in heat-up speed and operating efficiency. Also, the packaged boiler weighs only 220 pounds 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 though the service door (attached with slam latches) which makes the 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.

QUANTUM 90-100 NATURAL OR PROPANE GAS-FIRED BOILER

FEATURES AND BENEFITS *Continued*

▲ **Casting Temperature Safety Switch** – In the event there is lack of water 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 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 100°F (37.8°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 (98.2°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.

▲ **Vent Temperature Safety Switch** – The vent temperature safety switch is a disc thermostat [180°F (82.2°C) set point] on the induced draft fan outlet port. The switch protects the fan and CPVC vent pipe (furnished with boiler) from high temperature conditions for the discharging of flue gases. The vent temperature safety switch automatically resets when the vent temperature decreases 15°F (9.4°C).

▲ **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.

▲ **Differential Pressure Air Proving Switch** – The pressure switch monitors air flow by sensing the differential pressure measured in inches of water ("w.c."). The factory settings on these switches are 1.17" w.c. (2.9l mbar) for the Q90-100, 1.35" w.c. (3.36 mbar) for the Q90-75, and 1.55" w.c. (3.98 mbar) for the Q90-50. The contracts 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.

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 in the 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.

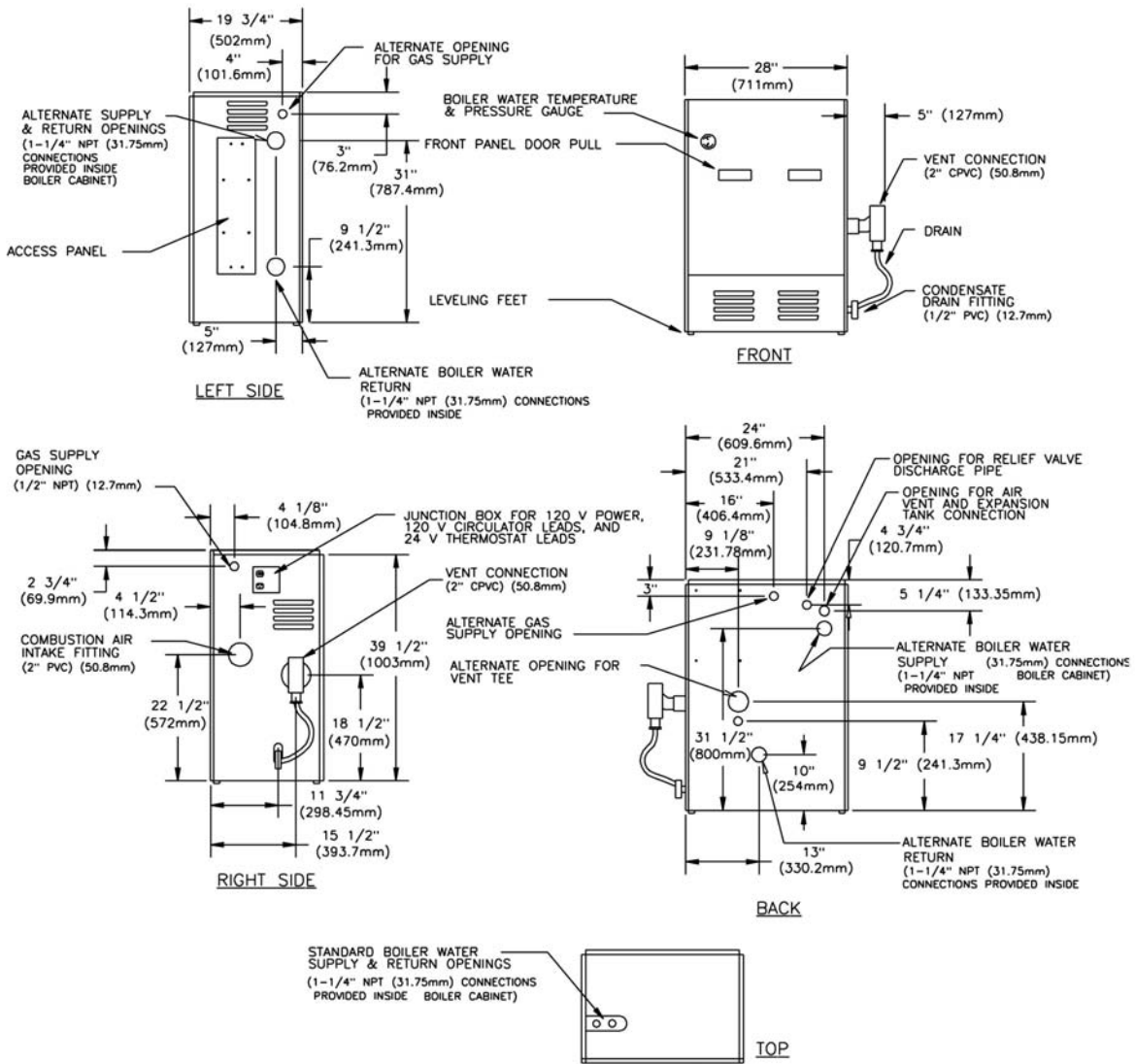
Benefits:

