

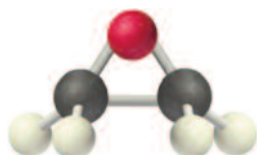


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MACView[®]

ETHYLENE OXIDE (ETOX) ANALYSER PORTABLE OR FIXED VERSION



Ethylene oxide

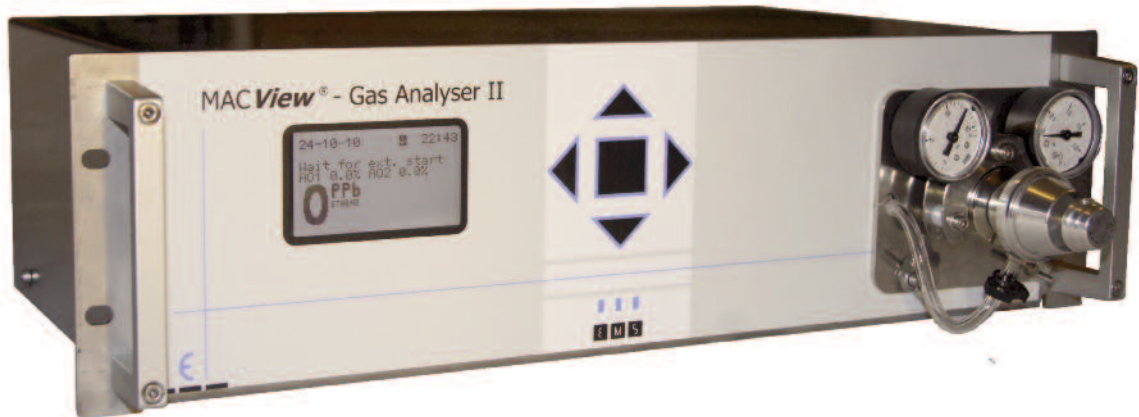
The concept for real EtOx measurement in warehouses, containers and confined spaces for human safety

The product

The MACView[®]-Ethylene Oxide (EtOx) Analyser is an extreme sensitive ethylene Oxide measurement device suitable for measurement in warehouses, containers and confined spaces to protect human from high concentrations of Ethylene Oxide (EtOx). Levels around 1 ppb resolution can be measured. The system can be extended by adding O₂ and CO₂ sensors, the possibility of syringe injection, and the Web Based Monitoring software that transferred data fully automatically. No difficult software anymore. A GPRS, UMTS or Ethernet modem is standard included. An external and simple system for easy calibration is optional available for the portable system. Ethylene Oxide (EtOx) is a toxic gas that it leaves no residue on items it contacts. It is used as a surface disinfectant that is widely used to disinfect medical equipment to replace steam sterilization for materials or packed goods that cannot withstand high temperatures.



MACView®-Ethylene Oxide (EtOx) Fixed 19" version



Human safety

It is dependant of the local regulations, but all safety rules such as determined by Niosh propose short exposure times for humans at low concentrations of Ethylene Oxide. Ethylene Oxide is a toxic gas. Exposure to humans must be minimized. For those exposures, you can not prevent, measurement with the MACView®-Ethylene Oxide Analyzer produces valuable information about the total exposure of humans to EtOx.

Versions

There are 2 versions available of the MACView®-Ethylene Oxide Analyzer.

Portable version: This version is easy to use in combination with periodical measurements that has been done for periodic inspection. Also this version is easy to use in logistics and to measure inside containers that could be contaminated by Ethylene Oxide. It has a battery inside and is flexible to use across a wide variety of portable applications. For example a probe can be inserted to measure the EtOx in a container or a package before opening the container or package.

Fixed version: This fixed version or 19" version is a rack mount device for fixed measurements on the same place. It is able to run 24 hours a day and even a gas bottle for periodic calibration is integrated. This version is perfect for continuous warehouse monitoring. The fixed version provides standard 3 sample inlets that can be connected to a hose and where they are used as remote sample inlets. In a warehouse it is possible to measure on different places fully automatically.

How to use

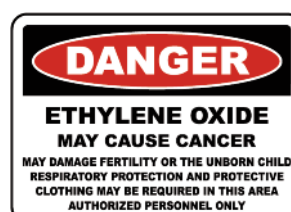
The MACView®-Ethylene Oxide Analyzer is able to monitor continuously the Ethylene Oxide concentrations. Data is permanently stored and

logged to a website. The portal provides also information to the user about the average concentrations of exposure and also can provide this information on screens inside warehouses to inform people real-time of the present concentrations.

Customers that use the MACView®-Ethylene Oxide Analyzer declare that the added value of the instrument is that measurements are performed reliable, without effort of labor. The machine provides 24 hours a day automatic measurements. You now can see what happens with the background concentrations of EtOx and that you got a clear picture of the process. You will see things that you have never seen before and can relate the change in air-quality with situations that occur. With the portable analyser a simple press on a button a measurement is started. If necessary the analyser can run in continuous mode. So every 15 minutes, samples are taken and stored in the internal memory.

