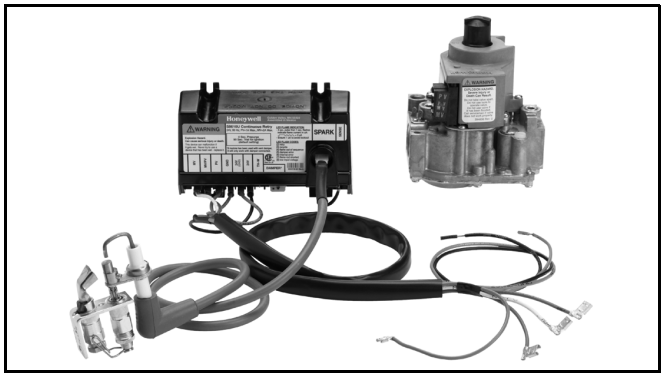
Honeywell

Y8610U Intermittent Pilot Retrofit Kit

PRODUCT DATA



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, induced draft, or power burner equipment. Meets ANSI Z21.71 standard for automatic intermittent pilot ignition systems on central furnaces and boilers.

FEATURES

- Y8610U kits can be used with either natural or LP gas.
- The S8610U ignition control provides a 90 second maximum ignition trial, shuts off, waits five minutes nominal, then re-initiates the pilot ignition sequence. The ignition trial, shutoff, and wait cycle repeat until the pilot lights or the call for heat ends.

Each kit includes:

— S8610U Intermittent Pilot Module
— VR8304M Dual Valve Combination Gas Control
or
VR8204A 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 with VR8304M
— Installation hardware

Temperature Ratings:

— S8610U: -40°F to 165°F (-40°C to 74°C)
— VR8304M: -40°F to 175°F (-40°C to 79°C)
— VR8204A: 0°F to 175° F (-18°C to 79°C)

Intermittent Pilot Gas Ignition Control Module

- Uses flame rectification for flame sense
- Internal spark generator lights pilot gas; main burner lights after pilot flame lights and proves
- 100% shutoff of pilot and main gas if burner fails to light
- Continuous retry ignition sequence prevents nuisance lockouts
- Two LEDs indicate system status and flame signal strength

Gas Control Valve

- Straight through body pattern
- VR8304M capacity is 270 ft^3/hr (7.6 m^3/hr)
- VR8204A capacity with or without 1/2” x 3/4” adapter is 150 ft^3/hr (4.2 m^3/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

Contents

Automatic Ignition Systems
ANSI Z21.20

68-0291-03

Table 1. S8610U Universal Intermittent Pilot Gas Ignition Control Module.

Igniter-Sensor Type	Valve Current Rating @ 24 Vac	Prepurge Timing (field selectable)	Trial for Pilot Ignition (field selectable)	Ignition Sequence Type	Ignition Sequence (After prepurge, if prepurge is selected)	Integral Damper Connector
Combination (one rod; local flame sensing)	1.0 A Pilot and 2.0 A Main	0 (zero) or 30 seconds; 0 (zero) seconds recommended	15 or 90 seconds; 90 seconds recommended	Retry	Spark and pilot gas ON until lightoff or trial for ignition ends. If established flame is lost, trial for ignition restarts immediately. If pilot fails to light, pilot gas and spark turned off (100% shutoff). After 5 minute delay, a new trial for ignition is initiated. This sequence continues until lightoff or "Call for Heat" is removed.	Included for use as needed. If initially installed and powered up with damper attached, unit must always have a vent damper connected.

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.

Y8610U Intermittent Pilot Retrofit Kit

Electrical Ratings:

- Voltage and Frequency: 24 Vac, 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

S8610U Intermittent Pilot Gas Ignition Control Specifications

Control Voltage: Line 24 Vac (18-30 Vac) 50/60 Hz

Trial for Ignition: See Table 1 above

Prepurge: See Table 1 above

Flame Failure Response Time: 2 seconds maximum

LEDs:
The green LED provides system status, error codes and indicates flame sensing

Operating Temperature:
Minimum ambient temperature rating is -40°F (-40°C)

Maximum ambient temperature rating when used with 2.0 A main valve is 165°F (74°C)

Relative Humidity: 0% to 95% non condensing

Dimensions: See Fig. 2 on page 4.

