



Big Dutchman®



CombiTunnel ventilation

For the ideal climate in your pig house at all times
– no heat or cold stress, increased welfare, higher performance –

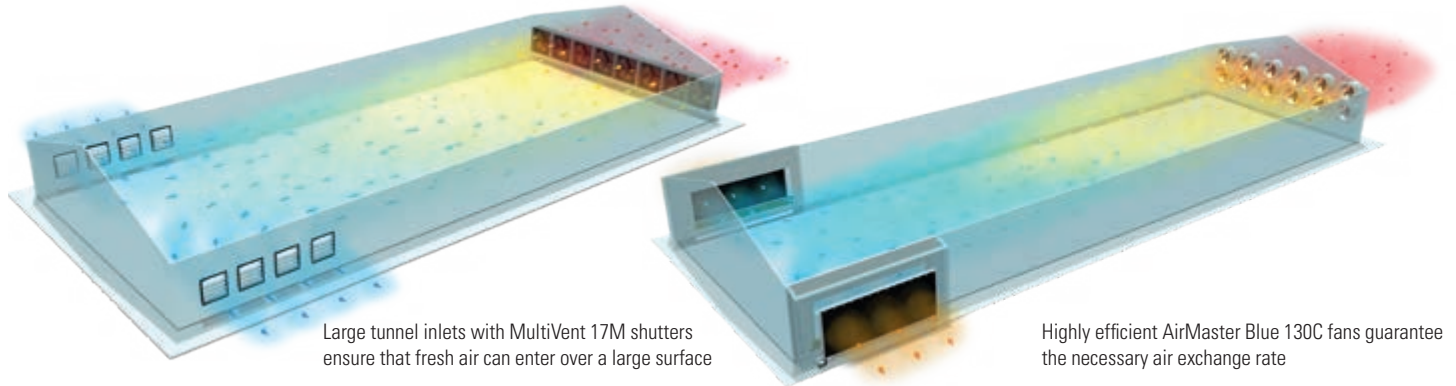
How to prevent heat stress: ventilation in **tunnel mode**

Tunnel ventilation is the most *simple* and, at the same time, the most *efficient* ventilation system for achieving high air speeds at animal level.

A high air speed will significantly decrease the temperature that is perceived by the pigs

(use of windchill effect). Even with high temperatures and high humidity, the pigs are thus able to transfer excess body heat to the surrounding air. When temperatures continue rising, our RainMaker 2 pad cooling system can be activated. This system cools the fresh

air to a temperature where the windchill is at its most effective. In this way, heat stress can be prevented at any temperature. This keeps the pigs' performance at a steady and high level and their feed and water consumption normal.



➤ Exhaust air

When working with tunnel ventilation, the counterpressure for the fans is quite high. This pressure depends on the length of the barn and on the air speed and requires **highly efficient and very pressure-resistant fans** that can guarantee the necessary air exchange rate.

We recommend our pressure-resistant, highly efficient and energy-saving **AirMaster Blue 130C, AirMaster V 140 and V 130** fans (with and without cone).

