

## **CAR PARK FANS**

# Induction Thrust Fans





# **The Centre of Expertise for your car park ventilation projects**

from day-to-day pollution  
clearance to complete  
smoke control





Traditional car park ventilation system designs are based on duct runs with high and low level extract, or more simplistic designs based on extract and natural supply points (such as ramps) that generally result in poor/insufficient air distribution. By contrast, the modern solution from Woods Air Movement removes the need for any ducting by using Jet and Thrust Fans to distribute the air.

We are ready to support your project from design and CFD simulations to showcasing the wide range of benefits for both clients and users, including energy efficiency, ROI calculations, and compliance with all relevant safety standards.

Woods Air Movement has the widest range of car park fans available in today's market: from the largest Induction Thrust Fan; through to compact, lightweight Jet Thrust Fan models to meet any installation requirement. That means we can deliver all the air movement functions, capacity, performance and fire safety criteria that any type of car park requires – whatever its size and purpose.

At Woods Air Movement, we have the know-how, product technology and experience to always give you the correct combination, whatever the application. In short, we have the solution you need.





# The Complete Solution to Car Park Ventilation

Ducted systems are the traditional approach to enclosed car park ventilation, with fresh air levels based on a given number of air changes per hour. Constant running of a ventilation system, even in extended periods of low, or even no traffic or ventilation requirement, results in high day-to-day running costs.

The better solution is to incorporate a Thrust Fan System. Ventilation can be designed using a CO and/or NOx monitoring system, so that selected fans run only when necessary. Additional savings are made due to lower pressure main extract fans being used as they do not have to cope with system resistances found in ducted systems.

All our designs will be prepared to the customer's requirements, taking into account any regulations that apply. If required, the Thrust Fan System can be designed on a traditional volumetric air change

rate, and/or using CO, LPG and NOx monitoring systems. Emergency ventilation can be designed using volumetric or design fire calculations.

Woods Air Movement realises the importance and possible life saving function of our Thrust Fan System and offers full Computational Fluid Dynamics (CFD) modelling to every customer, on every project. With over a 99% uptake by our customers, they too realise the importance of getting it right. CFD ensures system optimisation and, more importantly, that the occupants safety is not compromised.

We can avoid the poor design or 'guesstimates' used by some, by employing best practice CFD modelling methods. This avoids making a project unnecessarily expensive by using too many fans, or an under performing system by specifying too few.





## A MODERN APPROACH

**Thrust Fan Systems are one of the most cost effective ways to ventilate, both in terms of installation cost and long term running costs**

The Woods Air Movement Thrust Fan System is one of the most efficient and cost effective car park ventilation systems available on the market today.

Both day-to-day pollution and emergency smoke are safely and effectively ventilated. Designed to the highest standards and meeting the most stringent criteria to ensure all design requirements are met.

- HIGH SYSTEM PERFORMANCE
- LOW INSTALLATION COSTS
- LOW RUNNING COSTS
- OPTIMISES CAR PARK SPACE
- CFD SYSTEM DESIGN

Although the Woods Air Movement Thrust Fan System works on surprisingly simple principles, highly qualified engineers utilise Computational Fluid Dynamics (CFD) to optimise each design and ensure a state of the art end product.

This systematic approach to design, paired with Woods Air Movement high-tech and efficient product design, ensures an optimised high performance car park system.

## POLLUTION CLEARANCE

The Thrust Fan System is an efficient and reliable ventilation system, providing fresh air and removing harmful emissions to ensure the safety of car park occupants. It is designed as a duct-free system, relying on a series of strategically placed jet fans, to control and distribute air around the car park. Main extract fans, take the contaminated air out of the space, with fresh make up air supplied from entrance/exit ramps, or through supply fans if required.

Choice of fan sizes, operating systems and detection systems allows versatility in the Thrust Fan System design, allowing the most efficient design to meet the car park requirements. Extract rates can be varied by constant pollution monitoring. Sensors placed at optimum points around the car park, allowing the control system to regulate which fans operate to dilute and/or extract the contaminated air.

The system's high flexibility allows the most favorable operation both in terms of safety, economy and efficiency.

# ITF

## Induction Thrust Fan



### INTRODUCTION

The induction thrust car park fans from Woods Air Movement feature a high efficiency centrifugal impeller driven directly by a specially designed compact two-speed induction motor, which makes this product especially suitable for low height car parks.

The induction fans can be used for a general ventilation duty/pollution control and hot smoke extraction for temperatures **up to 400°C (572°F)** for a duration of 2 hours. These products are tested to **ISO 13350:2015** (Air Performance) and certified to **EN12101-3:2015** (High Temperature).

### HOW IT WORKS

Induction Thrust car park fans work by drawing polluted air and fumes up through a centrifugal impeller and then forcing it out in a thin 'blade' at ceiling level. Clean air is supplied from the car park entrance and from ventilation axial fans; dirty air is removed in the same way. In the event of a fire, the ITFs switch to emergency mode to push smoke quickly and efficiently towards the extraction points.

