Premix-type Line Burners

Style A, B & C LINOFLAME® Burners

Short, ribbon-type flames are produced by modular-designed sections with “customized” drillings. These modular sections can provide burner elements that most nearly match your application’s heat and/or flame distribution requirements.

Heat releases up to 525,000 Btu/hr per lineal foot of burner and turndown ratios up to 7:1 are possible from the three different styles of LINOFLAME® Burners. Each style is designed with over 25 popular sections to maximize the application flexibility of this type of line burner. Let Maxon help you design the burner element to meet your needs.

Type “VF” LINOFLAME® Burners

Like the Style A, B & C line burners above, the Type “VF” LINOFLAME® Burners also provide a ribbon of fire, but in a wider and V-shaped pattern. Cast iron, V-faced, modular sections incorporate standardized drillings for interchangeability.

Heat releases up to 600,000 Btu/hr per lineal foot of burner and turndown ratios up to 10:1 are produced from two different types of LINOFLAME® Burners: “VFL” (V-faced, low capacity) and “VFH” (V-faced, high capacity).

Positive flame retention and constant cross-ignition are provided without separate ignition rails. Maintenance and cleaning are easy.

“VF” LINOFLAME® Burners make stable operations possible in fresh still air, highly inert air streams, or with air velocities up to 4000 SFPM.

Manufactured under U.S. Patent #3,511,589; European patents granted and pending.
Premix-type Line Burners

INFRAWAVE® Burners

A high-intensity infra-red energy radiates from the high face temperatures of the ceramic refractory grids of an INFRAWAVE® Burner.

Their design produces a low forward velocity air movement, minimizing disturbances of granular or powder products.

Modular-designed sections permit tailoring total heat release and radiant pattern to your particular application requirements.

Two versions of INFRAWAVE® Burners (“SG” single grid or “DG” double grid) provide the application flexibility that dramatically boosts production speeds by concentrating heating into small areas and/or onto fast-moving products.

Typical applications for INFRAWAVE® Burners are:

- Direct spot heating
- Direct heating/drying on a conveyer
- Oven process heating or drying
- Moving web heating/drying processes

Manufactured under U.S. Patents RE 24,405 and 3,588,301

Air/gas premixing equipment used to provide thorough blending of air/gas mixture to Maxon Line Burners

PREMIX® Blower Mixers

MULTI-RATIO® Mixers

VENTITE™ Inspirator Mixers

Series “HG” Mixing Tubes

Series “LG” Mixing Tubes

Manufactured under U.S. Patents RE 24,405 and 3,588,301
Design and Application Details

Style A, B & C LINOFLAME® Burners

Principle of Operation

These LINOFLAME® Burners consist of a cast iron air-gas manifold, incorporating a drilled face and flame retention ignition rails. When supplied with a full air/gas premixture, they provide a “ribbon” flame pattern.

The replaceable ignition rail design forms a zipper channel on the face of the burner which provides positive flame retention and quick, reliable cross-ignition throughout the entire burner assembly.

Over 200 modular sections are available in various shapes and configurations. These sections may be assembled into virtually any desired shape in order to match flame and heat distribution to your job requirements.

Customized drilled sections are also available. The LINOFLAME® Burner’s discharge area must be matched to the air/gas premixing equipment being used. By specifically sizing each drill pattern to the job specification, a truly unique burner element can be created that is tailored to meet your exact heating requirements. They are cataloged for the matching premixing equipment with several of the most popular drilling options.

The short ribbon-type flame widely distributes the desired heat release for greater temperature uniformity. They provide stable operation in still, fresh air and/or in highly inert air stream atmospheres.

Capacities of LINOFLAME® Burner assemblies are established by the minimum and maximum differential mixture pressures developed by the air/gas premixing equipment. Refer to the appropriate catalog section of Maxon premixing devices for the capacity and turndown range of the complete system.

Three styles of LINOFLAME® Burner sections are offered. All styles (sizes) incorporate cast iron burner bodies and are available with cast iron or alloy ignition rails. The alloy ignition rails offer extended life in difficult service conditions and are recommended for propane-fired applications or those involving temperatures above 400°F (204°C). Ambient airstream temperatures passing over the burner should not exceed 600°F.

Style A LINOFLAME® Burners offer the highest heat release potential per lineal foot. They are available in 36 and 72 holes per foot drilling patterns. Normal maximum capacities are up to 525,000 Btu/hr per lineal foot at 7.5” wc differential mixture pressure.

Style B LINOFLAME® Burners provide medium heat release potential per lineal foot and are available in 24, 36, 72 and 96 holes per foot drilling patterns. Normal maximum capacities are up to 250,000 Btu/hr per lineal foot at 13” wc differential mixture pressure. (Main drillings for 24 hole pattern do not need to be specified.)

Style C LINOFLAME® Burners provide the lowest heat release per lineal foot. These burners are offered in 24 holes per foot drilling pattern only. Normal maximum capacities are up to 25,000 Btu/hr per lineal foot at 2.5” wc differential mixture pressure.

Direct spark ignition rails are available in most LINOFLAME® sections that provide a means of direct mounting an 18mm spark ignitor onto the face of the burner. This allows a constant source of spark to ignite the air/gas premixture coming out of the main and/or ignitor ports of the LINOFLAME® Burner section.
**Capacity/Selection Data**

**Style A, B & C LINOFLAME® Burners**

**LINOFLAME® Burner Designations**

Each LINOFLAME® Burner section is identified with a designation code that identifies the specific type, shape, size, drilling pattern, and drill sizes of the main and ignitor ports.