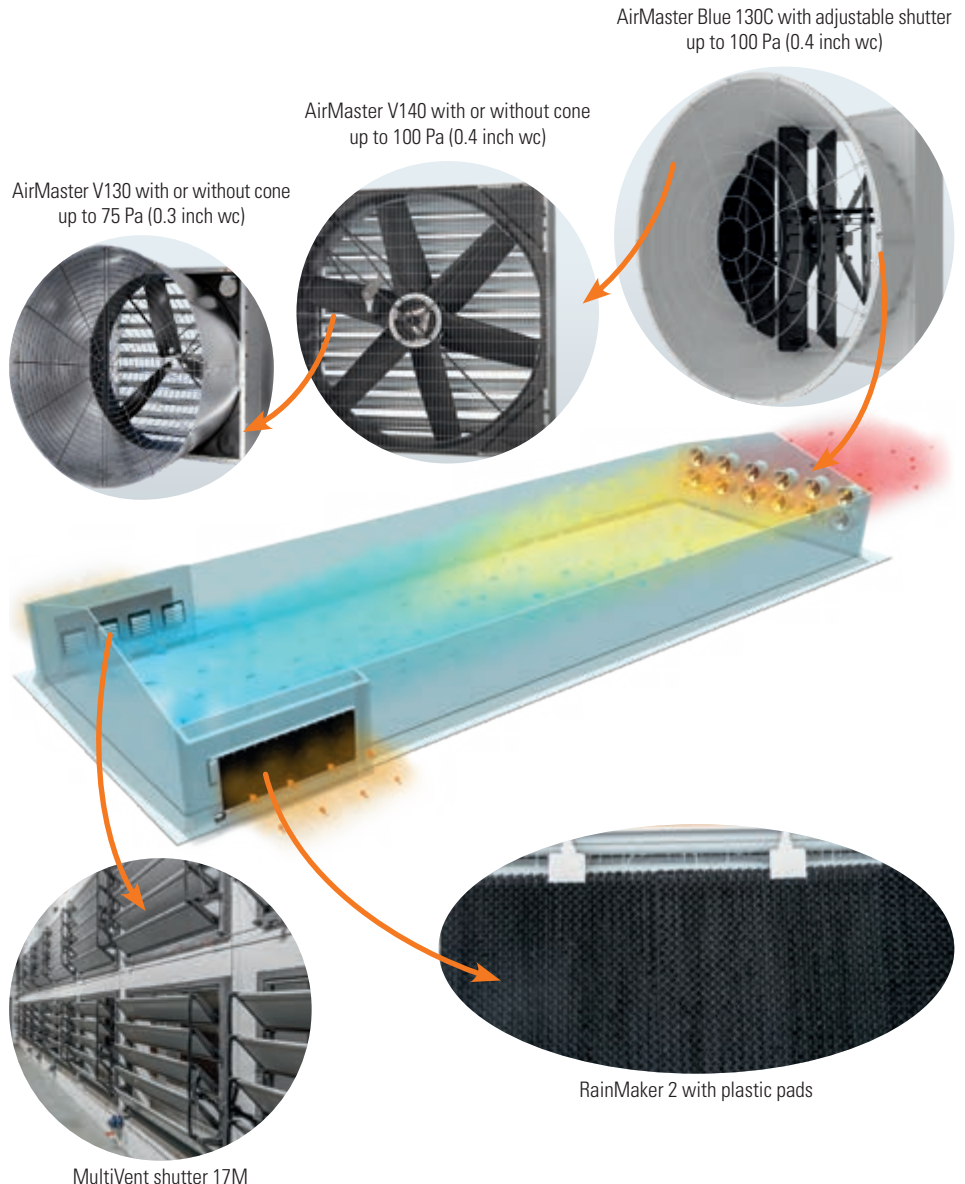
➤ Fresh air

Fresh air enters the barn through large tunnel inlets near the gable, for example curtains, tunnel doors or shutters.

We recommend using **MultiVent shutters**. These shutters are easy to adjust for the specific air flow and air direction and have a large air flow rate.

➤ Cooling system

If an additional cooling system is required, we recommend our pad cooling system **RainMaker 2 with pads made of plastic**. RainMaker 2 is an open system that is easy to inspect visually and easy to service. Regular cleaning of the plastic pads with a high-pressure cleaner is important. This stops mineral deposits from clogging the pads and keeps the counterpressure for the fans to a low level. At the same time air flow rates remain high.



CombiTunnel ventilation

Combination of two different ventilation systems to create one intelligent climate solution

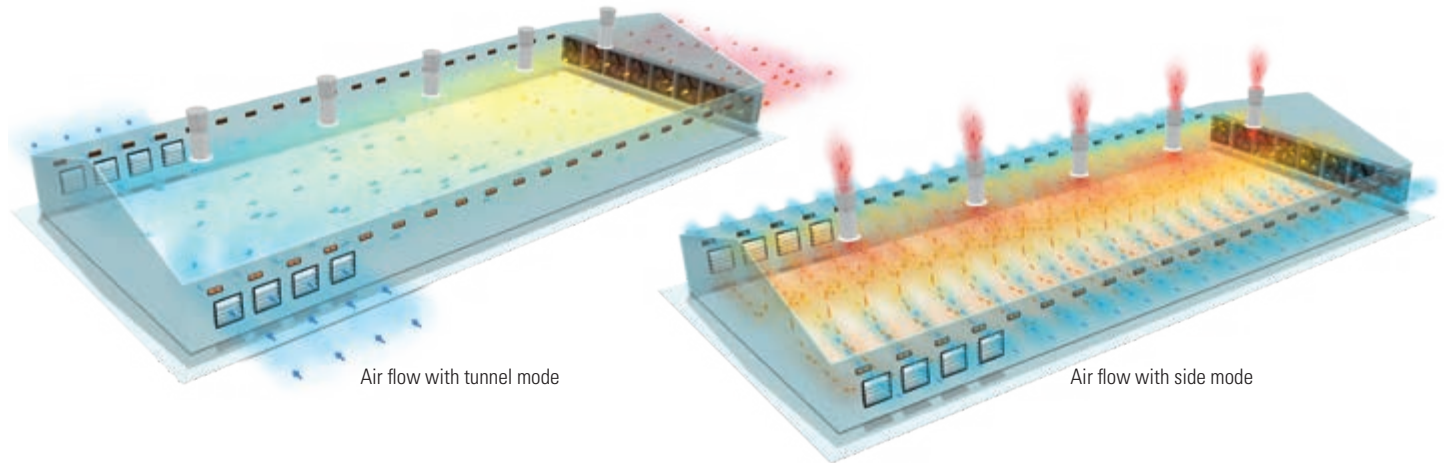
The CombiTunnel ventilation system from Big Dutchman is a very successful ventilation system that has proven its worth over many years. It creates perfect climate conditions for pigs anywhere in the world so your production process is secure.

