GM-7000 Series Multi-function Gas Control Valve

Installation

IMPORTANT: These instructions are intended as a guide for qualified personnel installing or servicing Johnson Controls products. Carefully follow all instructions in this bulletin and all instructions on the appliance. Limit repairs, adjustments, and servicing to the operations listed in this bulletin or on the appliance.

WARNING: Risk of Explosion. The system must meet all applicable codes. Improper installation may cause gas leaks, explosions, property damage, and injuries.

WARNING: Risk of Explosion. To prevent leakage of upstream gas, shut off the gas supply at the main manual shutoff valve before installing or servicing the GM-7000 valve.

CAUTION: Risk of Equipment Damage. To prevent damage to the valve when mounting to pipework, do not use a wrench on any surface other than the casting flats provided at the inlet and outlet end of the valve body.

Perform the following procedure to install the GM-7000 valve.

1. Ensure that the specified maximum ambient (surface) temperature is not exceeded (see the Technical Data section).
2. Ensure that the power supply voltage is compatible with the required control valve voltage.
3. Mount the valve. The GM-7000 valve may be mounted on a horizontal manifold with the magnetic operators (solenoid coils) pointed up (vertical) or in any position not exceeding 90° from the vertical. (See Figure 1.) The valve may also be mounted on a vertical manifold in any position around its axis. Do not install the solenoid coils upside down.

4. Install the valve on the manifold, ensure the gas flows through the valve body in the direction indicated by the arrow on the body. If the valve is installed with the gas flow in the opposite direction of the arrow, leakage can occur.

Note: If installing a valve with threaded connections, use an approved pipe joint sealing compound on male threads before assembly. An optional thread lubricant may have been factory applied to the first two or three threads of the inlet and outlet to avoid galling. Take care to see that excess compound is removed after mounting. Threads of pipe and nipples must be smooth and free of tears and burrs. Steam clean all piping to remove foreign substances such as cutting oil or thread chips.

Figure 1: GM-7000 Valve Mounting Position
5. Connect the pilot tubing (when necessary) to the threaded pilot connection on the underside of the valve body (see Figure 2) and run the tube to the pilot burner within the appliance. Connect the pilot tube to the valve by means of an optional compression fitting.

6. Check for leakage before making any valve adjustments.
   a. Shut off the gas at the main manual shutoff valve and open the pressure connection between the manual shutoff valve and the GM-7000 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.

7. Make wiring connection. Refer to the Wiring section for specific wiring instructions.

8. Determine outlet pressure by applying power to the valve and energizing both valve solenoids. Use the outlet pressure tap connection on the underside of the valve body to monitor the outlet pressure. The outlet pressure tap is a bleed hole with a cast spigot, sealed with a threaded brass needle screw. (See Figure 3.) To monitor the outlet pressure, turn the screw in a counterclockwise direction one or two turns and fit a 9-mm diameter flexible tube over the cast spigot. After all valve adjustments have been made and the desired outlet pressure has been obtained, remove the flexible tube. Tighten the needle screw by turning it clockwise with a slotted screwdriver until hand tight, sealing the bleed hole.

9. Check for leakage at the bleed hole. Paint the bleed hole with a rich soap and water solution (or use acceptable gas leak detection equipment). If bubbles occur, this is an indication of a gas leak. To stop a leak, tighten the needle screw. Replace the valve if the leak cannot be stopped.

   Note: If installing a valve with a pressure regulator, set the valve to the desired outlet pressure. Refer to the Adjustments section for specific adjustment procedures. After setting the valve outlet pressure, ensure that the leak-limiting seal cap is replaced. (See Figure 3.)

10. Observe at least three complete operating cycles to ensure that all components are functioning correctly before leaving the installation.
### Wiring

**WARNING: Risk of Shock.**
Disconnect the power supply before making electrical connections to avoid electrical shock or equipment damage. Ensure that the operating voltage is identical to the information on the product identification label.

