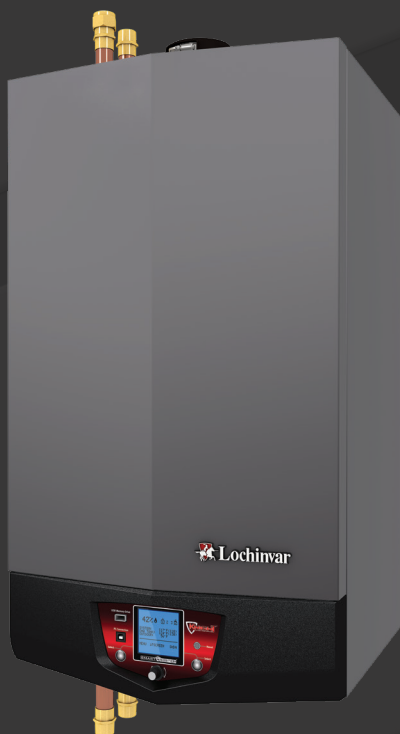
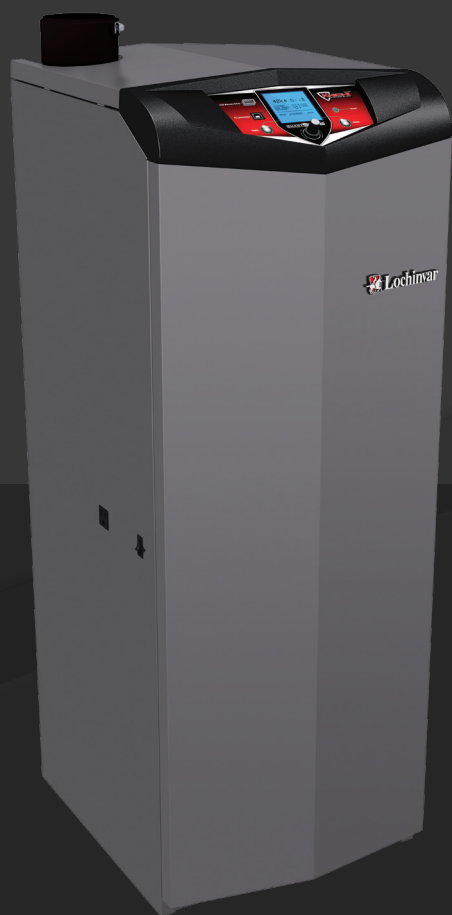




**HIGH EFFICIENCY
CONDENSING BOILERS**



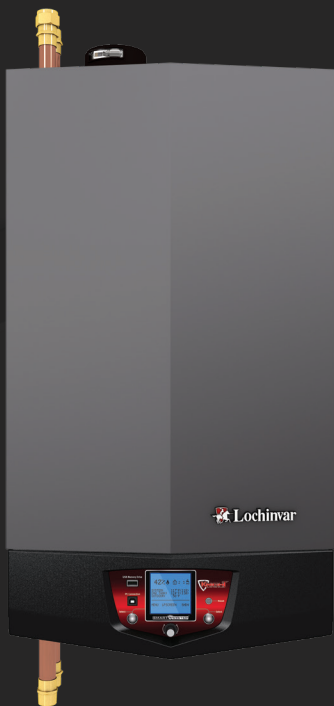
NOBLE[®]
FIRE TUBE

DESIGNED ★ ENGINEERED ★ ASSEMBLED

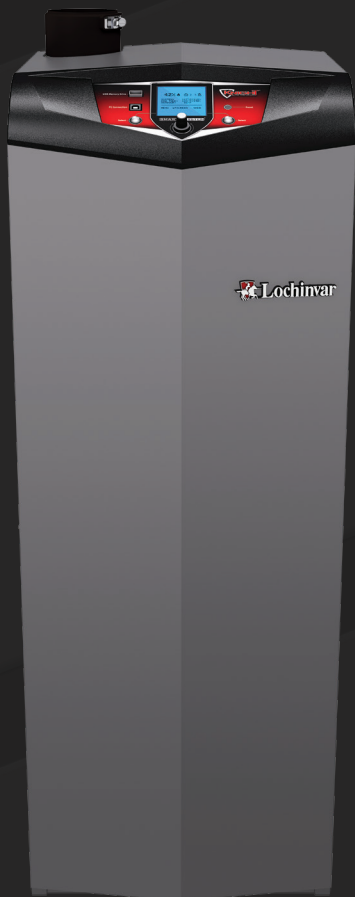
USA



Lochinvar[®]



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.

