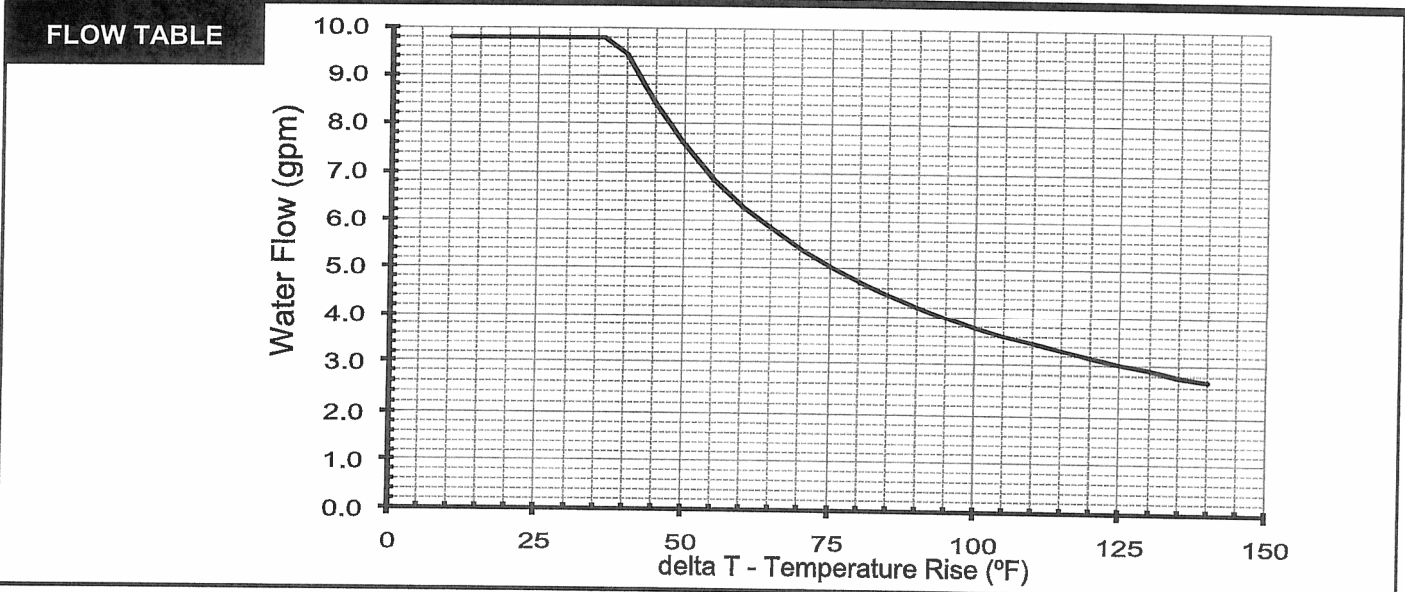


Type of Appliance	Condensing, Tankless, Temperature controlled, continuous flow, gas hot water system, Energy Star Qualified
Rinnai model number	REU-KB3237FFUD-US
Operation / Installation	Forced combustion; indoor only
Minimum/Maximum Gas Rate (Input)	15,200 - 199,000 BTU/h
Electrical	Appliance: AC 120 Volts - 60 Hz Temperature Controller: DC 12 Volts
Electrical Consumption	Normal: 64 w Standby: 2 w Anti-frost protection: 146 w
Ignition System	Direct electronic ignition
Hot Water Capacity	Minimum flow rate: 0.26 GPM Minimum activation flow rate: 0.4 GPM Maximum flow rate: 9.8 GPM
Temperature	98° - 120° F (factory default) Maximum temperature is selectable at 120° F or at 140° F; 98° - 185° F available with the MCC-91-2 controller for commercial and hydronic applications
Temperature (without remote)	120° F (factory default) or 140° F
Approved Gas Types	Natural or Propane (ensure unit matches gas type)
Energy Factor (EF)	Natural Gas: 0.95 Propane: 0.95
Service Connections	Gas supply: 3/4 inch MNPT Cold water inlet: 3/4 inch MNPT Hot water outlet: 3/4 inch MNPT
Isolation & Pressure Relief Valves Included	Heavy duty forged brass Webstone Isolator valves EXP E2, certified to NSF/ANSI 61-8 for potable water
Water Flow Control	Water flow sensor, electronic water control and by-pass control
Minimum/Maximum Water Supply Pressure	15 - 150 PSI (50 PSI or above is recommended for maximum flow)

Rinnai is continually updating and improving products; therefore, specifications are subject to change without prior notice. Local, state, provincial and federal codes must be adhered to prior to installation.



