



**HIGH EFFICIENCY  
CONDENSING BOILERS**



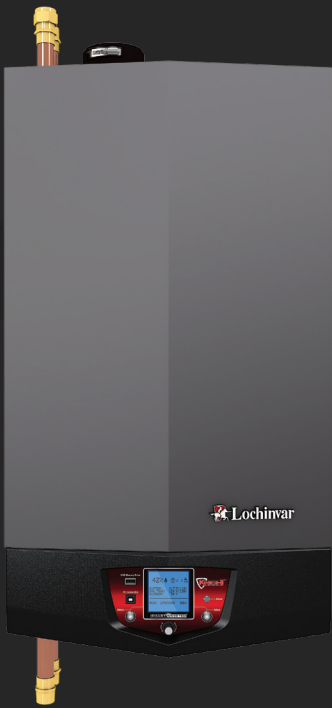
**NOBLE<sup>®</sup>**  
FIRE TUBE

DESIGNED ★ ENGINEERED ★ ASSEMBLED

**USA**



**Lochinvar<sup>®</sup>**



**WHB**  
KNIGHT WALL MOUNT



**KHB**  
KNIGHT FLOOR MOUNT

## NO ONE BRINGS IT ALL TOGETHER LIKE LOCHINVAR

Lochinvar is the industry leader that other leading companies call upon for the most advanced and efficient water heating products in the world. For that reason, Lochinvar is trusted to go beyond the call of duty to find a solution for every project, no matter the size. You will not find a water heating company that works harder or cares more.

That's why no one brings it all together quite like Lochinvar.

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## A HISTORY OF INNOVATION

For nearly 80 years, Lochinvar, an American company, has been a leader of innovation and high-efficiency water heating. Through Lochinvar's pride in leadership and commitment to excellence, the company has continually improved year after year.

Today, Lochinvar touts the broadest line of high-efficiency water heating solutions, a world-class research & development department, comprehensive service with every sale and industry-leading training through Lochinvar University.

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## ALWAYS LEADING THE CHARGE

Introduced in 2005, the KNIGHT® boiler was a major step forward for Lochinvar. Designed for both new construction and replacement applications, the KNIGHT quickly became recognized by the industry as the gold standard for installation flexibility and ease of serviceability.

In 2008, the KNIGHT boiler line was broadened to reach up to 800,000 BTU/hr with the introduction of the KNIGHT XL residential and light commercial boiler, and in 2010 a new and innovative SMART SYSTEM™ control was added to both the KNIGHT and KNIGHT XL boiler products to increase their feature set.

The SMART SYSTEM control makes the setup and operation of KNIGHT boilers easier through its large display, color-coded screens, soft keys and navigation dial used for transitioning from screen to screen quickly.

With over 100,000 units sold to date, the KNIGHT boiler line has continued to benefit from Lochinvar's commitment to perpetual innovation with four model generations and a host of design, efficiency and installation enhancements.

