

Gas Detection.



# Agriculture

Reliable gas detection of toxic and explosive gases  
in the agricultural sector



## Areas of agriculture

- Biogas plants
- Indoor farming
- Fertilizer production
- Animal rendering
- Livestock monitoring

# Biogas Plants

## Safety against CH<sub>4</sub> / H<sub>2</sub>S / CO<sub>2</sub> / O<sub>2</sub>

In addition to process optimization, personal protection and plant safety are of crucial importance when operating biogas plants. With the gas warning devices from MSR-Electronic

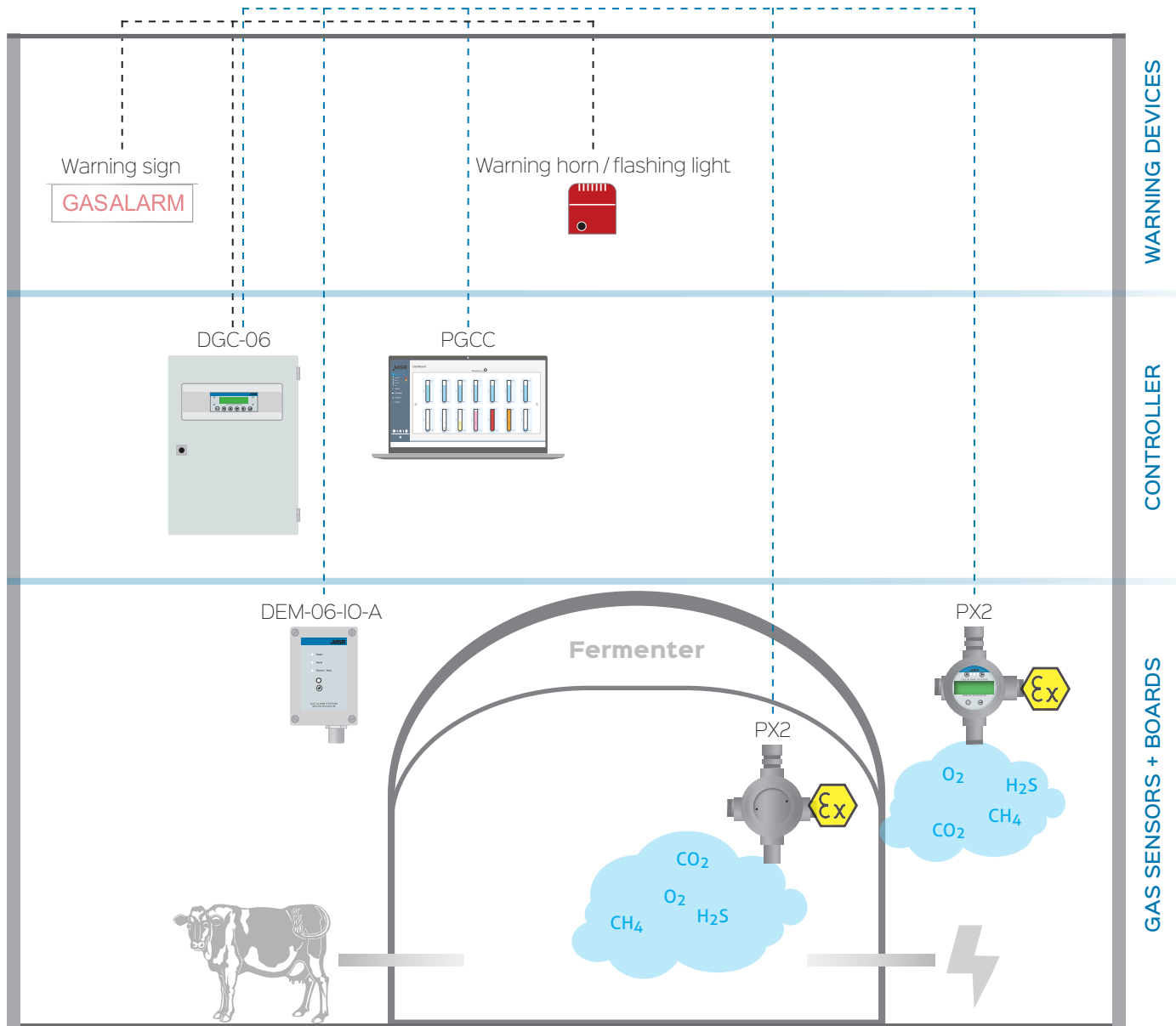
you can prevent dangers. Gas sensors, controllers and warning devices are used to measure combustible and toxic gases as well as oxygen. Leakages are thus localized at an early stage.

