JISU

Low Profile Car Park Fan

ELTA

JETVENT CAR PARK IMPULSE VENTILATION

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’s 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.

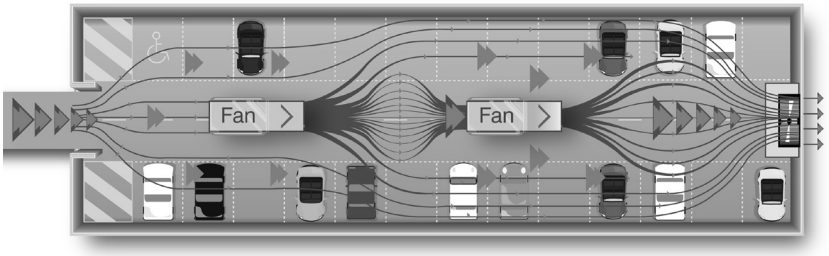
JETVENT CAR PARK IMPULSE VENTILATION

Standards

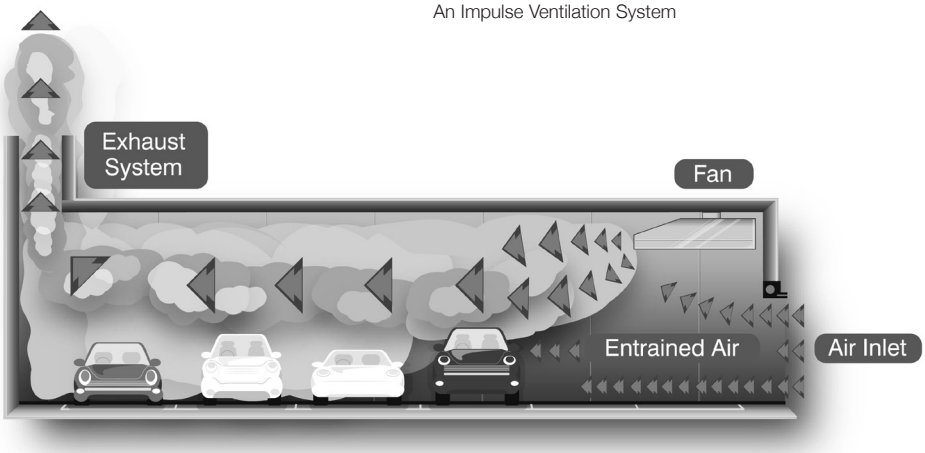
The JetVent range of Impulse Fans are designed and manufactured with procedures as defined in IS09001:2008 and have been tested to satisfy the following Standards:

- 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.

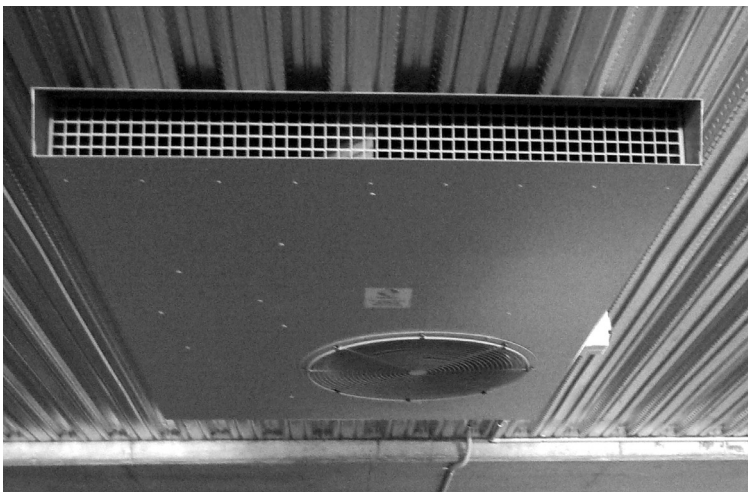
The following pages provide an overview of the JetVent Impulse ventilation systems. For further information contact your Elta representative.