*For example:*

LINOFLAME® Burner Designation: L B A – 12 – 96 – 36 – 43

- **L** = LINOFLAME® Burner
- **B** = Style of LINOFLAME® Burner
  - A = Style A
  - B = Style B
  - C = Style C
- **A** = Type of ignition rail
  - A = with alloy rails
  - (blank) = with cast iron rails
- **Specific Section**
  - -3 = 3” straight
  - -6 = 6” straight
  - -8 = 8” straight
  - -12 = 12” straight
  - -12S = 12” straight with bossed side inlet
  - -12B = 12” straight with bossed back inlet
  - -3B = 3” straight with bossed back inlet
  - -TS = 12” tee section with side inlet
  - -TB = 12” tee section with bottom inlet
  - -TX = 12” cross ignition
  - -E3 = 3” elbow
  - -E6 = 6” elbow

- **Number of holes/lineal foot**
  - 24
  - 36
  - 72
  - 96

*The maximum drill size for ignitor ports is .188” diameter.*

In the example above, we have described a 12” straight section of Style B LINOFLAME® Burner with alloy ignition rails and a 96 hole drilling pattern. The main ports are drilled with #36 drill and the ignitor ports are #43 drilled.
Capacity/Selection Data

Total heat release and LINOFiAME® Burner footage are normally selected from the tables given in the various premixing equipment sections of the Maxon catalog:

- PREMIX® Blower Mixers ............... Bulletin 3100
- Series LG & HG Mixing Tubes,
- MULTI-RATIO™ Mixers ................ Bulletin 3200
- VENTITE™ Inspirator Mixers .......... Bulletin 3300

Based on capacity information given in these catalog sections, and within the constraints of duct size and air volume flows, a LINOFiAME® Burner assembly is designed utilizing the available sections shown on the following pages.

When ordering a burner assembly made up from these available module components, be sure to provide an assembly sketch of the complete burner (as viewed from the back, or upstream, side) including locations of all accessories and/or individual component sections.

Start-up and operating procedures will be greatly simplified if observation ports are provided and positioned to allow direct visual inspection of both pilot and main flame.

All “open” ends of burner assembly must be closed off with one of the end closures or pilot assemblies shown on the following pages. Any end plate ports not used must be plugged.

Burner inlet feed piping must be adequate to provide a well-distributed flow of air/gas throughout the burner assembly.

Inlet flanges bolt directly to burner body casting and accept threaded NPT piping.

Do not exceed the capacity feed limitations shown in the table below.

Burner duct area displacement

For purposes of calculating operating air velocities and resulting static pressure drops across the burner assembly, use the following equivalent displacements:

**Velocity of air flowing past a LINOFiAME®**

### Displacement Area
<table>
<thead>
<tr>
<th>Section Description</th>
<th>Displacement Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot; straight sections (-3)</td>
<td>.064 ft²</td>
</tr>
<tr>
<td>6&quot; straight sections (-6)</td>
<td>.117 ft²</td>
</tr>
<tr>
<td>8&quot; straight sections (-8)</td>
<td>.152 ft²</td>
</tr>
<tr>
<td>12&quot; straight &amp; back inlet sections (-12)</td>
<td>.223 ft²</td>
</tr>
<tr>
<td>Tee section, bottom inlet (-TB)</td>
<td>.300 ft²</td>
</tr>
<tr>
<td>Tee section, side inlet (-TS)</td>
<td>.359 ft²</td>
</tr>
<tr>
<td>Tee section, cross ignition (-TX)</td>
<td>.270 ft²</td>
</tr>
<tr>
<td>3&quot; elbow section (E-3)</td>
<td>.176 ft²</td>
</tr>
<tr>
<td>6&quot; elbow section (E-6)</td>
<td>.175 ft²</td>
</tr>
</tbody>
</table>

**Burner assembly used for air heating is determined by dividing SCFM of air passing over the burner by the net area** (in ft²) of the cross-section of the duct surrounding the burner. This net area is determined by subtracting the space displaced by the LINOFiAME® Burner from the gross area of the duct itself.

Avoid continuous straight runs longer than 7 feet of LINOFiAME® Burner. Beyond that length, the burner should be broken into separately-fed, shorter lengths (connected by cross ignition end plate sets) to minimize burner distortion and stresses during alternate heating and cooling cycles.

Use alloy ignition rails whenever burner is to be fired on propane, or when application involves temperatures above 400°F (204°C).

Do not use side inlet tees if air velocities across the LINOFiAME® Burner assembly exceed 1000 SFPM because of the air stream turbulence created.

To center-feed Style C LINOFiAME® Burner assemblies, use a Style B bottom inlet section and two LBC-3 reducing sections.

Warning: Discharge areas of this or any premix-type burner are carefully matched to the equipment supplying air/gas premixture. Increasing the discharge area by adding to the burner or enlarging burner ports could result in ignition within the burner or backfire during operation.

Inlet feed capacity limitations

<table>
<thead>
<tr>
<th>Burner inlet flange</th>
<th>Maximum Btu/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2&quot; end inlet (LFE- 1-1/2&quot;) [1]</td>
<td>350,000</td>
</tr>
<tr>
<td>1-1/2&quot; back inlet (LFB- 1-1/2&quot;)</td>
<td></td>
</tr>
<tr>
<td>2&quot; end inlet (LFE- 2&quot;) [1]</td>
<td>600,000</td>
</tr>
<tr>
<td>2&quot; back inlet (LFB- 2&quot;)</td>
<td></td>
</tr>
<tr>
<td>2-1/2&quot; back inlet (LFB- 2-1/2&quot;)</td>
<td>850,000</td>
</tr>
<tr>
<td>3&quot; back inlet (LFB- 3&quot;)</td>
<td>1,250,000</td>
</tr>
</tbody>
</table>

[1] Do not extend straight rows of LINOFiAME® Burner if capacity exceeds 600,000 Btu/hr (150,000 Btu/hr for Style C). The effect of velocity pressure in such instances will prevent uniform heat distribution.
**Dimensions** (in inches)

**Style “A” LINOFLAME® Burner Sections**

**6” Straight**
LA-6, LAA-6

**12” Straight**
LA-12, LAA-12

**Inlet Feed Section**

**12” Back Inlet Tee**
LA-TB, LAA-TB

**6” Elbow Section**
LAA-E6

**Inlet flange set options**
for back inlet tee section

<table>
<thead>
<tr>
<th>ANSI Flange Identification</th>
<th>NPT Pipe Thread*</th>
<th>Dimension &quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFB- 1-1/2”</td>
<td>1-1/2”</td>
<td>0.88</td>
</tr>
<tr>
<td>LFB- 2</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>LFB- 2-1/2”</td>
<td>2-1/2”</td>
<td>1.25</td>
</tr>
<tr>
<td>LFB- 3</td>
<td>3”</td>
<td></td>
</tr>
</tbody>
</table>

