INTRODUCTION

This section of the catalogue details the performances of a wide range of axial flow fan types as follows:-

Duct Mounted Axial Fans
- AP Series - direct-drive
- APH Series - direct-drive horizontal hangers
- APV Series - direct-drive vertical mounted
- APS Series - direct-drive smoke-spill
- APB Series - belt drive
- BFA Series - bifurcated direct-drive
- APPM Series - direct-drive PM motor
- APEC Series - direct-drive EC motor

Wall Mounted Fans
- SQ Series - square plate, direct driven

Axial Roof Units
- RDE/RDLE Series - downflow cowl, exhaust
- RDS/RDLS Series - downflow cowl, supply
- RVE/RVLE Series - vertical discharge
- RSS/RSSL Series - vertical discharge, smoke spill
- HC Series - high capacity, vertical discharge
- SS Series - smoke spill

The above fans range in diameter from 315mm to 2000mm.

The curves shown on pages *C-12 to C-24* show a range of performances for the **AP series** of direct-driven axial flow fans in Type D Installation (see below) operating at a range of standard motor speeds. The other fan types listed above incorporate casings or housings that impact on their performance result. The Fans by Fantech Product Selection Program will produce performance curves for these other fan types that have automatically taken these losses into account.

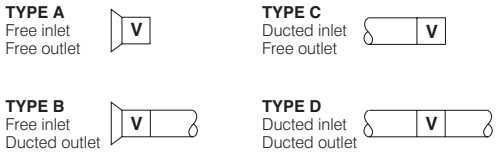
TEST STANDARDS

The International Standards Organisation (ISO) achieved a standardised fan test code with the publication of ISO5801. This Standard replaces BS848:Part 1, 1980 upon which it was based.

Fan performances for the 1000 Series have been aerodynamically tested to BS848:Part 1, 1980, 1400 and 2000 Series to ISO5801:1997 and Series 1 to ISO5801:2007.
All four series have been tested to BS848:Part 2, 1985 for sound performance.

The main difference between the above Standards and those they replaced, is the installation Types A, B, C and D such that, if a fan unit is designed for use in any one of these arrangements, the variation in performance should be established and shown.

Both BS848:Part 1 and ISO 5801 are the most recognised test standards for their



understanding of measuring techniques and accuracy in fan performance testing.

If the same fans were tested to pre-1980 air flow and noise Standards and then to the latest Standards, different performances would be obtained. The results from the later Standards give differences of as much as:-

- -5% in volume
- -10% in pressure
- -5% in efficiency
- +2 to 6dB in noise

These differences should be borne in mind when making comparisons of fans tested to the different Standards, as they are the result of the test method and not the product.

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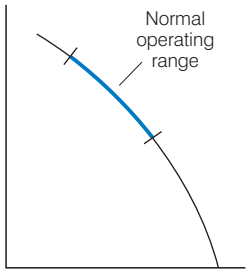
PERFORMANCE VARIATIONS

The achieved fan performances can differ from the test performances shown on the subsequent pages due to two main effects:-

a) The encroachment of irregular or abrupt changes within the system close to the fan. If good design practice is followed, then the fan will receive nearly uniform air into its inlet, and discharge its air flow in an almost ideal pattern. If this is achieved the fan will perform to its expected level.

   Reference to the "Do's and Don'ts" tips on *page P-1* will assist in avoiding pitfalls. The advice in "Do's and Don'ts" applies to the application of all fans, not just axial flow fans.

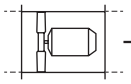
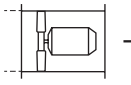
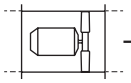
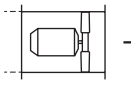
b) Changes to the internal elements of the fan: e.g. large junction boxes on motors, belt drive stacks or excessive blade tip clearances.



C

FORMS OF RUNNING

The main series of tests were conducted on Form B units and comparative tests were carried out on Form A units. Resultant performance differences occur mainly on the outlet side of the fan, as correct practice should result in the presence of a duct or inlet cone on the fan inlet.

