

**JETVENT**  
*AXIALS*



**FANTECH**  
VENTILATION



Impulse **Ventilation**

# JETVENT

## introduction

JetVent Axial Impulse fans have been specifically designed to provide a high velocity airflow to help overcome problems caused in part by obstructive structural beams and the low overall ceiling heights found in car parks.

The innovative design of the JetVent Axial Impulse fan has been proven to provide major benefits in terms of reduced installation and running costs as well as effective smoke and contaminant movement.



## excellent performance and safety

Technical excellence and innovation in application of our equipment are the cornerstones of any Elta product - JetVent is no exception to this approach.

The harmony of our engineering excellence and technical sophistication combine to provide a first class product which meets demanding smoke, as well as general fume applications.

With tomorrow's technology at our finger tips, utilising market leading software, Elta can pinpoint, analyse and make design changes and improvements to our products without the expense of conventional prototyping, working with our customers to meet their specific needs.



# JetVent: the principle

The impulse ventilation system is based on a number of small, strategically located high velocity fans in place of the large and expensive distribution ductwork traditionally used in car parks.

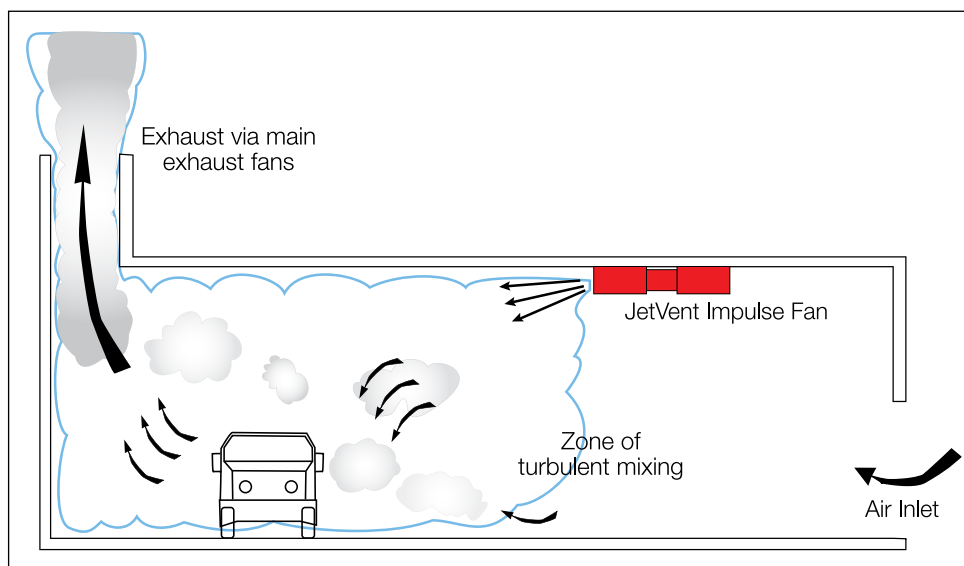
Impulse fans operate on well proven tunnel ventilation principles, producing a high velocity jet which adds momentum to the air in front of the fan imparting thrust to all the surrounding air via mixing and entrainment as it diffuses. The volume of entrained air is significantly greater than that passing through the fan.

The impulse fans are carefully positioned to direct the airflow towards the main extract fan intake points. The main extract fans are sized to provide the required flow rates, however, given the

reduced need for, or complete elimination of the large, expensive ducting, the resulting reduction in system resistance means the exhaust fans are typically smaller and consume less energy.

Impulse fan performance is rated in terms of the thrust developed by the fan, which is the product of the mass flow rate times the change in velocity, i.e. volume flow rate times the air density times the fan outlet velocity, and is measured in Newtons.

Figure 1.0: Impulse Ventilation. Section View: Discharge angled to efficiently move air



## why impulse ventilation?

There are a number of very obvious yet subtle differences between conventional mechanical and impulse ventilation systems, namely;

- The distribution ducting used in traditional systems (Figure 2.0) is replaced by a number of small JetVent impulse fans (Figure 3.0) to direct the airflow across the designated area.
- Without the distribution duct resistance, smaller exhaust and supply fans and / or motors can be used.

