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# INSTALLATION & OPERATION MANUAL FOR CALDWELL MODULATING VALVE KIT

This manual is for the installation and operation of the Caldwell Modulating Valve Kit.



#### WARNING

Read manual thoroughly before installing or operating the Modulating Valve Kit. Keep this manual in a location for quick access and reference.



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CALDWELL LPGE MODULATING VALVE KIT  
INSTALLATION AND OPERATING INSTRUCTIONS

PACKING LIST

<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	Bulletin 955	Installation & Operation Instructions
1	740530	Modulating Valve
1	735043	30 Degrees - 240 Degrees Thermometer
1	713040	1/2" Street Elbow
1	714147	1/2" NPT Nipple x 2" Blk.
1	714865	Pressure Gauge (0-60 PSI)
1	717389	Copper Tube Assembly
1	717488	Flame Probe Bracket Assembly
1	713271	Nipple 1/2" NPT x 1 1/2" Blk.
1	712869	Union Pipe - 1/2" NPT Blk.
1	Bulletin 975	Flame Probe Adaptor Assembly Instructions
1	772400	Orifice Kit for Modulating Valve.

INSTALLATION INSTRUCTIONS

This manual is for the installation of the Caldwell modulating valve kit on Caldwell LPGE model heaters.

Standing facing the burner in the direction of the air flow you will note the plumbing on the right side of the heater. Installation of the modulating valve will require rearrangement of the plumbing. Figure 1 illustrates how the plumbing will appear when properly rearranged and assembled. Follow the following steps to install the modulating valve.

**NOTE: BE CAREFUL NOT TO BREAK OR KINK THE CAPILLARY TUBE.**

- 1. Preliminary to Installation.** Before starting to install the modulating valve to the heater, install a bypass orifice into the modulating valve. The modulating valve is shipped with the blank orifice installed. Refer to the instructions on installing the bypass orifice provided with the modulating valve and install a new bypass orifice. The bypass orifice required varies with each installation; however, the green bypass orifice is recommended to be installed and will provide an approximate 30 degrees F temperature rise regardless of the modulating valve setting. Note that the bypass orifice is used to avoid ignition shut down from the flame sensor if the modulating valve operating temperature is changed repeatedly during operation.
- 2. Remove the pressure regulator.** This is accomplished by first disconnecting the copper tube assembly at the upper line strainer and at the pressure regulator. Remove the thermostat clipped on the copper tube assembly. Loosen the set screw at the plumbing inline bracket and remove the eyebolt nut. The plumbing assembly can now be pulled away from the housing. Remove the pressure regulator leaving the 1/2" nipple intact with the plumbing assembly. Slide the plumbing assembly back to the housing and secure the eyebolt but do not tighten.



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3. **Assemble the modulating valve plumbing.** Take the modulating valve and holding it such that the gas flow arrow is as shown in Figure 1. Thread the 1/2" street elbow in the right side of the valve. Install the 1/2" x 1 1/2" nipple in the left side of the valve. Secure one half of the 1/2" union pipe onto the 1/2" x 1 1/2" nipple, and the other one-half onto the 1/2" x 1 1/2" nipple which was left intact with the plumbing assembly.
4. **Reassembling the regulator-mod valve.** Thread the 1/2" x 2" nipple into the street elbow. Thread the regulator onto the 1/2" x 2" nipple. Now connect the two halves of the 1/2" union together and tighten securely. Using the new copper tube assembly, reconnect the upper line strainer and the regulator inlet as shown in Figure 1. Replace the thermostat clip on the new copper tube assembly.
5. **Installation of regulator, pressure gauge.** Install the 0-60# pressure gauge on the pressure regulator as shown in Figure 1. To install the pressure gauge, the plug in the pressure regulator must be removed first.
6. **Secure the plumbing line.** Center the plumbing outlet in the burner inlet and retighten the setscrew and eyebolt nut.
7. **Assembly check.** After completing the assembly, check to see that all gas flows as shown in Figure 1.

**NOTE: Unit should be checked for gas leaks using soap and water and if a leak is present, it should be eliminated.**

Installation of the modulating valve and plumbing assembly is now complete. The heat sensor and thermometer location and installation must now be made. Refer to Figure 2 on page 5 for an illustration of the installation.

