



V5306, V5307, V5308, and V5309 Servo Pressure Regulators

FOR THE V400, V800, VR400, VR800, AND VR8440 FAMILIES OF COMBINATION GAS CONTROLS

INSTALLATION INSTRUCTIONS

APPLICATION

These Servo gas pressure regulators are for Adatrol (add-on) or replacement use on Resideo V400, V800, VR400, VR800, and VR8440 combination gas controls. Utilizing the Servo principle of operation, they control burner manifold pressure by repositioning the main valve diaphragm.

FEATURES

- Provide straight line regulation.
- The V5306 provides standard pressure regulation.
- The V5307 provides "step opening" regulation. It restricts the flow of gas during burner ignition period, minimizing burner concussion and flame roll-out.
- The V5308 is manually adjustable to a HI setting (rated input) or to a LO setting. During mild weather, LO setting prolongs the period of burner operation resulting in closer temperature control and greater comfort.
- The V5309 is for use on mobile homes and recreational vehicles. Depending on the type of fuel available, it can be manually set for operation on natural or LP gas.
- All four types of regulators are interchangeable and adapt to all pipe sizes and capacities.
- Regulators mount on top surface of control.
- Installation and adjustment readily accomplished with a screwdriver.
- 391937 Conversion Kit changes a (V5306) pressure-regulated natural gas valve to a pressure-regulated LP gas valve.

Standard Models

TYPE OF GAS: Models available for all heating gases.

CAPACITY: Dependent on combination gas control.

Table 1. Capacity^a.

cfh	m ³ /hr
110	3.1
225	6.3
250	7.0
335	9.4

^a 1000 Btu/ft³, 0.64 sp gr nat. gas at 1 in. wc p.d.
[37.3 MJ/rn³, 0.64 sp gr nat. gas at 0.25 kPa p.d.].

ADJUSTMENT RANGE: See Table 2.

PRESSURE RATING: A.G.A. rating 1/2 psig (14 in. wc [3.4 kPa]) inlet pressure. Designed for safe operation up to 28 in. wc [6.9 kPa].

LEAK LIMITER: Internal orifice.

AMBIENT TEMPERATURE RATING:

V5306A,C, V5307 A, V5308A, and V5309A:
32 °F to 175 °F [0 °C to 79 °C].

V5306B:
-40 °F to 175 °F [-40 °C to 79 °C].

MOUNTING: Top surface of combination gas control (two mounting screws, gasket).

OPTIONAL SPECIFICATION: V5307 available with 1 in. wc [0.25 kPa] limited adjustment range.

ACCESSORY: 394074 Operator-regulator Cover Plate Assembly for addition of regulator to C580, C581, CS580, or CS581 when valve operator is not required. Includes 2 gaskets, 6 screws, adapter casting, and blank regulator cover plate.



Table 2. Servo Pressure Regulator Specifications.

