Big Dutchman®

Exhaust Air Chimneys

for efficient air removal

Exhaust air chimneys – the right solution for every type of barn!

Big Dutchman offers an extensive product line of exhaust air chimneys and corresponding chimney fans for optimal exhaust air removal. Thanks to the flow-optimised chimneys, the fan's air performance is improved and power consumption can be reduced by up to 20 percent.
The fans we use in our chimneys are of an exceptionally high quality, winter-proof and corrosion-free, and consume little power. Our product range includes both the well-proven standard FC fans and a new generation of fans with aerodynamic blades. These fans require even less power and are pressure-resistant and quiet.
Our recommendation is to install three-phase fans. These are very pressure-resistant and much more efficient than single-phase fans (power requirements up to 10 percent lower). The following chimneys and connected systems are available:

- ✔ CL 600 and CL 920 exhaust air chimneys
- ✔ CL 600 guide vane
- ✔ BD exhaust air chimneys VC
- ✔ chimney silencers
- ✔ centralised exhaust air removal
- ✔ MultiStep®
- ✔ Dynamic MultiStep
- ✔ ECblue
- ✔ DynamicAir

CL 600 – the Original for climate pros

The versatile exhaust air chimney with a unique design

The CL 600 exhaust air chimney has an aerodynamic shape and ensures optimum ventilation conditions. The chimney is made of polypropylene, has a smooth, dirt-repelling surface and is insensitive to sunlight and frost. The chimney can easily be cleaned with a high-pressure cleaner. The labyrinth seal installed between the roof duct and the roof sheet guarantees watertightness. No additional sealing material is required. The self-supporting design renders supplementary suspension or bracing unnecessary. Roof sheets and external extension ducts are made of GRP and can be adapted on site. The roof sheet is available customised to the roof slope, roof profile, height above roof, colour of the roof and for side or ridge installation. In addition to different standard roof sheet profiles, we can also provide customised profiles. The ridge-installed roof sheet is available as smooth version only. Assembly and disassembly are easily possible.

1. Diffusor –> increases the exhaust air performance (Venturi effect)
2. 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 –> ensures optimal house ventilation
6. Roof sheet –> available with different profiles
7. Exhaust air duct –> extendable
8. Butterfly valve –> closes off the chimney and reduces the air flow in a speed-controlled system
9. Suction head –> designed specifically for higher air performance

As the individual chimney components can be combined very flexibly, many different requirements can be met:

- ✔ colour selection: light grey or red-brown;
- ✔ light-proof if light plate or light pan are used;
- ✔ 0.5 m exhaust air extension duct;
- ✔ installation of a rain cowl instead of the diffusor, fitted to the roof duct;
- ✔ 1.0 m duct extension for the roof sheet (above roof);
- ✔ pipes in the roof space can be easily heat-insulated by means of additional insulation.

CL 920 – the XL version

Exhaust air chimney with high air performance

The air performance of the CL 920 is almost double that of the CL 600, which is why the CL 920 should be installed in barns with large exhaust air removal requirements. The suction head with integrated butterfly valve and the diffusor are made of polypropylene. The high-density polyurethane foam exhaust air duct consists of two half pipes, thus saving transport costs. This structure ensures good insulation and prevents condensation water. The chimney is also easy to clean. Noises are significantly reduced as an additional advantage. The chimney can be connected to the roof by means of a roof sheet, similar to the CL 600, or by means of an economic, universal roof covering.

Both CL 600 and CL 920 can also be installed into the wall. Compared to wall fans (gable or side wall), CL 600 and CL 920 are much easier to adjust, especially with minimum ventilation. They are also less sensitive to wind.

CL 600 guide vane

for a significantly increased working range of the chimney

The CL 600 guide vane is simply screwed tightly to the CL 600 exhaust air chimney right above the fan. The exhaust air jet is concentrated by deviating the radial and circular flow components. This leads to a significantly increased working range of the chimney. The guide vane can be retrofitted easily.