1. **Location of mounting holes.** Approximately 2 to 3 feet to the right side of the transition and halfway between the foundation and the bin floor and centered in the hill of the corrugation drill a 3/4" diameter hole and tap 1/2" NPT. Proceed in mounting the thermometer into this hole. Now drill a 1 5/32" diameter hole approximately 4" to the left of the other hole and tap 1" NPT.
2. **Installation of heat sensor bushing.** To mount the heat sensor you need to use the squeeze connector. To mount the heat sensor, first disassemble the squeeze connector. Then mount the half of the squeeze connector with the 1" NPT threads into the 1 5/32" tap hole on the bin. Now slip the other half of the squeeze connector over the heat sensor. Make sure that the plastic parts are slipped on first then the rubber bushing. Slip the squeeze connector all the way to the other end of the heat sensor
3. **Installation of heat sensor.** Now install the heat sensor into the bin and connect the two halves of the squeeze connector.

**NOTE: MAKE SURE THE SENSOR PROBE IS POSITIONED SUCH THAT THE WORD "TOP" AS STAMPED INTO THE BULB IS ON THE TOP.**



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**NOTE: MAKE SURE THAT THE HEAT SENSOR BULB IS INSTALLED LEVEL OR THAT THE HEAT SENSOR HAS A SLIGHTLY HIGHER ELEVATION ON THE OUTSIDE OF THE BIN VERSUS THE INSIDE.**

### OPERATING INSTRUCTIONS

The modulating valve uses the air temperature in the bin plenum to regulate the gas flow into the burner and when set properly will maintain a constant air temperature in the bin plenum.

1. Operation of the heater is the same as outlined in its manual.
2. Note that the maximum operating pressure of the modulating valve is 30# PSI. The temperature range of the modulating valve is 90-210 degrees F and should not be exceeded or possible damage to the valve will result. Liquid propane should not be run through the modulating valve.
3. Adjustment of the modulating valve is accomplished by turning the handle in (clockwise) to increase the temperature range and by turning it out (counterclockwise) to decrease the temperature range.
4. With the modulating valve handle turned in completely, operate the heater and adjust the regulator to maintain about 8 PSIG pressure, at the manifold pressure gauge (not the regulator pressure gauge). Now adjust the modulating valve handle about midway of its adjustment range and operate the heater and monitor the temperature of the bin plenum on the thermometer. The heat sensor should reach an equilibrium with the modulating valve in approximately 5 to 15 minutes. Monitoring this temperature, adjust the modulating valve to increase or decrease the bin plenum temperature to meet the drying temperature desired. Note that each time the modulating valve is adjusted a few minutes of monitoring will be required to determine the resulting equilibrium temperature. Note that if a high enough temperature can not be obtained by adjusting the modulating valve, adjust the regulator to a higher pressure setting and then repeat the setting of the modulating valve.
5. Low heat applications of the modulating valve may result in ignition shut down because sufficient heat is not available at the flame probe. The flame probe bracket provided should then be added as shown on Bulletin 975. The flame probe should be adjusted to sense the flame.



