

PROFIRE[®] NT SERIES BURNERS

1.5 TO 92.4 MMBTU/HR

High-efficiency burner technology for the most stringent emissions requirements.

Developed to meet and exceed the California emission standards

Designed and developed with a Flue Gas Recirculation 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 C-B ProFire an outstanding choice... for the end user, and the air we breathe.

NT Series features ultra-low NOx emissions:

- < 9 ppm NOx on natural gas @ 3% O₂
- < 12 ppm NOx on natural gas @ 3% O₂
- < 15 ppm NOx on natural gas @ 3% O₂



The ProFire NT/ Series feature 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 F.G.R. modulating valve, allows a precise amount of induced F.G.R. and fuel/air ratio control throughout the firing range. This system provides the right amount of air and F.G.R. for combustion. Excellent flame retention is assured at all firing rates.

NT Series features the unique C-B NATCOM technology for a stable, controlled flame front throughout the entire firing range.

The center core stabilizer acts as a fuel-rich zone, while the multiple gas lances are a fuel-lean zone. Each zone is controlled by a butterfly gas valve with actuators. Excellent flame retention is assured at all firing rates.

The gas lances feature a unique nozzle configuration with back flow orifices for staged gas zone.

NT Series was designed using C-B NATCOM's advanced computational fluid dynamics (CFO) for a burner concept that matches the geometry and aerodynamic parameters of the furnace.

C-B NATCOM center core technology is offered on the NT Series to enhance the performance and operation of the system.

DESIGN COMPONENTS

C-B NATCOM Technology

Adaptable to most types of combustion chamber configurations

Center Core Gas STABILIZER

Multiple staged gas injectors

C-B Natcom Center Core Technology

Hammerhead injectors with back flow orifices

Rotary Air Damper (NTH, NTD)

Backward-curved impeller

Induced F.G.R.

F.G.R. 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 ProFire NTXL was designed and developed with a Flue Gas Recirculation system which has been proven to be the benchmark in the industry. Emissions reduction, fuel savings, performance, and reliability make the ProFire NTXL an excellent choice. The Cleaver-Brooks ProFire 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 ProFire NTXL is an ultra-low-NOx burner capable of less than 9 ppm NOx emissions.

ProFire NTXL



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 force draft fans

Available to <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 ProFire NTD was designed and developed with a Flue Gas Recirculation system which has been proven to be the benchmark in the industry. The Cleaver-Brooks ProFire 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 ProFire NTD is an ultra-low-NOx burner capable of less than 9 ppm NOx emissions.

ProFire NTD



In addition to all the features listed under the ProFire D, the ProFire NTD has these features:

Available to <9 ppm NOx.

Induced FGR modulating valve and shutoff valve.

Parallel Positioning is standard for optimal control throughout the firing range.

#2 Oil capability for backup fuel.

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.

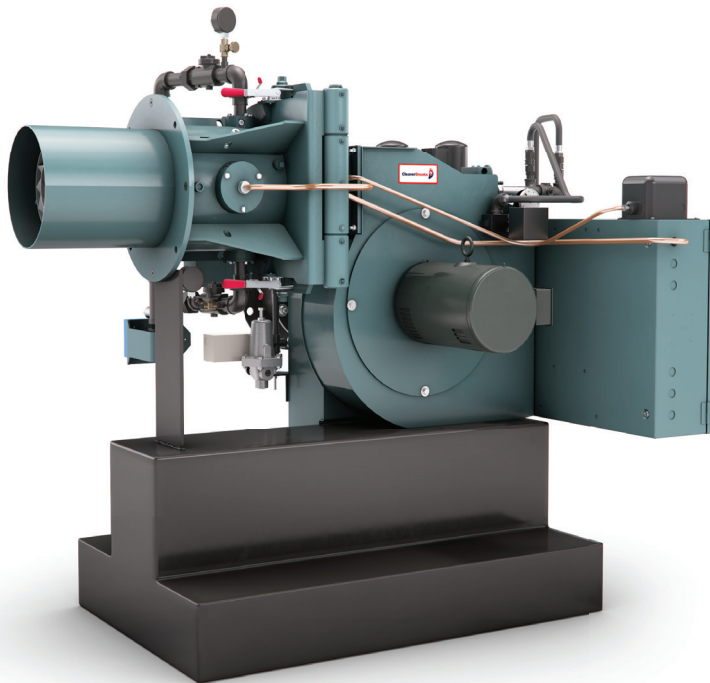
Frame	Model Range	Boiler HP	Capacities		Mode of Operation	Fuel	Parallel Positioning
			MBH	GPH			
Size 5-8	126-336	300-800	12,600-33,500	90-239	Full Modulation	Gas, Oil, Comb.	Standard

Ultra-Low-NOx Configuration



The ProFire NTD was designed and developed with a Flue Gas Recirculation (FGR) system which has proven to be the benchmark in the industry, the C-B ProFire NTH burner is capable of firing up to 300 HP firetube and watertube boilers. The ProFire 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.

