

# UNIJET CAR PARK VENTILATION SYSTEM

FOR SMOKE AND POLLUTION CONTROL

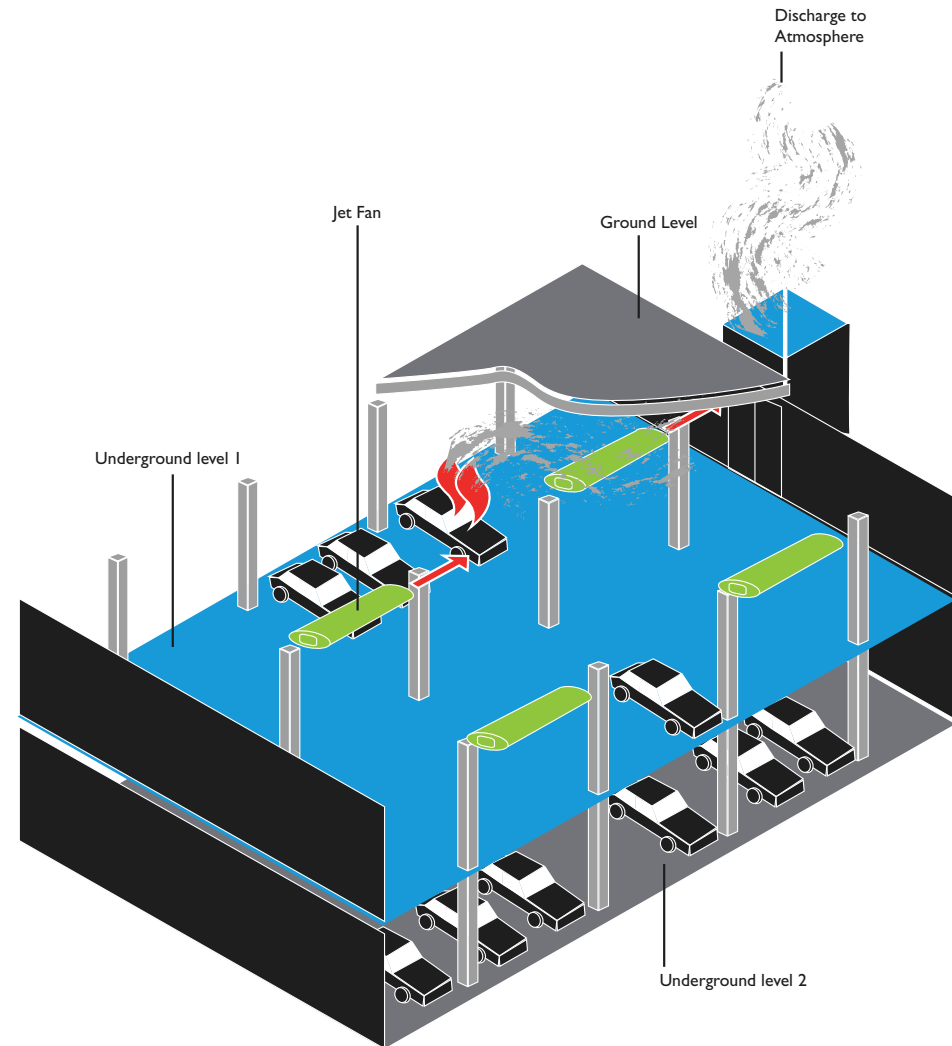


## Overview

Unijet is a packaged car park ventilation system designed to provide smoke clearance and pollution ventilation to covered car parks to comply with current building regulations and also meeting the standards set out in BS7346 Part 7 (2006) – Specifically “impulse ventilation to achieve smoke clearance”

## System Description

The Unijet car park ventilation system delivers combined pollution and smoke clearance using jet fans to provide an energy efficient and safe solution whilst requiring the least possible plant space. The system comprises high temperature extract fans to exhaust smoke and pollution to atmosphere with strategically positioned jet or impulse fans used to move stale air or smoke to the extract fan positions. Fully automatic controls monitor carbon monoxide levels and smoke or temperature conditions within the car park to operate the fans at the appropriate level to maintain safe and comfortable conditions within the car park.



