

low carbon **-ec**  
direct drive fans




**torin-sifan**  
The Partner of Choice



## torin-sifan

For over 100 years, torin-sifan have been a leader in servicing the Air Movement requirements of our customers. From our Head Office and Manufacturing facility in the United Kingdom we supply annually over 1 million products to the International Air Movement Industry.

Fifty percent of our production volumes are products incorporating low carbon  technology with this growing significantly each year due to European legislation requirements.

### international markets

Our customers are involved in numerous diverse markets ranging from Heating, Ventilation, Air Conditioning and Refrigeration industries to Business Machines, Telecommunications & Domestic Appliances. Our diverse range of standard and customised products are well suited to the needs of these sectors and more.

With sales evenly split between our home market in the UK and numerous export customers, all serviced by our technically competent international sales team, our business is truly

international. Support is provided by experienced product development and applications engineers backed up by an excellent research and development facility.

### technology partners

Understanding the needs of our customers, the legislation that affects our industries and creating value & innovation is at the very heart of our business. This is reflected in a clear and continual commitment to research & development.

This philosophy has helped torin-sifan to be at the forefront of our industry in the development of a full range of energy saving low carbon  products. This has positioned us as the preferred choice for energy efficient Air Movement solutions in various markets where local legislation is demanding low carbon technology.

torin-sifan is an **ISO 9001** approved organisation.



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## direct drive pedigree

torin-sifan first started manufacturing Direct Drive fans in our UK Factory in 1964 and has since established itself as a leading producer of Direct Drive fans in Europe. Literally millions of torin-sifan Direct Drive fans have been produced and supplied into the European air movement market over the years.

torin-sifan have a full range of Direct Drive products utilising both traditional AC Motor technology as well as three phase AC Motors with integrated inverter for higher efficiencies and more flexible controllability.

## efficiency and EuP

The high efficiency of the <sup>ec</sup> motors used in the DDEC range gives power savings of up to 30% compared to the traditional AC motor.

The DDEC range has been tested to AMCA test standard 210/85, type A free inlet and outlet.

The efficiency of the DDEC range has been assessed in accordance with ISO 12759 – Efficiency Classification for Fans. This has shown the DDEC range to exceed the efficiency requirements of the Energy Using Products Directive (2009/125/EC) that will become effective January 2013.

Our latest generation low carbon <sup>ec</sup> range offers the ultimate in efficiency and controllability with full onboard integrated electronics. This range exceeds the efficiency requirements of the Energy Using Products (EuP) Directive effective in 2013 and the more stringent levels that will be applied in 2015.


In addition all of our Direct Drive ranges benefit from a range of accessories that can be factory fitted including outlet flanges, mounting feet, cubic frames and painted finish.


The DDEC range makes it possible to achieve static efficiencies of 54%. This gives EuP fan motor efficiency grades (FMEG) of up to 65. (For forward curved fans, tested with free inlet/ outlet, the 2013 EuP FMEG requirement is 38 which increases to 42 in 2015).




The efficiency of the <sup>ec</sup> motor in this range of products, combined with the knowledge that known future legislation requirements can be met, provides a leading solution to industry.



## low carbon technology


low carbon  motors have grown in popularity enormously over the past five years in many areas of Europe. This is due primarily to the significant energy reduction legislation that has been introduced and the demands this has placed on the product development plans of manufacturers.

As a result, it is very clear to see why  motors have become the logical choice for manufacturers as they seek to develop products with best in class energy performance for their customers.

Firstly,  motors are approximately 30% more efficient than their AC counterparts due to the different methods they employ to generate torque. An AC motor creates torque by means of inducing current through copper windings or aluminium bars, a process that consumes energy. However an  motor uses permanent magnets to create an interactive magnetic field. The generation of this interactive magnetic field in an  motor by permanent magnets does not consume energy.

In addition, the 30% motor efficiency benefit can be significantly enhanced by the incorporation

of a full electronics package, either on-board or separate to the motor. This offers the flexibility of infinitely variable speed control and the ability for the electronics to convert mains voltage to DC supply at a level optimal for efficient motor operation. All of this is self contained within the motor electronics.