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

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

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

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
   1885 Douglas Drive North
   Minneapolis, Minnesota 55422-4386
3. http://customer.honeywell.com or http://customer.honeywell.ca

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Toronto, 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.

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.

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. Refer to Fig. 14 on page 12.

Fasten with No. 6-32 machine screws or No. 8 sheet metal screws or 8-18 x 5/8 pan head tapping screws of appropriate length.

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.

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

VR8204A and VR8304M Dual Valve Combination Gas Controls Specifications

Table 2. VR8204A and VR8304M Dual Valve Combination Gas Controls Specifications.

Model	Capacity[a]	Pipe Size	Ambient Temperature Rating	Dimensions
VR8204A	150 ft^3/hr (4.2 m^3/hr); (with or without 1/2" x 3/4" adapter)	1/2 in. X. 1/2 in. NPT inlet x outlet[b]	0° to 175° F (-18° to 79° C)	See Fig. 4 on page 5
VR8304M	270 ft^3/hr (7.6 m^3/hr)	1/2 in. X. 3/4 in. NPT inlet x outlet	-40° to 175°F (-40° to 79°C)	See Fig. 3 on page 5

[a] Based on 1,000 Btu/ft^3, 0.64 specific gravity natural gas at 1 in. wc pressure drop (37.3 MJ/m^3, 0.64 specific gravity natural gas at 0.25 kPa pressure drop).

[b] 3/4 in. straight flange included to provide 3/4" NPT outlet if needed.

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 on page 4)

Electrode/Flame Rod Material: Kanthal

Maximum Temperature Ratings:
Ground Rod Tip: 1775°F (968°C)

Ceramic Insulator: 1250°F (677°C)

Dimensions: See Fig. 5 on page 6.

Mounting:
Attach the supplied ground rod and adapter, which replace the thermocouple on the existing pilot burner

