

PERMIT ISSUED

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

| | | |
|-----------------------|----------------------------|---------------------|
| Permit No: 04-0526 | Issue Date: MAY 24 2004 | CBL: 044 A012001 |
|-----------------------|----------------------------|---------------------|

| | | | | |
|--|---|--|----------------------------|---------------|
| Location of Construction: 2 McCormick Pl | Owner Name: Swan Properties Llc | Owner Address: 16 Hillcrest Dr | City of Portland | Phone: |
| Business Name: | Contractor Name: William Carr | Contractor Address: 368 Gray Rd Falmouth | Phone 2077970630 | |
| Lessee/Buyer's Name | Phone: | Permit Type: HVAC | Zone: R6 | |

| | | | | |
|--|---|--|--|-----------------------------|
| Past Use: 5 Condo Unit | Proposed Use: 5 Condo Unit/ Install a Weil Mclain Direct Vent gas boiler. In the basement | Permit Fee: \$111.00 | Cost of Work: \$10,000.00 | (CEO District): 2 |
| Project Description: Install a Weil Mclain Direct Vent gas boiler. In the basement | | FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied | INSPECTION: Use Group: R2 Type: NIA 5/22/04 Signature: [Signature] | |
| | | PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.) Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Signature: _____ Date: _____ | | |

| | | | | |
|------------------------------------|--|------------------------|--|--|
| Permit Taken By: Idobson | Date Applied For: 05/04/2004 | Zoning Approval | | |
|------------------------------------|--|------------------------|--|--|

| Special Zone or Reviews | Zoning Appeal | Historic Preservation |
|--|--|--|
| <input type="checkbox"/> Shoreland | <input type="checkbox"/> Variance | <input type="checkbox"/> Not in District or Landmark |
| <input type="checkbox"/> Wetland | <input type="checkbox"/> Miscellaneous | <input type="checkbox"/> Does Not Require Review |
| <input type="checkbox"/> Flood Zone | <input type="checkbox"/> Conditional Use | <input type="checkbox"/> Requires Review |
| <input type="checkbox"/> Subdivision | <input type="checkbox"/> Interpretation | <input type="checkbox"/> Approved |
| <input type="checkbox"/> Site Plan | <input type="checkbox"/> Approved | <input type="checkbox"/> Approved w/Conditions |
| Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input checked="" type="checkbox"/> | <input type="checkbox"/> Denied | <input type="checkbox"/> Denied |
| Date: 5/18/04 | Date: | Date: [Handwritten] |

My exterior work requires A Separate review and approval

CERTIFICATION

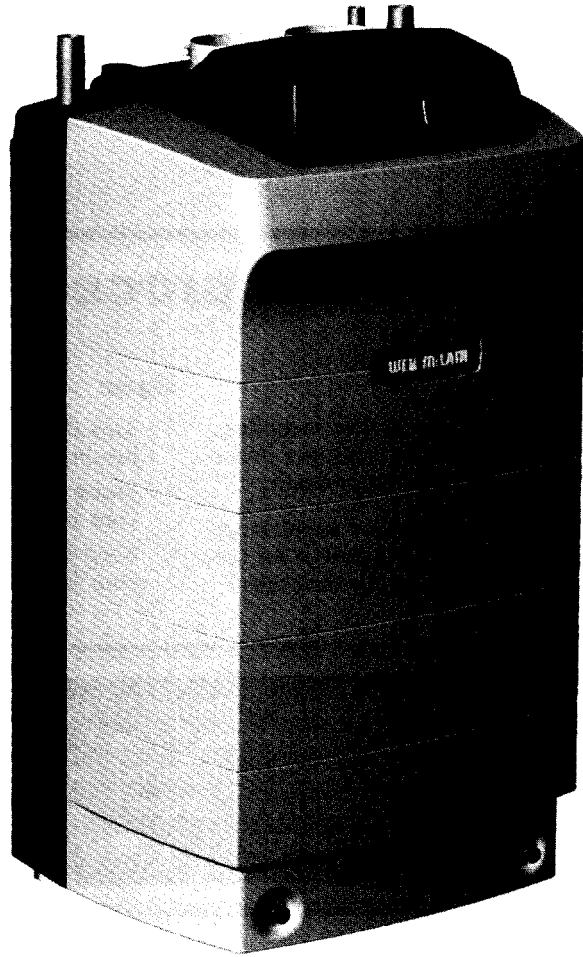
I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

| | | | |
|---|---------|------|-------|
| SIGNATURE OF APPLICANT | ADDRESS | DATE | PHONE |
| RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE | | DATE | PHONE |



Ultra *Gas-fired water boiler*

Vent Supplement



Installation of:

- Vent piping
- Air piping



Ultra
with **PhD** PRECISION
HYDRONIC
DATA *technology*

WARNING This document must only be used by a qualified heating installer/service technician. Read all instructions, including this Supplement and the Boiler Manual, before installing. Perform steps in the order given. Failure to comply could result in severe personal injury, death or substantial property damage.