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## THE BEST KNIGHT EVER

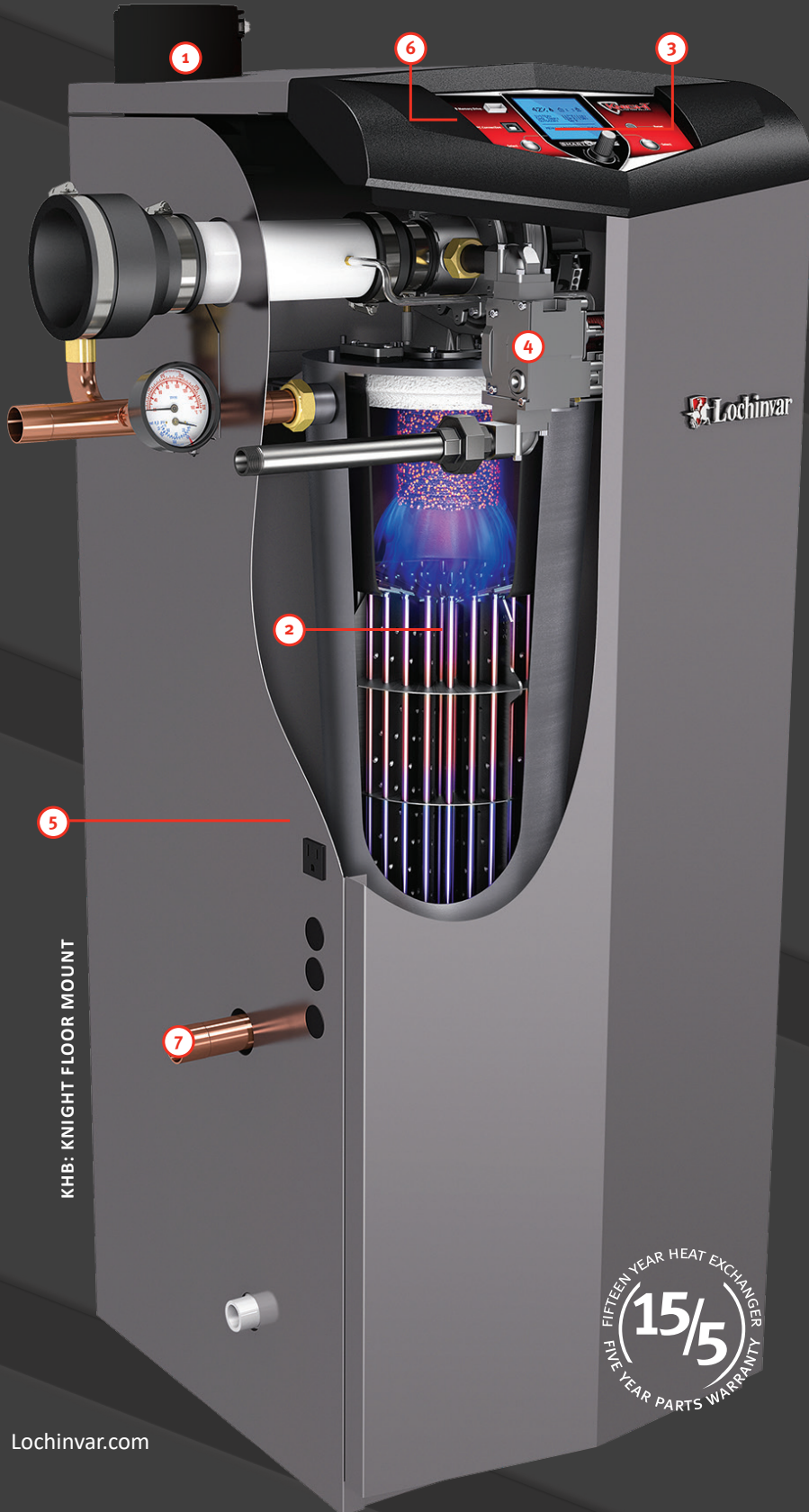
Lochinvar is proud to introduce the new, improved KNIGHT fire tube boiler—delivering ultimate ease of installation and unmatched operational reliability and serviceability.

Recent upgrades keep KNIGHT at the head of the class, allowing it to continue to lead the charge as the industry-leading high-efficiency residential boiler. With more adjustable parameters than any other competitor, KNIGHT is the most flexible residential boiler you can install.

Today, the new KNIGHT boiler family is available in 13 model options—six floor mounts and seven wall mounts. It also offers a broader range of heating capacity from 55,000 to 399,000 BTU/hr—while continuing to work at 95% AFUE efficiency.

# KNIGHT<sup>®</sup>

FIRE TUBE BOILER



KHB: KNIGHT FLOOR MOUNT



WHB: KNIGHT WALL MOUNT

## KNIGHT FEATURES

### 1 UNIVERSAL VENT CONNECTOR\*

Allows for easy installation of multiple vent materials.

### 2 FIRE-TUBE HEAT EXCHANGER

Low pressure drop saves on pump operation costs and provides installation flexibility, while stainless steel fights off corrosion.

### 3 SMART SYSTEM USER INTERFACE

A plain English, code free interface with multicolor diagnostic display.

### 4 10:1 MODULATION TURNDOWN

Saves money on fuel cost.

### 5 ELECTRICAL OUTLET (not shown on WHB)\*

Plug available for work light or condensate pump.

### 6 LOCH-N-LINK<sup>®</sup> USB PROGRAMMING

Allows for saving of parameters onto a USB drive for use at a different job site.

