DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING PERMIT

This is to certify that IRIS NETWORK THE

Located At 189 PARK AVE

Job ID: 2011-11-2687-HVAC

CBL: 052- C-003-001

has permission to Install a Knight Heating System

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

11/18/2011

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

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: 2011-11-2687-HVAC **Located At:** 189 PARK AVE **CBL:** 052- C-003-001

Conditions of Approval:

Building

1. Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.
2. Ventilation of this space is required per ASRAE 62.2 or 62.1, 2007 edition.
3. The appliance and venting shall be installed in accordance with the UL listing, IMC 2009 and NFPA 211
4. This solid fuel appliance/stove/insert shall be installed, operated and maintained per the manufacturers specifications, the UL listing, NFPA 211 and IMC 2009.
5. Separate permits are required for any electrical, plumbing, sprinkler, fire alarm, HVAC systems, heating appliances, including pellet/wood stoves, commercial hood exhaust systems and fuel tanks. Separate plans may need to be submitted for approval as a part of this process.

Fire

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:	
2011-11-2687-HVAC	11/8/2011	052- C-003-001	
Location of Construction: 189 PARK AVE	Owner Name: THE IRIS NETWORK	Owner Address: 189 PARK AVE PORTLAND, ME 04102	Phone:
Business Name: Iris Network	Contractor Name: Pine State Services, Inc	Contractor Address: 5 Industry Road, South Portland, ME 04106	Phone: 883-1200
Lessee/Buyer's Name:	Phone:	Permit Type: HVAC	Zone: C-37
Past Use: Offices/instruction and residential	Proposed Use: Same: offices/instruction and residential – to install a Knight heating system	Cost of Work: $36,000.00	CEO District:
		Fire Dept: ✓ Approved w/ conditions ___ Denied ___ N/A Signature: Capt. Pelletier 11/15/11	Inspection: Use Group: Type: HVAC Signature:
Proposed Project Description: direct vent Knight heating system		Pedestrian Activities District (P.A.D.)	
Permit Taken By: Gayle			

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: 11/10/11	Date:	Date:

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

FILL IN AND SIGN WITH INK

APPLICATION FOR PERMIT
HEATING OR POWER EQUIPMENT

2011 11 7689 Com CBL: 053 C008 C-57

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 189 Iris Network Use of Building office Date 11-8-11

Name and address of owner of appliance Iris Network 189 Park Ave Portland

Installer's name and address Pine State Services Inc
5 Industry Rd S.P. ME 04106 Telephone 883-1200

Location of appliance:
- ☑ Basement
- ☐ Floor
- ☐ Attic
- ☐ Roof

Type of Fuel:
- ☑ Gas
- ☐ Oil
- ☐ Solid

Appliance Name:

U.L. Approved ☑ Yes ☐ No

Will appliance be installed in accordance with the manufacture's installation instructions? ☑ Yes ☐ No

IF NO Explain:

The Type of License of Installer:
- ☐ Master Plumber #
- ☐ Solid Fuel #
- ☐ Oil #
- ☐ Gas # PNT 1218
- ☐ Other

Type of Chimney:
- ☐ Masonry Lined
  Factory built
- ☐ Metal
  Factory Built U.L. Listing #
- ☑ Direct Vent
  Type PVC UL#

Type of Fuel Tank
- ☐ Oil
- ☑ Gas

RECEIVED
NOV - 8
Dept. of Building Inspections
City of Portland Maine

Size of Tank

Number of Tanks

Distance from Tank to Center of Flame feet.

Cost of Work: $ 36,000

Permit Fee: $ 360.00

Approved

Fire:

Ele.:

Bldg.:

