Installation Instructions

Variable Speed Blower Kit for Gas Furnace Applications

⚠ WARNING!

To avoid the risk of electrical shock, personal injury, or death, disconnect electrical power before installing this kit or performing maintenance.

Before beginning installation, read these instructions thoroughly and follow all warning and cautions in these instructions and on the unit. These instructions are primarily intended to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/ service personnel for this type of equipment. Improper installation, service, adjustment, or maintenance can cause fire, electrical shock or other conditions which may result in personal injury or property damage. Unless otherwise noted in the instructions, only factory authorized kits or accessories may be used when modifying this product.

1. SPECIFICATIONS

The variable speed blower kit is designed for installation in gas furnaces, “B” and “C” cabinet models only. This kit is not applicable for “A” cabinet models. This kit may be field-configured for air conditioning/heat pump airflows from 2 to 5 tons nominal capacity.

2. INSTALLATION REQUIREMENTS

Check Equipment - After unpacking, inspect the kit thoroughly for concealed damage. If damage is found, notify the transportation company immediately and file a concealed damage claim. All installations shall be made as described in the installation instructions and in accordance with applicable national and local codes including the requirements of local utilities.

3. INSTALLATION

Upflow Installations

1. Disconnect electrical power to the furnace.
2. Remove the upper and lower access doors from the furnace.
3. Remove the electrical plug containing the blower wires from the receptacle located on the left side of the blower deck.
4. Remove the blower assembly from the furnace.
5. Attach the blower mounting brackets to the variable speed blower. The brackets may be included with the kit or may be taken from the old blower.
6. Slide the variable speed blower kit into the furnace. Be sure that the sides of the blower are captured by all of the blower mounting tabs in the blower deck. Secure with the two screws removed in step 4.
7. Remove the plastic cap from the extra hole in the blower deck located on the left side.
8. Route the bundle of wires coming from the control box of the kit through the extra hole in the blower deck. Secure the wires through the hole using the strain relief bushing provided.
9. Skip to section marked “All Applications”.

Downflow Installations

For downflow installations, the blower control box will be mounted separately from the blower. Begin installation by preparing the blower as follows.

1. Remove the blower control panel from the blower leaving all wiring connected.
2. Attach included mounting feet to the control box. Mount so that the mounting flanges are parallel to the control box and facing out.

80+ Downflow

1. Disconnect electrical power to the furnace
2. Remove the upper and lower access doors.
3. Remove the blower motor leads from the control board.
4. Remove the flue pipe from in front of the blower access door.
5. Remove the blower access door.
6. Slide the entire blower assembly out of the furnace.
7. Install the variable speed blower into the furnace with the motor on the left side. Be sure that the sides of the blower are captured by the blower mounting tabs in the blower deck.
8. Re-install the blower access door and carefully route the blower wiring through the strain-relief bushing on the left side.
9. Mount the blower control box onto the blower access door. If the unit does not have holes provided, add 1/8” holes per Fig. 1.
10. Skip to section marked “All Installations”.

90+ Downflow

1. Disconnect electrical power to the furnace.
2. Remove the upper and lower access doors.
3. Remove the blower motor leads from the control board.
4. Remove the flue pipe and combustion air intake where it is in front of the blower access door.
5. With other wiring still intact, remove the blower access door and carefully place aside, being careful not to damage the components or wiring.
6. Slide the entire blower assembly out of the furnace.
7. Install the variable speed blower into the furnace with the motor on the left side. Be sure that the sides of the blower are captured by the blower mounting tabs in the blower deck.
8. Re-install the blower access door and carefully route the blower wiring through the strain-relief bushing on the left side.
9. Mount the blower control box onto the blower access door. If the unit does not have holes provided, add 1/8" holes per Fig. 1. Also, if mounting holes are not

