

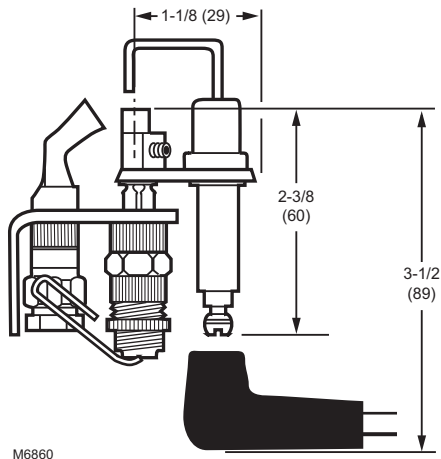


Fig. 5. 392431 Igniter-sensor mounting dimensions in inches. (mm).

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 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 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.

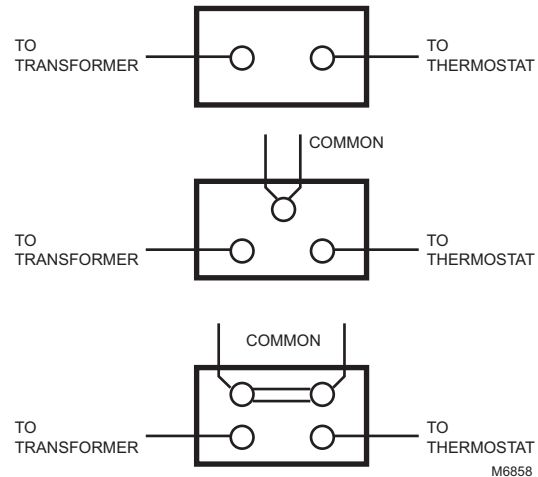


Fig. 6. Wiring connections on standing pilot gas controls.

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 HAZARD CAN 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.

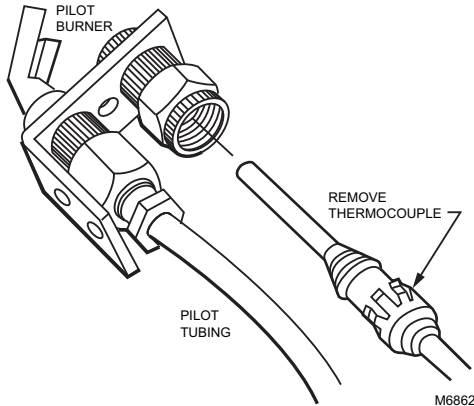
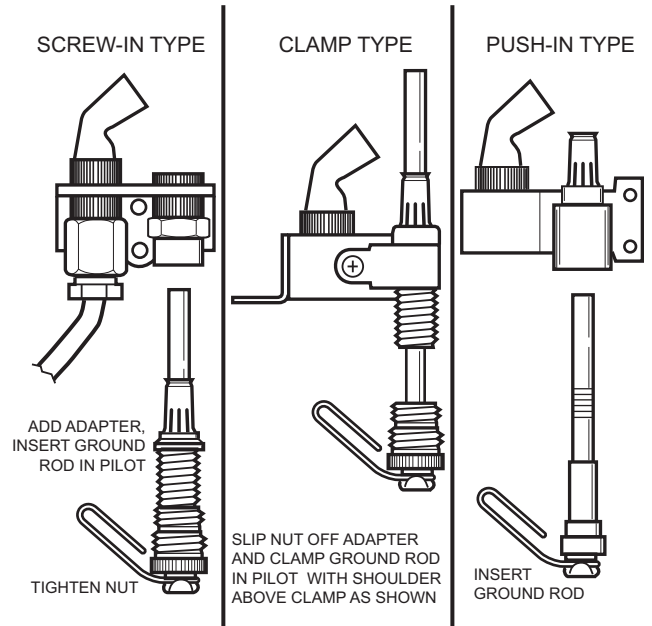


Fig. 7. Remove thermocouple from pilot burner.

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.



BE SURE THE GROUND CLIP IS SNAPPED ONTO THE PILOT BURNER OR ITS GAS LINE.

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Fig. 8. Mount ground rod on pilot burner.