In an  motor, commutation is achieved by the motor's electronic circuitry. This provides exactly the required current, at exactly the right time, for precise control of the motor throughout its speed range. The same electronics can also self generate a 10V output to allow control of the motor via a potentiometer. In addition the same electronics is capable of receiving inputs (PWM/ 0-10V) from external sources. This allows for the precise control of various conditions such as humidity, CO<sub>2</sub>, temperature, pressure etc. In any given situation, the fan can be made to move the exact amount of air required at a given point in time, through speed regulation.



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# Low Carbon Technology

The use of speed control has a significant effect in reducing energy consumption. Reducing the speed of an **ec** motor by 50% can reduce its power consumption by a factor of 8 in an air moving application. Running a fan faster than required is therefore very wasteful.

Furthermore, AC Fans have a peak efficiency at a single point on their operating curve, with efficiency varying substantially under speed control. **ec** motors on the other hand have an efficiency that can be made to vary very little across the full speed profile of the fan.

It is also worthy of note that **ec** motors operate at very low noise levels under speed control and do not generate the characteristic whining noises associated with AC motors when speed controlled.

Combining the efficiency of the **ec** motor and the efficiency available from speed control can therefore result in up to 75% overall efficiency gains for **ec** motors when compared to their AC equivalents.


- **Efficiency** - Up to 75% more efficient than a traditional AC motor
- **Control** - Infinite speed control by 0-10Vdc or PWM without loss of efficiency.
- **Intelligence** - Programmable for constant volume and protection features.
- **Low Noise** - For quiet operation.
- **Low specific fan power** - for best in class performance






# low carbon direct drive fans

## description:

The torin-sifan low carbon  direct drive fans are a range of forward curved fans powered by intelligent, controllable and highly efficient  motors with integrated drive electronics.

Impeller diameters range from 201-178 (7/7) to 321-321 (12/12) driven by  motors ranging from 250W to 750W output.

The motor is Class B insulated and has maintenance free ball bearings.

The fans are designed for continuous operation in a temperature range of -40 to +50 Deg C.

Fan cases and impellers are manufactured from corrosion resistant galvanised steel.


Fan impellers are dynamically balanced to ISO 1940 Grade 6.3.

This type of high flow fan finds application in, amongst others, ventilation units, air handling units, air curtain, heat recovery, and especially where noise is an important consideration.



Apart from the efficiency of the  direct drive fans their built-in intelligence and inherent controllability gives the designer considerable scope when using this range in their units.

## emc:

The  range of direct drive fans meet the EMC radiated and conducted emissions requirements of EN55016-2-3 and 2-1 and the immunity requirements of EN61000-4-11,4-2 and 4-4.



## customised solutions available

Please discuss any customisation of these products that you may desire as, in many instances, this can be accommodated very easily.

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# features & benefits

## standard features

- Mains power input of 115 or 230V, 50 or 60Hz,
- Speed control without loss of efficiency by either 0-10Vdc or PWM input signals.
- Soft start
- A 10Vdc output integrated into the motor so speed can be controlled by a simple potentiometer without the need of an external signal.
- Motor rotation selection allowing for right or left hand motor position (as viewed looking into the fan discharge).
- Tacho output signal.
- EMC and EuP compliant.
- Motor failure indicator.
- Motor current limitation
- Locked rotor protection
- Over temperature protection
- Passive power factor correction
- Shaft vertical or horizontal use.
- **Lowest specific fan power and noise in it's class**


## optional features

- Programmable constant flow.
- Networking via Modbus/RS48 interface for remote monitoring and control.
- IP 54 motor enclosure, for weatherproof applications
- Painted finish

