DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING PERMIT

This is to certify that Install Lochinvar Boilers Located At 856 BRIGHTON AVE

Job ID: 2011-09-2272-HVAC CBL: 259- D-001-001

has permission to Install two Lochinvar Boilers
provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.	A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

Fire Prevention Officer **Code Enforcement Officer / Plan Reviewer**

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCU0PIED.

PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life • *www.portlandmaine.gov*

Director of Planning and Urban Development
Penny St. Louis

Job ID: 2011-09-2272-HVAC **Located At:** 856 BRIGHTON AVE **CBL:** 259- D-001-001

Conditions of Approval:

Installation shall comply with City Code Chapter 10.

Fuel-fired boilers shall be protected in accordance with NFPA 101, *Life Safety Code.*

Installation shall comply with NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*;

NFPA 54, *National Fuel Gas Code*;

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*;

NFPA 91, *Standard for Exhaust Systems for Air Conveying Vapors, Gases, Mists, and Noncombustible Particulate Solids*;

NFPA 70, *National Electrical Code*; and the manufacturer's published instructions.

City of Portland, Maine - Building or Use Permit Application

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

Job No:	Date Applied:	CBL:	
2011-09-2272-HVAC	**9/20/2011**	**259- D-001-001**	
Location of Construction: **858 BRIGHTON AVE**	Owner Name: Breakwater School	Owner Address: **856 BRIGHTON AVE PORTLAND, ME 04102**	Phone:
Business Name:	Contractor Name:, **JOHNSON & JORDAN, INC**	Contractor Address: **18 MUSSEY RD SCARBOROUGH ME 04074**	Phone: **(207) -883-8345**
Lessee/Buyer's Name:	Phone:	Permit Type: **HVAC - HVAC**	Zone: **R-3 / B-1**
Past Use: Breakwater School	Proposed Use: Same – Breakwater School – install two Lochinvar Boilers in the basement	Cost of Work: **179000.00**	CEO District:
		Fire Dept: ✓ Approved w/ Conditions ___ Denied ___ N/A Signature: Capt. Perrino 10/3/11	Inspection: HVAC Use Group: Type: Signature:
Proposed Project Description: **Install two Lochinvar Boilers**		Pedestrian Activities District (P.A.D.)	
Permit Taken By:			

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building Permits do not include plumbing, septic or electrial work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
___ Shoreland	___ Variance	✓ Not in Dist or Landmark
___ Wetlands	___ Miscellaneous	___ Does not Require Review
___ Flood Zone	___ Conditional Use	___ Requires Review
___ Subdivision	___ Interpretation	___ Approved
___ Site Plan	___ Approved	___ Approved w/Conditions
___ Maj ___ Min ___ MM	___ Denied	___ Denied
Date: OK 9/27/11 ABM	Date:	Date: ABM

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 appication 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

R-3

FILL IN AND SIGN WITH INK

10306

Fee'd 9/20

APPLICATION FOR PERMIT
HEATING OR POWER EQUIPMENT

tx's Okay-

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL 259-D-1 Use of Building school Date 9/19/11

Name and address of owner of appliance Breakwater school

856 Brighton Ave. Portland Me. 04102

Installer's name and address Johnson + Jordan Mech.

18 Mussey Rd. Scarborough Me. Telephone (207) 883-8345

Location of appliance:

- [x] Basement
- [ ] Floor
- [ ] Attic
- [ ] Roof

Type of Fuel:

- [x] Gas
- [ ] Oil
- [ ] Solid

Appliance Name: Lochinvar boilers

U.L. Approved [x] Yes [ ] No

Will appliance be installed in accordance with the manufacture's installation instructions? [x] Yes [ ] No

IF NO Explain: _____

The Type of License of Installer:

- [x] Master Plumber # 6230
- [ ] Solid Fuel # _____
- [ ] Oil # _____
- [x] Gas # PNT 4955
- [ ] Other _____

Type of Chimney: 04074 Att John Land

- [ ] Masonry Lined
  Factory built _____
- [ ] Metal
  Factory Built U.L. Listing # _____
- [x] Direct Vent
  Type PVC UL# _____

