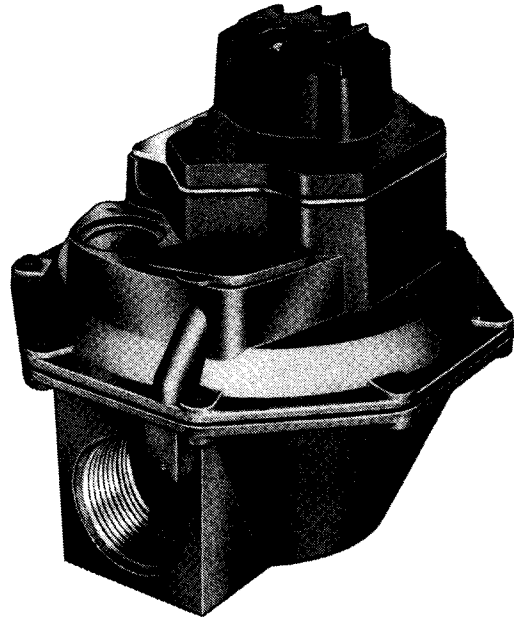


V4843A, V8843A Automatic Diaphragm Gas Valves

The electrically operated V4843A/V8843A Automatic Diaphragm Valves control the flow of natural and LP (liquefied petroleum) gases. These valves are used on atmospheric boilers, commercial water heaters and roof-top heaters.



- A line voltage, 2-wire thermostat or controller is used with the V4843A model and the V8843A is used with a 24-volt thermostat.
- Valves open in less than six seconds.
- Valves close on power failure; valves are recommended for final shutoff service.
- Maximum closing time is three seconds.
- Electrical terminations: 120 volt models have 5/8 inch leadwires, 24 volt models have screw terminals.
- Inlet and outlet pressure taps.
- Valves are ideally suited as redundant valves when used with the V4844/8844B,C,L,N Combination Valves (diaphragm valves with integral pressure regulation).
- For use with natural and LP (liquefied petroleum) gases.

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Specifications

MODELS:

V4843A 120 Vac electrically operated automatic diaphragm gas valve with a maximum operating gas pressure of 0.5 psi [3.4 kPa].

V8843A 24 Vac electrically operated automatic diaphragm gas valve with a maximum operating gas pressure of 0.5 psi [3.4 kPa]

TYPE OF GAS: Suitable for natural and LP gases.

VALVE CAPACITIES: See Table 3.

VALVE PATTERN: Straight through, nonoffset.

VALVE BODY MATERIAL: Die-cast aluminum.

ELECTRICAL TERMINATIONS (optional):

120 Vac models: conduit cover with 18 gauge, 220° F [105° C] 54 inch leadwires.

24 Vac models: screw terminals.

VALVE OPENING TIME: Six seconds maximum at 14 in. w.c. inlet pressure.

VALVE CLOSING TIME: Three seconds maximum (on power failure).

MAXIMUM OPERATING PRESSURE: See Table 1.

POWER CONSUMPTION:

24 Vac models: 4.8 watts.

120 Vac models: 5.8 watts.

AMBIENT TEMPERATURE RATING:

V4843A; -40° F to 175° F.

V8843A; -40° F to 150° F.

MAXIMUM FLUID TEMPERATURE:

V4843A; 175° F.

V8843A; 150° F.

DIMENSIONS: See Fig. 1.

WEIGHT:

Pipe Size (in.)	lb.	kg
1	4.0	1.8
1-1/4	3.8	1.7
1-1/2	4.8	2.2
2	4.4	2.0

MOUNTING POSITION: Upright (horizontal).

APPROVALS:

Underwriters Laboratories Listed: File No. HLLH1639 Guide No. YIOZ.

American Gas Association Design Certified: Report No. 70-26A.

Canadian Gas Association Certified: Report No. 1301-CC-5342.

ACCESSORY:

AT72D Transformer (40 VA) for all V8843A models.

TABLE 1—MODELS AVAILABLE.