### CONSTRUCTION DETAILS

The Induction Thrust Fans feature a two speed, AC, motor with a minimum IP55 rating, of the totally enclosed type, manufactured from cast iron, which allows our product to provide day-to-day pollution control (at the low-speed duty) and rapid hot smoke extraction during emergency conditions.

The fan casing and ceiling mount bracket are both manufactured from galvanised steel to provide product longevity and reliability. There is an externally mounted terminal box or electrical isolator which is pre-wired to the drive motor and offers a quick and hassle-free installation process.

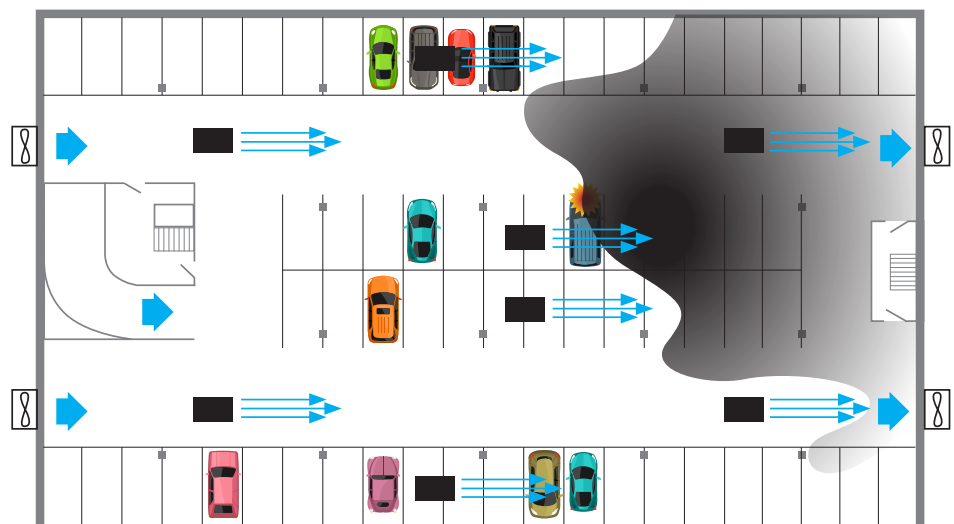
To provide enhanced safety, the unit is also fitted with an inlet protection guard. The steel impeller is balanced to grade G6.3 (in accordance with ISO 14694:2003, Category BV-3) to minimise vibration.





## CFD

Thrust Fan Systems are designed using Computational Fluid Dynamics to predict how smoke will behave



# F300 ITF 50 (50Hz)

## Technical Parameters

Model	ITF 50 54-8
Fan Description	Uni-Directional Induction Thrust
Flow Rate	1.3 / 0.65 m³/s
Thrust	42 / 10 N
Nominal Speed	1445 / 720 rpm
Shaft Power	0.99 / 0.12 kW
Air Density	1.2 kg/m³
Emergency Rating	300°C / 2 hours

## Motor Details

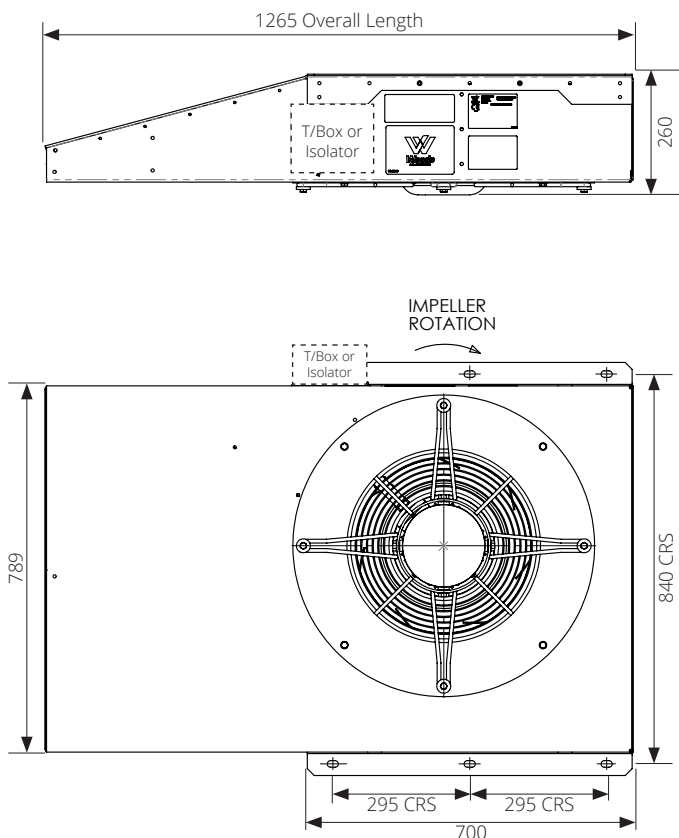
Frame Size	90S
Motor Rating	1.38 / 0.35 kW
Full Load Current	3.63 / 1.21 A
Starting Current	21.5 / 4.69 A
Electrical Supply	400 V / 50 Hz / 3 ph
Start Type	Direct
Control	Two Speed
Efficiency	73% / 65%