NOTICE Installation must comply with local requirements and with the National Fuel Gas Code, ANSI 2223.1 for U.S. installations or CSA B149.1 or B149.2 for Canadian installations.

1 Prepare boiler location

Removing from existing vent

DANGER Do not install the Ultra into a common vent with any other appliance. This will cause flue gas spillage or appliance malfunction, resulting in possible severe personal injury, death or substantial property damage.

WARNING Failure to follow all instructions can result in flue gas spillage and carbon monoxide emissions, causing severe personal injury or death.

When removing existing boiler from existing common vent system:

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

- a. Seal any unused openings in the common venting system.
- b. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion or other deficiencies which could cause an unsafe condition.
- c. Test vent system — Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
- d. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
- e. Test for spillage at draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar, or pipe.
- f. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined herein, return doors, windows, exhaust fans, fireplace dampers, and any other gas-burning appliance to their previous conditions of use.

Any improper operation of common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1 — latest edition. Correct by resizing to approach the minimum size as determined using the appropriate tables in Part 11 of that code. Canadian installations must comply with B149.1 or B149.2 Installation Code.

Vent and air piping

Vent and air system

NOTICE | Installation must comply with local requirements and with the National Fuel Gas Code, ANSI 2223.1 for U.S. installations or CSA B149.1 or B149.2 for Canadian installations.

The Ultra boiler requires a special vent system, designed for pressurized venting. Ultra boilers are rated ANSI Z21.13 Category IV (pressurized vent, likely to condense in the vent).

You must also install air piping from outside to the boiler air intake adapter. The resultant installation is categorized as direct vent (sealed combustion).

You may use any of the vent/air piping methods covered in this supplement. Do not attempt to install the Ultra boiler using any other means.

WARNING DO NOT mix components from different systems. The vent system could fail, causing leakage of flue products into the living space. Use only PVC, CPVC or ABS pipe and fittings, with primer and cement specifically designed for the material used.

Vent and air piping and termination

The Ultra boiler vent and air piping can be installed through the roof or through a side wall. Follow the procedures in this document for the method chosen. The maximum vent length depends on boiler size. Refer to the information in this supplement to determine acceptable vent and air piping length.

Combustion air for the Ultra boiler must be ducted directly to the boiler from outside (direct vent installation).

Follow all instructions in this document and the Ultra Boiler Manual to install vent and air piping.

2 Vent/air termination — through roof

WARNING

Follow instructions below when determining vent location to avoid possibility of severe personal injury, death or substantial property damage.

NOTICE

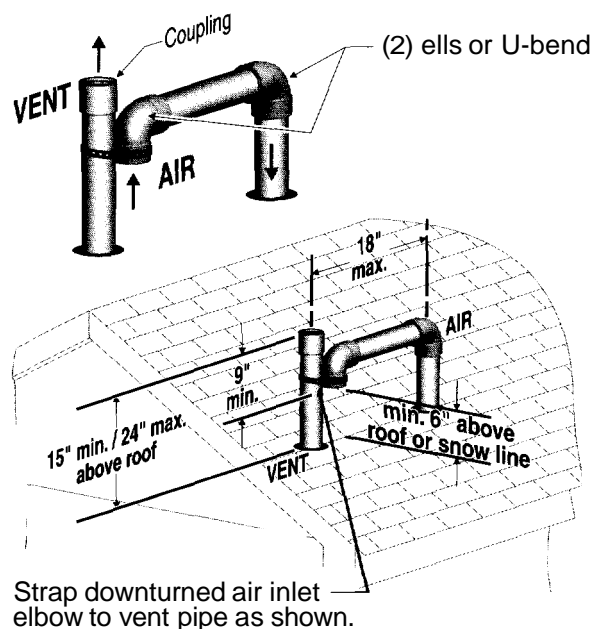
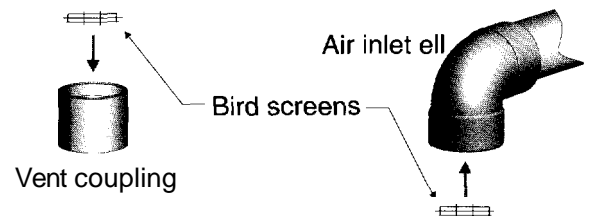
Installation must comply with local requirements and with the National Fuel Gas Code, ANSI 2223.1 for U.S. installations or CSA B149.1 or B149.2 for Canadian installations.