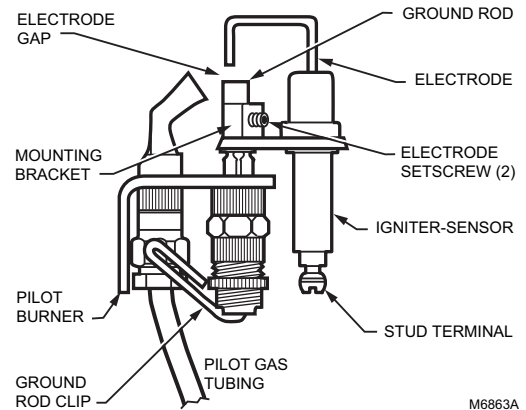


Fig. 9. Fasten igniter-sensor to ground rod.

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 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.

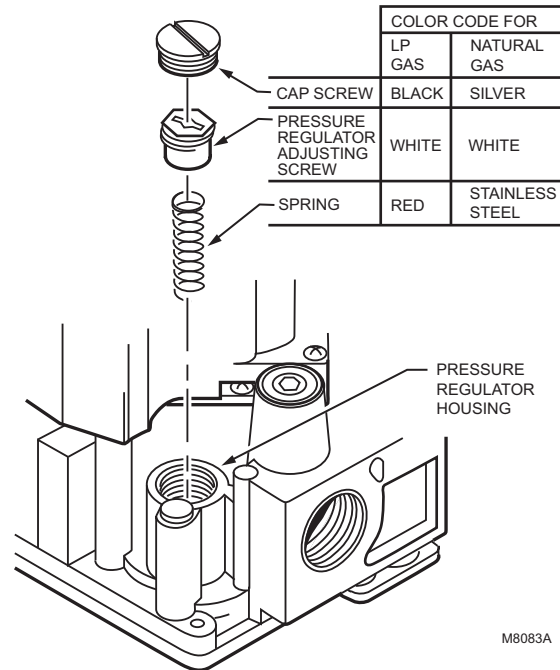


Fig. 10. Installation of conversion kit in regulated gas control.

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.

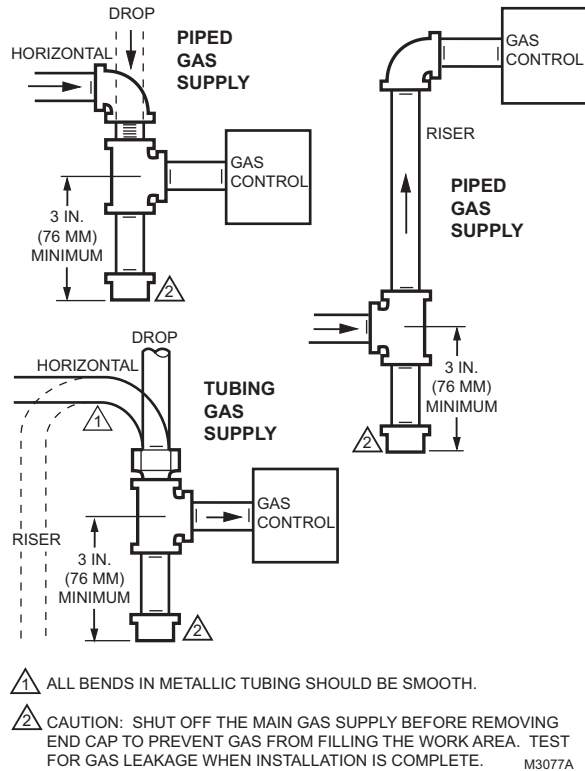


Fig. 11. Install sediment trap.

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 3.

NOTE: See Table 3 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 3. 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. 12.

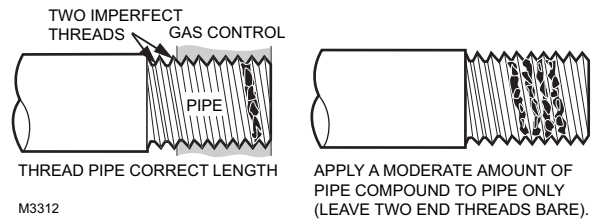


Fig. 12. Use moderate amount of pipe compound.

