



● **Air Quality Monitoring System**

Environmental & Process Monitoring

February, 2014

Agenda

- Gas Analysis Technology
- Particulate Monitoring Technology
- AQMS Introduction



● Gas Analysis Technology

Gas analyzer

Invent Chemiluminescence gas analyzer and Pulsed fluorescence gas analyzer 40 to 45 years ago

Today we offer the industry's widest choice of air quality instruments to provide solutions that add flexibility and convenience to ambient monitoring for the Environmental Compliance Industry and Researchers alike.



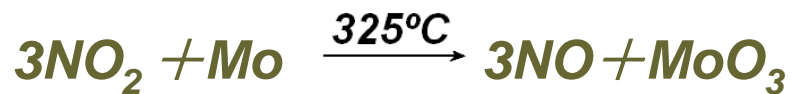
Gas analyzer



| | |
|-------------------------------------|------------------------------------|
| SO ₂ | 43i / 43iHL / 43iTLE |
| NO/NO ₂ /NO _x | 42i / 42iHL / 42iTL / 42iLS / 42iD |
| NO/NO _y | 42iY |
| CO | 48i / 48iHL / 48iTLE |
| O ₃ | 49i |
| CO ₂ | 410i |
| NH ₃ | 17i |
| HCL | 15i |
| H ₂ S/SO ₂ | 450i |
| THC | 51i |
| CH ₄ /NMHC | 55i |
| Calibrator | 146i / 49iPS |
| Zero Gas | 111 / 1160 / 1150 |

Gas Analyzer

Offering EPA and Internationally approved instruments



$$I / I_0 = e^{KLC}$$

**42i NO-NO2-NOX
Chemiluminescent Gas Analyzer
RFNA-1289-074**

**43i SO2
Pulsed fluorescence Analyzer
EQSA-0486-060**

**48i CO
Gas filter correlation gas analyzer
RFCA-0981-054**

**49i Ozone
UV Photometric gas analyzer
EQOA-0880-047**

● **Particulate Monitoring Technology**

Particulate Products



| | |
|----------------------|---|
| TEOM 1405 series | Ambient Particulate Monitor |
| 5014i/FH62C14 | β Continuous Particulate Monitor |
| 5030i/5030SHARP | Synchronized Hybrid Ambient Real-time Particulate Monitor |
| 5012 MAAP | Multi-Angle Absorption Photometer |
| Partisol 2000i/2025i | Air Sampler |
| 2000iD/2025iD | Dichotomous Air Sampler |
| Partisol 2300 | Speciation Sampler |
| HIVOL | High-Volume Air Sampler |



6 key PM technologies

- Gravimetric
- Light Scattering
- Beta Attenuation
- Hybrid Light Scattering/Beta Attenuation
- TEOM (Tapered Element Oscillating Microbalance)
- TEOM with FDMS (Filter Dynamics Measurement System)



Summary of Technologies

- Optical Technique:
 - PDR 1500
 - ADR 1500Fast response; very precise, dependent on aerosol characteristics
- β -ray attenuation:
 - FH62C14/5014*i*Slow response, very accurate, independent of aerosol characteristics
- Optical Technique with:
 β -ray attenuation (Hybrid)
 - 5030 / 5030*i*Fast response, very precise and accurate, independent of aerosol characteristics.
- Oscillating Microbalances:
 - 1405 TEOM
 - PDM 3600Fast response, very precise and accurate, independent of aerosol characteristics
- Oscillating Microbalances:
with FDMS
 - 1405 F / 1405 DFVolatile, non-Volatile Information



