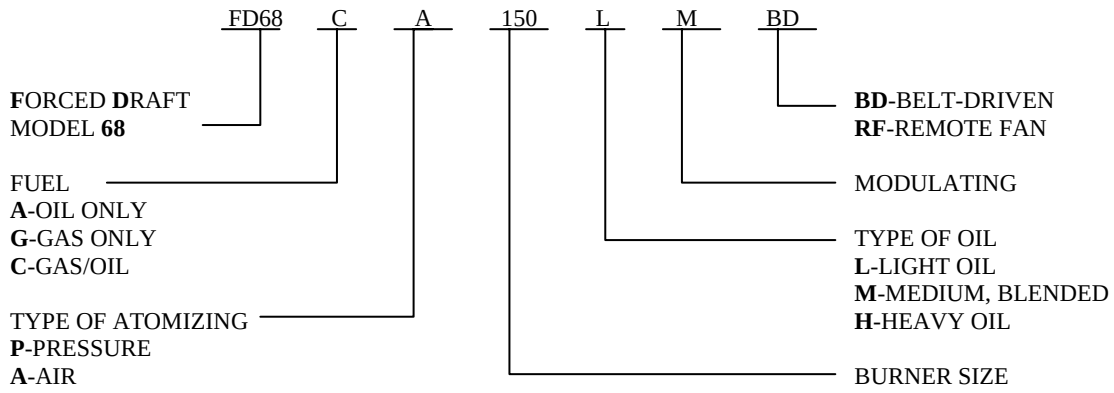
SPECIFICATION GUIDE

The suggested specifications for series FD68-LN burners are presented in a modular form on the following pages 4000-60B through 4000-60E.

The following data can be used to fill in the information appropriate for the burner size required:

MODEL DESIGNATIONS



Model **-LM**: Designed for use with grade #2 oil or lighter. No provision for pre-heating oil is incorporated on the burner itself. Standard design includes an oil supply back pressure regulating valve for recirculating oil from the oil inlet on the burner. Pressure atomization is available up to size 300. Air atomization is available for all sizes.

Model **-MM**: Designed for use with blended fuel oils up through grade #5. A single oil pre-heater is incorporated into the burner design to raise the oil to atomizing temperature. Standard design includes an oil supply back pressure regulating valve for recirculating oil from the discharge of the oil heater. Pre and post firing nozzle purge system is available as an option.

Model **-HM**: Designed for use with the heaviest grades of fuel oil. Oil is heated to atomizing temperature with a single heater on sizes 50 - 125 and dual heaters on sizes 150 - 1000. Standard design includes a triple-pass oil manifold to continually keep all oil piping hot up to the nozzle, an oil supply back pressure regulating valve for recirculating the oil from the burner inlet, a relief valve for recirculating oil from the oil heater discharge, and a pre and post firing nozzle purge system.

BURNER SIZE	FIRING RATE MBH	BLOWER MOTOR HP	MAX FURN PRESS for RATED CAPACITY
75	2,500	3/4HP	1.5 "wc
100	4,200	1-1/2HP	0.75 "wc
125	4,200	2HP	2.0 "wc
150	6,300	2HP	0.75 "wc
200	8,400	5HP	0.5 "wc
250	8,400	7-1/2HP	2.0 "wc
300	12,600	7-1/2HP	0.75 "wc
400	16,800	15HP	2.0 "wc
500	21,000	20HP	0.75 "wc
625	25,200	25HP	2.0 "wc
800	29,400	30HP	2.5 "wc
1000	33,600	40HP	3.0 "wc
1000SP	38,000	50HP	2.0 "wc

<SPECIFICATIONS FOR ALL FD68-LN BURNERS>

Furnish and install ___<*qty*> S.T. Johnson model_____ forced draft, axial flow, burner(*s*) for firing the boiler(s) to full rated capacity of _____boiler HP. The complete burner system including the burner management control system shall be listed by underwriters laboratories and bear the UL label. In addition to UL the burner system shall meet the requirements of _____ < FM, IRI, CSD-1 ETC>.

