

# RADIANT TUBE COMBUSTION SYSTEMS

## SINGLE-END RECUPERATIVE

MODEL: SER

Revision: 1

BULLETIN  
3902

### DESCRIPTION

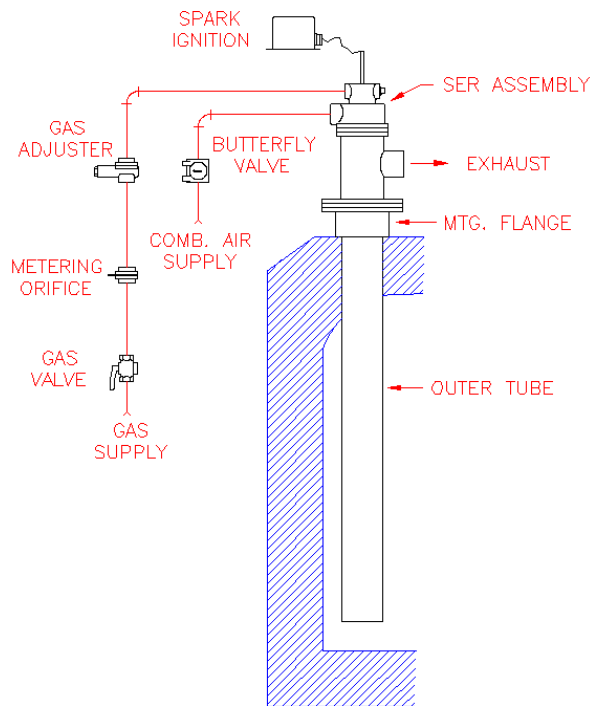
In a furnace operating with a conventional radiant tube combustion system, 65 to 70% of the heat created by combustion is wasted in the flue gas.

Single-ended recuperative radiant tube combustion system (SER) reduces that wasted heat dramatically. Because it uses up to 70% of the available exhaust gas heat to preheat incoming combustion air the furnace's fuel consumption is reduced significantly (Fig. 1).

The result is average fuel savings of up to 50%.

The patented SER is a complete system, combining burner, radiant tube and recuperator in a single, compact unit.

It comes with all the accessories needed, from adjustable gas cocks to butterfly valves to ignition system (Fig. 1).



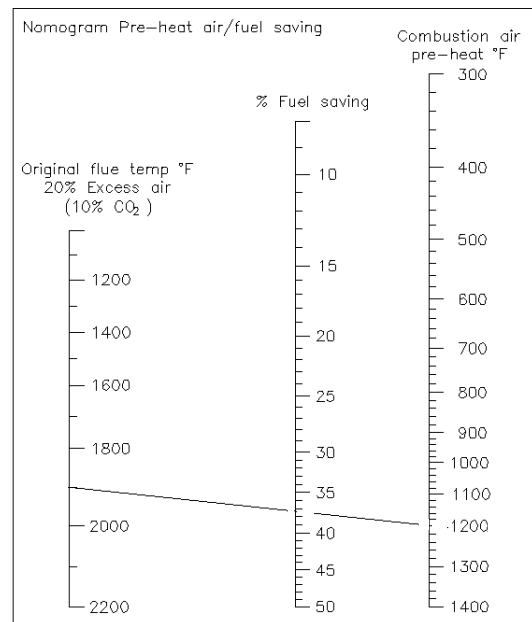
**Fig. 1.** As the incoming combustion air passes through the SER's recuperator section, it is preheated by hot exhaust gases. The medium velocity, sealed nozzle mix burner utilizes both gas and preheated air and fires down a center flame tube to provide uniform progressive combustion.



### FEATURES

Because existing hardware and applications vary from facility to facility, every SER is custom engineered to maximize combustion efficiency.

SER users typically experience fuel savings of 40 to 50%.



**Fig. 2.** To determine the fuel savings expected, draw a straight line from flue gas temperature to post-conversion preheat temperature. For example, air preheated to 1200 degrees F from 1900 degrees F flue gas will result in fuel savings of about 37-1/2%.

**CAUTION:** Operation of combustion equipment can be hazardous resulting in bodily injury or equipment damage. Each burner should be supervised by a combustion safeguard and only qualified personnel should install, make system adjustments and perform any required service.



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**NOTICE:** Pyronics practices a policy of continuous improvement in the design of its products. It reserves the right to change the specifications at any time without prior notice.

# SER RECUPERATIVE COMBUSTION SYSTEMS

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Every SER component is designed to give many years of reliable service. Materials are carefully evaluated to assure component life consistent with the application - generally speaking, FeNiCr or FeCrNi in either a cast or wrought form are used.

These materials are fabricated or formed into components engineered for extended reliability.

For example, the SER's medium velocity burner provides delayed mixing and uniform progressive combustion, for even tube heating and temperature uniformity.

Its innovative spark system delivers consistently trouble-free ignition.

Features like these result in reliable performance, year after year. The proof is in the field: thousands of SER's are already providing dependable service in captive and commercial heat treat shops around the world.

Because SER's are easy to install and service, they reduce conversion downtime to a minimum.

Installation is simply a matter of removing existing tubes and burners and re-piping the main gas and air supplies to the SER. Even for untrained personnel, it takes as little as four man-hours per tube.

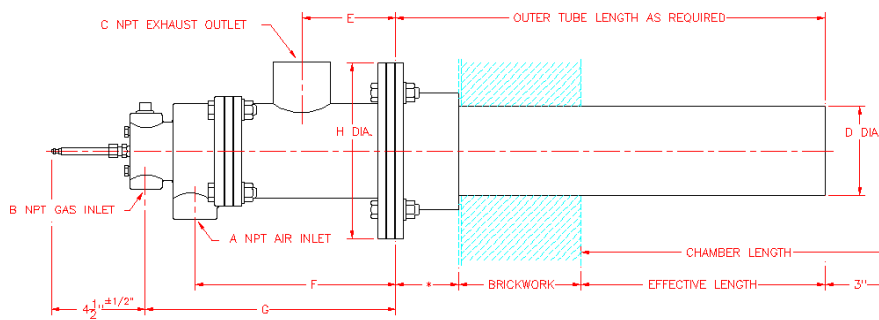
Servicing an SER is simple. The precisely sized and integrated components provide for easy adjustment of gas/air ratios.

All of which means furnace efficiency can be maximized with virtually no sacrifice in productivity.

Max. air pressure required 1.75" W. C.  
Max. gas pressure required 1" W. C.  
\*Dissipation rate is based upon theoretical calculation considering no specific environment.

Furnace Temp °F	*Dissipation Rate BTU/sq. in./hr
1560	77
1650	68
1750	60
1830	50
1920	40

## DIMENSIONS



\* = 3" UNLESS OTHERWISE SPECIFIED.

Model No.	A NPT	B NPT	C NPT	D DIA	E	F	G	H DIA
3-1/4 SER	1	1/2	2	3-1/4	5-1/4	9-5/8	12	7-1/4
4-1/4 SER	1	1/2	2	4-1/4	4-1/2	9-5/8	12	8-1/2
4-1/2 SER	1	1/2	2	4-1/2	4-1/2	9-5/8	12	8-1/2
6 SER	1-1/4	1/2	3	6	4-1/2	9-3/4	12-1/2	9-3/4

NOTE : All dimensions in inches  $\pm 1/8$

## ORDERING INFORMATION

Contact factory for assistance.