



# World's 1st

## Smoke Control System Eng. Co

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# Elevator Hoistway Pressurization Systems

A new type of smoke control system that pressurizes air in the platform by using the hoistway of an emergency elevator as a vertical duct. In an event of a fire, the safety of evacuees can be ensured by supplying fresh air to the platform preventing smoke from entering it.

(Article 16 of National Fire Safety Code (NFSC) 501A (Air supply) – Use the hoistway of an emergency elevator as a supply air flow)

**GLOBALENP** is the first company in the world to have the technology to design a air supply and pressurization system using a hoistway. As specialized company with numerous achievements, we provide professional consulting and design review for the elevator hoistway pressurization system.

(Implemented over 1900 sites, as of October 2020)

## Key features

### Construction cost and process reduction effects

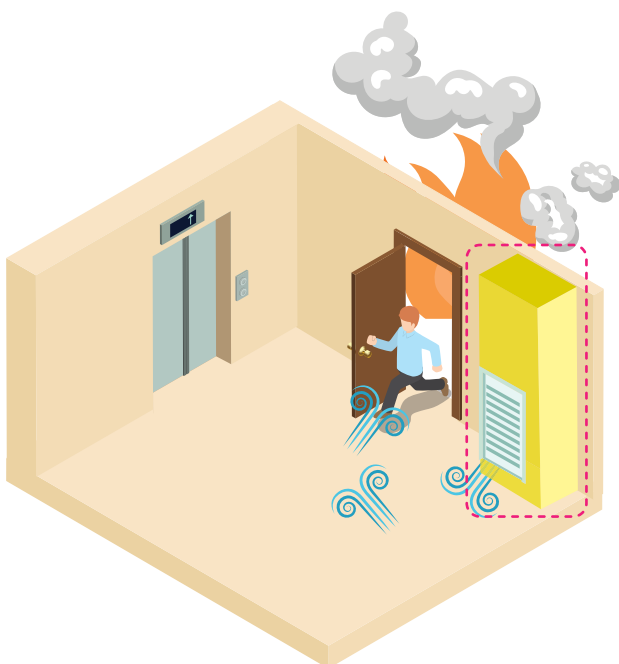
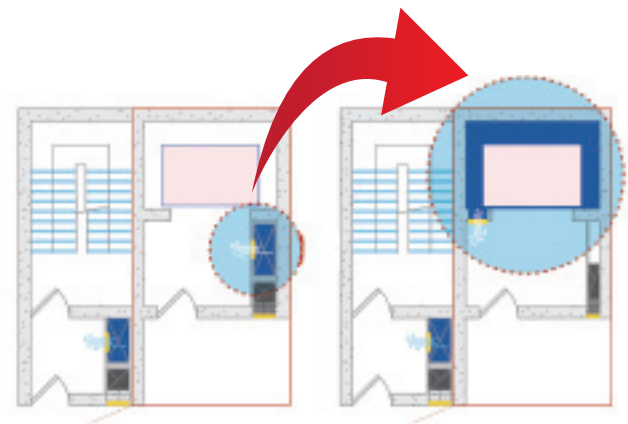
Since it is a smoke control system that utilizes the hoistway as a vertical duct, no separate or additional vertical duct work is required. Therefore, it is possible to reduce the construction cost required for this work, which leads to keeping the costs low and reducing additional work processes for construction.

### Increased space utilization

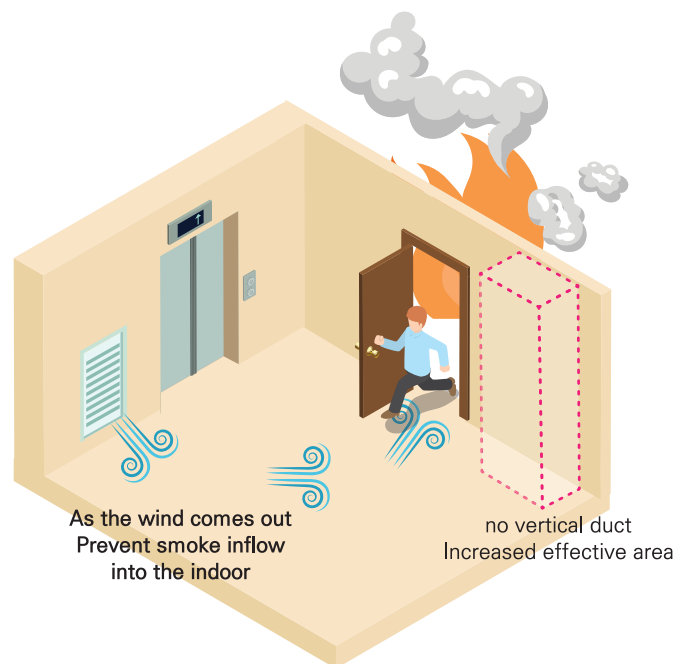
Space utilization improves as it can secure an additional platform area as much as the vertical duct area.