Determine location

Locate the vent/air terminations using the following guidelines:

1. The total length of piping for vent or air must not exceed the limits given in Table 2, page 11.
2. The air piping must terminate in a down-turned elbow strapped to the vent pipe as shown in Figure 1. This location avoids recirculation of flue products into the combustion air stream.
3. The vent piping must terminate in an up-turned coupling as shown in Figure 1.
4. You must consider the surroundings when terminating the vent and air:
 - a. Position the vent termination where vapors will not damage nearby shrubs, plants or air conditioning equipment or be objectionable.
 - b. The flue products will form a noticeable plume as they condense in cold air. Avoid areas where the plume could obstruct window views.
 - c. Prevailing winds could cause freezing of condensate and water/ice buildup where flue products impinge on building surfaces or plants.
 - d. Avoid possibility of accidental contact of flue products with people or pets.
 - e. Do not locate the terminations where wind eddies could affect performance or cause recirculation, such as inside building corners, near adjacent buildings or surfaces, window wells, stairwells, alcoves, courtyards or other recessed areas.
 - f. Do not terminate above any door or window. Condensate can freeze, causing ice formations.
 - g. Locate or guard vent to prevent condensate damage to exterior finishes.
5. Maintain clearances to vent termination as given below:
 - a. Vent must terminate:
 - At least 6 feet from adjacent walls.
 - No closer than 5 feet below roof overhang.
 - At least 7 feet above any public walkway.
 - At least 3 feet above any forced air intake within 10 feet.

Figure 1 Vertical termination of air & vent



U103

- No closer than 12 inches below or horizontally from any door or window or any other gravity air inlet.
 - b. Air inlet must terminate at least 6" above the roof or snow line; at least 9" below the vent termination; and the vent pipe must not extend more than 24" above the roof as shown in Figure 1.
 - c. Do not terminate closer to 4 feet horizontally from any electric meter, gas meter, regulator, relief valve or other equipment. Never terminate above or below any of these within 4 feet horizontally.
6. Locate terminations so they are not likely to be damaged by foreign objects, such as stones or balls, or subject to buildup of leaves or sediment.
 7. Do not connect any other appliance to the vent pipe or multiple boilers to a common vent pipe.

3 Vent/air termination – sidewall

WARNING Follow instructions below when determining vent location to avoid possibility of severe personal injury, death or substantial property damage.

WARNING A gas vent extending through an exterior wall shall not terminate adjacent to the wall or below building extensions such as eaves, parapets, balconies or decks. Failure to comply could result in severe personal injury, death or substantial property damage.

NOTICE Installation must comply with local requirements and with the National Fuel Gas Code, ANSI 2223.1 for U.S. installations or CSA B149.1 or B149.2 for Canadian installations.

Determine location

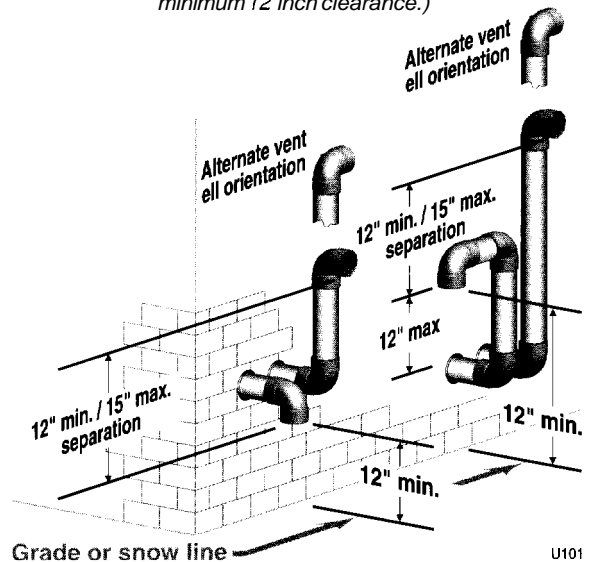
Locate the vent/air terminations using the following guidelines:

1. The total length of piping for vent or air must not exceed the limits given in Table 2, page 11.
2. The air piping must terminate in a down-turned elbow as shown in Figure 3. This arrangement avoids recirculation of flue products into the combustion air stream.
3. The vent piping must terminate in an elbow pointed outward or away from the air inlet, as shown in Figure 3.

WARNING Do not exceed the maximum lengths of the outside vent piping shown in Figure 3. Excessive length exposed to the outside could cause freezing of condensate in the vent pipe, resulting in potential boiler shutdown.

4. You must consider the surroundings when terminating the vent and air:
 - a. Position the vent termination where vapors will not damage nearby shrubs, plants or air conditioning equipment or be objectionable.
 - b. The flue products will form a noticeable plume as they condense in cold air. Avoid areas where the plume could obstruct window views.
 - c. Prevailing winds could cause freezing of condensate and water/ice buildup where flue products impinge on building surfaces or plants.
 - d. Avoid possibility of accidental contact of flue products with people or pets.
 - e. Do not locate the terminations where wind eddies could affect performance or cause recirculation, such as inside building corners, near adjacent buildings or surfaces, window wells, stairwells, alcoves, courtyards or other recessed areas.

