

NOXMATIC AXIAL FLOW BURNER INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

CUSTOMER:

JOB NAME:

SHOP ORDER #:

P.O. #:

MODEL:

FIRING RATE:

EMISSIONS TARGET:

FLAME SAFEGUARD:

FUEL AIR CONTROL:

VFD:

MOTOR HP/ VOLTAGE:

ELECTRICAL SCHEMATIC:

GAS TRAIN:

REGULATOR:

ACTUAL DEAD ZONE DIM:

FIRING HEAD DEAD ZONE:

FIRETUBE DIAMETER:

OPTIONS:

VACUUM GAUGE/SWITCH:

OIL BACKUP:

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NOTICE: This manual is provided to supply general information on the installation, operation and maintenance of the NOXMATIC burner system. The burner must be installed and operated by trained personnel, guided by generally accepted industry practice. Do not attempt to operate the burner without familiarizing yourself with these instructions and the manufacturer's instructions for all components in the system. Failure to do so can result in personal injury, loss of life and damage to property.

Specifications and procedures are subject to change without notice. Please consult factory for older unit specifications, or whenever the equipment supplied does not match descriptions in this manual.

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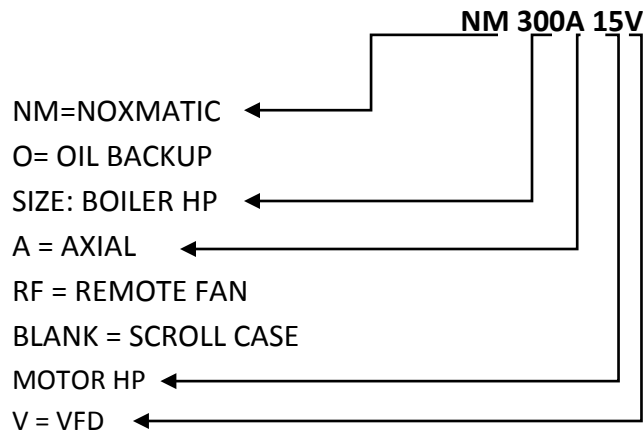
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MODEL: NOXmatic type A
Ultra Low NOx
Gas Burners

OVERVIEW

The NOXMATIC A series of burners is based on the trademark Johnson high performance axial flow design. This incorporates a swing open housing that allows easy access and maintenance. The standard configuration uses a variable frequency drive to control air flow, with a gas mixing manifold and metal fiber firing head. The structure of the firing head creates the correct pressure drop to anchor the flame on the outside surface of the fiber material. With proper maintenance this will easily and reliably give ultra low NOx readings with no FGR.

MODEL DESIGNATIONS



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ORDERING INFORMATION

The following information is required to process orders or quotations:

All systems:

Burner Model desired.
Burner capacity of boiler HP.
Type of boiler or furnace.
Furnace pressure to be fired against.
Electrical specifications.
Elevation (if greater than 2,000 ft.)
Insurance or local code requirements.
Control system programmer desired.
Control options desired.
Emissions requirements.

Gas systems:

Type of gas.
Gas supply pressure at burner installation.

Important Dimensions:

The firing head needs to be custom made to fit the boiler. This is the "dead zone" dimension.
For a fire tube boiler: the dimension from the furnace mounting flange to the boiler tube sheet.
For a water tube boiler: the thickness of the front wall.

Contact your sales representative for more information.

IMPORTANT DIMENSIONS:

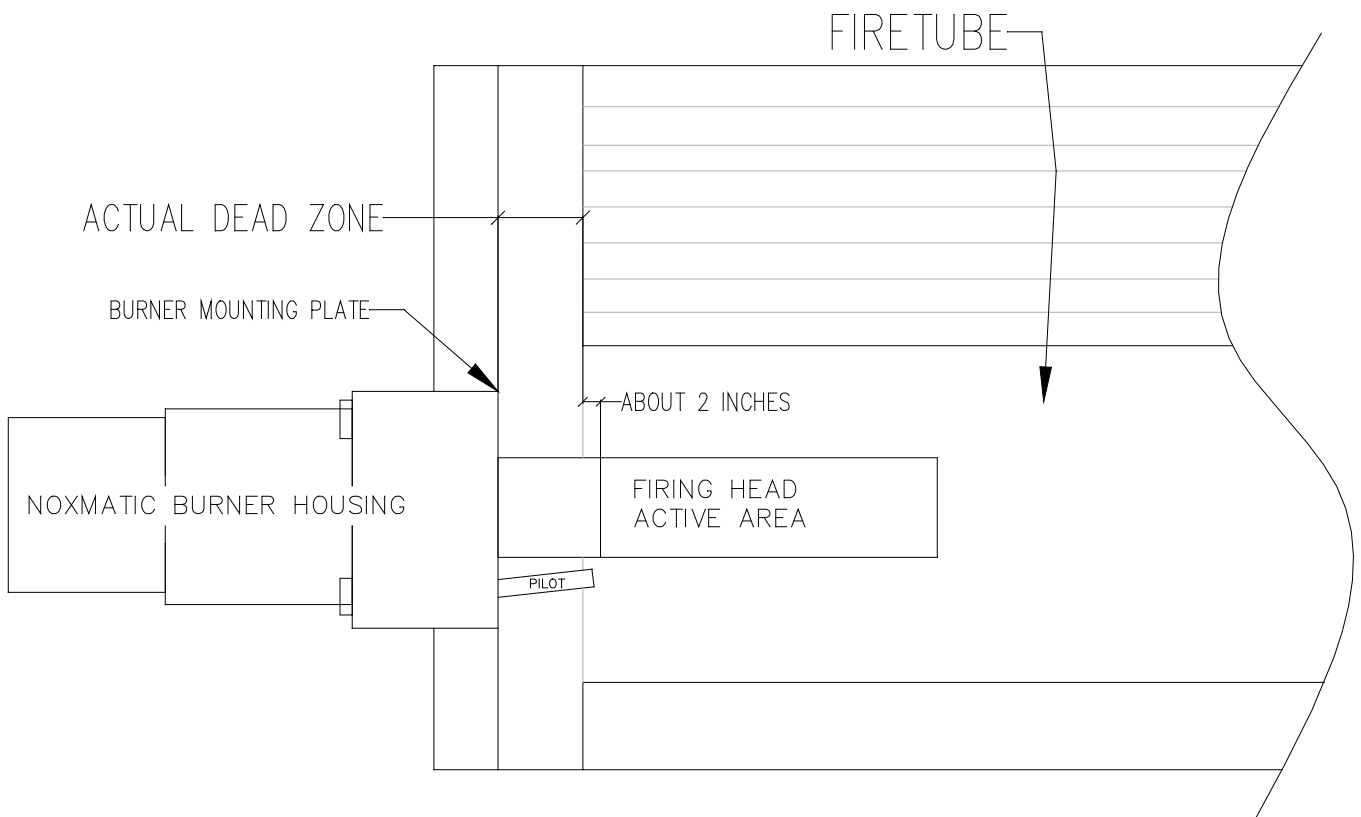
The firing head needs to be custom made to fit each application.

There will be an inactive zone between where the burner is mounted, and the inside of the fire tube or water tube where the heating area will be. We are calling this the “dead zone”.

As shown on the diagram below, the “actual dead zone” is the measurement from where the burner will be mounted, to the edge of the tube sheet.

The “firing head dead zone”, or the inactive area on the firing head, will be the “actual dead zone” plus 2 inches. This dimension is in whole inches only.

The diameter of the firetube is important as well. There needs to be a minimum of 4-6 inches around the firing head. If the firing head is too close to the side walls there will be flame impingement, and it may not meet emissions. The diameter of the firing head will need to be sized accordingly.



**NOXMATIC SERIES
GAS BURNERS
INSTALLATION OVERVIEW**

WARNING: LIFTING

Both the windbox (stationary cylinder) and the swing away fan assembly (swing cylinder) have provision for installing a lifting lug, however the burner must always be lifted by placing a lifting eye on the windbox. The entire burner assembly should NEVER be lifted by the swing cylinder only as this will cause unnecessary strain on the hinge assembly.

BURNER MOUNTING DIMENSIONS

Burner Size	X CUT OUT	Y BOLT CIR.	Z BOLTS
100-150	11	21 ¼	6
200-238	13	30 ¼	6
250-300	17	30 ¼	6
350-400	18	35 ¼	6
500-600	22	39 ½	12
700-800	24	39 ½	12

All dimensions in inches.

Note: This is the minimum clearance for the center hole only. Additional clearance will be needed for the pilot.

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INSTALLATION GUIDELINES

- The mounting cut out area must be large enough to allow the firing head to pass through easily, and there must be adequate clearance for the pilot tube.
- The area around the firing head must be packed with Kaowool or similar, with a suggested minimum depth of 4". Note that the active area of the firing head is slightly raised compared to the dead area. The insulation should be as tight as possible against the firing head dead zone, but will still allow the firing head to be removed if necessary.
- The area around the pilot tube must be packed with Kaowool or similar.
- The dead zone on the firing head should extend past the insulation by 2" - a minimum of 1".

IMPORTANT:

DO NOT DAMAGE THE FIBERMAT FIRING HEAD DURING INSTALLATION.

It is strongly suggested that two or more people be used to install the firing head. On the larger sizes, it is **ABSOLUTELY NECESSARY**, and is strongly suggested that one person be inside the boiler during installation to help guide and protect the firing head from damage.

WARNING: Damage to the firing head or the metal fibermat surface voids all warranties and could result in damage to property and serious injury.

WARNING: Do not attempt to repair damaged firing heads.

WARNING: Do not attempt to fire damaged firing heads.

- The firing head should have a high temperature gasket between it and the mounting flange. This is installed at the factory. There should be a second gasket between the firing head flange and the firing head extension tube. This is installed in the field.

INSTALLING THE INSULATION

The **actual dead zone dimension** is the area between where the burner/firing head mounts, to where the start of the fire tube is.