### 7 INSTALLATION FLEXIBILITY

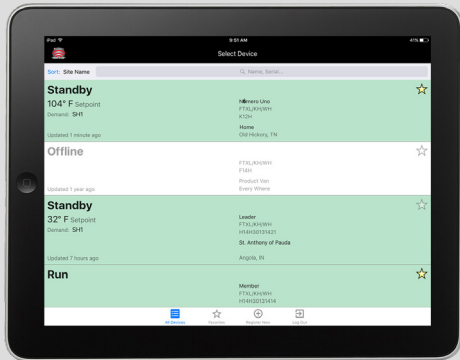
Top and bottom water connection for the WHB. Top and left side connections for the KHB for easy retro-fitting, such as a cast iron efficiency upgrade.

### VARIABLE SPEED ECM PUMP\*

Saves electricity and lowers operating cost.



\*New Features on WHB and KHB models.



# BOILER CONTROL FROM ANYWHERE

The industry's most advanced boiler control system now includes the CON-X-US® Remote Connect option and Loch-N-Link® USB drive programming feature. See below for a complete list of SMART SYSTEM™ functions and features.

From wherever you are, the CON-X-US option lets you use any internet-capable device to link up with the SMART SYSTEM on an unlimited number of KNIGHT boilers. With CON-X-US, you're always in touch and in control. Optional CON-X-US control board is sold separately.

- » DO REGULAR CON-X-US CHECKS FOR ALL YOUR KNIGHT CUSTOMERS, AND LET THEM KNOW YOU'RE MONITORING THEIR BOILER'S PERFORMANCE.
- » ADJUST SETPOINTS, DOMESTIC HOT WATER, RESET CURVES, PUMP DELAYS AND MORE, USING THE CON-X-US INTERACTIVE DISPLAY.
- » STATUS ALERTS VIA TEXT OR E-MAIL LET YOU KNOW WHEN A KNIGHT BOILER NEEDS ATTENTION.



## SMART SYSTEM™ FUNCTIONS AND FEATURES

### SMART SYSTEM™ FEATURES

- › **Smart System Digital Operating Control**  
Multi-Color Graphic LCD Display w/Navigation Dial,  
Soft Keys and Loch-N-Link® USB programming
- › **Three Boiler Setpoint Temperature Inputs**  
Plus Domestic Hot Water Prioritization
- › **Built-in Cascading Sequencer for up to 8 Boilers, with Cascade Redundancy**  
Multiple Size Boiler Cascade  
Lead Lag  
Efficiency Optimization  
Front End Loading Capability
- › **Outdoor Reset Control with Outdoor Air Sensor**  
Programmable for Three Reset Temperature Inputs
- › **Programmable System Efficiency Optimizers**  
Space Heat Night Setback  
DHW Night Setback  
Anti-Cycling  
Outdoor Air Reset Curve  
Ramp Delay  
Modulation Factor Control  
Boost Temperature & Time
- › **Four Pump Control**  
System Pump with Parameter for Continuous Operation  
Boiler Pump with Variable Speed Control  
Domestic Hot Water Pump  
Domestic Hot Water Recirculation
- › **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 Space Heat/DHW Switching Times
- › **Building Management System Integration**  
0-10 VDC Input to Control Modulation or Setpoint  
0-10 VDC Modulation Rate Output  
0-10 VDC Input to Enable/Disable Call for Heat
- › **Access to BMS Settings through Graphic LCD Display**
- › **High-Voltage Terminal Strip**  
120 VAC / 60 Hertz / 1 Phase Power Supply  
Three Sets of Pump Contacts

- › **Low-Voltage Terminal Strip**  
DHW Recirculation Pump Start/Stop  
24 VAC Device Relay  
Configurable Proving 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  
0-10 VDC Boiler Rate Output Contacts  
0-10 VDC Variable Speed System Pump Signal Input  
0-10 VDC 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
- › **Maintenance Reminder**  
Custom Maintenance Reminder with  
Contractor Contact Information  
Installer Ability to De-activate Service Reminder
- › **Low-Water Flow Safety Control & Indication**
- › **Password Security**
- › **Customizable Freeze Protection Parameters**

### STANDARD FEATURES

- › **ENERGY STAR Most Efficient Product**
- › **95% DOE AFUE Efficiency (55-285)**
- › **Modulating Burner with up to 10:1 Turndown**  
Direct Spark Ignition  
Low NOx Operation
- › **ASME Stainless Steel Heat Exchanger**  
30 PSI ASME Relief Valve