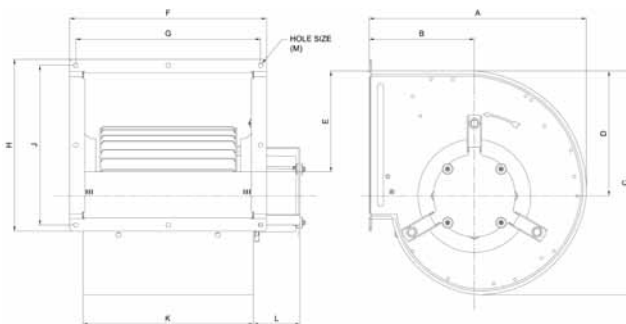
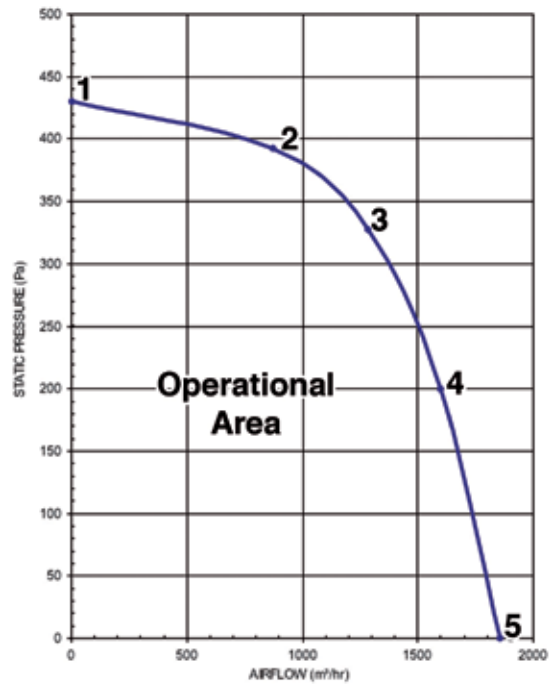




# low carbon direct drive fan's duel inlet **200mm** (part no DDEC201-178)

DDEC201-178 376W output  Motor	
Supply (V/Ph/Hz)	230/1/50 or 60 Hz
Max Airflow (M3/Hr)	1853
Max Current (A)	3.14
Max Input Power (W)	489
Max Speed (rpm)	1799

DDEC201-178 Performance Data					
Data Point	Static Pressure (Pa)	Airflow (m3/hr)	Current (A)	Speed (RPM)	Power (W)
1	430.00	0.00	1.224	1732	174.9
2	393.00	873.00	2.458	1799	374.0
3	328.00	1287.00	3.140	1799	489.0
4	200.00	1600.00	3.124	1654	486.2
5	0.00	1853.00	3.111	1536	484.0



DDEC201-178 - Dimensions			
A	310	G	272
B	149	H	265
C	322	J	241
D	180	K	232
E	180	L	84
F	296	M	8 dia

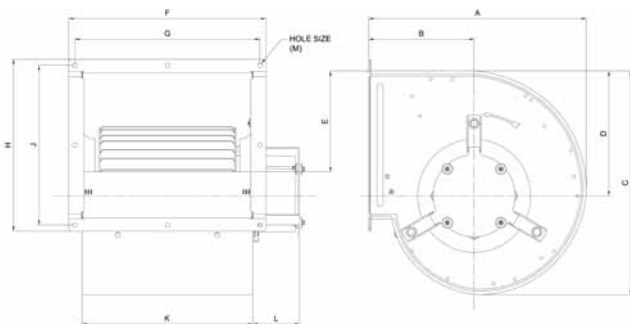
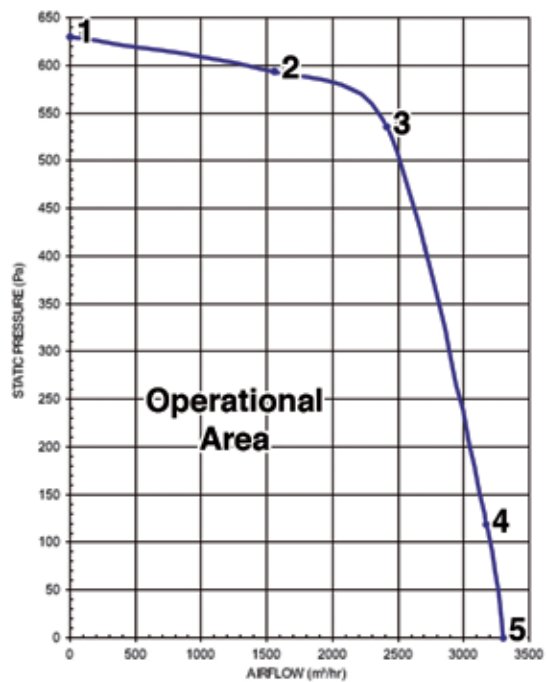
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# low carbon **-ec** direct drive fan's dual inlet **241mm** (part no DDEC241-181)