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.

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.

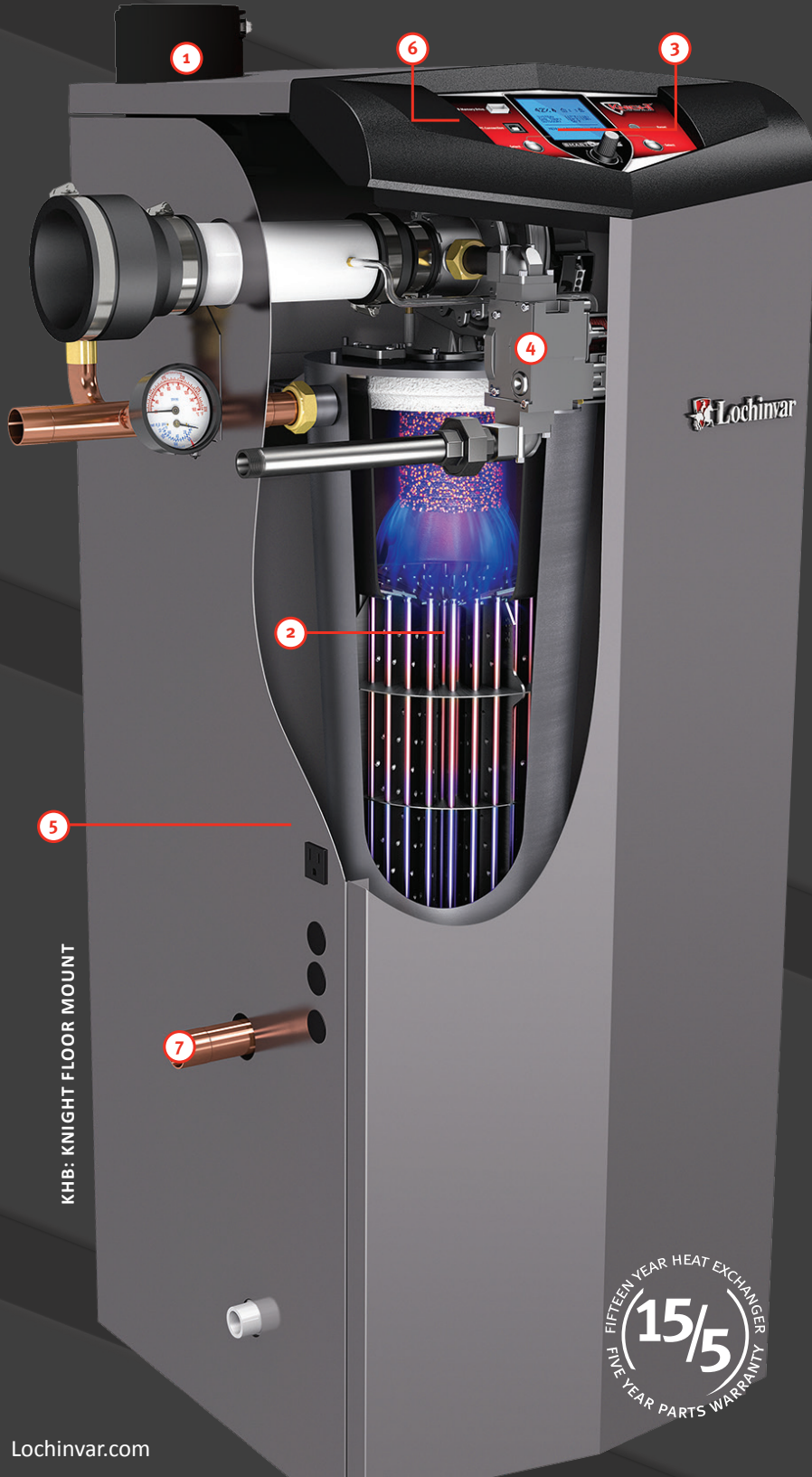
With over 100,000 units sold to date, the KNIGHT boiler line has continued to benefit from Lochinvar's commitment to perpetual innovation with four model generations and a host of design, efficiency and installation enhancements.