## Sound Data for Combined Inlet & Outlet Levels

Acoustic Spectrum									Sound Power Overall Levels*	Sound Pressure Overall Levels*
Octave Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	L <sub>wA</sub>	L <sub>pA</sub>
Half Speed	80	79	77	78	71	65	59	55	78	57
Full Speed	83	98	92	87	84	81	79	73	91	70

\* Sound Power Level, L<sub>w</sub> = dB re 10<sup>-12</sup> W  
 \* @ 3m Distance, spherical Propagation Sound pressure level, L<sub>pA</sub> = dB re 2 x 10<sup>-5</sup> Pa

## Dimensional Details



All dimensions are in mm.

Approximate Fan Weight: 81 kg

### Notes:

Induction Fans are fitted with terminal boxes or isolators.

Sound Power Level, L<sub>w</sub> = dB re 10<sup>-12</sup> W

Sound pressure level, L<sub>pA</sub> = dB re 2 x 10<sup>-5</sup> Pa, provided for comparative purposes at a distance of 3m, based on spherical propagation in free field conditions.



# F300 ITF 100 (50Hz)

## Technical Parameters

Model	ITF 100 54-8
Fan Description	Uni-Directional Induction Thrust
Flow Rate	2.3 / 1.11 m³/s
Thrust	83 / 20 N
Nominal Speed	1400 / 690 rpm
Shaft Power	2.31 / 0.28 kW
Air Density	1.2 kg/m³
Emergency Rating	300°C / 2 hours

## Motor Details

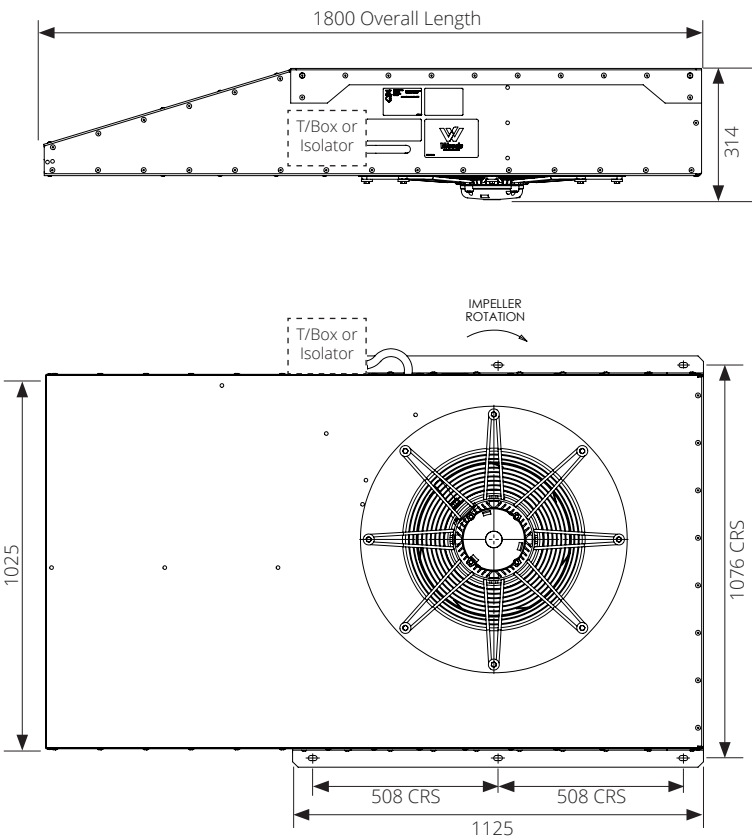
Frame Size	90 L
Motor Rating	2.42 / 0.61 kW
Full Load Current	5.42 / 2.12 A
Starting Current	30.4 / 7.21 A
Electrical Supply	400 V / 50 Hz / 3 ph
Start Type	Direct
Control	Two Speed
Efficiency	75.0 / 61.0 %

## Sound Data for Combined Inlet & Outlet Levels

Acoustic Spectrum									Sound Power Overall Levels*	Sound Pressure Overall Levels*
Octave Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	L <sub>wA</sub>	L <sub>pA</sub>
Half Speed	88	81	77	75	71	69	64	65	77	57
Full Speed	89	102	96	91	89	87	86	77	95	75

\* Sound Power Level, L<sub>w</sub>= dB re 10<sup>-12</sup> W      Sound pressure level, L<sub>pA</sub> = dB re 2 x 10<sup>-5</sup> Pa  
 \* @ 3m Distance, spherical Propagation

## Dimensional Details



All dimensions are in mm.  
 Approximate Fan Weight: 170 kg

**Notes:**  
 Induction Fans are fitted with terminal boxes or isolators.  
 Sound Power Level, L<sub>w</sub>= dB re 10<sup>-12</sup> W  
 Sound pressure level, L<sub>pA</sub> = dB re 2 x 10<sup>-5</sup> Pa, provided for comparative purposes at a distance of 3m, based on spherical propagation in free field conditions.

