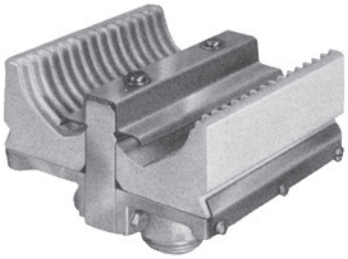
Bulletin 410
6/86

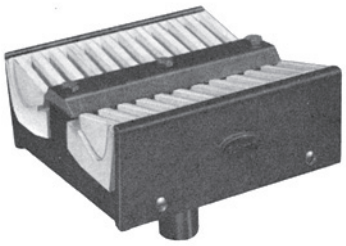
Eclipse Combustion

Gas-Fired Infra-Red Generators

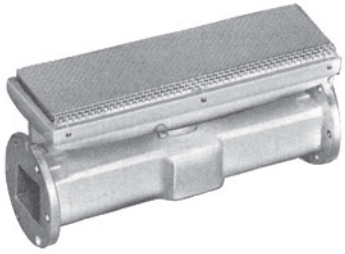
Low NO_x and CO!



100 Series Infra-Rad



200 Series Infra-Rad



Infra-Glo

Eclipse infra-red generators are gas burners designed specifically for industrial heat processes such as preheating, baking, drying, and curing. Eclipse manufactures two types of infra-red generator:

Infra-Rad Burners (pp. 2-5), are impingement type burners which generate intense, concentrated radiation and produce a blast of hot exhaust gases. Two models of Infra-Rad burner provide a choice of operating characteristics.

Infra-Glo Burners (pp. 5-7), are grid type burners producing a relatively soft, uniform radiation.

All burners are line-type pre-mix burners consisting of individual burner sections bolted together and mounted on an air/gas manifold. This sectional approach allows great flexibility in designing burner configurations closely tailored to specific job requirements.

AIR/GAS SUPPLY

Three basic methods are used to supply an air/gas mixture to these burners.

Proportional Mixing Systems use a venturi type device to mix the air and gas. Air from a blower flows through a venturi sleeve, entraining gas which is introduced at the venturi throat. Before entering the venturi, the gas is reduced to atmospheric pressure by a zero governor valve. An adjusting screw in the mixer is used to set the air/gas ratio. Once set, the air/gas ratio remains constant throughout the capacity range of the mixer. Mixture volume is controlled by a butterfly valve in the air line to the mixer. Proportional mixers are shown in the typical installations on pages 7 and 8 of this Bulletin. For more information on proportional mixers, see Eclipse Bulletins L-300 and L-310.

Mechanical Mixing Systems use a gas-tight centrifugal pressure blower with a valve on the air inlet to control blower volume. A gas valve, integral with the air valve, controls gas flow into the blower according to changes in the air valve position. A series of adjusting screws is provided to initially set the air/gas ratio at several points in the throttling range. Once the proper air/gas ratios are set, no further adjustment is necessary. See Eclipse Bulletins L-400 and L-410 for more information on mechanical mixing systems.

Carburetor Mixing Systems, like mechanical systems, use linked air and gas valves to control air/gas ratio throughout the operating range. Unlike proportional or mechanical systems, however, mixture volume can be controlled downstream of the mixer. Carburetor systems provide accurate control over turndown ranges of 100:1 or more, and are often used in large installations where many individually controlled burners are supplied from one central mixing system. See Eclipse Bulletin L-500 for more information on carburetor mixing systems.

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. Eclipse can supply such equipment or information on alternate sources.

ECLIPSE™
Innovative Thermal Solutions

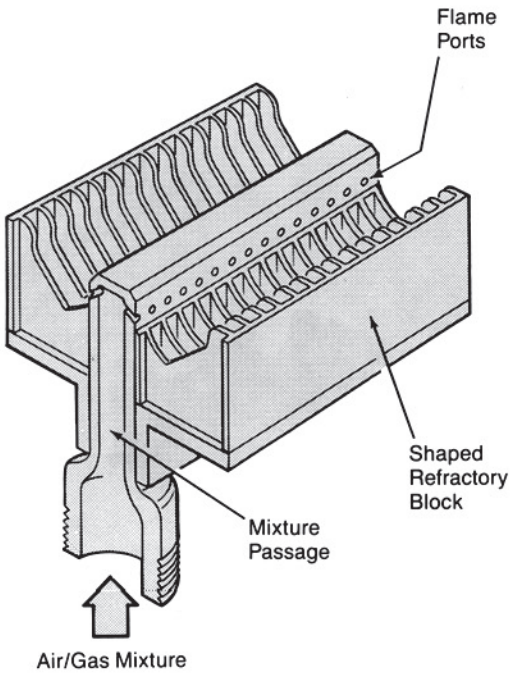
INFRA-RAD BURNERS

Infra-Rad Burners are impingement type infra-red generators incorporating shaped refractory blocks. Rows of small ports direct flame against the curved block surfaces, heating them to temperatures ranging from 1800° F to 2200° F. Infra-Rad burners produce a high intensity, concentrated radiation. In addition, the curvature of the refractory directs a hot, turbulent stream of exhaust gases toward the product, scrubbing the surface of vapor films and enhancing heat transfer.