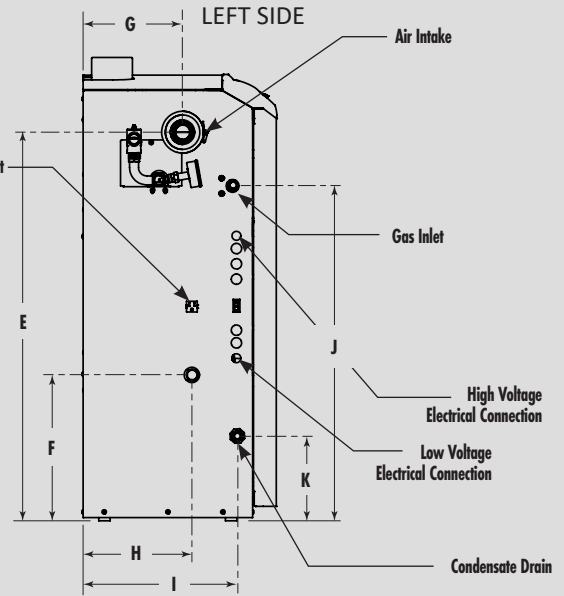
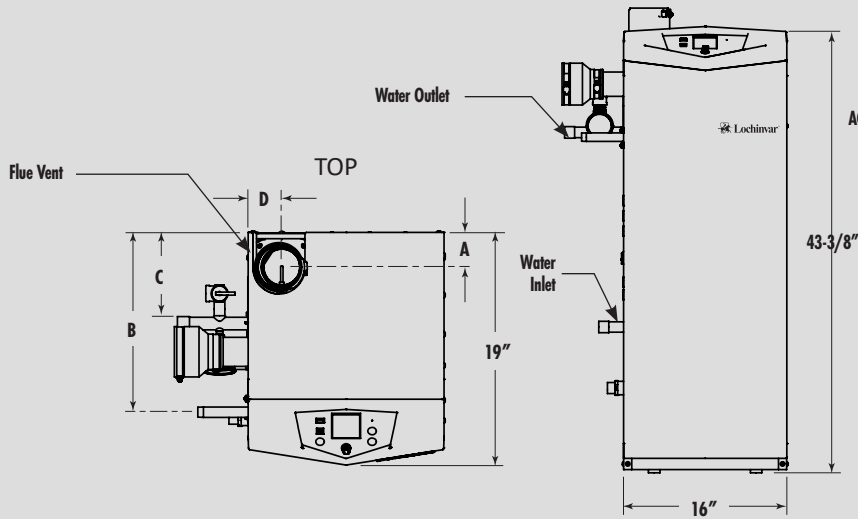
- › **MNPT Top and Bottom Water Connections (WHB 55-285 only)**
- › **Vertical & Horizontal Direct Vent**  
PVC, CPVC, Polypropylene or SS Venting up to 100 ft.
- › **Universal Vent Adapter**  
Built-in Combustion Analyzer Port
- › **Smart System Control**
- › **Condensate Trap**
- › **ECM Variable Speed Boiler Circulating Pump**
- › **110V Convenience Outlet**
- › **High Altitude Models Available**
- › **Other Features**  
Automatic Reset High Limit  
Adjustable High Limit w/Manual Reset  
Boiler Circulating Pump  
Zero Clearances to Combustible Materials  
15-Year Limited Warranty (See Warranty for Details)  
5-Year Limited Parts Warranty
- › **Firing Codes**  
M9 Standard Construction  
M7 California Code

### OPTIONAL EQUIPMENT

- CON-X-US Remote Connectivity
- Modbus Communication
- BACnet MSTP
- Flow Switch
- Low-Water Cutoff w/Manual Reset & Test Alarm Bell
- Concentric Vent Kit
- SMART SYSTEM™ PC Software
- Condensate Neutralization Kit
- BMS Gateway to LON or BACnet IP
- Multi-Temperature Loop Control
- Sidewall Vent Termination
- Wireless Outdoor Sensor
- LP Conversion Kit