Model	Voltage and Frequency	Maximum Operating Pressure		Pipe Size (in.)	Thread Type
		psi	kPa		
V4843A	120V/60 Hz	0.5	3.4	1, 1-1/4, 1-1/2, 2	NPT
V8843A	24V/60 Hz	0.5	3.4	1, 1-1/4, 1-1/2, 2	NPT

Ordering Information

When purchasing replacement and modernization products from your TRADELINE® wholesaler or your distributor, refer to the TRADELINE Catalog or price sheets for complete ordering number, or specify:

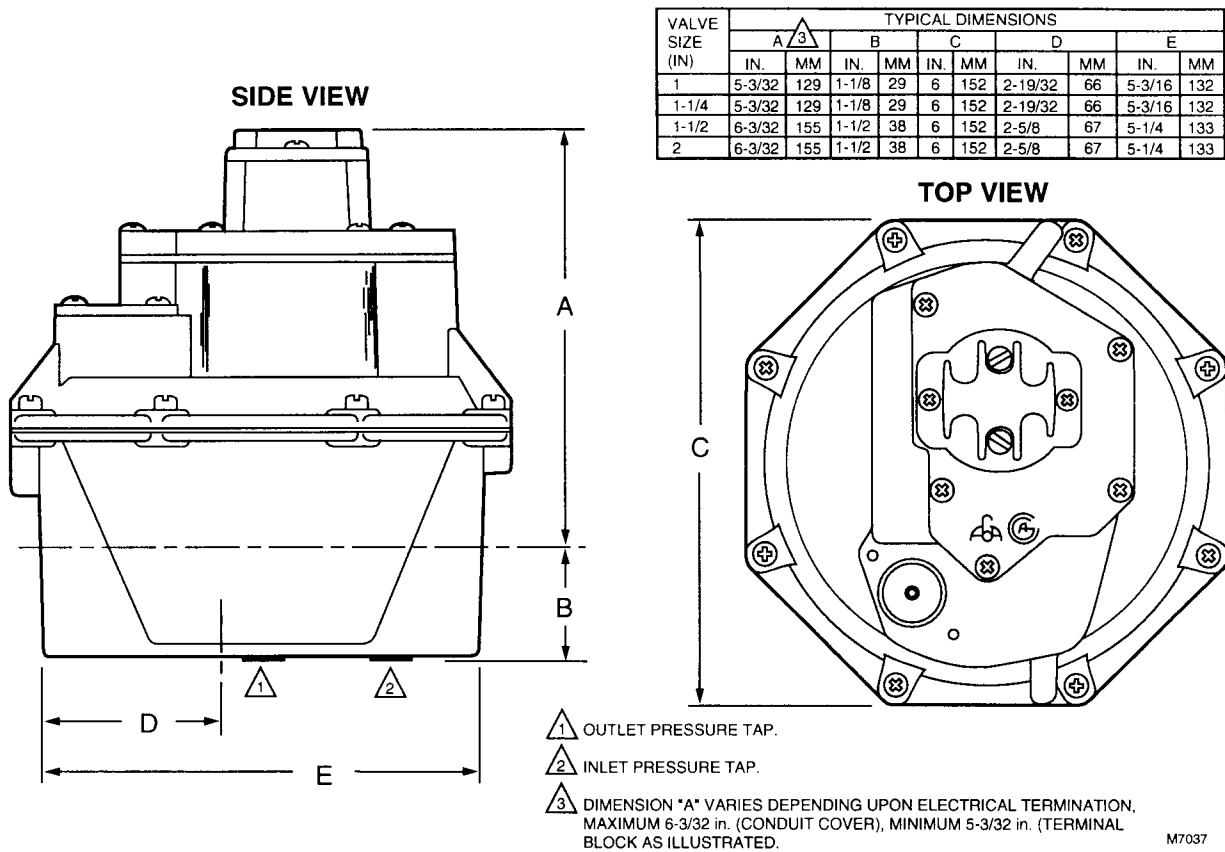
1. Order number.
2. Pipe size.
3. Operating pressure rating.
4. Transformer for V8843A.

