resideo

VR8245 and VR8345 Electronic Ignition Gas Controls

INSTALLATION INSTRUCTIONS

APPLICATION

The electronic ignition gas controls are used in gas-fired appliances with capacities up to 415 cu ft/hour at 1 inch wc pressure drop [11.8 cu m/hour at 0.25 kPa] for natural gas. These gas controls will operate with a direct spark (DSI), hot surface (HSI) or intermittent pilot ignition. The control includes a manual valve, two automatic operators, a pressure regulator, pilot adjustment, pilot plug, conduit cover and ignition adapter. Refer to the following list for the specifications.

SPECIFICATIONS

Ambient Temperature Range: -40° to 175°F [-40° to 79°C].

Body Pattern: Straight-through.

Ignition Adapter: Configures device to operate with direct spark or hot surface ignition.

Electrical Ratings:
Voltage and Frequency: 24 Vac, 50/60 Hz.
Current Draw: See Table 3 for current draw.

Capacity: See Table 1.

Table 1. Gas Capacity.

Models	Size	1" PD Capacity	Minimum Regulated Capacity	Maximum Regulated Capacity
VR8245	1/2X1/2	150,000	20,000 (40,000 for LP)	200,000
VR8345	1/2 X 1/2	240,000	30,000	340,000
	3/4 X 3/4	300,000	30,000	415,000
	1/2 X 3/4	270,000	30,000	370,000

[a] Capacity based on 1000 Btu/cu ft, 0.64 specific gravity natural gas at 1 in. wc pressure drop [37.3 MJ/cu m, 0.64 specific gravity natural gas at 0.25 kPa pressure drop].

Use conversion factors in Table 2 to convert capacities for other gases.

Table 2. Gas Capacity Conversion Factors.

Gas	Specific Gravity	Multiply Listed Capacity By
Manufactured	0.60	0.516
Mixed	0.70	0.765
Propane	1.53	1.62

Approvals:
American Gas Association Design Certificate: L2025007.
Canadian Gas Association Design Certificate: L2025007.

Pipe Adapters: Includes two 3/4 to 1/2 inch NPT bushings and one 1/2 to 3/8 inch NPT bushing.

Models include: Natural to LP conversion kit and Reducer bushings

Cross Reference: See Table 4 for cross reference information.

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 the instructions and on the product to make sure the product is suitable for your application.
3. The installer must be a trained, experienced service technician.
4. After installation is complete, use these instructions to check out product operation.

⚠ WARNING

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

Follow these warnings exactly:

1. Disconnect 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 Gas Leak Test after completion of installation.
3. When working with a system using intermittent pilot ignition, do not bend pilot tubing at gas control or pilot burner after compression fitting has been tightened because gas leakage at the connection can result.
4. Always install sediment trap in gas supply line to prevent contamination of gas control.
5. Do not force the gas control knob. Use only your hand to turn the gas control knob. Never use any tools. If the gas control knob will not operate by hand, call a qualified service technician to replace the gas control. Force or attempted repair can result in fire or explosion.

Table 3. Fuel Conversion Kits.

Valve	Size (Inlet and Outlet)	Pressure Regulator Type	Current Draw (A)	Conversion Kits	
				Natural Gas - LP	LP - Natural Gas
VR8245M	1/2 x 1/2	Standard	.5	393691	394588
VR8345H,K	3/4 x 3/4	Slow-Opening	.7	393691	394588
VR8345M	3/4 x 3/4	Standard	.7	393691	394588
VR8345Q	3/4 x 3/4	2-Stage	.9	396021	396025

Table 4. Cross Reference.

Service Part	Resideo	White-Rodgers	Robert-Shaw
VR8245M2530	VR8204M1075, VR8204M1091, VR8204A1201, VR8204A1219, VR8204A2001, VR8204A2076, VR8204A2175, VR8204A2803, VR8205A2008, VR8205M1106, VR8205A2024, VR8205M2310, VR8205M2443	36E01-204, 36E01-205, 36E01-206, 36E01-305, 36E22-214, 36E36-304, 36E93-304, 36G22-214, 36J22-214	720-079 (7200IPER), 720-080 (7200IPER-LP), 722-051 (2000DERHC), 722-079 (2000IPERHC)
VR8345H4555	VR8204H1006, VR8304H4503, VR8305H4013, VR8305H4039, VR8205H1003	36E24-214, 36E52-214, 36E93-304, 36E98-304	720-070 (72000IPER-S7C), 720-071 (72000IPER-S7C), 720-072 (72000IPER-S7C), 720-073 (72000IPER-LP-S7C)
VR8345M4302	VR8204A1201, VR8204A1219, VR8204A2001, VR8204A2175, VR8204A2803, VR8204M1075, VR8205A2008, VR8205M1106, VR8205M2310, VR8205M2443, VR8304M3509, VR8304M4002, VR8304M4507, VR8305M3506, VR8305M4066, VR8305M4165, VR8305M4231	36C68-423, 36C74-413, 36E01-204, 36E01-205, 36E01-206, 36E01-305, 36E22-214, 36E36-304, 36E93-304, 36G22-214, 36J22-214	720-051 (7200DER), 720-079 (7200IPER), 720-080 (7200IPER-LP), 722-051 (2000DERHC), 722-079 (2000IPERHC)
VR8345Q4563	VR8205Q2381, VR8205Q2555, VR8205Q2662, VR8205Q2746, VR8205Q2787, VR8305Q4453, VR8304Q4511, VR8305Q4138, VR8305Q4146, VR8305Q4500	36C76-406, 36C76-420, 36C76-463, 36D13-208, 36D13-405, 36E54-214, 36E96-314, 36G54-214	720-082 (7200IPER2-4)

