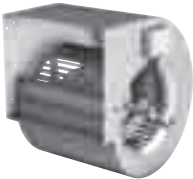
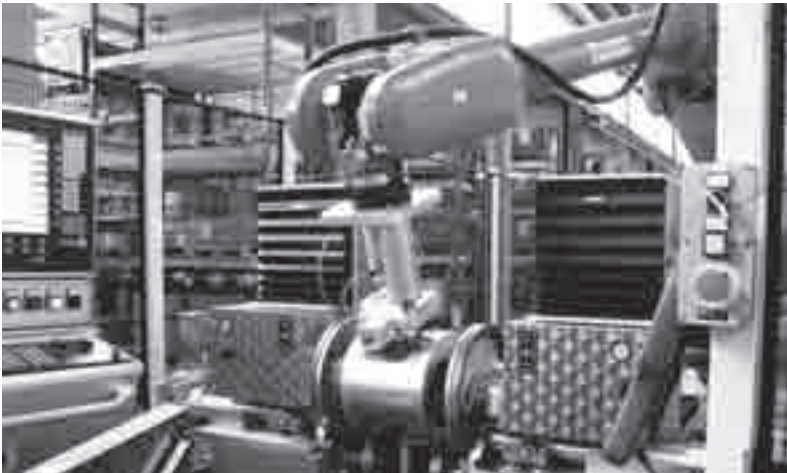


Centrifugal Fans direct driven

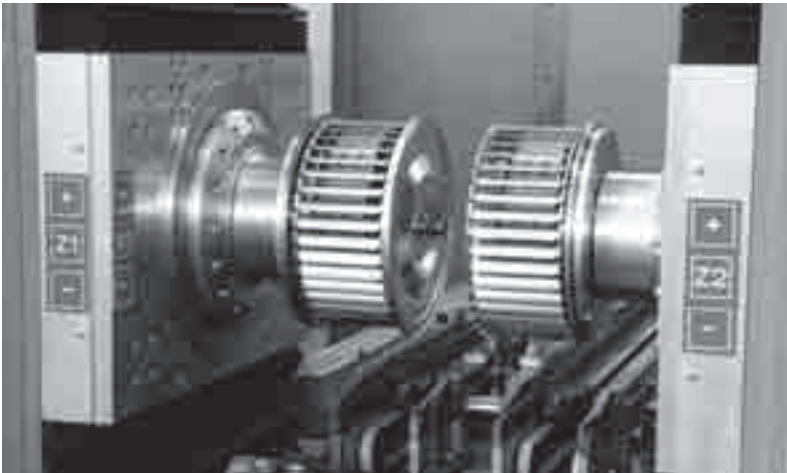
NICOTRA | Gebhardt



Nicotra Gebhardt technologies like ...

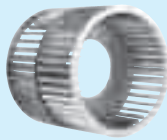

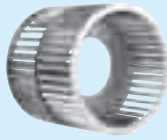

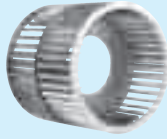






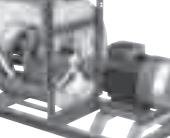


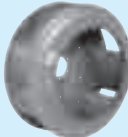

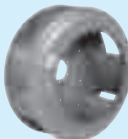





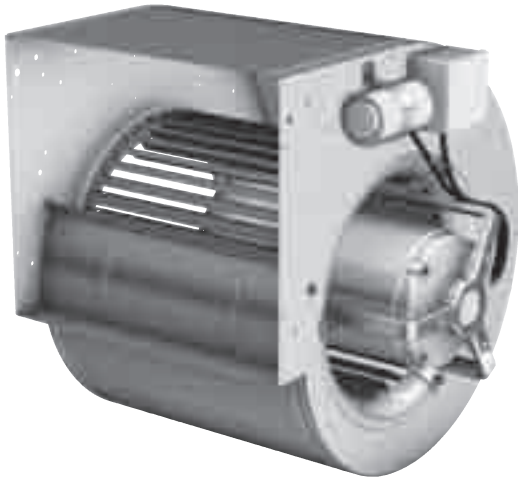
Automated manufacture of compact scroll and impeller with forward curved blades



Own AC and Brushless-DC motor production for optimal tuning of motor and fan!