**CAUTION: Risk of Equipment Damage.**
For 24 VAC applications, the ground wire must not be connected to prevent possible grounding of the 24 VAC transformer secondary.

The GM-7_3_ is supplied with 6.35 x 0.8 mm (1/4 in.) male tag terminals, and connections should be made using 6.35 x 0.8 mm (1/4 in.) female, fully insulated push-on terminals.

Route the electrical connection for the valve solenoid actuators from the burner sequence control to the valve.

### Adjustments

**IMPORTANT:** All adjustments must be made in conjunction with the gas appliance and in accordance with the appliance manufacturer’s instructions. Only authorized personnel should make adjustments. See each version for specific adjustments.

**WARNING: Risk of Explosion.**
The minimum flow rate of the valve must not be adjusted below the minimum safe working rate of the appliance.

**GM-7_3_**
The GM-7_3_ model has a direct-acting pressure regulator. The regulator can be adjusted by turning the adjusting screw to determine the compression of the regulator spring against the regulator diaphragm.

To adjust the outlet pressure, remove the leak-limiting seal cap to expose the adjusting screw. (See Figure 3.) Turn the screw (using a suitable screwdriver) in a clockwise direction to increase or in a counterclockwise direction to decrease the outlet pressure of the valve.
Troubleshooting

This procedure requires the use of a voltmeter or multimeter.

**WARNING: Risk of Personal Injury.**

Before performing this procedure, refer to any specific instructions issued by the appliance manufacturer with regard to servicing their equipment. Such instruction must take precedence over this procedure. If in doubt, replace the entire valve.

![Diagram of Burner Ignition Troubleshooting](image-url)

*Figure 4: Burner Ignition Troubleshooting*
### Technical Data

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th>GM-7000 Series Multi-function Gas Control Valve</th>
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<tbody>
<tr>
<td><strong>Types of Gas</strong></td>
<td>Natural, Liquefied Petroleum (LP), manufactured, mixed, and LP gas-air mixtures</td>
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| **Maximum Operating Pressure** | North America: 1/2 psi  
Europe: 50 mbar; Class B (EN 126 and 161) |
| **Maximum Differential Pressure** | 20 mbar (8 in. W.C.) |
| **Reverse Pressure Ratings** | 50 mbar (20 in. W.C.) Minimum; Class B (EN 126 and 161) |
| **Regulator Classification** | Class C (EN 126) |
| **Direct-acting Regulator Pressure Range** | Natural Gas: 5 to 15 mbar (2 to 6 in. W.C.)  
LP Gas: 22.5 to 30 mbar (9 to 12 in. W.C.) |
| **Permissible Ambient (Surface) Temperature** | 0 to 70°C (32 to 158°F) |
| **Body Connections** | 1/2 in. Rp with Flange Connection Holes (M4 x 0.7 mm pitch x 6 mm deep) |
| **Valve Torsion Group** | Group 2 (EN 126 and EN 161) |
| **Pressure Taps** | M5 x 0.8 Thread |
| **Pilot Connection** | Optional 6 mm, 4 mm, 1/4 in., or Blank Plug |
| **Dirt Strainer** | 0.5 mm (0.02 in.) Mesh |
| **Operating Time Rating** | 100% Continuous |
| **Valve Timings** | Closing Time: ≤1 Second  
Opening Time: ≤1 Second  
Dead Time: <1 Second |
| **Power Rating** | 9.5 VA per Coil; Class B (EN 161) |
| **Electrical Connections** | 2-pin Solenoid Coil: 2 x 6.35 mm (1/4 in.) Terminals |
| **Agency Listings** | CSA (AGA/CGA) Certificate Number 176837-1156688  
EC Type Examination Certificate Number C87AP57  
Supplementary EC Certificate Number EC-87/94/57/M2 |

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*

*Refer to the GM-7000 Series Multi-function Gas Control Valve Product Bulletin (LIT-4350300) for necessary information on operating and performance specifications of this product.*

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