



COPPER-FIN II[®]

**Commercial Gas
Boilers**

High Efficiency In A Space-Saving Design



From 400,000 to 2,070,000 Btu/hr
85% Thermal Efficiency
Less Than 20 ppm NOx Rating

Copper-Fin II® Gas Boilers – The Proven Performers.

Thermal Efficiency Is Higher..... While Footprint And Vent Sizes Are Smaller

Lochinvar's Copper-Fin II line of high efficiency commercial gas boilers gives you all the advantages of copper finned tube heat exchanger technology plus the benefits of a sealed combustion system. Every Copper-Fin II model offers four major advantages: higher efficiency, smaller footprint, smaller vent diameters and multiple venting options. Our Copper-Fin II models offer dollar - stretching proportional firing that provides a measured response to the demand for heat — as much or as little as needed.



Outstanding Thermal Efficiency

Copper-Fin II boilers offer a remarkably high 85% thermal efficiency. This means that 85¢ out of every fuel dollar goes into heating the water, dramatically reducing the operating cost of the equipment. Copper-Fin II achieves this efficiency through the combination of an advanced fan assisted combustion system and exclusive gasketless copper fin tube heat exchanger. A time tested and proven combination.



The heat energy from the combustion process is transferred to the water as it passes through the solid copper finned tube heat exchanger. The sealed combustion design of the Copper-Fin II eliminates external heat losses, this means that the energy dollars heat the water, not the mechanical room. It also ensures that the jacket stays cooler, providing greater safety and requiring less clearance from combustible walls - just 1" in most cases.

Proportional Firing: Greater Savings, More Accurate Temperatures

The Copper-Fin II's proportional firing lowers your energy costs and delivers more consistent water temperatures. Multiple gas valves supply gas to the burners in stages, and multiple speed blowers maintain the proper airflow to ensure the most efficient combustion at each level of use. Our built-in sequencer controls each of these functions. With digital accuracy, the built-in sequencer carefully monitors the need for heat, and as demand increases or decreases, it automatically adjusts the blower output and gas valve input. As the demand is met, the boiler decreases output gradually, turning off gas valves and reducing combustion air in direct proportion. This allows the Copper-Fin II to maintain a

constant setting. In fact, it's accurate to within 1° Fahrenheit — a remarkable achievement for units of this capacity. And the proportional firing system features component redundancy, greatly reducing the chance for total system shutdown.

Compact Design - For Installation Ease

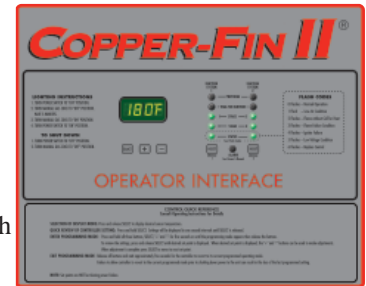
The Copper-Fin II is compact enough to fit through standard 36" doorways with ease. Even our 2 million Btu/hr model is only 33-1/2" wide. This space-saving design frees up more space in the mechanical room. And our optional Stack Frame lets you put two units in the footprint of just one.

Meets The Toughest Air Quality Standards

Because of our unique fan-assisted combustion process, the Copper-Fin II exceeds today's toughest NO_x emissions requirements. An independent certification laboratory test gave us a rating of less than 30 ppm — corrected to 3% O₂. And less NO_x means a cleaner environment.

Control at Your Fingertips

The enhanced operator interface panel provides fingertip control of the built-in multi-stage digital temperature controller. Its refined user friendly design simplifies service while providing additional diagnostic information with fewer mechanical parts.



Making Installation Easier... For Less

High-efficiency, fan-assisted combustion means you can use a smaller diameter vent stack — up to 8" smaller than typically required. This makes installation less expensive and less time-consuming.

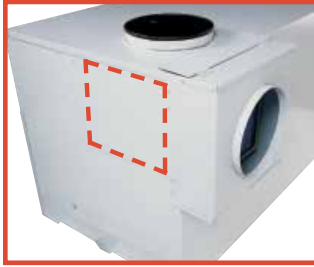
Vent Cost Savings

Btu/hr INPUT	ATMOSPHERIC VENT SIZE	COPPER-FIN II VENT SIZE	\$ SAVINGS*
400,000	10"	6"	\$ 657.00
500,000	10"	6"	\$ 657.00
650,000	12"	8"	\$ 731.00
750,000	14"	8"	\$ 1,450.00
990,000	16"	10"	\$ 1,790.00
1,260,000	16"	12"	\$ 1,463.00
1,440,000	18"	12"	\$ 2,432.00
1,800,000	20"	14"	\$ 3,526.00
2,070,000	22"	14"	\$ 3,738.00

*Comparison based on 25' vent system using Type "B" double wall vent material, storm collar and vent cap.

Our Enhanced Models Raise The Bar...Again

Our enhanced Copper-Fin II models offer the same reliable, efficient operation and feature a more service friendly design. The gas inlet and shutoff cocks, electrical and BMS connections have been repositioned toward the front of the unit for easier service access and simpler installation. And the new referenced gas valve design improves operational performance by monitoring the pressure in the sealed combustion chamber to maintain the optimum air/fuel mixture.



