

Sulphuric Acid Plant

Measurement of the acid dewpoint in sulphuric acid applications



Photograph of Model 440A Continuous Monitor illustrating special acid plant measurement probe and stainless steel case

High costs associated with repairing or replacing economizers and heat exchangers, the inevitable plant downtime and economic implications, make the monitoring of water or steam ingress a fundamental process requirement.

Applications

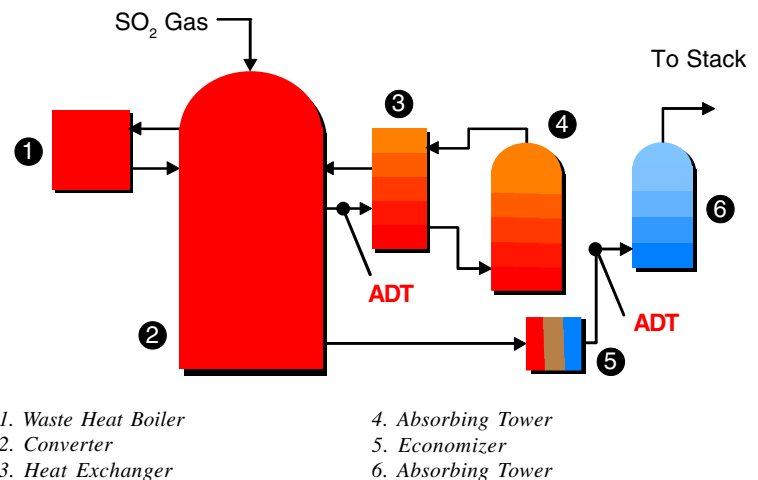
- Sulphuric Acid Plants
- Fertilizer Plants
- Chemical Plants

LAND
combustion

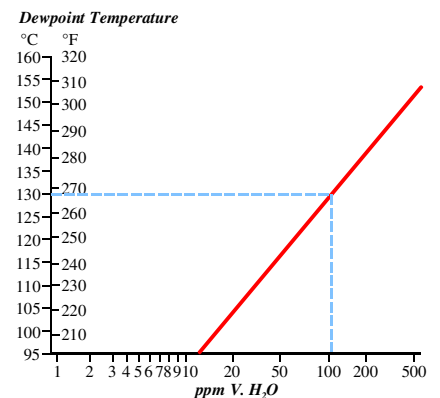
In sulphuric acid applications it is essential that there is no moisture content in the process gas to avoid problems of internal corrosion at the heat exchangers and economizers. A small amount of moisture in the process stream, resulting in acid condensate build-up, is indicated as an acid dewpoint reading. This reading gives warning of plant leaks and allows repair before corrosion damage can occur.

Benefits to Process Control

- **Detection of Steam and Water Leaks**
Reduces Tube Failures
Eliminates Unnecessary Plant Shutdowns
- **Monitoring Moisture Variations in Process Streams**
Maintains Quality of Finished Product



Moisture can enter into the process via leaks or malfunctions in the waste heat boilers, economizers, sulphur guns or drying towers, and is often difficult to detect. However, the Acid Dewpoint is very sensitive to changes in concentration of water vapor, which is indicated by acid dewpoint temperature increases. Monitoring of the dewpoint will immediately detect any leaks in the process.



Graph showing the changes in ADT as a result of increases in the water present in the process

Acid Plant Probe

The Acid Plant system uses a special probe dedicated to this application. A sealing gland arrangement ensures that the probe can be safely inserted into the gas stream. The detector is protected against deposits which may have formed in the duct entry by a special cover.

Key Features include:

- **Suitable for High Pressure applications**
Back Pressure Regulator maintains probe integrity in positive pressure applications
Flanged Sealing Gland protects from acid gases

Portable or Continuous Models

The Model 220A is a lightweight, portable instrument designed for periodic investigation of plant leakage. The Model 440A is a continuous monitor for permanent installation in the acid stream.

Many of our customers install a Model 440A at the economizer outlet, before the inlet to the absorption tower; when the acid dewpoint indicates a problem, a Model 220A is used to locate the position of the leak by taking measurements upstream of the Model 440A installation.

Specifications

Model 440A

As Model 440 except:

Probe:	Acid Plant Probe
Mounting:	Flanges and Probe Sealing Gland
Housing:	Stainless Steel enclosure, IP65 (NEMA 4) protection
Dimensions:	760 x 600 x 210mm (30 x 23.6 x 8.26")
Weight:	40 kg/ 88 lbs approx.
Output:	2 current loop 4-20mA selectable for ADT, MMT or Cell current

Model 220A

As Model 220 except:

Probe:	Acid Plant Probe
Mounting:	Flanges and Probe Sealing Gland
Multi-Scale Display:	No Efficiency indication

Information

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Mexico:	Telephone: +52 5209 8438

URL: <http://www.landinst.com/comb/>

Specifications

Acid Plant Probe

Probe	
Detector:	Borosilicate glass thimble with platinum ring electrode and platinum/platinum - 13% rhodium thermocouple
Detector Temp. Range:	0 to 400°C/30 to 750°F
Length:	0.9m/3ft standard 38mm/1½" diameter
Weight:	4.5kg/10lbs
Mounting Flange:	3" 150lb flange with 1½" Swagelok fitting and Teflon compression ring
Back Pressure Range:	0 to 10psi (0 to 0.7bar)
Electrical Connections:	6 pin connector to control unit

Continuous Product Development may make it necessary to change these details without notice

Model 440A - System Overview

1. User Keypad & Display
2. Air Supply to Measurement Probe
3. Electrical/Signal Connection to Measurement Probe
4. Measurement Probe System
5. Mounting Flange with Sealing Collar (Leak Protection)
6. Back Pressure Regulator
7. Probe Detector and Protection Cover

