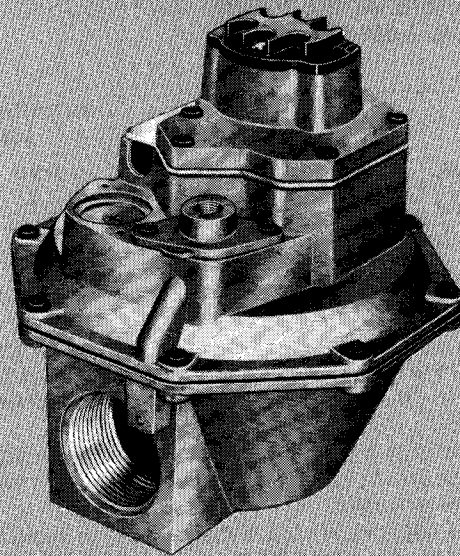


# Honeywell

## AUTOMATIC DIAPHRAGM VALVE WITH PILOT TAKEOFF

THE V4843/8843P ARE ELECTRICALLY OPERATED DIAPHRAGM VALVES WITH A PILOT TAKEOFF AND ARE USED AS A REDUNDANT VALVE IN SYSTEMS WITH AN INTERMITTENT PILOT. THE VALVES ARE SUITABLE FOR USE WITH NATURAL AND LP GASES.

- A line voltage, two-wire thermostat or controller is used with the V4843P model and the V8843P is used with a 24 volt thermostat.
- Valves open in less than six seconds.
- Valves close on power failure.
- Maximum closing time is three seconds.
- V4843/8843P are rated for usage over the ambient temperature range  $-40^{\circ}$  F [ $-40^{\circ}$  C] to  $+150^{\circ}$  F [ $+66^{\circ}$  C].
- Electrical terminations optional.
- Inlet and outlet pressure taps.
- Valves are ideally suited as redundant valves when used with the V4843/8843 B,C,L,N or V4844/8844 B,C,L,N combination (integral pressure regulation) valves.



V4843P;  
V8843P

# SPECIFICATIONS

**MODELS:**

V4843P 120 Vac electrically operated diaphragm gas valve with pilot takeoff and maximum operating pressure of 0.5 psi [3.4 KPA].

V8843P 24 Vac electrically operated diaphragm gas valve with pilot takeoff and a maximum operating pressure of 0.5 psi [3.4 KPA].

**TYPE OF GAS:** Suitable for natural and LP gases.

**VALVE CAPACITIES:** See Table III.

**VALVE PATTERN:** Straight through, non-offset.

**VALVE BODY MATERIAL:** Die-cast aluminum.

**PILOT TAPPING:** 1/8 in. NPT pilot takeoff.

**MAXIMUM OPERATING PRESSURE:** See Table I.

**VALVE OPENING TIME:** Six seconds maximum at 14 in. water column (w.c.) inlet pressure.

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

**POWER CONSUMPTION:** 24 Vac models 4.8 watts. 120 Vac models 5.8 watts.

**AMBIENT TEMPERATURE RATING:** -40° F to +150° F [-40° C to +66° C].

**ELECTRICAL TERMINATIONS (OPTIONAL):** Conduit cover with 18 gauge, 220° F [105° C] leadwires.

1/4 in. spade terminals.

Screw terminals.

**MOUNTING POSITION:** Upright to 90° from upright.

**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

**APPROVALS:** UNDERWRITERS LABORATORIES LISTED: File No. MH1639 Guide No. Y10Z.

**AMERICAN GAS ASSOCIATION DESIGN CERTIFIED:** Report No. 70-26A

**CANADIAN GAS ASSOCIATION CERTIFIED:** Report No. 1301-CC-5342.

**ACCESSORY:** Transformer AT72D for all V8843P models.

**TABLE I**

MODEL	VOLTAGE AND FREQUENCY	MAXIMUM OPERATING PRESSURE		PIPE SIZE (INCHES)	THREAD TYPE
		PSI	KPA		
V4843P	120V/60HZ	0.5	3.4	1, 1 1/4, 1 1/2, 2	NPT
V8843P	24V/60HZ	0.5	3.4	1, 1 1/4, 1 1/2, 2	NPT

## 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 (Btu's per hour) or in cf/h (cubic feet per hour).

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

3. Find the capacity in cf/h. If the capacity is listed in Btu/h, 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 II.

