

Big Dutchman®



Exhaust air chimneys

for efficient exhaust air removal
in pig and poultry production

Exhaust air chimneys - the best solution for every type of barn

Big Dutchman offers an extensive product line of exhaust air chimneys and corresponding built-in fans for optimal exhaust air removal. Thanks to the flow-optimised chimneys, the air rate of the fans is increased and the power consumption is reduced by up to 20 %.

The Ziehl Abegg fans which are well-adapted to our chimneys have an exceptionally high quality, are corrosion-free, winter-proof and have low energy requirements. There are different types of fans available.

Our product range includes both standard fans (FC) and sickle-shaped fans (FE). These are even more pressure-resistant, operate at a low noise level and, as all ZA-fans, are equipped with die-cast blades.

Also, we recommend installing three-phase fans as these are very pressure-resistant and much more efficient (up to 10% less power requirements). Based on the building conditions and the special requirements, the following chimneys and connected systems can be installed:

- ✓ exhaust air chimneys CL 600 and CL 920
- ✓ BD exhaust air chimneys VC
- ✓ MultiStep®
- ✓ EC-blue
- ✓ chimney silencer
- ✓ DynamicAir
- ✓ guide vane
- ✓ centralised exhaust air removal

CL 600 – the Original

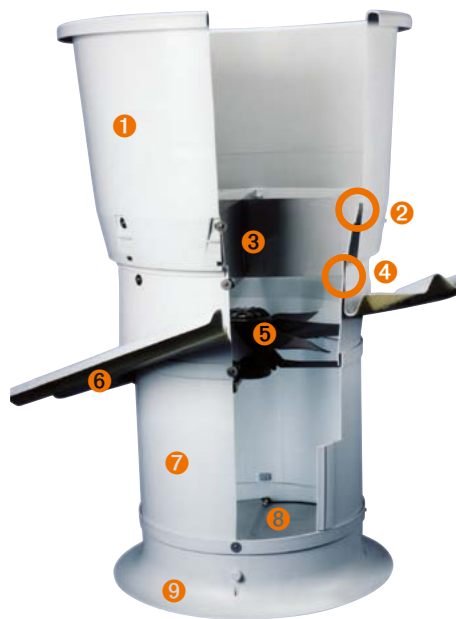
Exhaust air chimney – unique design, optimal air guiding, versatile use

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 ensures

watertightness. Additional sealing material is not necessary. 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, for side or ridge installation, height above roof and colour.

In addition to different standard roof sheet profiles, we can also provide customised profiles. The ridge-installed chimney is available as smooth version only. Assembly and disassembly are easily possible.

- 1 Diffusor → increases the exhaust air rate (Venturi effect)
- 2 Rain run-off
- 3 Roof duct for the connection between cone and roof sheet
- 4 Labyrinth seal → prevents water from entering through the roof
- 5 Built-in fan → for 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 → special design for higher air rates



The flexible combination of the individual components of the chimney makes it possible to fulfil different requirements:

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

CL 920

Exhaust air chimney with a high extraction rate at minimum energy consumption

The air rate of the CL 920 exhaust air chimney is almost double that of the CL 600, which is why the CL 920 should be installed in houses with large exhaust air removal requirements.

Suction head with integrated butterfly valve and polypropylene diffusor are shaped aerodynamically as at the CL 600 and therefore ensure an efficient house ventilation. The exhaust air pipe consists

of a core of high-density polyurethane foam (30 mm thickness) and a two-sided GRP coating. This set-up makes for good insulation, prevents the formation of condensation water, is easy to clean and

also provides good noise reduction. The exhaust air pipe can be transported in two parts and can then be mounted on site easily and safely by means of a patented PVC profile. The connection to the roof can be carried out by means of a roof plate as with the CL 600 or by means of an economic universal roof covering.

Both exhaust air chimneys, CL 600 and CL 920, can also be installed in a wall. In comparison to wall fans (gable or side wall) they have a much better adjustability especially during minimum ventilation and are less sensitive to wind.