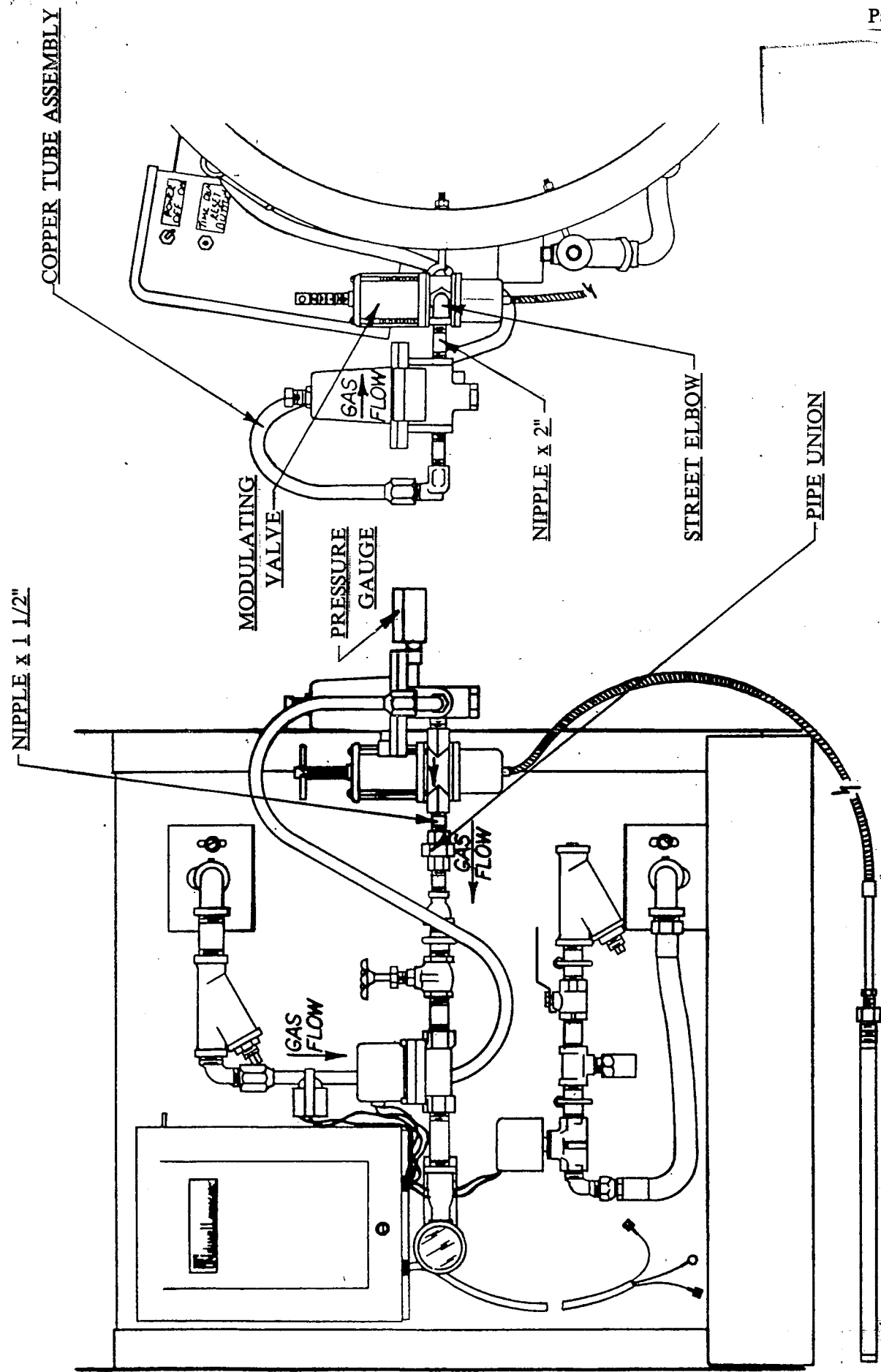


FIGURE 1. ILLUSTRATION OF MODULATING VALVE INSTALLED

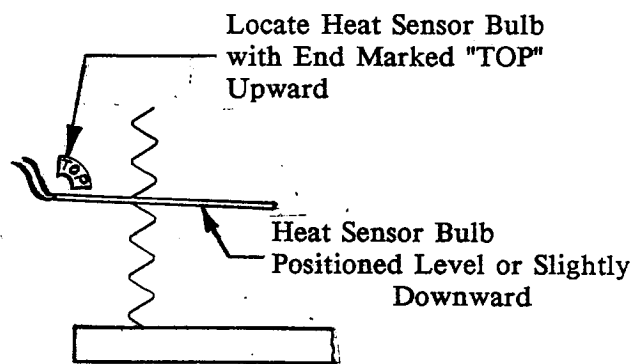
