



G93 Model B Series BASOTROL® Combination Automatic Gas Valve

Application

The G93 valves are suitable for use with natural gas, Liquefied Petroleum (LP) gas, or LP gas-air mixtures. Typical applications include central heating units, unit heaters, commercial clothes dryers, and similar applications.

Installation

IMPORTANT: Only qualified personnel should install or service BASO Gas Products products. These instructions are a guide for such personnel. Carefully follow all instructions in this document and all instructions for the appliance.

IMPORTANT: Make all gas installations in accordance with applicable local, national, and regional regulations.



CAUTION: Risk of Electric Shock.
Disconnect power supply before making electrical connections to avoid electric shock.



WARNING: Risk of Explosion or Fire.
Shut off the gas supply at the main manual shutoff valve before installing or servicing the G93. Failure to shut off the gas supply can result in the release of gas during installation or servicing, which can lead to an explosion or fire, and may result in severe personal injury or death.



WARNING: Risk of Explosion, Fire, or Electric Shock. Label all wires before they are disconnected when replacing or servicing the G93. Wiring errors can cause improper or dangerous operation and may result in an explosion, fire, or electric shock leading to severe personal injury or death.

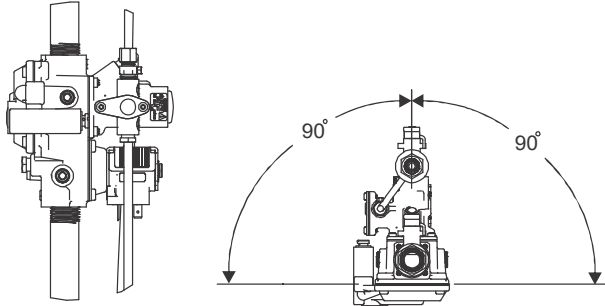
IMPORTANT: Verify that the valve is installed only in applications where the specified maximum ambient (surface) temperature and maximum operating pressures will not exceed the limits in the *Technical Specifications* section.

To install the G93 valve:

1. Shut off power to the appliance.
2. Shut off the gas at the main manual shutoff valve.
3. Label each wire with the correct terminal designation prior to disconnection.
4. Compare the voltage on the valve with the power source voltage to ensure the correct unit is being installed. For valves with 25-volt coils, use a National Electrical Code (NEC), Class 2 transformer.
Note: The transformer must be mounted to a grounded metal enclosure.
5. Ensure that the gas flows through the valve body in the direction indicated by the arrow on the valve body. If the valve is installed with the gas flow in the opposite direction of the arrow, leakage can occur.

IMPORTANT: Do not use a wrench on any surface other than the casting flats provided at the inlet and outlet ends of the valve body. The G93 may be damaged in the mounting process if a wrench is used on any other surface. Using a wrench incorrectly may void the warranty.

6. Mount the G93 on a horizontal manifold with the solenoid pointed up (vertical) or in a position not exceeding 90° from vertical. The valve may also be mounted on a vertical manifold in any position around its axis (Figure 1).



Vertical mounting may be 360° around its axis with the gas flow either up or down, but always in the direction of the arrow.

Horizontal mounting limited to 90° from upright.

Figure 1: G93 Mounting Positions

7. Installer must be a trained, experienced, flame safeguard control technician. Threads of the pipe and nipples must be smooth and free of tears and burrs. A sediment trap should also be installed in accordance with the National Fuel Gas Code NFPA 54 (see Figure 4). Mount the valve to the pipework, use a quality rated pipe tape, UL listed seal material rated for gasoline, propane, and other gases. If not available, a quality grade pipe dope, a light amount on the male threads, starting two threads away from the first engaging thread. If pipe dope lodges on the valve seat, it will prevent proper closure. Remove excess compound after mounting the valve to the pipework.
8. Thread pipe (the amount shown in Table 1) for insertion into the control. Do not thread the pipe too far. Valve distortion or malfunction may result if the pipe is inserted too deep.