Form	Air flow direction	Installation Type (see previous page)	Air flow variation	Sound variation
B		D	As shown on performance curves	As shown on data sheets
B		A, B & C	As shown on selection program	As shown on data sheets
A		A, B & C	As shown on selection program	+2 to 3 dB
A		D	$q_v \times 1.02$ $P_sF \times 1.04$ } as compared to type 'D' performance	+2 to 3 dB

BLADEVANE DOWN-STREAM GUIDE VANES

A normal axial flow fan, whilst being very economical and compact, imparts motion to the air in an axial and rotational direction. The rotating component is usually called 'swirl'. The swirl component eventually dissipates, but by using BladeVane down stream guide vanes, it can be converted to more useful static pressure. Static pressure increases of 10%-25% can be achieved with BladeVane, thus giving an increase in efficiency. As the work is done after the air leaves the fan, Down-stream guide vanes do not require any additional fan power. They are most effective at pitch angles over 20° and produce small increase in sound levels of 1-2dB.



MULTI-STAGE AXIAL FLOW FANS

APCR multi-stage axial fans with contra-rotating impellers can be supplied up to 2000mm diameter.

A two-stage assembly develops approximately 2.4 times the pressure developed by a single-stage fan and increases the overall sound level by 8 to 10 dB.

To select a contra-rotating axial fan from the curves in this catalogue, divide the specified static pressure by 2.4 and then select as though it were a single-stage unit. The kW derived is for one stage only and the noise level will be 8 to 10 dB higher than the single-stage fan.

DSGVs are available on most inline axial flow models in a metal PowerV series or plastic BladeVane series.

NOTE: Reference should be made to Fantech for complete selections of these fan arrangements. Alternatively selections can be made using the Fans by Fantech Product Selection Program.

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IMPELLER RANGE

The impeller ranges included in this catalogue have harnessed the latest technology in axial impeller design, resulting in enhanced pressure development, energy efficiency and reduced noise levels.

There are four main ranges: -
1: 315 to 1000mm diameter using 131, 181, or 251mm diameter hubs
1000: 315 to 1000mm diameter using 150 or 250mm diameter hubs.
1400: 800 to 1400mm diameter using 255 or 350mm diameter hubs.
2000: 1250 to 2000mm diameter using 400 or 550mm diameter hubs.

For performances beyond those detailed in this catalogue, and for applications such as mine and tunnel ventilation, please refer to our sales engineers for information.

IMPELLER SPECIFICATION

Blades
The blades have been designed for optimal performance, for both aerodynamic needs as well as noise characteristics. They are available in a range of materials as shown below:-

Range of diameters	No of blades	Hub Dia mm	Materials
315 to 800	3 or 6	131	GRP, Alum. or Anti-static GRP
315 to 900	5 or 10	150	GRP, Alum. or Anti-static GRP
315 to 900	3, 6 or 9	181	GRP, Alum. or Anti-Static GRP
560 to 1000	7 or 14	250	GRP, Nylon, Alum. or Anti-static GRP
560 to 1000	3, 6, 9 or 12	251	GRP, Alum. or Anti-Static GRP
800 to 1250	3 or 6	255	GRP, Alum. or Anti-static GRP
800 to 1400	3, 6, 9 or 12	350	GRP, Alum. or Anti-static GRP
1000 to 1800	3, 6 or 9	400	GRP or Aluminium
1250 to 2000	3, 6, 9 or 12	550	GRP or Aluminium

Impeller Ranges
The stress limits of the blades vary from one material to another and simplified criteria are incorporated on the curves. However, if selecting fans using the Fans by Fantech Product Selection Program, you may find solutions where higher pitch angles are chosen; these selections are quite acceptable.
It should be noted that, as we are constantly reviewing the materials we use, these limits may be extended.

Hubs
All hubs use Fantech TECH-LOCK® taper bushes as standard. The bush ensures ease of fitting and removal of the impeller from the motor shaft should adjustment of the pitch angle, cleaning or repair of the impeller prove necessary.

