INDUSTRIAL COMBUSTION

E Series

BURNER SOLUTIONS

Complete burner systems for large or small applications

The Industrial Combustion burner difference.

Our full line of high-quality, low-emissions burners are specifically engineered to increase your boiler's efficiency and decrease fuel costs and emissions. Innovative features help the Industrial Combustion line improve the performance of any boiler. With the flexibility of multiple fuel options, there is an Industrial Combustion burner appropriate for commercial, industrial and institutional applications.

D Series

The burner is the heart.

Designed for maximum efficiency and low emissions, Industrial Combustion offers the right burner solution for virtually any boiler room retrofit application. With our extensive engineering expertise and vast aftermarket support network, we can help determine what burner is right for you, regardless of boiler manufacturer.

Lower Excess Air

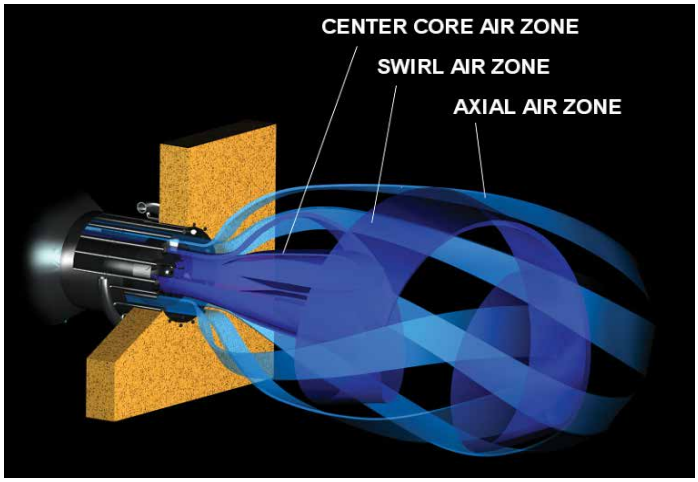
Excess air robs every burner of power and efficiency. Industrial Combustion designs its burners to have the lowest excess air possible for the given turndown range and NOx level. We can evaluate your current burner to determine if you are losing efficiency through high excess air levels.

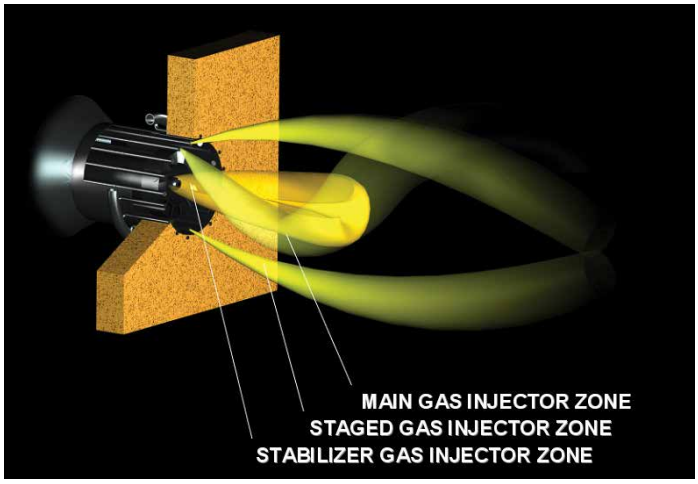
High-Turndown Capability

Most older burners and many new burners have narrow operating bands of only 3:1 turndown, incapable of following real-life loads and demand. Frequent and needless boiler cycling occurs, leading to reduced boiler efficiency. Industrial Combustion burners are high-turndown burners, allowing the boiler to modulate up and down to better match the needs of the process and reduce energy waste.

Lower NOx

Designed and developed with a flue gas recirculation system that has since proven to be the industry benchmark, our lower-NOx burners feature advanced combustion technology for a stable, controlled flame front throughout the entire firing range. Computational Fluid Dynamics modeling helps us develop absolute compatibility of the burner and furnace.





Advanced CFD modeling on every burner

Proper burner design minimizes emissions and maximizes efficiency.

Computational Fluid Dynamics (CFD) modeling helps design the heat delivery and transfer components into a seamlessly matched package for optimum heat transfer, highest efficiency, and burner longevity. Absolute compatibility of the burner and furnace is critical to achieving our super-high standard of efficiency.

