

Model 900 Air Demand Analyzer

THE NEED

In the past, conventional Claus sulfur recovery processes were adequately controlled on the basis of ratio or excess process air. However, the development of new and modified sulfur recovery processes has dramatically changed the analytical requirements placed on the tail gas analyzer. These applications require accurate chemical concentration data over wide dynamic ranges. Selective oxidation processes may require the analyzer to control the H_2S/SO_2 ratio at values ranging from 1:7 to greater than 10:1. In addition, there is an increased need to provide reliable process data during upset conditions (to 5% H_2S or SO_2), to ensure correct response to such conditions. Data on COS and CS_2 concentrations are also increasingly used to monitor catalyst and overall sulfur plant performance.

AMETEK's Western Research® Model 900 Air Demand Analyzer was specifically designed to meet the more demanding analytical requirements of these new processes. Used in conjunction with the ASR 900 sampling probe, which provides trouble-free sampling, the Model 900 ensures maximum data availability for optimum operation of all sulfur recovery processes.

THE MEASUREMENT

The Western Research® Model 900 uses our proprietary high resolution UV technology in a dual beam, multiple wavelength configuration. Resolution better than 0.02 nm is provided by high intensity, line source lamps. These sources emit at a fixed wavelength, providing great measurement stability, and emit low total power, removing the potential for sample photolysis. The high resolution enables unparalleled linearity over a wide dynamic range (less than 1% deviation over 4 to 5 orders of magnitude), which in turn leads to simple, robust data analysis. A six-position filter wheel enables one reference and five measure wavelengths. The dual beam configuration, combined with the reference measurement, ensures low noise performance, with minimal baseline and span drift.

When combined with the ASR 900 sample probe, the Model 900 is a complete analytical system, providing maximum performance and minimal maintenance. The ASR 900 probe incorporates a temperature controlled sulfur condenser, providing sulfur vapor control at the sample point and ensuring that no plugging will occur in the sample lines and analyzer. An integrated shut-off valve allows servicing without removal of the probe.



Model 900 Air Demand Analyzer

BENEFITS

- Measures up to five species simultaneously
- H_2S , SO_2 , Sv, COS, CS_2
- Uniquely capable of monitoring off ratio applications
- Reliable, trouble-free sampling
- Automated zero gas calibration
- Provides Modbus serial interface with plant DCS

APPLICATIONS

- Conventional Claus processes
- Selective oxidation processes
- Coke ovens

PERFORMANCE SPECIFICATIONS

Methodology: Multiple wavelength, high resolution, non-dispersive UV

| Species Measured | Minimum Full Scale | Maximum Full Scale |
|------------------|--------------------|--------------------|
| H ₂ S | 5000 ppm | 10% |
| SO ₂ | 2500 ppm | 10% |
| CS ₂ | 5000 ppm | 10% |
| COS | 5000 ppm | 10% |
| Sv | 50 ppm | 500 ppm |

Accuracy¹: Better than 1% full scale

Reproducibility¹: Better than 0.5% full scale

Linearity¹: Better than 1% full scale

Response Time: Typically less than 30 s to T₉₀ (excl. sample system)

Number of Gases: Up to 5 simultaneously (refer to AMETEK for possible combinations)

Power: 120 VAC ±10%, 47-63 Hz or 220 VAC ±10%, 47-63 Hz 600 W (for analyzer only)

Approvals and Certifications

NEC/CEC Class I, Division 2, Groups C & D
 CENELEC EEx pd IIB T3
 GOST 1ExpdIIBT3 (certification pending)
 Complies with all relevant European Directives
 GOST Pattern Approval

Typical Sample Flow: 3 to 5 l/min (0.1 to 0.2 SCFM)

Sample Transport: Air aspiration

Temperature Control: Independent control of four zones (oven, sample line, probe, vent line)

Pressure and Temperature Compensation: Standard

Ambient Temperature: 41°F to 122°F (5°C to 50°C)

