

Ndir gas analyzer for low ranges MOD. ENOX DPB



- High sensibility sensor with correlation cell
- No periodic calibration needed due to automatic zero calibration
- Double measuring path length - about 1000 mm long
- LCD display with all measuring and service indications
- Automatic temperature compensation
- Automatic and continuous flow control
- Fault and service alarms for each gas
- 2 measure alarms for each gas
- 7 digital outputs and 6 digital inputs
- 4 analog outputs
- Small dimensions
- QAL 1 certification (according to EN 14181 and EN 14956 as for procedures specified by EN 15267) by TUV Rheinland

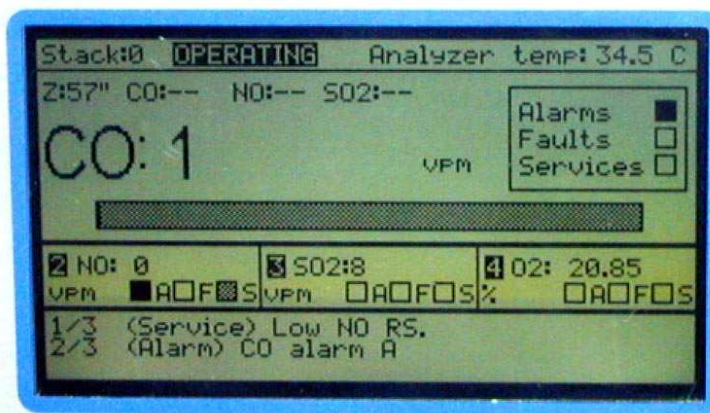
Overview

The analyzer is housed in a steel 19" rack 3 vertical units high.

The connector for digital and analogical input and output, the filtered power connected with switch and fuses and the fittings for sample inlet and outlet are located on the rear panel.

A low flow detector and optionally a diaphragm pump, an AISI solenoid valve for automatic zero calibration and an electrochemical cell for the O₂ measurement in the sample gas are located inside the housing.

A 16-keys keyboard, a fast to be checked and replaced fine filter and a big back-lighted LCD display are present in the front panel.



Technical description

The Enox multigas analyzer is an industrial photometer based on the non dispersive photometry in the infrared, for the contemporary measure of several gases.

The main feature of this analyzer model DPB (Double Path Beam) is to have a long optical path to obtain very high sensitivity which can guarantee the declared performance even on very low ranges as for the lower and lower emission limit prescribed by Law.

The main pulse to follow and reach this solution has been driven from the necessity to develop an NDIR NO (nitrogen oxide) analyzer whose performances are comparable with the ones of more expensive analyzers normally used where the emission limits are about some tens vpm.

The technology used is based on correlation filters (GCF) and optical non dispersive absorption (DOAS). A high stability sensor, working at a very low temperature (-35 °C) and the GFC technology ensure a nearly fully immunity to cross sensitivity, high stability and sensitivity.

The measuring principle, the optical bench and the automatic and accurate compensation of room temperature variations enable to avoid the expensive and complicated automatic calibrations, which are anyway possible.

A large back lighted graphic display continuously shows measured gases value (including a large bar graph), alarms, service requirements, faults (separated for each gas) and the alarms from the sampling system. All alarms have the acknowledgement routine. All anomaly messages are reported on the display for the immediate knowledge of any malfunctioning. Relays contacts enable all the diagnostic to be retransmitted.

This instrument has been designed to be user friendly and reduce as much as possible the costs of the analysis system in which it will be used. The analyzer can manage a multiplexing CEM up to four emission points and can be directly connected to a P.C. provided with special Fer software, named DAS-DAC, for data acquisition, monitoring and reporting.

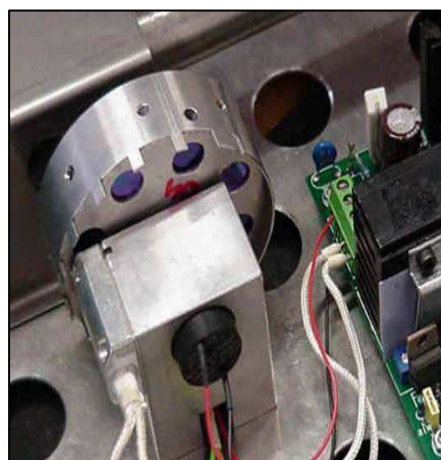
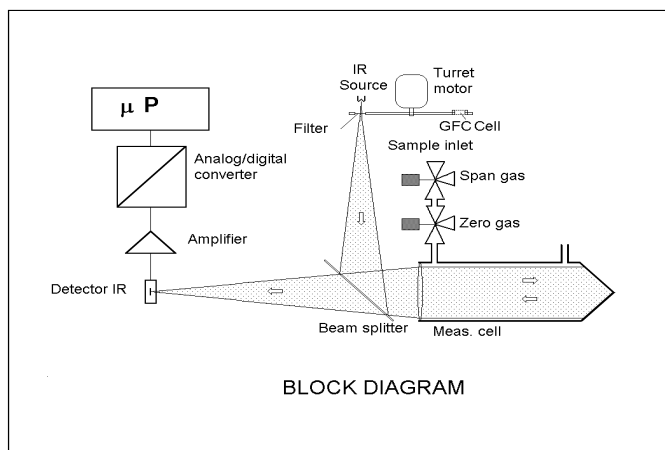
Operating principle