Figure 2.0 Conventional ducted system

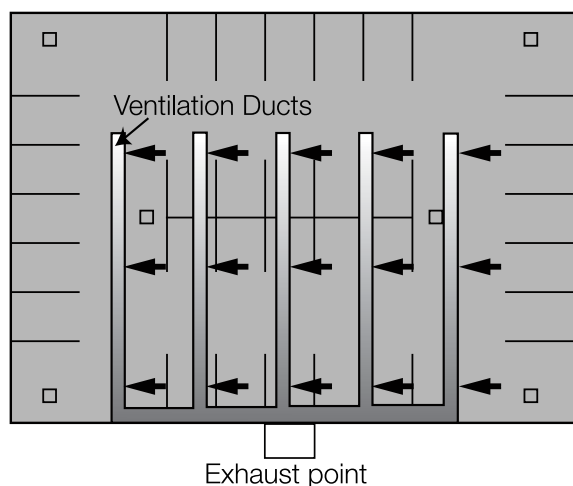
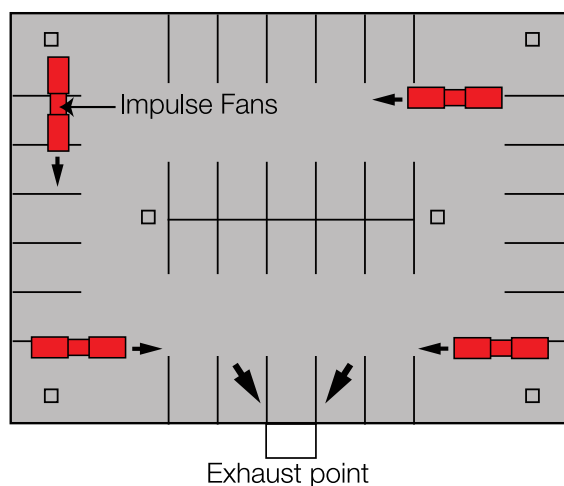


Figure 3.0 Equivalent impulse layout



# features & benefits

The JetVent Axial Impulse fan range comprises several standard and non-standard sizes. They are provided with either uni-directional or truly reversible airflow, as well as a number of optional ancillaries.

JetVent can run in either normal extract mode or at a once only smoke operation at 300°C for 2 hours which means cost savings as a single fan provides both general and smoke extract requirements.

# JETVENT



## no ductwork requirement

By adding momentum to the air, JetVent thrusts air towards the desired extract points to ensure contaminant laden air and smoke are cleared effectively and efficiently.

This principle eliminates the need for ductwork within the car park, as the JetVent effectively transfers the polluted air, (allowing for better use of limited space) in underground facilities.

By eliminating ductwork, the system resistance for the application is greatly reduced, which means lower pressure drops are required by the extract fans, lower power consumption, and reduced running and energy costs.

Greater flexibility in installation and operation of JetVent units easily avoids the potential problem of stagnant areas.

JetVent used in conjunction with multi-purpose sensors provides further energy savings by selectively operating fans in polluted areas only, at specific speeds.

## lower maintenance

With no ductwork, maintenance costs are greatly reduced as there is no ducting to become blocked, damaged or subject to leakage.

## cost effective

JetVent provides scope for reduced installation and overall construction costs compared with using more traditional ducted systems. The high efficiency impellers make this application a very economical method of moving high volumes of air.

## design appeal

The integral bell mouth inlet has a streamlined appearance for improved performance and sound reduction.

## better security

The elimination or reduction in ductwork means a safer, lighter environment with better security (due to the increased visibility), for efficient use of CCTV cameras.

## slim, robust design

JetVent axial fans are of a robust, heavy duty construction for added strength and durability. Fan casings are heavy gauge, sheet steel, roll formed, welded and hot dipped galvanised after fabrication to BS 729.

The design of the JetVent Axial allows designers to overcome problems caused by obstructive structural beams and low overall ceiling heights, without compromising performance characteristics.

The JetVent fan outlet design ensures a highly efficient uni-directional or truly reversible thrust of the airflow into the designated area.

The integral mounting feet with four fixing points for mounting the unit to the ceiling greatly assists in reducing installation times.



## specification

The JetVent Axial Impulse range comprises multiple thrust types, suitable for ambient temperature operation (at 40°C) plus a one off operation at 200°C or 300°C for 2 hour high temperature smoke conditions to European Standard EN12101-3:2002.

## impeller

Adjustable pitch aerofoil section impellers are provided with blades made from high quality pressure die cast aluminium alloy (LM6). Hubs are made from pressure die cast aluminium (LM24). The assembled impellers have their blades positively locked by pinning, which provides added security for operation in the smoke regime.

Impellers are dynamically balanced to Grade G6.3.

## silencers

Integral inlet and outlet silencer are mounted to either side of the fan housing, with an integral bell mouth to provide reduced sound levels and optimal performance. Silencers are constructed from pre-galvanised sheet steel outer and pre-galvanised perforated sheet inner lining.

