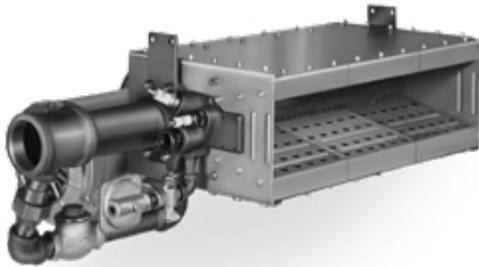


# Honeywell-Eclipse AirHeat Burners AH, TAH, CAH, AH-O, TAH-O, RAH, TAH-R

## OPERATING INSTRUCTIONS

EN

Version 1 · Edition 04.21 · 32-00203-03 · EN



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### SAFETY

#### Disclaimer Notice

In accordance with the manufacturer's policy of continual product improvement, the product presented in this brochure is subject to change without notice or obligation.

The material in this manual is believed adequate for the intended use of the product. If the product is used for purposes other than those specified herein, confirmation of validity and suitability must be obtained. Honeywell-Eclipse warrants that the product itself does not infringe upon any United States patents. No further warranty is expressed or implied.

#### Liability and Warranty

We have made every effort to make this manual as accurate and complete as possible. Should you find errors or omissions, please bring them to our attention so that we may correct them. In this way we hope to improve our product documentation for the benefit of our customers. Please send your corrections and comments to our Marketing Communications Manager.

It must be understood that Honeywell's liability for its product, whether due to breach of warranty, negligence, strict liability, or otherwise is limited to the furnishing of replacement parts and Honeywell-Eclipse will not be liable for any other injury, loss, damage or expenses, whether direct or consequential, including but not limited to loss of use, income, or damage to material arising in connection with the sale, installation, use of, inability to use, or the repair or replacement of Honeywell-Eclipse's products.

Any operation expressly prohibited in this manual, any adjustment, or assembly procedures not recommended or authorized in these instructions shall void the warranty.

#### Document Conventions

There are several special symbols in this document. You must know their meaning and importance.

**1 2 3 a b c** ... = Action

→ = Instruction/Note

#### Audience and Purpose

The purpose of this manual is to ensure the installation and adjustment of a safe, effective and trouble-free combustion system.

The audience is expected to have previous experience with this type of equipment.

The purpose of this manual is to make sure that you carry out the installation of a safe, effective, and trouble-free system.

#### Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

## **⚠ DANGER**

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

## **⚠ WARNING**

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

## **⚠ CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

### **Safety**

Important notices which help provide safe burner operation will be found in this section. To avoid personal injury and damage to the property or facility, the following warnings must be observed. All involved personnel should read this entire manual carefully before attempting to start or operate this system. If any part of the information in this manual is not understood, contact Honeywell before continuing.

## **⚠ DANGER**

The burners covered in this manual are designed to mix fuel with oxygen and burn the resulting mixture. All fuel burning devices are capable of producing fires and explosions when improperly applied, installed, adjusted, controlled or maintained.

- Do not bypass any safety feature; fire or explosion could result.
- Never try to light the burner if it shows signs of damage or malfunction.

## **⚠ WARNING**

- The burner is likely to have HOT surfaces. Always wear protective clothing when approaching the burner.
- Honeywell products are designed to minimize the use of materials that contain crystalline silica. Examples of these chemicals are: respirable crystalline silica from bricks, cement or other masonry products and respirable refractory ceramic fibers from insulating blankets, boards, or gaskets. Despite these efforts, dust created by sanding, sawing, grinding, cutting and other construction activities could release crystalline silica. Crystalline silica is known to cause cancer, and health risks from the exposure to these chemicals vary depending on the frequency and length of exposure to these chemicals. To reduce the risk, limit exposure to these chemicals, work in a well-ventilated area and wear approved personal protective safety equipment for these chemicals.

## **⚠ CAUTION**

- This manual gives information for the use of these burners for their specific design purpose. Do not deviate from any instructions or application limits in this manual without written advice from Honeywell.

### **Capabilities**

Only qualified personnel, with good mechanical aptitude and experience with combustion equipment, should adjust, maintain, or troubleshoot any mechanical or electrical part of this system.

### **Operator Training**

The best safety precaution is an alert and trained operator. Train new operators thoroughly and have them demonstrate an adequate understanding of the equipment and its operation. A regular retraining schedule should be administered to ensure operators maintain a high degree of proficiency.

### **Replacement Parts**

Order replacement parts from Honeywell only. Any customer-supplied valves or switches should carry UL, FM, CSA, CGA and/or CE approval where applicable.

### **Storage**

Store the burner inside. Exposure to the elements can damage the burner.

## **APPROVAL OF COMPONENTS**

### **Limit Controls and Safety Equipment**

All limit controls and safety equipment must comply with all applicable local codes and/or standards and must be listed for combustion safety by an independent testing agency. Typical application examples include:

- American: NFPA 86 with listing marks from UL, FM, CSA
- European: EN 746-2 with CE mark from TuV, Gastec, Advantica

### **Electrical Wiring**

All the electrical wiring must comply with all applicable local codes and/or standards such as:

- NFPA Standard 70
- IEC 60364
- CSA C22
- BS7671

### **Gas Piping**

All the gas piping must comply with all applicable local codes and/or standards such as

- NFPA Standard 54
- ANSI Z223
- EN 746-2

### **Where to Get the Standards?**

#### **The NFPA Standards are available from:**

National Fire Protection Agency  
Batterymarch Park  
Quincy, MA 02269  
[www.nfpa.org](http://www.nfpa.org)

#### **The ANSI Standards are available from**

American National Standard Institute  
1430 Broadway  
New York, NY 10018  
[www.ansi.org](http://www.ansi.org)

#### **The UL Standards are available from**

333 Pfingsten Road  
Northbrook, IL 60062  
[www.ul.com](http://www.ul.com)

#### **The FM Standards are available from**

1151 Boston-Providence Turnpike  
PO Box 9102  
Norwood, MA 02062  
[www.fmglobal.com/approvals](http://www.fmglobal.com/approvals)

#### **Information on the EN standards and where to get them is available from**

Comité Européen de Normalisation  
Stassartstraat 36  
B-1050 Brussels  
Phone: +32-25196811  
Fax: +32-25196819  
[www.cen.eu](http://www.cen.eu)

Comité Européen de Normalisation Electronique  
Stassartstraat 36  
B-1050 Brussels  
Phone: +32-25196811  
Fax: +32-25196919  
[www.cenelec.org](http://www.cenelec.org)

## BURNER OPERATING PARAMETERS AND REQUIREMENTS

### ⚠ CAUTION

It is dangerous to use any fuel burning equipment unless it is equipped with suitable flame sensing devices and automatic fuel shut-off valves. Honeywell-Eclipse can supply such equipment or information on alternate sources.

