

Fans in Fire Safety
Pressurisation and Ventilation Equipment



FläktWoods

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Introduction

Fläkt Woods Limited (FW) are the acknowledged leaders in the specialised world of air movement technology.

Over 100 years experience in designing and manufacturing air movement equipment has kept FW in the forefront of innovation, enabling the company to maintain their leadership in a sophisticated and competitive market.

This long experience and expertise forms the basis for the range of fans and roof extract units designed specifically for the control and ventilation of fire smoke.

Fläkt Woods Limited are a company committed to Quality Assurance.

Registration to BS EN ISO 9001:94 means that FW design is quality assured as well as the manufacture. The commitment to quality doesn't stop with the hardware. The performance data comes from standard tests carried out in FW's own laboratory which is BSI and AMCA approved. Woods fans can be bought with the confidence that they will achieve the published performance data and match the assured quality essential in FIRE SAFETY SYSTEMS.

Two main areas of fire safety are detailed within this publication.

Smoke Control by PRESSURISATION Smoke Control by VENTILATION

Further detailed information on Fan selections and specification can be obtained from Publication JM/SS or by contacting a Fläkt Woods Sales Centre.

Applications

There are basically two methods of Fire Smoke Control which utilise fans and fan equipment - PRESSURISATION and VENTILATION.

In any building fire smoke can be the major killer, and hence reliable smoke control systems can act both to save lives and assist fire fighting. Woods Fire Safety Fans are designed and tested for use in smoke control systems.

Smoke Control by PRESSURISATION

PRESSURISATION is often the preferred method of smoke control in buildings where the staircases, lift lobbies and corridors form part of the escape routes. i.e. high rise buildings with multiple occupants, Hotels, Offices and Residential Flats. Smoke Control using pressure differential is based on two simple principles:-

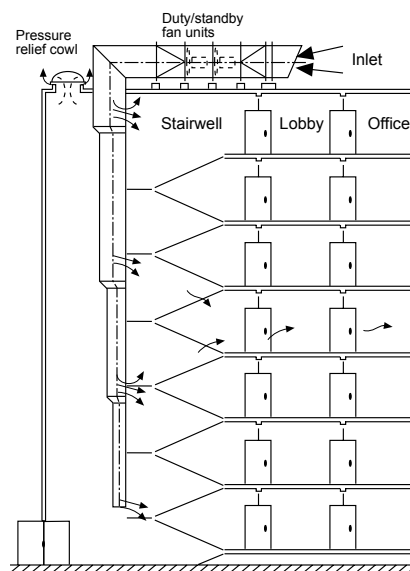
Airflow can control smoke movement if the average VELOCITY is of sufficient magnitude

A PRESSURE differential across a barrier can act to control smoke movement.

These two principles form the basis for the design of pressurisation systems to control smoke movement, the details of which are outlined in the Fire Safety in Buildings

- Codes of Practice - BS5588 Parts 4 and 5.

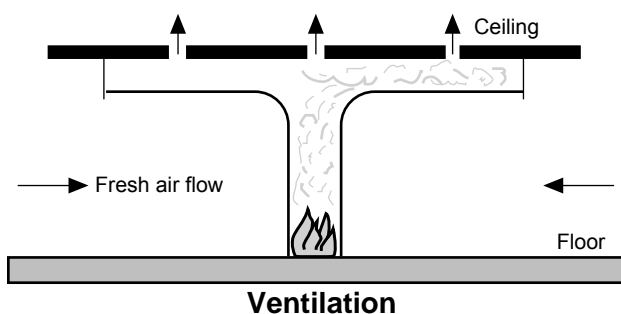
Stairwell Pressurisation System Schematic



Pressurisation

Woods offer fans from their JM Aerofoil/Varofoil ranges for use on pressurisation supply systems, and their H.T. Series Bifurcated for Exhaust Systems, supported by Woods Technical Paper ref WTP41 - Fans In Fire Safety- Smoke Control By Pressurisation.

Smoke Control by VENTILATION



VENTILATION is used mainly in buildings with large open areas - Shopping Malls, Sports Centres, Car Parks, Department Stores etc. Smoke Ventilation systems are designed to:-

- Keep the hot smoke above the escaping occupant.
- Assist the fire brigade in fighting fire.
- Minimise damage to buildings and contents.
- Clear the residue smoke after fire has been extinguished.

Smoke Ventilation fans are required to exhaust the hot fire smoke away from the building for given periods of time. Woods H.T. and JM H.T. Series smoke venting fans and roof extract units achieve this using simple designs and well proven components.

The application of the H.T. fan ranges are supported by two Woods Fans In Fire Safety technical papers ref WTP20 - Fans For Fire Smoke Venting and WTP 39 Regulations, Codes of Practice, System Reliability.

All H.T. Series fans and roof extract units are suitable for continuous operation at temperatures up to 500°C maximum and can therefore be used to provide the normal ventilation requirements of the building.

Pressurisation Equipment

Supply Fans - JM Aerofoils

Woods new JM Aerofoil fans meet all the requirements of Pressurisation Supply fans identified in WTP41.

JM Aerofoils develop up to 15% more pressure than more traditional aerofoil sections providing improved stability and steeper performance curves. (see opposite).

Blade pitch angles of JM Aerofoil fans can be simply adjusted on site, allowing the air duty to be matched to site conditions (within motor limitations).

JM Aerofoils are lightweight. Their impellers are electronically balanced allowing their installation into most structures.

This catalogue details only a small selection from the JM Aerofoil range chosen to meet most Pressurisation Supply fan duties. For full product specification and performance see publications C22a and C23a.

Supply Fans - Varofoil

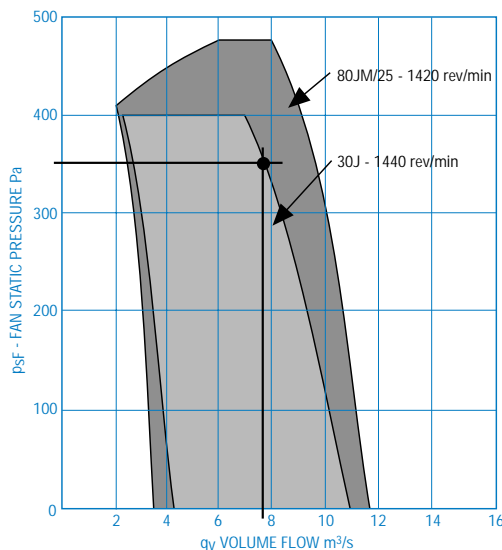
Woods Varofoil - Variable Pitch in Motion fans are available to provide the supply air for a pressurisation system. The performance of the fan can be automatically adjusted to match the requirements of the system thereby reducing the size of pressure relief dampers.

Publication VF2010 details full information on Woods Varofoil range.



Supply Fans - standby

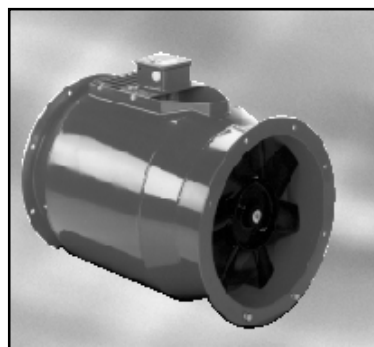
Fans can be mounted in either Series or Parallel to provide 100% standby. Please consult Woods technical staff for advice on selection.



Exhaust Fans - H.T. Series

Most Woods H.T. Series Bifurcated fans are independently tested and certified by T.U. - Munich to handle 600C for 90 minutes - category G of BS7346 Part 2. This rating is above that recommended by most codes of practice.

For additional information please refer to section on smoke venting equipment in this publication.



Pressure Relief Cowls

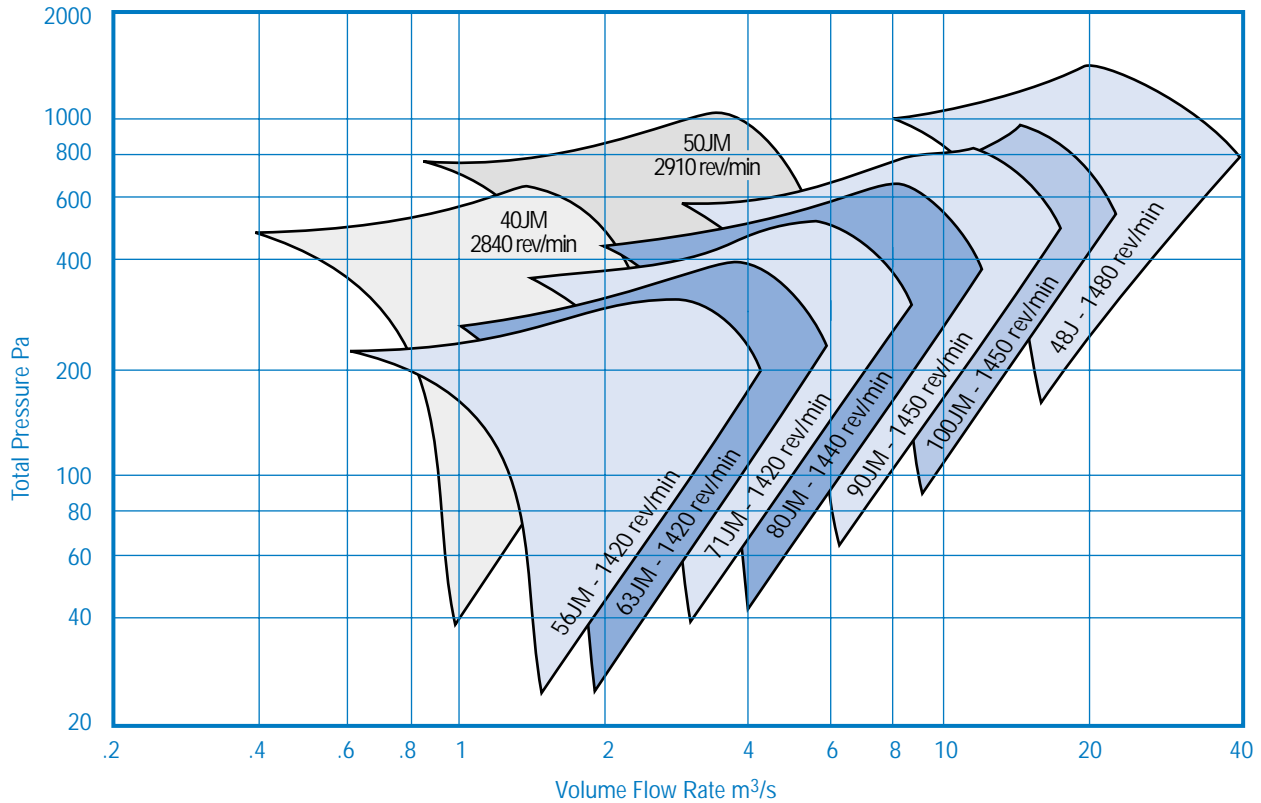
Woods Pressure Relief Cowls provide a convenient unobtrusive method of bleeding the excess air from the staircase, necessary to maintain 50 Pa with all doors closed. Based on the Woods Colchester Range of roof extract units, they are roof top mounted and generally out of sight.