DDEC241-181 760W output <b>-ec</b> Motor	
Supply (V/Ph/Hz)	230/1/50 or 60 Hz
Max Airflow (M3/Hr)	3300
Max Current (A)	6.3
Max Input Power (W)	1100
Max Speed (rpm)	1794


DDEC241-181 Performance Data					
Data Point	Static Pressure (Pa)	Airflow (m3/hr)	Current (A)	Speed (RPM)	Power (W)
1	630.00	0.00	1.853	1791	280.0
2	594.00	1557.00	4.016	1794	650.0
3	535.00	2416.00	6.235	1791	1064.0
4	120.00	3175.00	6.265	1426	1032.8
5	0.00	3300.00	6.300	1283	1100.0



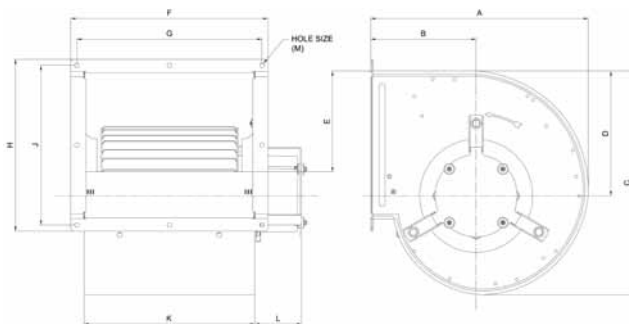
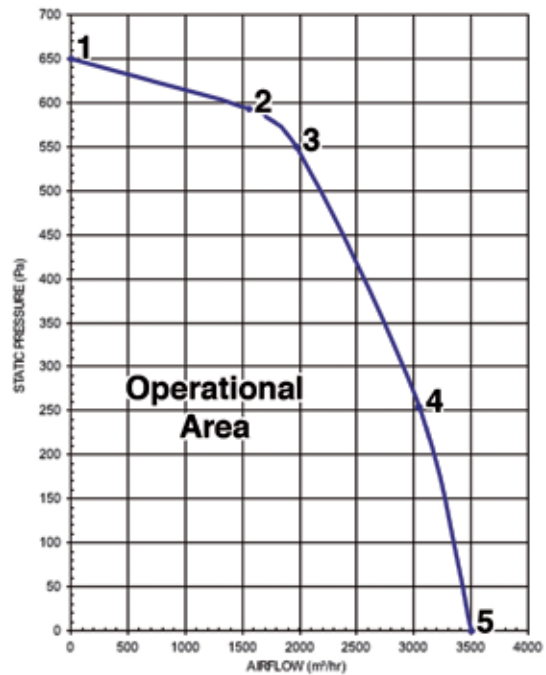
DDEC241-181 - Dimensions			
A	382	G	253
B	186	H	301
C	392	J	280
D	219	K	233
E	176	L	124
F	274	M	8 dia



# low carbon direct drive fan's duel inlet **241mm** (part no DDEC241-241)

DDEC241-241 760W output  motor	
Supply (V/Ph/Hz)	230/1/50 or 60 Hz
Max Airflow (M3/Hr)	3500
Max Current (A)	5.4
Max Input Power (W)	905
Max Speed (rpm)	1791