#### Application

Honeywell-Eclipse AirHeat Burners are line type burners ideal for generating large volumes of clean, hot air. Applications include ovens, dryers, fume incinerators, and similar industrial equipment.

#### AH, TAH, CAH

The "AH" models feature an integral combustion air blower mounted on the back of the burner's steel case. By supplying the correct air volume and pressure to the burner, the blower allows stable operation over a wide range of duct velocities without installing a profile plate around the burner.

#### AH-O, TAH-O

"AH-O" and "TAH-O" models are designed for mounting in ducts where all of the air required for combustion is available from the process airstream. Because these burners depend on the airstream for combustion air, a profile plate must be used to establish proper air flow past the burner. Because these burners depend on the airstream for combustion air, a profile plate must be used to establish proper air velocity past the burner. Air temperatures can be as high as 450°F (250°C) upstream of the burner and 1000°F (540°C) downstream.

#### RAH, TAH-R

Combustion air is supplied to "RAH" and "TAH-R" models by a blower located outside the duct. This allows the burners to operate in recirculating airstreams with air temperatures upstream of the burner as high as 750°F (400°C). Because combustion air is supplied to the burner from outside the duct, RAH and TAH-R burners provide stable operation over a wide range of duct velocities without installing a profile plate around the burner.

## BURNER ENVIRONMENT

#### Weather Protection

Protect burners from the weather.

#### Combustion Air

Must be free of contaminants. Honeywell-Eclipse strongly recommends use of a combustion air filter to remove airborne particles. If corrosive fumes or materials are present in the air, supply the blower with fresh, clean air from an uncontaminated area of the plant.

#### Room Openings

If the burner is mounted on the side of the duct, provide at least one square inch of opening to the outdoors for every 4000 Btu/hr (1.2 kW) of burner firing rate. This will admit fresh combustion air.

#### Access

Provide access to the burner for inspection and maintenance.

## TECHNICAL DATA

Fuels: Natural gas or 100% propane vapor.

#### Fuel Type

Fuel	Symbol	Gross Heating Value	Specific Gravity	WOBBE Index
Natural Gas	CH <sub>4</sub> 90%+	1000 BTU/ft <sup>3</sup> (40.1 MJ/m <sup>3</sup> )	0.60	1290 BTU/ft <sup>3</sup>
Propane	C <sub>3</sub> H <sub>8</sub>	2525 BTU/ft <sup>3</sup> (101.2 MJ/m <sup>3</sup> )	1.55	2028 BTU/ft <sup>3</sup>
Butane	C <sub>4</sub> H <sub>10</sub>	3330 BTU/ft <sup>3</sup> (133.7 MJ/m <sup>3</sup> )	2.09	2303 BTU/ft <sup>3</sup>

BTU/ft<sup>3</sup> at standard conditions (MJ/m<sup>3</sup> at normal conditions)

#### Gas Differential Pressures for Various Inputs

Various Inputs Btu/hr. per Foot of Burner, in 1000's	Gas Differential Pressures "w.c.	
	Natural Gas	Propane
550	1.20	0.50
600	1.40	0.60
650	1.65	0.70
700	1.90	0.80
750	2.10	0.85
800	2.20	0.90
1000	3.50	1.30

Various Inputs kW per Meters of Burner	Gas Differential Pressures mbar	
	Natural Gas	Propane
529	3.0	1.2
577	3.5	1.5
625	4.0	1.8
673	4.8	2.0
721	5.2	2.1
769	5.5	2.2
962	8.7	3.3

If using an alternative fuel supply, contact Honeywell-Eclipse with an accurate breakdown of the fuel components.

Pilot Input: Approximately 25,000 Btu/h (7.3 kW)

Piloting: Integral spark-ignited pilot; ignited plug included.

Flame Monitoring: Flame rod supplied. UV scanner adapters are available. For UV scanners, Honeywell-Eclipse recommends a flame monitoring system that terminates the ignition spark and proves the pilot flame without spark prior to opening the main gas valves.

Honeywell-Eclipse recommends flame supervision to meet all applicable local codes and standards

Materials: All portions of the burner exposed to the flame are cast iron or 321 stainless steel.

Emissions: Emissions performance depends not only on the burner, but also on other factors such as chamber temperature, chamber design, and heat loading. For estimates of emissions performance in your application, contact Honeywell-Eclipse.

Packaging Options: Available with complete valve trains and control systems. AH burners and systems can be supplied already mounted on duct sections as specified by the customer. Contact Honeywell-Eclipse for information on custom packaged systems.

## AH, TAH, CAH

Models:

- AH: Line-shape, blower mounted on rear
- TAH: "I"-shape, blower mounted on rear
- CAH: Cross-shape, blower mounted on rear

Gas Turndown: 40:1

Ambient Temperature Limits (Based on blower motor limitations):  
-40° to +104°F (-40° to + 40°C)

Downstream Temperature Limits: 1500°F (815°C)

Motor: Standard: 230/460/3/60 TEFC. Other motors can be supplied.

Inputs, Pressures and Flame Lengths:

Rated Input Btu/h/ft (kW/m)	Gas Pressure <sup>1)</sup>		Flame Length <sup>2)</sup> inches (cm)
	Nat. Gas "w.c. (mbar)	Propane "w.c. (mbar)	
800,000 (762)	2.2 (5.5)	0.9 (2.2)	28 (71)
1,000,000 (962)	3.5 (8.9)	1.3 (3.2)	46 (117)

1) Measured between the gas inlet and a tap on the duct wall 10" to 20" (25 to 50 cm) downstream of the burner.

2) Flame length is a function of burner input, air  $\Delta P$  and air flow across the burner face. If flame length is not critical, then these figure may vary. Based on parallel air flow. If mounted in a cross flow, the flame will be shorter.

## AH-O, TAH-O

Models:

- AH-O: Line-shape
- TAH-O: "I"-shape

Airstream Temperatures:

Upstream of Burner: 450°F (250°C)

Downstream of Burner: 1000°F (540°C)

Oxygen Level: 18% oxygen required in the process airstream.