The inlet silencer has a zinc plated guard attached, whilst the outer silencer has a deflector fitted to guide the air in the direction required.

NOTE: All accessories for these units are incorporated during testing to ensure accurate thrust test figures are obtained from our thrust rig.

## casing

JetVent axial fans are of robust, heavy duty construction for added strength and durability. Fan casings are heavy gauge, sheet steel, roll formed, welded and hot dipped galvanised after fabrication to BS 729.

The integral 4-Point mounting feet allow the unit to be mounted easily to the ceiling.

## motors

Motors are totally enclosed airstream cooled, metric frame protected to IP55.

Motors have Class F or Class H insulation and are rated for normal continuous duty at 40°C and once only emergency operation in smoke conditions of 200°C or 300°C for 2 hours.

Motors are either single speed or two speed. Two speed motors shall have a Dahlander winding with direct starting at both speeds. However single speed units may have speed choice using inverters.

## quality management

Units are designed and manufactured with procedures as defined in BS EN ISO 9001: 2000.

All JetVent units are tested at elevated temperatures in accordance with the requirements of the European standard EN12101-3:2002.



# performance & electrical data

## Un-Flanged Units

Motors shown below are suitable for the following:-

- A) General use at temperatures (ambient) +40°C
- B) One off high temperature use of 300°C for 2 hours
- C) 400Volt / 3 Phase / 50Hz Electrical Supply
- D) All thrust figures are measured under test conditions
- E) Volume flow and velocity figures shown may have been calculated in accordance with test requirements
- F) All the test data shown has been prepared in accordance with ISO 13350 1999 / BS 848-10-1999

### JetVent - Uni Directional - Standard Thrust

Product Code	Thrust Newtons	Volume Flow Rate m <sup>3</sup> /s	Velocity m/s	Sound Pressure dBA @1m
JVSU-CPA-315 2-3	21	0.95	16.52	62
JVSU-CPA-400 2/4-3	51/12	1.95/0.97	20.91/10.42	64/50

Product Code	Speed r/min	Motor Power kW	FLC Amps	SC Amps	Absorbed Power kW
JVSU-CPA-315 2-3	2960	0.80	1.91	11.46	0.45
JVSU-CPA-400 2/4-3	2855/1448	1.30/0.28	2.41/0.75	14.50/2.85	1.02/0.16

### JetVent - Truly Reversible - Standard Thrust

Product Code	Thrust Newtons	Volume Flow Rate m <sup>3</sup> /s	Velocity m/s	Sound Pressure dBA @1m
JVSR-CPA-315 2-3	20	0.96	16.73	64
JVSR-CPA-400 2/4-3	52/13	2.02/1.02	21.64/10.87	66/57

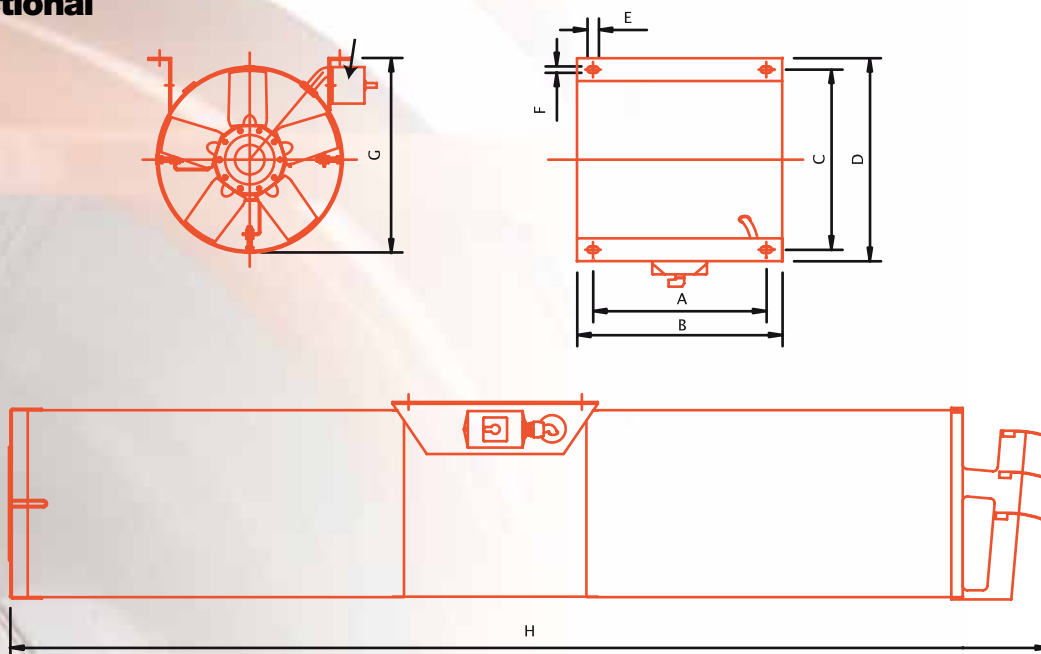
Product Code	Speed r/min	Motor Power kW	FLC Amps	SC Amps	Absorbed Power kW
JVSR-CPA-315 2-3	2950	0.80	1.91	11.46	0.47
JVSR-CPA-400 2/4-3	2841/1443	1.30/0.28	2.41/0.75	14.50/2.85	1.17/0.17

