EC greenVent®

The ventilation of the future.

Helios

The professionals choice

ECgreenVent

Energy, the topic for the future.
Efficiency, the demand of our time.

Across the globe energy is the topic of the future. Due to the rapid increase in global economic growth and the increasing population, the enormous additional demand for energy presents us with great challenges. By 2030 alone the increase in the demand for energy is expected to rise further by another 40%.

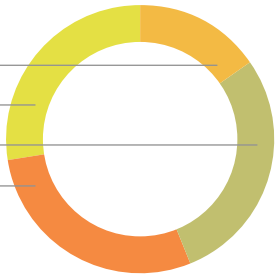
The demand for energy burdens our environment and as a consequence the pressure to move over to a more sustainable energy supply is growing.

The buzzword of the day. Energy efficiency improvement.
The most effective and most economical method for a safe and climate-friendly energy supply is to increase energy efficiency. Considering the fact that about 45% of energy is used in industry and trade, for example in Germany (see graphic) it is obvious that these areas particularly should be targeted.

Until a few years ago the optimisation of heating was almost exclusively the focus point, primarily in non-residential buildings and all building control technologies including ventilation, cooling and illumination.

Distribution of final energy consumption in Germany 2008 among various sectors of consumption

15,5 % business, trade, service
28,5 % traffic
28,7 % industry
27,3 % household



source: Bundesministerium für Verkehr, Bau- und Wohnungswesen

Fans use
410 TWh
in Europe every year.

through Eco-Design Directive targeted reduction in electricity consumption
34 TWh

Ventilation. Great potential saving.
Special attention must be paid to ventilation: according to the EU commission the energy consumption of fans at present is about 410 TWh in Europe every year. This number offers great potential for making a contribution to the achievement of the Eco-Design Directive. This seeks to save about 16 million tons of CO_2 per year and reduce the current consumption by 34 TWh.

Helios has taken up this need of the moment as one of the leading European fan manufacturers and offers a complete EC-program already today. **By use of electronically commutated fan motors, energy savings of over 50 % can be achieved during speed control.**

ECgreenVent

Small principle. Big effect.

The main component of a fan today is still an AC-motor. This runs according to the number of pole pairs and mains frequency (in general 50 Hz) and the resulting static rotating field of the slip.

Example for a 2-pole motor, 50 Hz:
50 Hz x 60 sec./pole pair. – 5 % slip
= 2850 R.P.M.

In contrast, the rotating field at the EC-motor becomes brushless by constant electronic switching and adapting to the required operating conditions.

Permanent magnets form the magnetic poles, the frequency is thereby not of importance. According to the desired speed the motor winding with a fixed switching frequency is alternately supplied with energy. Thus a continuous, almost linear regulation is possible over the entire speed range (fig. 2).

From the use of modern, energy efficient EC drive technology clearly higher fan efficiencies (fig. 3) are the result, since almost no losses occur in the EC-motor by iron, copper and slip. In addition, EC-fans operate wearless and maintenance-free and are characterised by a noiseless run. The disturbing motor humming of AC-motors when controlled does not occur.

fig. 1 **Energy consumption within the control range**

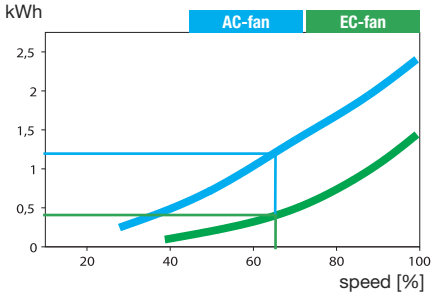


fig. 2 **Speed control**

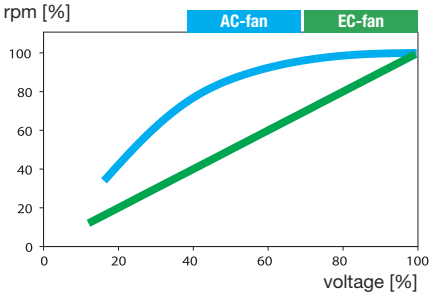
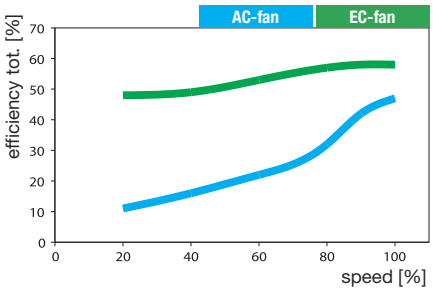