➤ Tunnel mode

Tunnel mode is activated when outside temperatures are high. This creates a good cooling effect while consuming little energy.

➤ Side mode

Side mode is activated when outside temperatures are low. Because fresh air intake is through multiple evenly-spaced inlets, ambient temperature throughout the barn is similar.



Powerful arguments for Big Dutchman products

Tunnel ventilation

- ✓ increasing the windchill effect means higher air speeds and thus an increased counterpressure for the fans: our pressure-resistant and highly efficient fans with low power consumption are therefore essential components;
- ✓ large tunnel inlets supply fresh air over a large surface: our MVT shutters can be adjusted for the specific air direction and air speed and ensure airtight closure when ventilating in side mode;
- ✓ the plastic pads of our RainMaker 2 cooling system also work well with water of a low quality and can be cleaned regularly with a high-pressure cleaner: this keeps fan counterpressure to a minimum for a long service life;
- ✓ due to extremely accurate PID control, our 307pro and 310pro climate computers can dose the amount of water that is sprayed onto the plastic pads in such a way that cooling is kept to the necessary minimum. This saves water and keeps the barn dry.

Side ventilation

- ✓ our CL 1200/CL 1911 wall inlets create a stable air circulation all the way to the centre of the barn, filling the entire room for even temperatures;
- ✓ the cool and humid fresh air flows along the ceiling where it mixes with warm inside air before it reaches the pigs: the pigs' body heat is used, heating requirements are low and draughts are prevented;
- ✓ our CL 600/CL 820 exhaust air chimneys separate fresh air and exhaust air clearly: this improves hygiene and drastically reduces the influence of the wind;
- ✓ in the event of power failures, thermal currents and the effect of the chimneys create a natural ventilation system, ensuring that the pigs survive;
- ✓ the motorized shutters can also be powered by a battery so that, in the event of power failures, they can be opened automatically or even temperature-controlled.

Advantages of CombiTunnel ventilation

- ✓ CombiTunnel ventilation covers a wide temperature range and is therefore ideal for all climate zones;
- ✓ temperatures in the barn are at an optimal level over the entire year: healthy animals, high performances, good feed conversion, low mortality;
- ✓ with low outside temperatures and in side mode, the low air flow rate can be regulated very precisely to maintain even temperatures in the entire barn;
- ✓ with high outside temperatures and in tunnel mode, high air speeds are possible at animal level to make use of the windchill effect;
- ✓ the 307pro/310pro climate computers allow for a smooth transition from side to tunnel mode and vice versa.

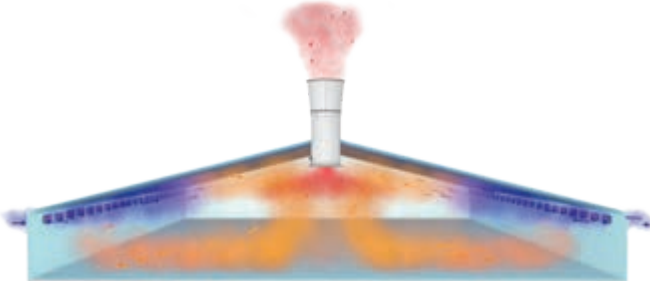
How to use the pigs' body heat efficiently: ventilation in side mode

Side ventilation is the best ventilation system for achieving *even* temperatures throughout the barn.