9.21.11

RECEIVED
SEP 20 2011
Dept. of Building Inspections
City of Portland Maine

Type of Fuel Tank

- [ ] Oil
- [ ] Gas

Size of Tank _____

Number of Tanks _____

Distance from Tank to Center of Flame _____ **feet.**

Cost of Work: $ 179,000

Permit Fee: $ 1,810

Approved

Fire: _____

Ele.: _____

Bldg.: _____

Approved with Conditions

- [ ] See attached letter or requirement

_____ Inspector's Signature

_____ Date Approved

Signature of Installer Francisco Tavares

White - Inspection Yellow - File Pink - Applicant's Gold - Assessor's Copy

CITY OF PORTLAND, MAINE

Department of Building Inspections

Original Receipt

9-20 20 11

Received from Shaun Jordan

Location of Work 856 Brighton

Cost of Construction $________ Building Fee: ________

Permit Fee $________ Site Fee: ________

Certificate of Occupancy Fee: ________

Total: $1,810

Building (IL) ___ Plumbing (I5) ___ Electrical (I2) ___ Site Plan (U2) ___

Other HVAC

CBL: 295-D-1

Check #: 1953

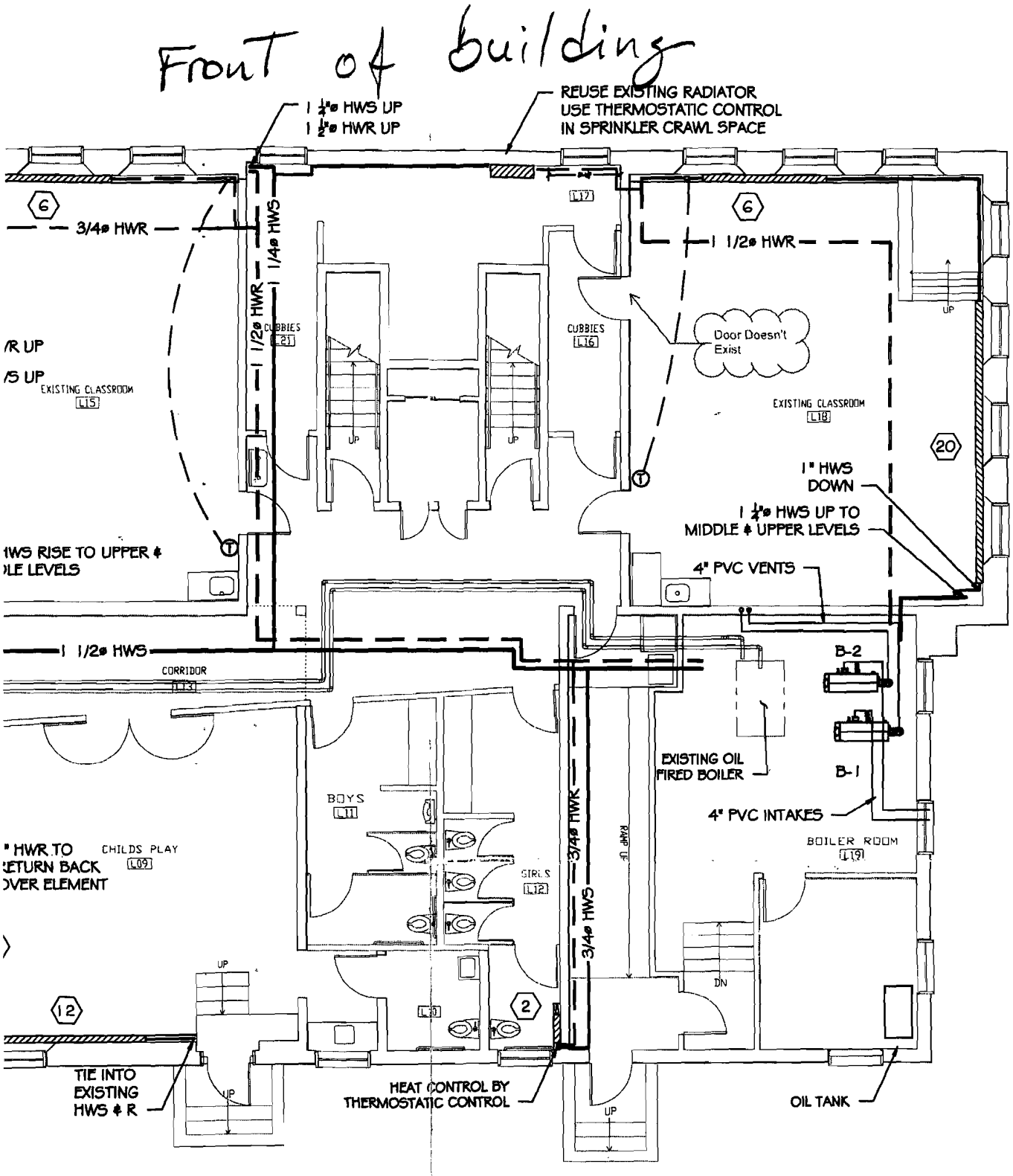
Total Collected $ $1,810

No work is to be started until permit issued.
Please keep original receipt for your records.