**TABLE II — 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 Fig. 2, 3, 4, or 5.

*(continued on page 3)*

# ORDERING INFORMATION

**WHEN PURCHASING REPLACEMENT AND MODERNIZATION PRODUCTS FROM YOUR TRADELINE WHOLESALE OR DISTRIBUTOR, REFER TO THE TRADELINE CATALOG OR PRICE SHEETS FOR COMPLETE ORDERING NUMBER OR SPECIFY—**

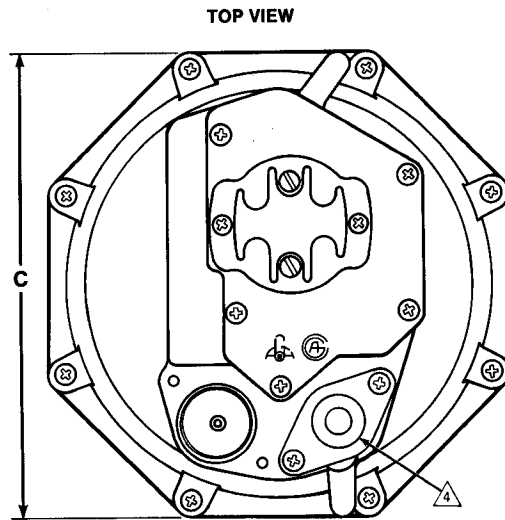
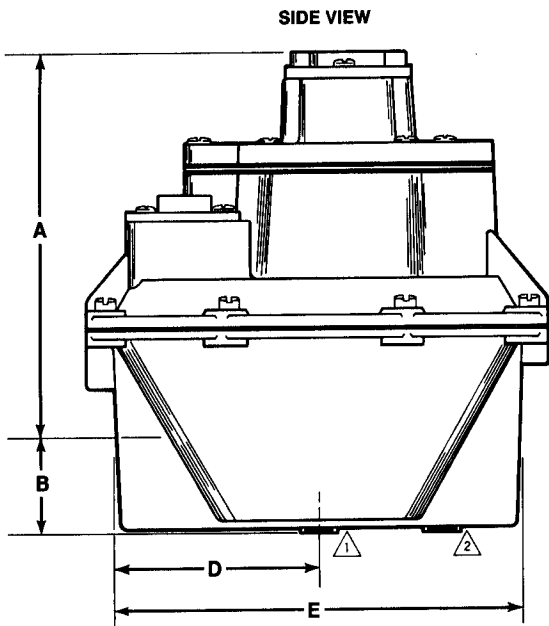
- |                  |                               |
|------------------|-------------------------------|
| 1. Order number. | 3. Operating pressure rating. |
| 2. Pipe size.    | 4. Transformer for V8843P.    |

**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 RESIDENTIAL DIVISION SALES OFFICE (CHECK WHITE PAGES OF PHONE DIRECTORY).
2. RESIDENTIAL DIVISION CUSTOMER SERVICE  
HONEYWELL INC., 1885 DOUGLAS DRIVE NORTH  
MINNEAPOLIS, MINNESOTA 55422-4386 (612) 542-7500

**IN CANADA—HONEYWELL LIMITED/HONEYWELL LIMITEE, 740 ELLESMERE ROAD, SCARBOROUGH, ONTARIO M1P 2V9. INTERNATIONAL SALES AND SERVICE OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD.**

VALVE SIZE (INCHES)	TYPICAL DIMENSIONS									
	A <sup>3</sup>		B		C		D		E	
	IN.	MM	IN.	MM	IN.	MM	IN.	MM	IN.	MM
1	5-3/32	129	1-1/8	29	6	152	2-19/32	66	5-3/16	132
1-1/4	5-3/32	129	1-1/8	29	6	152	2-19/32	66	5-3/16	132
1-1/2	6-3/32	155	1-1/2	38	6	152	2-5/8	67	5-1/4	133
2	6-3/32	155	1-1/2	38	6	152	2-5/8	67	5-1/4	133



- △ 1 OUTLET PRESSURE TAP.
- △ 2 INLET PRESSURE TAP.
- △ 3 DIMENSION "A" VARIES DEPENDING UPON ELECTRICAL TERMINATION, MAXIMUM 6-3/32 in. (CONDUIT COVER), MINIMUM 5-3/32 in. (TERMINAL BLOCK AS ILLUSTRATED).
- △ 4 PILOT TAKEOFF.