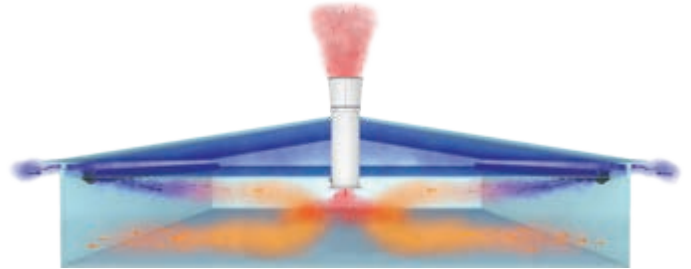
Fresh air enters the barn *simultaneously* along its entire length, with the air streams

filling the entire interior. The pigs then heat up the cold and humid fresh air, thus drying it. This is the only way of completely absorbing the water vapour produced by the pigs through ventilation without

causing excessive air movement in the animal area (ventilation without draughts).



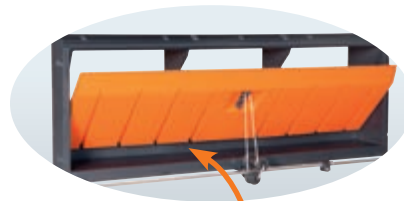
With side ventilation, the fresh air flows along the ceiling, where it warms up before it slowly drops down.



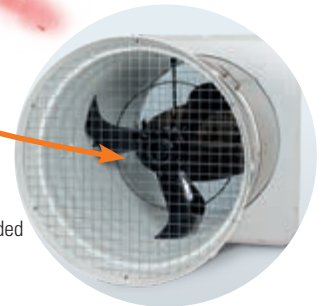
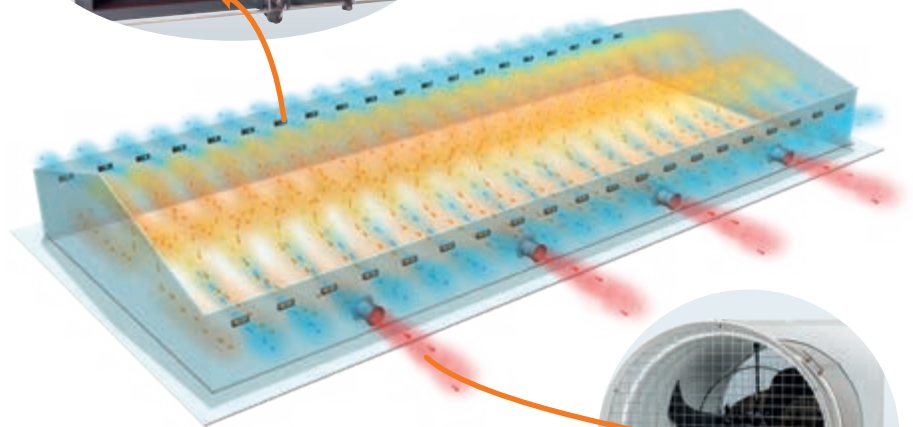
Ventilation in side mode is also a good solution in barns with a ceiling below the roof with our CL 1540 ceiling inlet.

➤ Fresh air

At the core of every side ventilation system are the air inlets in the wall or in the ceiling. Through these inlets, fresh air enters the barn. We recommend our well-proven **CL 1200/CL 1911 F** wall inlets. Strong tension springs open and close these inlets very accurately and simultaneously and keep them airtight when closed. The patented advanced inlet control furthermore allows for a wide range of ventilation settings. Our wall inlets also have the perfect throwing range: 100 percent of the fresh air flows upwards to the ceiling where it can warm up. The target is the creation of a stable and circulating air flow so temperature conditions are the same for all pigs in the barn.