Suffix Letter ^a of Complete Combination Control	Type of Pressure Regulation	Model No. of Regulator Provided	Type of Gas	Outlet Pressure to Burner				Range of Adjustment	
				Standard Factory Settings		Ranges of Optional Factory Settings			
				in. wc	kPa	in. wc	kPa		
"A"	Standard	V5306A-C ^{b,c}	Nat.	3.5	0.9	3 to 5	0.7 to 1.2	3 to 5 ^e	0.7 to 1.2
			LP	11.0	2.7	8 to 12	2 to 3	8 to 12 ^e	2 to 3
"B"	None	Blank Plate	LP	Depends on LP gas tank					
"C"	Step-Opening	V5307A	Nat.	0.9 step (50% of full rate); 3.5 full rate	0.2 step (50% of full rate); 0.9 full rate	Step—0.6 to 50% of full rate press.; Full rate—3 to 5	Step—0.1 to 50% of full rate press.; Full rate—0.7 to 1.2	Step—none; Full rate—3 to 5	Step—none; Full rate—0.7 to 1.2
			LP	2.2 step (45% of full rate); 11.0 full rate	0.5 step (45% of full rate); 2.7 full rate	Step—1.0 to 50% of full rate press.; Full rate—8 to 12	Step—0.2 to 50% of full rate press.; Full rate—2 to 3	Step—none; Full rate—8 to 12	Step—none; Full rate—2 to 3
"D"	Hi-Lo Flame	V5308A	Nat.	0.9 on Lo (53% of Hi); 3.5 on Hi	0.5 on Lo (53% of Hi); 0.9 on Hi	Lo—0.6 to 50% of Hi; Hi—3 to 5	Lo—0.1 to 50% of Hi; Hi—0.7 to 1.2	Non-adjustable	Non-adjustable
			LP	2.75 on Lo (50% of Hi); 11 on Hi	0.7 on Lo (50% of Hi); 2.7 on Hi	Lo—1.0 to 50% of Hi; Hi—8 to 12	Lo—0.2 to 50% of Hi; Hi—2 to 3		
"E" ^d	Lp-Nat. Changeover	V5309A	LP	11.0 at setting	2.7 at setting	8 to 12	2 to 3	Non-adjustable	Non-adjustable
			Nat.	3.5 at setting	0.9 at setting	3 to 5	0.7 to 1.2		

^a Examples of position of SUFFIX LETTER in model number of complete control: V800A, V800B, and V800C.

^b V5306B Pressure Regulator ("A" models) is low-temperature rated for -40 °F to 175 °F (-40 °C to 79 °C). The V5306B may be used to replace a V5306A with 32 °F to 175 °F (0 °C to 79 °C) ambient temperature rating.

^c V5306C ("A" models^a) has a 1.0 in. wc (0.25 kPa) adjustment range.

^d Not available in high capacity models.

^e Models available with limited adjustment of 1.0 in. wc (0.25 kPa).

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. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

CAUTION

1. Disconnect power supply to prevent electrical shock or equipment damage before beginning installation.
2. If system is in operation and Lite-Rite gas cock at ON, turn gas cock to OFF.
3. After installation is complete, be sure to complete Gas Leak Test.

Replacing a Pressure Regulator

To replace a servo pressure regulator, proceed as follows:

1. Note location of regulator as shown in Fig. 1 and 2.
2. Remove and discard inoperative regulator and original gasket.
3. Before installing new regulator, inspect gasket area (also ports) on operator and remove any foreign material.
4. Press new gasket into circular recess in adapter casting (Fig. 2) or operator cavity (Fig. 1).
5. Position new regulator over locating pin, and fasten with 2 screws provided. Tighten evenly and securely.

NOTE: On controls equipped with V5307 step-opening pressure regulator, insert long screw in outside corner. Long screw extends through regulator and operator into control body.

These servo pressure regulators are used in Adatrol (add-on) or replacement installations of V400, V800, VR400, VR800, and VR8440 series combination gas controls. When added to a "B" model combination gas control (with operator), an automatic, regulated control is completed. A servo pressure regulator may also be added to a C580, C581, CS580, or CS581 Pilotstat Manifold Gas Control to provide regulation.

Adding a Pressure Regulator to Original Equipment Pilotstat Control

The addition of a pressure regulator to an original equipment Pilotstat manifold control (top view, Fig. 3), requires installation of the adapter casting assembly, Part No. 394074. Install as follows:

1. Remove and discard rectangular cover plate and gasket (top view, Fig. 3) on manifold control.
2. Before installing adapter casting, inspect gasket area (also ports) on manifold and remove foreign material.