E2248A

FIG. 1—MOUNTING DIMENSIONS OF V4843/8843P DIAPHRAGM GAS VALVES.

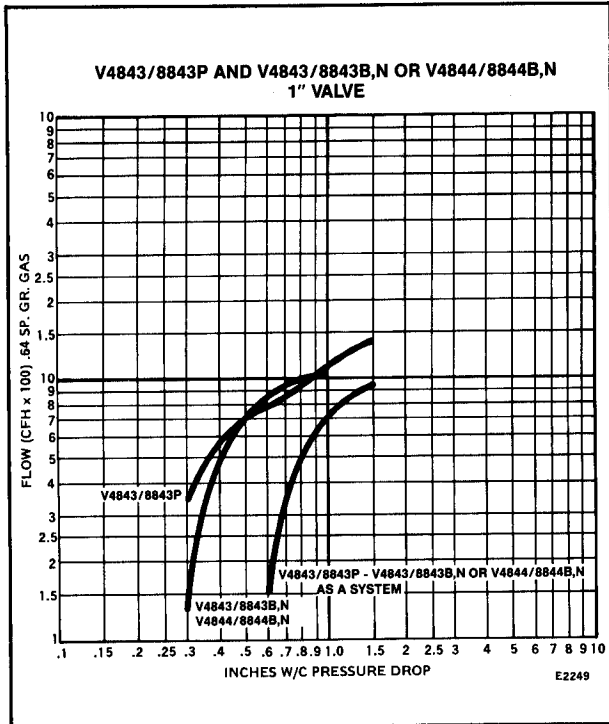


FIG. 2—CAPACITY VS. PRESSURE DROP CURVES FOR 1 in. VALVE.

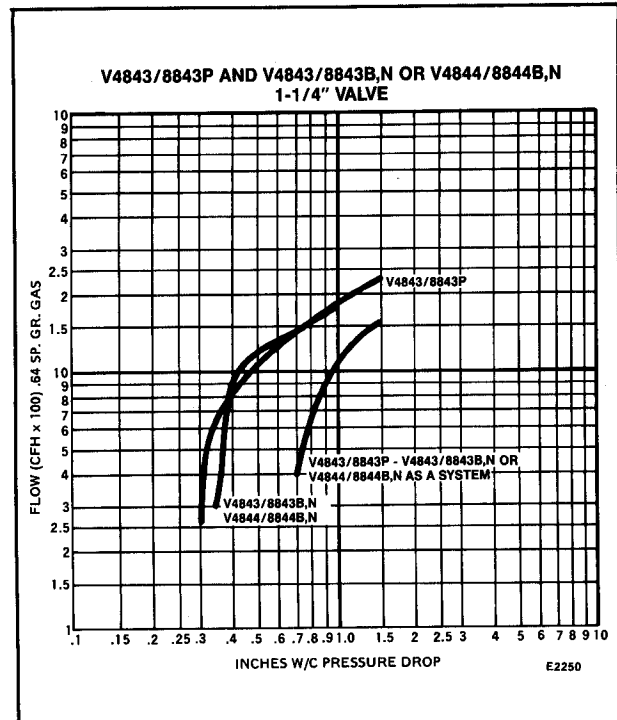


FIG. 3—CAPACITY VS. PRESSURE DROP CURVES FOR 1 1/4 in. VALVE.

