ASPROC

DEMISTER SAMPLING PROBE

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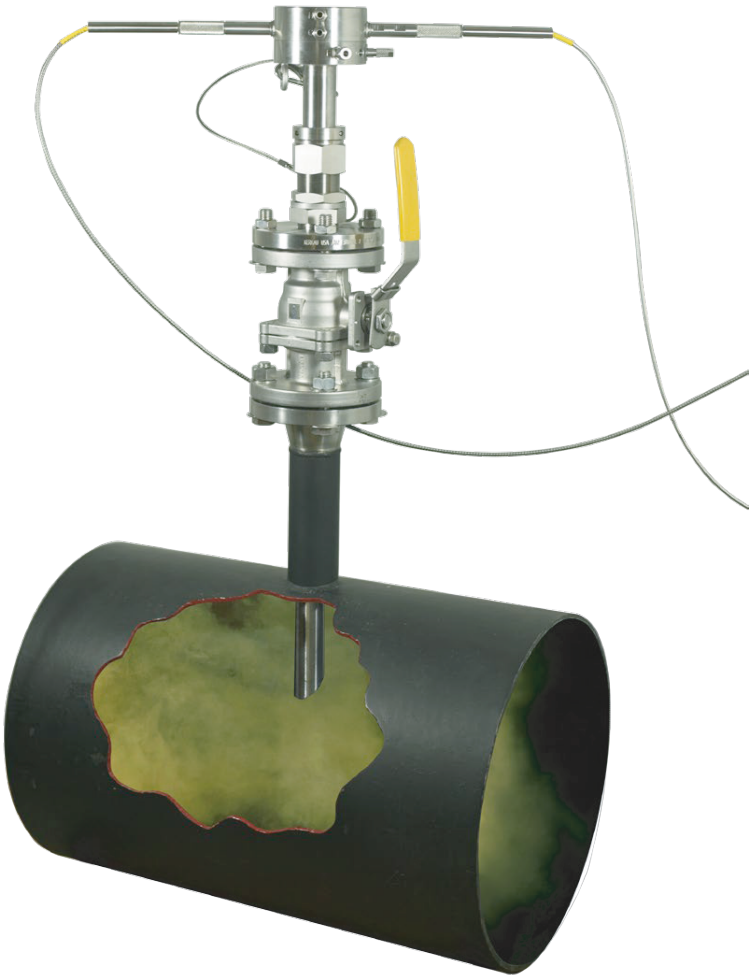


Automatic sulfur vapor removal inside the probe.

The patented DEMISTER Probe for the TLG-837 Tail Gas Analyzer is mounted directly on the process pipe. The absorbance measurement occurs inside the probe head, minimizing the sample transport time. Entrained sulfur vapor is removed from the sample as an internalized function. This probe was designed to be lightweight and compact, making it easy to install and service by a single technician.

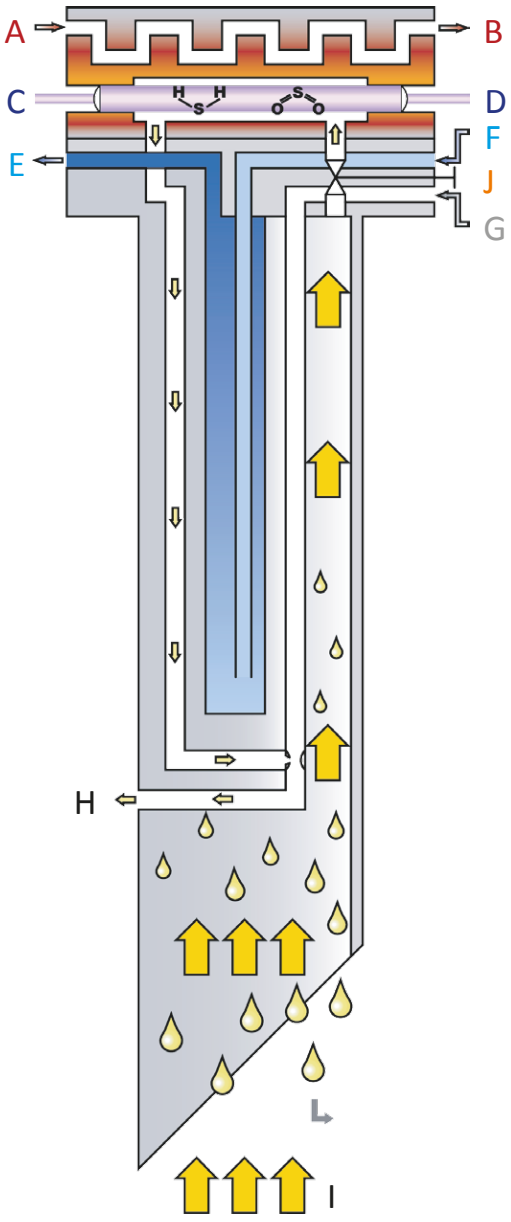
Features

- Patented sulfur vapor removal mechanism with no external demister
- Totally solid state with no moving parts, sample lines, or heat tracing — modern design for low maintenance
- Ultra-safe fiber optic design — no toxic/explosive sample gas in analyzer enclosure
- Light, compact form factor simplifies installation and reduces physical footprint
- Process isolation valve for safe and easy access to the flow cell

Probe Concept

Tail gas contains elemental sulfur which is quick to condense and plug mechanical cavities or obstruct optical signals. Online analysis of tail gas requires a sulfur removal mechanism in order to operate at all.

