



Big Dutchman®



CombiTunnel ventilation

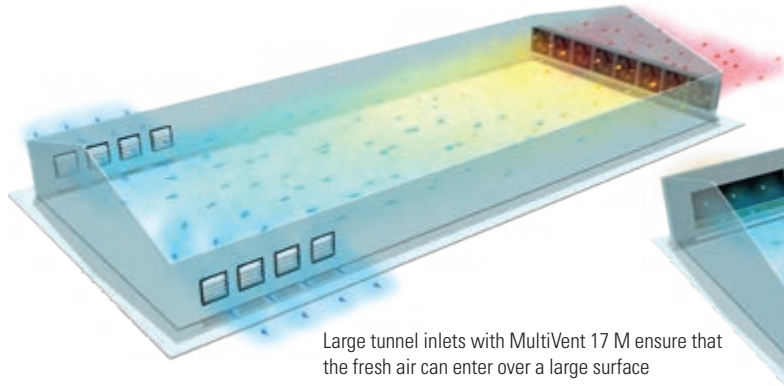
For the ideal climate in your poultry house at all times
— no heat or cold stress, increased welfare, higher performance —

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

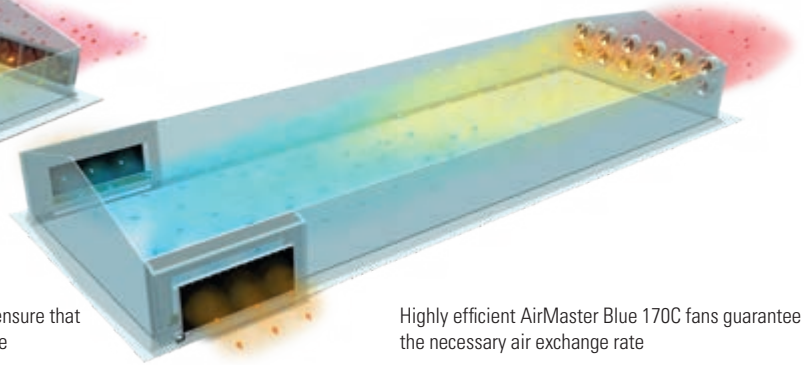
Tunnel ventilation is the most *simple* and, at the same time, the most *efficient* ventilation system to create high air speeds at bird level. A high air speed will significantly decrease the temperature that is perceived by the birds (use of the windchill effect). Even in case of

high temperatures and high humidity, the birds are thus able to transfer excess 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 manner, heat stress can be prevented at any temperature. This will keep the birds' performance at a steady and high level and their feed and water consumption normal.



Large tunnel inlets with MultiVent 17 M ensure that the fresh air can enter over a large surface



Highly efficient AirMaster Blue 170C fans guarantee the necessary air exchange rate

➤ 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 170C, V 140 and V 130** fans (with and without cone).

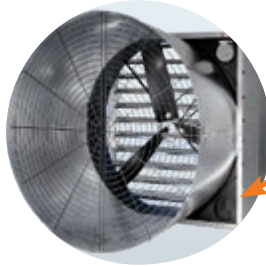
➤ Fresh air

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.

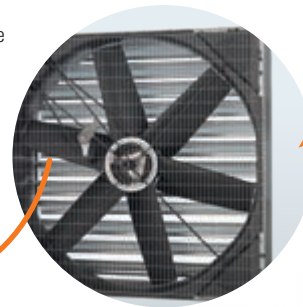
➤ Cooling system

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 rates remain high.