Fixings
All impellers are assembled using high-tensile, zinc-plated set screws and self-locking nuts.

Handing
Right and left-hand blades are available enabling the selection of contra-rotating or multi-stage axial flow fans up to 2000mm diameter. If contra-rotating fans of a larger diameter are required please refer to our sales department.

Standard Material
GRP blades will be supplied for normal clean ventilation applications as standard except where otherwise specified, or where local regulations prohibit their use.

Balance
The balance of all impellers is carefully checked before leaving our facilities to ensure vibration-free running.

Fully-adjustable Blades
All impeller pitch-angles are fully adjustable. For the range, up to size 1400, the required blade angles are set on jigs. For the 2000 Range, pitch angle setting is by protractor.

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OPERATING SPEEDS AND TEMPERATURES

Impellers installed for O.E.M. applications are submitted to the vibration, cyclic torques and temperature cycles that prevail within the item of equipment. It can therefore be misleading to state maximum conditions unless the full operating environment is known, as all the above points can be inter-related.

The table below should be used as a guide only. For accurate figures use the Fantech Product Selection Program.

Blade Material	Temperature Range	Limiting Tip Speed**
Series 1 & 1000 Impellers*		
1000 Impeller*		
Aluminium	-40°C to +200°C	115m/s
GRP	-40°C to +70°C	95m/s
Anti-static GRP	-40°C to +70°C	95m/s
1400 & 2000 Impellers#		
Aluminium	-40°C to +200°C	105m/s
GRP	-40°C to +70°C	95m/s
Anti-static GRP***	-40°C to +70°C	95m/s

* Up to 1000mm diameter ** Applicable to 20°C *** 1400 Series only
\# 1400 Series = 800mm to 1400mm; 2000 Series = 1250mm to 2000mm

REVERSAL OF AIR FLOW

Air flow direction can be reversed on fans fitted with standard three-phase motors by simply reversing the direction of rotation.

The impact on performance in reverse rotation approximates to:-

Air flow reduction	-30%
Pressure reduction	-55%
Power reduction	-25%

TRULY REVERSIBLE

Equal volume flow in both directions can be achieved by blade reversal procedures carried out when the impeller is being assembled.

The impact on performance when compared to standard performance approximates to:-

Air flow reduction	-15%
Pressure reduction	-25%
Power reduction	-20%

CONSTRUCTION

All axial fan casings are rolled and flanged from either pre-galvanised sheet or heavy-gauge mild steel that is hot-dip galvanised after manufacture. All hot-dip galvanising of axial flow fan products is to AS/NZS4792:2006 and is the standard finish on the fans larger than 800mm diameter and their accessories. The standard casings enclose the impeller and motor completely. Weatherproof external terminal boxes are standard.

The motor is wired into the external terminal box through flexible terminal weatherproof conduit and a separate earthing screw is provided.

An inspection hatch is standard on fans 1000mm diameter and over, a 50mm sight hole is fitted on smaller fans. An inspection hatch is available on the smaller fans.

Motors suited to harzardous areas are wired to the outside of the case and left with a generous length of lead. This is so the client can connect to their own terminal box in accordance with the requirements for the particular hazardous zone.

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AXIAL FLOW FAN RANGE

DUCT MOUNTED



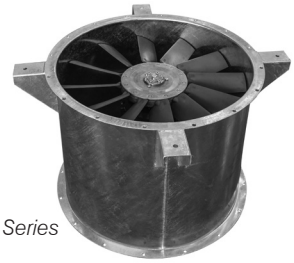
AP Series

Direct-drive - AP Series (315 to 2000 mm diameter)
The entire range can be provided in a wide choice of speeds to meet an extensive number of performances and applications. If a speed or duty you require is not shown please contact our sales engineers for assistance. In general, all hazardous or special application motors can be fitted if required.



APH Series

Direct-drive APH Series (315 to 1600 mm diameter)
As an alternative to hanging via feet bolted to the flange, the APH casing is designed with horizontal hanging bars on the sides of the case. It allows for installations to be closer to the ceiling.