The DEMISTER probe actively removes sulfur from the rising sample as an internalized function within the probe body. Recycling the steam generated by the Claus process, the probe controls the temperature along its body at a level where all elemental sulfur vapor in the rising sample condenses and drips back down to the process pipe. The sample that reaches the optical measurement cell in the probe head is virtually sulfur-free, posing no threat of plugging, freezing, or interference.



Demister Probe Legend

(A) Steam In
(B) Steam Out
(C) Light Signal In
(D) Light Signal Out
(E) Steam Out
(F) Demister Steam In
(G) Aspirator Air In
(H) Sample Return Point
(I) Sample Entry Point
(J) Process Isolation Valve
(💧) Liquid Sulfur Droplet
(➡) Sample Route

Automatic Sulfur Vapor Removal

Inside the probe, an internal 'demister' chamber (concentric to the probe body) is fed with low pressure steam (see **E** & **F**). Since the LP steam is much cooler than the tail gas, this chamber has a cooling effect on the rising sample.

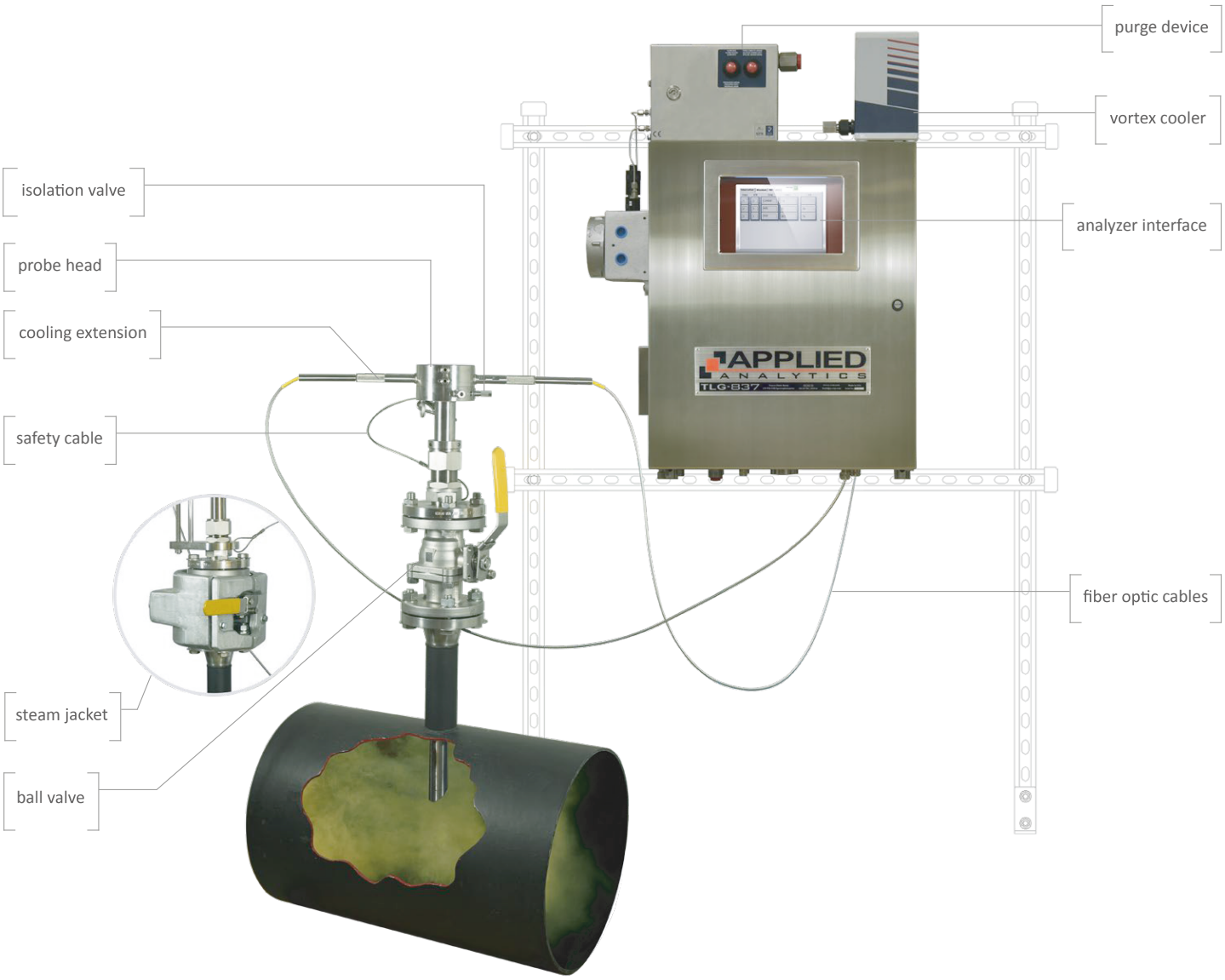
Elemental sulfur has the lowest condensation point of all of the components in the tail gas. Due to the internal probe temperature maintained by the LP steam, all of the elemental sulfur in the rising sample is selectively removed by condensation while a high-integrity sample continues upward for analysis in the probe head.