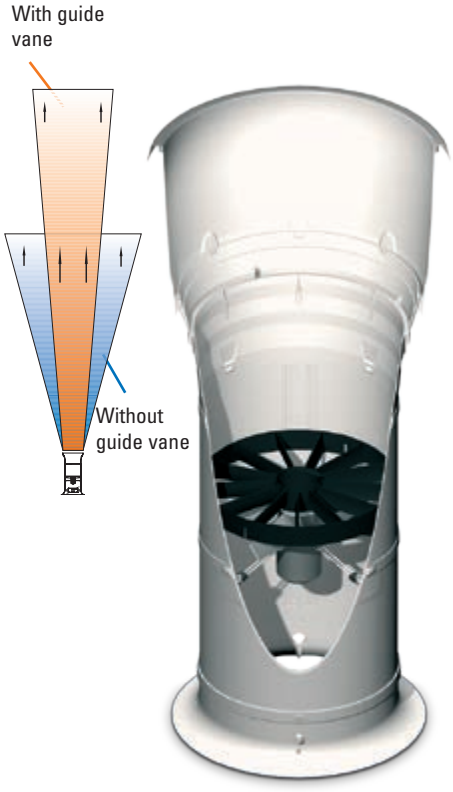


Illustration of the plume with and without guide vane

Advantages

- ✔ up to 80 % increased working range of the chimney;
- ✔ only minimal decrease (approx 3 %) in exhaust air performance of the chimney;
- ✔ no chimney extension required –> no storm bracings, no unappealing outward appearance of the barn;
- ✔ economic alternative compared to chimney extension;
- ✔ quick and easy assembly.

Accessories for the CL 600 and CL 920 chimneys

Drip tray, grey
- CL 600: diameter 1.1 m, code no. 60-40-4060
- CL 920: diameter 1.7 m, code no. 60-40-3086
- Used for rain protection

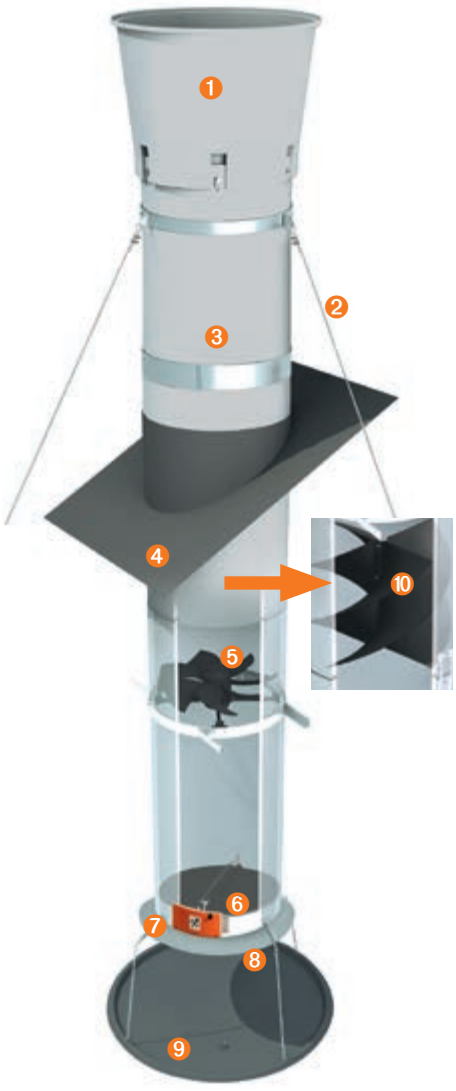
Light plate, black
- CL 600: diameter 1.4 m, code number 60-40-4261
- Used for rain protection and light absorption

Light pan, black
- CL 600: diameter 1.35 m, code number 60-40-4262
- Used to reduce the degree of light incidence in the house