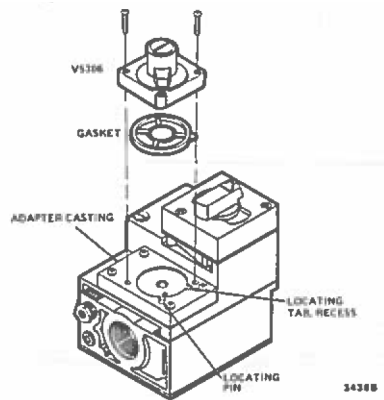


Fig. 1. Installing pressure regulator on adapter casting.

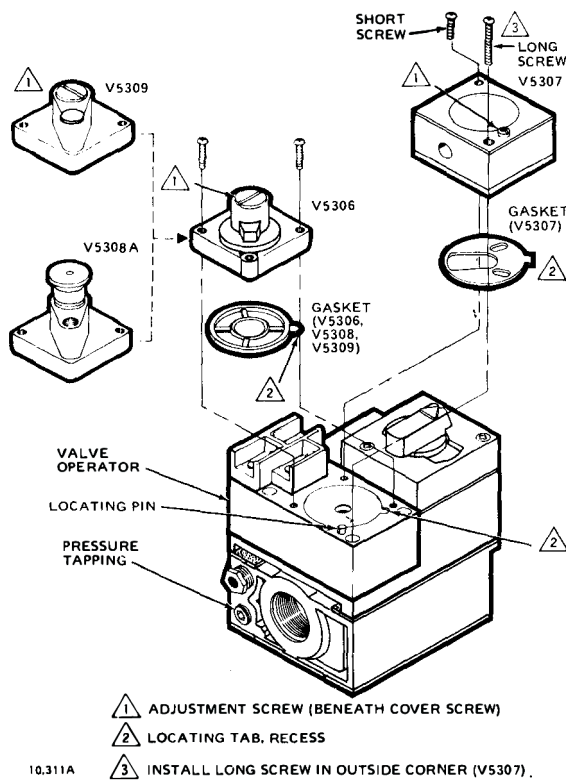


Fig. 2. Servo pressure regulator installation on combination gas control equipped with valve operator.

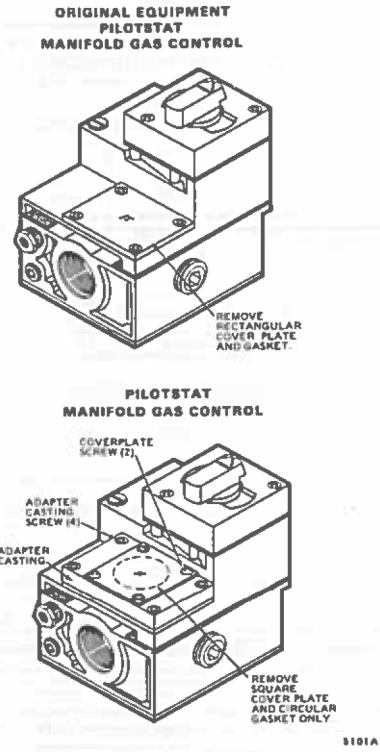


Fig. 3. Optional Pilotstat manifold gas controls.

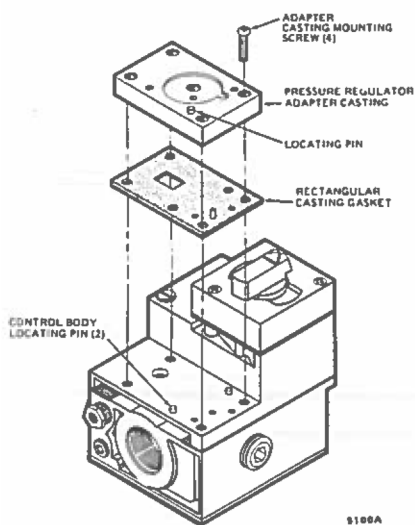


Fig. 4. Installing adapter casting.

3. Carefully place rectangular gasket and casting (Fig. 4) on manifold so that locating pins mate with gasket and casting.
4. Insert 4 long mounting screws packed with casting assembly. Tighten evenly and securely.