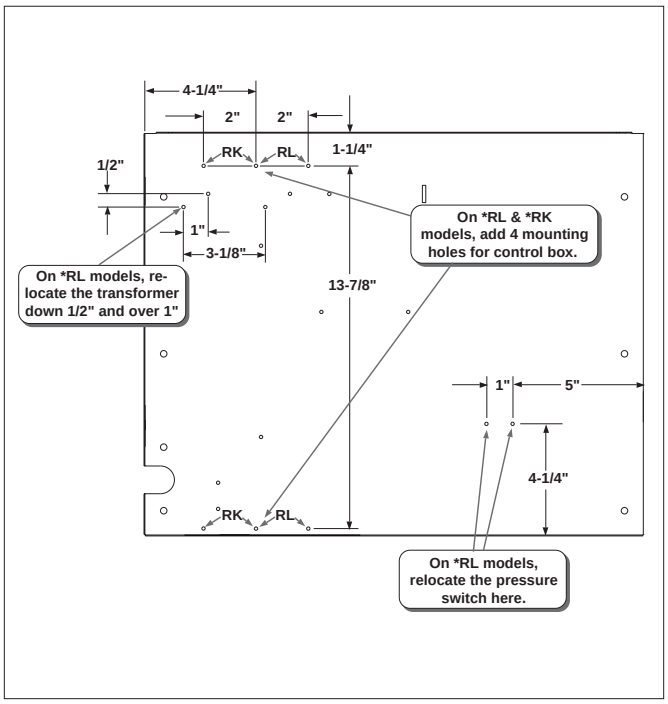

Figure 1. Downflow Blower Access Door

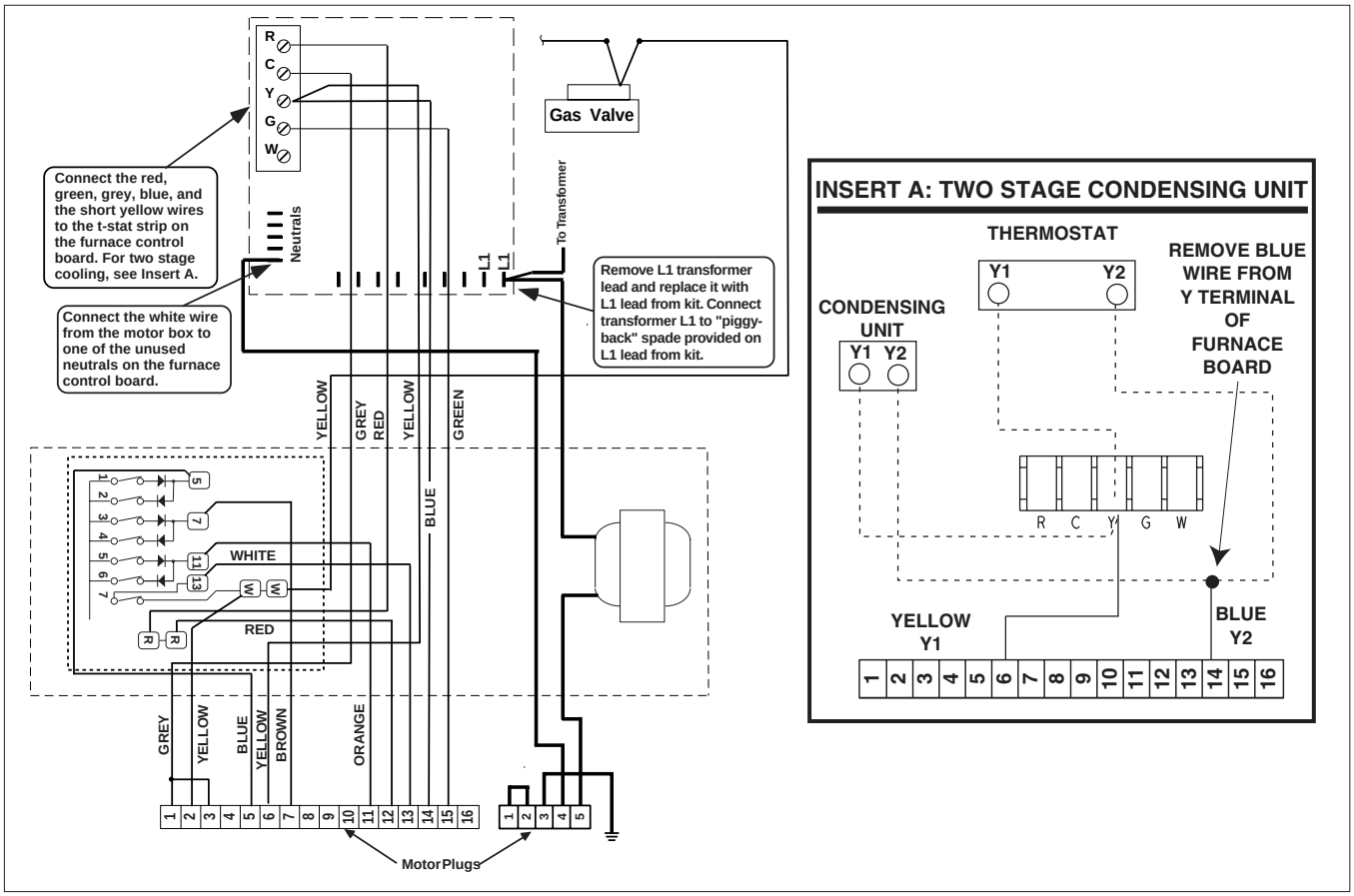

Figure 2. Wiring Diagram

included in the furnace, the transformer and the pressure switch will have to be re-located:

a. Remove the transformer.

b. Drill new 1/8" mounting holes per Fig. 1.

c. Re-install the transformer using the new mounting holes.

d. Remove the pressure switch and pressure switch tubing.

e. Drill new 1/8" mounting holes per Fig. 1.

f. Re-install the pressure switch using the new mounting holes and connect using the supplied tubing.

All Installations

1. Connect wires to the furnace according to the wiring diagram, Fig. 2. Use the "Y" adapter supplied in the literature pouch to connect the long yellow wire to the gas valve. Connect the remaining wires for power supply and thermostat interface according to Fig. 2.

When connecting with a two-stage condensing unit, reference Insert A on Figure 2.

⚠ IMPORTANT!

On downflow 80% installations, wires must be routed away from hot surfaces.

NOTE: The wires coming from the bottom of the variable speed blower control box are connected to the blower motor at the factory. Check these connections and tighten as necessary

2. Remove the cover of the variable speed blower control box. Refer to section 4 and configure the blower.

   NOTE: Changes to blower configuration must be made with the power to the unit OFF. Changes made with power ON may be ignored by the blower.

3. Re-install the variable speed blower control box cover and the furnace access panels.

4. Restore power to the furnace. Installation is now complete.

4. CONFIGURING THE BLOWER