Ancillaries

Guards	Bellmouth Inlets
Mounting feet	Vibration Isolators
Matching flanges	Pressure relief dampers/
Flexible connectors	Cowls
Air operated dampers	

Performance Data

JM Aerofoils - Supply Air Fans



				m³/sec @ Pa							380-420 V / 50 Hz / 3ϕ			
Code	Speed rev/min	dB(A) @ 3m	Pitch Angle (°) min/max	0	50	100	200	300	400	500	Motor	Motor Rating (kW)	Full Load Current (at 400 V) (A)	Starting Current (at 400 V) (A)
40JM/16/2/5...	2840	67 67	8° 32°	1.0 2.6	0.95 2.5	0.9 2.4	0.8 2.25	0.7 2.1	0.5 1.85	- 1.6	BT9 CT9	0.58 1.70	1.4 3.5	6.0 20.0
50JM/20/2/6...	2910	77 73	8° 24°	2.1 4.3	2.0 4.2	1.9 4.1	1.8 4.0	1.6 3.8	1.5 3.6	1.4 3.4	CT9 F2225	1.70 3.80	3.5 7.1	20.0 44.0
56JM/20/4/6...	1420	61 64	8° 38°	1.5 4.2	1.4 4.0	1.3 3.2	0.7 3.0				BT9 CT9	0.3 1.4	0.9 3.5	4.6 14.0
63JM/20/4/6...	1420	67 69	8° 36°	2.0 6.0	1.8 5.6	1.6 5.3	1.3 4.6				CT5 F2225	0.58 2.7	1.7 5.8	6.5 31.0
71JM/20/4/6...	1420	69 69	8° 36°	3.1 8.8	2.8 8.4	2.6 8.0	2.2 7.3	1.6 6.3			CT9 F2249	1.4 4.4	3.5 9.3	14.0 52.0
80JM/25/4/6...	1440	72 75	8° 36°	4.2 11.2	4.0 10.8	3.8 10.5	3.0 9.6	2.0 8.0			F2245 D132/18	2.1 6.3	4.7 12.8	30.0 65.0
90JM/25/4/6...	1450	75 79	8° 32°	6.2 15.2	5.9 14.6	5.6 14.1	4.7 13.2	3.8 12.0	2.5 10.5		F2245 D132/24	2.1 9.0	4.7 18.0	30.0 100.0
100JM/25/4/6...	1450	78 83	8° 32°	9.0 22.0	7.0 21.0	8.0 20.0	7.0 18.5	6.0 17.5	4.5 15.5	3.5 13.5	F2249 D160/26	4.4 17.0	9.3 33.0	52.0 185.0
48J	1480	84 94	8° 31°	17.0 41.6	16.6 41.2	16.3 41.0	15.9 40.1	15.1 39.6	14.7 38.5	14.0 37.4	D160/LBK D200/57	25.0 65.0	44.0 120.0	330.0 790.0

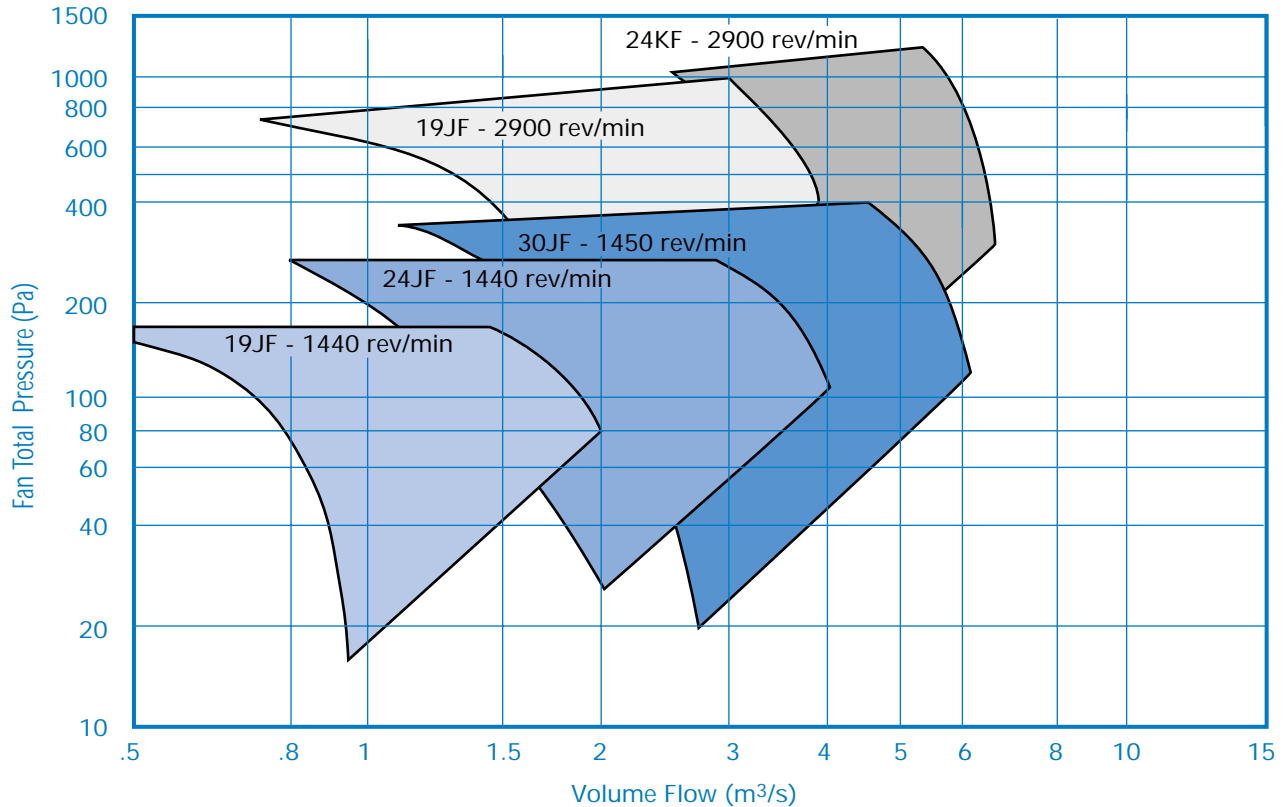
Notes

Fans detailed above are a small selection from the JM Aerofoil range, chosen to cover most Pressurisation System duties. They are not the only fans available and alternatives may better suit the requirements of a particular system, see publication C22a, C23a or C1a.

100 % standby can be provided by mounting JM Aerofoils in either series or parallel. Please Consult Woods technical staff for advice on fan selection.

Performance Data

Bifurcated Fans - HT600/1.5B - Exhaust System Fans



Code	Speed rev/min	dB(A) @ 3m	Pitch Angle (°) min/max	m³/sec @ Pa								380-420 V / 50 Hz / 3φ			
				0	50	100	200	300	400	500	600	Motor	Motor Rating (kW)	Full Load Current (at 400 V) (A)	Starting Current (at 400 V) (A)
19 JF	1440	58	8°	1.0	0.85	0.72						F2245C	1.0	2.4	14.0
		62	28°	2.15	1.95	1.80						F2245C	1.0	2.4	14.0
19 JF	2900	75	8°	2.0	1.9	1.80	1.75	1.60	1.45	1.3	1.0	F2225C	2.5	5.6	38.0
		79	28°	4.4	4.3	4.2	3.95	3.75	3.60	3.4	3.2	F2229C	5.5	11.1	90.0
24 JF	1400	65	8°	1.7	1.6	1.4	0.9					F2245C	1.0	2.4	14.0
		69	28°	4.3	4.0	3.8	3.3					F2245C	2.2	5.0	30.0
24 KF	2950	83	8°	3.5	3.45	3.4	3.3	3.2	3.1	3.15	3.0	D132SC	5.5	10.9	65.0
		87	28°	7.2	7.15	7.1	7.0	6.9	6.7	6.5	6.4	D160LC	18.5	34.8	245.0
30 JF	1450	73	8°	2.7	2.5	2.3	1.8	1.1				F2245C	1.8	4.1	24.0
		75	20°	6.6	6.4	6.1	5.7	5.0				F2249C	3.8	7.7	45.0

Bifurcated fans must be sited away from the fire zone to ensure a supply of ambient air to motor compartment (50°C Max)

Smoke Venting Equipment

Woods of Colchester Limited, have made Aerofoil fans suitable for continuous operation in high temperature air streams for over 25 years. These fans are currently fitted into Drying Machines, and Smoke Venting systems, all over the world.

This long experience forms the basis for the new range of H.T. SERIES fans and roof extract units designed specifically for Fire Smoke Ventilation.

Woods manufactures fan motors, and is therefore able to look critically at the requirements of motor insulation, bear-

ings and lubricants which are vital elements in achieving high temperature performance. Extensive stress tests on fan impellers for operation at high temperatures has enabled Woods to make the best use of existing designs and materials.

A full high temperature test programme has been successfully completed. Some of these tests were carried out at independent laboratories.

These tests, combined with Woods' renowned high standard of engineering and quality assurance, serve to support

the H.T. Series specification.

Extensive market research has resulted in the H.T. Series being offered in six temperature/time categories. This added flexibility enables a fan, or roof extract unit, to be selected to match the requirements of the system, ensuring the most cost effective installation.

The equipment detailed in this publication is not the full range of items available. If the requirement is not included please enquire to head office.

CATEGORY		CATEGORY CODE *	FAN TYPES AVAILABLE	ROOF EXTRACT UNITS AVAILABLE
TEMPERATURE (°C)	TIME (Hours)			
150	2.0	H.T.150/2	AEROFOIL BIFURCATED VAROFOIL	DVA & UDA
200	2.0	H.T.200/2	AEROFOIL BIFURCATED VAROFOIL	DVA & UDA
250 300	2.0 0.5	H.T.300/0.5	AEROFOIL BIFURCATED VAROFOIL(†)	DVA & UDA
300	1.0	H.T.300/1	AEROFOIL BIFURCATED	DVA & UDA
400	2.0	H.T.400/2A	AEROFOIL BIFURCATED	UDA
600	1.5	H.T.600/1.5B	BIFURCATED	UDA

(†) Varofoil Fan - For Temperatures Above 250°C Please Enquire.

* Add suffix "B" when Bifurcated fan is specified, eg. H.T.400/2B

Performance Testing

Quality is assured at Woods. The H.T. SERIES is no exception, the compliance of Woods to EN ISO 9001.94 the international standard for Quality Assurance confirms this.

H.T. Series fans and roof extract units have successfully completed an extensive programme of high temperature tests in accordance with BS7346: Part 2: 1990, from 200 °C to 600 °C for periods varying from 30 minutes to two hours.

Some of these tests have been witnessed by independent authorities such as the Loss Prevention Council (F.I.R.T.O.) in the U.K., or undertaken in independent laboratories at C.T.I.C.M. in France and Technische Universität (T.Ü.) in Germany.

