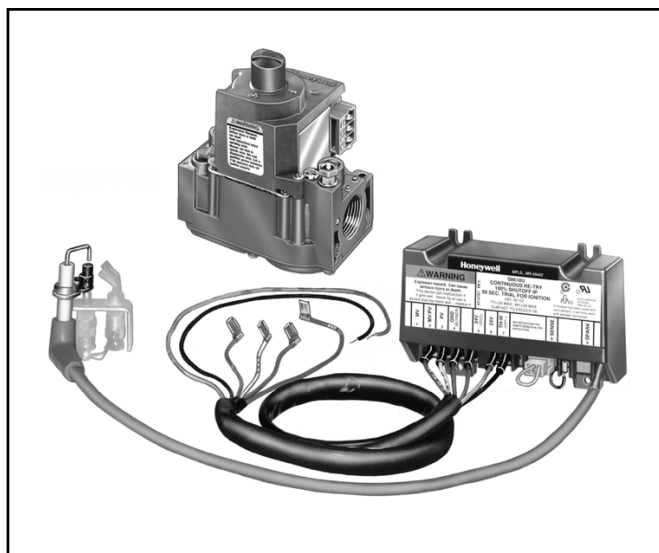


## Y8610U Intermittent Pilot Retrofit Kit

### PRODUCT DATA



#### Each kit includes:

- S8610U Intermittent Pilot Module.
- VR8304M Dual Valve Combination Gas Control.
- 392431 Igniter-Sensor.
- 394800-30 Ignition Cable.
- 393691 Natural to LP Gas Conversion Kit.
- Wiring Harness.
- 393690-14 Straight Flange Kit (3/4 in.) .
- Reducer adapters for gas control.
- Adhesive mounting option for S8610.
- Installation hardware.
- **Temperature Rating:**
  - VR8304M: -40°F to 175°F (-40°C to 79°C).
  - S8610U: -40°F to 165°F (-40°C to 74°C). (If main valve current is 1A or less, 175°F (79°C) maximum ambient applies.)

#### MODULE

- Uses rectification principle for flame sensing.
- Provides 13 kV peak capacitive discharge spark output (at 25 pF load).

#### GAS CONTROL

- Straight through body pattern.
- VR8304M capacity at 1 in. wc pressure drop (0.25 kPa pressure drop is 270 ft<sup>3</sup>/hr (7.6 m<sup>3</sup>/hr).
- Manual ON-OFF valve blocks gas flow into the gas control when in the OFF position.
- Two main automatic valves—one solenoid-operated, and one a servo-operated diaphragm system.

#### IGNITER/SENSOR

- Single electrode made of Kanthal provides both ignition and flame sensing.
- Rated for 1775°F (968°C) at electrode tip, 1250°F (677°C) at ceramic insulator.

### GENERAL

The Y8610U is a complete kit for converting conventional standing pilot systems to intermittent pilot systems. It is used on gas-fired atmospheric furnaces, boilers, and heating appliances. Not for use on direct vent or power burner equipment. Meets ANSI Z21.71 standard for automatic intermittent pilot ignition systems for field installations.

### FEATURES

- Y8610U kits can be used with either natural or LP gas.
- Y8610U provides a 90 second maximum ignition trial, shuts off, waits six minutes nominal, then reinitiates the pilot ignition sequence. The ignition trial, shutoff, and wait cycle repeat until the pilot lights or the call for heat ends.
- Y8610U kits can be used with either natural or LP gas; it provides timed trial for ignition and 100 percent pilot shutoff on loss of flame.

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## SPECIFICATIONS

### IMPORTANT

*The specifications given in this publication do not include normal manufacturing tolerances. Therefore, units might not match the listed specifications exactly. Also, units are tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.*

### SUPER TRADELINE® Models

SUPER TRADELINE® models are selected and packaged for ease of handling, ease of stocking, and maximum replacement value. SUPER TRADELINE® model specifications are the same as those of standard models, except as noted.

#### SUPER TRADELINE® Model Available:

Y8610U Intermittent Pilot Retrofit Kit:

- Meets ANSI Z21.71 Automatic Intermittent Pilot Ignition Systems for Field Installation.
- For natural or LP gas applications.
- 90 second maximum ignition trial, shuts off, waits six minutes nominal, then reinitiates the pilot ignition sequence. The ignition trial, shutoff, and wait cycle repeats until the pilot lights or the call for heat ends. 100 percent pilot shutoff on loss of flame.
- S8610U Intermittent Pilot Module.
- VR8304M Dual Valve Combination Gas Control.
- Refer to Fig. 1 for other components.

#### Ambient Temperature Rating:

VR8304M: -40°F to 175°F (-40°C to 79°C).

S8610U: -40°F to 165°F (-40°C to 74°C). (If main valve current is 1A or less, 175°F (79°C) maximum ambient applies.)

Also refer to Igniter-Sensor specifications.

#### Electrical Ratings:

Voltage and Frequency: 20.5 to 28.5 Vac (24 Vac nominal), 60 Hz.

Current Rating: 0.7A (includes both module and gas control).

Thermostat Anticipator Setting: 0.7A plus current ratings of other devices in the thermostat control circuit.

#### Relative Humidity Rating:

5 to 90 percent at 95°F (35°C).

#### Thermostat Compatibility:

Compatible with any Honeywell 24V thermostat and with competitive 24V thermostats that are powered independently of the module.

#### Transformer Sizing:

Add current ratings of Y8610, vent damper, and any other control system components. Multiply this total by 24V to determine the transformer VA requirement.

#### Wiring Connections:

Between the module and gas control: 30 in. (762 mm) wiring harness with 1/4 in. quick-connect terminals.

Between the module and the igniter-sensor: 30 in. (762 mm) ignition cable with stud terminal and 1/4 in. quick-connect terminal.

#### Intermittent Pilot Module Specifications:

S8610U Intermittent Pilot Module, for natural or LP gas applications only.

#### Dimensions:

See Fig. 2.

#### Flame Failure Response Time:

0.8 second maximum at 1.0 uA flame current.

#### Ignition Timing:

Provides a 90 second maximum ignition trial, shuts off, waits six minutes nominal, then reinitiates the pilot ignition sequence. The ignition trial, shutoff, wait cycle repeats until the pilot lights or the call for heat ends. During the shutoff sequence, gas is shut off 100 percent.

#### Mounting:

Mounts in any position except with terminals up. Recommended mounting position is with terminals down to provide maximum protection from dripping water or dust accumulation. Fasten with No. 6-32 machine screws or No. 8 sheet metal screws of appropriate length. Refer to Fig. 12.

#### Spark Generator Output:

13 kV peak at 25 pF load (16 kV peak open circuit).

#### Terminals:

1/4 in. male quick-connects. S8610U has Molex plug for connection to Honeywell D80D Vent Damper. Once the S8610U has powered a vent damper, the module works only if the vent damper is connected.

## ORDERING INFORMATION

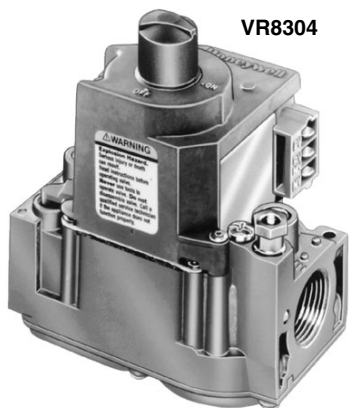
For ordering information when purchasing replacement and modernization products from your TRADELINE® wholesaler or your distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number, or specify:

1. SUPER TRADELINE® order number.

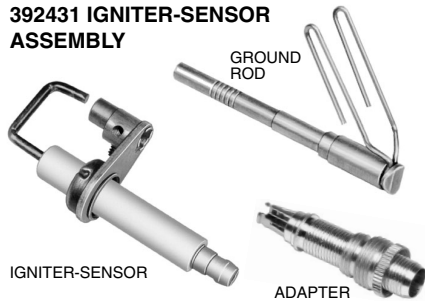
If you have additional questions, need further information, or want to comment on our products or services, please write or phone:

1. Your local Honeywell Home and Building Control sales office (check white pages of phone directory).
2. Home and Building Control Customer Logistics  
Honeywell Inc.,  
1885 Douglas Drive North  
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitee, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.  
International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.



**392431 IGNITER-SENSOR ASSEMBLY**

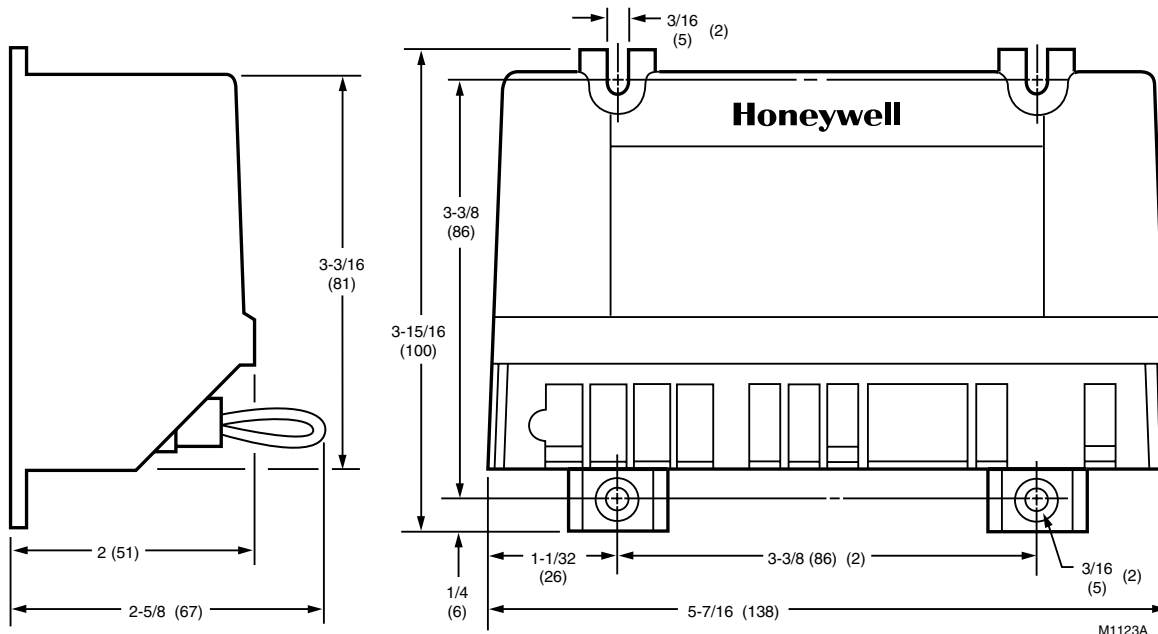


**ALSO INCLUDED:**

- 394800-30 IGNITION CABLE (30 IN. (760 mm))
- 393690-14 STRAIGHT FLANGE KIT
- 393691 NATURAL GAS TO LP CONVERSION KIT
- REDUCER BUSHINGS FOR GAS CONTROL
- SCREWS
- WIRE NUTS (3)

M6866

**Fig. 1. Y8610 retrofit kit components.**



**Fig. 2. S8610U module dimensions.**

**Dual Valve Combination Gas Control Specifications**

**Model:**  
VR8304M Dual Valve Combination Gas Control.

**Ambient Temperature Rating:**  
-40° to 175°F (-40° to 79°C).

**Capacity<sup>a</sup>:**  
270 ft<sup>3</sup>/hr (7.6 m<sup>3</sup>/hr) at 1 in. wc (0.25 kPa) pressure drop.

**Pipe Size<sup>b</sup>:**  
1/2 in. x 3/4 in. NPT inlet x outlet.

<sup>a</sup> Based on 1,000 Btuh/ft<sup>3</sup>, 0.64 specific gravity natural gas at 1 in. wc pressure drop (37.3 MJ/m<sup>3</sup>, 0.64 specific gravity natural gas at 0.25 kPa pressure drop).