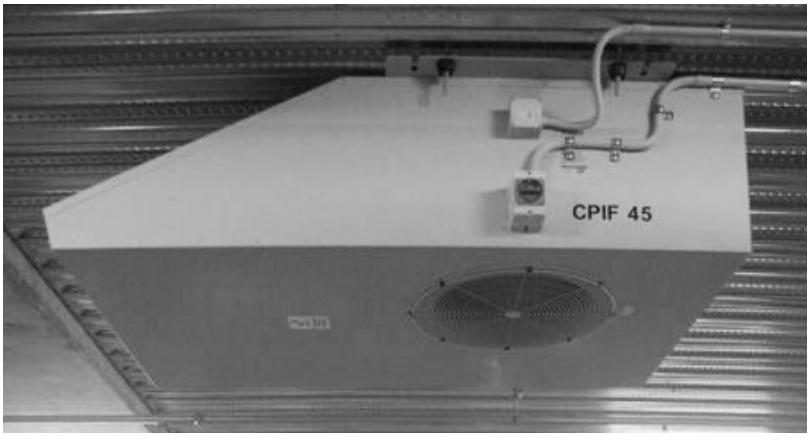


An Impulse Ventilation System



How an Impulse Ventilation System works





JETVENT CAR PARK FANS – JISU

Description

The JISU of JetVent Fans are available in 50 and 100N thrust capacities. This range is suitable for ambient and also high temperature applications as required in fire/smoke control applications. All models feature a low profile housing that is suitable for car parks with low ceiling heights. These units may be used in conjunction with Variable Speed Drives (VSD) for efficient speed control.

Typical Applications

Enclosed or semi-enclosed spaces that contain harmful vehicle exhaust pollutants and require fire/smoke control. 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

- Highly efficient, aerodynamically designed internal flow elements.
- Available with powerful 50 or 100N thrust capacities.
- Engineered for smoke-spill applications and suitable for ambient operating temperatures up to 80°C.
- Compact low profile design makes it suitable for applications with low ceiling heights.
- Durable galvanised steel fan housing with light grey powder coated finish as standard.
- Integral mounting feet allows unit to be easily fitted to the ceiling.

Smoke-Spill Standards

- Designed to comply with the air performance and high temperature requirement of Standards AS/NZ1668.1:1998 and AS4429:1999. Both Standards are mandatory for smoke-spill installations.
- Tests up to 200°C for 2 hours and 300°C for 30 minutes have been successfully concluded.

In the case of a fire occurring, JetVent smoke-spill models will stop operating for a predetermined time to allow occupants to escape the building. After this time the JetVent fan will commence operation again.

Construction

Low profile galvanised steel housing with aerodynamically designed internal flow elements. Light grey powder coated finish as standard. Backward curved centrifugal impeller manufactured from durable aluminium.

Motors

Type - external rotor, squirrel cage induction motor.

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

Bearings - sealed-for-life, ball.

Speed controllable using Variable Speed Drives which must be bypassed in smoke control mode. Sinusoidal filters are required for Variable Speed Drive control.

Motors are suitable for ambient conditions as well as high temperature conditions required for smoke-control applications.

Maximum ambient temperature 80°C.

Testing

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.

High temperature requirements tested to AS4429:1999.

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 website.

Control Systems

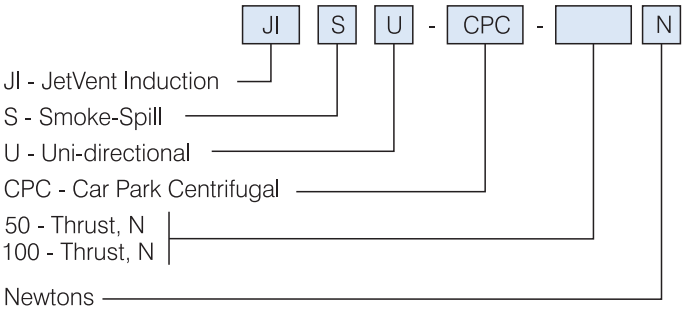
There are two types of analogue control systems used with the JetVent JISU:

- 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.

Ancillary Equipment

Variable Speed Drives

How To Order



Suggested Specification

The high velocity jet fans shall be of the JetVent JISU as designed and manufactured by Elta and be of the model number shown. The housing shall be of galvanised steel with a light grey powder coated finish as standard.