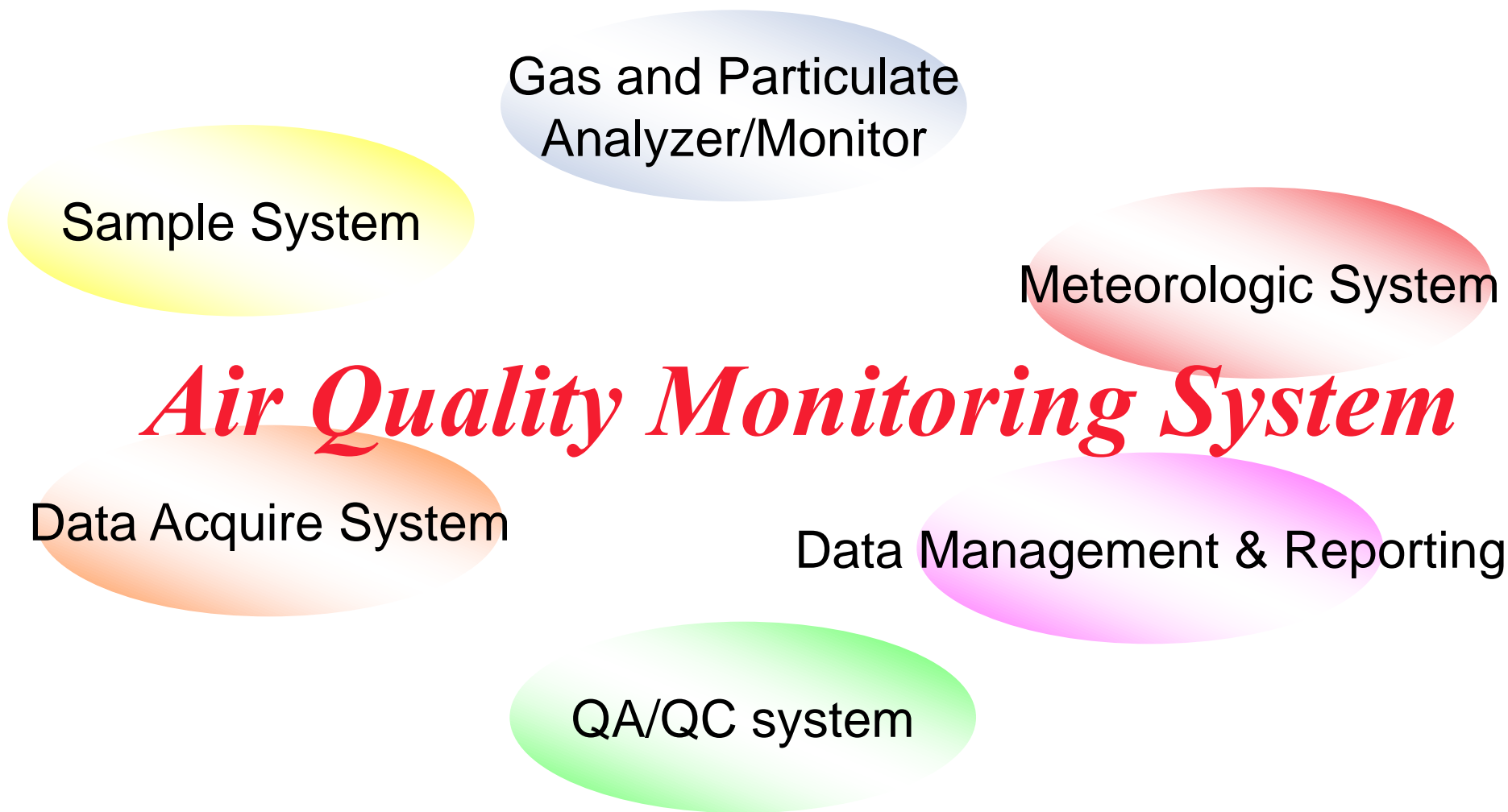


● AQMS Introduction

AQMS

- A network with substations for region's air quality monitoring
- Real time monitoring
- Long time, no-stop working
- Data processing ability (data report and chart)
- Unattended automatic operation





AQMS Applications

- Regulatory monitoring for compliance / Air-Quality Networks
- Source identification and control / Area/Fenceline Monitoring
- Emergency response
- Determining gaseous or particulate trends



Thermo Scientific AQMS in China

- Beijing EMC set up first set of AQMS in China
- Hundreds of Thermo Scientific AQMS running in China

Beijing AQMS in 1983



Update in 2005年



Thermo Scientific AQMS in China

Guangdong Atmospheric Supersite



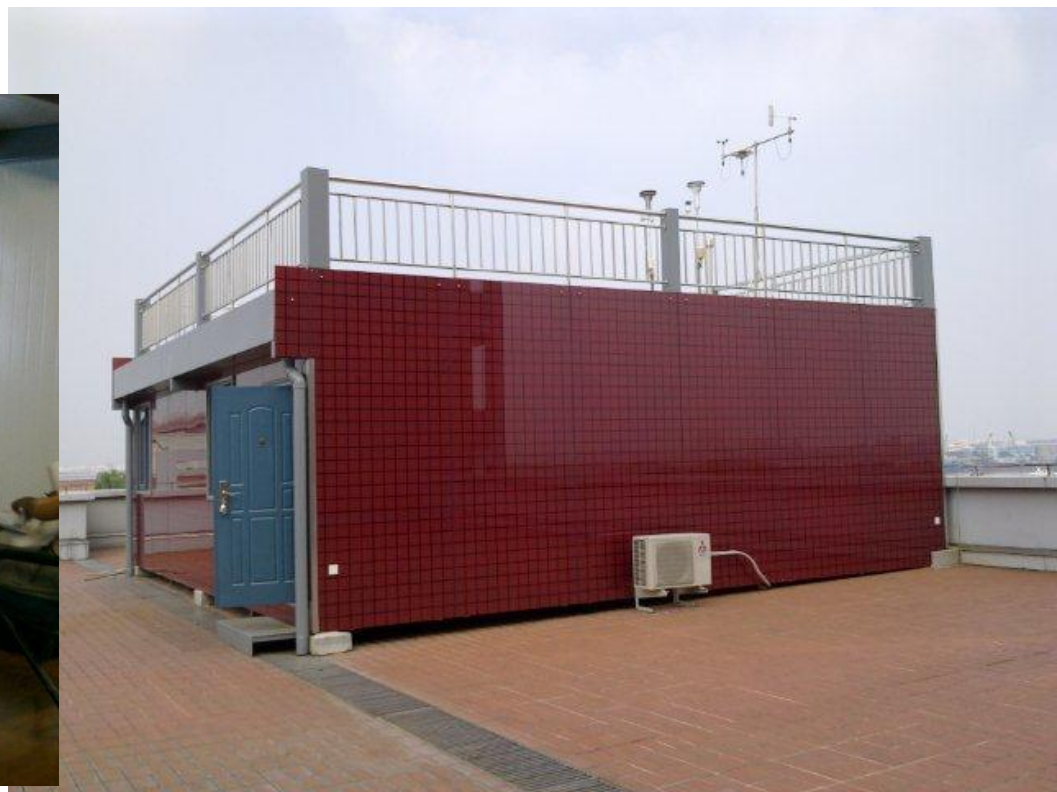
Thermo Scientific AQMS in China

Ningbo EMC Ambient Monitoring Station



Thermo Scientific AQMS in China

Ningbo EMC Ambient Monitoring Station



Thermo Scientific AQMS in China

Shanghai EMC Roadside Air Quality Monitoring Station



Thermo Scientific AQMS in China

Urumchi EMC Mobile AQMS



Thank you for your time and attention



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S C I E N T I F I C

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