The DES Series Infra-Red Tube Heater is a positive pressure, single-stage radiant heater system. This insert manual is a supplement to the Tube Heater General Manual and provides specific information related to the DES Series model. All persons involved with the installation, operation and maintenance of the heater system must read and understand the information in this insert manual and the Tube Heater General Manual accompanying this insert.

**WARNING**

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operation and maintenance instructions thoroughly before installing or servicing this equipment.

This heater must be installed and serviced by trained gas installation and service personnel only. Failure to comply could result in personal injury, asphyxiation, death, fire or property damage.

In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain the required clearances from the heater to the combustibles. Signs must either be posted adjacent to the heater thermostats or in the absence of such thermostats, in a conspicuous location.

**Not for residential use!** Do not use this heater in the home, sleeping quarters, attached garages, etc. Installation of a commercial tube heater system in residential indoor spaces may result in property damage, serious injury, asphyxiation or death.

**For Your Safety**

If you smell gas:

- Do not try to light any appliance.
- Do not touch any electrical switch.
- Do not use any phone in your building.
- Immediately call your gas supplier from a neighbor’s phone.
- Follow the gas supplier’s instructions.
- If you cannot reach your gas supplier, call the fire department.

*Keep these instructions for future reference.*
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**NOTE:** See page 10 for a list of available models and specifications.
1.0 Safety

Read and understand all safety information and warnings in this insert manual and the Tube Heater General Manual before installation, operation and maintenance of the radiant tube heater system.

Safety Labels and Their Locations

Product safety signs or labels should be replaced by the product user when they no longer are legible. Contact either your local distributor or the product manufacturer for obtaining replacement signs or labels.
Clearance to Combustibles

Placement of explosive objects, flammable objects, liquids and vapors close to the heater may result in explosion, fire, property damage, serious injury or death. Do not store or use explosive objects, liquids and vapor in the vicinity of the heater.

Clearance to combustibles is defined as the minimum distance that must exist between the tube surface, or reflector, and any combustible items (see Figure 1.1). It also pertains to the distance that must be maintained from moving objects around the tube heater.