The H.T. Series is certified and approved for use in fire smoke venting systems.

BS



Specifications - Fans

Aerofoil Fans

Full technical data of the highly efficient Woods Aerofoil Fan range can be found in publication C22a and C1a.

Aerofoil fan motors are rated to handle the peak powers of the fans at both ambient and high temperature. Aerofoil fans have a safe non-overloading characteristic. **Two speed motors available** - please enquire.

Casings

The cylindrical casing, housing the fan, is made of steel, hot dipped galvanised after manufacture. It is flanged at each end.

S-Type - The casing surrounds the impeller only and supports the motor mounting. The electrical terminal box is mounted on the motor. Suitable for temperatures up to 300°C.

L-Type - The casing completely surrounds both the impeller and motor. The terminal box is mounted on the casing and pre-wired at works.

Bifurcated - Simpler than the usual or split case fan, the Woods Bifurcated Aerofoil is similar to a normal axial flow fan, but the motor is isolated from the main air stream in a tunnel which extends to one side of the fan casing. The motor is cooled by a cooling fan mounted on the tail end of the motor. An unobstructed supply of air at ambient temperature of max 50 °C must be available to cool the motor, through the tunnel.

Impellers

Fan categories H.T.150/2: H.T.300/0.5 and H.T.300/1 mostly use the classic Woods

Aerofoil impeller, die cast in aluminium alloy. Components are X-ray inspected to ensure compliance with standards. Categories H.T.400/2A:

H.T.400/2B use either an aluminium impeller or a specially designed impeller fabricated in steel to provide stability at the higher temperatures. The H.T.600/1.5 uses the steel impeller exclusively.

Both impellers have a range of blade angles and impeller solidity (number of blades) for flexibility of air duty. Impeller blade angles are set and fixed at works.

Motors

Woods H.T. Series fans utilise a totally enclosed squirrel cage motor. The motor carcass is constructed of either aluminium alloy or cast iron dependent on the temperature of operation.

The grades of motor insulation have been selected to meet the specific requirements of each H.T. Category, as the essential property of withstanding thermal shock is not common to all high temperature materials. At temperatures above 400°C, bifurcated fans with motor out of the air stream are the only reliable solution.

Motor tests indicate that when new, all motors used on Woods H.T. Series fans have a safety margin of an average of twice the expected survival times, this being based on Woods extensive test experience gained during the development of their range of specifications.

Lubrication

Woods H.T. Series fan motor bearings must be lubricated

strictly in accordance with the instructions on the motor name-plate.

The motor bearings and greases used in the H.T. Series have been selected to provide long life at normal ambient temperature and still survive the emergency condition during this life-time.

The special greases required for fan motors operating above 300°C are unsuitable for conventional relubricating methods - extended lubricators, grease guns etc. Here the motor will need to be dismantled and regreased at specified intervals. This does not apply to Bifurcated Fans where the motor is separated from the hot gases.

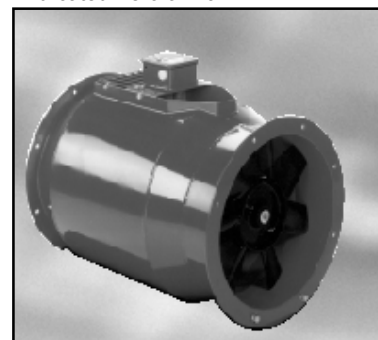
Electrical Supplies

H.T. Series fans are available for connections to 380 - 420 V / 50 Hz / 3 ϕ electrical supplies. For other voltages and frequencies - please enquire.

L-Type Aerofoil Fan



Bifurcated Aerofoil Fan



Specifications - Roof Extract Units

The DVA Unit - Suitable for operation up to 300°C (See page 8 for time categories)

- 5 Unit Sizes 400 mm to 1000 mm.
- Volume Flow up to 10 m³/s.
- Air Pressure up to 500 Pa available

Unit Construction

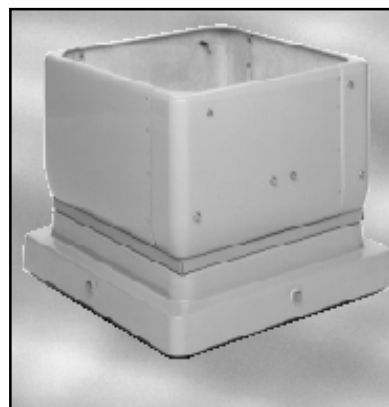
Weathershield and base in strong lightweight glass re-inforced polyester resin rendered fire retardant to BS476: Part 7 Class 2.

Standard colour is to BS4800: 08B/21.

The cowl is secured to the mounting brackets by stainless steel screws. Air operated, anti-backdraught shutters are fitted as standard.

Fans

The DVA range is powered by the Woods Aerofoil fan described on page 10. On an open inlet, a bellmouth must be used to obtain the specified performance. **Two speed motors are available** - please enquire.



DVA Roof Unit

The UDA Unit - Suitable for operation up to 400°C (See page 8 for time categories)

- 9 Unit Sizes 300 mm to 2000 mm.
- Volume Flow up to 45 m³/s.
- Air Pressure up to 1000 Pa available

Unit Construction

The unit base is constructed from sheet steel, hot dipped galvanised after manufacture. The windshield and air operated shutters, designed to prevent the ingress of rain or snow, are manufactured from aluminium.

Fans

The UDA range is powered by the Woods Aerofoil fan described on page 10. On an open inlet, a bellmouth must be used to obtain the specified performance. **Two speed motors are available** - please enquire.



UDA Roof Unit

Ancillaries - Fans and Roof Extract Units

All standard steel ancillaries e.g. Mounting Feet, Bellmouth Inlets, Matching Flanges, Wire Guards etc., are suitable for 600°C,

Aerofoil dampers are limited to 400°C.

Upstream Guidevane Units ie GJ type fans with aluminium impellers

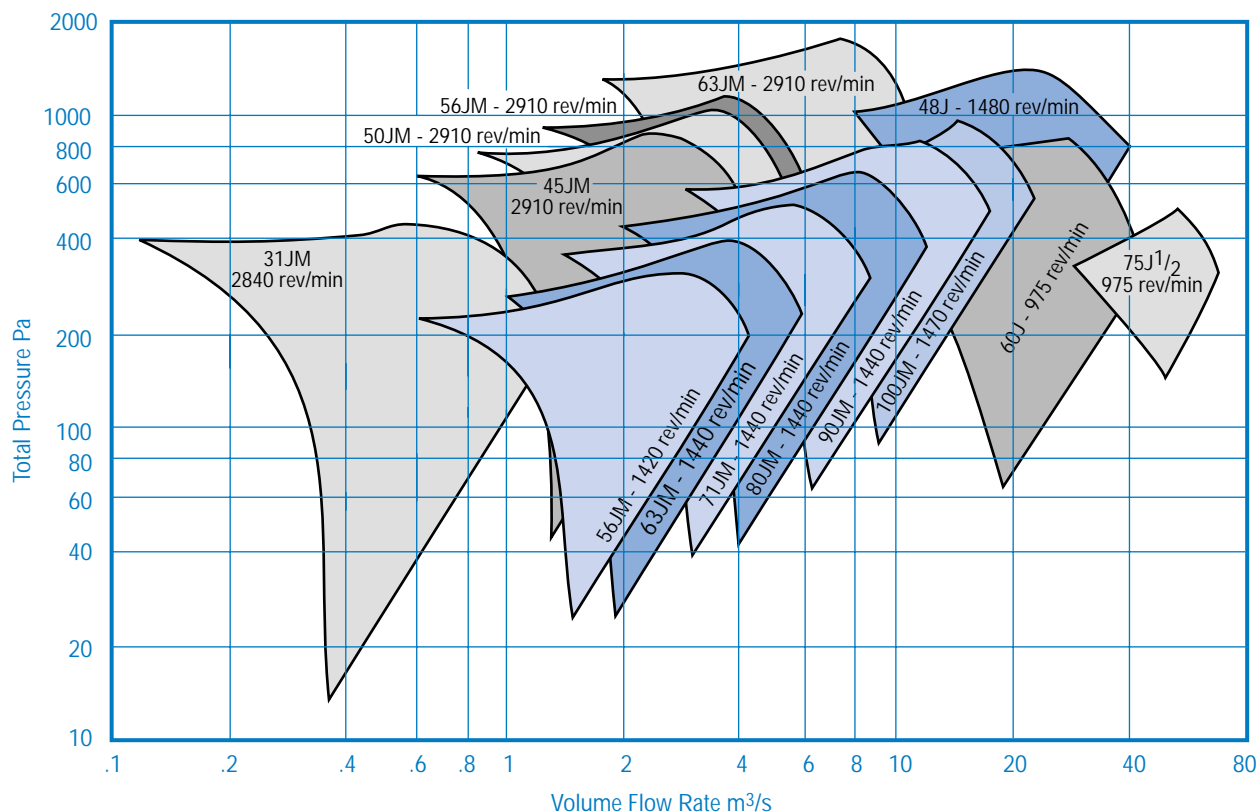
can be used up to 300°C, providing the impeller is suitable for this temperature.

Flexible Connector - Silicon coated glass fibre fabric.

Vibration Isolators - Spring type are available for all fans.

Aerofoil Fans

Category - HT150/2; HT200/2; HT300/0.5; HT300/1



Notes:-

1. Most Woods Aerofoil Fans can be built to the H.T. Series specification. A selection of popular fans are detailed in this publication. Please enquire for alternative pitch angles and speeds.

2. The performance curves shown are examples of the range of fans available. Fully specified quotations for single or two speed fans will be supplied upon request.