## Gas Hazards

Methane can react explosively with air. This represents a high hazard potential for the operator of biogas plants. An explosive mixture exists if the concentration of methane in the air is between 4.4 and 16.5% by volume. Monitoring in pump rooms can protect people from dangerous leaks. The continuous measurement in the double membrane (biogas air hood) ensures tightness and therefore no loss.

## Benefits

- Perfect integration into the modern biogas plant
- Monitoring possible on the CHP and in the membrane
- All data can be read via bus to controller
- The PX2 with methane sensor (zone 2) is the main player in biogas plants
- Good adaptation of the PX2 to the requirements of modern biogas plants but also gas turbines



## Biogas plants



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How-to: Commissioning of the PolyXeta®.

# Indoor Farming

## Safety against CO<sub>2</sub> / O<sub>2</sub> / O<sub>3</sub>

By indoor farming we mean the cultivation of food (e.g. mushrooms, strawberries, lettuce, etc.) and plants in tiers without sunlight indoors. 24-hour lighting with LED lamps and climate control ensure that the temperature and humidity are always optimal (Smart Farm). Sin-

ce the plants do not grow on soil, but on plastic plates, they must be supplied with water and nutrients. This is mostly done automatically by computer control. The gardeners only come to the greenhouse to harvest and plant.

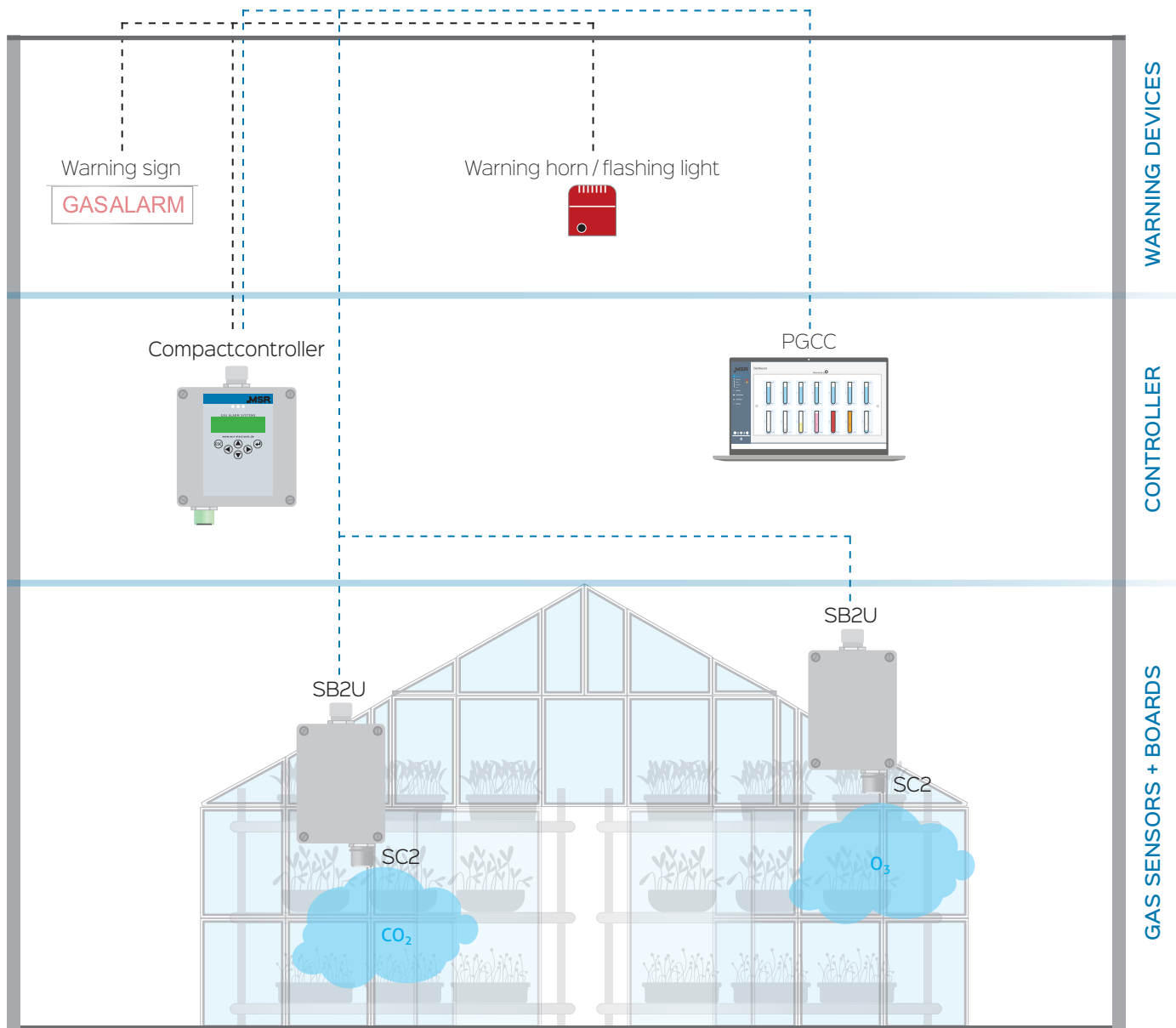
## Gas Hazards

Gases such as CO<sub>2</sub> are used, for example, in the cultivation of cannabis as an aid to enrichment (growth acceleration) in order to achieve optimum yields and increase productivity. Since CO<sub>2</sub> is odorless, colorless and tasteless, there is a great danger to personnel. But too much CO<sub>2</sub> can also slow down or even stop photosynthesis in plants.

Ozone is often used to purify water or the ambient air. Ozone irritates the respiratory tract, causes coughing, headaches or breathing difficulties. Restrictions on lung function are also possible. Detection is therefore also necessary here.

## Benefits

- Easy to use, no separate tool required
- System can be expanded at any time, can grow modularly
- X-Change technology for safe and easy sensor replacement
- Precise sensor technology in analog or digital design
- Monitoring can be carried out without entering the room
- Access control can be easily implemented



## Indoor farming



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# Fertilizer Production

## Safety against CH<sub>4</sub>, CO<sub>2</sub>, NH<sub>3</sub>, H<sub>2</sub>, N<sub>2</sub> and other gases

A variety of gases and substances are required for the production of fertilizers, including ammonia, in the production of which hydrogen and nitrogen are converted to ammonia in a

