Product Information
**Air Cleaner for Poultry and Pigs**

- Ammonia reduced by 89% on average
- Maximum ammonia reduction from start-up
- Dust reduction
- Non-clogging filters
- Efficient droplet separators
- Droplet separators can be drawn out and washed from the outside
- Easy maintenance
- User friendly
- Easy to install
- Corrosion resistant material

# Air Cleaner for Poultry and Pigs

Ammonia is a natural residual product from livestock production and because of environmental regulations many farmers are facing limits for ammonia emission – especially when they increase their animal production. In order to make it possible for farmers to enlarge their production in areas with ammonia restrictions, Munters has developed air cleaners.

The Munters Air Cleaner (MAC) was designed to deal with the unique environmental challenges offered by cleaning exhaust air from poultry and pig buildings. Such air contains a heavy load of sticky dust, which is very difficult to remove from the air stream and sticks to all elements of the air cleaner. The MAC features a droplet separator that can handle such conditions and which is easily accessible and removable for periodic cleaning. This innovative design reduces ammonia emission by more than 89% on average and was also awarded with the Agromek Price in 2012 for its user friendly cleaning system.



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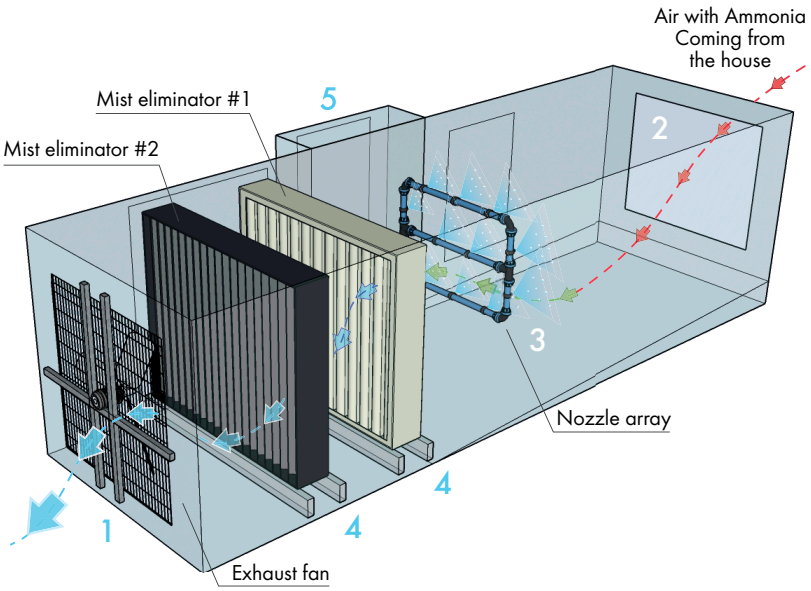
# Design




The air cleaner consists of a long box. In one end of the box is a fan (1), which extracts air from the building (2) through the box. In the air cleaner is a nozzle array (3), which sprinkles droplets consisting of a mixture of water and sulphuric acid. When the extracted air containing ammonia passes over the droplets, the ammonia molecules in the air react with the liquid. The droplets fall to the bottom of the box or are collected by the droplet separators (4) and led to the bottom of the box. Thus the ammonia is separated from the ventilation air before the air is released to the surroundings.
On one side of the box is a technical cabinet (5). The technical cabinet consist of a controller, a pump which circulates the liquid between the bottom of the box and the nozzles and a dosing pump which adds acid to maintain a constant pH level in the liquid. In the bottom of the air cleaner is a bilge, which pumps liquid to a storage tank. The separated liquid can be used as a fertilizer on the field.
The air cleaner is distinguished by high ammonia reduction and that it doesn't have any filters. Compared to conventional filters the droplet separators are easy to clean. Another advantage is that the droplet separator can be pulled out of the box and washed from outside with a traditional high pressure cleaner. This provides a good working environment and easy maintenance. The air cleaner is simply built, with the phrase "Keep it simple" been used during the whole development process.

# Partial air cleaning

By using a MAC it is not necessary to clean all the air from a poultry or pig house. In many climate zones in the world, there is a huge variation in outdoor temperature during the year. Typically the livestock housing units are cooled by outside air, which results in a much lower ventilation rate in the house during winter compared to the summer period. In contrast to the yearly differences in ventilation rate, the variation of the ammonia evaporation in the housing unit during the year is negligible.
In Denmark the ventilation rate is less than 20% of the maximum capacity for more than 40% of the time during a year. That means, if an air cleaner is able to clean the first 20% of the maximum ventilation capacity, then 100 % of the ventilated air is cleaned during 40% of the hours in a year. Additionally the air cleaner will clean 20% of the maximum ventilation capacity rest of the year.
An example - A MAC connected to a layer house in Denmark with 13,000 birds and a room temperature of 21 °C will have 20% partial air cleaning. The first 20% of the air will go through the air cleaner and get cleaned with an efficiency of 80%. The rest of the air will leave the house uncleaned through traditional exhaust fans. During a year the ammonia emission will be reduced by 58% and more than 2,000 kg of ammonia will be collected and available as fertilizer.

- Efficiency:
  VERA certificate states 89% annual ammonia reduction.
- Flow:
  25.000 $m^3$/hour at 40 Pa.
- Plug and play:
  As soon as the air cleaner is started the maximum ammonia reduction will be achieved. No biological material needs to form. You can, for instance, wait until day 10 to start the air cleaner, as the ammonia emission in the beginning of a production cycle is limited.
- Keep it simple:
  The MAC has a simple design which is an advantage in terms of maintenance and service.
- No filters:
  The ammonia is captured by droplets suspended in the air stream.
- Extraction system:
  Droplet separators can be drawn out and washed from the outside.
- MAC connected to a layer house with 13,000 birds:
  - 20% partial air cleaning;
  - 58% ammonia reduction from layer house;
  - 2,000 kg ammonia captured.

Air Cleaner is developed and produced by Munters A/S, Denmark

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