

S261 Solenoid Gas Valve
2-Way, Normally Closed**INSTALLATION AND SERVICE**SDI: S261-1
Effective: 10-96
Supersedes: 4-95**DESCRIPTION**

S261 Solenoid Gas Valves are normally-closed, pilot operated, diaphragm type solenoid valves, commonly used for safety shutoff of condensate-free combustible gases.

Both the diaphragm and sealing materials are constructed of Nitrile for tight shutoff, while the valve body is die-cast aluminum for durability and strength. The junction box and attached coil housing rotate 360° for ease of wiring.

OPERATION

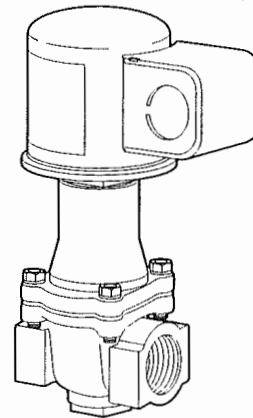
S261 valves are closed when de-energized. When energized, the solenoid coil pulls the plunger/poppet assembly up to open the pilot orifice. Line gas pressure then pushes the diaphragm assembly from the valve seat, permitting gas flow through the valve.

When the coil is de-energized, the return spring pushes the plunger/poppet assembly to close the pilot orifice. Line gas pressure, assisted by the return spring, forces the diaphragm assembly against the valve seat to shut off gas flow.

SPECIFICATIONS

Use S261 Solenoid Valves within the operating conditions indicated on the nameplate. Consult the S261 catalog sheet for full product specifications and ordering information.

Service. The S261 is suitable for use with natural, manufactured, mixed, LP and LP-air heating gases, including high sulfur, scrubbed coke and scrubbed/dried sewer gases.

TO 1 1/2"
(G5, J5, J7)2" +
(K4)**Figure 1. Typical S261 Solenoid Valve****Table 1. Operating Temperatures**

Inlet and Outlet Ports (inch)	Coil Catalog I.D.	Coil Class	Temperature (°F)	
			Media Nominal	Ambient Min/Max
3/8 to 1 1/2	F	155	77	-20 to 175
2 to 3	F	155	77	32 to 175

Table 2. Voltage and Current

Voltage	Current (VA)	
	Inrush	Holding
24V 60 Hz 110-120V/50-60 Hz 220-240V/50-60 Hz	150	31

Table 3. Flow Characteristics

Catalog Number	Pipe Inlet/Outlet (inch NPT)	Orifice (inch)	Operating Pressure (psi)	Gas Capacity (Btu/hr)
S261CG5	3/8	3/4	0 - 30	217,000
S261DG5	1/2	3/4	0 - 30	322,000
S261EG5	3/4	3/4	0 - 30	370,000
S261FJ5	1	1 1/2	0 - 25	1,120,000
S261GJ7	1 1/4	2	0 - 25	1,710,000
S261HJ7	1 1/2	2	0 - 25	1,790,000
S261JK4	2	4 1/2	0 - 25	4,180,000
S261KK4	2 1/2	4 1/2	0 - 25	5,700,000
S261LK4	3	4 1/2	0 - 25	7,100,000

* 1,000 Btu/ft³, 0.64 specific gravity natural gas @ 1" W.C.P.D.

Valve

Operating Mode: Normally-closed, two-way

Duty Cycle: 100%

Mounting Positions:

Body connections to 1 1/2": Upright or horizontal

Body connections larger than 1 1/2": Upright only

Housings. Junction box is standard. Rainproof (NEMA 3R) conduit housing is also available.

Electrical

Voltages: 110-120 V/50-60 Hz standard.

Coil: CS5 coils, rated at 17.5 Watt. Class 155 (F). See Table 4 for replacement coils.