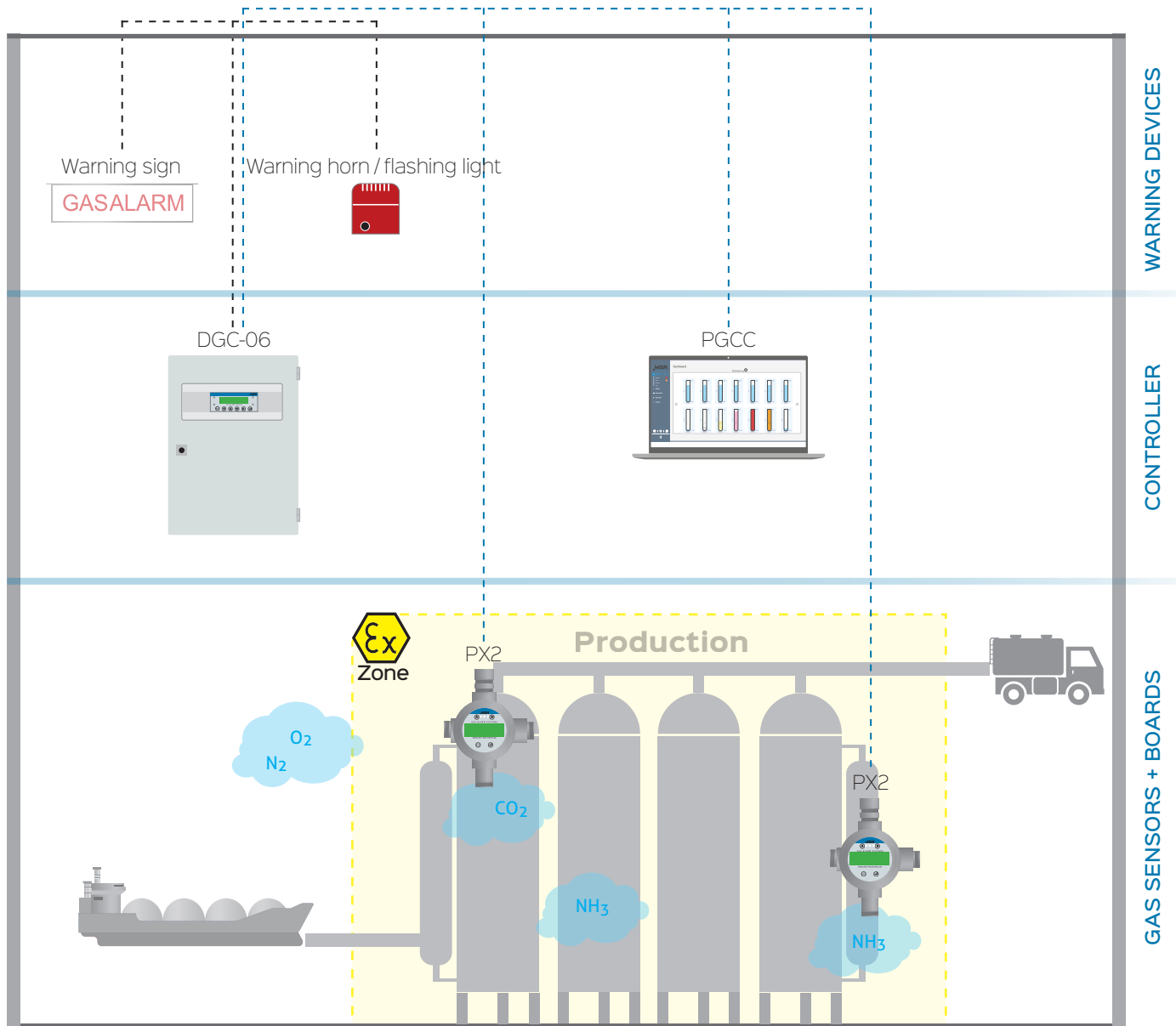
technical synthesis (e.g. Haber-Bosch process). The refinement of natural gas (methane) into high-quality raw materials also plays a major role here.

## Gas Hazards

Gases can be released into the ambient air during both production and storage. Methane can react explosively with air. In addition to methane, ammonia also poses a high risk potential for employees. By monitoring the storage tanks, people can be protected from dangerous leaks. Continuous measurement in production ensures tightness and therefore no loss.

## Benefits

- Very powerful large controller that can be adapted to any situation thanks to its modular design
- X-Change technology for safe and easy sensor replacement
- Compatible with a wide range of BMS systems
- Compact ATEX device with full digital and analog connectivity at the same time
- Robust against dust, humidity and high/low temperatures
- Individual parameterization possible



## Fertilizer production



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# Animal Rendering

Safety against CO<sub>2</sub>, NH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>OH, H<sub>2</sub>S

After the death of large and domestic animals, slaughterhouse waste, animal by-products, blood etc. are collected centrally in a rendering plant. This serves to protect against animal diseases and unauthorized burials. The raw material is loaded into collecting contain-

ers, shredded, thermally sterilized and further processed into animal meal, animal feed, biodiesel and grease. The material is categorized beforehand. Animals with notifiable diseases are disposed of directly.