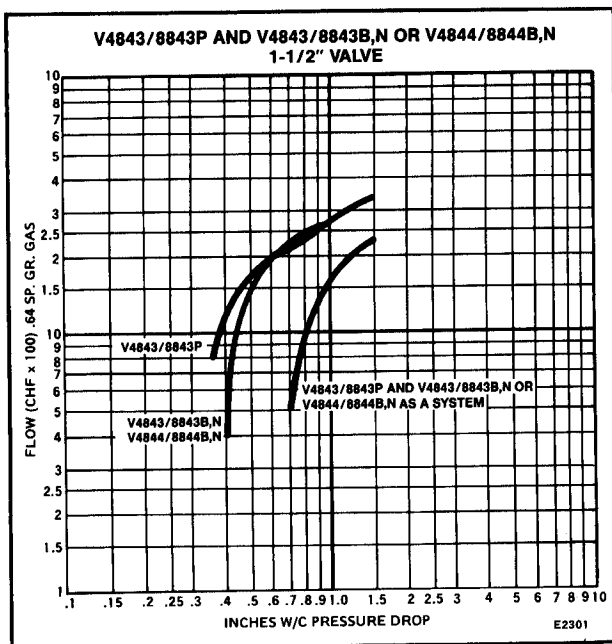


FIG. 4—CAPACITY VS. PRESSURE DROP CURVES FOR 1½ in. VALVE.

6. Determine the maximum pressure drop across the valve and draw a vertical line at this pressure on Fig. 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 which 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.

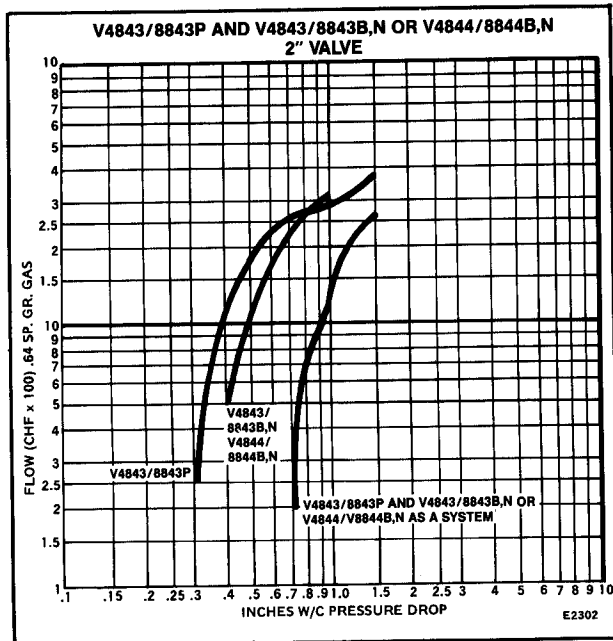


FIG. 5—CAPACITY VS. PRESSURE DROP CURVES FOR 2 in. VALVE.

TABLE III — FLOW CAPACITY

MODEL	VALVE SIZE (INCHES)	A.G.A. RATING FOR 0.64 SP. GR. GAS AT 1 IN. W.C. PRESSURE DROP
V4843P	1	1000 cf/h
	1-1/4	1600 cf/h
V8843P	1-1/2	2500 cf/h
	2	3000 cf/h

## 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, flame safeguard control technician.

4. After installation is completed, check out product operation as provided in these instructions.

## WARNING

The V4843/8843P valves must be used as redundant valves in gaseous fuel control systems with intermittent pilot as the main valve and pilot are energized simultaneously. Refer to Figs. 8 and 9. Failure to follow these instructions could result in a hazardous condition.

## CAUTION

1. Turn off gas supply before starting installation.
2. Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.

### 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, putting a moderate amount on the male threads only. If pipe dope lodges on the valve seat, it will prevent proper closure. If using LP (Liquified Petroleum) gas, use a pipe dope resistant to the action of LP gas.
  4. 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.
  5. The gas flow MUST be in the same direction as the arrow on the bottom of the valve body.
- If flow is not in direction of arrow, valve may not shut off.

# WARNING

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

7. Make electrical connections as illustrated in the wiring diagrams, Figs. 8 and 9.

8. Turn on main gas and check valve installation for leaks with a soap solution.

## CONNECT PILOT TUBING (FIG. 7)

1. Square off and remove burrs from end of tubing. Bend tubing to desired form for routing to pilot burner. Do not bend tubing at the valve after the compression nut has been tightened, as this may result in gas leakage at the connection.

2. Obtain a  $\frac{1}{8}$  in. NPT brass compression fitting and slip the fitting over the tubing and slide out of the way.

### IMPORTANT

When replacing a valve, cut off the old compression fitting and replace with a new compression fitting. Never use the old compression fitting as it may not provide a tight gas seal.

