INDUSTRIAL COMBUSTION

NT SERIES BURNERS

1.5 TO 92.4 MMBTU/HR

High-efficiency, low emissions <9ppm NOx burner technology for the most stringent emissions requirements.

Developed to meet and exceed the most stringed emission standards.

Designed and developed with a flue gas recirculation (FGR) system proven to be the benchmark in the industry, firing up to 2200 HP boilers. With over 500 units in the field nationwide, our commitment to engineering excellence and the environment has not changed. Air pollution reduction, fuel savings, performance, and reliability, make the Industrial Combustion NT Series an outstanding choice – for the end user and the air we breathe.

NT Series features ultra-low NOx emissions:

NTD Series

On natural gas @ 3% 0_2:
< 9 PPM NOx
< 12 PPM NOx
< 15 PPM NOx

The NT Series features an advanced design impeller with backwards-inclined vanes. Unlike ordinary forward-curved impellers, the backward-incline design does not allow for dust to collect on the vanes, thus allowing the impeller to maintain its original balance while supplying combustion air. Our special air intake box with a rotary air damper (NTH, NTD) and FGR modulating valve, allows a precise amount of induced FGR and fuel/air ratio control throughout the firing range. This system provides the right amount of air and FGR for combustion. Excellent flame retention is assured at all firing rates.

NT Series features the unique Industrial Combustion technology for a stable, controlled flame front throughout the entire firing range.

Each zone is controlled by a butterfly gas valve with actuators. Excellent flame retention is assured at all firing rates.

NT Series was designed using Industrial Combustions' advanced computational fluid dynamics (CFO) for a burner concept that matches the geometry and aerodynamic parameters of the furnace.

Design Components

Industrial Combustion Technology
Adaptable to most types of combustion chamber configurations

Center Core Gas STABILIZER
Multiple staged gas injectors

Industrial Combustion Center Core Technology
Hammerhead injectors with backflow orifices

Rotary Air Damper (NTH, NTD)
Backward-curved impeller

Induced FGR
FGR modulating valve and shutoff valve

Oil Back-up
Parallel positioning for precise air-fuel metering

Hinged
For easy access of internal components

NT Fuel Applications for Firing:

- Natural Gas
- Light Fuel Oil (#2, Amber Oil)
- Propane – Air Mix

NT Fuel and Air Flows

The NT burner head's unique core and radially variable pitch swirl blades provide absolute flame stability at all loads for excess air from 20 to 60%.

The NT burner head is mounted inside the blast tube. Gas is directed to the various gas paths via connecting piping.

The high fuel-to-air mixing efficiency is obtained from the axial, radial and tangential turbulent air flow field generated at the burner outlet. This is combined with high velocity fuel jets, resulting in an optimized and well defined mixing pattern for maximum local mixture uniformity.

Ultra-Low-NOx Configuration

The NTXL Series was designed and developed with a flue gas recirculation (FGR) system which has been proven to be the benchmark in the industry. Emissions reduction, fuel savings, performance and reliability make the NTXL an excellent choice. The Industrial Combustion NTXL Series burner offers natural gas, propane air mix, air atomized #2 oil and combination gas and oil fuel options from 37.8 to 92.4 MMBTU per hour, with full modulation operation and parallel positioning for greater efficiency and cost savings. The NTXL is an ultra-low-NOx burner capable of less than 9 PPM NOx emissions.

NTXL Burner

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

Available to less than 9 PPM NOx

No. 2 Oil capability for back-up fuel

Frame	Model range	Boiler HP	Capacities		Mode of operation	Fuel	Parallel positioning
			MBH	GPH			
Size 1–3	378–924	900–2,200	37,800–92,400	270–660	Full modulation	Gas/Comb.	Required

Note: A parallel positioning system is required for burner management and combustion control. Consult factory for options.

Ultra-Low-NOx Configuration

The NTD Series was designed and developed with a flue gas recirculation (FGR) system which has been proven to be the benchmark in the industry. The Industrial Combustion NTD Series burner offers natural gas, propane air mix, air atomized #2 oil, and combination gas and oil fuel options from 12.6 to 33.5 MMBTU per hour, with full modulation operation and parallel positioning for greater efficiency and cost savings. The NTD is an ultra-low-NOx burner capable of less than 9 PPM NOx emissions.

