# Measuring H2S/H2 in a Tail Gas Treatment Units (TGTU)

Applied Analytics Application Note No. AN-050

**Application Summary**

Analyte: **Hydrogen Sulfide ($H_2S$), Hydrogen ($H_2$)**

Detector: **OMA-300 Process Analyzer**

Process Stream: **Tail gas from Claus Process**

Typical Measurement Range: **0-4,000 PPMV $H_2S$, 0-10% $H_2$**

**Introduction**

The purpose of a tail gas treatment unit (TGTU) is to maximize the conversion of sulfur compounds to $H_2S$. With an efficiently run TGTU, sulfur recovery efficiency can be increased up to 99.99%.

A Sulfur Recovery Unit (SRU) is responsible for converting most of the sulfur containing compounds into elemental sulfur, but after the SRU up to 5% of sulfur containing compounds may remain. The stream that leaves the SRU is known as "tail gas" and is the feed stream for the TGTU. The sulfur compounds that are still contained within the tail gas are converted by the TGTU into $H_2S$ using a catalytic hydrogenation reduction stage and an amine absorber. The treated gas is then directed to an incinerator and the rich amine may be directed back to the SRU.

The purpose of making the $H_2S$ & $H_2$ measurement is to validate the reduction reaction. In addition, the $H_2S$ measurement is also used to identify the sulfur load heading to the amine absorber. The OMA-300 Process Analyzer continuously outputs both $H_2S$ and $H_2$ readings, providing new measurements approximately every 5 seconds.

**OMA-300 Process Analyzer Benefits**

- Continuously measures $H_2S$ and $H_2$ level in TGTU using UV-Vis spectrophotometer
- Totally solid-state build with no moving parts — modern design for low maintenance
- Ultra-safe fiber optic design eliminates the need to bring sample fluid inside analyzer unit
- One-time calibration at factory or site. No need for re-calibration

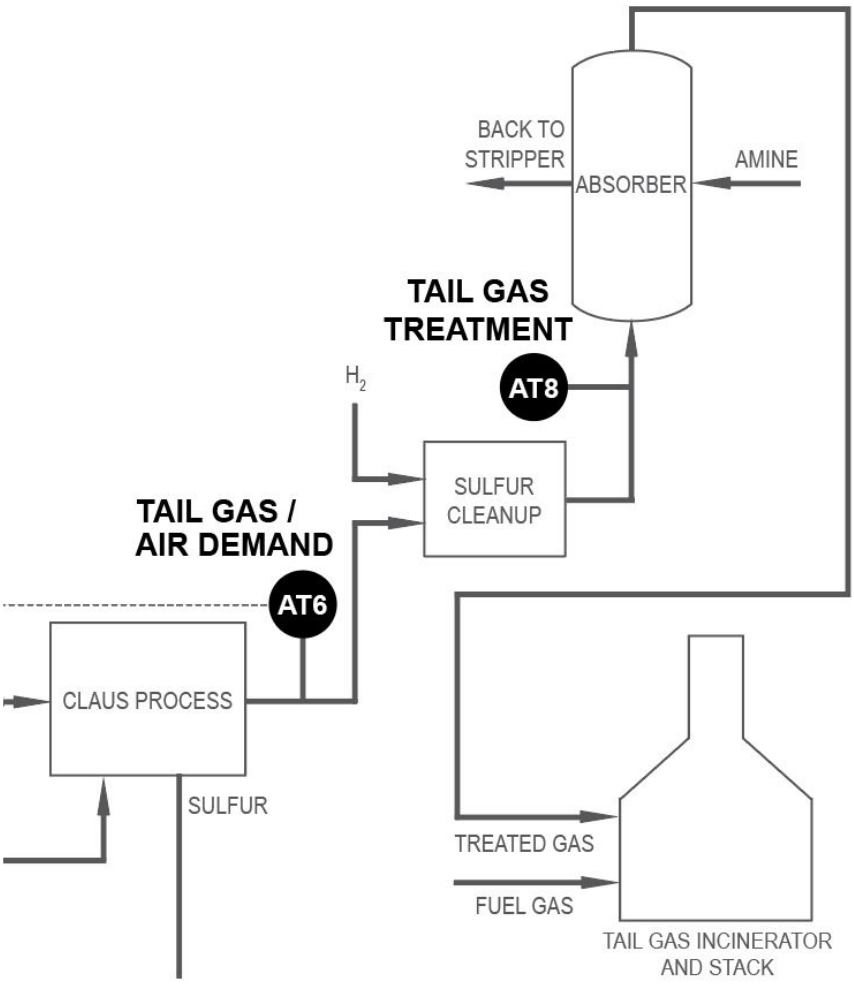


Diagram of a Typical Tail Gas Treatment Process

$H_2S$ and $H_2$ are measured at AT8 in the stream leaving the TGTU, before being sent to the amine absorber.

**Further Reading**

| Subject | Location |
|---|---|
| OMA-300 H2S Analyzer<br>Data sheet | https://aai.solutions/documents/OMAH2S.pdf |
| OMA-300 Process Analyzer<br>Data sheet | https://aai.solutions/documents/AA_DS001A_OMA300.pdf |
| Tail Gas / Air Demand Analyzer<br>Brochure | https://aai.solutions/documents/TLG837.pdf |



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