CAUTIONS

- This valve should be installed and serviced only by a trained and experienced service technician.
- Verify valve ratings satisfy design requirements of the application before installing.
- This valve is normally closed (N.C.) to permit flow when powered. **DO NOT USE IN PLACE OF A NORMALLY OPEN VALVE.**
- Piping must comply with applicable local and national codes and ordinances, including the National Fuel Gas Code (ANSI Z223.1/NFPA No. 54).
- Wiring must meet applicable electrical codes and ordinances. Installations in Canada require use of rigid metal conduit to ground electrical enclosure of this valve when rated over 30 volts. Verify power circuit is properly connected and grounded before operating valve.
- Upon completion of installation or servicing, perform the functional checkout contained in these instructions before start up.
- Turn off electrical supply before installing or servicing.
- Turn off gas supply before installing valve. Isolate, depressurize and purge all interconnected piping.
- Do not use the solenoid as a lever for turning the valve body onto a pipe. Use a wrench on the body flat nearest the port being connected.

INSTALLATION

1. Be sure all interconnected piping is free of foreign matter. If particulate matter is an anticipated problem, install a fine mesh strainer of adequate capacity upstream of the valve.
2. Use pipe dope sparingly on male pipe threads only.
3. Connect limit and safety controls in the hot side of line voltage circuits.
4. Valves with 1 1/2" or smaller body connections (orifice G5, J5 or J7) can be mounted either horizontally or vertically. Valves with body connections larger than 1 1/2" (orifice K4) must be mounted upright.

SERVICE

Service should include periodic inspection and cleaning. Organize an inspection schedule based on the flow media, environment and frequency of use. Include a leak check on every inspection.

Coil Replacement (See Table 4 and Figure 2)

NOTE Valve body can be left in-line during coil replacement.

1. Remove conduit cover (3). Deenergize and disconnect the power wiring.
2. Remove screw (1), lockwasher (2), and coil jacket (4).
3. Remove the operator assembly (5 thru 9) from the plunger tube (10).

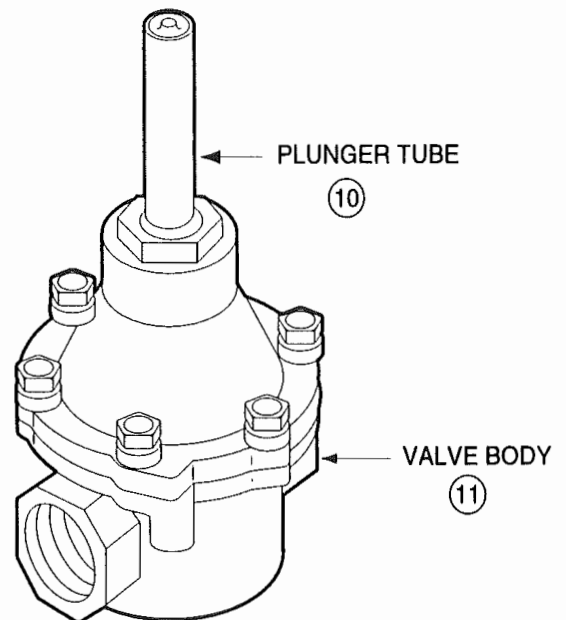
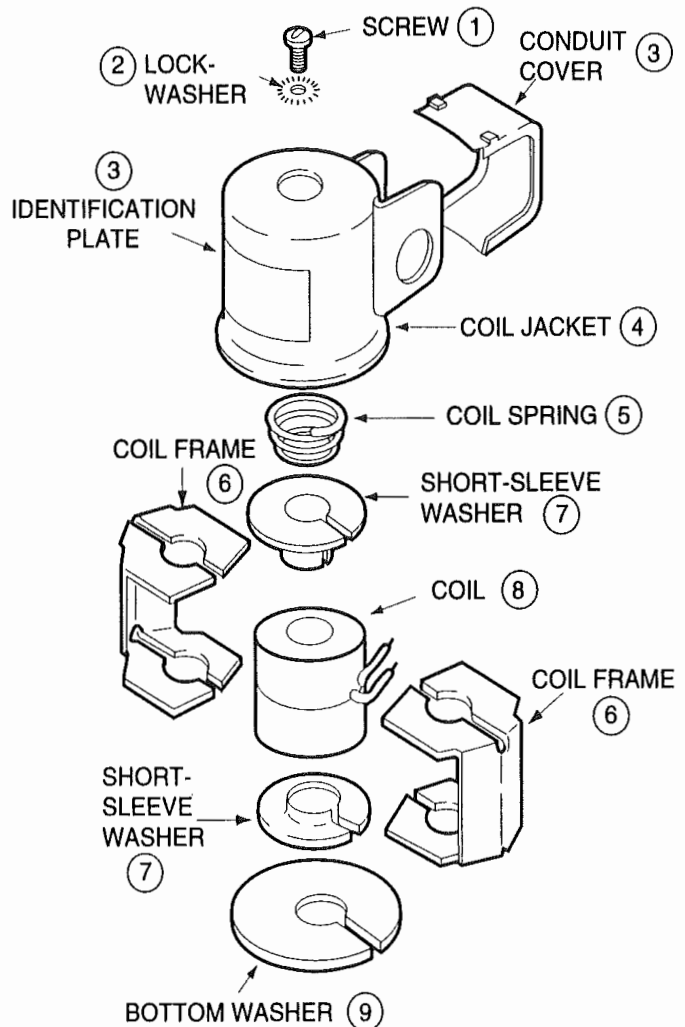