5. Remove protective seals over the gas control inlet and outlet, if necessary.
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 or Fig. 4 on page 5 depending on the valve used.

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 or Fig. 4 on page 5 depending on the valve used). 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. 13.

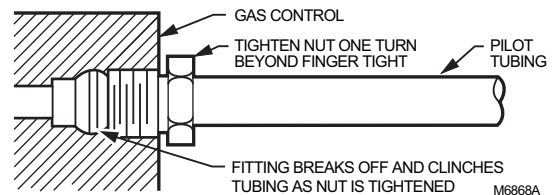


Fig. 13. Always use new compression fitting.

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 the threads. Turn the fitting until finger tight. Use a wrench to tighten one more turn. Do not overtighten.
5. Connect the other end of the pilot gas tubing to the pilot burner according to the pilot burner manufacturer instructions.

Locate and Mount the S8610U Intermittent Pilot Module

Location

Identify a mounting location for the S8610U ignition control. The mounting location must provide:

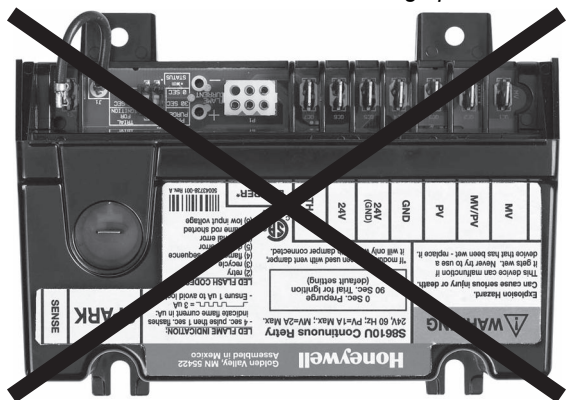
- Good, clear access to the field wiring terminals.
- Operating ambient temperatures between -40°F (-40°C) and 165°F (74°C).
- Direct the cable route to the pilot burner. The cable route must be 30 inches (762 mm) or less and not expose the cable to excessive heat.
- Relative humidity below 95% non condensing.
- Protection from water, steam or corrosive chemicals that are used to clean the appliance.
- Protection from dripping water, such as from an overfilled humidifier or from condensation.
- Protection from dust or grease accumulation.

Mounting

Mount the ignition control module with the terminals down to protect them from dripping water and dust. The control module can also be mounted with the terminals on either side. Do not mount with the terminals pointing up. Fig. 14 illustrates the incorrect mounting position. Use the S8610U as a template to mark the mounting hole pattern. Drill new holes, as required. Fasten securely with four – No. 6-32 machine screws, or No. 8 sheet metal screws, or 8-18 x 5/8 Pan Head tapping screws.

IMPORTANT

Do not mount with terminals facing up.



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Fig. 14. Incorrect mounting.

Wire the System



CAUTION

ELECTRICAL SHOCK OR EQUIPMENT DAMAGE HAZARD.

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

All wiring must comply with local codes and ordinances. Refer to Fig. 15 and Table 5 on page 13 for typical connections.

IMPORTANT

1. As shown in the wiring diagrams, a common ground is required on:
The pilot burner mounting bracket, **and** the GND (BURNER) terminal on the ignition control module. Failure to use the GND (BURNER) terminal may result in intermittent loss of spark and/or loss of flame current sensitivity.
2. Make sure the transformer has adequate VA. The ignition control module requires at least 0.1 A at 24 Vac. Add the current draws of all other devices in the control circuit, including the pilot and main valves in the gas control, and multiply by 24 to determine the total VA requirement of these components. Add this total to 2.4 VA (for the ignition control module). The result is the minimum transformer VA rating. Use a Class II transformer if replacement is required.

Connect Vent Damper (Optional)

If the ignition control module is to be used with an existing vent damper and harness to be connected to the module's integral damper connector in an atmospheric appliance, perform the following to connect it to the module:

IMPORTANT

*After the initial power-up, the ignition control module senses the presence of the vent damper connection. If the vent damper is connected, the ignition control module permanently configures itself to operate **only** with the damper connected.*

Once an ignition control module powers up with a vent damper connected, the module will not function without a vent damper being connected.