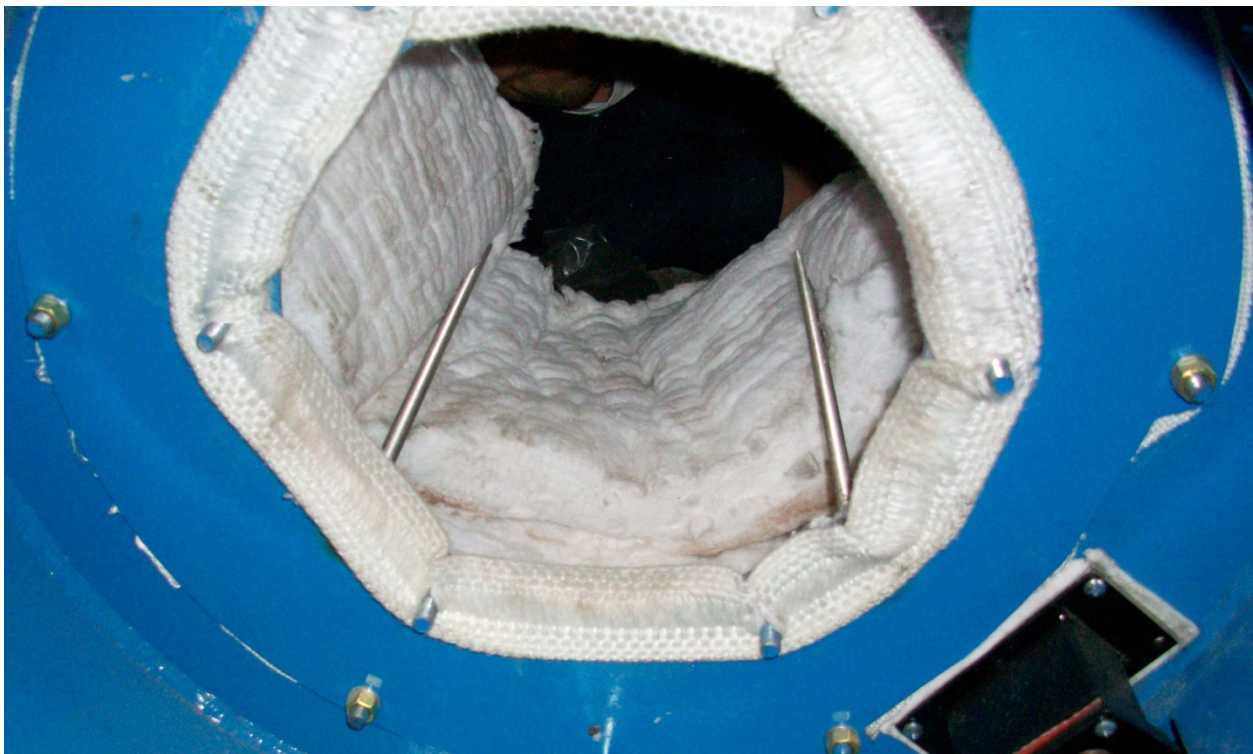
On a water tube boiler, this is equal to the thickness of the front wall.

This dimension is going to be different for almost every installation, and the firing head and pilot need to be made custom for each job.

The firing head dead zone is the actual dead zone plus 2". This is designed so that the active area will be 2" inside the firetube.

NOTE: This dead zone area needs to be packed with Kaowool (or similar) fiber insulation.

NOTE: There needs to be a way to attach the Kaowool, to prevent it from falling out.



This picture is of an installation on a fire tube boiler. (Note: incomplete by 1 layer of wool.)

The width of the Kaowool is a maximum of 2" and a minimum of 1" shorter than the dead zone dimension on the firing head. The Kaowool should be at least an inch away from the active area on the firing head; otherwise you might get flame impingement and poor emissions.

Note the stainless steel all thread. This is to gently hold the wool in place.

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This is the inside view of the same installation with the firing head installed.

The gap in the center of the Kaowool is just large enough to allow the firing head to pass through. If the opening in the center is too large, this will expose the deadzone to excessive heat and may cause premature failure. If the wool is packed tightly against the deadzone, it will make the firing head unnecessarily difficult to remove.

NOTE: The firing head will be shipped with a plastic covering on it. This will protect the firing head when it is being installed, and allow it to slip through the insulation easily and without trouble. It must be removed after the firing head is installed.

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This is a picture of a watertube installation.