**NOTE:**

- 1) All dBA Figures shown are free field sound pressure levels at 45° to inlet/outlet
- 2) All starting currents shown are direct online (DOL)
- 3) Air density used in all figures is 1.2kg/m<sup>3</sup>
- 4) Low speed provisions provided by inverter on a single speed motor OR two speed tap wound motor

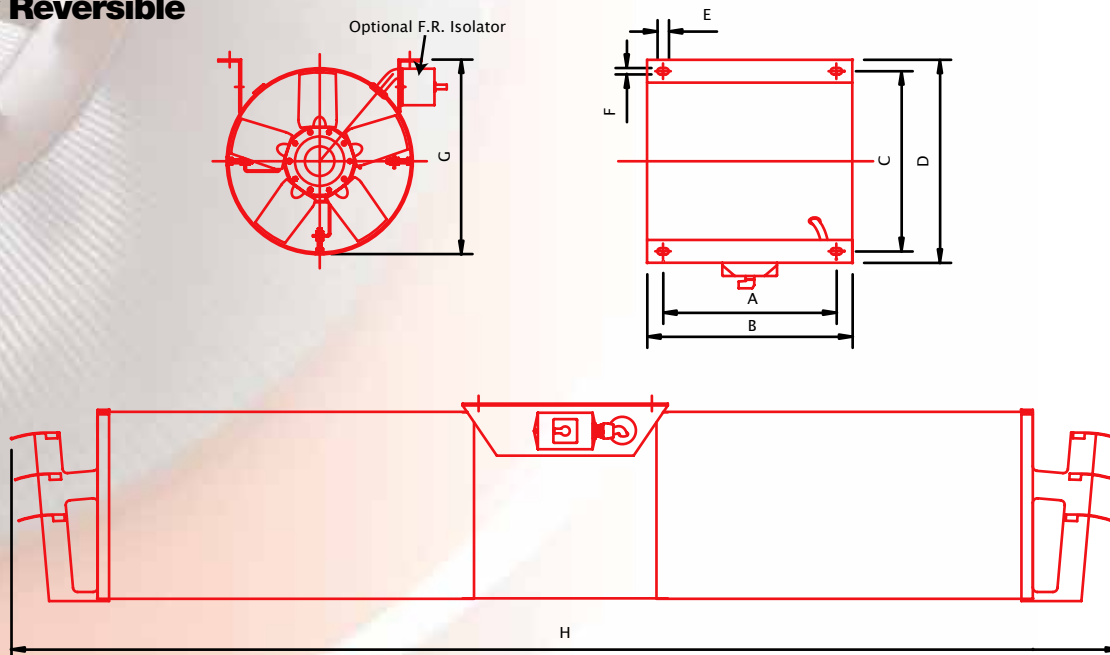
# dimensional data - JetVent Axial

## Uni Directional



Product Code	A	B	C	D	E	F	G	H	Weight kg
JVSU-CPA-315 2-3	380	450	350	400	25	14	335.5	1990(Max)	65
JVSU-CPA-400 2/4-3	380	450	395	445	25	14	427	2880(Max)	75

## Truly Reversible



Product Code	A	B	C	D	E	F	G	H	Weight kg
JVSR-CPA- 315 2-3	380	450	350	400	25	14	335.5	2098(Max)	65
JVSR-CPA-400 2/4-3	380	450	395	445	25	14	427	3030(Max)	75

# performance & electrical data

## Flanged Units

Motors shown below are suitable for the following:-

- A) General use at temperatures (ambient) +40°C
- B) One off high temperature use of 300°C for 2 hours
- C) 400Volt / 3 Phase / 50Hz Electrical Supply
- D) All thrust figures are measured under test conditions
- E) Volume flow and velocity figures shown may have been calculated in accordance with test requirements
- F) All the test data shown has been prepared in accordance with ISO 13350 1999 / BS 848-10-1999

