The Eclipse 63 TFB-H burner is designed to fire all types of radiant tubes at maximum inputs from 200,000 to 600,000 Btu/hr. For high fire inputs below 200,000 Btu/hr., the Eclipse 63 TFB-L burner, Bulletin H-347, should be used. 63 TFB-H burners contain stainless steel internals for use with combustion air temperatures up to 950° F. They are ideal for recuperative systems that reduce fuel consumption by transferring waste flue gas heat to the burner air supply. 63 TFB-H burners will burn propane or natural gas.

A primary air screw allows the flame length of these burners to be adjusted to the length of the firing tube. The flame profile provides uniform heat release along the entire length of the firing tube, eliminating hot spots and ensuring long radiant tube life.

63 TFB-H burners are designed to mount tightly to the radiant tube flange. To place the nozzle at the inner face of the appliance wall, burner length from the mounting flange to the inner face must be specified on the order. In addition, the inside diameter of the radiant tube must be specified so that the proper diameter nozzle may be supplied. The radiant tube should run straight downstream of the burner for a length equal to eight tube diameters before the first bend or elbow. Sufficient length of firing tube must be available in the appliance to provide adequate heat transfer.

CONTROL

The 63 TFB-H is designed for two position (high-low or high-off) control. Low fire inputs down to 20,000 Btu/hr. can be achieved providing sufficient excess air is available for combustion. Although time proportional control may be used, proportional temperature control should not be used, as sustained operation at some intermediate firing rates may produce undesirable radiant tube temperature profile.

ADVANTAGES

- Easy installation and burner accessibility
- Adjustable flame length
- Exceptional flame stability
- Low gas pressure requirements
- Minimum high fire excess air
- Good flame visibility
- High heat transfer at low noise levels
- Excellent radiant tube temperature uniformity

ASSEMBLIES

The basic assembly consists of burner body, spark rod, alloy gas tube, alloy burner nozzle, and mounting gaskets. Two peep sights are provided, one viewing down the center of the gas tube, the other sighting along the outside of the gas tube.

The customer must install a combustion air valve at the burner air inlet if ambient air is used, or at the recuperator inlet for preheated air systems. A gas cock plus adjustable limiting orifice valve should be installed at the gas inlet. For ease and accuracy of burner adjustment, Eclipse recommends that a metering orifice be placed in the gas line to each burner.

IGNITION AND FLAME MONITORING

The 63 TFB-H burner is ignited by direct spark at high fire. Although flame rods can be used to monitor preheated combustion air burners, Eclipse recommends UV scanners. High ambient temperatures will be encountered at burners using preheated combustion air. Eclipse recommends the use of scanner coolers or heat block seals to protect the UV scanner.

CAUTION: It is dangerous to use any fuel burning equipment unless it is equipped with suitable flame sensing device(s) and automatic fuel shut-off valve(s). Eclipse can supply such equipment or information on alternate sources.
Combustion air pressure is measured at the pressure tap shown in the dimension drawing.
Gas pressure required is less than 1" w.c. at all firing rates.

### MAXIMUM RADIANT TUBE HEAT TRANSFER RATES

**CAUTION:** Exceeding these rates will shorten tube life.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1550</td>
<td>70</td>
<td>65%</td>
</tr>
<tr>
<td>1650</td>
<td>60</td>
<td>64%</td>
</tr>
<tr>
<td>1750</td>
<td>50</td>
<td>63%</td>
</tr>
<tr>
<td>1850</td>
<td>45</td>
<td>62%</td>
</tr>
</tbody>
</table>

1 For tube free to radiate on three sides. For tubes closely enclosed by brickwork, i.e. lower tubes or continuous furnaces, reduce the figure shown by 15 Btu/Hr./Sq. In.
2 Using burner and recuperator.

### BURNER INPUT CALCULATION

Example: The "U" tubes shown are to be retrofitted with 63 TFB-H burners and Eclipse Bayonet-Ultra recuperators. Chamber temperature is 1650°F.

**Max. Burner Input = Max. Radiant Tube Heat Transfer x Radiant Tube Surface Area
Heat Transfer Efficiency**

#### Max. Radiant Tube Heat Transfer (from chart above):
- Upper Tubes = 60 Btu/Hr./Sq. In.
- Lower Tubes = 45 Btu/Hr./Sq. In.

**Surface Area =** O.D. x π x (Effective Length x 2)
- Upper Tubes: 6" x 3.14 x 200" = 3768 Sq. In.
- Lower Tubes: 6" x 3.14 x 200" = 3768 Sq. In.

**Heat Transfer Efficiency (from chart above):** = 64% or .64

**Max. Burner Input**
- Upper Tubes = \( \frac{60 \text{ Btu/Hr./Sq. In.} \times 3768 \text{ Sq. In.}}{.64} \)
  = 353,300 Btu/Hr.
- Lower Tubes = \( \frac{45 \text{ Btu/Hr./Sq. In.} \times 3768 \text{ Sq. In.}}{.64} \)
  = 265,000 Btu/Hr.

**DIMENSIONS & SPECIFICATIONS 63 TFB-H-PCA**

**ECLIPSE COMBUSTION**

ROCKFORD, ILLINOIS 61103 (815) 877-3031

CANADA: ECLIPSE FUEL ENGINEERING CO.

HOLLAND: FLAMECO-ECLIPSE

ENGLAND: ECLIPSE THERMAL SYSTEMS