APV Series

Direct-drive - APV Series (315 to 2000 mm diameter)
The full range of sizes and speeds can be supplied as direct-drive APV units for applications where the fan must be installed vertically. The casing is designed with integral outriggers to facilitate vertical mounting.



APS Series

Direct-drive - APS Series (315 to 2000 mm diameter)
For smoke spill applications Fantech can supply fans up to 2000mm diameter fully tested to meet the Australian Standards AS/NZS1668.1:1998 and AS4429:1999.
See page *C-8* for more information.



APB Series

Belt-drive - APB Series (315 to 2000 mm diameter)
The full range of sizes and speeds can be supplied as belt-driven APB units for applications where the motor must be out of the air stream.

When selecting these fans allowance for the additional pressure loss caused by the drive arrangement must be taken into account as follows:-

- Open belts: no extra pressure loss
- Sealed belt guard: add 5% to the design pressure.



BFA Series

Bifurcated - BFA Series (400 to 1250 mm diameter)
This range is available in a wide choice of speeds. Bifurcated axial flow BFA fans are designed for handling toxic, noxious, abrasive and hot gases. They can be used as an alternative to the APB belt-driven range.

The maximum air temperature the standard bifurcated fan can handle continuously, and without special treatment to the impeller and motor, is 100°C for an aluminium impeller, or 70°C for GRP.

Bifurcated fans can be built to accommodate temperatures of up to 200°C continuous for sizes up to 1250mm and 250°C for sizes up to 630mm.

For this type of application it is essential the fan be mounted in normal ambient conditions, that the central motor tunnel is aligned vertically and that the motor has Class H insulation and equivalent lubrication of the bearings.

Refer to Fantech if the fans are to handle higher temperatures or the motor tunnel is not vertical.

When selecting these fans the following allowances must be made to the duty to compensate for the central shroud:-

Sizes 400 to 560 - 1.0 × p_dF
Sizes 630 to 1250 - 0.7 × p_dF

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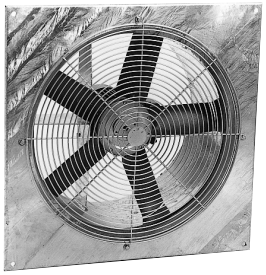
Direct-drive - APPM Series (315 to 1400mm diameter)
This range utilises next generation, Permanent Magnet (PM) motor technology to increase energy efficiency, lower noise output and reduce overall unit weight.

Direct-drive - APEC Series (315 to 1000mm diameter)
This range incorporates an Electronically Commutated (EC) shaft motor delivering ultra energy efficient operation with the benefit of in-built variable speed control.

Note: Down Stream Guide Vanes can be added to most axial flow fans where installation permits to increase pressure development by 10-25%.

Dimensions of the AP/APH/APV/APS/APB/BFA/APPM/APEC fans are on page *C26-27*

WALL MOUNTED



Square Plate - SQ Series (315 to 1250 mm diameter)
This range is available in a wide choice of speeds. All square-plate fans, irrespective of air flow direction, incorporate a bell-mouth entry; the direction of air flow must be nominated at the time of order.

Generally all motors for hazardous areas can be fitted if required.
When selecting these fans installations Type A must be used.

The square plates are of heavy-gauge steel and are hot dip galvanised after manufacture.

Dimensions of the SQ Series are shown on page *A-21*.

See Wall Mounted section, pages *A-15/A-27* for alternative selections of sizes 025 to 800 diameter square plate fans.

ROOF MOUNTED







Alpha & Beta Industrial - RDLE, RVLE, RDLS & RSSL (500 to 1000mm diameter)
This series of axial roof mounted fans is available in both vertical and downflow configurations. The range can be supplied in a number of speeds and includes a vertical exhaust smoke-spill model (RSSL). Cowls on the downflow units are made from plastic and the vertical discharge windbands are made from galvanised steel.
All models incorporate a pressed galvanised steel base.

