

## TECHNICAL SPECIFICATIONS

|                        |  |
|------------------------|--|
| Measured components    | Up to 3 gases with NDIR + oxygen<br>Lowest ranges:<br>1. CO 0...100 ppm<br>2. CO2 0...200 ppm<br>3. NO 0...200 ppm<br>4. SO2 0...1000 ppm<br>5. CH4 0...500 ppm<br>6. O2 0...25% in volume<br>Highest ranges:<br>100% or saturation.   |
| Measure units          | vpm, mg/m3, mg/Nm3, %  |
| Scope View             | Integrated oscilloscope for the signal's waveforms displaying and for choosing the measures to be used for the analysis.   |
| Flow control on sample | Continuous on flow lower than 0.5 l/min  |
| Digital Output         | N. 2 contacts settable alarms on each measure, except oxygen<br>N. 1 contact service for each measure, except oxygen<br>N. 1 contact fault for each measure, except oxygen, and flow fault<br>N. 1 contact for calibration<br>N. 2 contacts for solenoid valve, in case of external calibration (24 Vcc 50 mA) |
| Zero calibration.      | Automatic with ambient air or nitrogen. Tunable frequency and duration   |
| Response time (T90)    | Depending on mobile averages settable  |
| Mobile averages        | Short tunable between 11 and 20"<br>Long tunable between 15 and 300".<br>Automatic switching between one and the other following the switching settable criteria.  |
| Noise                  | <= 1% of lowest range  |
| Ambiental conditions   | Temperature for measure +5...+40°C<br>Temperature for stocking and transport -10...+55°C<br>Moisture: <90% RH not condensing   |
| Panel filter           | Retention: 1 micron  |
| Alimentation           | 110-230 V AC +/-10%  |
| Power                  | About 70 VA  |

|                               |   |
|-------------------------------|---|
| Display                       | 240X128 pixel, graphic, back lighted LCD, tunable contrast via software. It shows:<br>- Measured values with units<br>- Bar graph for one gas<br>- Alarms state and managing<br>- Times to next zero and span automatic calibration if activated<br>- Stack measured if in scanning.  |
| Analogical Output             | N. 4 4-20 mA linear isolated. Max load 500 ohm.   |
| Serial Output                 | RS 232, RS 485, Modbus  |
| Analogical input              | N. 6 4-20 mA for retransmission and process value data acquisition  |
| Digital Input (12 Vcc 100 mA) | N. 1 Distant calibration<br>N. 1 sampling system fault<br>N. 4 stack currently on measure (for scansions)<br>N. 4 low cylinder pressure   |
| Span Calibration              | Automatic available but not necessary. Tunable frequency and duration   |
| Warm up time                  | 5'<br>45' best performance  |
| Drift                         | Negligible with automatic zero calibration: <ul style="list-style-type: none"> <li>&lt; 2% of lowest range without automatic zero calibration</li> <li>Ambient temperature: negligible continuously compensated</li> <li>Atmospheric pressure: settable</li> <li>zero: none</li> <li>span about 1% of measured value for 1% of atmospheric pressure change</li> </ul> |
| Keyboard                      | 16 keys membrane  |
| Sample gas status             | <ul style="list-style-type: none"> <li>pressure 20...80 mbar</li> <li>flow 30...180 NI/h</li> <li>temperature +5...+50°C</li> <li>dew point at least 5°C under ambient temperature</li> </ul>   |
| Protection                    | IP20  |
| Dimensions                    | 450x132x380   |
| Weight                        | kg. 12  |

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## ENOX

### MULTIGAS NDIR ANALYSER



- 19" Rack mounting.
- No calibration needed due to automatic zero calibration
- LCD Display with all measuring and service indications
- Automatic temperature compensation
- Automatic flow control
- Fault and service for each gas
- 2 measure alarms for each gas
- 7 digital output and 6 input
- 4 analog output and 6 input
- RS232-485 (option mod-bus)

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## ENOX – Multicomponent NDIR gas analyser

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

The technology which has been 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 used technology ensure a nearly fully immunity to cross sensitivity, high stability and sensitivity.

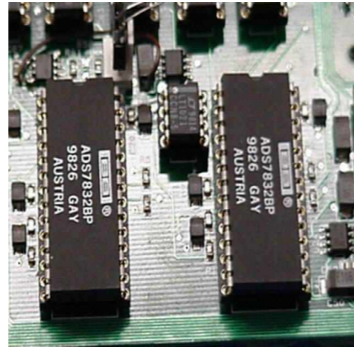
A very powerful electronic unit that can acquire all available measures (4000 per second for each analyzed gas) reduces the noise to a minimum value.

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

A large back lighted graphic display continuously supplies the value of the measured gases (including a large bar graph), the alarms, the service requirements, the 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 what has gone wrong. Contacts enable to retransmit all the diagnostic.

This instrument has been drawn to be user friendly and reduce as much as possible the costs of the analysis system in which it will be used. The analyser can be directly connected to a P.C. provided with a special software, named Enoxlogger, for data acquisition.



