MULTI POSITION SINGLE STAGE 2–STAGE GAS FURNACES

Service Manual

N8MPN, N8MPL, *8MPN, *8MPL, *8DNL, *8MPT & *8MPV

This manual supports condensing gas furnaces manufactured in 2003

Manufactured by:

International Comfort Products

Part Number 441 08 2010 01

10/2004

N8MPN – Non-Condensing Single Stage

N8MPL – Non-Condensing Single Stage Low Nox

*** 8MPN – Non-Condensing Single Stage Deluxe**

*** 8MPL – Non-Condensing Single Stage Deluxe Low Nox**

***8DNL – Non-Condensing Single Stage Downflow**

*** 8MPT – Non-Condensing Two Stage PSC Motor**

*** 8MPV – Non-Condensing Two Stage Variable Speed**

*** Denotes Brand (T, C or H)**

TABLE OF CONTENTS

1. INTRODUCTION

This service manual is designed to be used in conjunction with the installation manual and/or technical support manual provided with each furnace.

These furnaces represent the very latest in mid-efficiency gas furnace technology. Consequently, they incorporate the use of certain controls that contain highly sophisticated electronic components which are **not user serviceable**. therefore, it is essential that only competent, qualified, service personnel attempt to install, service, or maintain this product.

This Service manual was written to assist the professional HVAC service technician to quickly and accurately diagnose and repair any malfunction of this product.

This service manual covers our new multi-position furnaces. The overall operation of all of these models is essentially the same.

This manual, therefore, will deal with all subjects in a general nature (I.E. all text will pertain to all models) unless that subject is unique to a particular model or family, in which case it will be so indicated.

⚠ WARNING

The information contained in this manual is intended for use by a qualified service technician who is familiar with the safety procedures required in installation and repair and who is equipped with the proper tools and test instruments.

Installation or repairs made by the unqualified persons can result in hazards subjecting the unqualified person making such repairs to the risk of injury or electrical shock which can be serious, or even fatal not only to them, but also to persons being served by the equipment.

If you install or perform service on equipment, you must assume responsibility for any bodily injury or property damage which may result to you or others. We will not be responsible for any injury or property damage arising from improper installation, service and/or service procedures.

2. UNIT IDENTIFICATION

The unit's rating plate contains important information for the service technician. It also lists the complete Model Manufacturing and Serial Numbers.

These complete numbers are required to obtain correct replacement parts (example, in certain model families a unit having a MARKET REVISION of "C" is likely to be equipped with one or more different components.

MODEL NUMBER IDENTIFICATION GUIDE

*	8	M P	D	0 75	B	1 2	A	1

Brand Identifier
T = Tempstar
C = Comfortmaker
H = Heil
A = Arcoaire
X = Evaluation

Brand Identifier
8 = Non-Condensing, 80+% Gas Furnace
9 = Condensing, 90+% Gas Furnace

Installation Configuration
UP = Upflow DN = Downflow UH = Upflow/Horizontal
HZ = Horizontal DH = Downflow/Horizontal
MP = Multiposition, Upflow/Downflow/Horizontal

Major Design Feature

1 = One (Single) Pipe	N = Single Stage
2 = Two Pipe	P = PVC Vent
D = 1 or 2 Pipe	T = Two Stage
L = Low NOx	V = Variable Speed

Input (Nominal MBTUH)

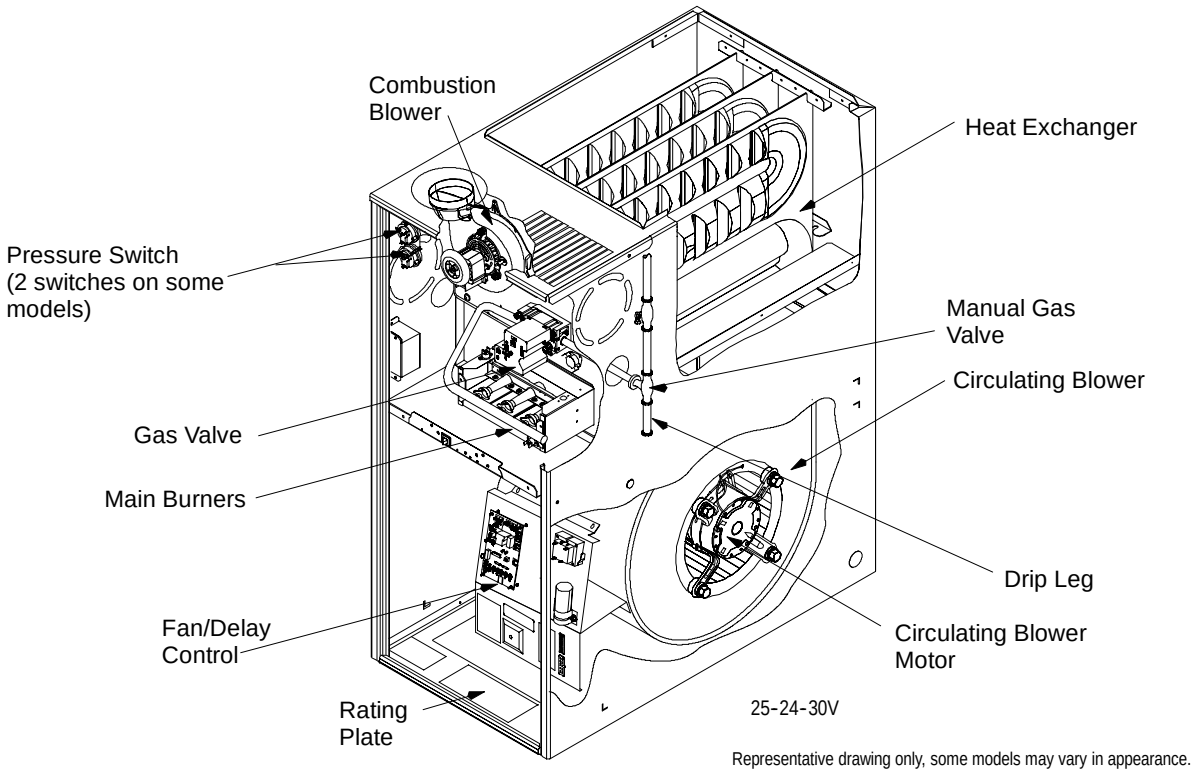
Cabinet Width
B = 15.5″ Wide
F = 19.1″ Wide
J = 22.8″ Wide
L = 24.5″ Wide

Cooling Airflow
08 = 800 CFM
12 = 1200 CFM
14 = 1400 CFM
16 = 1600 CFM
20 = 2000 CFM

Marketing Digit
Denotes minor change

Engineering Rev.
Denotes minor changes

Figure 1 **Component Locations for Four Position Furnaces**



Representative drawing only, some models may vary in appearance.

3. FURNACE THEORY OF OPERATION

The high efficiencies and lower profile (compared to previous series) of this furnace have been obtained using design techniques not typical of traditional furnace designs. A brief description of these new design techniques and the purpose they serve follows.

1. Reducing the height of the furnace while maintaining the high efficiency of pervious models required maintaining the **surface area** of the heat exchanger and yet minimizing the overall size.

The design required to achieve these results is the "SERPENTINE" design, wherein the flue gasses must follow a serpent shaped passage through the heat exchanger via convection.

This "Serpentine" path is resistive to normal convective flow, and requires that a partial vacuum be created at the outlet of the heat exchanger to maintain the flow of flue products through the heat exchanger.

2. The serpentine heat exchanger design does not lend itself well to the ribbon type, or slotted port type burner found in more traditional design furnaces for the following reasons:

   A. The flame "height" of a ribbon or slotted port type burner would make it difficult (if not impossible) to prevent impingement of the flame on the heat exchanger surfaces whole maintaining the low profile heat exchanger.

For these reasons, an "INSHOT" type burner is used in this series. The inshot burner (also called a "jet" burner) fires a flame straight out its end. This burner is designed to fire into a tube style heat exchanger, making it an ideal application in the tube–like passages of the serpentine heat exchanger.

3. To overcome the resistance to convective flow of the heat exchanger requires the use of an Induced Draft Combustion Blower Assembly.
4. The Combustion Blower Assembly is mounted on the outlet side of the heat exchanger, This blower creates a partial vacuum (negative pressure) within the heat exchangers drawing the flue products out of the furnace.
5. A pressure switch (Air Proving Switch) is used as a safety device that prevents the ignition system from firing the furnace until it senses that a proper draft has been established through the furnace.

4. ELECTRICAL SUPPLY

⚠ WARNING

ELECTRICAL SHOCK HAZARD.

Failure to do so can result in death, personal injury and/or property damage.

Turn OFF electric power at fuse box or service panel before making any electrical connections and ensure a proper ground connection is made before connecting line voltage.

SUPPLY CIRCUIT

The furnace cannot be expected to operate correctly unless it is properly connected (wired) to an adequately sized (15 amp.) single branch circuit.

SUPPLY VOLTAGE

Supply voltage to the furnace should be a nominal 115 volts. It MUST be between 97 volts and 132 volts. Supply voltage to the furnace should be checked WITH THE FURNACE IN OPERATION. Voltage readings outside the specified range can be expected to cause operating problems. Their cause MUST be investigated and corrected.

ELECTRICAL GROUND

Grounding of the electrical supply to ALL FURNACES IS REQUIRED for safety reasons.

CHECKING GROUNDING AND POLARITY

Grounding may be verified as follows:

1. Turn the power supply "**OFF**".
2. Using an **Ohmmeter** check for continuity between the Neutral (white) wire and Ground wire (green) of the supply circuit.
3. With the Ohmmeter set on the R x 1 scale, the reading should be **zero Ohms.**
4. A zero Ohm reading indicates that the neutral is grounded back to the main panel.
5. An alternate check would be to check for continuity from the Neutral to a cold water pipe, (Pipe must be metal, and must have a continuous, uninterrupted connection to ground) or to a continuous, uninterrupted connection to ground) or to a driven ground rod.
6. Any **readings other than zero Ohms** would indicate a poor ground, or no ground.

Polarity may be verified as follows:

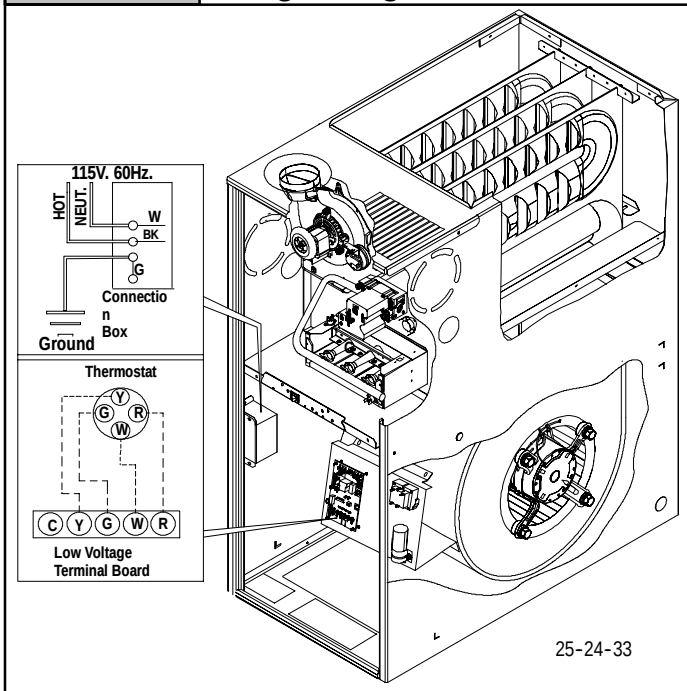
1. Turn the power supply "**ON**".
2. Using a **Voltmeter** check for voltage between the **Hot** (Black) and **Neutral** (White) wire of supply circuit.

POLARITY

CORRECT POLARITY of the line voltage supply to all furnaces is also required for safety reasons.

3. Reading should be **Line** (Supply) **Voltage.**
4. Check for Voltage between the **Neutral** (White) wire and **Ground** wire of the supply circuit.
5. Reading should be **zero Volts**. (if line voltage is read, polarity is reversed)
6. A zero Volt reading indicates there is no voltage potential on Neutral wire.
7. Double check by checking for voltage between the **Hot** (Black) wire and **Ground** wire of the supply circuit.
8. Reading should be **Line** (supply) **Voltage**. (if zero volts is read, there is no ground, or polarity is reversed.)

Figure 2 **Electrical Connections Single Stage**

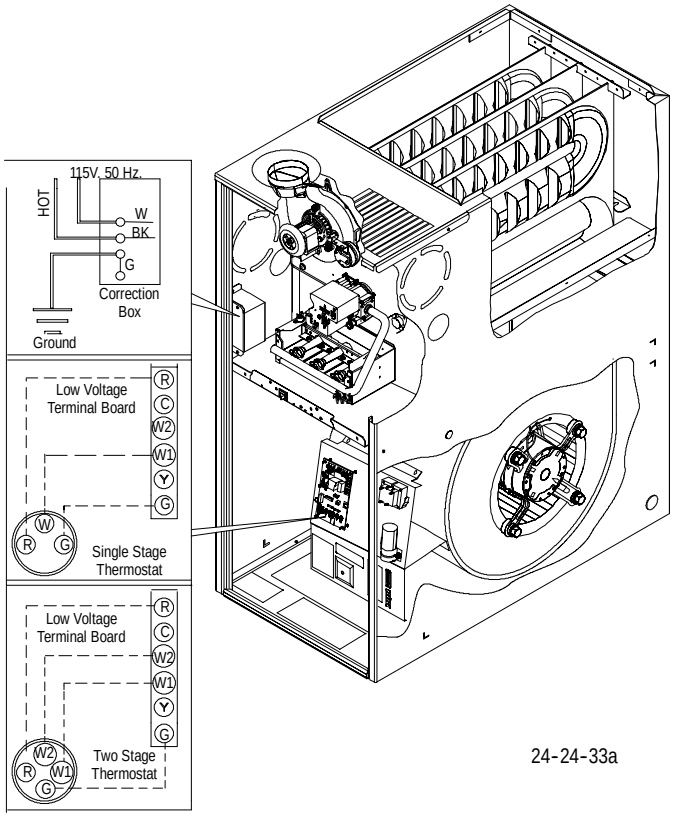


NOTE: 115 VAC/60Hz/single-phase
Operating voltage range*: 127 max, 104 min.

* Permissible limits of voltage at which unit will operate satisfactorily

Figure 3 Electrical Connections *8MPV

NOTE: Junction Box can be mounted to either the left or right side.

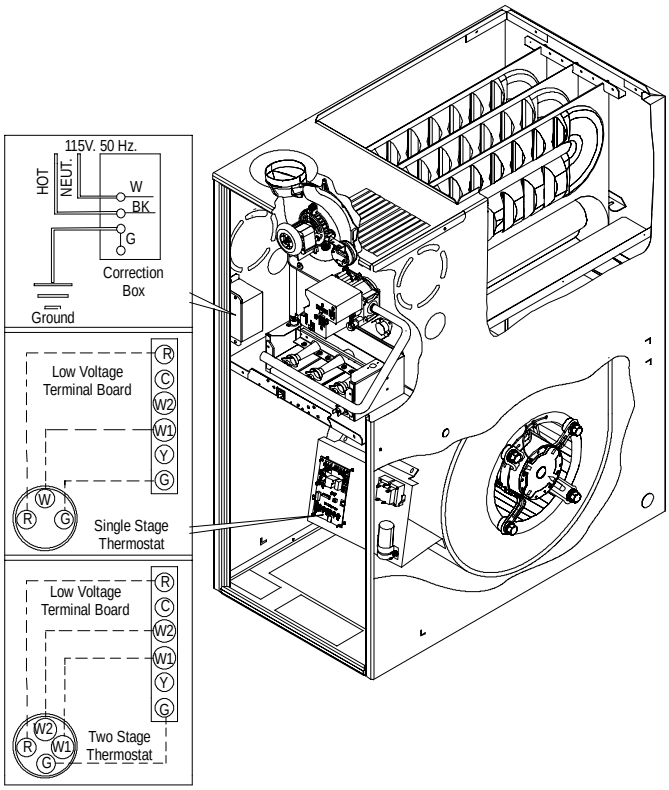


NOTE: 115 VAC/60Hz/single-phase
Operating voltage range*: 127 max, 104 min.

* Permissible limits of voltage at which unit will operate satisfactorily

Figure 4 Electrical Connections *8MPT

NOTE: Junction Box can be mounted to either the left or right side.



NOTE: 115 VAC/60Hz/single-phase
Operating voltage range*: 127 max, 104 min.

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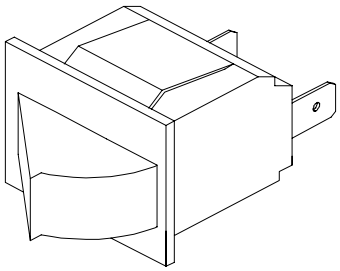
* Permissible limits of voltage at which unit will operate satisfactorily

5. INTERLOCK SWITCH

The blower compartment door of all models is equipped with an interlock switch. This switch is “Normally Open” (closes when the door is on the furnace) and interrupts furnace operation when the door is open. This interlock switch is a safety device, and SHOULD NEVER BE BY-PASSED.

Since this is a single pole switch, (breaking only one side of the line) proper line voltage is essential to insure that furnace components are not “HOT” when switch is open. (See *Checking Grounding and Polarity*)

Figure 5 Typical Interlock Switch



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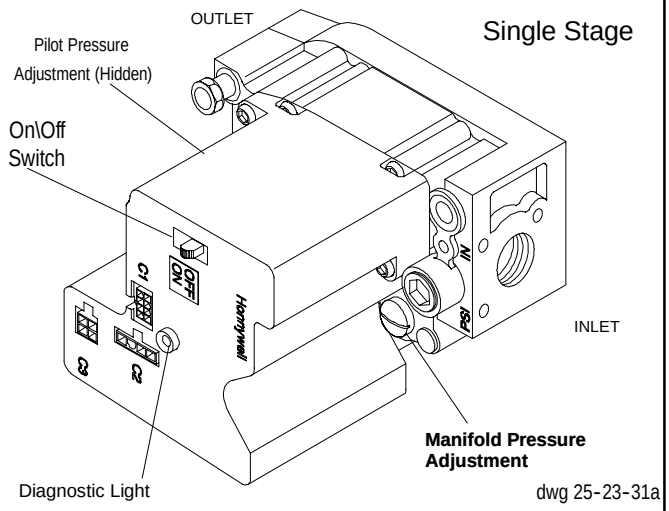
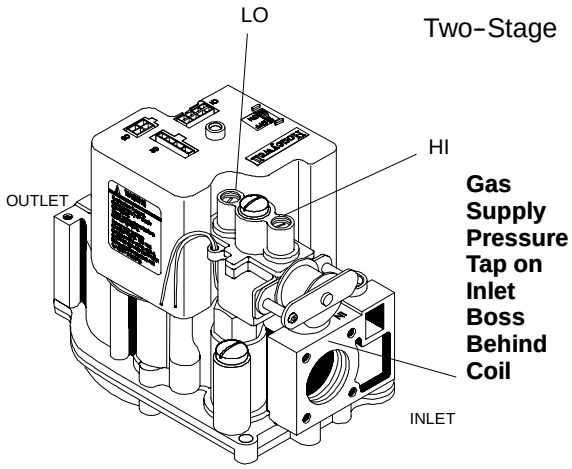
6. GAS SUPPLY

Figure 6 Typical Gas Valve Honeywell





An adequately sized gas supply to the furnace is required for proper operation. Gas piping which is undersized will not provide sufficient capacity for proper operation. Piping should be sized in accordance with accepted industry standards.

