Big Dutchman®

# Exhaust air chimneys

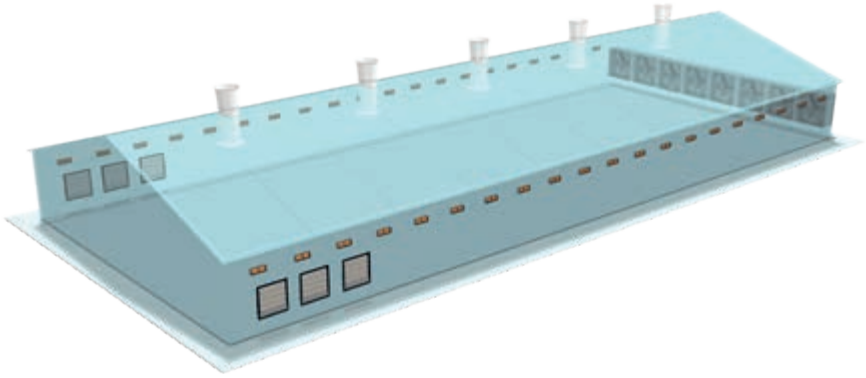
for efficient and optimised air extraction

# Exhaust air chimneys: the right solution for every type of housing!

Big Dutchman offers an extensive product range of exhaust air chimneys and corresponding chimney fans to ensure that exhaust air extraction is ideally matched to the animals' needs. Thanks to the flow-optimised chimneys, the fan's air flow rate improves, making the exhaust air volume flow especially efficient. The fans used in the chimneys, with sickle-shaped blades, are of excellent quality. The blades are made of aluminium in a moulded die-casting process and are, therefore, proof against severely cold conditions and resistant to corrosion. Due to their aerodynamic shape, they are even more efficient and resistant to pressure and produce less noise than traditional fans. The following chimneys and exhaust air principles can be used:

- CL 600 and CL 820 exhaust air chimneys
- wall chimneys
- MultiStep, Dynamic MultiStep and DynamicAir control principles
- BD exhaust air chimneys VC
- centralised exhaust air extraction

## What are the advantages of exhaust air chimneys?



- ✔ clear separation of fresh air and exhaust air for better hygiene;
- ✔ multiple decentralised extraction points for a uniform air quality in the house;
- ✔ significantly reduced influence of the wind;
- ✔ battery-operated emergency opening system with motor-driven damper using thermal flows in case of power failures.

# CL 600 and CL 820: the originals for climate professionals

## Versatile exhaust air chimneys with a unique design

The Big Dutchman CL series exhaust air chimneys have proven their worth hundreds of thousands of times in the past 25 years and come with the following exceptional characteristics:

- ✔ aerodynamic design for efficient air extraction;
- ✔ made of polypropylene with a smooth, dirt-repellent surface for high stability;
- ✔ resistant to sunlight and frost and therefore very durable;
- ✔ easy to clean with a high-pressure washer;
- ✔ labyrinth seal installed between roof duct and roof sheet for watertightness;
- ✔ no additional sealing material required;
- ✔ the self-supporting design means that supplementary suspension or bracing is unnecessary;
- ✔ roof sheet and external ducts are made of GRP to allow for adjustments on site;
- ✔ the roof sheet is supplied according to roof slope and profile, side or ridge installation and height above roof;
- ✔ easy to install;
- ✔ the CL 74 actuator reduces the volume flow exactly as required for minimum ventilation.

CL 820 exhaust air chimney

1. Diffuser: increases the air flow rate (Venturi effect)
2. Efficient rain run-off
3. Roof duct: connects the cone and the roof sheet
4. Labyrinth seal: prevents water from entering through the roof
5. Built-in chimney fan: saves power, is resistant to pressure, produces little noise
6. Roof sheet: is available with different profiles
7. Exhaust air pipe: can be extended
8. Butterfly valve: closes off the chimney and reduces the airflow in a speed-controlled system
9. Suction head: shaped specifically for higher flow rates


Because the individual chimney components can be combined very flexibly, many different requirements can be met.

- ✔ colour selection: light grey or black;
- ✔ house can be darkened if light plate, light pan or light helix is used;
- ✔ 0.5 m or 0.75 m exhaust air pipe extension;
- ✔ installation of a chimney cowl instead of the diffuser, fitted to the roof duct;
- ✔ 1.0 m pipe extension for the roof sheet (above roof);
- ✔ pipes in the roof space can easily be insulated with additional insulation.

