



# Big Dutchman®



## **CombiTunnel ventilation**

The intelligent climate system  
for your poultry house

# CombiTunnel ventilation is a combination of two different ventilation systems

## Side ventilation

To ensure stable negative pressure ventilation, corresponding air inlets and exhaust air elements, heaters and an automatic control system including an emergency opening function are required.

### 1. Fresh air

Big Dutchman recommends to use air inlets that are distributed along the entire length of the house:

- CL 1200 and CL 1200-B all-purpose wall air inlets with automatic motor winch for wall incorporation or for use as flange valve, depending on the building design (other alternatives are also possible).

Fresh air enters the house at high speed (3-5 m/s) without creating a draft. This results in uniform temperatures, as well as good air quality in the bird area and ensures a uniform distribution of birds throughout the house.

### 2. Exhaust air

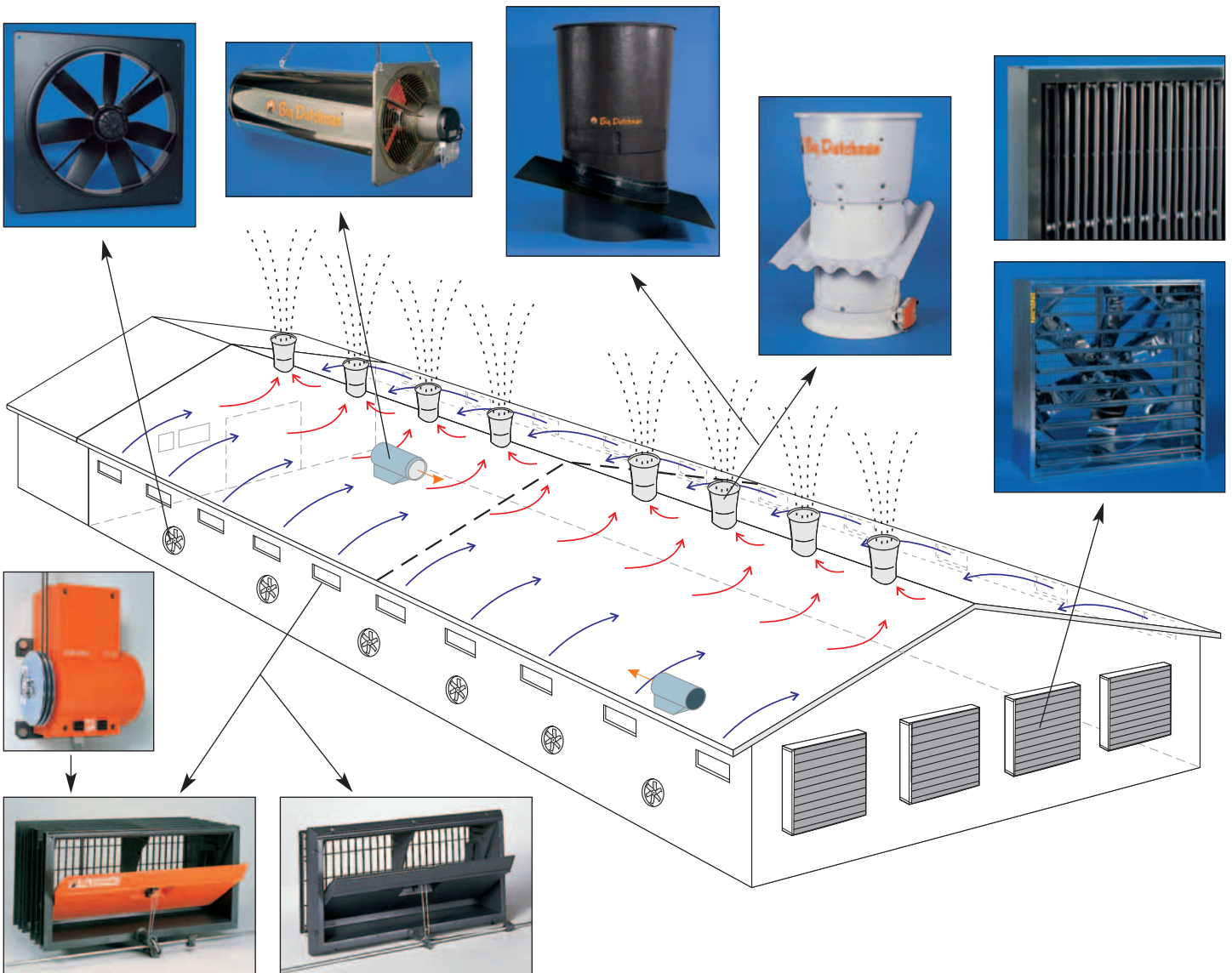
The following components are available:

- exhaust air chimneys for roof-installation suitable for precise, continuously controlled removal of air;
- wall ventilators located at the side wall of the house. If the exhaust air rate is not sufficient, additional exhaust air fans installed in the gable – AIR MASTER with or without shades – are started up. They are also active during tunnel ventilation.

### 3. Heating appliances

To satisfy the birds' heat requirements in the winter time, Big Dutchman offers the following appliances in its product range:

- hot air blower (JET MASTER);
- gas jet heater;
- box heater



# for an intelligent solution to maximise the performance potential of your birds

## CombiTunnel ventilation

The so-called CombiTunnel ventilation recommended by Big Dutchman is a combination of two different ventilation methods in the same house. Thus, it is possible to profit from the advantages of both systems:

- in case of low outside temperatures, the house is ventilated in side mode = very uniform temperatures throughout the entire house;
- in case of high outside temperatures, the house is ventilated in tunnel mode = high wind chill effect at low energy costs.

This solution is especially suitable for climates that are characterized by heavy fluctuations in temperature – high temperatures in the summer, low temperatures in

the winter – or major differences in temperature from day to night.

Both ventilation systems are controlled by a Viper or MC 36 CT climate computer. It is also possible to automatically switch between the two ventilation systems. When the system runs in tunnel mode, both computers use the measured air speed to calculate the wind chill effect!

In case of power failure or technical breakdowns, the temperature-controlled emergency opening fail-safe system MC 78 CT with a built-in maintenance-free 24 V battery ensures the survival of the birds by opening the air inlets and exhaust air elements.

### Control systems for CombiTunnel ventilation



Climate computer Viper



Extension box Viper



Climate computer MC 36 CT

#### Important functions

fresh and exhaust air control:

- side mode
- tunnel mode
- CombiTunnel ventilation

max. no. of motors for fresh air

max. no. of motors for tunnel openings

max. no. of temperature sensors

max. no. of humidity sensors

outside temperature sensor

no. of controllable heaters

simple switching of the computer if only one half of the house is in use

ventilation steps/groups

minimum ventilation in puls/pause mode

control of cooling and humidifying

automatic negative pressure control with pressure sensor

max. no. of relays

temperature-controlled emergency opening system

options for ventilation control:

- Basic Step (simple control)
- Flex Step (flexible control)
- Ultimatic (demanding control)

display of wind chill

#### Viper

#### MC 36 CT

✓

✓

✓

✓

✓

✓

6

2

2

1

8

2

2

2

1

1

6 (in 4 zones)

2 (in 2 zones)

✓

-

16 steps

8 Multistep

✓

✓

✓

✓

✓

-

20, 30, 40

20

✓

✓

✓

-

✓

✓

✓

✓

✓ (Ultimatic)

✓



Temperature-controlled emergency opening system MC 78 CT

# Tunnel ventilation

When the outside temperatures are high and the ventilation system runs in tunnel mode, fresh air enters the house over so-called tunnel air intakes that are located close to the gable in both side walls. The fresh air is drawn into the house by a slight negative pressure that is created by high-performance exhaust ventilators mounted at the opposite end wall. That way, the fresh air travels the length of the house and drives out the stale air – all this with minimal energy consumption. That means, fresh air enters the house on a large surface and replaces the stale air without mixing with it. Due to the uniformly high air velocities of 1-3 m/s at bird level, the wind chill effect reduces the temperatures felt by the animals by 3-8°C, depending on the age and weight of the birds. If the outside temperature exceeds 30°C, the cooling effect of the wind chill is reduced. In this case, the fresh outside air has to be additionally cooled before it enters the house.

## 1. Tunnel air intake

The air intakes are large openings equipped with protective screens. The intakes are automatically opened and closed by means of curtains, flaps or shutters to regulate the amount of sucked-in air.