3. Push tubing into the pilot gas tapping on the outlet end of the valve until it bottoms. While holding tubing all the way in, slide compression fitting into place and engage threads — turn until finger tight. Then use wrench and tighten one turn beyond finger tight.

4. Connect other end of tubing to pilot burner according to pilot burner manufacturer's instructions.

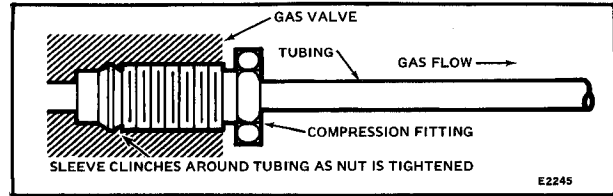


FIG. 7—CONNECTING TUBING TO PILOT TAPPING.

## WIRING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.

2. All wiring must comply with applicable codes, ordinances, and regulations. Use NEC Class 1 (line voltage) wiring.

3. For normal installations, use moisture-resistant 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. 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.

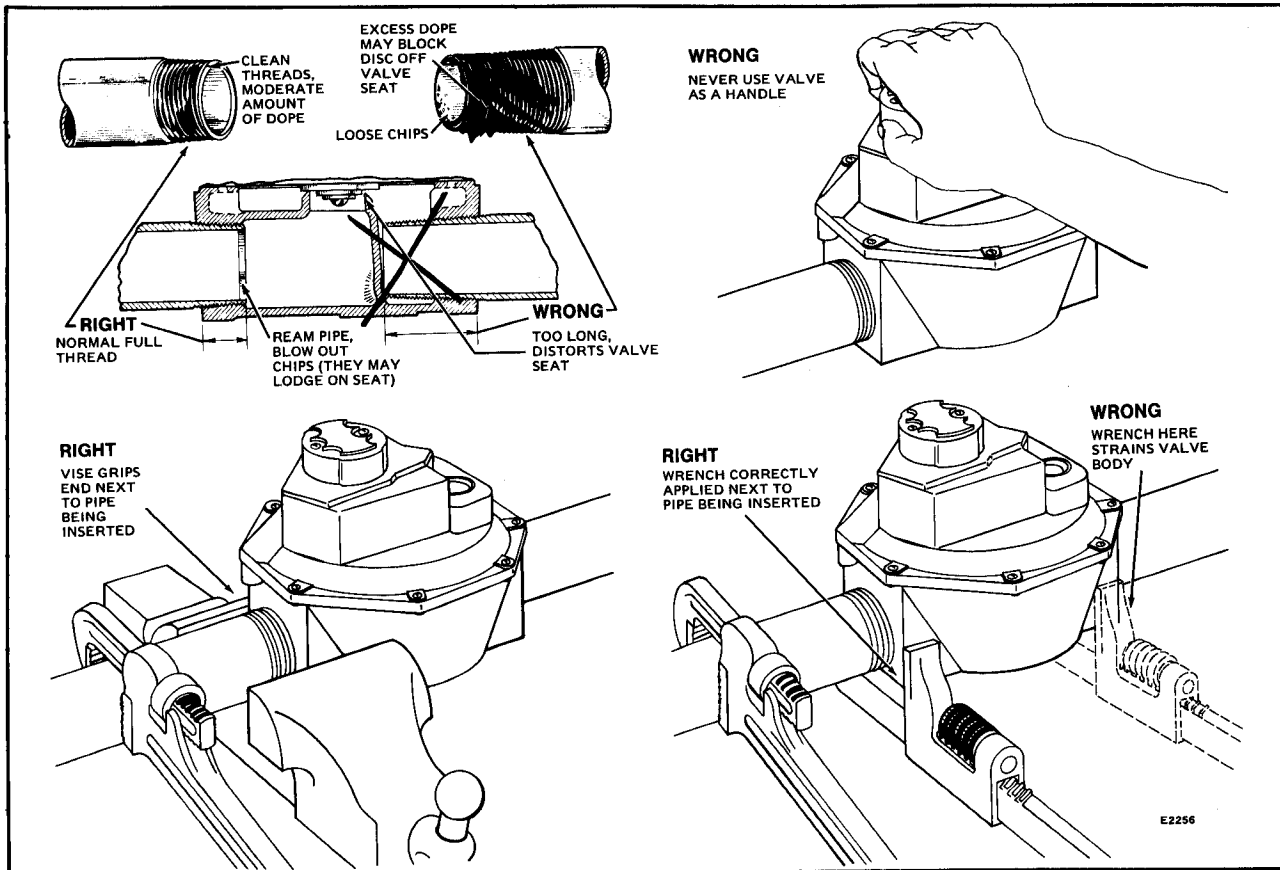


FIG. 6—PREPARING THE PIPING AND INSTALLING THE VALVE.