Accessories for CL 600 and CL 920



Drip plate (grey)

- CL 600: Ø 1.1 m, Code-No. 60-40-4060
- CL 920: Ø 1.7 m, Code-No. 60-40-3086
- function: rain protection



Light plate, black

- CL 600: Ø 1.4 m, Code-No. 60-40-4261
- function: rain protection and light absorption



Light pan, black

- CL 600: Ø 1.35 m, Code-No. 60-40-4262
- function: reduction of light incidence in the house

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

Description details

FC 063-6ET FC = standard fan
FE 063-6DT FE = sickle-shaped fan

63 = impeller diameter 63cm
 6 = 6-pole

E = single-phase (1~ 230 V)
 D = three-phase (3~ 400 V)

T = pipe installation

Type	FC063-6ET / FC063-6DT	FE091-6ET / FE091-6DT	FE091-6DT.6N.3
Code-No.	60-47-7863 / 60-47-7763	60-47-9092 / 60-47-9592	60-50-0021
Motor protection switch (Ampere)	3.0 / 1.5	5.4 / 2.2	3.8
Sound power level L_{WA} (dB(A))	82 / -	81 / 84	88

Air performance data

Type	CL 600 with FC063-6ET / FC063-6DT*			CL 920 with FE091-6ET / FE091-6DT			CL 920 with FE091-6DT.6N.3**		
	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)
0	14130 / 13700	39 / 34	11.8 / 11.5	26900 / 27800	29 / 31	10.8 / 11.2	30800	41	12.9
10	13810 / 13250	41 / 36	11.6 / 11.1	25300 / 26900	32 / 34	10.3 / 10.8	30000	44	12.5
20	13220 / 12720	43 / 40	11.1 / 10.6	24200 / 25800	34 / 36	9.8 / 10.4	29500	46	12.3
30	12660 / 12200	47 / 43	10.6 / 10.2	23000 / 25000	38 / 38	9.6 / 10.1	29000	48	12.1
40	12110 / 11400	50 / 48	10.1 / 9.5	21700 / 24000	42 / 41	8.8 / 9.5	28600	50	12.0
50	11360	55	9.5	20200 / 23000	46 / 44	8.5 / 9.1	27900	53	11.7
60	10380	60	8.7	18600 / 21700	51 / 47	7.7 / 8.4	27200	56	11.4
80	-	-	-	15200 / 18300	-	6.3 / 7.3	25960	-	10.8

The listed air performance data was measured at an air density of 1.2 kg/m³.

* The data was taken from SJF test report No. 911 - 1997.

** with exhaust air washer installed



BDexhaust air chimneys VC

large selection of cross sections

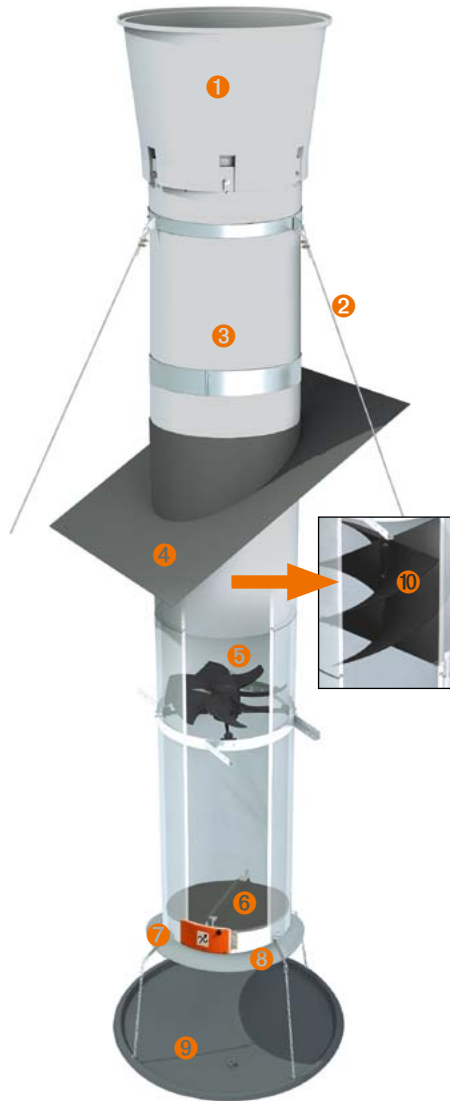
BD exhaust air chimneys are available with several different diameters (520, 650, 730, 820, 920 and 1270 mm) and can therefore be adapted to every ventilation concept. The fans and exhaust air chimneys offered by Big Dutchman are exactly coordinated. An exhaust air chimney with intake nozzle and diffuser leads to 10 to 15 % higher airflow rates. At the same time, the specific capacity is reduced by 5 to 10 %.