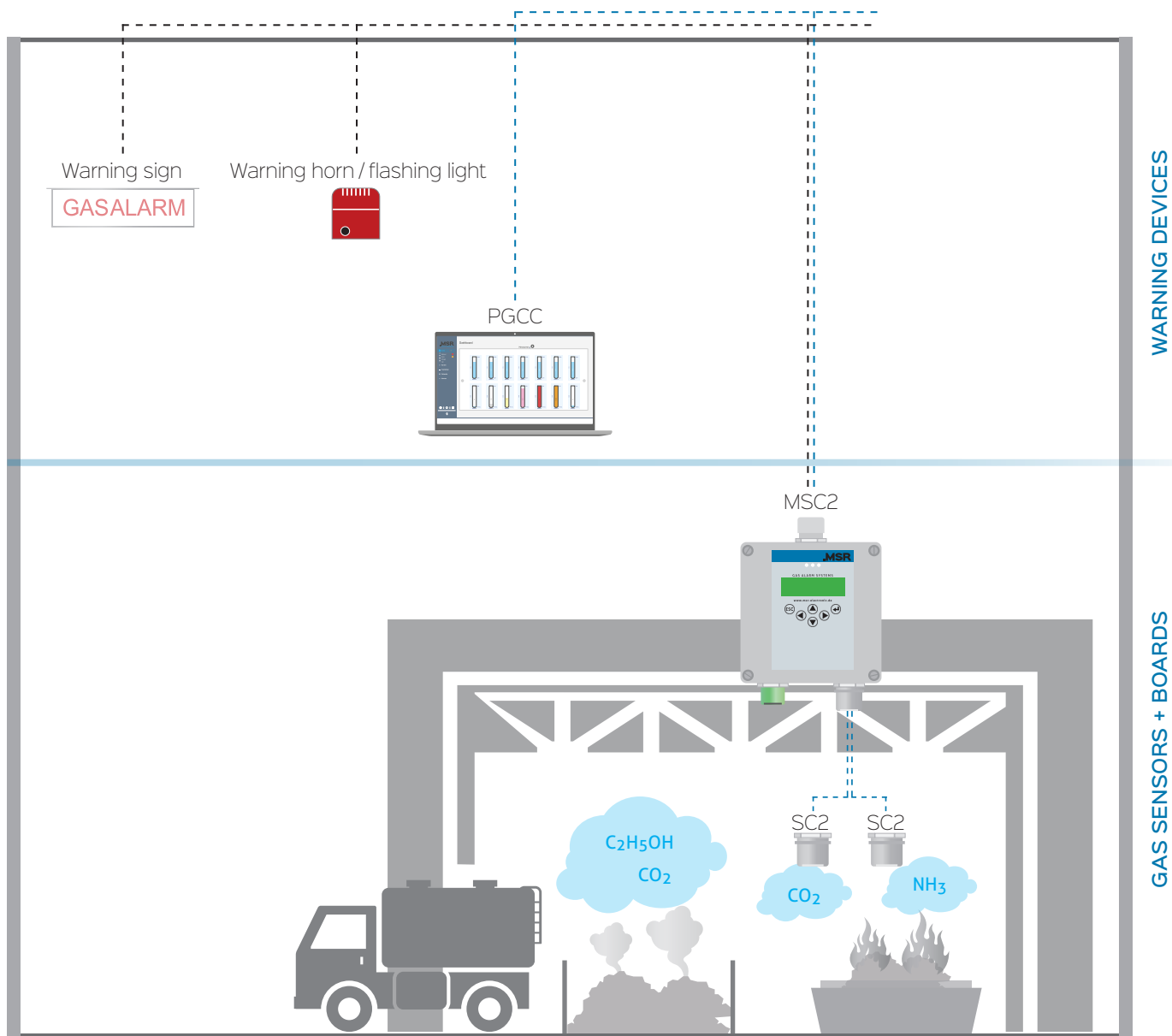
## Gas Hazards

Decomposition can produce various hazardous gases such as ethanol, CO<sub>2</sub>, ammonia and hydrogen sulphide. These can escape during storage in the delivery bunker and during further processing steps, so that monitoring must be installed to minimize the high risk potential for personnel.

## Benefits

- Precise sensor technology in analog or digital design
- Access control can be easily implemented
- Small controller or large controller possible
- X-Change technology for safe and easy sensor replacement
- Modular design





## Rendering



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# Livestock Monitoring

## Safety against CO<sub>2</sub>, NH<sub>3</sub>, H<sub>2</sub>S

To ensure the welfare of the animals, the stables must be monitored and regulated in terms of temperature (heat stress), light, humidity, ventilation (fresh air) and gas concentration. In addition to animal welfare, this also has an im-