⚠ CAUTION

Never apply a jumper across or short the valve coil terminals. This can burn out the heat anticipator in the thermostat or damage the electronic intermittent pilot (IP) module.

IMPORTANT:

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

Follow the appliance manufacturer instructions if available; otherwise, use the following instructions.

Converting Between Natural And LP Gas

WARNING

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

Convert standard-opening, slow-opening, and 2 stage gas controls from natural gas to LP gas with the conversion kit included with this gas control. For conversion kit part number, see Table 3.

To convert from one gas to another:

VR8245M, H, K AND VR8345M, H, K:

1. Turn off gas supply at the appliance service valve.
2. Remove regulator cap screw and pressure regulator adjusting screw. Refer to Fig. 3.
3. Remove the existing spring.
4. Insert the replacement spring. Refer to Fig. 4.
5. Install the new plastic pressure regulator adjustment screw. Assure that the screw top is flush with the regulator top.
6. Turn pressure regulator adjustment screw clockwise eleven complete turns. The preliminary pressure setting is approximately 10.0 in. wc (2.5 kPa) for LP gas regulator (393691) and 3.5 in. wc (0.9 kPa) for natural gas regulator (394588).
7. Check the regulator setting using a manometer or by clocking the gas meter. See Check and Adjust Gas Input to Main Burner section.
8. Install the new cap screw and O ring.
9. Mount conversion label on the gas control.

VR8345Q:

1. Turn off gas supply at the appliance service valve.
2. Remove the pressure regulator cover assembly. Refer to Fig. 5.
3. Remove the existing stem/spring assembly.
4. Insert the replacement stem/spring assembly.
5. Replace the pressure regulator cover assembly and tighten screws.
6. Mount conversion label on the gas control
7. Check the regulator setting using a manometer or by clocking the gas meter. See Check and Adjust Gas Input to Main Burner section.

INSTALL BUSHINGS TO CONTROL

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

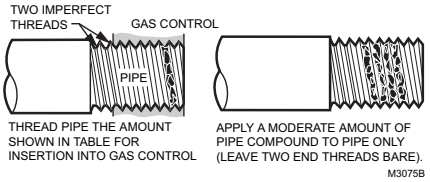


Fig. 1. Use moderate amount of pipe compound.

Complete the instructions below for installing the piping, installing the control, connecting the pilot gas tubing and the wiring. Make sure the leak test you perform on the control after completing the installation includes leak testing the adapters and screws.

Choose Gas Control Location

Locate the combination gas control in the appliance vestibule on the gas manifold. In replacement applications, locate the gas control in the same location as the old control.

Do not locate the gas control where it can be affected by steam cleaning, high humidity, dripping water, corrosive chemicals, dust or grease accumulation, or excessive heat.

For proper operation, follow these guidelines:

- Locate gas control in a well-ventilated area.
- Mount gas control high enough above the cabinet bottom to avoid exposure to flooding or splashing water.
- Make sure the ambient temperature does not exceed the ambient temperature ratings for each component.
- Cover gas control when the appliance is cleaned with water, steam, or chemicals or to avoid dust and grease accumulation.
- Avoid locating gas control where exposure to corrosive chemical fumes or dripping water is possible.

Install Piping to Gas Control

All piping must comply with applicable codes and ordinances or with the National Fuel Gas 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, make sure the ends are square, deburred and clean. Make sure all tubing bends are smooth and without deformation.
2. Run pipe or tubing to the gas control. If tubing is used, obtain a tube-to-pipe coupling to connect the tubing to the gas control.
3. Install sediment trap in the supply line to the gas control. See Fig. 2.

