

1. Record Nr.	UNINA9910566692403321
Autore	Jahnke J. A (James A.)
Titolo	Continuous emission monitoring / / James A. Jahnke
Pubbl/distr/stampa	Hoboken, New Jersey : , : Wiley, , [2022] ©2022
ISBN	1-119-43400-9 1-119-43399-1
Edizione	[Third edition.]
Descrizione fisica	1 online resource (467 pages)
Disciplina	628.530287
Soggetti	Continuous emission monitoring Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	COVER -- TITLE PAGE -- COPYRIGHT PAGE -- CONTENTS -- PREFACE -- CHAPTER 1 INTRODUCTION TO CEM SYSTEMS -- A BRIEF HISTORY -- TYPES OF MONITORING SYSTEMS -- Extractive Systems -- In-Situ Systems -- Remote Sensors -- Parameter Monitoring Systems -- Analytical Techniques Used in CEM System Instrumentation -- Data Acquisition and Handling Systems -- THE ROLE OF QUALITY ASSURANCE -- APPLICATION -- SUMMARY -- BIBLIOGRAPHY -- CHAPTER 2 CEM REGULATIONS -- IMPLEMENTING RULES IN THE UNITED STATES -- U.S. Federal Implementing Rules -- State Programs and Federal Programs Administered by the States -- 40 CFR Part 62 - Federal Requirements for Existing Units Not Covered by a State Plan -- 40 CFR Part 70 - Title V Operating Permits -- PERFORMANCE SPECIFICATIONS -- QUALITY ASSURANCE REQUIREMENTS -- Part 60 Quality Assurance Procedures -- Other U.S. QA Procedures -- The Role of Calibration Gases -- INTERNATIONAL RULES -- Canada -- Europe -- Asia -- Latin America* -- Developing a National Continuous Emission Monitoring Program -- ENFORCEMENT POLICIES AND CEM SYSTEMS -- Compliance Indicating Systems - Using CEM Systems for Reporting Excess Emissions -- Enforcement Levels -- Level 2 -- Compliance Monitoring Systems - Using CEM Systems for Direct Compliance -- Compliance Assurance Monitoring and the Credible Evidence Rule --

Periodic Monitoring -- Epilogue -- REFERENCES -- BIBLIOGRAPHY --
CHAPTER 3 EXTRACTIVE SYSTEM DESIGN -- SOURCE-LEVEL EXTRACTIVE
SYSTEMS -- Hot/Wet Systems -- Cool/Dry Systems with Conditioning
-- Sample Probes -- Umbilical Line -- Calibration Gas System
and Cylinder Gas Pressure Regulators -- Moisture Removal Methods --
Sample Pumps -- Fine Filters -- Assembling a Cool/Dry Extractive
System -- CLOSE-COUPLED SYSTEMS -- DILUTION EXTRACTIVE
SYSTEMS -- Dilution Probes -- Dilution Air Cleanup Systems --
External Dilution Systems (Probes).
Enhancing the Operation of Dilution Systems -- Dilution Extractive
Systems: Wet or Dry Measurement? -- SAMPLING INTERFACE/MONITOR
CALIBRATION -- EXTRACTIVE SYSTEM COMPONENTS AND ACCESSORIES
-- MINI-SYSTEMS -- MODULAR SAMPLING SYSTEMS -- CHAPTER 4
INTRODUCTION TO THE ANALYTICAL METHODS -- THE PROPERTIES
OF LIGHT -- The Wave Nature of Light -- Absorption of Light by
Molecules -- The Beer-Lambert Law -- LIGHT SCATTERING BY
PARTICLES -- Rayleigh Scattering: $r/1$ -- Mie Scattering: $r/1$ --
Geometric Optics: $r/1$ -- Opacity and Transmittance -- Bouguer's
Law -- COMPONENTS OF A SPECTROMETER: BUILDING AN INSTRUMENT
-- Radiation Sources -- Wavelength Selection -- Detectors -- Multipath
Gas Cells -- Optical Components -- Constructing a Spectrophotometer
-- CHAPTER 5 EXTRACTIVE SYSTEM ANALYZERS -- SPECTROSCOPIC
METHODS - INFRARED MONITORING INSTRUMENTS -- Nondispersive
Infrared Analyzers -- Laser-Based Analyzers -- Fourier-Transform
Infrared (FTIR) Spectroscopy -- SPECTROSCOPIC METHODS -
ULTRAVIOLET MONITORING INSTRUMENTS -- Nondispersive Ultraviolet
Photometers -- SPECTROSCOPIC METHODS - LUMINESCENCE --
Fluorescence Analyzers for SO₂ Measurement -- Chemiluminescence
Analyzers for NO and NO_x Measurement -- Low NO_x Measurements.
