



# mcr J-FLO

## COMPLEX JET FAN SYSTEM FOR GARAGES



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Jet fan systems are used for smoke exhausting from underground garages as a solution alternative to conventional duct systems. When detecting smoke or excessive concentrations of CO and LPG gases, the system devices are activated on receiving a signal from the power supply and control unit and, using a piston effect in their operation, they circulate smoke and gases in the entire cross-section of the garage respectively to the air inlet (aeration dampers and supply air fans) into the exhaust/smoke exhaust opening (smoke exhaust dampers and exhaust fans). Not allowing for excessive smoke accumulation and temperature rise, they provide a safe and effective escape and facilitate the operation of rescue teams.

The jet fan systems may also be used for comfort ventilation, aerating garage under their normal use. They operate with the CO and LPG detection systems, monitor the acceptable level of pollutants and dilute and remove gases harmful to people's health.

The **mcr j-FLO jet fan system** is designed for mechanical ventilation of single and multi-floor garages where in accordance with applicable regulations automatic smoke exhaust devices (smoke exhaust mechanical ventilation) are to be used.

In the case of a fire/smoke, the **mcr j-FLO** complex jet fan system for garages:

- » ensures temperature allowing safe escape of the garage users (below 60°C up to 1.80m above the floor),
- » ensures enough visibility for the garage users to escape the garage (less than 10m up to 1.80m above the floor),
- » facilitates operation of rescue teams by not allowing the temperature to rise above 100°C at a distance above 10m from the fire source,
- » contributes to the building structure protection by maintaining temperatures below 200°C at a height above 2.50 m from the floor (in the space under the ceiling).

# | SYSTEM COMPONENTS

All devices included in the mcr j-FLO system are approved for use in building industry, in fire protection. The mcr j-FLO complex jet fan system for garages consists of:

## | main supply and exhaust fans, unidirectional or reversible

These fans (installed inside or outside the rooms) are designed to transport the amount of air required to ensure adequate aeration or smoke removal from the garage space.

### mcr Monsun

- » fire resistances: without resistance - BO version, F300, F400
- » sizes from DN 400 to DN 1250
- » capacity up to 140 000 m<sup>3</sup>/h
- » compression up to 1300 Pa
- » options: long / short casing, vertical / horizontal installation
- » motor power from 0,75 kW to 55 kW

**CE certificate of conformity with EN 12101-3:2002**



### mcr Pasat

- » fire resistances F400, F600
- » 2 sizes available: DN 630 and DN 710
- » capacity up to 52 000 m<sup>3</sup>/h
- » compression up to 1800 Pa
- » unidirectional motor
- » single or two speed motors

**CE certificate of conformity with EN 12101-3:2002**



## | jet fans, unidirectional or reversible

The function of the jet fans is to ensure proper direction and speed of the ventilation air or smoke flow in the direction of exhaust fans.

### mcr Bora

- » fire resistances: without resistance - BO version, F300, F400
- » available from DN 290 to DN 560
- » thrust up to 216 N
- » unidirectional or reversible motor operation
- » single or two speed motors
- » motor power from 0,12 kW to 16 kW

**CE certificate of conformity with EN 12101-3:2002**





## mcr **FEN** (centrifugal fan)

- » fire resistances: without resistance - BO version, F300, F400
- » thrust up to 100 N
- » unidirectional, two speed motors
- » motor power from 0,2 kW to 2,2 kW