Figure 3 Sidewall termination of air & vent:
 (Apply left illustration unless air termination ell would not provide the minimum 12 inch clearance to grade or snow line. Apply right illustration for other applications, where exit openings are too low to provide the minimum 12 inch clearance.)



- f. Do not terminate above any door or window. Condensate can freeze, causing ice formations.
- g. Locate or guard vent to prevent condensate damage to exterior finishes.
5. Maintain clearances as shown in Figures 3, 4, and 5, pages 7, 8 and 9. Also maintain the following:
 - a. Vent must terminate:
 - At least 6 feet from adjacent walls.
 - No closer than 5 feet below roof overhang.
 - At least 7 feet above any public walkway.
 - At least 3 feet above any forced air intake within 10 feet.
 - No closer than 12 inches below or horizontally from any door or window or any other gravity air inlet.
 - b. Air inlet must terminate at least 12" above grade or snow line; at least 12" below the vent termination; and the vent pipe must not extend more than 24" vertically outside the building as shown in Figure 3.
 - c. Do not terminate closer to 4 feet horizontally from any electric meter, gas meter, regulator, relief valve or other equipment. Never terminate above or below any of these within 4 feet horizontally.

3 Vent/air termination – sidewall *(continued)*

Termination and fittings

1. Prepare the vent termination elbow and the air termination elbow (Figure 6) by inserting the bird screens provided with the boiler. Bird screens are provided for either 3-inch (Ultra-155) or 4-inch (Ultra-230) fittings.
 - a. If using 3-inch piping for an Ultra-230, cut the 4-inch bird screen supplied by placing 3-inch fitting on screen and cutting around it as a template.
2. When completed, the air termination coupling must be oriented at least 12 inches below the vent termination and at least 12 inches above grade or snow line as shown in Figure 3, page 7.
3. You can orient the vent termination elbow either directly outward or 90 degrees away from the air inlet elbow as shown in Figure 3, page 7.
4. Maintain the required dimensions of the finished termination piping as shown in Figure 3, page 7.
5. Do not extend exposed vent pipe outside of building more than shown in this document. Condensate could freeze and block vent pipe.

Multiple vent/air terminations

1. When terminating multiple Ultra boilers, terminate each vent/air connection as described in this supplement.

WARNING All vent pipes and air inlets must terminate at the same height to avoid possibility of severe personal injury, death or substantial property damage.

2. Place wall penetrations to obtain minimum clearance of 12 inches between vent pipe and adjacent air inlet elbow, as shown in Figure 7 or Figure 8 for U. S. installations. For Canadian installations, provide clearances required by CSA B149.1 or B149.2 Installation Code.
3. The air inlet of an Ultra boiler is part of a direct vent connection. It is not classified as a forced air intake with regard to spacing from adjacent boiler vents.

Figure 7 Multiple vent/air terminations (must also comply with Figure 4)

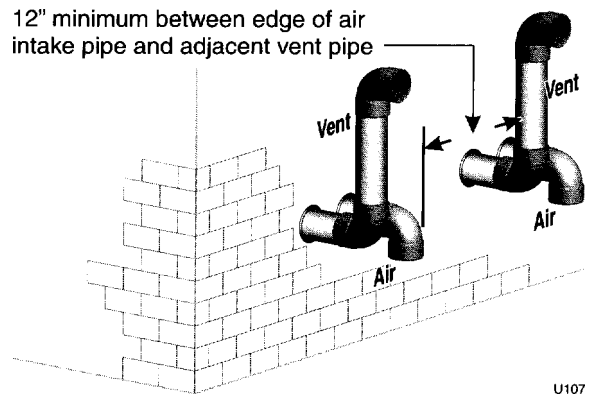
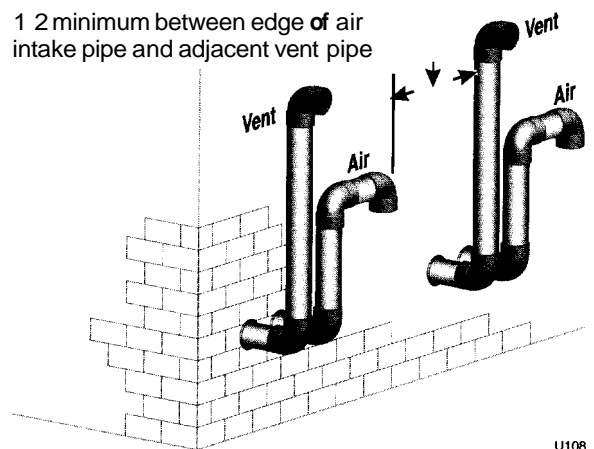


Figure 8 Multiple vent/air terminations (must also comply with Figure 4)
(Apply this method only where exit openings are too low to provide minimum 12 inch clearance above grade/snow line.)