If you have additional questions, need further information or would like to comment on our products or services. Please write or phone:

1. Your local Honeywell Home and Building Control Division Sales Office (check white pages of phone directory).
2. Home And Building Control Customer Satisfaction
 Honeywell Inc., 1885 Douglas Drive North
 Minneapolis, Minnesota 55422-4386 (612) 951-1000

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Fig. 1—Mounting dimensions of V4843/V8843A diaphragm gas valves.



GAS VALVE SIZING

1. Check the burner nameplate for (a) the type of gas used, and (b) the gas flow capacity. The capacity will be listed in Btu/h (British thermal units per hour) or in cf/h (cubic feet per hour).

2. Contact the local gas utility for information regarding (a) the sp gr (specific gravity) and (b) the Btu/cu ft (Btu per cubic foot) for the type of gas used.

3. Find the capacity in cf/h. If the capacity is listed in Btu, convert to cf/h by the following formula:

$$\text{Capacity in cf/h} = \frac{\text{Btu/h (burner nameplate)}}{\text{Btu/cu ft (gas utility)}}$$

4. For gases with specific gravities other than 0.64, multiply the burner cf/h by the proper conversion factor in Table 2.

TABLE 2—CONVERSION FACTORS.

Type of Gas	sp gr (average)	Multiply cf/h by
Manufactured	0.60	1.033
Mixed	0.70	0.956
LP-Propane	1.53	0.647
LP-Butane	1.98	0.569

5. Use the corrected capacity in cf/h when determining the gas valve size from Figs. 2, 3, 4 or 5.

6. Determine the maximum pressure drop across the valve and draw a vertical line at this pressure on Figs. 2, 3, 4 or 5.

7. At the point of intersection of the vertical line and the curve, draw a horizontal line to intersect the flow (capacity) scale. The point of intersection indicates the capacity that can be obtained with the maximum pressure drop.

8. If the capacity at the maximum pressure drop is insufficient, use the capacity vs. pressure drop curve for the next larger valve size and repeat steps 6 and 7.

To size two identical valves piped in series:

1. Find the cf/h for the type of gas used.
2. Consider both valves as one unit. Determine the maximum pressure drop across the one unit.
3. Find the pressure drop across the first valve by assuming it to be 45 percent of the total pressure drop.
4. Find the valve size from Figs. 2, 3, 4 or 5.
5. The second valve will be the same size as the first valve.
6. See also V4843/V8843N curves in Figs. 2, 3, 4 or 5.

Fig. 2—Capacity vs. pressure drop curves for 1 in. valve.

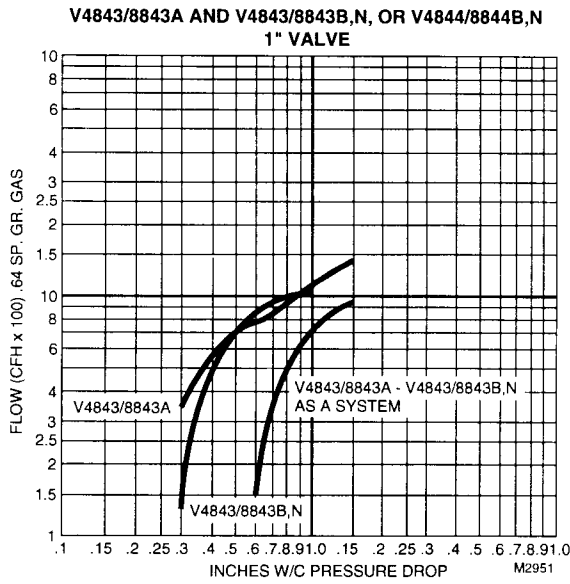


Fig. 4—Capacity vs. pressure drop curve for 1-1/2 in. valve.

