INTRO Body Copy: Thermal Solutions has designed the Evolution® high efficiency copper-finned boilers to meet the needs of today's commercial heating requirements.

The Evolution takes the very best of existing copper-finned boiler technology to the next level by incorporating a list of design features not found in competitors' products. Real-life serviceability, innovative heat exchanger design, clean and efficient advanced combustion, and unique timesaving controls are all combined in a compact quick-connect package with efficiencies of up to 88%. The Evolution is truly a step above the rest.

INNOVATIVE HEAT EXCHANGER DESIGN

The Evolution is adaptable to virtually any installation. Rear connection ports and complete front and rear access to the unit's components and controls simplify side-by-side modular applications. When venting is a concern, the Evolution offers sealed (direct vent) and power vent options so that the need to construct a costly chimney is eliminated. In addition, the easy setup and even easier maintenance makes the Evolution boilers ideal for either retrofit or new construction projects.

Central to the Evolution's highly efficient operation is the design of its copper-tube heat exchanger. Not only does it efficiently maintain heat transfer, but the innovative gasketless Marbon steel header provides for easy inspection, cleaning, and individual tube replacement. The combustion chamber is also completely vesselless, ensuring a clean and efficient combustion process.

The rugged industrial cast aluminum blower and fan wheel are equipped with a replaceable combustion air filter (99% efficient to one micron) to create excellent combustion characteristics and even air distribution.

Designed to operate at 88% thermal efficiency with NOx ratings less than 9.9 ppm, the Evolution's noiseless ceramic radiant burner runs at minimal excess air levels, creating highly efficient, trouble-free operation.

Instead of using a series of relays, the Evolution utilizes state-of-the-art microprocessor flame safeguard controls to provide extensive diagnostic information including first-out fault annunciation using an LED diagnostic display. The optional display unit, as shown at the left, can be easily incorporated to provide additional operational information and history.

WORKING SMARTER NOT HARDER

- Feature-Rich Operating Control
- Intelligent Multiple Boiler Staging
- Building Management System Interface
- Auxiliary Device Control
- Rugged Heat Exchanger Design
- Unmatched Fireside Heating Surface
- Advanced Combustion <10 ppm Ultra-Low NOx Emissions <50 dBA Noise Levels
- Maintenance-Free Burner 10-Year Warranty
- Up to 87% Efficiency
- UL Certified Boiler Package
Thermal Solutions designed its Evolution high efficiency copper-fin tube boiler to meet the complexities of today's building systems. For nearly two decades, the Evolution boiler has been the industry benchmark for quality, reliability, and performance. Coupled with the Thermal Solutions Boiler Control (TSBC™), the Evolution is the most sophisticated and easily integrated boiler product available.

The Evolution takes copper-fin tube boiler technology to the next level by incorporating a list of unique design features. These include Rugged Heat Exchanger Design, Advanced Maintenance-Free Combustion, Feature-Rich Operating Control, and Ease of Installation and Service. *The Evolution Boiler truly is a step above the rest.*

**Rugged Heat Exchanger Design**

Central to the Evolution Boiler's design is its heat exchanger, which boasts twice as much heating surface than our competition. The rolled copper-fin tube, patented H/F True Fin, is extruded from a solid piece of copper that results in high quality and unsurpassed heat transfer. The gasket-less header design allows for easy inspection, cleaning, and individual tube replacement. Completely enclosed in a stainless steel compartment, the combustion chamber effectively handles short-term condensing periods (cold start) to protect the boiler. The Evolution heat exchanger has thicker tubes (.072") and more robust heads than any other hot water boiler product (compare the weights) that makes it very forgiving, more durable and built to last!

**Advanced Maintenance-Free Combustion**

*The Evolution ceramic radiant burner never requires inspection or maintenance!* Designed to operate with NOx emissions less than 10 ppm, the whisper quiet ceramic radiant burner (<50 dBA) runs at minimal excess air levels providing high efficient, trouble-free operation. The burner features a larger surface area and lower flux that allows for greater heat transfer and more uniform heating that extends the life of the copper tubes. A rugged cast-aluminum blower assembly, fitted with a replaceable combustion air filter that is 99% efficient to one micron, is used to keep the burner free of contaminants. A commercial-grade microprocessor based flame safeguard with LED diagnostic display, proven spark ignition, and a UV flame scanner complete the Evolution's unsurpassed combustion system for safety and reliability. The Evolution boiler can be operated with its jacket panels removed during inspection, avoiding the nuisance problems associated with pressurized compartments.