## APPLICATIONS

The analyser 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, furnaces, etc.
- Process gas
- Monitoring of emissions of engines and test bench
- Analysis of gases from
- Air quality in green houses, tunnels, parkings
- Analysis of protection atmosphere

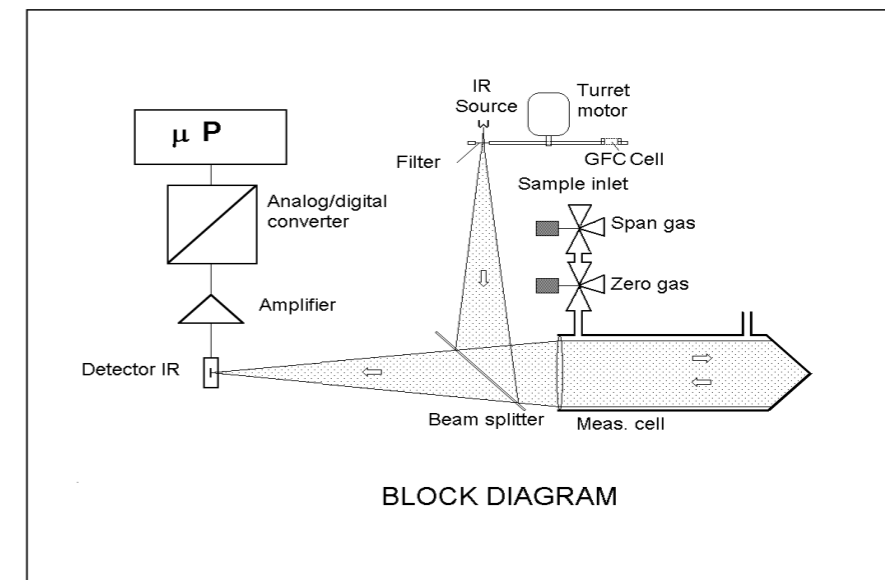
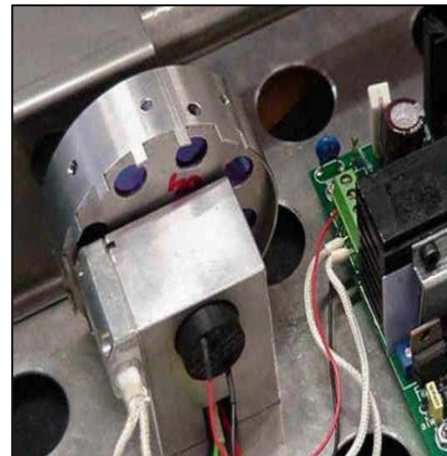
## WORKING PRINCIPLE

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

For each measured gas this radiation is routed alternatively through an interferential filter and a cuvette filled with nitrogen and a filter and a cuvette 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 is the measure. The gas concentration is proportional to the difference of the two signals.

Gases which may have a cross sensitivity with the measured gas, generate the same variation of the measure and reference signals. Therefore the measure is not affected.



The wheel that holds the cuvettes and filters rotates at 3000 r.p.m. The sensor can acquire 50 measures each time one of the cuvettes is in front of the I.R. source. A large quantity of measures is available. They must be amplified and computed, ensuring high precision and stability.

Two microprocessors connected via a dual ram are used.

With this approach no measures are lost and the instrument can manage all functions: updating display, alarms, serial outputs, analog and digital inputs etc.

The analyser can be optionally provided with an electrochemical cell for O<sub>2</sub> measuring.

## DESCRIPTION

The analyser is housed in a metallic enclosure suitable for 100% DV mounting.

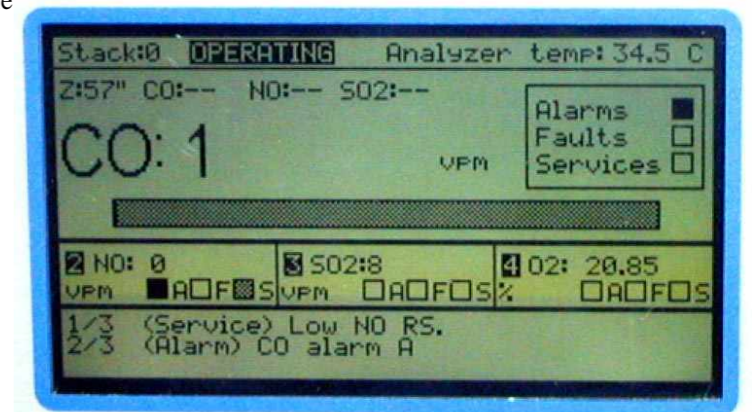
The electronic circuit is placed on the rear part of the housing.

All connectors for input and output signals are directly welded in the printed circuit, avoiding wire and connectors inside the housing.

On the rear part are also placed the filtered plug with switch and fuses for the main power supply and the inox pneumatic connections for gas inputs and outputs.

Inside the housing are present a membrane pump, the electrovalve for the autozero calibration, a flow sensor and the optional cell for O<sub>2</sub> measuring.

The panel includes a 16 keys keyboard, a fine filter with the visible filtering element and the back lighted display



## DPB Version

Polluting compound and emissions measure the more and more reduced in the air, have demanded the reduction of the full-scale of the instrument in order to render the measure of more and more small analyzable gas amounts possible.

Version DPB differs from the base version for the fact that uses an optical path much longer with consequent increase of the variation of measure signal with the same gas concentration. Is therefore possible to reduce drastically the full-scale of measurable gases. Particular attention has been placed in the measure of CO and CO<sub>2</sub> in air or in the products of combustion obtaining:

| Gas measured    | Least full-scale | Maximum full-scale |
|-----------------|------------------|--------------------|
| CO              | 10.00 ppm        | 15000 ppm          |
| CO <sub>2</sub> | 10.00 ppm        | 5000 ppm           |
| NO              | 50.00 ppm        | 15000 ppm          |

All the other characteristics remain unchanged; only the weight increases of 1.1 Kg.