DDEC241-241 Performance Data					
Data Point	Static Pressure (Pa)	Airflow (m3/hr)	Current (A)	Speed (RPM)	Power (W)
1	650.00	0.00	1.968	1677	300.0
2	593.00	1556.00	4.453	1791	733.0
3	550.00	1969.00	5.283	1791	884.0
4	253.00	3045.00	5.412	1420	905.0
5	0.00	3500.00	5.287	1145	880.4



DDEC241-241 - Dimensions			
A	382	G	325
B	186	H	301
C	392	J	280
D	219	K	300
E	177	L	82
F	346	M	8 dia

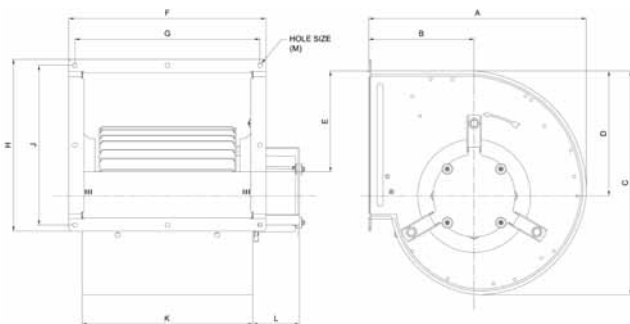
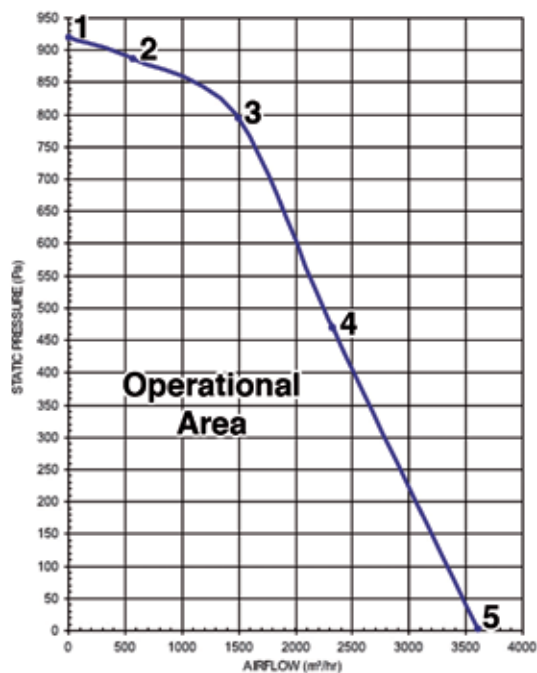
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# low carbon **-ec** direct drive fan's dual inlet **270mm** (part no DDEC270-203)

DDEC270-203 760W output <b>-ec</b> motor	
Supply (V/Ph/Hz)	230/1/ 50 or 60 Hz
Max Airflow (M3/Hr)	3600
Max Current (A)	6.03
Max Input Power (W)	982
Max Speed (rpm)	1799

DDEC270-203 Performance Data					
Data Point	Static Pressure (Pa)	Airflow (m3/hr)	Current (A)	Speed (RPM)	Power (W)
1	920.00	0.00	2.972	1730	459.5
2	887.00	564.00	3.715	1796	595.0
3	795.00	1490.00	6.029	1799	982.0
4	470.00	2318.00	5.890	1448	957.0
5	3.00	3600.00	6.025	1064	977.0