<sup>b</sup> With a 1/2 x 3/4 in. straight flange (included).

**Dimensions:**  
See Fig. 3.

**Mounting:**  
Can be mounted from 0 to 90 degrees, in any direction, from the gas control upright position.

**Pressure Rating:**  
1/2 psig (3.45 kPa) inlet pressure.

**Terminals:**  
1/4 in. male quick-connect terminals.

**Igniter-Sensor Specifications**

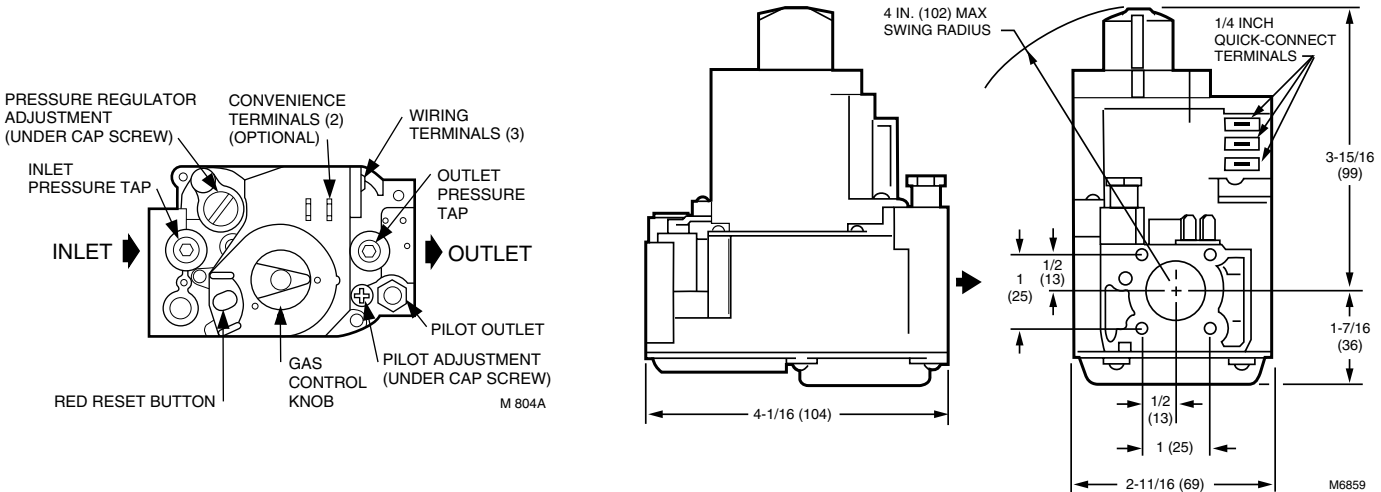
**Model:**  
392431 Igniter-Sensor. Includes igniter-sensor assembly, ground rod, and adapter (refer to Fig. 1).

**Dimensions:**  
Refer to Fig. 4.

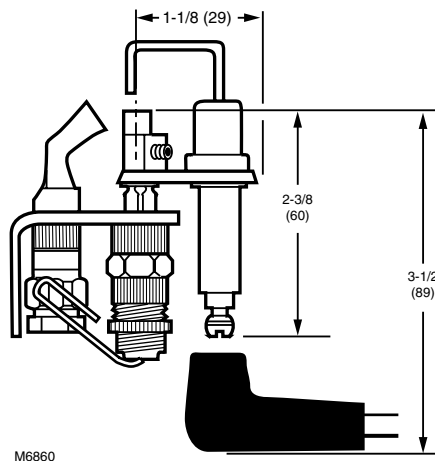
**Electrode/Flame Rod Material:**  
Kanthal.

**Maximum Temperature Ratings:**  
Ground Rod Tip: 1775°F (968°C).  
Ceramic Insulator: 1250°F (677°C).

**Mounting:**  
Replaces the thermocouple on the existing pilot burner.



**Fig. 3. VR8304M mounting dimensions in in. (mm).**



**Fig. 4. 392431 Igniter-Sensor mounting dimension in in. (mm).**

## PLANNING THE INSTALLATION

Intermittent pilot systems are used on various types of central heating equipment and on heating appliances such as commercial cookers, agricultural equipment, industrial heating equipment, and pool heaters. Some of these applications can make heavy demands on the controls, either because of frequent cycling or because of moisture, corrosive chemicals, dust, or excessive heat in the environment. In these applications, special steps could be required to prevent nuisance shutdowns and premature control failure. These applications require Honeywell Home and Building Control Engineering review; contact your Honeywell Sales Representative for assistance.

### Frequent Cycling

These controls are designed for use on space heating appliances that typically cycle three to four times an hour during the heating season and not at all during the cooling season. In applications with significantly greater cycling rates and longer heating seasons, we recommend monthly checkout because the controls can wear out more quickly.

### Water or Steam Cleaning

Once a module or gas control has been wet, it can operate unreliably and must be replaced. If the appliance is cleaned with water or steam, the controls and associated wiring should be covered so water or steam flow cannot reach them. The controls should be high enough above the cabinet bottom so flooding or splashing water can not reach them during normal cleaning procedures. If necessary, shield the controls to protect them from splashing water. A NEMA 4 enclosure is recommended for the ignition module; see the Electronic Ignition Service Manual, form 70-6604.

### High Humidity or Dripping Water

Over time, dripping water or high ambient humidity can create unwanted electrical paths on the module circuit board, causing the module to fail. Never install an appliance where water can drip on the controls.

In addition, high ambient humidity can cause the gas control to corrode, and finally to fail.

When the appliance is installed in a humid atmosphere, make sure air circulation around the module and gas control is adequate to prevent condensation. It is also important to regularly check out the system. A NEMA 4 enclosure could be needed; see the Electronic Ignition Service Manual, form 70-6604.

### Corrosive Chemicals

Corrosive chemicals can also attack the module and gas control and eventually cause a failure. Where chemicals are used routinely for cleaning, make sure the cleaning solution cannot reach the controls. Where chemicals could be suspended in air, as in some industrial and agricultural applications, protect the ignition module from exposure with a NEMA 4 enclosure; see the Electronic Ignition Service Manual, form 70-6604.

### Dust or Grease Accumulation

Heavy accumulation of dust or grease can cause the controls to malfunction. Where dust or grease can cause a problem,

provide covers for the module and the gas control that emit environmental contamination. A NEMA 4 enclosure is recommended for the ignition module; see the Electronic Ignition Service Manual, form 70-6604.

### Heat

The controls can be damaged by excessively high temperatures. Make sure the maximum ambient temperature at the control location does not exceed the rating of the control. If the appliance normally operates at very high temperatures; insulation, shielding, and air circulation could be necessary to protect the controls. Proper insulation or shielding should be provided by the appliance manufacturer; make sure adequate air circulation is maintained when the appliance is installed.

## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in these instructions and on the product to ensure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After completing installation, use these instructions to check product operation.

#### IMPORTANT

1. *Installer must comply with local codes and ordinances of the National Fuel Code (ANSI Z223.1—NFPA No. 54) and National Electrical Code (ANSI NFPA No. 70).*
2. *Installer must fill in and attach label to appliance being converted.*
3. *Use Y8610 Retrofit Kit only with atmospheric burners. Do not use on direct vent appliances or power burners.*
4. *Do not use the Y8610 Retrofit Kit with mercury pilots or 250 to 750 mV pilot systems.*

## WARNING

**FIRE OR EXPLOSION HAZARD  
CAN CAUSE PROPERTY DAMAGE,  
SEVERE INJURY, OR DEATH.**

Follow these warnings exactly:

1. Disconnect the power supply before wiring to prevent electrical shock or equipment damage.
2. To avoid dangerous accumulation of fuel gas, turn off gas supply at the appliance service valve before starting Installation and perform the Gas Leak Test immediately following the installation.
3. Never install where water can flood, drip, or condense on module or gas control. Never use a module or gas control that has been wet. If wet, controls can malfunction and lead to an accumulation of explosive gas.
4. Do not light or operate electric switches, lights, or appliances until you are sure the appliance area is free of gas. Liquefied petroleum (LP) gas is heavier than air and does not vent upward naturally.

## Perform the Preinstallation Safety Inspection

The preinstallation checks described in ANSI Standard Z21.71 in the ANSI Standards section must be performed before installing the Y8610. If an unsafe condition is detected, the appliance should be shut off and the owner advised of the unsafe condition. Any potentially unsafe condition must be corrected before proceeding with the Installation.

## Maintenance Requirements in Severe Environments

Regular preventive maintenance is important in any application, but especially in commercial cooking, agricultural, and industrial applications because:

- In these applications the equipment operates 100,000 to 200,000 cycles per year. Such heavy cycling can wear out the gas control in one to two years. A normal forced air furnace (the original application for the controls) typically operates less than 20,000 cycles per year.
- Exposure to water, dirt, chemicals, and heat can damage the module or the gas control and shut down the control system. A NEMA 4 enclosure can reduce exposure to environmental contaminants. See Electronic Ignition Service Manual, form 70-6604.

The maintenance program should include regular system checkout as outlined in the Checkout section.

## WARNING

**FIRE OR EXPLOSION HAZARD  
CAN CAUSE PROPERTY DAMAGE,  
SEVERE INJURY, OR DEATH.**

Do not attempt to disassemble or clean the module. Improper reassembly and cleaning can cause unreliable operation.