Two Infra-Rad models, the 100 Series and 200 Series, are available. Compared to the 200 Series, the 100 Series burners produce a more concentrated stream of exhaust gases. When 100 Series burners are mounted facing down, the exhaust will travel from 10″ to 12″ before losing momentum and rising. 100 Series burners can be operated with a turndown of 10:1. Radiant output drops in proportion to decreasing gas input.

200 Series burners produce a less intense stream of exhaust products. Like the 100 Series, 200 Series burners may be operated with a turndown of 10:1. However, the radiant output of the 200 Series drops off more sharply than the 100 Series as gas input is decreased.

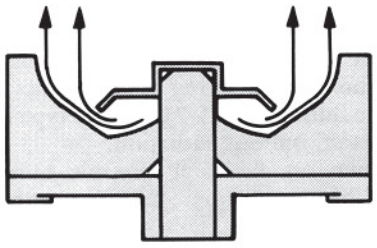
Both models can be supplied in single or double row sections. Corner sections can be supplied for 200 Series burners, allowing them to be installed in saw tooth, square wave, or other special configurations. Infra-Rad Burners may be ignited by direct spark or by a spark-ignited blast type pilot. Flame monitoring may be by flame rod or U.V. scanner.



IMPINGEMENT TYPE BURNER

SPECIFICATIONS

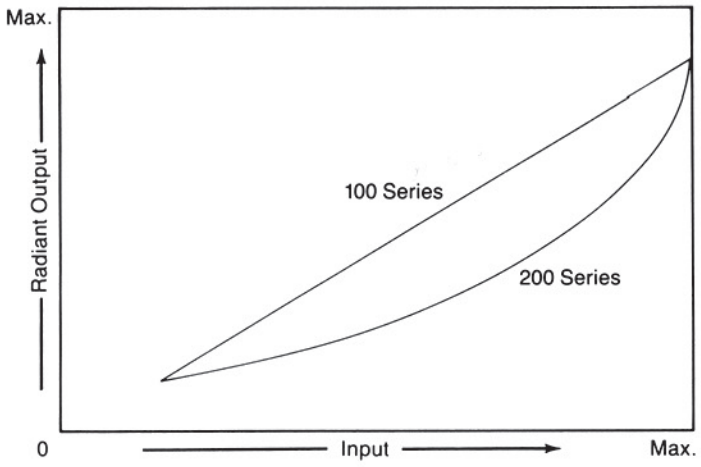
Burner	100 Series		200 Series	
	64 IR	67 IR	2124 IR	2066 IR
Rows Per Section	1	2	1	2
Section Length	6″	6″	12″	6″
Max. Input Per Section, Btu/Hr.	30,000	60,000	60,000	60,000
Mixture Press. Required	8″ w.c.	8″ w.c.	8″ w.c.	8″ w.c.

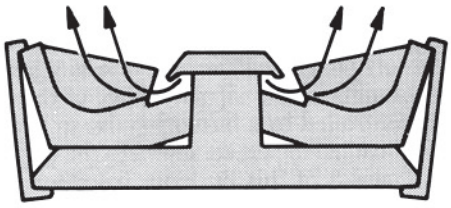


100 SERIES

Curvature concentrates exhaust stream.

INPUT VS. RADIANT OUTPUT



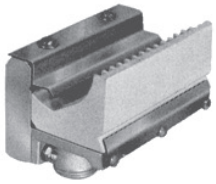


200 SERIES

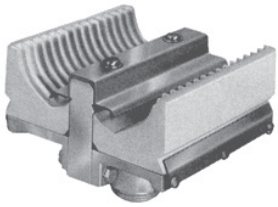
Curvature produces more diffuse exhaust stream.

INFRA-RAD BURNER CONFIGURATIONS

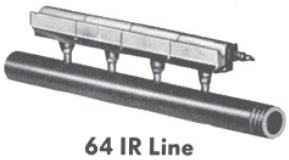
100 SERIES IR



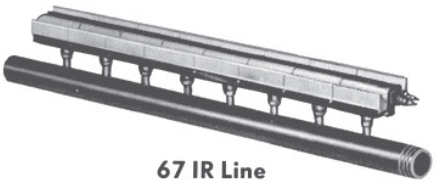
64 IR
Section



67 IR
Section



64 IR Line



67 IR Line

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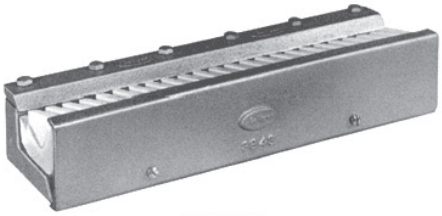
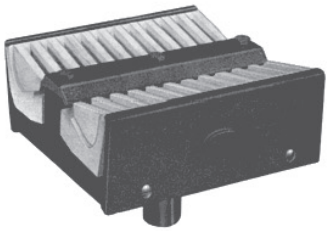
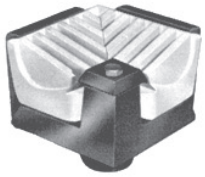
200 SERIES IR