### JetVent - Uni Directional - High Thrust

Product Code	Thrust Newtons	Volume Flow Rate m <sup>3</sup> /s	Velocity m/s	Sound Pressure dBA @1m
LCS 031-CPU 2/4-3	34/9	1.49/0.77	19.20/9.90	68/50
LCS 035-CPU 2/4-3	53/14	2.12/1.08	21.40/10.90	71/53
LCS 040-CPU 2/4-3	86/22	3.04/1.55	24.20/12.30	71/54

### JetVent - Truly Reversible - High Thrust

Product Code	Thrust Newtons	Volume Flow Rate m <sup>3</sup> /s	Velocity m/s	Sound Pressure dBA @1m
LCS 031-CPR 2/4-3	24/6	1.26/0.64	16.10/8.20	66/48
LCS 035-CPR 2/4-3	43/11	1.91/0.96	19.30/9.70	70/53
LCS 040-CPR 2/4-3	79/20	2.91/1.48	23.10/11.80	72/55

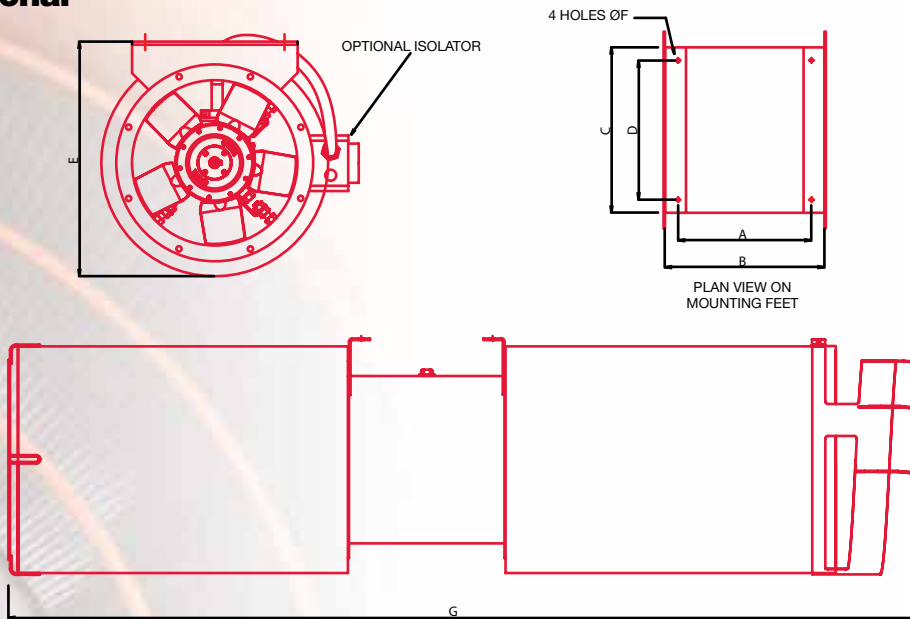
Product Code	Speed r/min	Motor Power kW	FLC Amps	SC Amps	Absorbed Power kW
LCS 031-CPR 2/4-3	2895/1470	1.30/0.28	2.65/0.80	14.80/3.61	0.86/0.13
LCS 035-CPR 2/4-3	2946/1488	2.53/0.58	5.25/1.70	27.80/5.44	1.54/0.23
LCS 040-CPR 2/4-3	2900/1476	2.53/0.58	5.25/1.70	27.80/5.44	2.52/0.38

**NOTE:**

- 1) All dBA Figures shown are free field sound pressure levels at 45° to inlet/outlet
- 2) All starting currents shown are direct online (DOL)
- 3) Air density used in all figures is 1.2kg/m<sup>3</sup>
- 4) Low speed provisions provided by use of inverters