4 Installing vent & air piping *(continued)*

Table 2 Min/max lengths of either air piping or vent piping

| Vent & air piping limits | |
|----------------------------------|-------------------------|
| Ultra-155 | |
| Minimum piping length (3") | 2 feet with 2 elbows |
| Maximum piping length (3") | 100 feet with 2 elbows* |
| Ultra-230 | |
| Minimum piping length (3" or 4") | 2 feet with 2 elbows |
| Maximum piping length (3") | 30 feet with 2 elbows† |
| Maximum piping length (4") | 100 feet with 2 elbows* |

* The 2 elbows above include the air intake termination elbow
 For piping using more than 2 elbows, reduce maximum allowable length
 • 7 feet for each additional 4-inch elbow
 • 7 feet for each additional 3-inch *long radius* elbow
 • 16 feet for each 3-inch *short radius* elbow

Figure 9 Piping to sidewall terminations

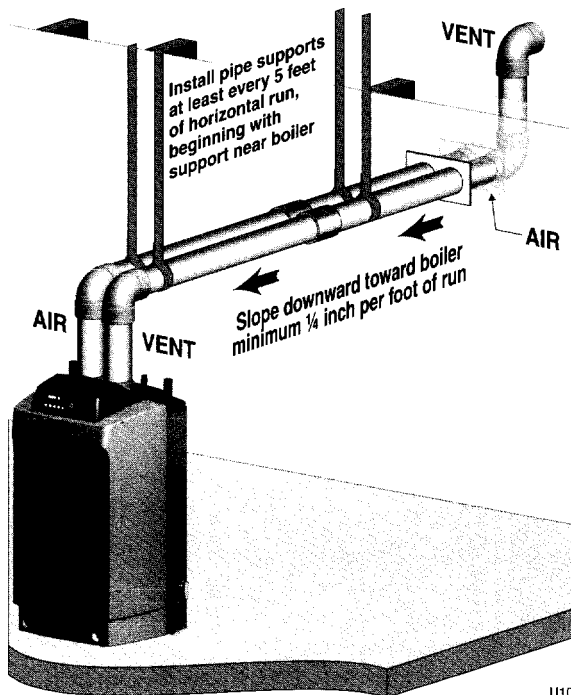
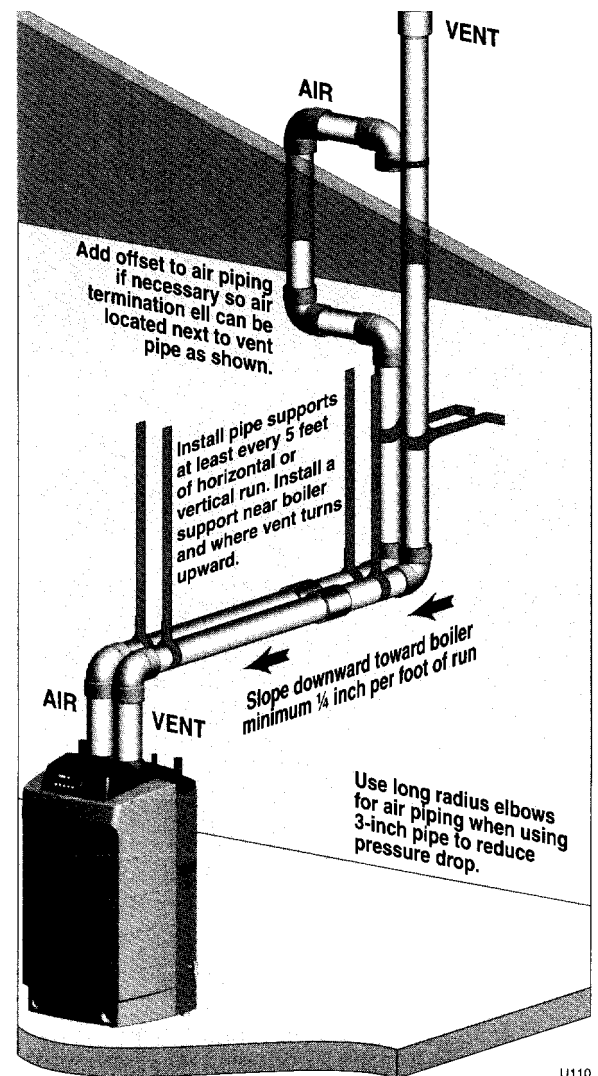


Figure 10 Piping to through-roof terminations



NOTICE When a large number of elbows is needed with 3-inch piping, use long radius elbows to reduce pressure drop. This allows a longer run of piping. See Table 2 notes for details.