BD exhaust air chimneys VC

Large selection of pipe diameters

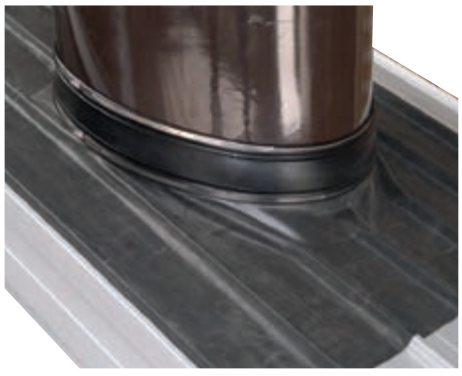
BD exhaust air chimneys are available with several different diameters (520, 650, 730, 820, 920 and 1270 mm) and can therefore be adapted to any ventilation concept and spacing of roof trusses. The fans and exhaust air chimneys offered by Big Dutchman are exactly coordinated. An exhaust air chimney with aspirating mouth and diffusor leads to a 10 to 15 percent higher air performance. At the same time, the specific power consumption is reduced by 5 to 10 percent.
BD exhaust air chimneys consist of 30 mm thick polyurethane pipes coated with smooth, glass-fibre reinforced polyester. This means that all BD chimneys are well-insulated, condensation water is prevented and noises are reduced.
The chimney pipes are delivered in halves (VC) and are assembled on site, thus saving transport costs. They are, however, also available as full pipes (AF). The chimney is closed off by a butterfly valve. Each chimney is delivered with the necessary fixing material.
A roof sheet seals all chimneys.



1. Diffusor –> increases the exhaust air performance (Venturi effect)
2. Storm bracing
3. Exhaust air duct -> 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
9. Drip tray
10. Light helix

As 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 or 1.5 m chimney extension;
- ✔ chimney suspension: with anchorage fishplates for houses without intermediate ceiling, with anchorage ring for houses with intermediate ceiling;
- ✔ light helix made of high-quality plastic reduces the infiltration of daylight at minimal pressure losses.



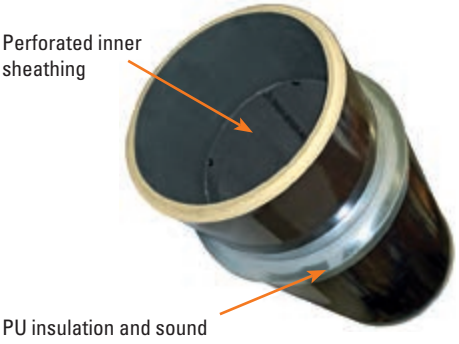
TopSeal roof covering

As an alternative to the roof sheet, it is also possible to use the TopSeal roof covering. This roof covering consists of a weather- and UV-resistant black EPDM film (special rubber) which is permanently elastic and highly tear-proof and therefore has a long service life. TopSeal is delivered pre-assembled including a collar based on the chimney diameter. This makes assembly on site quick and simple as the film need only be glued to the roof surface with a special adhesive. TopSeal can be used for roofs with a slope of up to 20 degrees.

Chimney silencer

for BD exhaust air chimneys VC

The new chimney silencer is an innovation used to reduce noise emissions. The German Technical Inspection Association TÜV Nord measured a noise reduction of up to 12 dB(A) (for pipe diameters of 650, 730, 820 and 920 mm) in official tests. The total length of the silencer is 2.5 m.



BD exhaust air chimney 1270

The BD exhaust air chimney 1270 is designed for an extremely high air performance while consuming very little energy. Chimney and fan can be mounted easily on site. The module closing flap with integrated aspirating mouth ensures that the chimney produces a uniform and linear air flow. We recommend these chimneys especially for centralised air removal systems outside of the animal area, if possible, as light incidence and penetration of rain water do not play such a vital role here.