# KNIGHT BOILER DIMENSIONS AND SPECIFICATIONS

FRONT

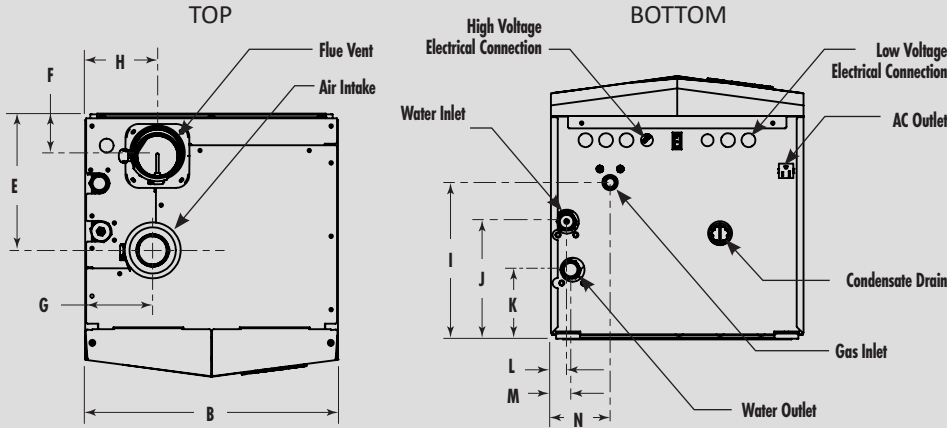
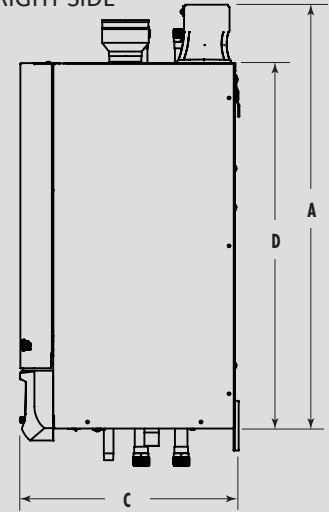


## FLOOR MOUNT



Model Number	Input MBH		Heating Capacity MBH	Net AHRI Rating Water, MBH	AFUE, %	A	B	C	D	E	F	G	H	I	J	K	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
	Min	Max																			
KHB055N	8.3	55	51	44	95.0	3 1/2	13 1/4	6	2 3/4	37 2/3	13 1/2	8 1/3	10 1/2	15	32 1/2	8 1/3	1/2	1	2	2	160
KHB085N	8.5	85	79	69	95.0	3 1/2	13 1/4	6	2 3/4	37 2/3	13 1/2	8 1/3	10 1/2	15	32 1/2	8 1/3	1/2	1	2	2	165
KHB110N	11	110	102	89	95.0	2 3/4	14 3/4	7 1/2	2 3/4	38	14 1/3	9 3/4	10 1/2	15	33	8 1/3	1/2	1	3	3	170
KHB155N	15.5	155	143	124	95.0	2 3/4	14 3/4	7 1/2	2 1/2	38	14 1/3	9 3/4	10 1/2	15	33	8 1/3	1/2	1	3	3	175
KHB199N	19.9	199	184	160	95.0	3	15 1/2	7 1/2	2 1/2	38 1/3	14 1/3	10 1/2	11 1/2	15	33	8 1/3	1/2	1 1/4	3	3	195
KHB285N	28.5	285	264	230	95.0	3	15 1/2	7 1/2	2 1/2	38 1/3	14 1/3	10 1/2	11 1/2	15	33	8 1/3	1/2	1 1/4	3	3	205