# F400 ITF 50 (50Hz)

## Technical Parameters

Model	ITF 50 54-8
Fan Description	Uni-Directional Induction Thrust
Flow Rate	1.3 / 0.65 m³/s
Thrust	42 / 10 N
Nominal Speed	1445 / 720 rpm
Shaft Power	0.99 / 0.12 kW
Air Density	1.2 kg/m³
Emergency Rating	400°C / 2 hours

## Motor Details

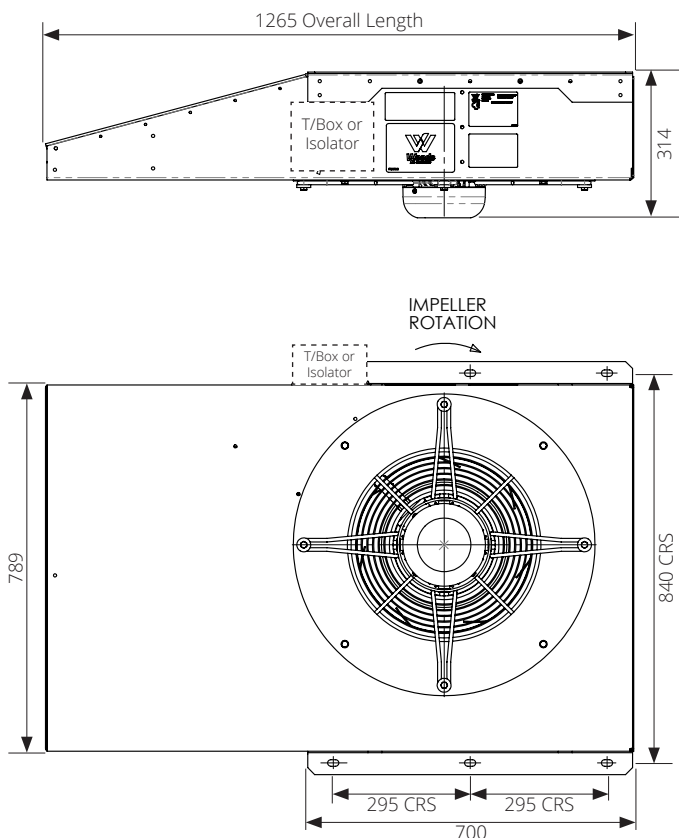
Frame Size	90L
Motor Rating	1.84 / 0.46 kW
Full Load Current	4.80 / 1.69 A
Starting Current	27.5 / 4.99 A
Electrical Supply	400 V / 50 Hz / 3 ph
Start Type	Direct
Control	Two Speed
Efficiency	72% / 63%

## Sound Data for Combined Inlet & Outlet Levels

Acoustic Spectrum									Sound Power Overall Levels*	Sound Pressure Overall Levels*
Octave Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	L <sub>W</sub> <sub>A</sub>	L <sub>p</sub> <sub>A</sub>
Half Speed	80	79	77	78	71	65	59	55	78	57
Full Speed	83	98	92	87	84	81	79	73	91	70

\* Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W    Sound pressure level, L<sub>p</sub><sub>A</sub> = dB re 2 x 10<sup>-5</sup> Pa  
 \* @ 3m Distance, spherical Propagation

## Dimensional Details



All dimensions are in mm.

Approximate Fan Weight: 81 kg

### Notes:

Induction Fans are fitted with terminal boxes or isolators.

Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W

Sound pressure level, L<sub>p</sub><sub>A</sub> = dB re 2 x 10<sup>-5</sup> Pa, provided for comparative purposes at a distance of 3m, based on spherical propagation in free field conditions.





# F300 ITF 50 (60Hz)

## Technical Parameters

Model	ITF 50 64-8
Fan Description	Uni-Directional Induction Thrust
Flow Rate	1.6 / 0.87 m³/s
Thrust	60 / 15 N
Nominal Speed	1725 / 857 rpm
Shaft Power	1.71 / 0.21 kW
Air Density	1.2 kg/m³
Emergency Rating	300°C / 2 hours