Net Free Area: 10 sq. in. per lineal foot 212 sq. cm. per lineal meter

Rated Input Btu/h/ft (kW/m)	Gas Pressure <sup>1)</sup>		Flame Length <sup>2)</sup> inches (cm)	Air $\Delta P$ Across Burner <sup>3)</sup> "w.c. (mbar)	Air Flow Per Area of Opening <sup>4)</sup> scfm/in <sup>2</sup> (Nm <sup>3</sup> /h/ cm <sup>2</sup> )
	Nat. Gas "w.c. (mbar)	Propane "w.c. (mbar)			
550,000 (530)	1.2 (3.0)	0.5 (1.2)	18-24 (46-61)	0.4 (1.0)	13.6 (3.39)
800,000 (762)	2.2 (5.5)	0.9 (2.2)	24-30 (61-76)	0.7 (1.7)	17.6 (4.39)
1,000,000 (962)	3.5 (8.9)	1.3 (3.2)	40-46 (102-117)	1.0 (2.5)	21.5 (5.36)

1) Measured between the gas inlet and a tap on the duct wall 10" to 20" (25 to 50 cm) downstream of the burner.

2) Flame length is a function of burner input, air  $\Delta P$  and air flow across the burner face. If flame length is not critical, then these figure may vary. Based on parallel air flow. If mounted in a cross flow, the flame will be shorter.

3) Air at 70°F and sea level.

4) Required flow per unit area of combined profile opening and burner net free area to produce the corresponding air  $\Delta P$ .

## RAH, TAH-R

Models:

- RAH-O: Line-shape
- TAH-R: "I"-shape

Gas Turndown: 40:1

Rated Input Btu/h/ft (kW/m)	Gas Pressure <sup>1)</sup>		Flame Length <sup>2)</sup> inches (cm)
	Nat. Gas "w.c. (mbar)	Propane "w.c. (mbar)	
800,000 (762)	2.2 (5.5)	0.9 (2.2)	28 (71)
1,000,000 (962)	3.5 (8.9)	1.3 (3.2)	46 (117)

1) Measured between the gas inlet and a tap on the duct wall 10" to 20" (25 to 50 cm) downstream of the burner.

2) Flame length is a function of burner input, air  $\Delta P$  and air flow across the burner face. If flame length is not critical, then these figure may vary. Based on parallel air flow. If mounted in a cross flow, the flame will be shorter.

## CONTROL SYSTEM REQUIREMENTS

### Turndown Method

Input is normally controlled by a motorized butterfly valve placed in the gas line leading to the burner.

### Regulator Loading Lines

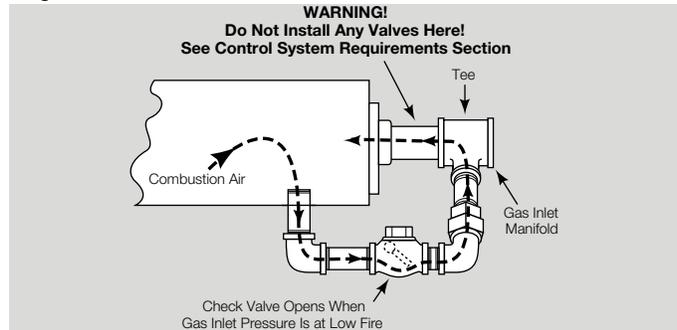
Connect the top diaphragm chambers of the main gas and pilot gas regulators to the duct approximately 10" (250mm) downstream of the burner. This will allow the regulators to maintain a constant supply pressure to the burner regardless of varying pressures in the duct.

### Piloting

Pilot gas flow is adjusted shown in page 8 (Startup and Adjustment)

### Check Valve

At high fire, the gas pressure at the burner inlet is higher than the air pressure, and the check valve is closed. At low fire, gas pressure falls below the air pressure, and the check valve opens, permitting a small amount of air to mix with the gas. This pre-mix at low fire stabilizes the flame and helps distribute the flame evenly down the length of the burner.



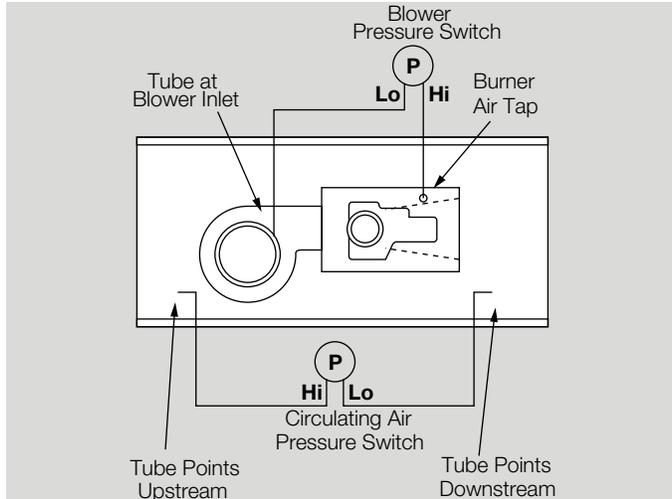
### ⚠ WARNING

Do not install any valve or controlling device in the gas line between the burner and the check valve tee. Because this section of the gas line carries a partial pre-mix at low fire, it is possible under unusual conditions for the flame to travel back through the pipe to the tee. Devices installed in this section may be damaged and may melt, releasing gas to the atmosphere and causing fires or explosions.

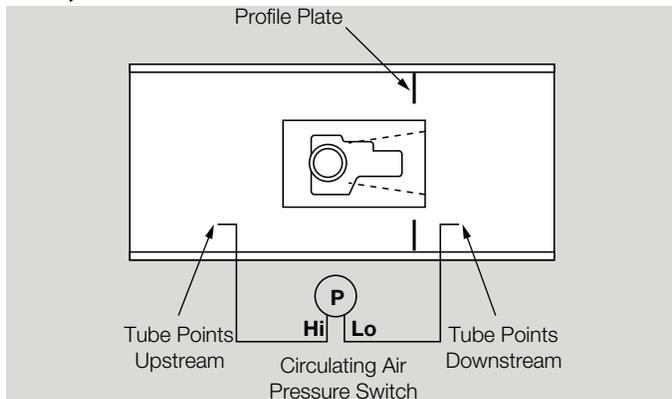
### Pressure Switch Connection

See following Figures for the typical connection of combustion air and circulating fan limit switches.