2124 IR
Section

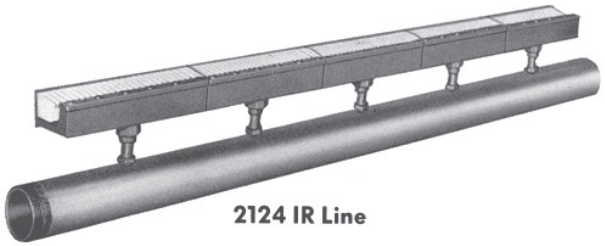


2066 IR
Section

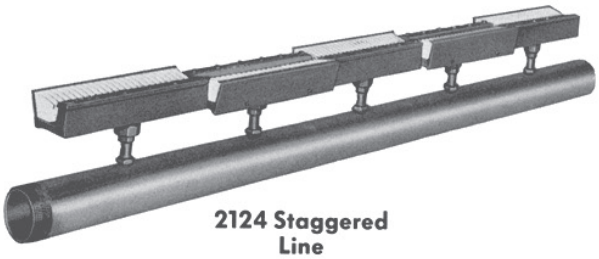


2124 IR Corner

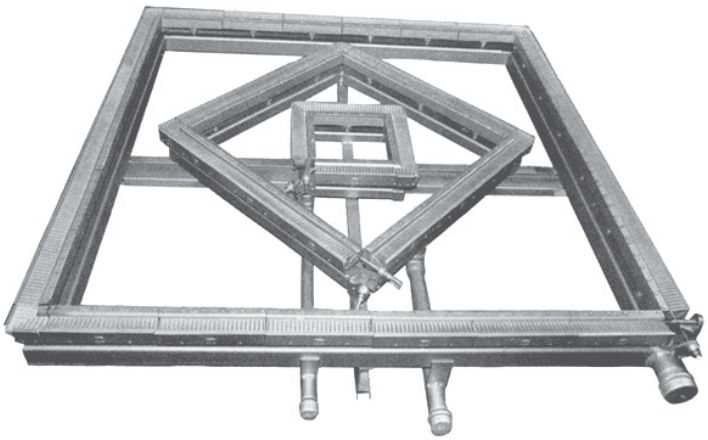
2066 IR Line



2124 IR Line

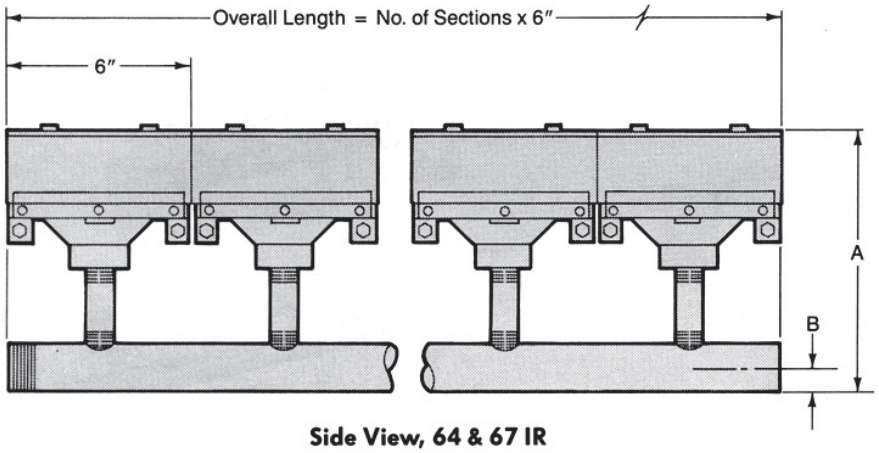


2124 Staggered
Line

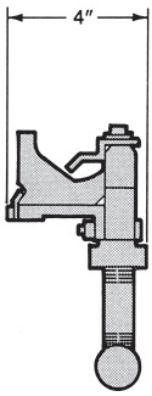


Using 2124IR straight and corner sections, nearly any burner configuration can be designed.

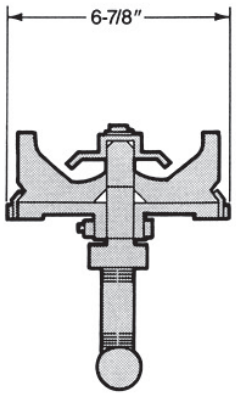
DIMENSIONS
100 SERIES IR



Side View, 64 & 67 IR



End View
64 IR



End View
67 IR

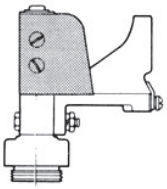
Pipe Size	Maximum Number of Sections		Dimensions In Inches		Weight Per Section, Lbs.	
	64 IR	67 IR	A	B	64 IR	67 IR
1-1/2	10	5	7-5/8	15/16	8	12
2	20	12	9	1-3/16	9	12-1/2
2-1/2	22	14	9-5/8	1-7/16	10-1/2	13-1/2
3	40	26	10-3/16	1-3/4	11-1/2	14-1/2
4	82	42	11-3/16	2-1/4	13	16
6	100	90	13-3/8	3-5/16	17	20

Manifold is schedule 40 pipe.
Contact factory for lengths over 252″.
Inlet may be placed at end (standard), bottom, or side of manifold.