## Motor Details

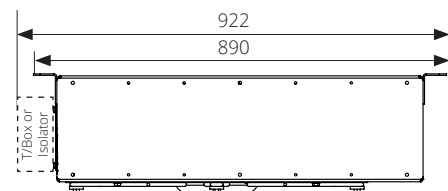
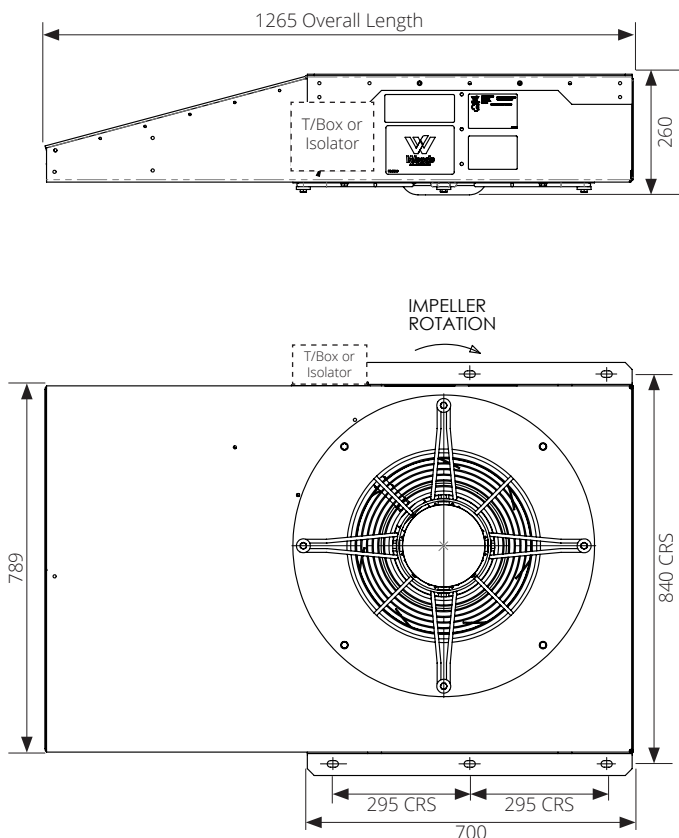
Frame Size	90L
Motor Rating	1.84 / 0.46 kW
Full Load Current	3.86 / 1.45 A
Starting Current	23.9 / 4.35 A
Electrical Supply	400 V / 60 Hz / 3 ph
Start Type	Direct
Control	Two Speed
Efficiency	78.9% / 67.5%

## Sound Data for Combined Inlet & Outlet Levels

Acoustic Spectrum									Sound Power Overall Levels*	Sound Pressure Overall Levels*
Octave Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	L <sub>W</sub> <sub>A</sub>	L <sub>p</sub> <sub>A</sub>
Half Speed	76	82	80	82	75	68	63	59	81	61
Full Speed	87	91	102	94	90	86	85	80	97	77

\* Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W  
 \* @ 3m Distance, spherical Propagation

## Dimensional Details



All dimensions are in mm.

Approximate Fan Weight: 92 kg

### Notes:

Induction Fans are fitted with terminal boxes or isolators.

Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W

Sound pressure level, L<sub>p</sub><sub>A</sub> = dB re 2 x 10<sup>-5</sup> Pa, provided for comparative purposes at a distance of 3m, based on spherical propagation in free field conditions.



# F300 ITF 100 (60Hz)

## Technical Parameters

Model	ITF 100 64-8
Fan Description	Uni-Directional Induction Thrust
Flow Rate	2.4 / 1.17 m³/s
Thrust	96 / 23 N
Nominal Speed	1735 / 855 rpm
Shaft Power	3.00 / 0.38 kW
Air Density	1.2 kg/m³
Emergency Rating	300°C / 2 hours

## Motor Details

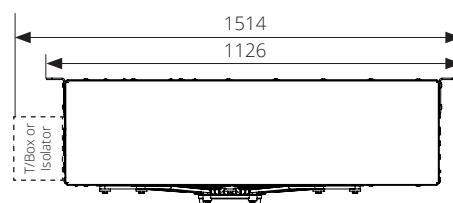
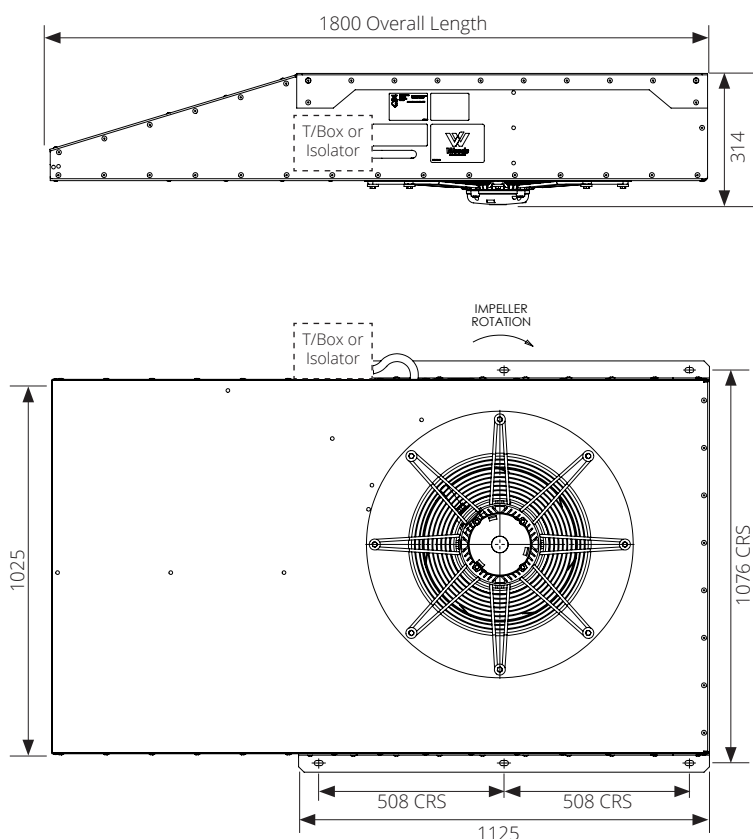
Frame Size	100 L
Motor Rating	3.08 / 0.77 kW
Full Load Current	6.98 / 2.94 A
Starting Current	54.4 / 12.3 A
Electrical Supply	400 V / 60 Hz / 3 ph
Start Type	Direct
Control	Two Speed
Efficiency	79.6 / 67.5 %

