### Furnace/Water Heater Worksheet

<table>
<thead>
<tr>
<th>Structure Type</th>
<th>Furnace Location</th>
<th>Furnace Type</th>
<th>Delivery</th>
<th>Supplied Fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement</td>
<td>Paved Air Ducted</td>
<td>Ducted</td>
<td>Natural Gas</td>
<td></td>
</tr>
<tr>
<td>Main Level</td>
<td>Forced Air Ducted</td>
<td>Ducted</td>
<td>Natural Gas</td>
<td></td>
</tr>
<tr>
<td>Manufactured</td>
<td>Upper Level</td>
<td>Fured</td>
<td>Forced Air Ducted</td>
<td></td>
</tr>
</tbody>
</table>

#### Appliance in Bedroom
- Gas/Oil Leaks
- Proper Fuel Supplied

<table>
<thead>
<tr>
<th>Model</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Initial Test
- Formula for Measured Gas Input
  - c_u/hr + c_s/hr + c_f/hr x 3600 = Btu/hr

#### RE-TEST
- Formulas To
  - c_u/hr x 230 = Pascal
  - c_f/hr x 230 = Pascal

### Furnace
- Furnace Efficiency (%)
- Carbon Monoxide (%)
- CO (ppm)
- CO2 (ppm)
- Flame Interference

#### Water Heater
- Electric Connections
- Electrical Connections
- Thermostatic
- Blower Amps
- Motor Amps
- Airflow Amps
- Furnace Amps
- Water Heater Amps

#### Notes:

- Technician: 
  - Company: 
  - Date: 
- Inspector: 
  - Company: 
  - Date: 
- Client: 
  - Date: 

Type of Ambient CO Monitoring used during testing (not to exceed 35ppm ambient per SWS 2.2.01.15b)
REMEMBER - check for flame interference when the fan comes on – interference is an indication of a cracked heat exchanger
Fuse – 1.25 times total amperage of all the furnace components and should be rated for time delay or slow burn.

Target Fan Off Temp - 90°F (85°F to 95°F)
Target Fan On Temp - 120°F to 140°F not to exceed 160°F
High Limit Switch 200°F and not greater than 250°F

Desired Heat Rise 30 to 50°F Maximum 80°F (or per nameplate) – After 5 Minutes

Carbon Monoxide (CO) in appliance vent must be less than 200 ppm per 2.0201.1g

<table>
<thead>
<tr>
<th>70% Efficiency Furnace</th>
<th>80% Efficiency Furnace</th>
<th>90% Efficiency Furnace</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO &lt; 200 ppm</td>
<td>CO &lt; 200 ppm</td>
<td>CO &lt; 200 ppm</td>
</tr>
<tr>
<td>O₂ 5% - 10%</td>
<td>O₂ 4% - 9%</td>
<td>O₂ 4% - 9%</td>
</tr>
<tr>
<td>CO₂ 6% - 11%</td>
<td>CO₂ 7% - 12%</td>
<td>CO₂ 7% - 12%</td>
</tr>
<tr>
<td>Stack Temperature 350°F - 475°F</td>
<td>Stack Temperature 325° - 450°F</td>
<td>Stack Temperature &lt;120°F</td>
</tr>
</tbody>
</table>

Note: CO₂ % is calculated based on the O₂ % utilizing the following formula (20.9 -% O₂) x Max CO₂ produced by fuel/20.9.

Nat Gas Max CO₂ = 11.9
LP Gas Max CO₂ = 13.9

Draft Measurements for atmospheric combustion (outside temperature directly affects draft readings) Need updated SWS section HERE

- >80°F outside draft must be >-.005 inches H₂O
- 30°F to 80°F outside draft must be >-.010 inches H₂O
- <30°F outside draft must be >-.020 inches H₂O

Typical Gas Pressures

<table>
<thead>
<tr>
<th>Natural Gas</th>
<th>LP Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply pressure 5 – 7 inches H₂O</td>
<td>Supply pressure 11 – 14 inches H₂O</td>
</tr>
<tr>
<td>Manifold pressure 3.5 inches H₂O</td>
<td>Manifold pressure 10 inches H₂O</td>
</tr>
</tbody>
</table>

De-rate Gas Input for Altitude – 4% of the rated BTU input for every 1,000 feet above sea level
Cold Air Return (CAR) minimum size 2 square inches per 1000 Btu output

NOTE: The manufacturer’s specifications may vary from these recommended values; the manufacturer’s specifications supersede all listed values.

*Combustion Air 50Ft³ /1000 Btu for atmospheric per 2.0201.1a and 2.0201.2a