

MODEL S-5012

Chemiluminescence NO-NO₂-NO_x Analyzer



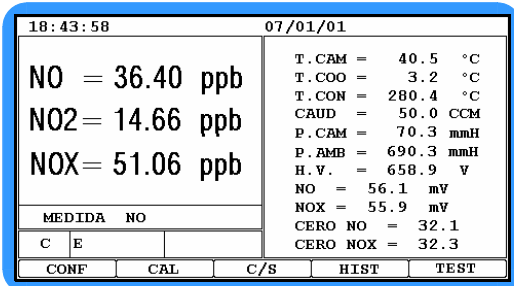
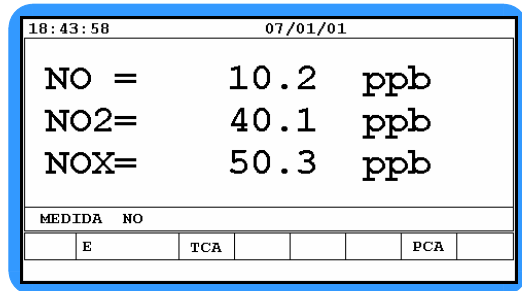
Advantages – Features

- ◆ **NO₂ to NO Converter** with increased resistance to Ammonia effects.
- ◆ **Measurements:** (NO), (NO_x), (NO-NO₂-NO_x)
- ◆ **Automatic** Temperature and Pressure Correction
- ◆ **Concentrations** in ppb, µg/m³, ppm.
- ◆ **Autorange** or operator adjustable.
- ◆ **Modular Electronics** common with SIR Models:
-S-5001 SO₂. -S-5014 O₃.
-S-506 CO. -S-5000 Multi-Gas Calibrator.
- ◆ **Automatic** zero correction.
- ◆ **External Sensors** can be logged, data can be: stored and presented in graphical and tabulated formats.
- ◆ **Electronic** Diagnostic Transducers.
- ◆ **Internal** Datalogger and Memory.
- ◆ **Graphical Screen** with simultaneous presentation of Concentrations and Diagnostics.
- ◆ **Bi-directional** Communication for External Control, “RS232/RS485”.
- ◆ **Calibration:** manual, automatic and remote.
- ◆ **Dedicated Menus and Graphical Screen** allowing total external control:
 - Configuration
 - Calibrations
 - Graphics
 - Zero/Span
 - Diagnostics
 - Data History
 - Alarm History
 - Test of elements
- ◆ **Powerful Calibration and Maintenance Menus** (protected by password).
- ◆ **Calibration** not only for the pollutants but also for internal electronics of functional parameters.
- ◆ **Multi-tasking software** allows viewing test variables while operating.
- ◆ **Adaptive filtering** selectable.
- ◆ **Continuous self checking** with warning alarms and table of alarms history.
- ◆ **Signals Generation** for checking Data Acquisition Channels.
- ◆ **Options:**
 - PCMCIA Board.
 - Internal Span.
 - NH₃ Measurements.

SERVICE CAPABILITIES AND EXTERNAL CONTROL

MAIN SCREEN.- Simultaneous display of:

- Date and Time.
- Concentrations and Units.
- Internal valves status.
- Activated digital inputs.
- Up to six alarm conditions.
- Current measurement phase.
- Backlight, automatic activation.



DIAGNOSTICS SCREEN.-

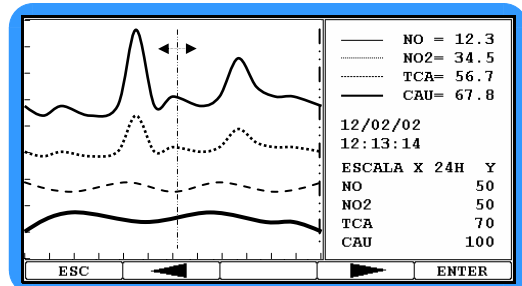
- Powerful diagnostic software, determination of possible faults.
- The anomalous parameter is shown with an arrow.
- Continuous Quality Control.

SERVICE AND CALIBRATION.-

- Authorization through a password.

