

ANALYZER SOLUTIONS FOR YOUR PROCESS!

4610 NO_x Photometric Analyzer System

The 4610 Analyzer System is designed for source monitoring of nitrogen oxides. With minor changes, it can also be used for analysis of much higher concentrations (up to 100%) of nitrogen oxides in gas streams typical in acid plants.

- Complete system for monitoring NO and NO₂ from emission sources.
- Minimum full scale range 200 ppm.
- Selective, with no interference from H₂O, CO₂, CO, SO₂, SO₃ atmospheric gases, or particulates.
- No catalyst or ozone generation required.
- No wet chemistry involved. Operates without reagent solutions or devices for metering chemicals.
- Simplicity: Little operator training or attention required.
- Proven high reliability: Unsurpassed on-line performance.
- Low maintenance: Simple, rugged design minimizes maintenance and need for spare parts. No special skills needed for servicing.
- Unsurpassed long-term accuracy: Easy calibration and interference-free measurement give operators high confidence in results.
- Fully accepted by EPA: To date, all AMETEK source monitoring systems have passed EPA certification.

Principle of Operation

Stack gas is pulled through the analyzer system by an air-driven aspirator of TEFLON® TFE resin. Nitrogen dioxide (NO₂) in the sample gas is analyzed directly; the analyzer's patented splitbeam design (Figure 1) measures the difference in light absorption by NO₂ at two different wavelengths (436 nanometer (nm) measuring wavelength and a 578 nm reference wavelength).

This splitbeam design, which has no moving parts, automatically compensates for particulates in the sample stream, lamp aging, or window fouling, without the maintenance requirements of chopped beam systems.

Since nitric oxide (NO) is essentially transparent in the visible and ultraviolet, it first must be quantitatively converted to NO₂. The 4610 does this conversion by reacting the sample containing NO with oxygen at 5 atmospheres pressure in the sample cell. This reaction is both rapid and reproducible. A flow diagram of the operation is shown in Figure 2.