NATURAL GAS

Inlet (Supply) pressure to the furnace should be checked (at the gas valve) with ALL OTHER GAS FIRED APPLIANCES OPERATING. Inlet (Supply) pressure to the furnace under these conditions MUST be a minimum of 4.5″ W.C. (Water Column). If the inlet pressure is less, it may be an indication of undersized piping or regulator problems.

LP GAS

Inlet (Supply) pressure to the furnace should be checked in the same manner as for Natural Gas, however with LP Gas, the inlet pressure MUST be a minimum of 11″ W.C. If this cannot be obtained, problems are indicated in either the regulator or pipe sizing.

Table 1 Gas Pressures Below 2000′

Gas Type	Supply Pressure			Manifold Pressure
	Recommended	Max.	Min.	
Natural	7″	14″	4.5″	3.5″
LP	11″	14″	11″	10″

Important Note:

- **With Propane gas, the rated input is obtained when the BTU content is 2,500 BTU per cubic foot and manifold pressure set at 10″ W.C.**
- **If Propane gas has a different BTU content, orifices MUST be changed by licensed Propane installer.**
- **Measured input can NOT exceed rated input.**
- **Any major change in gas flow requires changing burner orifice size**.

CHECKING INPUT (FIRING) RATE

Once it has been determined that the gas supply is correct to the furnace, it is necessary to check the input (firing) rate, This can be done in two (2) ways. First by checking and adjusting (as necessary) the manifold (Outlet) pressure. The second way is to “Clock” the gas meter.

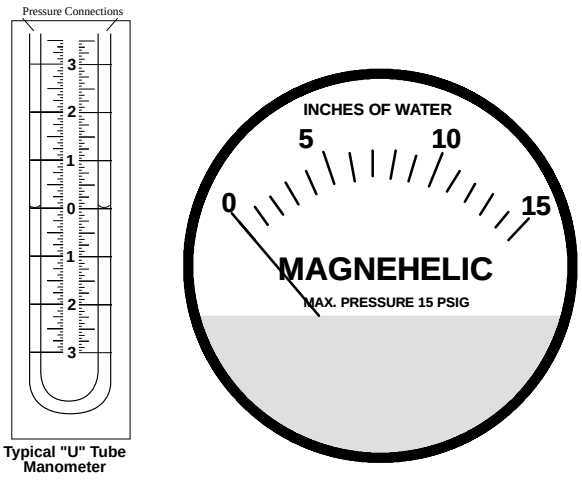
⚠ WARNING

FIRE OR EXPLOSION HAZARD.

Failure to turn OFF gas at shut off before connecting manometer can result in death, personal injury and/or property damage.

Turn OFF gas at shut off before connecting manometer.

Figure 7 Gas Pressure Testing Devices



CHECKING MANIFOLD PRESSURE For Single Stage

1. Connect a manometer or Magnehelic gauge (0–12″ W.C. range) to the pressure tap on the "OUTLET" side of the gas valve.
2. Turn gas "ON", fire the furnace, and remove adjustment cover (screw–cap).
3. Turn adjustment screw clockwise (IN) to INCREASE pressure, and counterclockwise (OUT) to DECREASE pressure.
4. At altitudes **BELOW 2,000′** set manifold pressure to 3.5″ W.C. for Natural Gas, and 10″ W.C. for LP Gas.
5. For **Natural Gas** units **ABOVE 2,000′**, set manifold pressure according to **Table 2**.
6. For **LP Gas** units **ABOVE 2,000′**, insure that orifice size has been changed (per *"National Fuel Gas Code"* – Appendix "F") if gas supply has not already been de–rated for altitude by the gas supplier.
7. For ALL UNITS ABOVE 8,000′, contact the factory for SPECIFIC de–rating information.

CHECKING MANIFOLD PRESSURE for Two Stage

1. Connect manometer or Magnehelic gauge to the tapped opening on the outlet side of gas valve. Use a manometer with a 0 to 12″ minimum water column range.
2. Turn gas **ON.** Operate the furnace on high fire by using a jumper wire on the R to W1 & W2 thermostat connections on the fan board.
3. Remove the adjustment cover on the gas valve. Turn adjusting screw counterclockwise to decrease the manifold pressure and clockwise to increase. See **Figure 6**.
4. Set the manifold pressure to value shown in **Table 1** or **Table 3**.
5. Operate the furnace on low fire by using a jumper wire on the R to W1 thermostat connections on the fan board.
   Note: The fourth (4th) DIP switch should be in the on position to set the low fire manifold pressure. (See wiring digram)
6. Repeat steps 4 and 5 for low fire operation.
7. When the manifold pressures are properly set, replace the adjustment screw covers on the gas valve.
8. Remove the jumper wires from the thermostat connections on the fan board. Remove manometer and replace plug in gas valve.
9. Reture fourth (4th) DIP switch to previous setting.
10. Replace the burner compartment door.

MANIFOLD PRESSURE AND ORIFICE SIZE FOR HIGH ALTITUDE APPLICATIONS For Single Stage

Table 2 NATURAL GAS

Heat Value Btu/Cu.Ft.	Elevation Above Sea Level						
	0–1999 (″ ·wc)	2000–2999 (″ ·wc)	3000–3999 (″ ·wc)	4000–4999 (″ ·wc)	5000–5999 (″ ·wc)	6000–6999 (″ ·wc)	7000–7999 (″ ·wc)
800	3.5	3.5	3.5	3.5	3.5	3.5	3.5
850	3.5	3.5	3.5	3.5	3.5	3.5	3.5
900	3.5	3.5	3.5	3.5	3.5	3.5	3.4
950	3.5	3.5	3.5	3.5	3.3	3.2	3.1
1000	3.5	3.4	3.3	3.2	3.0	2.9	2.8
1050	3.2	3.1	3.0	2.9	2.7	2.6	2.5
1100	2.9	2.8	2.7	2.6	2.5	2.4	2.3
Orifice Size	#42	#42	#42	#42	#42	#42	#42

MANIFOLD PRESSURE AND ORIFICE SIZE FOR HIGH ALTITUDE APPLICATIONS For Two- Stage

Table 3 — **High Altitude Pressure Chart 2000–8000 ft. (Natural Gas)**

Heat Value Btu/Cu.Ft.	Elevation Above Sea Level													
	0–1999		2000–2999		3000–3999		4000–4999		5000–5999		6000–6999		7000–7999	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
800	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7
850	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7
900	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.4	1.7
950	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.3	1.6	3.2	1.6	3.1	1.5
1000	3.5	1.7	3.4	1.7	3.3	1.6	3.2	1.5	3.0	1.5	2.9	1.4	2.8	1.4
1050	3.2	1.6	3.1	1.5	3.0	1.5	2.9	1.4	2.7	1.3	2.6	1.3	2.5	1.2
1100	2.9	1.4	2.8	1.4	2.7	1.3	2.6	1.3	2.5	1.2	2.4	1.2	2.3	1.1
Orifice Size	#42		#42		#42		#42		#42		#42		#42	

"CLOCKING" GAS METER (NATURAL GAS)

1. Check with gas supplier to obtain ACTUAL BTU content of gas.
2. Turn "OFF" gas supply to ALL other gas appliances.
3. Time how many seconds it takes the smallest (normally 1 cfh) dial on the gas meter to make one complete revolution.
4. Calculate input rate by using ACTUAL BTU content of gas in formula shown in example.

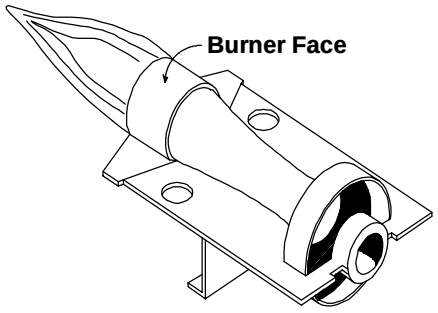
Example			
Natural Gas BTU Content	**No. of Seconds Per Hour**	**Time Per Cubic Foot in Seconds**	**BTU Per Hour**
1,000	3,600	48	75,000
1,000 x 3,600 ÷ 48 = 75,000 BTUH			

7. BURNERS

Burners used in this series of furnace are of the "INSHOT" type. Their operation can be compared to that of a torch in that they produce a hard, sharp, somewhat noisy flame. Noise should not be an issue, however, because of the closed compartment design. In order to insure that the burners are operating properly, and at their design noise level, proper adjustment of the gas (manifold) pressure is essential. See page 6 for further information on manifold pressure adjustments.

The burners used in this series ARE NOT EQUIPPED WITH AIR SHUTTERS, as none are required. Proper operation (flame characteristics) is obtained by insuring that the orifice size, and manifold pressure are correct for the fuel being used and the altitude of the installation.

Figure 8 — **Main Burner**



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8. LP PRESSURE SWITCH

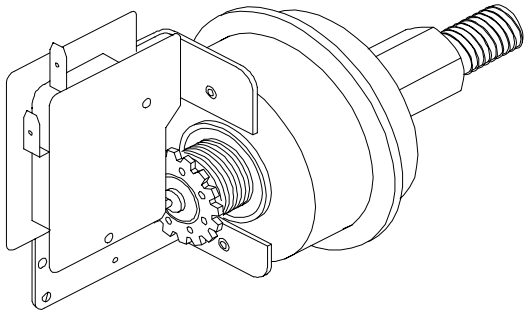
Models converted to operate on LP Gas will be installed with an LP Pressure Switch. If so equipped, the switch will be located in the gas supply line (in a "Tee" fitting), just ahead of the gas valve.

The purpose of this switch is to prevent furnace operating under low line (Supply) pressure conditions. Operating under low line pressure conditions, can create problems such as incomplete combustion, flashback, sooting, etc.

The switch is a "Normally Open" pressure operated switch that is wired in series with the furnace (vent) pressure switch. The LP Pressure Switch closes when line (Supply) pressure is 8.0″ W.C. or higher. the LP Pressure Switch Opens if line pressure falls below 6.0″ + 0.6″ W.C. interrupting power to the gas valve.

On some models, it is located (electrically) between the Furnace (vent) pressure switch and the gas Valve.

Figure 9 **Typical LP Pressure Switch**



9. HIGH ALTITUDE OPERATION

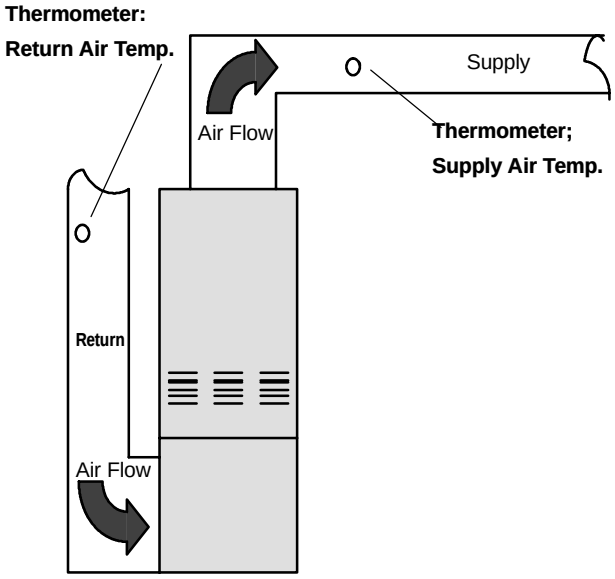
These furnaces are designed to operate in the majority of the country without modifications. At altitudes over 2,000′ above sea level, however, certain measures need to be taken to insure continued, safe reliable operation. For example, units must be de–rated for altitude (by adjusting manifold pressure and/or changing orifice size) based upon the type of fuel (I.E. Natural Gas or LP gas), Btu content of the gas, and installed altitude.

ALL UNITS must have a high altitude pressure switch installed at altitudes above 4,000′ above sea level.

When servicing a unit installed at altitudes above 2,000′ insure that it has been properly modified to operate at that altitude. See the sections on Gas pressure (Page 9), and pressure switches (Page 12) to obtain specific information for you particular installation altitude.

10. CHECKING TEMPERATURE RISE

Figure 10 **Checking Temperature Rise**



The furnace is designed to operate within a certain specified range of temperature rise.

Operating the furnace outside the specified range may result in lower efficiency and/or comfort levels, as well as premature combustion component failures.

Simply stated, the temperature rise through the furnace is the difference in temperature between the return air, and the supply air.

NOTE: BEFORE CHECKING TEMPERATURE RISE BE CERTAIN THAT MANIFOLD PRESSURE IS PROPERLY ADJUSTED.

TYPICAL OPERATING TEMPERATURE RISE RANGE

Single-Stage	
Model	**Range**
50 Mbtu	35°F – 65°F
75, 100 & 125 Mbtu	40°F – 70°F

Two-Stage		
Model	**Fire**	**Range**
50 Mbtu	HI	35°F – 65°F
	LOW	35°F – 65°F
75 Mbtu, 100 Mbtu & 125 Mbtu	HI	40°F – 70°F
	LOW	40°F – 70°F

For specific temperature rise check pages 30 thru 36 of this manual.

Always check current "*Technical Support Manual*"

Operate the furnace for 15 minutes before taking temperature readings. Subtract the return air temperature from the supply air temperature. The result is the temperature rise. Compare with the allowable rise listed for the model (size) you are checking.

Temperature Rise can be checked by placing a thermometer in the return air duct within 6′ of furnace. Place a second thermometer in the supply duct at lease two (2) ft. away from the furnace. (This will prevent any false readings caused by radiation from the furnace heat exchanger) Make sure that the FILTER IS CLEAN and that ALL REGISTERS AND/OR DAMPERS ARE OPEN.

If the rise is not within the specified range, it will be necessary to change the heating blower speed. **If the rise is too high**, it will be necessary to **increase the blower speed**. **If the rise is too low**, it will be necessary to **reduce the blower speed**.

Example:

Supply Temp.	170°	
Return Temp.	70°	
Temperature Rise	100°	= Too High

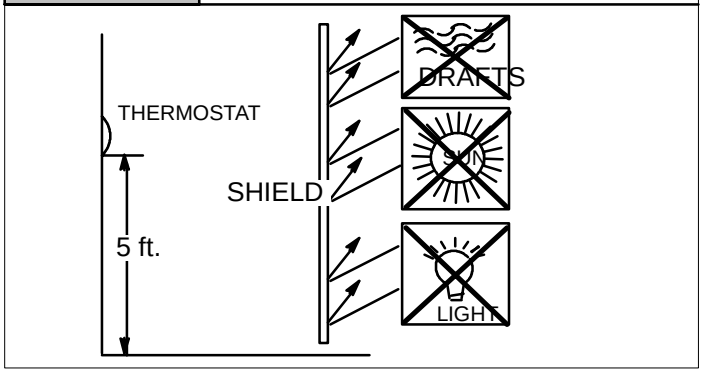
Solution: Increase Blower Speed

11. ROOM THERMOSTATS

Room thermostats are available from several different manufactures in a wide variety of styles. They range from the very simple and inexpensive Bi-metallic type to the complex. They are simply a switch (or series of switches) designed to turn equipment (or components) “ON” or “OFF” at the desired conditions.

An improperly operating, or poorly located room thermostat can be the source of perceived equipment problems. A careful check of the thermostat and wiring must be made then to insure that it is not the source of problems.

Figure 11 **Thermostat Location**



LOCATION

The thermostat should not be mounted where it may be affected by drafts, discharge air from registers (hot or cold), or heat radiated from the sun of appliances. Never install in alcoves, bathrooms or bedrooms.

The thermostat should be located about 5 ft. above the floor in an area of average temperature, with good air circulation. Normally, an area in close proximity to the return air grille is the best choice.

Mercury bulb type thermostats **MUST** be level to control temperature accurately to the desired set-point. Electronic digital type thermostats SHOULD be level for aesthetics.

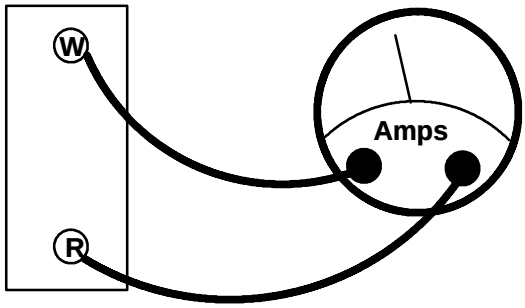
HEAT ANTICIPATORS

Heat anticipators are small resistance heaters built into most electric-mechanical thermostats. Their purpose is to prevent wide swings in room temperature during furnace operation.

In order to accomplish this, the heat output from the anticipator must be the same regardless of the current flowing through it. Consequently, most thermostats have an adjustment to compensate for varying current draw in the thermostat circuit.

The proper setting of heat anticipators then is important to insure proper temperature control and customer satisfaction.

Figure 12 **Measuring Current Draw**



The best method to obtain the required setting for the heat anticipator, is to measure the actual current draw in the control circuit (“W”) using a low range (0-2.0 Amps) Ammeter. (See **Figure 12**) After measuring the current draw, simply set the heat anticipator to match that value.

If a low range ammeter is not available, a “Clamp-on” type meter may be used as follows:

1. Wrap EXACTLY ten (10) turns of wire around the jaws of a clamp-on type ammeter.
2. Connect one end of the wire to the “W” terminal of the thermostat sub-base, and the other to the “R” terminal.
3. Turn power on, and wait approximately 1 minute, then read meter.
4. Divide meter reading by 10 to obtain correct anticipator setting.

NOTE: For 2 Stage heating thermostats the above procedure MUST be performed twice. Once for first stage (W1), and once for second stage (W2), if both stages have adjustable heat anticipators.

If an ammeter is not available, a setting of 0.30 amps may be used for models equipped with the HONEYWELL SV9541M Gas Valve/Ignition Control. They should, however, provide satisfactory operation in most cases.

Electronic thermostats do not use a resistance type anticipator. These thermostats use a microprocessor (computer) that determines a cycle rate based on a program loaded into it at the factory.

These cycle rates are normally field adjustable for different types to equipment. The method of adjustment, however, varies from one thermostat manufacturer to another. Check with the thermostat manufacturer to find out the proper way of adjusting the cycle rate.