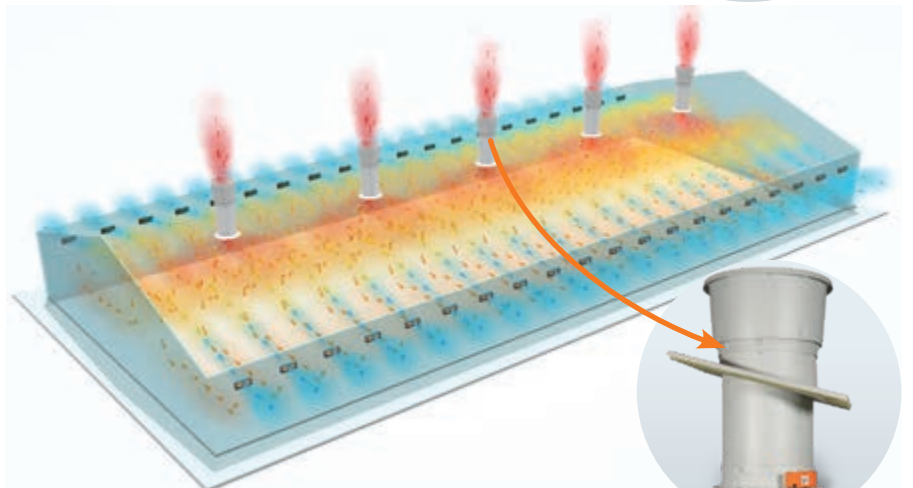
CL 1911 F wall inlet



CL 820 wall chimney, two-sided

➤ Exhaust air

For ideal exhaust air extraction, especially with minimum ventilation, we recommend distributing extraction points along the entire barn length. These points can be installed in the long sides of the barn or on the roof. It is then possible to achieve an even air speed and therefore a very uniform apparent temperature. For MultiStep control, we recommend our **CL 820 wall chimneys**. Our **CL 600 / CL 820 chimneys**, installed on the roof, offer an even more effective option.



CL 600 / 820 exhaust air chimney on the roof

The 307pro/310pro climate computers control the CombiTunnel ventilation system



310pro with large 10-inch touch screen

Our modern 307pro/310pro climate and production computers ensure that the temperature in your barn is ideal at all times. This is made possible by a future-proof software and the use of sensors that determine important parameters such as temperature, humidity, CO₂ concentration, NH₃ concentration and air pressure. The sensors measure and check changes in the air and are the basis of any computer-controlled climate system. Big Dutchman offers a wide variety of sensors suitable for livestock buildings. Below, you will find a selection of available sensors.

Essential tasks include:

- prevent heat stress, but only cool as much as necessary;
- keep the relative humidity low to ensure that the barn remains dry;
- switch from tunnel to side mode at the best time to ensure even temperatures in the barn;
- maintain exactly the desired temperature through PID control;
- this means: ideal feed consumption, no unnecessary water intake, high uniformity of pigs.



DOL 10 temperature sensor specifically for the pads

DOL 12 temperature sensor

DOL 114 sensor for relative humidity

DOL 18 negative pressure sensor

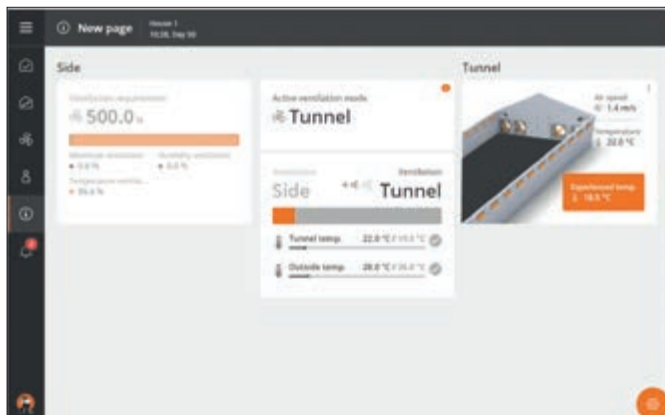
DOL 19 CO₂ sensor

DOL 53 NH₃ sensor

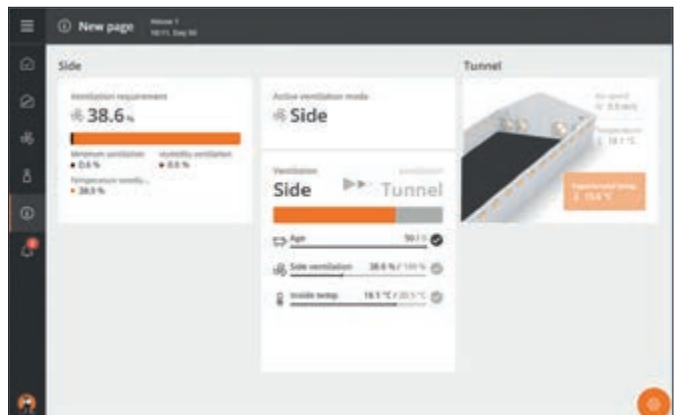
Good overview of the switch-over function on the 310pro screen: you decide when and how to switch modes!

