

# EC Fan Selection

Energy Efficient  
Motors & Fans



**AXAIR**  
FANS UK LIMITED  
[www.axair-fans.co.uk](http://www.axair-fans.co.uk)

2012 Edition



# ...About Axair Fans UK

## **Application Knowledge:**

Over 20 years experience in general air movement; including corrosive, explosive and hot fume handling.

## **Stock Facility:**

Large modern warehouse facility containing a vast selection of fans, fan components and general accessories.

## **Customised Build:**

Fans assembled from standard components to create the perfect mechanical and electrical solution to safe fume extraction.

## **Customer Care:**

Experience a sense of partnership with Axair Fans.



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Tel: 01782 349430 Fax: 01782 349439 Email: [sales@axair-fans.co.uk](mailto:sales@axair-fans.co.uk) [www.axair-fans.co.uk](http://www.axair-fans.co.uk)

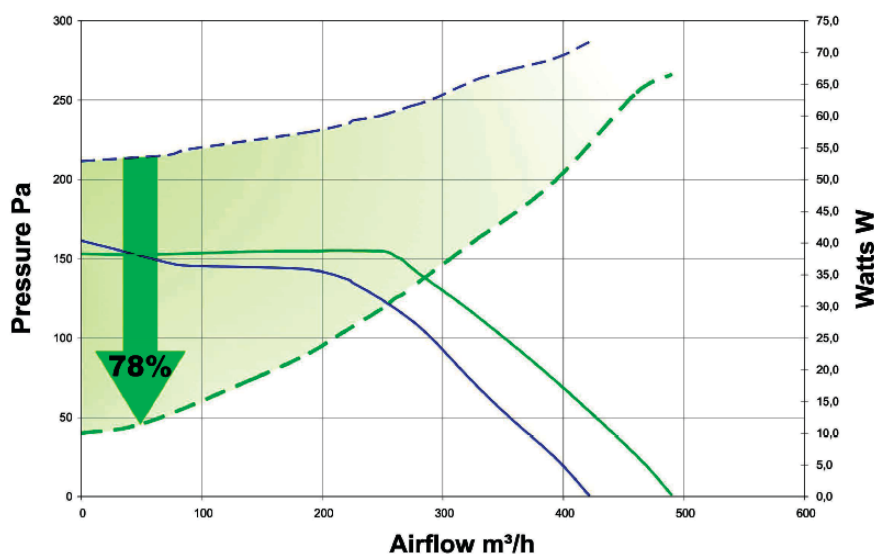
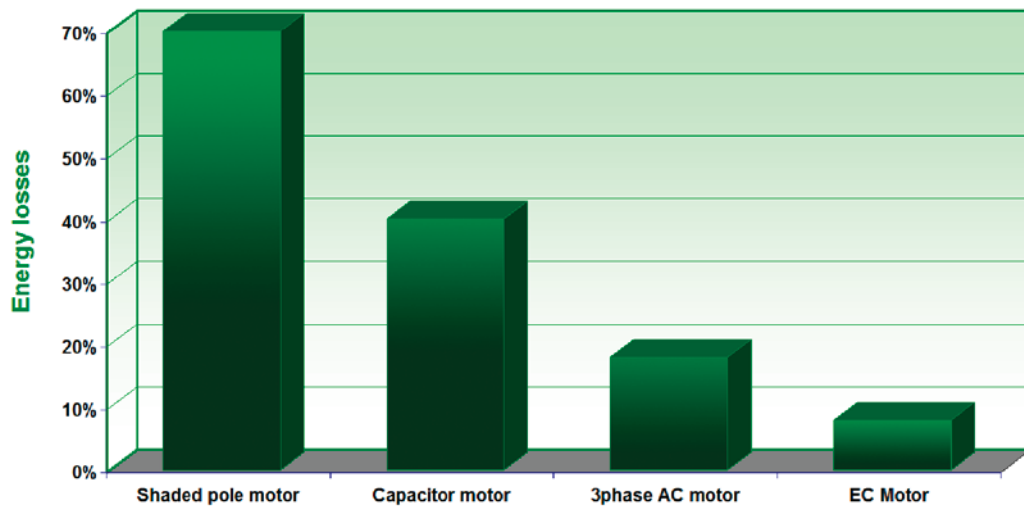
All specifications, data and drawings are subject to alterations without prior notice

# What is EC Technology ?

EC stands for Electronically Commutated, and it combines AC and DC voltages bringing the best of both worlds. The motor runs on a DC voltage, but with a single phase 230VAC or three phase 400VAC supply. The motor incorporates voltage transformation within the motor. The non-rotating part of the motor (stator) is extended to make room for an electronic PCB board which includes power transformation AC to DC, as well as the controls.

## Benefits

- **Energy savings** : Minimum power consumption & better efficiency than AC equivalent
- **Control** : 100% speed controllable, not frequency dependant. Can be set up for constant airflow or pressure applications, 0-10VDC or PWM control signal.
- **Low motor temperature** : For longer lifetime than AC equivalent
- **Simplicity** : Electronic & power transformation are completely integrated within the motor