Maintenance frequency must be determined individually for each application based on:

- *Cycling frequency:* Appliances that cycle more than 20,000 times annually should be checked monthly.
- *Intermittent use:* Appliances that are used seasonally should be checked before shutdown and again before the next use.
- *Consequence of unexpected shutdown:* Where the cost of an unexpected shutdown is high, the system should be checked more often.
- *Dusty, wet, or corrosive environment:* Because these environments can cause the controls to deteriorate more rapidly, the system should be checked more often.

Any control should be replaced if it does not perform properly during Checkout or Troubleshooting. In addition, replace any module if it is wet or looks like it has been wet. Protective enclosures, see Planning the Installation, are recommended regardless of checkout frequency.

## Shut Down Appliance

- 1 Turn off the gas supply at the appliance service valve. Do not use the gas control knob.
- 2 Turn off the electricity at the service entrance.

## Check Appliance Wiring

The standing pilot gas control wires are used with the Y8610 kit. Carefully identify and tag the wires before disconnecting. See Fig. 5 for the most common types of terminal arrangements.

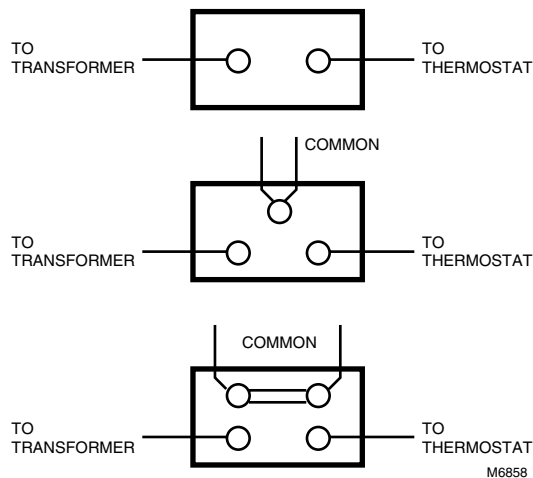


Fig. 5. Wiring connections on standing pilot gas controls.

## Remove Standing Pilot Gas Control

- 1 If the gas control has a common terminal(s), remove the wires connected to the common terminal(s) and splice together with one of the wire nuts provided.
- 2 Label and remove the remaining wires.

## WARNING

Do not bend the pilot gas tubing at the gas control or at the pilot burner to prevent gas leakage at the connection.

- 3 Disconnect the pilot tubing at the gas control. Cut off and discard the compression fitting. Do not disturb the compression fitting or pilot tubing at the pilot burner.
- 4 Disconnect the thermocouple lead at the gas control.
- 5 Disconnect the gas piping at the gas control.
- 6 Discard the gas control.

## Remove Thermocouple

Unscrew or snap the thermocouple out of the pilot burner and discard. See Fig. 6.

NOTE: It could be necessary to pull out the main burner for access to the pilot burner. Do not move or relocate the pilot burner. Do not bend tubing near the pilot burner.

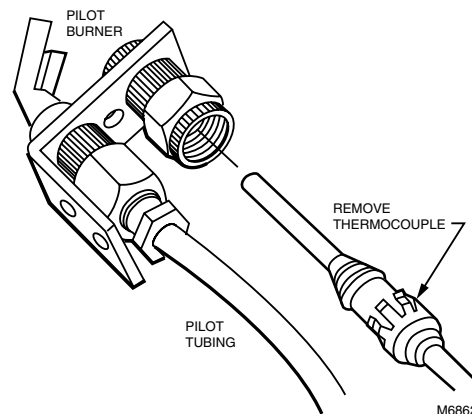


Fig. 6. Remove thermocouple from pilot burner.

## Install Igniter-Sensor Assembly

- 1 Install the ground rod, if needed. See Fig. 7.
  - Mount adapter to the ground rod, if needed.
  - Align the ground rod so the clip hugs the pilot burner and keeps the ground rod from rotating. See Fig. 8.
  - Insert the ground rod in place of the thermocouple on the pilot burner. Push the ground rod all the way up and fasten as shown in Fig. 7.
- 2 Slide the igniter-sensor mounting bracket over the top of the ground rod.
- 3 Adjust the electrode position so the electrode tip and spark gas are in the pilot flame. Turn the ground rod to move the igniter-sensor up and down.
- 4 Check that the chosen position allows room to connect the ignition cable to the stud terminal.
- 5 Tighten the setscrews on the mounting bracket using the hex wrench provided.

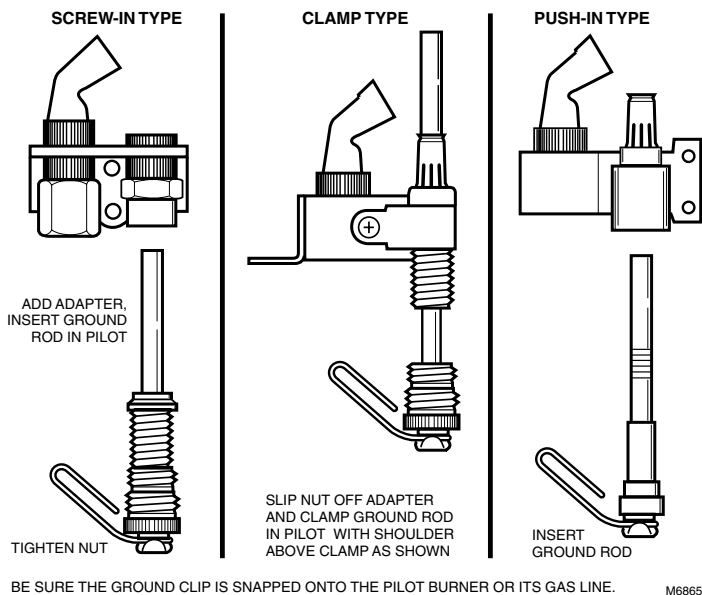


Fig. 7. Mount ground rod on pilot burner.

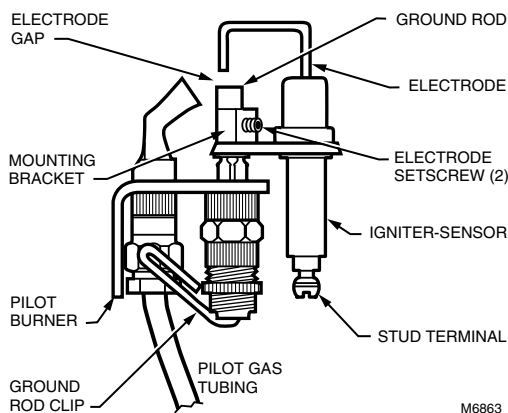


Fig. 8. Fasten igniter-sensor to ground rod.

## Install the Gas Control

### ⚠ WARNING

**FIRE OR EXPLOSION HAZARD  
CAN CAUSE PROPERTY DAMAGE,  
SEVERE INJURY, OR DEATH.**

Follow these warnings exactly:

1. Do not bend the pilot gas tubing at the gas control or at the pilot burner after the compression fitting is tightened. Gas leakage at the connection can result.
2. Always install a sediment trap in the gas supply line to prevent contamination of the gas control.
3. Do not force the gas control knob. Use only your hand to turn the gas control knob. If the gas control knob does not operate by hand, the gas control should be replaced by a qualified service technician. Force or attempted repair can result in a fire or explosion.

### IMPORTANT

*These gas controls are shipped with protective seals over the inlet and outlet tappings. Do not remove the seals until ready to connect the piping.*

## Converting Between Natural and LP Gas

### ⚠ WARNING

**FIRE OR EXPLOSION HAZARD  
CAN CAUSE PROPERTY DAMAGE,  
SEVERE INJURY, OR DEATH.**

1. Do not attempt to use a gas control set for natural gas on LP gas or a gas control set for LP gas on natural gas.
2. When making a conversion, main and pilot burner orifices must be changed to meet appliance manufacturer specifications.

To convert from natural gas to LP, use the 393691 LP Conversion Kit that is included with the Y8610U Intermittent Pilot Retrofit Kit. To convert from LP to natural gas, use the 394588 Natural Gas Conversion Kit (ordered separately). Step-opening gas controls cannot be converted.

To convert control from one gas to another:

- 1 Turn off the main gas supply to the appliance.
- 2 Remove the regulator cap screw and pressure regulator adjusting screw. See Fig. 3.
- 3 Remove the existing spring.
- 4 Insert the replacement spring with the tapered end down. See Fig. 9.
- 5 Install the new plastic pressure regulator adjustment screw so that the top of the screw is flush (level) with the top of the regulator. Turn the pressure regulator adjustment screw clockwise six complete turns. This provides a preliminary pressure setting of about 10.0 in. wc (2.5 kPa) for LP regulator and 3.5 in. wc (0.9 kPa) for natural gas regulator.
- 6 Check the regulator setting either with a manometer or by clocking the gas meter. See the Checkout section.
- 7 Install the new cap screw.
- 8 Mount the conversion label on the control.
- 9 Install the control and appliance according to the appliance manufacturer instructions.

## Install Adapters to Gas Control (if used)

### 393690-14 Straight Flange (3/4 in.)

- 1 Remove the seal over the gas control inlet or outlet.
- 2 Make sure that the O-ring is fitted in the flange groove. If the O-ring is not attached or missing, do not use the flange.
- 3 With the O-ring facing the gas control, align the gas control threaded holes with the flange clearance holes.
- 4 Insert and tighten the screws provided with the flange. Tighten the screws to 25 inch pounds of torque to provide a gas tight seal.

## Bushings

- 1 Remove the seal over the gas control inlet or outlet.
- 2 Apply a moderate amount of good quality pipe compound to the bushing, leaving the two end threads bare. For an LP installation, use a compound resistant to LP gas. Do not use Teflon tape.
- 3 Insert the bushing in the gas control and thread the pipe carefully into the bushing until tight.

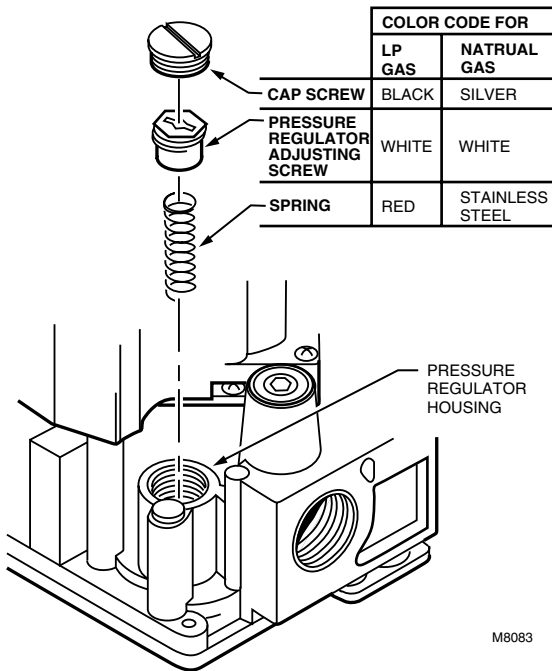


Fig. 9. Installation of conversion kit in regulated gas control.