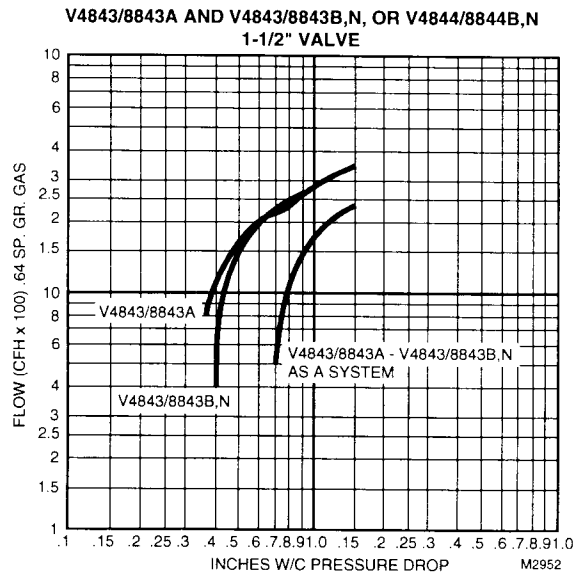


Fig. 3—Capacity vs. pressure drop curves for 1-1/4 in. valve.

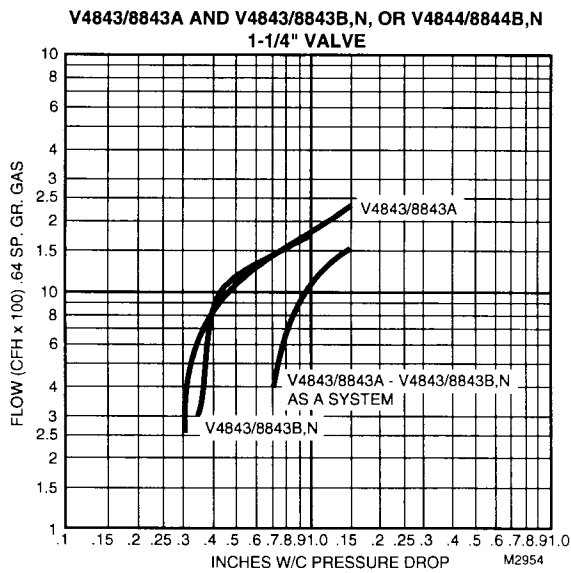


Fig. 5—Capacity vs. pressure drop curve for 2 in. valve.

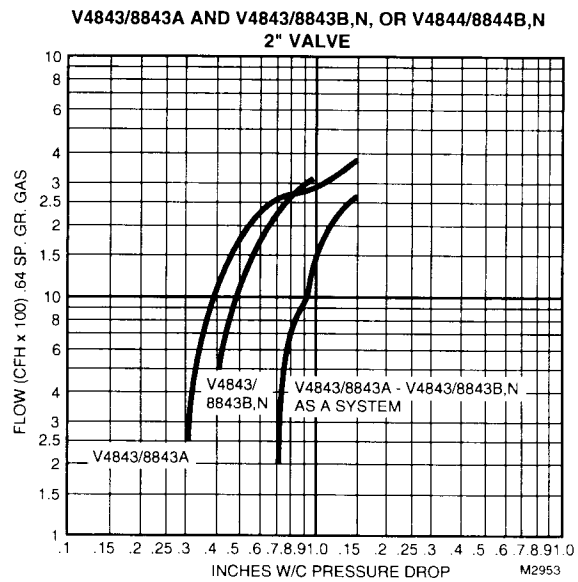


TABLE 3—FLOW CAPACITY.

Model	Valve Size (inch)	AGA Rating for 0.64 sp gr Gas at 1 in. w.c. Pressure Drop
V4843A	1	1000 cf/h
V8843A	1-1/4	1600 cf/h
	1-1/2	23500 cf/h
	2	3000 cf/h

Installation

WHEN INSTALLING THIS PRODUCTS...

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, flame safeguard control technician.
4. After installation is complete, check out product operation as provided in these instructions.