RIGHT SIDE



## WALL MOUNT



Model Number	Input MBH		Net AHRI Rating, Water, MBH	AFUE, %	Combustion Efficiency, %	Thermal Efficiency, %	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Ship Wt. (lbs.)	
	Min	Max																								
WHB055N	8.3	55	51	44	95.0	-	40"	18-3/4"	16"	31-1/8"	8-1/2"	3-3/4"	4-1/2"	6-1/2"	7-1/4"	8-7/8"	3-1/2"	1-1/2"	1-1/2"	6"	1/2"	1"	2"	2"	139	
WHB085N	8.5	85	79	69	95.0	-	39-3/4"	18-3/4"	16"	31-1/8"	8-1/2"	3-3/4"	4-1/2"	6-1/2"	7-1/4"	8-7/8"	3-1/2"	1-1/2"	1-1/2"	6"	1/2"	1"	2"	2"	142	
WHB110N	11	110	102	89	95.0	-	41-1/4"	18-3/4"	19"	31-1/8"	10"	2-3/4"	5"	5-1/4"	11-1/2"	8-1/2"	5"	1"	1"	4-1/2"	1/2"	1"	3"	3"	159	
WHB155N	15.5	155	144	125	95.0	-	41-1/4"	18-3/4"	19-1/8"	31-1/8"	10"	2-3/4"	5"	5-1/4"	11-1/2"	8-1/2"	5"	1"	1"	4-1/2"	1/2"	1"	3"	3"	166	
WHB199N	19.9	199	184	160	95.0	-	41-1/4"	18-3/4"	19-1/8"	31-1/8"	10-1/2"	3"	5-1/4"	6"	11"	9-1/2"	6-1/4"	1-1/2"	1-1/2"	4-1/2"	1/2"	1-1/4"	3"	3"	175	
WHB285N	28.5	285	264	230	95.0	-	41-3/4"	18-3/4"	21-1/8"	31-1/8"	15"	3"	3-3/4"	5-1/4"	12-1/4"	11"	6-1/4"	1-1/2"	1-1/2"	6-1/2"	1/2"	1-1/4"	3"	3"	184	
WHB399N	39.9	399	377	328	-	96.0	94.4	43-5/8"	25-1/4"	21-7/8"	34-3/8"	3-1/8"	4-1/4"	23"	3-7/8"	8-3/4"	12-1/2"	9-1/4"	2"	2"	23"	3/4"	1-1/2"	4"	4"	213

Information subject to change without notice.

Dimensions shown are approximate and should not be used for construction purposes.

\*\*"Output" is "Heating Capacity" for units with inputs <300 MBH and "Gross Output" for units ≥300 MBH.

Change "N" to "L" for LP gas models.

The Net AHRI Water Ratings shown are based on a piping and pickup allowance of 1.15.

Lochinvar should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc.

The ratings have been determined under the provisions governing forced draft burners.



# INTRODUCING THE NOBLE® RESIDENTIAL BOILER

Lochinvar is proud to introduce the Noble® boiler—our newest high-efficiency residential boiler. Noble, Lochinvar’s first-ever value-inspired boiler, comes with many of the industry-leading features you would expect to find in a Lochinvar residential boiler. With the addition of the Noble fire-tube boiler, Lochinvar now offers one of the broadest lines of residential condensing boiler products in the industry.

Designed, engineered and assembled in the USA, the Noble boiler delivers performance far beyond other value-priced residential boilers in its class. It touts several of the industry-leading features first pioneered by Lochinvar’s KNIGHT boiler—the top-selling residential boiler since 2005 and still the leading premium solution in hydronic heating.



## VALUE PRICED AT THE TOP OF ITS CLASS

Noble comes to market as a leader in standard residential boilers, and the best option to step up from a traditional cast iron boiler to a high efficiency design. It comes with many standard features, including a Universal Vent Connector—a multi-material connector that allows for PVC, CPVC, polypropylene and stainless steel connections directly into the unit. It also offers a 10:1 turndown ratio, a built-in cascading sequencer for up to eight units, and Lochinvar’s revered SMART CONTROL™ system, the gold standard for boiler control systems that includes an intuitive setup wizard and text-based display.

Because it is a Lochinvar boiler, Noble is easy to install, set up and service, and promises to deliver the lasting reliability and serviceability the industry has come to expect from a Lochinvar boiler.

## COMPETITIVE COMPARISON

COMPETITION	DISPLAY	HEAT EXCHANGER	VENT CONNECTOR	MODULATION TURNDOWN	DESIGNED, ENGINEERED AND ASSEMBLED IN THE USA
<b>NOBLE®</b> <small>FIRE TUBE</small>	ENGLISH	FIRE TUBE HEAT EXCHANGER	UNIVERSAL VENT CONNECTOR	10:1	YES
<b>BRAND B</b>	CODES	WATER TUBE HEAT EXCHANGER	VENT ADAPTERS NEEDED	5:1	YES
<b>BRAND N</b>	CODES	WATER TUBE HEAT EXCHANGER	VENT ADAPTERS NEEDED	UP TO 15:1	NO
<b>BRAND V</b>	CODES	WATER TUBE HEAT EXCHANGER	VENT ADAPTERS NEEDED	LESS THAN 6:1	NO



## NOBLE FEATURES

### 1 UNIVERSAL VENT CONNECTOR

Multi-material connector allows either PVC, CPVC, polypropylene or stainless steel connection directly to the appliance without adapters. NOBLE also has a built-in combustion analyzer port.