Featuring ultra-low-NOx emissions, from less than 15 PPM and less than 9 PPM NOx on natural gas at 3% O_2, each Industrial Combustion burner has a special intake box, with a rotary air damper and FGR modulating valve, that allows a precise amount of induced FGR and fuel-to-air ratio control throughout the firing range.

Fuel prices and stricter emissions requirements make upgrading your existing boiler smart.

With the average lifespan of a boiler being 20 years or more, most boilers will need to upgrade their burners two or three times to maintain optimum efficiency. If your existing burner is more than 10 years old, even if it's a low-NOx burner, recent advancements in technology make your burner a candidate for replacement. Turnkey conversions and retrofits make it easy to bring virtually any system back up to its original specs or even better.

Controls help make the difference.

Industrial Combustion burners can truly reach their full potential when paired with an appropriate, integrated burner management system. Only through proper controls can the burner constantly fire at peak performance. There are a number of options from a number of manufacturers that can add significant fuel savings and increased efficiency.

Touchscreen Controls

Parallel Positioning

Unlike the single point control, parallel positioning systems use independent actuators for precise and repeatable metering of fuel and combustion air, properly proportioning firing cycle after firing cycle, which saves you energy, up to 10% or more, depending on the condition of your present burner setup and load characteristics.

Controlling Lead/Lag

Lead/lag sequences the operation of multiple boilers, matching system load to the optimum output for your system. It enables the boilers to operate at peak efficiency, reduces cycling and decreases maintenance and downtime, all controlled from a burner management system.

Variable-Speed Drive

When you allow a motor to operate only at the speed needed at a given moment (as opposed to the constant 3,600 rpm of a typical drive), you eliminate unnecessary electrical cost. These variable-speed drives also produce quieter operation compared to a standard motor, and they reduce maintenance costs by decreasing the stress on the impeller and bearings.

Adjusting Oxygen Trim

An oxygen sensor and transmitter for the exhaust gas can ensure peak efficiency. The sensor/transmitter continuously senses oxygen content and provides a signal to the controller that “trims” the air damper and/or fuel valve, maintaining a consistent oxygen concentration. This minimizes excess air while optimizing the fuel-to-air ratio, saving you money.

The right burner for virtually any application.

Designed for maximum efficiency and low emissions, Industrial Combustion offers the right burner solution for virtually any boiler room application. With our extensive engineering expertise and vast aftermarket support network, we can help determine what burner is right for you, regardless of boiler manufacturer.

	NOx Levels	Recommended Boiler Types	Capacity (Horsepower)
			0.375 (8.9) · 0.5 (12) · 1.0 (23.8) · 1.3 (31) · 2.5 (59.5) · 3.6 (85.7) · 8.4 (200) · 10.5 (250) · 16.8 (400) · 25.2 (600) · 33.6 (800) · 42.0 (1000) · 63.0 (1500) · 72.6 (1728.6) · 92.4 (2200)
	**XL Series** #2 Oil, Natural Gas, Propane (page 6)	Less than 30 PPM NOx	Firetube Industrial Watertube	33.6–92.4 MMBTU (800–2200 HP)
	**S1 Series** #2-#6 Oil, Natural Gas, Propane (page 7)	Less than 30 PPM NOx	Firetube Industrial Watertube	42–63 MMBTU (1000–1500 HP)
	**E Series** #2 Oil, Natural Gas, Propane (page 8)	Uncontrolled or less than 30 PPM NOx	Firetube Firebox Commercial Watertube Cast-Iron Boilers Thermal Fluid Heater	8.4–42.0 MMBTU (200–1000 HP)
	**D Series** #2-#6 Oil, Natural Gas, Propane, Alternative Fuels (page 9)	Uncontrolled or less than 30 PPM NOx	Firetube Firebox Thermal Fluid Heater	3.6–42.0 MMBTU (85.7–1000 HP)
	**MTH Series** Gas only (page 10)	Less than 9 PPM NOx	Firetube Watertube Boilers Oven Kiln Drier Thermal Fluid Heating	2.5–63.0 MMBTU (59.5–1500 HP)
	**M Series** #2-#6 Oil, Natural Gas, Propane, Alternative Fuels (page 11)	Uncontrolled NOx only	Firetube Firebox Thermal Fluid Heating	1.4–10.5 MMBTU (33.3–250 HP)
	**V/VNF Series** #2 Oil, Natural Gas, Propane (page 12-13)	Uncontrolled or less than 30 PPM NOx	Firetube Firebox Watertube Cast-Iron Boilers	1.3–16.8 MMBTU (31–400 HP) VNF 2.4–8.4, Firetube Only
	**Q Series** Gas only (page 14)	Uncontrolled or less than 30 PPM NOx	Firetube Firebox Cast-Iron Sectional Commercial Watertube Boilers Furnaces Ovens	0.375–2.5 MMBTU (8.9–59.5 HP)