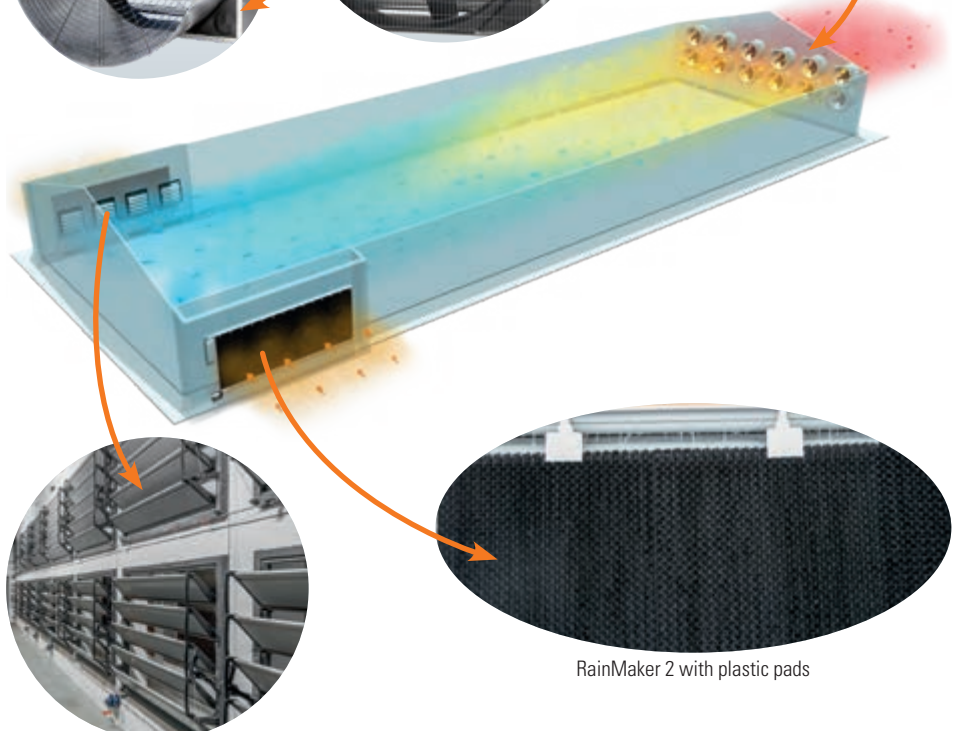
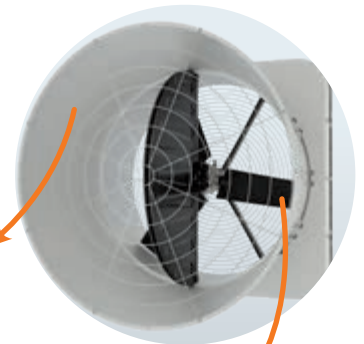
AirMaster V130 with or without cone
up to 75 Pa (0.3 inch wc)



AirMaster V140 with or without cone
up to 100 Pa (0.4 inch wc)



AirMaster Blue 170C
up to 125 Pa (0.5 inch wc)



MultiVent shutter 17M

RainMaker 2 with plastic pads

CombiTunnel ventilation

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

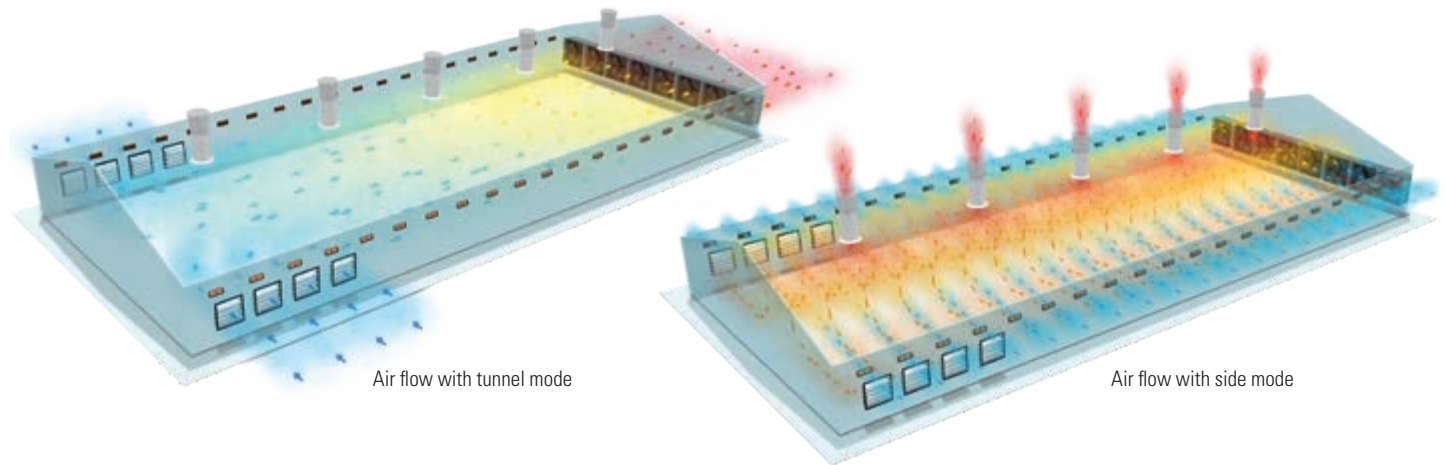
The CombiTunnel ventilation system from Big Dutchman is a very successful ventilation system that has proven its worth over many years. It creates perfect climate conditions for poultry anywhere in the world so your production process is secure.