12. CONTROL WIRING

Control wiring is an important part of the total equipment installation, since it provides the vital communications link between the thermostat, and the equipment malfunctions. Control wiring that is either too long, undersized, or improperly connected (be it simply loose, or on the wrong terminal) can in fact be the source of many equipment problems.

ALWAYS check to make sure that the control wiring is connected to the proper terminal(s) of the equipment and thermostat you are using. Remember, also, that the thermostat terminals are not always identified alike by different thermostat manufacturers. Connections MUST be clean and tight to insure trouble–free operation.

For years, installers have run a wire from the "Y" terminal of the room thermostat and connected it directly to the contact on coil of a condensing unit. (not making any connection to the furnace with this wiring. Then, run the low voltage "Common" wire from the condensing unit back to the "C" terminal of the furnace.

With the HONEYWELL ST9160B electronic Fan Timer/Furnace Control, the "Y" terminal of the furnace does in fact serve a particular purpose. Failure to connect it will result in certain improper operation as follows:

The COOLING fan speed is energized via the "Y" terminal. Failure to connect the thermostat "Y" terminal to the "Y" terminal on the control will result in the failure to energize the COOLING speed on a call for cooling from the thermostat. (The HEATING speed will be energized instead via the "G" terminal)

13. TWINNING KITS

Some installations may require a Heating capacity or Airflow capabilities greater than a single furnace of this series can provide.. When this is necessary, furnaces may be installed in a "Twinned" configuration.

The Twinning Kit allows the two (2) furnaces to be controlled by the same room thermostat. When Twinned, the circulating (conditioned air) blowers of BOTH furnaces will operate simultaneously.

Models equipped with a HONEYWELL ST9160B series Fan Timer/Furnace Control may be twinned using a model NAHA003WK01 twinning kit.

To assist troubleshooting efforts of "Twinned" installations, "TYPICAL" control wiring diagrams are provided on pages ** through **.

14. LIMIT SWITCHES

Two (2) different kinds of limit switches are used on this series of furnaces. They are the main limit and roll out limit switches. The main limit, and roll limit switches are used on all models.

NOTE: All limit switches are **safety devices** and other than for testing purposes, **should never be jumped out!** Limit switches are "normally closed" electrical switches, designed to open when their predetermined "limit setting" has been reached.

It should also be remembered, that when a limit switch opens, it more than likely is not due to a bad switch! The cause of the opening limit must be found and corrected, before the furnace can resume proper operation.

⚠ WARNING

FIRE HAZARD.

Failure to do so can result in death, personal injury and/or property damage.

Limit controls are factory preset and MUST NOT be adjusted. Use ONLY manufacturer's authorized replacement parts.

The specific functions of the two (2) limit switches used in this series of furnaces are as follows:

MAIN LIMIT SWITCH

A "Normally Closed" switch located on the front partition of the furnace. It monitors supply air temperature, and interrupts furnace (burner) operation when a supply air temperature is sensed which would result in the furnace exceeding Maximum allowable outlet air temperature. While the main limit is open, combustion blower, and/or the circulating blower will be energized continuously. This control is an "Automatic" reset control, which will reset itself when the temperature sensed drops to a safe level.

If furnace (burner) cycles on this limit switch, (I.E. switch opens and closes during furnace operation) it is more than likely due to a high temperature rise through the furnace. (See checking temperature on page 8 of this manual)

High temperature rise can be caused by either OVER FIRING (high manifold pressure. incorrect orifices, etc.) or LOW AIR FLOW (dirty filter, blower speed too low, excessive static in duct system, etc.)

Figure 13 Typical Limit Switch

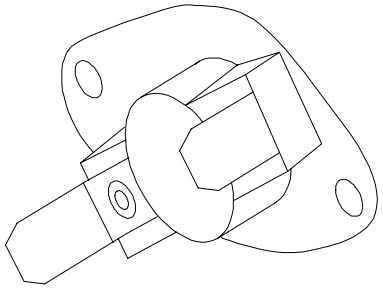
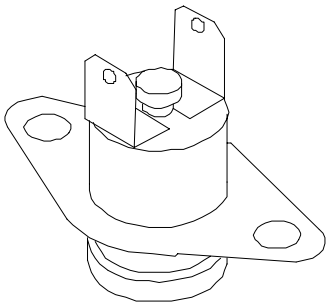


Figure 14 Typical Roll Out Limit Switch



To verify this, the cut–out (opening) point of the switch should be checked (using a thermocouple type thermometer connected to the face of the switch) as follows:

1. Operate furnace for several minutes.
2. Block return air grille(s) to furnace.
3. Observe temperature at which switch opens (burner operation ceases).
4. Remove blockage from return grille(s).
5. Observe temperature at which switch closes (burner operation resumes).
6. Compare readings with the limit setting listed in the appropriate chart for the model you are servicing.

If switch is opening within the specified range, then it is simply doing its job, and the cause of the over–temperature must be determined and corrected.

If, however, the switch is found to be opening prematurely, then it should be replaced. When replacing ANY limit switch, use ONLY a switch of EXACTLY the same temperature setting. Use of a different temperature limit switch can create a dangerous situation. Some of the main limit switches used in this series are SIMILAR IN APPEARANCE. DIFFERENT TEMPERATURE SETTINGS, HOWEVER, ARE USED for different models. Be certain you have the correct control for the model you are servicing.

ROLL OUT LIMIT

A “Normally Closed” switch (wired in series with the Main Limit switch) mounted on the burner box.

This switch may be of the manual type, depending upon the particular model and/or family. Different temperature (OPENING) settings are also used on different models. When replacing this switch, be absolutely certain the correct one is used.

CAUTION

NEVER use an automatic reset roll out switch to replace a manual reset type roll out switch.

Doing so may cause potentially unsafe and/or intermittent operation.

The roll out switch monitors the temperature inside the burner box, and interrupts furnace (burner) operation when its temperature indicates flame roll out has occurred.

If the roll out switch has opened, the cause must be determined. Some possible reasons for flame roll out include a restricted primary or secondary heat exchanger or over fired furnace.

MANUAL RESET SWITCH MODELS

Furnace models which are equipped with a Honeywell ST9160 Fan timer/furnace control use a manual reset roll out switch. Once the roll out switch has opened, burner operation will be prevented until the roll out switch is “Manually Reset” by pressing the red button located on the switch. While the roll out switch is open, (Depending upon the particular model) the combustion blower and/or circulating blower will be energized continuously.

AUXILIARY LIMIT SWITCHES

All models are equipped with one (1) additional (AUXILIARY) limit switch mounted on the blower deck. Its purpose is to monitor return air temperature, and interrupt burner operation when a temperature is sensed which could result in the filter surface(s) exceeding allowable temperatures. Depending upon the particular model, the combustion blower, and/or circulating blower may be energized continuously while the auxiliary limit switch remains open.

This control is an “Automatic” reset control which will reset itself when the temperature drops to a safe level. See the Tech. Service Data Sheet for the model you are servicing, to obtain its specific auxiliary limit switch setting.

15. PRESSURE SWITCHES

Blower Pressure Switch

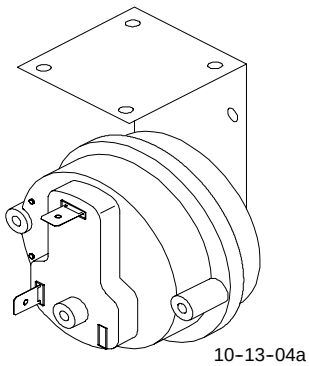
An air proving switch (pressure switch) is used on all models to insure that a draft has been established through the heat exchanger before allowing burner operation.

To insure continued SAFE, RELIABLE, operation, NEVER SUBSTITUTE a pressure switch with one that is similar in appearance. ONLY FACTORY PROVIDED or AUTHORIZED SUBSTITUTES ARE ACCEPTABLE.

All models installed at altitudes of 4,000′ above sea level or higher require replacing the standard pressure switch with a high altitude pressure switch. The different pressure switch

settings allow continued SAFE, RELIABLE, high altitude operation.

Figure 15 **Pressure Switches**



Under normal operating conditions, sufficient negative pressure will be created to close the pressure switch, and keep it closed to keep furnace operating. Under abnormal conditions, however, such as a restricted vent pipe, or a leak in one of the heat exchangers, sufficient negative pressure will not be created. This will result in the switch failing to close or failing to remain closed during furnace operation.

When servicing a unit whose pressure switch will not close, or remain closed during operation, the operating pressure of that furnace should be checked and compared to approximate operating pressures listed in **Table 4** and the switch setting(s) listed above for the model family you are servicing.

It is important to remember, that greater negative pressures are created by the furnace when "HOT" (I.E. upon initial start-up) than when "COLD" (I.E. after furnaces has been in operation for a few minutes). Because of this, furnace pressure should ONLY be checked when "HOT" to insure accurate readings.

Table 4 lists approximate operating pressures. They are included in this manual to provide you with a "Barometer" to gauge our pressures against. The pressures you obtain in the field will differ slightly from these figures based upon vent length, gas pressure, operating temperature, etc.

Major discrepancies in pressures, will normally cause problems with pressure switch operation. These Major discrepancies should be investigated as follows:

Table 4	APPROXIMATE OPERATING PRESSURES (″ OF W.C.)
Model	**Vent Length**
Single Stage ALL Models	Close -0.69
	Open -0.59
2-Stage & Variable Speed ALL Models	Hi Fire (Close) -0.60
	Hi Fire (Open) -0.59
	Lo Fire (Close) -0.40
	Lo Fire (Open) -0.30

Lower (Lesser) Negative Pressures

Lower than normal negative pressures measured at the **Combustion Blower** may be caused by:

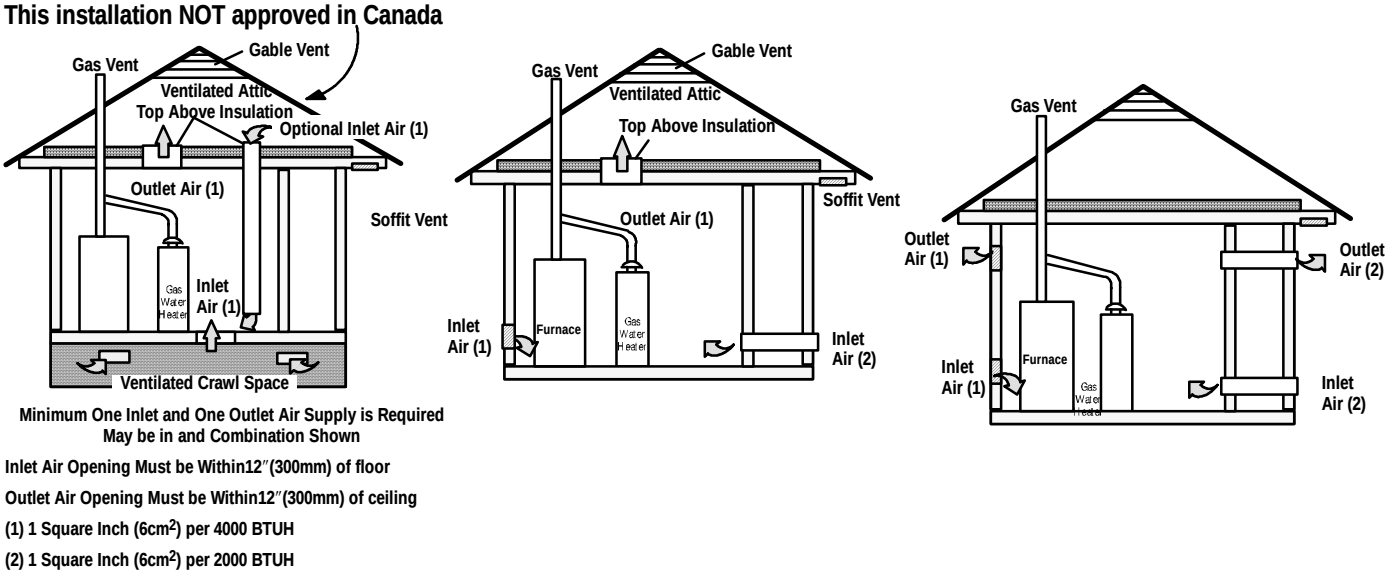
1. Restriction on the **Outlet** side of the combustion blower. (I.E. Blocked Flue, Vent too long, Heat Exchanger leak, etc.)
2. Leak (lack of restriction) on the **Inlet** side of the combustion blower.

Higher (Greater) Negative Pressures

Higher than normal negative pressures measured at the **Combustion Blower** may be caused by:

1. Restriction on the **Inlet** side of the combustion blower. (I.E. Plugged Heat Exchanger, air inlet orifice too small)

Figure 16 **Typical Vent/Combustion Air Piping Installation**



Minimum One Inlet and One Outlet Air Supply is Required May be in and Combination Shown

Inlet Air Opening Must be Within12″(300mm) of floor

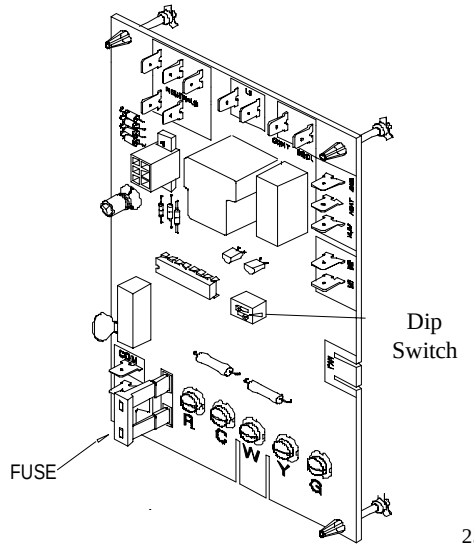
Outlet Air Opening Must be Within12″(300mm) of ceiling

(1) 1 Square Inch (6cm^2) per 4000 BTUH

(2) 1 Square Inch (6cm^2) per 2000 BTUH

16. HONEYWELL ST9160B Series FAN TIMER/FURNACE CONTROL

Figure 17 **Honeywell ST9160B**



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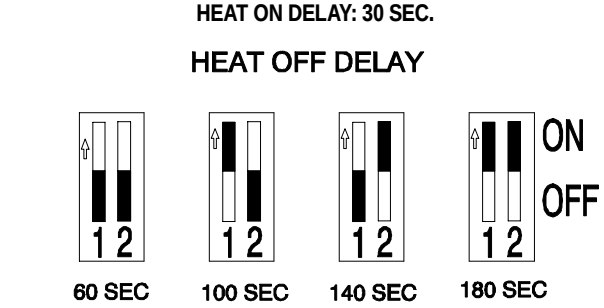
The Honeywell ST9160B Electronic Fan Timer/Furnace Control contains NO USER SERVICEABLE COMPONENTS. It is, as its name implies, a fan timer and a furnace control of sorts. In addition to controlling the fan operation for heating, it also takes the place of the blower relay, the combustion air relay and/or the system relay.

The ST9160B is used in models equipped with the SV9541M GAS VALVE/IGNITION CONTROL. It provides the power source to begin the ignition sequence through a monitored safety circuit. It also serves as a low voltage terminal strip. Accessory terminals for connecting a Humidifier and/or Electronic Air cleaner are also provided, as well as a Continuous fan terminal which allows for continuous fan operation at a speed other than either the heating or cooling speed.

The control provides a fixed (non-adjustable) 60 second "ON" and 60 second "OFF" delay for the circulating blower in COOLING and a 30 second "ON" delay for the circulating blower in HEATING.

The ST9160B control also provides an adjustable HEATING "OFF" delay for the circulating blower which can be field adjusted to 60, 100, 140, or 180 seconds.

Figure 18 **Heating "OFF" Delay DIP switch Setting**



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Setting "OFF" and "ON"

Setting the ST9160B Heating Fan "OFF" Delay is accomplished by the positioning of "DIP" switches. The label on the back of the furnace door indicates how to position these switches to obtain the desired setting. (See **Figure 18**)

The **ST9160B Heating "OFF" delay** can be set to (60. 100, 140, or 180). The control was shipped out in the 140 position. This may be satisfactory for some installations, but not for others.

The **Heating "ON" delay is fixed at 30 seconds is not adjustable.**

The "OFF" delay should be set as long as possible without creating "COLD AIR" complaints at the end of the cycle.

Troubleshooting

The operation of the HONEYWELL ST9160B series FAN TIMER/FURNACE CONTROL (as well as the operation of the furnace in general) can be verified in a few minutes by using two (2) jumper wires (to jumper terminals of the low voltage terminal strip) and the "TEST SEQUENCE" below.

17. ST9160B TESTING SEQUENCE

If furnace successfully passes this testing sequence, it can be assumed that there are no problems with the ST9160B FAN TIMER/FURNACE CONTROL. If it does not, however, it does not necessarily mean that there are problems with the control. Any malfunctions should be thoroughly investigated before replacing and components.

CHECKING **COOLING** FUNCTIONS

1. JUMPER "Y" & "G" TO "R"
2. CHECK COOLING FAN DELAY "ON"
3. CHECK COOLING SPEED FAN OPERATION
4. REMOVE JUMPER
5. CHECK COOLING FAN "OFF" DELAY

CHECKING **HEATING** FUNCTIONS

1. JUMPER "W" TO "R"
2. CHECK COMBUSTION BLOWER START-UP
3. CHECK IGNITION SYSTEM ACTIVATION
4. WHEN MAIN BURNER LIGHTS, CHECK HEATING FAN "ON" DELAY
5. CHECK HEATING SPEED FAN OPERATION
6. REMOVE JUMPER
7. CHECK POST PURGE DELAY
8. CHECK HEATING FAN "OFF" DELAY

18. ST9160B - UNIQUE CONTROL FUNCTIONS/RESPONSES

There are some unique responses from these controls that differ from what one would normally expect, and may be somewhat confusing. (See **Figure 17**) Specifically, these are as follows:

Energizing the "G" terminal of this control will cause the blower to run on the HEATING speed. (With most other furnaces, the blower relay is energized via the "G" terminal normally causing the blower to run on the cooling speed.)

Energizing the "G" & "Y" terminals (together) will cause the blower to run on the COOLING speed. It is important that you take note of this, since control wiring improperly connected can cause perceived as well as real equipment problems.

For example, in the past, the "Y" terminal in nearly all furnaces was simply a binding post. There was no electrical connection between this terminal and the rest of the furnace.

The "CONTINUOUS" terminal of the ST9160B control is energized **ONLY** when there is NO OTHER CALL FOR OPERATION of any kind. If there is a call for HEAT, COOL, or "FAN ON", this terminal is DE-ENERGIZED. The purpose of this terminal is to provide a means of air circulation during "OFF CYCLES" at a different speed than either heating or cooling. **The use of this terminal is operational, and there will be no speed tap wires connected to this terminal when the furnace is shipped.**

"CONTINUOUS" fan should not be confused with "FAN ON" which is obtained by switching the fan selector switch on the thermostat sub-base to "**FAN ON**", (energizing the "**G**" terminal) which causes the blower to run on the "**HEATING**" **speed.**

Consequently, many installers would not use this terminal to connect the "Y" signal from the thermostat, but would run it directly from the thermostat to the condensing unit, the run the "Common" signal back to the furnace "C" terminal.