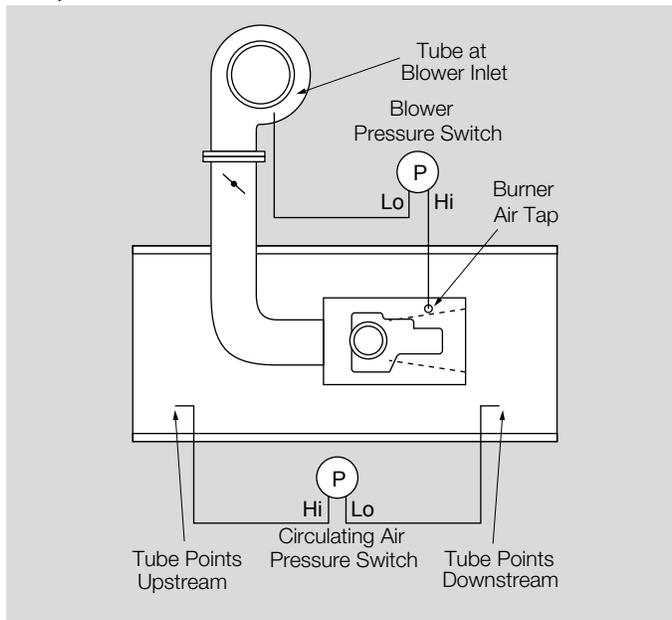
#### AH, TAH, CAH



#### AH-O, TAH-O



#### RAH, TAH-R



### Ignition

Ignition voltage should be 6000 VAC.

#### Air Damper (only RAH, TAH-R)

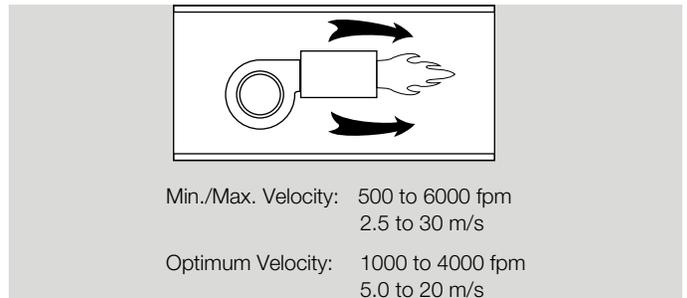
Install an air damper at the combustion air blower inlet, or between the blower and the burner to allow adjustment of combustion air flow.

## DUCT DESIGN AND BURNER MOUNTING

### AH

→ On burners longer than 3 ft (0.9 m), use a hanger or a pedestal to support the blower and motor.

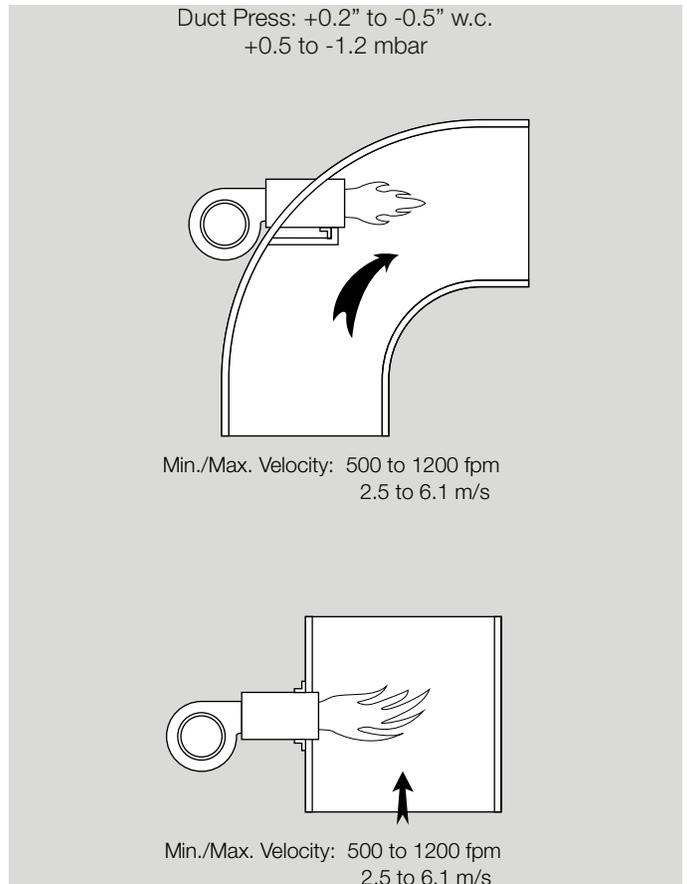
### In-Duct



→ Provide at least 3" (76 mm) clearance between burner and top, bottom, and sides of the duct.

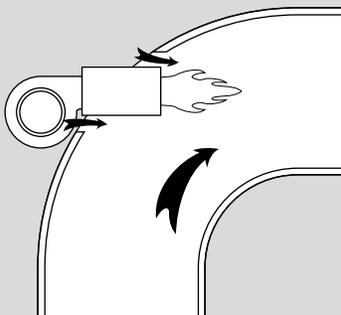
→ Profile plates are not required for good burner operation, but uniform velocity must be maintained for full length of burner. If velocity is not uniform, profile plates can be used to correct this condition.

### Sealed

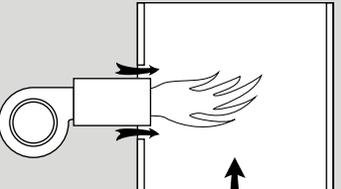


## Slot-Fired

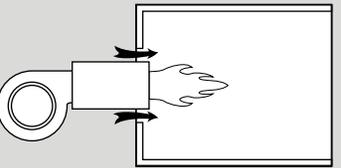
Duct Press: 0" to -0.5" w.c.  
0 to -1.2 mbar



Min./Max. Velocity: 500 to 1200 fpm  
2.5 to 6.1 m/s



Min./Max. Velocity: 500 to 1200 fpm  
2.5 to 6.1 m/s



Min./Max. Velocity: 500 to 6000 fpm  
(2.5 to 30 m/s)

Optimum Velocity: 1000 to 4000 fpm  
(5.0 to 20 m/s)

## AH-O

### Profile Plate and Duct Design

To calculate the open area between the burner perimeter and the edge of the profile plate opening, solve the following equation:

$$A_G = \frac{\text{Flow}_T}{\text{Flow}_R} - (A_{NF} \times L_F)$$

$A_G$  = Area in of the gap between the profile plate and the burner.

$\text{Flow}_T$  = Total air flow around and through the burner.

$\text{Flow}_R$  = Air flow required per unit of open area to produce the specified pressure drop.

$A_{NF}$  = Burner net free area (from page 3 (Technical data) ).

$L_F$  = Burner length.