Control panel

The MACView®-Ethylene Oxide Analyzer is available in the measurement range of: 0-5.000 ppb. In this 0-5.000 ppb version it gives the measured values in number of ppb's (parts per billion) on the display. In every analyser 2 additional sensors can be placed for O2 or CO2. Data is logged in the analyser, where also date and time is stored. The complete menu has a intuitive control panel.





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The **MACView®-Ethylene Oxide (EtOx) Analyser** is easy to use, easy to read-out, reliable and the best alternative for EtOx measurement in warehouses, logistics, closed containers and confined spaces.



Connection to external control systems

This fixed version analyser is suitable for a connection with external control systems. For this purpose there are IO-connections on the backside of the analyser, which can be connected to an external data or control system like PLC's or SCADA systems.

Data / software

With the **MACView®-Ethylene Oxide Analyser** data can be logged with date and time stamp. Approximately 100.000 records can be logged and at the portable version, the internal rechargeable Lithium-Ion battery pack will work for 12 hours continuously.. The complete menu has a intuitive control panel. The analyser and software are available in the languages: English, Dutch and optional on request in the languages, German, Italian, Spanish and French. This gives a state of the art control to the system ready for immediate start!

Calibration

The **MACView®-Ethylene Oxide Analyser (Portable version)** has an external option for an external low pressure gas bottle that contains calibration gas. The calibration interval can be determined by the user. With a calibration interval of 2 weeks, the calibration bottle can be used approximately 1 year. **MACView®-Ethylene Oxide Analyser (Fixed version)** has an internal calibration bottle where the automatic interval can be adjusted in the settings of the analyser.

Periodic checks

The **MACView®-Ethylene Oxide Portable Analyser** is multipoint calibrated and checked if it leaves the factory. Periodic maintenance is offered to guarantee its functionality. Inform to the possibilities there are per

analyser. With the periodic checks all necessary maintenance is done to guarantee a year working 24 hours / 7 days a week without any problem. If you have detailed questions about this product and its application please contact EMS for more information.



TECHNICAL SPECIFICATIONS

MACView®-EtOx Portable Analyser

Type of instrument	MACView®-EtOx Analyser, for ethylene oxide measurement based on the solid state electrochemical sensor technology with very high sensitivity and stability
Versions available	0-5.000 ppb EtOx resolution 1 ppb max. inaccuracy $\pm 0.5\%$
Versions available	Portable version for handheld monitoring, measurement of containers / confined space Fixed 19" version for fixed mounting to measure rooms of storages
Option for add a 2nd sensor	Optical O2 sensor measurement range 0 - 25% , 0.001% resolution < 1% O2
Option to add a 3th sensor	Optical CO2 sensor measurement range 0 - 0.2% 0 - 1% / 0 - 10% CO2 inaccuracy $\pm 0.1\%$
Syringe injection port for analysis	Volume syringe injection for sample applications, analysis possible by syringe injection
Software	Webportal with standard Web Interface internet connection use with internet browser
LAN / WAN interface	GPRS and UMTS (3G & 4G) or ethernet 10/100Mbit TCP/IP RJ45 or optional WLAN 54Mbps
Sample speed	2 modes Real time: 1 sample/sec. / Automatic: 180-7200 seconds per measurement
Inputs / outputs flow	2 inputs on portable / 3 inputs on fixed analyzer
Material of housing	Stainless steel IP62 housing, fixed analyser: is 19" rack mount housing
Standards	NEN-EN-IEC 61000-6-1 up to 4, CE
Operation modes	Measurements, dosing, standby, flushing, real-time or syringe injection measurement
Signals / alarms	ppb / ppm hysteresis adjustable on relays (programmable per function), status messages, power, failure
Data collection	Web enabled by webportal / SD-Card internal database, date time for 100.000+ records
Service connection	USB, SD Card, Serial RS 232 interface and RS485 interface
Battery Pack (portable)	Lithium-Ion 11.500 mAh, charged while system is running, approx. 10 hrs runtime @20°C
Charger (portable)	External charger
Supply	110 - 230 VAC 75W
Working temperature	-10 + 50 degrees Celsius, relative humidity 5 - 99%, not condensed
Languages	Give up 2 languages at order: English, Dutch
Control panel	Intuitive menu with graphical display and backlight
Dimensions	Portable: Width 230 x Depth 405 x Height 180 mm 19" fixed version: Width 480 x Depth 350 x Height 301 mm
Weight	Portabe version: 11.3 Kg Fixed 19" version: 12.8 kg
Options	Portable version: External calibration package for manual periodic calibration 19" fixed version: Internal calibration bottle included in the device