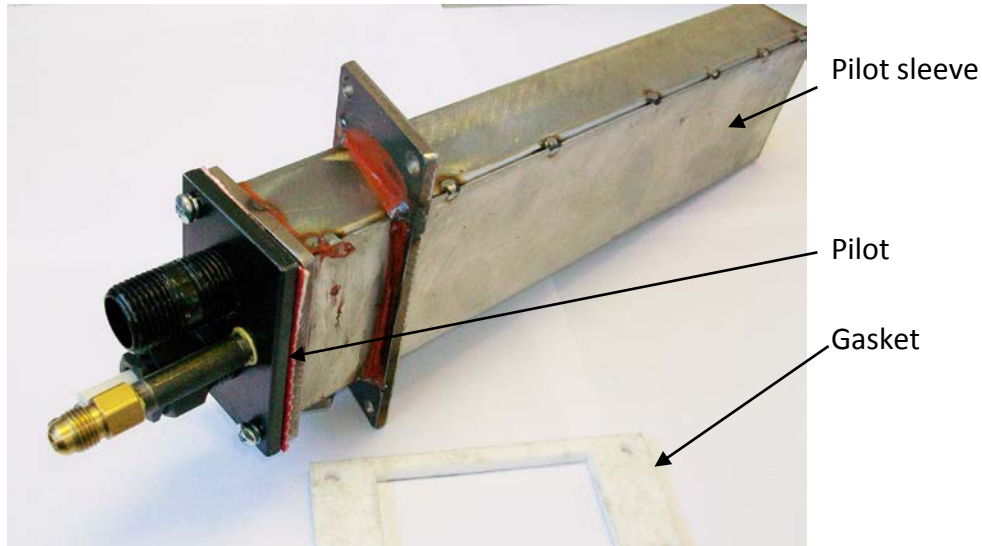
NOTE: The width of the Kaowool is the thickness of the front wall.

This was anchored into the wall itself, and does not need any all thread as did the firetube installation.

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PILOT

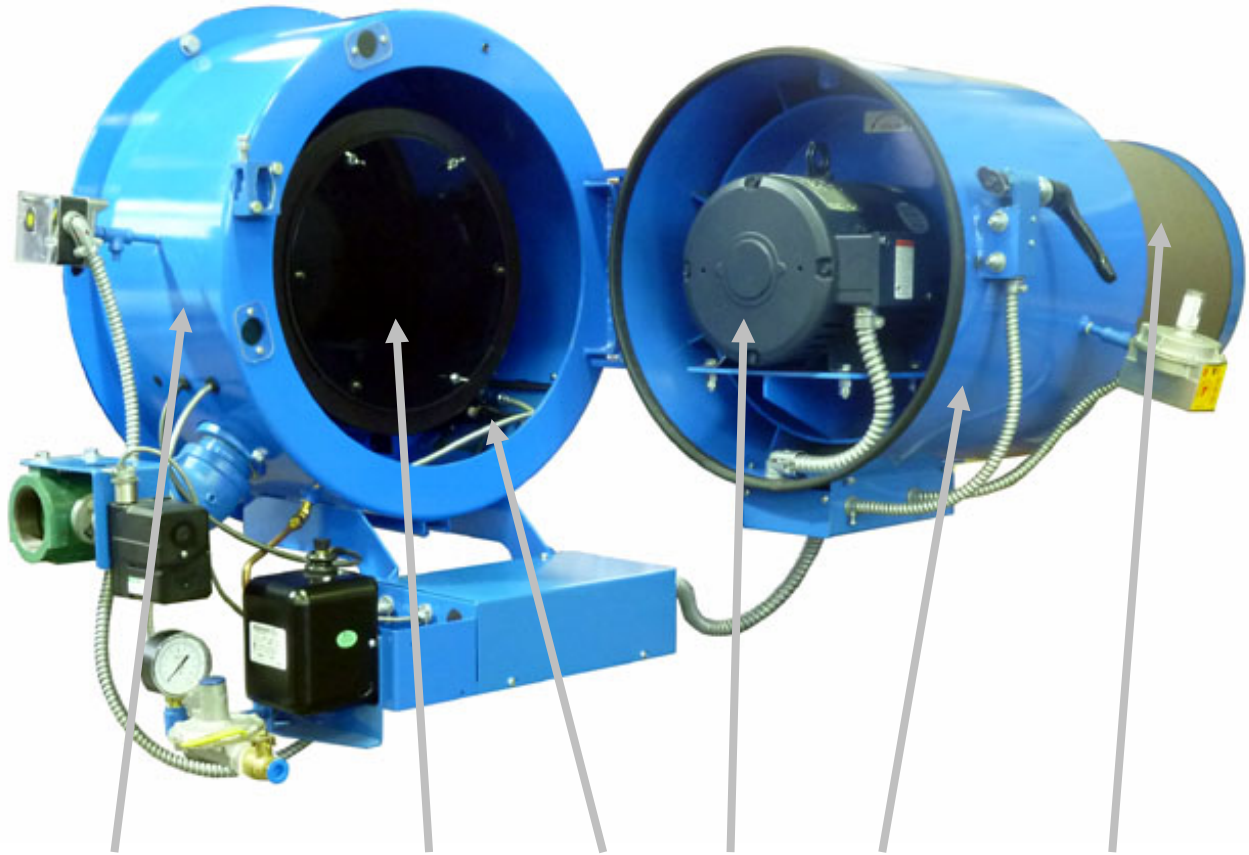


The NOXmatic pilot is a two piece assembly with the pilot and the pilot sleeve. The entire pilot assembly needs to be custom built to match the length of the burner dead zone dimension.

The pilot assembly will be installed with the angle facing towards the firing head, and with the scanner on the top. The pilot sleeve is designed to stay in place with the burner when installed, and the pilot itself can be removed separately through the access hole in the side of the housing.