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.



KHB: KNIGHT FLOOR MOUNT

FIFTEEN YEAR HEAT EXCHANGER
15/5
 FIVE YEAR PARTS WARRANTY



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® 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*

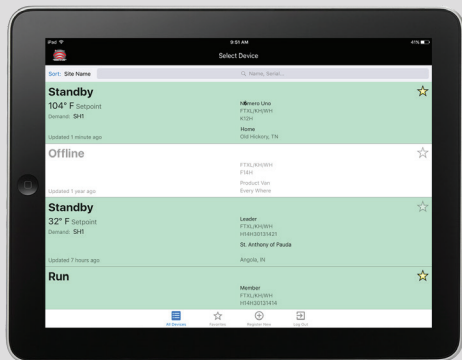
Saves electricity and lowers operating cost.

*New Features on WHB and KHB models.





CON-X-US®



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

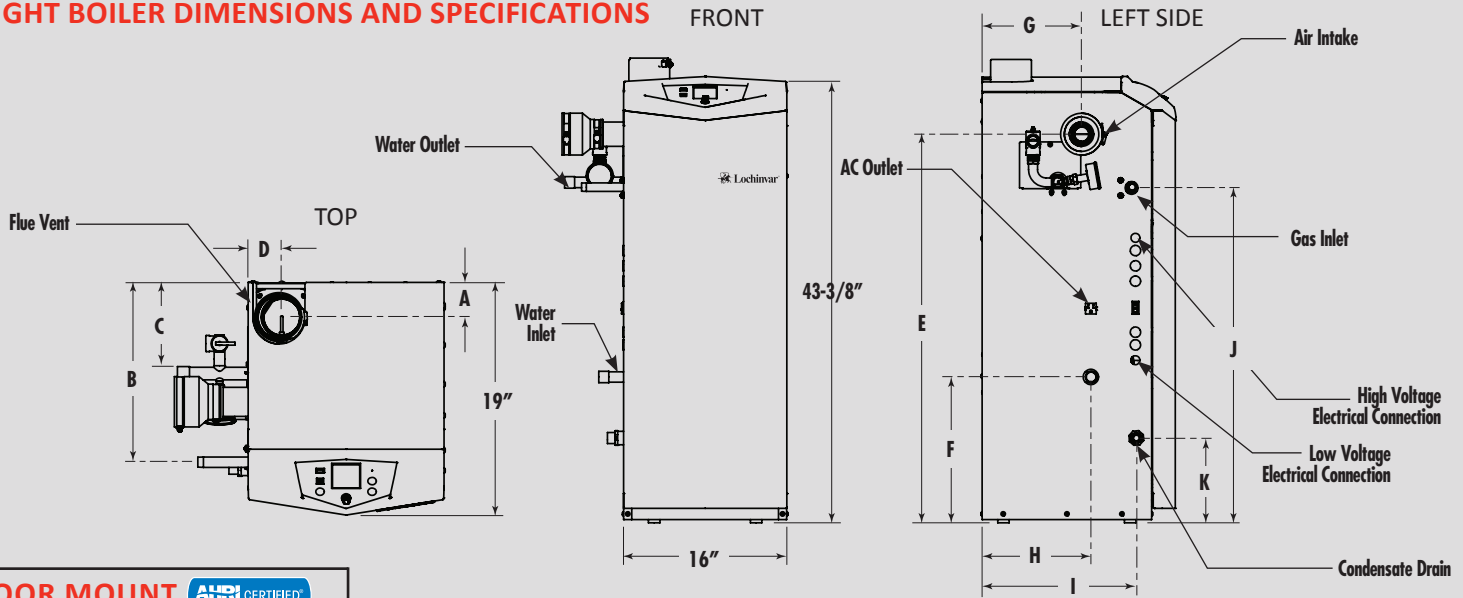
M9 Standard Construction
M7 California Code