WARNING Do not insulate vent piping. Exception: Where vent pipes pass through unheated spaces, such as crawl spaces or unheated garages, apply 1/2 inch fiberglass insulation to the portion of the vent pipe in the unheated space only.

WEIL-McLAIN^{with} PhD PRECISION HYDRONIC DATA *technology*

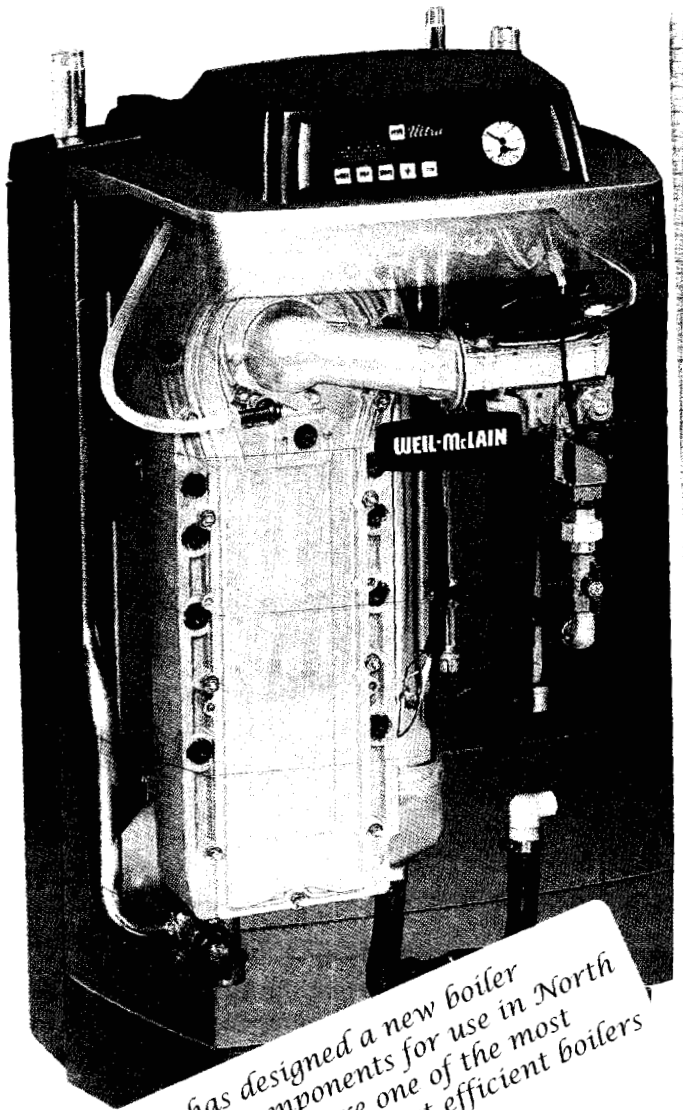
PhD, Precision Hydronic Data, is an intelligent system that delivers Precision Hydronic heating and domestic hot water needs while maximizing efficiency by measuring and responding to the Data parameters of your heating system.

PhD technology is built around proven, engineered components that have been in operation for many years. Key components include:

- ◆ Combustion control components:
 - ◆ Negative-regulated gas valve that Precisely delivers gas to the boiler.
 - ◆ Venturi mixing body that Precisely mixes air and gas for high efficiency.
 - ◆ Variable speed motor that matches combustion output to heating needs.
 - ◆ Boiler intelligence with a control that maintains proper, efficient and Precise Hydronic heat via inputs of all system Data.

- ◆ Mono-block aluminum heat exchanger with demonstrated successful service for over 15 years.

- ◆ Pre-mix burner used for many years in top-of-the-line boilers.



Weil-McLain has designed a new boiler combining these components for use in North America. The results are one of the most advanced, most reliable, most efficient boilers available.

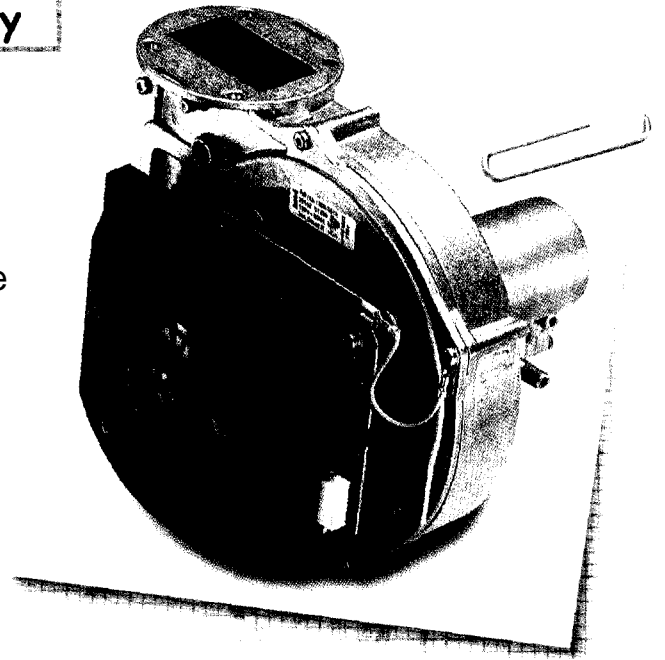
Ultra
with PhD PRECISION HYDRONIC DATA *technology*



Proven air and gas flow sensing technology

The same Data collected to optimize efficiency allows for simpler design and operation. PhD technology uses an advanced combination of combustion control components. The gas valve is combined with a venturi air fuel mixing body.