➤ 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. Since the fresh air is not supplied from one central point, temperatures are very similar everywhere in the barn.



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 an essential component;
- ✓ 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 close airtight 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: the counterpressure for the fans is kept to a minimum for a long service life;
- ✓ due to the extremely accurate PID control, our ViperTouch climate computer 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 birds: the birds' body heat is used, heating requirements are low and the litter and manure remain dry;
- ✓ 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 case of power failures, thermics and the chimneys create a natural ventilation system, ensuring that the birds survive;
- ✓ the motorized shutters of the fans work with a battery so in case 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 birds, 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 bird level to make use of the windchill effect;
- ✓ the ViperTouch climate computer allows for a smooth transition from side to tunnel mode and vice versa.

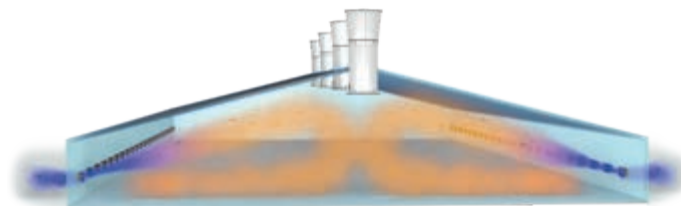
How to use the birds' heat efficiently: ventilation in **side mode**

Side ventilation is the most comfortable ventilation system for *even* temperatures in the entire barn.

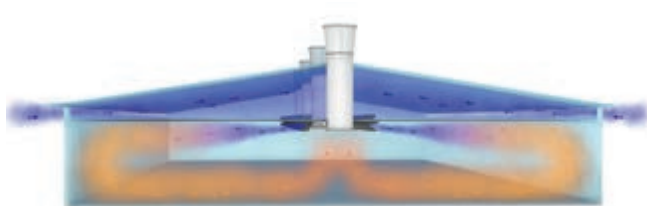
The fresh air enters the barn along its entire length *at once*, with the air jets

filling the entire room. The birds 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 birds through ventilation without

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



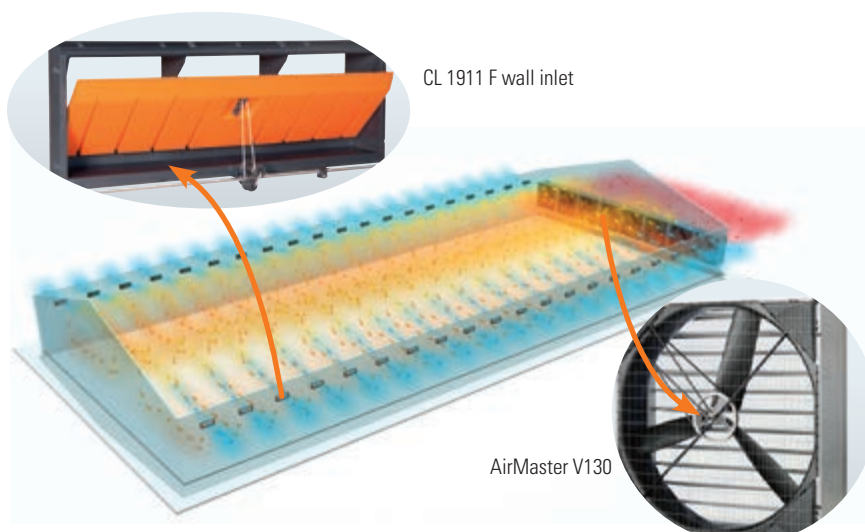
With side ventilation, the fresh air flows along the ceiling, where it warms up before it slowly drops down.



