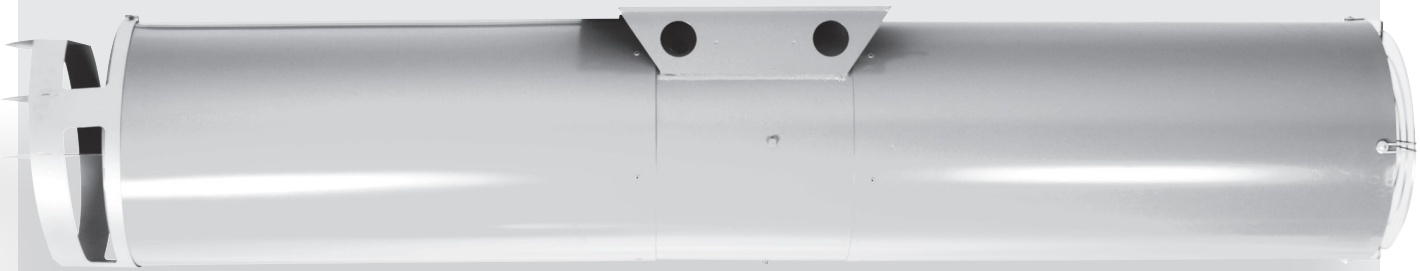
JFU

JetVent Axial Fan

ELTA



JETVENT

Introduction

The ventilation of enclosed or semi-enclosed spaces where vehicles operate is essential for removing exhaust fumes containing harmful pollutants. Some of these pollutants include Carbon Monoxide (CO), Nitrous Oxides (NOX), Sulphur Dioxide (SO2) and heavy metal compounds that accumulate in spaces such as commercial and residential car parks, loading bays and drive through “take away” facilities.

The most significant development in ventilation design for these spaces has been the Introduction of Impulse fan systems. It is an innovative alternative to traditional distribution ductwork systems and provides a number of significant benefits. The system provides constant air movement ensuring harmful pollutants do not gather in dead areas.

How It Works

An Impulse Ventilation System is based on a number of small, strategically located high velocity JetVent fans that replace the air distribution ductwork in enclosed/semi-enclosed spaces. They can also be used to increase cross-flow ventilation in large open sided car parks.

JetVent Fans operate on well proven longitudinal tunnel ventilation principles. The fans produce a high velocity jet of air, in turn moving a larger quantity of air surrounding the fan through a process known as entrainment. The JetVent Impulse fans are positioned within the space to mix the air and direct it towards the main extraction fan intake points.

The main extract fans are sized to provide the required airflow rates for the size and design of the car park. However given the reduction or complete elimination of ducting in an Impulse Ventilation design, system resistance is reduced and therefore smaller, lower power extract fans than those required in a ducted system are possible. These typically consume less energy and take up less space within the car park.

The amount of air entrained by a single JetVent fan increases with the velocity and the quantity of air being discharged by the fan. These characteristics directly relate to the thrust rating of the fan, which is measured in Newtons (N).

JetVent impulse ventilation systems can be designed and controlled to accommodate any building code requirements as well as fire and smoke control parameters to satisfy the relevant building fire regulations and authorities. The JetVent Impulse ventilation system is being installed to increase the efficiency and amenity of car parks throughout South East Asia, Australia and New Zealand.

Industry Award Winner

The JetVent Digital EC and its demand control system was presented with the 2012 ARBS Industry Product Excellence Award in recognition of its simplicity, energy efficiency and its ability to adapt to most car parks. The award was also confirmation of Elta commitment to innovation, continuous improvement and its drive to develop innovative cost effective solutions.

Advantages

- Greater energy efficiency. A JetVent System results in less resistance through the supply and exhaust air mechanical systems.
- Can potentially add additional car park spaces because of smaller or fewer ventilation risers and plant rooms.
- Provides a more open, uncluttered space because of the reduction or elimination of the air distribution ductwork.
- Ability to multi zone the space can reduce power consumption by the fans operating on a demand basis.
- Helps to lower floor-to-ceiling heights which can reduce excavation and construction costs. This is due to JetVent fans having a small vertical profile and their mounting position being very flexible.