## 2. Exhaust air removal

Used here are AIR MASTER fans with high air rates and low energy consumption (with or without cone,

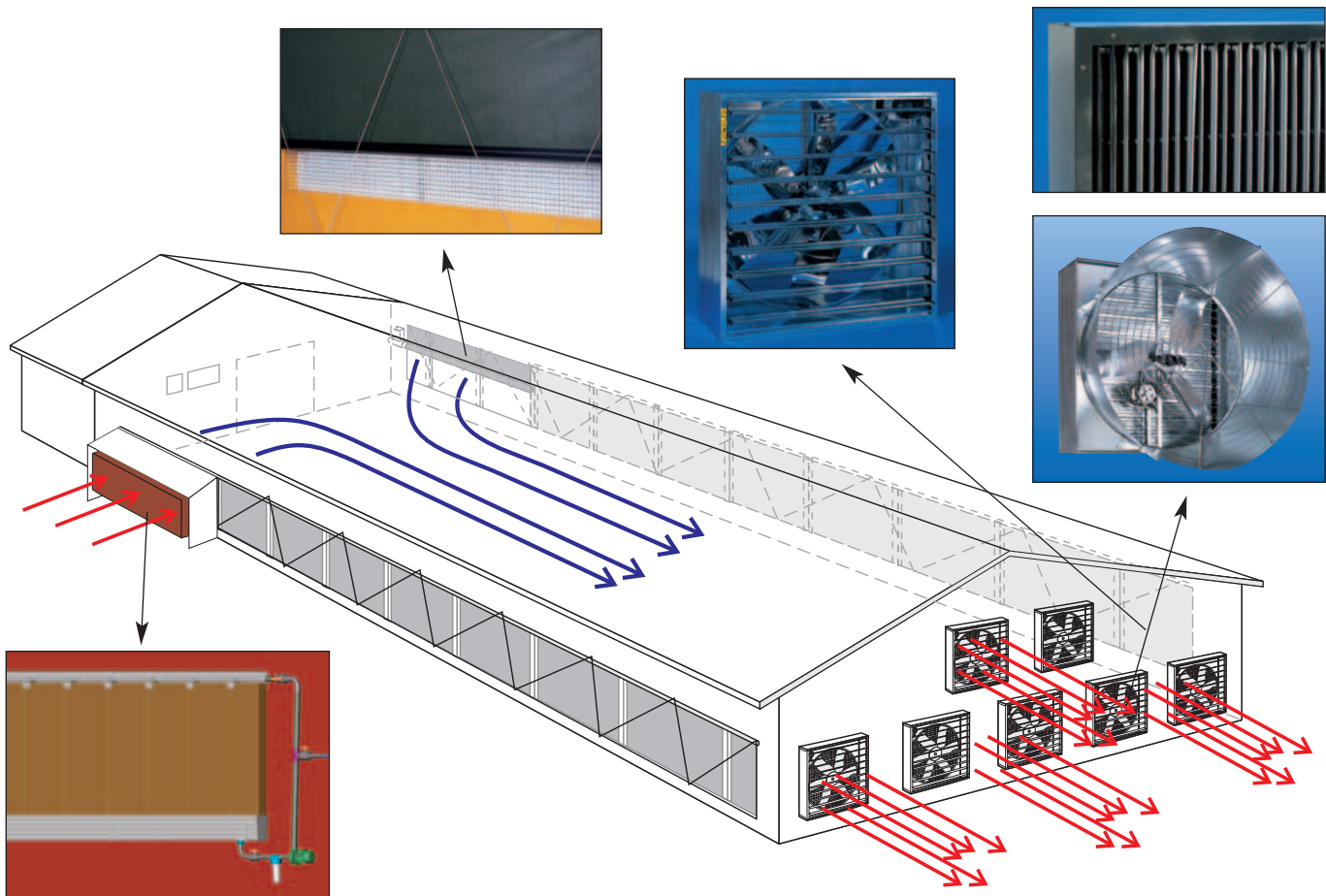
with or without shades).

Cone fans are preferably used in houses with increased back pressure, up to -80 Pa, or in houses that allow only little room for the installation of exhaust air fans. These fans achieve significantly increased air rates and are therefore very suitable for tunnel ventilation in cage houses.