## Sound Data for Combined Inlet & Outlet Levels

Acoustic Spectrum									Sound Power Overall Levels*	Sound Pressure Overall Levels*
Octave Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	L <sub>W</sub> <sub>A</sub>	L <sub>p</sub> <sub>A</sub>
Half Speed	85	89	79	79	75	71	70	61	81	61
Full Speed	90	93	102	95	93	89	86	79	99	78

\* Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W  
 \* @ 3m Distance, spherical Propagation

## Dimensional Details



All dimensions are in mm.

Approximate Fan Weight: 170 kg

### Notes:

Induction Fans are fitted with terminal boxes or isolators.

Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W

Sound pressure level, L<sub>p</sub><sub>A</sub> = dB re 2 x 10<sup>-5</sup> Pa, provided for comparative purposes at a distance of 3m, based on spherical propagation in free field conditions.

# F400 ITF 50 (60Hz)

## Technical Parameters

Model	ITF 50 64-8
Fan Description	Uni-Directional Induction Thrust
Flow Rate	1.6 / 0.87 m <sup>3</sup> /s
Thrust	60 / 15 N
Nominal Speed	1725 / 857 rpm
Shaft Power	1.71 / 0.21 kW
Air Density	1.2 kg/m <sup>3</sup>
Emergency Rating	400°C / 2 hours

## Motor Details

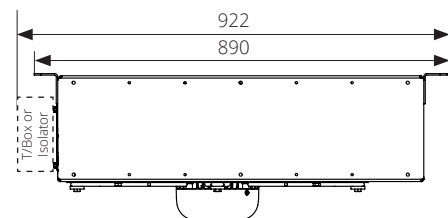
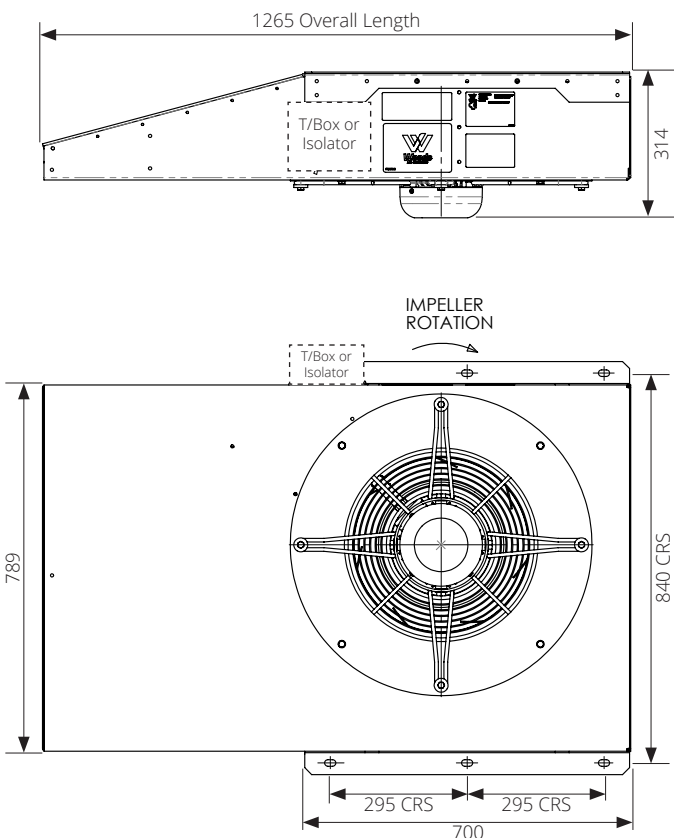
Frame Size	90L
Motor Rating	1.84 / 0.46 kW
Full Load Current	3.86 / 1.45 A
Starting Current	23.9 / 4.35 A
Electrical Supply	400 V / 60 Hz / 3 ph
Start Type	Direct
Control	Two Speed
Efficiency	78.9% / 67.5%

## Sound Data for Combined Inlet & Outlet Levels

Acoustic Spectrum									Sound Power Overall Levels*	Sound Pressure Overall Levels*
Octave Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	L <sub>W</sub> <sub>A</sub>	L <sub>p</sub> <sub>A</sub>
Half Speed	76	82	80	82	75	68	63	59	81	61
Full Speed	87	91	102	94	90	86	85	80	97	77

\* Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W  
 \* @ 3m Distance, spherical Propagation

## Dimensional Details



All dimensions are in mm.

Approximate Fan Weight: 92 kg

### Notes:

Induction Fans are fitted with terminal boxes or isolators.