### 2 DIRECT VENTING UP TO 100 FEET

Offers five venting options for tremendous installation flexibility. It permits direct-vent air intake and exhaust runs up to 100 equivalent feet using either PVC, CPVC, polypropylene or AL29-4C stainless steel vent pipe.

### 3 ADVANCED NEGATIVE REGULATION TECHNOLOGY

Safely and reliably operates with supply gas pressure as low as 4 inches water column. Its negative regulation (neg/reg) technology eliminates mechanical dampers as it automatically adjusts fan speed to ensure the correct volume and mix of fuel and air throughout the firing range.

### 4 FIRE-TUBE HEAT EXCHANGER

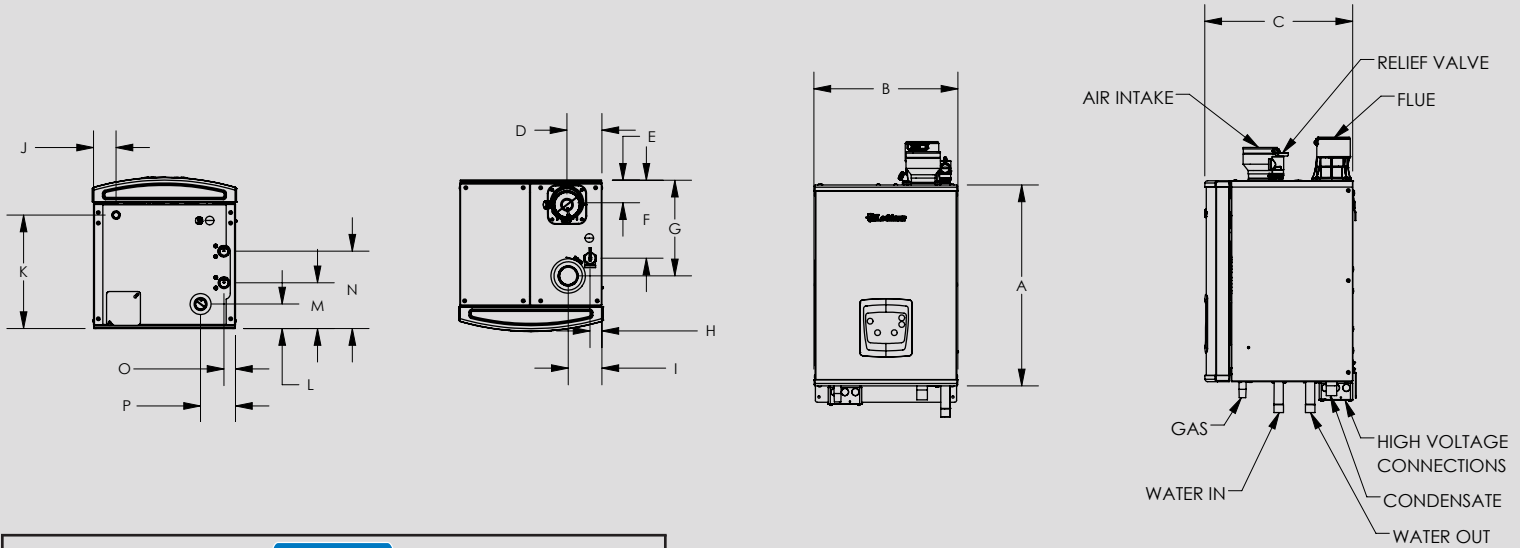
Low pressure drop saves on pump operation costs and provides installation flexibility, while stainless steel fights off corrosion.

## ALWAYS LEADING THE CHARGE

The Noble residential boiler is the perfect hydronic heating solution for homeowners seeking the reliability, ease of installation, and engineering prowess of a Lochinvar high efficiency product. The Noble boiler is available in four sizes: the NKB080N with max input of 80,000 BTU/hr, the NKB110N with max input of 110,000 BTU/hr, the NKB150N with max input of 150,000 BTU/hr and the NKB199N with a max input of 199,000 BTU/hr.

The Noble boiler was designed for durability with 95% AFUE efficiency, a fire-tube stainless steel heat exchanger, and a 10/5 (heat exchanger/parts) warranty. The Noble boiler is also engineered with installation and serviceability in mind, including a simple layout and construction as well as technical support from Lochinvar professionals to assist with troubleshooting.