Table 1: NPT Pipe Thread Length into Valve

Pipe Size (NPT) or BSPT	Thread Pipe Amount (in.)	Maximum Depth Pipe (in.)
1/2	3/4	1/2
3/4	13/16	3/4

9. For any threaded connections, threads of pipe and nipples must be smooth and free of tears and burrs. Steam clean all piping inside diameter to remove foreign substances such as cutting oil or thread chips before installing into the valve. Apply a moderate amount of good quality pipe compound (do not use Teflon tape) to pipe only, leaving two end threads bare (see Figure 2). On LP installation, use compound resistant to LP gas.

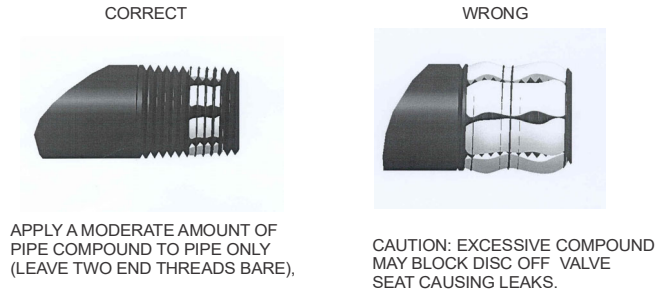


Figure 2: Use a Moderate Amount of Pipe Compound

10. Connect pipe to gas control inlet and outlet. Use a wrench on the square ends of the control. If a flange is used, place the wrench on the flange rather than on the control. This process should be used for both the installation and removal of the valve in a gas system. (see Figure 3).

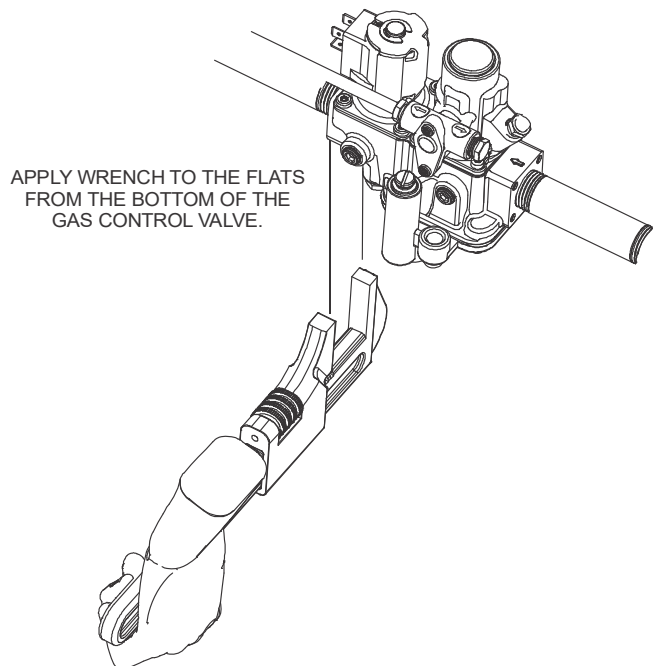


Figure 3: Proper Use of Wrench on Gas Control
DO NOT USE THE SOLENOID OR POWER UNIT FOR LEVERAGE

7. Attach the thermocouple securely to the pilot burner, and screw the terminal end to the BASO® power unit terminal on the valve. Make sure this connection is clean. Tighten the thermocouple lead nut finger tight, plus a maximum of 1/8 turn. Do not overtighten.

8. Pilot gas connections.

- a. **Internal Pilot Gas Valve Models** receive pilot gas internally from the valve body.

Note: Pilot gas flow comes out of either gas valve top housing ports.

On internal pilot gas valve models, plumb the pilot burner fitting to either of the pilot gas ports on the valve. Plug the unused pilot gas port on the gas valve. **See Figure 4.**

- b. **External Pilot Gas Valve Models** receive pilot gas from an external gas source.