# Accessories for the CL 600 and CL 820 chimneys

## Water collector, light plate, light pan, chimney cowl, light helix


**Water collector, grey**
- CL 600: diameter 1.1 m, code no. 60-45-4360
- CL 820: diameter 1.4 m, code no. 60-49-3594
- Used for rain protection

***Note:*** Should be installed 60 cm or 80 cm below the chimney, depending on the chimney diameter. This prevents sunlight from reaching the floor. Performance losses are below 2 per cent.


**Light plate / water collector, black**
- CL 600: diameter 1.4 m, code no. 60-45-4370
- CL 820: diameter 1.7 m, code no. 60-49-3598
- Used for rain protection and darkening

***Note:*** Should be installed 60 cm or 80 cm below the chimney, depending on the chimney diameter. This prevents sunlight from reaching the floor. Performance losses are below 3 per cent.

**Light pan, black**
- CL 600: diameter 1.35 m, code no. 60-40-4264
- CL 820: diameter 1.50 m, code no. 60-52-2748
- Used to reduce the degree of light incidence in the house

***Note:*** Tiltable installation is possible to facilitate cleaning. Performance losses are approx. 20 per cent.

**Chimney cowl with/without bird guard wire mesh**
- CL 600: code no. 60-40-4063 / 60-47-3944
- CL 820: code no. 60-52-2734 / 60-52-2733
- Used for rain protection

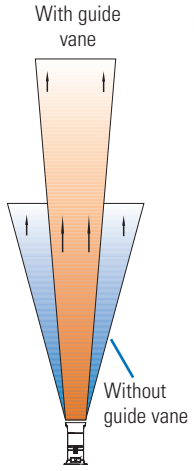
***Note:*** Performance losses are approx. 15 per cent.

**Light helix**
- CL 600: code no. 60-43-3075
- CL 820: code no. 60-43-3077
- Used to reduce the incidence of daylight to a minimum with performance losses of approx. 13 per cent.

# Guide vane for CL 600 and CL 820

## For a significantly increased working range of the chimney

The guide vane is simply screwed tightly to the exhaust air chimney, right above the fan. The exhaust air jet is concentrated by deviating the radial and circular air flow control components. This leads to a significantly increased working range of the chimney. The guide vane can be retrofitted easily.




Plume with and without guide vane

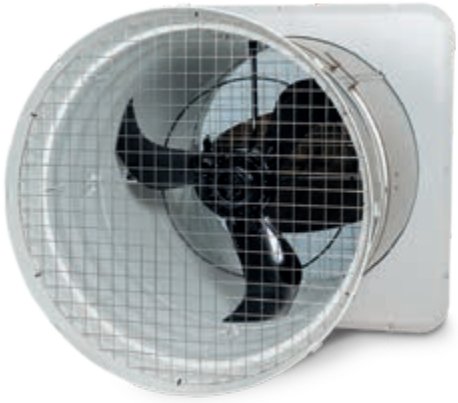
### ADVANTAGES

- ✔ up to 80 per cent increased working range of the chimney;
- ✔ only minimal decrease (approx. 3 per cent) of the chimney's air flow rate;
- ✔ no chimney extension required, i.e. no storm bracing and no unattractive outward appearance of the house;
- ✔ economic alternative to a chimney extension;
- ✔ quick and easy installation.

# CL 600 and CL 820 exhaust air chimneys for wall installation

## Very good adjustability and pressure resistance even at low air flow rates

The CL 600 and CL 820 exhaust air chimneys are well suited for installation into a gable end or side wall. Compared to simple wall fans, wall chimneys can control the exhaust air volume flow more precisely thanks to the motor-driven shutter, especially with minimum ventilation. They are also less susceptible to wind. The exhaust air volume can thus be aligned more accurately with the animals' actual needs. For space and weight reasons, a diffuser is not part of the standard equipment, but is an option when ordering.



CL 820 exhaust air chimney for wall installation

Suction head with shutter and actuator

# ECblue

## The innovative fan with high potential for energy savings

ECblue fans not only save energy but are also extremely resistant to pressure and thus even less susceptible to wind. Pressure stability is especially important with minimum ventilation. The noise level of the ECblue fans is also approx. 50 per cent lower than that of standard fans. ECblue is powered by an external-rotor EC motor. In combination with Dynamic MultiStep, you can save up to 50 per cent in electricity costs compared to traditional systems!

ECblue chimney fan

### ADVANTAGES

- ✔ very high energy-saving potential;
- ✔ high efficiency in the entire speed range;
- ✔ universal activation via a 0-10 V analogue signal;
- ✔ the pre-set ventilation level is precisely maintained due to the built-in speed feedback;
- ✔ very low noise level thanks to corrugated blade edges;
- ✔ easy installation.