**Example:** Size a profile plate for a seven foot long burner to fire at 800,000 Btu/hr. Air flow around and through the burner will be 60,000 scfm.

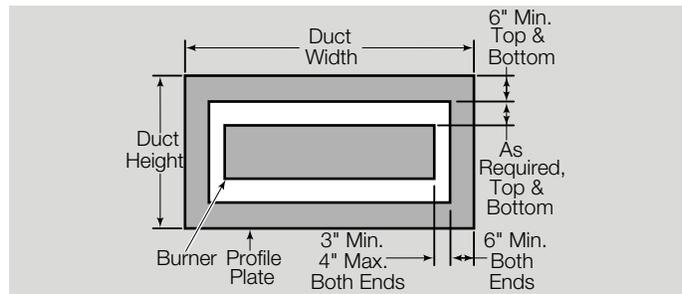
$\text{Flow}_T$  = 60,000 scfm

$\text{Flow}_R$  = 21.5 scfm per sq. in. (from table page 3 (Technical data) ).

$A_{NF}$  = 10 sq. in. per ft. (from page 3 (Technical data) ).

$L_F$  = 7 ft

$$A_G = \frac{60,000}{21.5} - (10 \times 7) = 2720 \text{ sq. in.}$$

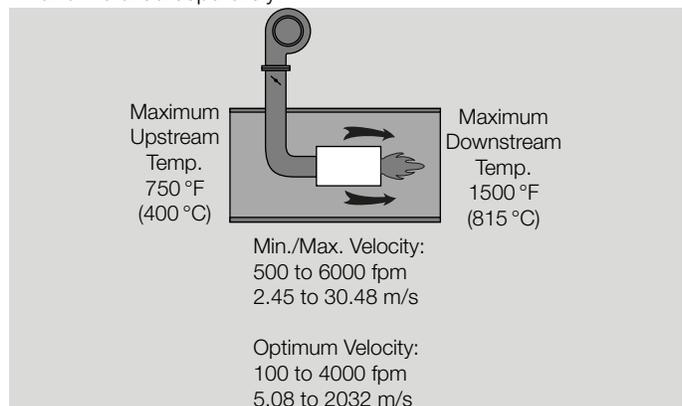


### Mounting Guidelines:

- The profile opening must provide uniform air flow down the length of the burner.
- If the air flow is in doubt, provide adjustable profile plates so that final settings can be made in the field.
- Profile plates should be positioned flush with the firing end of the burner. If necessary the plates can be located up to 1/2" back from the firing end, but **under no circumstances** should they be in front of the burner.

### RAH

- Provide at least 3" (76 mm) clearance between burner and top, bottom and sides of the duct.
- Profile plates are not required for good burner operation, but uniform velocity must be maintained for full length of burner. If velocity is not uniform, use profile plates to correct it.
- Support the blower and motor independently of the burner.
- The blower and the adjoining duct (shown in the darker shaded areas) are not part of the burner assembly; they must be purchased and installed separately.



### Blower Sizing

- Blower Volume: Select a burner capable of producing 13,000 cfm per lineal foot of the burner
- Blower Pressure: = 2 (maximum duct pressure) - minimum duct pressure

### Blower Pressure Calculation: Pressure System

#### Example 1:

Maximum Duct Pressure: 30" w.c.

Minimum Duct Pressure: 9" w.c.

Blower Pressure = 2 (30") - 9" = 51" w.c.

#### Example 2:

Maximum Duct Pressure: 0.5" w.c.

Minimum Duct Pressure: 0.2" w.c.

Blower Pressure = 2 (0.5") - 0.2" = 0.8" w.c.

**NOTE:** On pressure systems, the blower pressure must be at least 1.5" w.c. more than the maximum duct pressure. In Example 2, the blower pressure should be: 0.5" + 1.5" = 2.0" w.c.

**Blower Pressure Calculation: Suction System**

→ On suction systems, no blower is needed if duct pressure is always - 1.5" w.c. or less, and the ratio of lowest to highest pressure is no greater than 3

**Example 1:**

Maximum Duct Pressure: -6" w.c.  
 Minimum Duct Pressure: -20" w.c.  
 Since the ratio of lowest pressure to highest is 3.3, a blower is required:

Blower Pressure = 2 (30") - 9" = 51" w.c.

**Example 2:**

Maximum Duct Pressure: -0.4" w.c.  
 Minimum Duct Pressure: -0.9" w.c.  
 Blower Pressure = 2 (-0.4") - (-0.9") = 0.1" w.c.

**NOTE:** On suction systems, the blower pressure must be at least 1.5" w.c. more than the maximum duct pressure. In Example 2, the blower pressure should be: -0.9" + 1.5" = 0.6" w.c.

**Blower Pressure Calculation: Suction-to-Pressure System**

**Example 1:**

Maximum Duct Pressure: 2" w.c.  
 Minimum Duct Pressure: -1.0" w.c.  
 Blower Pressure = 2 (2") - (-1.0") = 5" w.c.

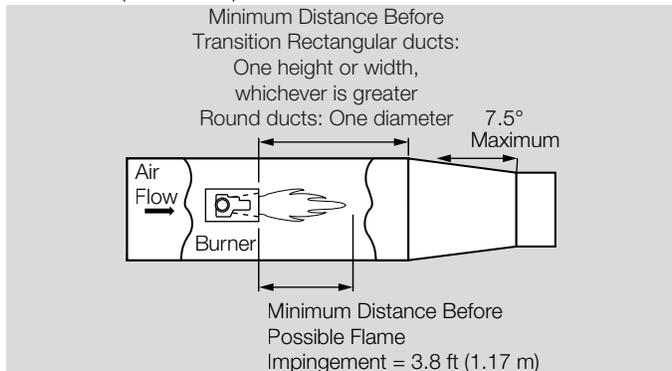
**Example 2:**

Maximum Duct Pressure: 0.5" w.c.  
 Minimum Duct Pressure: -0.2" w.c.  
 Blower Pressure = 2 (0.5") - (-0.2") = 1.2" w.c.

**NOTE:** On pressure-to-suction systems, the blower pressure must be at least 1.5" w.c. more than the maximum duct pressure. In Example 2, the blower pressure should be: 0.5" + 1.5" = 2.0" w.c.

**Duct Lengths**

- Center the burner in the duct.
- Allow a minimum of 3.8 ft (1.17 m) from burner to the nearest point of possible flame impingement at an input of 1,000,000 Btu/h/ft (962 kW/m).



**Valve Train Support**

Support valve trains independently of the burner.