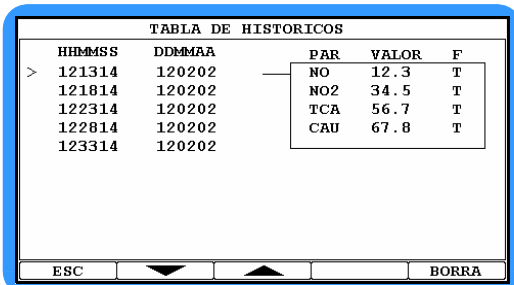
GRAPHICS SCREEN.-

- Simultaneous Graphics of up to four parameters.
- Selectable integration periods 5, 10, 15, 30, 60 min.
- Selection cursor, date, time, value, measuring ranges.



EXTERNAL SENSORS

- It is possible to connect external sensors.
- The Datalogger and Memory are configurable.

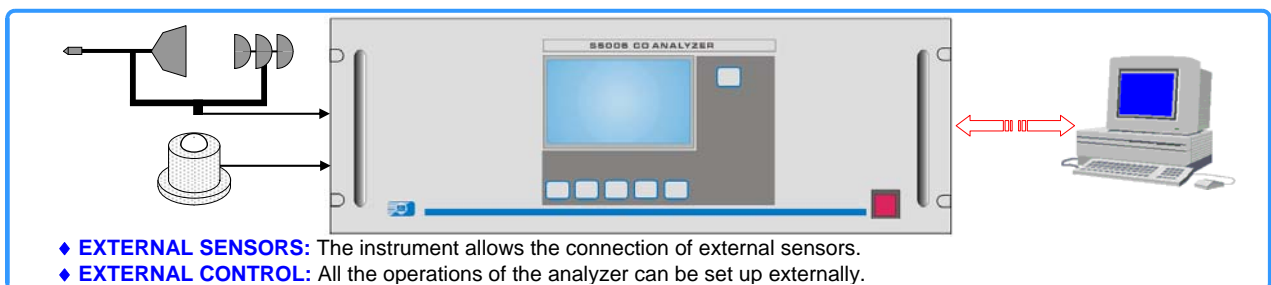
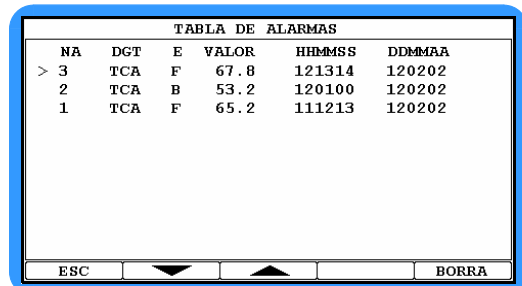


DATA HISTORY.-

- Automatic generation of tables for the selected parameters: data, diagnostics, external sensors.
- Selectable integration periods: 5, 10, 15, 30, 60 min.
- Cursor for quick reference to date.
- Indication of:
 - Parameter.
 - Date.
 - Value.
 - Time.
 - Operative conditions (flag).

ALARMS TABLE.-

- Automatic generation of alarms of selectable parameters: data, diagnostics, external sensors.



