

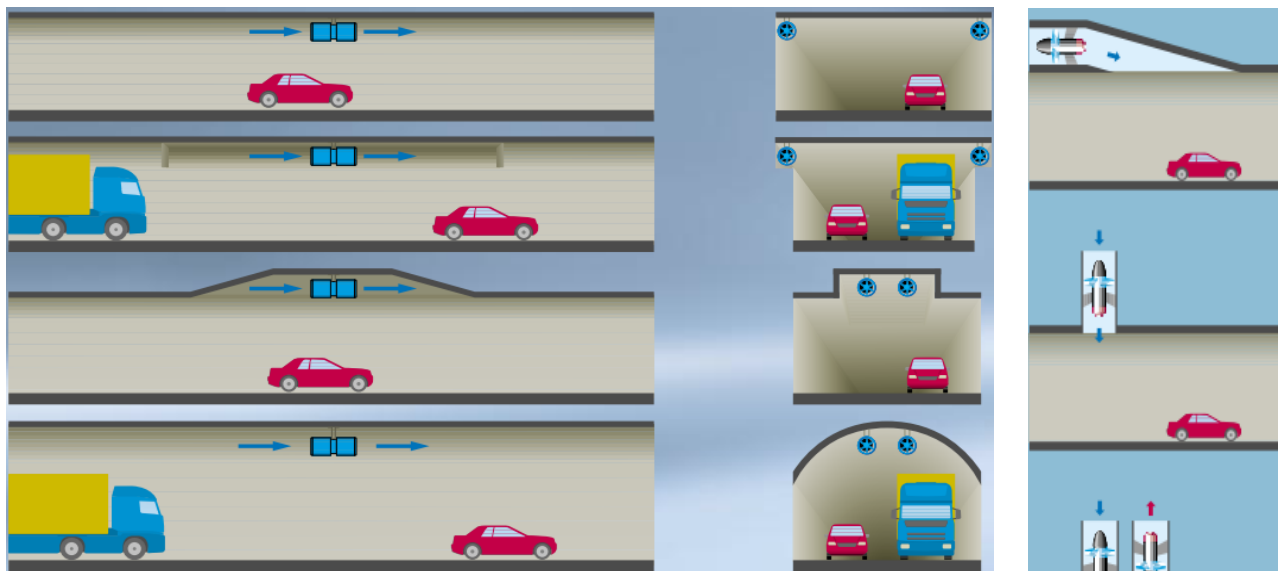
Sales Application Note

Exhaust Fans

APPLICATION

In all areas which are difficult to reach or it takes a lot of time to evacuate people, exhaust fans are installed. As example: car tunnels, parking houses, Metro stations, public buildings etc. The main purpose of the drive is the control of the incoming air and the exhaust air.

Depending on the tunnel manufactures, there are different systems and structures.



In normal cases, fans are controlled depending on CO-concentration (petrol driven vehicles) and visibility impairment (diesel powered vehicles).The control pulses are transmitted from separate measuring instruments for CO-concentration and visibility impairment.

The drives help to ensure safe driving conditions in the tunnel by running the fans on demand, using information from sensors connected to an automation management system. When data from the sensors indicates that ventilation is needed, the fans at the tunnel openings start and increase speed gradually. If more ventilation is needed, the fans inside the tunnel also start, increasing the air movement through the tunnel.

In the event of fire, the system is programmed to run all fans at full speed to evacuate the smoke from the tunnel by the shortest possible route.

APPLICATION REQUIREMENTS

- **Fire mode (for smoke extraction)**
Useful in case of a fire (evacuation mode). The drive ignores all inverters alarms, which usually causes a motor/fan stop and continues running until its destruction. Priority is to extract the smoke.
- **Braking capability**
In case of fire, the system can request to change the air flow from “insufflation” to “extraction”. In many specs, the time to perform this job is specified like “the system must be able to reverse the air flow within 30s”.
- **Temperature**
Between -10°C to +40°C or sometimes +50°C without derating on motor speed. There is also a special specification that says “certification for temperature up to +70°C”
- **Output signals requirements of the inverter**
Inverter in alarm
Inverter running
Frequency speed arrival (FAR)
- **Network Type**
Mainly IT neutral system
- **Safety feature**
Sometimes “STO SIL 2”.
- **Fieldbus**
Ethernet IP or Profibus DP.
- **Regulation**
PID control
- **Normative & Harmonics**
Sometimes customer wants to have a THDi(%) at PCC lower than” 5%”. IEE519-1992 or following the local regulation
- **Installation**
IP21 minimum, inverter is installed in a cabinet and then in an electrical room. Also, the distance between inverter and motor can be long : between some meters up to 500m.

FUJI ELECTRIC SOLUTION

Fuji has some different equipment depending on the amount of requirements; mainly all of requirements are fulfilled by FRENIC-HVAC and depending on some requirements like braking capability or even very low THD some other equipment can be added such as RHC (active front end).



ADVANTAGES OF FUJI ELECTRIC SOLUTION

- Powerful PID control built in the inverter (1 main PID, 2 gains set and 4 auxiliary PID).
- Automatic energy savings function, reaching higher energy savings' rates at low speeds.
- 3 values of jump frequency selectable, for avoiding mechanical resonance frequencies. Easy and fast tool integrated in inverter's keypad to set these frequencies during commissioning.
- Flying start for pick up the speed of the fan in case of air influence over the fan. Also for running again the fan after non finished cost to stop.
- For FRENIC-HVAC, DC Reactor and EMC filter built-in up to 90kW (C2 supported, 2nd environment supported), EMC filter built-in 110kW to 710kW (C3 supported, 2nd environment).
- For FRENIC-HVAC, protective structure IP21 or IP55 can be selected with the model up to 90kW.