All models feature alternate air inlet connections for greater installation flexibility. This field convertible option provides the ability to connect the air inlet on either the right side or the rear of the unit. And the built-in air inlet filter reduces maintenance

and improves performance by trapping dust and airborne particulates that can foul the burners and blowers.

You'll also save installation time and expense with Lochinvar's direct vent option, featuring our innovative Aire-Lock™ combustion system. The direct vent option allows the installer to vent the by-products of combustion directly through a side wall without the use of an auxiliary draft inducer. By using approved vent material and an air intake pipe, this option effectively "detaches" the unit from the mechanical room by pulling all combustion air from outside the building and venting all combustion by-products outside through a side wall. A feature that can really simplify an installation while reducing overall installed costs.

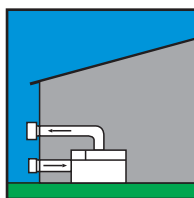


Referenced gas valves and shutoff cocks are in the upper deck for easier access. And our Lochinvar exclusive "Aire-Lock" transition ducts provide a positive path for the sealed combustion system that does not require the upper chamber panel to be installed allowing for accurate adjustment during operation.



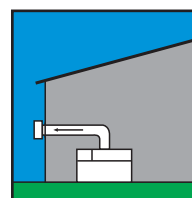
All BMS connections are on the front portion of the unit and have been designed for easier access and connection.

Venting Options



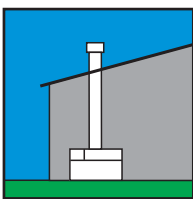
Aire-Lock Direct Vent

Utilizes sealed Aire-Lock combustion system to draw fresh air 50 equivalent feet from a sidewall. Vents horizontally up to 50 equivalent feet through the sidewall using Category IV approved vent material.



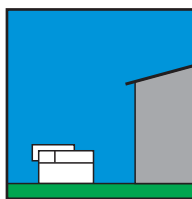
Sidewall (CH 401-751)

Draws fresh air from inside the room. Vents up to 50 equivalent feet directly through the outside wall using Category IV approved vent material. Does not require a powered sidewall cap.



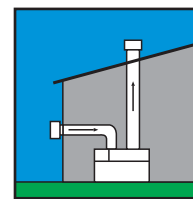
Conventional

Vents into conventional flue or vent breaching using Type B double wall vent.



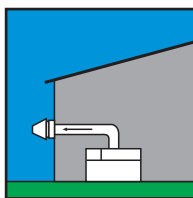
Outdoor

Requires optional outdoor vent cap. Use when indoor space is a problem or if outdoor location gives better access.



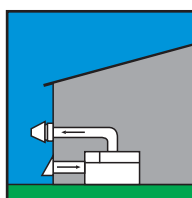
DirectAir Vertical with Sidewall Inlet

Draws fresh air from outside and vents through conventional vertical flue.



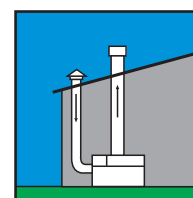
Powered Sidewall

Vents directly through the outside wall using an optional powered sidewall cap. Ideal when a vent stack is not practical.



Power DirectAir Horizontal

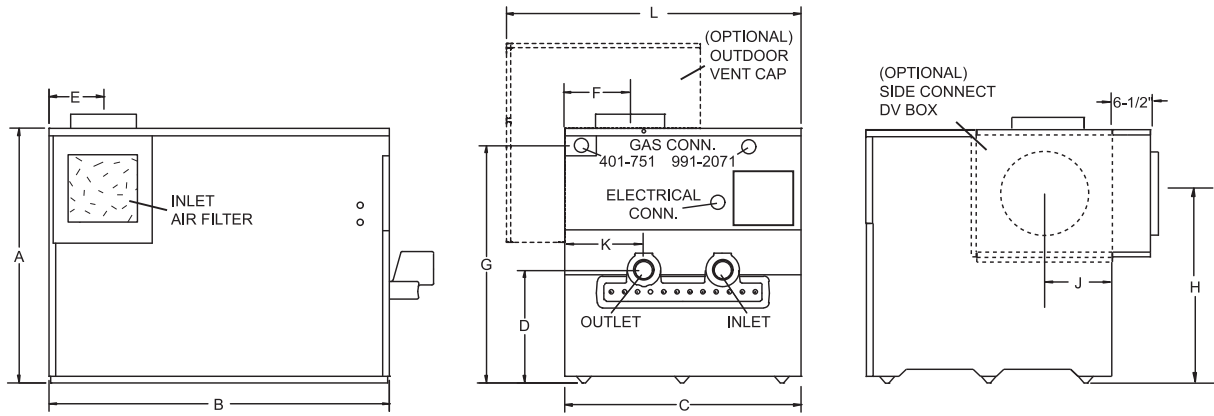
Draws fresh air from outside and vents through sidewall using optional powered sidewall cap.



DirectAir Vertical

Draws fresh air from outside and vents through conventional vertical flue.

