Parking Garage Ventilation Systems
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A FlaktWoods Company
FläktWoods is a world leader in the technology of air movement. Our knowledge and experience with ventilation systems is now being used to produce an innovative solution for enclosed parking facilities. FläktWoods has rapidly become an industry leader, offering tailored solutions for these facilities around the world.

Enclosed or underground parking garages are ventilated primarily to remove harmful vehicle emissions and other pollutants, providing fresh air for customer and employees. Ventilation is also a requirement in the event of a fire to remove hot smoke, facilitate escape and to provide a clear access for fire fighters. Ventilation rates for parking facilities can be calculated based on air changes, volume per parking space, or the amount of air required to dilute pollutant to a certain level. These criteria are specified in the relevant national and local building codes and regulations and will vary between general ventilation for pollution control and emergency ventilation for smoke control.

Traditional parking facility ventilation systems use exhaust (and sometimes supply) fans in conjunction with ductwork to distribute air around the facility, providing a common system for both pollution and smoke control. Unfortunately, the positioning of exhaust grilles within the system is not always ideal.

Fresh air is sometimes exhausted before it becomes contaminated with pollutants, or conversely, it becomes excessively contaminated. This can also result in fresh air being exhausted during emergency operation rather than being distributed throughout the parking facility.

FläktWoods innovative parking garage ventilation system uses JETFAN fan technology together with the main supply and exhaust fans which eliminates most of the problems associated with conventional ducted systems. The FläktWoods system is based on the operation of small JETFAN units installed in the ceiling of the parking facility. They are positioned to control the distribution of the air within the structure. They can be used to create a flow of air at both high and low levels with in the facility, effectively using the same air twice, resulting in a more efficient use of air than conventional ducted systems. JETFAN units act in a similar way to traditional ducted systems, pulling air into the fan inlet (i.e., a grille) and discharging at a high level towards the exhaust locations (i.e., a duct). A typical system includes the main exhaust fans; supply fans (if required) JETFAN units, detection system for pollution, CFD analysis, control panels and associated wiring. This enables the system to be designed around the specific requirements of each facility and insures that the system operates as designed.

### FläktWoods System Benefits

#### Eliminates the need for ductwork
Our parking facility ventilation system uniquely positions JETFANS and exhaust fans, which remove contaminated air to the exhaust points. This eliminates the need for expensive ductwork and its installation.

#### Reduced System Resistance
Our system eliminates the use of ductwork for the parking facility. This significantly reduces system resistance. Main supply and exhaust fans can be selected at lower speeds, which reduces power absorption and therefore reduces operating costs and permits lower noise levels.

#### Space Optimization
Our system reduces obstructions within the facility, which increases the space available for parking and building rental. This eases the installation of other services such as utilities and equipment.

#### Reduced Design/Installation Costs
With our system, there are no complicated duct systems to design and install, therefore the cost of the complete system is reduced.
**Optimized System Design**

Our system uses Computerized Fluid Dynamics (CFD) analysis to plan and optimize the complete ventilation system.

**Reduced Operating Costs**

Our system monitors air quality (pollution levels) therefore the ventilation system is operated only on demand, further reducing operating costs.

![JETFANS Move Contaminants](image)

**Our Tailored Solution**

Our system is a more detailed approach to the parking facility ventilation system, based on the project-specific requirements.

**FläktWoods System Overview**

**Main Supply/Exhaust Fans**

American Fan and FläktWoods heat-rated JM-series axial flow fans are ideal for supply and exhaust purposes. Supply fans are sometimes used to provide fresh air into the parking facility, plus provide air to ramps and inlet grilles/louvers. Our fans are designed and independently certified (UL) for operation at high temperatures. The JM-series is available up to 1600mm diameter with a wide range of accessories. Reversible flow JM fans are available and can be ordered to provide more flexible control of smoke and pollution. For further information contact your local representative.

![JETFAN Units](image)

**Computational Fluid Dynamics (CFD)**

Our CFD software is used to model and analyze airflow in complex systems. Our software is able to calculate solutions for velocity, pressure and temperature.

Our analysis of a parking facility design using CFD is an effective way of ensuring that the distribution of the air is sufficient to effectively ventilate the structure. CFD can also be used to model both the general ventilation (pollution) and emergency (smoke) cases. Rather than simply complying with regulations, CFD offers the opportunity to provide an engineered solution to parking garage ventilation.

**Control and Detection Equipment**

Carbon Monoxide (CO) is the major pollutant in parking facilities. The concentration of other pollutants such as nitric oxides and soot are considered less critical. (CO is a colorless odorless poisonous gas produced from the incomplete combustion of carbon-based fuels.)

**Smoke Detection**

Our smoke detectors are located throughout the parking facility to ensure prompt detection of fires. Upon detection the alarm sounds and the ventilation system switches into emergency smoke exhaust mode, assisting in escape and providing access to fire fighters.

**Controls**

Our integrated control system insures that the ventilation system performs as designed. The type of control and complexity required is matched to the specific details of the project.

![Commissioning Smoke Test](image)

**Commissioning**

Our factory-approved inspection team will perform a “walkdown”, perform functional testing and provide a final report to assure proper installation.

**Complete Package**

American Fan Company/FläktWoods provides a comprehensive package, including Supply and Exhaust Fans, JETFAN units, CFD Analysis, Controls and Commissioning to ensure that the system works as designed.
FlaktWoods Parking Facility Ventilation Systems are installed throughout the world.

American Fan Company
2933 Symmes Road
Fairfield, Ohio 45014
Voice: +1-513-874-2400
Fax: +1-513-870-6249
www.flaktwoods.com