

## ECLIPSE AIR HEAT BURNERS For Propane & Butane Mixtures

The Eclipse Air Heat Burners described in Bulletin 140 are designed to operate with a constant combustion air flow. Some applications, however, require combustion air flows that vary with gas input. Burners using butane or butane/propane mixtures, for example, require high combustion air pressures for adequate air/gas mixing. At low fire, the air pressure must be turned down to prevent flame instability. For other applications, such as LEL and solvent ovens, control of total air flow or oxygen levels can be critical.

When air heat burners are used with varying combustion air flows, modifications must be made to the standard burner as well as the control system. Burner modifications include smaller air holes in the wings to promote fuel mixing.

### CONTROL SYSTEM

Additional control system components are shown in Fig. 1. A motor-operated main air control valve responds to the temperature controller. The loading line transmits air pressure changes to the top of the biasable proportionator (ABP), which varies gas flow accordingly. The system is adjusted to produce a gas turndown of 15:1 with an air turndown of 3:1. Table 1 shows the air and gas pressure differentials. For set-up and adjustment procedures, see page 2.

Figure 1—Control System

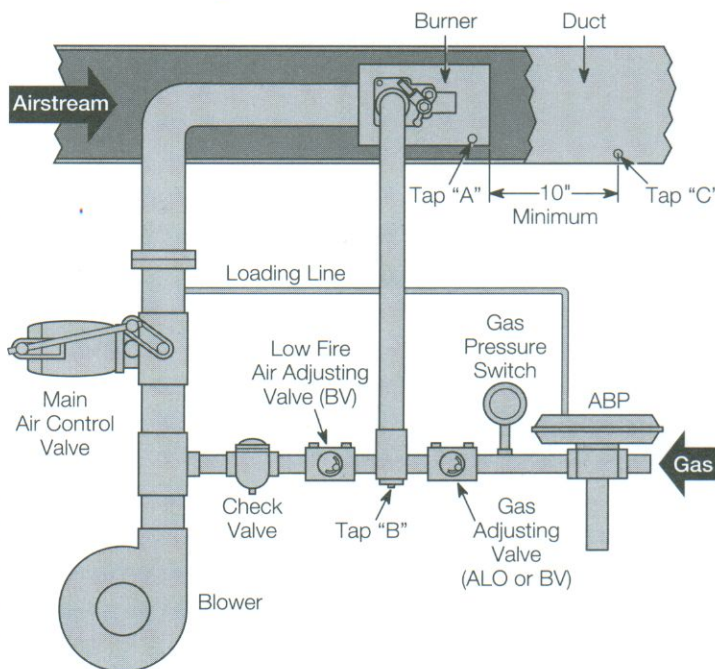


Table 1—Air and Gas Differential Pressures

Btu/Hr Per Lineal Ft.	Air $\Delta P$ ("w.c.)*	Gas $\Delta P$ ("w.c.) for Various Gas Mixtures**					
		Natural	Propane	Butane	50% Butane, 50% Propane	70% Butane, 30% Propane	30% Butane, 70% Propane
1,000,000	10.0	3.50	1.40	1.10	1.24	1.18	1.30
800,000	6.4	2.24	0.90	0.70	0.79	0.76	0.83
500,000	2.5	0.88	0.35	0.28	0.31	0.30	0.33

\* As measured between Taps "A" and "C" shown in Figure 1. Air flow is 11,000 SCFH per lineal foot of burner.

\*\* As measured between Taps "B" and "C" shown in Figure 1.



## SET-UP & ADJUSTMENT

1. Shut off the gas supply to the burner.
2. Start the combustion air and duct blowers.
3. Adjust the linkage on the air control valve to produce the high fire air differential pressure shown in Table 1.
4. Drive the main air control valve to low fire and turn the knob of the low fire adjusting valve to produce a differential pressure of 0.2" w.c. between taps "B" and "C".
5. Differential pressure of .6" — 1.0" w.c. is required between taps "A" and "C" at the low fire position.
6. Light and adjust the pilot in the same manner as a standard AH burner.
7. Open the gas adjusting valve to 3/8 of full open.
8. With the main air control valve at low fire, open the gas shut-off valves and light the main burner.
9. Adjust the bias screw on the gas proportionator (ABP) to the minimum gas flow that will produce a stable flame down the entire length of the burner.
10. Drive the main air control valve to high fire.
11. Use the gas adjusting valve to produce a high fire gas differential pressure as indicated in Table 1.
12. Cycle the burner between low and high fire, checking to be sure that differential pressure readings are correct.



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