Figure 2. S261 Solenoid Gas Valve

4. Slide the coil frames (6) off of the old coil (8) and remove the short sleeve washers (7). Install the new coil (8) and reassemble the operator assembly as originally configured.
5. Verify proper operation before entering into service.

Replacement Coils

To order a replacement coil, specify the appropriate coil part number (Table 4) for your valve catalog number.

Table 4. Replacement Coil Chart

Voltage	Cat. No. Digits 6, 7 & 8	Coil Part No.
24V 60 Hz	F01	CS5AF01A18
110-120V/50-60 Hz	F02	CS5AF02A18
220-240V/50-60 Hz	F04	CS5AF04A18

FUNCTIONAL CHECKOUT (Figure 3)

1. Check valve for proper operation. With main gas supply shut off, operate through five cycles.
2. With main gas supply on, close the downstream manual gas cock, operate the system and check for leaks with rich soap and water solution.
3. Turn off power to deenergize the control system and S261 gas safety shutoff valve (SSOV).
4. Turn off the gas supply at the upstream manual gas cock.
5. Make sure that the manual test petcock is closed.

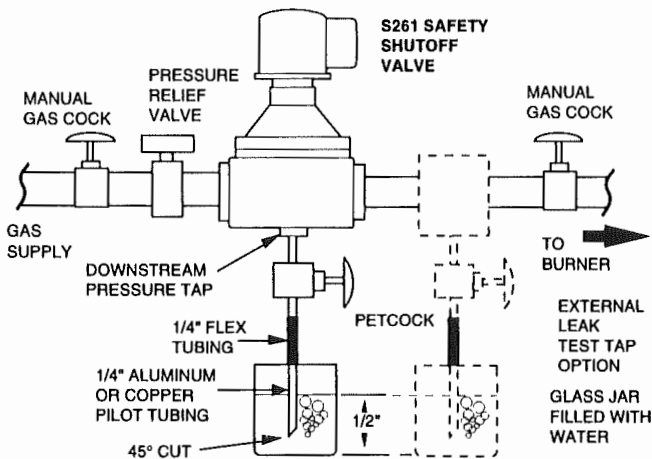
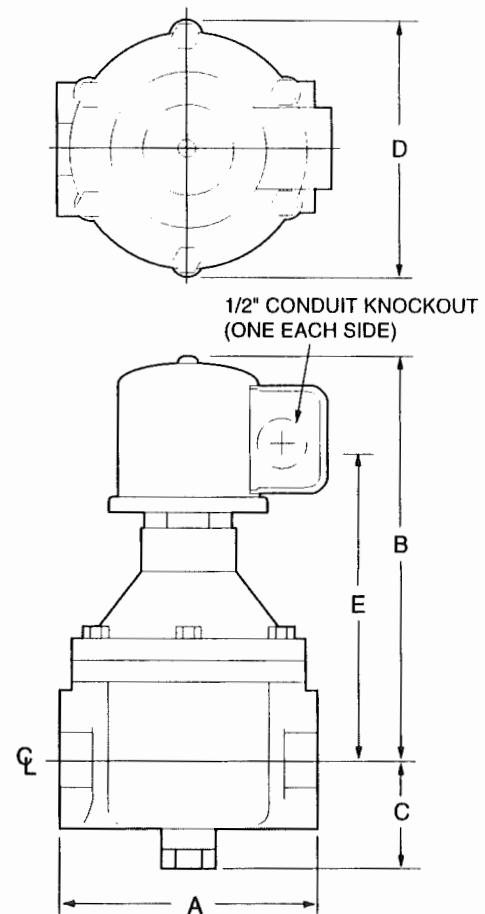