# MultiStep

## The exhaust air control principle for stepless ventilation

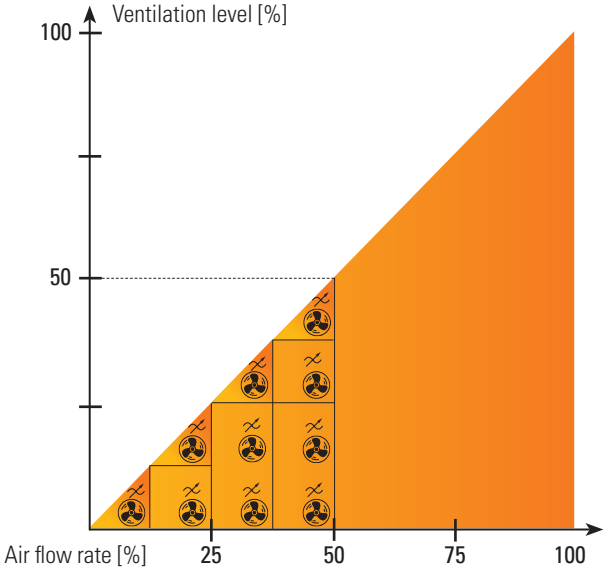
MultiStep combines stepless control and on/off group control. The benefit: stepless ventilation that optimally meets the livestock's needs. The entire ventilation system is more pressure-stable and less susceptible to wind.
The climate computer controls just one exhaust air chimney steplessly from 0 to 100 per cent and only starts up additional chimneys at full capacity (on/off method) when required.
The CL 74V actuator is used to control one or two exhaust air chimneys steplessly. If more than two chimneys are to be controlled steplessly, the CL 74 actuator is also available for an analogue 0-10 V control signal. For the on/off method, the chimneys are divided into groups. The CL 74 actuator (on/off) is used for this method. All actuators are installed directly at the adjusting axis of the butterfly valve/damper and are supplied with 24 V power. This makes for a simple and safe emergency opening system in case of power failures (378 T).

Chimney with actuator and damper

# Dynamic MultiStep

## The energy-saving exhaust air control principle for stepless ventilation

The enhanced version of the well-proven MultiStep exhaust air control principle is called "Dynamic MultiStep". Dynamic MultiStep works exclusively with the new, extremely energy-saving ECblue fans. Instead of starting at 100 per cent speed, these fans begin working as low as approx. 50 per cent of maximum speed. Only after all fans in the house have been started one after another at 50 per cent (a value that may vary depending on the required pressure resistance) is their speed increased simultaneously to 100 per cent when the ventilation demand requires this. Compared with the MultiStep solution, the power consumption of the new Dynamic MultiStep control principle is another 50 per cent lower! **Very clever:** lowering the speed by half requires just one eighth of the energy! A climate computer is responsible for controlling this system as well.




# DynamicAir

## For precise recording of the volume flow of exhaust air chimneys

The DynamicAir principle was invented to optimise the air exchange in livestock houses even further. With minimum ventilation rates, especially, it is very important to know exactly how much air passes through the exhaust air chimney to be able to provide optimal climate conditions for the animals and to reduce the heating costs at the same time. For this purpose, the DynamicAir sensor is installed in the chimney's aspirating mouth. The sensor transmits the measured signal to the climate computer, which translates the signal into the respective exhaust air rate. This permits a very accurate control of the air exchange. The climate computer contains the characteristic curve of the extraction unit as determined in a test facility. The chimney's volume flow is not reduced!


## ADVANTAGES

- ✔ very accurate recording of the air flow rate of exhaust air chimneys without any additional mechanical/moving components;
- ✔ reduction of heating costs thanks to precise minimum ventilation;
- ✔ suitable for both new buildings and for retrofitting*;
- ✔ long service life at a continuously high operational reliability.

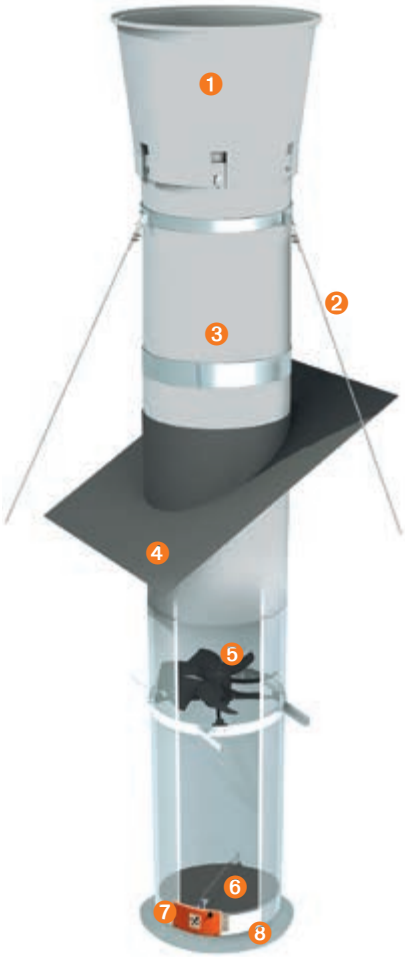
* only in combination with the 307*pro*, 310*pro* and ViperTouch climate computers