This method of wiring will result in improper operation from this control. The control MUST receive a "Y" signal in order for it to energize the "COOL" terminal, bringing on the blower in the cooling speed. If it is wired as above, the condensing unit will come on, but the blower will run on the HEATING speed.

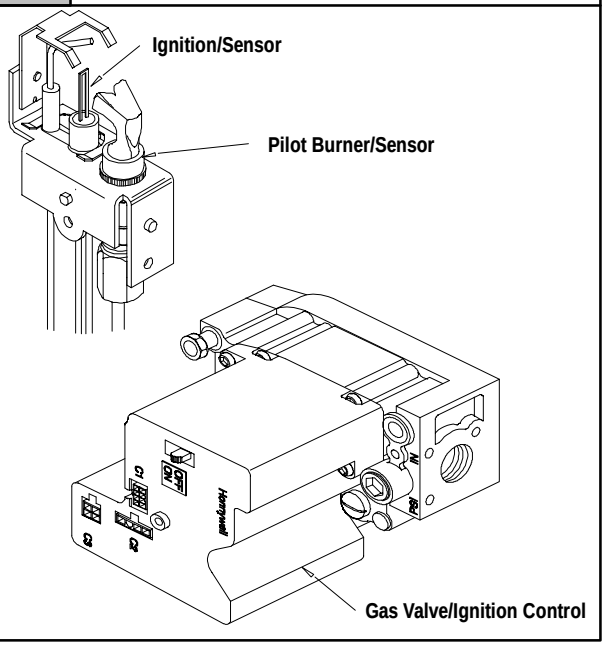
"NO TERMINALS" ENERGIZED (on low voltage terminal strip) - If a speed tap wire has been connected to the "CONT." (continuous) terminal, (operational terminal provided on the ST9160B series controls) the blower will run on this speed. Maximum allowable connected load for this terminal is 8.0 FLA.

The **ST9160B Electronic Air Cleaner** terminal (**EAC**) IS **ONLY** energized in conjunction with the HEATING and COOLING speed terminals. **The maximum allowable connected load to the HUM terminal is 0.8 (eight tenths) Amp.***

*The combined connected loads of the EAC and HUM terminals cannot exceed a total of 0.8 (eight tenths) amp.

19. HONEYWELL SV9541M GAS VALVE/IGNITION CONTROL

Figure 19 **Honeywell ST9541M Ignition System**



The system consists basically of only two (2) components. The Ignition System Control and the Pilot Hardware. The operate on Two (2) 24 volt power circuits received from the ST9160B Fan Timer/Furnace Control. One is the power supply to the ignitor, the second is to activate the ignition sequence.

The Ignition System Control manages the ignition sequence, and the flow of gas to the pilot and main burners. It is in essence a combination Gas Valve and Ignition control.

It contains sophisticated electronic components (internally) and has NO USER SERVICEABLE COMPONENTS. Should a problem be verified internally within the device, IT IS NOT REPAIRABLE, and must be replaced.

The Pilot Hardware includes the pilot burner, the hot surface element that lights the pilot burner, the flame rod that senses pilot flame, and the cable that attaches to the system control.

The hot surface element is made of tough *break resistant* ceramic composite material. It operates on 24 Volts A.C. The Igniter/Flame Rod assembly can be replaced independently from the pilot burner assembly.

The system operation is quite simple, and forgiving (I.E. nuisance lockouts are eliminated)

20. HONEYWELL SV9541M SYSTEM OPERATION

Connecting the furnace to the line voltage supply with the blower door interlock switch closed provides 24 volts to power the system. (This is accomplished by the connections from terminals [pins] #4 & #2 from the ST9160B fan timer to terminals #1 & #3 of the SV9541M gas valve.)

When the thermostat calls for heat, (the combustion blower starts, causing the pressure switch to close completing the circuit to the ignition system control) there will be approximately a two (2) second delay, while the ignition system control runs a self check.

Part of the self check is to see if a flame signal is detected. If a flame signal is detected upon a call for heat (and naturally there shouldn't be), the ignition system control will energize the electronic fan timer output (causing the conditioned air blower to start after the fixed 60 second "ON" delay) and will keep the valve and ignitor to circuit off.

Assuming that no flame signal is detected upon the call for heat, (Normal operation), the ignition system control will power the ignitor circuit (24 volts) causing the ignitor to heat up.

If a flame outage (I.E. loss of gas supply, blown out, etc.) should occur during a run cycle (Main burner operation), the ignition system immediately de-energize the main valve and re-power the ignitor circuit placing the system back in to the "Trial For Ignition" mode.

As previously, it will remain in this "Trial For Ignition" mode (Ignitor powered and pilot valve open) either until the pilot lights and flame is sensed, or until the call for heat ends.

The SV9541M system **is not sensitive** to furnace grounding or line voltage polarity. Accordingly, you cannot experience a lockout due to those reasons.

If the ignitor circuit is not proven (I.E. the ignitor is missing, broken, or the connections are loose) their will be no response from the ignition system control. (Lockout)

Once the ignitor circuit has been proven, and the ignitor begins to heat up, the pilot valve will be energized allowing gas to flow to the pilot burner.

With the ignitor now hot, and gas flowing to the pilot , the pilot should light, and the sensor should sense flame.

If no flame is sensed, (I.E. no gas, pilot not lit, flame not enveloping sensor, etc.) the ignitor will stay on, and the pilot valve will remain open until it does sense flame, or until the call for heat is satisfied. THE SYSTEM WILL NOT LOCK OUT under this condition.

Assuming that the pilot does light, and flame is sensed, (normal operation) the ignition system control will turn the ignitor off, while energizing the main valve. This will allow the pilot to light the main burner. It will also energize the electronic fan timer output (causing the conditioned air blower to start after the fixed 60 second "ON" delay).

Assuming that the main burner did not experience any problems during the run cycle (normal operation) it would continue to operate as long as the call for heat remained.

Once the call for heat ended, the ignition system control would immediately close the main and pilot valves, and de-energize the electronic fan timer output.

De-energizing the electronic fan timer output causes the "OFF" delay timing to begin, and when the pre-selected time (90, 100, 140, or 180 seconds) expires, the blower will turn off.

TROUBLESHOOTING

Malfunctions of the HONEYWELL SV9541M "Smart Pilot" system may be easily diagnosed using a voltmeter and a spare igniter/flame rod assembly.

The igniter itself can also be checked using an Ohmmeter. Resistance of a "Good" igniter should be 10 Ohms or less.

See trouble shooting flow chart and the sequence of operation flow chart on pages 36 and 37 of this manual for additional information on the operation and troubleshooting of this system.

21. CHECKING FLAME CURRENT

The Honeywell SV9541Q Ignition system used in this furnace series proves (verifies) flame via the Flame Rectification method.

Flame Rectification is a process of converting Alternating Current (A.C.) into Direct Current (D.C.) During the ignition sequence, an alternating current (A.C.) Voltage is applied to the Flame probe.

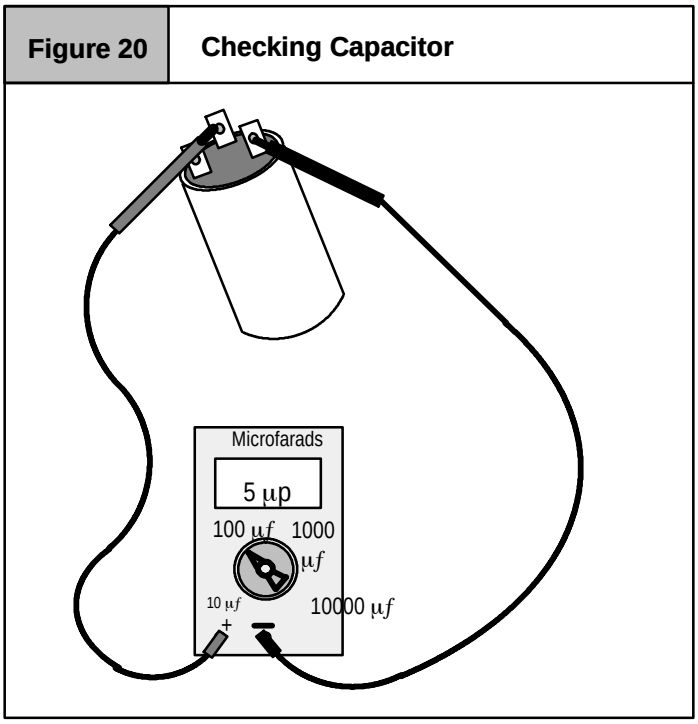
When the burner lights the flame conducts an electrical current between the flame probe and the burner ground. Due to the difference in size between the flame probe and the burner ground area this current flows mostly in one direction. This creates a pulsating Direct Current that flows back to the ignition control proving flame.

This flame current (D.C. Microamps) may be checked (while flame is present) using a D.C. Flame Sensor kit is available from outside vendors.

Minimum Micro Amp Current is 0.2 micro amps.

22. CAPACITORS

Figure 20 **Checking Capacitor**



Capacitors are used for both the circulating (conditioned air) blower motor and the exhaust (combustion) blower. Before replacing one of these motors (assumed to be bad) the condition of its capacitor should be verified, since it, and not the motor, may be the source of the problem.

Before checking **any** capacitor, the supply power to the unit should be turned "OFF". The capacitor should then be discharged (through a resistor) before testing. A 20,000 Ohm 2 Watt resistor can be used for this purpose.

The condition of the capacitor should then be verified with a capacitor analyzer (one that indicated the capacitor's value in microfarads) rather than with an Ohmmeter. The reason for this, is that an Ohmmeter test can only indicate if a capacitor is "OPEN', or "SHORTED", it cannot verify if its value (microfarads) is within an acceptable range.

Capacitor should test to within 10% of its rated value. Capacitors testing outside this range should be replaced. A weak capacitor can be the cause of a motor failing to start.

23. BLOWER ASSEMBLY

All models use a multi-speed, permanent split capacitor motor, direct-drive, blower assembly. Different size (HP) motors and/or different diameter blower wheels are used in each model to obtain the required air flow. The entire blower assembly slides out on rails for servicing after removing the two screws at the front.

SELECTING BLOWER SPEEDS

The wide variety of applications and installations of furnaces throughout the country makes it impossible to "Factory Select" blower speeds that will provide proper operation for all installations. This means then, that the blower speeds for both heating and cooling must be "Field Selected" for each particular installation to insure proper operation. is to prevent wide swings in room temperature during furnace operation.

The criteria for selecting the proper blower speeds **IS NOT** "High for Cooling, Low for Heating". Although that may be how it works out SOMETIMES, it can (in many cases) be exactly the opposite. (I.E. a Lower speed for Cooling, and a Higher speed for Heating)

The PROPER CRITERIA FOR SELECTING BLOWER SPEEDS is as follows:

HEATING

A blower speed must be selected that will provide proper temperature rise through the furnace. (See "checking tem-

perature rise" found elsewhere in this manual), The required CFM for a particular temperature rise can also be calculated using the following formula:

$$\frac{\text{Output BTU}}{\text{Temp. Rise X 1.08}} = \text{CFM}$$

EXAMPLE: using a 75 Mbtu furnace of this series with an output of 67,500 Btuh and a desired temperature rise of 50° F (range of 40–70° F allowable) and a measured external static pressure of 0.2″ W.C. with a dry coil.

$$\frac{67{,}500}{50 \times 1.08} \quad \text{or} \quad \frac{67{,}500}{54} = 1250 \text{ CFM}$$

Checking the blower performance data for this model, (see Figure 36) indicates that @ 0.2″ W.C. E.S.P. medium–high speed will deliver 1249 CFM. Accordingly, medium speed should be used in this example for the HEATING speed.

COOLING

A blower speed must be selected that will provide proper air flow (Nominal 400 CFM per ton) for the size (capacity) air conditioning coil being used at the external static pressure of the Duct system (installation). This requires CHECKING THE EXTERNAL STATIC PRESSURE, then consulting the BLOWER PERFORMANCE DATA to determine the required speed tap.

EXAMPLE: A 24,000 BTU (2 TON) air conditioning system, using the same 75,000 BTU furnace as in the previous example. The external static pressure is measured and found to be 0.4″ W.C.

400 CFM (nominal) per TON required

400 x 2 = 800 CFM required

Checking the blower performance data (see Figure 36) for this model indicates that @ 0.4″ W.C. ESP low speed will deliver 788 CFM. Accordingly, low speed should be used in this example for the COOLING speed.

Table 5 Blower Performance Data 75,0000 BTUH

Air Delivery in Cubic Feet per Minute (CFM) (Furnace Rated @ 0.5″ W.C. ESP)					
External Static Pressure Inches of W.C.	TAP	LOW	MED L	MED H	HIGH
	.10	778	984	1263	1576
	.20	786	1003	1249	1532
	.30	790	1003	1244	1489
	.40	788	1001	1215	1432
	.50	781	982	1186	1371
	.60	765	962	1146	1308
	.70	743	923	1094	1229

SAMPLE ONLY

CHANGING BLOWER SPEED

The procedure for changing blower speeds (if needed) is shoun in **Table 6.**

⚠ WARNING

ELECTRICAL SHOCK HAZARD.

Failure to do so can result in death and/or personal injury.

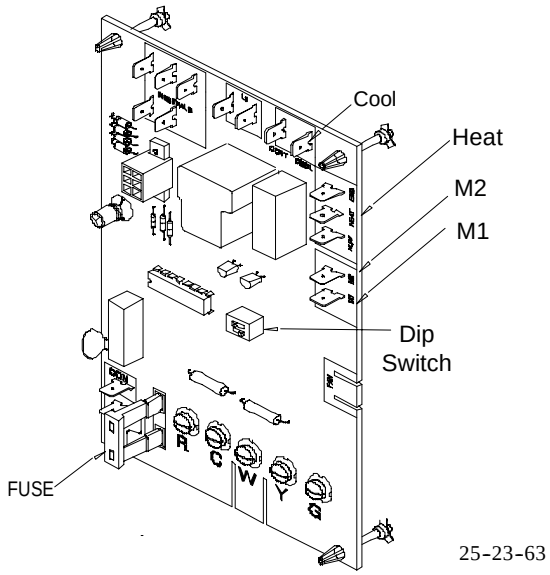
Turn OFF power to furnace before changing speed taps.

Table 6 Blower Speed Chart

Wire Color	Motor Speed
Black	High
Orange*	Med–High
Blue	Medium
Red	Low

*Med–High speed may not be provided on all models.

Figure 21 **Honeywell ST9160B**



HONEYWELL ST9160B

HEATING SPEED

Should it be necessary to change blower speeds to obtain proper temperature rise, simply take the appropriate speed tap wire, and plug it on to the terminal marked “HEAT”.

COOLING SPEED

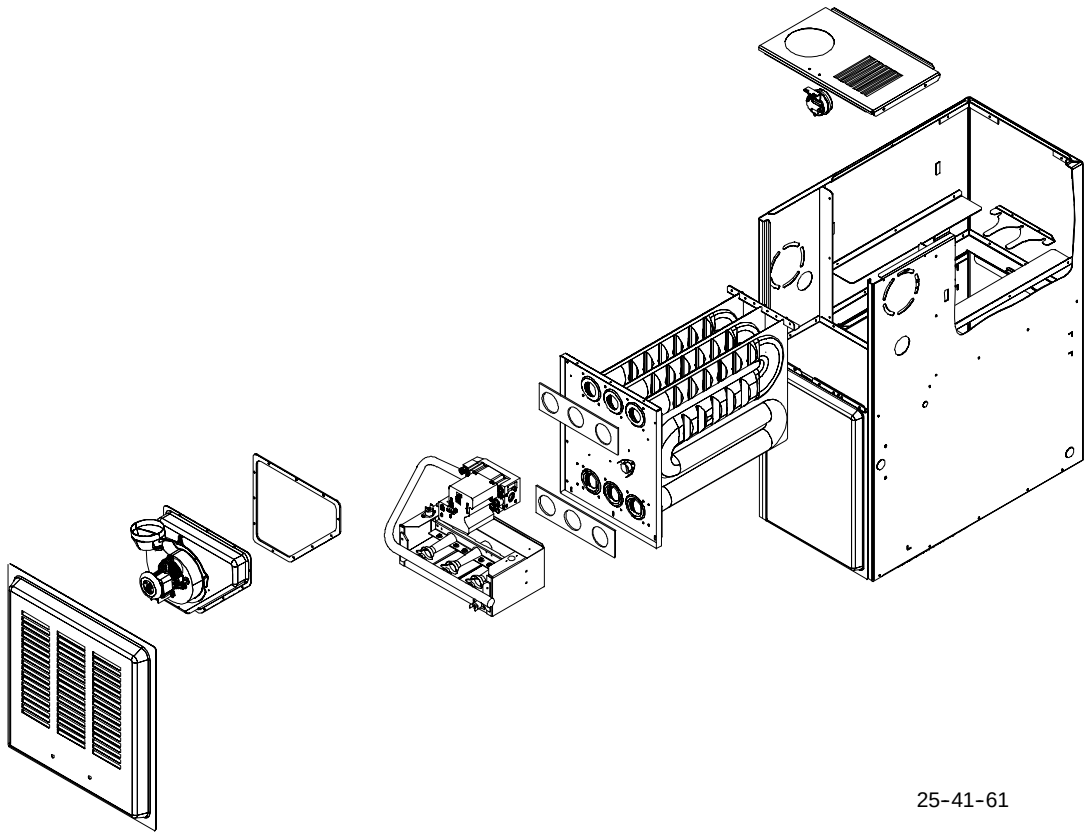
When the proper speed has been determined, simply plug it on to the terminal of the control marked “COOL”.

“UNUSED” TERMINALS

There are two (2) terminals (marked “UNUSED MOTOR LEADS” on the Honeywell ST9160B which has no internal connection to the control. Their purpose is to provide a place to connect. “UNUSED” speed tap wires to keep them out of the way and prevent them from shorting out against the furnace casing, or each other.

24. HEAT EXCHANGER REMOVAL/REPLACEMENT

Figure 22 **"Exploded" Parts View – Typical Four Position Furnaces**



Primary Heat Exchanger

1. Turn "OFF" electrical power and gas supply to furnace.
2. Disconnect vent pipe to furnace at flexible coupling.
3. Disconnect combustion air inlet pipe at top panel (if needed).
4. Remove furnace top panel.
5. Disconnect gas piping to furnace at gas valve. Note: Before performing next step, insure that the wiring diagram is available and readable, or tag all wires first.
6. Disconnect tubing and wiring to pressure switch, limit switches, and gas valve.
7. Remove screws securing burner box to front partition.
8. Remove combustion blower.
9. Remove machine screws securing transition assembly to furnace partition.
10. Remove the collector box.
11. Remove machine screws securing secondary heat exchanger inlet flange to lower partition.
12. Remove screws around perimeter of both the upper and lower partitions (leaving the screws across the center of the two panels in place).
13. Primary Heat Exchanger can now be removed with both upper and lower partitions attached.
14. Reverse procedure to reinstall, making sure that any gaskets that have been torn during disassembly are replaced with new ones.
15. After reassembly, turn the gas supply on, and check for leaks. All leaks must be repaired immediately.
16. Perform an operational check of the furnace.