Taken by: ________

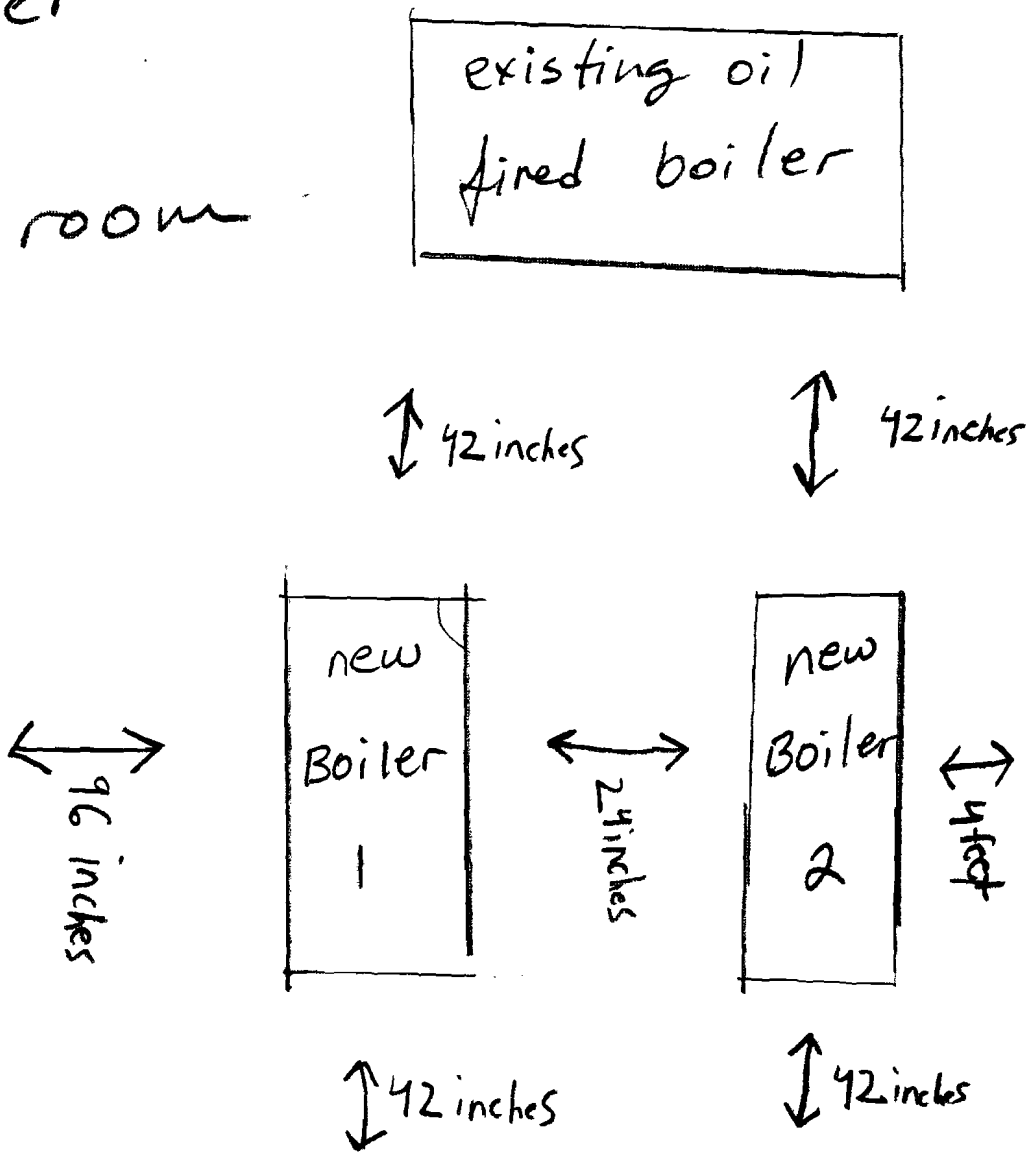
WHITE - Applicant's Copy
YELLOW - Office Copy
PINK - Permit Copy