## Install Gas Control Piping

All pipe must comply with local codes and ordinances or with the National Fuel Code (ANSI Z223.1 NFPA No. 54), whichever applies. Tubing installation must comply with approved standards and practices.

- 1 Use new, properly reamed pipe free from chips. If tubing is used, ensure that ends are square, deburred, and clean. All tubing bends must be smooth and without deformation.
- 2 Run the new pipe or tubing to the gas control. When tubing is used, obtain a tube-to-pipe coupling to connect the tubing to the gas control.
- 3 Install a sediment trap in the gas supply line. See Fig. 10.

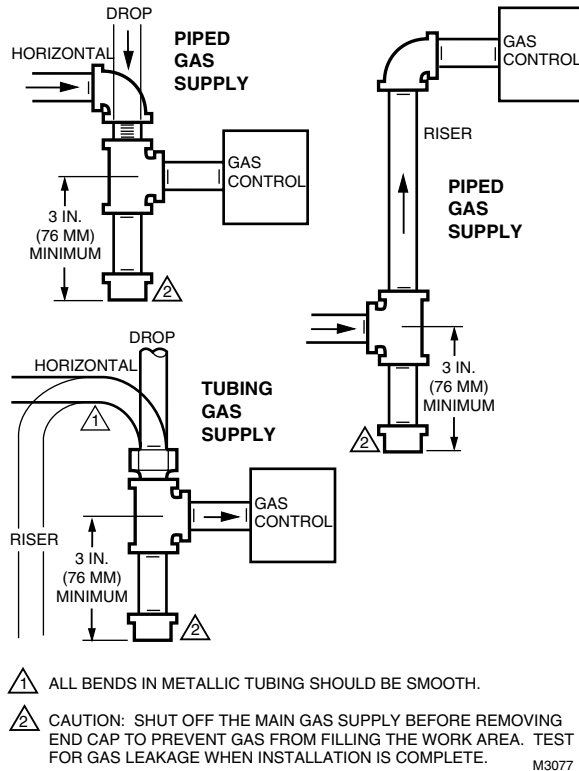


Fig. 10. Install sediment trap.

## Mount Gas Control

- 1 The gas control can be mounted from 0 to 90 degrees, in any direction including vertically, from the upright position of the gas control knob.
- 2 Mount the gas control so the gas flow is in same direction as the arrow on the gas control bottom.
- 3 Thread the pipe as listed in Table 1.

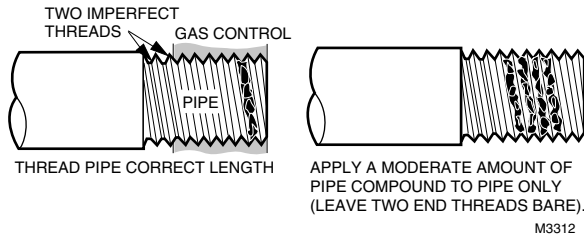
NOTE: See Table 1 for maximum pipe threading depth. If the pipe is inserted too deeply into the gas control, the second main valve or safety valve can distort or malfunction.

Table 1. NPT pipe thread length (in.).

Pipe Size	Overall Thread Length	Maximum Depth Pipe Can Be Inserted Into Gas Control
3/8	9/16	3/8
1/2	3/4	1/2
3/4	13/16	3/4

- 4 Apply a moderate amount of good quality pipe compound to pipe only; leave the two end threads bare. Do not use teflon tape. In LP installations, use a compound resistant to LP gas. See Fig. 11.
- 5 Remove protective seals over the gas control inlet and outlet, if necessary.





**Fig. 11. Use moderate amount of pipe compound.**

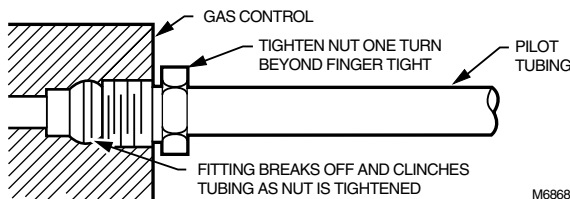
- 6 Connect the pipe to the gas control inlet and outlet. Tighten the inlet and outlet connections using a wrench on the gas control projecting wrench boss. See Fig. 3.

### Connect Pilot Gas Tubing

- 1 Cut the pilot gas tubing and bend as necessary for routing to the pilot burner.
  - Do not make sharp bends or deform the tubing.
  - Do not bend the tubing at the gas control after the compression nut has been tightened; gas leakage at the connection can result.
- 2 Square off and remove the burrs from the tubing end.
- 3 Unscrew the brass compression fitting from pilot gas outlet (see Fig. 3). Slip the fitting over the pilot gas tubing and slide out of the way.

**NOTE:** When replacing a gas control, cut off the old compression fitting and replace with the new compression fitting provided on the new gas control. Never use the old compression fitting as it might not provide a gas tight seal. See Fig. 12.

- 4 Push pilot gas tubing into the pilot gas tapping until it bottoms. While holding the tubing all the way in, slide the compression fitting into place and engage threads. Turn the fitting until finger tight. Use a wrench to tighten one more turn. Do not overtighten.
- 5 Connect other end of the pilot gas tubing to the pilot burner according to pilot burner manufacturer instructions.



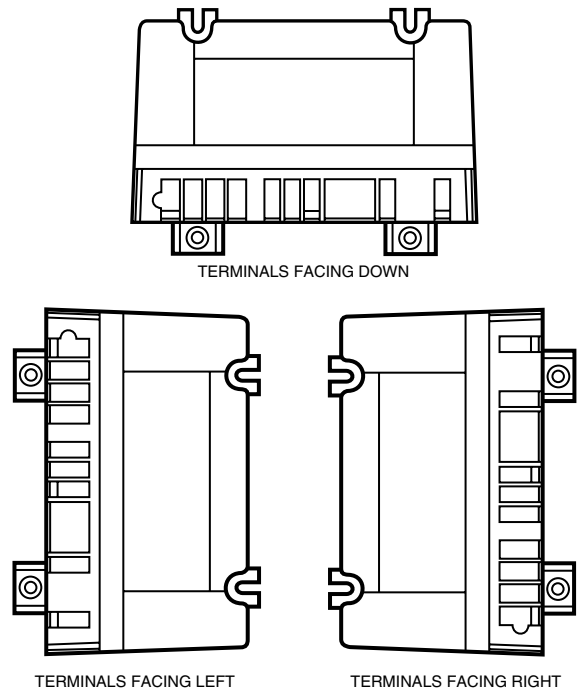
**Fig. 12. Always use new compression fitting.**

### Mounting S8610U Intermittent Pilot Module

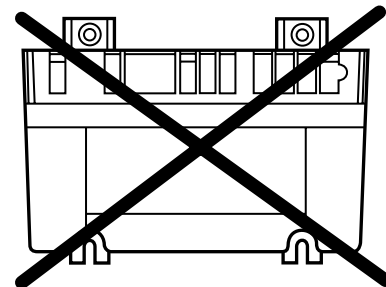
Select a location close to the pilot burner to allow the ignition cable to run to the igniter-sensor. The ambient temperature and other conditions should match those listed in the Specifications.

We recommend mounting the module with the terminals down so the terminals are protected from dripping water and dust. It can also be mounted with the terminals on either side. Do not mount the module with the terminals pointing up. See Fig. 13 for mounting recommendations. Fasten the module securely with four No. 6-32 machine screws or No. 8 sheetmetal screws of appropriate length.

### MOUNT IN ONE OF THESE POSITIONS



### DO NOT MOUNT WITH TERMINALS FACING UP



**Fig. 13. S8610 mounting recommendations.**

### Wiring the System



### CAUTION

Disconnect the power supply before making wiring connections to prevent electrical shock or equipment damage.

### Connect the Ignition Cable

- 1 Connect one end of the ignition cable to the male quick-connect SPARK terminal on the S8610 Module.
- 2 Connect the other ignition cable end to the 392431 Igniter-Sensor.

### Connect the Vent Damper

The D80D Vent Damper can be used with all ignition modules, although the Molex plug provided on some modules simplifies wiring connections when used with the D80D Plug-in Vent Damper. Once a module with a vent damper plug has powered a vent damper circuit, it cannot be used in a gas system without a vent damper. A non-replaceable fuse in the module blows on

initial power-up. Once this fuse has blown, the module does not work unless the vent damper is connected.

To connect the plug-in vent damper:

- ❶ Remove and discard the vent damper plug from the module terminal strip.
- ❷ Using the wiring harness supplied, insert the matching pin plug into the receptacle on the module and the other end to the vent damper.

To connect the D80B Vent Damper, follow the wiring diagrams supplied with the vent damper.

### Connect S8610 Module

- ❶ Connect the gas control and other remaining system components to the ignition module terminals as shown in Fig. 14 through 16:
  - Fig. 14 shows a basic circuit for a heating only atmospheric burner system.
  - Fig. 15 shows a heating only atmospheric burner system with a D80D Vent Damper.
  - Fig. 16 shows a heating only system with a D80B Vent Damper.