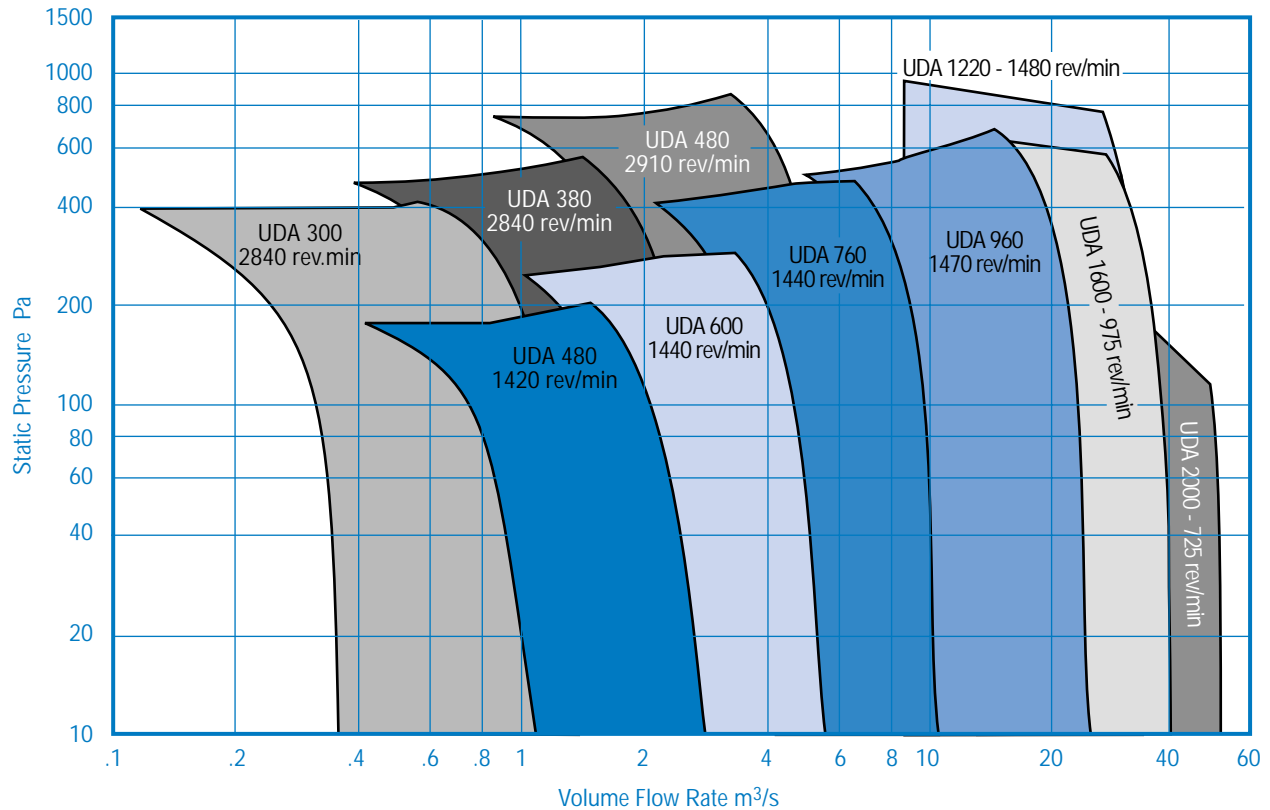
Code	Motor	Motor Rating (kW)	Speed rev/min	Pitch angle (max.)
31JM/16/2/5...	CT5 (†) D80/A	1 0.9	2840 2840	40° 40°
45JM/20/2/6...	F2229B (†) D112/M	5.7 4.6	2910 2910	40° 40°
50JM/20/2/6...	F2229B (†) D112/M	5.7 4.6	2910 2910	32° 28°
56JM/20/2/6...	F2229B (†) D112/M	5.7 4.6	2910 2910	22° 18°
56JM/20/4/6...	F2245B (†) D90/LN	2.5 1.75	1420 1420	40° 40°
63JM/25/2/6...	DF160/L	22	2910	36°
63JM/25/4/9...	F2249B (†) D112/M	4.2 4.6	1440 1440	40° 40°
71JM/25/4/9...	DF132/MS	6.3	1440	36°
80JM/25/4/9...	DF132/M	10	1440	36°
90JM/25/4/9...	DF160/L	17.3	1440	36°
100JM/25/4/9...	DF160/LBK	25	1470	36°
48J	DF225/M	54	1480	26°
60J	DF250/MG	45	975	24°
75J ^{1/2}	DF250/MG	37	725	26°

(†) - Not suitable for category HT300/1

Roof Extract Units

TYPE UDA

Category - HT150/2; HT200/2; HT300/0.5; HT300/1



Notes:-

- Most Woods Aerofoil Fans can be built to the H.T. Series specification. A selection of popular fans are detailed in this publication. Please enquire for alternative blade pitch angles and speeds.
- The performance curves shown are examples of the range of fans available. Fully specified quotations for single or two speed fans will be supplied upon request.
- When selecting aerofoil fans for use in Roof Extract Units allow for the following overall static pressure losses through the unit:-

Type UDA - 1.0 x fan velocity pressure. (Plus any inlet duct system resistance).

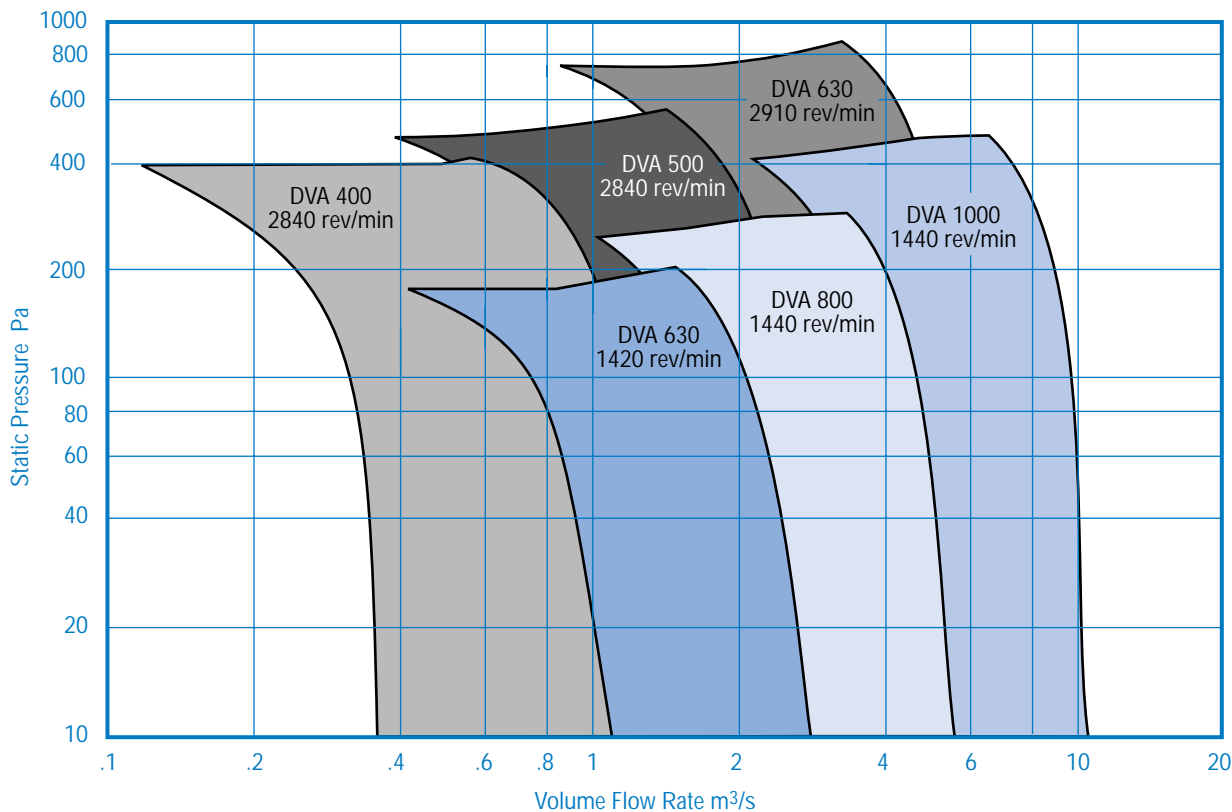
Code	Fan Ref	Motor Rating (kW)	Speed rev/min	Pitch angle (max.)
UDA 300	31JM CT5 (†)	1.0	2840	40°
	31JM D80/A	0.9	2840	40°
UDA 380	40JM CT9 (†)	1.7	2840	32°
	40JM D80/A	0.9	2840	18°
UDA 480	50JM F2229B (†)	5.7	2910	32°
	50JM D112/M	4.6	2910	28°
	50JM CT9 (†)	1.3	1420	40°
	50JM D80/B	0.9	1420	40°
UDA 600	63JM DF160/L	22.0	2950	36°
	63JM F2249B (†)	4.2	1440	36°
	63JM D112/M	4.6	1440	36°
UDA 760	80JM DF132/M	10.0	1440	36°
UDA 960	100JM DF160/LBK	25.0	1470	36°
UDA 1220	48J DF225/M	52.0	1480	26°
UDA 1600	60J DF250/M	55.0	975	29°
UDA 2000	75J ^{1/2} DF250/MG	37.0	725	26°

(†) - Not suitable for category HT300/1

Roof Extract Units

TYPE DVA

Category - HT150/2; HT200/2; HT300/0.5; HT300/1



Notes:-

1. Most Woods Aerofoil Fans can be built to the H.T. Series specification. A selection of popular fans are detailed in this publication. Please enquire for alternative blade pitch angles and speeds.

2. The performance curves shown are examples of the range of fans available. Fully specified quotations for single or two speed fans will be supplied upon request.

3. When selecting aerofoil fans for use in Roof Extract Units allow for the following overall static pressure losses through the unit:-

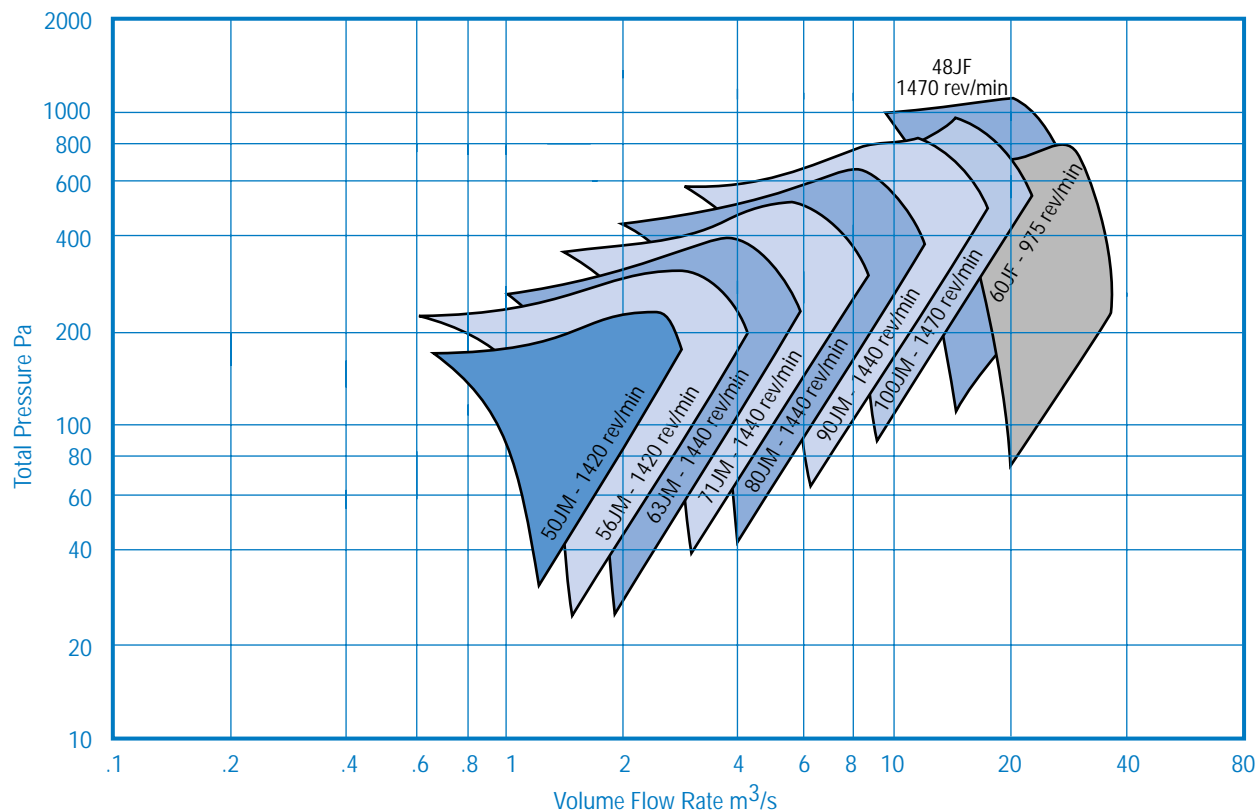
Code	Fan Ref.	Motor Rating (kW)	Speed rev/min	Pitch angle (max)
DVA 400	31JM CT5 (†)	1.0	2840	40°
	31JM D80/A	0.9	2840	40°
DVA 500	40JM CT9 (†)	1.7	2840	32°
	40JM D80/A	0.9	2840	18°
DVA 630	50JM F2229/B(†)	5.7	2910	32°
	50JM D112/M	4.6	2910	28°
	50JM CT9 (†)	1.3	1420	40°
	50JM D80/B	0.9	1420	40°
DVA 800	63JM F2249/B(†)	4.2	1440	40°
	63JM D112/M	4.6	1440	40°
DVA 1000	80JM DF132/M	10.0	1440	36°

(†) - Not suitable for category HT300/1

Type DVA - 0.2 x fan velocity pressure. (Plus any inlet duct system resistance).