NTD Burner

Available to less than 9 PPM NOx

Induced FGR modulating valve and shutoff valve, right or left connections

Parallel Positioning is standard for optimal control throughout the firing range

No. 2 Oil capability for back-up fuel

Rotary Air Damper for precise fuel-to-air ratios

Hinged Air Housing for easy access to internal components

Gas Injectors are a low-NOx, lance-style, hammerhead design, with all gas injectors mounted to an internal gas manifold assembly

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

Frame	Model range	Boiler HP	Capacities		Mode of operation	Fuel	Parallel positioning
			MBH	GPH			
Size 5–8	126–336	300–800	12,600–33,500	90–239	Full modulation	Gas, Oil, Comb.	Standard

Ultra-Low-NOx Configuration

The NTH Series was designed and developed with a flue gas recirculation (FGR) system which has proven to be the benchmark in the industry, the Industrial Combustion NTH burner is capable of firing up to 300 HP firetube and watertube boilers. The NTH features an advanced design impeller with backwards-inclined vanes. Unlike ordinary forward-curved impellers, the backward incline design does not allow for dust to collect on the vanes, thus allowing the impeller to maintain its original balance while supplying combustion air. A special air intake box with a rotary air damper and FGR modulating valve, allows a precise amount of induced FGR and fuel-to-air ratio control throughout the firing range.

NTH Burner

Available to less than 9 PPM NOx

Induced FGR modulating valve and shutoff valve

Parallel Positioning is standard for optimal control throughout the firing range

Fuel Options gas, #2 oil and combination fuel capabilities

Rotary Air Damper precise fuel-to-air ratios

Hinged Air Housing for easy access to internal components

Gas Injectors are a low-NOx, lance-style, hammerhead design, with all gas injectors mounted to an internal gas manifold assembly

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

Panel Options top or rear mount available

Frame	Model range	Boiler HP	Capacities		Mode of operation	Fuel	Parallel positioning
			MBH	GPH			
Size 2–4	32–86	36–299	1,500–12,500	90–239	Full modulation	Gas, Oil, Comb.	Standard

Capacities and Ratings

Less than 15 PPM and less than 9 PPM Ultra-Low-NOx Configuration (NTXLG, NTXLLG)

Burner model no. & frame size	378-1	420-1	462-1	504-1	546-2	588-2	630-2	672-3	756-3	840-3	924-3
Gas input (MBTU/hr)	37,800	42,000	46,200	50,400	54,600	58,800	63,000	67,200	75,600	84,000	92,400
Oil input (US gal/hr)	270	300	330	360	390	420	450	480	540	600	660
Boiler HP @ 80% efficiency	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,800	2,000	2,200
Blower motor HP	50	50	75	100	100	100	125	150	150	200	200
Separate compressor motor HP	15	15	15	15	15	15	15	15	15	15	15
Furnace pressure (" w.c.)	6.8	8.3	8.7	8.9	9.3	9.6	11.1	9.5	9.5	10	10.1
Standard gas train pipe size (in.)	3	3	3	3	3	4	4	4	4	4	4
Gas pressure required (psi)	10	10	10	10	10	10	10	10	10	10	10
FGR line piping (in.)	14	14	14	16	16	16	16	18	18	20	20

Input is based on fuel BTU content and altitude of 2,000 feet or less. If altitude > 2,000 feet and < 8,000 feet, derate capacity 4% per 1,000 feet over 2,000 feet. Consult factory for higher altitudes. Gas input is based on natural gas with 1,000 BTU/cu.ft., 0.60 gravity, 0" w.c. furnace pressure and the aforementioned conditions. Oil input based on 140,000 BTU/gal and the aforementioned conditions. Consult factory for 50 Hz. applications. Contact the factory for shipping weight estimation.

Less than 15 ppm and less than 9 ppm Ultra-Low-NOx Configuration (NTDG, NTDLG)

Burner sizes		126	147	168	210	252	294	315	336
Gas input (MBTU/hr)		12600	14600	16700	20900	25100	29300	31400	33500
Oil input (US gal/hr)		90	105	120	149	179	209	224	239
Boiler HP @ 80% efficiency		300	350	400	500	600	700	750	800
Remote oil pump motor HP		1/2	1/2	3/4	3/4	3/4	3/4	3/4	3/4
Compressor motor HP: IC shower head oil nozzle		5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2
Compressor motor HP: oil nozzle		15	15	20	20	20	25	25	30
Minimum gas pressure required (psi)		6	6	6	6	8	8	8	8
<15 PPM	Frame size	5	5	6	6	7	7	8	8
	Blower motor HP	20	25	25	40	50	60	75	75
	FGR line piping (in)	6	8	8	8	8	10	10	10
	Furnace pressure (" w.c.)	3.3	4.6	5.2	3	4.6	6.2	7.1	8
<9 PPM	Frame size	5	6	6	6	8	8	-	-
	Blower motor HP	25	40	50	50	75	75	-	-
	FGR line piping (in)	8	10	10	10	12	12	-	-
	Furnace pressure (" w.c.)	4.1	5.7	6.4	3.7	5.7	7.7	-	-

Input is based on fuel BTU content and altitude of 2,000 feet or less. If altitude > 2,000 feet and < 8,000 feet, derate capacity 4% per 1,000 feet over 2,000 feet. Consult factory for higher altitudes. Gas input is based on natural gas with 1,000 BTU/cu.ft., 0.60 gravity, 0" w.c. furnace pressure and the aforementioned conditions. Oil input based on 140,000 BTU/gal and the aforementioned conditions. Consult factory for 50 Hz. applications.