HONEYWELL SV9541M "SMART VALVE" Sequence of Operation

The following is the normal operating sequence for the control system.

Cooling (Y) Request:

24 VAC signals applied to Y & G terminals of EFT (electronic fan timer) control.

- Cool motor speed energized after 6 second Cool Fan On Delay time.

Y & G signals removed from EFT.

- Cool motor speed de–energized after 60 second Cool Fan Off Delay time.

Circulating Fan (G) Request:

24 VAC signals applied to G terminals of EFT control.

- Heat motor speed energized without delay.

G signal removed from EFT.

- Heat motor speed de–energized without delay.

Heating (W) Request:

24 VAC signals applied to W terminal of EFT control.

- Inducer motor turns on.
- The gas valve solenoid energizes.
- Following a 3 second prepurge delay, the pilot valve opens and the ignitor begins to warm up.
- After the pilot lights, the main burners energize and light.
- Timed from the opening of the main gas valve, the control will delay 30 seconds before switching the fan to Heat speed.

W signal removed from EFT.

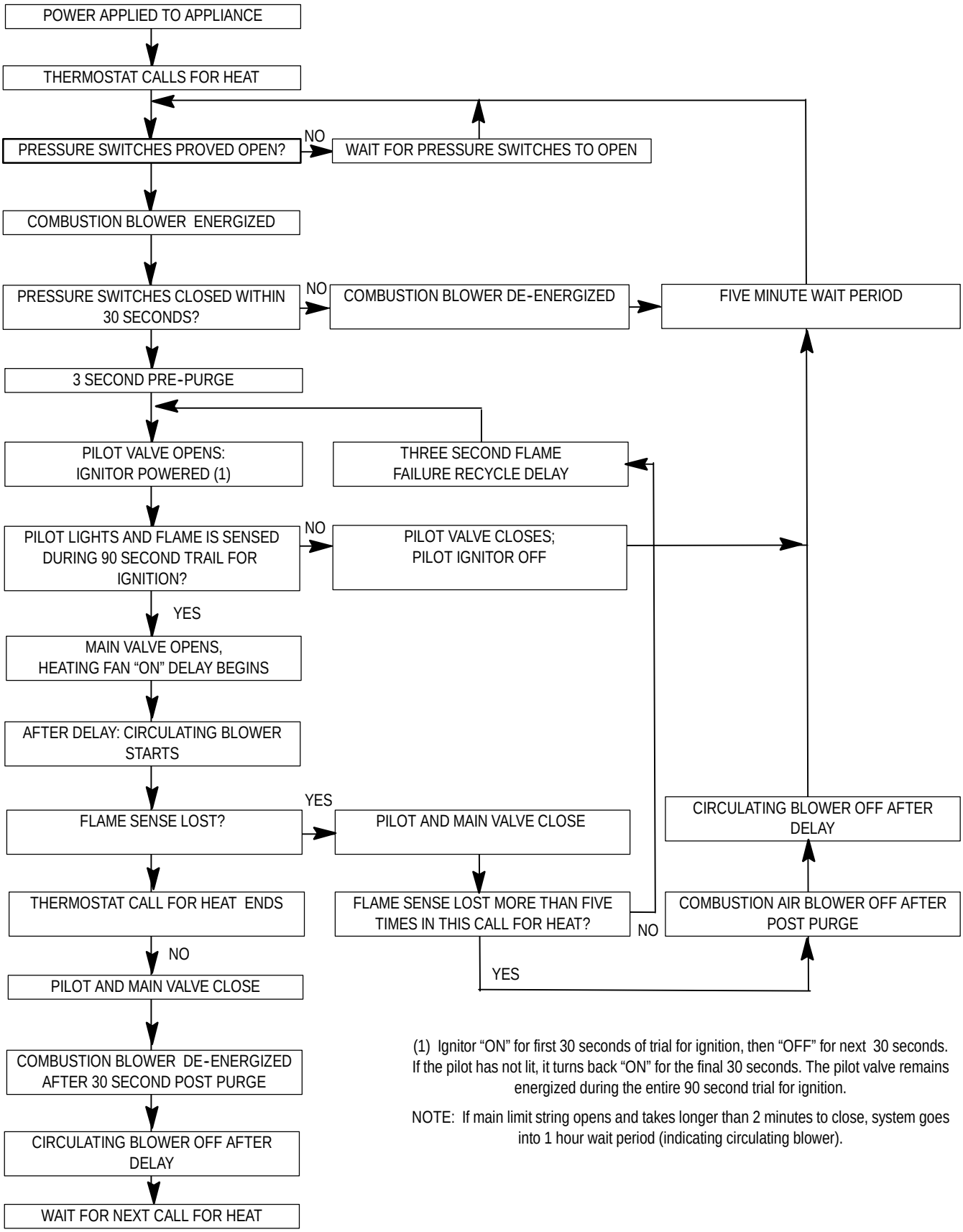
- The gas valve de–energizes and the main burners go out.
- The inducer runs at its present speed for a 30 second postpurge period.
- Timed from the gas valve de–energizing, the Heat fan speed de–energizes after the selected Heat Fan Delay time expires.

Heating Request with Gas Supply Line Shut Off:

24 VAC signals applied to W terminal of EFT control.

- Inducer motor turns on.
- The gas valve solenoid energizes.
- Following a 3 second prepurge delay, the pilot valve opens and the ignitor begins to warm up.
- The ignitor glows red–hot for 30 seconds, then turns off.
- The igniter stays off for 25 seconds, then begins to warm–up again.
- The igniter glows red–hot for 30 seconds, then turns off.
- The pilot valve closes 3 seconds after the igniter de–energizes.
- The inducer de–energizes 5 seconds after the pilot valve closes.
- The SmartValve proceeds to soft lockout and flashes error code 6.
- The control exits soft lockout after 5 minutes and begins another ignition sequence.

HONEYWELL SV9541M "SMART VALVE" Sequence of Operation



(1) Ignitor "ON" for first 30 seconds of trial for ignition, then "OFF" for next 30 seconds. If the pilot has not lit, it turns back "ON" for the final 30 seconds. The pilot valve remains energized during the entire 90 second trial for ignition.

NOTE: If main limit string opens and takes longer than 2 minutes to close, system goes into 1 hour wait period (indicating circulating blower).

HONEYWELL SV9541 "SMART VALVE" Trouble shooting

The 6 + X designation indicates a combination of flash codes: 6 flashes shows the control is in soft lockout, followed by X flashes to indicate the reason the control went into soft lockout. Last status code indicates repair to address first

LED STATUS	INDICATES	CHECK/REPAIR
Off	No power to system control.	Line voltage input at L1 and Neutral connectors on ST9160B Fan Timer. Low voltage (24V) power at 24 VAC and COM terminals on ST9160B System wiring harness is in good condition and securely connected.
Heartbeat Bright – Dim	Normal indication whenever the system is powered, unless some abnormal event has occurred.	Not Applicable – Normal Operation (stand by or call for heat)
2 Flashes	Pressure switches closed when it should be open (i.e. when call for heat begins). (Combustion blower is not energized until pressure switches opens)	Pressure switches stuck closed (system will wait for pressure switch to open). Pressure switches miswired or jumpered.
3 Flashes	Pressure switches , open when they should be closed (i.e. longer than 30 seconds after combustion blower/ inducer is energized). System goes into 5-minute delay period, with combustion blower/inducer off. At end of the 5-minute delay, another cycle will begin.	Ignition system control switch must be in the ON position. Pressure switches operation, tubing, and wiring. Restrictions in furnace air intake or vent piping.
4 Flashes	Main Limit or Roll Out Switch is open. Combustion blower is energized, Circulating blower is energized heat speed.	Main limit switch. Manual reset burner rollout switch. Limit and rollout switch wiring is in good condition and securely connected. Duct restriction/overfire.
5 Flashes	Flame signal sensed out of proper sequence. Combustion blower is energized, Circulating blower is energized heat speed after the "ON" delay.	Flame at pilot burner.
6 Flashes + 1 Flash	Soft Lockout. Failed to light pilot during 90 sec. trial for ignition Combustion air blower is de-energized, Circulating blower is de-energized after the "OFF" delay. After 5-minute delay time, control system will reset and initiate a new ignition sequence,	Gas supply off or pressure too low or high for appliance to operate. Damaged or broken HIS element Flame sense rod contaminated or in incorrect position. Pilot burner located in incorrect position. Pilot burner lead wires are in good condition and popery connected. Pressure switches operation, tubing, and wiring.
6 Flashes + 2 Flashes	Soft Lockout. Last failure was Flame Sense lost during run. Maximum recycle count exceeded Combustion air blower is de-energized, Circulating blower is de-energized after the "OFF" delay. After 5-minute delay time, control system will reset and initiate a new ignition sequence,	Gas supply off or pressure too low or high for appliance to operate. Flame sense rod contaminated or in incorrect position. Pilot burner located in incorrect position. Pilot burner lead wires are in good condition and properly connected. Cycling, pressure switch Pressure switches operation, tubing, and wiring.

HONEYWELL SV9541 "SMART VALVE" Trouble shooting continued

LED STATUS	INDICATES	CHECK/REPAIR
6 Flashes + 3 Flashes	Soft Lockout. Last failure was pressure switch Maximum recycle count exceeded Combustion air blower is de-energized, Circulating blower is de-energized after the "OFF" delay. After 5-minute delay time, control system will reset and initiate a new ignition sequence,	Ignition system control switch must be in the ON position. Pressure switches operation, tubing, and wiring. High winds blowing against vent.
6 Flashes + 4 Flashes	Soft Lockout. Last failure was limit circuit opened during run. Combustion air blower is de-energized, Circulating blower is de-energized after the "OFF" delay. After 5-minute delay time, control system will reset and initiate a new ignition sequence,	Main limit switch. Limit and rollout switch wiring is in good condition and securely connected. Restriction in duct work. Dirty filter Overfire
7 Flashes	Soft Lockout. Blower failure (typical) Limit trip took longer than 2 minutes to reset. System will start a new ignition sequence after 1 hour, if call for heat still present.	Dead blower. Blocked duct work.

SV9541M ELECTRICAL VARIATION
SINGLE STAGE

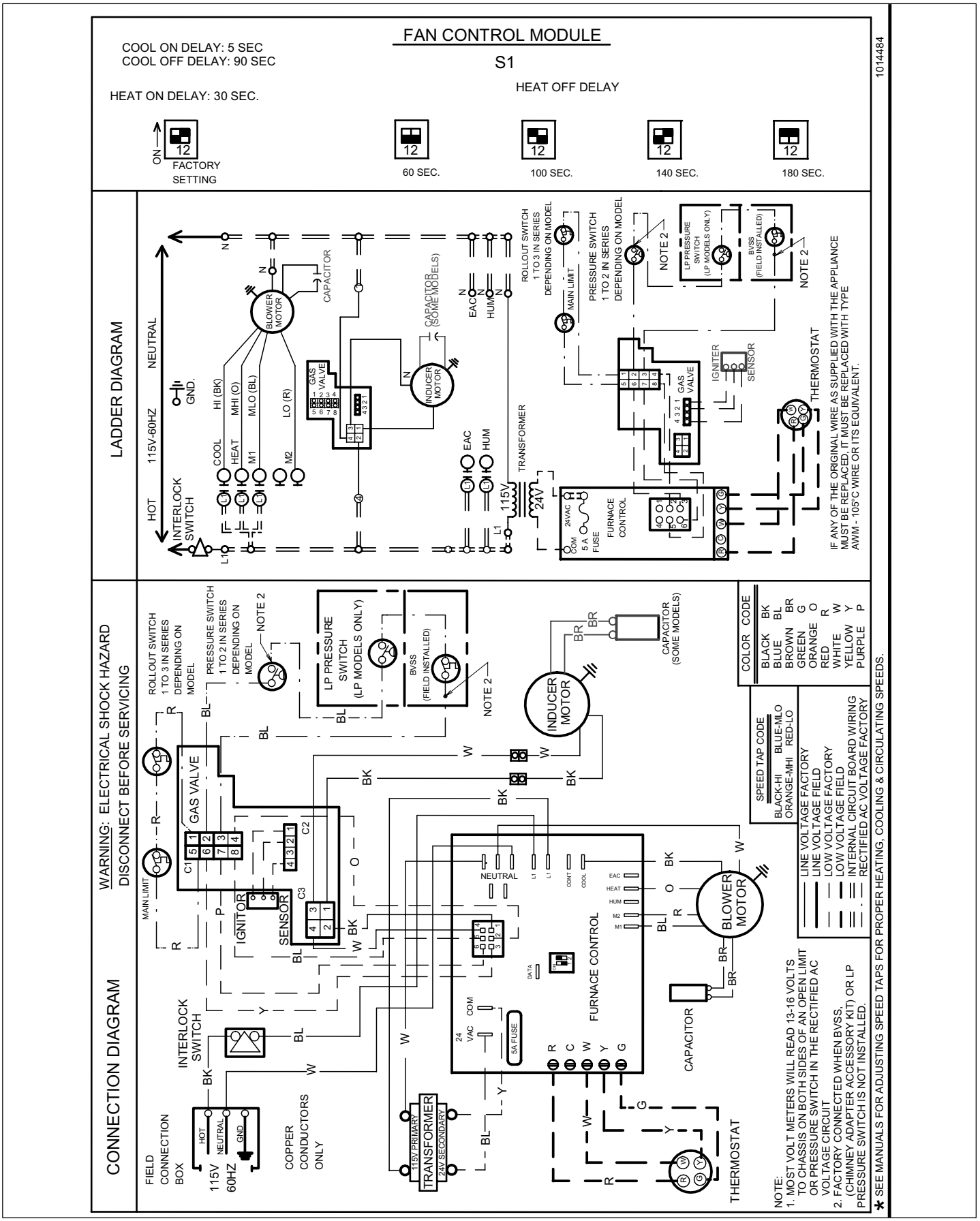
Connector (Pin #)	Description	Voltage Signal	When Signal is Present
Neutrals (5-1/4″ QC's)	Neutral	0 VAC (Neutral and earth ground should be at the same potential)	Always present
L1 (2-1/4″ QC's)	Line Voltage	115 VAC	Present when blower door interlock switch is closed.
HEAT (1/4″ QC's)	Fan power	*115 VAC	Present when Heat fan speed is on (Open Limit mode)
COOL (1/4″ QC's)	Fan power	*115 VAC	Present when Cool fan speed is on (Cool (Y) mode).
EAC (1/4″ QC's)	Electronic Air-Cleaner power	115 VAC	Present when High Heat or Cool fan speed is on.
CONSTANT FAN (1/4″ QC's)	Continuous Fan power	*115 VAC	Present when other fan speeds is off.
HUM (1/4″ QC's)	Humidifier power	115 VAC	Present when the Heat speeds is on.
P1 (pin 1)	Line Voltage	115 VAC	Present when the door interlock switch is closed.
P1 (pin 2)	Data Line	Non-periodic 1/2 wave rectified AC (measures as an unstable AC voltage bouncing between 12 VAC and 16 VAC	Present when the door interlock switch is closed.
P1 (pin 3)	C (xfmr common)	0 VAC	Always present
P1 (pin 4)	Neutral	0 VAC	Always present
P1 (pin 5)	24 VAC	24 VAC	Present when the door interlock switch is closed.
P1 (pin 6)	R	24 VAC	Present when the door interlock switch is closed.
C1 (pin 1)	Limit return	1/2 wave rectified AC	Present when the door interlock switch is closed. This voltage decreases when a limit switch is open.
C1 (pin 2)	Pressure Switch supply	1/2 wave rectified AC	Present when the door interlock switch is closed. This signal is the same as the C1 (pin 1)
C1 (pin 3)	Pressure Switch return	1/2 wave rectified AC	Present when the door interlock switch is closed. This AC voltage decreases when the Low Pressure Switch closes.
C1 (pin 4)	Data Line	Non-periodic 1/2 wave rectified AC	Present when the door interlock switch is closed. Same signal as P1 (pin 5).
C1 (pin 5)	Limit Supply	1/2 wave rectified AC	Present when the 24 VAC transformer is powered.
C1 (pin 6)	C (xfmr common)	0 VAC	Always present
C1 (pin 7)	R	24 VAC	Present when the door interlock switch is closed.
C1 (pin 8)	24 VAC	24 VAC	Present when the door interlock switch is closed.
C2 (pin 1)	HSI return	24 VAC (with igniter present)	Present when HSI is not turned on. When HSI is on, this signal is 0 VAC to 10 VAC depending on input line voltage potential.
C2 (pin 2)	HSI supply	24 VAC	Present when the door interlock switch is closed.
C2 (pin 3)	Not connected	0 VAC	Not connected
C2 (pin 4)	Flame sense	>80 VAC	Present when the door interlock switch is closed.
C3 (pin 1)	Inducer supply	115 VAC	Present when the inducer draft blower motor is on (Heat modes, Open Limit mode).
C3 (pin 2)	L1	115 VAC	Present when the door interlock switch is closed.
C3 (pin 3)	Inducer return	0 VAC	Always present (neutral connection).
C3 (pin 4)	L2 (neutral)	0 VAC	Always present

* With a motor tap connected, voltage appears at "unpowered" fan terminals whenever the motor is running due to feedback through the motor windings.