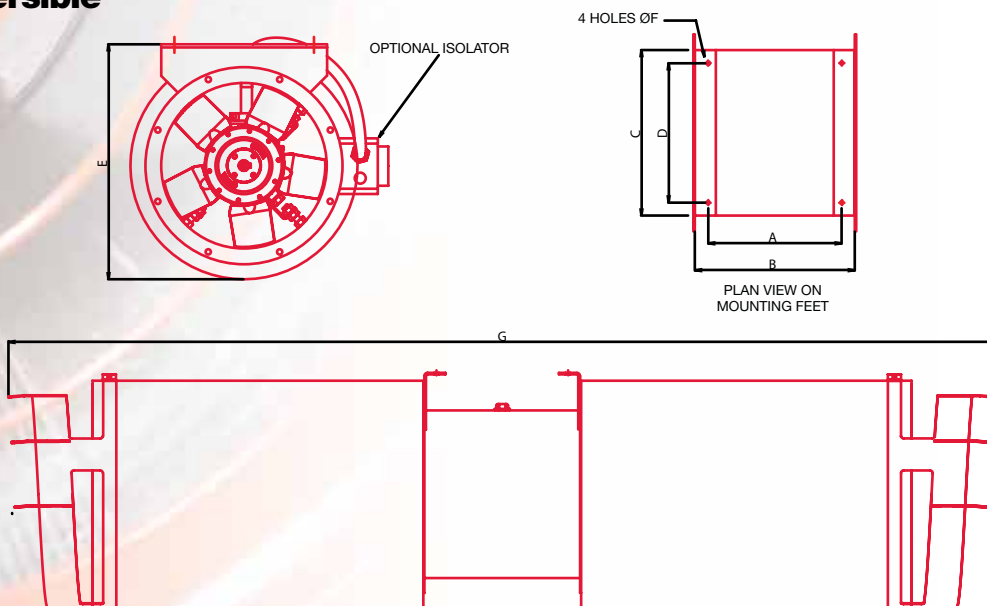
# dimensional data - JetVent Flanged

## Uni Directional



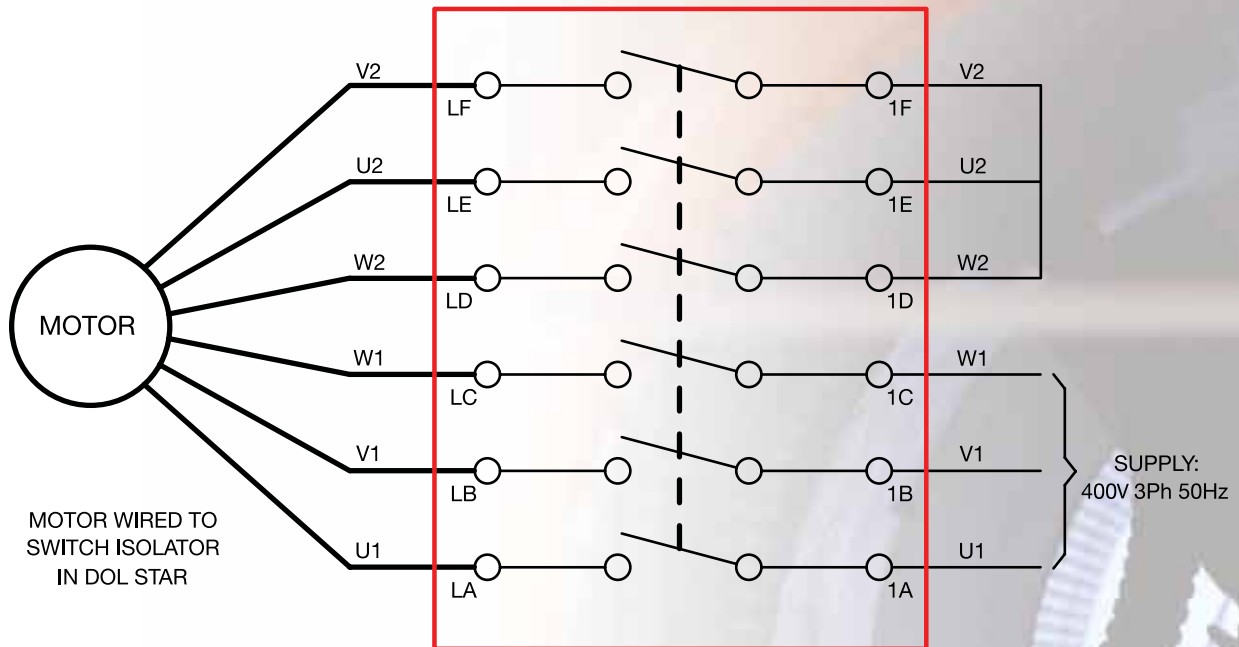
Product Code	A	B	C	D	E	F	G	Weight kg
LCS 031-CPU 2/4-3	250	300	315	265	447	9	1751(Max)	51
LCS 035-CPU 2/4-3	348	400	355	305	443	9	1839(Max)	60
LCS 040-CPU 2/4-3	339	400	400	350	523	9	2323(Max)	72