Designing The System

An impulse ventilation system can be tailored to suit virtually any car park design and size. The system layout will first need to be identified followed by the creation of an initial design.

A Computational Fluid Dynamics (CFD) analysis is often required to prove and further refine the impulse ventilation system design. Elta is able to facilitate a CFD and assist with the information required to perform the analysis.

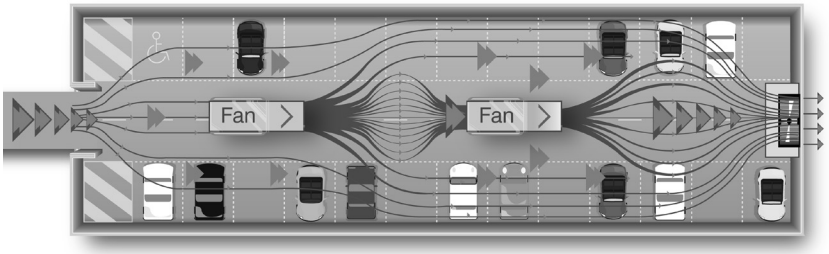
For further information on how to create an initial impulse ventilation system design, contact your Elta representative about the “JetVent Practical Guide for Selection & Application” or refer to the Elta website.

Standards

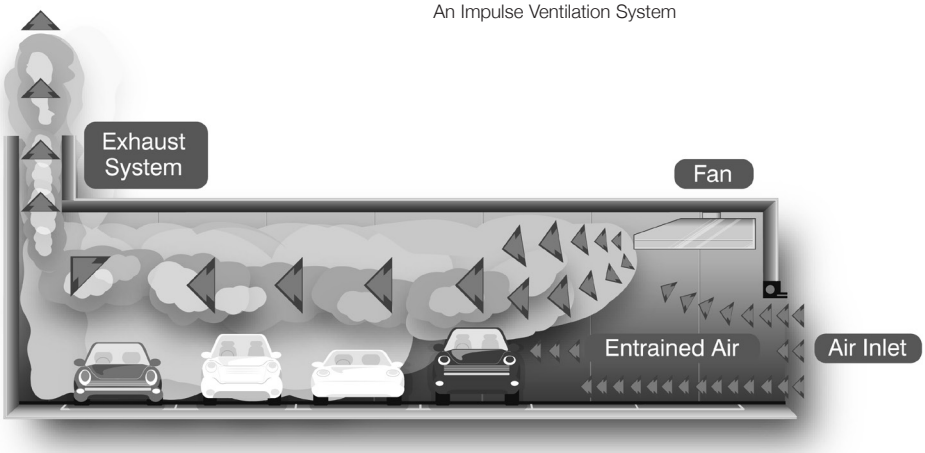
The JetVent range of Impulse Fans are designed and manufactured with procedures as defined in IS09001:2008 and have been tested to satisfy the following Standards:

- Thrust-air performance based on tests to BS848 Part 10,1999 “Fans for general purpose - Performance testing of jet fans”.
- Noise Data based on tests to BS848:Part 2,1985.
- Axial and centrifugal units tested for smoke spill requirements as outlined in AS4429:1999.

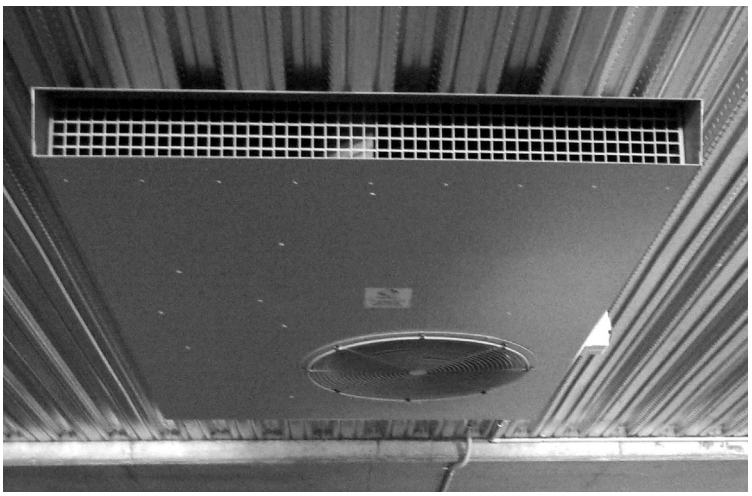
The following pages provide an overview of the JetVent Impulse ventilation systems. For further information contact your Elta representative.