Controller

MC-91-1US (included)
 Deluxe controller: MC-100V-1US (optional)
 Bathroom controller: BC-100V-1US (optional)
 MCC-91-1US (optional; for hydronic and commercial applications)

Controller Cable

Non-polarized two-core cable, minimum 22 AWG

Safety Devices

- Flame failure - Flame Rod
- Boiling protection
- Combustion fan rpm check
- Over current - glass fuse
- Remaining flame (OHS)
- Thermal fuse
- Automatic frost protection

Clearances from Combustibles

* 24 inches required for serviceability

- Top of heater - 6 inches
- Front of heater - 6 inches *
- Sides of heater - 2 inches
- Back of heater - 0 inches
- Bottom of heater - 12 inches
- From vent pipe - 0 inches

Clearances from Non-combustibles

* 24 inches required for serviceability

- Top of heater - 2 inches
- Front of heater - 6 inches *
- Sides of heater - 1/2 inches
- Back of heater - 0 inches
- Bottom of heater - 12 inches
- From vent pipe - 0 inches

Min. / Max. Gas Supply Pressure

Natural Gas: min 5" W.C. max 10.5" W.C.
 Propane Gas: min 8" W.C. max 13.5" W.C.

Manifold Gas Pressure (inches W.C.)

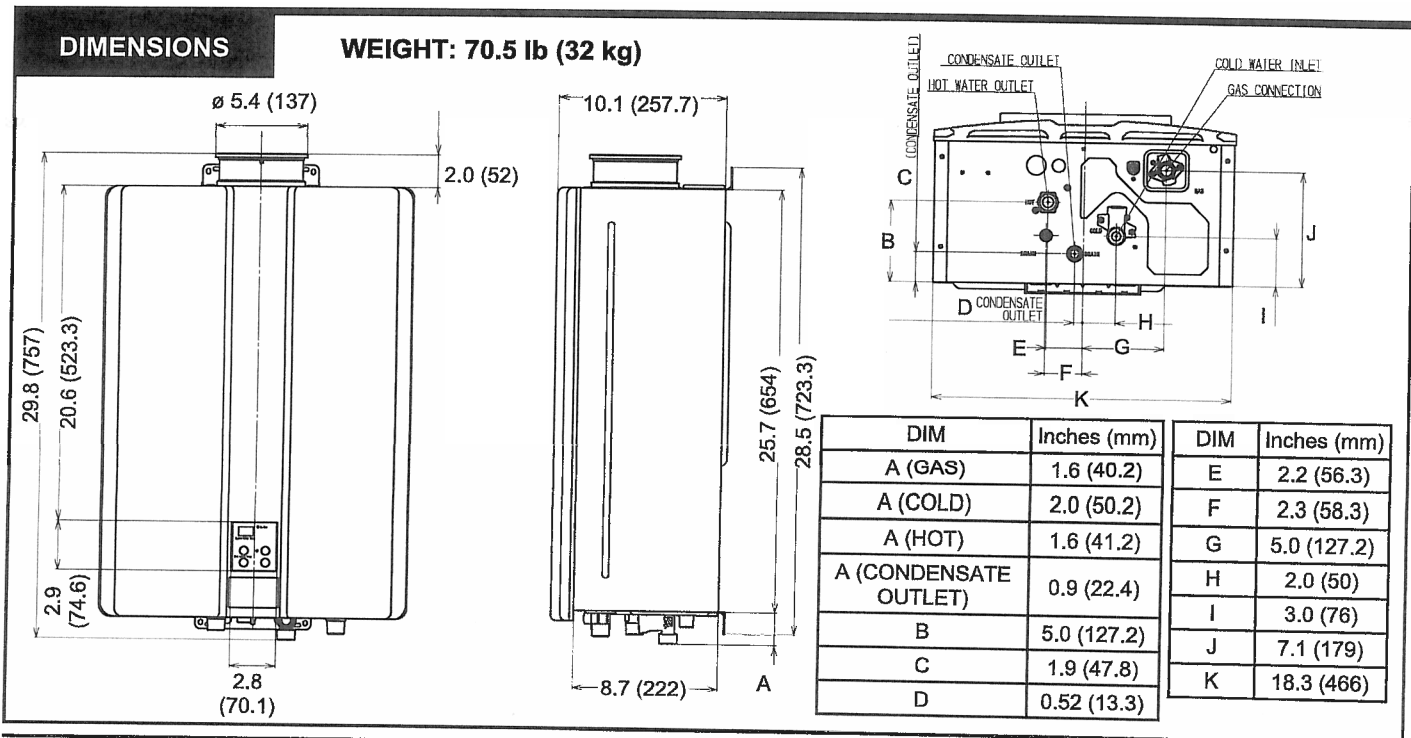
Natural Gas: high fire 3.1" W.C. low fire 0.51" W.C.
 Propane Gas: high fire 3.7" W.C. low fire 0.52" W.C.