NOTE: Discard square regulator cover plate, 2 short screws, and circular cork type gasket provided with assembly. These are not used.

5. Press regulator gasket into circular recess of adapter casting (Fig. 1).
6. Position new regulator over locating pin (Fig. 1), and fasten with screws provided. Tighten evenly and securely.

Adding a Pressure Regulator to a Combination Gas Control or Pilotstat Control

The Pilotstat manifold gas controls (bottom view, Fig. 3) have an adapter casting assembly to facilitate addition of a servo pressure regulator.

To install pressure regulator on "B" model combination gas controls and Pilotstat manifold gas controls, proceed as follows:

1. Remove and discard blank regulator cover plate and gasket (lower view, Fig. 3).
2. Inspect gasket area (also ports) on casting or valve operator and remove any foreign material.
3. Press regulator gasket into circular recess of adapter casting (Fig. 1) or operator cavity (Fig. 4).
4. Position new regulator over locating pin and fasten with 2 screws provided. Tighten evenly and securely.

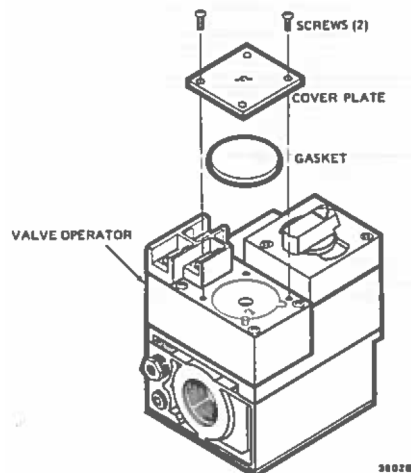


Fig. 5. Exploded view of "B" model combination gas control showing blank cover plate.

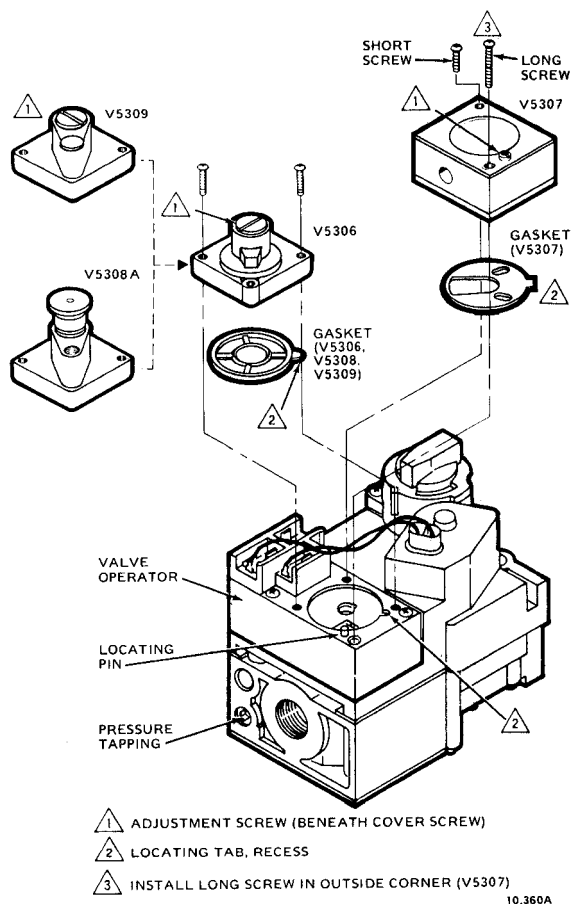


Fig. 6. Installation of pressure regulators on dual valve combination gas controls (VR8440 shown).