The switch from one ventilation mode to the other is barn-specific. Depending on your goals, the mode will change earlier or later. If you want to focus on even temperatures along the entire length of your barn, for example, ventilation should remain in side mode for

as long as possible. It takes just one glance to find out which mode is currently active and at which level the ventilation system is running.



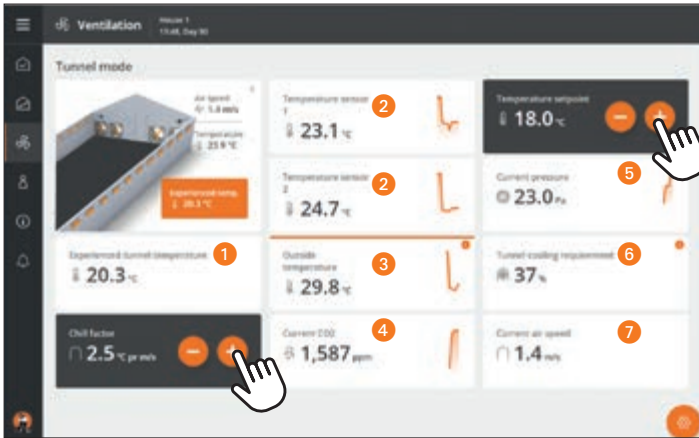
Ventilation system currently running in tunnel mode



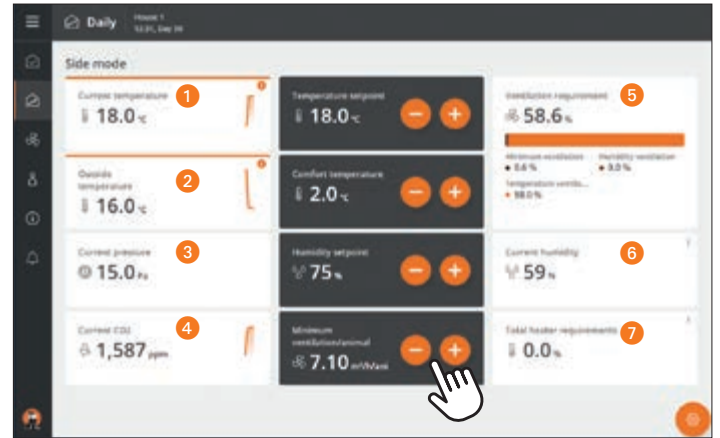
Ventilation system currently running in side mode

Configure the screen of 310pro according to your needs

Our recommendation for tunnel mode:



Our recommendation for side mode:



- Temperature control in tunnel mode according to the *temperature perceived by the pigs*
- 1 Apparent temperature due to the air speed
- Windchill effect: can be adjusted and indicates the cooling effect achieved by the air speed
- 2 Temperature in the barn (front and rear): the temperature increase towards the fans should not be higher than 2 to 3 °C
- 3 Current outside temperature
- 4 Current CO₂ concentration in the air
- Target temperature: can be adjusted
- 5 Pressure monitoring at the front of the barn: a too high negative pressure can indicate clogged pads; pressure monitoring at the rear of the barn: to check the fans' air flow rate
- 6 Cooling demand: indicated in percent
- 7 Current air speed

- Target temperature: can be adjusted and is kept at the desired level (patented PID control)
- Comfort temperature ("little windchill"): can be adjusted, involving an increase in temperature; with higher air exchange rates, the air will move more in the animal area, compensating any draught effects
- Target humidity: can be adjusted
- Minimum ventilation: can be adjusted to prevent too much cooling in the barn and to reduce heating costs
- 1 Current temperature in the barn
- 2 Current outside temperature
- 3 Current negative pressure in the barn
- 4 Current CO₂ concentration in the air
- 5 Current ventilation demand in the barn
- 6 Current humidity in the barn
- 7 Current heating demand in the barn

Perfect climate in the barn, healthy pigs and high performances. These are the requirements of today and will remain the requirements of tomorrow. All necessary

products, from wall inlets and efficient fans to an effective cooling system, are available from Big Dutchman, and of course at the highest quality. For more information, visit

www.bigdutchman.com and let our experts advise you. In a detailed consultation, they will help you find the best solution for your requirements.



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