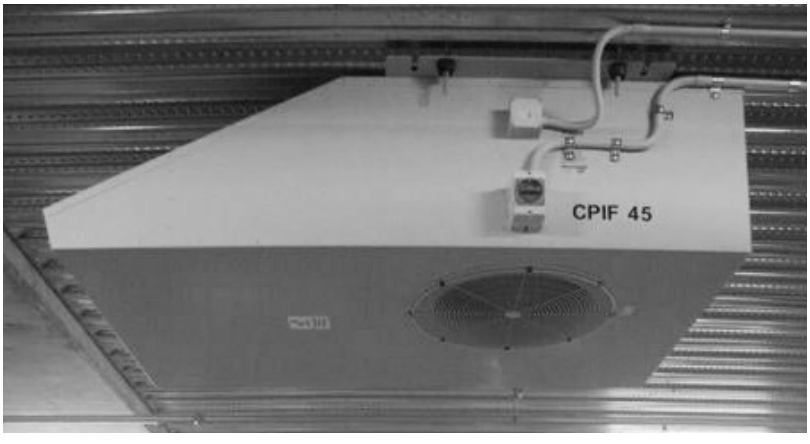


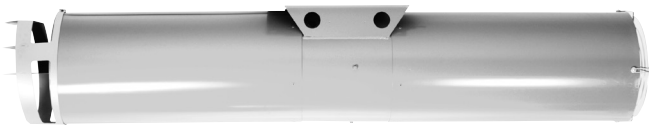
An Impulse Ventilation System



How an Impulse Ventilation System works







Description

The JFU Series of JetVent axial fans have been designed to provide effective ventilation in most spaces that contain harmful vehicle exhaust pollutants. They can be supplied for unidirectional or truly reversible airflow and are available in 2 sizes, 315mm and 400mm diameter. Units approved to AS4429:1999 for high temperature smoke exhaust are also available.

Typical Applications

Enclosed or semi-enclosed spaces that may contain harmful vehicle exhaust pollutants. These spaces include commercial and residential car parks, loading bays, drive through facilities and indoor go-kart tracks. Can also increase cross-flow ventilation in open car parks.

Features

- Available with single (high) or 2 speed (high/low) motor.
- Integral aerodynamically designed silencers provide quiet operation.
- Bell mouth inlet and outlet optimises performance.
- Units can be speed controlled using Variable Speed Drives.
- Can be supplied for uni-directional or truly reversible airflow.
- Fitted with a high performance aerofoil impeller.
- Durable galvanised steel housing with light grey powder coated finish as standard.
- Integral mounting feet allows unit to be easily mounted to ceiling.
- Electrical isolator fitted on ambient temperature units.

Construction

Galvanised steel housing with integral aerodynamically designed silencers. Light grey powder coated finish is standard. Axial flow aerofoil impellers manufactured from aluminium.

Motor

Type - squirrel cage induction motor.

Electricity supply - 415V, three-phase, 50Hz.

Bearings - sealed-for-life, ball.

Single or 2-speed as nominated.

Speed controllable using Variable Speed Drives.

Standard motors are suitable for ambient conditions up to 40°C. Units for high temperature conditions, such as smoke-control, are available.

Internal Thermal Protection

Thermisters can be provided on all motors except where Standards prohibit their use.