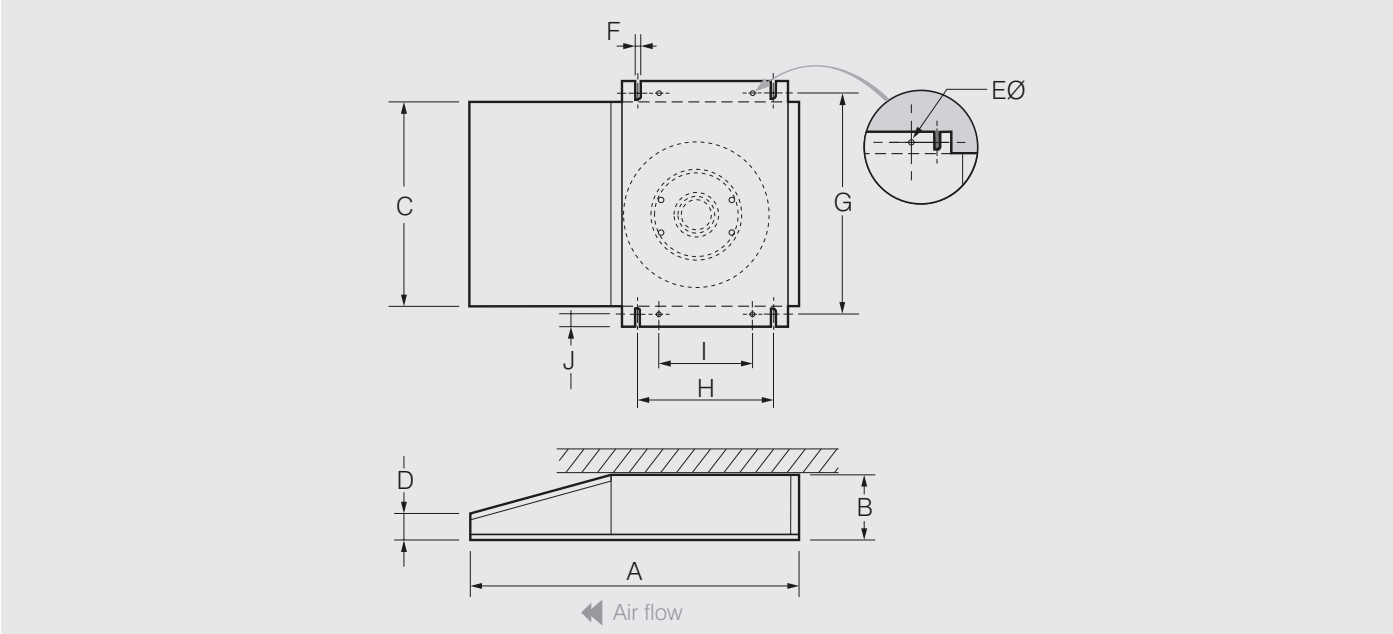
They shall incorporate mounting feet, aerodynamically designed internal flow elements and impellers of backward-curved centrifugal design manufactured from aluminium. They shall comply with the air performance and high temperature requirement of Standards AS/NZ1668.1:1998 and AS4429:1999 and shall be tested up to 200°C for 2 hours and 300°C for 30 minutes.

Performance data shall be based on tests to BS848:Part 10,1999 for thrust and BS848:Part 2, 1985 for noise.

Tel **+603 7846 0340** Email **info@elta.asia** Website **elta.asia**

JETVENT CAR PARK FANS – JISU

Dimensions



Model FPMD...	Dimensions, mm A	B	C	D	EØ	F	G	H	I	J	Approx. wt. kg
JISU-CPC-50N	1262	250	790	102	30	16	890	607	427	60	85
JISU-CPC-100N	1832	320	1150	69	30	16	1240	600	450	50	184

Technical And Noise Data

Model JIU-..	Fan Speed rev/ sec	Free Air m^3/s	Thrust N	JISU... 3 ph. kW	Amps	Max. °C	Car park Installed Noise Levels dB(A)#	Free-field Noise Rating dB(A) @ 3m	Sound Power Levels L_wdB re 1pW 63	125	250	500	1k	2k	4k	8k
JISU-CPC-50N	23(H)	1.63	50	1.42*	2.8	40	78	69	78	94	89	88	82	81	77	69
	15(L)	1.06	20	0.37*	1.8	40	68	68	68	84	79	78	72	71	67	59
JISU-CPC-100N	21(H)	2.39	100	2.60*	4.6	40	77	68	86	93	88	86	83	82	76	67
	14(L)	1.59	44	0.77*	3.0	40	68	59	75	82	77	75	72	71	65	56

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

* Estimated power consumption.

JETVENT CAR PARK FANS – JISU

Notes

Tel **+603 7846 0340** Email **info@elta.asia** Website **elta.asia**

Notes

ELTA

Elta Asia Sdn Bhd

Tel **+603 7846 0340**
Email **info@elta.asia**

elta.asia

JISU-2026 Issue A

FS 676456

A MEMBER OF ELTA GROUP