V125 T chimney fan

Module closing flap

Central exhaust air removal
to bundle the emission sources

Reducing emissions from livestock housing facilities will become more and more important in the future. Especially for new barn buildings, licensing authorities often require that the point of exit of the exhaust air be installed at a height of no less than 10 m and that the exhaust air is extracted at one location (i.e. bundled).

This makes the air jet produced by a bundled emission source more stable. To accomplish this there are different concepts available from Big Dutchman.

One solution is to install a chimney extension to reach the required height. We will gladly supply our customers with all data required for the frequently necessary statics calculation.
A more convenient, but also more complex solution is erecting an exhaust air tower. Let our experts advise you to find the best possible solution for your individual requirements.

Advantages of an exhaust air tower

- ✔ separation of animal area and exhaust air tower significantly improves hygienic conditions;
- ✔ no leaking air because of idle fans;
- ✔ no openings for unwanted leakage of rain water into the building;
- ✔ no undesired incidence of light;
- ✔ thorough and simple cleaning of tower and chimneys with a high-pressure cleaner, separate from the barn;
- ✔ simple installation of the chimneys on the tower;
- ✔ no problems with the static values of the roof;
- ✔ no stability problems in case of strong wind.

MultiStep®

The energy-saving exhaust air principle using the CL 74 and CL 74V actuators

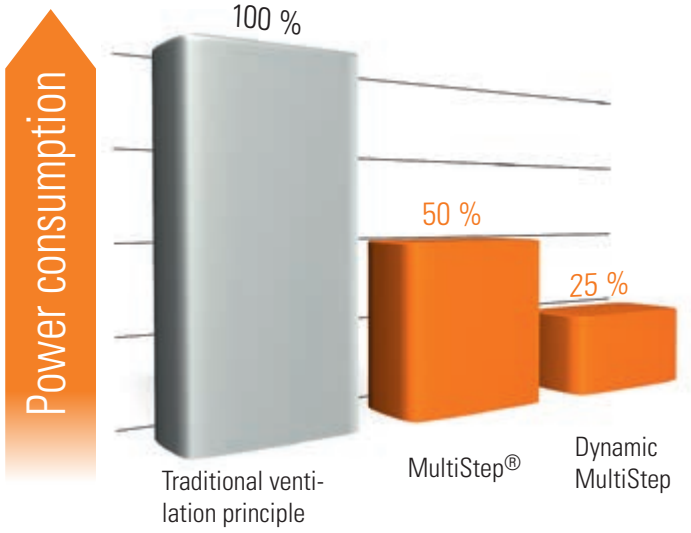
The exhaust air principle MultiStep® combines stepless control and group control. The principle's advantage is a significant reduction in energy consumption while the same air performance can be maintained: Compared to traditional negative-pressure systems, annual savings of up to 50 percent are possible. Due to the steady, maximum exit speed of the exhaust air, unpleasant odours are significantly reduced. The entire ventilation system is more pressure-resistant and less susceptible to wind.
The climate computer controls just one exhaust air chimney steplessly from 0 to 100 percent and only starts up additional chimneys at full capacity (on/off) when required.
The relay-controlled CL 74V actuator is used to control one or two exhaust air chimneys individually. If more than two chimneys are to be controlled steplessly, the CL 74 is also available for an analogue control signal 0-10 V. For the on/off method, the chimneys are divided into groups. The CL 74 actuator (open/close) 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 in case of power failures (378 T).

CL 600 with actuator and damper

Dynamic MultiStep

The enhanced version of the MultiStep® exhaust air principle

The enhanced version of the well-proven MultiStep principle is called "Dynamic MultiStep". This system works exclusively with the new ECblue fans that save even more energy. Instead of starting them at 100 percent speed, these fans begin working as early as at 30 percent (up to 50 percent depending on the required pressure resistance). Only after all fans have been started one after another at 30 percent is their speed increased simultaneously to 100 percent when the ventilation demand requires this. Compared to the already very energy-efficient MultiStep solution, the power consumption of the new Dynamic MultiStep exhaust air principle is another 50 percent lower! The climate computer is responsible for controlling this system as well.