The variable speed blower kit is equipped with a microprocessor-controlled variable speed motor that is pre-programmed to deliver optimum airflow in a variety of conditions and system configurations. Before operation, the variable speed blower kit must be configured to match the unit with the system, system options, and climatic conditions. With the variable speed blower kit installed and configured properly, the furnace will respond directly to thermostat inputs. During normal operation, the motor will gradually change speed in response to changes in system variables such as the thermostat settings, duct static, filter, etc. The variable speed blower kit is configured by setting the 7 switches located on the motor control board as described below.

⚠ IMPORTANT!

The variable speed blower kit has been designed to give the installer maximum flexibility to optimize system performance, efficiency, and comfort. Because there are so many ways to configure the kit it is important to read and follow these instructions carefully.

Determining Nominal System Capacity (A/C & H/P)

In order to select the appropriate airflow for AC and HP operation the nominal system capacity must be known. The nominal system capacity is ALWAYS the nominal capacity of the outdoor unit. In some cases the nominal system capacity is not the same as the nominal capacity of the indoor coil.

Selecting The Cooling/Heat Pump Airflow

The cooling/heat pump airflow is selected by setting switches 1 through 4 on the motor control board located in the blower control panel. All airflows for other modes of operation (except gas heat) are determined by this setting. Table 1 shows the airflow values versus the airflow selector switch settings, and the range of airflow settings recommended for each nominal system capacity.