*ISO threaded flanges available; contact Maxon.
Dimensions (in inches)
Style “B” LINOFLAME® Burner Sections

Burner Sections

<table>
<thead>
<tr>
<th>Style</th>
<th>Description</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot; Straight</td>
<td>LB-3, LBA-3</td>
<td>3&quot; Straight</td>
</tr>
<tr>
<td>6&quot; Straight</td>
<td>LB-6, LBA-6</td>
<td>6&quot; Straight</td>
</tr>
<tr>
<td>8&quot; Straight</td>
<td>LB-8, LBA-8</td>
<td>8&quot; Straight</td>
</tr>
<tr>
<td>12&quot; Straight</td>
<td>LB-12, LBA-12</td>
<td>12&quot; Straight</td>
</tr>
</tbody>
</table>

End view typical of all Style B LINOFLAME® Burner straight sections

Bossed Inlet Feed Sections

<table>
<thead>
<tr>
<th>Style</th>
<th>Description</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot; Elbow Section</td>
<td>LB-E3, LBA-E3</td>
<td>3&quot; Elbow Section</td>
</tr>
<tr>
<td>6&quot; Elbow Section</td>
<td>LB-E6, LBA-E6</td>
<td>6&quot; Elbow Section</td>
</tr>
</tbody>
</table>

Typical Cross Section View of Style B LINOFLAME® Burner with alloy ignition rails

* ISO threaded manifolds available as loose parts; contact Maxon.
Dimensions (in inches)
Style “B” LINOFLAME® Burner Sections

Inlet Tee Feed Sections

12” Back Inlet Tee
LB-TB, LBA-TB
Tee section with back inlet requires a back inlet flange set from below

12” Side Inlet Tee
LB-TS, LBA-TS
Tee section with side inlet requires a back inlet flange set from below

3” Midget Section
LM-3-72

End inlet flange set

<table>
<thead>
<tr>
<th>ANSI Flange Designation</th>
<th>NPT Pipe Thread*</th>
<th>Dimension “A”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2” LFE</td>
<td>1-1/2”</td>
<td></td>
</tr>
<tr>
<td>2” LFE</td>
<td>2”</td>
<td></td>
</tr>
</tbody>
</table>

End Inlet Flange Set

Cross Ignition Section
LB-TX, LBA-TX

Universal Support Bracket
(normally ordered in pairs).
Carbon steel and stainless steel versions available.

Cross Ignition End Plate Set
LX-EP, LXA-EP
(normally supplied in pairs)

Inlet flange set options for inlet tee sections above

<table>
<thead>
<tr>
<th>ANSI Flange Identification</th>
<th>NPT Pipe Thread</th>
<th>Dimension “A”</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFB- 1-1/2”</td>
<td>1-1/2”</td>
<td>0.88</td>
</tr>
<tr>
<td>LFB- 2</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>LFB- 2-1/2”</td>
<td>2-1/2”</td>
<td>1.25</td>
</tr>
<tr>
<td>LFB- 3</td>
<td>3”</td>
<td></td>
</tr>
</tbody>
</table>

LDP Division Plate

LEP Plain End Plate

EP-FR End Plate

* ISO threaded flanges available; contact Maxon.
Dimensions (in inches)
Style “C” LINOFIAME® Burner Sections

12” Straight
LC-12, LCA-12

9” Straight
LC-9, LCA-9

Typical Cross Section view of Style C LINOFIAME® Burner with
alloy ignition rails

Cross Ignition End
Plate Set
LX-EP, LXA-EP
(normally supplied in pairs)

B to C Reducing Section
LBC-3-24

Typical Cross Section view of Style C LINOFIAME® Burner with
cast iron ignition rails

Flame Rod Holder

Typical mounting of flame rod holder and/or
pilot mounting bracket

LEP Plain End Plate

Pilot Mounting Bracket

1-1/4” LFC End Inlet Flange*

LDP Division Plate

* ISO threaded flanges available; contact Maxon.
Pilot Capacities/Specifications/Dimensions (in inches) for Style A, B & C LINOFLAME® Burners

End-mounted LINOPAK Pilots for Style A, B, & C LINOFLAME® Burners

<table>
<thead>
<tr>
<th>Sketch Number (below)</th>
<th>Pilot Description</th>
<th>Pressures required to pilot mixer</th>
<th>Nominal Capacity 1000's Btu/hr</th>
<th>Pilot Assembly Includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Inert air LINOPAK pilot</td>
<td>8-27&quot; wc</td>
<td>30</td>
<td>No</td>
</tr>
<tr>
<td>1</td>
<td>Fresh air LINOPAK pilot</td>
<td>...</td>
<td>30</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Fresh air LINOPAK pilot (w/vane)</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Inert air LINOPAK pilot (w/vane)</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Pressure type LINOPAK pilot</td>
<td>4-7&quot; wc</td>
<td>15</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Pressure type LINOPAK pilot (w/vane)</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Fresh Air Type**

**Pressure Type**

Optional/Replacement Parts

Optional Flame Rod

1/4" Thd.