The burner shall be capable of firing against a furnace pressure from negative 0.10"w.c. To a positive_____"w.c. without a reduction in capacity or efficiency. All air required for combustion shall be supplied by an integral, axial flow, backward inclined blower wheel driven by a standard NEMA frame motor rated at no more than ___HP. The combustion air volume shall be controlled by a triple-disc rotary air shutter assembly. Adjustment of individual air damper blades shall not be required to set proper air flow.

The blower assembly shall include an inlet silencer assembly and be hinged for easy access to the firing head, pilot assembly, blower motor and air diffuser. Access to these internal components shall be gained without disconnecting any linkage or piping.

The burner assembly shall include a refractory burner throat rated at 3000 degrees f encased in a stainless steel housing, a flame observation port, an electric modulating system with manual limiting potentiometer, and a gas/electric ignition system.

The combustion air flow pattern in the combustion chamber shall be controlled by a stainless steel air diffuser and air rotation blades which will result in two counter-rotating flows to insure a uniform and intimate fuel/air mixture. The air rotation blades shall be adjustable to set the rate of fuel/air mixing and properly shape the flame geometry to the combustion chamber.

The low emission burner system shall incorporate an induced flue gas recirculation system which shall introduce the recirculated flue gas upstream of the firing head/air diffuser assembly. Flue gases shall be induced into the combustion airstream by the single axial flow forced draft blower, integral with the burner assembly. Forced FGR systems requiring a second blower shall not be an acceptable means of flue gas recirculation.

The volume of recirculated flue gas shall be controlled by a flanged butterfly-type control valve mounted at the FGR inlet to the burner. The volume of FGR shall be controlled by the computerized burner management system and FGR servomotor.

The burner blower housing shall swing open to allow full access to the firing head without disconnecting or disturbing the FGR piping/ductwork.

< SPECIFICATIONS TO BE INSERTED FOR GAS FIRED SYSTEMS>

Gas shall be introduced into the combustion air stream via multiple gas spuds located around the perimeter of the firing head. Each gas spud shall have multiple orifices to properly distribute the gas into the combustion air stream, and shall have the capability of being rotated to change the pattern of gas distribution.

A ____<*pipe size*> gas pipe train shall be furnished and installed to meet the specifications set forth by _____<UL, CSD-1, IRI,FM>. At a minimum the following components shall be included:

Main safety shut-off valve W/ motorized actuator
<& proof-of-closure switch if input is greater than 5000MBTU/HR>
Blocking solenoid <optional motorized> safety shut-off valve.
Low gas pressure switch & high gas pressure switch.
Main manual shut-off valve.
Leak test manual shut-off valve.
N.O. Vent solenoid valve *<only required for UL above 12500MBTU/HR and IRI>*
Main gas pressure regulator ratedat_____ gas supply pressure.

< SPECIFICATIONS TO BE INSERTED FOR PRESSURE ATOMIZING OIL SYSTEMS >

Fuel oil shall be introduced into the combustion air stream via (4) return-flow pressure atomizing nozzles. The oil shall be supplied to the burner at 300psig by a separate motor-driven oil pump, and the oil delivery rate to the combustion chamber shall be modulated in conjunction with the combustion air via an oil metering valve in the oil return line.

The oil supply piping shall include (2) oil safety shut-off valves, a low oil pressure switch, and an oil supply pressure gauge. The return oil piping shall include a return oil pressure gauge, an oil metering valve, and a solenoid valve to prevent reverse oil flow to the nozzles when the burner is not firing.

The oil nozzles and nozzle body assembly shall be removable from the burner for maintenance without the disassembly, or removal, of other burner components such as the firing head, diffuser, etc.

< SPECIFICATIONS TO BE INSERTED FOR AIR ATOMIZING #2 OIL SYSTEMS WITH THE STANDARD OIL METERING VALVE>

Fuel oil shall be introduced into the combustion air stream via an air atomizing, internal mixing, oil nozzle. The oil shall be supplied to the burner by a separate gear pump driven by a standard NEMA frame motor, and the oil delivery rate to the combustion chamber shall be modulated in conjunction with the combustion air via an oil metering valve in the oil supply line.

The oil supply piping shall include (2) safety shut-off valves, an oil metering valve, a back pressure regulating valve ,a low oil pressure switch, an oil supply pressure gauge, and a nozzle pressure gauge.