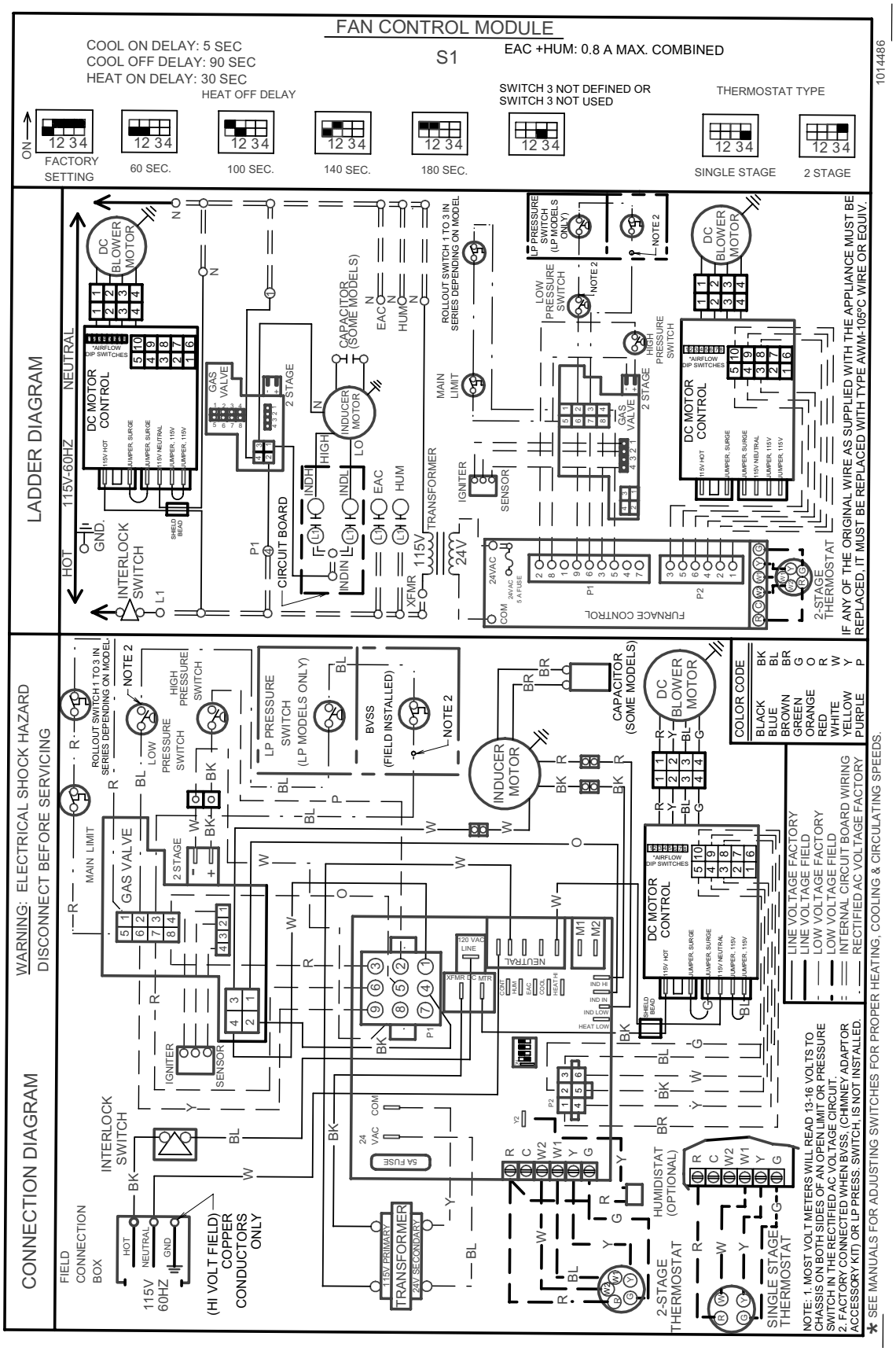
** Voltage appears on the "unpowered" inducer terminal whenever the inducer motor is running due to feedback through the motor windings.

NOTE1: Using a Fluke 79 digital Multi-Meter (DMM), 1/2 wave rectified AC voltage typically measures about 14 VAC. The Fluke 79 is not a "true" RMS meter.

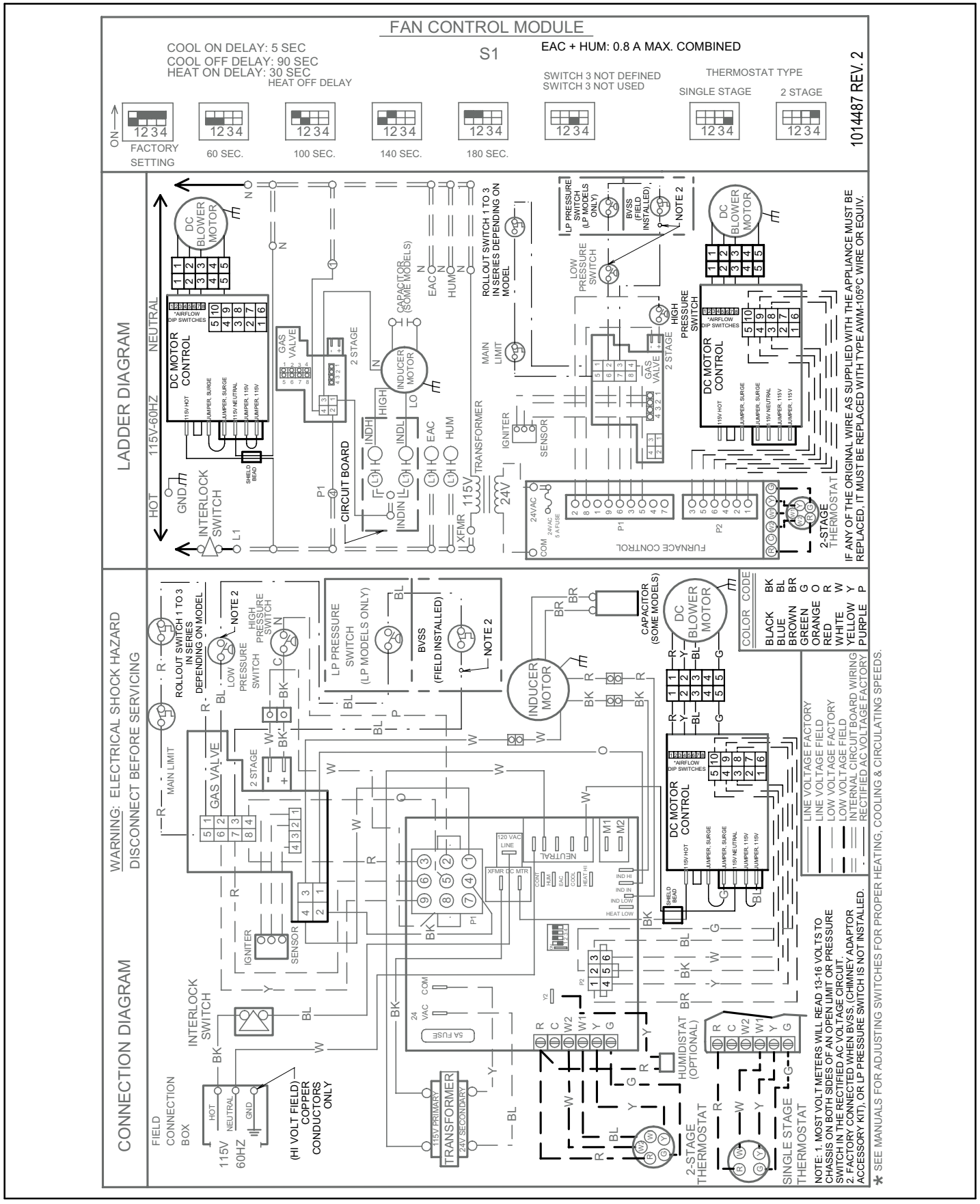
25. Wiring Diagram N8MPN/L, *8MPN/L & *8DNL



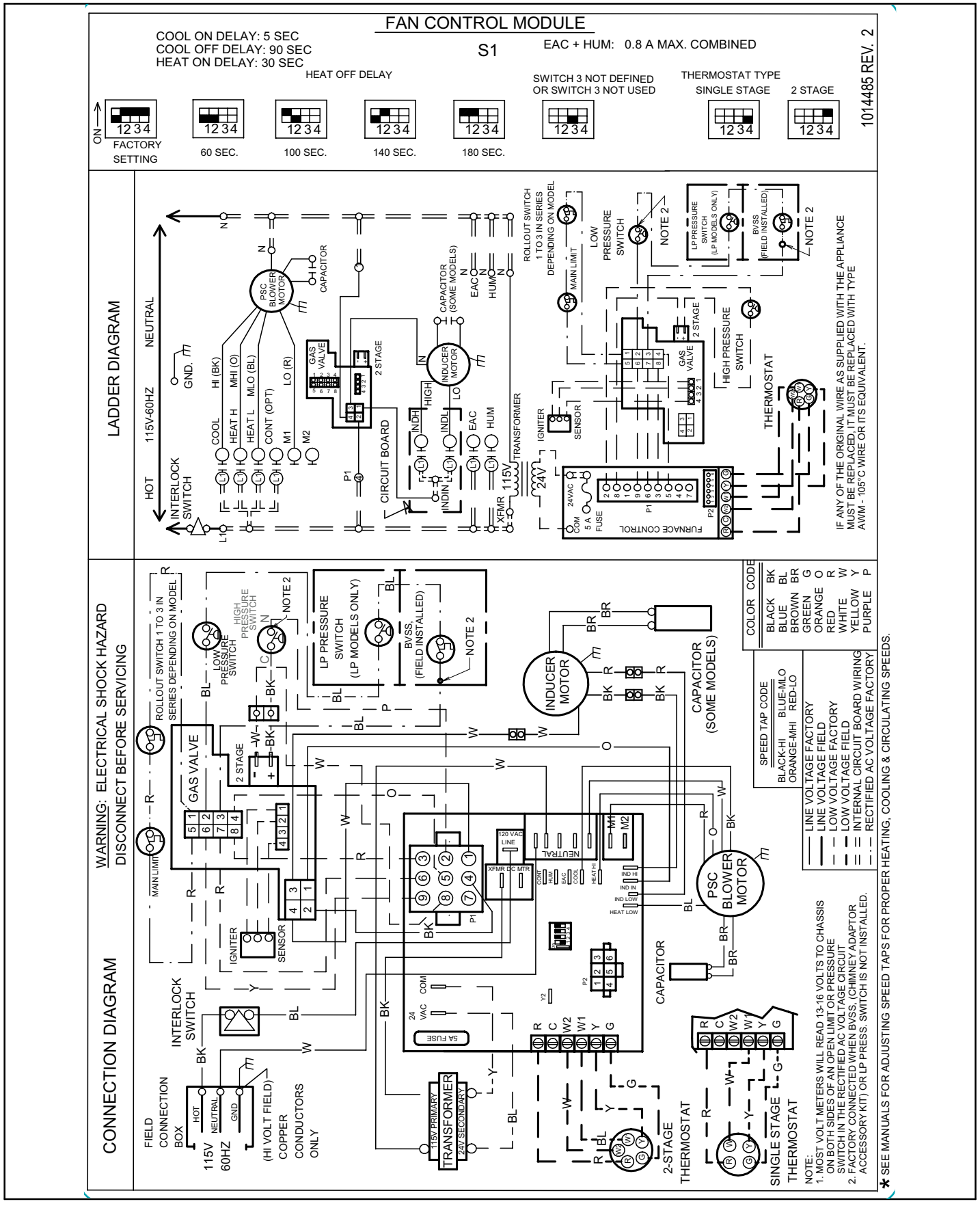
Wiring Diagram ($^1/_2$ HP DC Blower Motor)



Wiring Diagram (1 HP DC Blower Motor)



Wiring Diagram *8MPT



26. Model Specifications

Manufacturers Number (Mfr No - See Rating Plate**)**
ALL Models (N8MPN)

Specifications

	N8MPN 050B12		N8MPN 075B12		N8MPN 075F16		N8MPN 100F14		N8MPN 100F20		N8MPN 100J22		N8MPN 125J20		N8MPN 125J22	
General																
Input (Btuh)	50,000		75,000		75,000		100,000		100,000		100,000		125,000		125,000	
Output (Btuh)	40,000		60,000		60,000		80,000		80,000		81,000		100,000		100,000	
Temp. Rise (°F)	35-65		35-65		25-55		30-60		35-65		30-60		30-60		30-60	
Electrical (Volts/Hz/FLA)	115/60/9.8		115/60/8.9		115/60/10.6		115/60/9.0		115/60/12.0		115/60/12.0		115/60/12.0		115/60/12.0	
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Transformer Size (VA)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
T'stat Heat Anticipator	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10
Gas & Ignition																
Std. Main Orifices (No/Size)	2/#42	2/#54	3/#42	3/#54	3/#42	3/#54	4/#42	4/#54	4/#42	4/#54	4/#42	4/#54	5/#42	5/#54	5/#42	5/#54
Gas Valve Honeywell SV	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541
Regulation Type	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP
Manifold Press. (Inch's WC)	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0
Pilot Orifice Size	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011
Ignition Type/Series	HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP	
Lock-Out Time	NA		NA		NA		NA		NA		NA		NA		NA	
Combustion																
Flue Outlet Size (Inches)	4		4		4		4		4		4		4		4	
Limits & Controls																
Thermal Sensor (°F)	300		300		300		300		300		300		300		300	
Limit Control	See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List	
Std. Pressure Sw. (Part No)	1013529		1013529		1013529		1013529		1013529		1013529		1013529		1013529	
Press (Close)	-0.69		-0.69		-0.69		-0.69		-0.69		-0.69		-0.69		-0.69	
Press (Open)	-0.59		-0.59		-0.59		-0.59		-0.59		-0.59		-0.59		-0.59	
Fan Control (Type)	HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160	
Fan Control On	30		30		30		30		30		30		30		30	
(Timed-secs) Off	60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180	
Blower Data																
Type & Size	11-8		11-8		11-10		11-10		11-10		11-10		11-10		11-10	
Motor Amps/Rpm	10.3/1100		8/1050		10.3/1100		8/900		10/1050		11.9/900		10/1050		11.9/900	
Motor Type/H.p.	PSC/1/2		PSC/1/2		PSC/1/2		PSC/1/2		PSC/1/2		PSC/3/4		PSC/1/2		PSC/3/4	
Cap. Mfd/Volts	10/370		7.5/370		10/370		7.5/370		10/370		40/370		10/370		40/370	
Filter Type (600 FPM)	Washable		Washable		Washable		Washable		Washable		Washable		Washable		Washable	
Filter Size (") (Not Supplied)	14x25x1		14x25x1		16x25x1		16x25x1		16x25x1 (2)		20x25x1		20x25x1		20x25x1	
1600 CFM and over	--		--		16x25 (2)		--		16x25 (2)		16x25 (2)		16x25 (2)		16x25 (2)	
Min. Cool Cap. (Tons)	1.5		1.5		3		2		3		3		3		3	
Max. Cool Cap. (Tons)	3		3		4		3.5		5		5.5		5		5.5	

Gas Conversion Kits

Nat to LP NAHF002LP or *1009509

LP to Nat NAHF002NG, *1009510

* Must be ordered from Service Parts

Two side filter racks (left and right) required for upflow applications. Side returns are not permitted with downflow or horizontal furnace applications.

Manufacturers Number (Mfr No - See Rating Plate**)**
ALL Models (N8MPL)

Specifications

	N8MPL 050B12		N8MPL 075B12		N8MPL 075F16		N8MPL 100F20		N8MPL 100J22		N8MPL 125J20		N8MPL 125J22	
General														
Input (Btuh)	50,000		75,000		75,000		100,000		100,000		125,000		125,000	
Output (Btuh)	40,000		60,000		60,000		80,000		80,000		100,000		100,000	
Temp. Rise (°F)	35-65		35-65		25-55		35-65		30-60		30-60		30-60	
Electrical (Volts/Hz/FLA)	115/60/9.8		115/60/8.9		115/60/10.6		115/60/12.0		115/60/12.0		115/60/12.0		115/60/12.0	
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Transformer Size (VA)	40	40	40	40	40	40	40	40	40	40	40	40	40	40
T'stat Heat Anticipator	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10
Gas & Ignition														
Std. Main Orifices (No/Size)	2/#42	2/#54	3/#42	3/#54	3/#42	3/#54	4/#42	4/#54	4/#42	4/#54	5/#42	5/#54	5/#42	5/#54
Gas Valve Honeywell SV	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541
Regulation Type	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP
Manifold Press. (Inch's WC)	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0
Pilot Orifice Size	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011
Ignition Type/Series	HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP	
Lock-Out Time	NA		NA		NA		NA		NA		NA		NA	
Combustion														
Flue Outlet Size (Inches)	4		4		4		4		4		4		4	
Limits & Controls														
Thermal Sensor (°F)	300		300		300		300		300		300		300	
Limit Control	See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List	
Std. Pressure Sw. (Part No)	1013529		1013529		1013529		1013529		1013529		1013529		1013529	
Press (Close)	-0.69		-0.69		-0.69		-0.69		-0.69		-0.69		-0.69	
Press (Open)	-0.59		-0.59		-0.59		-0.59		-0.59		-0.59		-0.59	
Fan Control (Type)	HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160	
Fan Control On	30		30		30		30		30		30		30	
(Timed-secs) Off	60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180	
Blower Data														
Type & Size	11-8		11-8		11-10		11-10		11-10		11-10		11-10	
Motor Amps/Rpm	10.3/1100		8/1050		10.3/1100		10/1050		11.9/900		10/1050		11.9/900	
Motor Type/H.p.	PSC/1/2		PSC/1/2		PSC/1/2		PSC/1/2		PSC/3/4		PSC/1/2		PSC/3/4	
Cap. Mfd/Volts	10/370		7.5/370		10/370		10/370		40/370		10/370		40/370	
Filter Type (600 FPM)	Washable		Washable		Washable		Washable		Washable		Washable		Washable	
Filter Size (") (Not Supplied)	14x25x1		14x25x1		16x25x1		16x25x1		20x25x1		20x25x1		20x25x1	
1600 CFM and over	--		--		16x25 (2)		--		16x25 (2)		16x25 (2)		16x25 (2)	
Min. Cool Cap. (Tons)	1.5		1.5		3		3		3		3		3	
Max. Cool Cap. (Tons)	3		3		4		5		5.5		5		5.5	

Gas Conversion Kits

Nat to LP NAHF002LP, *1009509

LP to Nat NAHF002NG, *1009510

* Must be ordered from Service Parts

Two side filter racks (left and right) required for upflow applications. Side returns are not permitted with downflow or horizontal furnace applications.