18mm Spark Ignitor

Optional electrode cover protects porcelain insulator and electrical connection from dirt and moisture. May be used for ambient temperatures up to 450°F (232°C).
Pilot Capacities/Specifications/Dimensions (in inches) for Style A, B & C LINOFLEAME® Burners

Side-mounted pilots for Style A, B, & C LINOFLAME® Burners

<table>
<thead>
<tr>
<th>Sketch Number (below)</th>
<th>Pilot Description</th>
<th>Pressures required to pilot mixer</th>
<th>Nominal Capacity 1000’s Btu/hr</th>
<th>Pilot Assembly Includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Natural Gas</td>
<td>Combustion Air</td>
<td>Pilot</td>
</tr>
<tr>
<td>1</td>
<td>Fresh air type LINOPAK pilot</td>
<td>8-27” wc</td>
<td>---</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Recirculating type (with vane)</td>
<td>4-7” wc</td>
<td>8-16 oz.</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Pressure type pilot (with vane)</td>
<td>4-7” wc</td>
<td>---</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Open port venturi pilot</td>
<td>4-7” wc</td>
<td>2-15 PSIG</td>
<td>30</td>
</tr>
</tbody>
</table>

Fresh Air Type

Pressure Type

Inert Air Type

NOTE: Sketch 2 shows pilot mounting bracket mounted to side of a LINOFLAME® Burner section. Pilot assembly and mounting bracket must be ordered separately.
Design and Application Details
Type “VF” LINOFLAME® Burners

Principle of Operation
Type “VF” LINOFLAME® Burners consist of a cast iron air/gas manifold incorporating a V-shaped drilled burner face. When supplied with a full air/gas premixture, they provide a wide ribbon flame pattern. The “VF” V-faced burner design provides excellent flame retention and constant cross ignition with differential mixture pressures up to 10 inches w.c. without separate flame ignition rails.

Maintenance and cleaning are easier, due to the larger drilled ports on the face and the absence of flame ignition rails on the “VF” LINOFLAME® Burner.

As with other premix-type line burners, the “VF” LINOFLAME® Burner is assembled using modular component sections. Over 23 modular shapes may be assembled to most any desired shape, matching flame and heat distribution to your heating requirements.

Standard drilled sections permit matching the discharge area to the specific premixing equipment used by simply controlling the total burner assembly footage.

Two varieties of “VF” LINOFLAME® Burners are available:

“VFH” (V-faced, high capacity) is normally rated up to 600,000 Btu/hr per lineal foot of burner with 10” wc mixture pressure.

“VFL” (V-faced, low capacity) is rated up to 300,000 Btu/hr per lineal foot of burner with 10” wc mixture pressure.

Turndown ratios of 10:1 are common with both “VFL” and “VFH” LINOFLAME® Burner assembly applications.

Capacities of Type “VF” LINOFLAME® Burners depend on both mixture pressure and air velocity over the burner.

Nominal ratings are shown in the graph below which plots mixture pressure (in inches wc) against heat release per lineal foot of burner. Graph is based on firing in still air or in air streams with velocities less than 1500 fpm for VFL, 2000 fpm for VFH Burner.

Minimum capacities must be increased to those figures shown in Table 1 below if velocity exceeds those outlined above. Do not exceed 3000 SFPM velocity with VFL (4000 SFPM velocity for VFH).

Maximum ratings require 10” wc mixture pressure, but must be reduced by 5% if firing into a highly inert atmosphere.

Table 1: Minimum firing rate (1000’s Btu/hr per lineal foot) for various velocities (SFPM)

<table>
<thead>
<tr>
<th>Burner Type</th>
<th>Still Air</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
<th>3000</th>
<th>4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFL</td>
<td>30</td>
<td>30</td>
<td>34</td>
<td>37</td>
<td>40</td>
<td>---</td>
</tr>
<tr>
<td>VFH</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>65</td>
<td>70</td>
<td>80</td>
</tr>
</tbody>
</table>
Temperature limitations
Ambient and/or return air stream temperatures passing over the burner should not exceed 800°F (427°C). Downstream temperature should not exceed 1000°F (538°C) for recirculated air streams, 1200°F (649°C) for all fresh air.

Burner inlet feed piping must be adequate to provide a well-distributed flow of air/gas throughout the burner assembly. In regards to capacity, there is no penalty for either an oversized header or too many inlet feeds on the burner assembly.

Inlet flanges bolt directly to burner body casting and accept threaded NPT piping.

Do not exceed the capacity feed limitations shown in the table below.

Burner duct area displacement
For purposes of calculating operating air velocities and resulting static pressure drops across the burner assembly, use the equivalent displacements given in the table below.

Velocity of air flowing past a LINOFLAME® Burner assembly used for air heating is determined by dividing SCFM of air passing over the burner by the net area (in ft²) of the cross section of the duct surrounding the burner. This net area is determined by subtracting the space displaced by the LINOFLAME® Burner from the gross area of the duct itself.

Total heat release and “VF” LINOFLAME® Burner footage are normally selected from the tables given in the various premixing equipment sections of the Maxon catalog.

Series LG & HG Mixing Tubes,
MULTI-RATIO™ Mixers .............. Bulletin 3200
VENTITE™ Inspirators ............... Bulletin 3300

Based on capacity information given in these catalog sections, and within the constraints of duct size and air volume flows, a “VF” LINOFLAME® Burner assembly is designed utilizing the available sections shown on the following pages.

### Inlet Feed Capacity Limitations

<table>
<thead>
<tr>
<th>Feed Location</th>
<th>Type “VFH” LINOFLAME® Burner</th>
<th>Type “VFL” LINOFLAME® Burner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flange Designation Used</td>
<td>Maximum Feet per Leg [1]</td>
</tr>
<tr>
<td>End of straight</td>
<td>VFH-2 EF</td>
<td>2</td>
</tr>
<tr>
<td>12” back inlet</td>
<td>VFH-3 BF</td>
<td>5</td>
</tr>
<tr>
<td>12” x 12” back inlet cross</td>
<td>VFH-3 XF</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>VFH-4 XF</td>
<td>10</td>
</tr>
</tbody>
</table>

[1] A “leg” is defined as the additional burner sections attached to any one end of the section containing the inlet.