**Feature-Rich Operating Control**

Designed by boiler experts, as stand-alone or easily integrated into today's complex building management systems, the Thermal Solutions Boiler Control (TSBC) provides unparalleled design characteristics. Key features include advanced boiler modulation, intelligent multiple boiler staging (peer-to-peer) by connecting an RJ11 telephone cable between boilers for communication, outdoor air temperature reset, warm weather shutdown, domestic hot water priority and multiple auxiliary device control, making the TSBC the most advanced onboard boiler control in the industry.

**Ease of Installation & Service**

All rear connections and complete front and rear access to the unit's components allows for space saving side-by-side modular arrangements. The Evolution's flexible venting options include sealed or room air combustion, direct vent, or conventional venting for multiple boiler common stack arrangements. Quick setup and low maintenance make the Evolution boiler an ideal choice for either retrofit or new construction projects.
**EVOLUTION® FEATURES**

- Wide Range of Sizes: 500,000-3,000,000 BTU/h.
- Commercial-Grade Microprocessor based flame safeguard providing combustion management and safety.
- Heavy 16-gauge negative pressure steel jacket that protects the boiler and eliminates nuisance problems associated with pressurized compartments.
- Replaceable combustion air filter 99% efficient to one micron to ensure burner reliability and trouble-free maintenance.
- Industrial cast-aluminum non-sparking blower assembly contributes to our whisper quiet (<50 dBA) operation.
- All rear connections allows for minimum side-to-side clearances.
- Gasketless header design allows for easy tube inspection and cleaning.
- Corrosion-resistant stainless steel enclosure surrounds combustion chamber.
- Flexible venting options include sealed or room air combustion, direct vent or conventional venting.
- Meets the stringent UL testing requirements and certified as a boiler package.

**STANDARD EQUIPMENT**

**Pressure Vessel Design**
- Copper Fin-Tube Construction
- Carbon Steel or Cast Iron Header Design
- Gasketless Heat Exchanger
- ASME Section IV Certified, "H" Stamp
- MAWP 160 PSIG & Max Temp 250°F
- Five Year Heat Exchanger Warranty
- Twenty Year Thermal Shock Warranty

**Combustion Design**
- Ceramic Radiant Burner, Non-Corroding
- Maintenance-Free Burner Design
- Ultra-Low NOx Emissions (to <10 ppm)
- Whisper Quiet Operation (<50 dBA)
- Combustion Air Filter, 99% Efficient
- Industrial Cast-Aluminum Blower Assembly
- Variable Frequency Drive
- Electric Spark-to-Pilot Ignition System
- Ten Year Burner Warranty

**Boiler Equipment**
- Thermal Solutions Boiler Control (24 Vac)
- High Limit w/Manual Reset Safety Temperature Control
- Water Flow Switch
- Low Water Cut-Off w/Manual Reset Safety Controller
- Inlet & Outlet Temperature Sensors
- Combustion Air Switch
- Blocked Filter Switch
- Pressure & Temperature Gauge
- Safety Relief Valve (Available Settings 30 to 150 PSI)
- Single-Point Electrical Supply (Available in 1 or 3 phase)

**Burner Equipment**
- UL/FM/CSD-1 Gas Train
- Full Modulation with Infinite Proportional Firing
- Natural or LP Gas
- Inlet gas pressure available from 4" wc to 5 psig
- Pilot Gas Valve
- Pilot Gas Regulator
- Pilot/Leak Test Cocks
- Modulating Gas Valve
- Low & High Gas Pressure Switches w/Manual Reset

**Venting**
- Sealed or Room Air Combustion (Cat IV)
- Direct Vent (sidewall or vertical) up to 50ft (Cat. IV)
- Conventional (Cat. II)

**TSBC Control Key Features**
- Advanced Boiler Modulation
- Intelligent Multiple Boiler Staging (8 Boilers)
- Building Management System Interface
- Outdoor Air Temperature Reset
- Remote System Temperature
- Warm Weather Shutdown
- Domestic Hot Water Priority
- Auxiliary Device Control
  - Mixing Valve
  - Boiler Pump
  - System Pump(s)
  - Combustion Air Damper or Inducer
- 0-10 VDC Input
### Ratings and Dimensional Data

#### Boiler Ratings

<table>
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<tr>
<th>Model</th>
<th>Input MBH</th>
<th>Gross Output MBH</th>
<th>Net Ratings Water MBH*</th>
<th>SQ.Ft Per BHP</th>
<th>Footprint</th>
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- *Net water ratings shown are based upon an allowance of 1.15. Dimensions are shown in Inches.
- The manufacturer 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 boiler-burner units.

#### Dimensions and Specifications

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*Gas pilot dimension on models 2000S, 2500, & 3000 only

**DB&B and DB&B with proof of closure option only

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