**Support**

**AH, TAH, CAH**

The mounting flange or brackets supplied with an AH burner are capable of supporting the weight of the burner and blower. The AH burner case itself is designed to support the weight of the blower, so the blower does not require independent support.

**RAH, TAH-R**

The mounting brackets supplied with the burner are capable of supporting the weight of the burner. Support the blower and air manifold independently of the burner.

**Air Manifold (only RAH, TAH-R)**

The air manifold must be large enough to supply the required combustion air flow with minimum pressure drop. Do not use more than one 90° bend between the blower and the burner air inlet.

**Gas Piping**

Use flexible nipples to allow for thermal expansion of the burner.

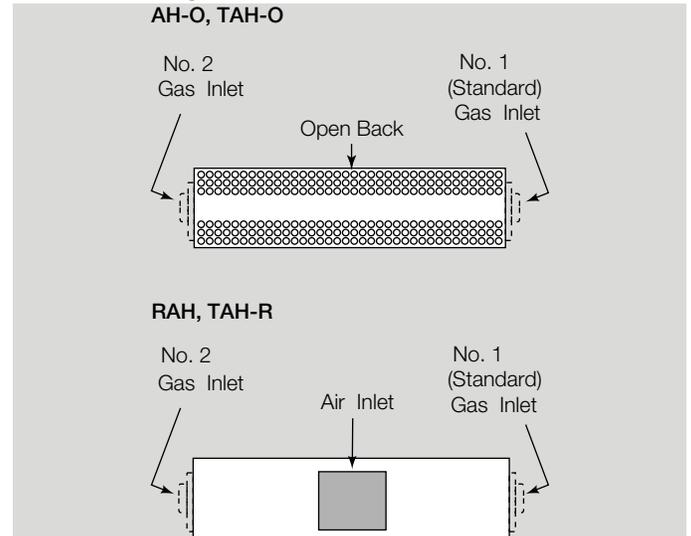
**Check Valve Piping**

Gas flow through the check valve must be horizontal, see page 4 (Check Valve)

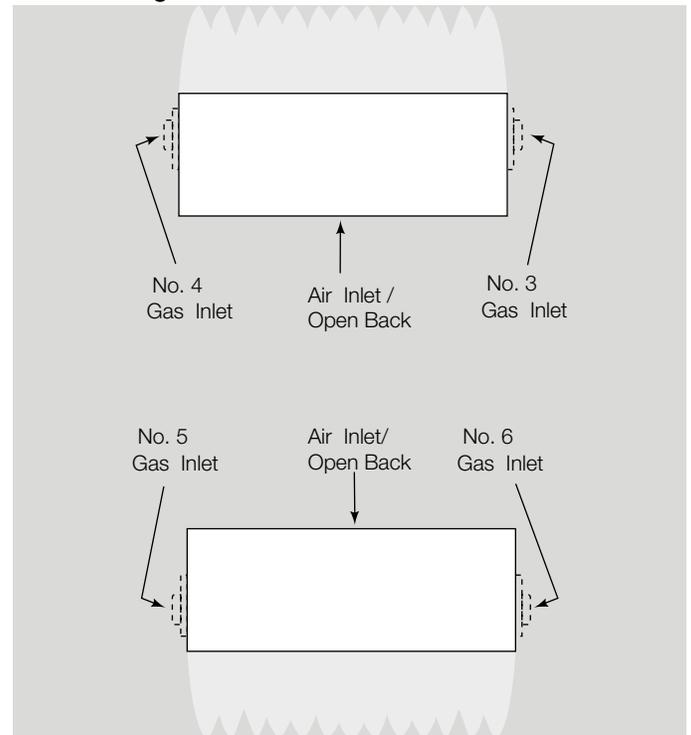
**BURNER FIRING ARRANGEMENTS (AH-O, TAH-O, RAH, TAH-R)**

The AirHeat burner can fire in any direction. Flow through the burner's check valve, however, must be horizontal. A guide for identifying some standard arrangements is shown below. Be sure to indicate the appropriate number arrangement when ordering. If no arrangement is indicated, No 1 will be furnished as standard.

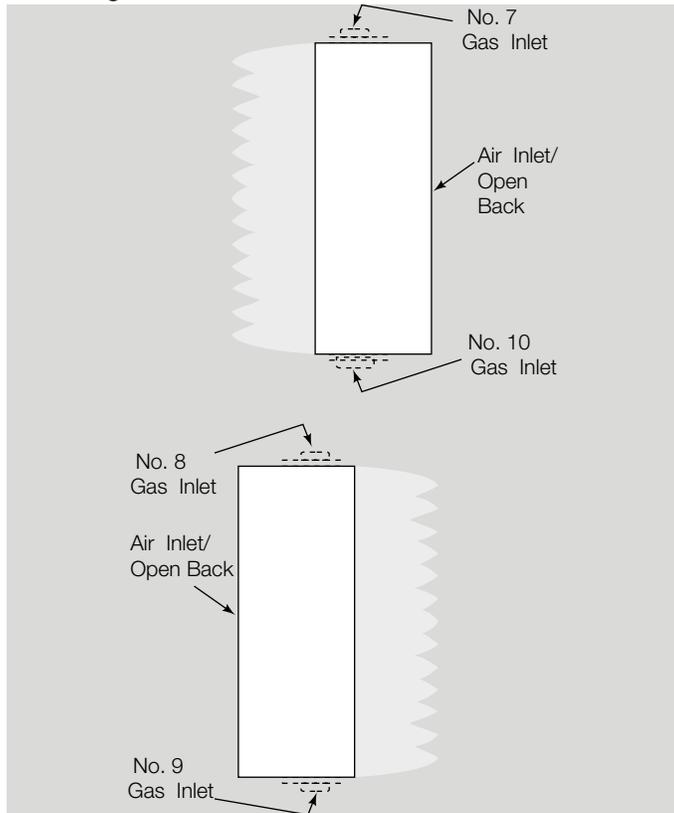
**Horizontal Firing**



**Vertical Firing**



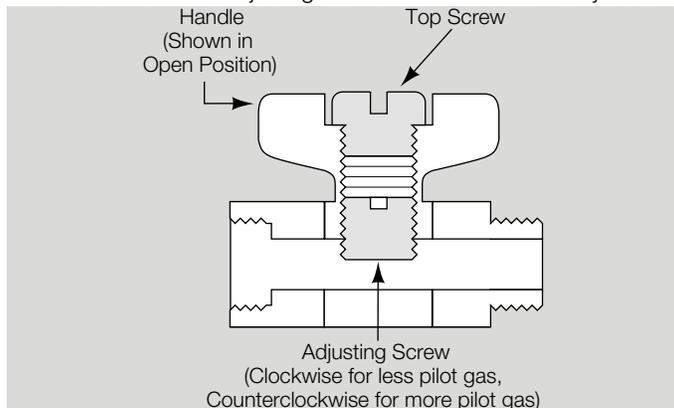
## End Firing



## STARTUP AND ADJUSTMENT

### Initial Settings

- 1 Adjust the linkage of the gas control valve so that when heat is called for, the valve is 10° from fully open, and when cooling is required, the valve is approximately 5° from fully closed.
- 2 Close all manual gas cocks.
- 3 With the pilot cock handle in the closed position, remove the top screw and turn the adjusting screw five turns out from fully closed.