## Truly Reversible

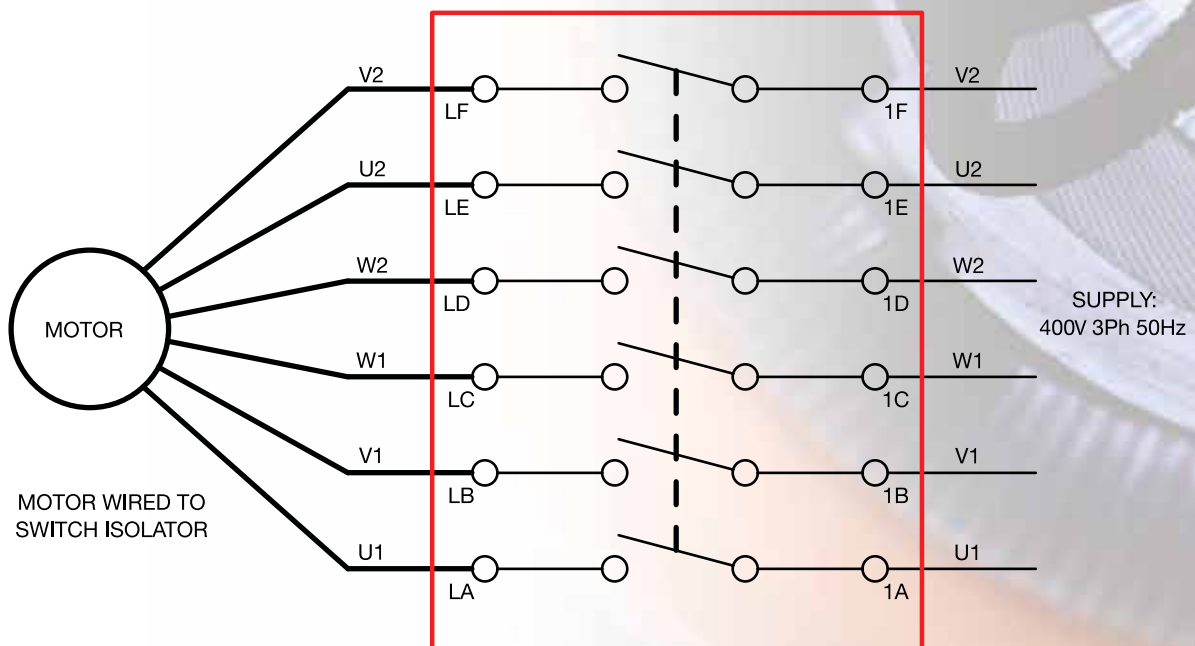


# wiring diagrams - both forms

## Single Speed (D.O.L. - STAR)



## Two Speed Single Winding



LOW SPEED  
SUPPLY U1, V1 & W1

HIGH SPEED  
SUPPLY W2, U2 & V2  
AND LINK U1, V1 & W1

# market applications

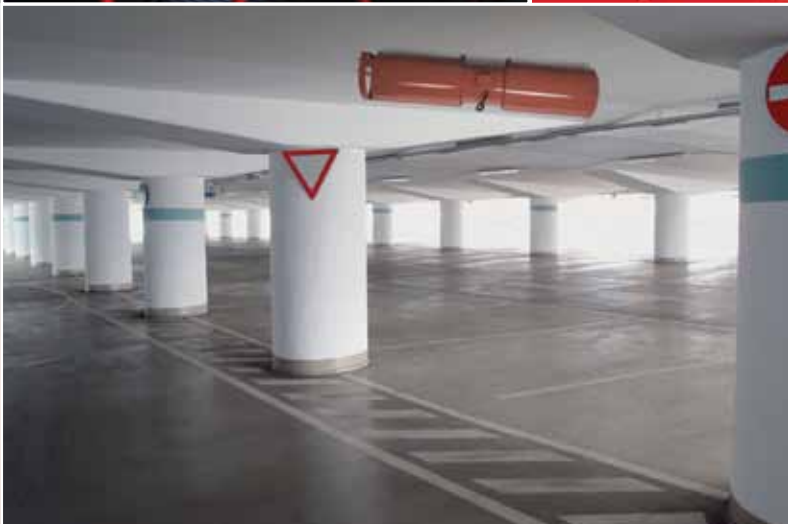
Elta Fans has a wealth of experience and knowledge dedicated to understanding your particular and specific needs. Whether your criteria include optimising space, specific performance characteristics, low noise level or a high specification finish, the JetVent Axial range continues to enhance Elta's reputation in the design and supply of specialist ventilation products.