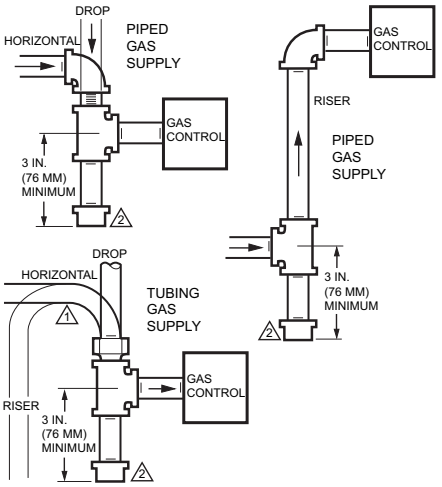


Fig. 2. Install sediment trap.

Install Gas Control

1. This gas control can be mounted from 0 to 90 degrees in any direction from the vertical position of the gas control knob.
2. Mount the gas control so gas flow is in the direction of the arrow on the bottom of the gas control.
3. Thread pipe the amount shown in Table 5 for insertion into the gas control.

IMPORTANT:

Do not thread pipe too far. Valve distortion or malfunction can result when the pipe is inserted too deeply into the gas control.

Table 5. NPT Pipe Thread Length in in.

Pipe Size	Thread Pipe This Amount	Maximum Depth Pipe Can Be Inserted Into 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 (do not use Teflon tape) to pipe only, leaving two end threads bare. See Fig. 1. On LP installations, use compound resistant to LP gas.
5. Remove seals over gas control inlet and outlet if necessary.
6. Connect pipe to gas control inlet and outlet. Use wrench on the square ends of the gas control. See Fig. 3 and 6.

When working with an intermittent pilot ignition system, go to Connect Pilot Gas Tubing section next. When installing on a hot surface or direct spark ignition system, go to the Wiring section.

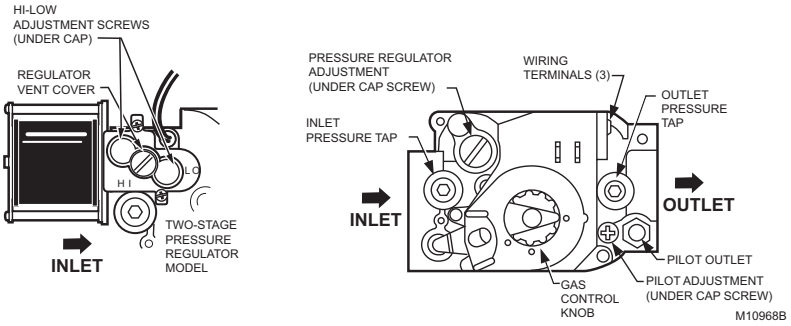
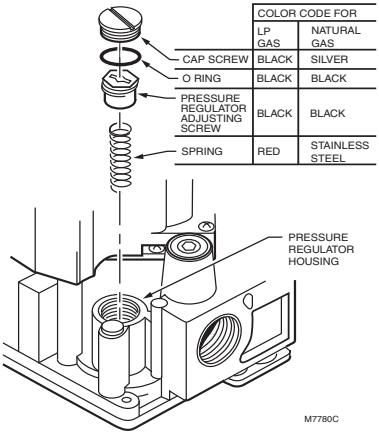


Fig. 3. Top view of gas control.



	COLOR CODE FOR	
	LP GAS	NATURAL GAS
CAP SCREW	BLACK	SILVER
O RING	BLACK	BLACK
PRESSURE REGULATOR ADJUSTING SCREW	BLACK	BLACK
SPRING	RED	STAINLESS STEEL

Fig. 4. 393691, 394588 Coversion kit installation in regulator

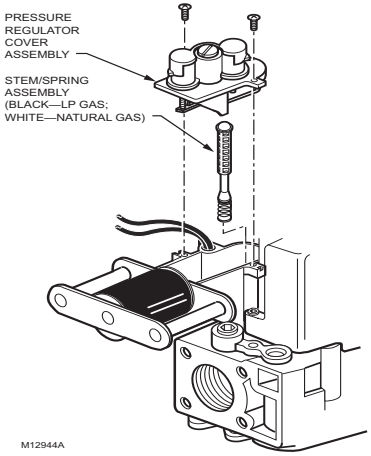


Fig. 5. 396021, 396025 two stage conversion kit installation.

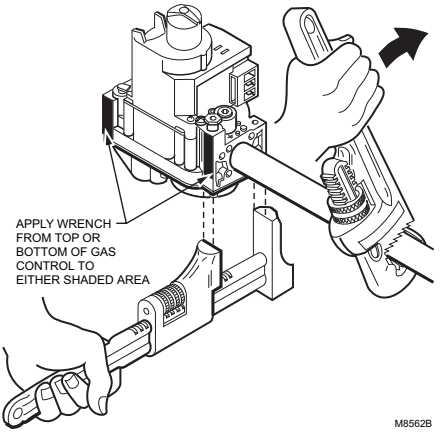


Fig. 6. Proper use of wrench on gas control.