Energy savings thanks to EC motor

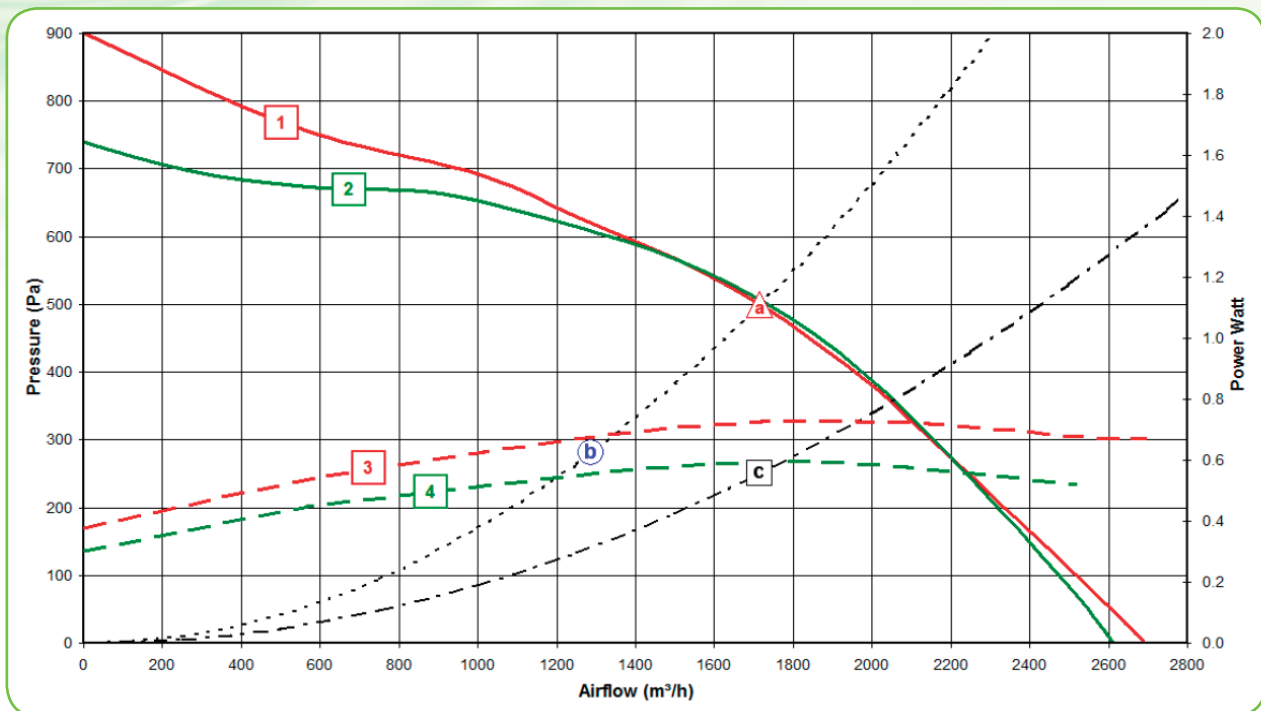
— **EC Airflow** GRED7 160x62R / I07-A7  
— **AC Airflow** 4GRE25 160x62R / H04-06

— **Watts EC**  
— **Watts AC**

# Benefits of EC Fans

The benefits of EC fans can be measured by comparing 2 backward curved centrifugal motorised impellers (from manufacturer Rosenberg), one in AC and the other in EC.

Model	Curve	Fan/ Motor Type	Supply	Motor Power	Speed	Maximum Airflow	Maximum Pressure
<b>DKHR 280-2SW087.5FA</b>	Airflow curve 1 Power curve 3	AC - 3 Phase fan / 2 pole motor	400Volts 50Hz (Delta connection)	0.70 Kwa	2610	2691 m <sup>3</sup> /h	900 Pa
<b>GKHR 280. CIW087.5FA</b>	Airflow curve 2 Power curve 4	EC 3 phase fan	380/480Volts 50/60Hz	1.68 Kwa	3700	3776 m <sup>3</sup> /h	1500 Pa



Model	Point a 1716m <sup>3</sup> /h at 500Pa	Point b 1287m <sup>3</sup> /h at 280Pa	Point c 1716m <sup>3</sup> /h at 250Pa
<b>DKHR 280-2SW087.5FA</b>	Power : 0,7Kwa Efficiency : 29.2%	Power : 0,43Kwa Efficiency : 20%	Power : 0,50Kwa Efficiency : 20%
<b>GKHR 280.CIW087.5FA</b>	Power : 0,59Kwa Efficiency : 42.9%	Power : 0,29Kwa Efficiency : 37.6%	Power : 0,37Kwa Efficiency : 35%

Point b : Speed reduced to 75% of volume on point a (1287m<sup>3</sup>/h at 280Pa). Typically the case in an application where a night time set back system is in place (Point a : full ventilation when building is occupied during the day).

Point c : In the case of a filtered application, Position against a clean filter (point a : Dirty filter) Please note that all the data on the AC fans exclude any power used and heat loss generated by the speed controller or inverter control, which tends to increase as the speed of the fan is driven down.

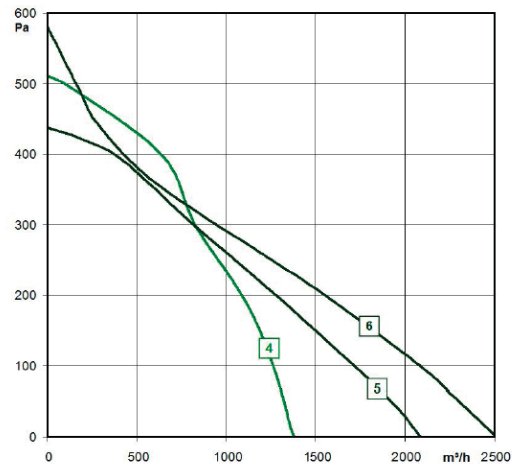
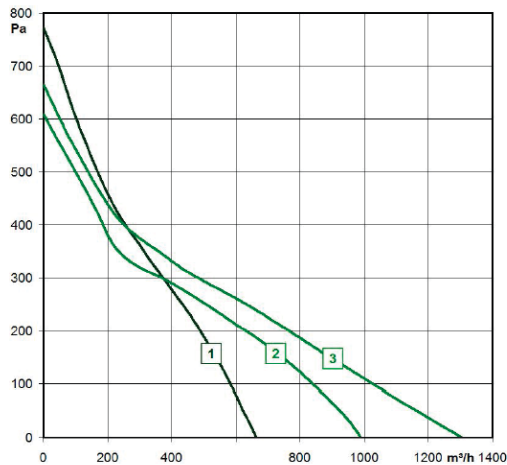


# EC Free Running Impeller

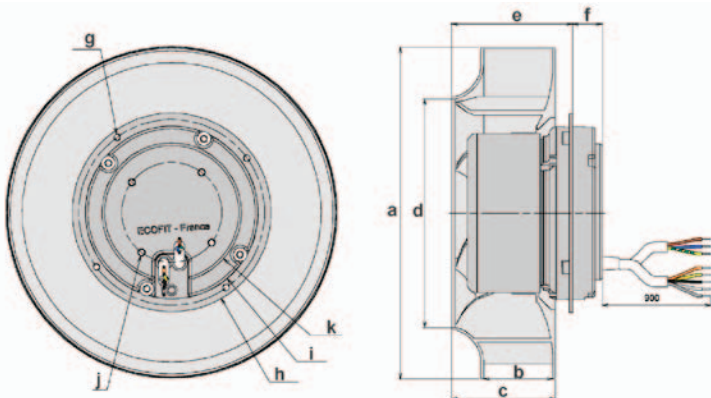
## Backward curved Ø192 to 315

Backward curved motorised impellers with motor Ø92 - Mounted on ball bearings, motor protection IP44, Class F windings. Impellers are either plastic or metal. All models are supplied with integrated EC control system, 0-10VDC or PWM output and speed sensor as standard. Inlet rings are supplied separately. This selection is designed & manufactured by Ecofit (France).