Aerofoil Fans

Category - HT400/2



Notes:-

1. Most Woods Aerofoil Fans can be built to the H.T. Series specification. A selection of popular fans are detailed in this publication. Please enquire for alternative blade pitch angles and speeds.

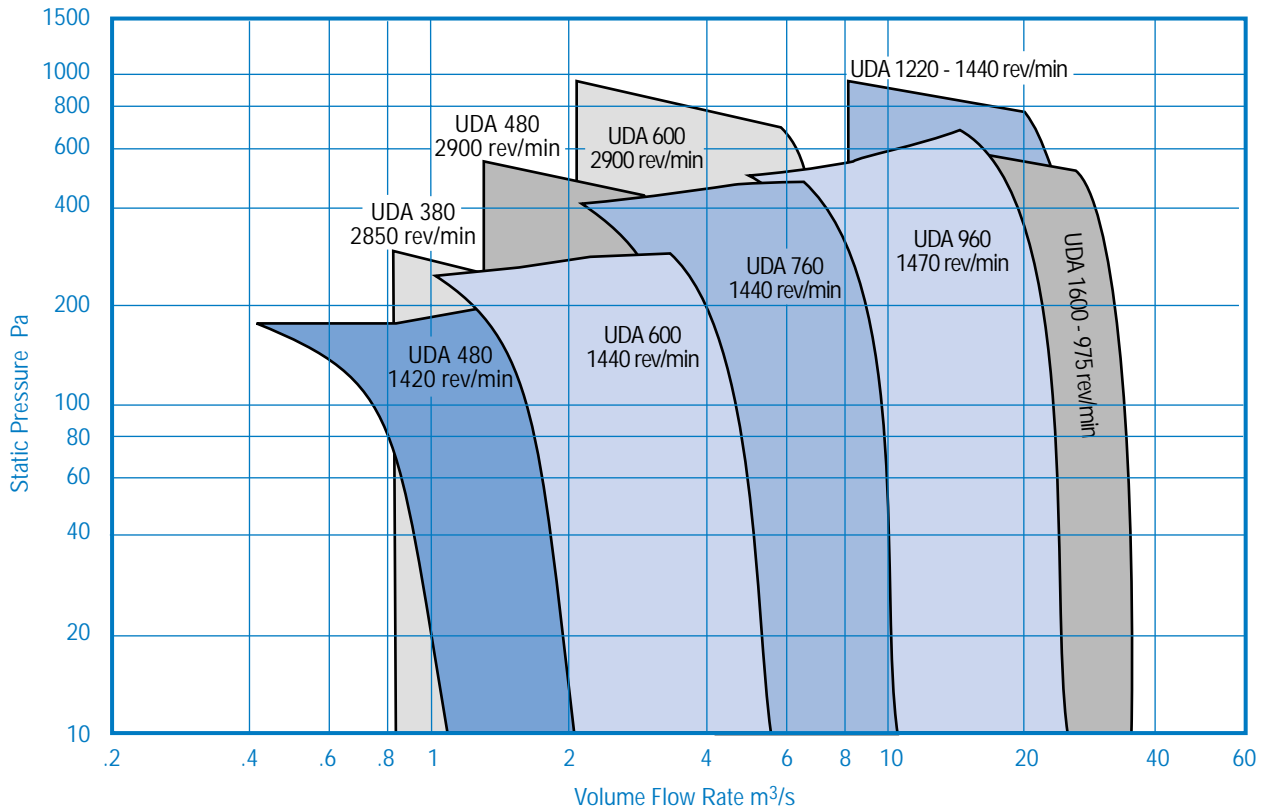
2. The performance curves shown are examples of the range of fans available. Fully specified quotations for single or two speed fans will be supplied upon request.

Code	Motor	Motor Rating (kW)	Speed rev/min	Pitch angle (°) (max.)
50JM/20/4/6...	D80/B	0.75	1420	36°
56JM/20/4/6...	D90/LN	1.5	1420	40°
63JM/25/4/9...	DF112/M	4	1440	40°
71JM/25/4/9...	DF132/MS	5.5	1440	36°
80JM/25/4/9...	DF160/LM	11	1440	36°
90JM/25/4/9...	DF160/LAK	18.5	1440	36°
100JM/25/4/9...	DF160/LBK	21	1470	32°
48JF	D225/M	40.5	1470	20°
60JF	D250/M	40.5	975	20°

Roof Extract Units

TYPE UDA

Category - HT400/2A



Notes:-

- Most Woods Aerofoil Fans can be built to the H.T. Series specification. A selection of popular fans are detailed in this publication. Please enquire for alternative blade pitch angles and speeds.
- The performance curves shown are examples of the range of fans available. Fully specified quotations for single or two speed fans will be supplied upon request.
- When selecting aerofoil fans for use in Roof Extract Units allow for the following overall static pressure losses through the unit:-

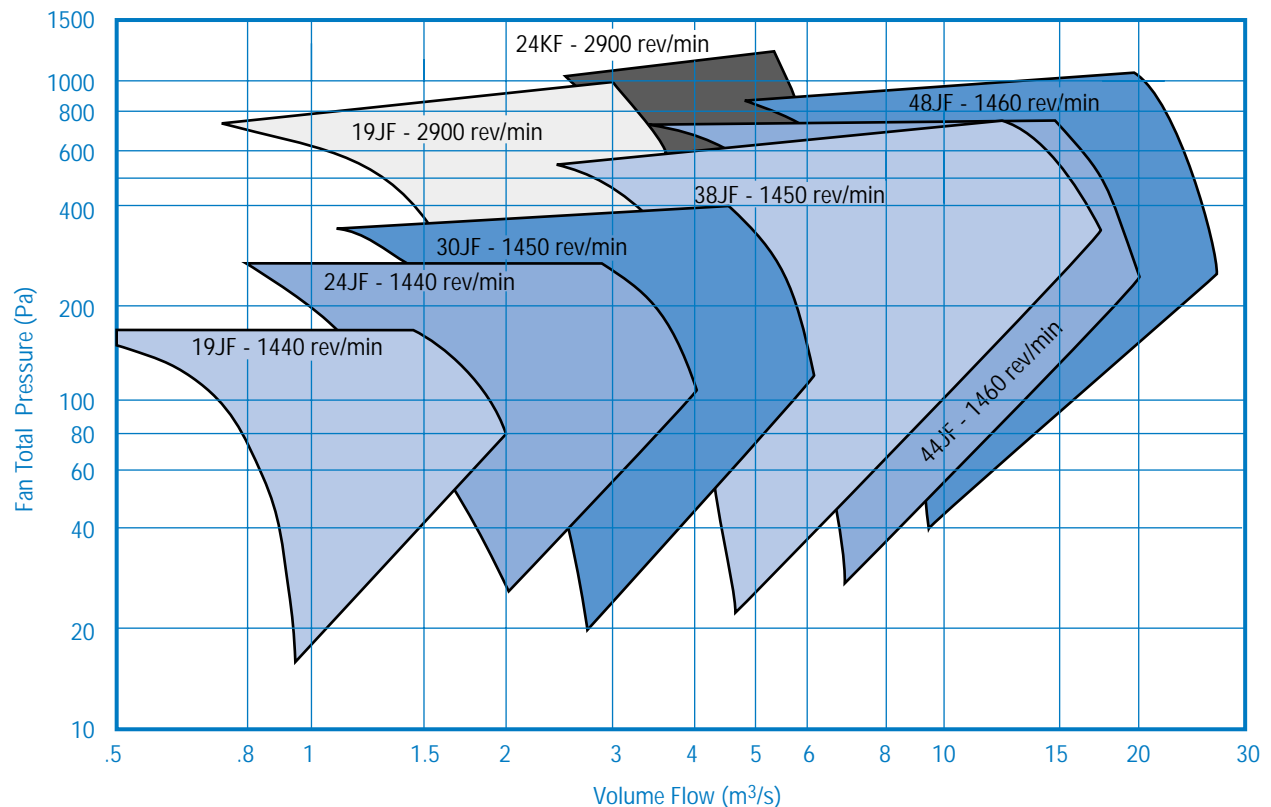
Type UDA - 1.0 x fan velocity pressure. (Plus any inlet duct system resistance).

- For this category L-type Aerofoil fans only are available.

Code	Fan Ref.		Motor Rating (kW)	Speed rev/min	Pitch angle (max.)
UDA 380	15J	D90/LN	2.2	2850	36°
UDA 480	19JF	D112/M	4.0	2900	24°
	50JM	D80/B	0.75	1420	36°
UDA 600	24KF	D160/LMB	15.0	2900	28°
	63JM	DF112/M	4.0	1440	40°
UDA 760	80JM	DF160/LM	11.0	1440	36°
UDA 960	100JM	DF160/LBK	21.0	1470	32°
UDA 1220	48JF	D225/M	40.5	1470	20°
UDA 1600	60JF	D250/M	40.5	975	20°

Bifurcated Fans

Category - HT400/2B; HT600/1.5B



Notes:-

1. Most Woods Bifurcated Fans can be built to the H.T. Series specification. A selection of popular fans are detailed in this publication. Please enquire for alternative blade pitch angles and speeds.

2. The performance curves shown are examples of the range of fans available. Fully specified quotations for single or two speed fans will be supplied upon request.

3. Bifurcated fans must be sited away from the fire zone to ensure a supply of ambient air to motor compartment (50°C Max).