Approved with Conditions

☐ See attached letter or requirement

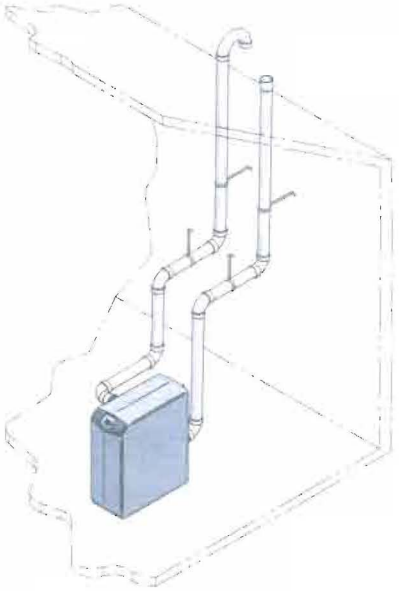
Inspector's Signature Date Approved

Signature of Installer Lee Neely

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

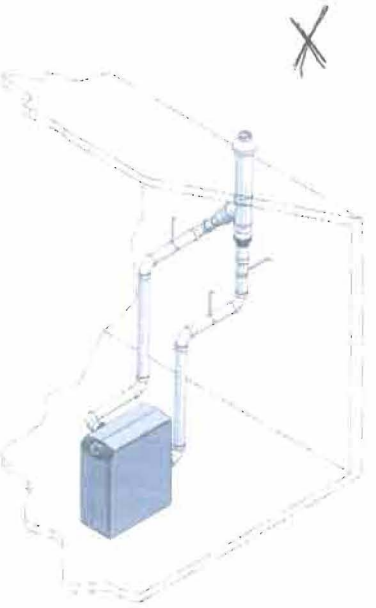
3 General venting

Direct venting options - Vertical Vent



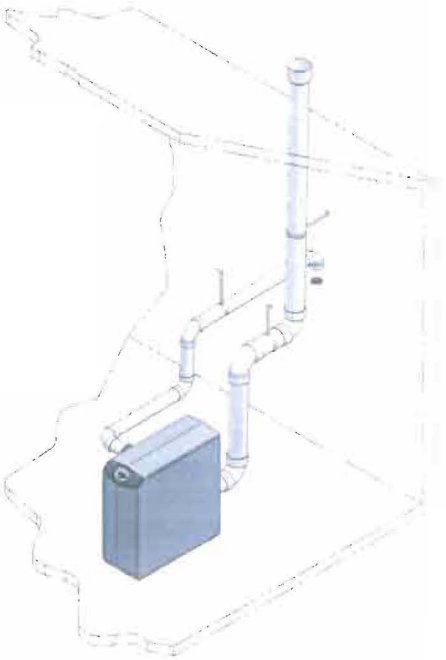
PVC/CPVC
Two Pipe
See Figure 5-1A

Stainless Steel
Two Pipe
See Figure 5-1B

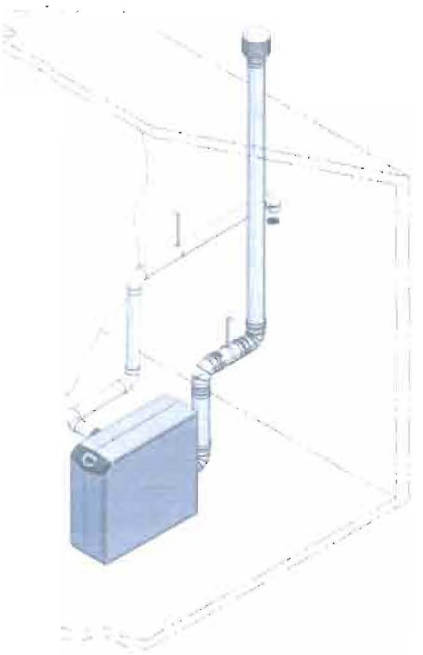


PVC/CPVC
Concentric
See Figure 5-5
Models 400 - 601 Only

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.