Model	Impeller	Voltage (Volts)	Frequency (Hz)	Input Power (Wa)	Maximum Current (A)	Maximum Airflow (m <sup>3</sup> /h)	Speed (RPM)	Max. Air Temperature (°C)	Curve (Nr)
RRED7 192x40R	Plastic	230	50/60	80	0.72	665	3325	+50	1
RRED7 220x45R	Plastic	230	50/60	78	0.66	965	2735	+50	2
RRED7 225x63R	Plastic	230	50/60	113	0.85	1185	2460	+50	3
RREL4 250x56R	Metal	230	50/60	140	0.65	1380	2585	+45	4
RREL4 280x80R	Metal	230	50/60	160	0.74	2085	2085	+45	5
RREL4 315/101R	Plastic	230	50/60	177	0.82	2510	1790	+45	6



Model	Øa	b	c	Ød	e	f	Øg	Øh	Øi	Øj	Øk
<b>RRED7 192x40R</b>	192	40	60	132	70	17.5	107.5	115	97.7	58	80
<b>RRED7 220x45R</b>	220	45	63	159	71	17.5	107.5	115	97.7	58	80
<b>RRED7 225x63R</b>	225	63	90	159	99	17.5	107.5	115	97.7	58	80
<b>RREL4 250x56R</b>	252	56	84.3	172	99	39.5	125	133	212.2	58	80
<b>RREL4 280x80R</b>	281	80	111.4	191	126	39.5	125	133	212.2	58	80
<b>RREL4 315x101R</b>	315	101	127	202	152.5	39.5	125	133	212.2	58	80



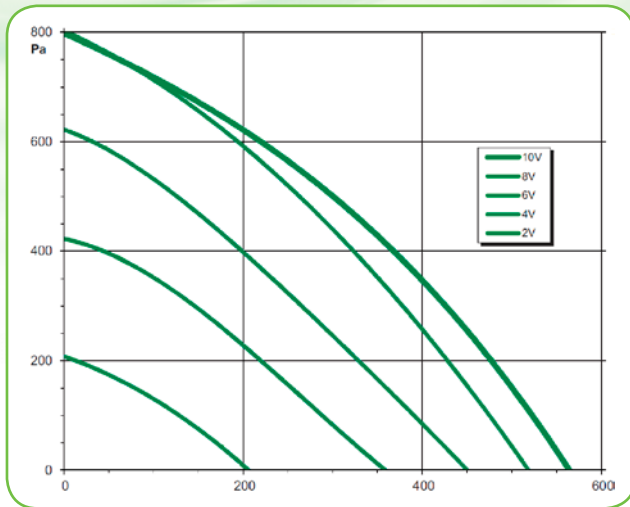
Please contact Axair for full datasheets and latest news on EC fans

# EC Centrifugal fans

## Forward curved Single Inlet Ø160

Forward curved motorised impellers with motor Ø92 - Mounted on ball bearings, motor protection IP44, Class F windings. Impellers are metal. All models are supplied with integrated EC control system, 0-10VDC or PWM output and speed sensor as standard. Inlet rings are supplied separately.

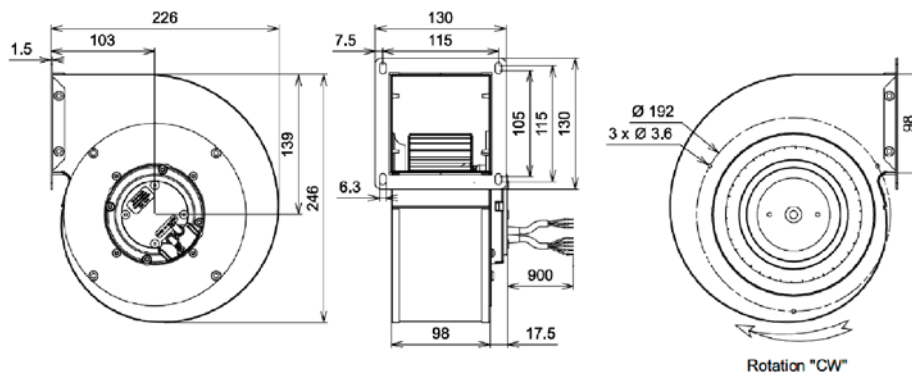
Model	Voltage	Frequency	Input Power	Maximum Current	Maximum Airflow	Speed	Max. Air Temperature
	(Volts)	(Hz)	(W)	(A)	(m <sup>3</sup> /h)	(RPM)	(°C)
<b>GRED7 160x62R</b>	230	50/60	98	0.88	560	1660	+50



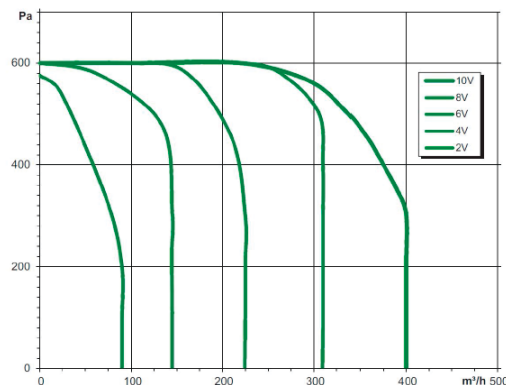
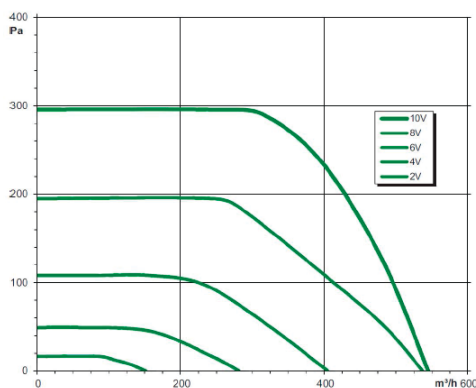
This graph shows a typical curve with a standard Software for a 160 diameter forward curved centrifugal fan. The 0-10VDC function allows a 100% speed control-lability

Other sizes, airflows and programs are available on request.

Many programs can be set up to suit the application, for example constant airflow or constant pressure.