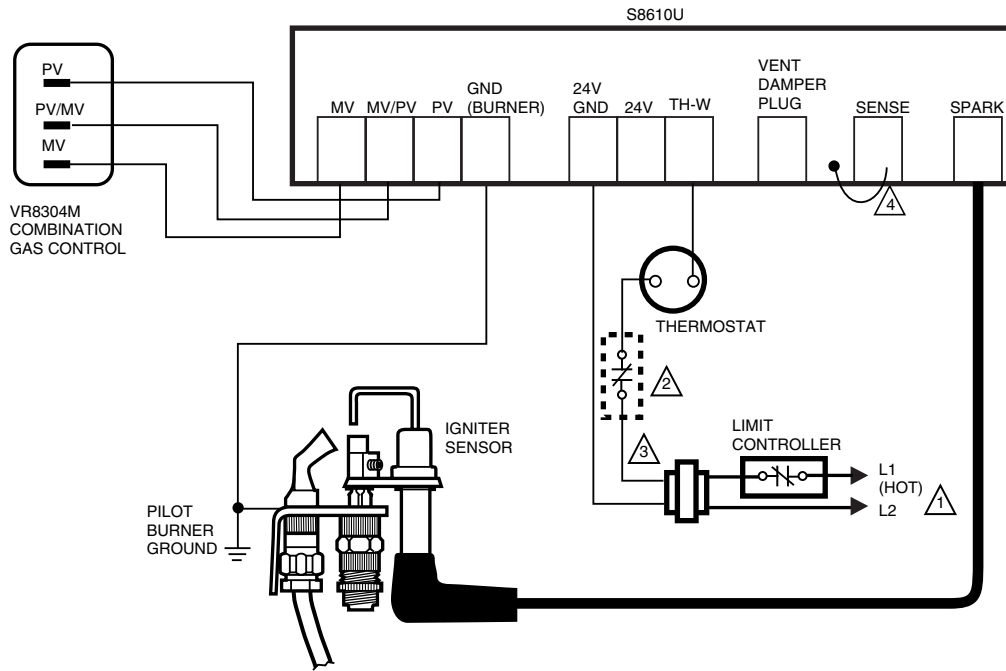
- ❷ Adjust the thermostat heat anticipator to match the system current draw. The current draw equals the total current required for the ignition module (0.2A) plus the gas control and any other auxiliary equipment in the control circuit.

### Connect Ground Control System

The igniter, flame sensor, and ignition module must share a common ground with the main burner.

- ❶ Connect the ground wire with the female 1/4 in. quick-connect terminal to the male quick-connect GND (BURNER) terminal on the ignition module.
- ❷ Strip the other end of the wire and fasten it under the igniter bracket mounting screw. If necessary, use a shield to protect the ground wire from radiant heat.
- ❸ The burner serves as the common grounding area. If there is not a good metal-to-metal contact between burner and ground, run a lead from the burner to ground.

NOTE: Earth ground is not required.



- ❶ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- ❷ ALTERNATE LIMIT CONTROLLER LOCATION.
- ❸ CONTROLS IN 24V CIRCUIT MUST NOT BE IN GROUND LEG TO TRANSFORMER.
- ❹ JUMPER WIRE FROM CIRCUIT BOARD TO SENSE CONNECTOR REMAINS IN PLACE.

M6861

Fig. 14. Y8610 in typical atmospheric burner heating system.

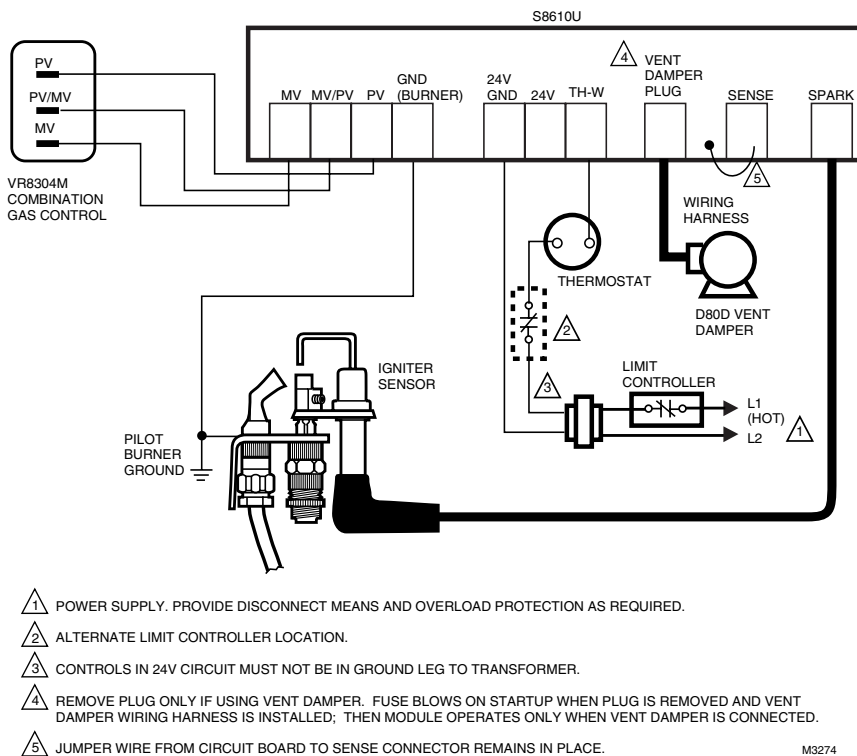


Fig. 15. Y8610 in typical atmospheric burner heating system with D80D Vent Damper.

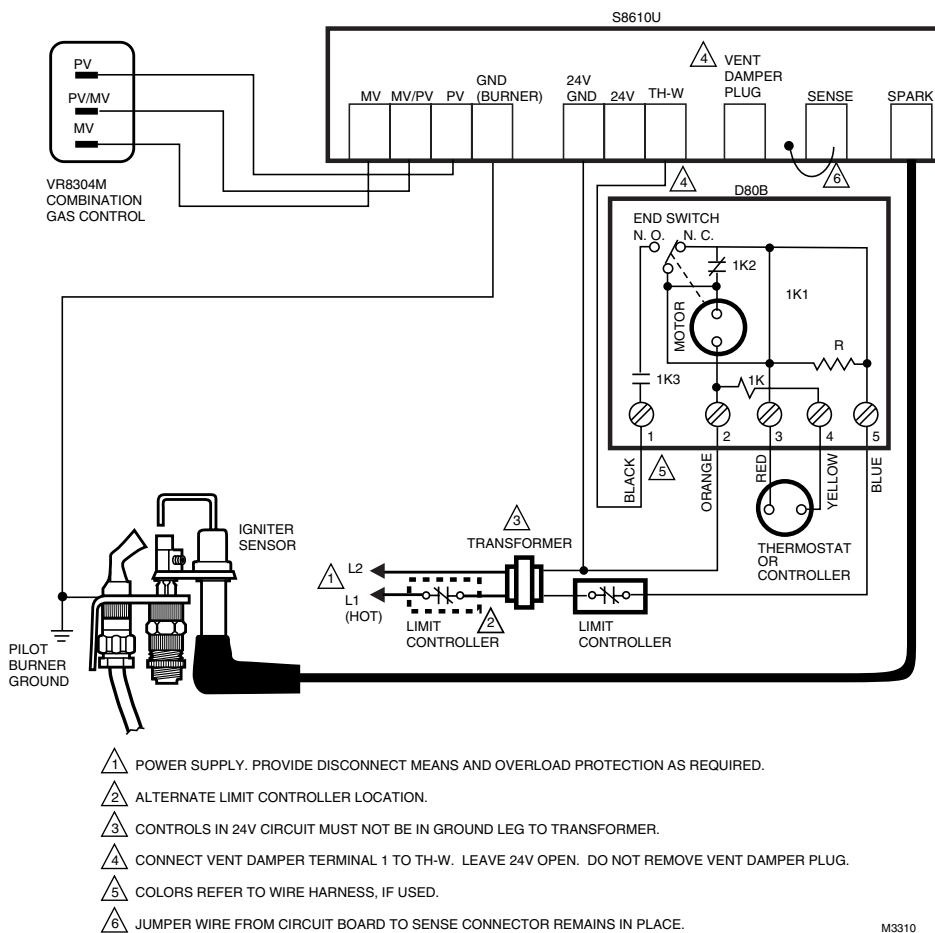


Fig. 16. Y8610 in typical atmospheric burner heating system with D80B Vent Damper.

## CHECKOUT

Check out the gas control system:

- At initial appliance installation.
- As part of regular maintenance procedures. Maintenance intervals are determined by the application. See Planning the Installation section for more information.
- As the first Troubleshooting step.
- Anytime work is done on the system.

### WARNING

**FIRE OR EXPLOSION HAZARD  
CAN CAUSE PROPERTY DAMAGE,  
SEVERE INJURY, OR DEATH.**

1. If you smell gas or suspect a gas leak, turn off the gas at the manual service valve and evacuate the building. Do not try to light any appliance and do not touch any electrical switch or telephone in the building until no spilled gas remains.
2. Perform the Gas Leak Test after initial Installation and anytime work is done to the gas piping.

#### STEP 1: Perform a Visual Inspection.

- With the power off, make sure all wiring connections are clean and tight.
- Turn off all power to appliances and the ignition module.
- Open manual shutoff valves in the gas line to the appliance.
- Perform Gas Leak Test.

### WARNING

**FIRE OR EXPLOSION HAZARD  
CAN CAUSE PROPERTY DAMAGE,  
SEVERE INJURY, OR DEATH.**

Check for gas leaks with soap and water solution anytime work is done on a gas control.

## Gas Leak Test

- 1 Paint all pipe connections upstream of the gas control with a rich soap and water solution. Bubbles indicate a gas leak.
- 2 If a gas leak is detected, tighten the pipe connection.
- 3 Stand clear while lighting the main burner to prevent injury caused from hidden gas leaks, which could cause flashback in the appliance vestibule. Light the main burner.
- 4 With the main burner in operation, paint all pipe joints (including adapters) and gas control inlet and outlet with a rich soap and water solution.
- 5 If another gas leak is detected, tighten the adapter screws, joints, and pipe connections.
- 6 Replace the part if the gas leak cannot be stopped.

#### STEP 2: Review Normal Operating Sequence and Module Specifications.

- See Specifications and Operation sections.

#### STEP 3: Reset the Module.

- Turn the thermostat to its lowest setting.
- Wait one minute.

As you perform Steps 4 through 9, watch for points where operation deviates from normal. See the Troubleshooting Guide, Fig. 19, to correct the problem.

#### STEP 4: Check Safety Shutoff Operation.

- Turn the gas supply off at the manual shutoff valve.
- Set the thermostat or controller above the room temperature to call for heat.
- Watch for spark at pilot burner.
- Time spark from start to shutoff. See Specifications section.
- Open the gas control knob and ensure no gas is flowing to the pilot or main burner.
- Set the thermostat below the room temperature and wait one minute before continuing.

#### STEP 5: Check and Adjust Gas Input to Main Burner.

### CAUTION

1. Do not exceed the input rating stamped on the appliance nameplate, or manufacturer recommended burner orifice pressure for the size orifice(s) used. Make sure the main burner primary air supply is properly adjusted for complete combustion (see the appliance manufacturer instructions).
2. If checking gas input by clocking the gas meter:
  - Make sure that the only gas flow through the meter is that of the appliance being tested.
  - Make sure that other appliances are turned off and that the pilot burners are extinguished (or deduct the gas consumptions from the meter reading).
  - Convert the flow rate to Btuh as described in the Gas Controls Handbook, form 70-6202 and compare to the Btuh input rating on the appliance nameplate.
3. If checking gas input with a manometer (pressure gauge):
  - Make sure the gas control knob is in the PILOT position before removing the outlet pressure tap plug to connect the manometer.
  - Turn the gas control knob back to PILOT when removing the manometer and replacing the outlet pressure tap plug.
  - Shut off the gas supply at the appliance service valve or, for LP gas, at the gas tank before removing the outlet pressure tap plug and before disconnecting the manometer and replacing the outlet pressure tap plug.
  - Perform the Gas Leak Test at the inlet pressure tap plug.