### Securing stable smoke control performance

Smoke control performance can be stable by securing it with the use of a hoistway consisting of wide internal spaces as a vertical duct.



Vertical duct system



Elevator hoistway pressurization systems

# Barometric Damper

In the event of a fire, evacuees must evacuate to a smoke control area (Pressurized Smoke Control Zone) that has pressurized air to prevent harmful smoke from entering. During this time, if excessive air is supplied to the Pressurized Smoke Control Zone, the pressure inside this zone becomes higher than the external pressure, making it difficult to open the door.

The Barometric Damper is a breakthrough pressure regulator that can solve this problem. This is a device that maintains the pressure in the Pressurized Smoke Control Zone at constant level by discharging the air inside the Pressurized Smoke Control Zone to the outside when air is supplied excessively to the extent that the pressure inside the Pressurized Smoke Control Zone exceeds the appropriate level. (Korea Fire Institute (KFI) certified product)

## Key features

### Easy installation

A pressure control device that is installed between the Pressurized Smoke Control Zone and the outside to discharge excess air. It is a mechanical device that does not require electrical equipment (piping/wiring) installation, so it can be easily installed.

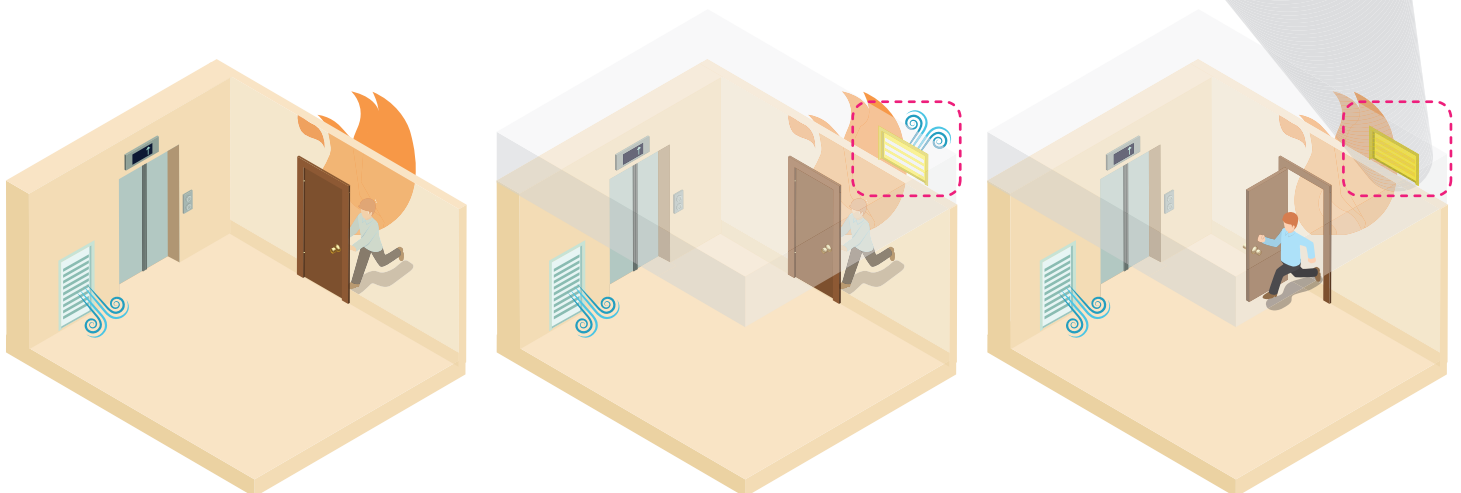
### Accurate pressure control

The best pressure regulating device to implement for maintaining the pressure in the Pressurized Smoke Control Zone at an appropriate level, as it even works with micro pressure of 1Pa.

### Easy maintenance

Since it consists of a mechanical device with a simple structure, which does not require a separate power source, maintenance and management are easy.

The product can be manufactured in two ways (forward/reverse) according to the discharge direction.