# NOBLE BOILER DIMENSIONS AND SPECIFICATIONS



NOBLE BOILER		Input MBH		AFUE%	Heating Capacity MBH	Net AHRI Rating MBH	A	B	C	D	E	F	G	H
Model Number	Max	Min	Model Number											
NKB080N	80	8.3	95.0	74	64	24"	17-1/4"	17-1/4"	2-1/4"	5-1/8"	8-1/2"	5-1/8"	1-1/2"	
NKB110N	110	11.0	95.0	102	89	24"	17-1/4"	18"	2-3/4"	2-7/8"	9"	5-1/2"	2-7/8"	
NKB150N	150	15.0	95.0	139	121	24"	17-1/4"	18"	4-1/2"	2-3/4"	9-1/8"	11-3/4"	4-1/2"	
NKB199N	199	19.9	95.0	185	161	24"	17 1/4"	18"	4 1/8"	2 3/4"	9 3/8"	11 1/2"	4"	

Model Number	I	J	K	L	M	N	O	P	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
NKB080N	1-1/2"	6-3/8"	12-5/8"	5-1/8"	4-5/8"	8-1/2"	1-1/2"	2-1/2"	1/2"	1"	2"	2"	120
NKB110N	2-7/8"	7-3/4"	13-1/8"	2-7/8"	5-1/2"	9"	2"	3"	1/2"	1"	3"	3"	126
NKB150N	4-1/2"	2-7/8"	13-1/8"	3"	5-3/8"	9-1/8"	1-7/8"	4-5/8"	1/2"	1"	3"	3"	132
NKB199N	4"	2 3/4"	13 1/2"	2 7/8"	5 1/2"	9 1/4"	1 3/8"	1 3/8"	1/2"	1"	3"	3"	140

Information subject to change without notice. Change "N" to "L" for LP gas models. The Net AHRI Water Ratings shown are based on a piping and pickup allowance of 1.15. Lochinvar should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc. The ratings have been determined under the provisions governing forced draft burners.

## SMART CONTROL™ FUNCTIONS AND FEATURES

### SMART CONTROL™ FEATURES

- ▶ SMART CONTROL Digital Operating Control
  - LCD Display with words not codes
- ▶ Outdoor Reset Control with Outdoor Air Sensor
- ▶ Domestic Hot Water Prioritization
  - Separately Adjustable Space Heat/DHW Switching Times
- ▶ Programmable System Efficiency Optimizers
  - Space Heating Max Rate Limiting
  - Anti Cycling
  - Outdoor Air Reset Curve
- ▶ Three Pump Control
  - System Pump
  - Boiler Pump
  - DHW Pump
- ▶ High-Voltage Junction Box
  - 120 VAC / 60 Hertz / 1 Phase Power Supply
- ▶ Low Voltage Terminal Strip
  - Flow Switch Contacts
  - Tank Sensor Contacts
  - SH Thermostat Contacts
  - DHW Thermostat Contacts
  - Low-Water Cutoff Connection
  - System Sensor Contacts
  - Outdoor Air Sensor Contacts
  - Cascade Contacts

- ▶ Time Clock for Data Logging
  - Last 10 Lockouts
- ▶ Low-Water Flow Safety Control & Indication
- ▶ Password Security
- ▶ Built-in Cascading Sequencer for up to 8 units
  - Multiple Size Boiler Cascade

### STANDARD FEATURES

- ▶ Modulating Burner with 10:1 Turndown
  - Direct-Spark Ignition
  - Low-NOx Operation
- ▶ ASME Stainless Steel Heat Exchanger
- ▶ Vertical & Horizontal Direct-Vent
  - PVC, CPVC, Polypropylene or SS Venting up to 100 feet
- ▶ Condensate Trap
- ▶ California Code Compliant
- ▶ Other Features
  - Automatic Reset High Limit
  - Adjustable High Limit w/Manual Reset
  - Wall-Mount Bracket
  - Zero Clearances to Combustible Materials
  - 10-Year HEX Warranty (See Warranty for Details)
  - 5-Year Parts Warranty

### OPTIONAL EQUIPMENT

- Low-Water Cutoff w/Manual Reset & Test
- Concentric Vent Kit
- Condensate Neutralization Kit
- Sidewall Vent Termination
- Floor Stand
- Wireless Outdoor Sensor
- Nat to LP Gas Conversion Kit



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DESIGNED ★ ENGINEERED ★ ASSEMBLED



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