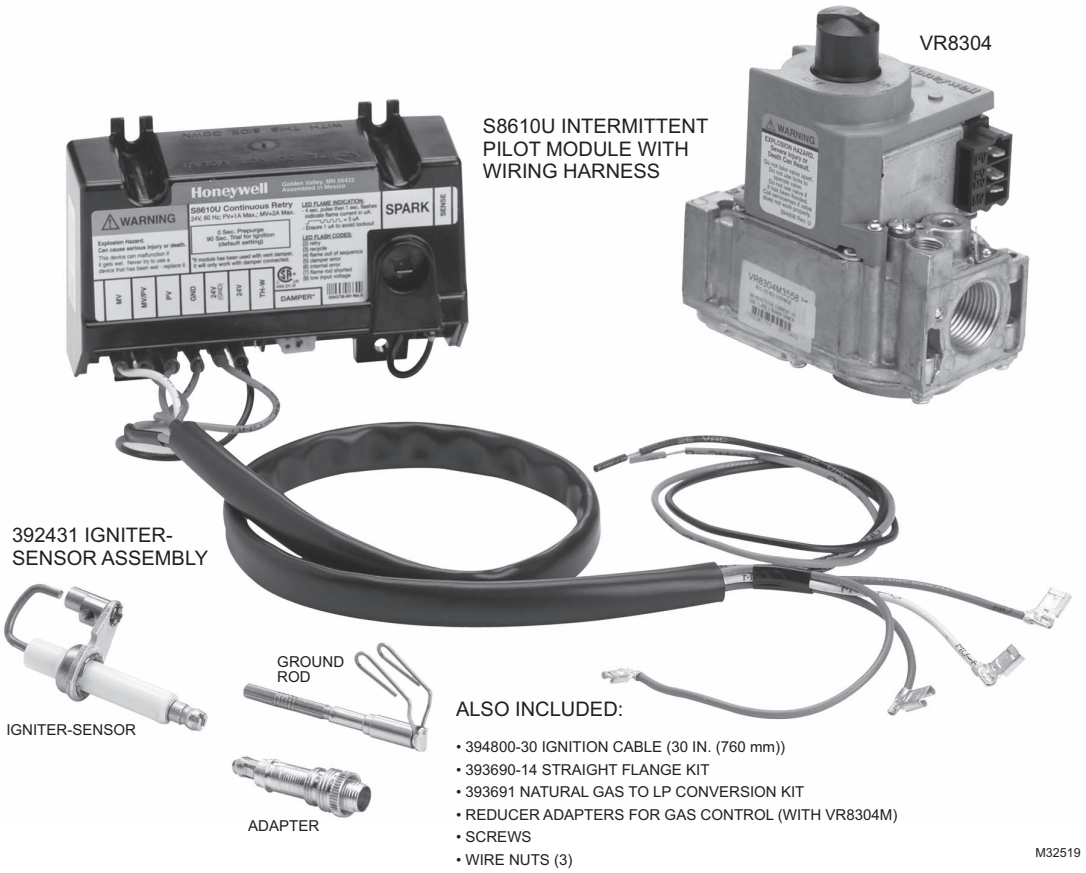


Fig. 1. Y8610U retrofit kit components.

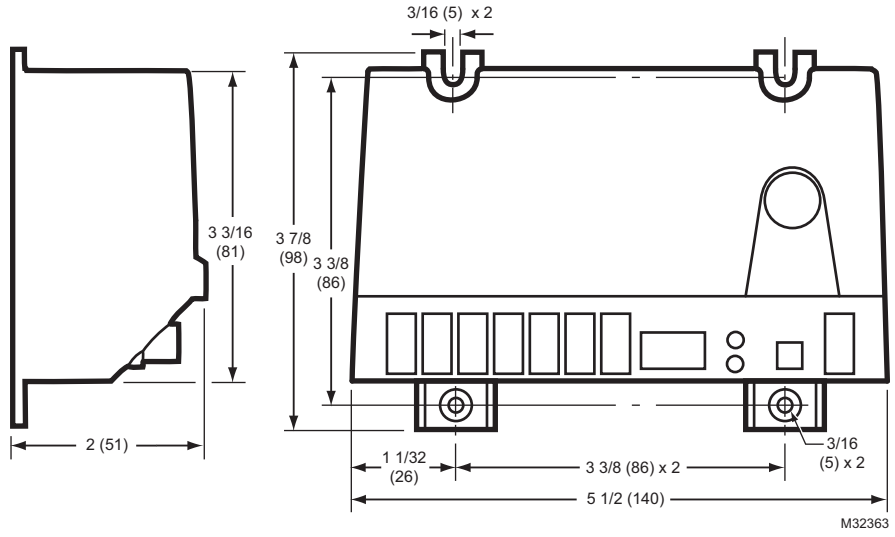


Fig. 2. S8610U module dimensions in inches (mm).