<p>High performance centrifugal fans DDM double width, double inlet, (DWDI), with built-in, optimised external rotor motor, made of galvanised sheet steel; available in various models; Impeller with forward curved blades of galvanised steel plate</p>			DDM
<p>High performance centrifugal fans DDMB double width, double inlet, (DWDI), with built-in, brushless-DC external rotor motor and external commutation unit, made of galvanised sheet steel; available in various models; Impeller with forward curved blades of galvanised steel plate</p>			DDMB
<p>High performance centrifugal fans DD double width, double inlet, (DWDI), built-in, optimised internal rotor motor, made of galvanised sheet steel; available in various models; Impeller with forward curved blades of galvanised steel plate</p>			DD
<p>High performance centrifugal fans RZA rotavent double inlet, with built-in, low-slip external rotor motor, made of galvanised sheet steel or welded and coated, with multi position feet and connecting flange at discharge; Impeller with true aerofoil blades, welded and painted – system <i>rotavent</i></p>			RZA
<p>High performance centrifugal fans RZP rotavent double inlet, with built-in, brushless-DC external rotor motor and external commutation unit, made of galvanised sheet steel; with multi position feet and connecting flange at discharge; Impeller with true aerofoil blades, welded and painted – system <i>rotavent</i></p>			RZP
<p>High performance centrifugal fans RZM rotavent double inlet, fan with directly coupled motor fitted on pedestal and base frame, made of galvanised sheet steel with heavy duty reinforced side frame, connecting flange at discharge, Impeller with true aerofoil blades, welded and painted – system <i>rotavent</i></p>			RZM
<p>High performance centrifugal fans REM/TEM single inlet, with flanged IEC standard motor out of air stream, in unterschiedlichen Ausführungsvarianten, Impeller with true aerofoil blades, welded and painted (REM) or forward curved blades of galvanised steel plate (TEM), with or without pedestal for horizontal or vertical mounting</p>			TEM/REM
<p>High performance plug fans RLM optimised for use without scroll. Motor impeller with inlet cone, motor base and basic frame manufactured as a module and adjusted</p>			RLM
<p>High performance plug fans RLE optimised for use without scroll. Vier unterschiedliche Laufradbaureihen, built-in, AC or brushless-DC external rotor motor, Inlet cone as an option</p>			RLE
<p>Fittings / Accessories ■ complete system accessories ■ fittings and options</p>			Accessories
<p>Technical Description ■ Descriptions ■ Operating limits ■ Notes</p>			Description



The best fan for your application!

DD range – direct driven fans

Direct driven centrifugal fans of DD range with forward curved impeller directly mounted on the shaft of the internal rotor motor are the ideal solution for your applications in the HVAC business.

The fact of manufacturing by ourselves each fan component – the casing, the impeller and motor – enables us to create fans that perfectly meet the requirements of high performances and low power consumptions.

The wide range of different versions and motor types allows you to find the fan exactly matching what you really need.

You anyway get the generally recognized advantages of the direct drive technology :

- **Maintenance free**
- **No transmission losses**
- **Long fan life time**
- **High reliability**
- **Low operating costs**

And, more, all the additional product advantages of the DD range are at your fingertips.



Compact casing!

Aerodynamically optimized in terms of both airflow and design, scrolls are made of galvanized steel and automatically assembled using an innovative procedure, providing a sturdy and long-lasting product.

- **without welding points for no corrosion troubles**
- **high precision manufacturing process for high quality product**



Real forward curved impeller!

The impeller has been optimized for the best efficiency, match to the special motor features.

We manufacture the high performance impellers through a highly – automated and innovative production process.

- **low noise level**
- **low power consumption**



Optimized internal rotor motor

The fan impeller is directly mounted on the motorshaft thus providing efficient motor cooling by the fan airflow.

Motor speed can be adjusted either by the use of transformers and TRIAC regulators. Motors are generally fitted with thermal protector for protection against overheating.

- **high reliability and efficiency**
- **wide range of operative conditions**



Easy electrical connection

All fans could be provided with connection box, terminal block or loose cable.

A wiring diagram sticker, placed on each fan, describes the correct electrical connection.

- **fast and easy wiring**
- **safe operation**

Program overview:

DD range

This kind of fans are specially conceived for use in dust-free environments, at temperatures up to +40°C, or higher on selected models. The performance data have been obtained in a laboratory registered by AMCA for AMCA 210/99 air performance testing. Data are not certified by AMCA.

Fan range DD

- Impeller size (width and diameter) up to 18"
- Speed variation either by step-transformers or stepless
- Internal rotor motor with intergrated thermal protector
- Fan models suitable for 60Hz supply are available
- Air Flow up to 18000 m³/h
- Static pressure up to 800 Pa

The variety of DD

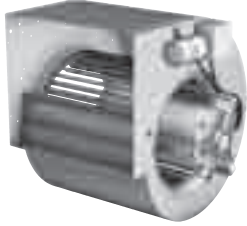
We have the right fan for all your application!