Using the wiring harness on the appliance, insert the matching 6-pin plug into the connector labeled P1 (see Fig. 15 on page 13) on the S8610U ignition control module and connect the other end to the vent damper.

NOTE: The connector (P1) accepts a Molex 03-06-2061 plug on the existing vent damper harness.

Connect Ignition Cable

Use the provided ignition cable to connect the S8610U module to the pilot burner.

Be sure the ignition cable is not exposed to high temperature while the appliance is operating.

NOTE: The cable must not run in continuous contact with a metal surface or spark voltage may be greatly reduced. Use ceramic or plastic standoff insulators as required.

To install:

1. Connect one end of the cable to the male quick connect SPARK terminal on the ignition module.
2. Connect the other end of the cable to the igniter or igniter-sensor stud on the pilot burner/igniter-sensor.

Wiring Connections

Connect the provided harness to the ignition module and the gas control. The harness ends are labeled for easy installation. See Table 4.

Table 4. Wiring Harness Connections.

Harness Wire Color / Wire Label	S8610U Terminal	Gas Control Terminal / Tstat Load
Black / 25 VAC	TH-W	Thermostat call for heat to original standing pilot valve
Orange / 25 VAC-GND	24V (GND)	Transformer 24 VAC ground lead to original standing pilot valve
Red / MV	MV	MV
White / MV-PV	MV-PV	MV-PV
Blue / PV	PV	PV
Green / GND	GND	Ground terminal on gas control

Use Fig. 15 and Table 5 to make the remaining wiring connections.

NOTE: The 24V terminal on the S8610U is used only when a vent damper is installed.

Fig. 16 on page 14 illustrates the typical wiring connections in a heating system with an atmospheric burner.

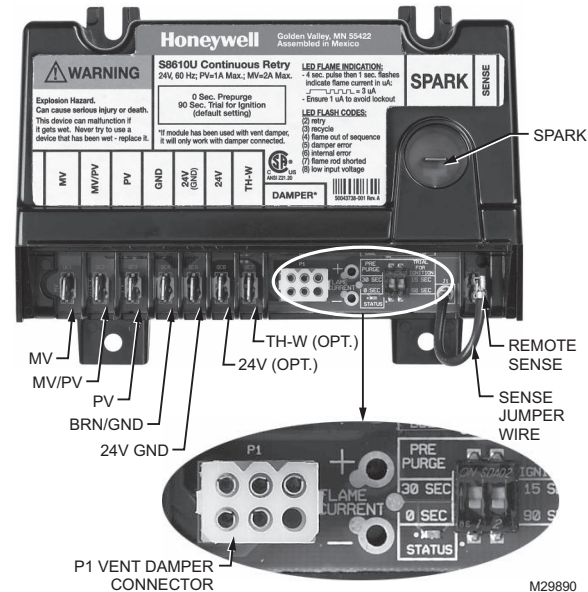
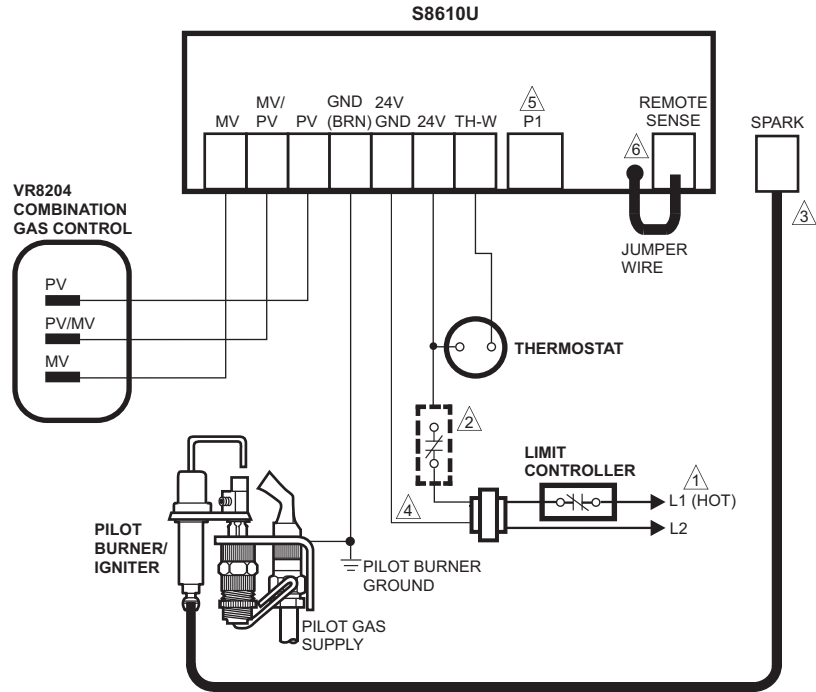