Note: Pilot gas flow through the gas valve top housing can be in either direction as indicated by the arrows.

On external pilot gas valve models, plumb the pilot gas line from an external gas source to either pilot gas port on the gas valve. Plumb the other pilot gas port to the pilot burner fitting. **See Figure 5.**



WARNING: Risk of Explosion or Fire.

Never connect an external gas line to an internal pilot gas model. Pilot gas would flow freely in one port and out the other, which could lead to an explosion or fire and may result in severe personal injury or death.



WARNING: Risk of Explosion or Fire.

Verify that there are no gas leaks by testing with appropriate equipment. Never use a match or lighter to test for the presence of gas. Failure to test properly can lead to an explosion or fire and may result in severe personal injury or death.

9. Check for leakage:

- a. Shut off the gas at the main manual shutoff valve and open the pressure connection between the manual shutoff valve and the G93 valve.
- b. Connect air tubing with a maximum pressure of 1-1/2 times the valve's maximum operating pressure (as indicated on the valve) to the opened pressure connection.
- c. Paint all valve body connections with a rich soap and water solution.

If bubbles occur, this is an indication of a leak. To stop a leak, tighten joints and connections. Replace the part if the leak cannot be stopped.

If bubbles do not occur, remove the air tubing and close the pressure connection.

10. Perform the *Checkout* section before leaving the installation.

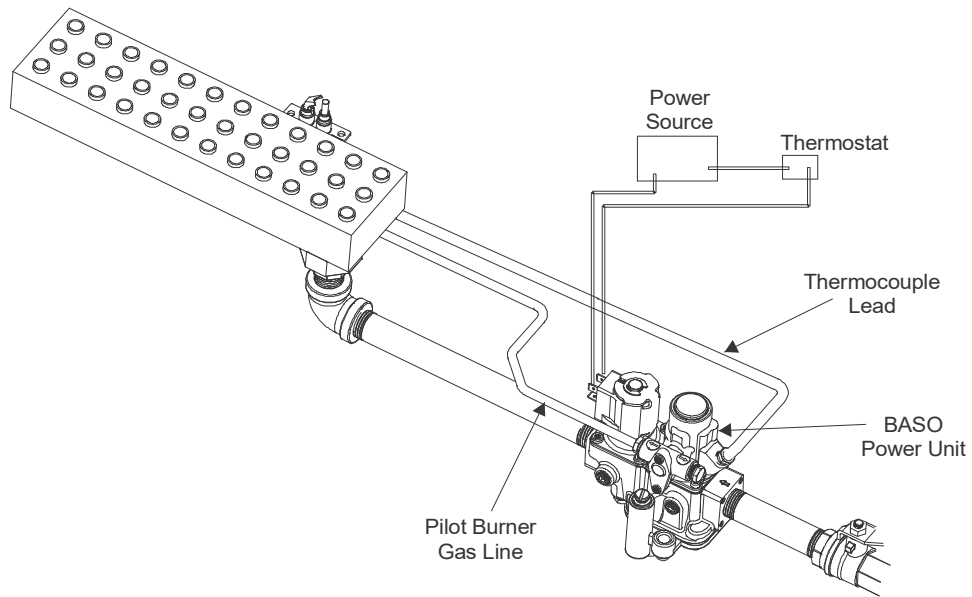


Figure 4: Typical Installation for Internal Pilot Gas Flow

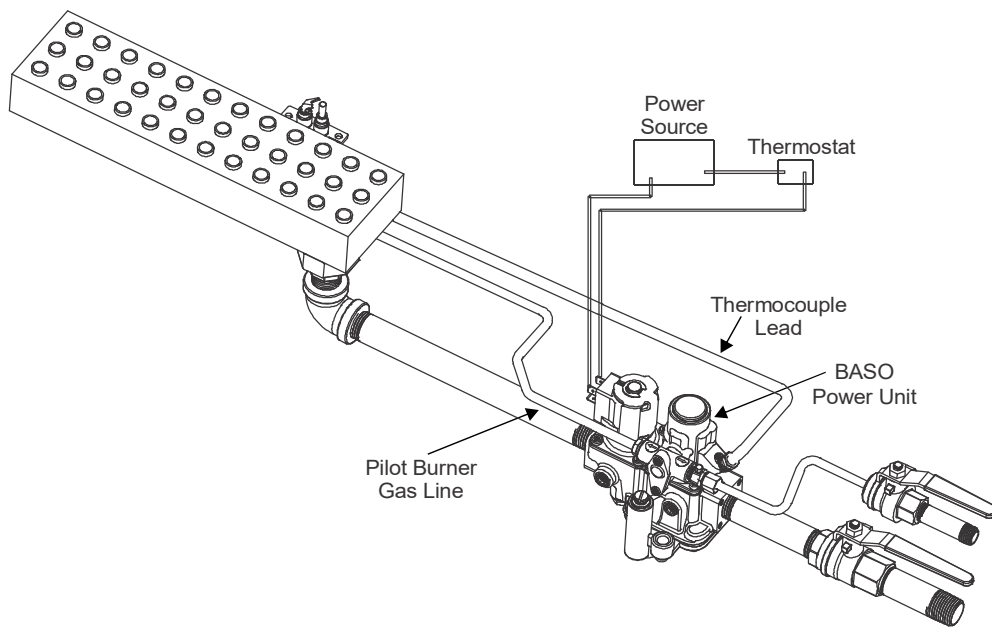



Figure 5: Typical Installation Showing External Pilot Gas Flow

Setup and Adjustments

Checkout



WARNING: Risk of Explosion or Fire.
Follow this or an equivalent checkout procedure after installation. Before leaving the installation, verify that the gas valve functions properly and that the system has no gas leaks. Gas leaks can lead to an explosion or fire, and may result in severe personal injury or death.