Many different sizes, versions and motor types are available in the DD range.

Version	Description	Figure
DD	Lap-jointed scroll made from galvanized steel and forward curved blades impeller, directly mounted on an internal rotor motor.	
+SCT	with terminal box mounted	
+FL	with discharge flange mounted	
+SB	with housing feet either mounted or loose	

DD

Specifications



High performance centrifugal fan DD

Double width, double inlet (DWDI), direct driven forward curved blades fan. Lap-jointed scroll of galvanized steel (EN10142) assembled through a high technology roller-lock seaming (sizes ≥ 7 inches), spot-welded scroll of galvanized steel (sizes < 7 inches).

Straight cut off plate at fan outlet.

Impeller with forward curved blades of galvanized steel, directly mounted on an "Internal Rotor" motor for optimal motor cooling and no transmission losses.

Open (IP20) or closed (IP32/44/55) motor frame;

Motors may be single- or three-phase; single- or multi speed, speed-adjustable by voltage regulation through transformers or TRIAC regulators. Motors suitable for use at 50Hz or 60Hz are available.

Built-in thermal protection devices either in series or wired out is standard fit.

Maintenance free self-aligning ball bearings, vibration isolation pads.

Impeller dynamically balanced according to ISO 1940.

Different fan options and accessories, motor types and sizes available - see technical data.

Fan data

Fan type		
Volume flow	q_v		m^3/h
Fan static pressure	p_{sF}		Pa
Density at Inlet	ρ_1		kg/m^3
Temperature of gas medium	t		$^{\circ}C$
Max. power consumption	P_e		kW
Speed	N		1/min
Frequency	f		Hz
Sound power level (A weighted)	L_{WA}		dB
Weight	m		kg

Fittings / Accessories

- Outlet flange - O
- Outlet flexible connection - A (sizes $\geq 7/7$)
- Mounting feet - O/A (sizes $\geq 7/7$)
- Terminal box - O
- Inlet guard -O/A
- Outlet guard - O/A
- Powder-coating - O
- TRIAC electronic regulators - A

Legend

- O = Options
- A = Accessory
- O/A = The item could be delivered as an option or an accessory

Please, check availability of each individual option or accessory on each specific fan model.

Description

Safety

These fans are intended to be incorporated into finished products for the treatment of clean and filtered air, free of dust, particles, shavings, grease, etc., within the rated ranges of temperature and electrical supply.

The design of the installation shall guarantee the essential safety requirements, as specified by the locally enforceable legislation, including safety against human contact with moving parts, e.g. by application of the design principles stated in EN ISO 12100.

When the inlet and/or outlet of a fan are connected to a ducting system, or to a closed plenum, including integral filters or grids, these may be designed also to provide the specified protection level.

Otherwise, the fan must be protected by fitting appropriate inlet or outlet guards, designed in accordance with EN ISO 13857, available from Nicotra Gebhardt as accessories or options.

Type code

1F 3F	2P 4P 6P	1V 2V 3V 4V	FL	SCT	SP	SB	GRG	GRGP
Single phase Three phase	2-pole 4-pole 6-pole	1-Speed 2-Speeds 3-Speeds 4-Speeds	Outlet flange	Terminal box	Special version	Mounting Feet	Inlet guard	Outlet guard

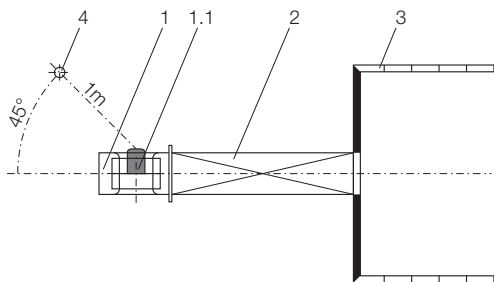
Performance data

Air performance ratings shown in this catalogue have been derived from performance tests made with installation type "B", with free inlet and ducted outlet.

The performance data shall be obtained in a laboratory registered by AMCA for AMCA 210/99 air performance testing. Data are not certified by AMCA.

Ratings are referred to the standard air density of $\rho_1 = 1.2 \text{ kg/m}^3$ at the fan inlet.

Sound



In the diagrams, the A-weighted housing and free inlet sound power level L_{WA7} is given as the emission parameter for the ventilator.

The A-weighted noise level L_{pA7} for a distance of 1m (see sketch) is achieved approximately in that the correction value given below is subtracted from the respective A sound power level.