-- ELECTROANALYTICAL METHODS -- Polarographic Analyzers --
Potentiometric Analyzers Using Ion-Selective Electrodes --
Electrocatalytic Analyzers for Measuring Oxygen -- Paramagnetic
Techniques for Measuring Oxygen -- Magnetopneumatic Instruments
-- Thermal Conductivity Analyzers -- DEVELOPMENTS IN EXTRACTIVE
SYSTEM GAS ANALYZERS -- Traditional Approaches -- Developing
Approaches -- CHAPTER 6 IN-SITU GAS MONITORING SYSTEMS --
POINT (SHORT-PATH) IN-SITU MONITORS -- Probe Designs -- Point
Monitor Analytical Methods -- Electrocatalytic In-situ Method --
Advantages and Limitations of Point In-situ Systems.
INTEGRATED-PATH MONITORING SYSTEMS -- Single-Pass Systems --
Double-Pass Systems -- Optical Depth -- Stratification Issues --
Integrated-Path Analyzer Calibration Issues -- Integrated-Path
Analyzer Analytical Methods -- Advantages and Limitations
of Integrated-Path CEM Systems -- Certification Test Criteria
for Integrated-Path Monitors -- Quality Assurance for In-situ CEM
Systems -- IN-SITU SYSTEMS VS. EXTRACTIVE SYSTEMS -- CHAPTER 7
FLOW RATE MONITORS -- REFERENCE METHODS FOR VOLUMETRIC
FLOW -- Type-S Pitot Tube (Method 2) -- Three-Dimensional Pitot
Tubes (Method 2F) -- Yaw-Nulling (Method 2G) -- Wall-Effect
Measurements (Method 2H and CTM-041) -- Vane Anemometers --
Tracer Gas Dilution -- CONTINUOUS FLOW MONITORING METHODS --
Single Type-S Pitot Tube -- Averaging Differential Pressure Probes --
Thermal Mass Flowmeters -- Ultrasonic Flow Monitors -- Time-of-
Flight Methods -- OTHER METHODS -- The Stack Venturi -- Physical
Models -- Computational Fluid Dynamics -- Determination of Flow
Rates from Engineering Calculations -- MONITORING FLOW IN PIPES --
CALIBRATING FLOW MONITORING SYSTEMS -- The "Pre-RATA" and the
K Factor -- Problems in Calibrating Against a Reference Method --

PERFORMANCE SPECIFICATIONS FOR FLOW MONITOR CERTIFICATION --
Part 60 Appendix B Performance Specification 6 -- Part 75 Appendix
A Specifications. -- Environment Canada Specifications -- EN-ISO
16911 Specifications -- FLOW MONITOR QUALITY ASSURANCE -- Daily
Calibration Checks -- Daily Interference Checks -- Quarterly Leak
Checks -- Flow-to-Load Ratio Test -- Semiannual/Annual RATA --
CHAPTER 8 OPACITY MONITORS -- BASIC COMPONENTS
OF TRANSMISSOMETERS -- DESIGN SPECIFICATIONS
AND MANUFACTURER'S PERFORMANCE SPECIFICATIONS FOR OPACITY
MONITORS -- Opacity Monitoring Specific Design Criteria --
Manufacturers' Performance Specification Tests.