### Start Blower

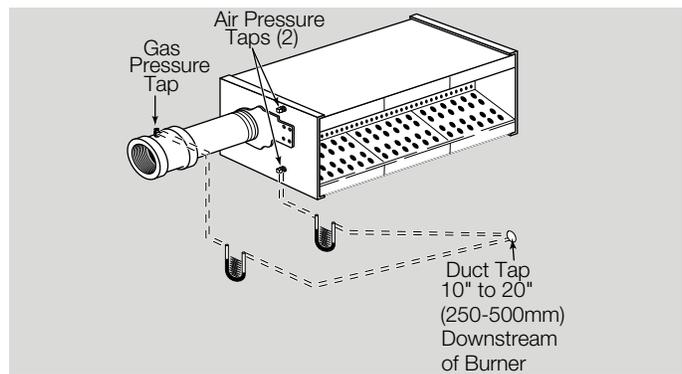
- 1 Start the combustion air blower.
- 2 Check the rotation to make sure it is correct. If not, have a qualified electrician rewire the blower for proper rotation.

### Start Circulation Fan

- 1 Start the duct circulation fan.

### Set Air Pressure Drop

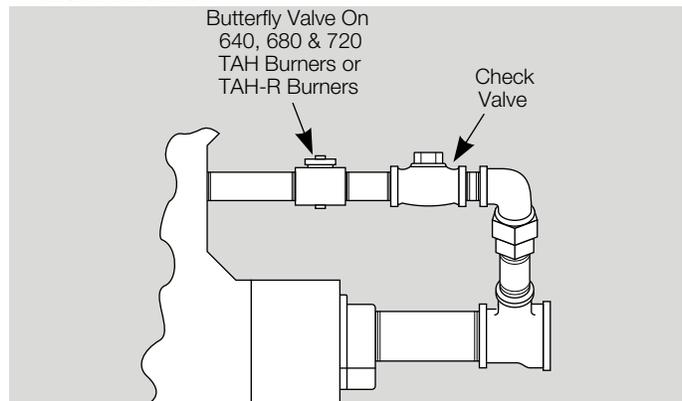
- 1 Measure the air pressure drop across the burner.



- 2 Adjust the air pressure drop is between 0.4 "w.c. (1 mbar) minimum and 1.0 "w.c. (2.5 mbar) maximum.

→ For a given input, lower air pressure drops will produce a longer flame, and higher drops will produce a shorter flame.

→ **Large Burners Only:** Some models, such as the 640, 680, and 720 TAH or TAH-R burners, contain a butterfly valve in the check valve line.



→ On these models, after setting the air flow as described, measure the air pressure drop between the gas pressure tap and the duct. Gas flow must be off. Adjust the butterfly valve to produce an air pressure drop of 0.2 "w.c. (0.5 mbar).

### Start Spark

- 1 Energize the ignition spark.

### ⚠ WARNING

– Do not touch the ignition rod, ignition wire, or transformer while the spark is energized, or you will get a shock.

### Set Pilot Flow

- 1 Open all pilot gas valves, including the handle of the pilot cock, see "Initial Settings". The pilot should light.
- 2 Turn the pilot adjusting screw to produce a bushy blue flame that provides a flame monitoring signal strong enough to reliably open the gas shut-off valves.

### Set Gas Flow

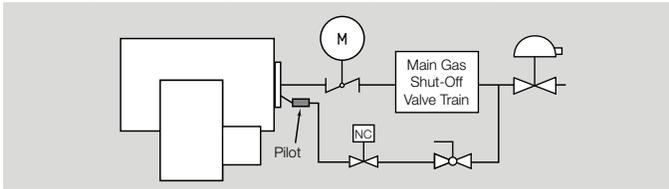
- 1 Measure the gas differential pressure as demonstrated in Set Air Pressure Drop.
- 2 With the gas control valve at low fire, open all main gas valves. The burner should light with a stable, blue low fire flame that extends evenly down the burner length.
- 3 Drive the control valve to high fire and adjust the gas adjusting valve to produce a pressure drop that corresponds to the desired high fire rate.
- 4 When setting high fire, ensure the flame does not impinge on anything downstream of the burner. To shorten the flame length for a given gas input, increase the air pressure drop as described in page 8 (Startup and Adjustment) paragraph above.

### Check All Settings

- 1 Return the burner to low fire and check to ensure the burner remains lit with a stable flame that extends down the burner length.
- 2 Cycle the burner between low and high fire several times, checking pressure drops and flame lengths.

### Spark Ignited Pilot

→ When ordered, the pilot is packaged with the burner and includes an adjustable flow gas cock and pressure regulator.



### CAUTION

– It is not possible to use a continuous or intermittent pilot. The pilot fuel flow should be interrupted after the trial ignition period has expired.