HIGH EFFICIENCY COMMERCIAL CONDENSING BOILERS

KNIGHT® COMMERCIAL BOILER XL

SMART SYSTEM™

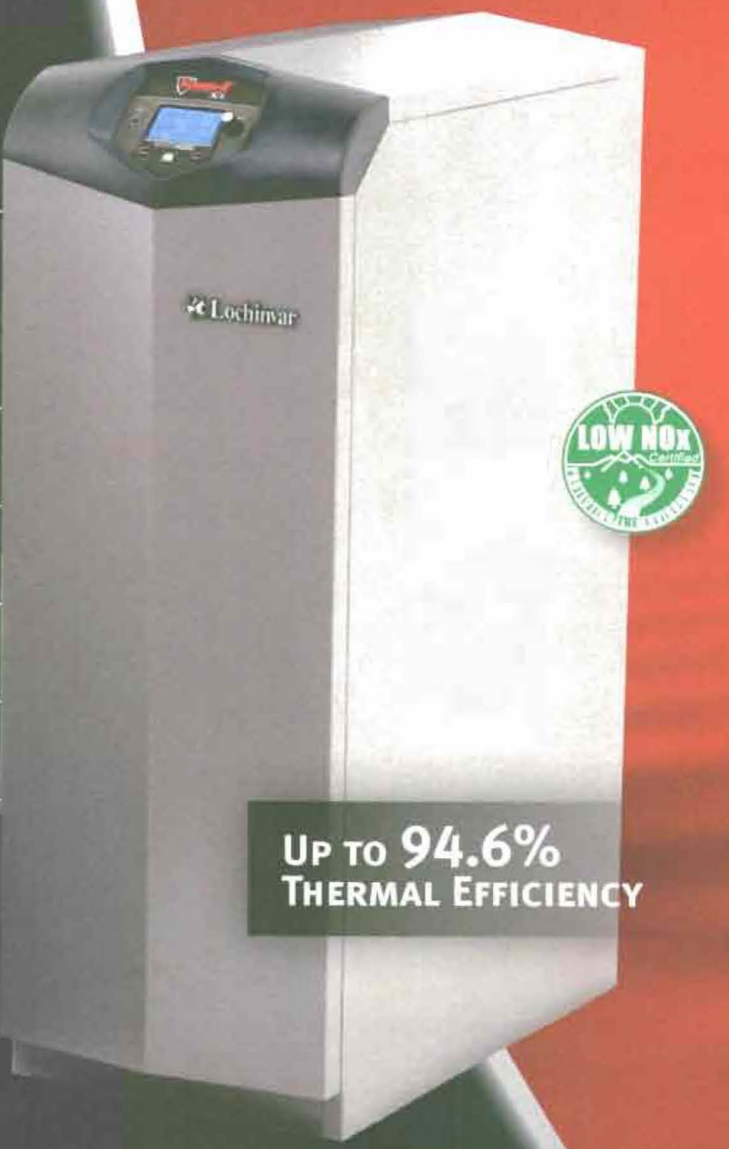
OPERATING CONTROL FEATURING
A BUILT-IN CASCADING SEQUENCER

5 MODELS: 399,000 – 800,000 BTU/HR

FIRING RATE MODULATION TO 5:1

LESS THAN 20 ppm NOx

DIRECT VENT FLEXIBILITY TO 100 FEET



UP TO 94.6%
THERMAL EFFICIENCY

Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters

Lochinvar.com

KNIGHT® COMMERCIAL BOILER XL

The Smartest Choice for Condensing Boiler Performance

The KNIGHT® XL, engineered with Lochinvar's exclusive SMART SYSTEM™ control and an array of other innovative features, places it far ahead of any commercial heating boiler in its class. It promises and delivers ultimate ease of installation and maintenance. With up to 94.6% thermal efficiency, low-NOx emissions and a fully modulating burner, it is the best "green choice" for today's environmentally focused market.

Five modulating/condensing stainless steel KNIGHT XL boilers are available with 399,000–800,000 Btu/hr inputs and remarkably small space-saving footprints. All are equipped for direct-vent installation with air intake and exhaust runs up to 100 feet using PVC, CPVC or AL29-4C vent materials. This range of choices is ideal for light-duty applications such as small hotels, schools and office buildings. For higher-demand applications, up to eight KNIGHT XL units can be installed utilizing the built-in cascading sequencer to deliver up to 6.4 million Btu/hr heating capacity.

THE KNIGHT XL BOILER reflects Lochinvar's constant commitment to providing all the options you need to serve every application.

KNIGHT XLs installed and commissioned by Black & McDonald

Advanced Negative Regulation Technology

KNIGHT XL safely and reliably operates with supply gas pressure as low as 4 inches water column. Negative Regulation (Neg/Reg) technology automatically adjusts fan speed that ensures the correct volume and mix of fuel and air throughout the firing range.

Two-in-One Stainless Steel Heat Exchanger

A primary heat exchanger combined with a secondary heat exchanger captures flue gas heat and condenses to utilize available latent energy. The stainless steel, pH-tolerant design features a weld-sealed assembly with no O-rings or gaskets and does not require special glycol. ASME Section IV approved and stamped.

Fully Modulating Burner

The SMART SYSTEM allows fully modulating combustion with 5:1 turndown. The burner can fire as low as 20% of maximum input and modulates the firing rate up to 100% as demand increases. The burner is a single stainless steel assembly covered with woven steel mesh and fires in a 360° pattern along the entire length of the primary heat exchanger. This allows the compact KNIGHT XL to exceed the capacity of units with larger multiple burners.