When installing the tube heater system, clearances to combustibles for the Series tube heater and configuration must be maintained. Refer to Chart 1.1 on the following page to determine the required distances for your model.
Chart 1.1 • Clearance to Combustibles in Inches (see Figure 1.1 for Mounting Angles)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Mounting Angle</th>
<th>Front</th>
<th>Behind</th>
<th>Top</th>
<th>Below</th>
</tr>
</thead>
<tbody>
<tr>
<td>DES (20, 30, 40) - (50, 60) [N, P]</td>
<td>45°</td>
<td>39</td>
<td>8</td>
<td>10</td>
<td>47</td>
</tr>
<tr>
<td>with 1 side shield</td>
<td>0°</td>
<td>29</td>
<td>8</td>
<td>6</td>
<td>47</td>
</tr>
<tr>
<td>with 2 side shields</td>
<td>0°</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>47</td>
</tr>
<tr>
<td>20 ft. from burner</td>
<td>0°</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>DES (20, 30, 40) - 75 [N, P]</td>
<td>45°</td>
<td>39</td>
<td>8</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>with 1 side shield</td>
<td>0°</td>
<td>29</td>
<td>8</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>with 2 side shields</td>
<td>0°</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>20 ft. from burner</td>
<td>0°</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>DES (30, 50, 40) - 100 [N, P]</td>
<td>45°</td>
<td>14</td>
<td>14</td>
<td>6</td>
<td>66</td>
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<td>0°</td>
<td>29</td>
<td>8</td>
<td>6</td>
<td>66</td>
</tr>
<tr>
<td>with 2 side shields</td>
<td>0°</td>
<td>16</td>
<td>16</td>
<td>6</td>
<td>66</td>
</tr>
<tr>
<td>20 ft. from burner</td>
<td>0°</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>DES (40, 50, 60) - 125 [N, P]</td>
<td>45°</td>
<td>58</td>
<td>8</td>
<td>10</td>
<td>76</td>
</tr>
<tr>
<td>with 1 side shield</td>
<td>0°</td>
<td>42</td>
<td>8</td>
<td>6</td>
<td>76</td>
</tr>
<tr>
<td>with 2 side shields</td>
<td>0°</td>
<td>20</td>
<td>20</td>
<td>6</td>
<td>76</td>
</tr>
<tr>
<td>20 ft. from burner</td>
<td>0°</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>DES (40, 50, 60) - 150 [N, P]</td>
<td>45°</td>
<td>63</td>
<td>8</td>
<td>10</td>
<td>81</td>
</tr>
<tr>
<td>with 1 side shield</td>
<td>0°</td>
<td>42</td>
<td>8</td>
<td>6</td>
<td>81</td>
</tr>
<tr>
<td>with 2 side shields</td>
<td>0°</td>
<td>23</td>
<td>23</td>
<td>6</td>
<td>81</td>
</tr>
<tr>
<td>20 ft. from burner</td>
<td>0°</td>
<td>11</td>
<td>11</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>DES (50, 60) - 175  [N, P]</td>
<td>45°</td>
<td>63</td>
<td>8</td>
<td>10</td>
<td>92</td>
</tr>
<tr>
<td>with 1 side shield</td>
<td>0°</td>
<td>50</td>
<td>8</td>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>with 2 side shields</td>
<td>0°</td>
<td>30</td>
<td>30</td>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>20 ft. from burner</td>
<td>0°</td>
<td>11</td>
<td>11</td>
<td>6</td>
<td>44</td>
</tr>
<tr>
<td>DES (50, 60) - 200 [N, P]</td>
<td>45°</td>
<td>63</td>
<td>8</td>
<td>10</td>
<td>94</td>
</tr>
<tr>
<td>with 1 side shield</td>
<td>0°</td>
<td>54</td>
<td>8</td>
<td>6</td>
<td>94</td>
</tr>
<tr>
<td>with 2 side shields</td>
<td>0°</td>
<td>30</td>
<td>30</td>
<td>6</td>
<td>94</td>
</tr>
<tr>
<td>20 ft. from burner</td>
<td>0°</td>
<td>11</td>
<td>11</td>
<td>6</td>
<td>44</td>
</tr>
</tbody>
</table>

* Heaters mounted on an angle between 0° to 45° must maintain clearances posted for 0° or 45°; whichever is greater.

Figure 1.1 • Mounting Angles
2.0 Installation

⚠️ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, serious injury or death. Read and understand, the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment. Only trained, qualified gas installation and service personnel may install or service this equipment.

Not for residential use! Do not use this heater in the home, sleeping quarters, attached garages, etc. Installation of a commercial tube heater system in residential indoor spaces may result in property damage, serious injury or death.

Instructions for the following are detailed in the Tube Heater General Manual:

Note: Electronic versions of all manuals are available at www.detroitradient.com

- Design considerations
- Hanger suspension and placement
- Tube layout and assembly
- Burner control box suspension
- Reflectors (and accessories)
- Venting and combustion air intake
- Gas requirements
- Baffle assembly

Electrical Requirements

NOTICE

It is recommended that the thermostat be installed on the hot side of a fused supply line and have sufficient amphere rating for the heater(s) that it controls.

- 120 Volt - 60 Hz, 3-wire.
- 120 Volt thermostat connection.
- Starting current 1.7 amps
- Running current 1.1 amps
Wiring

**WARNING**

**Electric Shock**
Field wiring to the tube heater must be connected and grounded in accordance with national, state, provincial, local codes and to the guidelines in the Detroit Radiant General and Series manuals. In the United States refer to the most current revisions to the ANSI/NFPA 70 Standard and in Canada refer to the most current revisions the CSA C22.1 Part I Standard.

**Figure 2.1 • Field Wiring Diagrams**

A. 120V Thermostat Connection(s).

![Diagram of 120V Thermostat Connection(s)]

- Heaters on the same vent must share the same thermostat.
- NOTE: Up to 10 line voltage tube heaters can be wired to 22 amp thermostat.

B. 24V Thermostat Control (requires optional combination relay transformer P/N: R8285B).

![Diagram of 24V Thermostat Control]

- Common required for thermostats that require constant power
- NOTE: The transformer relay selected must be capable of handling the combined start-up amperage per relay branch.
- A transformer relay is used in conjunction with most low voltage thermostats when wiring tube heaters.
Before field wiring this appliance - Check existing wiring; replace if necessary.