In Situ Measurement

The point of interaction between the light signal and the sample gas occurs directly in the flow cell disk inside the probe head (**C** & **D**). The flow cell disk has a built-in high pressure steam channel (**A** & **B**) to heat the cell and ensure that any present sulfur remains gaseous—eliminating the possibility of condensation on the optical windows.

The Sample Return

An aspirator (**G**) creates a Venturi effect which pulls the sample up the probe body intake path, through the flow cell for analysis, and down the return line. The used sample is released back into the process pipe (**H**).



Probe Retractor
Allows easy removal by hand or power drill.

Probe Head
Houses flow cell disk where optical measurement occurs.

Cooling Extension
Protects fiber optics from the heat of the sample gas.

Thermocouple
Provides probe temperature measurement to analyzer.

Safety Cable
Safety measure to prevent probe ejection.

Fiber Optic Cables
Transmit light signal b/w probe and analyzer unit.

Full Port 2” Ball Valve
Provides process seal so that probe can be inserted or removed without requiring process shutdown.

Isolation valve
Shut off process flow to the flow cell to clean collimators.

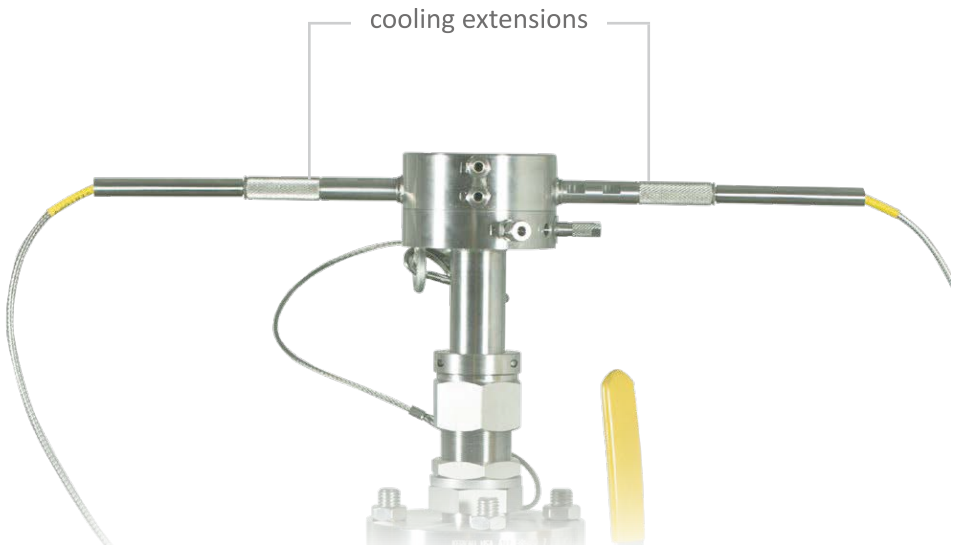
Flow Cell Disk

The flow cell disk is built into the probe head. A special steam-traced channel above the flow cell disk is continuously fed with HP steam in order to heat the flow cell and prevent any residual elemental sulfur from condensing and fouling the optical windows. It also has an automated self-wash steam cycle if used in conjunction with the Utility Control Panel.

NOTE: this demo flow cell disk has a glass cutaway to display the steam tracing channel above the measurement cell.

Cooling Extensions

The cooling extensions screw into opposite ends of the optical path inside the flow cell disk. These steel extensions protect the fiber optic cables from the heat of the sample.



Technical Data	
Environment	Indoor/Outdoor (no shelter required)
Dimensions	Probe Average Dimensions: 36” length x 12“ widest diameter (914mm x 305mm) Optional Utility Control Panel: 24” H x 24” W x 8” D (610mm H x 610mm W x 203mm D) Note: Dimensions are dependent on process pipeline
Weight	Probe Average Weight: 29 lbs. (13 kg) Optional Utility Control Panel: 25 lbs. (11 kg)
Wetted Materials	Standard: Stainless Steel 316/316L, Kalrez *Various custom materials available — please inquire.*
Probe Material	Standard: Stainless Steel 316/316L *Other materials available*
Utility Management	Optional: Utility Control Panel Data sheet: http://aai.solutions/documents/AA_DS004C_TLG837_UCP.pdf
Instrument Air	70 psig (-40 °C dew point)