- 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.

CONNECTIONS

120 Volts AC, 60 Hertz, 1 Phase, Less Than 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 RATINGS & CAPACITIES



SEA LEVEL THROUGH 2,000 FEET (609.6 m) ELEVATION SPECIFICATIONS Gas Fired Hot Water Boiler			
Model No. (Natural and Propane Gases)	Q90-50	Q90-75	Q90-100
Input – Btuh (KW)	50,000 (14.7)	75,000 (22.0)	100,000 (29.3)
Heating Capacity – Btuh (KW)	45,000 (13.2)	68,000 (19.9)	90,000 (26.4)
¹⁾ Net I=B=R Btuh (KW)	39,000 (11.4)	59,000 (17.3)	78,000 (22.9)
²⁾ AFUE	90%		
Number of Boiler Sections	2		
Boiler Capacity – US Gallons (L)	2.6 (9.8)		
³⁾ Flue Size Outlet Diameter – in. (mm)	2 (50.8)		
Package Shipping Weight – lbs. (kg)	220 (3.1)		
Gas Piping Size IPS – in. (mm)	1/2 (12.7)		
Supply & Return Connection NPT – in. (mm)	1-1/4 (31.8)		
Drain Connection NPT – in. (mm)	3/4 (19)		

1) Net I=B=R ratings indicate the amount of remaining heat the boiler can provide to heat the radiation or terminal units under normal conditions and thermostatic control. Ratings are based on an allowance of 1.15 in accordance with the piping and pickup factors shown in the I=B=R Standard as published by The Hydronics Institute, Inc. Selection of boiler size should be based on "Net I=B=R Rating" being equal to or greater than the calculated heat loss of the building.

2) AFUE (Annual Fuel Utilization Efficiency) and Heating Capacity is based on the Department of Energy's test procedure.

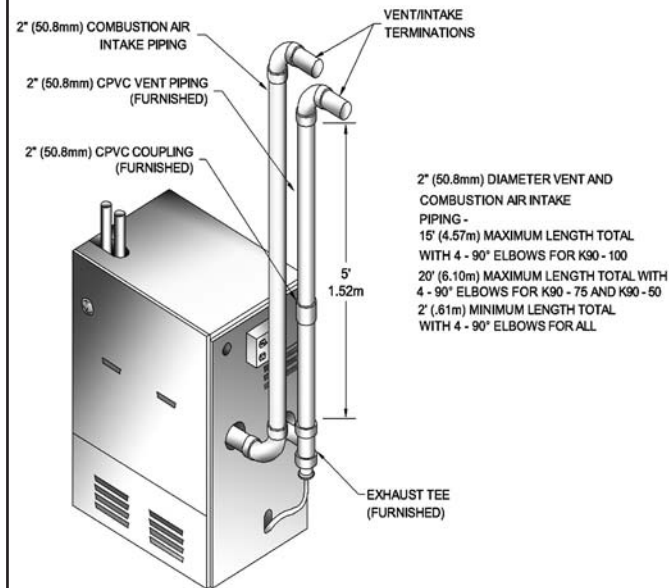
3) Maximum allowable length of vent and intake pipe is 20' (6.1 m) each of 2" (50.8 mm) PVC with 4 ells or 100' (30.5 m) each of 3" (76.2 mm) PVC with 4 ells for Models Q90-75 and Q90-50.