- ◆ Without air flow, gas is not pulled into the mixing body, eliminating the need for a pressure switch and simplifying operation and troubleshooting.
- ◆ Fuel changes become a snap. Simply install the fuel orifice supplied with the *Ultra*. This changes the operation from natural gas to propane in a few minutes with no other adjustments.
- ◆ **No** product changes, adjustments, or kits are required for high-altitude applications. PhD technology, again Precisely measuring Oata, adjusts for changes in air density at higher altitudes.



Proven water temperature sensing technology

PhD technology Precisely measures the water temperature Data going into and out of the heat exchanger or 'block'.

- This allows the high-limit control and operating temperature to be Precisely measured. **No** additional limit device is needed.
- ◆ **Low** water and low flow protection is also provided.
 - ◆ **IF** the flow is restricted, PhD technology reduces the firing rate until operation is satisfactory. The amount of heat available is lowered, but this is superior to most flow measurement shut-off devices that simply turn the boiler off, running the risk of no heat in the winter.
 - ◆ **IF** the water temperature sensors indicate no water is present, PhD technology shuts down the boiler, preventing damage.

Outdoor reset with supply temperature boost

With the included outdoor temperature sensor installed, PhD technology will regulate the target system temperature, based on the outdoor temperature. The colder it is outside, the warmer the supply temperature will be. PhD technology will increase the target temperature 18°F after 10 minutes of continuous operation. This 'boost' in temperature enables the control to adjust the target temperature dramatically for larger heating loads. The boosted target temperature is then reduced 2°F for each minute after the call for heat ends, allowing the control to return to a 'standard' target temperature for the next heat demand. The result is a Precise target temperature setting for fast and comfortable heat delivery.

More domestic hot water at lower cost

PhD technology operates the boiler at reduced firing rates to maximize efficiency and running time. Also, when the domestic hot water tank has a heat demand, the boiler circulator is shut down and the boiler supply goes to maximum, providing priority for hot water and faster response. Part of the *Ultra* line is the *Ultra* PLUS indirect-fired water heater. This offers many advantages over a separate, gas-fired water heater.

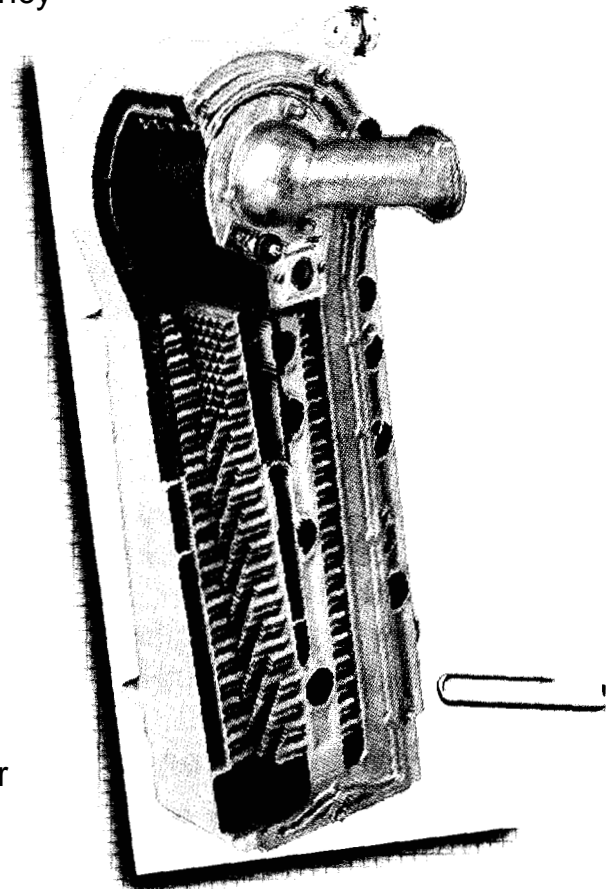
- 4 More domestic hot water when you need it
- ◆ Much more efficient than typical high-efficiency water heaters
- 4 Longer life than typical water heaters

summer/winter switch

For summer operation to meet domestic hot water demands, an external switch can be installed. When set to 'summer,' the boiler operates to a fixed setpoint, optimizing performance for providing domestic hot water.