Code	Motor	Motor Rating (kW)	Speed rev/min	Pitch angle (max.)
19JF	F2229C	5.5	2900	28°
19JF	F2245C	1.0	1440	28°
24KF	D160LC	18.5	2900	28°
24JF	F2245C	2.2	1440	28°
30JF	F2249C	3.8	1450	20°
38JF	D180LD	22.0	1450	28°
44JF	D200LD	30.0	1460	20°
48JF	D225MD	45.0	1460	20°

Control Equipment

An essential part of any Smoke Venting system is its control gear. Woods offer the following control system variations with the H.T. Series Fans and Roof Extract Units on Fire Safety Systems.

1 Emergency Extract Only:

Type ESS.
Type ESS/SD Star Delta

2 Normal Ventilation/ Emergency Extract Starter:

(Single Speed Units)
Type EDSS/D.O.L.
Type EDSS/SD Star Delta.

3 Two Speed Starter/High Speed Emergency Extract:

(Two Speed Units)
Type EDSS/DW Dual Wound.
Type EDSS/PC Pole Change.

In emergency conditions fans can be started in one of three ways:

- Using emergency button mounted on control panels.
- By automatic smoke detectors.
- By using manual remote emergency buttons.

Electrical Supply

Three Phase Panels require a sustained three phase supply plus neutral, wired with fire resistant cable and a separate single phase supply for the control circuits.

Single Phase Panels require sustained single phase supply wired with fire resistant cable and a separate single phase supply for

the control circuits.

If control circuit supply fails or is disconnected by sensors, panel will switch to emergency extract.

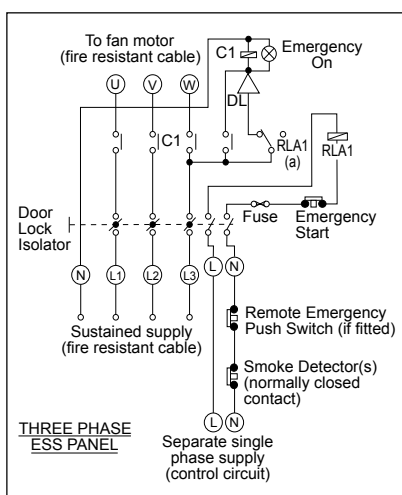
Control circuits are shown suitable for connection to 220-240 volt single phase supply. Other control circuit voltages are available. To ensure that control panels interface correctly with smoke detectors, please advise details of smoke detectors to be used. Note: Smoke detectors and remote emergency buttons are not supplied with the control panel. If fitted, overheat protectors in motor windings and any other motor protection device, must be by-passed in emergency.

Emergency Extract Only (Single Speed)

Fans/control operated in emergency conditions only.

Panel Ref:

ESS D.O.L Starting
ESS/SD Star/Delta Starting
(Automatic)

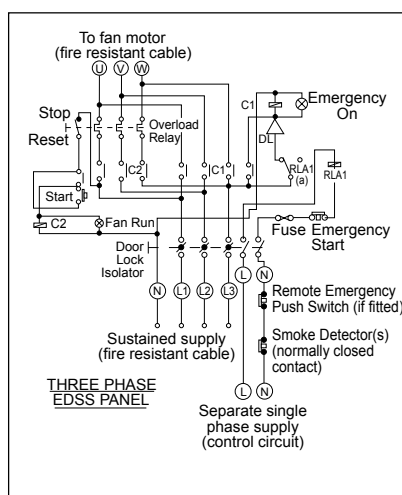


Starter/Emergency Extract (Single Speed)

For normal ventilation panel functions as a standard manual starter switching to permanent operation in emergency.

Panel Ref:

EDSS D.O.L Starting
EDSS/SD Star/Delta Starting
(Automatic)



Control Equipment (continued)

Using two speed motors for normal ventilation using either speed, panel functions as a D.O.L. starter, switching to high speed in emergency conditions.

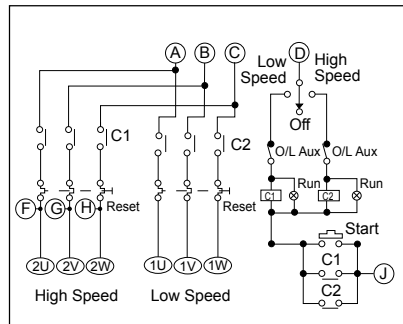
Panels can be supplied for use with two speed dual wound or pole change motors.

Panel Ref:
EDSS/DW Two speed dual wound motors
EDSS/PC Two speed pole change motors

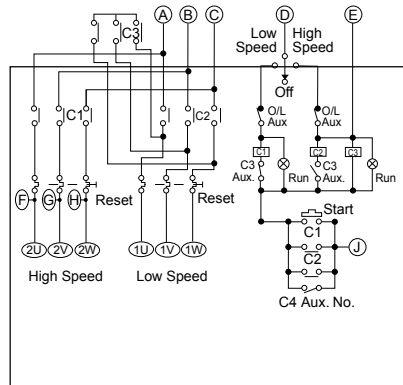
D.O.L. starting both speeds is standard.

Automatic Star/Delta starting can be supplied with EDSS/DW panels, please enquire.

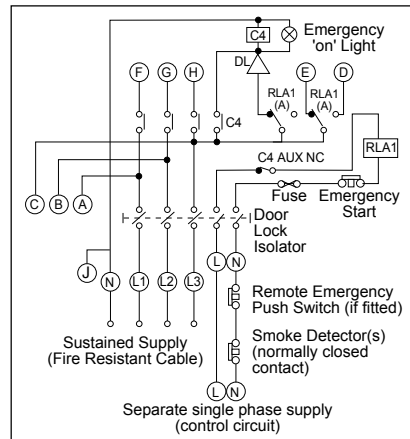
Power switching circuit for EDSS/DW control panel (direct on line starting).



Power switching circuit for EDSS/PC control panel (direct on line starting).



Control circuit for EDSS/PC and EDSS/DW control panels (direct on line starting).

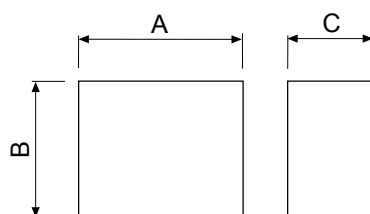


Panel construction & dimensions

All Woods smoke venting control gear is housed in sheet steel enclosures to IP44 and have the following standard features:

- Door Lock Isolator
- Indicator Lights
- Panels supplied with removable gland plates

Control Panel Dimensions

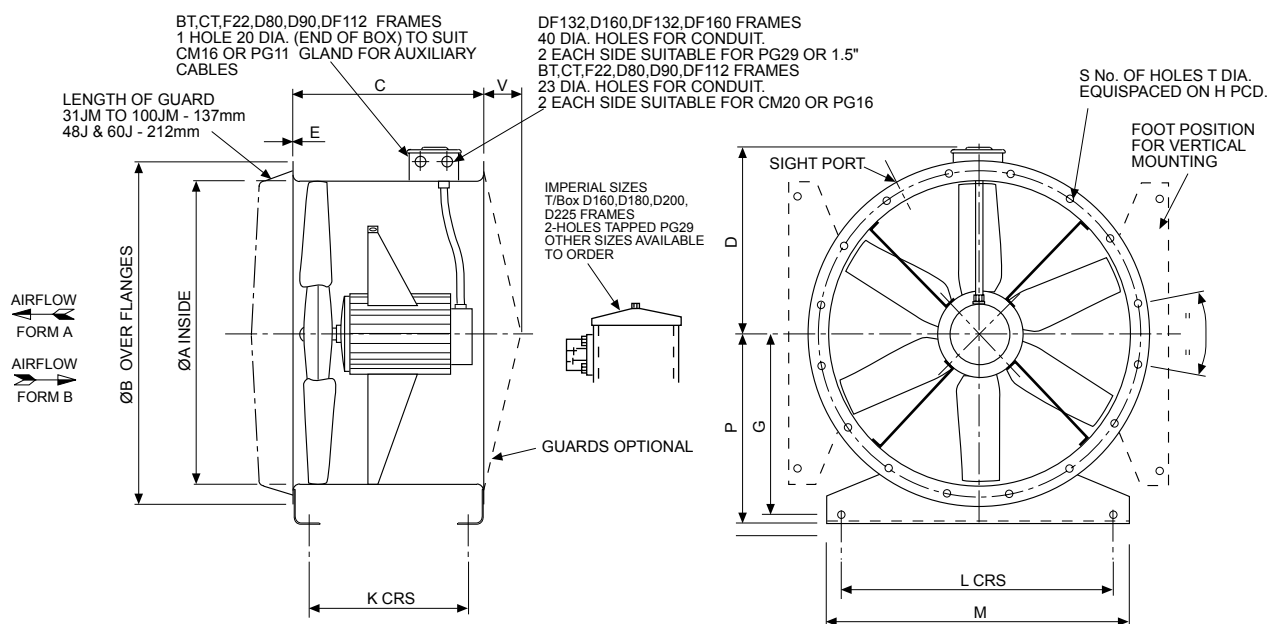


Model	Rating (kW)	A	B	C
ESS	4,5.5,9,11	215	215	150
ESS	22 & 37	240	420	240
EDSS	4 & 5.5	215	215	150
EDSS	9 & 11	240	300	150
EDSS	22 & 27	240	420	240

All dimensions in millimetres

Dimensions and Weights

Aerofoils (L Type)