Sound Power Level, L<sub>W</sub> = dB re 10<sup>-12</sup> W

Sound pressure level, L<sub>p</sub> = dB re 2 x 10<sup>-5</sup> Pa, provided for comparative purposes at a distance of 3m, based on spherical propagation in free field conditions.

# F400 ITF 100 (60Hz)

## Technical Parameters

Model	ITF 100 64-8
Fan Description	Uni-Directional Induction Thrust
Flow Rate	2.4 / 1.17 m³/s
Thrust	96 / 23 N
Nominal Speed	1735 / 855 rpm
Shaft Power	3.00 / 0.38 kW
Air Density	1.2 kg/m³
Emergency Rating	400°C / 2 hours

## Motor Details

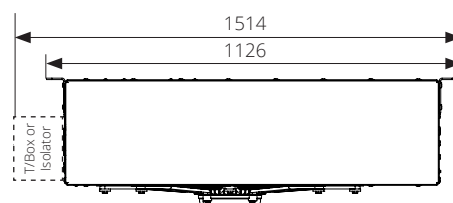
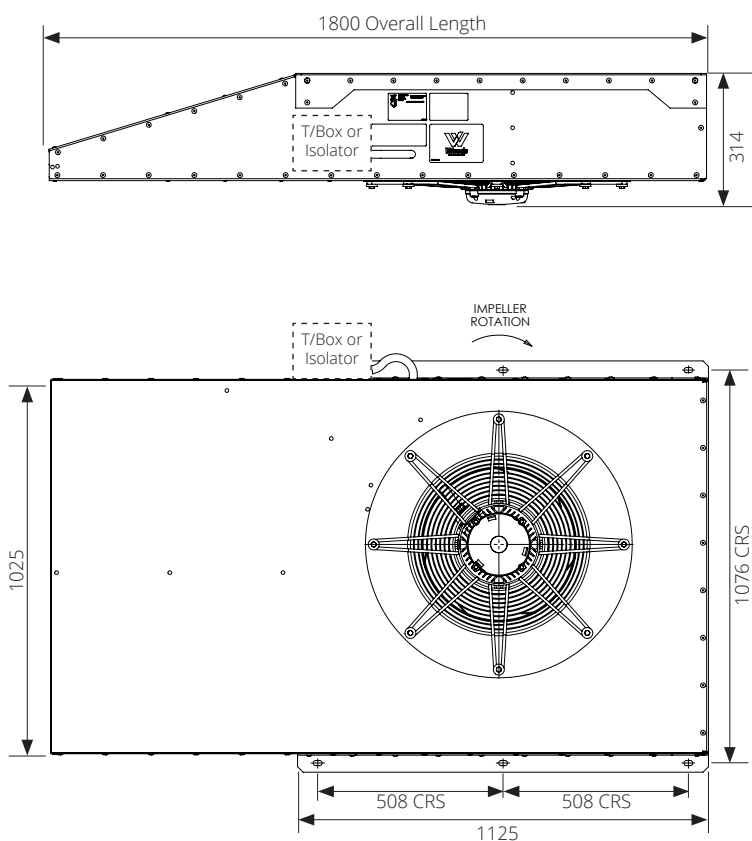
Frame Size	100 L
Motor Rating	3.08 / 0.77 kW
Full Load Current	6.98 / 2.94 A
Starting Current	54.4 / 12.3 A
Electrical Supply	400 V / 60 Hz / 3 ph
Start Type	Direct
Control	Two Speed
Efficiency	79.6 / 67.5 %

## Sound Data for Combined Inlet & Outlet Levels

Acoustic Spectrum									Sound Power Overall Levels*	Sound Pressure Overall Levels*
Octave Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K	L <sub>wA</sub>	L <sub>pA</sub>
Half Speed	85	89	79	79	75	71	70	61	81	61
Full Speed	90	93	102	95	93	89	86	79	99	78

\* Sound Power Level, L<sub>w</sub> = dB re 10<sup>-12</sup> W    Sound pressure level, L<sub>pA</sub> = dB re 2 x 10<sup>-5</sup> Pa  
 \* @ 3m Distance, spherical Propagation

## Dimensional Details



All dimensions are in mm.

Approximate Fan Weight: 170 kg

### Notes:

Induction Fans are fitted with terminal boxes or isolators.

Sound Power Level, L<sub>w</sub> = dB re 10<sup>-12</sup> W

Sound pressure level, L<sub>pA</sub> = dB re 2 x 10<sup>-5</sup> Pa, provided for comparative purposes at a distance of 3m, based on spherical propagation in free field conditions.



# Computational Fluid Dynamics Expertise and Support

Manual calculation methods, used by many, are extremely limited in their ability. Manual calculation is usually inaccurate, which is why we offers full CFD analysis to customers on all projects. Our CFD Engineers are highly qualified and experienced, using their knowledge and expertise to design the system with the correct number and positioning of Thrust Fans.