BD exhaust air chimneys consist of 30 mm thick polyurethane tubes coated with smooth glass-fibre reinforced polyester → good insulation, prevents condensation water, noise reduction.

The chimney tubes are delivered in halves and have to be assembled on site, thus saving transport costs. They are, however, also available as full tube (AF). The inside of the tubes is black to absorb the infiltrating daylight. The chimney is closed off by a damper.

Each chimney will be delivered with the required fixing material.

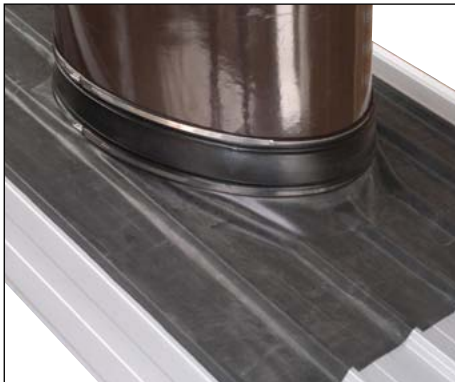
The chimney is sealed by a roof plate.



- ❶ Diffuser → increases the exhaust air rate (Venturi effect)
- ❷ Storm bracings
- ❸ Exhaust pipe → with 1.0 m or 1.5 m length
- ❹ Roof plate
- ❺ Built-in fan
- ❻ Damper
- ❼ Servomotor CL 74:
- ❽ Aspirating mouth
- ❾ Drip plate
- ❿ Light shield

The flexible combination of the individual components of the chimney makes it possible to fulfil different requirements:

- ✓ Available colours: light grey or dark brown;
- ✓ Chimney closure: pivoting damper or cover flap;
- ✓ Chimney tube available as half shell or full tube;
- ✓ Chimney extension 1.0 or 1.5 m;
- ✓ Chimney suspension: with anchorage fishplate for houses without intermediate ceiling, with anchorage ring for houses with intermediate ceiling;
- ✓ Light shield made of high-quality plastic: reduces infiltration of daylight at minimal pressure loss.



Roofing TopSeal

As an alternative to the roof plate, it is also possible to use the TopSeal roofing. This consists of a weather and UV-resistant black EPDM foil (special rubber) which is permanently elastic, highly tear-proof and therefore has a long service life. TopSeal is delivered pre-assembled

including a collar based on the chimney diameter. This ensures a quick and simple assembly on site as the foil only has to be glued to the roof surface with a special adhesive. TopSeal can be used for roofs with a slope of up to 20°.



BD exhaust air chimney 1270

The BD exhaust air chimney 1270 is designed for an extremely high air rate at an economic energy consumption. Chimney and fan are supplied as single parts and can simply be mounted on site. The module closing flap with integrated suction head ensures uniform and linear flow characteristics of the chimney.



Built-in fan V125 T



Module damper

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

Description details

FC035-4ET FC = standard fan 4 = 4-pole; 6 = 6-pole E = single-phase (1~ 230 V) T = pipe installation
FE091-6DT FE = sickle-shaped fan 35 = impeller diameter (cm) D = three-phase (3~ 400 V)

	FC050-4ET / FC050-4DT	FC063-6ET / FC063-6DT	FC071-6ET / FC071-6DT	FC080-6ET / FC080-6DT	FE091-6ET / FE091-6DT
Code-No.	60-47-9050 / 60-47-9550	60-47-9063 / 60-47-9563	60-47-9071 / 60-47-9571	60-47-9080 / 60-47-9580	60-47-9091 / 60-47-9592
Motor protection switch (A)	2.7 / 1.3	3.0 / 1.5	4.6 / 1.9	6.7 / 3.1	5.2 / 2.4
Sound power level L_{WA} (dB(A))	84 / -	82 / -	81 / -	85 / -	82 / 86