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

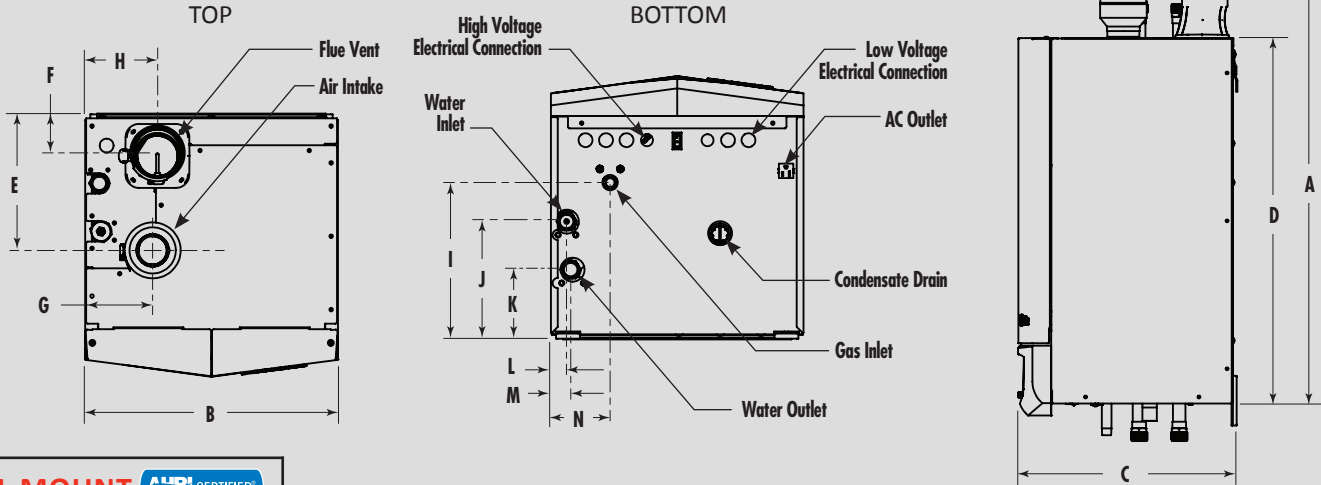


FLOOR MOUNT



Model Number	Input MBH			Heating Capacity MBH	Net MBH	A	B	C	D	E	F	G	H	I	J	K	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
	Max	Min	AFUE%																		
KHB055N	55	8.3	95.0	51	44	3-1/2"	13-3/4"	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	85	8.5	95.0	79	69	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	110	11.0	95.0	102	89	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	155	15.5	95.0	144	125	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	199	19.9	95.0	183	159	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	285	28.5	95.0	264	230	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			Heating Capacity MBH	Net MBH	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
	Max	Min	AFUE%																					
WHB055N	55	8.3	95.0	51	44	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	85	8.5	95.0	79	69	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	110	11.0	95.0	102	89	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	155	15.5	95.0	144	125	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	199	19.9	95.0	183	159	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	285	28.5	95.0	264	230	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**399	79.8	94.4*	377#	328	43-1/4"	25-1/4"	21-7/8"	34"	3-1/2"	4-1/4"	22-1/2"	3-7/8"	8-7/8"	12-1/2"	9-1/4"	2"	2"	21-1/2"	3/4"	1-1/2"	4"	4"	213	

*Thermal Efficiency%
Gross Output MBH

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.

**10:1 Turndown ratio and top and bottom water connections are not included on WHB399. WHB399 operates with a 5:1 turndown.