XL and LNXL Series

The XL series is offered in two standard configurations, vertical and horizontal. Vertical configurations support capacities ranging from 37.8 to 92.4 MMBTU, and horizontal configurations support capacities from 67.2 to 92.4 MMBTU. The standard and low-NOx vertical and horizontal configurations are capable of burning natural gas, propane gas and air-atomized #2 oil, as well as combination gas/#2 oil, #6 oil is available with steam atomization only. Full modulation operation is standard, and a parallel positioning system is required for burner management and combustion control.

XL/LNXL Burner

Available to less than 30 PPM NOx (LNXL) firing natural gas or LP

1800/3600 RPM Combustion Fan motor horsepower is based on NOx and capacity requirement

Air-Atomizing, low-pressure oil nozzle (steam atomization optional)

V-Port Oil Flow Control Valve is used for maximum capacity and precise oil flow control

Parallel Positioning required for optimal control throughout the firing range

Hinged Rear Door and Access Panels for easy access to internal components

Gas Manifold on oil burners standard for easy upgrade to combination units

Combustion Air Fan, efficient airfoil blade design smoothly lifts airflow over the entire blade, resulting in less motor horsepower requirement and significant noise reduction when compared to standard forced-draft fans

	Uncontrolled Emissions	Less than 30 PPM NOx
MMBTU (Gas Input)	37.8–92.4	37.8–92.4
GPH (Oil Input)	270–660	270–660
BHP (BHP = 33475 BTU/hr)	900–2200	900–2200
Fuels	Gas, #2 Oil, Combination	Gas, #2 Oil, Combination

S1 Series

The S1 series offers: natural gas, propane gas, air atomized #2-6 oil and combination gas and oil fuel options from 46.2 to 63.0 MMBTU per hour. The LNS1 burner, capable of <30 PPM NOx emissions offers: natural gas, propane gas, air atomized #2 oil and combination gas and oil fuel options from 42.0 to 63.0 MMBTU per hour. Full modulation operation and cam trim are standard for greater efficiency and cost savings. The S1 burner is an excellent choice when firing alternative fuels such as digester, waste oil, and biodiesel.

S1/LNS1 Burner

Low-Pressure, air-atomizing system on oil with rotary vane compressor

Cam Trim 14-point adjustment range on FGR

Parallel Positioning available for optimal control throughout the firing range

Nozzle Line Electric Heater standard on medium to heavy oil burners

Air Damper for precise fuel-to-air ratios

Hinged Air Housing for easy access to internal components

Backward-Curved Impeller provides adequate combustion air for various furnace pressure and high altitude applications

Induced FGR FGR modulating valve and shutoff valve (LNS1)

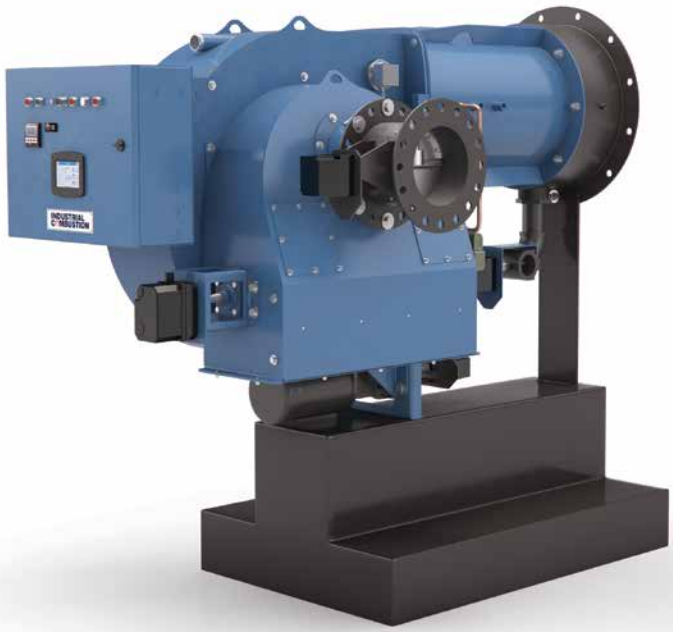
No. 2 Oil capability for back-up fuel (LNS1)