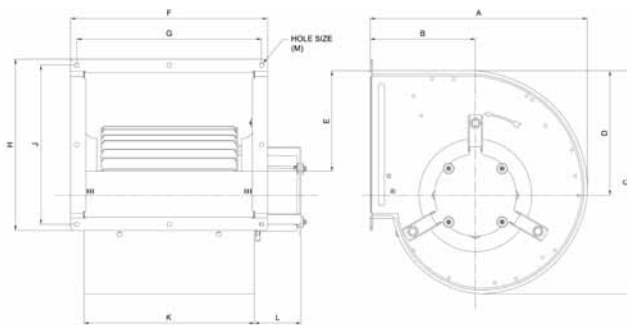
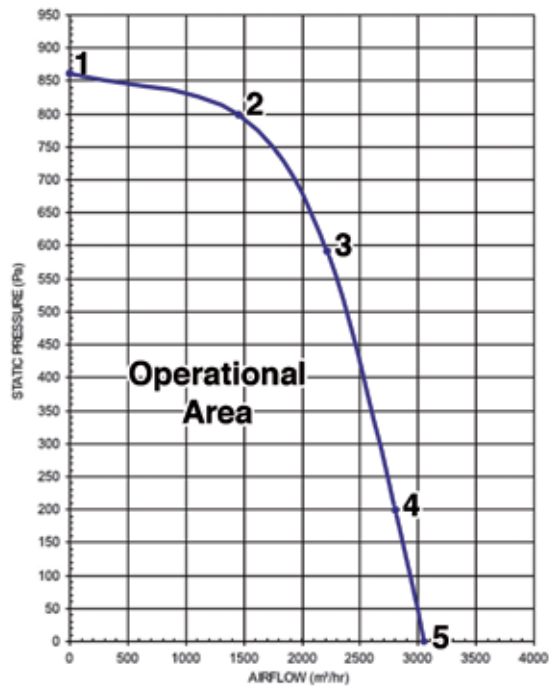
DDEC270-203 - Dimensions			
A	424	G	293
B	204	H	331
C	442	J	310
D	246	K	268
E	214	L	100
F	314	M	8 dia



# low carbon **ec** direct drive fan's dual inlet **270mm** (part no DDEC270-270)

DDEC270-270 760W Output <b>ec</b> Motor	
Supply (V/Ph/Hz)	230/1/50 or 60 Hz
Max Airflow (M3/Hr)	3050
Max Current (A)	6.28
Max Input Power (W)	1089
Max Speed (rpm)	1799

DDEC270-270 Performance Data					
Data Point	Static Pressure (Pa)	Airflow (m3/hr)	Current (A)	Speed (RPM)	Power (W)
1	862.00	0.00	3.639	1757	574.0
2	800.00	1448.00	5.427	1799	884.0
3	592.00	2214.00	5.910	1455	932.0
4	200.00	2796.00	6.124	1220	981.0
5	0.00	3050.00	6.280	1143	1089.0



DDEC270-270 - Dimensions			
A	424	G	358
B	204	H	331
C	442	J	310
D	246	K	333
E	214	L	70
F	379	M	8 dia

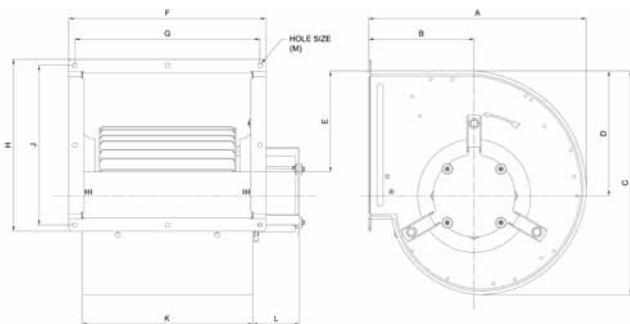
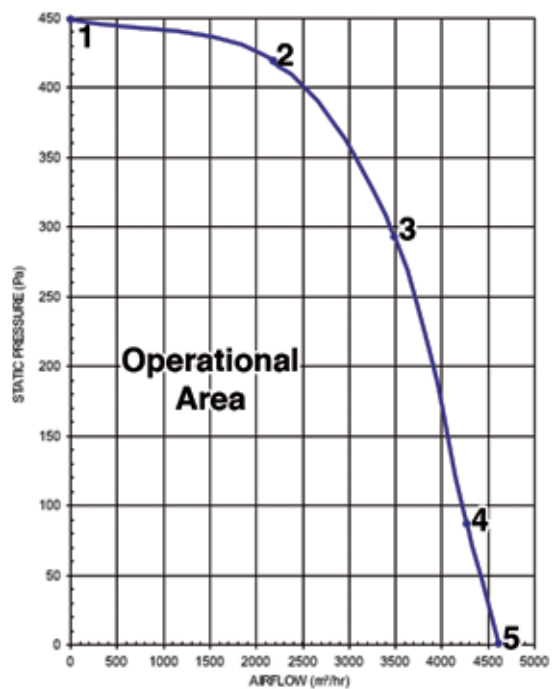
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# low carbon **-ec** direct drive fan's duel inlet **321mm** (part no DDEC321-241)