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 less susceptible to wind. This stability is very important when using minimum ventilation. This is because strong winds have extreme effects on the minimum ventilation concept, especially regarding the animal's well-being and the heating costs. The noise level of the ECblue fans is also approx. 50 percent lower than that of standard fans. ECblue is powered by an external-rotor EC motor. When using these fans in combination with Dynamic MultiStep, you may save up to 75 percent 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;
- ✔ pre-set ventilation level is precisely maintained due to the included speed feedback;
- ✔ very low noise level thanks to corrugated blade edges;
- ✔ easy and cost-efficient installation.

DynamicAir
for precise recording of the volume flow of exhaust air chimneys

DynamicAir is a new principle invented to optimise the air exchange in livestock housing facilities. Especially with minimum ventilation, 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.
To use DynamicAir, a negative-pressure sensor has to be installed in the aspirating mouth of the chimney. The sensor converts the measured differential pressure signal into an analogue 0-10 V signal and transmits this information to the climate computer. The computer translates this 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 DynamicAir sensor can be retrofitted easily.

Advantages

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

* only in combination with the 135*pro*, 235*pro* and ViperTouch climate computers

Technical specifications of built-in fans for the BD exhaust air chimneys

Description details

FC035-4ET FC = standard fan 4 = 4-pole; 6 = 6-pole E = single-phase (1~ 230 V); D = three-phase (3~ 4000 V) T = chimney fan

	FC050-4ET / FC050-4DT	FC071-6ET / FC071-6DT	FC080-6ET / FC080-6DT
Code no.	60-47-9050 / 60-47-9550	60-47-9071 / 60-47-9571	60-47-9080 / 60-47-9580
Nominal current (A)	2.7 / 1.3	4.6 / 1.9	6.7 / 3.1
Sound pressure level (dB(A))	84 / -	81 / -	85 / -

Air performance data

Type	BD 520 with FC050-4ET			BD 730 with FC071-6ET			BD 820 with FC080-6ET		
Neg. pressure (Pa)	Capacity (m^3/h)	Spec. output (W/1000 m^3/h)	Exhaust air exit speed (m/s)	Capacity (m^3/h)	Spec. output (W/1000 m^3/h)	Exhaust air exit speed (m/s)	Capacity (m^3/h)	Spec. output (W/1000 m^3/h)	Exhaust air exit speed (m/s)
0	8720	45	11.4	14000	36	11.7	25590	39	13.5
10	8500	47	11.1	13610	38	11.4	24790	41	13.0
20	8280	50	10.8	13200	40	11.0	23900	44	12.6
30	7940	53	10.4	12530	44	10.5	22910	47	12.1
40	7720	56	10.1	12060	46	10.1	21530	52	11.3
50	7340	60	9.6	11070	51	9.3	20560	55	10.8
60	6980	63	9.1	10120	56	8.5	19130	60	10.1
80	6300	68	8.2	8150	67	6.8	16100	70	8.5

All values were measured with fans of precision class 3 based on the standard density of air of 1.2 kg/m^3 on a test bench according to DIN 2466 (distance between fan and damper 1135 mm).
The motors are fabricated according to minimum ingress protection rating IP 54 (dust-proof and water-proof). All listed built-in chimney fans 1 ~ 230 V and 3 ~ 400 V can be controlled electronically or by a transformer. Upon request, the fans are also available frequency-controlled and/or with different supply voltages and/or 60 Hz.