100 SERIES ACCESSORIES

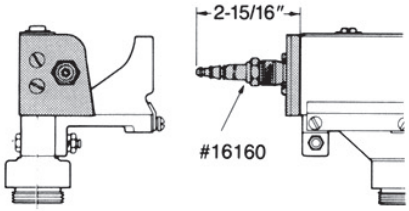
64 IR

Plain End Plate



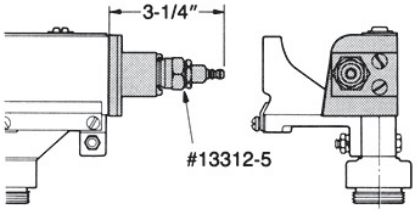
Assy. No. 113002

Ignition End Plate w/Spark Plug



Assy. No. 113004

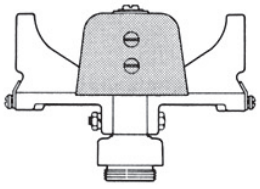
Flame Rod End Plate w/Flame Rod



Assy. No. 113007

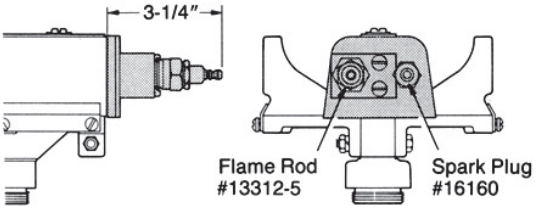
67 IR

Plain End Plate



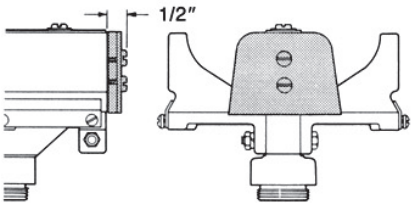
Assy. No. 113009

Ignition & Flame Rod End Plate w/Spark Plug & Flame Rod



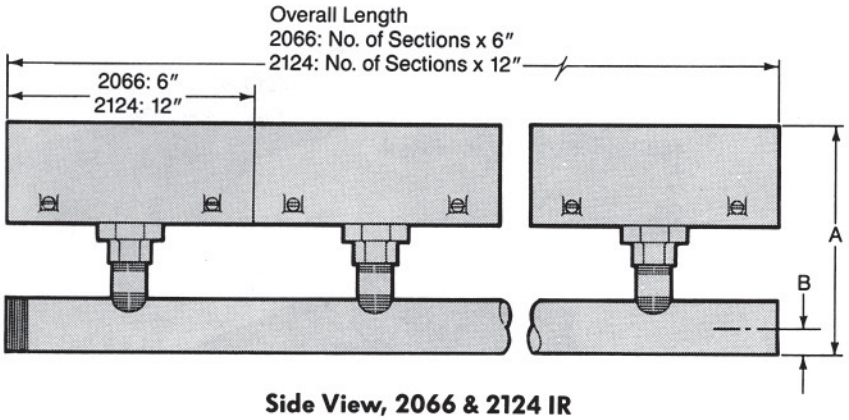
Assy. No. 113013

Flame Turn-Around End Plate

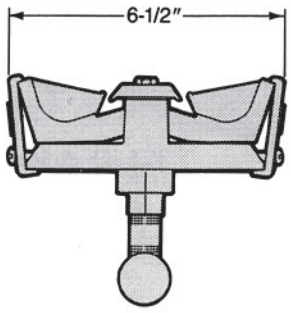


Assy. No. 113012

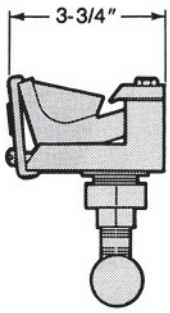
DIMENSIONS
200 SERIES IR



Side View, 2066 & 2124 IR



End View
2066 IR



End View
2124 IR

Pipe Size	Maximum Number of Sections		Dimensions In Inches		Weight Per Section, Lbs.	
	2066 IR	2124 IR	A	B	2066 IR	2124 IR
1-1/2	5	7	6	15/16	12	14
2	12	12	6-1/2	1-3/16	12-1/2	15-1/2
2-1/2	14	16	7	1-7/16	13-1/2	17
3	26	25	7-1/2	1-3/4	14-1/2	18
4	42	41	8-1/2	2-1/4	16	18
6	90	50	10-1/2	3-5/16	20	18-1/2

Manifold is schedule 40 pipe.
Contact factory for lengths over 252″.
Inlet may be placed at end (standard), bottom, or side of manifold.