Fig. 15. S8610U Typical wiring connections.

Table 5. S8610U Typical Wiring Connections.

Connector Label	Size or Type	Description
MV	1/4 inch	Main Valve connection
MV/PV	1/4 inch	Common terminal for gas valves
PV	1/4 inch	Pilot Valve connection
BRN GND	1/4 inch	Burner Ground
24V GND	1/4 inch	Return path to transformer
24V	1/4 inch	Optional—24 Vac power connection for Vent Damper
TH-W	1/4 inch	Connector for “Call for Heat” signal from thermostat
P1	6-pin keyed plug	Connector for Vent Damper connection (used to control a connected damper in atmospheric appliances)
Flame Current	Two holes	Micro-ammeter connector
P4 (Jumper)	Jumper	Provides a lockout for the DIP switch settings (See “Jumper” on page 15.)
SENSE JUMPER WIRE	Wire with 3/16 inch quick connect	Connects to the REMOTE SENSE connector for installations with a single spark rod (local flame sensing)
REMOTE SENSE	3/16 inch	Flame Sensor connector For single rod installations, connect the SENSE JUMPER WIRE to this terminal connector.
SPARK	1/4 inch	High voltage sparking electrode connection



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 ALTERNATE LIMIT CONTROLLER LOCATION.
- 3 MAXIMUM CABLE LENGTH 3 FT. [0.9 M].
- 4 CONTROLS IN 24V CIRCUIT MUST NOT BE IN GROUND LEG TO TRANSFORMER.
- 5 LEAVE VENT DAMPER PLUG (P1) UNCONNECTED.
- 6 CONNECT JUMPER WIRE TO THE REMOTE SENSE CONNECTOR.

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Fig. 16. Y8610U connections in a heating system with an atmospheric burner and no vent damper.

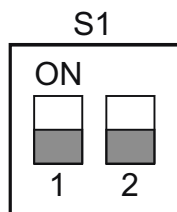
SETTINGS

DIP Switch (S1) Settings

The factory default settings for the S8610U are recommended for retrofit applications. These settings will provide the most reliable system operation.

Table 6. DIP Switch (S1) Settings.

Prepurge	Trial For Ignition	SW1	SW2
None	90 seconds	OFF	OFF



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Fig. 17. DIP switch (S1) - shown with factory default settings (OFF) for SW1 and SW2.

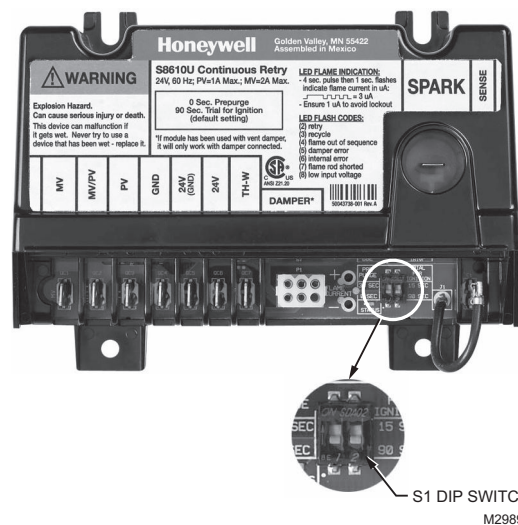


Fig. 18. DIP switch (S1) and jumper (P4) location.