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

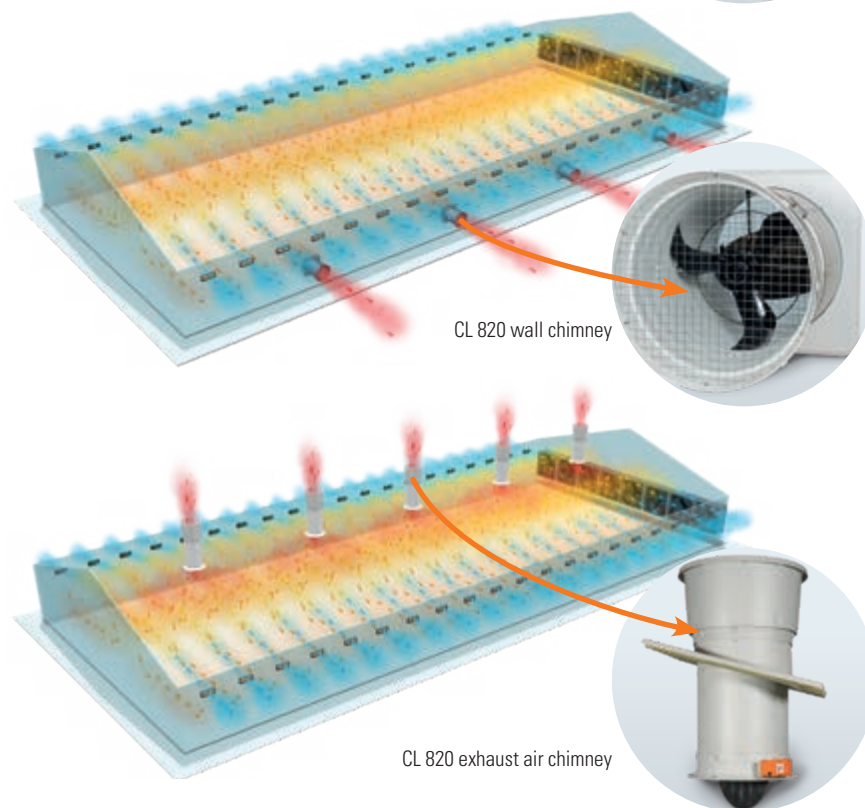
➤ Fresh air

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 adjusting range of the ventilation level. 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 creating stable and circulating air flow so temperature conditions are the same for all birds in the barn.



➤ Exhaust air

If centralised exhaust air extraction in the rear gable is requested or mandatory, the tunnel fans are also used for side ventilation. A drawback, however, are the large differences in air speed (large increase from the front to the rear). This also means that the temperature perceived by the birds varies at different locations in the barn: a disadvantage especially for rearing and broiler growing. We therefore recommend a decentralised exhaust air flow over the entire length of the barn, especially for the first 2 to 3 m³/h of air flow rate per bird. It is then possible to achieve an even air speed and therefore a very uniform apparent temperature. In the most simple cases, our **AirMaster V 130 wall fans** are the perfect solution. For MultiStep control, we recommend our **CL 820 wall chimney**. Our **CL 600/CL 820 chimneys**, distributed on the roof, are an even more comfortable option.



The ViperTouch climate computer controls the CombiTunnel ventilation system



ViperTouch with large 10-inch touch screen

Our modern climate and production computer ViperTouch ensures 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 of ViperTouch include:

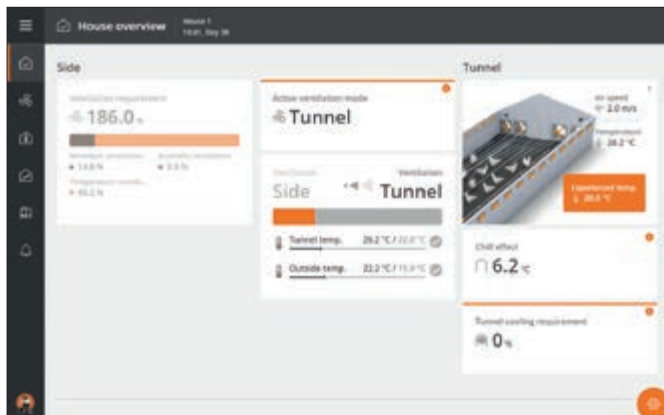
- prevent heat stress, but only cool as much as necessary;
- keep the barn dry (dry manure / dry litter);
- switch from tunnel to side mode at the best time to ensure even temperatures in the barn;
- maintain exactly the desired temperature through PID control;
- this means: ideal feed consumption, no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



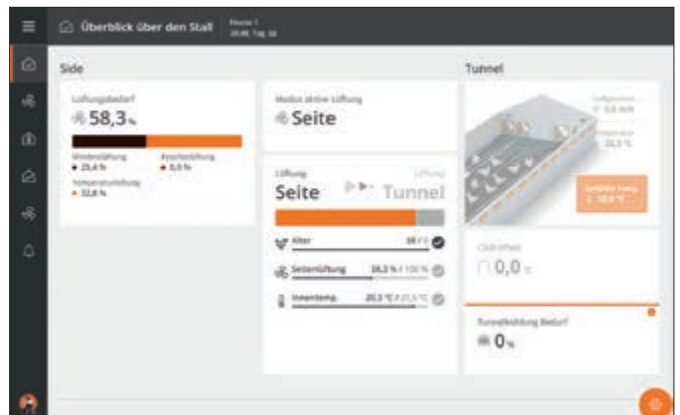
Good overview of the switch-over function on the ViperTouch screen: you decide when and how to switch modes!