The internal pressure is higher than the external pressure, so the door does not open.

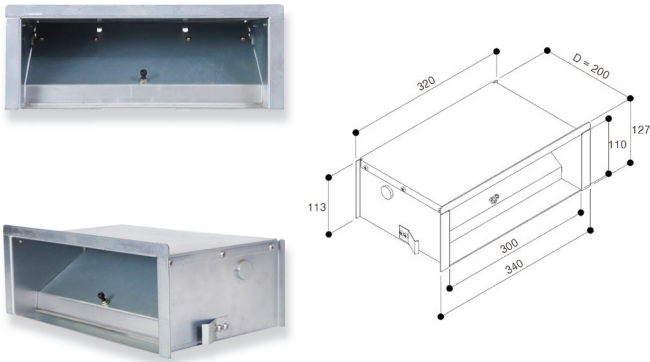
Barometric damper opens and over-supplied air is discharged from the smoke control zone

Once the appropriate level of pressure is formed, the door can be opened and evacuated.

# Barometric Damper

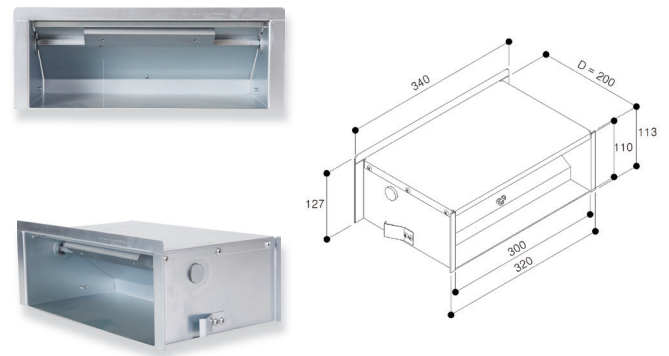
## Forward Barometric Damper

(Insert Barometric Damper into front of sleeve)



## Reverse Barometric Damper

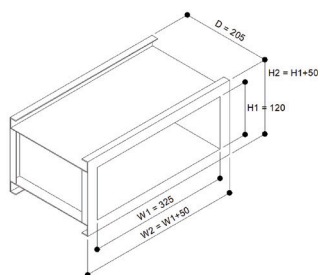
(Insert Barometric Damper into the back of the sleeve)



## Barometric Damper sleeve



\* The depth(D) and height(H1) can be adjusted.



## Example of Barometric Damper installation

(forward direction)



### How to install

- Install a sleeve when placing concrete at the frame stage (install horizontally)
- Insert Barometric Damper into the sleeve.
- Install Barometric Damper Grill for discharging in Pressurized Smoke Control Zone and outside.



## AOV (Automatic Opening Vent) windows operating by wind pressure

In the event of a fire, the smoke control facility raises the pressure by supplying air to the Pressurized Smoke Control Zone, and when the door is opened, the supplied air is discharged in a low pressure direction to prevent smoke from entering the Pressurized Smoke Control Zone to form wind. However, if the air is constantly pressurized, the supplied air leaks through the gap of the door of the Pressurized Smoke Control Zone and is discharged into the corridor or discharged into the corridor when the door is opened by the evacuee. If the exhausted air moves to the closed corridor and creates the same pressure as the Pressurized Smoke Control Zone, wind will not form when the evacuee opens the door to the Pressurized Smoke Control Zone, making it impossible to prevent the inflow of smoke.

AOV (Automatic Opening Vent) windows operating by wind pressure is a great way to solve this problem. When a fire occurs, the windows of the corridor are opened and the air moving from the Pressurized Smoke Control Zone to the corridor is discharged to the outside so that the pressure in the corridor does not increase. It is a device that improves the smoke control performance by keeping the pressure lower than the Pressurized Smoke Control Zone.