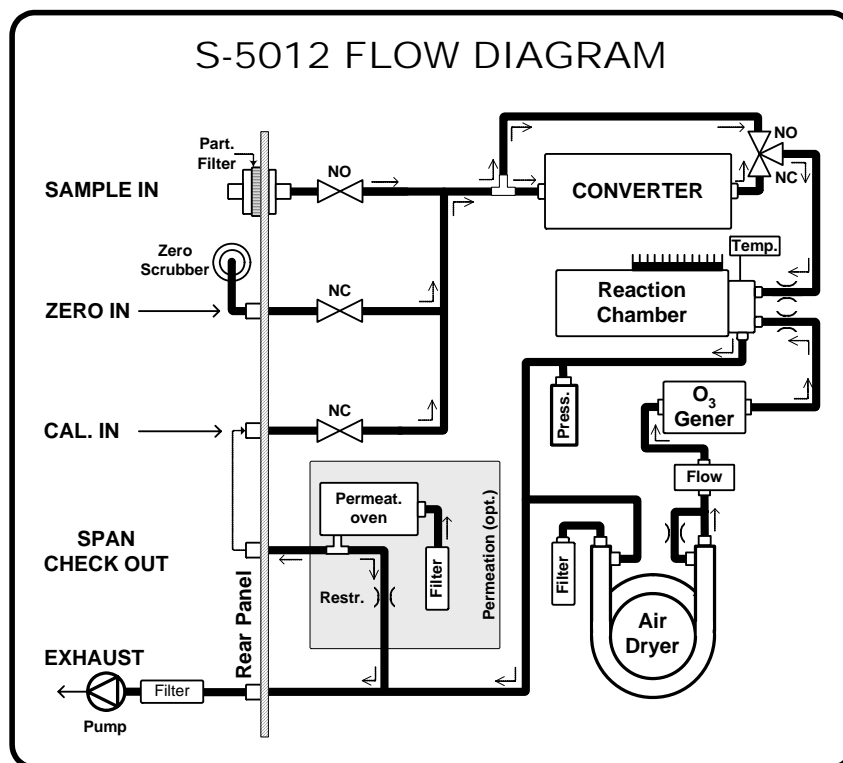
THEORY OF OPERATION

The SIR Model S-5012 Nitrogen Oxides Analyzer is designed to measure the amount of nitric oxide (NO), nitrogen dioxide (NO₂) and total oxides of nitrogen (NO_x) in a continuous, ambient air sample. The instrument reacts quickly to changes in NO, NO₂ and NO_x concentrations in the sample, while providing a highly stabilized measurement capability for extended periods, without repeated adjustments.

The analyzer utilizes the photometric detection of chemiluminescence which results from the gas phase reaction of ozone with NO. In this reaction, some of the resultant NO₂ is produced in an electronically excited state; the excited NO₂ immediately decays to the ground state (or normal NO₂) while emitting light in the spectral region from about 600 nm to 2400 nm, with a peak at about 1200 nm. This phenomenon is known as chemiluminescence. The intensity of light generated in the reaction is proportional to the concentration of NO present, and the reaction is applicable to the direct measurement of atmospheric concentrations of NO.

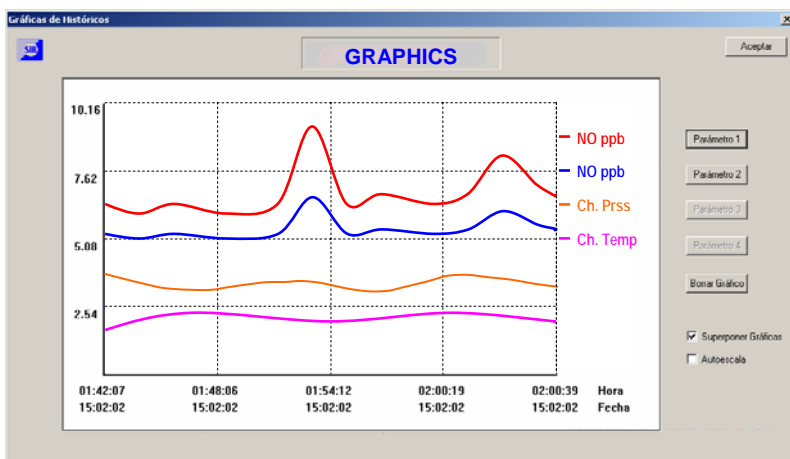
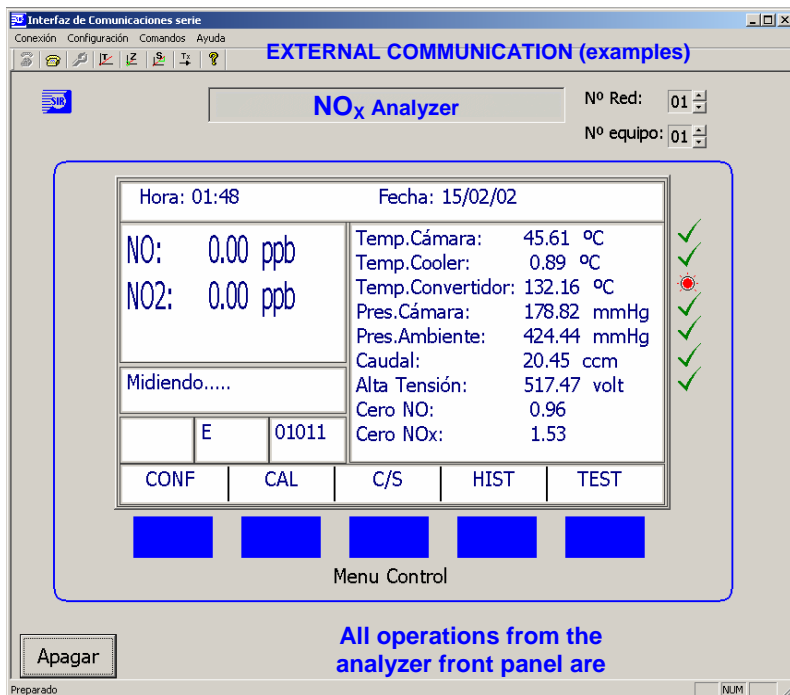
Measurements of NO₂ are made indirectly by first reducing the NO₂ to NO, then reacting the resultant NO with ozone and measuring the light intensity from the reaction. In practice, the NO₂ in a sample of air is first reduced to NO by means of a converter. Any NO, which is already present in the air sample, passes through the converter unchanged, causing a resultant total NO_x concentration equal to NO + NO₂. A portion of the air sample is also reacted with ozone without having passed through the converter, which yields the NO concentration. This latter NO measurement is subtracted from the previous NO_x measurement (NO + NO₂) to yield the final NO₂ measurement.

