

# BURNERS/PROFILE PLATES/PILOT ASSEMBLY

The burner is the heat source of the heater. The air stream crossing the burner furnishes combustion air. Combustion will occur properly when the air velocity and pressure drop across the burner are in the correct range. A unique feature to our direct fired heaters is the self-adjusting burner profile plates. These profile plates ensure that there is the proper air velocity and pressure drop across the burner for clean combustion. The spring-loaded profile plates react to the fresh air stream momentum and therefore need no motors or actuators to drive them.

Another important component to the burner is the pilot assembly. The pilot assembly consists of the pilot tube inlet to the burner, the ignition electrode for flame light off, and the flame rod for sensing the presence of flame.

## BURNERS

The burners used in the direct fired heater are constructed of stainless steel combustion baffles attached to a cast iron gas supply section with no moving parts. The burner is capable of 100% thermal efficiency with a maximum turndown ration of 30 to 1. The Midco "H" series burners are rated at a maximum BTU of 550,000 per foot of burner and meet the combustion standards of ANSI Z83.4. It also meets the following combustion levels:

- <5 ppm concentration of CO (Carbon Monoxide) added to air stream
- <.50 ppm concentration of NO<sub>2</sub> (Nitrogen Dioxide) added to air stream
- <4000 ppm concentration of CO<sub>2</sub> (Carbon Dioxide) added to air stream
- <1 ppm concentration of Aliphatic Aldehydes added to air stream

The burners used in the indirect fired heater furnaces are constructed of 100% 409 SS and are capable of 80% thermal efficiency and a maximum turndown ration of 2.5 to 1. The indirect fired burners are just one component that make up the furnace assembly. Other components in the furnace include the 100% 409SS heat exchanger, power vent and 100% 409SS drip pan.

## BURNER/FURNACE CHART

Unit	Minimum BTU/Hr	Maximum BTU/Hr	Burner Sizes Available
Size 1 Direct Fired	18,333	550,000	6" or 12"
Size 2 Direct Fired	18,333	825,000	12" or 18"
Size 3 Direct Fired	36,667	1,000,000	24"
Size 4 Direct Fired	45,833	1,650,000	30"
Size 5 Direct Fired	91,667	2,750,000	60"
Size 1 Indirect Fired	64,000	160,000	200 MBH
Size 2 Indirect Fired	128,000	320,000	350 MBH or 400 MBH
Size 3 Indirect Fired	256,000	640,000	700 MBH or 800 MBH

## PROFILE PLATE SPRING CHART

Direct Fired Unit	Spring	Torque Per Spring at 180°	Number of Springs Per Plate
Size 1	531944-0104	.18 to .22 in-lbs	2
Size 2	STS1643035	.26 to .28 in-lbs	3
Size 3	STS1643035	.26 to .28 in-lbs	4
Size 4	H2013-A	5.5 to 6 in-lbs	2
Size 5	H2013-A	5.5 to 6 in-lbs	2

## DIRECT FIRED PILOT ASSEMBLY

As previously mentioned, the Midco pilot assembly consists of the pilot tube, the ignition electrode, and the flame rod. It is very important that the spacing between components adhere to the diagram in Figure 1. The ignition electrode sparks directly to the pilot gas tube and the spacing between these components is critical for proper flame ignition. The gap between the flame rod and ground rod is also critical for proper flame sensing. Since the flame itself rectifies the signal sent to the flame rod, the distance between the flame rod and ground will effect the signal that the flame safety controller receives back from the flame rod. By maintaining the correct spacing here, service on the heater will be limited.

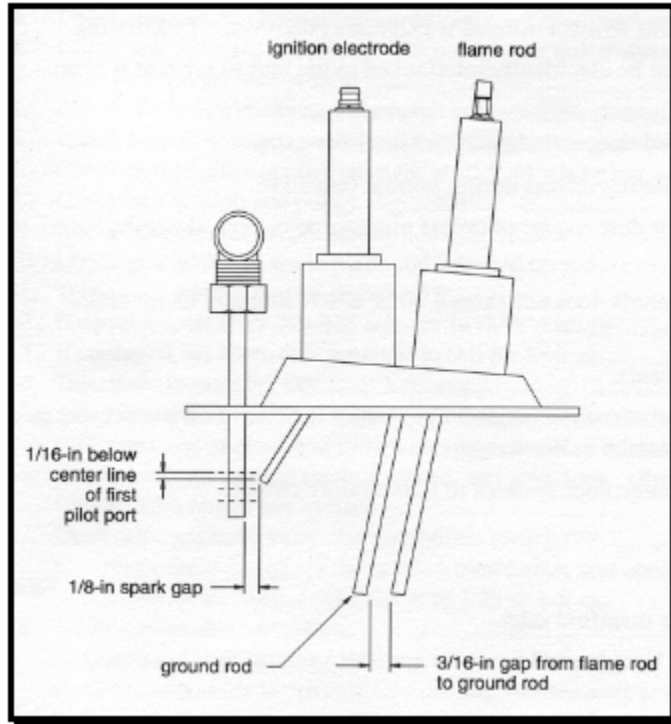


Figure 1

## INDIRECT FIRED PILOT ASSEMBLY

The indirect fired heater pilot assemblies contain a spark electrode, used for sparking and flame sensing, and a pilot tube. The spark electrode sparks directly to the pilot tube and once a flame is established, the electrode begins to sense the flame. The Robertshaw pilot assembly part number is 1830-722.