

1-Stage Furnace Blower Guard Kit

SAFETY CONSIDERATIONS

The following symbols and labels are used throughout this manual to indicate immediate or potential safety hazards. It is the owner's and installer's responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of personal injury, property damage, and/or product damage.



WARNING

ONLY PERSONNEL THAT HAVE BEEN TRAINED TO INSTALL, ADJUST, SERVICE OR REPAIR (HEREINAFTER, "SERVICE") THE EQUIPMENT SPECIFIED IN THIS MANUAL SHOULD SERVICE THE EQUIPMENT. THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SERVICE OR SERVICE PROCEDURES. IF YOU SERVICE THIS UNIT, YOU ASSUME RESPONSIBILITY FOR ANY INJURY OR PROPERTY DAMAGE WHICH MAY RESULT. IN ADDITION, IN JURISDICTIONS THAT REQUIRE ONE OR MORE LICENSES TO SERVICE THE EQUIPMENT SPECIFIED IN THIS MANUAL, ONLY LICENSED PERSONNEL SHOULD SERVICE THE EQUIPMENT. IMPROPER INSTALLATION, ADJUSTMENT, SERVICING OR REPAIR OF THE EQUIPMENT SPECIFIED IN THIS MANUAL, OR ATTEMPTING TO INSTALL, ADJUST, SERVICE OR REPAIR THE EQUIPMENT SPECIFIED IN THIS MANUAL WITHOUT PROPER TRAINING MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

DESCRIPTION

Blower Guard Kit (BGK-1S) is designed for use with Goodman, Amana & Daikin residential up-flow gas furnaces equipped with:

- 1) Constant torque ECM , or PSC indoor blower motor.
AND
- 2) Single-stage gas valve.
- 3) Single-speed draft inducer

Applicable Furnace Models:

GKS9**, GMES92**, GMSS92**, GMES96**,
GMSS96**, AKSS92**, AMES92**, AMSS92**,
AMES96**, AMSS96**, DK92SS**, DM92SE**,
DM92SS**, DM96SE**, VMES96**, VMSS96**

NOTE: This Blower Guard kit is not suitable for use on products with constant airflow ECM motors.

LIST OF TOOLS REQUIRED TO COMPLETE THIS INSTALLATION

Electric Drill
File or Debur Tool
3/8" Drill Bit
1/4" Nut Driver Bit
5/16" Nut Driver Bit
Tape
Multimeter
Needle Nose Pliers

KIT CONTENTS

Quantity	Description	Service part
1	Blower guard PCB	PCBBF150
1	3/8 Grommet	-
1	"U" Shaped Copper Tube	-
1	Pressure Switch	0130F01057
1	Pressure Switch Mounting Template	-
2	3/8 #8 Drill Point Screws	-
3	1 #6 Drill Point Screws	-
1	Wire Harness	0159F00155
1	2" Rubber Hose	-
3	Zip Tie	-
1	Wire Diagram Label	-
2	ATTENTION Label	-

IMPORTANT INFORMATION

This kit is designed to open the electrical circuit of the gas valve in the event of indoor-air blower motor failure. Pressure generated by the indoor-air blower will be monitored by a pressure switch mounted to the blower housing. In addition, routing the motor neutral wire through the current sensing component of the PCB provides electrical monitoring of blower operation. The supplied wire harness adapter will provide electrical connections between existing furnace low voltage wiring, Blower Guard PCB, and pressure switch. **BEFORE PROCEEDING, SHUT OFF GAS SUPPLY AT MANUAL SHUTOFF AND TURN OFF POWER TO UNIT.**

NOTE: To ensure proper operation, install, operate and maintain the unit in accordance with these installation instructions, all local building codes and ordinances. In their absence, follow the latest edition of the National Fuel Gas Code (NFPA 54/ANSI Z223.1), and/or CAN/CSA B149.1 Installation Codes.