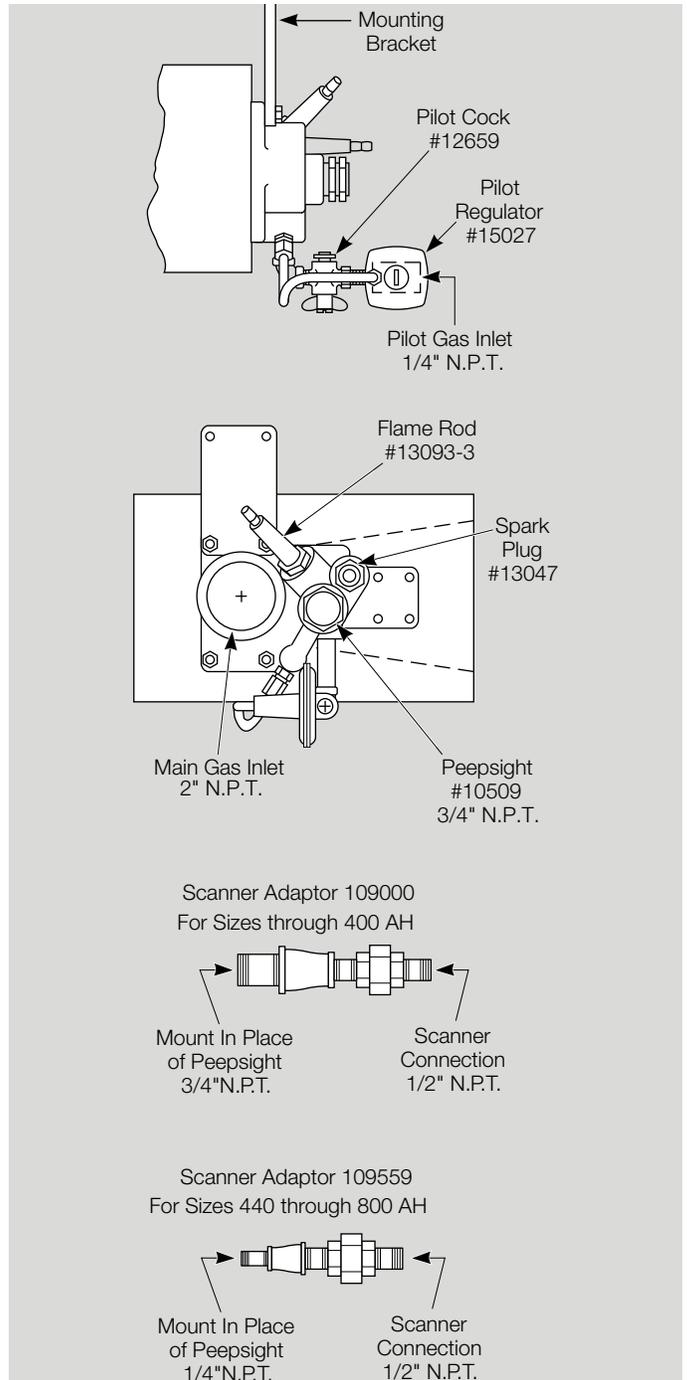
## ROUTINE MAINTENANCE

### Motor Lubrication (AH, TAH, CAH, RAH, TAH-R)

→ Oil the blower motor according to the manufacturer's instructions as printed on the motor label.

### Ignition Plug/Flame Rod

→ Ignition plugs and flame rods wear out over long periods of normal burner operation. Honeywell-Eclipse recommends that the user keep at least one of each in stock at all times to prevent nuisance shutdowns



Recommended spares

## ASSISTANCE IN THE EVENT OF MALFUNCTION

### Explanation of symbols

#### ? = Problem

- ! = Possible Cause
- = Solution

#### ? Burner does not start initially.

- ! Air pressure switches not making.
- ! Faulty pressure switches.
  - Check pressures in duct at location of switch connections.
  - Change pressure connections where a more positive pressure is present.
  - Check electrical portion of switch.

#### ? Burner kicks out shortly after start-up.

- ! Low gas pressure switch set too high.
  - Check low pressure switch setting.
  - Reset.

#### ? Pilot will not ignite on initial light-off.

- ! Raw gas fed into pilot causing carbon hair on spark plug.
  - Check spark plug for carbon hair; also check gap on plug. This gap should be 3/64" (1.3 mm) - 3/32" (2.3 mm).
  - Adjust pilot gas cock. Screw needle closed. With transformer powered open needle slowly, 1/4 turn at a time.

#### ? Flame failure when burner goes too high fire.

- ! Gas pressure to pilot regulator too high.
  - Check pilot gas pressure to regulator (should be 1 PSIG, 70 mbar, maximum).
  - Relocate pilot gas line or use second pilot regulator.
- ! Pilot casting bolts are not tight enough.
  - Check tightness of bolts.
  - Tighten bolts.
- ! Pilot regulator not reacting fast enough to duct pressure changes.
  - Check impulse line for possible dirt clogging. Check impulse line duct connection for effective pressure being transmitted to regulator.
  - Clean impulse line of any dirt particles and relocate duct connection to transmit maximum duct pressure.
- ! Check valve stuck open.
  - Clean check valve.
- ! Too much pilot gas.
  - Reduce pilot gas flow.

#### ? Flame failure when main burner returns from high to low fire.

- ! Gas pressure to pilot regulator.
- ! Under-gassing pilot
  - Check pilot gas pressure to regulator (should be 1 PSIG, 70 mbar, maximum).
  - Relocate pilot gas line or use second pilot regulator.
  - Check pilot regulator inlet and outlet gas pressures. Check pilot flame.
  - Open needle on pilot adjusting cock slowly 1/4 turn at a time.
  - Check impulse line for possible dirt clogging. Check impulse line duct connection for effective pressure being transmitted to regulator.
  - Clean impulse line of any dirt particles and relocate duct connection to transmit maximum duct pressure.

#### ? Main flame too large at high fire

- ! Gas pressure too high at burner inlet.
  - Check gas pressures.
  - Screw out on main gas pressure regulator. Adjust linkage on gas control valve to hold valve less than fully open when at high fire.
  - Check air pressure differential.
  - Open air shutter on makeup air blower.
- ! Check valve stuck open.
  - Clean check valve.

#### ? Main flame not extending beyond face of burner at high fire.

- ! Air pressure differential too high.
  - Check air pressure differential between combustion air manifold and main duct.
  - Close air shutter on makeup air blower.
- ! Burner not firing rated input.
  - Check gas pressure differential.
  - Screw in on main gas pressure regulator to provide more gas.
- ! Burner gas holes plugged.
  - Check gas holes for dirt or lint.
  - Clean gas holes with #42 MTD (2.3 mm) drill. Clean air holes with #27 MTD (3.6 mm) drill.

#### ? Main flame long and yellow

- ! Velocity past burner lower than 500 FPM (2.5m/s).
  - Check velocities and rotation of main circulating fan.
  - Open shutter on makeup air blower.
- ! Check valve stuck open.
  - Clean check valve.

## CONVERTING UNITS

See [www.adlatus.org](http://www.adlatus.org)



## FOR MORE INFORMATION

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Eclipse Inc.  
1665 Elmwood Rd. · Rockford, IL 61103  
United States  
[ThermalSolutions.honeywell.com](http://ThermalSolutions.honeywell.com)

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We reserve the right to make technical modifications in the interests of progress.