Figure 3. Testing for Through-the-Valve Leakage

6. Remove the plug from the leak test tap or downstream pressure tap in the SSOV body and connect test equipment.
7. Close the downstream manual gas cock.
8. Open the upstream manual gas cock.
9. Program the SSOV through the safety system to the full open position, then immediately deenergize it to seat the valve operationally.
10. Immerse the 1/4" tube vertically into a jar of water to a depth of about 1/2".
11. Slowly open the test petcock.
12. As the rate of bubbles coming through the water stabilizes, count the number of bubbles appearing during a 10-second period. Each bubble that appears during the 10-second period represents a flow rate of approximately 0.001 CFH.

To meet all requirements, leakage should not be more than 14 bubbles during a 10-second period for body sizes less than 2" (0.014 CFH = 400 cc/hr, approx.). For body sizes 2" or larger, leakage should not exceed 25 bubbles during a 10-second period (0.025 CFH = 700 cc/hr, approx.). If leakage exceeds the prescribed rate, replace valve.

13. Close the upstream manual gas cock.
14. Close the test petcock. Remove the test equipment and replace the leak test tap plug.
15. Turn on the gas supply at the upstream manual gas cock and energize the SSOV.
16. Test for leaks at the test tap with rich soap and water solution.
17. Deenergize the SSOV.
18. Open the downstream manual gas cock.
19. Restore the system to normal operation.



Pipe (NPT)	A	B	C	D	E
3/8, 1/2, 3/4	2.75	6.33	1.06	2.31	4.60
1	4.00	7.20	1.41	4.27	5.47
1 1/4 & 1 1/2	4.76	7.56	1.79	4.77	5.83
2	8.12	7.61	2.16	7.69	5.95
2 1/2 & 3	9.00	8.84	2.27	7.69	7.20

Figure 4. S261 Dimensions

TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	REMEDY
Valve operation is sluggish.	Solenoid coil short, or wrong voltage. Damaged plunger assembly. Dirt or other foreign matter restricting operation of valve.	Check coil voltage. Replace solenoid. Replace valve. Install strainer upstream of valve.
Valve fails to open.	Timers, limit controls or other devices not energizing circuit. Damaged plunger assembly preventing plunger operation. Solenoid coil short, burned-out or wrong voltage. Dirt, pipe compound or other foreign matter restricting operation of valve.	Check circuit for limit control operation, blown fuses, short circuits and loose wiring. Replace valve. Replace with ASCO General Controls solenoid coil of correct voltage. Replace valve. Install strainer upstream.
Valve fails to close.	Damaged plunger assembly preventing plunger operation. Dirt, pipe compound or other foreign matter restricting operation of valve. Limit controls improperly installed in grounded side	Replace valve. Replace valve. Install strainer upstream of valve. Wire controls in hot side of circuit.
Valve "chatters" during operation.	Valve supply voltage is improper (too low). Dirt or chips between top of plunger assembly and plunger tube.	Apply correct voltage to valve. Replace valve. Install strainer upstream of valve.