- 1 The gas control output pressure should match the manifold pressure listed on the appliance nameplate.
- 2 With the main burner operating, check the gas control flow rate using the meter clocking method or check the gas pressure using a manometer connected to the gas control outlet pressure tap. See Fig. 3.
- 3 If necessary, adjust the pressure regulator to match the appliance rating.

Gas control outlet pressure is normally set at 3.5 in. wc (0.9 kPa) nominal for natural gas. It can be adjusted from 3 to 5 in. wc (0.74 to 1.2 kPa).

Gas control outlet pressure is normally set at 10 in. wc (2.5 kPa) nominal for LP gas. It can be adjusted from 8 to 12 in. wc (2 to 3 kPa).

- a. Remove the pressure regulator adjustment cap and screw.
- b. Using a screwdriver, turn the inner adjustment screw clockwise to increase or counterclockwise to decrease the main burner gas pressure.
- c. Always replace the cap screw and tighten firmly.

- 4 If the desired outlet gas pressure or gas flow rate cannot be achieved by adjusting the gas control, check the gas control inlet pressure using a manometer at the inlet pressure tap. If the inlet pressure is in the normal range, replace the gas control; otherwise, take the necessary steps to provide proper gas pressure to the gas control.

#### STEP 6: Adjust Pilot Flame.

The pilot flame should envelop 3/8 to 1/2 in. (10 to 13 mm) of the ground rod and tip of the igniter-sensor. See Fig. 17 to adjust the pilot flame.

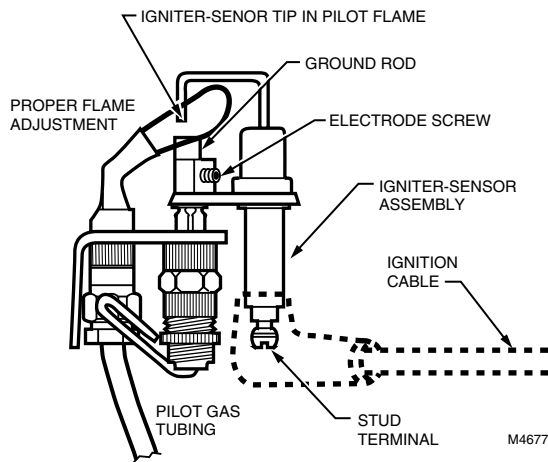


Fig. 17. Proper flame adjustment.

- 1 Remove the pilot adjustment cover screw. See Fig. 3.
- 2 Turn the inner adjustment screw clockwise to decrease or counterclockwise to increase the pilot flame.
- 3 Always replace the cover screw after adjustment and tighten firmly.

#### STEP 7: Check Other System Components

- On Furnaces: Make sure the limit controller and fan controller are operating in accordance with the appliance manufacturer instructions.
- On Boilers: Make sure the circulating water pumps, low water cutoffs, automatic feed controllers, pressure and temperature limit controllers, and relief valves are operating in accordance with the appliance manufacturer recommendations.

#### STEP 8: Check Normal Operation

- Set the thermostat or controller above the room temperature to call for heat.
- Make sure the pilot lights smoothly when the gas reaches the pilot burner.

- Make sure the main burner lights smoothly without flashback.
- Make sure the main burner operates smoothly without floating, lifting, or flame rollout to the furnace vestibule or heat buildup in the vestibule.
- If the gas line has been disturbed, complete the Gas Leak Test following Step 1.
- Turn the thermostat or controller below the room temperature. Make sure the main burner and pilot flames go out.

## OPERATION

System operation is divided into two stages:

1. Trial for ignition.
2. Main burner operation.

See Fig. 18 for the normal operating sequence.

### Trial for Ignition

#### Pilot Ignition

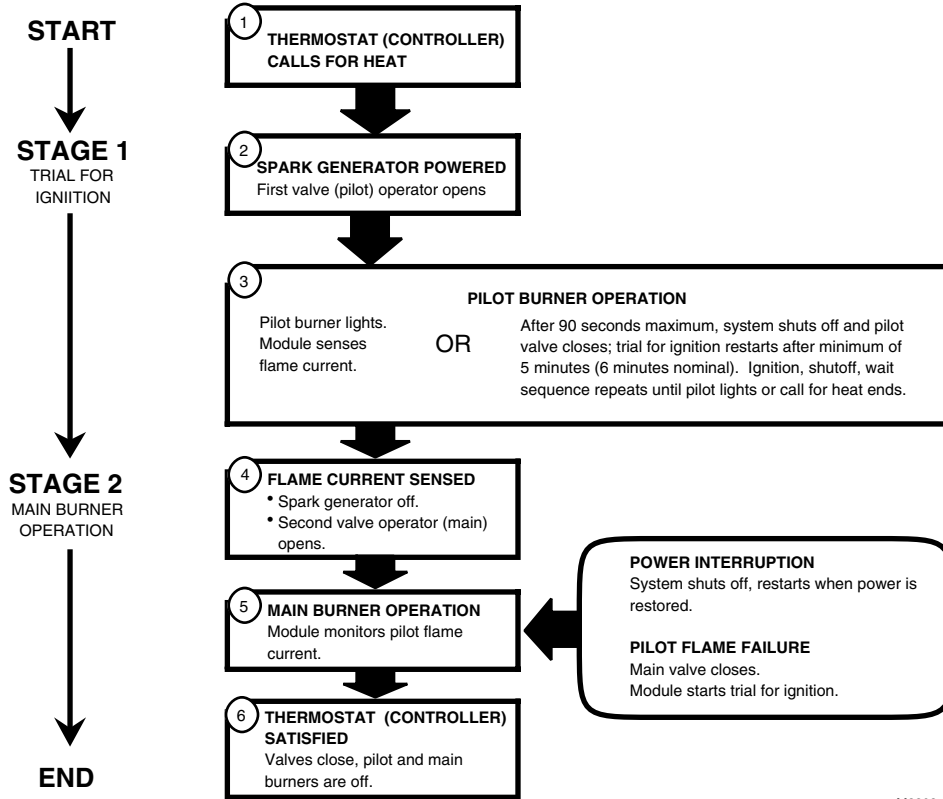
Following the call for heat, the module energizes the first main valve operator. The first main valve opens, which allows gas to flow to the pilot burner. At the same time, the electronic spark generator in the module produces a high voltage spark pulse output. The voltage generates a spark at the igniter-sensor that lights the pilot.

If the pilot does not light, or the pilot flame current is not at least 1.0 uA and steady, the module can not energize the second (main) valve and the main burner can not light. After 90 seconds maximum, the system shuts off and the pilot valve closes; trial for ignition restarts after a minimum of five minutes (six minutes nominal). Ignition, shutoff, and wait sequence repeats until pilot lights or call for heat ends.

### Main Burner Operation

When the pilot flame is established, a flame rectification circuit is completed between the sensor and burner ground. The flame sensing circuit in the module detects the flame current, shuts off the spark generator and energizes the second main valve operator. The second main valve opens and gas flows to the main burner, where it is ignited by the pilot burner.

When the call for heat ends, both valve operators are de-energized, and both valves in the gas control close.



M3308

Fig. 18. S8610 normal operating sequence.

## TROUBLESHOOTING

### IMPORTANT

1. The following service procedures are provided as a general guide. Follow appliance manufacturer service instructions if available.
2. Meter readings between gas control and ignition module must be taken within the trial for ignition period. Once the ignition module shuts off, wait for retry or reset at the thermostat.
3. If any component does not function properly, make sure it is correctly installed and wired before replacing it.
4. The ignition module cannot be repaired; if it malfunctions, it must be replaced.
5. Only trained, experienced service technicians should service intermittent pilot systems.

Perform the Checkout (see Checkout section) as the first step in troubleshooting. Then check the appropriate troubleshooting guide (Fig. 19) and the schematic diagram (Fig. 22) to pinpoint the cause of the problem. When troubleshooting indicates an ignition problem, see the Ignition System Checks section to isolate and correct the problem.

Following troubleshooting, perform the Checkout procedure again to be sure system is operating normally.

## Ignition System Checks

### STEP 1: Check ignition cable.

Make sure:

- Ignition cable does not run in contact with any metal surfaces.
- Connections to the ignition module and to the igniter or igniter-sensor are clean and tight.
- Ignition cable provides good electrical continuity.

### STEP 2: Check ignition system grounding. Nuisance shutdowns are often caused by a poor or erratic ground.

- A common ground, usually supplied by the pilot burner bracket, is required for the module and the pilot burner/igniter-sensor.
  - Check for good metal-to-metal contact between the pilot burner bracket and the main burner.
  - Check the ground lead from the GND (BURNER) terminal on the module to the pilot burner. Make sure connections are clean and tight. If the wire is damaged or deteriorated, replace it with No. 14-18 gauge, moisture-resistant, thermoplastic insulated wire with 105°C (221°F) minimum rating.
    - Check the ceramic flame rod insulator for cracks or evidence of exposure to extreme heat, which can permit leakage to ground. Replace the pilot burner/igniter-sensor and provide a shield, if necessary.
    - If the flame rod or bracket are bent out of position, restore to correct position.

**STEP 3: Check spark ignition circuit. You need a short jumper wire made from ignition cable or other heavily insulated wire.**

- Close the manual gas valve.
- Disconnect the ignition cable at the SPARK terminal on the module.

**⚠ WARNING**

When performing the following steps, do not touch stripped end of jumper or SPARK terminal. The ignition circuit generates over 10,000 volts and electrical shock can result.