NOx

Complies with South Coast Air Quality Management District 14 ng/J or 20 ppm NOx emission levels

Limited Warranty

Heat exchanger: 12 years* for residential, 10 years for residential and space heating, and 5 years* for commercial; All other parts: 5 years*; Labor: 1 year;
 (* 3 years if used as a circulating water heater within a circulation loop, when the water heater is in series with a circulation system and all circulating water flows through the water heater, and where an aquastat / thermostat, timer, or an on-demand recirculation system is not incorporated.)
 Refer to the manual for complete warranty information.





Lochinvar[®]
HIGH EFFICIENCY BOILERS & WATER HEATERS

**KNIGHT
HEATING BOILER
Submittal Sheet**

KBN-Sub-10

KNIGHT[®] FLOOR STANDING HEATING BOILERS

JOB NAME _____
LOCATION _____
ENGINEER _____
WHOLESALER _____
MECH. CONTRACTOR _____
MODEL NO. _____
TYPE GAS _____
Btu/hr INPUT _____
Btu/hr OUTPUT _____
NOTES

SMART SYSTEM[™] FEATURES

- › **SMART SYSTEM Digital Operating Control**
 - › Multi-Color Graphic LCD Display with Navigation Dial and Soft Keys
- › **Three Setpoint Temperature Inputs**
- › **Built-in Cascading Sequencer for up to 8 Boilers**
 - Cascade Multiple Sized Boilers
 - Lead Lag
 - Efficiency Optimization
 - Front End Loading Capability with Copper Fin II
- › **Outdoor Reset Control with Outdoor Air Sensor**
 - Programmable for Three Reset Temperature Inputs
- › **Programmable System Efficiency Optimizers**
 - Night Setback w/Override Function
 - DHW Night Setback w/Override Function
 - 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 Modulation Rate Output
 - 0-10VDC Input Signal from Variable Speed System Pump*
 - 0-10VDC Input to Enable/Disable call for heat
- › **High-Voltage Terminal Strip**
 - 120 VAC / 60 Hertz / 1 Phase Power Supply
 - Three Sets of Pump Contacts
- › **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
- 0-10VDC 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
- › **Access to BMS Settings through Graphic LCD Display**
- › **Maintenance Reminder**
 - Custom Maintenance Reminder with Contractor Info
 - Installer Ability to De-activate Service Reminder
- › **Low-Water Flow Safety Control & Indication**
- › **Dual Level Password Security**
- › **Customizable Freeze Protection Parameters**

STANDARD FEATURES

- › **ENERGY STAR Most Efficient Recognition**
- › **95% DOE AFUE Efficiency**
- › **Modulating Burner with 5:1 Turndown**
 - Direct-Spark Ignition
 - Low-NOx Operation
 - Field Convertible from Natural to LP Gas
- › **ASME Stainless Steel Heat Exchanger**
 - 30 psi ASME Relief Valve
- › **Vertical & Horizontal Direct-Vent**
 - PVC, CPVC, Polypropylene or SS Venting up to 100 feet
- › **Smart System Control**
- › **Condensate Trap**
- › **Other Features**
 - Automatic Reset High Limit
 - Adjustable High Limit w/Manual Reset
 - Boiler Circulating Pump
 - Adjustable Leveling Legs
 - Zero Clearances to Combustible Materials
 - 12-Year Limited Warranty (See Warranty for Details)
 - 5-Year Parts Warranty