## 3. Cooling

If the outside temperature exceeds 30°C and the wind chill no longer sufficiently cools the birds, the pad cooling system can be used to cool down the outside air before it enters the house. It is installed in a separate building called corridor. This has the following advantages:

- the tunnel openings are smaller  
=> this leads to higher air velocities  
=> better distribution of air  
=> the required air speed can be adjusted more precisely  
=> better insulation and reduced necessity for extra insulating plates in the winter time
- curtains, flaps and shutters are protected better against dust or other environmental influences
- better protection against wind, light and rain
- the pads can be accessed from both sides  
=> easy to maintain



## 2 examples for the use of CombiTunnel ventilation in cage houses

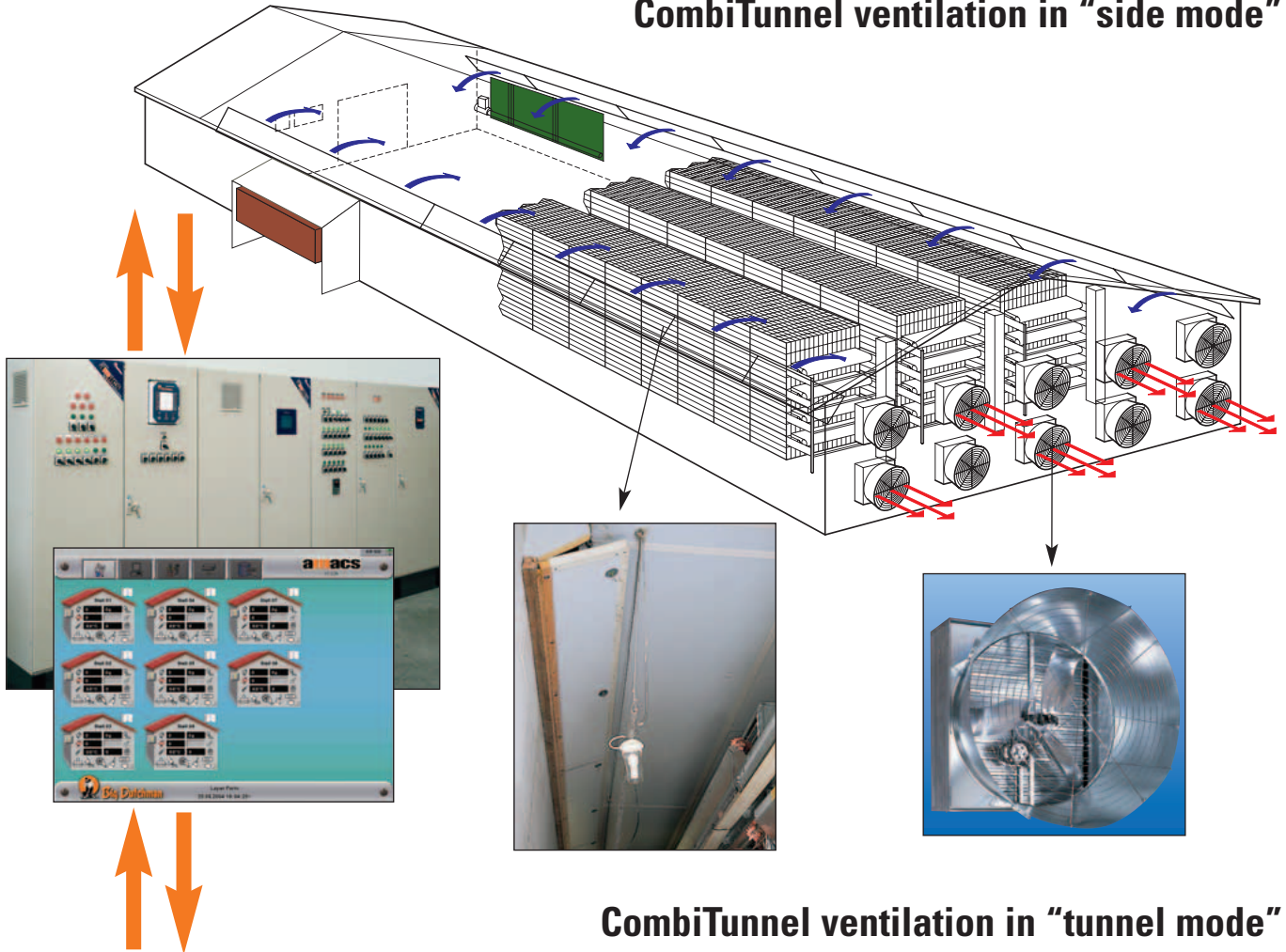
During side ventilation, the fresh air evenly enters the house over the baffles installed along both side walls and is removed from the house by means of the fans at the gable wall.