### Burner Duct Area Displacement

<table>
<thead>
<tr>
<th>Section Description</th>
<th>Type “VFH” LINOFLAME® Burner</th>
<th>Type “VFL” LINOFLAME® Burner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Designation</td>
<td>Displacement Area (ft²)</td>
</tr>
<tr>
<td>3” straight</td>
<td>VFH-3</td>
<td>0.1</td>
</tr>
<tr>
<td>6” straight</td>
<td>VFH-6</td>
<td>0.1</td>
</tr>
<tr>
<td>12” straight</td>
<td>VFH-12</td>
<td>0.4</td>
</tr>
<tr>
<td>12” back inlet straight</td>
<td>VFH-12B</td>
<td>0.4</td>
</tr>
<tr>
<td>6” elbow</td>
<td>----</td>
<td>---</td>
</tr>
<tr>
<td>12” x 6” tee</td>
<td>VFH-T</td>
<td>0.5</td>
</tr>
<tr>
<td>12” x 12” cross</td>
<td>VFH-X</td>
<td>0.6</td>
</tr>
<tr>
<td>12” x 12” back inlet cross</td>
<td>VFH-XB</td>
<td></td>
</tr>
</tbody>
</table>
Capacity/Selection Data
Type “VF” LINOFLAME® Burners

When making premix-type line burner comparisons, the discharge areas and capacity equivalents may be shown as follows:

1’ of VFL = 1/2’ of VFH = 1’ of Style B-96-36-43

When ordering a burner assembly made up from the available module components, be sure to provide an assembly sketch of the complete burner (as viewed from the back, or upstream, side) including locations of all accessories and/or individual component sections.

All “open” ends of burner assembly must be closed off with one of the end closures or pilot assemblies shown on the following pages. Any end plate ports not used must be plugged.

Ignition may be either direct spark (utilizing special flame rod and spark ignitor end closures offered) or more typically, by incorporating one of the available LINOPAK® pilots (offered for both low- and high-pressure gas supplies and in your choice of atmospheric and pressure types).

Burner expansion and bowing

Due to the increased mass of “VF” LINOFLAME® Burner casting, special consideration must be made to allow for the additional linear expansion.

“VF” Burner face temperatures are essentially constant (850°F) at their maximum firing rates. At this temperature, the theoretical linear expansion is 0.06 inches/lineal foot. (Example: A 5’ center-fed bar of “VF” LINOFLAME® Burner will deflect approximately 0.75” at 850°F and the deflection commences at the ends of its feed section.)

With or without inlet feed flexible connectors in the air/gas premixture line(s), the maximum linear distance recommended between cross-ignition end plates or between an end plate and a cross-ignition end plate is 10 ft.

Avoid continuous straight runs longer than 7 feet of LINOFLAME® Burner. Beyond that length, the burner should be broken into separately-fed, shorter lengths (connected by cross ignition end plate sets) to minimize burner distortion and stresses during alternate heating and cooling cycles.

Burner support methods provide support to your inlet feed manifolds and bolt the “VF” burner assembly to the inlet flanges. If Universal Support Brackets (USB) are used, locate them nearer to the inlet feed sections, and not at the extreme ends of the burner.

Start-up and operating procedures will be greatly simplified if observation ports are provided and positioned to allow direct visual inspection of both pilot and main flame.

End-mounted LINOPAK Pilots for VF LINOFLAME® Burners

<table>
<thead>
<tr>
<th>Available Natural Gas Pressures</th>
<th>Selection Parameter</th>
<th>Pilot Mixer</th>
<th>Type of Flame Safeguard</th>
<th>VFL LINOFLAME® Burner LINOPAK Pilot</th>
<th>VFL LINOFLAME® Burner LINOPAK Pilot</th>
<th>Normal Capacity (1000’s Btu/hr)</th>
<th>Pilot Assembly Includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Gas Pressures (4-7” wc)</td>
<td>Pilot Mixer</td>
<td>Venturi-type</td>
<td>UV scanner</td>
<td>VFH-LO-V-UV</td>
<td>VFL-LO-V-UV</td>
<td>20</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flame rod</td>
<td>VFH-LO-V-FR</td>
<td>VFL-LO-V-FR</td>
<td>20</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure-type (requires 4-16 psi combustion air)</td>
<td>UV scanner</td>
<td>VFH-LO-P-UV</td>
<td>VFL-LO-P-UV</td>
<td>25</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flame rod</td>
<td>VFH-LO-P-FR</td>
<td>VFL-LO-P-FR</td>
<td>25</td>
<td>Yes</td>
</tr>
<tr>
<td>Higher Gas Pressures (1-2 PSIG)</td>
<td>Pilot Mixer</td>
<td>Venturi-type</td>
<td>UV scanner</td>
<td>VFH-HI-V-UV</td>
<td>VFL-HI-V-UV</td>
<td>75</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flame rod</td>
<td>VFH-HI-V-FR</td>
<td>VFL-HI-V-FR</td>
<td>75</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Available Natural Gas Pressures</th>
<th>Selection Parameter</th>
<th>Pilot Mixer</th>
<th>Type of Flame Safeguard</th>
<th>VFL LINOFLAME® Burner LINOPAK Pilot</th>
<th>VFL LINOFLAME® Burner LINOPAK Pilot</th>
<th>Normal Capacity (1000’s Btu/hr)</th>
<th>Pilot Assembly Includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Gas Pressures (4-7” wc)</td>
<td>Pilot Mixer</td>
<td>Pressure-type (requires 4-16 psi combustion air)</td>
<td>UV scanner</td>
<td>VFH-HI-P-UV</td>
<td>VFL-HI-P-UV</td>
<td>75</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flame rod</td>
<td>VFH-HI-P-FR</td>
<td>VFL-HI-P-FR</td>
<td>75</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Dimensions** (in inches)

“VFH” LINOFLAME® Burner Sections

**VFH straight sections**

**VFH-12** 12”

**VFH-6** 6”

**VFH-3** 3”

**VFH-T 12” x 6” tee**

**VFH-X 12” x 12” cross**

**Inlet Feed Sections**

**VFH-12B 12” back inlet**

**VFH-3BF back inlet flange set for 12B inlet section**

**VFH-XB 12” x 12” back inlet cross**

**VFH-XB requires one of the inlet flange sets shown below (order separately)**

<table>
<thead>
<tr>
<th>(XB) back inlet cross inlet flange sets</th>
<th>NPT Pipe Size</th>
<th>Dimension &quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFH-3XF</td>
<td>3”</td>
<td>1</td>
</tr>
<tr>
<td>VFH-4XF</td>
<td>4”</td>
<td>1.31</td>
</tr>
</tbody>
</table>