Connect Pilot Gas Tubing (Intermittent Pilot Ignition Only)

1. Remove the pilot gas seal (plug).
2. Cut tubing to desired length and bend as necessary for routing to pilot burner.

CAUTION

Do not kink tubing.

1. Do not make sharp bends or deform the tubing.
2. Do not bend tubing within 3 inches of the gas control or pilot burner after compression fitting has been tightened because this can result in gas leakage at the connection.

3. Square off and remove burrs from end of tubing.
4. Use the compression fitting supplied with this gas control. Slip the fitting over the tubing and slide out of the way.

NOTE: When replacing a gas control, cut off old compression fitting and replace with the new compression fitting provided on the gas control. Never use the old compression fitting because it may not provide a gas-tight seal.

5. Push tubing into the pilot gas tapping on the outlet end of the control until it bottoms. While holding tubing all the way in, slide compression fitting into place, engage threads and turn until finger tight. Then tighten one more turn with wrench. Do not overtighten. Refer to Fig. 7 and 8.
6. Connect other end of tubing to pilot burner according to pilot burner manufacturer instructions.

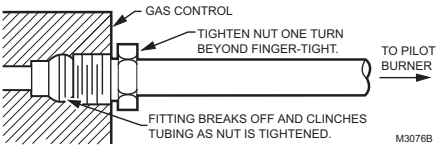


Fig. 7. Always use new compression fitting.

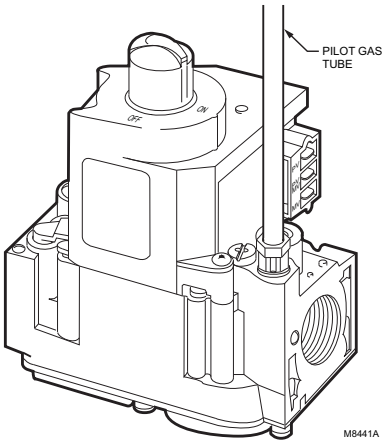


Fig. 8. Remove pilot gas seal (plug) and install pilot gas tube for intermittent pilot application on VR8345.

WIRING

⚠ CAUTION

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

Follow the wiring instructions furnished by the appliance manufacturer, if available, or use the following general instructions. Where these instructions differ from the appliance manufacturer, follow the appliance manufacturer instructions.

All wiring, including insulated quick connect terminals, must comply with applicable electrical codes and ordinances.

1. Check the power supply rating on the gas control and make sure it matches the available supply. Install thermostat and other controls as required.
2. When the gas control is installed on a hot surface or direct spark ignition system, attach the wire adapter provided to the wiring terminals. See Fig. 9 for the wire terminal location.
3. Connect control circuit to gas control terminals. See Fig. 3 and 10, 11, 12, or 13.
4. Adjust the thermostat heat anticipator to 0.7, the rating stamped on the valve operator.

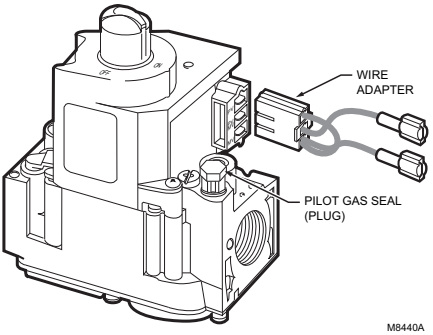
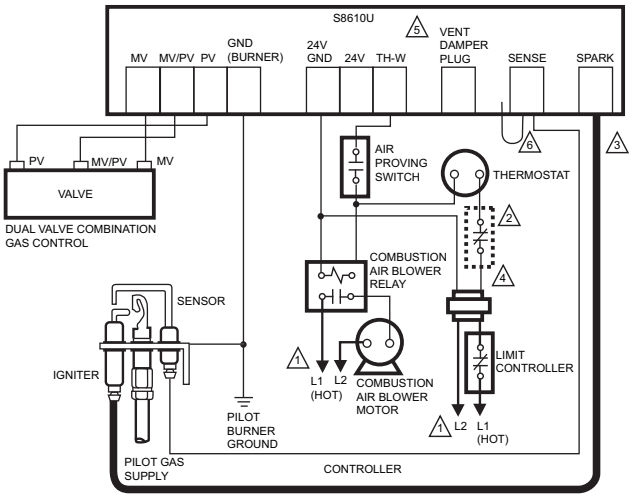


Fig. 9. Install wire adapter for hot surface or direct spark ignition systems. Pilot plug must be in the valve pilot opening.



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].