The graphs below show typical curves with either a constant pressure or a constant volume program. The size and main characteristics of the fan remain the same, except for the software which is tailored to the customer's request. This kind of program is ideal for all HVAC applications, such as Central Exhaust Systems or Heat Recovery Units

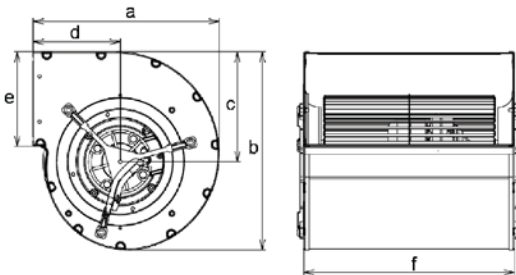
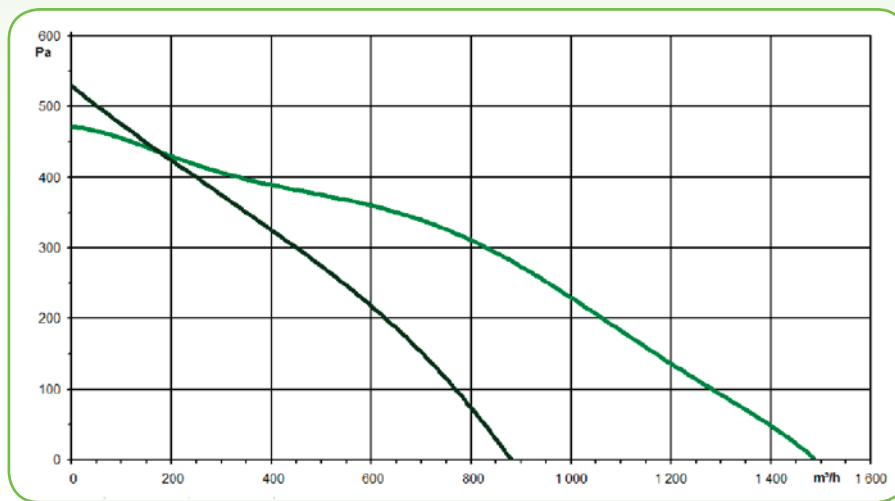


# EC Centrifugal fans

## Forward Curved Double Inlet Ø146 & 160

Forward curved motorised impellers with motor Ø92 - Mounted on ball bearings, motor protection IP44, Class F windings. Impellers are metal. All models are supplied with integrated EC control system, 0-10VDC or PWM output and speed sensor as standard. Inlet rings are supplied separately.

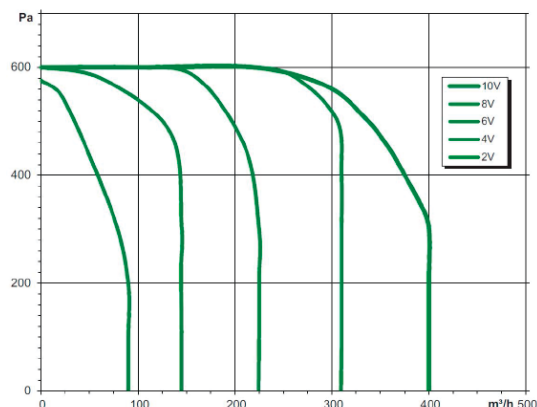
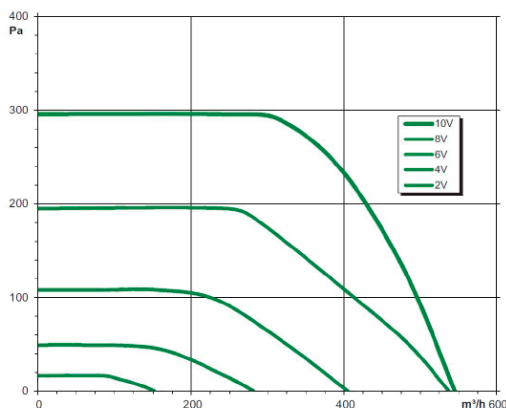
Model	Voltage	Frequency	Input Power	Maximum Current	Maximum Airflow	Speed	Max. Air Temperature	Curve
	(Volts)	(Hz)	(Wa)	(A)	(m <sup>3</sup> /h)	(RPM)	(°C)	
<b>GDRD7 146x188R</b>	230	50/60	84	0.57	880	1260	+50	1
<b>GDSL4 160x242L</b>	230	50/60	210	0.99	1485	1395	+45	2



Dimensions (mm)	a	b	c	d	e	f
<b>GDRD7 146x188R</b>	205	218	121	96	104	232
<b>GDSL4 160x242L</b>	226	246	139	103	98	276

GDRD7 : Lead wires coming on the right-hand side looking at the discharge  
 GDSL4 : Lead wires coming out on the left-hand side looking at the discharge

The graphs below show typical curves with either a constant pressure or a constant volume program for the GDRD7 version. The size and main characteristics of the fan remain the same, except for the software which is tailored to the customer's request. This kind of program is ideal for all HVAC applications, such as Central Exhaust Systems or Heat Recovery Units

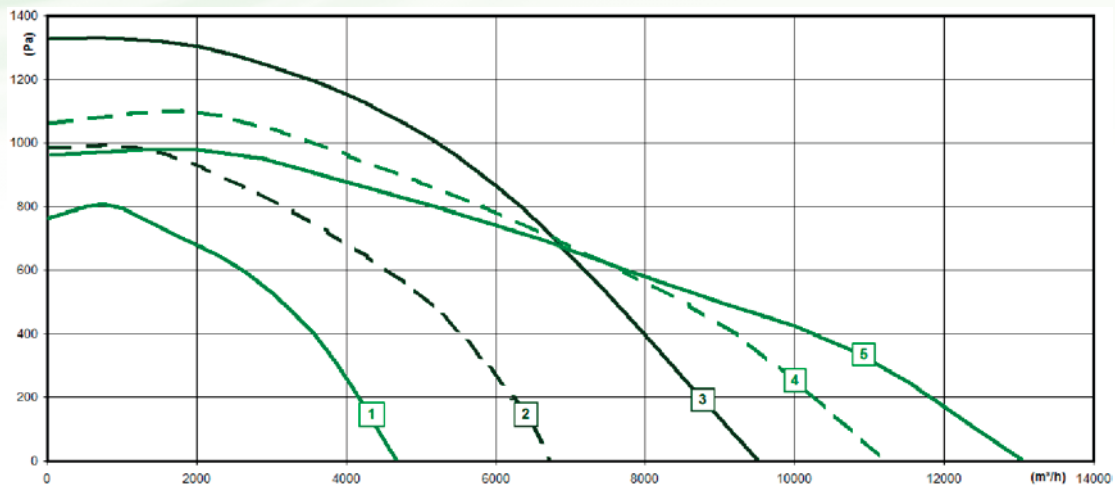


# EC Centrifugal fans

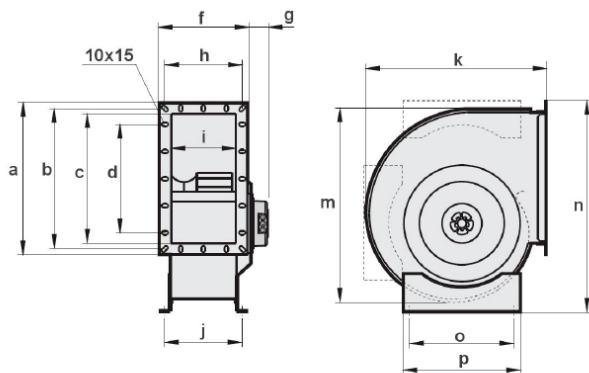
## With backward curved impellers Ø355 to 560