* ISO threaded flanges available; contact Maxon.
**Dimensions (in inches)**

"VFH" LINOFLAME® Burner Sections

**End Closures**

- **VFH-EC**: Typical for all VFH end closures
- **VFH-EC-FR**: Optional flame rod (order separately)
- **VFH-EC-SI**: 10 mm spark ignitor (included)

**End Inlet Sets**

- **VFH-2EF**: Centerline of burner
- **VFH-2EF-FR**: Optional flame rod
- **VFH-2EF-SI**: 14mm spark ignitor (included)

**VFH-XEP Expansion end plate set**

**VFH-HREP Hi-recirc end plate**
VFL LINOFLAME® Burner Sections

Dimensions (in inches)

<table>
<thead>
<tr>
<th>Straight Section</th>
<th>Dimension &quot;L&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFL-12</td>
<td>12&quot;</td>
</tr>
<tr>
<td>VFL-6</td>
<td>6&quot;</td>
</tr>
<tr>
<td>VFL-3</td>
<td>3&quot;</td>
</tr>
</tbody>
</table>

VFL straight sections

VFL-X 12" x 12" cross

VFL-T 12" x 6" tee

VFL-L 6" elbow section

Inlet Feed Sections

VFL-XB 12" x 12" back inlet cross

VFL-12B 12" back inlet

VFL-2BF back inlet flange set for 12B inlet section

VFL-3XF inlet flange set for XB section

VFL-12B requires inlet flange set below (order separately)

VFL-XB requires one of the inlet flange sets shown below (order separately)

Typical cross sectional view of VFL LINOFLAME® section

* ISO threaded flanges available; contact Maxon.
Dimensions (in inches)
VFL LINOFLAME® Burner Sections

End Closures

- **VFL-EC**
- **VFL-EC-FR**
  - Optional flame rod (order flame rod separately)
  - 1/4" Thd.
- **VFL-EC-SI**
  - 10mm spark ignitor (included)
  - 10mm Thread
  - Gap 0.125

End Inlet Sets

- **VFL-1-1/2"-EF**
- **VFL-XEP** expansion end plate set
- **VFL-HREP** hi-recirc end plate

- "Rajah" R/A/C #11
- Right angle terminal
Dimensions (in inches)
LINOPAK Pilots with VF LINOFLAME® Burners

LINOPAK Pilots (using UV scanner) with VF LINOFLAME® Burners

LINOPAK Pilots (using flame rods) with VF LINOFLAME® Burners

Pipe threads on this page conform to NPT (ANSI Standard B2.1)
### Premix-type Line Burners

#### Dimensions (in inches)

**18mm spark ignitor** included with all LINOPAK pilots

18mm Thread 2.75 \(.125\) Right angle terminal

**Universal Support Brackets (USB)**
(normally ordered in pairs)
(12 gauge mild steel) for VF LINOFIAME® Burners
Stainless steel versions available.

**Optional flame rod** for LINOPAK pilots

1/4" Thd.

**Air-Gas Pilot Mixers for all LINOPAK Pilots**

**Atmospheric type**

- Low pressures venturi type
- Medium pressures

**Pressure type**

- High pressures
- Low pressures

**External Mounting Assemblies for all LINOPAK Pilots**

<table>
<thead>
<tr>
<th>Description</th>
<th>Side View</th>
<th>Mtg. Plate Dim.</th>
<th>Opening Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes Mounting Plate with two (2) feed-through insulators for internal mounting of spark ignitor and flame rod</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Includes Mounting Plate with feed-through insulator for internal spark ignitor and provision for external UV scanner | | | |

Pipe threads on this page conform to NPT (ANSI Standard B2.1)
Design and Application Details
INFRAWAVE® Burners

Principle of Operation
INFRAWAVE® Burners utilize air-gas premixtures supplied to a ductile iron burner body/manifold. Drilled burner body ports and alloy deflector rails provide flame retention, direction, and reliable cross-ignition throughout the entire length of the modular designed burner assembly. Because the air-gas premixture passes through drilled ports in the burner body and not through a porous refractory, the problems of plugging caused by dirty/contaminated combustion air are virtually eliminated.

Small fingers of flame are deflected down between the ribs of the high-temperature refractory grids where the grids are rapidly heated to radiant temperatures. The average refractory face temperature (with 10" wc mixture pressure) is up to 2000°F (1093°C) and even at minimum capacities, this face temperature typically remains at 900°F (482°C).

The INFRAWAVE® Burner’s higher face temperatures provide a very high intensity infrared radiation source. The radiant power from a 2000°F face temperature is approximately 2.4 times the radiant power potential of the burner face temperature at only 1500°F.

Face temperatures, and thus the radiant power (capacity) effect of INFRAWAVE® Burners, increase from minimum capacities up to approximately 10" wc mixture pressures. Above that pressure, fingers of flame extend forward from the outer edge of the slots in the refractory grids. These hot products of combustion exit with a very low forward velocity after traveling along and between the refractory grid ribs. They can provide additional convection heating for overall increased system efficiencies.

Total heat release and INFRAWAVE® Burner footages are normally selected from the tables given in the various pre-mixing equipment sections of the Maxon catalog:

- PREMIX® Blower Mixers ............ Bulletin 3100
- Series LG/HG Mixing Tubes and MULTI-RATIO™ Mixers ....... Bulletin 3200

INFRAWAVE® Burners are offered in two (2) versions:
“DG” – high capacity double grid, or
“SG” – lower capacity single grid.

Modular design permits tailoring total heat release and radiant pattern to your particular application.

Heating intensity can be further varied by adjusting burner-to-product distances, since radiant heating intensity and effectiveness depend on the total radiating surface area. Misalignment or geometrical positioning of the workpiece with respect to an INFRAWAVE® Burner can reduce its ability to absorb radiant energy.

Typical INFRAWAVE® Burner mounting on a web/conveyor process

DG Burners should normally be installed to fire directly at the work. Efficiency of SG burners is improved by angling at approximately 45°. (See sketch above.)