Air performance data

Type	BD 520 with FC050-4ET			BD 650 with FC063-6ET			BD 730 with FC071-6ET		
	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)
0	8720	45	11.4	14000	36	11.7	18540	39	12.3
10	8500	47	11.1	13610	38	11.4	17950	42	11.9
20	8280	50	10.8	13200	40	11.0	17360	45	11.5
30	7940	53	10.4	12530	44	10.5	16590	48	11.0
40	7720	56	10.1	12060	46	10.1	16150	51	10.7
50	7340	60	9.6	11070	51	9.3	14750	57	9.8
60	6980	63	9.1	10120	56	8.5	13990	60	9.3
80	6300	68	8.2	8150	67	6.8	11190	73	7.4

Type	BD 820 with FC080-6ET			BD 920 with FE091-6ET / FE091-6DT			BD 1270 with V125 T		
	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)	performance (m³/h)	spec. performance (W/1000 m³/h)	exhaust air rate (m/s)
0	25590	39	13.5	25790 / 26860	31 / 31	10.8 / 11.2	49340	29	10.8
10	24790	41	13.0	24650 / 25900	34 / 33	10.3 / 10.8	47620	31	10.4
20	23900	44	12.6	23570 / 24880	37 / 35	9.8 / 10.4	45670	33	10.0
30	22910	47	12.1	22940 / 24090	39 / 38	9.6 / 10.1	43400	36	9.5
40	21530	52	11.3	21160 / 22700	43 / 41	8.8 / 9.5	41190	40	9.0
50	20560	55	10.8	20260 / 21760	46 / 44	8.5 / 9.1	39020	43	8.6
60	19130	60	10.1	18350 / 20030	51 / 49	7.7 / 8.4	36430	47	8.0
80	16100	70	8.5	15050 / 17540	63 / 56	6.3 / 7.3	29780	57	6.5

All values were measured with fans of precision class 3 based on the standard density of air of 1.2 kg/m³ on a test bench according to DIN 2466 (distance between fan and damper 1135 mm).

The motors are fabricated according to IP 54 (dust-proof and water-proof) protection class. All listed built-in fans 1 ~ 230 V and 3 ~ 400 V of the CL- and BD-series (except for V125 T) can be controlled electronically or by means of a transformer. On request the fans are also available as frequency-controlled and/or with different supply voltage and/or 60 Hz.

MultiStep the energy-saving exhaust air principle

With the MultiStep® exhaust air principle, which is a combination of stepless control and group control, the energy consumption is significantly reduced, while maintaining the same air rate. In comparison with traditional negative pressure systems, yearly savings of up to 60% are possible. Due to the steady, maximum exit speed odour trouble is significantly reduced. The entire ventilation system is more pressure-resistant and less susceptible to wind. The climate computer takes over control by controlling an exhaust air chimney steplessly from 0 to 100% and starting up

additional chimneys at full capacity (on/off) as required. For the individual control of up to two exhaust air chimneys, the servomotor CL 74 stepless is used. 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 in groups. This is done by means of the CL 74 open/close. All servo motors are directly installed at the adjusting axis of the butterfly valve / damper.

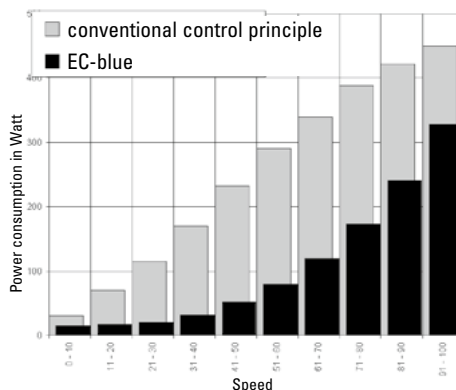


CL 600 with servo motor and damper

ECblue built-in fan for additional energy optimization

The energy-saving fan **ECblue** has a large energy-saving potential and can be used in stepless exhaust air chimneys.