INSTALLATION

- 1) Disconnect all wiring from furnace main control board.
- 2) Remove drain trap assembly.
- 3) From blower compartment, locate and remove screws from blower support rails. (see figure 1)

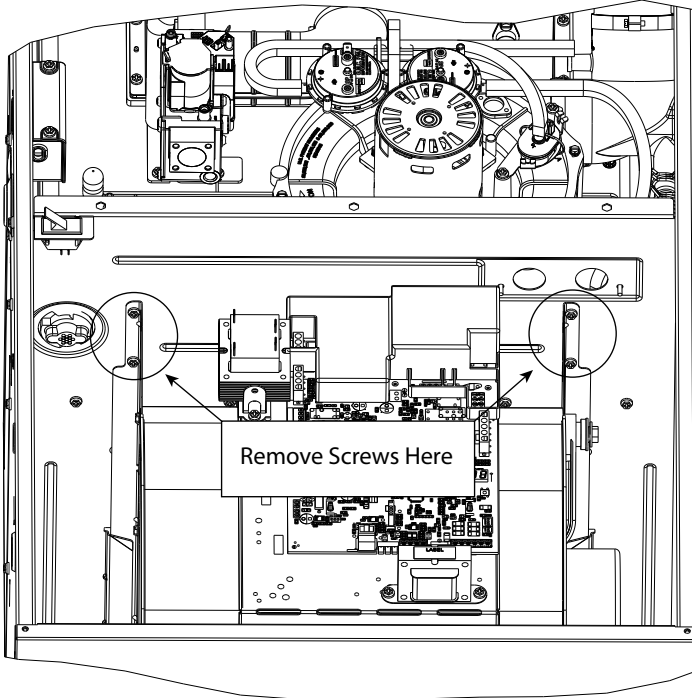


Figure 1

- 4) Remove blower assembly by pulling it from blower compartment.
- 5) Cut out pressure switch mounting template located on page 7 and affix to the backside of blower housing with tape. Ensure template is centered between the scroll housing sides and the top of the template is adjacent to the blower housing flange (See figure 2). Mark locations for rubber grommet and pressure switch mounting. Remove template after use.

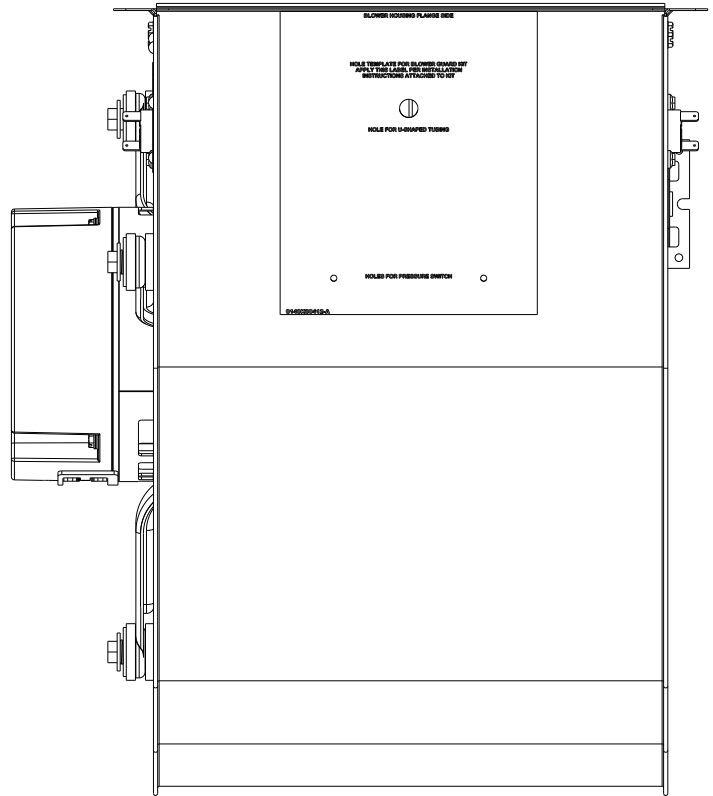


Figure 2

- 6) Drill 3/8" hole in blower housing at location marked "HOLE FOR U-SHAPE TUBING" Remove any burrs. Install 3/8" grommet.
- 7) Place pressure switch onto blower housing with pressure taps facing the flange so the bracket aligns with holes previously marked for "HOLES FOR PRESSURE SWITCH" from template.
- 8) Install provided 3/8" #8 drill point screws to affix pressure switch to blower housing.
- 9) Install copper "U" tube through grommet and connect 2" rubber hose between the copper tube and black port on pressure switch (see figure 3). Ensure the hose is securely attached on both sides. Ensure copper "U" tube inside blower housing is pointed down.