NOTE: If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wiring material having a temperature rating of at least 105 °C.

Figure 2.2 • Internal Wiring Diagrams
A. DES Ladder Diagram

B. DES Block Diagram
This page intentionally left blank.
There are no alternative wiring diagrams for the DES Series
<table>
<thead>
<tr>
<th>Model/Number</th>
<th>Gas Type (Select One)</th>
<th>BTU/H</th>
<th>Straight Length (Dim. A)</th>
<th>U-Tube Length (Dim. B)</th>
<th>Weight (lbs.)</th>
<th>Recommended Mounting Heights^</th>
<th>4” Combustion Chamber(s) (Black Coated)</th>
<th>4” Radiant Emitter Tube(s) (Uncoated)</th>
<th>Radiant Surface Area (sq. ft.)</th>
<th>36” Baffle Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>DES-20-50</td>
<td>N or LP</td>
<td>50,000</td>
<td>21'-7&quot;</td>
<td>13'-0&quot;</td>
<td>120</td>
<td>9’ to 14’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>20.2</td>
<td>5</td>
</tr>
<tr>
<td>DES-20-60</td>
<td>N or LP</td>
<td>60,000</td>
<td>21'-7&quot;</td>
<td>13'-0&quot;</td>
<td>120</td>
<td>10’ to 15’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>20.2</td>
<td>5</td>
</tr>
<tr>
<td>DES-20-75</td>
<td>N or LP</td>
<td>75,000</td>
<td>21'-7&quot;</td>
<td>13'-0&quot;</td>
<td>120</td>
<td>11’ to 18’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>20.2</td>
<td>5</td>
</tr>
<tr>
<td>DES-30-50</td>
<td>N or LP</td>
<td>50,000</td>
<td>31’-3”</td>
<td>**17’-8”</td>
<td>160</td>
<td>10’ to 15’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>30.4</td>
<td>4</td>
</tr>
<tr>
<td>DES-30-60</td>
<td>N or LP</td>
<td>60,000</td>
<td>31’-3”</td>
<td>**17’-8”</td>
<td>160</td>
<td>11’ to 18’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>30.4</td>
<td>4</td>
</tr>
<tr>
<td>DES-30-75</td>
<td>N or LP</td>
<td>75,000</td>
<td>31’-3”</td>
<td>**17’-8”</td>
<td>160</td>
<td>12’ to 20’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>30.4</td>
<td>4</td>
</tr>
<tr>
<td>DES-30-100</td>
<td>N or LP</td>
<td>100,000</td>
<td>31’-3”</td>
<td>**17’-8”</td>
<td>160</td>
<td>13’ to 23’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>30.4</td>
<td>5</td>
</tr>
<tr>
<td>DES-40-50</td>
<td>N or LP</td>
<td>50,000</td>
<td>40’-11”</td>
<td>22’-8”</td>
<td>190</td>
<td>11’ to 18’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>40.5</td>
<td>2</td>
</tr>
<tr>
<td>DES-40-60</td>
<td>N or LP</td>
<td>60,000</td>
<td>40’-11”</td>
<td>22’-8”</td>
<td>190</td>
<td>11’ to 18’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>40.5</td>
<td>2</td>
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<td>N or LP</td>
<td>75,000</td>
<td>40’-11”</td>
<td>22’-8”</td>