The ignition electrode forms a spark gap with the edge of the pilot flame retainer, always verify that this spark gap is correct. This should be 1/16" to 1/8". On installations with a very long pilot it is critical that this spark gap doesn't change when the pilot is installed.

ASSEMBLY OVERVIEW



STATIONARY CYLINDER GAS MANIFOLD PILOT MOTOR SWING CYLINDER AIR FILTER

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SEQUENCE OF INSTALLATION:

Note: The NOXMATIC burner will come from the factory with the gas manifold assembled as complete, with the firing head shipped separately. In all cases, this must be removed in order to install the firing head, BUT in some cases it will be necessary to have the gas manifold and the gas inlet in place in order to plumb the gas supply lines.

It is suggested to leave the gas manifold in place, to correctly locate the gas inlet, which is needed to run the gas supply piping. Once the supply piping is in place, then the gas manifold may be removed, so the firing head can be installed.

WARNING:

DO NOT TRY TO INSTALL THE FIRING HEAD TO THE BURNER, AND MOUNT IT IN ONE PIECE. IF THE FIRING HEAD IS DAMAGED, IT CAN NOT BE REPAIRED.

ASSEMBLING THE GAS MANIFOLD AND FIRING HEAD:

Note: The gas manifold and extension tube will need to be removed to install the firing head. The sequence of components, listed as going from the mounting plate outward:

1. High temp gasket (provided)
2. Firing head
3. Gasket
4. Firing head extension tube

Note: These share the same bolt pattern. The extension tube has one bolt hole cut out for clearance, so that nut can be used to hold the firing head in place during installation. Orient this so that it is towards the bottom of the assembly.

5. Gas manifold. Note: the access plate on the gas manifold should be OFF during installation. The gas manifold has 3 rods that push up against the mounting flange to set the depth. The diameter should be centered on the firing head. The manifold has 3 mounting tabs that line up on center with tabs welded on the inside of the stationary cylinder. The linkage bars can be on either side of these tabs. There is some room for adjustment, but it should be flat against the front and centered.

VERY IMPORTANT: The rubber gasket on the inlet pipe should be tight and properly seated.

6. The swirler goes inside the firing head, the arms attach with two bolts that screw into the sides of the extension tube. The depth is adjustable and will be set during commissioning.
7. Gas manifold access plate

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SWING CYLINDER HINGE AND LATCH ADJUSTMENT

Jarring during shipment can cause misalignment of the swing-away blower assembly to the windbox, or of the latch lug to the latch lock. The blower assembly is aligned to the windbox with adjusting bolts on the hinges; the weight of the blower assembly must be supported should it become necessary to loosen the fastening bolts for readjustment.

The latch assembly can be readjusted in both the horizontal and vertical directions after loosening the mounting screws. The latch lug can also be adjusted to insure tight closure of the blower assembly to the windbox by loosening the jam nut behind the lug and threading the lug closer to, or farther away from the latch lock.

The position of the latch handle relative to the latch lug can be changed by pulling out on the handle while pushing in on the end of the latch shaft and rotating the handle to the desired position.

CONTROL PANEL & SAFETY CONTROLS INSTALLATION

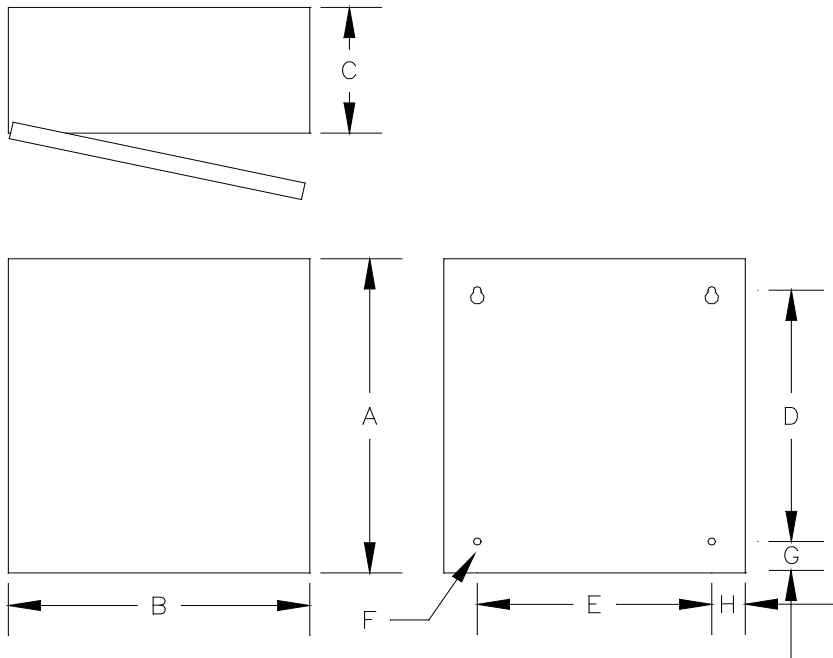
The control panel is furnished as a separate item and should be installed in a location other than immediately next to, or in line with the burner. It should be mounted on an adjacent wall or the side of the appliance. All wiring must comply with, and all branch circuits must be protected according to the national electrical code. Flame detector wiring between the burner and the control panel should be run in separate conduit from high voltage conductors.

