



MACView®  
MEASUREMENT  
TECHNOLOGY

## BACKGROUND

### MACView®-Greenhouse Gas Analyser

#### Plant vitalization effect

NO<sub>x</sub> is recently known and useful as a "plant vitalization effect" on (vegetable) crops, which means that a low concentration of NO<sub>x</sub> positively influences the development and growth of the plant. This results in an increase in biomass conversion on the photosynthesis process. Furthermore, it is known that NO<sub>2</sub> gives more flower setting and higher yields on certain crops at low concentrations. A high concentration of NO<sub>x</sub>, on the other hand, causes a growth reduction for all crops and can lead to damage to the plant and production losses.

#### Gasses

The analyzer simultaneously measures 5 gases that each have specific sources:

**NO<sub>x</sub> (Nitrogen oxides NO & NO<sub>2</sub>):** This gas almost always comes from combustion processes. These can be: (CHP) engines, burners, fire, stoves, central heating boilers and vans or cars. Crops can absorb NO to some extent. Above a certain absorption limit, the gas is harmful to the crop.

**C<sub>2</sub>H<sub>4</sub> (Ethylene or ethene):** Ethylene is a substance that is also released from combustion processes. Ethylene is also released from nature. Crops can produce ethylene in very small quantities. In practice, these quantities are so small that they are hardly measurable. Ethylene is an aging hormone for crops, and ethylene can suffer damage to the crop such as flower and fruit abortions.

**CO (Carbon monoxide):** Carbon monoxide is normally not particularly harmful to the crop. However, where NO, NO<sub>2</sub> and Ethylene is formed from combustion processes, there is almost always CO. With this parameter, a possible cause of air pollution in the greenhouse can be better detected.

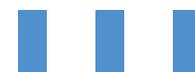
**CO<sub>2</sub> (Carbon dioxide):** In contrast to previous gases, this is a desired gas, necessary for the photosynthesis process. The undesirable gas concentrations often depend on the amount of CO<sub>2</sub> that is dosed. It is not that there is a direct link between CO<sub>2</sub> and unwanted gases.



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MEASUREMENT  
TECHNOLOGY



**Small nose, best quality**

**MACView®**  
**GREENHOUSE GAS ANALYSER**  
The solution for growth improvement  
and risk management of air quality

In the application of CO<sub>2</sub> flue gases from the boiler and CHP, the MACView®-Greenhouse Gas Analyzer is the solution for controlling CO<sub>2</sub> concentration and the greenhouse climate. Monitoring and climate control results in growth promotion and damage reduction. The analyzer is an extremely sensitive measuring instrument to monitor harmful (and undesired) gases NO<sub>x</sub> and ethylene in greenhouses in very low concentrations. The instrument also measures CO<sub>2</sub> (desired gas) and helps the grower gain insight into the amount of harmful (undesirable) gases at the crop level.