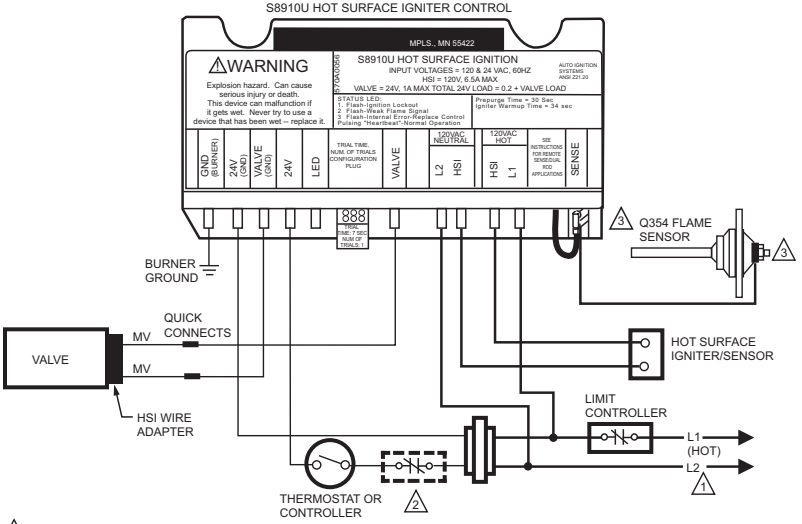
4 CONTROLS IN 24V CIRCUIT MUST NOT BE GROUND LEG TO TRANSFORMER.

5 LEAVE VENT DAMPER PLUG CONNECTED.

6 REMOVE JUMPER AND CONNECT SENSE TERMINAL ON TWO ROD APPLICATION ONLY.

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Fig. 10. VR8245M/VR8345M,H wiring connections in intermittent ignition system.



1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. MAKE SURE L1 AND L2 ARE NOT REVERSED. THIS WOULD PREVENT FLAME DETECTION.

2 ALTERNATE LIMIT CONTROLLER LOCATION

3 SENSE TERMINAL AND Q354 FLAME SENSOR ON D MODELS ONLY.

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Fig. 11. VR8245M/VR8345M,H wiring connections in hot surface ignition system.

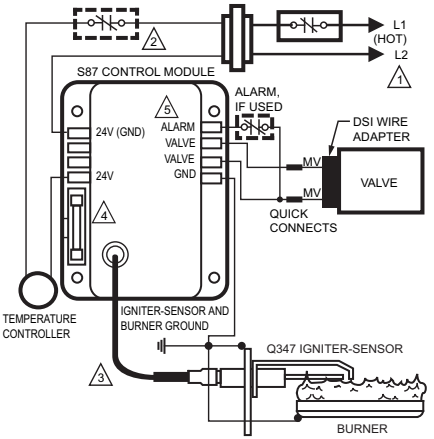


Fig. 12. VR8245M/VR8345M,H wiring connections in direct spark ignition system (single rod application).

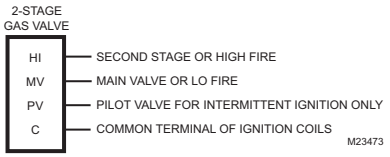


Fig. 13. VR8345Q wiring diagram.

Valve terminals:	Typically connects to:
Hi	W2, Hi
Mv or Lo	Mv, Lo, Valve
C	Mv/Pv, Valve
Pv	Pv

STARTUP AND CHECKOUT

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

1. Do not force the gas control knob. Use only your hand to turn the gas knob. Never use any tools.
2. If the gas control knob will not operate by hand, call a qualified service technician to replace the gas control.

Gas Control Knob Settings

The gas control knob operates differently in intermittent pilot, hot surface and direct spark ignition systems.

The gas control knob settings for an intermittent pilot system are as follows:

OFF: Prevents pilot and main burner gas flow.
ON: Permits gas to flow into the control body. Under control of the thermostat and intermittent pilot module, gas can flow to the pilot and main burner.

The gas control knob settings for hot surface or direct spark ignition systems are as follows:

OFF: Prevents main burner gas flow.
ON: Permits main burner gas flow. Under control of the thermostat and ignition module, gas can flow to the main burner.

NOTE: Gas controls are shipped with the gas control knob in the ON position.

Perform Gas Leak Test

WARNING
FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH
Check for gas leaks with a rich soap and water solution anytime work is done on a gas control.

Adjust the Pilot Burner Flame (Intermittent Pilot Ignition only)

The pilot flame should envelop 3/8 to 1/2 in. [10 to 13 mm] of the igniter-sensor tip. See Fig. 14. If the pilot flame is small or lazy, or does not touch the ground electrode or thermocouple, the inlet gas pressure may be too low, or the pilot orifice may be partially clogged. Check and repair as necessary. If the pilot flame is hard and noisy, the inlet gas pressure may be too high. If pilot adjustment is necessary, proceed as follows:

1. Remove the pilot adjustment cover screw. Refer to Fig. 3.
2. Turn the inner adjustment screw clockwise ↷ to decrease or counterclockwise ↶ to increase pilot flame.
3. To prevent gas leakage, always replace the cover screw after adjustment.