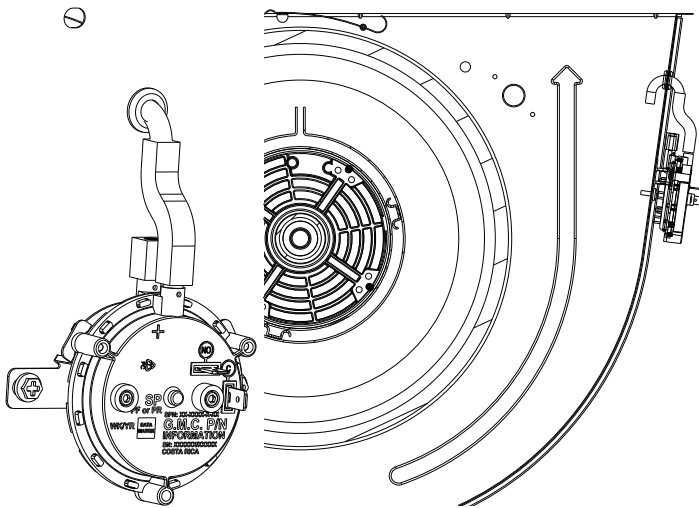
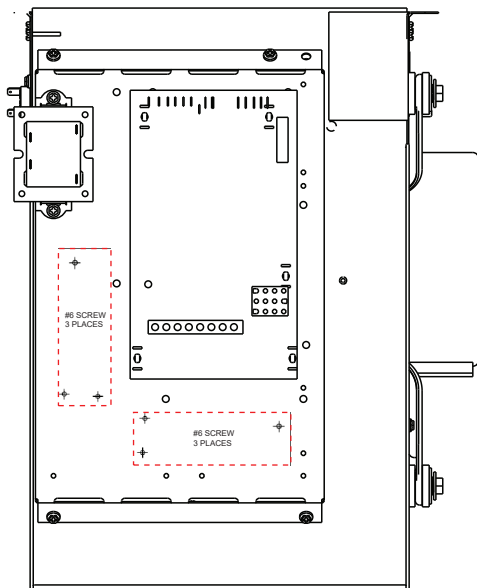


Figure 3

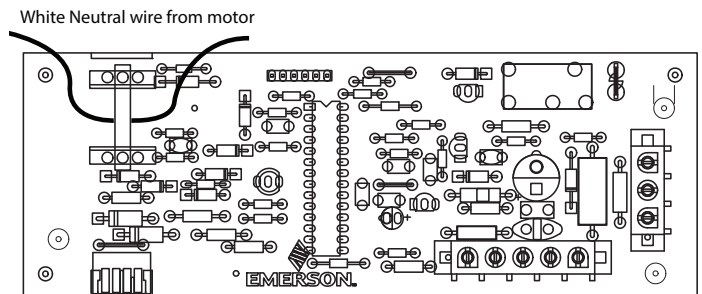
- 10) Install pressure switch wiring connections. Route wiring alongside existing auxiliary limit wires on the motor side. Secure harness wiring by affixing to auxiliary wires with provided zip tie.
- 11) Re-install blower housing & drain trap assemblies.
- 12) Find a suitable mounting location for the Blower Guard PCB on the existing furnace control mounting panel. Verify that the kit wiring harness will extend to the proposed location of Blower Guard PCB. The Blower Guard PCB must be located so that it does not interfere or come into contact with existing components. (see figure 4)



Suggested Locations for Blower Guard PCB
Figure 4

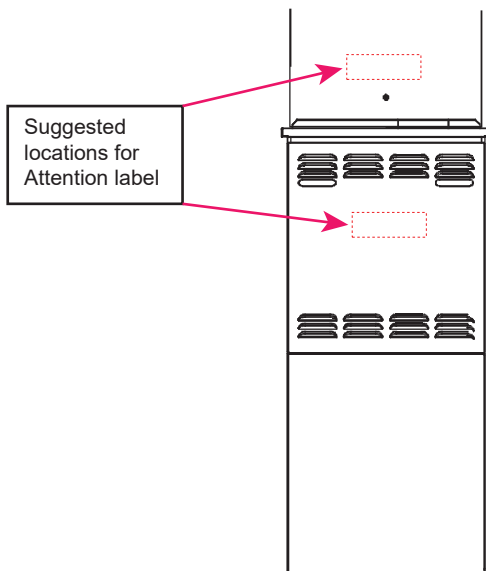
NOTE: Board should be at least 1/4" from other components.