The oil nozzle and nozzle body assembly shall be removable from the burner for maintenance without the disassembly, or removal, of other burner components such as the firing head, diffuser, etc.

Atomizing air shall be supplied by separate reciprocating air compressor driven by a standard NEMA frame motor, which includes a venturi style air inlet silencer, air filter, and an adjustable air bypass valve.

< SPECIFICATIONS TO BE INSERTED FOR AIR ATOMIZING #2 OIL SYSTEMS WITH THE OPTIONAL ELECTRONIC OIL METERING >

Fuel oil shall be introduced into the combustion air stream via an air atomizing, internal mixing, oil nozzle. The oil shall be supplied to the burner by a separate positive displacement gear pump driven by a standard NEMA frame motor. The oil delivery rate to the combustion chamber shall be modulated in conjunction with the combustion air via a variable speed DC drive system controlling the speed of the oil metering pump. The minimum and maximum firing rate of the burner shall be controlled by an electronic control circuit board located in the burner control panel. The setting of the fuel/air ratio shall not require the adjustment of linkages and/or metering valves.

The oil supply piping shall include a 3-way oil shut-off valve, a 2nd safety shut-off valve, a low oil pressure switch, and a nozzle pressure gauge. The return oil piping shall include a back pressure regulating valve.

The oil nozzle and nozzle body assembly shall be removable from the burner for maintenance without the disassembly, or removal, of other burner components such as the firing head, diffuser, etc.

Atomizing air shall be supplied by separate reciprocating air compressor driven by a standard NEMA frame motor, which includes a venturi style air inlet silencer, air filter, and an adjustable air bypass valve.

< SPECIFICATIONS FOR AIR ATOMIZING #4-5 OIL SYSTEMS WITH THE STANDARD OIL METERING VALVE>

Fuel oil shall be introduced into the combustion air stream via an air atomizing, internal mixing, oil nozzle. The oil shall be supplied to the burner by a separate gear pump driven by a standard NEMA frame motor, and the oil delivery rate to the combustion chamber shall be modulated in conjunction with the combustion air via an oil metering valve in the oil supply line. The burner shall include an electric oil trim heater to raise the oil to proper atomizing temperature.

Both the oil and air passages of the oil nozzle shall be purged with air before and after each firing cycle.

The oil supply piping shall include (2) safety shut-off valves, an oil metering valve, a back pressure regulating valve ,a low oil pressure switch, a low oil temperature switch, a high oil temperature switch, an oil temperature gauge, an oil supply pressure gauge, and a nozzle pressure gauge.

The oil nozzle and nozzle body assembly shall be removable from the burner for maintenance without the disassembly, or removal, of other burner components such as the firing head, diffuser, etc.

Atomizing air shall be supplied by separate reciprocating air compressor driven by a standard NEMA frame motor, which includes a venturi style air inlet silencer, air filter, and an adjustable air bypass valve.

< SPECIFICATIONS FOR AIR ATOMIZING #4-5 OIL SYSTEMS WITH THE OPTIONAL ELECTRONIC OIL METERING >

Fuel oil shall be introduced into the combustion air stream via an air atomizing, internal mixing, oil nozzle. The oil shall be supplied to the burner by a separate positive displacement gear pump driven by a standard NEMA frame motor. The oil delivery rate to the combustion chamber shall be modulated in conjunction with the combustion air via a variable speed DC drive system controlling the speed of the oil metering pump. The minimum and maximum firing rate of the burner shall be controlled by an electronic control circuit board located in the burner control panel. The setting of the fuel/air ratio shall not require the adjustment of linkages and/or metering valves.

Both the oil and air passages of the oil nozzle shall be purged with air before and after each firing cycle.

The oil supply piping shall include a 3-way oil shut-off valve, a 2nd safety shut-off valve, an electric oil trim heater, a low oil pressure switch, a low oil temperature switch, a high oil temperature switch, an oil temperature gauge, and a nozzle pressure gauge. The return oil piping shall include a back pressure regulating valve.

The oil nozzle and nozzle body assembly shall be removable from the burner for maintenance without the disassembly, or removal, of other burner components such as the firing head, diffuser, etc.