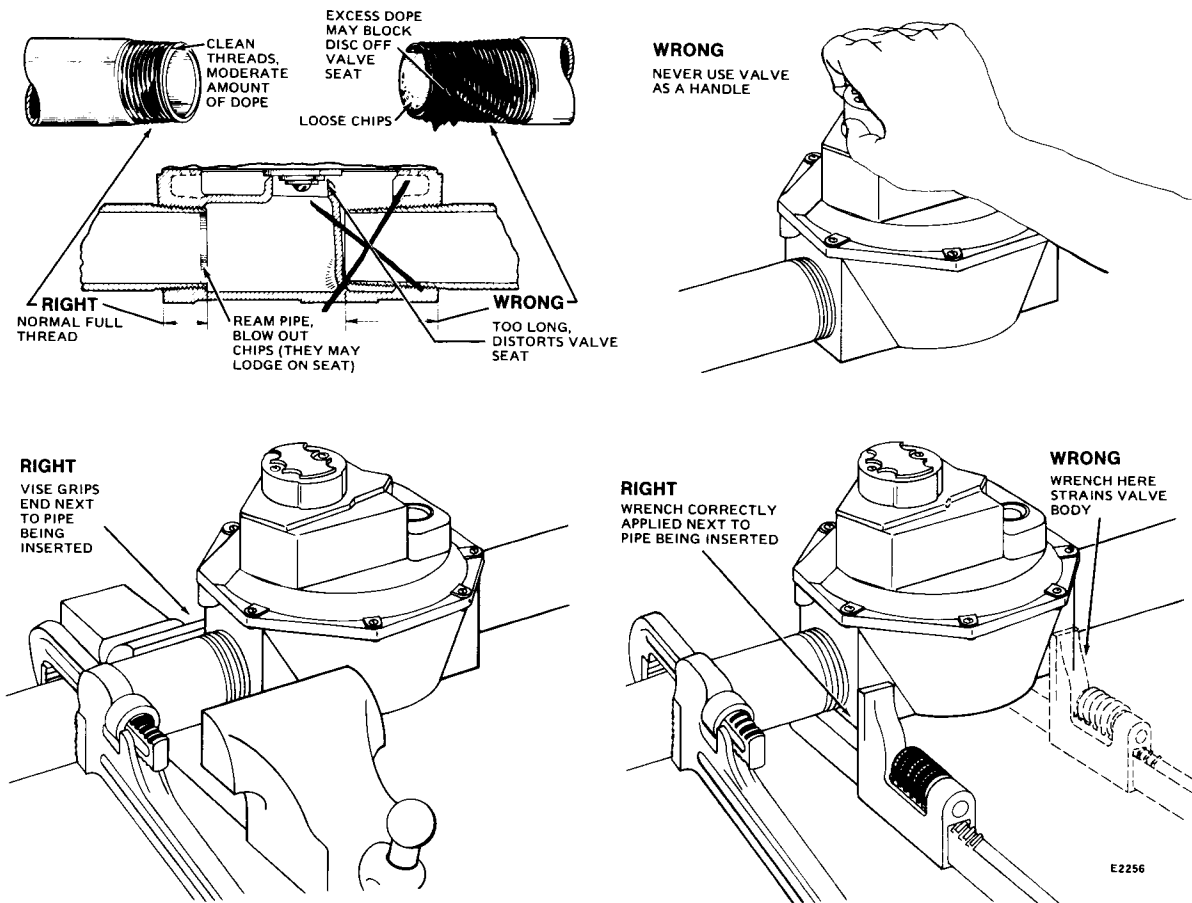
CAUTION

1. Turn off gas supply before starting installation.
2. Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.
3. Do not remove seal over valve inlet or outlet until ready to connect piping.