# BD exhaust air chimneys VC

## With different pipe diameters

The BD exhaust air chimneys VC are available with several different diameters and can, therefore, be easily adapted to any ventilation system and spacing of roof trusses. They are made of 30 mm thick polyurethane pipes coated with smooth, glass-fibre reinforced polyester. This means that all VC chimneys are well-insulated, condensation is prevented and noise is reduced. The chimney pipes are delivered in halves (VC) and are assembled on site, thus saving transport costs. They are, however, also available as fully-assembled pipes (AF). A roof sheet seals all chimneys.

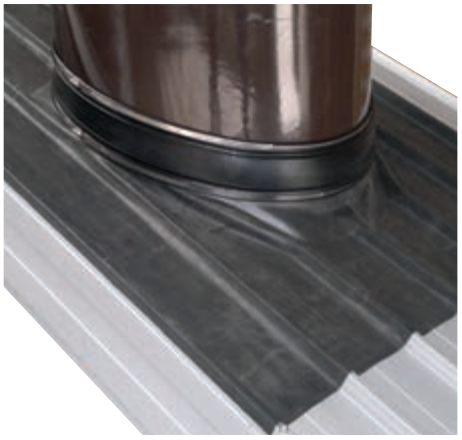
1. Diffuser: increases the air flow rate (Venturi effect)
2. Storm bracing
3. Exhaust air pipe: is available in lengths of 1.0 m or 1.5 m
4. Roof sheet
5. Built-in chimney fan
6. Shutter
7. CL 74 actuator
8. Aspirating mouth




Because the individual chimney components can be combined very flexibly, many different requirements can be met.

- ✔ colour selection: light grey or dark brown;
- ✔ chimney is closed off either by a butterfly valve or a pivoting damper;
- ✔ chimney pipe is available as half or full pipe;
- ✔ 1.0 m or 1.5 m chimney extension;
- ✔ chimney suspension: with anchoring plates for houses without intermediate ceiling, with anchorage ring for houses with intermediate ceiling.

The TopSeal roof covering is an alternative to the roof sheet. This roof covering is made of a black, weather- and UV-resistant EPDM film (special rubber), which is permanently elastic and highly tear-proof and therefore has a long service life. TopSeal is delivered pre-assembled and includes a collar based on the chimney diameter. This makes assembly on site quick and easy. TopSeal can be used for roofs with a slope of up to 20°.



TopSeal roof covering

Thanks to their stability, VC chimneys are a good choice when needing to extend the plume above the roof (prevention of the downwash effect). Due to the higher exhaust speed, emissions and unpleasant odours are discharged into higher air layers.

Example: exhaust air exits > 3 m above ridge

# Centralised exhaust air extraction

## To bundle the sources of emission

Reducing emissions from livestock houses will become increasingly important in the future. In some countries, authorities already require that the exhaust air be extracted at one central point (bundled), and that this point of exit be installed at a height of no less than 10 metres. A bundled emission system works like a large chimney with a stable airflow. The BD exhaust air chimney VC 920 is a good choice here:

- ✔ very high air flow rates;
- ✔ exhaust air pipe made of two high-density polyurethane foam half pipes for reduced transport costs;
- ✔ good insulation to prevent condensation;
- ✔ easy-to-clean chimney;
- ✔ good stability and noise reduction.

As an alternative to the extension of individual chimneys until they have reached the required height, a separate exhaust air tower can be erected at one gable end. This solution is more convenient, but also more complex. The CL 920 and VC 1270 exhaust air chimneys are well-suited for exhaust air towers. Both have very high air flow rates but do not consume too much power. VC 1270 has a modular shutter with integrated aspirating mouth so that the chimney produces a uniform and linear airflow.

Exhaust air chimney VC 1270 with modular shutter

V125 T chimney fan

Exhaust air tower

CL 920 exhaust air chimney

## Advantages of an exhaust air tower

- ✔ separation of exhaust air from animals for significantly improved hygiene;
- ✔ no leaking air caused by idle fans;
- ✔ no openings for unwanted leakage of rain water into the building;
- ✔ no undesired incidence of light;
- ✔ no issues with the static values of the roof;
- ✔ thorough and easy cleaning of tower and chimneys with a high-pressure washer, without entering the house;
- ✔ simple installation of the chimneys on the tower;
- ✔ no stability issues during strong winds.