Further information on this series is covered in the Roof Mounted section on pages *D-7/9*

New Generation Series - RDE, RDS, RVE & RSS (315 to 1250mm diameter)
These are available in both vertical and downflow configurations and can be supplied in a wide range of speeds. The range includes a downflow supply air model (RDS) and a vertical exhaust smoke-spill model (RSS). The hot dip galvanised heavy-gauge steel base incorporates a bell-mouth entry to optimise the air flow. Downflow cowls are generally plastic and vertical discharge windbands are galvanised steel.

Further information on this series is covered in the Roof Mounted section on pages *D-16/19.*

High Capacity and Smoke-Spill Series - HC & SS (500 to 1800mm diameter)
The HC series is for vertical discharge applications only. They have a hot dip galvanised steel construction and can be supplied in a wide range of speeds.
The SS Series is specifically designed for smoke-spill applications.

Further information on this series is covered in the Roof Mounted section on pages *D-60/62.*

In general all motors for hazardous areas and special application motors can be fitted to the axial roof units listed above if required.

See "Smoke-Spill Applications" on page C-8 for more comprehensive information on smoke-spill Standards and the range available.

Use the Fans by Fantech Product Selection Program when making accurate selections of any fans listed above.

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SMOKE-SPILL APPLICATIONS

Smoke-spill fans have to be tested to Standard AS4429:1999 to conform with the requirements of AS/NZS1668.1:2015. To meet the Standards Fantech conducted an extensive series of tests covering both air flow and temperature. The air flow tests for sizes 315mm to 1000mm diameter conformed to BS848:Part 1, 1980 and to ISO5801 for sizes 1.0m to 2.0m. The temperature tests were conducted in accordance with AS4429:1999, although the 300°C tests were extended from 0.5 hours to 2 hours to ensure we met the needs of some specifications.

The outcome of the series of tests is that we can supply fans ranging in diameter from 315mm to 2000mm at speeds as high as 2 pole depending on size and, for both 50 and 60Hz supply that fully comply with the Standards in all respects.

The following conditions can be met:-

- 200°C for two hours
- 200°C for four hours
- 250°C for four hours
- 280°C for 0.5 hours
- 300°C for 0.5 hours
- 300°C for two hours

For advice on Smoke-Spill wiring requirements, refer to the above Standard.

Contact our Sales Engineers for additional information.

COMPUTER SELECTION

The Fantech Product Selection Program encompasses the following features:-

- a fan selection program
- an attenuator selection program
- an acoustic analysis system
- a project schedule builder
- enables drawings to be downloaded through dwg/dxf files and
- enables revit models to be downloaded
- easily updated with the latest data from our website.

To obtain a copy of our Product Selection Program contact your nearest Fantech branch or visit www.fantech.com au.

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INTRODUCTION TO PERFORMANCE DATA GRAPHS

The Impeller data shown on pages C-12 to C-24 in this edition of the catalogue has been condensed to ensure it remains accurate and current. The graphs show the **AP series** of direct-drive axial flow fans in two impeller configurations for any one fan size/speed combination. These graphs include the impeller capable of developing the highest static pressure and an impeller with fewer blades that develops less pressure. The second configuration would generally be a cheaper, quieter and, possibly, a more efficient selection.

The performance curves in this section show the free-field sound pressure levels under spherical radiation conditions in dB(A), 3 metres away, on the outlet side of the fan.

Selecting from these graphs provides a guide only, albeit an accurate one, to possible selections. Basic noise level data as well as indicative power absorbed figures are incorporated on the graphs. The final selection for any particular fan is best achieved by contacting the nearest Fantech sales office, or by using the Fans by Fantech product Selection Program. The Program will show other possible impeller combinations between the two illustrated in this catalogue, and will provide full performance information including air flow, pressure, noise levels, absorbed power as well as complete dimensional information.

To ensure the information we provide our customers on the Impeller range is up to date and reflects new product developments and improvements, performance data is constantly being updated. This updated information is included on the Fans by Fantech Product Selection Program and Fantech website, the data contained in this catalogue is correct at the time of print.

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