Technical specifications of built-in fans for CL 600, CL 920 and CL 1270 chimneys

Description details

FC 063-6ET	**FC**	**063**	**6**	**E**	**T**
	FC = standard fan FF = sickle-shaped fan FN = sickle-shaped fan, bionic	impeller diameter	6 = 6-pole Z = 10-pole M = 10-10-pole	E = single-phase D = three-phase I = ECblue	T = chimney fan

BD-V125-T-3-1.5 PS = three-phase chimney fan with an impeller diameter of 125 cm

Air performance data

Type	CL 600 with FF063-6ET ❶/ FF063-6DT ❷/ FF063-ZIT ❸									CL 920 with FF091-6ET ❶/ FF091-6DT ❷/ FF091-ZIT ❸								
Neg. pressure (Pa)	Capacity (m³/h)			Spec. output (W/1000 m³/h)			Exhaust air exit speed (m/s)			Capacity (m³/h)			Spec. output (W/1000 m³/h)			Exhaust air exit speed (m/s)		
	❶	❷	❸	❶	❷	❸	❶	❷	❸	❶	❷	❸	❶	❷	❸	❶	❷	❸
0	12600	12900	15600	34.7	33.3	43.7	10.6	10.8	13.1	24700	25000	26000	32.1	28.5	27.1	10.3	10.4	10.9
10	12200	12500	15200	37.3	35.5	45.9	10.2	10.5	12.8	23600	24000	25100	34.6	30.7	29.2	9.9	10.0	10.5
20	11700	12100	14900	39.2	37.4	47.7	9.8	10.1	12.5	22500	22900	24200	37.4	33.3	31.6	9.4	9.6	10.1
30	11000	11500	14500	42.5	39.9	50.0	9.2	9.6	12.2	21300	21700	23300	40.2	36.3	34.1	8.9	9.1	9.7
40	10100	10700	14100	47.6	44.0	52.8	8.4	9.0	11.8	19500	20400	22300	44.3	39.8	37.0	8.2	8.5	9.3
50	8900	9700	13700	54.4	49.5	55.5	7.4	8.1	11.5	18000	19200	21200	48.6	43.3	40.0	7.5	8.0	8.9
60	5200	7300	13200	90.0	63.9	59.3	4.3	6.1	11.0	16200	17600	19900	53.9	47.6	43.3	6.8	7.4	8.3

Type	BD 1270 with FC125-MDT ❶/ BD-V125-T-3-1,5PS ❷/ FN125-ZIT ❸								
Neg. pressure (Pa)	Capacity (m³/h)			Spec. output (W/1000 m³/h)			Exhaust air exit speed (m/s)		
	❶	❷	❸	❶	❷	❸	❶	❷	❸
0	51100	46000	49300	36.0	29.3	21.5	11.2	10.1	11.0
10	49400	44300	48100	39.0	31.6	23.6	10.8	9.7	10.7
20	47600	42500	46900	42.2	34.0	25.8	10.4	9.3	10.5
30	45700	40600	45200	45.7	36.7	28.8	10.0	8.9	10.1
40	43600	38500	43500	49.5	39.6	32.1	9.6	8.4	9.7
50	41400	36200	41600	53.7	42.9	35.4	9.1	7.9	9.3
60	38900	33500	40000	58.4	46.8	38.5	8.5	7.4	8.9
70	36000	30400	38700	63.9	51.8	41.1	7.9	6.7	8.6
80	32600	26200	36600	70.7	58.8	45.1	7.2	5.7	8.1
90	28000		34000	80.3		50.0	6.1		7.6
100			30800			56.2			6.9

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

Fan	FF063-6ET	FF063-6DT	FF063-ZIT	FF091-6ET	FF091-6DT	FF091-ZIT	FC125-MDT	BD-V125-T-3-1,5PS	FN125-ZIT
Code no.	60-47-7900	60-47-7902	60-47-8973	60-47-7906	60-47-7907	60-47-8991	60-47-9125	60-48-4830	60-47-9032
Nominal current (amperes)	2.5	1.25	4.0	4.2	1.9	4.2	2.5	2.7	2.7
Sound power level (dB(A))*	71	71	75	74	75	77	83	88	74

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Technical details subject to change. en 7/2016