All safety controls indicated on the wiring schematic furnished with the burner must be installed and wired in the control system as shown. Any discrepancies, or changes, must be approved by the S.T. JOHNSON CO. prior to initial firing of the burner system.

All signal wiring should be run in separate conduit and shielded according to the wiring schematic supplied with the equipment.

STANDARD CONTROL PANEL MOUNTING DIMENSIONS

The installation dimensions for standard NEMA 1 control panel enclosures follow. Specifications for other than NEMA 1 enclosures, and/or the inclusion of optional control equipment, may result in different installation dimensions. If mounting dimensions are critical, check with the factory for information on specific jobs.



DESIGNATION	A	B	C	D	E	F	G	H
STANDARD	24	24	7.25	22.5	22.5	.38	1.125	1.875
LARGE	30	24	7.25	28.5	22.5	.38	1.25	3.25
X-LARGE	36	30	7.25	34.5	28.5	.38	1.25	3.25

All dimensions in inches.

REQUIRED SAFETY LIMIT CONTROLS FOR ALL MODELS

All burner systems must be installed with a pressure or temperature operating control and high limit control. These controls must be installed on the appliance in a location where they can accurately sense the pressure of the vapor, or temperature of the liquid being heated. Contact the appliance manufacturer if unsure of the correct mounting location. The electrical wiring schematic furnished with the burner indicates where these controls need to be wired into the control system.

The operating control functions to limit the firing of the burner to those pressures, or temperatures, below the set point of the control. Its N.C. contacts break upon rise of the pressure, or temperature. Typical operating controls are:

Honeywell L404A for pressure **Honeywell L4006A** for temperature

The high limit control functions to shut off the burner system at a pressure, or temperature slightly above the set point of the operating control. The set point of the high limit control must be less than the maximum pressure, or temperature, or the appliance the burner is applied to. The N.C. contacts of this control break on a rise in pressure, or temperature, and must result in manual reset of the control to resume operation of the burner system. Typical high limit controls are:

Honeywell L404C for pressure **Honeywell L6006E** for temperature

If safety limit controls were not furnished with the burner system, or with the appliance on which the burner is being installed, contact S.T. JOHNSON CO. or the appliance manufacturer to obtain the proper controls for installation prior to initial firing of the system.

CONTROL SYSTEM OVERVIEW



The Noxmatic series burners may be furnished with almost any brand of controller requested. The preferred configuration will use a variable frequency drive to control the blower motor, and almost any brand of VFD can be used. The scope of this is beyond what may be covered in this manual, and one should refer to the individual manufacturer's documentation.

A typical system as shown in the photo would be a Fireye YB110 flame safeguard, Fireye PPC6000 fuel/air controller, and Allen Bradley variable frequency drive.

WARNING:

START UP AND TUNING SHOULD BE PERFORMED BY TRAINED PERSONNEL ONLY.

VERY IMPORTANT!

MAKE SURE EVERYTHING IS DUST AND DEBRIS FREE BEFORE STARTING THE BURNER.

Wipe down all surfaces. Make sure there is no construction dust anywhere inside the system.

WARNING:

Most Variable Frequency Drives cannot withstand ambient temperatures above 120 F (50 C). If you expect ambient boiler room temperatures to exceed 120 F, appropriate cooling must be installed.

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GAS TRAIN INSTALLATION

SELECTION AND SIZING:

Gas trains are selected according to local code and insurance requirements. Components are sized according to available gas supply pressure, burner capacity, and furnace pressure. As a guide standard sizes are listed in the catalog bulletin along with the required outlet pressure of the main pressure regulator. Installation manuals for each job include drawings of the gas train furnished with the burner system.

LOCATION:

Gas trains should be located as close to the burner assembly as possible, preferably on the left side of the burner to facilitate easy connection to the gas control valve. Temperature limitations of all the components should be taken into account when mounting directly on the heating appliance. (Refer to the specifications and installation instructions furnished with the operating manual).

FIELD PIPING:

The piping should contain as few direction changes as possible between the main pressure regulator and the burner inlet to minimize the pressure drop. Proper sizing of components often results in a main pressure regulator with a smaller pipe size than the shut-off valves; this transition in pipe size should be made with a "bell type" reducer at least 4 pipe diameters downstream of the regulator outlet. Gas shut-off valves and regulators are all uni-directional and must be installed accordingly.

VENT CONNECTIONS:

Gas train assemblies to meet IRI code, and all gas trains for capacities greater than 12500 MBTU/hr, include a N.O. vent valve for installation between the (2) shut-off valves. This valve should be installed in a horizontal run of piping with the solenoid coil on the top. The pipe size of the vent line must be no smaller than the valve furnished with the burner system. Vent connections from all pressure regulators and pressure switches should also be vented to the outside of the building using 1/4" OD tubing as a minimum. All vent lines may be connected together but the size of the common vent line must be at least equal in area to the largest vent plus 50% of the area of the remaining vent lines.