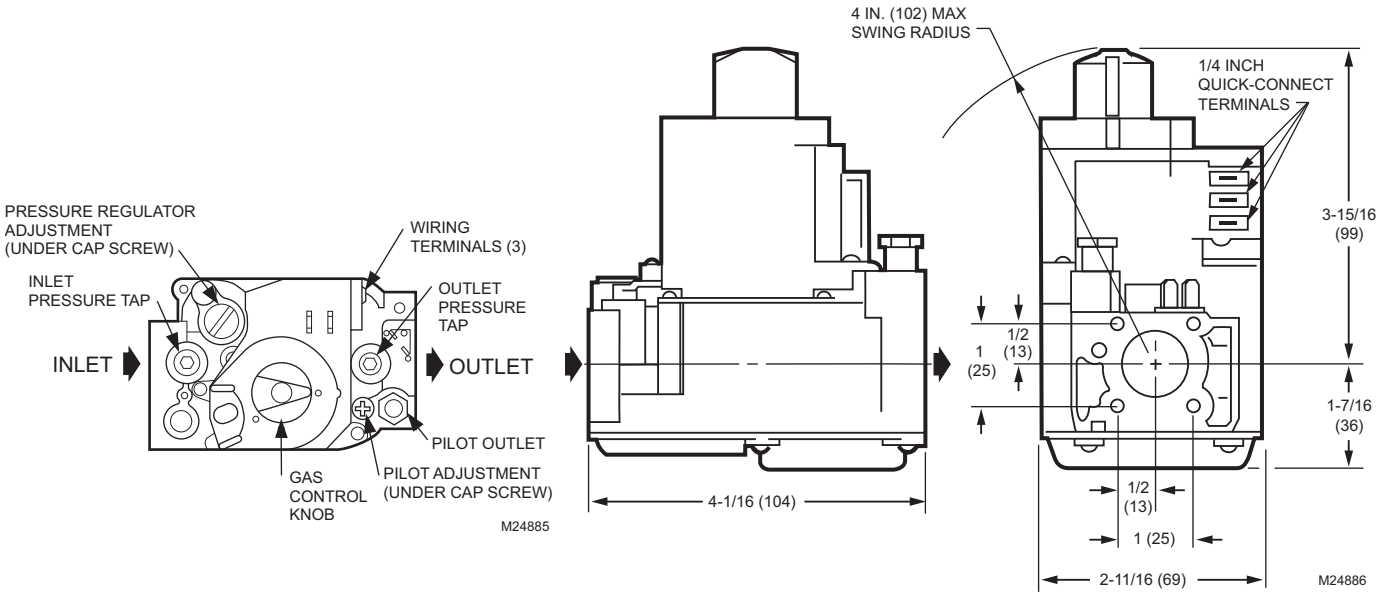


Fig. 3. VR8304M mounting dimensions in inches (mm).