DDEC321-241 760W Output <b>-ec</b> Motor	
Supply (V/Ph/Hz)	230/1/50 or 60 Hz
Max Airflow (M3/Hr)	4606
Max Current (A)	5.6
Max Input Power (W)	910
Max Speed (rpm)	1077


DDEC321-241 Performance Data					
Data Point	Static Pressure (Pa)	Airflow (m3/hr)	Current (A)	Speed (RPM)	Power (W)
1	449.00	0.00	1.542	1072	227.0
2	420.00	2163.00	3.858	1077	617.0
3	293.00	3489.00	5.600	969	910.0
4	87.00	4266.00	5.461	785	896.0
5	1.00	4606.00	5.482	715	894.0



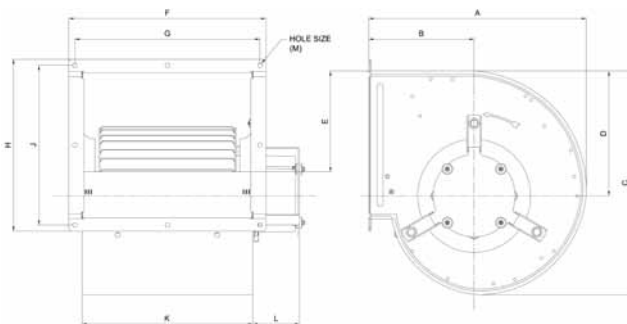
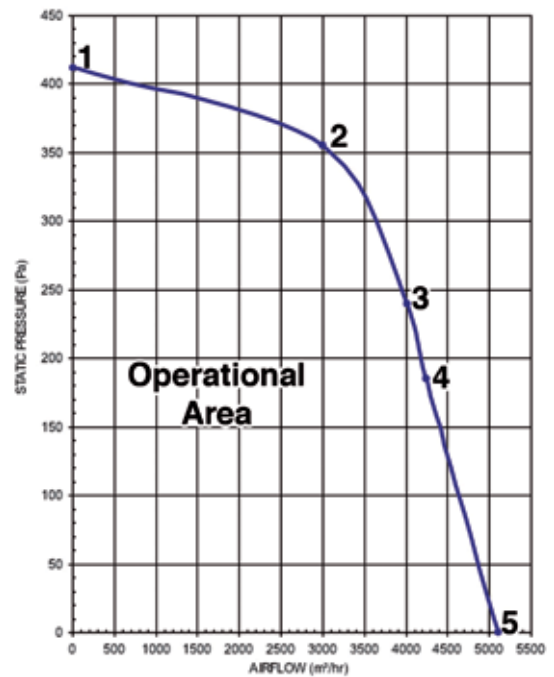
DDEC321-241 - Dimensions			
A	495	G	336
B	233	H	378
C	524	J	357
D	293	K	311
E	213	L	85
F	357	M	10 dia



# low carbon direct drive fan's duel inlet **321mm** (part no DDEC321-321)

DDEC321-321 760W Output  Motor	
Supply (V/Ph/Hz)	230/1/ 50 or 60 Hz
Max Airflow (M3/Hr)	5091
Max Current (A)	6.02
Max Input Power (W)	997
Max Speed (rpm)	1107

