



# SULFUR RECOVERY UNIT

## Combustion Equipment



**BURNERS**

**FLARES**

**INCINERATORS**

**PARTS & SERVICE**

# SULFUR RECOVERY UNIT Combustion Equipment



*High Capacity Low NO<sub>x</sub> SRU  
Thermal Oxidizer Burners*

## Custom-designed SRU equipment.

The Sulfur Recovery Unit (SRU) is often referred to as the Claus Process. This process recovers elemental sulfur from petroleum and natural gas refining processes and reduces the hazardous sulfur emissions to limits permitted by national and local air quality requirements. Zeeco supplies all of the combustion equipment used in the Claus process, including high intensity style burners, reaction furnaces, inline heaters/reducing gas generators, tail gas incinerators, and waste heat boilers.

---

*World's largest SRU tail gas incinerator — one of nine similar incineration systems supplied by Zeeco*



## World-class engineering & reliability.

Zeeco is a world leader in the development of combustion solutions for the refining, petrochemical, chemical, and power generation industries. Our staff members have extensive experience in design, fabrication, and operation of SRU combustion equipment.

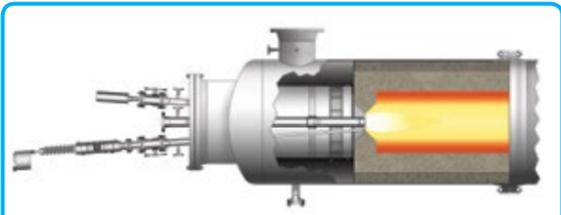
Zeeco has a proven track record of producing the world's largest and most advanced combustion equipment for the sulfur recovery process. Our combustion equipment is always custom engineered to meet our clients' specific needs, whatever the situation requires.

Equipment reliability is essential for profitable plant operations. For this reason, Zeeco chooses quality components and materials for all of our products to maximize service life and eliminate unnecessary shutdowns.

---

*SRU reaction furnace with firetube waste heat boiler*





### High Intensity Style Burners

Zeeco's high intensity style burners achieve rapid combustion in very small volumes in a wide range of conditions. This allows the burner to operate under reducing (oxygen-deficient) environments without smoke, soot, or oxygen slippage that otherwise could damage downstream catalytic reactors.

Zeeco employs proprietary spin vanes to create a vortex recirculation zone upstream of the burner discharge. Hot flue gas is recirculated into the burner mixing zone to create a highly stable flame front.

### Reaction Furnaces

The reaction furnace is the most important component of the SRU, initiating the conversion of H<sub>2</sub>S and other sulfur-bearing compounds to elemental sulfur. The overall reaction furnace dimensions are often specified by the process licensor. In the absence of licensor input, Zeeco can design the reaction furnace to meet your desired processing needs.



### Reaction Furnace Waste Heat Boilers

A firetube waste heat boiler is typically located directly downstream of the reaction furnace. This waste heat boiler generates waste heat steam while cooling the reaction furnace effluent. The inlet tube sheet of the reaction furnace waste heat boiler is typically refractory lined with ceramic ferrules located on the inlet of each tube to prevent damage to the tube sheet and the tube sheet welds.

### Tail Gas Incinerators

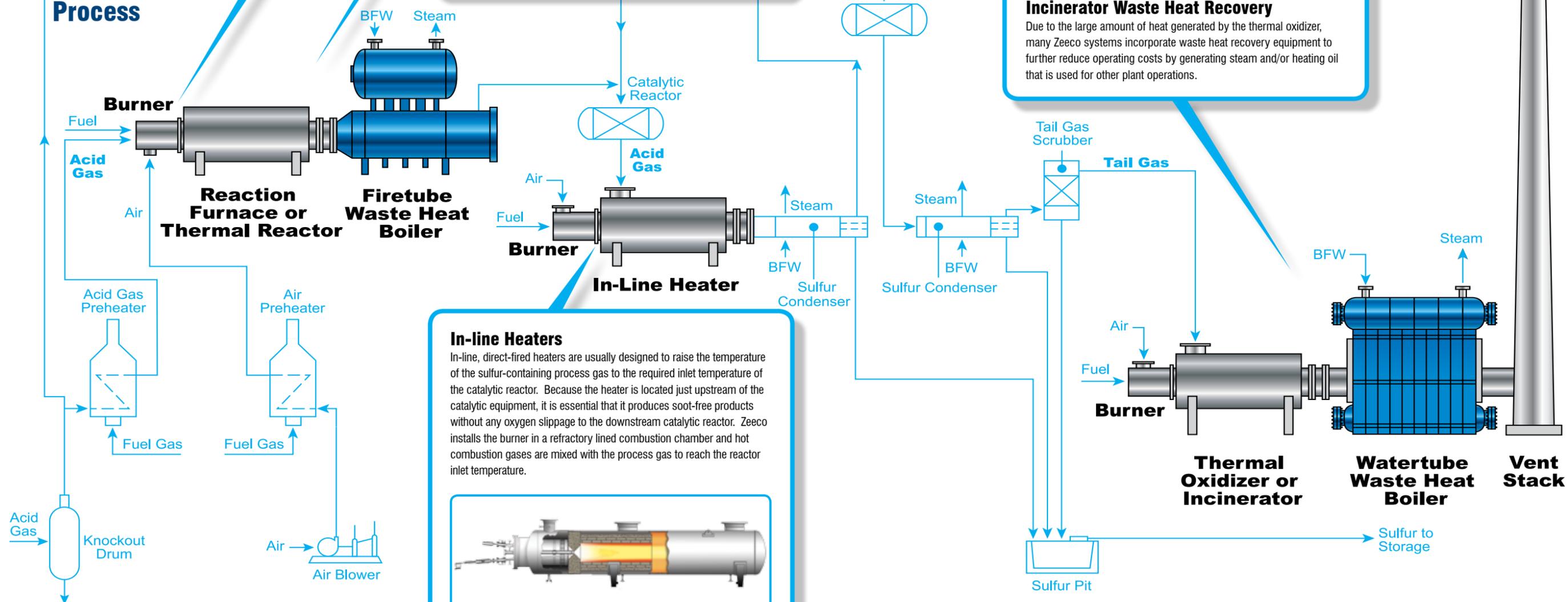
The tail gas resulting from the upstream Claus unit contains sulfur-bearing compounds that must be incinerated in order to oxidize the various compounds to sulfur dioxide and sulfur trioxide. The incineration process typically occurs between 1200-1600°F (650-870°C) in the presence of excess oxygen with a residence time between 0.7 and 2.0 seconds. The relatively inert tail gas must be carefully mixed with the flue gas products to achieve satisfactory oxidation of the sulfur-containing compounds without destabilizing the burner flame.