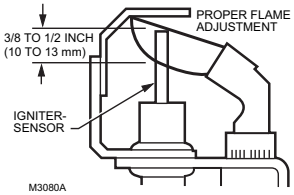


Fig. 14. Proper flame adjustment.

Check And Adjust Gas Input to Main Burner

⚠ CAUTION

Fire or explosion hazard.

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 certain the primary air supply to the main burner is properly adjusted for complete combustion (refer to the appliance manufacturer instructions).
2. WHEN CHECKING GAS INPUT BY CLOCKING THE GAS METER:
   - Make sure that the only gas flow through the meter is that of the appliance being checked.
   - Make certain that other appliances are turned off with pilot burners extinguished (or deduct that gas consumption from the meter reading).
   - Convert the flow rate to Btuh as described in Gas Controls Handbook, form 70-2602, and compare to the Btuh input rating on the appliance nameplate.
3. WHEN CHECKING GAS INPUT WITH A MANOMETER (PRESSURE GAUGE):
   - To connect the manometer, be sure the gas control knob is in the OFF position before removing the outlet pressure tap plug.
   - When removing the manometer, turn the gas control knob back to OFF and replace the outlet pressure tap plug.
   - Shut off the gas supply at the appliance service valve, or at the gas tank for LP gas, 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 outlet pressure tap plug.

Standard-Opening Pressure Regulator

1. The gas control outlet pressure should match the manifold pressure listed on the appliance nameplate.
2. With the main burner operating, check the gas control flow rate by 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. Refer to Table 6 for the factory set nominal outlet pressures and adjustment setting ranges.
   a. Remove the pressure regulator adjustment cap 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 to safeguard proper operation.
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 by using a manometer at the inlet pressure tap. If the inlet pressure is in the normal range (refer to Table 6 and 7), replace the gas control. Otherwise, take the necessary steps to provide proper gas pressure to the gas control.

Standard and Slow-Opening (H and M) Models

1. Carefully check the main burner lightoff. Make sure that the main burner lights smoothly and that all ports remain lit.
2. Check the full rate manifold pressure listed on the appliance nameplate. Gas control full rate outlet pressure should match this rating.
3. With main burner operating, check the control flow rate using the meter clocking method or check pressure using a manometer connected to the outlet pressure tap on the control. See Fig. 3.
4. If necessary, adjust the pressure regulator to match the appliance rating. See Table 6 and 7 for factory-set nominal outlet pressure and adjustment range.
   a. Remove the pressure regulator adjustment cap screw.
   b. Using a screwdriver, turn the inner adjustment screw (Fig. 3) clockwise ↷ to increase or counterclockwise ↶ to decrease the gas pressure to the burner.
   c. Always replace the cap screw and tighten firmly to prevent gas leakage.
5. If the desired outlet pressure or flow rate cannot be achieved by adjusting the gas control, check the gas control inlet pressure using a manometer at the inlet pressure tap of the gas control. If the inlet pressure is in the nominal range (see Table 6 and 7), replace the gas control. Otherwise, take the necessary steps to provide proper gas pressure to the control.

Two-Stage (Q) Models

Two-stage models require that you check and adjust both high and low pressure regulator settings. Two-stage appliance operating sequences vary. Consult the appliance manufacturer instructions for the specific operating sequence and regulator adjustment procedure for the appliance in which the control is installed.