Advanced mono-block cast aluminum heat exchanger

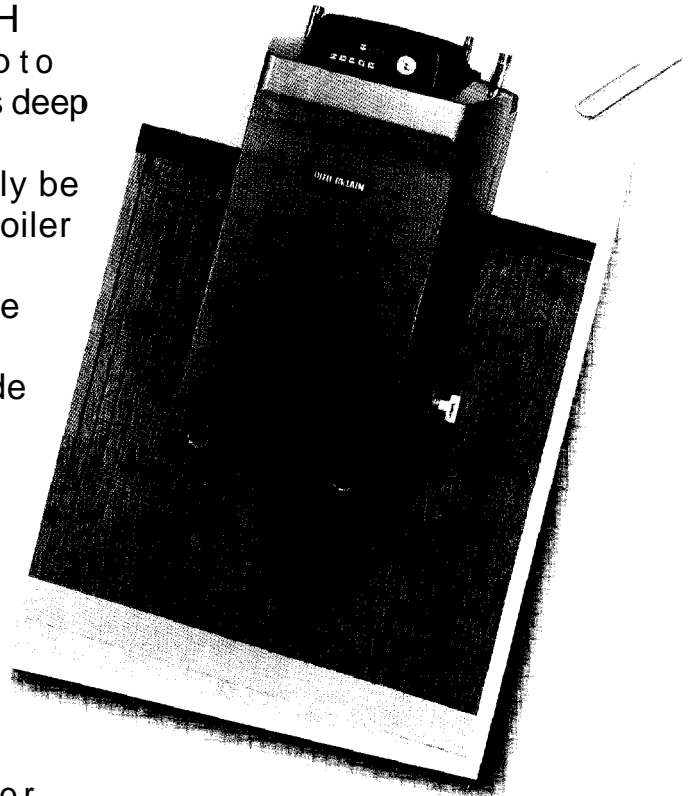
- ◆ **PhD technology** uses a low-mass aluminum heat exchanger with less water. This reduces the input required to heat up the boiler.
 - ◆ When the boiler heats up faster, it can provide heat to the system more quickly. This is especially important when the boiler is combined with an *Ultra* PLUS water heater. More hot water is available more quickly with **Phb technology**.
 - ◆ Stand-by losses are less with a low-mass product, reducing heating bills.
- ◆ Radiant-friendly design. The *Ultra* is designed for low-temperature radiant applications. In fact, the lower the system temperature, the more efficient **Phb technology** becomes. The combination of radiant and an *Ultra* PLUS water heater is one of the most efficient and comfortable systems available. Set the control limit for low temperature radiant heating. With domestic priority, the **PhD** system knows to increase the firing rate and take care of the hot water demand.
- The heat exchanger was designed in conjunction with one of the most experienced design firms in the world, having specialized in high efficiency aluminum heat exchanger design for over 15 years.
 - ◆ The cast aluminum heat exchanger is designed to operate in low-temperature condensing mode.
 - ◆ This mono-block design eliminates the need for seals between sections.



Installation and service features

PhD technology has the installer in mind:

- ◆ Small footprint. *Ultra* boilers are designed to minimize floor space. All the piping and connections are on the top of the boiler. You can place the *Ultra* boiler in a 'nook' that is only a few inches wider than the boiler. The jacket opens from the front, allowing access to all service needs.
- ◆ If floor space is unavailable, hang it on the wall. An inexpensive wall mount kit is available. The *Ultra* boiler has been designed to easily convert all water and gas piping to bottom outlets.
- ◆ Dual mounting is ideal for multiple boiler installations. Put two on the floor and hang two on the wall above them. Four *Ultra* 230 boilers installed in this fashion provide a 920 MBH system with variable firing, efficiencies up to 98%, in a floor space as small as 24 inches deep and 4 feet wide.
- ◆ **PhD technology** allows the *Ultra* to literally be installed without opening the jacket. The boiler comes pre-wired and all the piping and electrical connections are on the top of the boiler.
- ◆ A service receptacle is provided on the side of the *Ultra*. The service switch on the front of the unit turns off power to the boiler, but not to the service receptacle. You have power for a trouble light, voltmeter or other small tools. Additionally, you do not need to run special wiring for a condensate pump, simply plug it in.
- ◆ Diagnostic capabilities.
 - Fixed high-fire and low-fire settings for troubleshooting and testing.
 - ◆ **PhD technology** provides full internal error checking and will display all error codes and lockouts through the display. In addition, all sensor readings can also be monitored through the display to aid in troubleshooting.



Future of PhD technology

Being the best is good, but *Weil-McLain* is committed to making this technology even better. Future developments will allow the contractor to communicate with the boiler, to learn what is happening - and more importantly, what has happened - within the boiler system, thus determining the quickest path for troubleshooting the system and making the operation more efficient.