Manufacturers Number (Mfr No - See Rating Plate**)**
ALL Models (*8MPN)

Specifications

	*8MPN 050B12		*8MPN 075B12		*8MPN 075F16		*8MPN 100F14		*8MPN 100F20		*8MPN 100J20		*8MPN 125J20		*8MPN 150J20	
General																
Input (Btuh)	50,000		75,000		75,000		100,000		100,000		100,000		125,000		150,000	
Output (Btuh)	40,000		60,000		60,000		81,000		81,000		81,000		101,000		121,000	
Temp. Rise (°F)	35-65		30-60		30-60		35-65		35-65		35-65		35-65		35-65	
Electrical (Volts/Hz/FLA)	115/60/9.8		115/60/8.9		115/60/10.0		115/60/9.0		115/60/12.0		115/60/12.0		115/60/12.0		115/60/12.0	
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Transformer Size (VA)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
T'stat Heat Anticipator	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Gas & Ignition																
Std. Main Orifices (No/Size)	2/#42	2/#54	3/#42	3/#54	3/#42	3/#54	4/#42	4/#54	4/#42	4/#54	4/#42	4/#54	5/#42	5/#54	6/#42	6/#54
Gas Valve Honeywell SV	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541
Regulation Type	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP
Manifold Press. (Inch's WC)	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0
Pilot Orifice Size	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011
Ignition Type/Series	HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP	
Lock-Out Time	NA		NA		NA		NA		NA		NA		NA		NA	
Combustion																
Flue Outlet Size (Inches)	4		4		4		4		4		4		4		4	
Limits & Controls																
Thermal Sensor (°F)	300		300		300		300		300		300		300		300	
Limit Control	See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List	
Auxiliary Limit (°F)	130		130		130		130		130		130		130		130	
Std. Pressure Sw. (Part No)	1013529		1013529		1013529		1013529		1013529		1013529		1013529		1013529	
Press (Close)	-0.69		-0.69		-0.69		-0.69		-0.69		-0.69		-0.69		-0.69	
Press (Open)	-0.59		-0.59		-0.59		-0.59		-0.59		-0.59		-0.59		-0.59	
Fan Control (Type)	HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160	
Fan Control On	30		30		30		30		30		30		30		30	
(Timed-secs) Off	60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180	
Blower Data																
Type & Size	11-8		11-8		11-10		11-10		11-10		11-10		11-10		12-12	
Motor Amps/Rpm	10.3/1100		8/1050		10.3/1100		8/900		10/1050		11.9/900		10/1050		11.9/900	
Motor Type/H.p.	PSC/1/2		PSC/1/2		PSC/1/2		PSC/1/2		PSC/1/2		PSC/3/4		PSC/1/2		PSC/3/4	
Cap. Mfd/Volts	10/370		7.5/370		10/370		7.5/370		10/370		40/370		10/370		40/370	
Filter Type (600 FPM)	Washable		Washable		Washable		Washable		Washable		Washable		Washable		Washable	
Filter Size (") (Not Supplies)	14x25x1		14x25x1		16x25x1		16x25x1		16x25x1		20x25x1		20x25x1		20x25x1	
1600 CFM and over	--		--		16x25 (2)		--		16x25 (2)		16x25 (2)		16x25 (2)		16x25 (2)	
Min. Cool Cap. (Tons)	1.5		1.5		3		2		3		3		3		3	
Max. Cool Cap. (Tons)	3		3		4		3.5		5		5		5		5	

Gas Conversion Kits

Nat to LP NAHF002LP, *1009509

LP to Nat NAHF002NG, *1009510

* Must be ordered from Service Parts

Two side filter racks (left and right) required for upflow applications. Side returns are not permitted with downflow or horizontal furnace applications.

Manufacturers Number (Mfr No - See Rating Plate**)**
ALL Models (*8MPL)

Specifications

	*8MPL 050B12		*8MPL 075B12		*8MPL 075F16		*8MPL 100F20		*8MPL 100J20		*8MPL 125J20	
General												
Input (Btuh)	50,000		75,000		75,000		100,000		100,000		125,000	
Output (Btuh)	40,000		60,000		60,000		81,000		81,000		101,000	
Temp. Rise (°F)	35-65		30-60		30-60		35-65		35-65		35-65	
Electrical (Volts/Hz/FLA)	115/60/9.8		115/60/8.9		115/60/10.0		115/60/12.0		115/60/12.0		115/60/12.0	
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Transformer Size (VA)	40	40	40	40	40	40	40	40	40	40	40	40
T'stat Heat Anticipator	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Gas & Ignition												
Std. Main Orifices (No/Size)	2/#42	2/#54	3/#42	3/#54	3/#42	3/#54	4/#42	4/#54	4/#42	4/#54	5/#42	5/#54
Gas Valve Honeywell SV	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541
Regulation Type	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP
Manifold Press. (Inch's WC)	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0
Pilot Orifice Size	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011
Ignition Type/Series	HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP	
Lock-Out Time	NA		NA		NA		NA		NA		NA	
Combustion												
Flue Outlet Size (Inches)	4		4		4		4		4		4	
Limits & Controls												
Thermal Sensor (°F)	300		300		300		300		300		300	
Limit Control	See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List	
Auxiliary Limit (°F)	130		130		130		130		130		130	
Std. Pressure Sw. (Part No)	1013529		1013529		1013529		1013529		1013529		1013529	
Press (Close)	-0.69		-0.69		-0.69		-0.69		-0.69		-0.69	
Press (Open)	-0.59		-0.59		-0.59		-0.59		-0.59		-0.59	
Fan Control (Type)	HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160	
Fan Control On delay	30		30		30		30		30		30	
(Timed-secs) Off delay	60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180	
Blower Data												
Type & Size	11-8		11-8		11-10		11-10		11-10		11-10	
Motor Amps/Rpm	10.3/1100		8/1050		10.3/1100		10/1050		11.9/900		10/1050	
Motor Type/H.p.	PSC/1/2		PSC/1/2		PSC/1/2		PSC/1/2		PSC/3/4		PSC/1/2	
Cap. Mfd/Volts	10/370		7.5/370		10/370		10/370		40/370		10/370	
Filter Type	Washable		Washable		Washable		Washable		Washable		Washable	
Filter Size (") (Not Supplied)	14x25x1		14x25x1		16x25x1		16x25x1		20x25x1		20x25x1	
1600 CFM and over	--		--		16x25 (2)		16x25 (2)		16x25 (2)		16x25 (2)	
Min. Cool Cap. (Tons)	1.5		1.5		3		3		3		3	
Max. Cool Cap. (Tons)	3		3		4		5		5		5	

Gas Conversion Kits

Nat to LP NAHF002LP, *1009509

LP to Nat NAHF002NG, *1009510

* Must be ordered from Service Parts

Two side filter racks (left and right) required for upflow applications. Side returns are not permitted with downflow or horizontal furnace applications.

Manufacturers Number (Mfr No - See Rating Plate**)**
ALL Models

Specifications

	*8DNL050B12		*8DNL075B12		*8DNL075F16		*8DNL100F14		*8DNL100L20		*8DNL125L20	
General												
Input (Btuh)	50,000		75,000		75,000		100,000		100,000		125,000	
Output (Btuh) +	40,000		60,000		60,000		80,000		80,000		100,000	
Temp. Rise (°F)	35-65		35-65		35-65		35-65		30-60		35-65	
Electrical (Volts/Hz/FLA)	115/60/8.9		115/60/7.6		115/60/10.6		115/60/8.9		115/60/11.2		115/60/11.2	
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Transformer Size (VA)	40	40	40	40	40	40	40	40	40	40	40	40
T'stat Heat Anticipator	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10
Gas & Ignition												
Std. Main Orifices (No/Size)	2/#42	2/#54	3/#42	3/#54	3/#42	3/#54	4/#42	4/#54	4/#42	4/#54	5/#42	5/#54
Gas Valve Honeywell SV	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541	9541
Regulation Type	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP
Manifold Press. (Inch's WC)	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0
Pilot Orifice Size	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011
Ignition Type/Series	HW HSP		HW HSP		HW HSP		HW HSP		HW HSP		HW HSP	
Lock-Out Time	NA		NA		NA		NA		NA		NA	
Combustion												
Flue Outlet Size (Inches)	4		4		4		4		4		4	
Std. Outlet Temp (°F)	<480		<480		<480		<480		<480		<480	
Limits & Controls												
Thermal Sensor (°F)	300		300		300		300		300		300	
Limit Control	See Parts List		See Parts List		See Parts List		See Parts List		See Parts List		See Parts List	
Std. Pressure Sw. (Part No)	1013529		1013529		1013529		1013529		1013529		1013529	
Press (Close)	-0.69		-0.69		-0.69		-0.69		-0.69		-0.69	
Press (Open)	-0.59		-0.59		-0.59		-0.59		-0.59		-0.59	
Hi. Alt. Pressure Sw. (Part #)												
6,000' to 10,000'	1014051		1014051		1014051		1014051		1014051		1014051	
Press (Close)	-.57		-.57		-.57		-.57		-.57		-.57	
Press (Open)	-.47		-.47		-.47		-.47		-.47		-.47	
Fan Control (Type)	HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160		HW ST9160	
Fan Control On	30		30		30		30		30		30	
(Timed-secs) Off	60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180	
Blower Data												
Type & Size	11-8		11-8		11-10		11-10		11-10		11-10	
Motor Amps/Rpm	8/1050		8/1050		10/1050		8/900		11.9/900		11.9/900	
Motor Type/H.p.	PSC/1/2		PSC/1/3		PSC/1/2		PSC/1/2		PSC/3/4		PSC/3/4	
Cap. Mfd/Volts	7.5/370		5.0/370		10/370		7.5/370		40/370		40/370	
Filter Type	Washable		Washable		Washable		Washable		Washable		Washable	
Filter Size (")	16x18x1 (2)		16x18x1 (2)		16x18x1 (2)		16x18x1(2)		16x18x1 (2)		16x18x1 (2)	
Min. Cool Cap. (Tons)	1.5		1.5		3		2		3		3	
Max. Cool Cap. (Tons)	3		3		4		3.5		5		5	

Gas Conversion Kits

Nat to LP NAHF002LP (*1009509) or NAHL002LP (*1160991)

LP to Nat NAHF002NG, *1009510*

LP High Altitude *1160992

* Must be ordered from Service Parts

+ Tentative

Manufacturers Number (Mfr No -See Rating Plate**)**
ALL Models

Specifications

	*8MPV050B12A		*8MPV075F14A		*8MPV100J20A		*8MPV125J20A	
General								
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Transformer Size (VA)	40	40	40	40	40	40	40	40
T'stat Heat Anticipator	.10	.10	.10	.10	.10	.10	.10	.10
Input (Btuh) Std/Alt. Hi Fire	50,000		75,000		100,000		125,000	
Lo Fire	35,000		52,500		70,000		87,500	
Output (Btuh) Std/Alt. Hi Fire	40,000		60,000		81,000		101,000	
Lo Fire	28,000		42,000		61,000		71,000	
Temp. Rise (°F) Hi Fire	30-60		30-60		35-65		30-60	
Lo Fire	25-55		25-55		35-65		25-55	
Electrical (Volts/Hz/FLA)	115/60/8.2		115/60/9		115/60/12		115/60/12	
Gas & Ignition								
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Std. Main Orifices (No/Size)	2/#42	2/#54	3/#42	3/#54	4/#42	4/#54	5/#42	5/#54
Gas Valve (Honeywell)	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541
Regulation Type	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP
Manifold Press. Hi Fire (″ WC)	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0
Lo Fire (″ WC)	1.7	4.9	1.7	4.9	1.7	4.9	1.7	4.9
Pilot Orifice Size	.018	.011	.018	.011	.018	.011	.018	.011
Ignition Type/Series	HW HSP	HW HSP	HW HSP	HW HSP	HW HSP	HW HSP	HW HSP	HW HSP
Combustion								
Flue Outlet Size (Inches)	4	4	4	4	4	4	4	4
Limits & Controls								
Fan Control (Type)	HW ST9162		HW ST9162		HW ST9162		HW ST9162	
Fan Control On delay	30		30		30		30	
(Timed-secs) Off delay	60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180	
Thermal Sensor (°F)	300		300		300		300	
Limit Control Setting (°F)	See Limit in Parts List		See Limit in Parts List		See Limit in Parts List		See Limit in Parts List	
Std. Pressure Sw. (Part #)	1013862		1013862		1013862		1013862	
Hi Fire Press (Close)	-0.69		-0.69		-0.69		-0.69	
Hi Fire Press (Open)	-0.59		-0.59		-0.59		-0.59	
Lo Fire Press (Close)	-0.40		-0.40		-0.40		-0.40	
Lo Fire Press (Open)	-0.30		-0.30		-0.30		-0.30	
Blower Data								
Type & Size	11-8		11-10		11-10		11-10	
Motor Amps/Rpm	4.6/1050		12/900		12/900		12/900	
Motor Type/H.p.	DC/1/2		DC/1		DC/1		DC/1	
Filter Type	Washable		Washable		Washable		Washable	
Filter Size (″)	14x25x1/2		16x25x1/2		16x25x1/2 (2)		16x25x1/2 (2)	
Min. Cool Cap. (Tons)	1.5		1.5		3		3	
Max. Cool Cap. (Tons)	3		3.5		5		5	
Gas Conversion Kits								
Nat to LP	*1011789		*1011789		*1011789		*1011789	
LP to Nat	*1011787		*1011787		*1011787		*1011787	

*Must be ordered from Service Parts
Use the Fuel Gas Code to establish proper vent sizing.

Manufacturers Number (Mfr No –See Rating Plate**)**
ALL Models

Specifications

	*8MPT050B12A		*8MPT075F14A		*8MPT100F14A		*8MPT100J20A		*8MPT125J20A	
General										
Gas Type	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Input (Btuh) Std/Alt. Hi Fire	50,000		75,000		100,000		100,000		125,000	
Lo Fire	35,000		52,500		70,000		70,000		87,500	
Output (Btuh) Std/Alt. Hi Fire	40,000		60,000		81,000		81,000		101,000	
Lo Fire	28,000		42,000		57,000		61,000		71,000	
Temp. Rise (°F) Hi Fire	30-60		30-60		35-65		35-65		30-60	
Lo Fire	25-55		25-55		35-65		35-65		25-55	
Electrical (Volts/Hz/FLA)	115/60/5.3		115/60/9.2		115/60/9.2		115/60/12		115/60/12	
Transformer Size (VA)	40	40	40	40	40	40	40	40	40	40
T'stat Heat Anticipator	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Gas & Ignition										
GStd. Main Orifices (No/Size)	2/#42	2/#54	3/#42	3/#54	4/#42	4/#54	4/#42	4/#54	5/#42	5/#54
Gas Valve (Honeywell)	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541	SV 9541
Regulation Type	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP	SNAP
Manifold Press. Hi Fire (″ WC)	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0	3.5	10.0
Lo Fire (″ WC)	1.7	4.9	1.7	4.9	1.7	4.9	1.7	4.9	1.7	4.9
Pilot Orifice Size	.018	.011	.018	.011	.018	.011	.018	.011	.018	.011
Ignition Type/Series (Honeywell)	HSP	HSP	HSP	HSP	HSP	HSP	HSP	HSP	HSP	HSP
Combustion										
Flue Outlet Size (Inches	4	4	4	4	4	4	4	4	4	4
Limits & Controls										
Fan Control (Type)	HW ST9162A		HW ST9162A		HW ST9162A		HW ST9162A		HW ST9162A	
Fan Control On delay	30		30		30		30		30	
(Timed-secs) Off delay	60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180		60,100,140,180	
Thermal Sensor (°F)	300		300		300		300		300	
Limit Control Setting (°F)	See Limit in Parts List		See Limit in Parts List		See Limit inParts List		See Limit in Parts List		See Limit in Parts List	
Std. Pressure Sw. (Part No)	1013862		1013862		1013862		1013862		1013862	
Hi Fire Press (Close)	-0.69		-0.69		-0.69		-0.69		-0.69	
Hi Fire Press (Open)	-0.59		-0.59		-0.59		-0.59		-0.59	
Lo Fire Press (Close)	-0.40		-0.40		-0.40		-0.40		-0.40	
Lo Fire Press (Open)	-0.30		-0.30		-0.30		-0.30		-0.30	
Blower Data										
Type & Size	11-8		11-10		11-10		11-10		11-10	
Motor Amps/Rpm	10.3/1100		10.3/1100		8/900		10/1050		10/1050	
Motor Type/H.p.	PSC/1/2		PSC/1/2		PSC/1/2		PSC/3/4		PSC/1/2	
Cap. Mfd/Volts	10/370		10/370		7.5/370		40/370		40/370	
Filter Type	Washable		Washable		Washable		Washable		Washable	
Filter Size (″)	14x25x1		16x25x1		16x25x1		16x25x1 (2)		16x25x1 (2)	
Min. Cool Cap. (Tons)	1.5		1.5		1.5		3		3	
Max. Cool Cap. (Tons)	3		3.5		3.5		5		5	
Gas Conversion Kits										
Nat to LP	*1011789		*1011789		*1011789		*1011789		*1011789	
LP to Nat	*1011787		*1011787		*1011787		*1011787		*1011787	

*Must be ordered from Service Parts
Use the Fuel Gas Code to establish proper vent sizing.