Most Efficient
2019
www.energystar.gov

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
NOBLE® FIRE TUBE	ENGLISH	FIRE TUBE HEAT EXCHANGER	UNIVERSAL VENT CONNECTOR	10:1	YES
BRAND B	CODES	WATER TUBE HEAT EXCHANGER	VENT ADAPTERS NEEDED	5:1	YES
BRAND N	CODES	WATER TUBE HEAT EXCHANGER	VENT ADAPTERS NEEDED	UP TO 15:1	NO
BRAND V	CODES	WATER TUBE HEAT EXCHANGER	VENT ADAPTERS NEEDED	LESS THAN 6:1	NO



DESIGNED ★ ENGINEERED ★ ASSEMBLED
USA

**ENTRY-LEVEL
RESIDENTIAL BOILER**



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

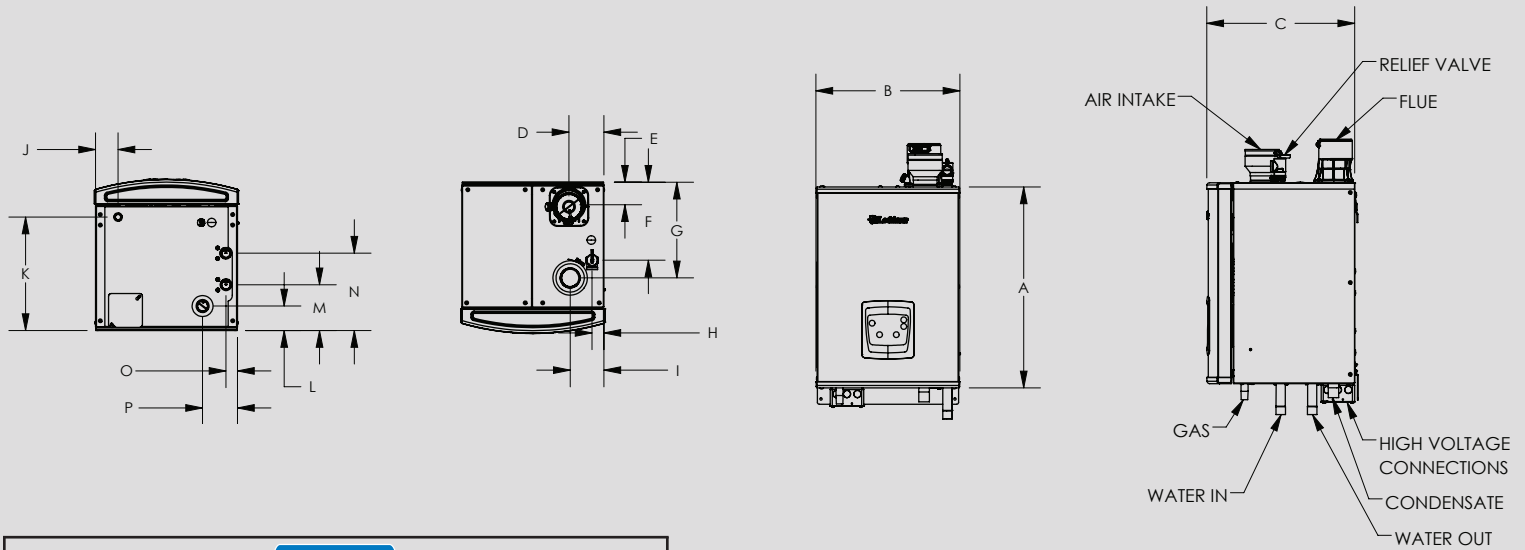
Low pressure drop saves on pump operation costs and provides installation flexibility, while stainless steel fights off corrosion.

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



Model Number	Input MBH		AFUE%	Heating Capacity MBH	Net MBH	A	B	C	D	E	F	G	H
	Max	Min											
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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Lochinvar.com

DESIGNED ★ ENGINEERED ★ ASSEMBLED



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