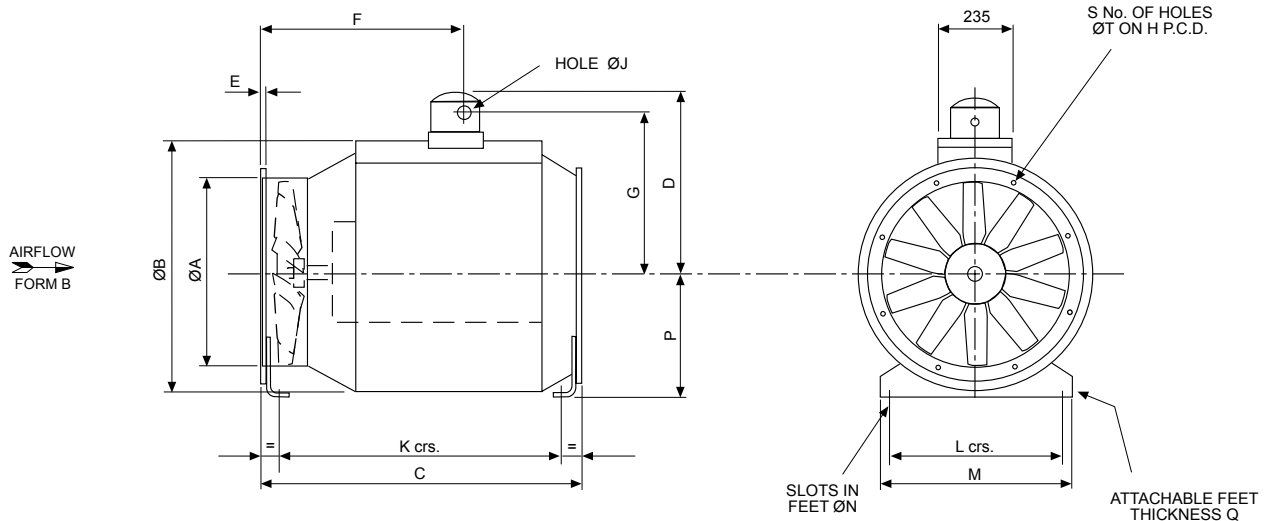
Code	Motor Frame	DIMENSION REFERENCE (mm)															Weight (kg)
		A	B	C	D	E	G	H	K	L	M	N	P	S	T	V	
31JM	CT5 D80	315	395	375	235	2.5	175	355	289	265	315	10	200	8	10	30	27
		315	395	375	235	2.5	175	355	289	265	315	10	200	8	10	30	31
40JM	BT9 CT5	400	480	375	279	2.5	225	450	289	350	400	10	250	8	12	30	26
		400	480	375	279	2.5	225	450	289	350	400	10	250	8	12	30	30
45JM	F2229 DF112	450	530	520	306	3	255	500	434	400	450	10	280	8	12	30	55
		450	530	520	306	3	255	500	434	400	450	10	280	8	12	30	72
50JM	CT9	500	594	375	338	2.5	290	560	289	450	500	10	315	12	12	30	34
	F2225	500	594	520	338	3	290	560	434	450	500	10	315	12	12	30	54
	F2229	500	594	520	338	3	290	560	434	450	500	10	315	12	12	30	65
	DF112	500	594	520	338	4	290	560	434	450	500	10	315	12	12	30	77
56JM	BT9	560	654	375	368	2.5	330	620	289	510	560	10	355	12	12	50	34
	CT9	560	654	375	368	2.5	330	620	289	510	560	10	355	12	12	50	38
	F2245	560	654	520	368	3	330	620	434	510	560	10	355	12	12	50	56
	F2229	560	654	520	368	3	330	620	434	510	560	10	355	12	12	50	67
	D90	560	654	520	368	3	330	620	434	510	560	10	355	12	12	50	58
	DF112	560	654	520	368	4	330	620	434	510	560	10	355	12	12	50	80
63JM	CT5	630	724	375	403	3	375	690	289	580	630	10	400	12	12	50	52
	F2225	630	724	520	403	3	375	690	434	580	630	10	400	12	12	50	70
	F2249	630	724	520	403	3	375	690	434	580	630	10	400	12	12	50	81
	DF112	630	724	520	403	4	375	690	434	580	630	10	400	12	12	50	96
	DF160	630	724	625	440	4	375	690	529	580	630	10	400	12	12	50	234
71JM	CT9	710	804	375	443	3	415	770	259	660	710	10	440	16	12	50	54
	F2249	710	804	520	443	3	415	770	404	660	710	10	440	16	12	50	85
	DF132	710	804	520	480	4	415	770	404	660	710	10	440	16	12	50	147
80JM	F2249	800	894	520	488	3	485	860	404	750	800	10	510	16	12	50	94
	D132	800	894	520	525	5	485	860	404	750	800	10	510	16	12	50	163
	DF132	800	894	520	525	5	485	860	404	750	800	10	510	16	12	50	194
90JM	F2245	900	1006	520	538	3	491	970	444	850	900	10	518	16	15	50	88
	D132	900	1006	520	575	5	491	970	444	850	900	12	518	16	15	50	183
	DF160	900	1006	625	575	5	491	970	549	850	900	12	518	16	15	50	280
100JM	F2249	1000	1106	520	588	3	547	1070	444	950	1000	10	574	16	15	50	107
	D160	1000	1106	625	625	5	547	1070	539	950	1000	12	574	16	15	50	268
	DF160	1000	1106	625	625	5	547	1070	549	950	1000	12	574	16	15	50	317
48J	D160/LBK	1219	1357	711	753	5	-	1289	574	1143	1219	14	737	20	18	86	287
	D200/57	1219	1357	914	753	6	-	1289	777	1143	1219	14	737	20	18	86	562
	D225/M	1219	1357	813	753	6	-	1289	674	1143	1219	14	737	20	18	86	638
60J	D225/M	1524	1694	813	910	6	-	1626	674	1422	1524	14	921	12	18	87	676
	D250/M	1524	1694	914	910	6	-	1626	775	1422	1524	14	921	12	18	87	904
75J 1/2	D250/M	please enquire															

Note : For vertical mounting details of 48J and 60J - please enquire

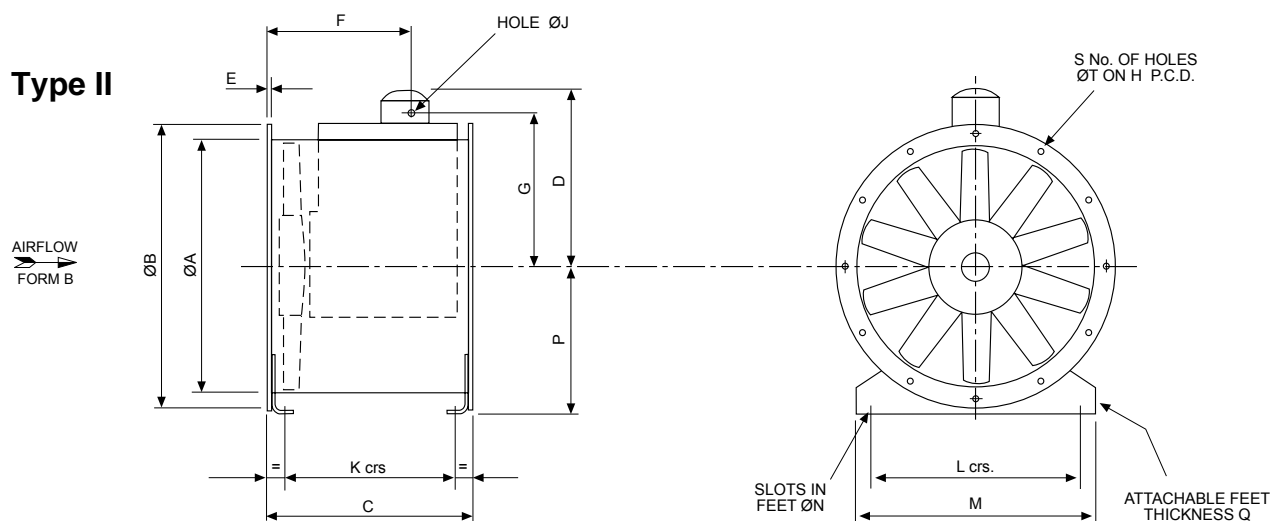
Dimensions and Weights

Bifurcated Fans

Type I



Type II

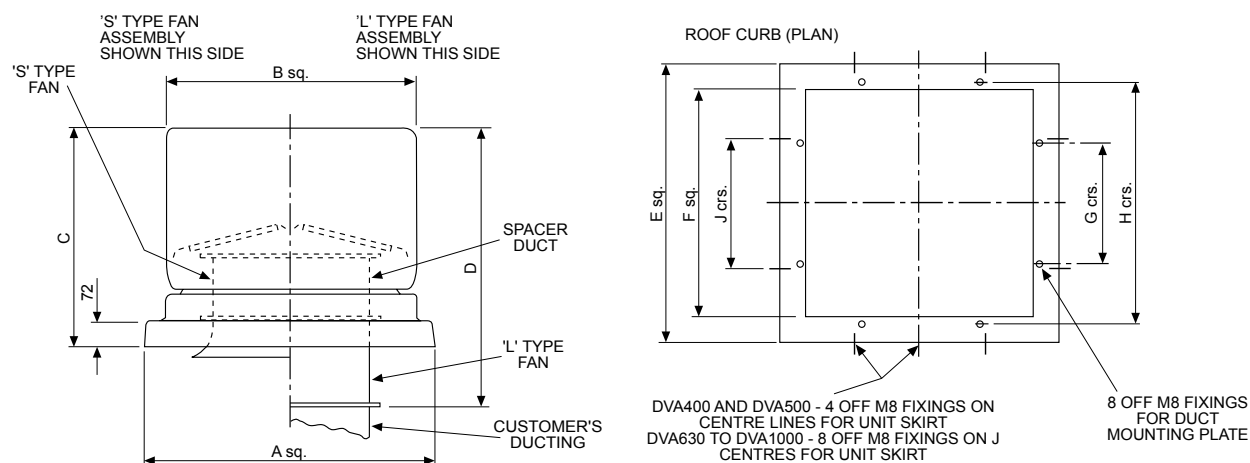


Code	Motor	Type	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	S	T	Weight (Kg)
19JF	F2225/45	I	483	592	787	408	6	376	366	541	692	438	483	11	311	3	8	14	100
	F2229	I	483	592	787	408	6	431	366	541	692	438	483	11	311	3	8	14	112
24JF	F2245	II	610	699	616	427	3	360	385	668	502	559	610	11	381	3	12	14	108
24KF	D132	I	610	721	1050	540	6	495	498	668	930	559	610	11	381	3	12	15	210
	D160LC	I	610	721	1050	578	6	550	493	668	930	559	610	11	381	3	12	15	250
30J	F2249	II	762	851	660	503	5	460	461	821	542	711	762	11	483	5	12	14	147
30JF	F2245	II	762	851	660	503	5	405	461	821	542	711	762	11	483	5	12	14	135
38JF	D180LD	II	965	1103	1000	689	5	565	604	1035	863	914	965	14	597	6	16	19	400
44JF	D200LD	II	1120	1258	1100	768	6	604	683	1190	958	1070	1120	14	710	6	20	15	520
48JF	D225MD	II	1219	1361	1250	827	12	705	736	1289	1099	1143	1219	14	737	6	20	19	750