A wide band infrared radiation is emitted by a non metallic, high stability source.

For each measured gas, this radiation is brought alternatively through an interferential filter and a filter with a glass cell (GFC) filled with high partial pressure of the gas to be analyzed.

A suitable optical system drives the IR radiation inside the analysis chamber and then to the detector which receives and amplifies alternatively the two signals: one is the measure, the other one is the reference. The gas concentration is proportional to the difference of these two signals.

Gases which may have a cross sensitivity with the measured gas generate the same variation both on measure signal and on reference signal. Therefore the measurement is not affected.



Applications

The analyzer can be used for gas measuring in a wide range of industrial applications:

- Combustion control
- Measuring of emissions of boilers, furnaces, domestic and industrial incinerators, cement plants, furnaces, etc.
- Process gas monitoring
- Monitoring of emissions from engines and turbine with NO_x lowering systems (SCR – DENOX – LENOX etc...)
- Analysis of gases from landfills
- Air quality in green houses, tunnels, parking
- Analysis of protection atmosphere

Technical specifications

Measured components	Up to 3 gases with NDIR + oxygen Lowest ranges: 1. CO 0...10 ppm 2. CO₂ 0...10 ppm 3. NO 0...50 ppm 4. SO₂ 0...100 ppm 5. CH₄ 0...50 ppm 6. HCl 0...50 ppm 7. NH₃ 0...50 ppm 8. O₂ 0...25% in volume Highest ranges: 100% or saturation.
Measure units	vpm, mg/m ³ , mg/Nm ³ , %
Scope View	Integrated oscilloscope for signal waveform displaying and for choosing the measures to be used for the analysis.
Flow control on sample	Continuous on flow < 0.5 l/min
Digital Output	N. 2 settable contact alarms on each measure, except oxygen N. 1 contact service for each measure, except oxygen N. 1 contact fault for each measure, except oxygen, and flow fault N. 1 contact for calibration N. 2 contacts for solenoid valve, in case of external calibration (24 Vcc 50 mA)
Zero calibration	Automatic with ambient air or nitrogen. Frequency and duration are tunable
Response time (T90)	Depending on settable mobile averages
Mobile averages	Short average tunable between 11 and 20" Long average tunable between 15 and 300" Automatic switching between one and the other following the switching settable criteria.
Performance	accuracy: 1% of full range linearity: 1% of full range repeatability: 1% of full range
Ambient conditions	Temperature for operating +5...+35°C Temperature for storage, transport -10...+60°C Moisture: <90% RH not condensing
Panel filter	Retention: 1 micron
Power supply	110-230 V AC +/-10%
Power consumption	About 70 VA

Display	240X128 pixel, graphic, back lighted LCD, tunable contrast via software. It shows: - Measured values with units - Bar graph for one gas - Alarms state and managing - Time to next zero and span automatic calibration if activated - Stack measured if in scanning
Analogical Output	N. 4 4-20 mA linear isolated outputs. Max load 500 ohm.
Serial Output	RS 232, RS 485, Modbus with transmission of all measurements and alarms
Span Calibration	Automatic available but not necessary. Tunable frequency and duration
Digital Input (12 Vcc 100 mA)	N. 1 remote calibration N. 1 sampling system fault N. 4 stack currently on measure (if scanning) N. 4 low cylinder pressure
Warm up time	30', best performance with temperature stability, depending on ambient situation
Protection	IP20
Drift	Negligible with automatic zero calibration: • < 2% of lowest range without automatic zero calibration • Ambient temperature: negligible and continuously compensated • Atmospheric pressure: ambient pressure settable • Zero: none • Span about 1% of measured value for 1% of atmospheric pressure change
Keyboard	16 keys membrane
Sample gas status	• pressure 20...80 mbar • flow 30...180 Nl/h • temperature +5...+50°C • dew point at least 5°C under ambient temperature
Dimensions	450x132x380
Weight	kg. 12

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