<td>190</td>
<td>12’ to 20’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>40.5</td>
<td>2</td>
</tr>
<tr>
<td>DES-40-100</td>
<td>N or LP</td>
<td>100,000</td>
<td>40’-11”</td>
<td>22’-8”</td>
<td>190</td>
<td>13’ to 23’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>40.5</td>
<td>4</td>
</tr>
<tr>
<td>DES-40-125</td>
<td>N or LP</td>
<td>125,000</td>
<td>40’-11”</td>
<td>22’-8”</td>
<td>190</td>
<td>14’ to 25’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>40.5</td>
<td>4</td>
</tr>
<tr>
<td>DES-40-150</td>
<td>N or LP</td>
<td>150,000</td>
<td>40’-11”</td>
<td>22’-8”</td>
<td>190</td>
<td>15’ to 27’</td>
<td>Titan/Alum</td>
<td>Hot-rolled</td>
<td>40.5</td>
<td>4</td>
</tr>
<tr>
<td>DES-50-100</td>
<td>N or LP</td>
<td>100,000</td>
<td>50’-7”</td>
<td>**27’-4”</td>
<td>235</td>
<td>15’ to 27’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>50.6</td>
<td>2</td>
</tr>
<tr>
<td>DES-50-125</td>
<td>N or LP</td>
<td>125,000</td>
<td>50’-7”</td>
<td>**27’-4”</td>
<td>235</td>
<td>15’ to 27’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>50.6</td>
<td>4</td>
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<tr>
<td>DES-50-150</td>
<td>N or LP</td>
<td>150,000</td>
<td>50’-7”</td>
<td>**27’-4”</td>
<td>235</td>
<td>16’ to 30’</td>
<td>Titan/Alum</td>
<td>Hot-rolled</td>
<td>50.6</td>
<td>4</td>
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<td>**27’-4”</td>
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<td>17’ to 35’</td>
<td>Titan/Alum</td>
<td>Hot-rolled</td>
<td>50.6</td>
<td>2</td>
</tr>
<tr>
<td>DES-50-200</td>
<td>N or LP</td>
<td>* 200,000</td>
<td>50’-7”</td>
<td>**27’-4”</td>
<td>235</td>
<td>18’ to 40’</td>
<td>Titan/Alum</td>
<td>Hot-rolled</td>
<td>50.6</td>
<td>2</td>
</tr>
<tr>
<td>DES-60-125</td>
<td>N or LP</td>
<td>125,000</td>
<td>60’-3”</td>
<td>32’-4”</td>
<td>265</td>
<td>16’ to 30’</td>
<td>Aluminized</td>
<td>Hot-rolled</td>
<td>60.7</td>
<td>2</td>
</tr>
<tr>
<td>DES-60-150</td>
<td>N or LP</td>
<td>150,000</td>
<td>60’-3”</td>
<td>32’-4”</td>
<td>265</td>
<td>17’ to 35’</td>
<td>Titan/Alum</td>
<td>Hot-rolled</td>
<td>60.7</td>
<td>2</td>
</tr>
<tr>
<td>DES-60-175</td>
<td>N or LP</td>
<td>* 175,000</td>
<td>60’-3”</td>
<td>32’-4”</td>
<td>265</td>
<td>17’ to 35’</td>
<td>Titan/Alum</td>
<td>Hot-rolled</td>
<td>60.7</td>
<td>2</td>
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<tr>
<td>DES-60-200</td>
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<td>60’-3”</td>
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<td>18’ to 40’</td>
<td>Titan/Alum</td>
<td>Hot-rolled</td>
<td>60.7</td>
<td>2</td>
</tr>
</tbody>
</table>