Atomizing air shall be supplied by separate reciprocating air compressor driven by a standard NEMA frame motor, which includes a venturi style air inlet silencer, air filter, and an adjustable air bypass valve.

< SPECIFICATIONS FOR AIR ATOMIZING #6 OIL SYSTEMS WITH THE STANDARD OIL METERING VALVE>

Fuel oil shall be introduced into the combustion air stream via an air atomizing, internal mixing, oil nozzle. The oil shall be supplied to the burner by a separate gear pump driven by a standard NEMA frame motor, and the oil delivery rate to the combustion chamber shall be modulated in conjunction with the combustion air via an oil metering valve in the oil supply line. The burner shall include electric oil trim heaters to raise the oil to proper atomizing temperature.

Heated oil shall be continually circulated through all the oil piping up to the oil nozzle when not firing. Both the oil and air passages of the oil nozzle shall be purged with air before and after each firing cycle.

The oil supply piping shall include (2) safety shut-off valves, an oil metering valve, a back pressure regulating valve ,a low oil pressure switch, a low oil temperature switch, a high oil temperature switch, an oil temperature gauge, an oil supply pressure gauge, and a nozzle pressure gauge.

The oil nozzle and nozzle body assembly shall be removable from the burner for maintenance without the disassembly, or removal, of other burner components such as the firing head, diffuser, etc.

Atomizing air shall be supplied by separate reciprocating air compressor driven by a standard NEMA frame motor, which includes a venturi style air inlet silencer, air filter, and an adjustable air bypass valve.

< SPECIFICATIONS FOR AIR ATOMIZING #6 OIL SYSTEMS WITH THE OPTIONAL ELECTRONIC OIL METERING >

Fuel oil shall be introduced into the combustion air stream via an air atomizing, internal mixing, oil nozzle. The oil shall be supplied to the burner by a separate positive displacement gear pump driven by a standard NEMA frame DC

motor. The oil delivery rate to the combustion chamber shall be modulated in conjunction with the combustion air via a variable speed DC drive system controlling the speed of the oil metering pump. The minimum and maximum firing rate of the burner shall be controlled by an electronic control circuit board located in the burner control panel. The setting of the fuel/air ratio shall not require the adjustment of linkages and/or metering valves.

Heated oil shall be continually circulated through all the oil piping up to the oil nozzle when not firing. Both the oil and air passages of the oil nozzle shall be purged with air before and after each firing cycle.

The oil supply piping shall include a 3-way oil shut-off valve, a 2nd safety shut-off valve, electric oil trim heaters, a low oil pressure switch, a low oil temperature switch, a high oil temperature switch, an oil temperature gauge, and a nozzle pressure gauge. The return oil piping shall include a back pressure regulating valve.

The oil nozzle and nozzle body assembly shall be removable from the burner for maintenance without the disassembly, or removal, of other burner components such as the firing head, diffuser, etc.

Atomizing air shall be supplied by separate reciprocating air compressor driven by a standard NEMA frame motor, which includes a venturi style air inlet silencer, air filter, and an adjustable air bypass valve.

< SPECIFICATIONS FOR BURNER MANAGEMENT CONTROL SYSTEMS>

The burner control system shall be housed in a separate NEMA1 Enclosure for mounting remotely from the burner. The continuous hinged door is to include all specified annunciating lights, an observation window to view the burner programmer status lights, and all switches required for burner operation.

The control system shall include:

A _____ model_____ burner programming control.
Starters and overloads for blower motor <*compressor*><*oil pump*>
Contactor(s) for oil heater(s) ,<-*MM & -HM models*>
Burner on-off switch <gas-off-oil switch for gas/oil burners>
Lights indicating: power on, ignition, main fuel, safety
Manual-auto firing switch
Manual firing rate limiting potentiometer
Numbered wiring terminal strip
Color coded wiring

<*Optional items*>

Branch circuit fusing
Branch circuit breakers
Main circuit breaker
Main fused disconnect with door interlock
Model_____first-out annunciator
<qty> burner lead-lag switch
Draft control system with auto/open damper switch
Audible alarm
Additional annunciating lights