The analyser provides automatic cycling between the NO and NO_x measurements, with the concentrations (NO₂) updated and displayed after each cycle. Normal cycle time is approximately 24 seconds.



S-5012 SPECIFICATIONS

- Ranges:** 0-50, 500 ppb, 20 ppm.
Other available.
- Autorange / Adjustable Range.**
- Measurements:** (NO)-(NO_x)-(NO/NO₂/NO_x)
- Units:** ppb, µg/m³, ppm
(µg/m³, referred to 0°C, 20°C, 25°C).
- Noise:** 0.2 ppb.
- Lower Detectable Limit:** 0.4 ppb.
- Zero Drift:** 0 (with autozero).
< 0.4ppb/24h (without autozero).
- Span Drift:** < 0.1%/24h
- Lag Time:** 30 Seconds.
- Rise Time:** 60 Sec. (95% FS).
- Fall Time:** 60 Sec. (95% FS).
- Precision:** ± 0.5% of reading.
- Linearity:** ± 1% of range
- Temperature Range:** 5-40°C.
- Sample F. Rate:** 0.2 lpm.
- O₃ F. Rate:** 25 ccm.
- Analog Outputs:** 4 (Volts-mAmp). (Adjustables).
- Analog Inputs:** 2 (external sensors).
- Digital Inputs/Outputs:** 5 Status, RS232 or RS485.
- Automatic:** Temperature and Pressure correction.
- Automatic:** Zero correction.
- Internal:** Datalogger and Memory.
- External Control and Download:** RS232 or RS485.
- Common Electronics:** SIR Analyzers/Calibrator.
with
- Power:** 115/220 VAC or 12VDC.
- Included Items:** Particulate filter.
Zero and Span Valves.
- Dimensions and Weight:**
- | | <u>Bench Mount</u> | <u>Rack Mount</u> |
|--|--------------------|-------------------|
| | 17.8 cm (7") | 17.8 cm (7") |
| | 43.5 cm (17") | 48 cm (19") |
| | 59 cm (23") | 59 cm (23") |
| | 18 Kg (40 lbs) | 19 Kg (43 lbs) |
- OPTIONS:** PCMCIA Card.
Internal Span.
NH₃ measurement.



Mantenimiento

MAINTENANCE MENU

General

Tiempo de ciclo: 15 Seg
Tiempo de medida: 10 Seg
Tiempo de cero: 10 Min
Tiempo de Span: 10 Min
Ciclo de Cero: 0002
Números negativos: No

Factor de Amplificación

Factor de milVolts: 00.42
Offset 1: 00.00
Offset 2: 00.50
Offset 3: 00.50
Ganancia Convert.: 01.00

Máximos y Mínimos

Máximo de NO: 000.54 ppb
Mínimo de NO: 000.00 ppb
Máximo de NO_x: 001.00 ppb
Mínimo de NO_x: 000.00 ppb

Filtrado

Num 1ª
Num 2ª
Num 3ª
Num 4ª

Aceptar
Cancelar

CE APPROVED
ACCORDING TO UNE-77212:1993
AND 1999/30/CE DIRECTIVE
US EPA APPROVAL: RFNA-0804-152
COMPLIES WITH EN 14211:2005