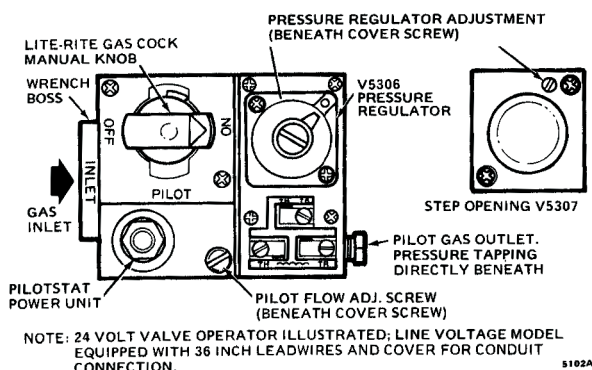



Fig. 7. Top view combination gas control V5306 pressure regulator and valve operator installed. V5307 shown at right. V5308 and V5309 shown in Fig. 8 and 9.

STARTUP AND ADJUSTMENT

Gas Cock Settings

Refer to gas control instructions.

Pilot Lighting Procedure (standing pilot valves only)

1. Slightly depress Lite-Rite knob if at PILOT position and turn clockwise  to OFF. Wait 5 minutes for all unburned gas to vent.

WARNING

Remember that liquefied petroleum (LP) gas will not vent upward normally, so forced ventilation may be required for installations below ground level.

2. Turn the Lite-Rite knob to PILOT, depress it completely, and light the pilot burner. The knob must be held down about one minute before the pilot burner will stay lit after releasing the knob.
3. Turn the knob to ON, and set the thermostat above room temperature to turn on main burner.

Gas Leak Test

WARNING

Do not omit this test.

With main burner in operation, paint pipe joints, pilot gas tubing connections, and valve gasket lines with rich soap and water solution. Bubbles indicate gas leakage. To stop leak, tighten joints and screws or replace the gasket.



NOTE: Gas leak will affect outlet pressure.

Check Gas Input and Burner Ignition

CAUTION

1. Do not exceed input rating stamped on nameplate of appliance, or manufacturer's recommended burner orifice pressure for size orifice(s) used. Make certain primary air supply to main burner is properly adjusted for complete combustion. Follow instructions of appliance manufacturer if provided.
2. IF USING METER CLOCKING METHOD:
Make certain there is no gas flow through the meter other than to the appliance being checked. Other appliances must remain off, and the pilot extinguished (or other consumption deducted from the meter reading).
3. IF USING MANIFOLD PRESSURE METHOD:
Be sure gas cock is in PILOT or OFF position before removing pressure tap plug to connect pressure gauge (manometer). Also turn gas cock back to PILOT or OFF when removing gauge and replacing plug. Repeat gas leak test at plug (main burner must be operating).

V5306 (standard PRV) Adjustment



1. Check input to main burner by clocking gas meter or by using a pressure gauge (manometer) connected to downstream tapping (Fig. 7). The standard natural gas model is factory-set at 3.5 in. wc [0.9 kPa] outlet pressure (nominal), but may vary from 3.2 to 3.8 in. wc [0.8 to 0.94 kPa]. Input can be adjusted from 3 to 5 in. wc [0.74 to 1.2 kPa]. The standard LP gas model is set at 11 in. wc [2.7 kPa] (nominal), but may vary from 10.2 to 11.8 in. wc [2.5 to 2.9 kPa]. Input can be adjusted from 8 to 12 in. wc [2 to 3 kPa]. If adjustment is required, proceed with step 2.
2. Remove cover screw (Fig. 7). Using screwdriver, turn adjusting screw clockwise  to increase or counterclockwise  to decrease gas pressure to burner.

NOTE: Adjustment fitting is plastic and may require slightly greater turning force than metal thread.

3. Replace cover screw.

V5307 (step-opening PRV) Adjustment

NOTE: Full rate pressure is adjustable-step rate is not.

