



# 800 Series TEA

Nitrogen Chemiluminescence Detector

## 800 Series TEA

The Thermal Energy Analyser (TEA) has been an industry standard for nitrosamine analysis since its introduction thanks to its incredible sensitivity and almost infinite selectivity for nitrogen containing compounds. The TEA 800 series was designed with input from users of older model TEA's from the outset to ensure this new model delivered everything customers wanted. Thanks to this input the TEA is now smaller, easier to service and simpler to operate, whilst still retaining the same great analytical performance as its predecessors.

### Easier to Use

- Controllable by pc via USB or RS232
- Simple and intuitive operation
- Pyrolyser temperature selectable from 250 to 700C for nitro or nitroso modes
- Optional separate 850C catalytic pyrolyser for nitrogen mode
- Nitro/nitroso modes eliminate interfering nitrogen compounds
- Optional CTR filters to remove pyrolysis by-products

### Easier to Service

- Modern design allows easier servicing
- Compatible with most GC's

### Compact Size

- Saves valuable bench space
- Foot print of only 38 x 37cm

### Ozone Destroyer

- Ozone Destroyer removes the need for ozone traps

### Ozone Generator

- Ozone generator features an electronically controllable oxygen flow and ozone production

### Industry Standard Performance

- Uses proven technology and principles
- Near infinite selectivity for nitrogen containing compounds
- High sensitivity

### Choice of Pumps

- Vacuum pump now external for easy servicing
- Oil-free pump option



### Technical Specifications

<b>Operating Modes:</b>	Nitro, Nitroso, Nitrogen with Catalyst (820 series only)
<b>Sensitivity:</b>	<2pg N/sec Signal to Noise 3:1
<b>Selectivity:</b>	gN/gC > 107
<b>Linearity:</b>	104
<b>O3 Voltage:</b>	Up control sensitivity selection 0 - 150
<b>PC Connectivity:</b>	Downloadable software included with instruments enabling method storage with PC, USB, RS232
<b>Size:</b>	Size 36cm (H) x 38cm (W) x 37cm (D) Weight 15kg
<b>Power:</b>	115V/230V, 50/60Hz 850 VA internally switch-able

## Principles of Operation

### Nitrogen Mode

In the nitrogen mode of the operation, the GC effluent containing nitrogen compounds is passed through a catalytic pyrolyser at a temperature from 700 to 850C to produce carbon dioxide, water vapour and nitric oxide. At temperatures from 700 to 825C all nitrogen, except molecular N<sub>2</sub>, in any nitrogen containing compound is converted to the nitrosyl radical.

Under vacuum, the nitrosyl radical is reacted with ozone to produce electronically excited NO<sub>2</sub>. The NO<sub>2</sub> rapidly decays to its ground state, emitting light in the process. The light is detected by a sensitive photomultiplier, whose signal is amplified and displayed on a chart recorder or integrator.

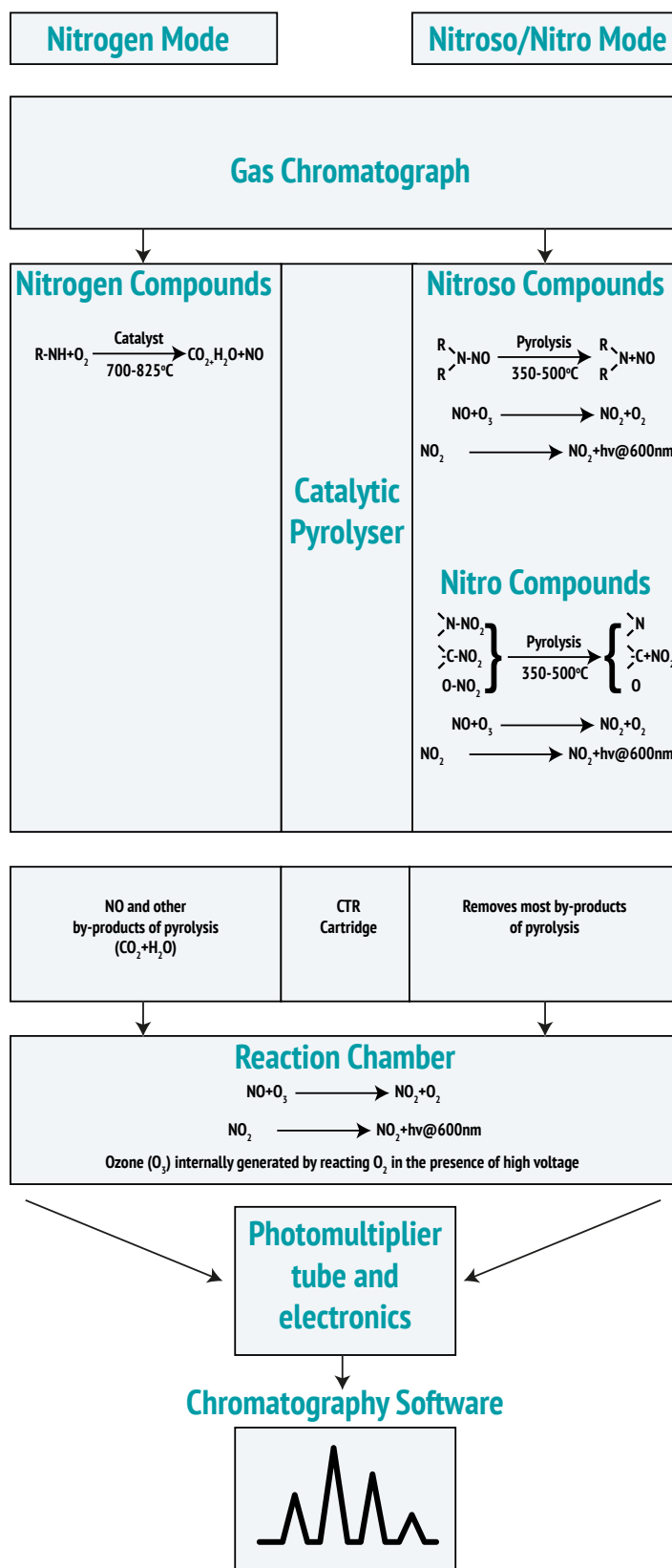
Since all organic materials (including solvents) produce CO<sub>2</sub> and H<sub>2</sub>O as pyrolysis products, the detector is uniquely selective only for those samples which contain nitrogen.

### Nitroso / Nitro Mode

In Nitroso/nitro mode, the GC effluent is introduced into a reductive catalytic pyrolyser. In the catalytic pyrolyser under vacuum, nitroso and nitro containing compounds cleave at the -NO or -NO<sub>2</sub> bonds, releasing the radicals. The nitrosyl radicals are further decomposed to nitro radicals in the high temperature pyrolyser. The pyrolyser reaction products then pass through a gas stream filter which allows only the nitrosyl radicals to pass through.

These nitrosyl radicals then react with ozone under vacuum to produce electronically excited NO<sub>2</sub>. The NO<sub>2</sub> rapidly decays to its ground state emitting light in the near infrared region which is detected by a sensitive photomultiplier. The signal is amplified and displayed on either an integrator or strip chart recorder.

In the diagram the yield of NO is a direct measurement of the nitro, nitroso or nitrogen compounds present.





To learn more about the 7000 GC Flowmeter please scan the QR code below  
or visit [www.ellutia.com/800-series-tea-detector](http://www.ellutia.com/800-series-tea-detector)



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