Burner face to product distance
INFRAWAVE® Burners discharge products of combustion with a low forward velocity. This minimizes the disturbance of granules and powders, but does not permit convection heating effect to cross large gaps. Side-fired and down-fired burners should generally be spaced 2-6” from product. Larger spacings are possible with upward firing.

The gap will normally be kept uniform along the entire burner length, with the distance field-adjustable to optimize performance.
INFRAWAVE® Burner capacities as a function of differential mixture pressures

Select all premixing equipment and control valves based on the “gross” fuel flow capacity curves shown on chart above.

Radiant power flow curves reflect the infrared heat output in radiant energy and do not take into consideration any convected heat available from the hot combustion products.

CAUTION: Emissivity of the product and/or geometric positioning of the workpiece will affect the infrared energy absorption rates.

### Typical product emissivity factors (@ 100°F)

<table>
<thead>
<tr>
<th>Material</th>
<th>Emissivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick, red</td>
<td>0.93</td>
</tr>
<tr>
<td>Cloth</td>
<td>0.75 - 0.9</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.94</td>
</tr>
<tr>
<td>Glass, window</td>
<td>0.93</td>
</tr>
<tr>
<td>Gypsum</td>
<td>0.91</td>
</tr>
<tr>
<td>Paint, black</td>
<td>0.98</td>
</tr>
<tr>
<td>Paint, white</td>
<td>0.91</td>
</tr>
<tr>
<td>Paper</td>
<td>0.95</td>
</tr>
<tr>
<td>Plaster</td>
<td>0.91</td>
</tr>
</tbody>
</table>

Radiant Heat Input Calculations

Consider mass and specific heat of system through-put, latent heat of vaporization and/or fusion, radiation and exhaust losses.

Check that adequate product area is exposed to radiant heating. A 12" length of “DG” INFRAWAVE® Burner has approximately 1.56 ft² of radiating surface area.
INFRAWAVE® Burner Application Considerations

DG Burners should normally be installed to fire directly at the work. Transfer efficiency of SG burners is improved by angling at approximately 45°. (See sketch below.)

Web stoppage may cause problems from residual heat, even with automatic burner shut-off. It may be necessary to use pillow blocks, air cylinder and lever arm to rotate the burner automatically out of the way upon deliberate or accidental web stoppage.

Spacing between rows. Because of burner face contours, the effective area of coverage is about double that of the actual physical size.

Adjacent rows of burner should be spaced far enough apart to allow dispersion of hot gases into the diluting ambient. As a rule-of-thumb: side- or up-firing burners should not be closer than 15” on center. Down-firing burners should not be closer than 18” on center.

If firing from both sides of a product, stagger burner rows to minimize heat concentration.

Hot combustion product/convection gases are always hotter than the lowest grid temperature. They may reach 2000°F (1093°C). If not collected, these gases disperse into the diluting ambient air and can have harmful effects on exposed equipment and components. The situation is particularly noticeable with down-fired burners where spark electrode and flame rod leads may require special insulation material.

Main flame characteristics. At minimum fire (0.2” wc mixture pressure) approximately a 1/8” long blue knife-edge flame should be visible beneath the deflector rails. There should be virtually no sound, and only very slight radiance visible on the refractory grids near burner ports.

At high fire (8” wc mixture pressure) small points of amber-tipped flame should be visible protruding from the ends of grid slots. Complete grid area should be radiant.

Mixture pressures above 8” wc will provide no further radiant increase, but will give flame extension from grid slot ends and an increased volume of hot convection gases.

Maximum infrared radiation, at any firing rate, is produced by the air-fuel ratio giving brightest refractory glow.

Physical damage to burner. Avoid mounting burner where work or other foreign material will fall or bump against it. Take care during storage and handling not to damage the refractory grid sections.

Required burner type, footage and configuration. In general, plastics and dry flammables cannot withstand the intense radiation of double-grid (DG) burner at high mixture pressures. Even single grid (SG) at full fire may be too much for solvent evaporation. Mixing equipment and combustion air pressure should be selected to achieve only the required mixture pressure.

The width of web, conveyor or product will generally determine maximum heat input from a single row of SG or DG burner. From this, total heat input will give you the required number of rows of burner and minimize the risk of longitudinal hot streaks.

Flame supervision. INFRAWAVE® Burners include provision for flame rod or UV scanner detection. Main flame pick-up is difficult below about 0.5” wc mixture pressure, so for lowest possible minimum capacity (and maximum turndown), interrupted pilots or direct spark ignition should be avoided. Flame rods sensing a pressure pilot may require cooling tees if porcelain is subject to temperatures exceeding 400°F (204°C) (as with down-fired burners).

UV scanners generally will require remote mounting and air cooling to survive the ambient temperatures encountered at the burner.

Warning: Test every UV flame sensing installation for dangerous spark excitation from ignitors, other burners and other possible sources of direct or reflected UV radiation.
Dimensions (in inches)
INFRAWAVE® Burners

Standard 6" and 12" straight sections

6" DG

12" DG

NOTE: All INFRAWAVE® Burner sections use ISO standard (metric) fasteners

6" SG

12" SG

Single-grid (SG) burners may be specified with grid position #1 or #2 as viewed from the pilot end of an assembly and shown at left. (If side-mounted accessories are used, grids will always be assembled on the same side as accessories.)
Dimensions (in inches)
INFRAWAVE® Burners

Standard 6" and 12" Straight Sections with Side-mounted Accessories

With spark ignitor and provision for FR/UV
Right: Plain SG-12" straight with optional flame rod

With pressure pilot, spark ignitor, adjustable orifice with provision for mounting a UV scanner
Right: DG-12" straight section shown with end closure set

With spark ignitor only (for direct ignition) or with provision for FR/UV

With pressure pilot

Inlet Feed Sections for INFRAWAVE® Burner assemblies

NOTE: Do not use 2" inlet flanges to feed more than 16' of SG burner (8' of DG). 3" inlet flanges may be used to feed a maximum of 32' of SG burner (16' of DG).