It should be noted that site acoustics, duct design, reverberation, natural frequencies etc. can all influence noise to a greater or a lesser extent.

$$L_{pA7} \approx L_{WA7} - dL$$

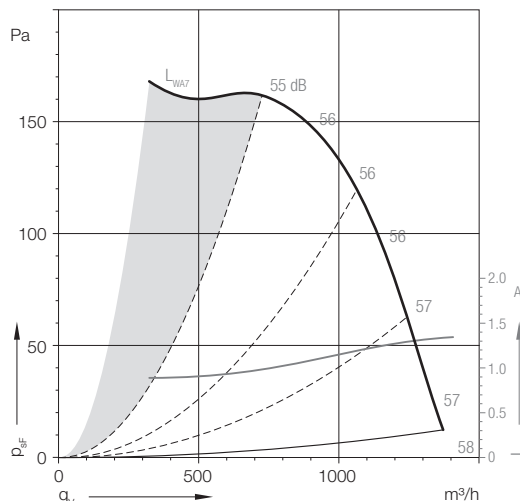
Correction values dL :

Size $\leq 10/10$: $dL = 7\text{dB}$

Size $\geq 12/9$: $dL = 8\text{dB}$

- 1 = Fan
- 1.1 = Motor
- 2 = duct on discharge
- 3 = Chamber
- 4 = Microphone position

Fan operating area



For a proper fan selection the duty point in the grey area to the left of the leftmost dashed parabolic line drawn on each performance diagram should preferably be avoided. In this area the fan stall is producing fluctuating pressure and fluctuating loads on the fan and motor; some single-phase motors may also be overheating in this low-load condition.

When the performance curves of a fan are cut to the right with continuous-line parabola, a fan selection with the duty point located below of this parabola shall be carefully avoided, because the drive motor would be overloaded and would be overheating. Such an operating condition may be evidenced by a motor input current exceeding the maximum rated value.

Description

Fan lifespan

The high level of manufacturing technology and the use of selected materials provide a considerable fan operating lifetime.

In most applications, the fan components more subjected to wear are the motor bearings.

The bearings are sized to reach, using 80% of the maximum allowed current and working at an air temperature not higher than 40°C, a L_{10h} operating life of 20,000 hours. This means a 7 years fan lifetime, for fans running 8 hours a day.

Media

This range of fans are specially designed for use into air handling units (AHU) and ventilation systems.

The centrifugal fans are ideal for conveying clean air.

The allowed air temperature comes from -20°C to +40°C.

Motors

Most motors have "F" ISO insulation class but some of the smaller models have nevertheless "B" ISO insulation class.

Motors could have IP32; 44; 54 or 55 protection class (closed frame) or IP10; IP20 protection class (open frame).

Detailed information for each fan model are provided with fan specification on the product pages.

Motor protection

All standard production motors are equipped with an integrated thermal overload protectors (TOP), as protection against thermal overload.

TOP may be wired internally to windings and then they'll automatically stop the motor, if a overheating event occurs, and start the motor again once it is cooled down.

TOP may alternatively be externally wired, that means TOP terminals are available to the user in the motor terminal block or terminal box.

In this case, the TOP terminals can be manually connected in series between power supply and motor windings or, alternatively, to an external device that switches off the mains to prevent that the motor be damaged by an overheating conditions.

Speed regulation generally

All standard production motors can always be used with transformers or devices which do not modify the sinusoidal wave line to change the fan speed is always allowed.

Speed regulation for fans equipped with single-phase motors

Single or multiple speed available. Single phase motors are generally suitable for speed regulation by changing the input voltage with our electronic single-phase RVM speed regulators (see chapter "Options/ Accessories" for further information).

The speed variable types are marked with an dot in the technical data tables.

The reduced – voltage curves shown in the catalogue may be obtained by either using transformers or our RVM regulators. In the last case, we have commonly used a 2-wires connection for running currents up to 3 Ampere max and a 3-wires connection for higher running currents.

Speed regulation of multi-speed fans is obtained by connecting the mains to the correct motor terminals according to the wiring diagram supplied with each fan.

Speed regulation for fans equipped with three-phase motors

Single or double speed available. Performance diagrams of single speed fans usually shows only the curve referred to a 230V star – 400V delta configuration.

Performance diagrams of double speed fans usually shows the curves referred to a 400V star (high speed) – 400V delta (low speed) configurations.

The use of RVT controllers or inverter is only acceptable with special motors equipped with a reinforced insulation of the windings. In this case, these devices shall be in accordance with the requirements of IEC / TS 60034-17:2006.