Direct Venting up to 100 Feet

KNIGHT XL offers 7 venting options and tremendous flexibility for placement of units within the building, because it permits direct-vent air intake and exhaust runs up to 100 equivalent feet using either PVC, CPVC or AL29-4C stainless steel vent pipe. A sidewall vent termination kit is shipped standard with every KNIGHT boiler.

Sidewall Vent Termination

Sidewall Vent Termination

SMART SYSTEM™

Refined Design Puts More Control and Information at your Fingertips

Advanced features include:

- Multi-Color Graphic LCD Display
- Navigation Dial
- USB Port
- Ability to control up to three different setpoint temperatures
- Modbus Capability (Optional)
- DHW Modulation Limiting
- DHW Night Setback*
- 0-10 V Boiler Rate Output
- 0-10V Signal to control variable speed boiler pump*
- 0-10V System Pump Signal Input*
- Heat Demand from 0-10V Input
- Installer Can Program Name and Number into the Boiler
- Installer Adjustable Freeze Protection Parameters
- Separately adjustable SH/DHW Switching times*
- Installer access to BMS and ramp delay settings

**Exclusive to Lochinvar Smart System*

At-a-Glance Color Coding

Blue Screen
Normal system operation.

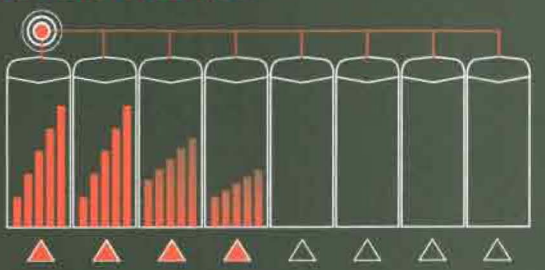
Yellow Screen
Maintenance due - shows the installer's name and number on the display.

Red Screen
Lockout mode.

New Selectable Cascade Options

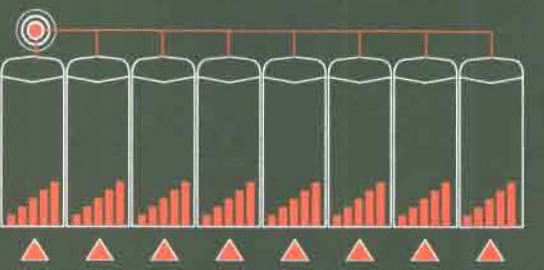
When multiple KNIGHT boilers are installed together, the SMART SYSTEM built-in sequencer can be set for "Lead-Lag" cascade or "Efficiency Optimized" cascade operation.

Lead-Lag Cascade



The "lead" boiler modulates with demand to capacity. As demand increases, additional boilers fire and modulate to capacity. This continues, with additional boilers firing and modulating to capacity until all units are operating. Every 24 hours, the SMART SYSTEM automatically shifts the lead boiler role to the next in the sequence, distributing lead-lag runtimes equally.

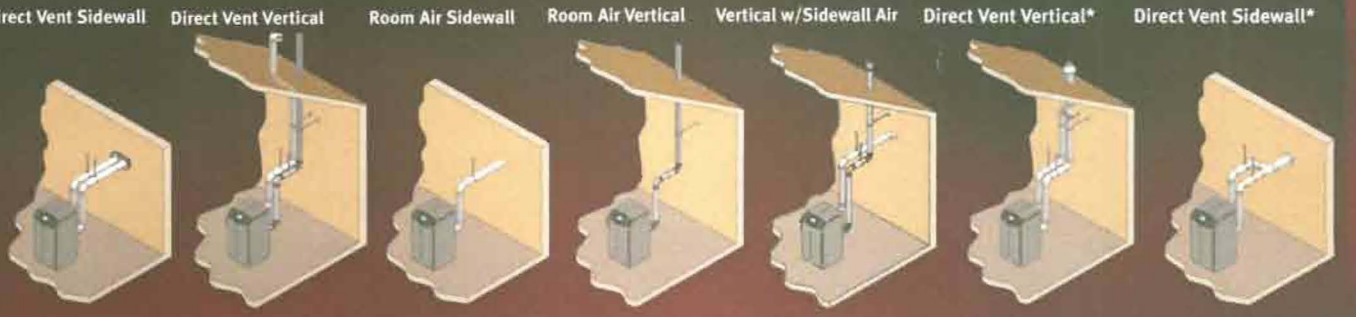
Efficiency Optimized Cascade



This feature optimizes the modulation capabilities of the Boiler Plant while evenly distributing run time across all cascaded boilers. Every 24 hours the SMART SYSTEM automatically shifts the 1st boiler on role to the next in the sequence, distributing run time equally.