* Model requires stainless steel tube clamp (P/N: TP-220) to be located at the seam between the primary combustion chamber and the secondary combustion tube downstream of the burner control box.
** Model requires 5EA-SUB accessory package when installing in a ‘U’ configuration (P/N: TF1B).
^ Factory recommended mounting heights are listed as a guideline.
Figure 2.4 · Tube Installation Sequence

**Important!** The combustion chamber & radiant tube sections must be installed in the following order.

- **20 Foot**
- **30 Foot**
- **40 Foot**
- **50 Foot**
- **60 Foot**

**Key**

- Burner Control Box with 16" Burner Tube
- Primary Combustion Chamber Tube
- Secondary Aluminized Combustion Chamber Tube *(150-200 MBH Models Only)*
- Uncoated Hot-rolled Steel Radiant Emitter Tube
- Standard Tube Clamp
- Stainless Steel Tube Clamp *(P/N: TP-220)*
  - 175-200 MBH models only - Located between 1st and 2nd 10 ft. tube sections.
- Baffle Location

**Note:** Refer to the Tube Heater General Manual, Chart 3.6 (page 22) for secured reflector joints.
3.0 Operation

⚠️ WARNING

This heater must be installed and serviced by trained gas installation and service personnel only.

Do not bypass any safety features or the heater’s built in safety mechanisms will be compromised.

NOTE: Reference the Tube Heater General Manual (LIOGTa) for installation requirements.

Sequence of Operation

Starting Circuit: Upon a call for heat, the fan is energized. Once operational static pressure is achieved, the differential switch will close, allowing power to the control and initiating the ignition sequence. After a 7-second pre-purge, the spark electrode is energized and the gas valve opens simultaneously. The trial for ignition is 15 seconds. If flame is not sensed, the heater will attempt two (2) additional times to re-ignite with 15-second interpurge periods.

Single Stage Running Circuit: After ignition, the flame rod monitors burner flame. If sense of flame is lost, the control immediately acts to reignite the gas-air mixture (identical to the starting sequence). If flame sense is not established within 15 seconds, the heater will attempt two (2) additional ignition sequences before proceeding to hard lockout. The control can be reset by briefly interrupting the power source.

Thermostat

NOTE: Different thermostats operate according to their particular features. Refer to thermostat specifications.
4.0 Troubleshooting Guide

Turn up thermostat

Does the fan blower turn on?  
- Yes
  - Replace ignitor.
  - Check the gap on the ignitor. Is the gap between 3/16” and 1/4”?
  - Yes
  - No

- No
  - Is the power at the heater 120V?  
  - Yes
    - Is the blower obstructed?  
      - Yes
        - No
          - Adjust gap.
          - Yes
            - No
              - Find the source of the electrical problem.

- No
  - Is the ignitor physically damaged?  
    - Yes
      - No
        - Replace ignitor.
        - Yes
          - No
            - Adjust gap.

During the ignition trial, does the gas valve open?  
- No
  - Test for 120V at the gas valve during valve opening (typically 10 seconds after power to the heater). Is there 120V to the valve?  
    - Yes
      - No
        - The circuit board and/or wiring harness could be faulty. These should be replaced

- Yes
  - Replace gas valve.
  - Correct problem.

Does the burner light?  
- No
  - Is the ball valve in the ON position?  
    - Yes
      - No
        - Turn Knob on ball valve to the ON position.

- Yes
  - No
    - Turn Knob on ball valve to the ON position.

Continued on page 16.
NOTICE
Bypassing any switch is intended for testing purposes only. Do not leave switch bypassed during normal operation or the heater's built-in safety mechanisms will be compromised.

**Key**

<table>
<thead>
<tr>
<th>Start Question</th>
<th>Process Question</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correct wiring or replace relay.**

**No**

**Is there 120V coming to the fan?**

**Yes**

The blower is faulty and must be replaced.

**Remove obstruction**

**Yes**

Is the inlet or outlet of the unit obstructed? i.e. ice, birds nest, dirt, etc.

**No**

Check for loose wiring or restrictions in hose connections to the pressure switch. Are they ok?

**No**

**Repair wiring or hose connections.**

**Yes**

**Check for loose wiring or restrictions in hose connections to the pressure switch. Are they ok?**

**The heater is equipped with a safety differential pressure switch. The switch is a normally open switch and is located in the air chamber. Temporarily place a jumper across the terminal of the switch. Does the ignitor spark?**

**Yes**

Replace the pressure switch after verifying the following:
- Baffle(s) is in the tube farthest from the burner.
- Heater, blower, squirrel cage, intake and exhaust are clean and free from dirt and obstructions.
- The 4" air intake pipe does not exceed 20 ft. and/or two elbows.
- There is not a negative pressure experienced at the area of air intake (i.e. attic space, high winds, very tight buildings, etc.)
If any of the above were occurring, please address the problem.

**Faulty wiring. Repair or replace wiring.**

**Yes**

Replace circuit board.

**No**

While the switch is temporarily bypassed, check for 120V from the switch to the circuit board. Does 120V enter the circuit board?

**Yes**

While the switch is temporarily bypassed, check for 120V from the switch to the circuit board. Does 120V enter the circuit board?
Continued from page 14.

Check that gas pressure is within minimum and maximum inputs as indicated on the heater's rating plate. Is gas pressure ok?

No

Make sure gas lines were purged of air and/or correct pressure problems.

Correct problem.