Front of building



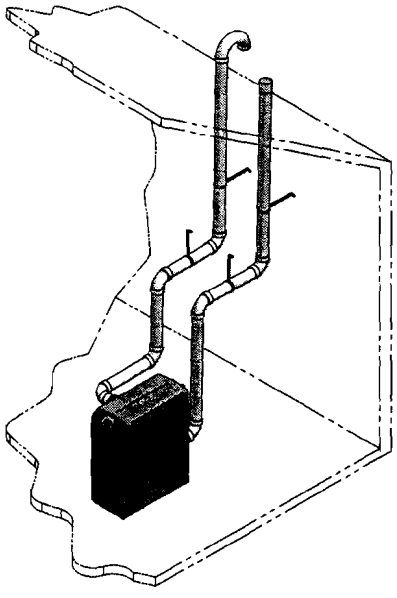
Breakwater school

Boiler room

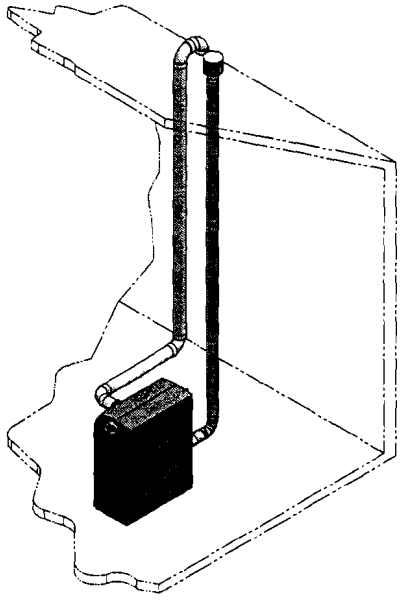


3 General venting

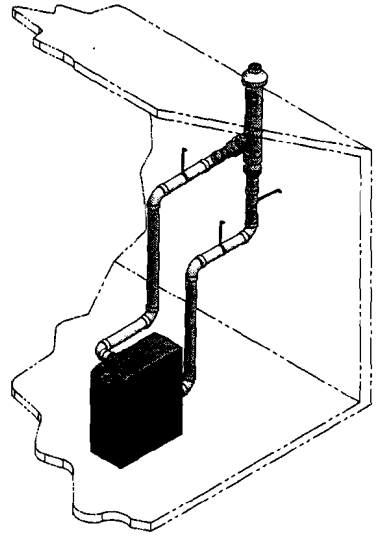
Direct venting options - Vertical Vent



PVC/CPVC
Two Pipe
See Figure 5-1A

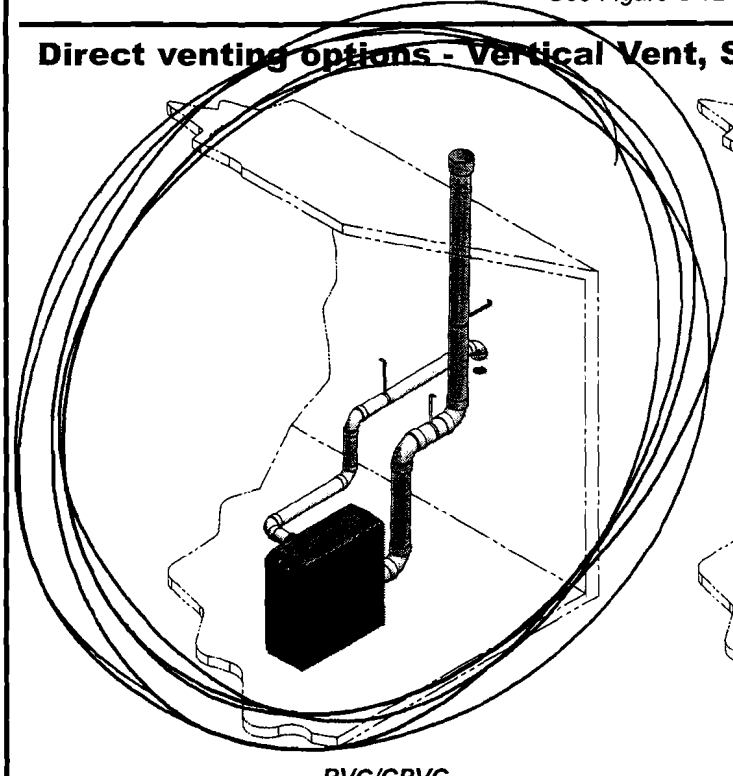


Stainless Steel
Two Pipe
See Figure 5-1B

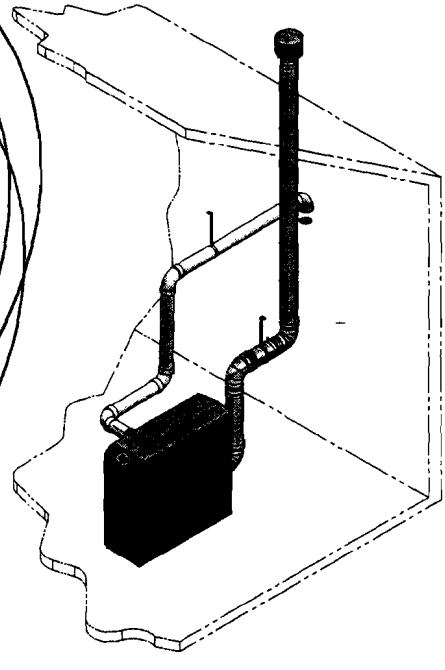


PVC/CPVC
Concentric
See Figure 5-5

Direct venting options - Vertical Vent, Sidewall Air



PVC/CPVC
Vertical Vent, Sidewall Air



Stainless Steel
Vertical Vent, Sidewall Air

NOTICE Stainless steel vent/air design and terminations will vary slightly by manufacturer.

Ratings

DESIGN CERTIFIED ® CERTIFIED ® DOE

Knight XL Boiler I=B=R Rating					Other Specifications				
Model Number Note: Change "N" to "L" for L.P. gas models.	Input MBH (Note 4)		Gross Output MBH (Note 1)	Net I=B=R Ratings Water, MBH (Note 2)	Boiler Water Content Gallons	Water Connections	Gas Connections	Air Size	Vent Size (Note 3)
	Min	Max							
KBN400	80	399	373	324	3.4	1-1/2"	1"	4"	4"
KBN501	100	500	467	406	4.2	1-1/2"	1"	4"	4"
KBN601	120	600	567	493	4.2	2"	1"	4"	4"
KBN701	140	700	660	574	5.0	2"	1"	4"	6"
KBN801	160	800	752	654	5.7	2"	1"	4"	6"

NOTICE Maximum allowed working pressure is located on the rating plate.