1. Set appliance to operate on high.
2. Carefully check the main burner lightoff. Make sure that the main burner lights smoothly and that all ports remain lit.
3. Check the full rate (high) manifold pressure listed on the appliance nameplate for high pressure. The gas control full rate outlet pressure should match this rating.
4. With main burner operating, check the gas control flow rate using the meter clocking method or check pressure using a manometer connected to the outlet pressure tap on the gas control. See Fig. 3.
5. If necessary, adjust the high pressure regulator to match the appliance rating. See Table 6 and 7 for factory-set nominal outlet pressure and adjustment range.
   a. Remove the pressure regulator adjustment cap (Fig. 3).
   b. Using a screwdriver, turn the inner adjustment screw for HI pressure clockwise ↷ to increase or counterclockwise ↶ to decrease the gas pressure to the burner.
6. After high pressure has been checked, check low pressure regulation. Two-stage appliance operating sequences vary. Consult the appliance manufacturers instructions for the specific operating sequence and regulator adjustment procedure for the appliance in which the control is installed and for instructions on how to prevent the control from moving to high stage while checking the low pressure regulator setting.
7. Check the low rate manifold pressure listed on the appliance nameplate. Gas control low rate outlet pressure should match this rating.
8. With main burner operating, check the gas control flow rate as before (using the meter clocking method or check pressure using a manometer connected to the outlet pressure tap on the control).
9. If necessary, adjust the low pressure regulator to match the appliance rating. See Table 6 and 7 for factory-set nominal outlet pressure and adjustment range.
   a. Remove the pressure regulator adjustment cap (Fig. 3). Using a screwdriver, turn the inner adjustment screw for LO pressure clockwise ↷ to increase or counterclockwise ↶ to decrease the gas pressure to the burner.
10. Once high and low pressure have been checked and adjusted, replace pressure regulator adjustment cap. If the desired outlet pressure or flow rate cannot be achieved by adjusting the gas control, check the control inlet pressure using a manometer at the inlet pressure tap of the control. If the inlet pressure is in the nominal range (see Table 6 and 7), replace the gas control. Otherwise, take the necessary steps to provide proper gas pressure to the control.

Table 6. Pressure Regulator Specification Pressures for Standard-Opening Natural Gas.

Model Type	Type of Gas	Nominal Inlet Pressure Range	Factory Set Nominal Outlet Pressure		Setting Range	
			Step	Full Rate	Step	Full Rate
Standard, Slow	NAT	5.0 to 7.0	—	3.5	—	3.0 to 5.0
	LP	12.0 to 14.0	—	10.0	—	8.0 to 12.0
Step	NAT	5.0 to 7.0	0.9	3.5	None	0.7 to 1.7
	LP	12.0 to 14.0	2.2	10.0	None	1.4 to 5.5
Two-Stage	NAT	5.0 to 7.0	—	1.7 Low 3.5 High	—	0.9 to 3.0 Low[a] 3.0 to 5.0 High
	LP	121.0 to 14.0	—	4.9 Low 10.0 High	—	2.5 to 7.0 Low 8.0 to 11.0 High

[a] Low Fire setting range for VR8304Q 1/2 in. by 1/2 in. and 1/2 in. by 3.4 in. is 1.5 to 3.0 in. wc.

Table 7. Pressure Regulator Specification Pressures (kPa).

Model Type	Type of Gas	Nominal Inlet Pressure Range	Factory Set Nominal Outlet Pressure		Setting Range	
			Step	Full Rate	Step	Full Rate
Standard, Slow	NAT	1.2 to 1.7	—	0.9	—	0.7 to 1.2
	LP	2.9 to 3.9	—	2.5	—	2.0 to 3.0
Step	NAT	1.2 to 1.7	0.2	0.9	None	0.7 to 1.7
	LP	2.9 to 3.9	0.5	2.5	None	1.4 to 5.5
Two-Stage	NAT	1.2 to 1.7	—	0.48 Low 0.9 High	—	0.22 to 0.75 Low[a] 0.75 to 1.2 High
	LP	2.9 to 3.9	—	1.2 Low 2.5 High	—	0.6 to 1.8 Low 2.0 to 2.5 High

[a] Low Fire setting range for VR8304Q 1/2 in. by 1/2 in. and 1/2 in. by 3.4 in. is 0.37 to 0.75 kPa.

Check Safety Shutdown Performance

WARNING
FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH
Perform the safety shutdown test any time work is done on a gas system.

NOTES: Read steps 1 through 7 below before starting and compare to the safety shutdown or safety lockout tests recommended for the intermittent pilot (IP), hot surface (HSI) or direct spark (DSI) module. When different, use the procedure recommended for the module.

1. Turn off gas supply.
2. Set the thermostat or controller above room temperature to call for heat.
3. • *Intermittent Pilot Ignition*—Watch for an ignition spark at pilot burner either immediately or following prepurge. See ignition module specifications.
   • *Hot Surface or Direct Spark Ignition*—Watch for an ignition spark or glow at hot surface igniter either immediately or following prepurge. See ignition module specifications.
4. If module has timed ignition, time the length of the igniter operation. See ignition module specifications.
5. • *Intermittent Pilot Ignition*—After the module locks out, turn on gas supply and make sure there is no gas flow to the pilot or main burner.

NOTE: With modules that continue spark until pilot lights or system is shut down manually, pilot should light when gas supply is turned on.

   • *Hot Surface or Direct Spark Ignition*—After the module locks out, turn on gas supply and assure there is no gas flow to main burner.

6. Set the thermostat below room temperature and wait at least 45 seconds to reset system.
7. Operate system through one complete cycle to make sure all controls operate properly.