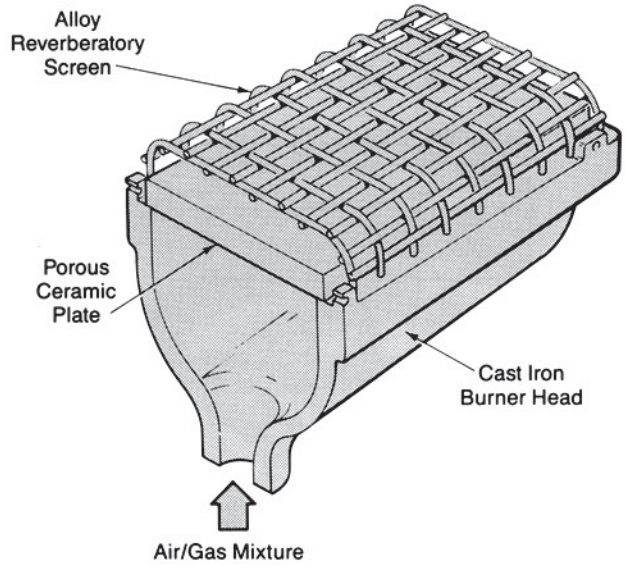
INFRA-GLO® BURNERS

Infra-Glo Burners contain a porous ceramic plate covered by an alloy reverberatory grid. A pressurized air/gas mixture flows through the ceramic and burns between the plate surface and the grid. Operating with a face temperature of approximately 1600° F, the ceramic plate emits a relatively soft, diffuse radiation to the product. Infra-Glo burner sections can be mounted in panel configurations to create large, uniformly radiant surfaces ideal for applications such as softening plastic sheets prior to vacuum forming.

Depending on ambient temperatures, product surface reflectivity, and product-to-burner distance, Infra-Glo Burners can be operated with fixed inputs from 15,000 to 20,000 Btu/hr. per linear foot of burner. To prevent the porous ceramic plate from clogging, the combustion air blower must be equipped with an air inlet filter to eliminate any dust or particulates.

Infra-Glo Burners may be ignited by direct spark or by a spark-ignited blast type pilot. Flame monitoring may be by flame rod or U.V. scanner.

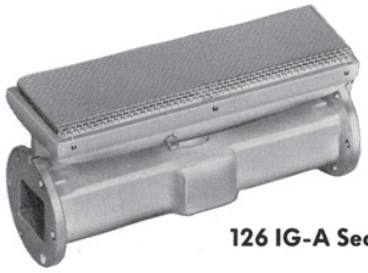
GRID TYPE BURNER



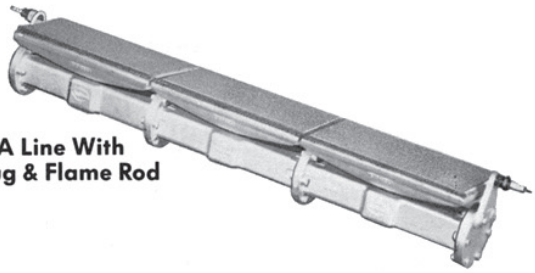
SPECIFICATIONS

Manifold Mixture Pressure Required:
3.3″ w.c.
Maximum Capacity per Section:
Natural Gas: 20,000 Btu/hr.
Propane: 16,000 Btu/hr.
Maximum Face Temperature:
Natural Gas: 1700°F
Propane: 1600°F

INFRA-GLO BURNER CONFIGURATIONS

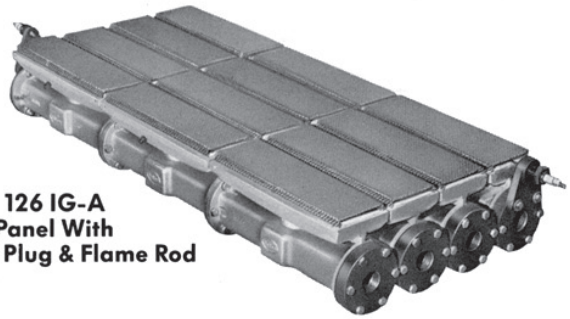


126 IG-A Section



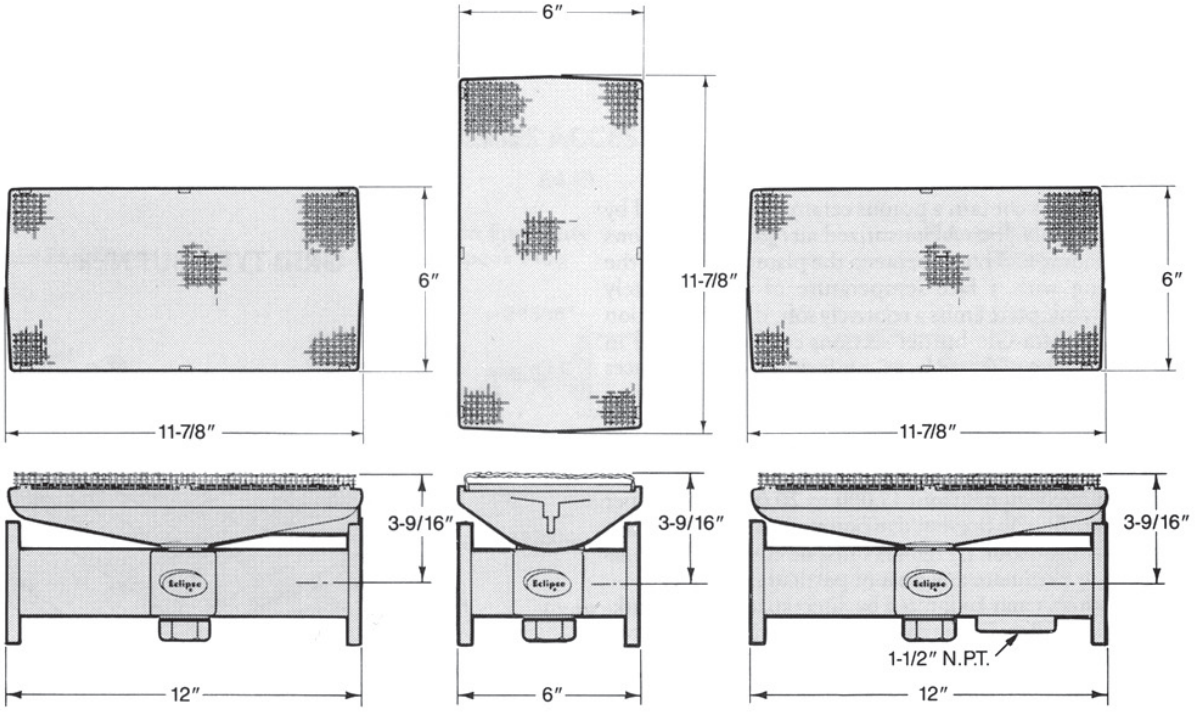
126 IG-A Line With
Ignition Plug & Flame Rod