PREPARE PIPING AND INSTALL VALVE (Fig. 6)

1. Use new, properly reamed pipe free from chips.
2. Do not thread pipe too far. Valve distortion or malfunction may result from excess pipe in valve.
3. Apply good quality pipe dope resistant to the action of LP gas, putting a moderate amount on the male threads only. If pipe dope lodges on the valve seat, it will prevent proper closure.
4. Install valve in a horizontal pipe line in an upright position with the gas flow in the direction indicated by the arrow on the casting.
5. Apply a parallel jaw wrench only to the flat next to the pipe being inserted. A wrench applied to the valve body itself or to the end farthest from the pipe being inserted may distort the casting causing a malfunction.
6. The gas flow *must* be in the same direction as the arrow on the bottom of the valve body.

Fig. 6—Preparing the piping and installing the valve.





WARNING

If flow is not in direction of arrow, valve may not shut off.

7. Make electrical connections as illustrated in the wiring diagrams; see Figs. 7, 8 and 9.
8. Turn on main gas and, with a soap solution, check valve installation for leaks.

WIRING

1. Disconnect power supply *before* making wiring connections to prevent electrical shock and equipment damage.
2. All wiring must comply with applicable electrical codes, ordinances, and regulations. Use NEC Class 1 (line voltage) wiring.
3. For normal installations, use moisture-resistance No. 14 wire suitable for at least 167° F [75° C] if using a Flame Safeguard Primary Control, or for at least 194° F [90° C] if using a Flame Safeguard Programming Control.
4. For high temperature installations, use moisture-resistant No. 14 wire selected for a temperature rating above the maximum operating temperature.
5. Check the power supply circuit. The voltage and frequency must match those of the valve.
6. Refer to Figs. 7, 8, or 9 for typical field wiring connections. Follow the burner manufacturer's wiring diagram if provided.
7. Make wiring connections at the electrical terminations provided at the top of the valve.

Fig. 7—Typical wiring diagram for V4843A.

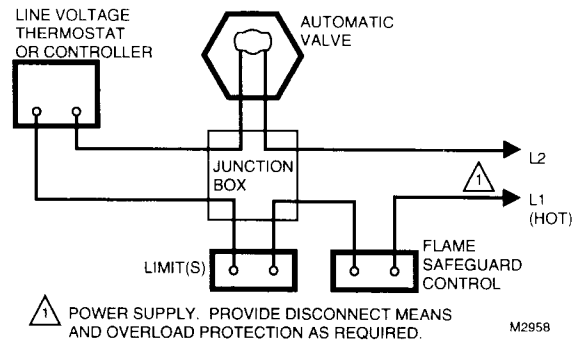


Fig. 8—Typical wiring diagram for V8843A.

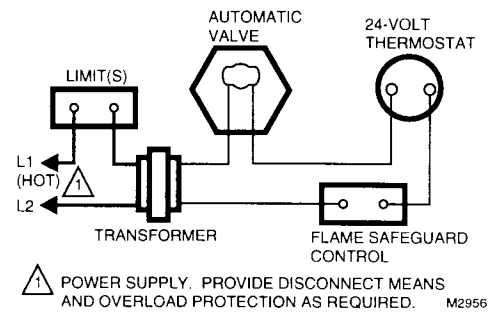
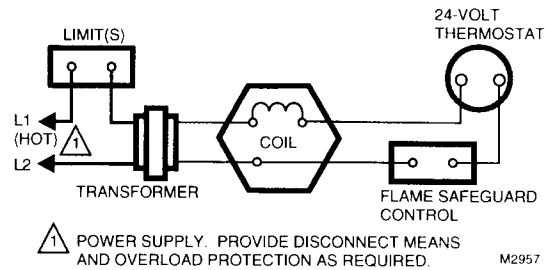


Fig. 9—Typical wiring diagram for V8843A with 3-screw electrical termination.



Operation

OPERATION OF THE V4843/V8843A

When the controller is not calling for heat, the valve solenoid coil is not energized. The plunger in the 3-way actuator is in the down position, which closes the bleed port and opens the supply port. The inlet gas flows into the upper portion of the valve until the gas pressure above and below the diaphragm is equalized. The valve closes and remains closed due to the combined forces of gas and spring pressures.