ProFire NTH



Available to <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 Number & 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 gph)	270	300	330	360	390	420	450	480	540	600	660
Boiler HP @ 80% Eff.	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	10.0	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. 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 50Hz. 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)	12,600	14,600	16,700	20,900	25,100	29,300	31,400	33,500	
Oil Input (US gal/hr)	90	105	120	149	179	209	224	239	
Boiler HP @ 80% Eff.	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: C-B Showerhead Oil Nozzle	5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	
Compressor Motor HP: NATCOM Oil Nozzle	15	15	20	20	20	25	25	30	
Min. Gas Pressure Req. (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	3.0	4.6	6.2	7.1	8.0
<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	-	-

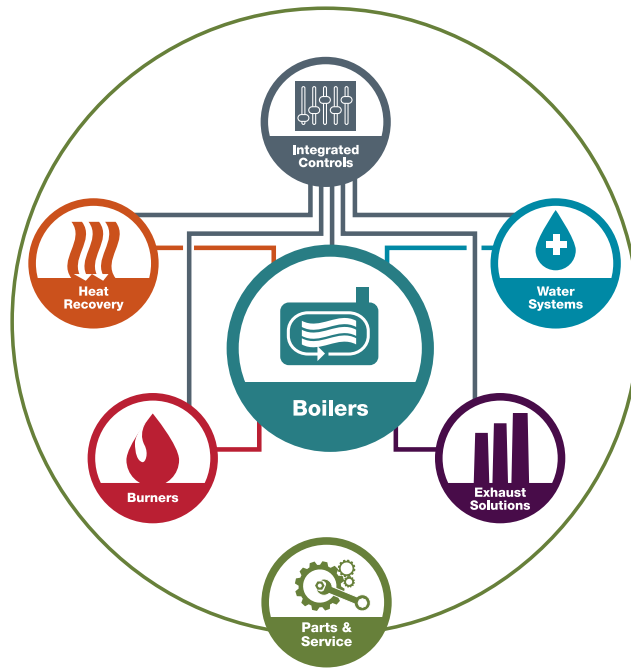
Input is based on fuel BTU content and altitude of 2,000 feet or less. If altitude >2,000 feet and <8,000 feet, derate capacity 4% per 1,000 feet over 2,000. Consult factory for higher altitudes. Gas input is based on natural gas with 1,000 BTU/cu.ft., 0.60 gravity, 0 "w.c. furnace pressure and the aforementioned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

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)		1,500	2,000	2,500	3,000	3,500	4,000	4,200	4,500	5,000	5,200	5,500
Oil Input (US gph)		-	-	-	-	-	-	-	32	36	37	39
Boiler HP @80% Eff.		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 Req. (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
	Furn. Press. "W.C.	0.5	0.8	1.3	1.1	1.5	1.6	0.7	2.1	2.5	1.0	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
	Furn. Press. "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 1/2	2	3	3	5	5	5	7 1/2
	Furn. Press. "W.C.	0.6	1.0	1.6	1.3	1.7	1.9	0.8	2.4	3.0	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
	Furn. Press. "W.C.	0.6	1.1	1.8	1.4	2.0	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 gph)		43	45	50	57	60	64	71	75	79	86	89
Boiler HP @80% Eff.		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 Req. (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
	Furn. Press. "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	-
	Furn. Press. "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	-
	Furn. Press. "W.C.	4.4	2.0	3.2	4.1	2.8	5.2	4.8	2.5	2.0	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	-	-	-
	Furn. Press. "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. Consult factory for higher altitudes. If furnace 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 furnace 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.



Providing energy-efficient, environmentally friendly boiler room solutions

Cleaver-Brooks is one of only a few boiler room solution providers in the world to operate a dedicated research and development facility. Having pioneered several industry-leading technologies, we remain just as committed today to introducing technology and products that enable a more energy-efficient and environmentally friendly generation of steam and hot water.

We distribute our products through the Cleaver-Brooks Representatives Association, or CBRA, an alliance of independently owned and operated companies that provide boiler room products and service. CBRA companies can be counted on to provide Cleaver-Brooks products and parts, engineering support, customer training, technical service and system maintenance. To find a CBRA representative near you, please visit cleaverbrooks.com/rebs.



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