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WARNING:

All piping and gas train components must be leak tested prior to the initial start up of the burner system. The manual gas cock installed downstream of the shut-off valves is provided for this testing. Gas shut-off valves should be leak tested periodically to insure there is no leakage through the valve seats. It is recommended this leak testing be performed monthly.

GENERAL GUIDELINES:

Note the location of the high and low gas pressure switches.

The Low Gas Pressure switch goes on the supply side, before any regulator. This is to safeguard against a failure in the supply pressure. This is a normally open switch that closes on a high pressure. The pressure should be set at an amount over what is required, such that if the supply drops below that, the switch will open. Most Noxmatic installations require around 1 psi.

NOTE: Some literature suggests that the low gas pressure switch may be set as low as $\frac{1}{2}$ of what is required for high fire. This will not work with the Noxmatic burner. The low pressure switch must be set to the minimum required for high fire, taking into account the pressure drops of the valve train.

The High Gas Pressure switch goes in line after the regulator. This is to safeguard against regulator failure. This is a normally closed switch that opens on a high pressure. This pressure should be set at an amount over what is required, such that if the regulator fails, the pressure will go high and the switch will open.

IMPORTANT:

If a Siemens SKP style regulator is used, the sensing line must be $\frac{1}{4}$ " I.D., and as short and straight as possible. The sensing tap must be located at least 5 pipe diameters downstream. Do not install the sensing line with unnecessary bends. This is a common error that will result in poor pressure regulation.

Regulator pressure will be set by the commissioning technician.

GAS SUPPLY REQUIREMENTS:

Low NOx burners in general are more sensitive to changes in fuel supply than non-low NOx burners, and the Noxmatic is no exception. This type of burner operates within a very specific range, and fluctuations in the gas supply- either flow or pressure- will cause problems. In some cases there may be existing problems with the gas supply that were not noticed with an older, non-low NOx burner. It is suggested to pay special attention to the fuel supply and to make sure that there is enough flow and pressure to meet *all* the needs of the location.

Note that standard Siemens valves can only handle 10 psi typically, and if the pressure is too high a step down regulator will be needed.

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BURNER START UP NOTES:

Burner commissioning requires that manometer readings must be taken for windbox pressure, gas manifold pressure, and air filter vacuum. The start-up process for the NOXmatic is not that different from other burner types, but one difference is that as a pre-mixed burner, a gas manifold 'pressure drop' figure is given for high fire reference rather than a gas manifold 'pressure'. This is done because furnace backpressures will vary from installation to installation. But this does mean that the manifold dP must be added to the burner dP (which includes the furnace backpressure) to get an expected figure for the gas manifold pressure at high fire. The process for determining this, and the subsequent steps, is outlined below:

- 1) The pressure measurement at the gas manifold inlet at purge will approximate the burner and furnace back pressure at HF, with the VFD at full Hz. The provided gas manifold dP is then added to this measured figure, with the combined total being approximately the expected gas manifold pressure at HF. Final HF settings should be based on a measured gas meter flow rate, of course, but this can be an initial figure to use for commissioning. It will also indicate at what level to set the outlet pressure from the regulator. A pressure that is roughly 50 percent higher pressure than this figure determined to be needed at the burner manifold should be supplied out of the gas valves, to account for gas control valve and other downstream component pressure drops, while still supplying adequate pressure at the burner. But if this initial setting needs to be adjusted due to inadequate gas capacity, it must be done.
- 2) The other two points to establish is the light off and low fire levels. They may be but aren't necessarily the same. The initial light off level will be either 1) one inch of air manifold pressure, or 2) the lowest VFD setting that can be achieved. Whichever occurs first can be the initial light off rate. The percent O₂ in the stack should be approximately 8 percent, so note that an emissions analyzer is required for commissioning.
- 3) The light off rate can be used for low fire, but low fire can be adjusted – lower or higher - depending on repeatability and emissions performance. Turndown can be increased as long as the burner is operating well and the burner conditions and measurements are reliably repeatable. If the emissions, particularly the percent O₂ level, are not consistently repeatable as the firing rate goes up and then back down, then low fire settings should be raised until it does become consistent.

- 4) With these reference points, a burner curve can be established. The general excess air (or percent O₂) level for NOXmatic operation is 7.5-8 percent O₂, and which should be fairly flat across the firing range. It might be somewhat higher than 8 percent at low fire, if emissions dictate, and lower (7.5 percent) at HF. Note that the higher the O₂ level, the lower the NO_x emissions will be. But O₂ levels can be set based on local emissions requirements, with some margin for variation. Care should be taken to avoid going much less than about 5.5-6 percent O₂ in the stack, as the flame begins to turn from blue flame to radiant as the O₂ goes decreases, and the burner is not designed for radiant flame operation. This operating condition that will damage the head.

MAINTENANCE:

A simplification of the main principle of operation of the Johnson NOXMATIC Gas burner is that one is blowing premixed air and gas through a type of metal fiber mat (the firing head). So it is important that the firing head doesn't get clogged. This problem is solved by using an air filter on the intake. It is also important that the air filter doesn't get clogged. If the air intake filter and firing head are kept clean, the burner will give years of easy, trouble free, ultra low emissions performance.