Make sure all components are functioning properly by performing the following test:

1. Test all joints and connection for leaks with a soap solution.
2. Close the main upstream shutoff valve and the pilot adjust (applications with a pilot adjust only). Wait at least 5 minutes for unburned gas to escape from the appliance and then reopen the valves.
3. Push the reset button and light the pilot burner. Continue to hold the reset button for 30 to 45 seconds or until the pilot remains lit when the reset button is released.
4. Set the thermostat to the highest setting. The main burner should now ignite from the pilot burner.
5. Extinguish the burner by closing the main upstream manual shutoff valve. Verify that the valve drops out within 90 seconds.
6. Relight the pilot burner.
7. Check the millivoltage (mV) output of the thermocouple and the milliampere (mA) dropout range of the BASO power unit to ensure that they meet the values listed in Table 1 and Table 2. Step-by-step procedures for these checks are included with the *Y99AB-4 BASO Test Kit Application Note (Part No. BASO-AN-Y99AB)*.
8. Observe at least three complete operating cycles to make sure that all components are functioning properly.
9. Reset the thermostat to the desired setting before leaving the installation.

Note: BASO recommends only BASO thermocouples that come from the original equipment manufacturer to provide optimum performance for your safety shutoff device.


Table 1: Thermocouple Output

Thermocouple		mV Range	
Lead Type	TurnDown	Normal	Not Less Than
K15	4 mV	20-28	15
K16	4 mV	25-35	17
K17	4 mV	30-40	25
K19	4 mV	25-35	17

Table 2: Dropout Range

mA Range of Power Unit Assembly	
Low	High
100	300

Regulator Adjustment



WARNING: Risk of Explosion or Fire.
Do not adjust the minimum flow rate of the valve below the minimum safe working rate of the appliance. This may cause gas leaks, which can lead to an explosion or fire, and may result in severe personal injury or death.