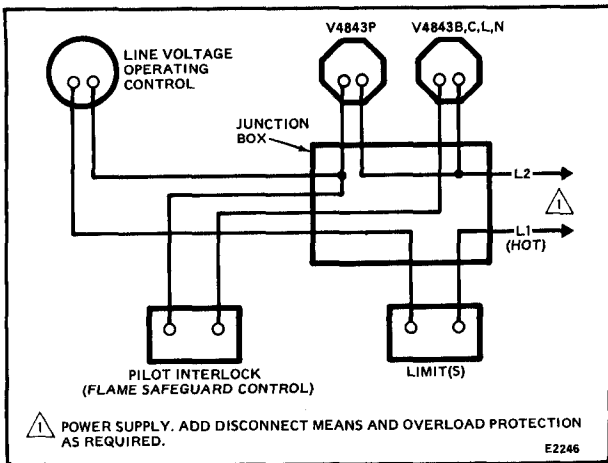


FIG. 8—TYPICAL WIRING DIAGRAM FOR V4843P.

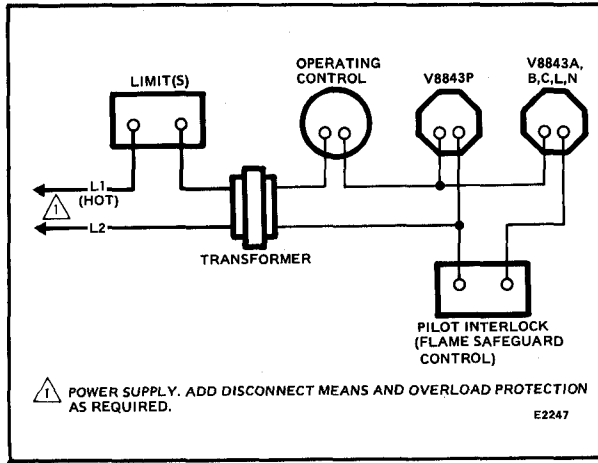


FIG. 9—TYPICAL WIRING DIAGRAM FOR V8843P.

## OPERATION

### OPERATION OF THE V4843/8843P

The V4843/V8843P valves are "on-off" automatic diaphragm gas valves incorporating a pilot takeoff.

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 shutting off the flow of gas to the main burner and pilot burner. The valve 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 energizing of the solenoid coil raises the plunger to the up position resulting in the opening of the bleed port and closing of the supply port. The gas above the diaphragm is bled to the intermittent pilot through the pilot take-off fitting.

As the gas bleeds from above the diaphragm, the gas pressure is greater below the diaphragm than above and

the valve begins to open. The pilot gas flow begins as soon as the normally closed bleed valve opens. 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 main valve and the pilot gas flow is shut off the instant the solenoid operates. 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 V4843/8843P valves will close shutting off the main and pilot gas supply. 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 ignition, 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 instruction sheet 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. The performance of the valve can be checked 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 V4843P valves, and is present in all controller circuits for all V4843P and 8843P 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 lead wires or terminal block. Be careful — there should be line voltage at the actuator of V4843P valves.
2. If there is no line 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 a V8843P only: If line voltage power is okay, check the transformer. Replace if necessary.
4. If there is still no voltage at the actuator, make sure all 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

### WARNING

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

### SCHEDULED INSPECTION AND MAINTENANCE

A schedule should be set up and followed for periodic inspection and maintenance, including the burner and all other controls as well as the valve(s). Refer to the instruction sheet for the flame safeguard control for more information.

**Honeywell Inc.**  
1885 Douglas Drive N.  
Golden Valley, MN 55422-4386

International Sales Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

PRINTED IN U.S.A.