On a call for heat, the controller contacts close and the valve solenoid coil is energized. The gas above the diaphragm bleeds internally to the outlet side of the valve.

As the gas bleeds from above the diaphragm, the gas pressure is greater below the diaphragm than above and the valve begins to open. When the gas pressure above the diaphragm reaches its minimum value (burner delivery pressure), the valve is fully opened.

After the controller is satisfied, the procedure is reversed. The controller contacts open and the solenoid coil is de-energized. The plunger is released, moving to the down position. The bleed port closes and the supply port opens, allowing gas to flow above the diaphragm. As the gas pressure above the diaphragm increases, the diaphragm moves downward and the valve begins to close. When the gas pressures above and below the diaphragm are equal, the valve is fully closed. Spring pressure assists in closing the valve. If the inlet gas supply fails and there is no gas pressure above the diaphragm, the spring pressure is adequate to close the valve.

In the event of power failure during automatic operation of the valve, the V4843A/V8843A Valves will close. Normal operation will resume upon the restoration of power.

Checkout and Troubleshooting



WARNING

Do not allow fuel to accumulate in the combustion chamber. If fuel is allowed to enter the chamber for longer than a few seconds without igniting, an explosive mixture could result.



CAUTION

1. Do not put the system into service until you have satisfactorily completed all applicable tests described in the Checkout section of the instructions for the flame safeguard control, and any other tests required by the burner manufacturer.
2. Close *all* manual fuel shutoff valves as soon as trouble occurs.

CHECKOUT

1. Check the performance of the valve by measuring the pressures at the inlet and outlet pressure taps at the bottom of the valve. The pressure reading at the outlet tap may be slightly higher than a downstream measurement due to dynamic gas flow effects. The measurement at the outlet tap is for reference only.
2. Shut off gas supply to valve and make sure valve is closed when setting up pressure measuring equipment.
3. Set thermostat or controller to energize the valve and check final outlet pressure.
4. Start the system and observe its operation through at least one complete cycle to be sure the valve functions as described in the Operation section.

TROUBLESHOOTING



CAUTION

Use utmost care during troubleshooting. Line voltage is present right at the actuator for V4843A Valves, and is present in all controller circuits for all V4843A and V8843A Valves.

IMPORTANT: *Do not assume that the valve must be replaced until all other sources of trouble have been eliminated.*

- A. If the valve will not open when the thermostat or controller is calling for heat:
1. Check that there is voltage at the valve actuator leadwires or terminal block. Be careful—there should be line voltage at the actuator of V4843A Valves.
 2. If there is no voltage at the actuator, first make sure line voltage power is connected to the master switch, the master switch is closed and overload protection (circuit breaker, fuse or similar device) has not opened the power line.
 3. For V8843A only: If line voltage power is okay, check the transformer. Replace it if necessary.
 4. If there is still no voltage at the actuator, make sure all the appropriate contacts in the thermostat (or controller), limit(s) and flame safeguard control are closed. If one or more is open, determine the cause(s) and correct the condition(s) before proceeding.
 5. If there is proper voltage at the valve actuator but the valve still does not open, first check that the gas pressure at the valve is normal.
 6. If the valve still does not open, replace the valve.
- B. If the valve will not close when one or more of the appropriate contacts in the thermostat (or controller), limit(s) or flame safeguard control is open:
1. Make sure that the gas flow is in the direction of the arrow on the valve body.
 2. Make sure the valve actuator is wired in the correct circuit. Open the master switch to remove power from the valve actuator. If the valve closes now, the actuator may not be wired properly.
 3. Look for a short in the electrical circuit.

Service Information



CAUTION

- Only qualified service technicians should attempt to service or repair flame safeguard controls and burner systems.
- Line voltage is present in the electrical circuits to the valve. Open the master switch before replacing the valve.

SCHEDULED INSPECTION AND MAINTENANCE

For periodic inspection and maintenance, set up a schedule and follow it. Include the burner valves, and all other controls. Refer to the flame safeguard control instructions for more information.

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