MAINTENANCE

WARNING
FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH
Improper cleaning or reassembly can cause gas leakage. When cleaning, be sure that the control is reassembled properly and perform gas leak test.

Regular preventive maintenance is important in applications such as commercial cooking, agricultural and industrial operations that place a heavy load on system controls because:

- In many such applications, particularly commercial cooking, 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.
- Exposure to water, dirt, chemicals and heat can damage the gas control and shut down the control system.

The maintenance program should include regular checkout of the gas control; see Startup and Checkout section. To check out the control system, see the appliance manufacturer literature. Maintenance frequency must be determined individually for each application. Some considerations are:

- *Cycling frequency*. Appliances that may cycle 100,000 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 would be high, the system should be checked more often.
- *Dusty, wet, or corrosive environment*. Since these environments can cause the gas control to deteriorate more rapidly, the system should be checked more often.

NOTE: If the gas control will be exposed to high ammonia conditions, e.g., those used in greenhouses or animal barns, contact your Resideo sales representative to request a gas control with corrosion resistant construction.

The gas control should be replaced if:

- It does not perform properly during checkout or troubleshooting.
- The gas control knob is hard to turn or push down.
- The gas control is likely to have operated for more than 200,000 cycles.

SERVICE

WARNING
FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY OR DEATH
Do not disassemble the gas control; it contains no replaceable components. Attempted disassembly or repair can damage the gas control.

CAUTION
Do not apply a jumper across or short the valve coil terminals. Doing so can burn out the heat anticipator in the thermostat or damage the ignition module.

If Main Burner Will Not Come On With Call For Heat

1. Make sure the gas control knob is in the ON position.
2. Adjust thermostat several degrees above room temperature.
3. Using an ac voltmeter, check for voltage at gas control.
   - *Intermittent Pilot Ignition*—If pilot lights, measure voltage across MV/PV and MV. If pilot does not light, measure across MV/PV and PV before safety lockout occurs.
   - *Hot Surface or Direct Spark Ignition*—Measure voltage across MV terminals at gas control.

4. If voltage is not present, check control circuit for pro-per operation.
5. If proper control circuit voltage is present, replace gas control.

Instructions To The Homeowner (For Your Safety, Read Before Operating)

⚠ WARNING

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

Follow these warnings exactly:

1. Pilot/main burner flame is lit automatically. Do not light the pilot/main burner flame manually.
2. Before lighting appliance, smell around the appliance for gas. Be sure to smell next to the floor because LP gas is heavier than air.
3. IF YOU SMELL GAS:
   - Turn off the gas supply at the appliance service valve. On LP gas systems, turn off gas supply at the gas tank.
   - Do not light any appliances in the house.
   - Do not touch electrical switches or use phone.
   - Leave the building and use a neighbor's phone to call your gas supplier.
   - If you cannot reach your gas supplier, call the fire department.
4. Do not force the gas control knob. Use only your hand to push down or turn the gas control knob. Never use any tools. If the gas control knob will not operate by hand, call a qualified service technician to replace the gas control. Force or attempted repair can result in a fire or explosion.
5. Call a qualified service technician to replace the gas control if it has been flooded with water.
6. Call a qualified service technician to replace the gas control in the event of any physical damage, tampering, bent terminals, missing or broken parts, stripped threads, or evidence of exposure to heat.

IMPORTANT:

Follow the operating instructions provided by the manufacturer of your heating appliance. The information below will be of assistance in a typical gas control application, but the specific controls used and the procedures outlined by the manufacturer or your appliance may differ and require special instructions.

To Turn On The Appliance

Stop: Read the warnings on page 8.

The pilot/main burner flame is lit automatically. *Do not attempt to manually light the pilot.* If the appliance does not turn on when the thermostat is set several degrees above room temperature, follow these instructions:

1. Set the thermostat to its lowest setting to reset the safety control.
2. Disconnect all electric power to the appliance.
3. Remove the gas control access panel.
4. Push in the gas control knob slightly and turn clockwise ↷ to OFF.
5. Wait five minutes to clear out any unburned gas. If you then smell gas, STOP! Follow step 3 of the Warning in the Instructions To The Homeowner section. If you do not smell gas, continue with the next step.
6. Turn the gas control knob counterclockwise ↶ to ON.
7. Replace the gas control access panel.
8. Reconnect all electric power to the appliance.
9. Set the thermostat to the desired setting.
10. If the appliance does not turn on, set the gas control knob to OFF and contact a qualified service technician for assistance.

Turning Off The Appliance

VACATION SHUTDOWN—Set the thermostat to the desired room temperature while you are away.

COMPLETE SHUTDOWN—Push in the gas control knob slightly and turn clockwise ↷ to OFF. Do not force. Appliance will completely shut off. Follow the Instructions to the Homeowner above to resume normal operation.

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