	Uncontrolled Emissions	Less than 30 PPM NOx
MMBTU (Gas Input)	46.2–63.0	42.0–63.0
GPH (Oil Input)	330–450	300–450
BHP (BHP = 33475 BTU/hr)	1100–1500	1000–1500
Fuels	Gas, Oil, Combination	Gas, Oil, Combination

E and LNE Series

The E series burner offers: natural gas, propane gas, air-atomized #2 oil and combination gas and oil fuel options from 8.4 to 42.0 MMBTU per hour. The LNE burner, capable of less than 30 PPM NOx emissions, offers: natural gas, propane gas, air-atomized #2 oil and combination gas and oil fuel options from 8.4 to 42.0 MMBTU per hour. Full modulation operation and cam trim are standard for greater efficiency and cost savings.

E/LNE Burner



Available to less than 30 PPM NOx firing natural gas and LP

Low-Pressure, air-atomizing system on oil with rotary vane compressor

Piston-Type positive displacement oil metering system

Cam Trim 14-point adjustment range

Parallel Positioning available for optimal control throughout the firing range

Rotary Air Damper precise fuel-to-air ratios

Hinged Air Housing for easy access to internal components

Gas Manifold on oil burners standard for easy upgrade to combination units

Combustion Air Fan, efficient rotary type damper and backward curved impeller, resulting in lower motor horsepower requirements and significant noise reduction when compared to standard forced-draft fans

Induced FGR FGR modulating valve and shutoff valve (LNE)

UL and cUL listed

	Uncontrolled Emissions	Less than 30 PPM NOx
MMBTU (Gas Input)	8.4–42.0	8.4–42.0
GPH (Oil Input)	60–300	60–270
BHP (BHP = 33475 BTU/hr)	200–1000	200–1000
Fuels	Gas, #2 Oil, Combination	Gas, Combination

D and LND Series

The D series burner offers: natural gas, propane gas, air-atomized #2–#6 oil and combination gas and oil fuel options from 4.2 to 42.0 MMBTU per hour. The LND burner, capable of less than 30 PPM NOx emissions, offers: natural gas, propane gas, air-atomized #2–#6 oil and combination gas and oil fuel options from 3.36 to 42.0 MMBTU per hour. Full modulation operation and cam trim are standard for greater efficiency and cost savings. The D burner is an excellent choice when firing alternative fuels such as digester, waste oil and biodiesel.

D/LND Burner

Available to less than 30 PPM NOx firing natural gas and LP

Low-Pressure, air-atomizing system on oil with rotary vane compressor

Piston-Type positive displacement oil metering system for precise oil control

Cam Trim 14-point adjustment range

Parallel Positioning available for optimal control throughout the firing range

Nozzle Line Electric Heater standard on medium to heavy oil burners

Rotary Air Damper for precise fuel-to-air ratios

Hinged Air Housing for easy access to internal components

Gas Manifold on oil burners standard for easy upgrade to combination units

Backward-Curved Impeller provides adequate combustion air for various furnace pressures and high-altitude applications

Induced FGR FGR modulating valve and shutoff valve (LND)