Backward curved single inlet fans - Mounted on ball bearings, motor protection IP44, Class F windings. Impellers are metal. All models are supplied with integrated EC control system, 0-10VDC or PWM output and speed sensor as standard. This selection is designed & manufactured by Rosenberg (Germany).

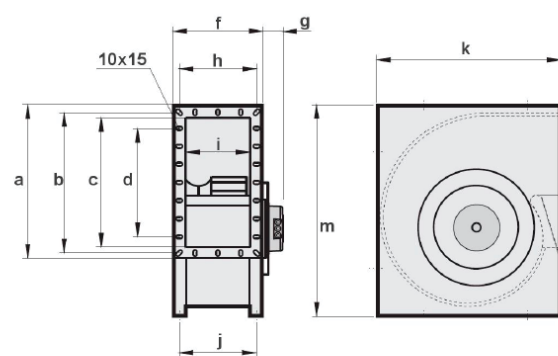
Model	Voltage (Volts)	Frequency (Hz)	Input Power (Wa)	Maximum Current (A)	Maximum Airflow (m <sup>3</sup> /h)	Speed (RPM)	Max. Air Temperature (°C)	Curve
<b>EHAG 355.5FA</b>	3~380-480V	50	0.81	1.50@400V	4700	1900	+50	1
<b>EHAG 400.5HF</b>	3~380-480V	50	1.56	2.60@400V	6700	1900	+40	2
<b>EHAG 450.6FF</b>	3~380-480V	50	2.70	4.25@400V	9500	1900	+40	3
<b>EHAG 500.6IF</b>	3~380-480V	50	2.90	4.60@400V	11200	1600	+40	4
<b>EHAG 560.6IF</b>	3~380-480V	50	2.75	4.40@400V	13000	1300	+40	5



Model		a	b	c	d	f	g	h	i	j	k	m	n	o	p
<b>EHAG 355.5FA</b>	1	512	489	452	400	286	25	263	226	268	602	664	696	355	400
<b>EHAG 400.5HF</b>	1	562	540	502	400	312	25	290	252	294	671	671	774	355	400
<b>EHAG 450.6FF</b>	2	629	605	569	448	348	83	324	284	324	726	828	-	-	-
<b>EHAG 500.6IF</b>	2	698	674	634	5x112	382	83	358	318	358	800	918	-	-	-
<b>EHAG 560.6IF</b>	2	775	751	711	6x112	421	83	397	357	397	892	1030	-	-	-



Drawing 1



Drawing 2

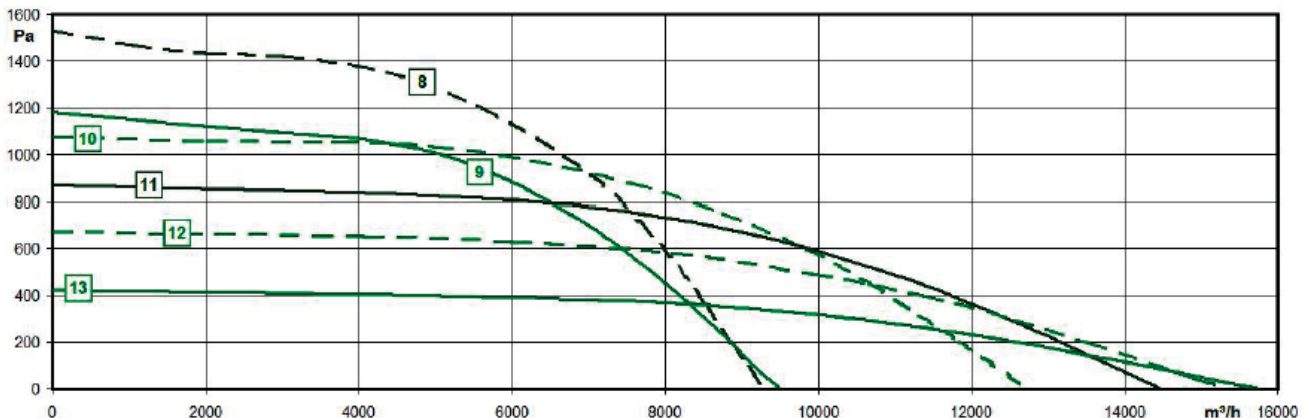
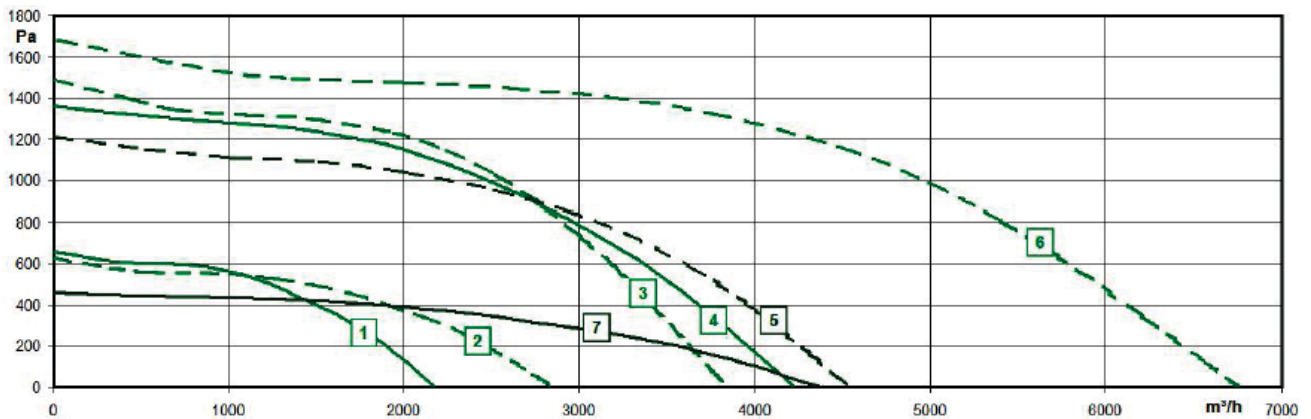


# EC Free Running Impeller

## Backward curved Ø250 to 710

Backward curved motorised impellers - Mounted on ball bearings, motor protection IP44, Class F windings. Impellers are either plastic or metal. All models are supplied with integrated EC control system, 0-10VDC or PWM output and speed sensor as standard. Inlet rings are supplied separately. This selection is designed & manufactured by Rosenberg (Germany).