IMPORTANT: Refer to and follow any specific instructions issued by the appliance manufacturer with regards to servicing their equipment.

The pressure regulator is adjustable and has been set to a specific customer requirement. If a different setting is desired, follow these instructions:

1. Shut off all gas to the appliance.
2. Turn the thermostat to the lowest setting or Off position.
3. Remove the pressure tap plug at the valve outlet or in the manifold pipe downstream of the valve.
4. Install a manometer or pressure gauge suitable for measuring desired orifice pressure.
5. Remove the seal screw at the end of the regulator stack.

6. Turn the gas on and place the thermostat at the highest setting.
7. Adjust the screw in the regulator stack to the desired reading on the manometer. (Turn clockwise to increase the outlet pressure and counterclockwise to reduce the outlet pressure.)
8. Reinstall the seal screw, which incorporates the proper size hole for venting to the atmosphere. (It may be necessary to cycle the valve several times to verify the desired outlet pressure.)
9. Turn off the gas supply and place the thermostat at the lowest setting.
10. Remove the pressure manometer and reinstall the pressure tap plug.
11. Turn the gas on and set the thermostat at the desired setting.
12. Check for leaks at the pressure tap plug with a soap solution before leaving the site.

Pilot Gas Adjustment (Applications With a Pilot Adjust)

Models with an optional manual pilot adjust allows adjustment of the pilot gas flame. To adjust the pilot gas flame:

1. Loosen the round head screw holding the small adjustment plate beside the manual rotor pilot valve knob, and turn the knob clockwise as far as it goes.
2. Slowly push the adjustment plate in a counterclockwise direction while watching the size of the pilot burner flame.
3. Stop moving the adjustment plate when the pilot flame reaches the proper size, and tighten the round head screw. The rotor pilot valve provides complete on/off operation with the adjustment fixed at the On position.

Pilot Servicing

If pilot flame problems occur, check the following:

- If the pilot flame burns yellow, it may be due to dirt or lint covering the lower portion of the pilot burner. Remove this using a soft brush or a vacuum.
- A flame approximately 1/2 in (12.7 mm) high must surround the thermocouple tip (Figure 6).
- Because this is an electrical connection, the thermocouple lead connection to the BASO power unit must be clean and free of grease.

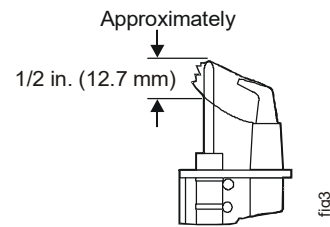


Figure 6: Flame Position

Repairs and Replacement



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WARNING: Risk of Explosion, Fire, or Electric Shock. Label all wires before they are disconnected when replacing or servicing the G93. Wiring errors can cause improper or dangerous operation and may result in an explosion, fire, or electric shock leading to severe personal injury or death.

Field repairs **must not** be made to the G93 valve. If the thermocouple meets the output listed in Table 1 and the valve does not function, replace the entire valve. Any attempt to repair this assembly voids the manufacturer's warranty. For a replacement valve, contact the original equipment manufacturer or the nearest BASO Gas Products distributor.

Accessories

Table 3: G93 Gas Valve Conversion Kits

Part Number	Regulator Type	Gas Conversion
Y71GF-3	Bottom Adjust	Natural Gas to LP Gas
Y71GF-4	Top Adjust	Natural Gas to LP Gas
Y71QH-2	Top Adjust	LP Gas to Natural Gas
Y71QH-3	Bottom Adjust	LP Gas to Natural Gas
Y71AA-5	Top or Bottom Adjust	Non-Regulation

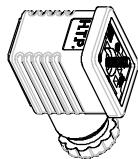


Figure 7: SVC200 Wire Connect DIN Type Connector

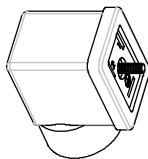


Figure 8: SVC210 Conduit 1/2 NPT DIN Type connector

Maintenance Schedule

Preventive maintenance programs are an important part of maintaining optimum and safe function of your BASO products. Commercial cooking and other heating equipment can be a heavy cycling demand on gas safety controls.