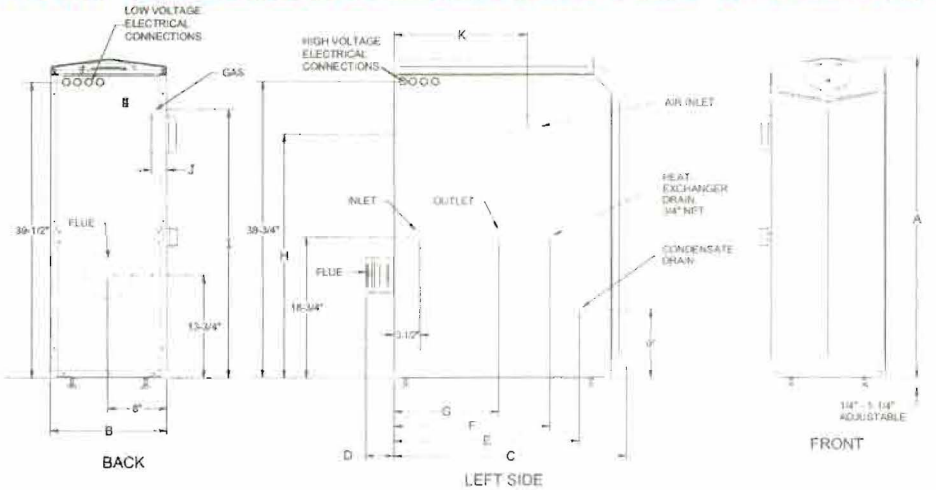
SMART SYSTEM Cascade option allows 2 - 8 boilers to be sequenced.

7 Flexible Venting Options



**Optional Concentric Vent Kit Sold Separately (for 400-601 Models)*

KNIGHT® XL BOILER DIMENSIONS AND SPECIFICATIONS



Model Number Guide

KB	N	701	M13
Model	Natural Gas	Btu/hr Input	Firing Controls

Knight XL Boiler,
Natural Gas,
***700**,000 Btu/hr input,*
***M13** firing controls*

KNIGHT XL HEATING BOILER

DIMENSIONS AND SPECIFICATIONS

Model Number	Input Min MBH	Input Max MBH	Thermal Efficiency	Output MBH	Net I=B=R MBH	A	B	C	D	E	F	G	H	I	J	K	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
KBN400	80	399	93.3%	373	324	42-1/2"	15-1/2"	27-3/4"	3-3/4"	20-3/4"	21"	14"	34"	34"	2"	18-3/4"	1"	1-1/2"	4"	4"	280
KBN501	100	500	93.3%	467	406	42-1/2"	15-1/2"	31-1/2"	3-3/4"	25-1/2"	21"	14"	32-1/2"	36"	2"	18"	1"	1-1/2"	4"	4"	310
KBN601	120	600	94.6%	567	493	42-1/2"	15-1/2"	36-1/4"	3-3/4"	25"	21"	14"	36"	32-3/4"	5-1/2"	19-1/2"	1"	2"	4"	4"	340
KBN701	140	700	94.3%	660	574	42-1/2"	15-1/2"	40-1/4"	3-3/4"	29"	23"	17"	36"	32-3/4"	3-1/4"	23-1/2"	1"	2"	4"	6"	370
KBN801	160	800	94.0%	752	654	42-1/2"	15-1/2"	45-1/4"	3-3/4"	33-1/4"	23"	17"	36"	32-3/4"	3-1/4"	27-3/4"	1"	2"	4"	6"	405

Notes: Indoor installation only. All information subject to change. Change "N" to "L" for LP gas models.