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## System Components

### Extract Fans

Main extract plant comprises run and standby axial flow fan units. All fans are tested to the latest internationally recognised standard ISO5801 Part 1, installation category D for aerodynamic performance and BS848 Part 2 (1985) for acoustic performance. The adjustable pitch Aerofoil impeller gives the exact performance required, with a non overloading fan characteristic. The impellers are all high pressure die cast to offer thin aerofoil sections for low generation of noise. The maximum pitch angles allow for speed control by frequency inverter. The motors are suitable for inverter speed control down to 20% of full speed. Fans are tested in compliance with high temperature test standard directive 89/106/EEC to EN 12101-3 and are rated to one off emergency operation at 300°C for 1 hour.

### Cylindrical Silencers (Optional)

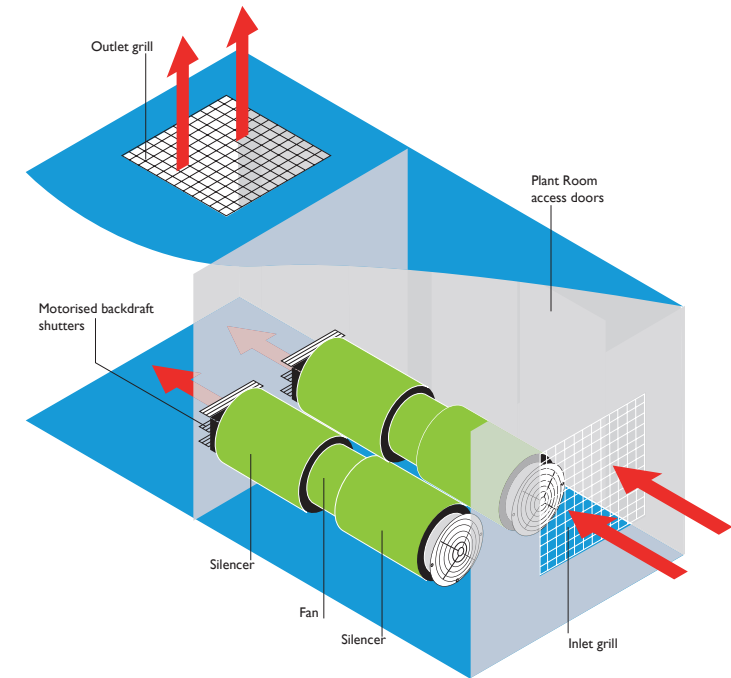
Casings are of rolled, pre-galvanised sheet steel with spun end rings incorporating tapped inserts for fixing. Suitable fixing screws are provided with all steel silencers. The absorbent material is acoustic grade mineral fibre with an erosion resistant facing. It is protected and contained by a pre-galvanised perforated steel sheet formed to match the fan diameter.

### Impulse Fans

High efficiency axial flow fan with adjustable blades to achieve the required performance. The fan unit is fitted with inlet and outlet silencers to give minimal operational noise levels. Deflector vanes are fitted to the fan outlet to guide the airflow. Fan motors are asynchronous flange type and can be single or two speed. The fans are delivered as a complete unit housed in an attractive oval casing for quick and easy installation. All jet fans are high temperature units to maintain operation in fire conditions.

### Control System

The control system is an intelligent PLC based modular control system using an ASi (Actuator Sensor Interface) network for operation of field hardware and Ethernet communications network for the HMI user interfaces in the cores and fire control centre. The system can also be interfaced with the BMS system to provide status indication for fans i.e. running/failed, fan speed via a 0-10V signal and alarm/active location.



Modular car park smoke clearance system

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## System Components (Continued)

### Motor Control Centre

The MCC contains all the necessary hardware to provide automatic operation of the system, including variable speed drives for all fans (for daily vent mode only), automatic changeover and can be interfaced with the fire detection system. Automatic control of the car park ventilation system is facilitated by CO monitoring that continually checks the air quality within the car park. CO heads are mounted throughout the car park to ensure that all areas are protected.

The fire mode function of the system is activated by the fire detection system. The run signals are relayed to the fan control panels through local interface units to initiate the required sequence of operation of the induction fans and main extract fans. Primary and secondary power supplies will ensure continuous operation of the system during primary mains failure.