### Incinerator Waste Heat Recovery

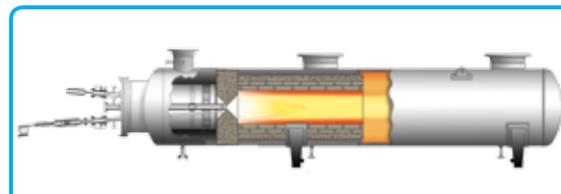
Due to the large amount of heat generated by the thermal oxidizer, many Zeeco systems incorporate waste heat recovery equipment to further reduce operating costs by generating steam and/or heating oil that is used for other plant operations.

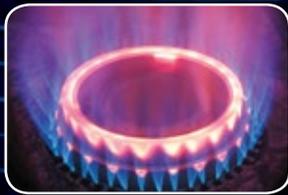
## Typical Claus Sulfur Recovery Process



### In-line Heaters

In-line, direct-fired heaters are usually designed to raise the temperature of the sulfur-containing process gas to the required inlet temperature of the catalytic reactor. Because the heater is located just upstream of the catalytic equipment, it is essential that it produces soot-free products without any oxygen slippage to the downstream catalytic reactor. Zeeco installs the burner in a refractory lined combustion chamber and hot combustion gases are mixed with the process gas to reach the reactor inlet temperature.





**ZEECO GLSF Ultra-Low NO<sub>x</sub>  
Free-Jet Burner**



## Ultra-low NO<sub>x</sub> technology.

Zeeco's tail gas incinerators can provide Ultra-Low NO<sub>x</sub> performance via the use of Zeeco's patented Free-Jet burner technology. ZEECO Free-Jet burner technology uses the jet momentum of the fuel gas injection system to entrain relatively inert tail gases in a manner that significantly lowers core flame temperatures, resulting in dramatically reduced thermal NO<sub>x</sub> production. Independent third party tests prove Zeeco's Ultra-Low NO<sub>x</sub> incineration technology provides as low as 5 ppm(vd) NO<sub>x</sub> performance under actual field conditions.

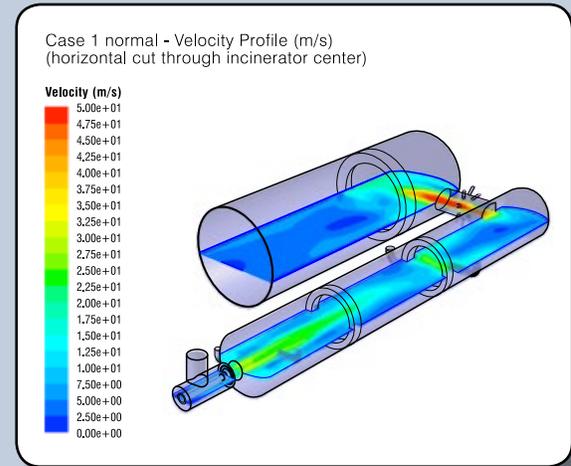
### *Natural draft SRU tail gas incinerator*



**ZEECO pilot burners are fully tested to ensure reliable long term operation in severe service**

## CFD.

The chemical and hydrocarbon industries employ Computational Fluid Dynamics (CFD) modeling tools to aid in equipment design. Zeeco combines CFD technology with our extensive experience in the design, fabrication, and operation of combustion equipment to ensure optimal performance.



## Trust Zeeco with your sulfur recovery equipment.

Zeeco has provided combustion and environmental solutions around the world for more than 35 years. Let us put our experience to work for you. Call us today for more information on Zeeco's full line of combustion products and replacement parts.



**BURNERS**



**FLARES**



**THERMAL OXIDIZERS**



**PARTS & SERVICE**



**Zeeco Corporate Headquarters**  
 22151 East 91st Street  
 Broken Arrow, Oklahoma 74014 USA  
 Phone: +1 918 258 8551 Fax: +1 918 251 5519  
 E-mail: sales@zeeco.com

[zeeco.com](http://zeeco.com)



ZEECO® combustion solutions are designed and manufactured to comply with applicable local and international standards as defined by our customers.



REGISTERED  
ISO 9001: 2008

CERTIFICATIONS APPLY TO ZEECO HEADQUARTERS.

ZEECO® is a registered trademark of Zeeco, Inc. in the U.S.

● ZEECO office, affiliate, sales, representative, or third party representative/licensee offices.

© 2015 COPYRIGHT ZEECO, INC. ALL RIGHTS RESERVED