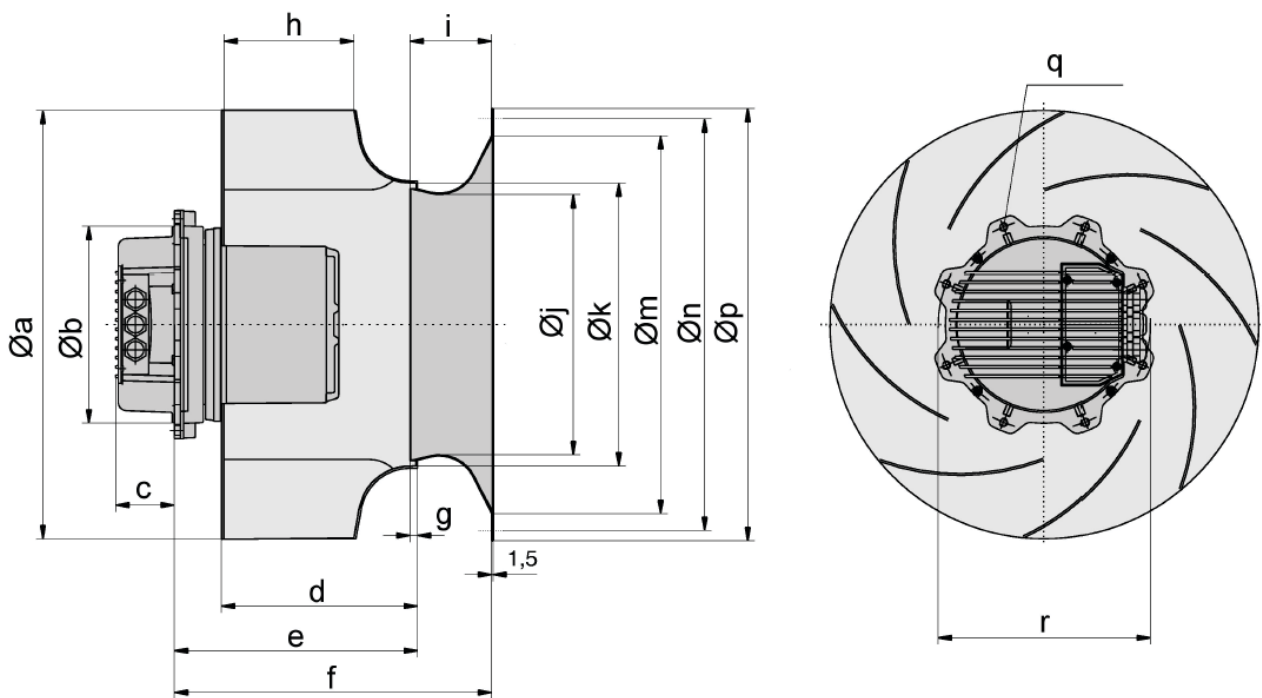
Model	Voltage	Frequency	Input Power	Maximum Current	Maximum Airflow	Speed	Max. Air Temperature	Curve
	(Volts)	(Hz)	(Wa)	(A)	(m <sup>3</sup> /h)	(RPM)	(°C)	
GKHR 250-CIW.078.4EA	1~200-277V	50/60	0.41	2.35@230V	2200	2750	+40	1
GKHR 280-CIW.087.4EA	1~200-277V	50/60	0.48	2.80@230V	2850	2400	+40	2
GKHR 280-CIW.087.5FA	3~380-480V	50/60	1.68	2.80@400V	3800	3700	+40	3
GKHR 315-CIW.080.5FA	3~200-240V	50/60	1.50	4.10@230V	4200	3150	+40	4
GKHR 315-CIW.098.5FA	3~380-480V	50/60	1.41	2.48@400V	4500	2950	+40	5
GKHR 355-CIW.110.6FF	3~380-480V	50/60	3.00	4.60@400V	6750	3050	+40	6
GKHR 400-CIW.098.4FF	1~200-277V	50/60	0.48	2.80@230V	4350	1430	+40	7
GKHR 400-CIW.123.6FF	3~380-480V	50/60	3.30	5.20@400V	9300	2600	+45	8
GKHR 450-CIW.138.6FF	3~380-480V	50/60	2.80	4.35@400V	9500	2050	+40	9
GKHR 500-CIW.155.6IF	3~380-480V	50/60	3.15	4.95@400V	12700	1750	+50	10
GKHR 560-CIW.174.6IF	3~380-480V	50/60	2.84	4.43@400V	14500	1400	+50	11
GKHR 630-CIW.195.6IF	3~380-480V	50/60	2.42	3.80@400V	15300	1100	+40	12
GKHR 710-CIW.219.6IF	3~380-480V	50/60	1.45	2.35@400V	15700	775	+40	13