Notes:

1. The ratings are based on standard test procedures prescribed by the United States Department of Energy.
2. Net I=B=R ratings are based on net installed radiation of sufficient quantity for the requirements of the building and nothing need be added for normal piping and pickup. Ratings are based on a piping and pickup allowance of 1.15.
3. Knight XL boilers require special gas venting. Use only the vent materials and methods specified in the Knight XL Installation and Operation Manual.
4. Standard Knight XL boilers are equipped to operate from sea level to 4,500 feet **only** with no adjustments. The boiler will de-rate by 4% for each 1,000 feet above sea level up to 4,500 feet.
5. High altitude Knight XL boilers are equipped to operate from 3,000 to 12,000 feet **only** with no field adjustments. The boiler will de-rate by 2% for each 1,000 feet above 3,000 feet. High altitude models are manufactured with a different control module for altitude operation, but the operation given in this manual remains the same as the standard boilers. A high altitude label (as shown in FIG. A) is also affixed to the unit.
6. Ratings have been confirmed by the Hydronics Institute, Section of AHRI.
7. Knight XL boilers comply with the requirements of CSD-1 Section CW-400 requirements as a temperature operation control. The manual reset high limit provided with the Knight XL is listed to UL353.

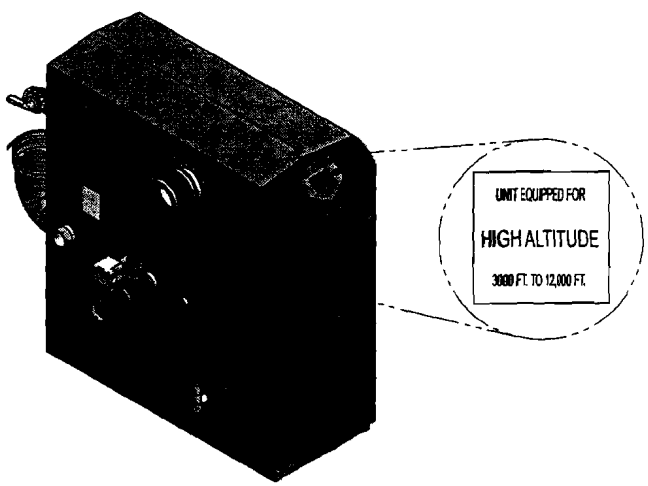
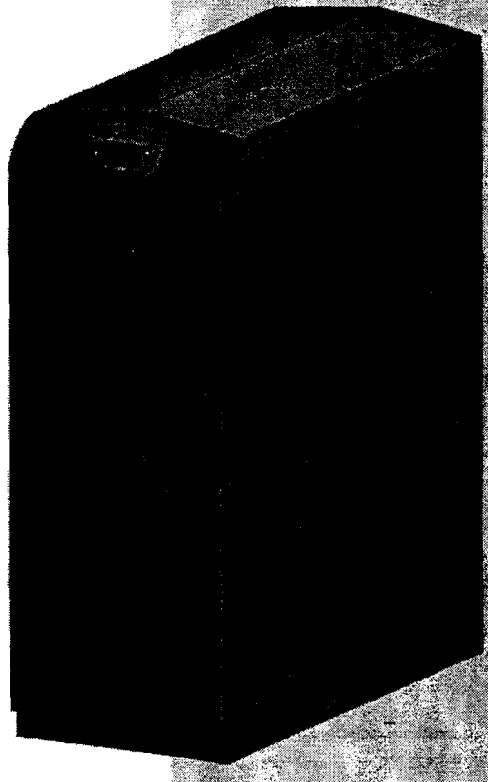


