

## Supplementary Information

This unit is equipped with a model PVF or a model PVG indirect gas-fired furnace that has a 4:1 turndown. The primary gas control valve used in these units is a Honeywell combination valve. It controls the high fire gas supply and acts as an on/off switch. In addition to the Honeywell valve, there is a Maxitrol EXA valve located just after the Honeywell combination valve and the EXA valve is the device that modulates or changes the gas volume that is being supplied to the furnace manifold. **Both of these valves require adjustment at time of unit start-up.**



**Typical EXA  
Modulating Gas Valve**



**Typical Honeywell  
Combination Valve**

The EXA gas valve has a built-in digital controller that will accept user settings for High Fire and Low Fire and will provide minimal hysteresis throughout the entire range of modulation. The EXA valve controls the amount of combustion gas that goes to the burners, while the Honeywell valve acts as an on/off switching device. During normal use, the amount of combustion gas will vary constantly, depending on the settings put in by the owner. This allows the EXA valve to regulate the heat output from the furnace and maintain a constant space temperature with minimal variation, or hysteresis.

The EXA Modulating Valve is controlled by a user interface known as the FX05 Controller, manufactured by Johnson Controls. The FX05 Controller sends an analog signal to the EXA modulating valve that causes the valve to send more or less gas to the furnace.

The Honeywell combination valve is normally closed. It requires 24 VAC to hold it open.

Both the EXA and Honeywell gas valves have been set at the factory for ideal operating gas pressures. Vibration during shipment of the unit and field conditions require that both valves be readjusted at the time of start-up.

At start-up,

- Set the regulator screw on the Honeywell combination valve as high as it goes (all the way in).
- Set the High Fire set point on the EXA valve to 3.5 inches WC for natural gas or 10.0 inches WC for LP gas.
- Set the Low Fire set point on the EXA gas valve at 0.3 inches WC for natural gas or 1.0 inch WC for LP gas.

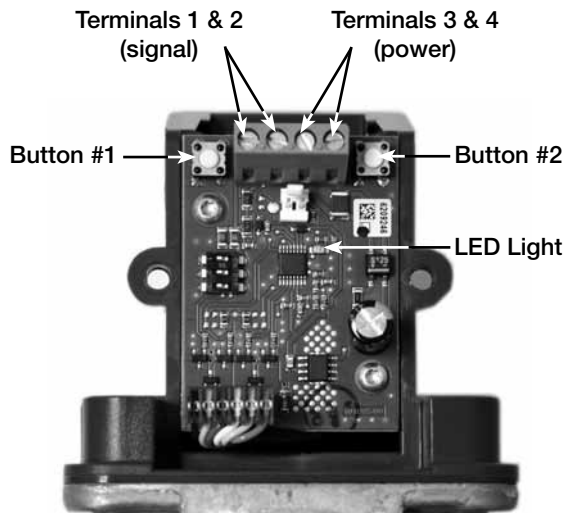
The Maxitrol EXA valve has four electrical connections on board. Two are for the 24 VAC needed to power the valve and two are for the input signal from the FX05 controller. The location of the 24 VAC power source varies, see the unit-specific wiring diagram. The input signal that causes the EXA valve to change gas volume is always provided by the FX05 Controller and varies from 2 – 10 VDC.

When a call for heat is provided to the FX05 Controller, the controller will provide a 10 VDC signal to the EXA valve so that it will always start in a high fire condition. After ignition, the controller will change its output signal, causing the volume of combustion gas to be reduced to as little as 25% of full flow (4:1 turndown).

For every installation of these gas-fired furnaces, it is necessary to set the High Fire and the Low Fire settings on the EXA valve. This is a simple process that must be done in the field after the rest of the unit is operational. To enter the High Fire and Low Fire settings, it is necessary to have access to the on-board printed circuit board in the EXA valve and to be able to observe the LED indicator light on the circuit board.

Remove the cover from the circuit board housing by loosening the two Phillips head retaining screws. Identify button #1, button #2 and the LED indicator light. (see photo on other side of this document)

## Adjust High and Low Fire Settings



**EXA Modulating Gas Valve**  
(with cover removed)

### NOTE

Before setting the EXA valve, make certain the Honeywell combination valve is set to the maximum setting. Turn the regulator screw all the way in.

### EXA Valve High Fire Setting

The High Fire setting on the valve must be adjusted to allow the correct maximum amount of gas at the burner manifold. Connect a manometer to the test port on the burner manifold. Press and hold button #1 until the LED lights solid red. Release the button. Observe the gas pressure on the manometer. The EXA valve can now be adjusted by pushing **button #1 to increase the pressure** or by pushing **button #2 to decrease the pressure**.

| High Fire Settings |                |
|--------------------|----------------|
| Natural Gas        | 3.5 inches WC  |
| LP Gas             | 10.0 inches WC |

Save the High Fire setting by simultaneously holding down buttons #1 and #2 until the LED turns off. If the new setting is not saved within five minutes, the EXA valve will default back to its last saved setting.

### NOTE

During the adjustment process, each push of either button will increase or decrease the pressure in steps. Holding down either button auto-steps and eliminates the need to repeatedly push the button. Use this feature to rapidly increase or decrease the gas flow.

### EXA Valve Low Fire Setting

The Low Fire setting on the valve must be adjusted to maintain the correct minimum amount of gas at

| Low Fire Settings |               |
|-------------------|---------------|
| Natural Gas       | 0.3 inches WC |
| LP Gas            | 1.0 inches WC |

the burner manifold. With a manometer installed at the burner manifold test port, press and hold down button #2 until the LED blinks red. Release the button. Observe the gas pressure on the manometer. The Low Fire setting can now be adjusted by pushing **button #1 to increase the pressure** or by pushing **button #2 to decrease the pressure**.

Save the Low Fire setting by simultaneously holding down buttons #1 and #2 until the LED turns off. If the new setting is not saved within five minutes, the EXA valve will default back to its last saved setting.

### NOTE

During the adjustment process, each push of either button will increase or decrease the pressure in steps. Holding down either button auto-steps and eliminates the need to repeatedly push the button. Use this feature to rapidly increase or decrease the gas flow.

Remove the manometer and reinstall the plug in the manifold test port.

Follow the instructions in the PVF/PVG Furnace IOM and unit IOM to complete the rest of the start-up.