It is powered by an external EC motor.

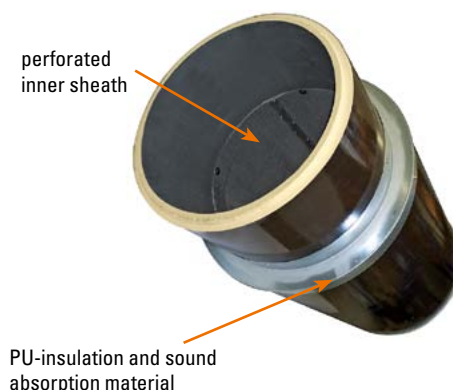


Advantages

- ✓ up to 45 % savings in energy possible;
- ✓ high efficiency over the entire speed range;
- ✓ universal activation over 0-10 V analog signal;
- ✓ the preset ventilation level is precisely maintained;
- ✓ low noise level thanks to corrugated blade edges;
- ✓ easy to install.

Chimney silencer for BD exhaust air chimneys VC

The new chimney silencer is an innovative product so as to reduce noise emissions. Official tests carried out by TÜV Nord measured a noise reduction of up to 12 dB(A) (for pipe diameters of 650, 730, 820 and 920 mm). Total length: 2.5 m.



DynamicAir

for the precise registration of the air rate of an exhaust air chimney

DynamicAir is a new principle for the optimization of the air exchange in a live-stock production facility. Especially during minimum ventilation, it is very important to know accurately how much air passes through the exhaust air chimney in order to be able to provide optimal climatic conditions for the animals and reduce the

heating costs at the same time. For DynamicAir, a negative pressure sensor has to be installed in the aspirating mouth of the exhaust air chimney, close to the butterfly valve. 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 the analogue 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 one-time measurement in a test facility. The DynamicAir sensor can easily be retrofitted.



Advantages

- ✓ very accurate registration of the air rate of an exhaust air chimney without any requirements for additional mechanical/movable components (such as measuring fans);
- ✓ 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.

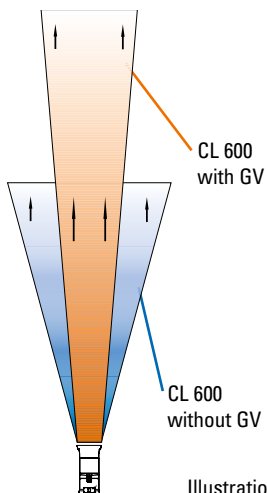
* only in combination with climate computers 135pro, 235pro and ViperTouch

CL 600-guide vane

for a significantly increased working range of the chimney

The guide vane (GV) developed by Big Dutchman is simply screwed tightly to the CL 600 exhaust air chimney right above the fan FC 063-6ET/DT. 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 simply be retrofitted.



Advantages

- ✓ up to 80 % increased working range of the chimney;
- ✓ only minimal decrease (approx. 3%) in exhaust air performance of the chimney;
- ✓ no chimney extensions required → no storm bracings, no negative look to the outward appearance of the house;
- ✓ economic alternative compared to chimney extensions;
- ✓ quick and easy assembly.



Central exhaust air removal for the focusing of emission sources

Reducing emissions from livestock housing facilities will become more and more important in the future. Especially in the case of new barn buildings, licensing

authorities, particularly in Germany, often require to install the point of exit of the exhaust air at a height of 10 m and to focus the exhaust air removal. This makes the

air jet from a focussed 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 support our customers in acquiring the often required statics calculation for such an extension. A second, more complex solution is the erection of 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 improved hygienic conditions;
- ✓ optimal climate conditions in the entire house → no cold zones;
- ✓ no openings for unwanted leakage of rain water into the building;
- ✓ depending on the ventilation level automatic adjustment e.g. of the roller curtain → optimal minimum ventilation;
- ✓ no undesired incidence of light;
- ✓ thorough and simple cleaning of tower and chimneys by means of a high-pressure cleaner;
- ✓ simple installation of the chimneys on the tower;
- ✓ no problems with the statics values of the roof;
- ✓ no stability problems in case of strong wind.



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