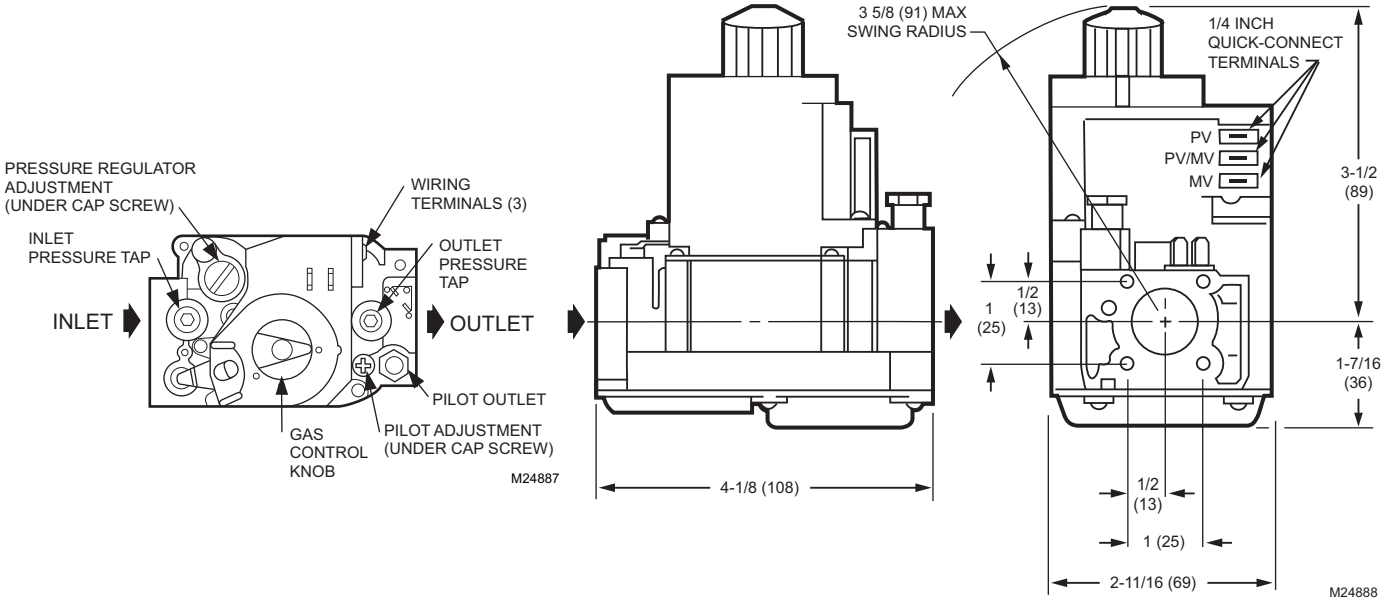


Fig. 4. VR8204A mounting dimensions in inches (mm).

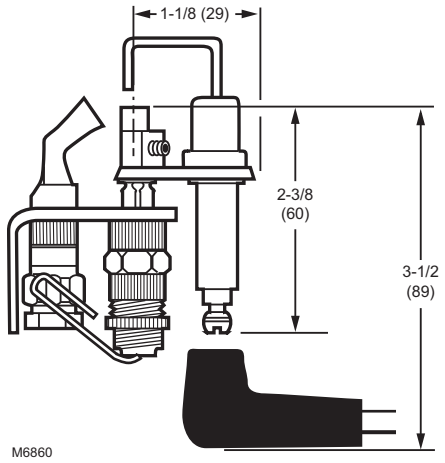


Fig. 5. 392431 Igniter-sensor mounting dimensions in inches. (mm).

PLANNING THE INSTALLATION

⚠ WARNING

Fire or Explosion Hazard.
Can cause severe injury, death or property damage.

1. Plan the installation as outlined below.
2. Plan for frequent maintenance as described in the Maintenance section.

Intermittent pilot systems are used on a wide variety of central heating equipment and on heating appliances such as commercial cookers, agricultural equipment, industrial heating equipment and pool heaters. Some of these applications may 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 situations, special steps may be required to prevent nuisance shutdowns and premature control module failure. These applications require special Honeywell review; contact your Honeywell Sales Representative for assistance.

Review the following conditions that can apply to your specific installation and take the precautionary steps suggested.

Frequent Cycling

These controls are designed for use on appliances that typically cycle three to four times an hour only during the heating season. In year-round applications with greater cycling rates, the control module can wear out more quickly; perform a monthly checkout.

Water or Steam Cleaning

If the control module gets wet, replace it. If the appliance is likely to be cleaned with water or steam, protect (cover) the controls and wiring from water or steam flow. Mount the controls high enough above the bottom of the cabinet so they do not get wet during normal cleaning procedures. Use a NEMA 4 enclosure for the ignition control module.

High Humidity or Dripping Water

Dripping water can cause the control module and the gas control to fail. Never install an appliance where water can drip on the controls.

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

If the appliance is in a humid atmosphere, make sure air circulation around the controls is adequate to prevent condensation. Also, regularly check out the system. A NEMA 4 enclosure is recommended for the ignition control module.

Corrosive Chemicals

Corrosive chemicals can attack the ignition control module and gas control, eventually causing a failure. If chemicals are used for routine cleaning, make sure they do not reach the controls. Where chemicals are suspended in air, as in some industrial or agricultural applications, use a NEMA 4 enclosure for the ignition control module.

Dust or Grease Accumulation

Heavy accumulations of dust or grease can cause controls to malfunction. Where dust or grease can be a problem, provide covers for the ignition control module and the gas control to limit contamination. A NEMA 4 enclosure is recommended for the ignition control module.

Heat

Excessively high temperatures can damage controls. Make sure the maximum ambient temperature at the control module does not exceed the rating of the control module. If the appliance operates at very high temperatures, use insulation, shielding, and air circulation, as necessary, to protect the controls. Proper insulation or shielding should be provided by the appliance manufacturer; verify proper 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, appliances with induced draft, 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 OR ELECTRICAL SHOCK 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. (See “Checkout” on page 15.)
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.