Design is verified by using industry recognised, highly accurate, CFD modelling software. The system is then adjusted and recalculated if required. CFD software allows the creation of visualisation planes, which intersect points of interest in the model, where contours and vectors of any stored variable, such as air velocity, pressure, temperature, etc., can be displayed. A range of parameters are considered in the analysis, including velocities, mass flow rates and pressure, to help determine the overall distribution of airflow within the space.

## MAIN FEATURES:

- Complex geometry modelling of any environment
- Advanced meshing techniques
- Steady state and transient analysis
- Pollution and Emergency ventilation simulation and analysis
- Advanced state of the art design fire modelling and simulation including both inert and combustion modelling techniques
- Iso-surfaces of smoke and temperature
- Local Mean Age of air (LMA) – used to access ventilation performance and quickly compare design solutions
- Graphical outputs for analysis include:
  - Air speed profiles
  - Streamline animations
  - Contaminant and/or toxicity profiles
  - Temperature profiles
  - Visibility profiles
  - Smoke visualisation

**Airflow behaviour is difficult and complicated to predict. Accurate calculation is paramount in order to create an effective car park ventilation system. Our modelling is backed up with both Laboratory test research and smoke test commissioning in real car parks to ensure accuracy.**



## CFD PROCESS STAGES:

**1**

A computer model of the layout of the car park is created. 3-D plots are sent to the customer for approval.

**2**

Once approved, the design layout of the car park and model geometry will be frozen, and detailed analysis undertaken.

**3**

The model is initially run with only the main fans operating. This identifies the main bulk airflow paths from the supply to the extract points and any areas of re-circulation within the space.

**4**

Thrust Fans are added to the model and positioned to distribute the airflow to all of the areas of the car park, ensuring removal of any stagnant areas of air.

**5**

A detailed report of the results is produced for each project with appropriate air speed plots, velocity profiles and particle animations.

# A complete fan range from Woods Air Movement

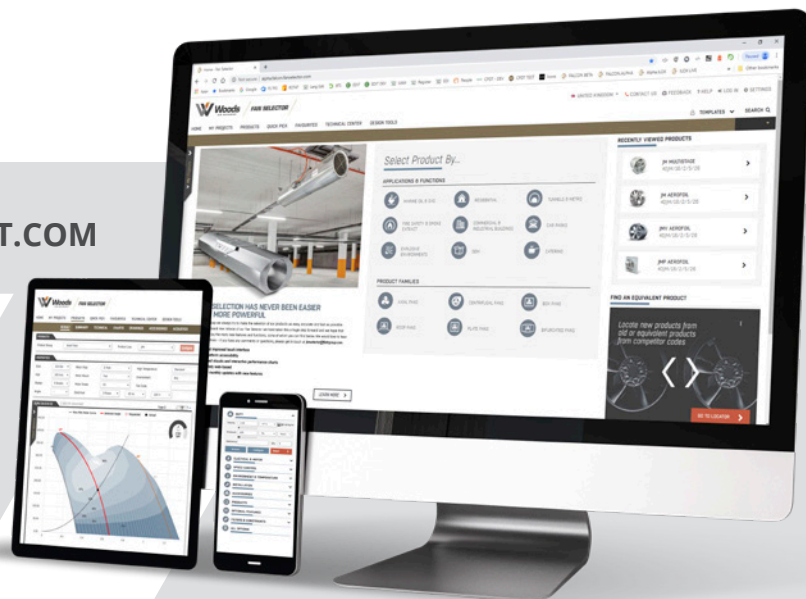
We manufacture the most reliable and best quality air movement and ventilation products for a wide range of applications and industries. Our state of the art production facilities operate under rigorous process controls, providing reassurance that the products will continue to perform faultlessly throughout their design life.

Most of our product range is available for dual use normal/emergency high temperature operation, please contact one of our sales team members for more technical information. If our products still do not meet your requirements then we have in-house capabilities to assist with designing, engineering and manufacturing the perfect solution for you.

## ENSURING THE BEST POSSIBLE QUALITY IN EVERY DETAIL

- We ensure our products follow the ISO1940 Balance standards and Vibration BS848 pt 7 ISO14694
- Manufactured in a site that is ISO 9001 & 14001 accredited.

> **WOODSAIRMOVEMENT.COM**



## PRODUCT SELECTION AND CONFIGURATION HAS NEVER BEEN EASIER – OR MORE POWERFUL

We always try to make the selection of our products as easy, accurate and fast as possible. With the brand new release of our Fan Selector we have taken a huge step forward and we hope that you will enjoy the many new features and functions – including web-based multi-platform accessibility with touch interface and interactive performance charts.

Woods Air Movement delivers smart and energy efficient Air Movement and Fire Safety solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance. The widest range of Air Movement and Ventilation products in the market, and strong market presence with over 100 years of experience and manufacturing of products, guarantees that we are always by your side, ready to deliver Excellence in Solutions.

**Contact our friendly sales team today  
for more information**

Call: +44 (0) 1206 222 555

Email: [quotations.woods@flaktgroup.com](mailto:quotations.woods@flaktgroup.com)  
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