DDEC321-321 Performance Data					
Data Point	Static Pressure (Pa)	Airflow (m3/hr)	Current (A)	Speed (RPM)	Power (W)
1	413.00	0.00	1.567	999	228.0
2	356.00	2985.00	4.832	1007	785.0
3	240.00	4000.00	6.021	885	997.5
4	185.00	4230.00	5.632	840	931.0
5	0.00	5091.00	5.464	664	924.0

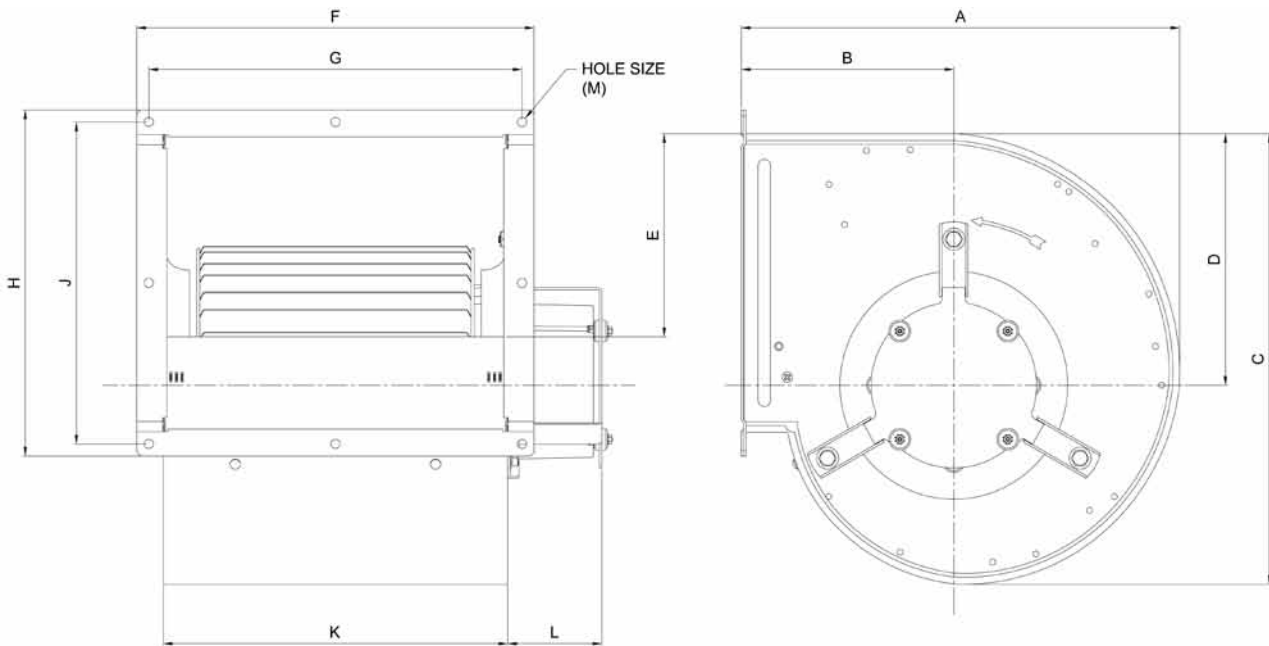


DDEC321-321 - Dimensions			
A	495	G	422
B	233	H	378
C	524	J	357
D	293	K	397
E	213	L	55
F	443	M	10 dia

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# Dimensions Summary



Dimensions												
Unit	A	B	C	D	E	F	G	H	J	K	L	M
DDEC201-178	310	149	322	180	160	296	272	265	241	232	84	8 dia
DDEC241-181	382	186	392	219	176	274	253	301	280	233	124	8 dia
DDEC241-241	382	186	392	219	177	346	325	301	280	300	82	8 dia
DDEC270-203	424	204	442	246	214	314	293	331	310	268	100	8 dia
DDEC270-270	424	204	442	246	214	379	358	331	310	333	70	8 dia
DDEC321-241	495	233	524	293	213	357	336	378	357	311	85	10 dia
DDEC321-321	495	233	524	293	213	443	422	378	357	397	55	10 dia

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