NOTE: The CFM values listed in the tables are not dependent on duct static pressure. The motor automatically compensates for changes in duct static pressure (within the limits of the motor).

NOTE: For single stage cooling, the indoor blower will operate at the CFM called out in the "High" column of Table 1.

For maximum capacity and energy efficiency, generally, a selection at or near the top of the CFM range for that nominal capacity is best. For maximum dehumidification, select an airflow near the middle or bottom of the CFM range for that nominal capacity.

NOTE: If coil icing is observed, the cooling/heat pump airflow selected may be too low. Double-check to be sure the setting selected is within the range shown in Table 1. Also check to be sure the system is properly charged (see outdoor unit Installation Instructions). If icing continues to occur, raise the selected airflow one or two steps.

Selecting The (Gas) Heating Airflow

The heating airflow is selected by setting switches 5, 6, and 7. Refer to Table 2 and select a nominal rise based on the furnace nominal efficiency and input. Follow the table column up to find the switch setting and nominal air-flow. Be sure that the selected rise is within the specification of the furnace as shown on the furnace rating label.

5. SYSTEM OPERATION

Cooling or Heat Pump Mode

When the thermostat calls for cooling or heat pump heating the circuit between R, G, and Y (O is ignored by the blower)

CFM		SWITCH NUMBER							Nominal A/C and HP Capacity
LOW	HIGH	1	2	3	4	5	6	7	
500	720	0	0	0	1				
550	800	0	0	0	0				
610	880	0	0	1	0				
650	945	1	0	0	1				
720	1050	1	0	0	0				
800	1155	1	0	1	0				
900	1305	0	1	0	1				
1000	1450	0	1	0	0				
1060	1530	1	1	0	1				
1100	1595	0	1	1	0				
1170	1700	1	1	0	0				
1290	1870	1	1	1	0				

2 TON
2.5 TON
3 TON
3.5 TON
4 TON
5 TON

Note: O = Off 1 = On

Table 1. All Cooling/Heat Pump Airflow Settings

is completed and the blower begins a pre-programmed on-cycle "profile". First, the blower ramps up to approximately 1/3 of the selected airflow and stays there for 30 seconds. Next, the blower ramps to approximately 3/4 of the selected airflow and stays there for another 30 seconds. The blower then ramps up to the selected airflow until the thermostat is satisfied. A one-minute off-cycle delay at approximately 1/2 of the selected airflow is initiated when the call from the thermostat ends.

IMPORTANT NOTE: When installing a 2-stage heat pump and a fossil fuel kit, the transformer MUST be upgraded to one with a 60VA rating (P/N 904077).

(Gas) Heating Mode

When the thermostat calls for heating the circuit between R and W is completed. The furnace control board initiates the ignition sequence. When the gas valve is energized a signal is transmitted to the blower through the wiring added in the blower installation procedure. The blower will start and run at a very low speed. After 30 seconds, the blower ramps up to the selected heating airflow. The blower will operate two minutes after the call for heating is removed. NOTE: Off-cycle delay settings on the furnace control board no longer control off-cycle blower timing. The off-cycle blower timing is preprogrammed into the variable speed blower and is not adjustable.

Manual Fan

When the manual fan switch on the thermostat is on, energizing G only, the blower will ramp to 50% of the selected cooling/heat pump airflow.

		Nominal Air-Flow							
		720	900	1056	1200	1350	1500	1656	1800
Switches	7	1	0	1	0	1	0	1	0
	6	0	0	0	0	1	1	1	1
	5	0	0	1	1	0	0	1	1
80+%	72,000		59	**51**	44				
	90,000			63	**55**	49	44		
	96,000			67	59	**53**	47		
	108,000				67	**59**	53	48	
	120,000					66	**59**	54	49
	126,000					69	62	**56**	51
	144,000						71	**64**	59
92+%	80,000			67	**59**	52	47		
	100,000				73	65	**59**	53	49
	120,000						71	**64**	59
		Temperature Rise °F (Recommended settings are **Bold**)							

NOTE: 0 = OFF 1 = ON

Table 2. Heating Airflow Settings