

## SRU

# Continuous Emission Measurement

## “Hot-Wet” Measurement

### What is it? Why does AMETEK use Hot-Wet Measurement?

“Hot-Wet” measurement means analyzing the stack gas sample on an “as-is” basis, and maintaining the integrity of the sample from extraction through analysis. The prime objective of Hot-Wet measurement is to prevent the condensation of acid mist or water vapor. The sample is generally analyzed at a temperature different from the process temperature (this may be hotter or cooler) but the sample composition is never altered.

Hot-Wet analysis is especially well-suited to the measurement of SO<sub>2</sub> emissions from a Claus sulfur recovery unit (SRU) incinerator using the AMETEK Models 919/920 or 4600 SO<sub>2</sub> analyzers for the following reasons.

1. A Claus SRU incinerator can generate significant quantities of SO<sub>3</sub> as well as extreme temperatures during upset conditions (sulfur entrainment,

“off ratio” etc). SO<sub>3</sub> is very corrosive and can damage “dry” gas or insitu type analyzers (even 316 SS). When the sample is maintained above the acid dew point, maintenance is simpler. When a sample is handled or manipulated (dried, diluted), reliability and accuracy are reduced. It is good analytical practice to reduce sample manipulation whenever possible.

2. In “dry gas” systems, when water is removed, components can sometimes be selectively removed. For example, if a sample containing a finite amount of SO<sub>2</sub> is cooled to below the water dew point, SO<sub>2</sub> dissolves in the water phase reducing the SO<sub>2</sub> being measured in the vapor phase. If the sample is cooled to the point where SO<sub>3</sub> condenses, corrosion can result.

3. Measuring the sample on an as-is basis is compatible with “Mass” emission measurement (kg/h of SO<sub>2</sub>). If the stack gas velocity is measured on a water-included base, the component of interest should also be measured in that way. The AMETEK analyzers have the option of “mass” measurement.
4. There are no moving parts in the analyzers. In a Hot-Wet system, sample is extracted and drawn through the analyzer with an air-driven eductor. There is no mechanical pump. In addition, the analyzers are built around an extremely robust splitbeam photometer; there is no rotating filter wheel.



Model 919 / 920 Analyzer



Model 4600 Analyzer

# Continuous Emission Measurement

## Analyzer Comparison Chart

	Model 919	Model 920	Model 4600
<b>MEASURING TECHNOLOGY</b>	Dual wavelength, high resolution, non-dispersive UV	Non-dispersive UV	Non-dispersive UV
<b>MINIMUM FULL SCALE</b>	0 - 250 ppm	0 - 250 ppm	0 - 100 ppm 0 - 5000 ppm
<b>MEASURABLE SPECIES</b>	SO <sub>2</sub> , NO, NO <sub>2</sub> , H <sub>2</sub> S, NH <sub>3</sub> , Cl <sub>2</sub>	SO <sub>2</sub> , NO, NO <sub>2</sub> , NOx, H <sub>2</sub> S, NH <sub>3</sub> , Cl <sub>2</sub> , COS, CS <sub>2</sub>	SO <sub>2</sub> , NO, NO <sub>2</sub> , H <sub>2</sub> S, NH <sub>3</sub> , Cl <sub>2</sub>
<b>APPROVALS AND CERTIFICATIONS</b>	NEC/CSA Class I, Zone 2 (Div 2), Groups C & D, NFPA 496 Z-Purge.  ATEX Certificate Number: KEMA 02ATEX2341X  ATEX II 2 G EEx pd IIB T3 GOST 1ExpydIIBT3  Complies with all relevant European Directives  GOST Pattern Approval	NEC/CSA Class I, Zone 2 (Div 2), Groups C & D, NFPA 496 Z-Purge.  ATEX Certificate Number: KEMA 02ATEX2341X  ATEX II 2 G EEx pd IIB T3 GOST 1ExpydIIBT3  Complies with all relevant European Directives  GOST Pattern Approval	CE NEC/CEC Class I, Division 2, Groups A, B, C, D, T6 to T4 areas.  Optional versions are available for Class I, Division 1, Groups C & D or ATEX II 2 G IIC T3 areas  The analyzer's controller is designated for use in Class I, Division 2, Groups A, B, C, D areas
<b>AMBIENT CONDITIONS</b>	5° to 50° C	5° to 50° C	-20 to 50° C
<b>COMMUNICATIONS</b>	<b>Analog:</b> 4 x 4 4-to-20 mA self-powered  <b>Digital:</b> One RS-232 port for service diagnostics, One RS-422 with Modbus protocol  <b>Relays:</b> 3 independent sets of SPDT relays alarm conditions	<b>Analog:</b> 4 x 4 4-to-20 mA self-powered  <b>Digital:</b> One RS-232 port for service diagnostics, One RS-422 with Modbus protocol  <b>Relays:</b> 3 independent sets of SPDT relays alarm conditions	RS-485 serial port  Remote dial-in capabilities available with AMETEK Western Research software

**WESTERN RESEARCH**  
 Technical Note



2876 Sunridge Way N.E., Calgary, AB T1Y 7H9  
 Ph. 1+403-235-8400, Fax 1+403-248-3550  
 www.ametekpi.com



© 2011, by AMETEK, Inc.  
 All rights reserved. Printed in the U.S.A.  
 F-0224 Rev. 1 (0111)

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

### SALES AND MANUFACTURING:

**USA - Delaware**  
 455 Corporate Blvd., Newark DE 19702 • Tel: +1-302-456-4400, Fax: +1-302-456-4444

**USA - Oklahoma**  
 2001 N. Indianwood Ave., Broken Arrow OK 74012 • Tel: +1-918-250-7200, Fax: +1-918-459-0165

**USA - Pennsylvania**  
 150 Freepport Road, Pittsburgh PA 15238 • Tel: +1-412-828-9040, Fax: +1-412-826-0399

### WORLDWIDE SALES AND SERVICE LOCATIONS:

**USA - Texas**  
 Tel: +1-713-466-4900, Fax: +1-713-849-1924

**CHINA**  
 Beijing / Tel: 86 10 8526 2111, Fax: 86 10 8526 2141  
 Chengdu / Tel: 86 28 8675 8111, Fax: 86 28 8675 8141  
 Guangzhou / Tel: 86 20 8363 4768, Fax: 86 20 8363 3701  
 Shanghai / Tel: 86 21 5868 5111, Fax: 86 21 5866 0969

**FRANCE**  
 Tel: 33 1 30 68 89 20, Fax: 33 1 30 68 89 29

**GERMANY**  
 Tel: 49 21 59 91 36 0, Fax: 49 21 59 91 3639

**INDIA**  
 Tel: 91 80 6782 3200, Fax: 91 80 6782 3232

**SINGAPORE**  
 Tel: 65 6484 2388, Fax: 65 6481 6588