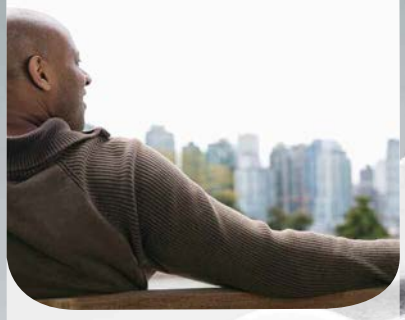
fig. 3 **Efficiency**



All important: EC-energy saving and reduction of operating costs
Thanks to the energy efficient EC-technology energy savings of over 50 % are achieved in the speed controlled operation. The saving is 30 % in the rating, i.e. at nominal speed.
Since fans are to a large extent speed adjusted operated, the operating cost can be reduced to the half by use of EC-fans (fig. 1). In addition there are lower capital costs for speed regulation.

Clearly superior: EC-technology within the range of speed regulation
The clear advantages of EC-technology become obvious during the speed control. While AC-fans are often speed controlled with cost-intensive transformer or phase angle firing controllers, EC-fans get along with more economical solutions. Since the required control components are already contained in EC-motor electronics, merely a control signal (speed potentiometer) is needed.

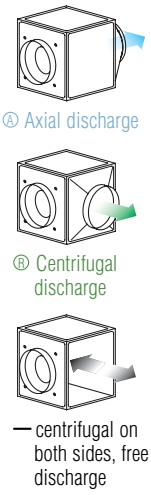
Spectacular: Difference in efficiency
With AC-motors, as is widely known, efficiency losses must be accepted, which substantially result from the slip losses in the speed control range (fig. 3). These disadvantages do not exist with EC-motors. The motor losses remain almost invariably small over the entire speed control range.



EC-motors are brushless direct current motors with shunt characteristic, which were developed specifically for use in ventilation and climate technical systems.

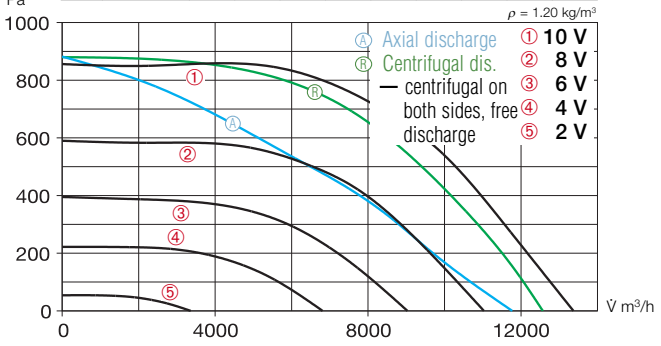
Models GB EC

Arbitrary installation position and assembly by five possible discharge directions.

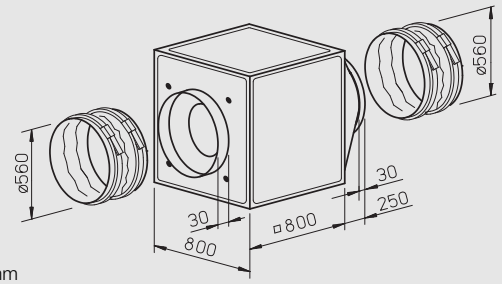


GBD EC 560

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	69	60	67	58	57	56	55	49
L_{WA}	Intake	dB(A)	79	61	71	73	74	72	66	60
L_{WA}	Extract	dB(A)	84	65	74	79	80	75	70	62



	unimpeded					
Voltage V	**n** min⁻¹	**V̇** m³/h	**P** W	**I** A	**Lp** dB(A)	**SFP** kW/m³/s
10	1400	13370	1847	2.90	49	0.49
8	1150	11030	1030	1.70	46	0.34
6	930	9030	578	1.00	43	0.23
4	710	6810	281	0.55	39	0.15