All dimensions in millimetres

Dimensions and Weights

DVA Roof Units



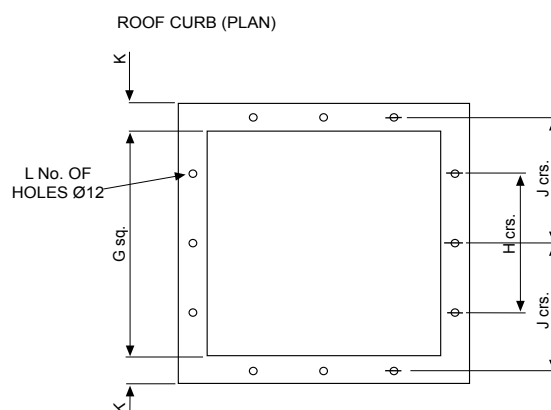
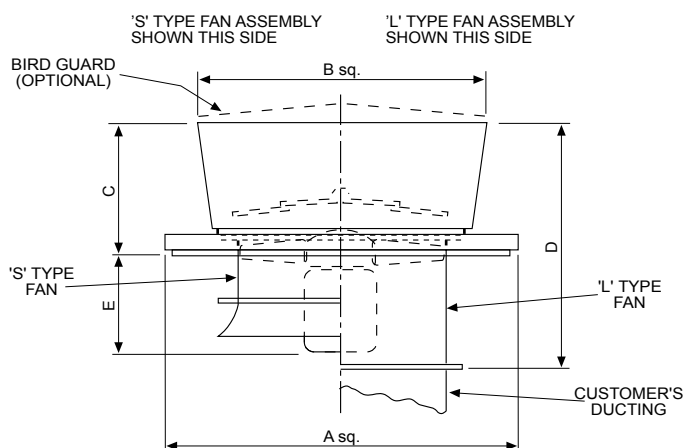
Unit Code	Fan Ref		A	B	C	D	E	F	G	H	J	Max Weight (Kg)	
												Less fan	With fan
DVA 400	31JM	CT5	600	530	480	783	550	400	210	460	-	18	45
	31JM	D80/A	600	530	480	783	550	400	210	460	-	18	49
DVA 500	40JM	CT9	700	630	530	833	650	500	260	560	-	24	54
	40JM	D80/A	700	630	530	833	650	500	260	560	-	24	56
DVA 630	50JM	CT9	900	780	630	933	850	700	360	740	400	47	81
	50JM	D80/B	900	780	630	1078	850	700	360	740	400	47	86
	50JM	F2229/B	900	780	630	1078	850	700	360	740	400	47	112
	50JM	D112/M	900	780	630	1078	850	700	360	740	400	47	124
DVA 800	63JM	F2249/B	1050	950	750	1198	1000	800	400	886	400	65	146
	63JM	D112/M	1050	950	750	1198	1000	800	400	886	400	65	161
DVA 1000	80JM	DF132/M	1250	1180	880	1328	1200	1000	300	1080	500	96	259

All dimensions in millimetres

All dimensions and weights shown are for L type fans.

Dimensions and Weights

UDA Roof Units

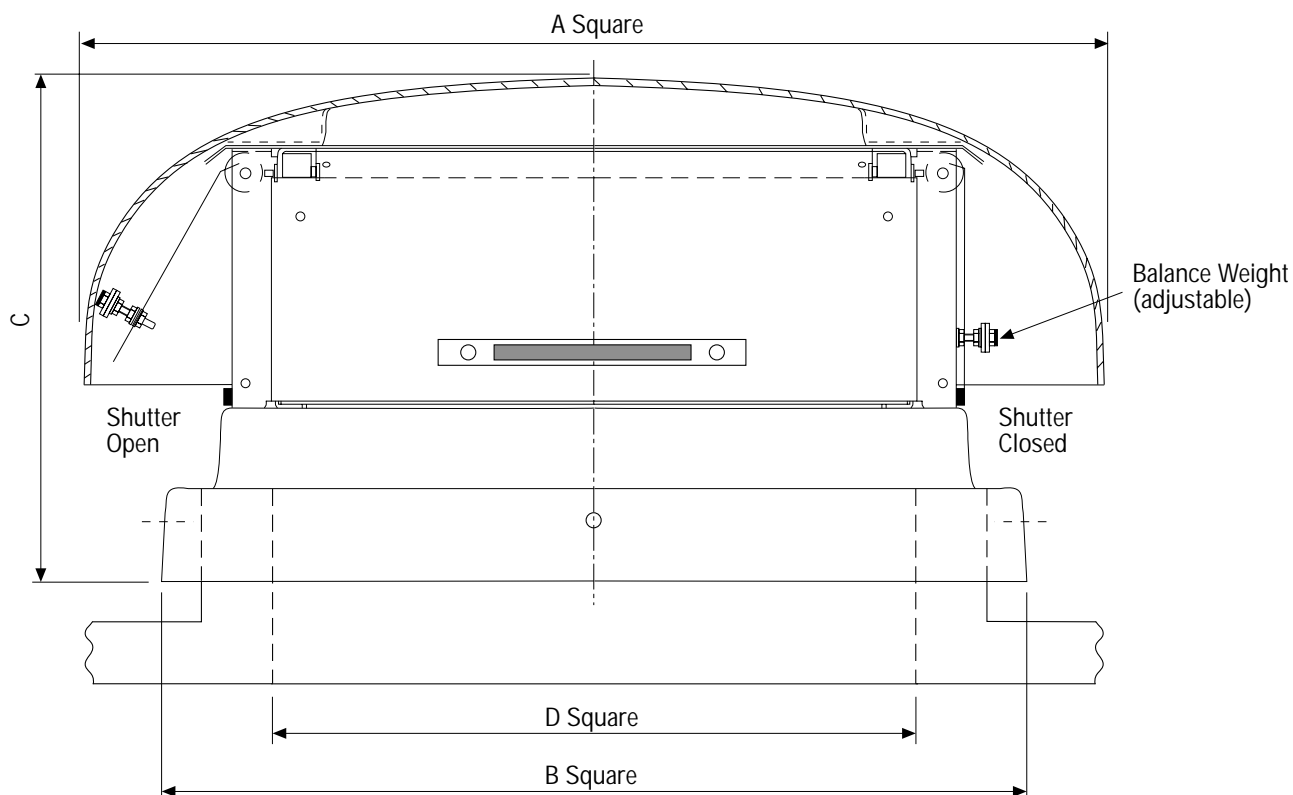


Unit Code	Fan Ref		A	B	C	D	G	H	J	K	L	Max Weight (Kg)	
												Less fan	With fan
UDA 300	31JM	CT5	600	530	302	627	400	-	245	75	4	10.9	37.9
	31JM	D80/A	600	530	302	627	400	-	245	75	4	10.9	41.9
UDA 380	40JM	CT9	700	628	344	669	500	340	288	75	8	14.2	44.2
	40JM	D80/A	700	628	344	669	500	340	288	75	8	14.2	46.2
	15J	D90/L	700	628	344	700	500	340	288	75	8	14.2	58.2
UDA 480	50JM	F2229B	850	743	398	868	600	400	350	75	8	18.4	83.4
	50JM	D112/M	850	743	398	868	600	400	350	75	8	18.4	93.4
	50JM	CT9	850	743	398	723	600	400	350	75	8	18.4	52.4
	50JM	D90	850	743	398	868	600	400	350	75	8	18.4	77.4
	50JM	D80/B	850	743	398	723	600	400	350	75	8	18.4	57.4
	19JF	D112/M	850	743	398	856	600	400	350	75	8	18.4	85.4
UDA 600	63JM	DF160/L	1050	879	398	973	800	490	450	100	8	28.8	243.8
	63JM	F2249B	1050	879	398	868	800	490	450	100	8	28.8	109.8
	63JM	D112/M	1050	879	398	868	800	490	450	100	8	28.8	117.8
	63JM	DF112/M	1050	879	398	868	800	490	450	100	8	28.8	117.8
	24KF	D160/LMB	1050	879	398	1059	800	490	450	100	8	28.8	223.8
UDA 760	80JM	DF132/M	1250	1048	434	904	1000	680	550	100	12	50	244
	80JM	DF160/LM	1250	1048	434	1009	1000	680	550	100	12	50	279
UDA 960	100JM	DF160/LBK	1450	1276	534	1109	1200	880	650	100	12	122	760
UDA 1220	48J	D225/M	1750	1585	665	1529	1500	1120	800	100	12	122	760
UDA 1600	60J	D250/M	2272	2026	706	1585	2000	1440	1050	100	12	409	1321
UDA 2000	75J ¹ / ₂	D250/M	2672	2438	749	1628	2400	1800	1250	100	12	545	Enq

All dimensions in millimetres

Dimensions and Weights

Pressure Relief Cowls

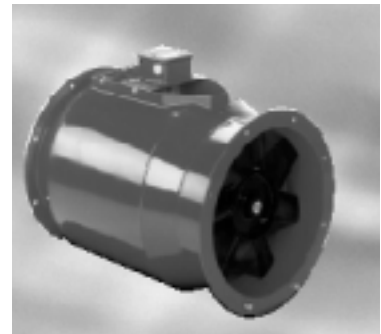


Cowl Ref	A	B	C	D	Outlet volume (max) @ 50 Pa (m ³ /s)	Weight (Kg)
PRC 500	820	700	400	500	1.2	24
PRC 800	1300	1050	550	800	3.0	40
PRC 1000	1700	1250	710	1000	5.0	68

All dimensions in millimetres

Conculsion and Benefits

- Fast positive smoke extraction and pressurisation.
- Woods high efficiency, high temperature smoke venting equipment using proven components.
- Extensively tested at high temperatures.
- Six temperature/time categories from 150°C to 600°C.
- Performance tested to BS848 (Part 1).
- Company quality registered to BS EN ISO 9001:94
- Products certified and witness tested by LPC (F.I.R.T.O) U.K., TÜ, (Germany) and CTICM (France).
- Pressure development to allow connection to ducted systems.
- Roof mounted units have fibreglass or aluminium cowls with a pleasing appearance and giving excellent resistance to atmospheric corrosion.
- High velocity discharge and dispersal.
- Optional spring loaded fusible link set to open roof unit shutters at 72°C.
- Control panels available.
- Full range of ancillaries available.



Precise Air Management

Fläkt Woods is a global leader in air management. We specialise in the design and manufacture of a wide range of air climate and air movement solutions. And our collective experience is unrivalled.

Our constant aim is to provide systems that precisely deliver required function and performance, as well as maximise energy efficiency.

Solutions for all your air climate and air movement needs

Fläkt Woods is the only company in the UK capable of providing total system solutions from the following portfolio:

● Fans

Advanced axial, centrifugal and boxed fans for general and specialist applications. Comprehensive range including high temperature and ATEX compliant options. Engineered for energy efficiency and minimised life cycle cost.

● Air Handling Units (AHUs)

Modular, compact and small AHU units. Designed to ensure optimisation of indoor air quality, operational performance and service life.

● Chillers

Air-cooled and water-cooled chillers with cooling capacity up to 1800kW. Designed to minimise annual energy consumption in all types of buildings.

Chilled beams

Active induction beams for ventilation, cooling and heating, and passive convection beams for cooling. For suspended or flush-mounted ceiling installation – and multi-service configuration.

With unique Comfort Control and Flow Pattern Control features.

● Smoke control and car park ventilation systems

Unique approach to car park ventilation, aided and optimised by Computational Fluid Dynamics (CFD) software. Complete turnkey solutions for designing, installing and commissioning mechanical and natural smoke ventilation.

● Controls and drives

Variable speed drives and control systems, all tested to ensure total compatibility with our products. Specialist team can advise on energy saving and overall system integration.

Technical Site Services

Our dedicated team providing comprehensive post-installation services. Including condition-based contract monitoring, preventative and routine maintenance, refurbishment and system upgrades.

Fläkt Woods operates a policy of continuous development and improvement. Accordingly, the Company reserves the right to supply products that may differ from those illustrated and described in this publication. Certified dimensions will be supplied on request on receipt of order.

FWGJRG/C10/0309

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See global website for international sales offices www.flaktwoods.com

The logo for Fläkt Woods, featuring the company name in a bold, green, sans-serif font. A stylized green swoosh or arc is positioned above the 't' in 'Woods'.