Design Specifications For Low-Level Opacity Monitors -- OPACITY
MONITOR INSTRUMENT DESIGN -- Beam Splitter Techniques -- Optical
Density/Opacity Calculations -- Stack-Exit Correlation -- Calibration
Filter Selection -- Combiner Equations -- Opacity-Mass Correlations --
OPACITY MONITOR PERFORMANCE SPECIFICATIONS -- Installation
Requirements -- Field Audit Performance Tests -- Opacity Monitor
Quality Assurance -- Quality Assurance Plan -- Daily Zero and Upscale
Calibration Drift Test -- Quarterly Audit - Three-Point Calibration Error
Test -- Annual Primary Zero Alignment -- Corrective Maintenance
and Diagnostic Tests -- REFERENCES -- BIBLIOGRAPHY -- CHAPTER 9
CONTINUOUS PARTICULATE MONITORING -- REGULATORY
SPECIFICATIONS -- CALIBRATING PARTICULATE MATTER CEMS (PM
CEMS) -- Reference Method Tests -- Statistical Analysis Procedures --
Issues Associated with the Correlation Method -- CONTINUOUS
PARAMETER MONITORING SYSTEMS (PM CPMS) -- Determining
the Operating Limit (Case A) -- Determining the Operating Limit (Case
B) -- BAG LEAK DETECTORS (BLD) -- ALTERNATIVE CALIBRATION
METHODS -- Generating Reference Samples -- Mass References --
Particle Size Standards -- PARTICULATE MEASUREMENT TECHNIQUES --
Accumulated Mass Sensors -- Optical Sensors -- Hybrid (Combination)
Systems -- Monitoring in Wet Stacks -- Probe Electrification Methods -
Triboelectric Devices Applied for Bag Leak Detection -- Choosing a PM
System -- PM CEMS QUALITY ASSURANCE - REQUIREMENTS
FOR CONTINUING OPERATION -- The Quality Assurance/Quality
Control Manual -- Routine Checks -- Quarterly Audits -- PM
Correlation Audits -- DEVELOPMENTS IN PM CEMS -- CHAPTER 10 CEM
SYSTEM CONTROL, DATA ACQUISITION, AND REPORTING -- CONTROL
SYSTEMS -- Computer Control -- Programmable Logic Controllers --
Data Loggers -- Embedded Microprocessors -- THE DAHS COMPUTER
-- CEM System Software Development.
Data Handling Functions of the DAHS Computer -- Data Reporting --
The U.S. EPA Excess Emission Report -- The U.S. EPA Part 75 Electronic
Data Report -- Other U.S. Reporting Programs -- Communication --
DAHS QUALITY ASSURANCE -- SUMMARY -- CHAPTER 11 CERTIFYING
CEM SYSTEMS -- PART 60 PERFORMANCE SPECIFICATIONS AND TEST
PROCEDURES -- Installation Specifications -- PART 60 DESIGN
SPECIFICATIONS FOR GAS MONITORING SYSTEMS -- Span -- Calibration
Drift Capability -- PART 60 PERFORMANCE SPECIFICATIONS FOR GAS
MONITORS -- Performance Specification Test (PST) Procedures in the
United States and Canada -- The Calibration Drift (Error) Test -- Part
60 Calibration Drift Calculations -- The Linearity (Measurement Error)
Test -- The Environment Canada Calibration Drift Test -- Cycle
Time/Response Time Test -- Dynamic Spiking Test (Method
of Standard Additions) -- The Relative Accuracy Test -- Bias Tests --
Relative Accuracy Procedure as a Percentage of the Emission Limit --
Relative Accuracy as a Percentage of Certified Gas Concentration
(Alternative Procedures) -- The Relative Accuracy Test Report --

Causes for Failure of a Relative Accuracy Test -- PART 75
PERFORMANCE REQUIREMENTS -- PART 63.8 MONITORING
REQUIREMENTS -- ENVIRONMENT CANADA EPS/1/PG/7 CEM
GUIDELINES -- INTERNATIONAL APPROACHES TO CEM SYSTEM
CERTIFICATION AND APPROVAL -- International Standards
Organization (ISO) Standards for Gas Monitoring Systems -- The
European Union EN 14181 Standard for Automated Monitoring Systems
-- DEVELOPING CEM CERTIFICATION PROCEDURES AND STANDARDS --
CHAPTER 12 MONITORING FOR MERCURY -- MERCURY ISSUES --
MERCURY REGULATIONS -- Coal-Fired Electric Generating Units --
Cement Plants -- Municipal Waste Combustors and Incinerators --
Canadian Mercury Regulations -- Mercury Emissions Outside of North
America -- MERCURY MONITORING -- Analytical Methods for Mercury
Monitoring.
Continuous Mercury Monitoring Systems.