1. With main burner operating, check input by clocking gas meter, or check burner manifold pressure using pressure gauge (manometer) connected to downstream pressure tapping (Fig. 7).
2. If adjustment is required, remove cover plug (Fig. 7). Using a small screwdriver, turn adjusting screw clockwise  to increase or counterclockwise  to decrease gas pressure to burner. Replace cover plug.
3. Check burner performance at step pressure, observing burner ignition and flame characteristics. Burner should ignite promptly and without flashback to orifice, and all ports should remain lit. Cycle burner several

times. (Wait 30 seconds between cycles to allow servo regulator to resume step action.) Repeat after allowing appliance to cool.

The Nat, and LP gas settings are selected by positioning the slotted shaft as shown in Fig. 9.

V5308 (Hi-LO PRV) Adjustment

The HI or LO flame setting is selected by positioning the white knob (Fig. 8) on the regulator. The burner will operate in the low fire position when knob is upward; it will operate in the high fire position when knob is downward.

1. Adjust to LO setting by pulling knob (Fig. 8) upward to its outermost position.

NOTE: Turn on main burner, observing ignition and flame characteristics. Burner should ignite promptly and without flashback to orifice, and all ports should remain lit. Cycle burner several times, and then repeat after allowing appliance to cool.

2. Adjust to HI setting by pushing the knob (Fig. 8) downward toward the regulator body.
3. Check gas input to appliance:
 - a. With burner operating check gas input by clocking gas meter, or check burner manifold pressure using pressure gauge (manometer) connected to downstream pressure tapping (Fig. 7).
 - b. If gas input exceeds nameplate rating, check burner orifice diameter against appliance manufacturer's specification for gas being used. (The V5308 is not field adjustable.)

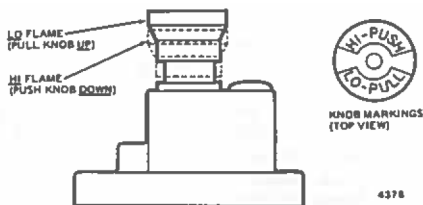


Fig. 8. HI and Lo settings, V5308 pressure regulator.

V5309 LP-Nat. changeover regulator) Adjustment

⚠ WARNING

When a gas system is being converted, the main burner and pilot orifices **MUST** be changed to meet appliance manufacturer's specifications for the particular gas. Refer to appliance manufacturer's instructions for orifice specifications and changeover procedures.

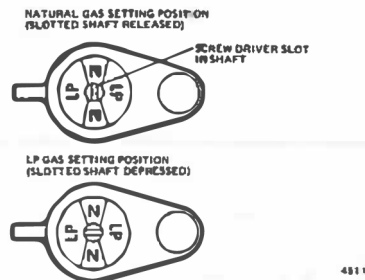


Fig. 9. Natural and LP gas settings, V5309.

Select Natural or LP Gas Setting

1. Adjust to LP gas setting as follows:
 - a. Remove the cover screw (Fig. 2).
 - b. With a small screwdriver, depress and rotate the shaft so the slot is in line with "LP" stamped on the bushing (Fig. 9).

NOTE: The shaft will remain depressed for LP gas operation.

- c. Replace the cover screw.
2. Adjust to Nat. gas as follows:
 - a. Remove the cover screw (Fig. 2).
 - b. With a small screwdriver, rotate the shaft so the slot is in line with "N" stamped on the bushing (Fig. 9).
 - c. Replace cover screw.
 3. Check gas input to appliance:
 - a. With burner operating, check gas input by clocking gas meter, or check burner manifold pressure using pressure gauge (manometer) connected to downstream pressure tapping (Fig. 7).
 - b. If gas input exceeds nameplate rating, check burner orifice diameter against appliance manufacturer's specification for gas being used. (The V5309 is not field adjustable.)

⚠ WARNING

At time of changeover to other gas, again check gas input alter changing pilot and main burner orifices. Follow procedure above.

CHECKOUT

Put the system into operation and observe through complete cycle to be sure all controls function properly.

V5306, V5307, V5308, AND V5309 SERVO PRESSURE REGULATORS



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