- 13) Using caution to protect wiring and the furnace control board, Install 1" #6 Drill point screws through PCB standoffs.
- 14) Connect the furnace 12-pin harness removed in step 1 to the mating end of the kit harness. Connect the remaining end of the 12-pin kit harness to the furnace PCB 12-pin connection.
- 15) Connect the 5-pin connector of the kit harness to the mating 5-pin location on the Blower Guard PCB.
- 16) Connect the 3-pin connector of the kit harness to the mating 3 pin location on the Blower Guard PCB. Reconnect remaining furnace PCB wires removed in step 1.
- 17) Remove the motor neutral wire from its current location on the furnace main control board.
- 18) Pass (do not loop) the motor neutral wire through the current sensing component of the Blower Guard PCB (see Fig. 5) and connect the neutral wire to its original location on the furnace control board.



Blower Guard PCB
Figure 5

- 19) Leave kit installation instructions on site with the furnace installation manual for future reference.
- 20) Restore electrical supply to furnace, turn on the gas valve & verify operation in heating, cooling, & continuous fan modes.
- 21) Affix the kit wiring diagram label to near the one provided with the original gas furnace.
- 22) Determine an appropriate location on the top furnace door and coil door to affix the ATTENTION labels included with the kit. See Figure 6 for suggested locations. Before affixing the labels to the equipment, ensure that the locations selected are thoroughly cleaned of any dirt and oils. Affix one of the labels on the top door of the furnace and the other to the coil door in the chosen locations.



Suggested Locations for Retrofit Labels
Figure 6

OPERATION

Expected Operation

- 1) Before a heating call, the Blower Guard PCB will be in an idle state with the green LED being constant. When a call for heat is received at the furnace and the gas valve is energized, the Blower Guard PCB enters "Start Up", and the green LED will begin to flash at a 1 second interval.
- 2) Blower operation begins 30 secs. after the flame is sensed.
- 3) The Blower Guard PCB must sense a closed pressure switch and motor current within 50 seconds after gas valve is energized.
- 4) If both closed pressure switch and motor current are detected, the Blower Guard PCB will enter the "Monitor Circulator Blower Running" state and the green LED will flash at half second intervals.

Note: The pressure switch circuit can be verified by measuring voltage across pin 1 & pin 3 on the 5 pin connector. 24V is expected when the pressure switch closes.

- 5) The Blower Guard PCB continues to monitor motor current and blower air pressure.
- 6) When the call for heat has been satisfied the Blower Guard PCB detects that the gas valve has been de-energized and will enter "Idle State".

IMPORTANT NOTE: Secure all wires to avoid their contact with any hot surfaces or moving parts.