The maintenance programs should include frequent checkout of the gas controls. Review the procedure as described in the setup and adjustments and check for leakage section of the instructions.

Exposure to water, chemicals, dirt, heat and grease can all contribute to premature shut down of the gas controls.

The frequency of the maintenance must be determined by the appliance manufacturer where the controls are installed and the end user for each individual application.

Things to consider when determining a preventive maintenance program:

- Number of cycles a gas control will see annually (more than 20,000 cycles). The gas control should be checked monthly.
- Gas controls used less than 20,000 cycles should be checked before every shutdown and restart process.
- Heavy grease, high heat, wash down exposure, corrosive environment areas should be checked with a higher frequency to prevent premature shutdown from rapid deterioration.

Simply doing a scheduled maintenance program will help remove the chances of a costly unexpected shutdown.

Never try to repair or replace a gas control unless you are an authorized licensed gas contractor as this will void the manufacturer's warranty. In all cases, use an authorized licensed gas contractor for any gas control replacement.

Technical Specifications

Product	G93 Series BASOTROL Combination Automatic Gas Valve
Maximum Operating Pressure	0.5 psi (35 mbar)
Valve Body	Aluminum
Permissible Ambient (Surface) Temperature	CSA: 32 to 155°F (0 to 68°C) UL: 32 to 125°F (0 to 52°C)
Conduit Connection Replacement	SVC200 replaces wire leads SCV210 replaces conduit connector
Electrical Rating	25 VAC, 50/60 Hz, 0.42 A 120 VAC, 50/60 Hz, 0.088 A 240 VAC, 50/60 Hz, 0.044 A
Recommended Thermocouple Lead Lengths	K15: 12 to 48 in. (305 to 1,220 mm) K16: 12 to 72 in. (305 to 1,830 mm) K17: 18 to 72 in. (457 to 1,830 mm) K19: 18 to 72 in. (457 to 1,830 mm)
Wiring Connections	1/4 in. (6.35 mm) male quick-connect terminals or 30 in. (762 mm) lead wires (other lengths are optional)
Regulator Adjustment	3 to 6 in. W.C. (7.5 to 15 mbar), top and bottom adjust regulator, natural gas 6 to 12 in. W.C. (15 to 30 mbar), top adjust regulator, LP gas 8 to 12 in. W.C. (20 to 30 mbar), bottom adjust regulator, LP gas
Inlet and Outlet Body Connections	1/2 x 1/2 in. NPT
Types of Gas	Natural, Liquefied Petroleum (LP), and LP gas-air mixtures
Packaging	Bulk pack supplied to original equipment manufacturer (individual pack optional)
Bulk Pack Quantity	32
Bulk Pack Weight	51 lb (23 kg)
Agency Listing	CSA Certificate Number 229521-1656066 (excludes G93H_ _) UL File Number MH2926
Specification Standards	ANSI Z21.78, CSA 6.20 UL Standard 372 and 429

Performance specifications are nominal and conform to acceptable industry standards. All agency certification of BASO products is performed under dry and controlled indoor environmental conditions. Use of BASO products beyond these conditions is not recommended and may void the warranty. Product must be protected if exposed to water (dripping, spraying, rain, etc.) or other harsh environments. The original equipment manufacturer or end user is responsible for the correct application of BASO products. Consult BASO Gas Products LLC for questionable applications. BASO Gas Products LLC shall not be liable for damages or product malfunctions resulting from misapplication or misuse of its products.

Refer to the *G93 Series BASOTROL® Combination Automatic Gas Valve Product Bulletin (BASO-PB-G93)* for necessary information on operating and performance specifications for this product.



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