Automatic changeover is incorporated into the plant room control panels to switch the power supplies in the event of primary supply failure. The fan control panel will accept two incoming 3 phase power supplies (by others) providing automatic change over in the event of primary mains failure. The secondary supply shall be capable of providing a continuous source of power for a minimum period of 2 hrs with the system operating at full load. The extract fan control panel provides the control & monitoring of the entire car park extract system. The panels can be externally wall mounted in an IP55 enclosure. Operation of the fans is monitored by current sensing so that in the event of fan failure the standby fans are automatically started. All extract

& impulse fans will be inverter controlled by the extract fan control panel to reduce starting currents and allow for adjustment of volume flow rates to achieve the required exhaust duty at the point of extract.

### CO Detector

The Tocsin 103 series of gas detectors are designed for cost effective safe area gas detection solutions. They incorporate microprocessor technology to give a stable 4-20mA process signal output or digital addressable output. The addressable output option allows detectors to be networked on a single cable run giving dramatic reduction in installation costs. The in built processor can be used to pre-calibrate the sensor prior to installation. Alternatively calibration can be achieved on site via the control panel or locally using a handheld PC device or laptop. A range of sensing technologies can be incorporated into the housing to provide the most appropriate detection method.

### Electrical Wiring

The electrical wiring for the system shall be provided in fireproof cable with a CWZ classification.

Fan Cabling	FP400 or equivalent
Controls Cabling	FP200 or Equivalent
CO Detection Cabling	CY Screened or equivalent

All cabling will be installed in accordance with the Electrical Wiring Regulations.

## Standard Solutions

For a quick and easy estimation of what you need for your car park use the following guide to ascertain how many fans, plant areas, and power requirements in minutes. Call our engineering team for costs or further assistance and we'll be happy to help.

## Four easy steps to protecting your car park

1. Decide what level of protection you need. If you're unsure please call us on 0870 240 6460
2. Calculate the floor area of your car park.
3. Use the chart overleaf to plan your installation e.g. plant room space, required inlet area etc. If your car park area falls outside the range of the table please contact our engineering team for a bespoke proposal.
4. Contact our projects team for an instant quote and a price list for future use. We can even provide you with our unique Carparkulator wheel to make it even easier for you to design and cost car park ventilation systems.