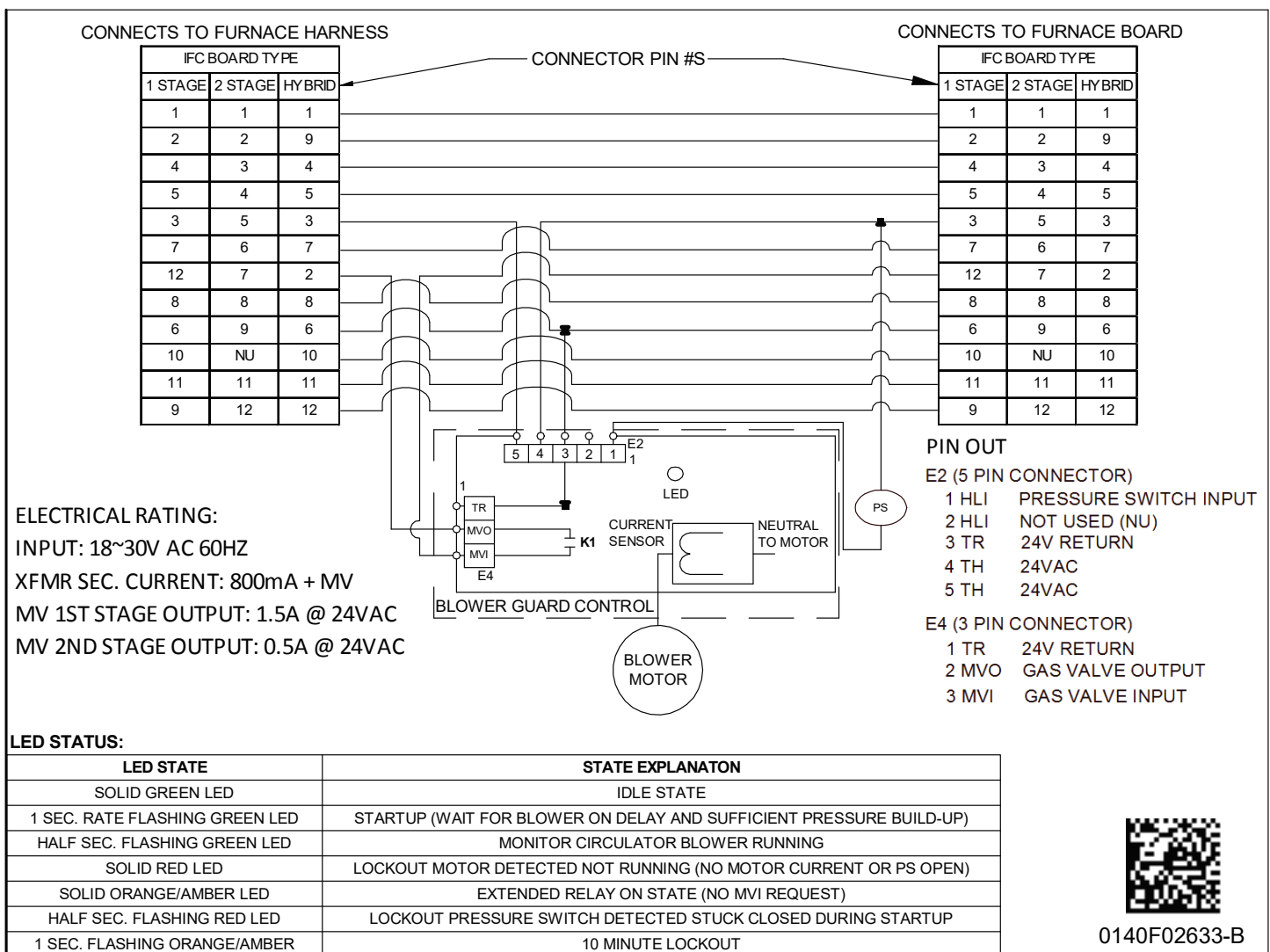
Fault Condition

- 1) If the blower air pressure is not sensed, then the Blower Guard PCB will enter "Lockout State," which is indicated by a solid red LED on the board. Typically, this is a result of the blower not operating.
- 2) If the pressure switch is closed while the motor current is not sensed, the Blower Guard PCB will enter "Lock-out pressure switch detected stuck closed", which is indicated by a flashing red LED. This can be caused by a pressure switch stuck closed or if the motor neutral wire is not routed through the current sensing component as required in step 19 above.
- 3) The service technician must inspect the drain pan and verify blower operation before attempting to restart the gas furnace. To do this, the technician will first need to set the thermostat to "OFF."

CAUTION: The service technician must ensure that the heating call (W) has been removed before resetting the gas furnace.

- 4) The service technician should inspect the drain pan to ensure that there are no signs of damage. If there are signs of damage, then contact your distributor to order a replacement drain pan.
- 5) To reset the gas furnace, the power to the unit must be reset. This will return the Blower Guard PCB to the "Idle State."
- 6) The service technician should then set the thermostat to "Cooling" and then "Constant Fan" (energize G).
- 7) The technician should verify that the blower is operational and working properly. If not, then diagnose the blower to determine why it is not operating.
- 8) Before attempting this step, ensure that the drain pan has been inspected and has no signs of damage. If there are signs of damage, replace the drain pan before proceeding. If the fan is operating properly, then set the thermostat to "Heating" while leaving the "Constant Fan" energized. **CAUTION:** The service technician should remain at the furnace during the start-up sequence to monitor the behavior of the system. Do NOT allow the furnace to run without supervision.
- 9) The service technician should monitor the start up sequence to diagnose why the Blower Guard PCB is going into the "Lockout State." Contact our Technical Service Department if you need further assistance.