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 dry litter or dry manure, ventilation will 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.



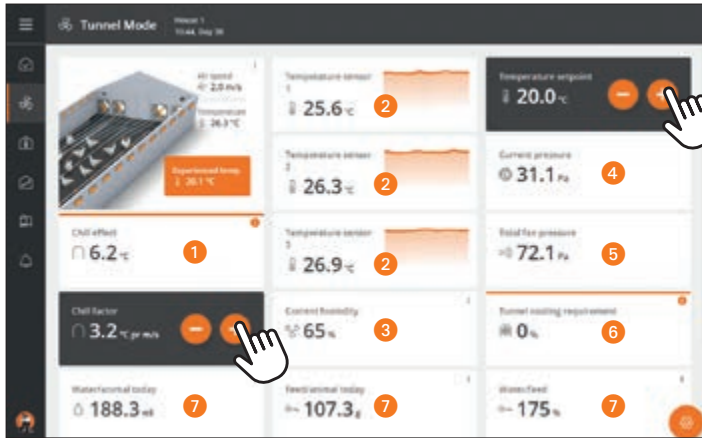
Ventilation system currently running in tunnel mode



Ventilation system currently running in side mode

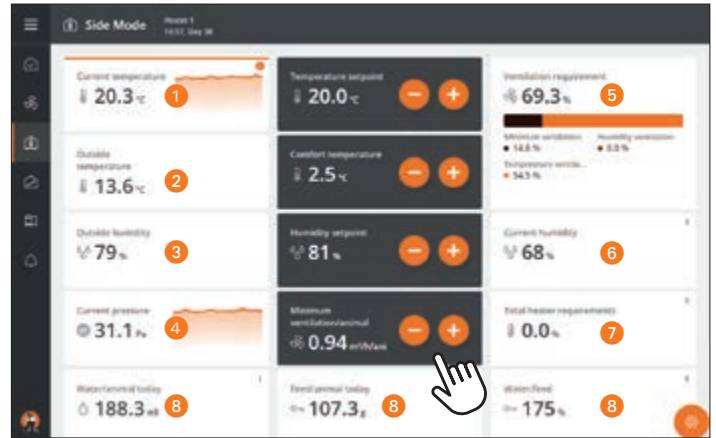
Configure the ViperTouch screen according to your needs

Our recommendation for tunnel mode:



- Temperature control in tunnel mode according to the *temperature perceived by the birds*
- 1 Cooling effect caused by the air speed
- Windchill effect: can be adjusted and indicates the cooling effect achieved by the air speed
- 2 Temperature in the barn (front, centre, rear): the temperature increase towards the fans should not be higher than 2 to 3 °C
- 3 Humidity (plays an important role in heat stress): the more humid the air, the higher the apparent temperature; humidity is considered when the apparent temperature is adjusted
- Target temperature: can be adjusted
- 4 Pressure monitoring at the front of the barn: a too high negative pressure can indicate clogged pads
- 5 Pressure monitoring at the rear of the barn: to check the air flow rate of the fans
- 6 Cooling demand: indicated in percent
- 7 Feed and water consumption: deviations are easy to recognise; for example, excess water consumption indicates heat stress. You can see all parameters at a glance.

Our recommendation for side mode:



- Target temperature: can be adjusted and is kept at the desired level (patented PID control)
- Comfort temperature ("little windchill"): can be adjusted as a temperature addition; with higher air exchange rates, the air will move more in the bird 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 save heating costs
- 1 Current temperature in the barn
- 2 Current outside temperature
- 3 Current outside humidity
- 4 Current negative pressure in the barn
- 5 Current ventilation demand in the barn
- 6 Current humidity in the barn
- 7 Current heating demand in the barn
- 8 Feed and water consumption: deviations are easy to recognise; for example, excess feed consumption indicates too low temperatures in the barn.

Perfect climate in the barn, healthy birds and high performances: these are the requirements of today, which 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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