STANDARD FEATURES

- **Up to 94.6% Thermal Efficiency**
- **Modulating Burner with 5:1 Turndown**
  - Direct-Spark Ignition
  - Low NOx Operation
  - Sealed Combustion
  - Low Gas Pressure Operation
- **ASME Stainless Steel Heat Exchanger**
  - ASME Certified, "H" Stamped Gasketless Heat Exchanger
  - 160 psi Working Pressure
  - 50 psi ASME Relief Valve
  - Highly efficient, condensing design
- **Vertical & Horizontal Direct-Vent**
  - Category IV venting up to 100 feet
  - PVC, CPVC or AL29-4C Venting up to 100 Feet
  - Factory Supplied Sidewall Vent Termination
- **Smart System Control**
- **Other Features**
  - On/Off Switch
  - Adjustable High Limit w/ Manual Reset
  - Automatic Reset High Limit
  - Flow Switch
  - Flue Temperature Sensor
  - Low Air Pressure Switch
  - Temperature & Pressure Gauge
  - Adjustable Leveling Legs
  - Condensate Trap
  - Zero Clearances to Combustible Material
  - 10 Year Limited Warranty (See Warranty)

SMART SYSTEM FEATURES

- **SMART SYSTEM Digital Operating Control**
  - Multi-Color Graphic LCD Display w/ Navigation Dial
- **Three Reset Temperature Inputs with curves for three set point temperature inputs**
- **Built in Cascading Sequencer for up to 8 Boilers**
  - Lead Lag
  - Efficiency Optimization
- **Outdoor Reset Control with Outdoor Air Sensor**
- **Programmable System Efficiency Optimizers**
  - Night Setback
  - DHW Night Setback
  - Anti-Cycling
  - Outdoor Air Reset Curve
  - Ramp Delay
  - Boost Temperature & Time
- **Three Pump Control**
  - System Pump With Parameter for Continuous Operation
  - Boiler Pump With Variable Speed Pump Control*
  - Domestic Hot Water Pump
- **Domestic Hot Water Prioritization**
  - DHW tank piped with priority in the boiler loop
  - DHW tank piped as a zone in the system with the pumps controlled by the Smart System
  - DHW Modulation Limiting
  - Separately Adjustable SH/DHW Switching Times*
- **Building Management System Integration**
  - 0-10VDC Input to Control Modulation or Set Point
  - 0-10VDC Input Signal from Variable Speed System Pump*
  - 0-10VDC Modulation Rate Output
  - 0-10VDC Input to Enable/Disable call for heat
  - Access to BMS Settings through Display
- **High Voltage Terminal Strip**
  - 120 VAC / 60 Hertz / 1 Phase Power Supply
  - Three sets of Pump Contacts with Pump Relays
- **Low Voltage Terminal Strip**
  - 24 VAC Device Relay
  - Proving Switch Contacts
  - Flow Switch Contacts
  - Alarm on Any Failure Contacts
  - Runtime Contacts
  - DHW Thermostat Contacts
  - 3 Space Heat Thermostat Contacts
  - System Sensor Contacts
  - DHW Tank Sensor Contacts
  - Outdoor Air Sensor Contacts
  - Cascade Contacts
  - 0-10 VDC BMS External Control Contact
  - 0-10VDC Boiler Rate Output Contacts
  - 0-10VDC Variable Speed System Pump Signal Input
  - 0-10VDC Signal to Control Variable Speed Boiler Pump
  - Modbus Contacts
- **Time Clock**
- **Data Logging**
  - Hours Running, Space Heating
  - Hours Running, Domestic Hot Water
  - Ignition Attempts
  - Last 10 Lockouts
- **Other Features**
  - Low Water Flow Safety Control & Indication
  - Password Security
  - Inlet & Outlet Temperature Readout
  - Customizable Freeze Protection Parameters
  - Custom Maintenance Reminder with Contractor Info

**Exclusive feature, available only from Lochinvar*

FIRING CODES

M9	Standard Construction
M7	California Code
M13	CSD1 / FM / GE Gap (KB501-KB801)

OPTIONAL EQUIPMENT

- Alarm Bell
- Condensate Neutralization Kit)
- Concentric Vent Kit (KB400-KB601)
- High & Low Gas Pressure Switches w/ Manual Reset (KB501-KB801)
- MODBUS Communication
- Low Water Cutoff w/Manual Reset & Test
- SMART SYSTEM PC Software
- Stainless Steel Vent Kits (KB701-KB801)
- Stack Frame

Patent Pending

Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters

300 Maddox Simpson Parkway, Lebanon, TN 37090 | 615-889-8900 | fax: 615-547-1000 | www.Lochinvar.com

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