# EC Free running impeller

## Backward curved Ø250 to 710

Model	Øa	Øb	c	d	e	f	g	h	i	Øj	Øk	Øm	Øn	Øp	q	r
GKHR 250-CIW.078.4EA	252	150	35.9	118	153.5	195	4.5	78	46	155	168	225	-	280	M6	164
GKHR 280-CIW.087.4EA	284	150	36	133	168	215	5	87	52	174	188	250	286	307	M6	164
GKHR 280-CIW.087.5FA	284	180	64	133	175	222	5	87	52	174	188	250	286	307	M6	198
GKHR 315-CIW.080.5FA	319	180	64	146	170	224	5.5	80	59	195	212	282	320	348	M6	198
GKHR 315-CIW.098.5FA	319	180	64	164	188	242	5.5	98	59	195	212	282	320	348	M6	198
GKHR 355-CIW.110.6FF	359	235	70	164	270	331	6	110	67	219	238	315	356	382	M6	252
GKHR 400-CIW.098.4FF	404	150	36	159	187.5	263.5	7	98	76	248	267	355	395	422	M6	164
GKHR 400-CIW.123.6FF	404	235	70	182	288	364	7	123	76	248	267	355	395	422	M10	252
GKHR 450-CIW.138.6FF	454	235	70	209	265	339	8	138	82	277	300	400	438	464	M10	252
GKHR 500-CIW.155.6IF	510	235	70	234	340	428.5	9	155	97.5	310	337	450	490	515	M10	252
GKHR 560-CIW.174.6IF	570	235	70	261	367	462.5	10	174	105.5	348	377	500	541	564	M10	252
GKHR 630-CIW.195.6IF	640	235	70	292	398	501	11	195	114	390	424	560	608	638	M10	252
GKHR 710-CIW.219.6IF	718	235	70	327	383	505.5	12.5	219	135	438	476	630	674	710	M10	252



Inlet rings supplied separately.  
 Other models available with different motors.  
 Please contact Axair Fans for individual datasheets,  
 including complete airflow curves specific to your  
 operating points, sound levels and dimensions.

Also available : Fan modules GKHM with integrated  
 inlet rings and brackets.

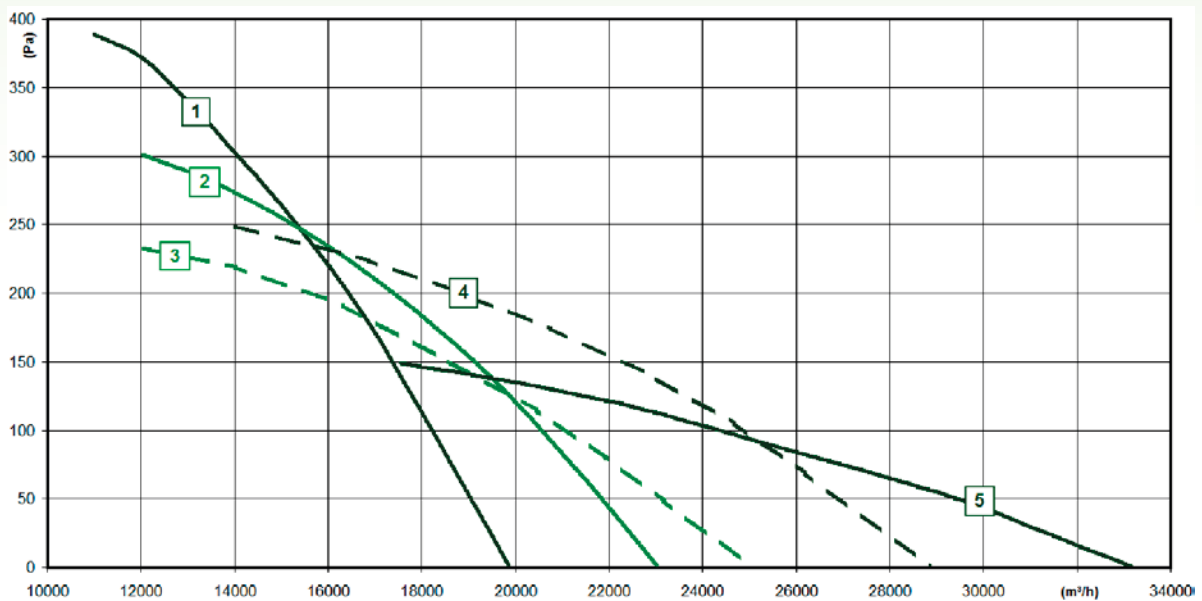


# EC Axial fans

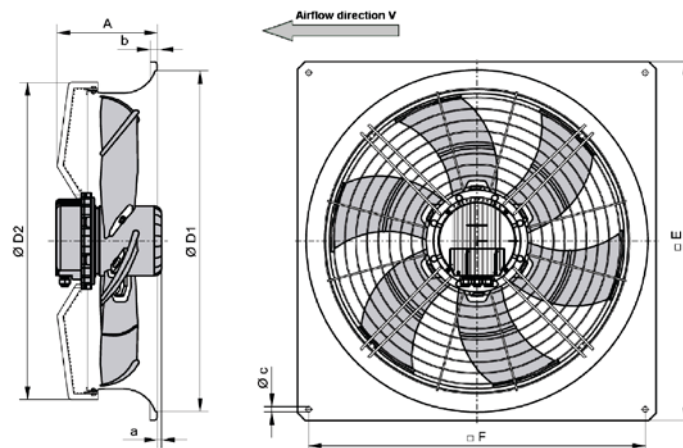
## Plate mounted Ø630 to 1000

Sickle blade axial fans with cast aluminium impellers - Mounted on ball bearings, motor protection IP54. This selection is designed & manufactured by Rosenberg (Germany).

Model	Voltage (Volts)	Frequency (Hz)	Input Power (Wa)	Maximum Current (A)	Maximum Airflow (m <sup>3</sup> /h)	Speed (RPM)	Max. Air Temperature (°C)	Curve (Nr)
<b>EHAG 355.5FA</b>	3~380-480V	50	0.81	1.50@400V	4700	1900	+50	1
<b>EHAG 400.5HF</b>	3~380-480V	50	1.56	2.60@400V	6700	1900	+40	2
<b>EHAG 450.6FF</b>	3~380-480V	50	2.70	4.25@400V	9500	1900	+40	3
<b>EHAG 500.6IF</b>	3~380-480V	50	2.90	4.60@400V	11200	1600	+40	4
<b>EHAG 560.6IF</b>	3~380-480V	50	2.75	4.40@400V	13000	1300	+40	5



Model	A	D1	D2	E	F	a	b	c
<b>AKFG 630 K.6IF</b>	230	696	700	805	750	26	20	11
<b>AKFG 710 K.6IF</b>	250	796	780	850	710	12	20	14.5
<b>AKFG 800 K.6IF</b>	300	920	870	970	910	-	17	14.5
<b>AKFG 900 G.6NA</b>	305	1025	990	1070	1010	15	20	14.5
<b>AKFG 1000 K.6NA</b>	320	1097	1075	1170	1110	20	20	14.5