During tunnel ventilation, the air inlets are closed and the fresh air is sucked through the tunnel air intakes travelling the length of the house at an increased

velocity. The air can additionally be cooled by a pad cooling system.

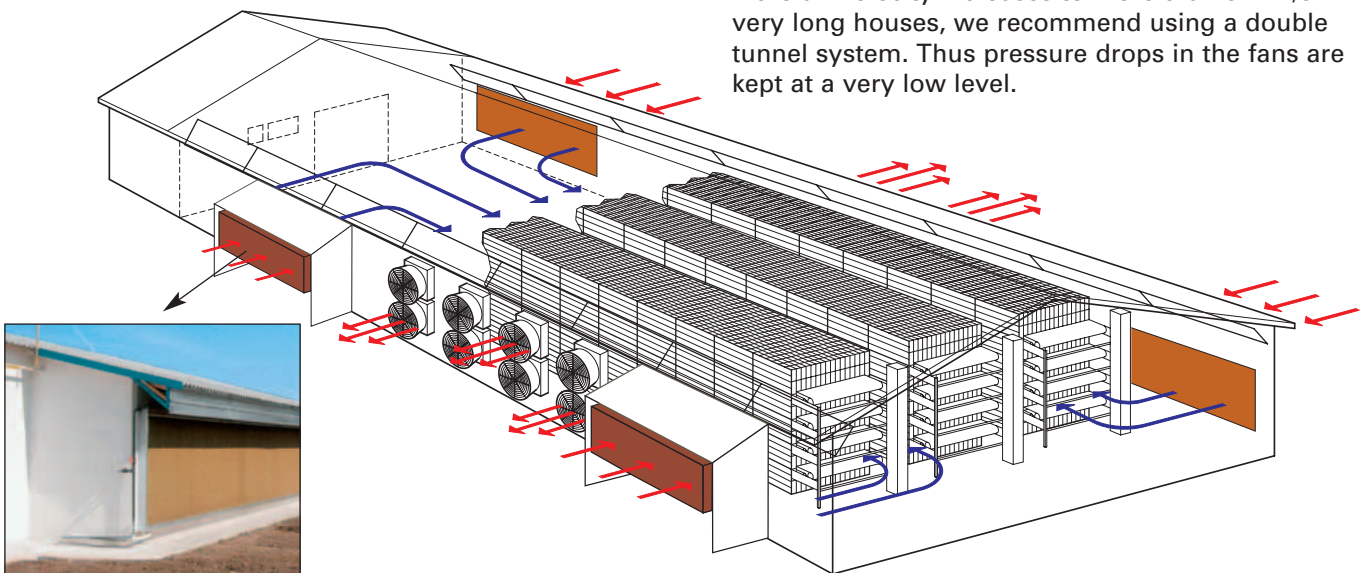
If you wish to control not only the climate but the entire house management with only one computer – light, feed, water, manure belt ventilation etc. – we recommend using the all-in-one agro management and control system, **amacs**.