612 IG-A Section



126 IG-A
Panel With
Ignition Plug & Flame Rod

INFRA-GLO ASSEMBLIES



126 IG-A

612 IG-A

126 IGB-A
Bottom Inlet Supplies
Up To Ten Sections

Catalog Number	Assembly Numbers	
	Manifold Section	Burner Head
126 IG-A	171052	109040
612 IG-A*	109376	109040
126 IGB-A	171053	109040

*Requires one spacer (#14398) between manifold sections for clearance between heads.

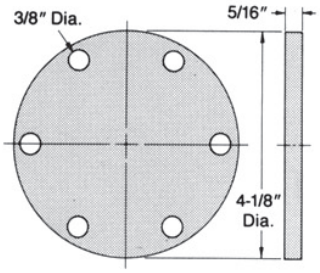
Ordering Information

Burner heads and manifolds are shipped separately and must be assembled in the field.

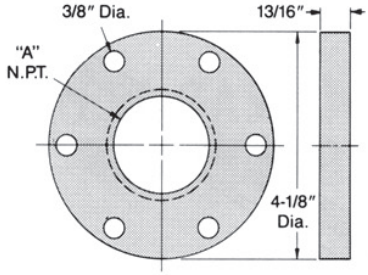
Head assemblies include hold-down bolt and gaskets.

Manifold assemblies include eight flange bolts and nuts.

INFRA-GLO ACCESSORIES

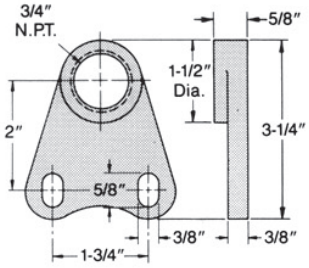


Plain End Flange
Part No. 3602

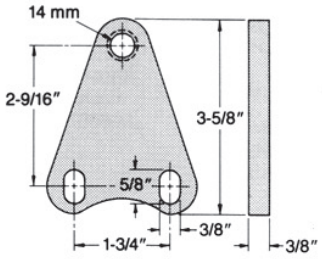


Inlet End Flange
Includes 8 Flange Bolts.

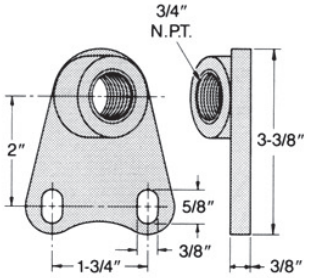
Assy. No.	"A"	Supplies
109364	1"	4 Burner Sections
109365	1-1/2"	7 Burner Sections
109366	2"	10 Burner Sections



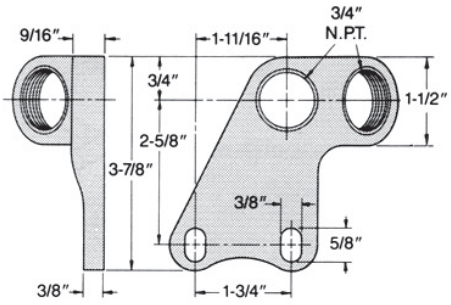
Flame Rod Bracket
Assy. No. 109361
Includes 2 Flange Bolts
Use Flame Rod #12392, 3" Long