Dim. in mm

ECgreen Vent **65% saving*** * with speed control

■ Specification

■ Casing

Self-supporting frame construction from aluminium hollow profiles. Double-walled side panels from galvanised sheet steel, lined with 20 mm thick temperature insulating and flame-retardant mineral wool. Intake cone for ideal airflow, spigot and flexible connector for duct connection. With discharge adapter (from square to circular) on the pressure side for low-loss discharge and flexible sleeve to reduce vibration transmission. Simple positioning by standard crane hooks.

☐ Impeller

Smooth running backward curved centrifugal impeller from aluminium, direct driven. Energy efficient with a low noise development. Dynamically balanced together with the motor to DIN ISO 1940 Pt.1 – class 2.5 .

☐ Motor

Energy saving, speed controllable EC-external rotor motors with highest efficiency, protection to IP 54. With ball bearings, maintenance-free and radio suppressed.

☐ Electrical connection

Standard terminal box (IP 54) is mounted with a permanently attached cable.

☐ Motor protection

Integrated electronic temperature monitoring for EC-motor and electronics.

☐ Speed control

Stepless speed control with potentiometer or stepless speed control with universal control system (see table). Duties at different speeds are exemplarily given in the performance curve.

☐ Assembly

Arbitrary installation position and flexible assembly by five possible discharge directions via the discharge adapter.
For wall mounting the wall bracket (accessories) has to be used. Outdoor installation is possible using outdoor cover hood and external weather louvers (accessories).

■ Sound levels

Total sound power levels and the spectrum figures in dB(A) are given for:
– sound level case breakout
– sound level intake
– sound level exhaust
In the table below as well as underneath the performance curve you can find additionally the case breakout level at 4 m (freefield conditions).

■ Accessories

Anti vibration mounts for installation indoors. Set of 4.
SDD-U Ref. No. 5627

Wall bracket for wall mounting.
GB-WK 560 Ref. No. 5626

External weather louvers to cover exhaust opening.
GB-WSG 560 Ref. No. 5640

Outdoor cover hood for outdoor installation.
GB-WSD 560 Ref. No. 5749

Condensate collector with condensate spigot (center) for pipe connection.
GB-KW 560 Ref. No. 5645

☐ Accessory-Details	Page
Universal control system, speed potentiometer	78 on

Type	Ref. No.	Connection Ø	Air flow volume (FID)	R.P.M.	Sound press. level case breakout	Motor power	Current	Wiring diagramm	max. air flow temperature	Nominal weight (net)	universal control system		Speed potentiometer flush mounted		surface mounted	
		mm	V̇ m³/h	min⁻¹	dB(A) in 4 m	kW	A	No.	+ °C	kg	**Type**	Ref. No.	**Type**	Ref. No.	**Type**	Ref. No.
3 phase motor, 400 V, 50 Hz, EC-motor, protection to IP 54																
GBD EC 560	5814	560	13370	1400	49	2.80	4.30	976	50	83.0	**EUR EC**	1347	**PU 24**	1736	**PA 24**	1737

EUR EC

■ Universal controller EUR EC Electronic control automatic with 0–10 V DC control output.

☐ Operation
For stepless control or adjustment of single- and 3-phase EC-fans with an input control signal of 0–10 V DC.