OPTIONAL EQUIPMENT

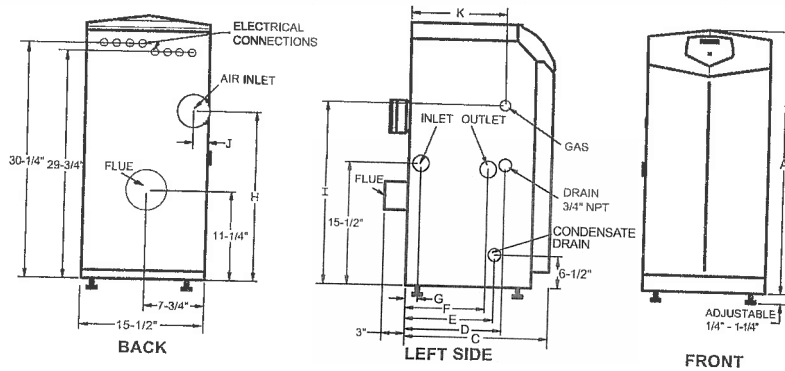
- CON-X-US Remote Connectivity
- Modbus Communication
- Condensate Neutralization Kit
- Multi Temperature Loop Control
- Flow Switch
- Low-Water Cutoff w/Manual Reset & Test
- Alarm Bell
- Concentric Vent Kit
- SMART SYSTEM PC Software
- Stack Frame
- BMS Gateway to LON or BACnet IP
- BACnet MSTP Communication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

FIRING CODES

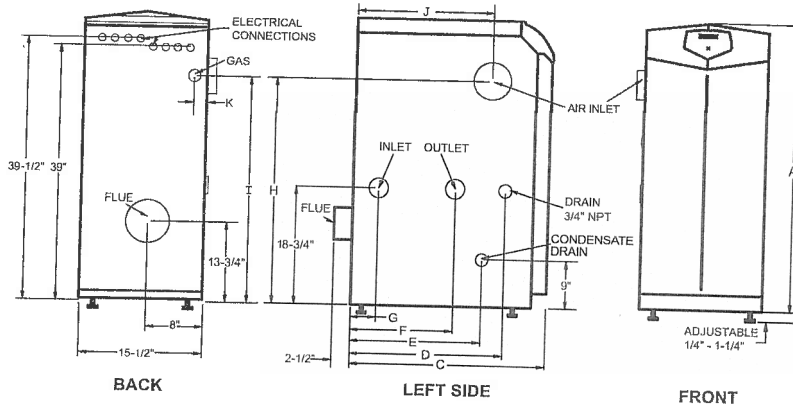
- M9 Standard Construction
- M7 California Code

KNIGHT Heating Boiler Dimensions & Specifications

Models:
KBN 081-211



Model:
KBN286



KNIGHT HEATING BOILER						DIMENSIONS AND SPECIFICATIONS														
Model Number	Input Min. MBH	Input Max. MBH	AFUE %	Heating Capacity MBH	NET AHRI Rating MBH	A	C	D	E	F	G	H	I	J	K	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
KBN081	16	80	95.0	74	64	33-1/4"	14"	7"	5-3/4"	5"	3"	20-1/2"	22"	1-3/4"	6-1/2"	1/2"	1"	3"	3"	125
KBN106	21	105	95.0	97	84	33-1/4"	14"	6-1/2"	5-3/4"	4-1/2"	1-1/2"	20-1/2"	22"	1-3/4"	6-1/2"	1/2"	1"	3"	3"	129
RBN151	30	150	95.0	139	121	33-1/4"	18"	12-1/4"	11-1/2"	10"	1-1/2"	21-1/4"	23"	1-3/4"	12"	1/2"	1"	3"	3"	157
KBN211	42	210	95.0	196	170	33-1/4"	22-1/4"	16-1/2"	15-3/4"	14-1/4"	5-1/4"	21-1/4"	23"	1-3/4"	16-1/4"	1/2"	1"	3"	3"	172
KBN286	57	285	95.0	267	232	42-1/4"	19-3/4"	12-3/4"	13-1/2"	6"	2"	34"	31"	11-3/4"	4-1/4"	3/4"	1-1/4"	4"	4"	224

Notes: Indoor installation only. All information subject to change. Change "N" to "L" for LP gas models.
Net ratings based on piping and pick-up allowance of 1.15



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