Ignition Plug Bracket
Assy. No. 109360
Includes 2 Flange Bolts
Use Plug #13047



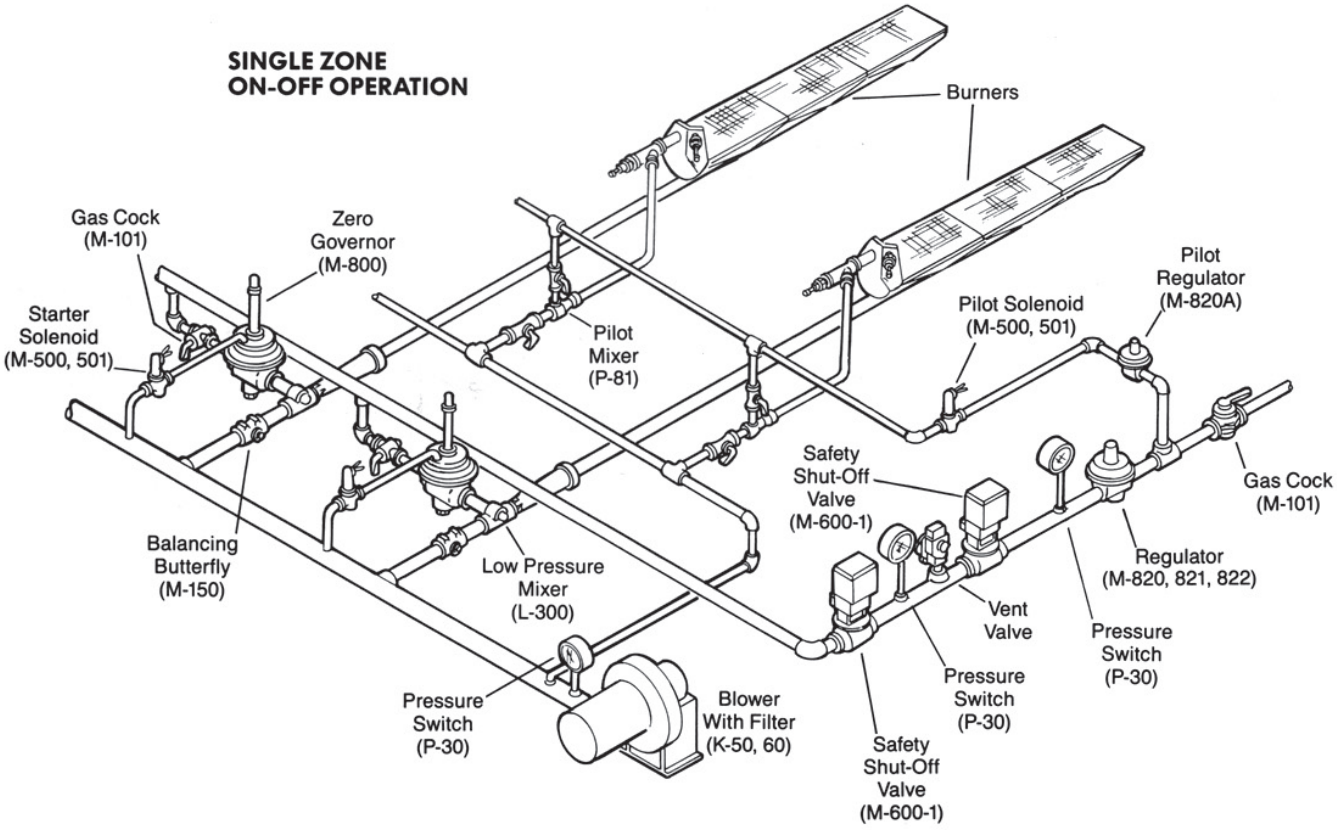
U.V. Scanner Bracket
Assy. No. 109362
Includes 2 Flange Bolts