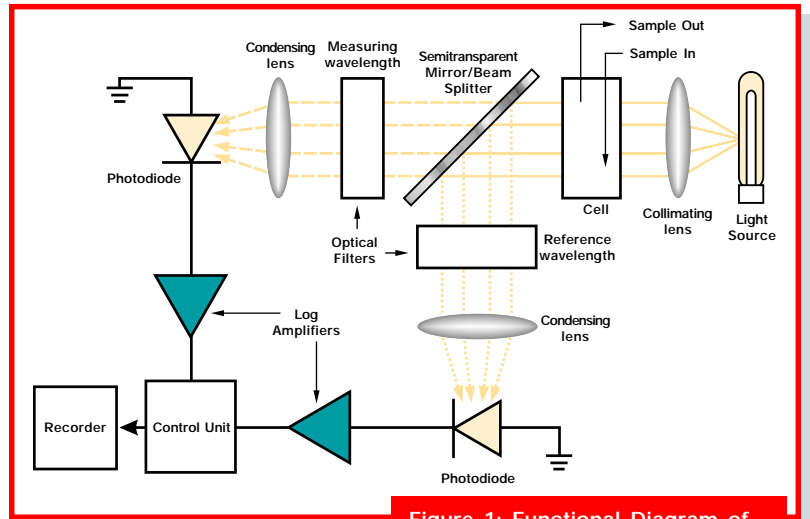


Figure 1: Functional Diagram of Series 4610 Photometric Analyzer

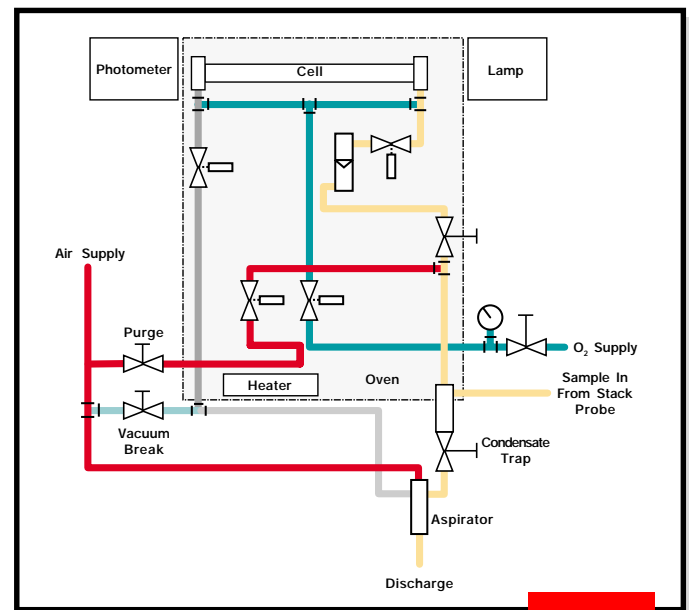


Figure 2

Rugged Construction and Minimum Maintenance

The system housed in a corrosion-resistant-painted, weatherproof cabinet, containing the photometer, power supply, and sample system. The controller is typically mounted on a control panel in a remote location. System electronic circuits and optical design have been performance-proven in thousands of installations. The system is designed for easy installation, high reliability, and minimum maintenance.

PERFORMANCE SPECIFICATIONS

Range:

NO_x: 0 to 200 ppm (wet basis) minimum full scale; 0 to 100% (wet basis) full scale range
O₂: 2 to 25% (wet basis) when required

Sample Points: Multiple

Analyzer Outputs: Linear with concentration; signals are 4 to 20 mADC, tracked and held for continuous output.

Photometric Accuracy: 1% of full scale

System Accuracy:

0 to 500 ppm: 2% full scale
0 to 250 ppm: 4% full scale
0 to 200 ppm: 5% full scale

Zero Standardization: Automatic every 10 minutes

Calibration: An optical calibration filter corresponding to a fixed NO_x concentration is standard. Span gases may be used as desired, or required by operating permit.

Sample Flow: About 3 L/min. or 6 std ft³/hr. (noncritical)

Ambient Temperature Requirements: -20° to 120° F (-29° to 49° C)

EPA Compliance: Meets all known EPA and local requirements

MECHANICAL SPECIFICATIONS

Field Unit: 72 x 48 x 12 in. (183 x 122 x 31 cm)

Weight: 1100 lb. (500 kg); steel cabinet, epoxy painted, NEMA 3RCV (Rain Shielded Convection Ventilated)

Sample Line: Electrically heated, self-limiting for nonhazardous areas, or temperature controlled for hazardous areas; insulated with tubing of TEFLON® TFE fluorocarbon resin for sample transport.

REQUIRED FIELD UNIT CONNECTIONS

Sample Inlet: Normally 1/4 inch; 3/8 inch available

Sample Discharge: 3/8 inch tube

Instrument Air: 1/4 inch tube for system air; 3/8 inch tube for high pressure blowback air

Electrical: 3/4 inch, 1 inch, and 1-1/2 inch conduit

REQUIRED SERVICES

Instrument Air: 45 to 90 psi (300 to 600 kPa) gauge instrument quality air; consumption 2 std ft³/min. field unit and 2 std ft³/min. for each probe with high-pressure blowback.

Oxygen: 60 psig (414 kPa) or greater welding grade

Electrical: 2 kVa, all worldwide power supplies acceptable, single phase for sample line up to 30 m (100 ft.); 3 phase for sample line longer than 200 ft. (61 m)

ELECTRICAL CLASSIFICATION

Standard field unit and probe suitable for non-hazardous area

Standard control station suitable for non-hazardous area

Other classifications available

OTHER AMETEK PROCESS INSTRUMENTS ANALYZERS FOR PROCESS MEASUREMENTS

- Concentration analysis of more than 1,800 gases, liquids, and vapors commonly processed in chemical and hydrocarbon plants.
- Sulfur removal and recovery process analysis, to optimize efficiency and economy in all respects of the process, and to comply with all regulatory requirements.
- Color analysis to monitor product quality and the presence of contaminants.
- Turbidity measurement to detect filter breakthroughs and monitor for particulate contamination.
- Optical rotation analysis to measure concentration of organic materials in critical process streams.

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

AMETEK®

PROCESS INSTRUMENTS

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