Additional Information

Jet fans should be treated as an Alternative Solution within the National Construction Code (NCC)(formerly the BCA) from a fire and smoke control perspective (in addition to the ventilation requirements). Therefore the fire engineer on the project would need to add the car park ventilation design into their fire engineering report for the project and ensure that they meet the relevant BCA performance clauses. For more information please refer to the JetVent “Practical Guide for Selection and Application” or the Elta Fans website.

Smoke-Spill Applications

Smoke-spill models have been fully tested to meet the air performance and high temperature requirements of Standards AS/NZS1668.1:1998 and AS4429:1999. In the case of a fire occurring, smoke-spill models will stop operating for a predetermined time to allow occupants to escape the building. After this time the fan will commence operation again.

Control System

There are two types of analogue control systems used with the JetVent JFU Series:

- Two speed system using relays to drive contactors connected to the fans.
- Variable speed system using 0 to 10 Vdc outputs to proportionally drive VSDs.

Suggested Specification

The high velocity axial jet fans shall be of the JetVent JFU Series as designed and manufactured by Elta Fans and be of the model number shown. The housing shall be of galvanised steel with a light grey powder coated finish as standard. They shall incorporate aluminium axial impellers of aerofoil design and aerodynamically engineered silencers. They shall be single or 2-speed as nominated.

Performance data shall be based on tests to BS848:Part 10,1999 for thrust and BS848:Part 2, 1985 for noise. Units for smoke-spill applications shall be tested to AS4429:1999.

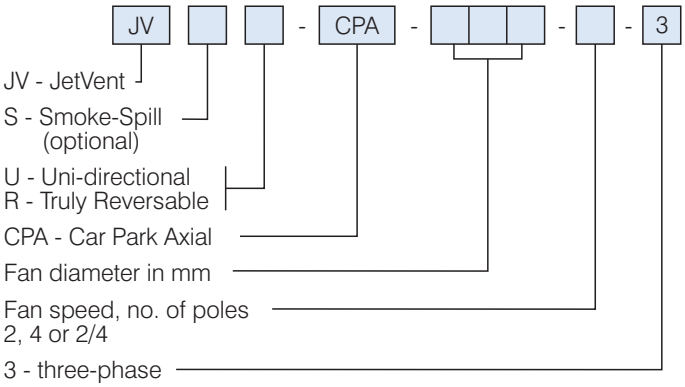
Ancillary Equipment

CO/NO_x Sensor

EcoVent Zone Controller

Variable Speed Drives

How To Order



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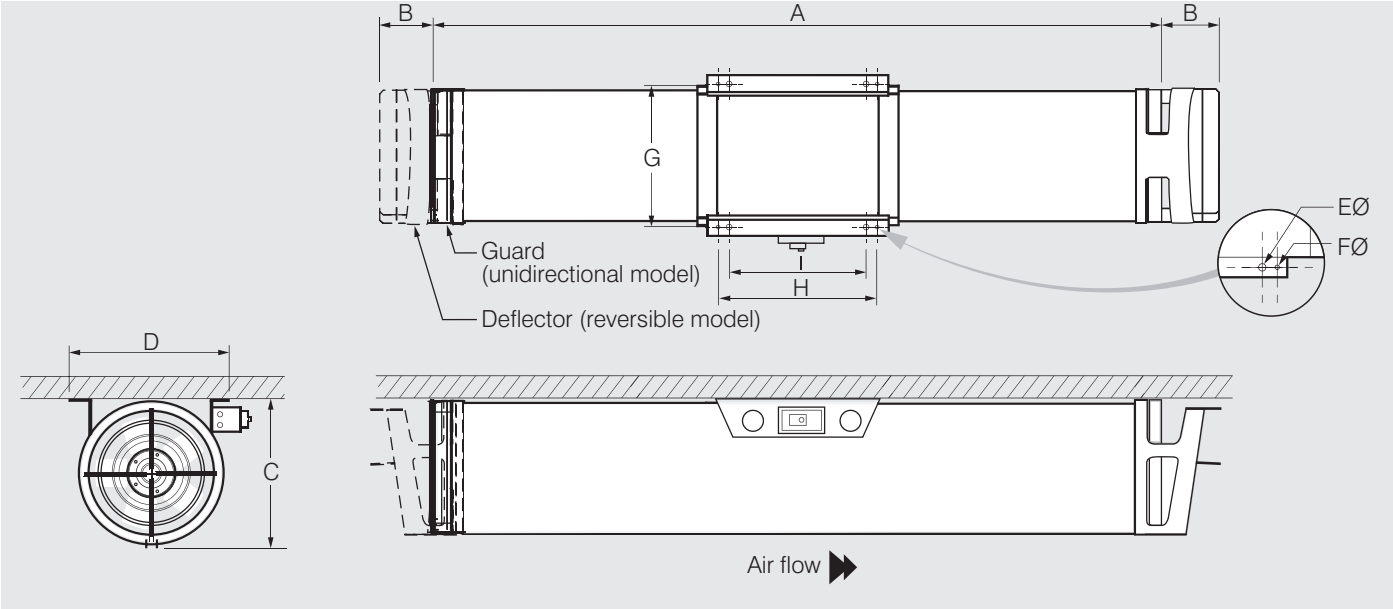
Dimensions