LED State	STATUS CODE	Status Explanation	LOCKOUT
Solid Green	IDLE	This control is IDLE during any thermostat call for cooling or continuous fan. The control only monitor blower operation during a thermostat call for gas heat.	N/A
1 second flashing green	START-UP (waiting for Heat On Delay)	Thermostat has initiated a gas heating call and the gas valve is energized (24v to Common and MV on the gas valve).	N/A
0.5 second flashing green	MONITOR CIRCULATOR BLOWER RUNNING	Thermostat has initiated a gas heating call, the gas valve is energized and the blower motor is running. Control is monitoring blower operation through a closed BGK pressure switch and current sensed on control.	N/A
Solid orange/amber	Extended Relay On (gas valve deenergized)	Thermostat call for gas heating is satisfied, gas valve is deenergized and blower is running - waiting for Fan Off Delay timer to terminate blower operation. * This Status Code can also be related to an issue with the Furnace operation (SEE Furnace IO for furnace status codes) The BGK control will show this status code if Furnace has an Open Limit, Open Front Cover Pressure Switch or other Furnace fault codes that deenergizes the gas valve and leaves the blower motor running.	N/A
Solid red	LOCKOUT MOTOR DETECTED NOT RUNNING	No motor current detected or BGK pressure switch open. The white neutral wire from the blower motor must pass through the orange current sensor on the BGK control (do not loop wire through). The BGK control must read current through this white wire and the BGK pressure switch must close within 50 seconds of the gas valve energizing to prove blower operation.	Requires power recycle
0.5 second flashing red	LOCKOUT PS DETECTED STUCK CLOSED DURING STARTUP	BGK pressure switch Stuck Closed at start of a gas heating call (BGK pressure switch Closed before gas valve is energized). The pressure switch is stuck closed, shorted or the pressure switch wires are jumpered together.	Requires power recycle
1 second flashing orange	SHORT RELAY LOCKOUT (internal counter reached maximum).	Thermostat call for gas heating was terminated before blower operation was confirmed. This status code will reset to Solid Green (IDLE) after 10 minutes.	10 Minute Lockout



Electrostatic Discharge (ESD) Precautions

NOTE: Discharge body's static electricity before touching unit.

An electrostatic discharge can adversely affect electrical components. Use the following precautions during furnace installation and servicing to protect the integrated control module from damage. By putting the furnace, the control, and the person at the same electrostatic potential, these steps will help avoid exposing the integrated control module to electrostatic discharge. This procedure is applicable to both installed and uninstalled (ungrounded) furnaces.

1. Disconnect all power to the furnace. Do not touch the integrated control module or any wire connected to the control prior to discharging your body's electrostatic-charge to ground.
2. Firmly touch a clean, unpainted, metal surface of the furnace away from the control. Any tools held in a person's hand during grounding will be discharged.
3. Service integrated control module or connecting wiring-following the discharge process in step 2. Use caution-not to recharge your body with static electricity; (i.e., do not move or shuffle your feet, do not touch ungrounded objects, etc.). If you come in contact with an ungrounded object, repeat step 2 before touching control or wires.
4. Discharge your body to ground before removing a new control from its container. Follow steps 1 through 3 if installing the control on a furnace. Return any old or new controls to their containers before touching any ungrounded object.



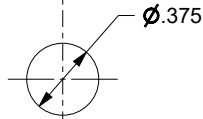
WARNING

IF THE INFORMATION IN THESE INSTRUCTIONS IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

- **DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.**
- **WHAT TO DO IF YOU SMELL GAS:**
 - **DO NOT TRY TO LIGHT ANY APPLIANCE.**
 - **DO NOT TOUCH ANY ELECTRICAL SWITCH; DO NOT USE ANY PHONE IN YOUR BUILDING.**
 - **IMMEDIATELY CALL YOUR GAS SUPPLIER FROM A NEIGHBOR'S PHONE. FOLLOW THE GAS SUPPLIER'S INSTRUCTIONS.**
 - **IF YOU CANNOT REACH YOUR GAS SUPPLIER, CALL THE FIRE DEPARTMENT.**
- **INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.**

BLOWER HOUSING FLANGE SIDE

HOLE TEMPLATE FOR BLOWER GUARD KIT
APPLY THIS LABEL PER INSTALLATION
INSTRUCTIONS ATTACHED TO THE KIT



HOLE FOR U-SHAPE TUBING



HOLES FOR PRESSURE SWITCH



0140K00412-A

CUSTOMER FEEDBACK

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You can also scan the QR code on the right for the product brand you purchased to be directed to the feedback page.



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