### CombiTunnel ventilation in “side mode”

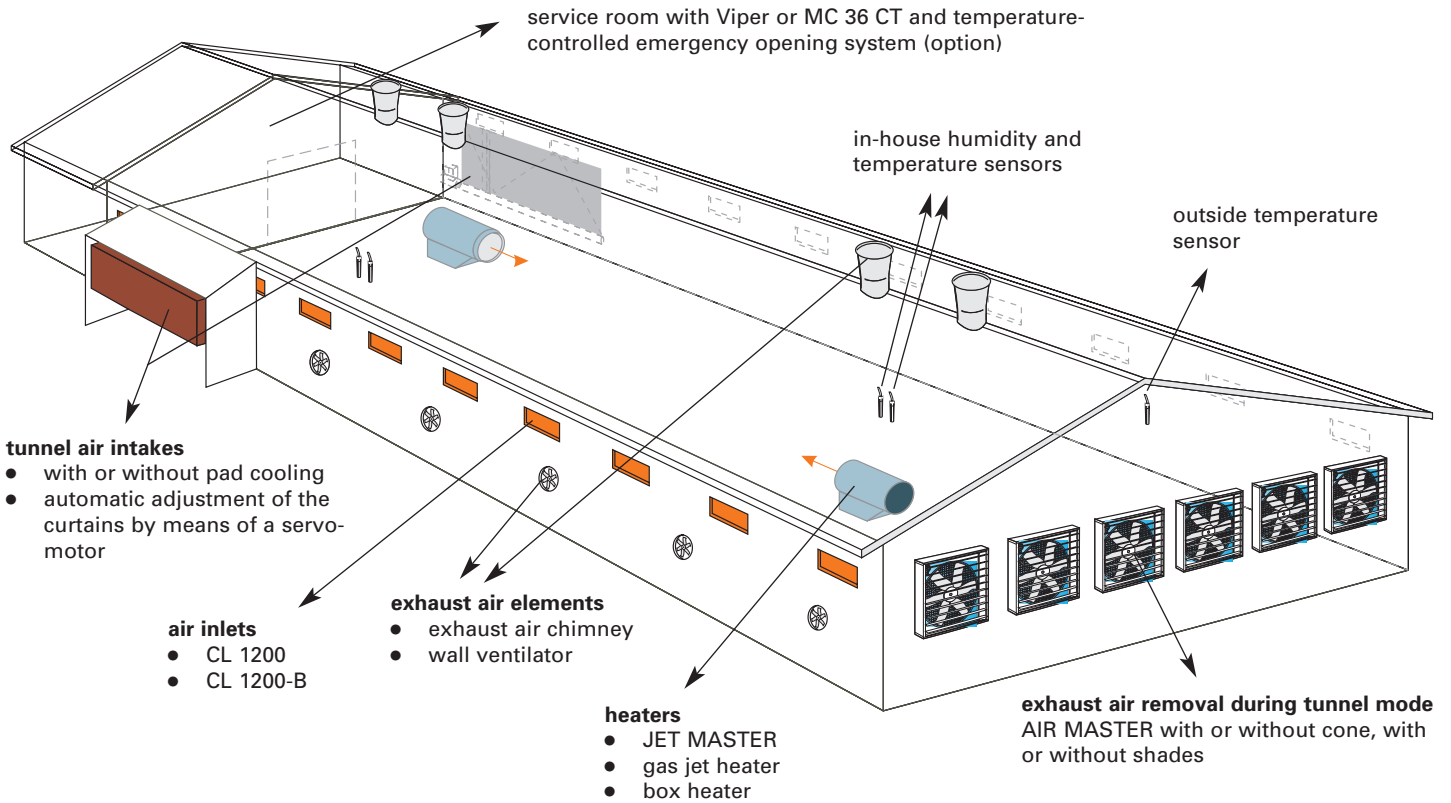


### CombiTunnel ventilation in “tunnel mode”

If the air velocity increases to more than 3-4 m/s in very long houses, we recommend using a double tunnel system. Thus pressure drops in the fans are kept at a very low level.



# CombiTunnel ventilation and possible component parts



## Advantages of CombiTunnel ventilation

- this ventilation system is especially suitable for regions with cold winters **and** hot summers => **ideal climate conditions throughout the whole year for healthy birds;**
- CombiTunnel ventilation provides the birds with constant climatic conditions throughout the **whole year** => high production results in the summer and the winter time; thus it is possible to take full advantage of the birds' genetic potential, good feed conversion;
- it is possible to compensate a wide temperature range from approx. -20°C to +40°C  
=> low outside temperatures: side ventilation – even a small air rate can be precisely regulated, thus ensuring uniform temperatures in the entire house;  
=> high outside temperatures: tunnel ventilation – high air velocities at bird level, taking advantage of the wind chill effect;
- the Viper climate computer allows for a smooth transition from side to tunnel mode and vice versa.



**Big Dutchman.**

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