# Technical data of the most important built-in chimney fans

### Description details

| | | | | | |
|---|---|---|---|---|---|
| **FF 063-6ET** | FF = fan with sickle-shaped blades | 063 = impeller diameter | 6 = 6-pole | E/D = single-phase/three-phase | T = chimney fan |
| **FF 080-ZIT** | FF = fan with sickle-shaped blades | 080 = impeller diameter | Z = 10-pole | I = ECblue (single-phase) | T = chimney fan |

| Fan type | | FF063-6ET | FF063-6DT | FF063-ZIT | FF080-6ET | FF080-6DT | FF080-ZIT |
|---|---|---|---|---|---|---|---|
| ***Code no.*** | | 60-47-7900 | 60-47-7902 | 60-47-9007 | 60-47-7915 | 60-47-7916 | 60-47-8999 |
| ***Nominal current*** | Ampere | 2.5 | 1.25 | 4.0 | 4.0 | 1.85/3.2 | 5.8-4.2 |
| ***Sound power level*** | dB(A) | 71 | 71 | 75 | 80 | 80 | 84 |

Additional fan types are available upon request.

## Ventilation performance data

| CL 600 Negative pressure | Air flow rate (m³/h) | | | Specific fan power (W/1000 m³/h) | | | Exhaust air exit speed (m/s) | | |
|---|---|---|---|---|---|---|---|---|---|
| | FF063-6ET | FF063-6DT | FF063-ZIT | FF063-6ET | FF063-6DT | FF063-ZIT | FF063-6ET | FF063-6DT | FF063-ZIT |
| 0 Pa | 12600 | 12900 | 15600 | 34.7 | 33.3 | 43.8 | 10.6 | 10.8 | 13.1 |
| 10 Pa | 12200 | 12500 | 15200 | 37.3 | 35.5 | 45.9 | 10.2 | 10.5 | 12.8 |
| 20 Pa | 11700 | 12100 | 14900 | 39.2 | 37.4 | 47.7 | 9.8 | 10.1 | 12.5 |
| 30 Pa | 11000 | 11500 | 14500 | 42.5 | 39.9 | 50.0 | 9.2 | 9.6 | 12.2 |
| 40 Pa | 10100 | 10700 | 14100 | 47.6 | 44.0 | 52.8 | 8.4 | 9.0 | 11.8 |
| 50 Pa | 8900 | 9700 | 13700 | 54.4 | 49.5 | 55.5 | 7.4 | 8.1 | 11.5 |
| 60 Pa | 5200 | 7300 | 13200 | 90.0 | 63.9 | 59.3 | 4.3 | 6.1 | 11.0 |

| CL 820 Negative pressure | Air flow rate (m³/h) | | | Specific fan power (W/1000 m³/h) | | | Exhaust air exit speed (m/s) | | |
|---|---|---|---|---|---|---|---|---|---|
| | FF080-6ET | FF080-6DT | FF080-ZIT | FF080-6ET | FF080-6DT | FF080-ZIT | FF080-6ET | FF080-6DT | FF080-ZIT |
| 0 Pa | 21600 | 21700 | 25000 | 33.4 | 28.5 | 33.6 | 11.3 | 11.4 | 13.1 |
| 10 Pa | 20500 | 20900 | 23900 | 36.4 | 30.9 | 36.4 | 10.8 | 11.0 | 12.6 |
| 20 Pa | 19600 | 20100 | 23600 | 39.1 | 33.5 | 39.1 | 10.3 | 10.5 | 12.4 |
| 30 Pa | 18800 | 19100 | 23000 | 41.9 | 36.4 | 40.9 | 9.9 | 10.0 | 12.1 |
| 40 Pa | 18000 | 18300 | 22400 | 44.6 | 39.1 | 43.7 | 9.5 | 9.6 | 11.8 |
| 50 Pa | 17200 | 17400 | 21700 | 47.9 | 42.1 | 45.7 | 9.0 | 9.2 | 11.4 |
| 60 Pa | 16100 | 16500 | 21200 | 51.9 | 45.7 | 48.6 | 8.5 | 8.7 | 11.1 |

We recommend using three-phase fans or ECblue fans. They are more resistant to pressure and more efficient than single-phase fans.
The indicated values are based on a mains frequency of 50 Hz.

All fans were tested on a DIN 241631 ISO 5801 certified test bench.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