Capacities and Ratings

Less than 15 ppm and less than 9 ppm Ultra-Low-NOx Configuration (NTH)

Burner sizes		15	20	25	30	35	40	42	45	50	52	55
Gas input (MBTU/hr)		1500	2000	2500	3000	3500	4000	4200	4500	5000	5200	5500
Oil input (US gal/hr)		-	-	-	-	-	-	-	32	36	37	39
Boiler HP @ 80% efficiency		36	48	60	72	84	96	100	108	120	125	131
Oil pump motor HP		-	-	-	-	-	-	-	3/4	3/4	3/4	3/4
Compressor motor HP		-	-	-	-	-	-	-	3	3	3	3
Min. gas pressure required (psi)		4	4	4	4	4	4	4	4	4	4	4
< 20 PPM	Frame size	2	2	2	2	2	2	2	3	3	3	3
	Blower motor HP	3/4	3/4	1	1	1 1/2	2	2	3	5	5	5
	Furnace pressure (" w.c.)	0.5	0.8	1.3	1.1	1 1/2	1.6	0.7	2.1	2 1/2	1	3.1
< 15 PPM	Frame size	2	2	2	2	2	3	3	3	3	3	3
	Blower motor HP	3/4	3/4	1	1 1/2	2	3	3	3	5	5	5
	Furnace pressure (" w.c.)	0.5	0.9	1.4	1.2	1.6	1.7	0.7	2.2	2.7	1.1	3.3
< 12 PPM	Frame size	2	2	2	2	2	3	3	3	3	3	3
	Blower motor HP	3/4	3/4	1	1.5	2	3	3	5	5	5	7 1/2
	Furnace pressure (" w.c.)	0.6	1	1.6	1.3	1.7	1.9	0.8	2.4	3	1.2	3.7
< 9 PPM	Frame size	2	2	2	2	2	3	3	3	3	3	3
	Blower motor HP	3/4	1	1 1/2	2	3	5	3	5	7 1/2	7 1/2	7 1/2
	Furnace pressure (" w.c.)	0.6	1.1	1.8	1.4	2	2.2	0.9	2.7	3.4	1.4	4.1

Burner sizes		60	63	70	80	84	90	100	105	110	120	125
Gas input (MBTU/hr)		6,000	6,300	7,000	8,000	8,400	9,000	10,000	10,500	11,000	12,000	12,500
Oil input (US gal/hr)		43	45	50	57	60	64	71	75	79	86	89
Boiler HP @ 80% efficiency		143	150	167	191	200	215	239	250	263	287	299
Oil pump motor HP		1	1	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Compressor motor HP		3	3	3	3	3	3	3	3	3	3	3
Min. gas pressure required (psi)		4	4	4	4	4	4	5	5	5	6	6
< 20 PPM	Frame size	3	3	3	3	3	4	4	4	4	4	4
	Blower motor HP	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	10	10	10	15	15
	Furnace pressure (" w.c.)	3.6	1.7	2.6	3.5	2.4	4.4	4.1	2.1	4.9	5.8	6.3
< 15 PPM	Frame size	3	3	3	4	4	4	4	4	4	4	-
	Blower motor HP	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	10	10	10	15	15	-
	Furnace pressure (" w.c.)	3.9	1.8	2.8	3.7	2.5	4.7	4.4	2.3	5.3	6.3	-
< 12 PPM	Frame size	3	3	4	4	4	4	4	4	4	4	-
	Blower motor HP	7 1/2	7 1/2	7 1/2	10	10	10	15	15	15	15	-
	Furnace pressure (" w.c.)	4.4	2	3.2	4.1	2.8	5.2	4.8	2.5	2	1.5	-
< 9 PPM	Frame size	3	3	4	4	4	4	4	4	-	-	-
	Blower motor HP	7 1/2	7 1/2	10	10	10	15	15	15	-	-	-
	Furnace pressure (" w.c.)	4.9	2.3	3.5	4.6	3.2	5.9	5.4	2.9	-	-	-

For firetube, firebox and commercial watertube boilers only. Turndown on tangent tube commercial watertube boilers may be restricted, consult factory. Consult factory for oil applications for burner models 15 through 42. Input is based on fuel BTU content, list furnace pressure and altitude of 2,000 feet or less. If altitude > 2,000 feet and < 8,000 feet, derate capacity 4% per 1,000 feet over 2,000 ft. Consult factory for higher altitudes. If furnance pressure exceeds listed value, derate capacity 5% for every 1/2" w.c. of pressure in excess of stated. Consult factory if derate exceeds 20%. Gas input is based on natural gas with 1,000 BTU/cu.ft., 0.60 gravity, 0 furnace pressure and the aforementioned conditions. Gas pressure based on zero furance pressure. For total pressure at manifold, add furnace pressure. Oil input based on 140,000 BTU/gal and the aforementioned conditions. Consult factory for 50Hz. applications.

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.

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