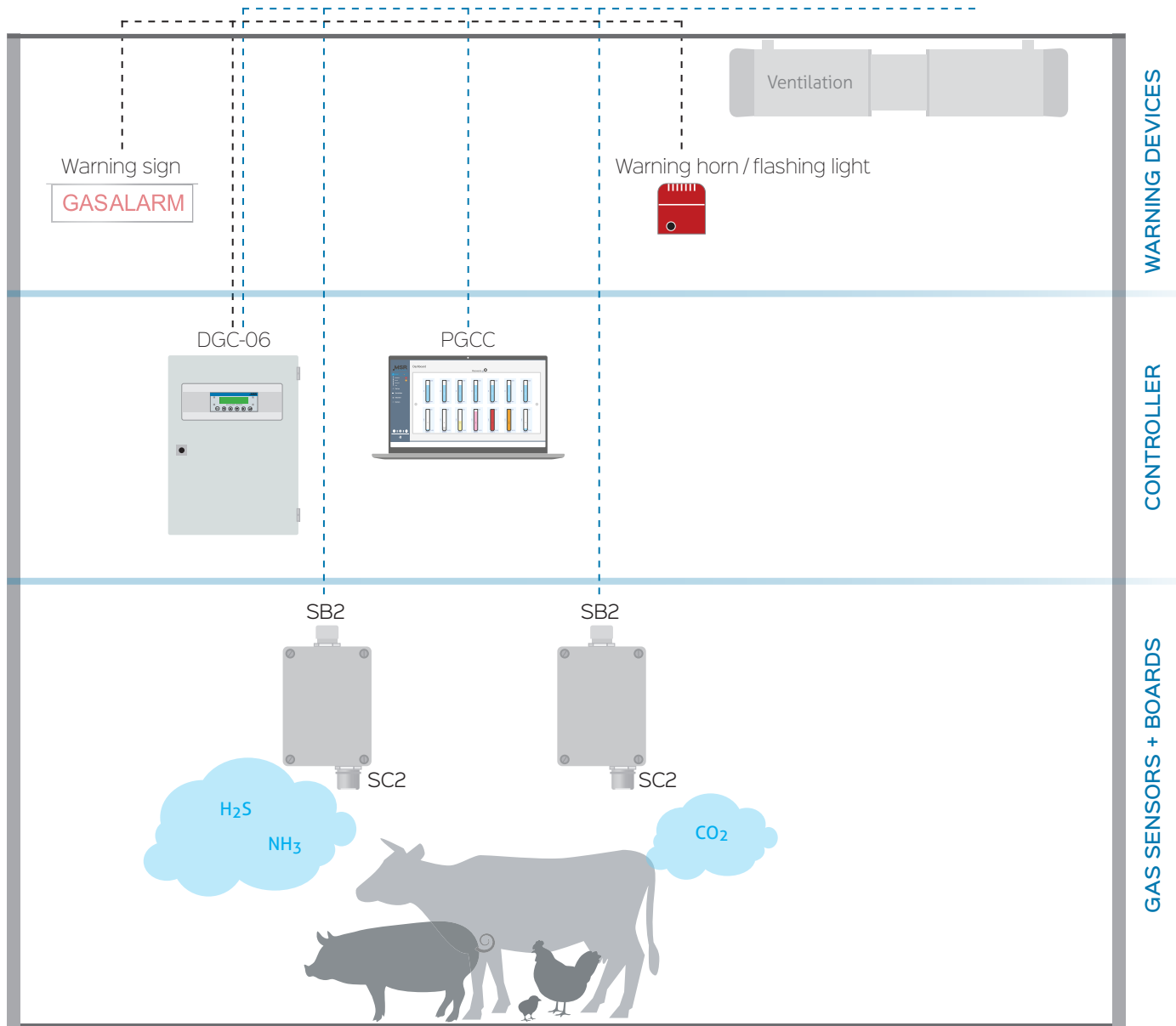
pact on meat quality. The gas concentration is also regulated in the Animal Welfare Livestock Farming Ordinance and is monitored by veterinarians and the veterinary office.

## Gas Hazards

An excessively high ammonia content not only impairs the quality of the meat, but also irritates the eyes and respiratory tract. In very high concentrations it is even corrosive and can cause serious damage and even death. For this reason, the Animal Welfare Livestock Farming Ordinance sets limits for gas concentrations of ammonia, carbon dioxide and hydrogen sulphide, which must of course be monitored. These measurements also enable active ventilation if the gas concentration is exceeded.

## Benefits

- Precise sensor technology in analog or digital design
- X-Change technology for safe and easy sensor replacement
- Modular design
- High degree of customization for a wide range of requirements



## Livestock monitoring



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Version 21/24