Pilot & Flame Rod Bracket
Assy. No. 109363
Includes 2 Flange Bolts

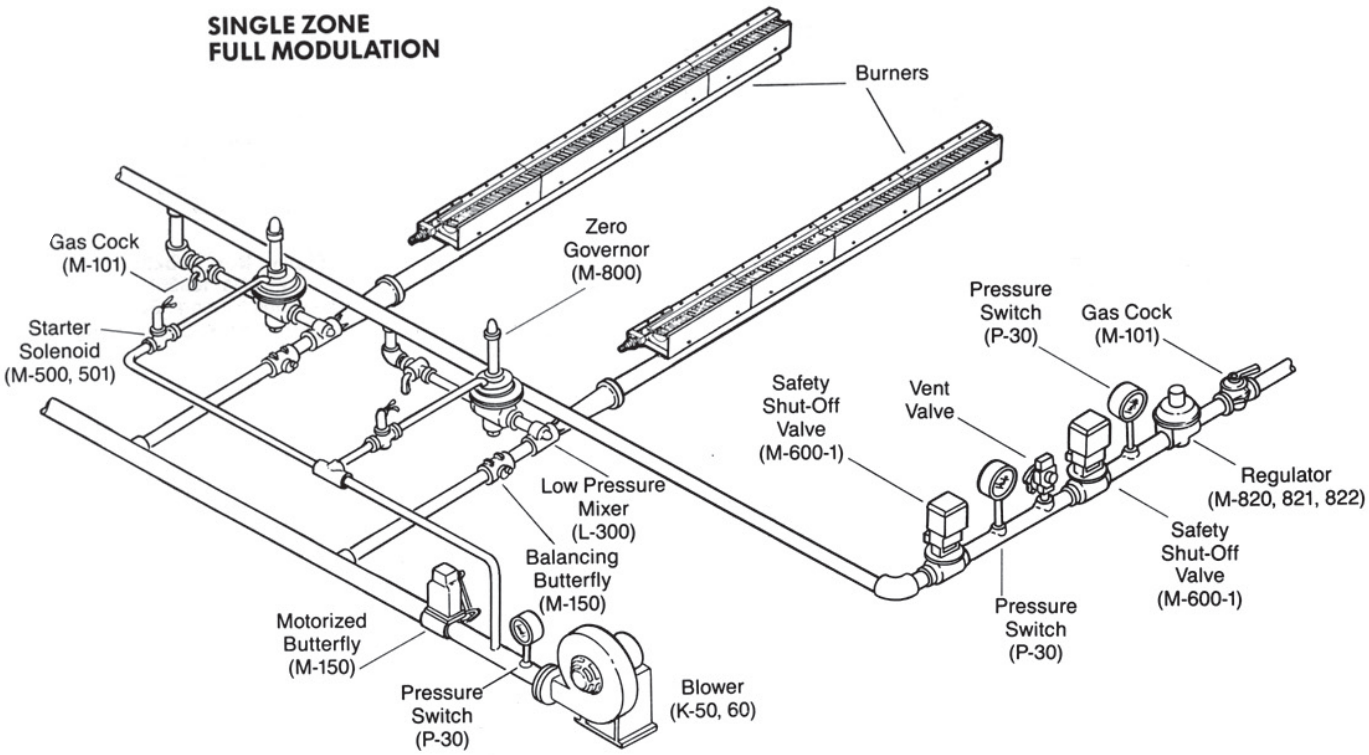
TYPICAL INSTALLATIONS

SINGLE ZONE
ON-OFF OPERATION

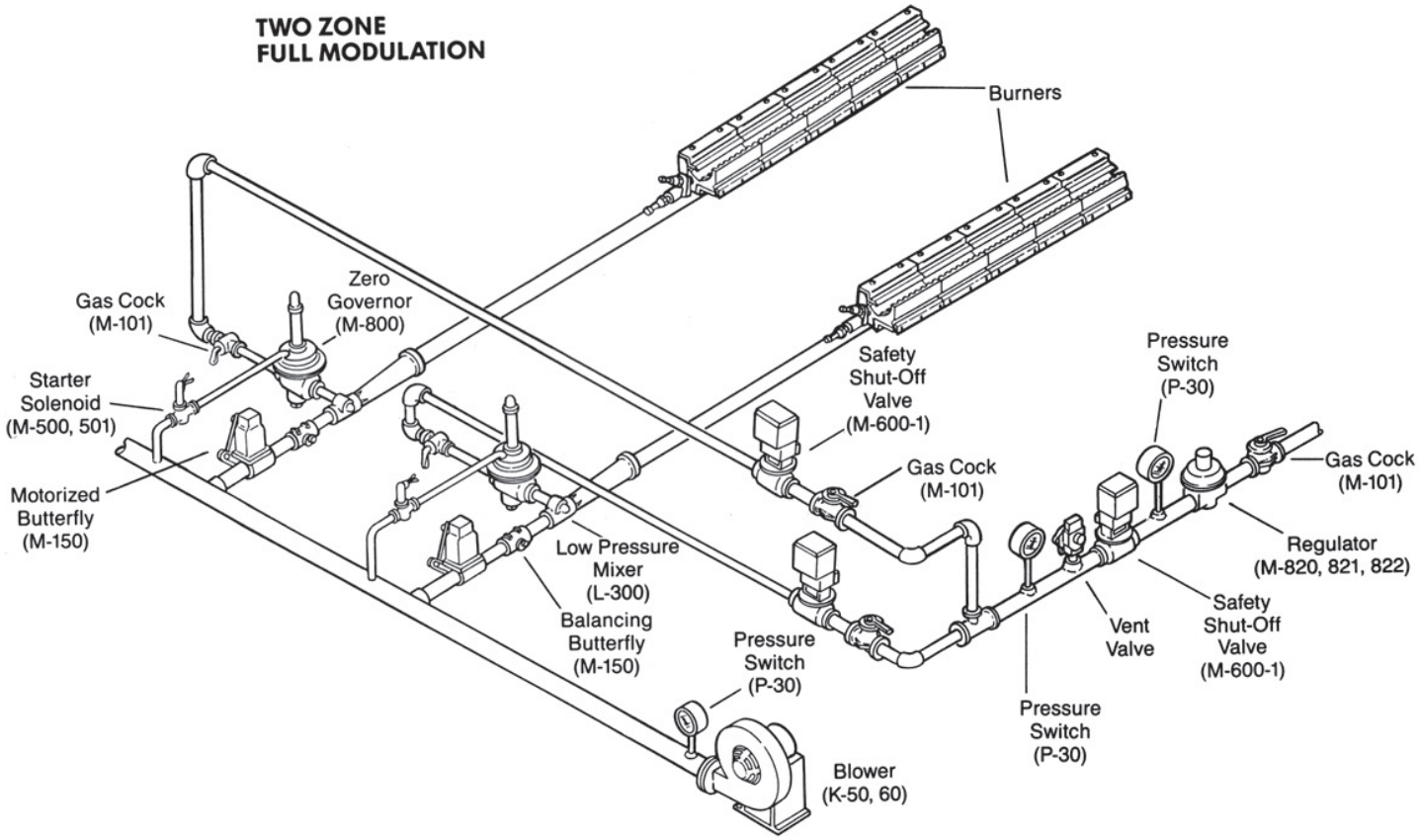


TYPICAL INSTALLATIONS

SINGLE ZONE FULL MODULATION



TWO ZONE FULL MODULATION



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