**CE certificate of conformity with EN 12101-3:2002**



## I power supply and control units for the system components

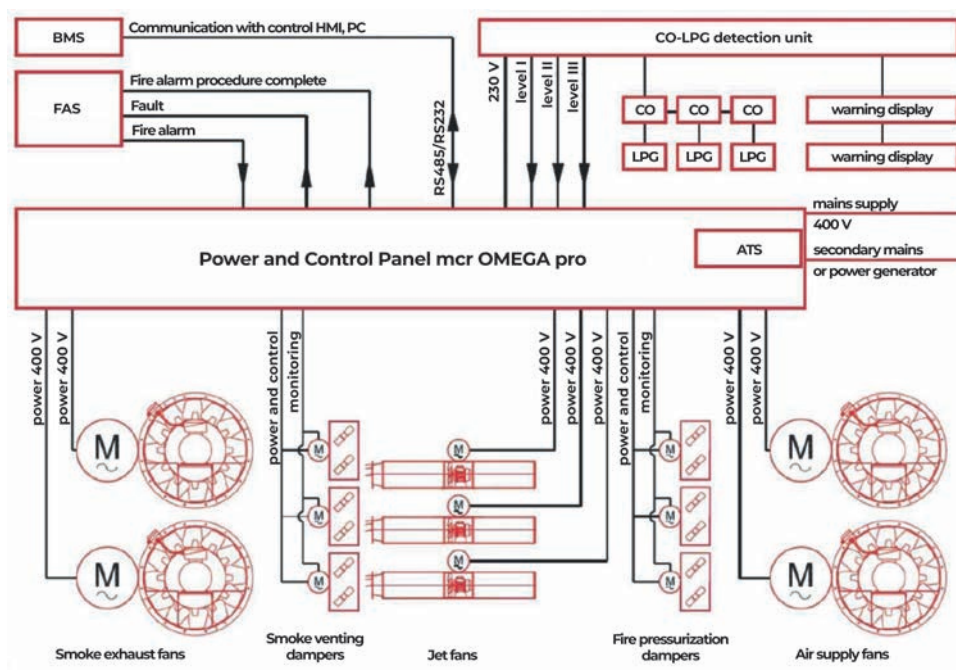
### mcr **Omega Pro**

The mcr Omega Pro control units allow power supply, control, monitoring and visualization of the operating status of devices within the system, both for the comfort and smoke exhaust functions. They run jet ventilation devices with the required capacity and in the right direction after receiving an alarm signal from the fire alarm control unit, the BMS system or CO and LPG detection units.

The control units should be installed in a separate room (separate fire zone). The most common systems consist of a single control unit per each air supply and exhaust shaft and separately for max 30 jet fans.



**Fig. 1** A typical configuration of the electrical control system using the mcr Omega Pro control unit



Configuration and the number of individual components of the system depend on the surface area, height, requirements, construction and location of the garage to be protected.

## | smoke control dampers for fire ventilation system

### mcr **WIP PRO/V**

The mcr WIP PRO/V dampers allow smoke extraction from the zones in which the jet ventilation operates, in order to prevent smoke and harmful gases from spreading throughout the car park.

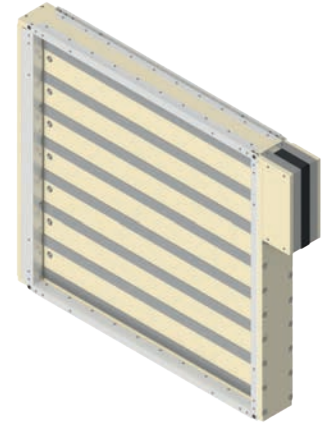
The smoke control dampers can be installed in the walls and ducts.

In normal use, dampers are closed. After detecting fire, by receiving a signal from the mcr Omega Pro control unit, the dampers automatically open in order to prevent the propagation of the smoke and fire gases to adjacent areas. Approved for battery installation

**CE certificate of conformity with EN 12101-8:2011**

Dimensions:

- » nominal width from 110 mm to 1250 mm
- » nominal height from 270 mm to 1250 mm



The fire resistance class

of the WIP PRO/V is the following:

- » EI120 ( $v_{ew}$  i→o)S1000 C<sub>10000</sub> AAmulti
- » EI120 ( $v_{ed}$  h<sub>od</sub> i→o)S1000 C<sub>10000</sub> AAmulti
- » EI120 ( $v_{ew}$  i→o)S1500 C<sub>10000</sub> AAmulti

### mcr **WIP LD**

The mcr WIP LD dampers are intended for installation in manually or automatically operated fire ventilation systems.

The devices are used in fire ventilation systems or in mixed fire and comfort ventilation systems (smoke evacuation or air supply systems).

The dampers prevent fire, smoke and fire gases from spreading to the adjacent compartments.

**CE certificate of conformity with EN 12101-8:2011**

Dimensions:

- » nominal width from 300 mm to 1100 mm
- » nominal height from 600 mm to 2300 mm



The fire resistance class

of the WIP LD V is the following:

- » EI120 ( $v_{ew}$  i→o)S1000 C<sub>10000</sub> AAmulti

## | power cords, cable supports and electrical installation equipment

In order to ensure uninterrupted electricity supply for the mcr j-FLO system devices during a fire, cable route assemblies are used (cables and cable trays) of the required fire resistance class. This resistance is confirmed by the certificates for the continuity of electricity supply or signal transmission for the time required to start and operate the device, which is designed to enable the safe escape of people from the garage protected space and ensure the safety of rescue teams.

## | CO, LPG and smoke detection system components

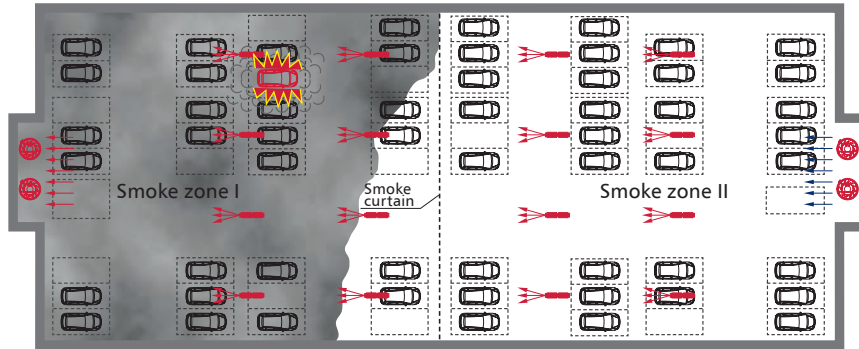
The CO and LPG detection system is designed for detection of carbon monoxide (CO) and propane-butane (LPG) in air. The CO and LPG detectors are the basis of the garage comfort ventilation control system. In case of exceeding the permissible concentrations of the gases, the CO and LPG detection system communicates with the mcr Omega control unit, which launches the jet fans and supply and exhaust fans in order to dilute and remove contaminated air. Additionally, the system is equipped with optoacoustic warning signs as devices to warn the users of the resulting hazard.