***Figure A** High Altitude Label Location*

KNIGHT® COMMERCIAL BOILER XL

Installation & Operation Manual
Models: 400 - 801



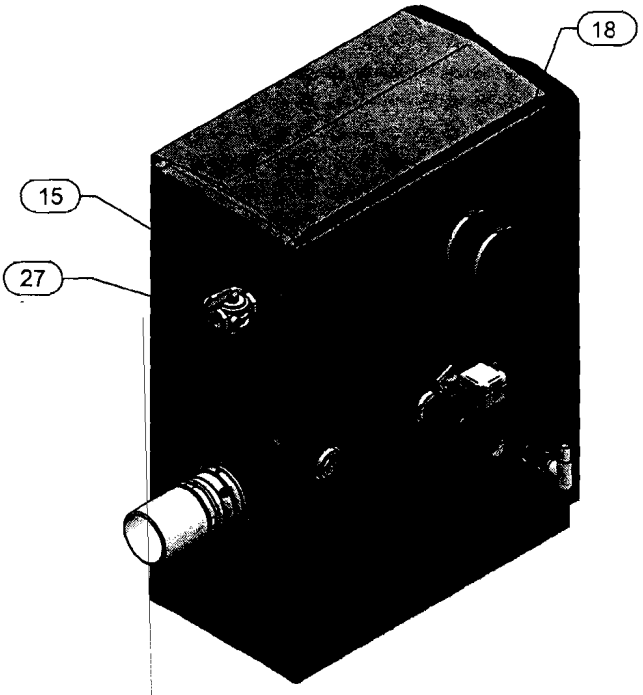
⚠WARNING This manual must only be used by a qualified heating installer / service technician. Read all instructions, including this manual and the Knight XL Service Manual, before installing. Perform steps in the order given. Failure to comply could result in severe personal injury, death, or substantial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

Save this manual for future reference.

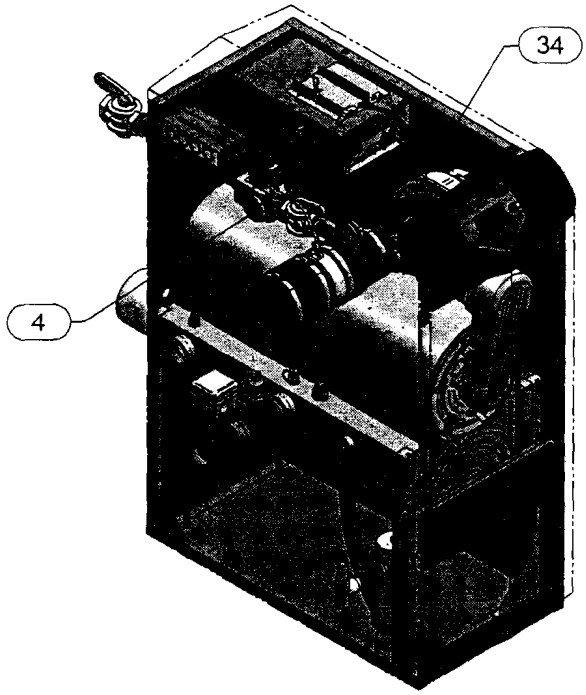
Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters

The Knight XL - How it works...

Model 501

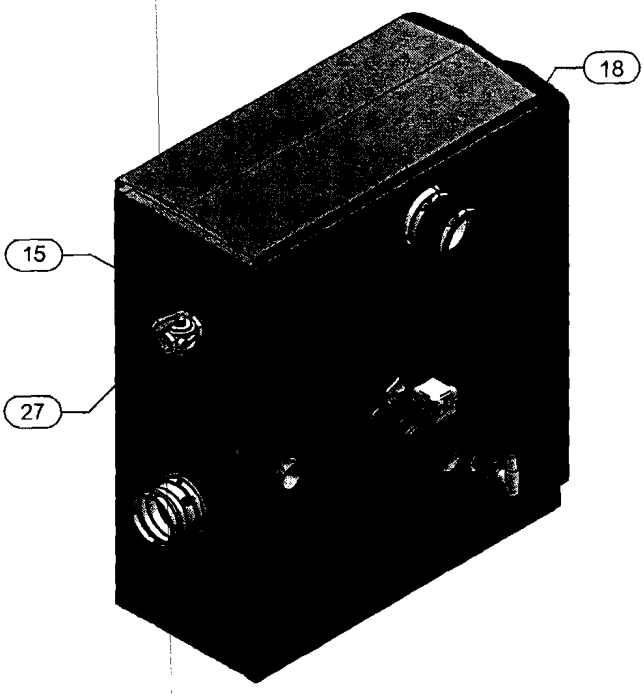


Rear View - Model 501

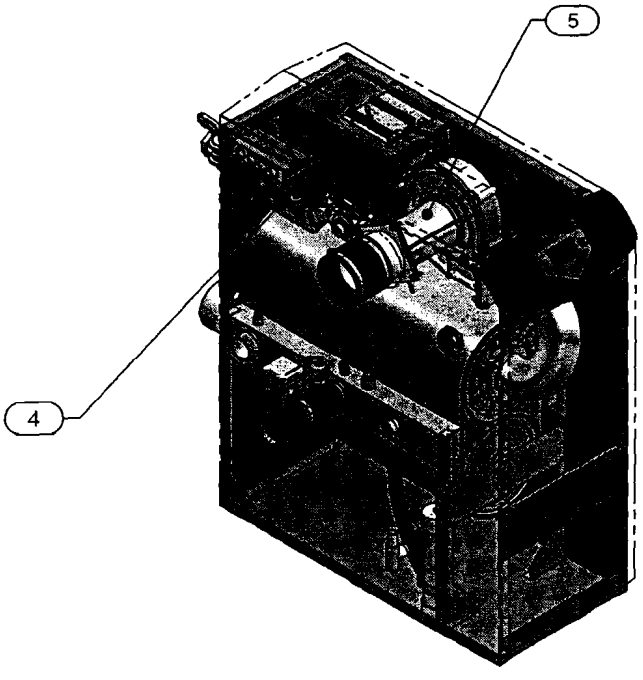


Left Side (inside unit) - Model 501

Models 601 - 801



Rear View - Models 601 - 801



Left Side (inside unit) - Models 601 - 801

3 General venting *(continued)*

Install vent and combustion air piping

⚠ DANGER The Knight XL must be vented and supplied with combustion and ventilation air as described in this section. Ensure the vent and air piping and the combustion air supply comply with these instructions regarding vent system, air system, and combustion air quality. See also Section 1 of this manual.