### Key features

#### New technology products

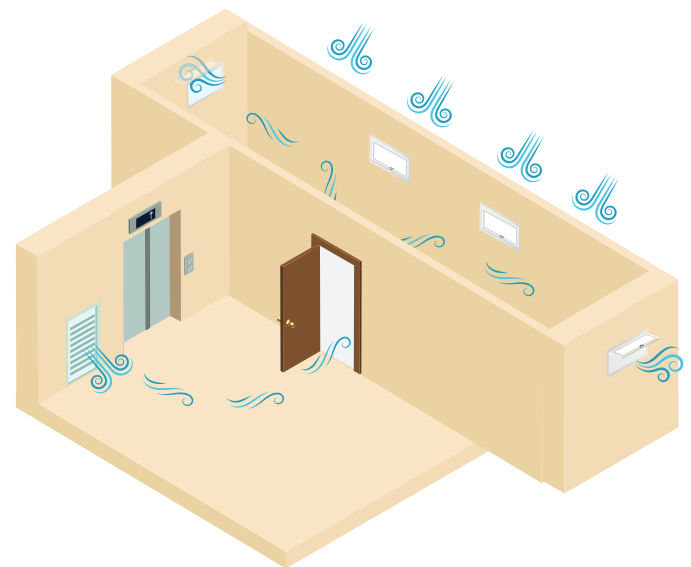
Selected as a new firefighting technology product (The 26th Fire Fighting New Technology Evaluation – National Fire Agency on September 2020)

#### Construction cost and process reduction effects

As it is a system that replaces exhaust facilities (vertical ducts, dampers, and blowers) for discharging the air flowing into the corridor from the Pressurized Smoke Control Zone to the outside, it ensures excellent process and cost reduction effect by replacing high cost exhaust facilities.

#### Increased space utilization

By replacing the exhaust facility, it can secure an additional area of the Pressurized Smoke Control Zone, and can be applied to various types of windows for the purpose of exhausting.



### Chain operating open/close type



It can be installed in the same way as the automatic closing device installed on the window, and it is a window that secures the opening area by adjusting the length of the chain.

Applicable object: Windows with 90 degree opening and existing height within 600mm

### Linear actuator open/close type



It is a window of a method that can generate relatively high force, and a sturdy link ensures an accurate opening area. Regardless of the height of the window, it is a window suitable for exhaust window control as it is controlled by the actuator's installation position and operating length.

Applicable target: Windows that must be opened and closed with high output

## Variable Air Volume System for Smoke Control

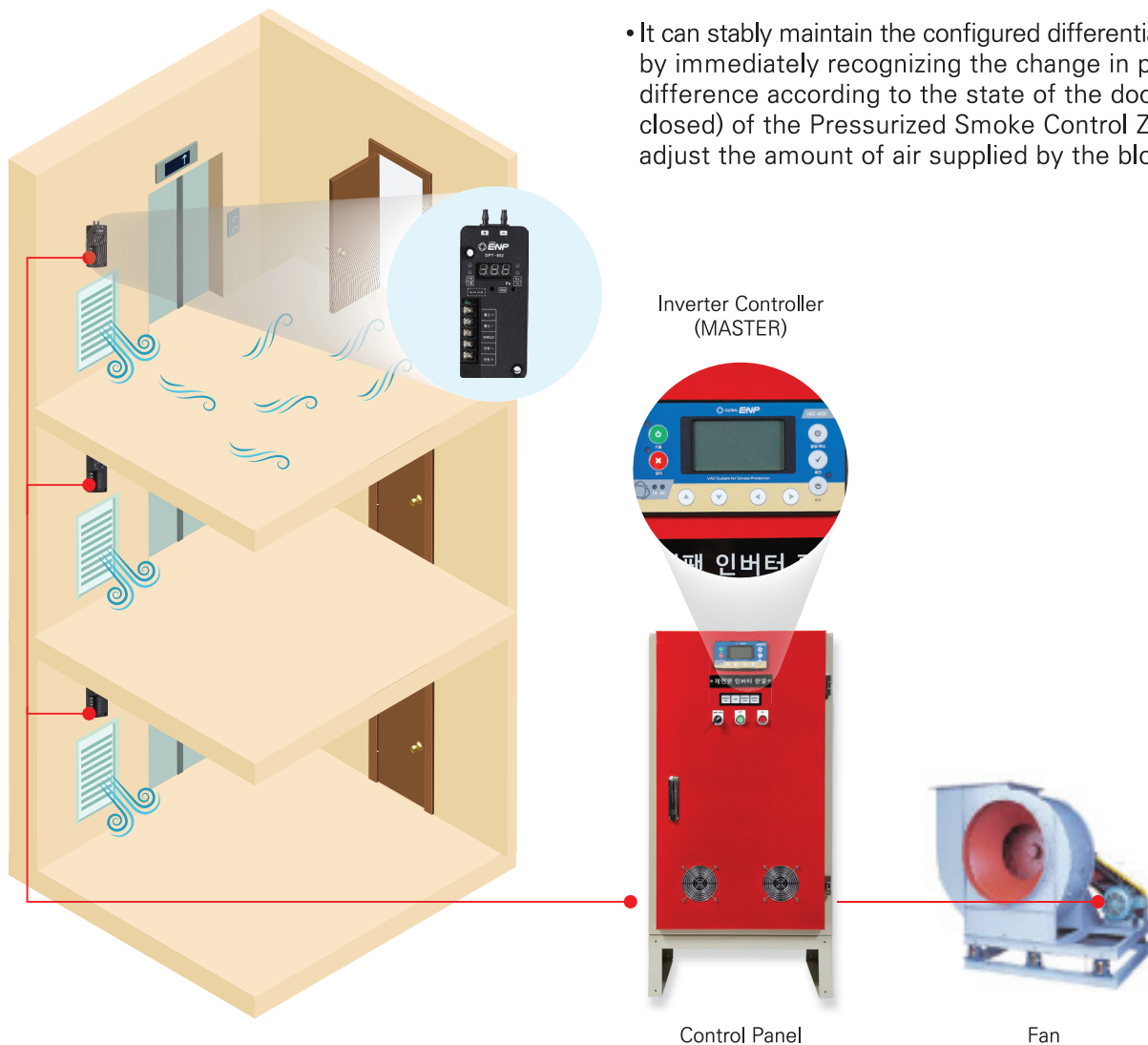
A facility, which pressurizing the air in a smoke control zone in order to ensure the safety of evacuees from harmful smoke generated in the event of a fire, we called it a smoke control system. If air is supplied excessively, the door to the Pressurized Smoke Control Zone may not open because the door to the Pressurized Smoke Control Zone is higher than the external pressure. If the air is insufficiently supplied, smoke may flow into the Pressurized Smoke Control Zone when the door is opened. Therefore, technology to keep the pressure inside the Pressurized Smoke Control Zone at an appropriate level is the core of the smoke control system.