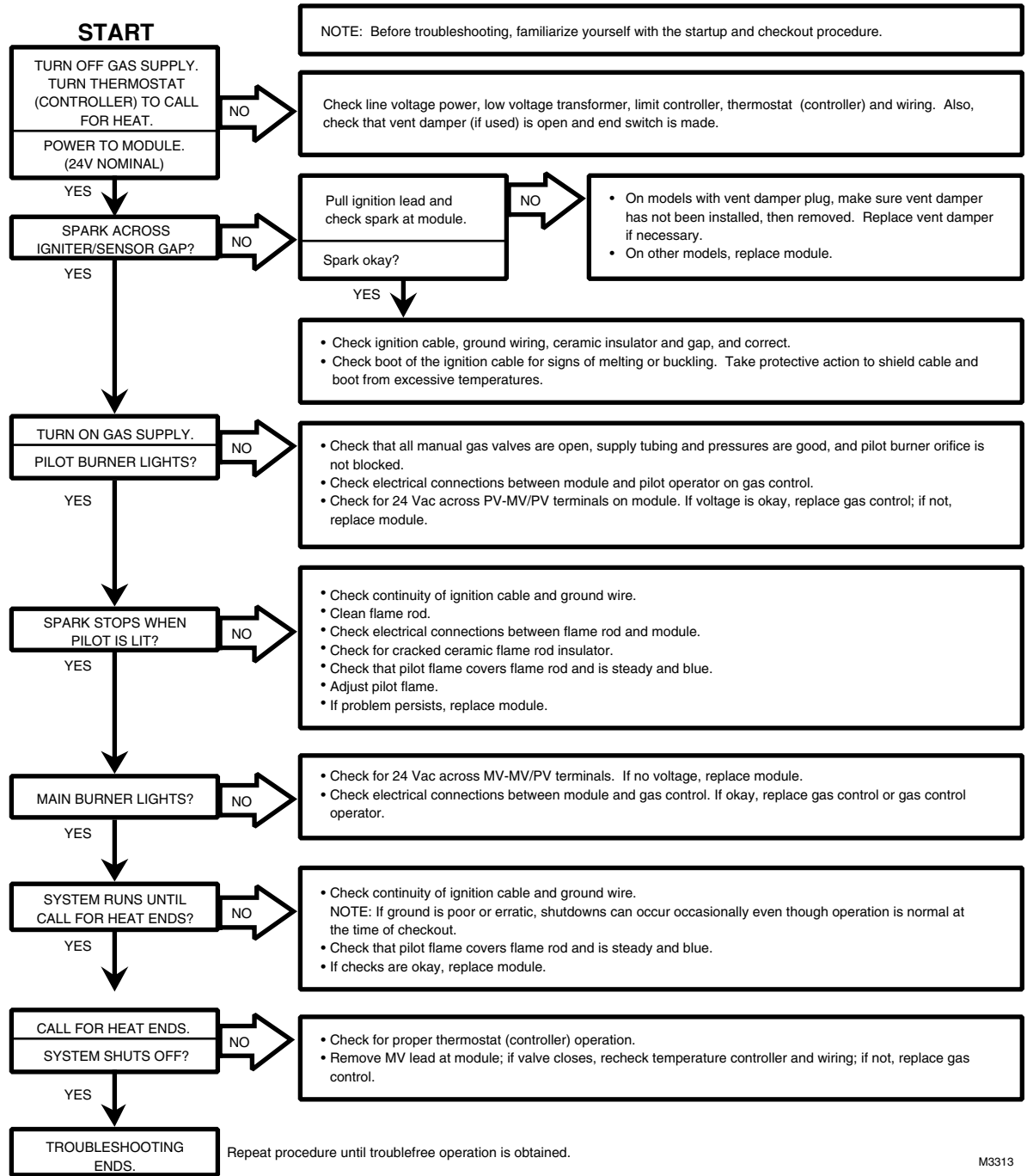
- Energize the module and immediately touch one end of the jumper firmly to the GND terminal on the module. Move the free end of the jumper slowly toward the SPARK terminal until a spark is established.
- Pull the jumper slowly away from the terminal and note the length of the gap when sparking stops. Check table below.

Arc Length	Action
No arc or arc less than 1/8 in. (3 mm)	Check external fuse, if provided. Verify power at module input terminal. Replace module if fuse and power are okay.
Arc 1/8 in. (3 mm) or longer.	Voltage output is okay.

**STEP 4: Check pilot and main burner lightoff.**

- Open the manual gas valve.
- Set the thermostat to call for heat.
- Watch the pilot burner during the ignition sequence to see if:
  - ignition spark continues after the pilot is lit;
  - pilot lights and the spark stops, but main burner does not light.

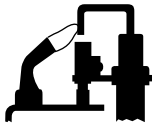




- Ensure adequate flame current as follows:
  - Turn off the furnace at the circuit breaker or fuse box.
  - Clean the flame rod with an emery cloth.
  - Make sure the electrical connections are clean and tight. Replace damaged wire with moisture-resistant No. 18 wire rated for continuous duty up to 105°C (221°F).
  - Check for a cracked ceramic insulator, which can cause short to ground, and replace the igniter-sensor, if necessary.
  - At the gas control, disconnect the main valve wire from the TH or MV terminal.
  - Turn on the power and set the thermostat to call for heat. The pilot should light but the main burner remains off because the main valve actuator is disconnected.
  - Check the pilot flame. Make sure it is blue, steady, and envelops 3/8 to 1/2 in. (10 to 13 mm) of the flame rod. See Fig. 20 for possible flame problems and their causes.
  - If necessary, adjust the pilot flame by turning the pilot adjustment screw on the gas control clockwise to decrease or counterclockwise to increase the pilot flame. Following adjustment, always replace the pilot adjustment cover screw and tighten firmly to assure proper gas control operation.
  - Set the thermostat below the room temperature to end the call for heat.
- Recheck ignition sequence as follows:
  - Reconnect the main valve wire.
  - Set the thermostat to call for heat.
  - Watch the ignition sequence at the burner.
  - If spark still does not stop after the pilot lights, replace the ignition module.
  - If the main burner does not light or if the main burner lights but system shuts down, check module, ground wire, and gas control, as described in the troubleshooting guide, Fig. 19.



M3313

Fig. 19. S8610U troubleshooting guide.



APPEARANCE	CAUSE
<p>SMALL BLUE FLAME</p> 	<p>CHECK FOR LACK OF GAS FROM:</p> <ul style="list-style-type: none"> <li>• CLOGGED ORIFICE FILTER</li> <li>• CLOGGED PILOT FILTER</li> <li>• LOW GAS SUPPLY PRESSURE</li> <li>• PILOT ADJUSTMENT AT MINIMUM</li> </ul>
<p>LAZY YELLOW FLAME</p> 	<p>CHECK FOR LACK OF AIR FROM:</p> <ul style="list-style-type: none"> <li>• DIRTY ORIFICE</li> <li>• DIRTY LINT SCREEN, IF USED</li> <li>• DIRTY PRIMARY AIR OPENING, IF THERE IS ONE</li> <li>• PILOT ADJUSTMENT AT MINIMUM</li> </ul>
<p>WAVING BLUE FLAME</p> 	<p>CHECK FOR:</p> <ul style="list-style-type: none"> <li>• EXCESSIVE DRAFT AT PILOT LOCATION</li> <li>• RECIRCULATING PRODUCTS OF COMBUSTION</li> </ul>
<p>NOISY LIFTING BLOWING FLAME</p> 	<p>CHECK FOR:</p> <ul style="list-style-type: none"> <li>• HIGH GAS PRESSURE</li> </ul>
<p>HARD SHARP FLAME</p> 	<p>THIS FLAME IS CHARACTERISTIC OF MANUFACTURED GAS</p> <p>CHECK FOR:</p> <ul style="list-style-type: none"> <li>• HIGH GAS PRESSURE</li> <li>• ORIFICE TOO SMALL</li> </ul>

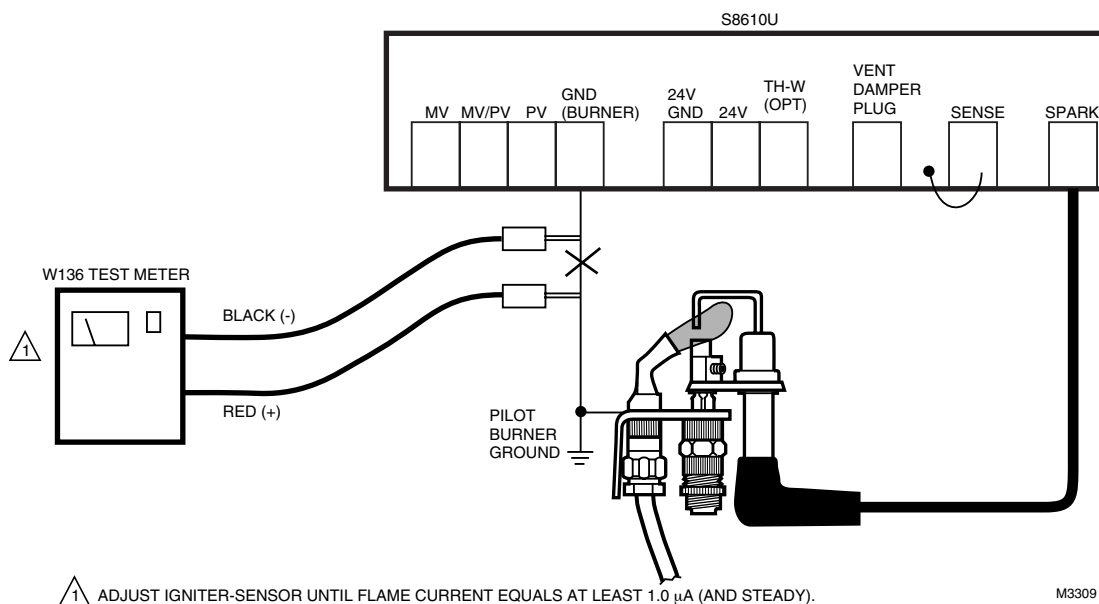
M558

Fig. 20. Examples of unsatisfactory pilot flames.

### Adjust Pilot Flame Current

The pilot flame current must measure at least 1uA and steady or nuisance shutdowns can occur. Use a Honeywell W136 to adjust the pilot flame current.