27. Circulation Air Blower Data

N8MPN/L050B12 & *8MPN/L050B12

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	454	672	1116	1335
	.30	351	609	1055	1237
	.50	278	550	991	1160
	.70	201	498	897	1029
	.90	---	422	783	903
	1.00	---	353	718	822

N8MPN/L075B12 & *8MPN/L075B12

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	665	925	1171	1501
	.30	616	893	1136	1407
	.50	563	840	1074	1307
	.70	517	741	977	1200
	.90	442	650	866	1050
	1.00	394	593	804	963

N8MPN/L075F16 & *8MPN/L075F16

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	803	1091	1548	2194
	.30	760	1082	1557	2070
	.50	699	1028	1500	1913
	.70	618	934	1369	1708
	.90	502	772	1138	1447
	1.00	423	661	984	1254

N8MPN100F14 & *8MPN100F14

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	742	916	1287	1723
	.30	625	845	1195	1638
	.50	525	747	1079	1515
	.70	440	662	1006	1371
	.90	348	553	868	1185
	1.00	297	490	787	1066

N8MPN/L100F20, *8MPN/L100F20, N8MPL100J20 & *8MPN/L100J20

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	1845	2058	2285	2508
	.30	1790	1992	2189	2379
	.50	1714	1903	2066	2232
	.70	1592	1769	1914	2049
	.90	1404	1571	1711	1839
	1.00	1291	1444	1541	1694

* Denotes Brand

N8MPN/L100J22

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	1820	2144	2218	2252
	.30	1747	1982	2135	2254
	.50	1680	1862	1996	2092
	.70	1551	1668	1819	1899
	.90	1353	1448	1584	1744
	1.00	1253	1380	1504	1633

N8MPN/L125J20 & *8MPN/L125J20

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	839	1211	1584	2267
	.30	829	1188	1559	2151
	.50	798	1111	1553	2049
	.70	734	1079	1505	1912
	.90	651	1015	1400	1704
	1.00	595	897	1308	1585

N8MPN/L125J22

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	1832	2041	2257	2366
	.30	1766	1958	2144	2291
	.50	1700	1864	2001	2116
	.70	1567	1705	1812	1956
	.90	1393	1507	1639	1750
	1.00	1284	1395	1529	1618

*8MPN150J20

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	LOW	MED L	MED H	HIGH
	.10	1590	1827	2073	2283
	.30	1519	1708	1993	2262
	.50	1440	1623	1904	2150
	.70	1331	1525	1774	1991
	.90	1163	1381	1579	1813
	1.00	1079	1277	1494	1694

*8DNL050B12/075F16

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	**LOW**	**MED L**	**MED H**	**HIGH**
	.10	673	929	1211	1481
	.30	599	815	1138	1365
	.50	490	733	1049	1266
	.70	394	595	884	1068
	.90	297	451	641	910
	1.00	238	420	510	777

*8DNL075B12

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	**LOW**	**MED L**	**MED H**	**HIGH**
	.10	649	748	975	1390
	.30	540	668	926	1317
	.50	445	575	1172	1201
	.70	379	463	733	1056
	.90	216	300	592	882
	1.00	168	192	524	768

*8MDNL100F14

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	**LOW**	**MED L**	**MED H**	**HIGH**
	.10	714	963	1310	1812
	.30	553	845	1216	1658
	.50	463	742	1125	1546
	.70	365	658	989	1425
	.90	---	629	834	1233
	1.0	---	419	733	1083

* Denotes Brand

*8DNL100F14

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	**LOW**	**MED L**	**MED H**	**HIGH**
	.10	1738	1963	2150	2288
	.30	1651	1839	2015	2125
	.50	1560	1722	1859	1975
	.70	1421	1566	1699	1789
	.90	1239	1385	1500	1583
	1.00	1030	1225	1361	1451

*8DNL125L20

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)				
	TAP	**LOW**	**MED L**	**MED H**	**HIGH**
	.10	1860	2085	2226	
	.30	1776	1954	2138	2246
	.50	1662	1830	1981	2084
	.70	1478	1629	1787	1878
	.90	1279	1432	1539	1623
	1.00	1168	1301	1369	1478

Circulation Air Blower Data - *8MPV

Heating, Cooling & Continuous Airflow Settings

Continuous Blower (CFM) @ 0.10″ Static

Switch Settings		Furnace Model		
#1	*#2*	*50K*	*75K*	*100/125K*
0*	0*	911	1046	1174
0	1	777	903	1032
1	0	664	771	858
1	1	542	632	698

*Factory Setting

Heating Air Temperature Adjustment (° F)*

Switch Settings			Furnace Model			
#3	*#4*	*#5*	*50K*	*75K*	*100K*	*125K*
0**	0**	0**	0	0	0	0
0	0	1	1	1	3	3
0	1	0	2	2	5	5
0	1	1	3	4	7	8
1	0	0	6	5	8	10
1	0	1	-3	-3	-5	-1
1	1	0	-5	-6	-8	-2
1	1	1	-7	-9	-12	-4

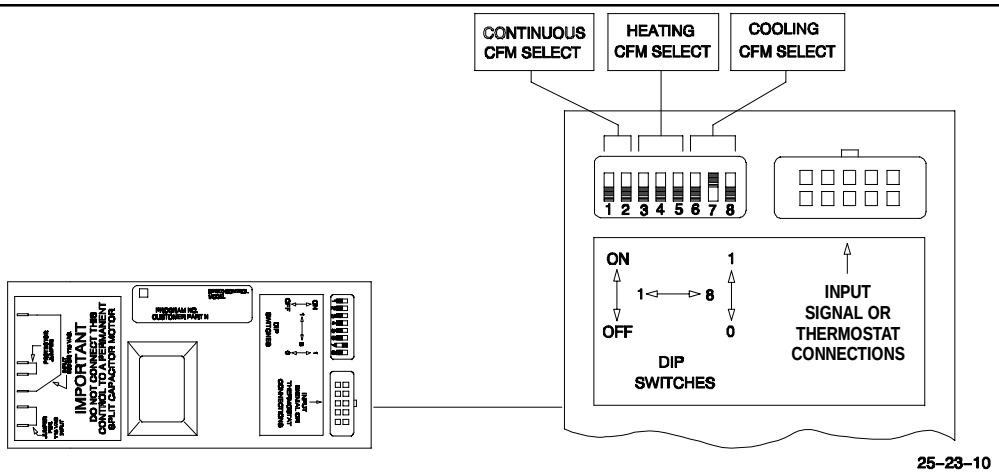
*Approximate air temperature change from factory setting @ 0.20″ static on high heat)low heat speed changes with change of high heat speed on most settings)
**Factory setting

Cooling (CFM) @ 0.50″ Static
(See Figure 1 - 3 for complete Airflow Range)

Switch Settings			Furnace Model		
#6	*#7*	*#8*	*50K*	*75K*	*100/125K*
0*	0*	0*	1167	1414	2169
0	0	1	1115	1306	2003
0	1	0	1000	1209	1806
0	1	1	907	1105	1601
1	0	0	810	1009	1408
1	0	1	760	907	1204
1	1	0	703	842	1006
1	1	1	656	816	813

*Factory setting

Blower Motor Settings



0 1 0

***EXAMPLE**
Cooling Airflows Switches 6, 7 & 8:

000 3.5 Ton
001 3.0 Ton
010 2.5 Ton
011 2.0 Ton

***See "Technical Support Manual" for correct airflow rates.**

Circulation Air Blower Data - *8MPV

Heating, Cooling & Continuous Airflow Settings

Figure 1

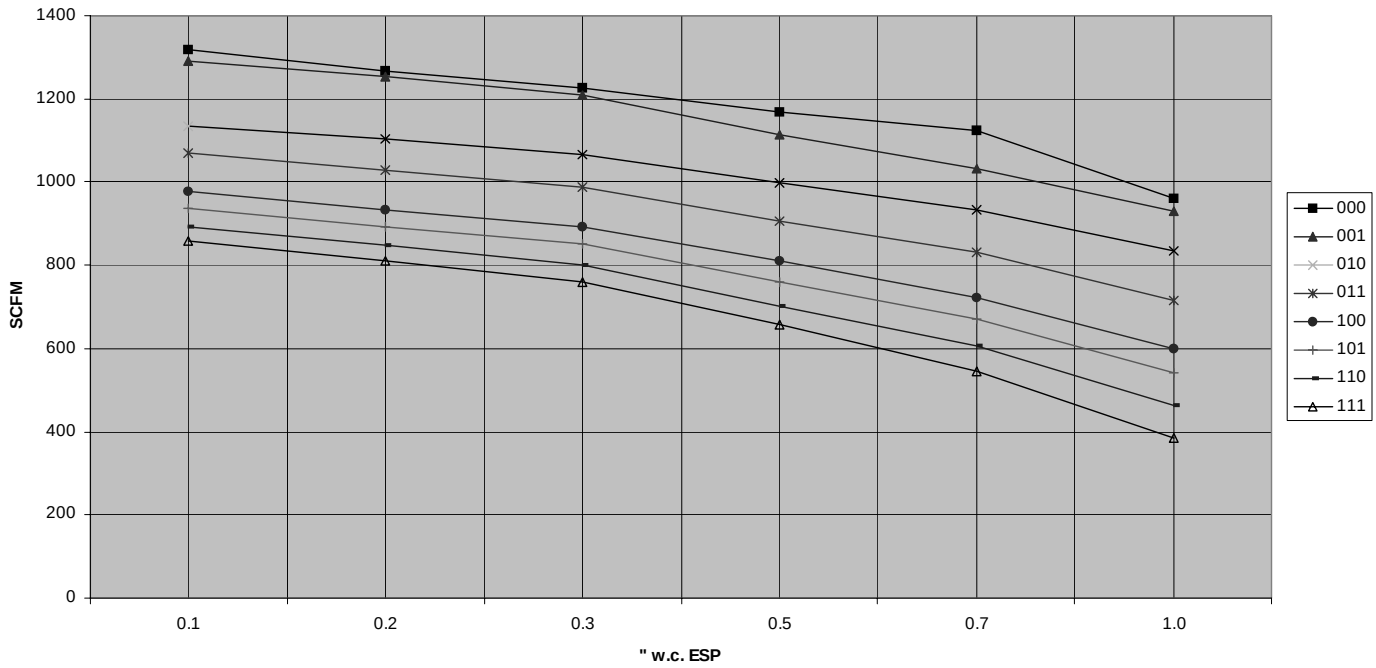
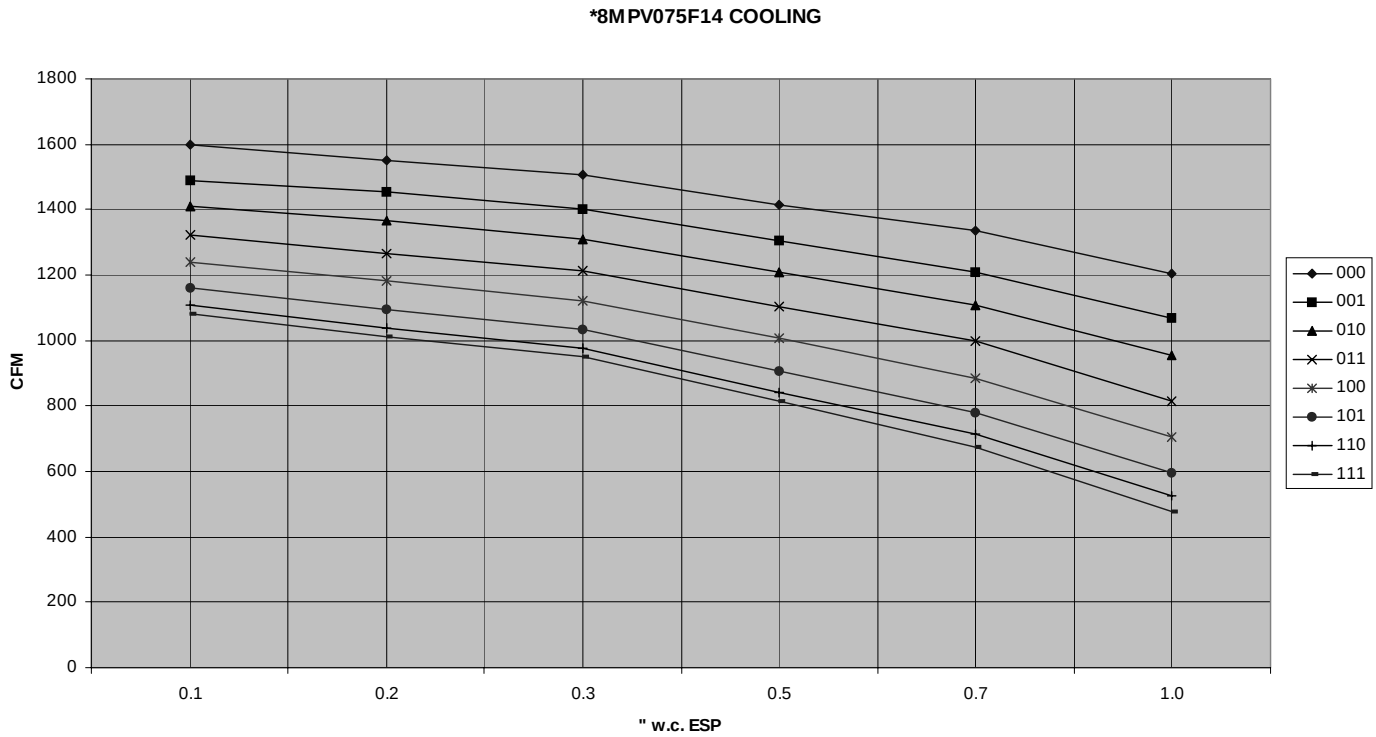


Figure 2



Circulation Air Blower Data - *8MPV

Heating, Cooling & Continuous Airflow Settings

Figure 3

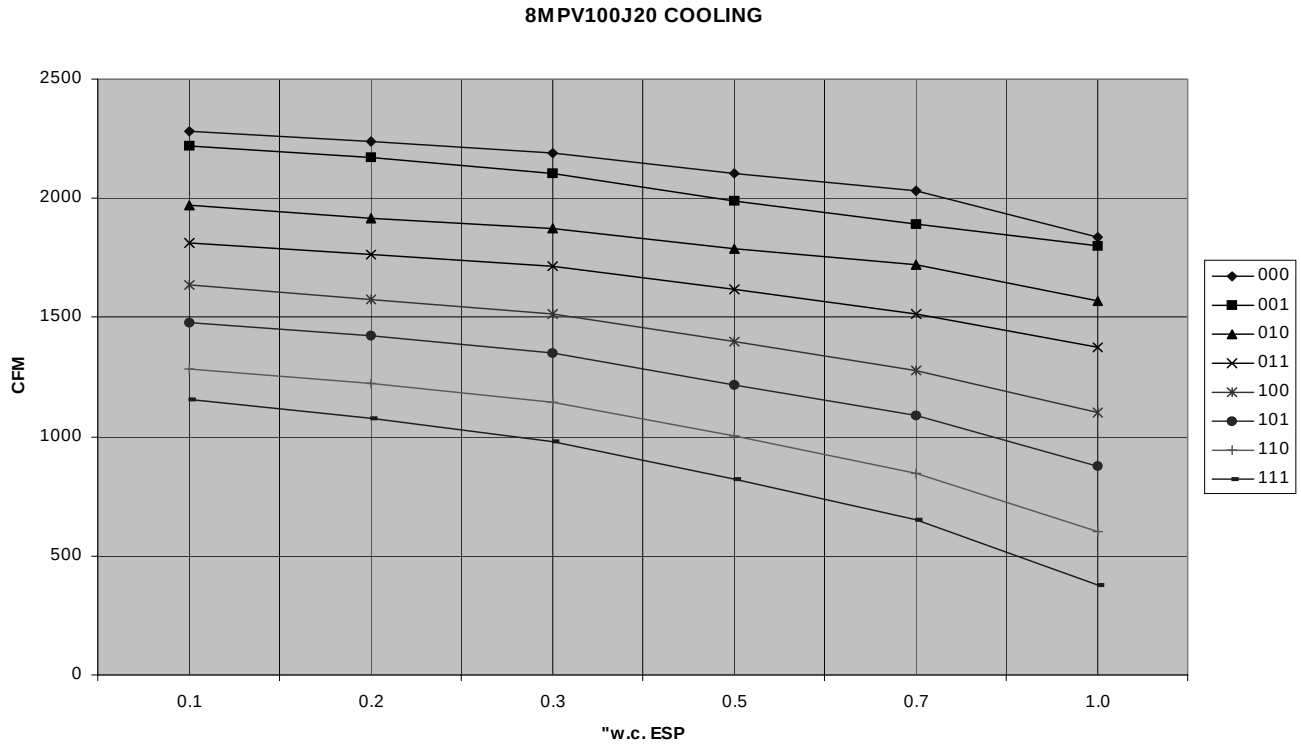
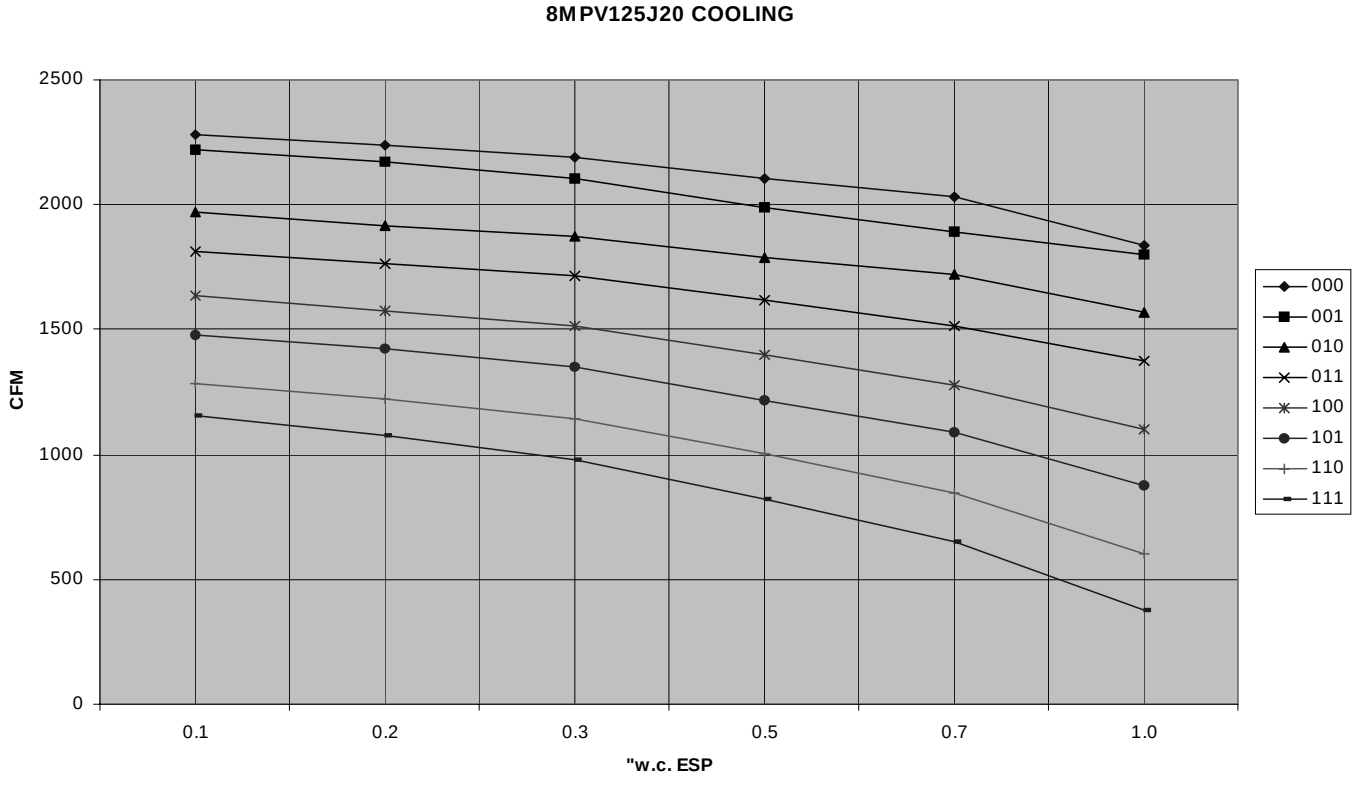


Figure 4



CIRCULATION AIR BLOWER DATA

*8MPT050B

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	675	859	--	1015	1394
	.20	662	846	--	999	1342
	.30	651	819	--	977	1289
	.40	636	795	--	952	1227
	.50	608	765	--	914	1163
	.60	564	735	--	870	1086
	.70	514	685	--	818	1002

*8MPT075F14 & *8MPT100F14

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	691	882	--	1211	1633
	.30	591	850	--	1155	1544
	.50	536	785	--	1089	1464
	.70	433	711	--	982	1307
	.90	342	856	--	850	1120
	1.00	308	527	--	763	1041

*8MPT100J20

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	1210	1441	--	1773	2104
	.20	1201	1430	--	1740	2078
	.30	1197	1453	--	1740	2061
	.40	1191	1441	--	1718	2020
	.50	1167	1425	--	1707	2005
	.60	1160	1390	--	1676	1953
	.70	1130	1365	--	1654	1917

*8MPT125J20

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5″ WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	1264	1520	--	1841	2161
	.20	1251	1506	--	1803	2132
	.30	1249	1486	--	1772	2079
	.40	1219	1456	--	1736	2042
	.50	1168	1427	--	1702	1991
	.60	1178	1415	--	1672	1914
	.70	1143	1358	--	1614	1838

INDEX

INDEX