Inspect finished vent and air piping thoroughly to ensure all are airtight and comply with the instructions provided and with all requirements of applicable codes.

Failure to provide a properly installed vent and air system will cause severe personal injury or death.

PVC/CPVC vent piping materials

⚠ WARNING Use only the materials listed in Table 3A (pg. 18) for vent pipe, and fittings. 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 Z223.1 for U.S. installations or CSA B149.1 for Canadian installations.

⚠ WARNING For closet and alcove installations, CPVC or stainless steel material MUST BE used in a closet/alcove structure. Failure to follow this warning could result in fire, personal injury, or death.

NOTICE All PVC vent pipes must be glued, properly supported, and the exhaust must be pitched a minimum of a 1/4 inch per foot back to the boiler (to allow drainage of condensate).

⚠ WARNING This appliance requires a special venting system. The vent connection to the appliance must be made with the starter CPVC pipe section provided with the appliance if PVC/CPVC vent is to be used. For stainless steel venting use an adapter from Table 3B (page 20) that corresponds with the intended vent manufacturer to be used and discard the CPVC starter piece. The field provided vent fittings must be cemented to the CPVC pipe section using an "All Purpose Cement" suitable for PVC and CPVC pipe. Use only the vent materials, primer, and cement specified in this manual to make the vent connections. Failure to follow this warning could result in fire, personal injury, or death.

⚠ WARNING Insulation should not be used on PVC or CPVC venting materials. The use of insulation will cause increased vent wall temperatures, which could result in vent pipe failure.

Requirements for installation in Canada

1. Installations must be made with a vent pipe system certified to ULC-S636.

   IPEX is an approved vent manufacturer in Canada supplying vent material listed to ULC-S636.

2. The first three (3) feet of plastic vent pipe from the appliance flue outlet must be readily accessible for visual inspection.

3. The components of the certified vent system must not be interchanged with other vent systems or unlisted pipe/fittings. For concentric vent installations, the inner vent tube must be replaced with field supplied certified vent material to comply with this requirement.

⚠ CAUTION Improper installation of PVC or CPVC systems may result in injury or death.

Installing vent or air piping

NOTICE Use only cleaners, primers, and solvents that are approved for the materials which are joined together.

1. Work from the boiler to vent or air termination. Do not exceed the lengths given in this manual for the air or vent piping.
2. Cut pipe to the required lengths and deburr the inside and outside of the pipe ends.
3. Chamfer outside of each pipe end to ensure even cement distribution when joining.
4. Clean all pipe ends and fittings using a clean dry rag. (Moisture will retard curing and dirt or grease will prevent adhesion.)
5. Dry fit vent or air piping to ensure proper fit up before assembling any joint. The pipe should go a third to two-thirds into the fitting to ensure proper sealing after cement is applied.

3 General venting

Table 3B *Approved Stainless Steel Terminations and Adapters*

Model	ProTech			Heat Fab				Z Flex		
	FasNSeal			Saf-T Vent				Z-Vent		
	Boiler Adapter	Flue Termination	Intake Air Termination	Boiler Adapter	Intermediate Adapter	Flue Termination	Intake Air Termination	Boiler Adapter	Flue Termination	Intake Air Termination
400-601	F303759	FSBS4 FSRC4(R.C)	FSAIH04 303888	KB285601	9454BUREZ-1*	9492 5400CI	9414TERM	2SVSLA04	2SVSTP04 2SVSRCX04	2SVSTEX0490
701-801	F303759 (Intake Only)	FSBS6	FSAIH04 303888							

* = This adapter must be used in addition to the boiler adapter for Saf-T vent pipe as shown in FIG. 3-11, unless approved vent other than standard diameter is used. Consult a Heat Fab representative for questions.

Table 3C *Stainless Steel Vent Termination Kit(s)*

Model	Kit Number
701 - 801	KIT3137

Stainless steel air intake/vent connections

1. **Combustion Air Intake Connector** (FIG.'s 3-11 and 3-12) - Used to provide combustion air directly to the unit from outdoors. A fitting is provided on the unit for final connection. Combustion air piping must be supported per guidelines listed in the National Mechanical Code, Section 305, Table 305.4 or as local codes dictate.
2. **Vent Connector** (FIG.'s 3-11 and 3-12) - Used to provide a passageway for conveying combustion gases to the outside. A transition fitting is provided on the unit for final connection. Vent piping must be supported per the National Building Code, Section 305, Table 305.4 or as local codes dictate.