Model	Dimensions, mm A	B	C	D	EØ	FØ	G	H	I	Appro. wt. kg
JVU-CPA-315	1808	142	336	417	25	13	367	420	360	62
JVU-CPA-400	2660	145	423	471	25	13	421	420	360	71

Technical Data And Noise Levels

Model JV../JVS..	Speed Setting	Fan Speed rev/sec	Free Air m³/s	Thrust N	JV... 3ph kW	Amps	Max. °C	Free-field Noise Rating dB(A) @ 3m	Sound Power Levels L_wdB re 1pW 63	125	250	500	1k	2k	4k	8k
U-CPA-315-2-3	-	48	0.96	20	0.55	1.35	40*	59	73	79	86	77	70	65	64	60
U-CPA-315-4-3	-	24	0.48	5	0.55	1.4	40*	49	61	72	66	68	63	61	57	52
U-CPA-315-2/4-3	High	48	0.96	20	0.8	1.9	40*	59	73	79	86	77	70	65	64	60
	Low	24	0.48	5	0.16	0.4	40*	49	61	72	66	68	63	61	57	52
U-CPA-400-2-3	-	48	1.95	50	1.5	2.9	40*	62	86	81	88	79	70	69	70	68
U-CPA-400-4-3	-	24	0.97	12	1.1	2.6	40*	47	72	80	69	63	55	54	55	49
U-CPA-400-2/4-3	High	48	1.95	50	1.7	3.5	40*	62	86	81	88	79	70	69	70	68
	Low	24	0.97	12	0.34	0.8	40*	47	72	80	69	63	55	54	55	49
R-CPA-315-2-3	-	48	0.97	20	0.55	1.35	40*	61	73	82	87	79	74	69	67	64
R-CPA-315-4-3	-	24	0.49	5	0.55	1.4	40*	50	61	71	68	72	62	60	57	52
R-CPA-315-2/4-3	High	48	0.97	20	0.8	1.9	40*	61	73	82	87	79	74	69	67	64
	Low	24	0.49	5	0.16	0.4	40*	50	61	71	68	72	62	60	57	52
R-CPA-400-2-3	-	48	1.99	50	1.5	2.9	40*	63	88	83	89	80	73	73	74	70
R-CPA-400-4-3	-	24	1.00	12	1.1	2.6	40*	54	73	89	72	70	58	56	55	53
R-CPA-400-2/4-3	High	48	1.99	50	1.7	3.5	40*	63	88	83	89	80	73	73	74	70
	Low	24	1.00	12	0.34	0.8	40*	54	73	89	72	70	58	56	55	53

Car park installed noise levels apply 8m away from the fan with multiple fans operating.

* Smoke-spill model can operate at 300°C for 2 hours and has an ambient maximum temperature of 70°C

Notes

Notes

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JFU-05-2026 Issue A

FS 676456

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