## OPERATION

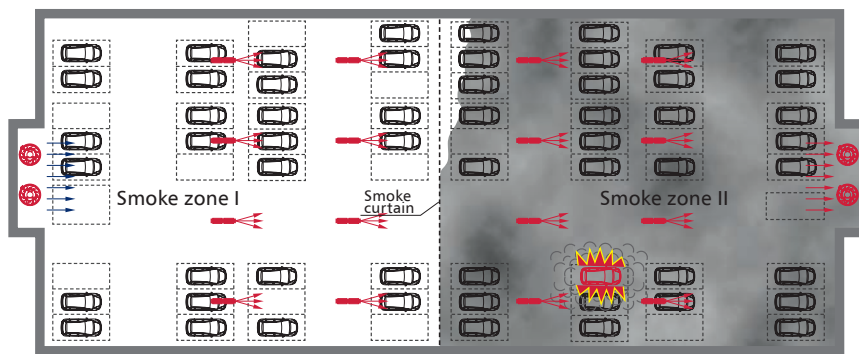
The smoke exhausting system function is to stop the smoke, only in the smoke area where the fire occurred, so that rescue teams can easily locate and extinguish the resulting fire.

Depending on the geometry of the garage and of the requirements, unidirectional or reversible ventilation systems are designed. The following example shows a reversible system diagram and its operation depending upon the location of the fire (smoke zone).

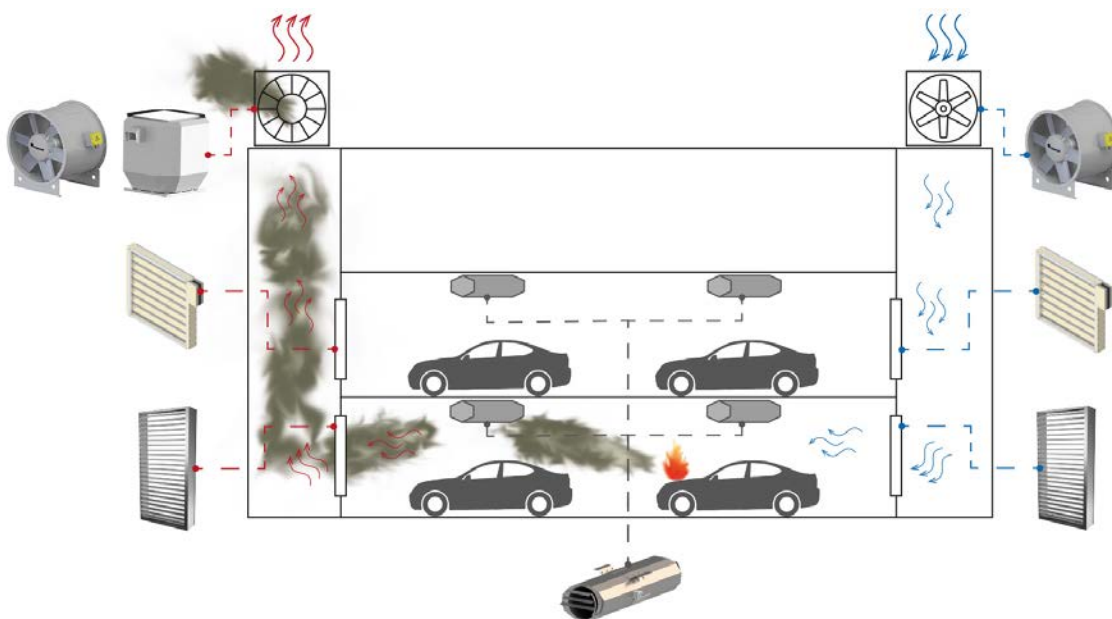
**Fig. 2** Diagram of reversible smoke removal by smoke exhaust fans in smoke zone I



**Fig. 3** Diagram of reversible smoke removal by smoke exhaust fans in smoke zone II



**Fig. 4** Diagram of garage



Immediately upon the detection of smoke, main supply and exhaust fans begin to work with the appropriate capacity, allowing safe evacuation. Dampers are closed in areas not covered by the fire threat. After completion of the evacuation, the jet fans are running in the direction of exhausting points, in order to remove harmful combustion fumes and hot gases.

## SYSTEM ADVANTAGES

- » operates both in the fire ventilation and comfort ventilation modes
- » lower operating costs as a result of smaller capacity of main fans
- » a reduction of the garage height, thereby saving on deep excavation costs under higher garage
- » no smoke ventilation ducts allow gaining more space under the ceiling
- » reducing the number of fire dampers in the absence of ducts, thus reducing the automation control
- » lower jet system cost compared to a conventional smoke exhaust ducts
- » high efficiency of carbon monoxide and propane-butane removal
- » easy identification of the source of fire
- » lowering the temperature of gases resulting in a reduction of losses after a fire in the building construction
- » easy and quick installation of the system



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