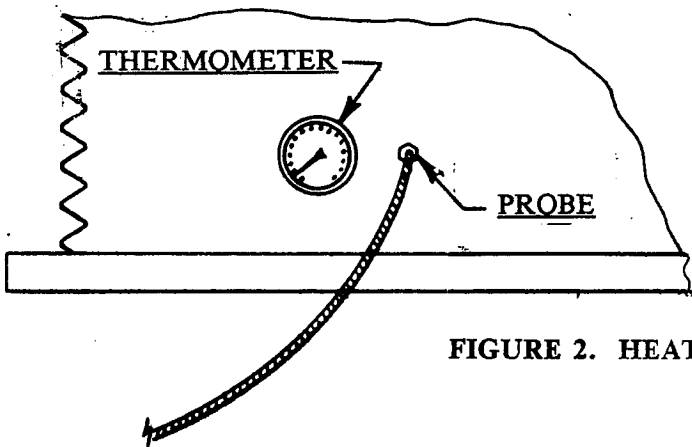
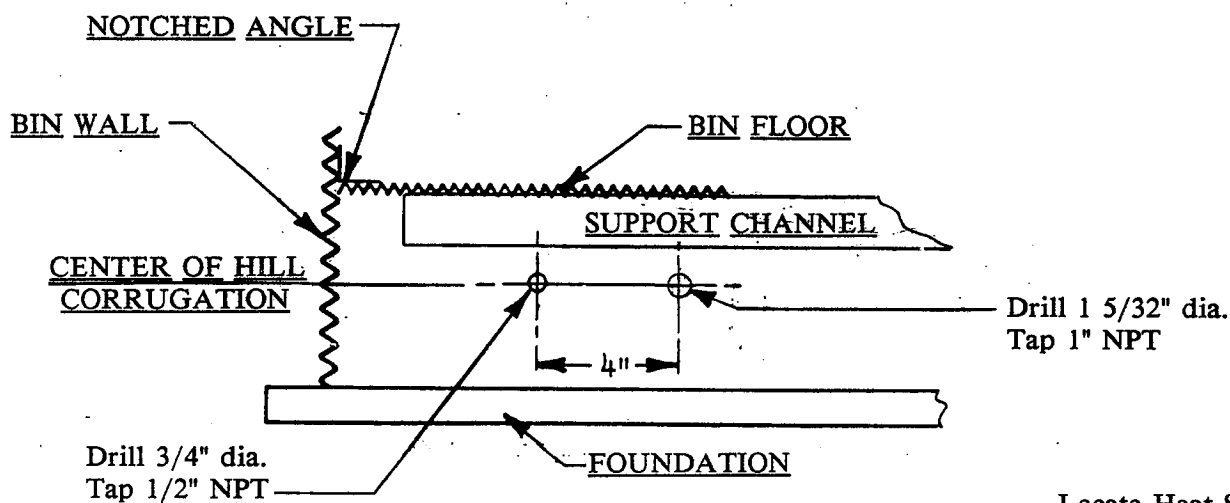
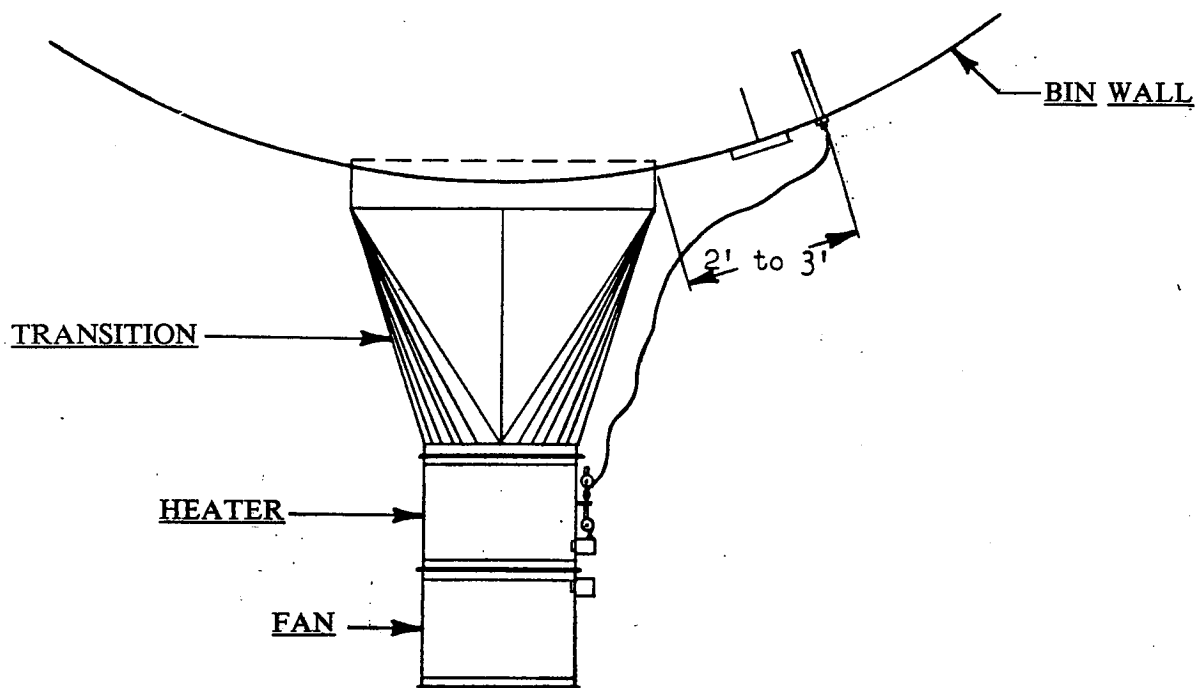


FIGURE 2. HEAT SENSOR INSTALLATION DETAIL