☐ Control functions
Simple and quick start-up of parameters via integrated "start-up wizard". Depending on the connected sensor a control can be carried out according to following control variables:
- **Manual speed control**, e.g. adjustable via keyboard
- **Temperature standard** (required accessory, temperature sensor LTR 40 or LTK 40)
- **Temperature with additional functions** hard-wired, (required accessory, temperature sensor LTR 40 or LTK 40)
- **Differential temperature control** (required accessory, temperature sensor LTR 40 or LTK 40)
- **Differential pressure standard** (required accessory, differential air pressure sensor LDF 500)
- **Differential pressure with outside temperature compensation** (required accessory, differential air pressure and temperature sensor LDF 500 and LTR 40 or LTK 40). Ideally used in central extract ventilation systems according to DIN 18017 in domestic applications.
- **Air velocity** (required accessory, air velocity sensor LGF 10)

The required sensor is to be ordered as accessory separately. The control ranges are freely adjustable within the sensor's range.

The aligned output voltage according to nominal value and current value is between 0 % (35 V) to 100 % (correspond to approx. 80 V – 230 V).

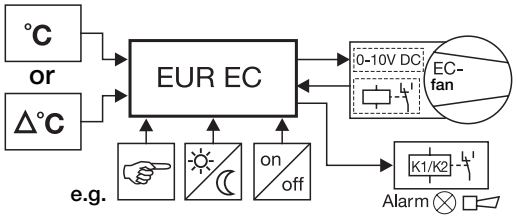
Inputs and outputs:
Outputs:
- 2 x analogue output 0–10 V control of e.g. a frequency inverter, shutter, EC-motor.
- 2 x voltage free relays, programmable, alarm, heating or status signals.

Inputs:
- 2 x sensor inputs, programmable on the particularly needed sensor type.
- 3 x digital inputs, programmable to enable, external interference, limit on/off, switching night time mode, internal/external, automatic/manual, reset, max. speed on/off.

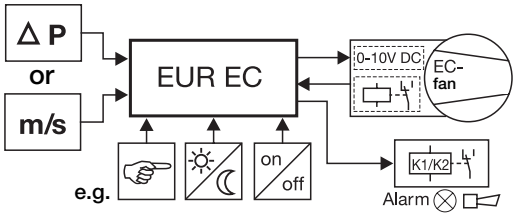
Settings
- Stepless selection of nominal values and control range.
- Min./max. power (speed) limitation.
- On/off switching of minimum air flow volume.
- Setting for a switched output e.g. for a heater via programmable relay.
- Stepless selection for alarm indication at over and under temperature, output on display or additionally on relay.
- Min. and max. shutter opening.
- Reverse control functions.
- Continuous control of ventilation dampers.
- The setting is carried out through a dirt resistant membrane keyboard.

☐ Display
- Multi functions LC-display
- Numerical nominal and actual value display with scale
- Symbols (alarm, heater, selection)
- Bar graph/level indicator
- Text display for menu, status and fault indications

Mode 2.03: Temperature control with additional function
Mode 2.05: Differential temperature control



Mode 4.01: Differential pressure control
Mode 6.01: Air velocity control



☐ Casing
Polymer, light grey, for surface mounting.
Protection to IP 54
Dim. mm W 223 x H 200 x D 115

■ Required accessories

LDF 500	Ref. No. 1322
Differential air pressure sensor. Range 0 – 500 Pa	
LGF 10	Ref. No. 1325
Air velocity sensor. Range 0 – 10 m/s	
LTA 40	Ref. No. 1336
Temperature sensor for outside. Range –20 to +60 °C Protection to IP 54	
LTK 40	Ref. No. 1324
Temperature sensor for in-duct installation. Range 0 to +40 °C	
LTR 40	Ref. No. 1323
Room temperature sensor. Range 0.5 to +40 °C	

EUR EC	**Ref. No. 1347**
Voltage	230 V, 1 ph., 50/60 Hz
Control output	0–10 V / max. 10 mA
Controlled output voltage	0 – 100 %
Control range temperature	0 – 40 °C
Control range pressure	0 – 500 Pa
Control range velocity	0 – 10 m/s
Permitted ambient temperature	0 to +40 °C
Weight	approx. 1.0 kg
Wiring diagram-No.	SS-1001

The professionals choice

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