Figure 3-11 *Near Boiler Stainless Steel Venting Models 400 - 601*

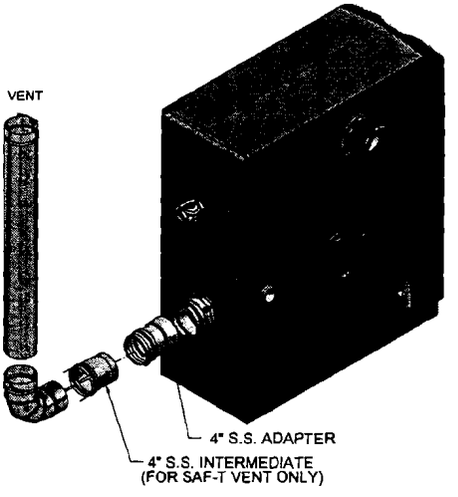
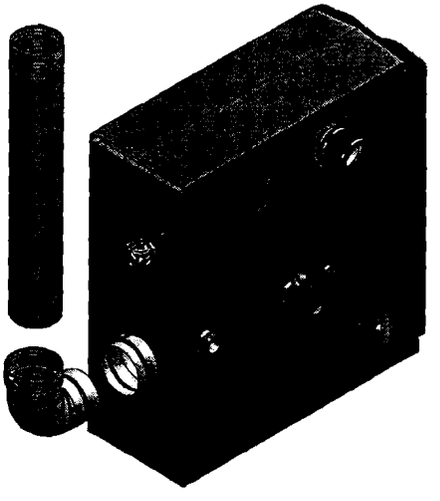


Figure 3-12 *Near Boiler Stainless Steel Venting Models 701 - 801*



3 General venting *(continued)*

The Knight XL uses model specific combustion air intake and vent piping sizes as detailed in Table 3D below.

Table 3D Air Intake/Vent Piping Sizes

Model	Air Intake	Vent
400 - 601	4 inches (102 mm)	4 inches (102 mm)
701 - 801	4 inches (102 mm)	6 inches (152 mm)

NOTICE Increasing or decreasing combustion air or vent piping is not authorized.

Minimum / Maximum allowable combustion air and vent piping lengths are as follows:

Combustion Air = 12 equivalent feet (3.7 m) minimum / 100 equivalent feet (30.5 m) maximum

Vent = 12 equivalent feet (3.7 m) minimum / 100 equivalent feet (30.5 m) maximum

When determining equivalent combustion air and vent length, add 5 feet (1.5m) for each 90° elbow and 3 feet (.9 m) for each 45° elbow.

EXAMPLE: 20 feet (6 m) of PVC pipe + (3) 90° elbows + (3) 45° elbows + (1) concentric vent kit (CVK3007) = 49 equivalent feet (15 m) of piping.

NOTICE The appliance output rating will reduce by up to 1.5% for each 25 feet (68 m) of vent length.

Table 3E Concentric Vent Kit Equivalent Vent Lengths

Model	Kit Number	Equivalent Vent Length
400	CVK3007	5 Feet (1.5 m)
501	CVK3007	30 Feet (9 m)
601	CVK3007	30 Feet (9 m)

Removing from existing vent

Follow the instructions in Section 1, page 12 of this manual when removing a boiler from an existing vent system.

Vent and air piping

Vent and air system:

NOTICE Installation must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1 for U.S. installations or CSA B149.1 for Canadian installations.

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

You may use any of the vent/air piping methods covered in this manual. Do not attempt to install the Knight XL 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 approved stainless steel, PVC or CPVC pipe and fittings. For PVC/CPVC use with primer and cement specifically designed for the material used.

Vent, air piping and termination:

The Knight XL vent and air piping can be installed through the roof or through a sidewall. Follow the procedures in this manual for the method chosen. Refer to the information in this manual to determine acceptable vent and air piping length.

Optional room air

NOTICE Optional room air is intended for commercial applications. Combustion-air piping to the outside is recommended for residential applications.

Commercial applications utilizing the Knight XL boiler may be installed with a single pipe carrying the flue products to the outside while using combustion air from the equipment room. In order to use the room air venting option the following conditions and considerations must be followed.

- The unit MUST be installed with the appropriate room air kit (Table 3F).
- The equipment room MUST be provided with properly sized openings to assure adequate combustion air. Please refer to instructions provided with the room air kit.
- There will be a noticeable increase in the noise level during normal operation from the inlet air opening.
- Using the room air kit makes the unit vulnerable to combustion air contamination from within the building. Please review Section 1, Prevent Combustion Air Contamination, to ensure proper installation.
- Vent system and terminations must comply with the standard venting instructions set forth in this manual.