12" DG
Bottom Inlet

NOTE: See photo above of DG-12" straight section showing end closure set mounted to close off the burner body/manifold cavity

12" DG
Side Inlet

Typical end view of side inlet section (with optional accessories)
Premix-type Line Burners

Dimensions (in inches)

INFRAWAVE® Burners

End-mounting Accessories for ALL Sections

End-mounted pilot and bracket for “SG” burner

Caution: Be sure to specify refractory grid position on SG INFRAWAVE® Burner. UV scanner/flame rod must be located on refractory grid side of burner element.

End-mounted pilot and bracket for “DG” burner

6” DG straight shown with end mounted pilot, bracket, flame rod (optional) and end closure kit (optional) on body manifold

Universal Support Bracket (normally supplied in pairs)

Flange and End Closure Plate Sets

2” ANS Inlet Flange

3” ANS Inlet Flange

End Closure Plate

① DIN threaded flange sets are also available upon request

Optional Flame Rods

Plain

With Cooling Tee

Replacement Spark Ignitors

10mm Spark Ignitor

14mm Spark Ignitor

18mm Spark Ignitor

Flame rod length “L” (in inches)

<table>
<thead>
<tr>
<th>INFRAWAVE® Section</th>
<th>With cooling tee</th>
<th>Without tee</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all 6” &amp; 12” SG or DG burner sections</td>
<td>6-13/16</td>
<td>4-1/2</td>
</tr>
<tr>
<td>For end mounted pilot assemblies</td>
<td>4-13/16</td>
<td>2-1/2</td>
</tr>
</tbody>
</table>
**Component Identification**

INFRAWAVE® Burners

---

**Suggested spare parts**
- Deflector rail(s)
- Grid clamp(s)
- Grid support(s)
- Refractory baffle grid(s)
- Manifold gaskets

**Gaskets**

Unless specified otherwise, burners are shipped from the factory with manifold and body/manifold joints sealed with Keypaste.

For field replacements or sections shipped loose, high temperature gaskets should be ordered and installed between manifolds and between body and manifold.

**To replace refractory baffle grids:**
1. Apply penetrating oil to grid clamp screws and let stand for a few minutes. If still tight, tap with a hammer to loosen.
2. Unscrew grid clamp screws sufficiently so that grid clamp may be tilted back to clear refractory grids as shown in Sketch 1.
3. Remove broken grid section and any remaining fragments as shown in Sketch 2.
4. Insert replacement grid and return grid clamp to original position holding grid firmly against grid support.
5. Center grids on each grid clamp section so they do not overlap, then retighten grid clamp screws firmly.

**NOTICE: INFRAWAVE® Burner grids must be cured before being taken to high fire.**

This curing process must take place on initial firing and is to include at least a 15 minute slow bring-up time where the grid is fired low and brought up through the firing rate at even increments over the 15 minute period.

After this process has taken place, the refractory grids may be fired in the normal manner without negative side effects.

Failure to cure the refractory grids in this manner may result in cracking and quick erosion of the grids, which results in shortened burner life.
Notes
Installation Instructions
for Style A, B, C LINOFLAME® Burners

**General**

LINOFLAME® Burner assemblies must be adequately supported and positioned. For small or simple burners, gas supply manifold may provide all the support needed.

In most cases, however, additional supports will be required. Avoid rigid mounting. Burner assembly expands and contracts with temperature variations, and rigid mounting creates severe stresses within the burner itself, its fastenings and/or supports.

**Supports**

If burner fires in still air:

**Sketch 1** below illustrates a typical upward-firing position. It is only necessary to supply sufficient support to hold burner weight. In some circumstances, the manifolding itself may provide adequate support particularly if inlets occur every 4' or less.

Use cross-ignition end plates to sectionalize longer burner assemblies exceeding 7' in length.

**Sketch 4** shows the burner suspended from a strap iron frame using USB (universal support brackets) supplied by Maxon. Note that rigid mounting is avoided by the 3/4" bracket hole which slips loosely over a 1/2" bolt or steel rod attached to the support. Gas piping would need independent support.

Sketch 5 shows the burner assembly resting upon angle iron brackets and not attached to them in any way. Gas manifolding would be independently supported and prevent forward movement of the burner.

**If burner fires into an air stream:**

Burners must be mounted so they fire parallel to and in the same direction as the movement of the air which is being heated. (See **Sketch 3** at right.)
Installation Instructions
for Style A, B, C LINOFLAME® Burners

If vertical rows of straight burner sections predominate, small assemblies (up to 10' of burner) can be supported from the gas manifold. For larger assemblies, see the examples below.

Sketch 6 shows angle iron used to support the burner. Note that narrow edge of angle faces air flow.

Sketch 7 shows how gas manifolding may be used to support the burner. If there are multiple inlets, you must avoid rigid connection by using the oversize U-bolt (loosely drawn-up) illustrated.

In vertical air streams, avoid upward-firing arrangements wherever possible. The increased chance of dirt falling into the burner (especially during a shut-down) can seriously affect performance and reliability. If unavoidable, however, support as shown in Sketch 8.

Sketch 9 shows USB (universal support brackets) used to support the burner from an overhead angle iron. One advantage this provides is that the support mechanism may be moved back from the burner, thus minimizing any airstream turbulence or diversion that it might cause.

Sketch 10 shows an alternate arrangement which offers the advantage of more controlled positioning. This arrangement is especially good if the burner is to be installed in a heater which must be shipped to another location.

Pilots

LINOPAK Pilots bolt directly onto the burner in place of an end plate, already in proper position. "Patch-on" pilots, when not factory-installed, must be mounted as shown in Sketch 11 below, at a location suitable to you.

To mount flame rod, insert it in the flame rod bracket. Position bracket on burner side as shown below so that flame rod passes directly over a main burner port and mark the two mounting holes. Then drill 5/32" holes, tap them #10-24 and bolt flame rod bracket in place.

To mount pilot hood, position it as shown below (off-setting slightly to clear flame rod if ground vane is present), mark mounting holes and drill 13/64" holes, tap 1/4"-20 threads and bolt pilot hood in place.

See also the gas train installation and start-up instructions for the particular proportioning and mixing equipment used in your system.