Maintenance Requirements in Severe Environments

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

- In many such applications, particularly commercial cooking, the equipment operates 100,000-200,000 cycles per year. Such heavy cycling can wear out the gas control in one to two years. A normal forced air furnace, for which the controls were originally intended, typically operates less than 20,000 cycles per year.
- Exposure to water, dirt, chemicals, and heat can damage the ignition control module or the gas control and shut down the control system. A NEMA 4 enclosure can reduce exposure to environmental contaminants.

The maintenance program should include regular checkout of the system as outlined under “Checkout” on page 15.

⚠ WARNING

FIRE OR EXPLOSION HAZARDCAN 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 ignition control module or gas control should be replaced if it does not perform properly on checkout or troubleshooting. In addition, replace any ignition control module or gas control if it is wet or looks like it has ever been wet. Protective enclosures as outlined under “Planning the Installation” on page 6 are recommended regardless of checkout frequency.

Perform the Pre installation Safety Inspection

The pre-installation checks described below must be completed before the Y8610U Intermittent Pilot Retrofit Kit is installed. If a condition that could result in unsafe operation is detected, the appliance should be shut off and the owner advised of the unsafe condition. Correct any potentially unsafe condition before proceeding with the installation. See “Exhibit A” on page 22.

The following safety checklist 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. Determine the following:
   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. Perform the following tests:
   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.

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 existing standing pilot gas control wires are used to control Y8610U Retrofit Kit. Carefully identify and tag the wires before disconnecting. See Fig. 6 for the most common types of terminal arrangements.

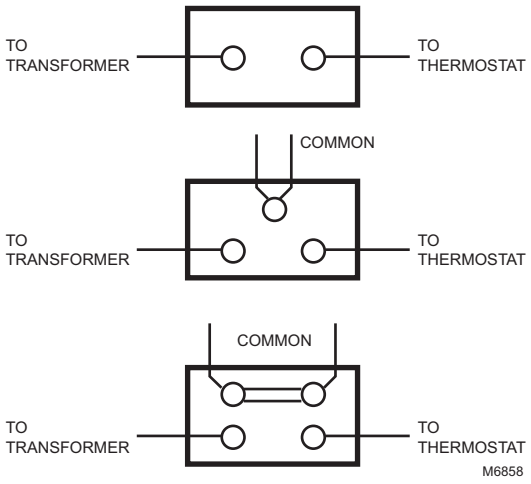


Fig. 6. Wiring connections on standing pilot gas controls.

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

FIRE OR EXPLOSION HAZARDCAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH.

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. 7.

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.

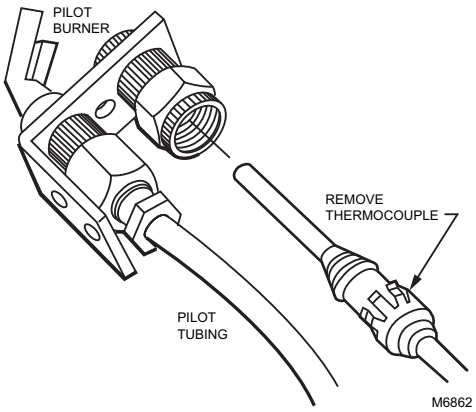


Fig. 7. Remove thermocouple from pilot burner.

Install Igniter-Sensor Assembly

1. Install the ground rod. See Fig. 8.
   - Mount adapter to the ground rod, if needed.
   - 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. 8.
   - Align the ground rod so the clip hugs the pilot burner and keeps the ground rod from rotating. See Fig. 9.
2. Loosen the setscrews on the mounting bracket and slide the igniter-sensor mounting bracket over the top of the ground rod. See Fig. 9.
3. Tighten the setscrews on the mounting bracket using the hex wrench provided. See Fig. 9.
4. Adjust the electrode position so the electrode tip and gap are in the pilot flame. Push/pull the ground rod to move the igniter-sensor up and down.
5. Check that the chosen position allows room to connect the ignition cable to the stud terminal. Rotate the igniter-sensor as necessary.
6. Tighten the setscrews on the mounting bracket using the hex wrench provided.