No

The following can cause the heater to shut down:
- Improper grounding.
- High winds.
- Taking combustion air from the attic.
- Dirty environment.
- Baffle not located properly.
- Fluctuating gas pressure.

No

Yes

Yes

Yes

Yes

No

No

Correct problem.

No

No

Yes

Adjust gap.

Check the gap on the ignitor. Is the gap between 3/16” and 1/4”?

Yes

Is the heater properly grounded? Is the polarity correct?

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Troubleshooting ends.
Check that gas pressure is within minimum and maximum inputs as indicated on the heater's rating plate. Is gas pressure ok?

Yes

With microammeter, check amperage at flame rod. Is it greater than 0.7 microamps?

No

Check that flame sensor wire is OK and then replace circuit board.

Yes

Correct Problem

No

Sensing Rod is faulty or flame is weak. Check that heater is operating at proper gas pressure as indicated on the heater's rating label. Clean or replace electrode if needed.

No

Check the gap on the ignitor. Is the gap between 3/16" and 1/4"?

No

Adjust gap.

Yes

Check that flame sensor wire is OK and then replace circuit board.

No

Correct Problem

Yes

Differential switch may be faulty or there is a restriction in the exhaust or intake.
5.0 Parts

Figure 5.1 • Burner Assembly Components

Chart 5.1 • Parts List

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP-1</td>
<td>Control Box Cover</td>
<td>TP-26C</td>
<td>10 Ft. Uncoated Hot Rolled Radiant Tube</td>
</tr>
<tr>
<td>TP-5</td>
<td>Flange Gasket</td>
<td>TP-31B</td>
<td>Control Box Mounting Bracket</td>
</tr>
<tr>
<td>TP-9</td>
<td>Conduit Coupling</td>
<td>TP-44</td>
<td>Metal Air Orifice w/ Screen - Consult Factory</td>
</tr>
<tr>
<td>TP-10</td>
<td>Conduit</td>
<td>TP-55A</td>
<td>Fan Blower</td>
</tr>
<tr>
<td>TP-11</td>
<td>Ignitor Box</td>
<td>TP-65I</td>
<td>Interlocking 36” Turbulator Baffle Section</td>
</tr>
<tr>
<td>TP-12</td>
<td>Ignitor Box Cover</td>
<td>TP-68A</td>
<td>Strain Relief Bushing</td>
</tr>
<tr>
<td>TP-13</td>
<td>8 x 1/2” Self-Drilling Screw</td>
<td>TP-70</td>
<td>Control Box Cover Gasket (**per foot)</td>
</tr>
<tr>
<td>TP-14</td>
<td>Sight Glass Gasket</td>
<td>TP-76</td>
<td>Rubber Grommet</td>
</tr>
<tr>
<td>TP-15</td>
<td>Sight Glass</td>
<td>TP-82</td>
<td>Reflector Center Support</td>
</tr>
<tr>
<td>TP-16</td>
<td>Sight Glass Washer</td>
<td>TP-97</td>
<td>1/4” x 1/4” Brass Int./Ext. Atmos. Barb Fitting</td>
</tr>
<tr>
<td>TP-17</td>
<td>Sight Glass Kit</td>
<td>TP-108</td>
<td>5 Ft. Coated Alum-Titan Tube w/ Clamp</td>
</tr>
<tr>
<td>TP-20C</td>
<td>10 Ft. Aluminum Reflector</td>
<td>TP-111</td>
<td>5 Ft. Coated Aluminized Tube w/ Clamp</td>
</tr>
<tr>
<td>TP-20D</td>
<td>10 Ft. Optional 304 Stainless Steel Reflector</td>
<td>TP-112</td>
<td>5 Ft. Aluminum Reflector</td>
</tr>
<tr>
<td>TP-21B</td>
<td>4” Tube Clamp</td>
<td>TP-114</td>
<td>Plastic Air Orifice - Consult Factory</td>
</tr>
<tr>
<td>TP-26A</td>
<td>10 Ft. Aluminized Combustion/Radiant Tube</td>
<td>TP-122</td>
<td>Gasket for Air Orifice and Air Collar</td>
</tr>
<tr>
<td>TP-26B</td>
<td>10 Ft. Titanium Treated Combustion Tube</td>
<td>TP-200A</td>
<td>Burner (50-100 MBH)</td>
</tr>
</tbody>
</table>