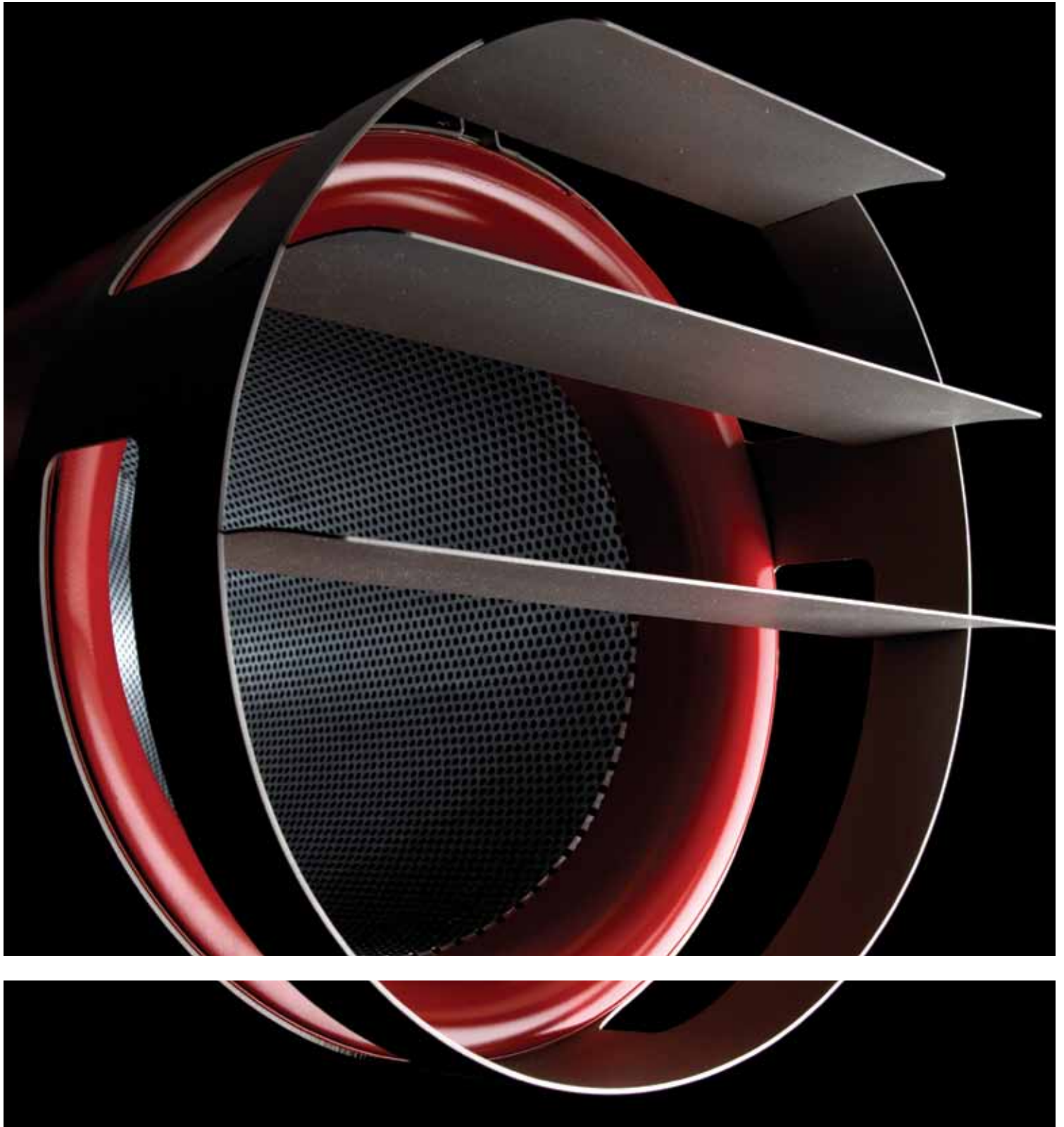
JetVent is designed to meet the requirements for general ventilation and smoke extract of fully enclosed or open sided car parks, as well as vehicle bays, metro stations and other applications such as distribution warehouses. By bringing fresh air in and thoroughly mixing the air, JetVent extracts harmful pollutants, namely carbon monoxide, nitrous oxides, fumes from vehicle fluids, oil and other fuels, whilst enhancing visibility by removing smoke haze created by diesel exhaust fumes.

Of equal importance is the need for ventilation in the event of a fire itself. JetVent Axial contributes to safeguarding lives by providing smoke clearance for occupants to escape, whilst enabling access for fire fighters to control the fire.



carbon monoxide, nitrous oxide





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