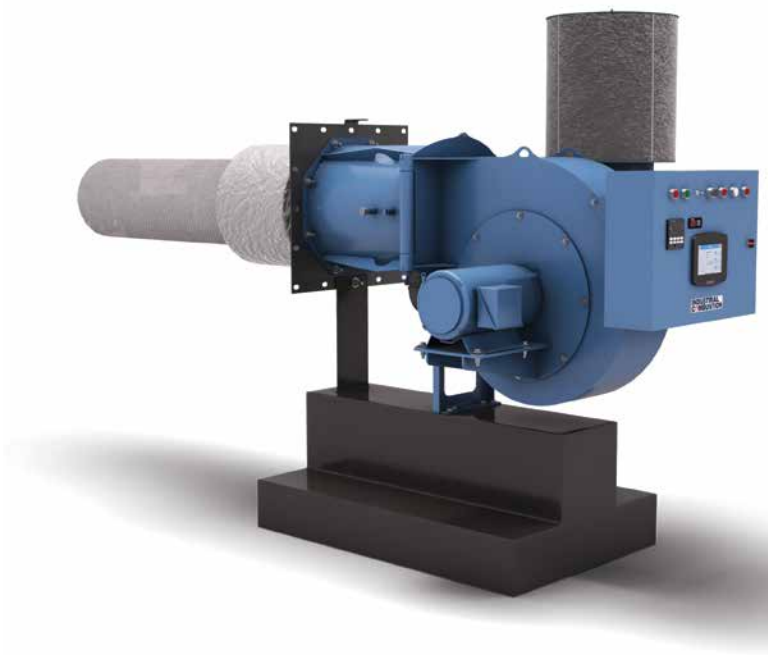
UL and cUL listed

	Uncontrolled Emissions	Less than 20 PPM NOx
MMBTU (Gas Input)	4.2–42.0	3.36–42.0
GPH (Oil Input)	30–300	24–300
BHP (BHP = 33475 BTU/hr)	100–1000	80–1000
Fuels	Gas, #2–#6 Oil, Combination	Gas, Combination

MTH Series

The standard MTH series includes parallel positioning as standard and offers natural gas and propane gas from 2.5 to 63.0 MMBTU per hour. Capable of low NOx/CO emissions without FGR, the MTH series features a rugged alloy fiber material combustion element over a stainless steel frame, providing flexibility, longevity and trouble-free operation for the life of the burner. The design is ideal for use with applications where low emissions are required and FGR is impractical or inaccessible. The MTH burner with surface stabilized combustion guarantees reliable, quiet operation and is capable of less than 9 PPM, meeting today's most stringent NOx emission levels.

MTH Burner



Available to less than 30 PPM NOx firing natural gas and LP

Parallel Positioning standard for optimal control throughout the firing range

Premix Fuel allows uniform flame distribution, low CO emission and high turndown

Hinged Air Housing on most sizes for easy access to internal components

Combustion Air Fan, efficient airfoil blade design smoothly lifts airflow over the entire blade, resulting in less motor horsepower requirements and significant noise reduction when compared to standard force draft fans

Low NOx Emissions achieved without FGR

Rugged Surface-Stabilized Premix Combustion Element ensures quiet combustion and low NOx/CO emissions throughout the entire firing range

UL and cUL listed from 2.5 to 16.0 MMBTU/hr

	Uncontrolled to 9 PPM
MMBTU (Gas Input)	2.5–63.02
GPH (Oil Input)	Not Applicable
BHP (BHP = 33,475 BTU/hr)	60–1,500
Fuels	Gas Only

M Series

The M series burner offers: natural gas, propane gas, air-atomized #2–#6 fuel oil and combination gas and oil fuel options from 1.4 to 10.5 MMBTU per hour. Full modulation operation is standard for optimum performance to meet load demand. The M burner is an excellent choice when firing alternative fuels such as digester, waste oil and biodiesel.

M Burner

Low-Pressure, air-atomizing system on oil with rotary vane compressor

Piston-Type positive displacement oil metering system for precise oil control

Cam Trim 14-point adjustment range standard on models M34–M105

Parallel Positioning available for optimal control throughout the firing range

Nozzle Line Electric Heater standard on medium to heavy oil burners

Rotary Air Damper for precise fuel-to-air ratios

Hinged Air Housing for easy access to internal components

Gas Manifold on oil burners standard for easy upgrade to combination units

Combustion Air Impeller provides adequate combustion air for various furnace pressures and high-altitude applications

UL and cUL listed (except ME and MEG 14–30)

	Uncontrolled Emissions
MMBTU (Gas Input)	1.4–10.5
GPH (Oil Input)	10–75[1]
BHP (BHP = 33475 BTU/hr)	33–250
Fuels	Gas, #2–#6 Oil, Combination

[1] Oil input (US gph) calculated for #2 Oil @ 140,000 BTU/gal

V and LNV Series

The V series burner offers: natural gas, propane gas, pressure-atomized #2 oil and combination gas and oil fuel options from 1.3 to 16.8 MMBTU per hour. The LNV burner, capable of less than 30 PPM NOx emissions, offers: natural gas, propane gas, pressure-atomized #2 oil and combination gas and oil fuel options from 1.3 to 14.7 MMBTU per hour.