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**Figure 5.2 • Tube & Reflector Components**

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP-201B</td>
<td>Burner (125-200 MBH)</td>
<td>TP-204</td>
<td>Gas Orifice - Consult Factory</td>
</tr>
<tr>
<td>TP-207</td>
<td>Pressure Switch Mounting Bracket</td>
<td>TP-504</td>
<td>Control Box Shell</td>
</tr>
<tr>
<td>TP-208</td>
<td>“Z” Mounting Bracket</td>
<td>TP-550</td>
<td>Spark Transfer Wire - Orange</td>
</tr>
<tr>
<td>TP-209</td>
<td>36E36A-246 Gas Valve Assembly - Natural Gas</td>
<td>TP-551</td>
<td>MARK 10DX-117 DSI Circuit Board w/ Pre-Purge</td>
</tr>
<tr>
<td>TP-209P</td>
<td>36E36A-240 Gas Valve Assembly - LP Gas</td>
<td>TP-552</td>
<td>Wiring Harness</td>
</tr>
<tr>
<td>TP-212</td>
<td>1/2” x 3” Pipe Nipple</td>
<td>TP-553</td>
<td>Spark Ignitor Mounting Bracket</td>
</tr>
<tr>
<td>TP-217</td>
<td>Pressure Barb Fitting</td>
<td>TP-554</td>
<td>Spark Ignitor Mounting Bracket Gasket</td>
</tr>
<tr>
<td>TP-218</td>
<td>Vinyl Differential Exhaust Sensing Tube</td>
<td>TP-555</td>
<td>Spark Ignitor Electrode</td>
</tr>
<tr>
<td>TP-219</td>
<td>Vinyl Differential Burner Sensing Tube</td>
<td>TP-579</td>
<td>4” Wire Hanger</td>
</tr>
<tr>
<td>TP-220</td>
<td>4” Stainless Steel Tube Clamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP-223</td>
<td>Gas Manifold</td>
<td>APS</td>
<td>Select Pressure Switch Below (BTU Dependent)</td>
</tr>
<tr>
<td>TP-331</td>
<td>Green Self-Tap Ground Screw</td>
<td>(TP-264B)</td>
<td>Atmospheric Pressure Switch (50 to 100 MBH)</td>
</tr>
<tr>
<td>TP-380</td>
<td>16” Burner Tube with Flange</td>
<td>(TP-264E)</td>
<td>Atmospheric Pressure Switch (125 to 150 MBH)</td>
</tr>
<tr>
<td>TP-383B</td>
<td>Spark Ignitor Plate</td>
<td>(TP-264D)</td>
<td>Atmospheric Pressure Switch (175 MBH)</td>
</tr>
<tr>
<td>TP-501</td>
<td>Divider Panel</td>
<td>(TP-264F)</td>
<td>Atmospheric Pressure Switch (200 MBH)</td>
</tr>
</tbody>
</table>
Kit Contents Check List

Chart 5.3 • Kit Contents for DES Series - Reference the length column for your model.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>20 ft.</th>
<th>30 ft.</th>
<th>40 ft.</th>
<th>50 ft.</th>
<th>60 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP-579</td>
<td>4&quot; Wire Hanger</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>TP-21B</td>
<td>4&quot; Tube Clamps*</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5*</td>
<td>6*</td>
</tr>
<tr>
<td>TP-82</td>
<td>4&quot; Reflector Center Support (RCS)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LIO - -</td>
<td>General Manual &amp; Insert Manual</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1/2&quot; Shut-Off Valve &amp; Inlet Tap</td>
<td>Field Supplied</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>24&quot; S.S. Flexible Gas Connector</td>
<td>Field Supplied</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Filled By: ___________________________

* One 4" stainless steel tube clamp (P/N: TP-220) is provided for each 175,000 - 200,000 BTU model. Place as shown on page 11.

Approvals

- CSA Design Certified
- Commercial/Industrial approval.

Limited Warranty

- 1 year - Burner box components.
- 2 years - Combustion and radiant tubes.
- 3 years - Stainless steel burner.

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