



PROFLAME+SRU™

Flame Scanner

Model ZPF-1200SRU



BURNERS

FLARES

INCINERATORS

PARTS & SERVICE

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Sulfur Recovery Unit



We Know Sulfur.

Recovering elemental sulfur, typically through the Claus Process, is a process Zeeco understands. We engineer and supply specialized Sulfur Recovery Unit (SRU) combustion equipment including high intensity style burners, reaction furnaces, inline heaters/reducing gas generators, tail gas incinerators, and waste heat boilers for installations worldwide.

Reliable Acid Gas Flame Monitoring.

The ZEECO® ProFlame+SRU™ Integrated Flame Scanner was specifically designed to provide reliable flame detection and superior background flame discrimination in SRUs. The ProFlame+SRU offers easily configurable set points and uses intuitive PC-based software to provide in depth flame analysis. Where standard monitoring technology using photoelectric sensors has failed, the ProFlame+SRU reliably monitors acid gas flames even under challenging operating conditions. In fact, ProFlame+SRU was specifically designed to correct the issues conventional UV/IR flame scanners often face in SRUs.

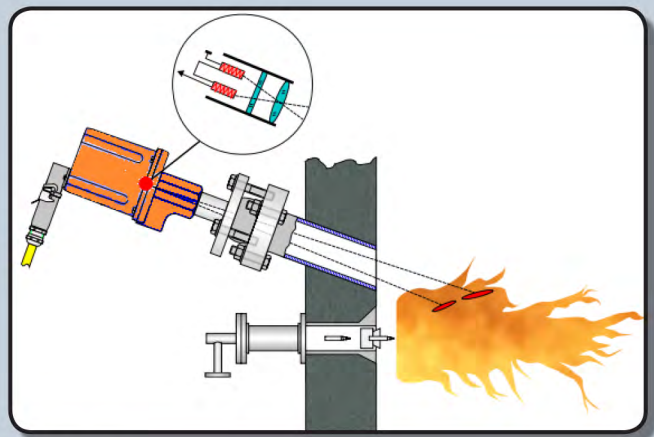
The Physics of Flame Detection in SRUs.

Amplitude and flicker frequency are the two primary components of the flame signal, where amplitude is the intensity at which oxygen and fuel mix under the right amount of heat, and the flicker frequency represents the fluctuations of a flame in motion. However, combustion of H₂S in an SRU creates a high radiation absorption range, a low flame flicker frequency response, and a low intensity flame due to the nature of the reducing atmosphere needed to carry out the Claus process – limiting the effectiveness of typical photoelectric UV or IR sensors, which only use intensity and flicker frequency to detect flame.

An Ultraviolet (UV) photoelectric sensor will pick up the flame during the light off process, but will not be able to detect the flame in later combustion stages due to the oxygen reduced atmosphere. An InfraRed (IR) photoelectric sensor may see the flame, but due to the low flicker frequency of the flame, can also respond to the IR radiation from the refractory tile lining the combustion chamber, sometimes resulting in a false flame detection.

The ProFlame+SRU Solution.

During combustion, energy is released in the form of electromagnetic radiation, which is distributed over a wide spectrum depending on the fuel type and is categorized by specific wavelengths.



THERMAL SENSORS

ProFlame+SRU converts this electromagnetic radiation into a measurable thermoelectric quantity and a corresponding thermal signature in accordance with established laws of physics. ProFlame+SRU uses two thermopiles to measure two different temperature points in the flame. This temperature differential is used to positively detect the H₂S flame because it is a more reliable measure of a flame in an SRU than strictly photoelectric detection.



Reaction Furnace Waste Heat Boiler



The temperature differential also provides a way to successfully discriminate the flame versus the constant temperature of the hot refractory. If no flame is present, both sensors will be reading the stable heat from the refractory, and the system will register no flame. In other words, by measuring the difference in temperatures at two selected points within the flame envelope, the constant radiation source of the refractory tile can now be completely eliminated.

ProFlame+SRU Design Features.

- Specifically designed for SRU applications
- Compact, fully integrated and exceptionally reliable
- State-of-the-art digital signal processing for easy flame analysis
- Easy to adjust flame relay-on and flame relay-off threshold settings
- Easily configurable frequency and gain settings for simple set-up
- Intuitive PC-based software to assist in troubleshooting
- Microprocessor based with electronic self-check for SIL3 applications
- Durable housing for a variety of operating environments
- Independently adjustable flame-on and flame-off response times: 1-6 sec.
- Reliable 0/4 to 20mA flame intensity output

Operating Parameters - Input.

Input voltage

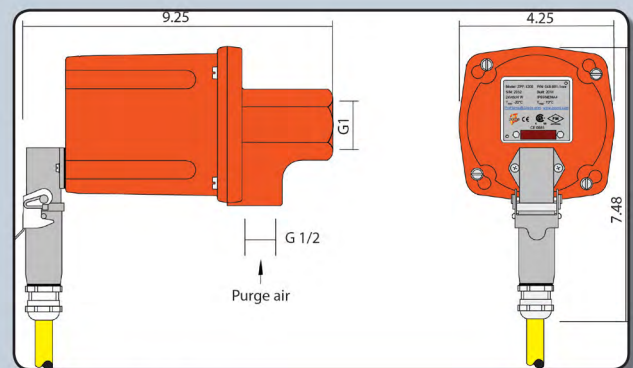
- Supply voltage: 24V dc, +10%/-15%
- Power consumption: 4 W

Purge air

- Cool, dry, clean air: 5 scfm (142 l/min) at 5" wc (12.5mbar) above windbox or furnace pressure (sight tube exit point), $\leq 38^{\circ}\text{C}$ (100°F) at wye fitting

Operating Parameters - Output.

- Output relay: SPDT, Flame-On is the N.O. contact and Flame-Off is the N.C. contact
- Contact rating: 48 Vdc at 1.0 A
- Flame intensity output: 0/4 to 20mA referenced to 24 Vdc common; 250 Ω max load resistance
- Flame status indication: Yellow LED for local Flame-On indication and Green LED for intensity. Remote flame signal trending, flame and marginal relay, flicker frequency, flame amplitude and raw signal analysis via PC based software.



SCANNER DIMENSIONS



BURNERS



FLARES



THERMAL OXIDIZERS



PARTS & SERVICE



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



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ISO 9001: 2008

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