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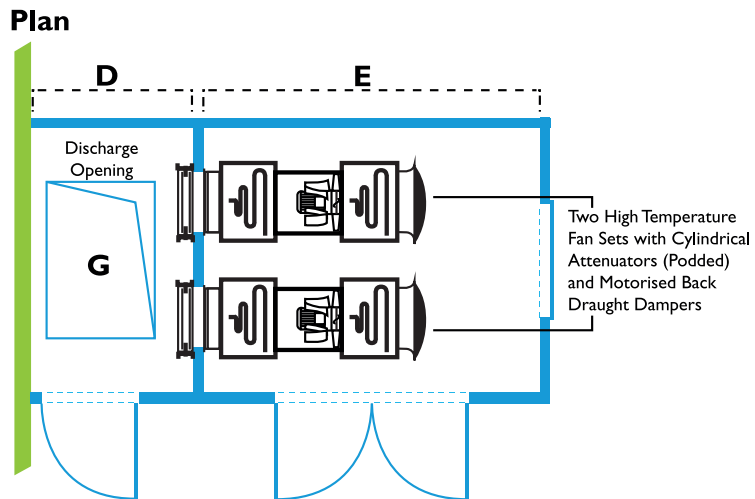
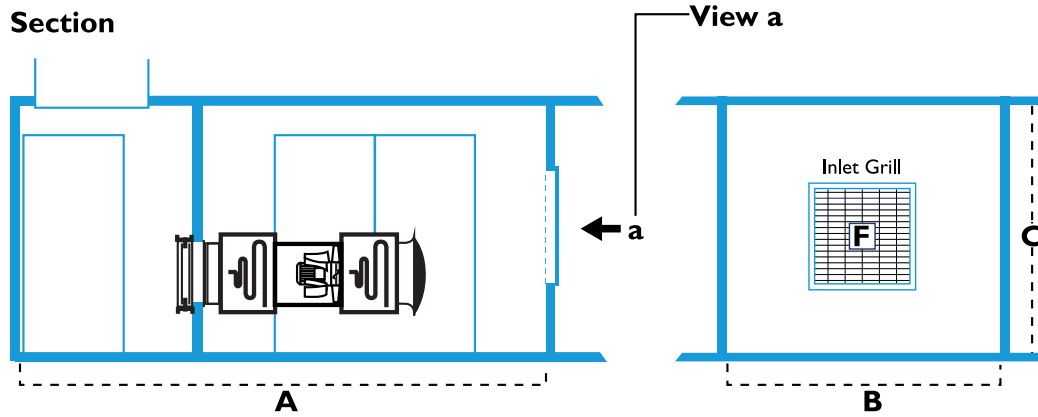
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TOTAL FLOOR AREA OF CAR PARK	NO. OF JET FANS	EXTRACT FAN DIAMETER	PLANT ROOM MINIMUM DIMENSIONS (MM)					OPENING AREA (FREE AREA)		CONTROL PANEL DIMENSIONS
			A	B	C	D	E	F (h x w)	G	
750	2	500 Ø	4700	2500	2100	1500	3100	1500 x 650	1.42m <sup>2</sup>	1000h x 800w x 250d
1000	3	630 Ø	5100	2800	2100	1500	3500	1500 x 850	1.9m <sup>2</sup>	1000h x 800w x 250d
1250	4	710 Ø	5400	3000	2100	1500	3800	1500 x 1100	2.4m <sup>2</sup>	1200h x 1200w x 400d
1500	5	800 Ø	5600	3200	2100	1500	4000	1500 x 1300	2.85m <sup>2</sup>	1200h x 1200w x 400d
1750	5	800 Ø	5600	3200	2100	1500	4000	1500 x 1500	3.35m <sup>2</sup>	1200h x 1200w x 400d
2000	6	900 Ø	5900	3500	2100	1500	4300	1800 x 1400	3.8m <sup>2</sup>	1200h x 1200w x 400d
2250	7	900 Ø	5900	3500	2100	1500	4300	1800 x 1600	4.3m <sup>2</sup>	1200h x 1200w x 400d
2500	7	1000 Ø	6200	3800	2200	1500	4600	1800 x 1800	4.75m <sup>2</sup>	1200h x 1200w x 400d
2750	8	1000 Ø	6300	3800	2200	1600	4600	1800 x 1950	5.25m <sup>2</sup>	1200h x 1200w x 400d
3000	9	1000 Ø	6400	3800	2200	1700	4600	1800 x 2150	5.75m <sup>2</sup>	1600h x 1000w x 400d
3250	9	1120 Ø	6700	4200	2300	1700	4900	1800 x 2300	6.2m <sup>2</sup>	1600h x 1000w x 400d
3500	10	1120 Ø	6800	4200	2300	1800	4900	1800 x 2500	6.7m <sup>2</sup>	1600h x 1000w x 400d
3750	10	1120 Ø	6900	4200	2500	1900	4900	1950 x 2450	7.15m <sup>2</sup>	1600h x 1000w x 400d
4000	11	1250 Ø	7200	4400	2500	1900	5200	1950 x 2650	7.65m <sup>2</sup>	1600h x 1000w x 400d
4250	12	1250 Ø	7300	4400	2500	2000	5200	1950 x 2800	8.1m <sup>2</sup>	1800h x 1200w x 400d
4500	12	1250 Ø	7400	4400	2500	2100	5200	1950 x 2950	8.6m <sup>2</sup>	1800h x 1200w x 400d
4750	13	1250 Ø	7500	4400	2500	2200	5200	1950 x 3000	9.05m <sup>2</sup>	1800h x 1200w x 400d

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*Plant Room Standard Arrangement*

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## What is included in your quotation:

### Unless confirmed in writing, this is what we provide:

- Project management to our ISO9001 procedures, including provision of design drawings, method statements and risk assessments
- Field wiring, identification and testing
- All cables, junction boxes and flex outlet plates.
- Termination and connection of field wiring to position of control panels and field devices
- On completion of commissioning, we provide 1 day of demonstration to approving authorities
- Standard limited warranty period
- First year's maintenance of system to comply with requirements of fire safety legislation

### Optional additional cost items:

- Electrical containment
- Power supplies
- Additional system demonstrations
- Smoke tests
- Collateral warranties

### Attendances by others:

- Material off loading and safe storage
- External hoisting and positioning of roof-mounted equipment
- Welfare facilities
- Task lighting and 110V power
- Safe access equipment, hoisting, craneage or scaffolding

### Builders work by others:

- Construction of suitably fire rated plant room
- Forming and weathering of discharge openings in plant room
- Chasing out walls and making good