



LSE
MONITORS

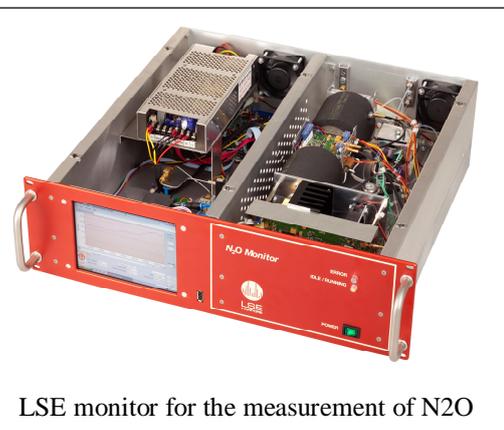
N₂O MONITOR FOR NITROUS OXIDE IN AMBIENT AIR AND STACK

Nitrous oxide measurements from LSE Monitors: a new solution for NCGG monitoring!

Emission coming from nitrogen containing soils, farm animals and natural processes as well as from industrial activities leads to the increase of the greenhouse gas nitrous oxide worldwide.

Nitrous oxide has to be monitored as a greenhouse gas in many background stations. It also has to be monitored in stacks from industry. Agricultural sources need to be studied as well. To decrease the greenhouse gas effect, emissions must be reduced. Monitoring is then needed to follow the effect of methods to reduce nitrous oxide concentrations.

LSE Monitors has developed a simple, low price, small and effective monitor based on a combination of a quantum cascade laser with photo acoustic technology to measure from ppm to mid ppb range, with a detection limit of 10 ppb and a time resolution of 90 s.



LSE monitor for the measurement of N₂O

QCL PAS technique and LSE Monitors

Infrared light that can be absorbed by nitrous oxide molecules is produced by a quantum cascade laser. The laser light is led through a resonator cell that is continuously flushed with the sample gas. If N₂O is present, the gas pressure increases as a result of absorption of the laser light. We modulate the laser at an acoustic frequency of 1600 Hz and the resulting pressure modulation can be measured by a microphone. The amplitude is proportional to the N₂O concentration. The detection limit is improved by the continuous admixture of a small flow of SF₆ and the implementation of an acoustic resonator. LSE Monitors is a joint venture between Sensor Sense BV in Nijmegen and Synspec BV in Groningen, combining knowledge of laser research, electronic design and analyser production.

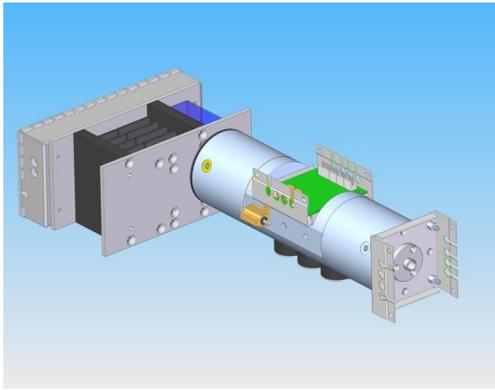
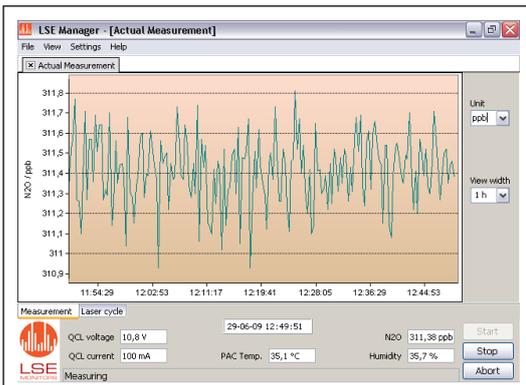
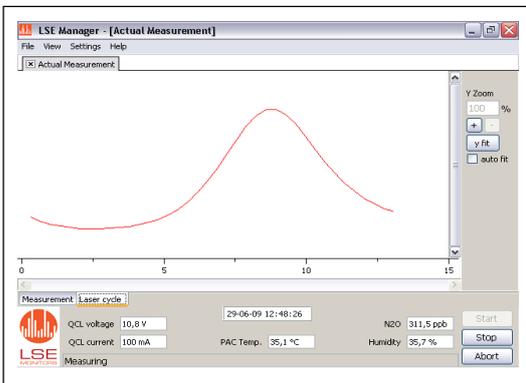


Photo acoustic cell



LSE monitor software runs on WinXpe



QCL temperature scan for N2O

TECH SPECS

Specifications can be changed without notification, the latest specs can be found on the website www.lsemonitors.nl

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13-04-2011

LASER EN PAS SPECS

N2O (Nitrous oxide)
ANALYSER

WAVELENGTH SUITABLE FOR NITROUS OXIDE
PHOTOACOUSTIC FREQUENCY 1600 Hz
NO INTERFERENCE FROM OTHER COMPOUNDS
AT THIS WAVELENGTH

RANGE, PRECISION, CALIBRATION GAS

RANGE

RANGE UP TO 10 PPM, TUNEABLE TO 75 PPM

PRECISION

A MAXIMUM PRECISION OF 20 PPB OR 2 % OF
MEASURED VALUE, WHICHEVER IS THE BIG-
GEST.

CALIBRATION

CALIBRATION TEST WITH NITROUS OXIDE,
MIN. 6 MONTHS, ADVISED 30 DAYS, AUTOCALI-
BRATION PROGRAMMABLE

TIME RESOLUTION / T90

90 S / < 2 MIN

REQUIRED SF6 FLOW

TYPICALLY 1 ML/MIN

TECHNICAL DATA

DIMENSIONS

19+rack, 3 Standard Height Units (12 cm),
depth 37,2 cm net, 8 kg.

POWER DEMAND

230 Vac, 200 VA (110 Vac available)

ENVIRONMENTAL
CONDITIONS

AMBIENT TEMPERATURE 5 TO 25°C
AMBIENT RELATIVE HUMIDITY 0% TO 90%
DEW POINT OF SAMPLE GAS SHOULD BE BELOW
25 °C.

SAMPLE CONNECTIONS

SWAGELOCK 1/8+