Maximum allowable length of vent and intake pipe is 15' (4.6 m) each of 2" (50.8 mm) PVC with 4 ells or 80' each (24.4 m) of 3" (76.2 mm) PVC with 4 ells for Model Q90-100.

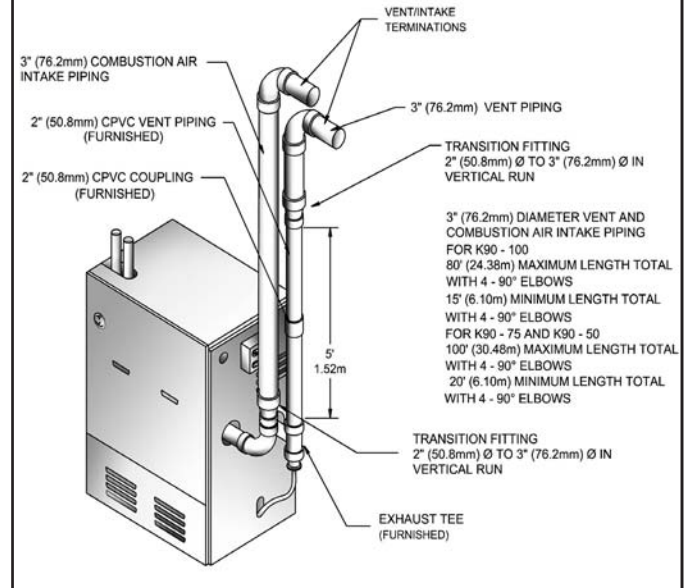
The first 5' (1.5 m) run on the vent pipe will be 2" (50.8 mm) CPVC (furnished).

QUANTUM 90-100 NATURAL OR PROPANE GAS-FIRED BOILER

2" Vent / Air Intake Piping



3" Vent / Air Intake Piping



BOILER CLEARANCES

Unit	Combustible Clearance Inch (mm)	Accessibility, Cleaning, and Servicing Inch (mm)
Top	1 (25.4)	8 (203.2)
Left Side	1 (25.4)	24 (609.6)
Right Side	8 (203.2)	-
Base	1 (25.4)	-
Front	0 (0)	24 (609.6)
Back	1 (25.4)	-
Intake/Vent Piping	0 (0)	-
Near Boiler Hot Water Piping	1 (25.4)	-

All distances measured from the cabinet of the boiler.

QUANTUM 90-200 STANDARD EQUIPMENT

Aluminum Boiler with Painted Jacket.	Completely installed and wired safety control system with burner consisting of: <ul style="list-style-type: none"> • Microprocessor Based Integrated Boiler Control (IBC) • 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	
Temperature and Pressure Gauge	
30 psi ASME Relief Valve	
Air Vent	
Service Switch	

SPECIFICATIONS

Gas-Fired, Direct-Vent Condensing Hot Water Boiler
May be installed on combustible flooring
1" clearance on top, right base, and back to combustible construction
8" Clearance left side for vent/air intake pipe installation
24" Clearance front and left side, 8" top clearance for servicing
0" Clearance for vent and air intake pipes to combustible construction



Dunkirk Boilers

85 Middle Rd.
 Dunkirk, NY 14048
<http://www.dunkirk.com>

85 Middle Rd. Dunkirk, NY 14048