Instrument Air: Minimum 30 psig, 1 CFM; instrument quality air

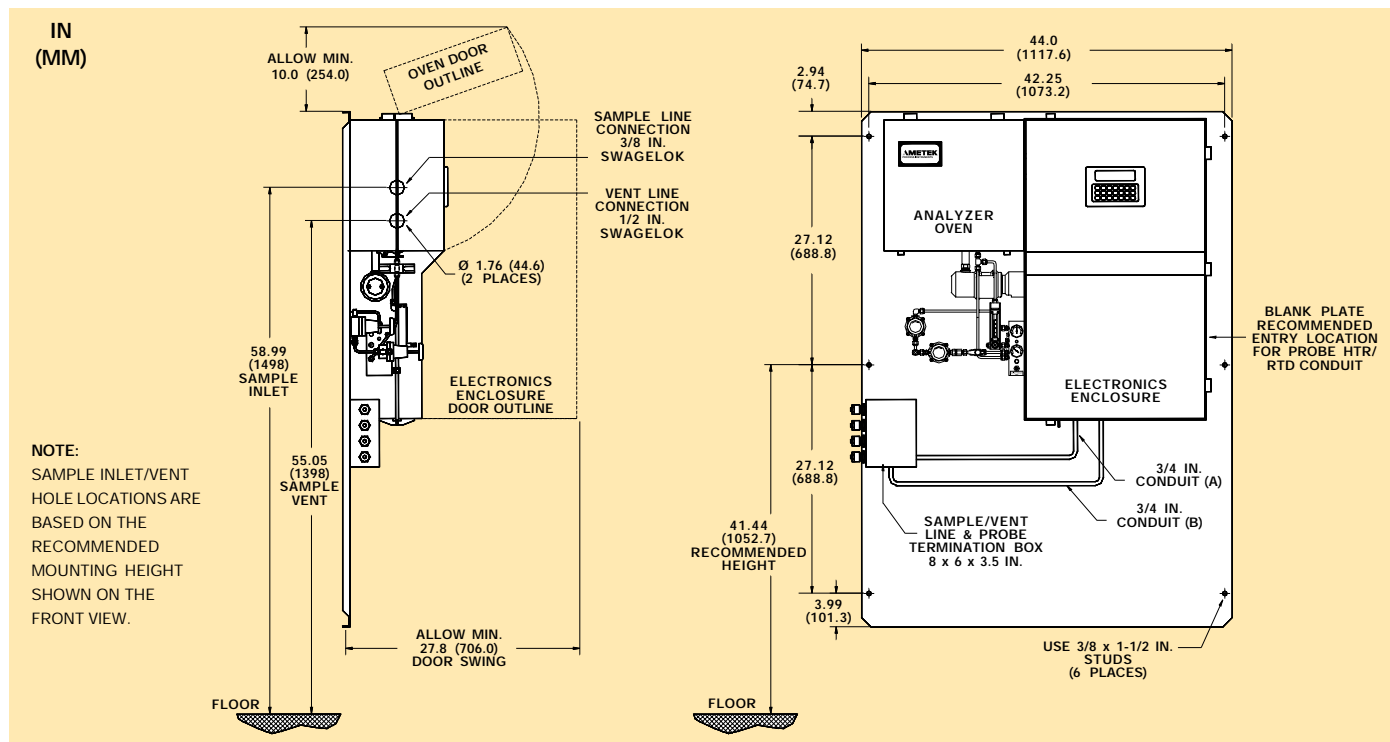
Physical Dimensions: 61 x 44 x 12 in. (1554 x 1118 x 305 mm)

Weight: Approximately 250 to 350 lbs. (115 to 160 kg)

Communications:

Analog 4 x 4 to 20 mA self powered
 Digital One RS-422 with Modbus protocol
 Relays 3 independent sets of SPDT relays alarm conditions

1. NOTE: Stated specifications apply to SO₂ and H₂S only. Please consult factory for specifications on other species.



One of a family of innovative process analyzer solutions from AMETEK Process Instruments. Specifications subject to change without notice.



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