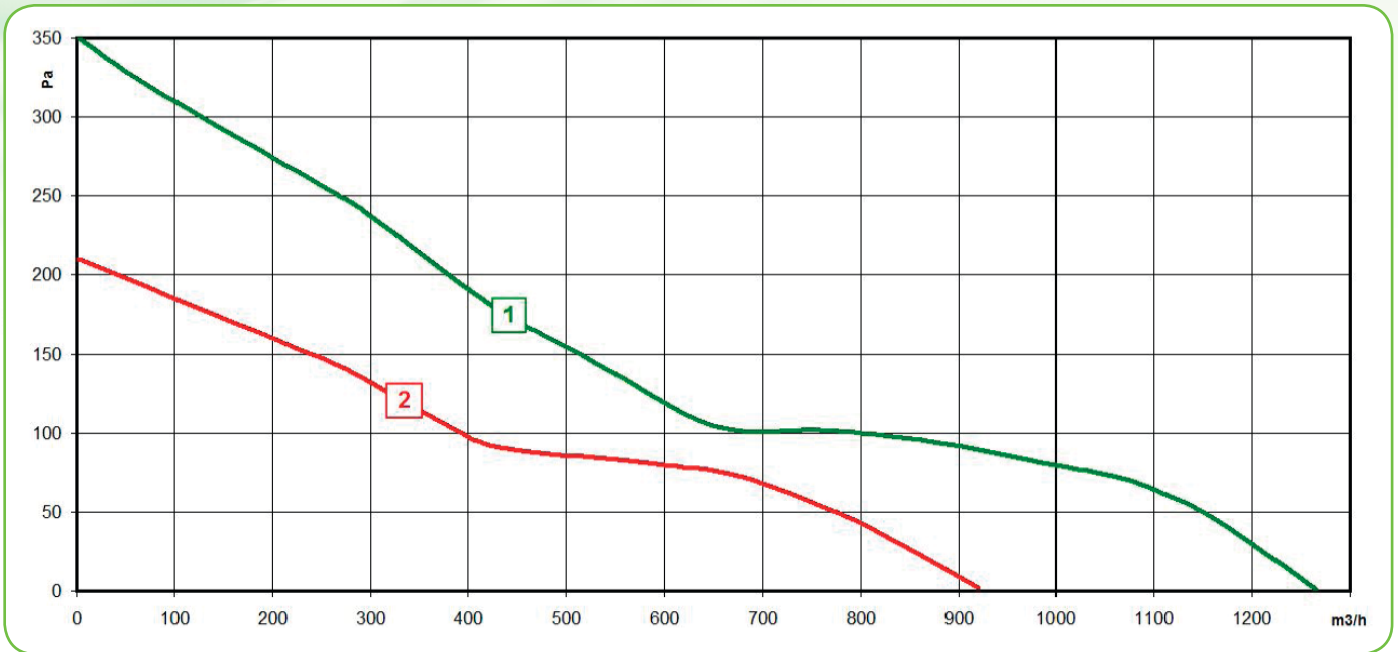


# EC Axial fans

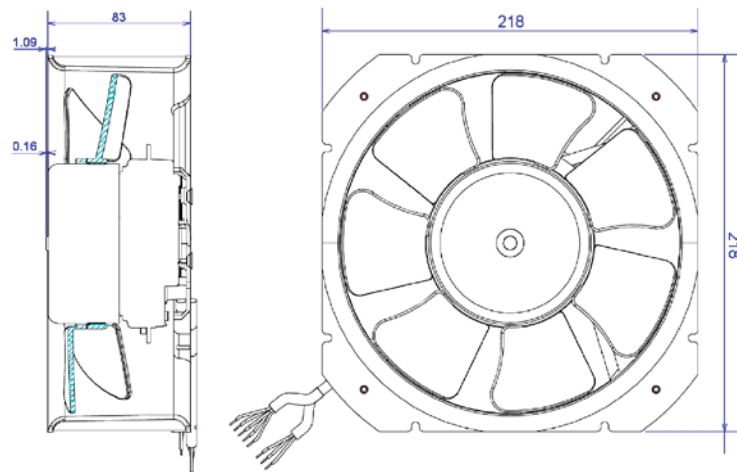
## Compact Frame mounted Ø200

Frame axial fan with cast plastic impellers - This fan can be mounted in any direction of airflow and is the same size as the AC version. Mounted on ball bearings, motor protection IP44. Motor fitted with integrated EC control system, 0-10VDC or PWM output and speed sensor as standard. This selection is designed & manufactured by Ecofit (France).

Model	Voltage (Volts)	Frequency (Hz)	Input Power (Wa)	Maximum Current (A)	Maximum Airflow (m <sup>3</sup> /h)	Speed (RPM)	Max. Air Temperature (°C)
<b>VGCD7 200V</b>	230	50/60	108	0,92	1265	3525	+50



The VGCD7 200 (curve 1) offers a higher rotational speed than the AC equivalent (Curve 2), which is limited to 50Hz asynchronous speed (2645rpm). Consequently, the maximum pressure of the EC is 67% higher than the AC, and the maximum airflow 34% higher than the AC.

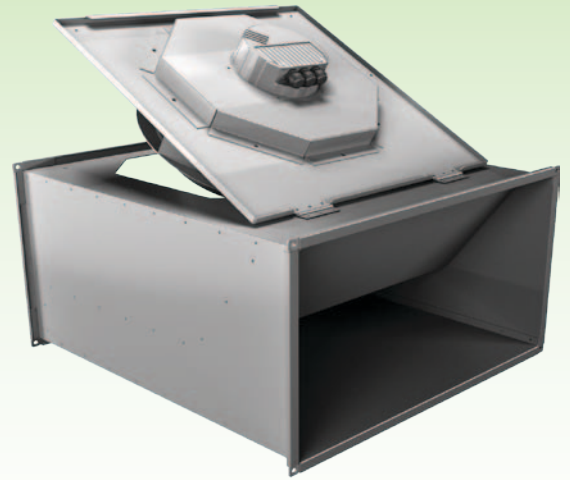




# Also Available...

## EC Rectangular inline duct fans

Fitted with backward curved motorised impellers  
Diameter 315 to 560mm  
Airflows up to 11,500m<sup>3</sup>/h  
Standard or specially sound insulated casing versions available.



## EC 'UNOBOX'

Ventilation / extraction units  
Fitted with backward curved motorised impellers  
Diameter 315 to 630mm  
Airflows up to 15,500m<sup>3</sup>/h  
Side panels are removable so the discharge is possible in any direction.

## EC Roof fans - Vertical discharge

With rain protective hood.  
Fitted with backward curved motorised impellers  
Diameter 315 to 630mm  
Airflows up to 12,000m<sup>3</sup>/h  
Side panels are removable so the discharge is possible in any direction.





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