V/LNV Burner

Cam Trim 14-point adjustment range available to less than 30 PPM NOx firing natural gas and LP

Parallel Positioning available for optimal control throughout the firing range

Dual-Blade Air Damper offers precise control of combustion air flow throughout firing range

Gas Manifold on oil burners standard for easy upgrade to combination units

Combustion Air Impeller provides adequate combustion air for various furnace pressures and high-altitude applications

Induced FGR FGR modulating valve and shutoff valve (LNV)

Panel Mount Options include top or rear mount flexibility

Inverted Configuration available in lieu of standard configuration to meet space requirements

UL and cUL listed

	Uncontrolled Emissions	Less than 30 PPM NOx
MMBTU (Gas Input)	1.3–16.8	1.3–14.7
GPH (Oil Input)	9.3–120	9.3–105.0
BHP (BHP = 33475 BTU/hr)	31–400	31–350
Fuels	Gas, #2 Oil, Combination	Gas, Combination

VNF Series

The VNF burner offers: natural gas, propane gas, high pressure atomized #2 oil and combination gas and oil fuel options from 2.1 to 8.4 MM BTU per hour. The low NOx VNF burner is capable of <30 PPM NOx emissions on natural gas and <120 PPM NOx emissions on No. 2 oil.

VNF Burner

- **Cam Trim** 14-point adjustment range available
- **Parallel Positioning** available for optimal control throughout the firing range
- **Dual-Blade Air Damper** offers precise control of combustion air flow throughout firing range
- **Gas Manifold** on oil burners standard for easy upgrade to combination units
- **Combustion Air Fan** is an air-foil blade design providing smooth air release from the blades allowing for increased blower efficiency
- **Induced FGR** FGR modulating valve and shutoff valve
- **No. 2 Oil** capability for back-up fuel
- **Panel Mount Options** include top or rear mount flexibility
- **UL and cUL** listed

	Uncontrolled Emissions	Less than 30 PPM NOx
MMBTU (Gas Input)	2.1–8.4	2.1–8.4
GPH (Oil Input)	15–60	15–60
BHP (BHP = 33475 BTU/hr)	50–200	50–200
Fuels	Gas, Oil, Combination	Gas, Oil, Combination

Q Series

The standard Q series includes on/off or full modulation linkageless operation with DC pulse width modulation and offers natural gas from 0.375 to 2.5 MMBTU per hour. Its totally enclosed, compact design allows provisions for sealed combustion or fresh air intake. Outside air can easily be connected to the blower inlet without any modifications to the burner.

Q Burner

Linkageless System standard for optimal control throughout the firing range

DC Pulse Width Modulation allows full blower speed control without the use of air dampers

Fully Enclosed Air Housing features a hinged cover for easy access to internal components and quiet operation

Combustion Air Fan efficient airfoil blade design smoothly lifts airflow over the entire blade, resulting in less motor horsepower requirements and significant noise reduction when compared to standard force draft fans

Sealed Combustion eliminates the need for outside air dampers and make-up air units typically required in every boiler room

UL/cUL and CSA listed

	Uncontrolled Emissions
MMBTU (Gas Input)	0.375–2.5
GPH (Oil Input)	Not Applicable
BHP (BHP = 33475 BTU/hr)	9–60
Fuels	Gas Only

Burner and Control Upgrades Are Easier Than Ever.

Industrial Combustion has the engineering team to design a turnkey solution for any boiler and any application. Contact an Industrial Combustion authorized distributor to determine what upgrade is right for you.

Evaluate your burner and controls for an upgrade if:

- Existing burners do not offer high turndown for maximum efficiency
- Your burner or boiler controls are more than 10 years old
- Burner controls are not fully integrated with boiler loads
- You must reduce emissions while maintaining efficiency
- Alternate fuels could provide energy savings and/or reduced emissions

Lower Fuel Costs

Following initial installation, fuel costs will become your biggest operating expense. Industrial Combustion works with you to custom-tailor burner and control solutions that help you increase efficiency and decrease fuel costs in virtually any boiler room environment. By installing the right burners, controls and heat recovery equipment, you can realize substantial savings immediately.

Lower Emissions

Lowering boiler room emissions can be challenging, regardless of the fuel type you are using. Whether for a sustainability effort or the result of a government-mandated emissions program, you can look to Industrial Combustion to help you reach your goals. We have long been a leader in offering low-emission solutions that are right for any application. Our team will work with you to design a retrofit solution utilizing our burners to achieve the low emissions you need.

INDUSTRIAL COMBUSTION

351 21st Street, Monroe, WI 53566 USA
608.325.3141 • info@ind-comb.com
ind-comb.com

Printed in the USA

IC-SA-1550
1/19