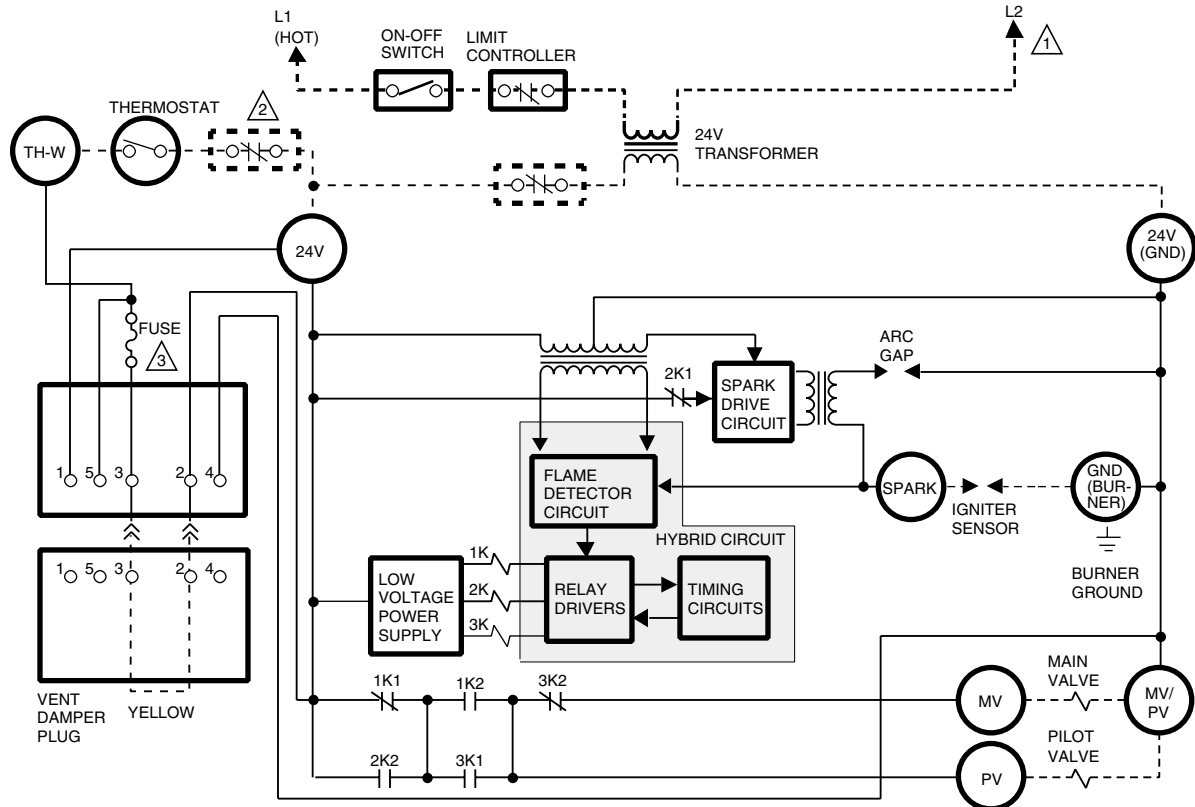
- 1 Disconnect the furnace power at the service entrance.
- 2 Disconnect the control module green ground wire.
- 3 Connect the microammeter negative lead to the control module GND (BURNER) terminal and the positive lead to the green ground wire (see Fig. 21).
- 4 Disconnect the red wire from the gas control TH or MV terminal to disable the gas control.
- 5 Loosen the set screws holding the igniter-sensor on the ground rod.
- 6 Restore power and set thermostat to call for heat.
- 7 Wait until the pilot lights and sparking stops. The main burner can not light.
- 8 Adjust the igniter-sensor position and watch the microammeter reading.
- 9 When you find the igniter-sensor position that gives the maximum microammeter reading, tighten the setscrews to lock the igniter-sensor in place. This reading must be at least 1.0 uA and steady.
- 10 Turn off power, remove microammeter, and reconnect red and green leads.
- 11 Perform Checkout procedures.



⚠️ ADJUST IGNITER-SENSOR UNTIL FLAME CURRENT EQUALS AT LEAST 1.0 uA (AND STEADY).

M3309

Fig. 21. Adjusting flame current.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 ALTERNATE LIMIT CONTROLLER LOCATION.
- 3 3.0 AMP NONREPLACEABLE FUSE. FUSE BLOWS WHEN VENT DAMPER IS PLUGGED IN.

— INTERNAL WIRING  
 - - - EXTERNAL WIRING

M3311

Fig. 22. Y8610U schematic diagram.

## ANSI STANDARDS

### Exhibit A

#### Recommended Procedure for Safety Inspection of an Existing Appliance Installation as a Preliminary Step to Applying an Automatic Intermittent Pilot System

The following procedure is intended as a guide to aid in determining that an appliance is properly installed and is in a safe condition for continuing use.

This procedure is predicated on central furnace and boiler installations equipped with an atmospheric gas burner(s) and not of the direct vent type. It should be recognized that generalized test procedures cannot anticipate all situations. Accordingly, in some cases, deviation from this procedure may be necessary to determine safe operation of the equipment.

- a. This procedure should be performed prior to any attempt at modification of the appliance or the installation.
- b. If it is determined there is a condition which could result in unsafe operation, the appliance should be shut off and the owner advised of the unsafe condition.

The following steps should be followed in making the safety inspection:

1. Conduct a Gas Leakage Test of the appliance piping and control system downstream of the shut-off valve in the supply line to the appliance.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restrictions, leakage or corrosion or other deficiencies which could cause an unsafe condition.
3. Shut off all gas to the appliance and shut off any other fuel-burning appliance within the same room. Use the shutoff valve in the supply line to each appliance. If a manual gas valve is not in the gas supply line within 6 feet of the appliance in an accessible location, one shall be installed.
4. Inspect burners and crossovers for blockage and corrosion.
5. Applicable only to warm air heating appliances. Inspect heat exchangers for cracks, openings or excessive corrosion.
6. Applicable only to boilers. Inspect for evidence of water or combustion product leaks.
7. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliance is located and other spaces of the building. Turn on clothes dryers. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers. If, after completing steps 7 through 12, it is believed sufficient combustion air is not available, refer to 1.3.4 of the National Fuel Gas Code (Z223.1) for guidance.
8. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
9.
  - a. Determine that the pilot is burning properly and that main burner ignition is satisfactory by interrupting and re-establishing the electrical supply to the appliance in any convenient manner.
  - b. Determine manifold pressure in order to match input after the new control is installed.
10.
  - a. Visually determine that main burner gas is burning properly; i.e., no floating, lifting or flashback. Adjust the primary air shutter(s) as required.
  - b. If appliance is equipped with high and low flame control or flame modulation, check for proper main burner operation at low flame.
11. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use a draft gauge, the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
12. Return doors, windows, exhaust fans, fireplace dampers and all other fuel-burning appliances to their previous conditions of use.
13. Applicable only to warm air heating appliances. Check both limit controller and fan controller for proper operation. Limit controller operation can be checked by temporarily disconnecting the electrical supply to the blower motor and determining that the limit control acts to shut off the main burner gas.
14. Applicable only to boilers:
  - a. Determine that the circulating water pumps are in operating condition.
  - b. Test low water cutoffs, automatic feed controls, pressure and temperature limit controls and relief valves in accordance with the manufacturer's recommendations and instructions to determine they are in operating condition.

**Exhibit A of ANSI Standard Z21.71 for Automatic Intermittent Pilot Ignition Systems for Field Installation.**

## Exhibit B

### Procedure for Installing Automatic Intermittent Pilot Systems

Prior to beginning this procedure, a preliminary examination of the appliance and the automatic intermittent pilot system should be made to determine that the automatic intermittent pilot system can be properly applied to the appliance.

This procedure is intended as a guide to aid in safely installing a listed automatic intermittent pilot system on an existing listed appliance equipped with an atmospheric gas burner(s) and not of the direct vent type.

This procedure is based on the assumption that the history of the specific installation has been one of safe and satisfactory operation.

This procedure is predicated on central furnace and boiler installations, and it should be recognized that generalized procedures cannot anticipate all situations. Accordingly, in some cases, deviation from this procedure may be necessary to determine safe operation of the equipment.

The following steps should be followed in making the modifications:

1. Perform a safety inspection of the existing appliance installation. See Exhibit A for a recommended procedure for such a safety inspection.
2. Shut off all gas and electricity to the appliance. To shut off gas, use the shutoff valve in the supply line to the appliance. If a manual gas valve is not in the gas supply line within 6 feet of the appliance in an accessible location, one shall be installed. Do not use the shutoff valve which is provided as part of a combination control.
3. Install the automatic intermittent pilot system in strict accordance with the manufacturer's installation instructions.
4. Turn on all gas and electricity to the appliance.
5. Determine that the appliance transformer has adequate capacity by following the steps outlined below:
  - a. Compute the approximate current draw by adding the current draw of the automatic intermittent pilot system to (1) the current draw of the associated valving, and (2) the current draw of any relays or other devices operated by the transformer.
  - b. Multiply the total current draw as computed above by 24 V to determine the total VA (volt-ampere) required.
  - c. The total VA (volt-ampere) required should be equal to or less than the VA rating of the transformer.
  - d. If the total VA (volt-ampere) required is greater than the VA rating of the transformer, the transformer must be replaced with a Class 2 transformer of adequate rating.
6. Check the heat anticipator in the comfort thermostat to determine if it is properly adjusted to the current draw of the control system. Follow the thermostat manufacturer's instructions.
7. Make certain wiring connections are tight and wires are positioned and secured so they will not be able to contact high temperature locations.
8. Conduct a Gas Leakage Test of the appliance piping and control system downstream of the shut-off valve in the supply line to the appliance.
9.
  - a. Adjust the thermostat to its highest temperature setting, and test manifold pressure and adjust the pressure regulator to match original input as required (refer to Exhibit A, step 9b).
  - b. Visually determine that main burner is burning properly; i.e., no floating, lifting or flashback. Adjust the primary air shutter(s) as required.
10. If the appliance is equipped with high and low flame control or flame modulation, check for proper main burner operation at both high and low flame.
11. Determine that the pilot is igniting and burning properly and that main burner ignition is satisfactory by interrupting and reestablishing the electrical supply to the appliance in any convenient manner. Make this determination with the appliance burner both cold and hot. Perform this step as many times as is necessary to satisfy yourself that the automatic intermittent pilot system is operating properly.
12. Test the pilot safety device (1) to determine if it is operating properly, and (2) for turndown characteristics according to the manufacturer's installation instructions. No adjustments should be made other than those recommended by the system manufacturer.
13. Sequence the appliance through at least three operating cycles.
14. Applicable only to furnaces. Check both the limit controller and the fan controller for proper operation. Limit control operation can be checked by blocking the circulating air inlet or temporarily disconnecting the electrical supply to the blower motor and determining that the limit controller acts to shut off the main burner gas.
15. Applicable only to boilers.
  - a. Determine that the circulating water pumps are in operating condition.
  - b. Test low water cutoffs, automatic feed water controls, pressure and temperature limit controllers and relief valves in accordance with the manufacturer's recommendation to determine they are in operating condition.
16. Add the labels (see 1.6.1-n and -o) on the appliance.

### Exhibit B of ANSI Standard Z21.71 for Automatic Intermittent Pilot Ignition Systems for Field Installation.

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