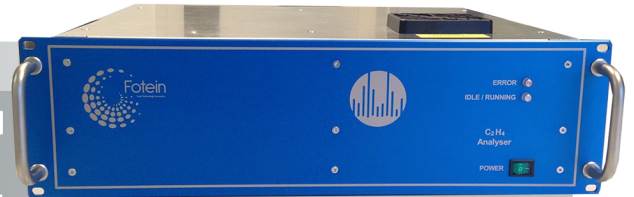# Ethylene monitoring for fruit storage applications

**Fotein and partners have developed a robust and cost-effective ethylene ($C_2H_4$) analyzer based on photo acoustics with a quantum cascade laser.** The concentration of $C_2H_4$ in sample air is continously measured with an extreme sensitivity. Ideal for ethylene production monitoring.

## Concept of measurement.

Infrared light produced by a quantum cascade laser is directed through a measurement cell. This cell is continuously flushed with sample gas. An integrated pump sucks ambient air through the monitor. If ethylene is present in the sample gas, the pressure increases as a result of absorption of laser light. The laser light intensity is modulated at an acoustic frequency of 1600 Hz and the resulting pressure modulation is measured by small microphones. The amplitude is proportional to the ethylene concentration.

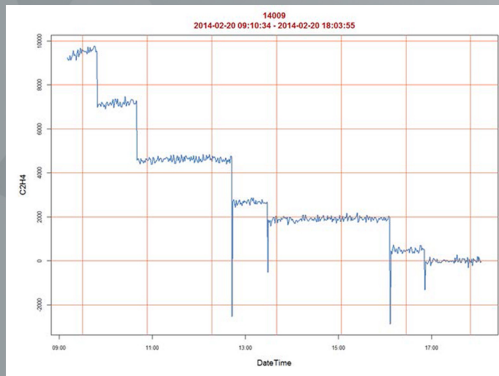### Span gas measurements in the range 0-10 ppm $C_2H_4$
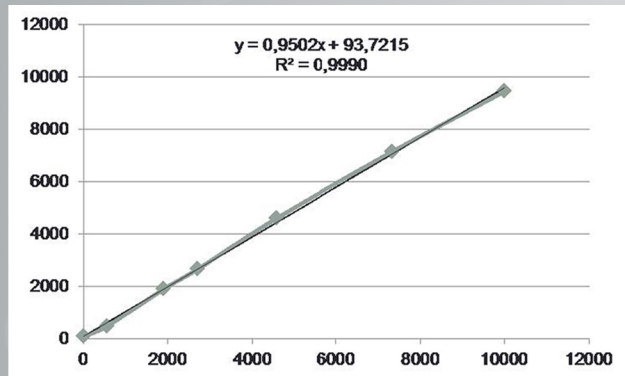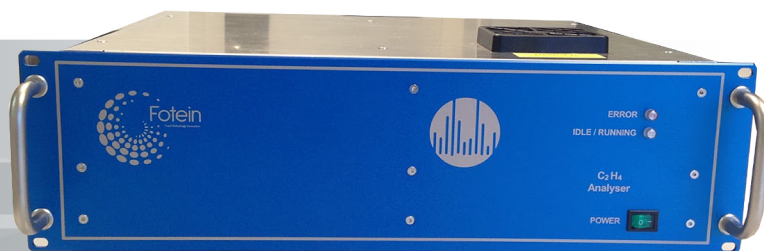


Fig. 1 Concentration steps



Fig. 2 Linearity

## Features

- Very low detection limit (sub-ppm range)
- Integrated sampling pump
- Virtually maintenance-free instrument
- User-friendly software
- CE certified
- Can be integrated in MyFruit, the storage controller of Van Amerongen

# Ethylene monitoring for fruit storage applications

## Specifications

| | |
|---|---|
| Product code | C2H4LA1.0 |
| Noise | 0.5 ppm |
| Range | 0 - 200 ppm |
| Precision | A maximum precision of 0.5 ppm or 2% of measured value, whichever is the biggest |
| Time resolution | 1 to 2 minutes |
| Response time ($T_{10-90\%}$) | < 1 min |
| Linearity | $R^2 > 0.999$ |
| Sample flow rate | 80 - 140 ml/min |
| **Callibration** | |
| Interval | Advised: every month |
| **Requirements** | |
| Sample temperature | 5-30$^0$C |
| Sample pressure | Stable during scan cycle, 0.7-1.0 atm |
| Sample humidity | Non-condensing for T > 25$^0$C and relative humidity between 0 and 90% |
| Voltage supply | 230 VAC (110 VAC available on request) |
| Gas connecions | Swagelock compatible, 1/8" |
| **Technical data** | |
| Dimensions | Suited for installation in 19" rack, 3 Standard Height units (12 cm), depth 37,2 cm |
| Weight | 8 kg |
| Power demand | 200 W |
| Comm. connection | 1 x Ethernet, 1 x RS232, 4 x USB |