WARNING: The control system is based on measurements taken during the pre-purge cycle. The burner must be cycled on and off at least once a day to insure all switches are working properly.

WARNING: After initial burner commissioning, maintenance and service personnel should not change the system configuration, including logic, set points, and sensing hardware, without a detailed engineering review and documentation. Failure to do so can result in damage to property, personal injury or death.

WARNING: After a safety shutdown, the burner should not be restarted until a trained operator determines the cause of the shutdown and takes the necessary corrective action to ensure that conditions are within specified operating limits prior to restarting. Failure to do so can result in damage to property, personal injury or death.

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The purge setting manometer readings - windbox pressure, gas manifold pressure, and air filter vacuum - taken at commissioning provide the baseline measurements to determine if the head or air filter are getting clogged.

Also note the visual appearance of the flame and head surface. There should have uniform distribution of flame, with robust blue tips. When the firing head or air filter becomes clogged, the air flow drops, and it will run rich, and the flames will become more radiant – burning back into the fiber material and glowing orange, then yellow. A bit of orange spots on the surface is normal. If the whole surface it starts to become orange, or even yellow it means maintenance is needed. A yellow flame operating condition is dangerous and will drastically shorten the life of the firing head. If left for too long, the firing head will fail, creating an unsafe condition.

DANGER: Never let the firing head go radiant. This will severely shorten the life of the firing head and may cause catastrophic failure.

Note: Being able to look at the flame is an important safety and maintenance issue. Many installations have a poor or nonexistent sight glass. This must be fixed.

- The air filter foam pre-filter must be cleaned once a week at a minimum. It is standard to provide a second pre-filter, so one can be washed and dried, while one is in use.

WARNING: Do not change the pre-filter while burner is in operation.

WARNING: Do not install a wet pre-filter.

- The main air filter should be cleaned on a regular basis. It is suggested to do this once a month, but a site with much dust or particles in the air would need more frequent cleaning. This is done by blowing it out, from the inside out, with compressed air. Depending on conditions, the air filter element may need to be washed. This should be done only as necessary, as the manufacturer recommends that a filter not be washed more than 2 or 3 times before replacement. If you keep the pre-filter and the air filter clean, you may never have to wash the air filter.

- It is suggested to have a second filter on hand as a replacement.

- An air filter vacuum switch is provided. This is there to provide notification that the air filter is dirty and needs to be cleaned. An increase in 0.5" wc from a new, clean filter vacuum

condition, at purge, would be the maximum increase to allow for in setting the vacuum filter switch.

- The firing head should be cleaned at a pre-determined interval. As a baseline reference, once a month vacuum out the firing head. Cleaning may need to be more or less frequent depending on boiler site conditions.

The condition of the firing head is monitored by windbox pressure. A 1 “wc increase at full flow (purge cycle) indicates a clogging condition, and the firing head should be cleaned promptly. A simple vacuuming and gentle blow out should be sufficient. If this doesn’t improve conditions, it will require that the head be repaired or replaced.

NOTE: Some sizes of firing head have a long manufacturing lead time, if boiler downtime is a serious concern it is recommended to purchase a second firing head to have on hand as a backup.

CONTROLS THEORY:

At purge (full air flow, gas off), manometer readings are taken on the windbox and gas inlet connection. This is the baseline measurement.

As the firing head gets clogged it creates more resistance to flow and the pressure at purge will RISE. A 1" rise in windbox pressure indicates that the firing head needs maintenance.

As the air filter gets clogged it can't draw enough air and the windbox pressure at purge will DROP. A 1" drop in windbox pressure indicates a problem with the air filter.

An alternate method is to measure vacuum at the air filter. When vacuum INCREASES by 0.5" from the initial, new filter condition purge measurement, the air filter needs to be cleaned or replaced.

COMISSIONING DATA:

JOB NAME: _____

LOCATION: _____

INSTALLED BY/ DATE: _____

COMISSIONED BY/ DATE: _____

BURNER MODEL/ SIZE: _____

BOILER MAKE/ SIZE/ STYLE: _____

FLAME SAFEGUARD MAKE/MODEL: _____

SETPOINT:	PURGE	IGN	1	2	3	4	5	6	7	8	9	10
FUEL												
AIR												
VFD - HZ												
WINDBOX P												
GAS MANIFOLD P												
O2												
CO												
NOX												
CO2												
STACK TEMP												
AMBIENT TEMP		GAS LINE SIZE:				MOTOR AMPS L1:				MOTOR V:		
		SUPPLY GAS P:				MOTOR AMPS L2:						
FLAME SIGNAL		REGULATED GAS P:				MOTOR AMPS L3:						

HIGH AIR PRESSURE SWITCH SETTING "wc: _____

LOW AIR PRESSURE SWITCH SETTING "wc: _____

IMPORTANT:

EQUIPMENT WILL NOT BE COVERED BY WARRANTY UNLESS THIS FORM IS COMPLETELY FILLED OUT AND A COPY RETURNED TO THE MANUFACTURER.

S.T. Johnson Company

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