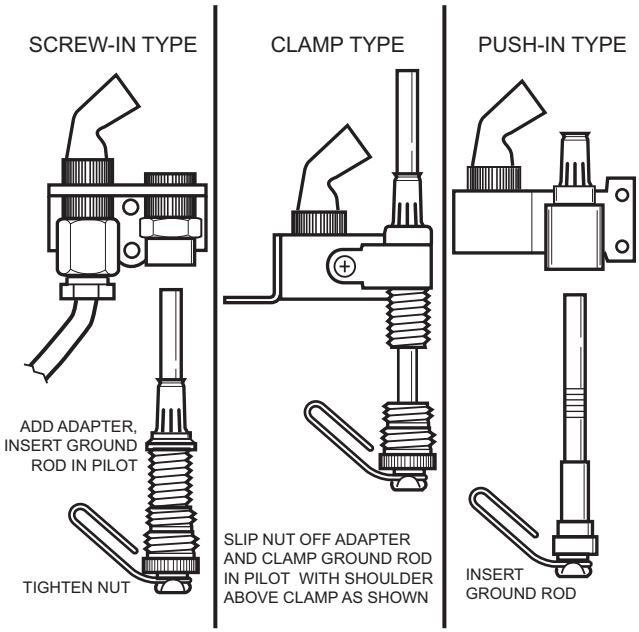


Fig. 8. Mount ground rod on pilot burner.

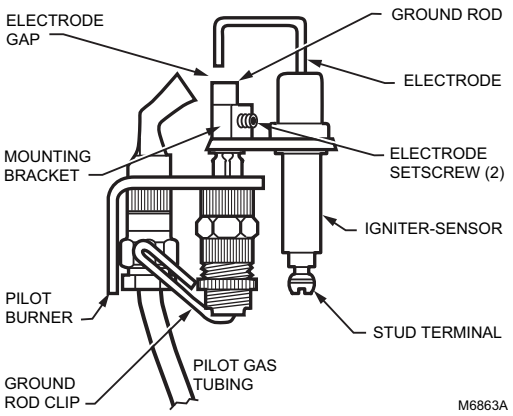


Fig. 9. Fasten igniter-sensor to ground rod.

Install the Gas Control

WARNING

FIRE OR EXPLOSION HAZARDCAN 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 HAZARDCAN 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 or Fig. 4 on page 5.
3. Remove the existing spring.
4. Insert the replacement spring with the tapered end down. See Fig. 10.
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 “Checkout” on page 15.
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.

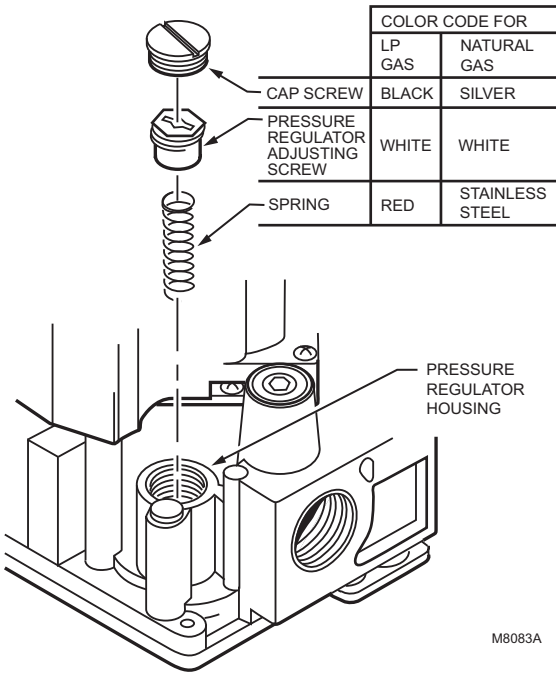


Fig. 10. Installation of conversion kit in regulated gas control.

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 is 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.

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. 11 on page 11.