Copper-Fin II® Boiler Dimensions & Specifications



Copper-Fin II Heating Boiler					Dimensions & Specifications														
Model Number	Input MBH	Thermal Efficiency	Output MBH	Net I=B=R MBH	A	B	C	D	E	F	G	H	J	K	L	Vent Size	Air Inlet	Gas Conn	Shipping Weight
CHN401	399	85%	339	291	31-1/2"	37-3/4"	22-1/4"	12-1/2"	7"	7"	29"	23-1/2"	8"	6-1/2"	30-3/4"	6"	6"	1-1/4"	378
CHN501	500	85%	425	365	31-1/2"	45-1/2"	22-1/4"	12-1/2"	7"	7"	29"	23-1/2"	8"	6-1/2"	30-3/4"	6"	6"	1-1/4"	414
CHN651	650	85%	553	475	31-1/2"	56-3/4"	22-1/4"	12-1/2"	8-1/2"	8-1/4"	29"	23-1/2"	8"	6-1/2"	30-3/4"	8"	8"	1-1/4"	500
CHN751	750	85%	638	548	31-1/2"	64"	22-1/4"	12-1/2"	8-1/2"	8-1/4"	29"	23-1/2"	8"	6-1/2"	30-3/4"	8"	8"	1-1/4"	543
CHN0991	990	85%	842	723	36"	48-1/4"	33-1/2"	15-3/4"	8"	9-1/4"	33-3/4"	27"	9-1/4"	9"	41-3/4"	10"	10"	2"	773
CHN1261	1,260	85%	1,071	920	36"	58-1/2"	33-1/2"	15-3/4"	10-1/4"	10"	33-3/4"	27"	9-1/4"	9"	41-3/4"	12"	12"	2"	863
CHN1441	1,440	85%	1,224	1,052	36"	68-3/4"	33-1/2"	15-3/4"	10-1/4"	10-1/2"	33-3/4"	27"	9-1/4"	9"	41-3/4"	12"	12"	2"	965
CHN1801	1,800	85%	1,530	1,315	36"	82-1/4"	33-1/2"	15-3/4"	10"	11-1/2"	33-3/4"	27"	9-1/4"	9"	41-3/4"	14"	12"	2"	1,100
CHN2071	2,070	85%	1,760	1,512	36"	92-1/2"	33-1/2"	15-3/4"	10"	11-1/2"	33-3/4"	27"	9-1/4"	9"	41-3/4"	14"	12"	2"	1,219

Notes: Change 'N' to 'L' for LP gas models. No deration on LP models. Water connections for models CH 401-751 are 2" NPT on 6-1/2" centers. Header increases "B" dimension 3-1/2" for models CH 401-751 and 6-1/4" for models CH 0991-2071. Water connections for models CH 0991-2071 are 2-1/2" NPT on 11-1/4" centers. Performance data is based on manufacturer test results.

Standard Features

- 85% Thermal Efficiency
- ASME Copper Finned Tube Heat Exchanger
- Gasketless Heat Exchanger Design
- Proportional Firing
- Built-In Sequencer with up to 4 stages of operation
- Adjustable High Limit w/ Manual Reset
- Digital Operator Interface Panel
- Sealed Combustion Chamber
- Stainless Steel Burners
- Low NOx Operation Exceeds the most Stringent Air Quality Requirements
- 160 PSI Working Pressure
- Loch-Heat Ceramic Tile Combustion Chamber
- Hot Surface Ignition
- ASME Pressure Relief Valve
- Referenced Gas Valves
- Flow Switch
- PID Temperature Control
- Combustion Air Filter
- Freeze Protection
- Field Convertible Air Inlet Connection
- Pump Relay w/ Delay

- Built-in System Redundancy
- 24 Volt Control System
- Temperature & Pressure Gauge
- BMS Terminal Strip
- Down Stream Test Valves
- 10 Year Limited Warranty on Heat Exchanger (See warranty for details)

Optional Equipment

- Alarm Bell
- Contacts for Air Louvers
- Contacts on any Failure
- Cupro-Nickel Heat Exchanger
- High Gas Pressure Switch w/ Manual Reset
- High & Low Gas Pressure Switch w/ Manual Reset
- Indoor/Outdoor Reset
- Manual Reset Low Water Cut-Off w/test
- MP² Sequencer
- Stack Frame
- Combustible Floor Shield (CH 401-751)

Venting Options

- Aire-Lock™ Direct Vent Sealed Combustion
- DirectAire® Vertical
- DirectAire® Vertical w/ Sidewall Inlet
- Outdoor Installation
- Power DirectAire® Horizontal
- Powered Side Wall
- Sidewall (CH 401-751)

Firing Controls

- M9 Hot Surface Ignition with Electronic Supervision (Standard)
- M13 GE GAP/FM/CSD1 (CH 501-2017)
- M7 California Code

Registered under U.S. Patent #5,989,020

For Ease In Ordering By Model Number



This heater is 500,000 Btu/hr natural gas Copper-Fin® II boiler. It has M9 firing controls.



Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters



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