The Variable Air Volume System for Smoke Control is an innovative device that efficiently controls the amount of air supplied to maintain the pressure in the Pressurized Smoke Control Zone at the pressure level set by the user, by controlling the motor speed of the blower with an inverter.

(Signed up on-site delivery contract for more than 1,500 units, as of October 2020)

### Key features

- The Variable Air Volume System for Smoke Control consists of a control panel (including the control unit) and a Differential Pressure Transmitter.
- Maintenance performance of stable differential pressure can be secured even in the aging of buildings, and the ability to respond to changes in atmospheric air is superior.
- It is a system that controls the motor speed of blower. The Differential Pressure Transmitter (DPT) installed inside the Pressurized Smoke Control Zone measures the indoor pressure and transmits the differential pressure data between the external pressure to the Inverter Controller (ISC-801) and rotates the fan motor to maintain the pressure value set by the user.
- It can stably maintain the configured differential pressure by immediately recognizing the change in pressure difference according to the state of the door (open/closed) of the Pressurized Smoke Control Zone and adjust the amount of air supplied by the blower.



## Control Panel



### Key features

A panel that operates the blower while the inverter operates to pressurize the air when a start signal is received due to a fire. It is an actuator that controls the fan motor speed so that the pressure level input to the control unit can be maintained by comparing the pressure set by the user in the Inverter Controller with the pressure data of the Differential Pressure Transmitter installed inside the Pressurized Smoke Control Zone.

Main power	380V 3-phase 4-wire (R,S,T,N)
Control power	AC 220V (U,V,W) / DC 24V
Manual mode	Inverter operation at fixed frequency
Auto mode	Variable operation of frequency according to differential pressure data
Power rating	3.7kW ~ 37kW
Size	3.7 ~ 22kW: 600mm(W) x 1000mm(H) x 300mm(D) 30 ~ 37kW: 700mm(W) x 1000mm(H) x 300mm(D) Lower base: basic; 200mm (height adjustable)

## Inverter controller (ISC-801)



### Key features

Installed on the front of the control panel and controls the Variable Air Volume System for Smoke Control. The user can input the desired pressure value, and the information of the pressure data it measured by the Differential Pressure Transmitter can be checked in real time through the monitor.

By collecting the pressure data received from the Differential Pressure Transmitter, you can control speed of the blower motor in various ways, such as average, minimum, maximum, and user-specified values.

Model	ISC-801
Power	DC 24V
Service Temp.	-20°C ~ 70°C
Display	LCD 128 x 64 Dot Matrix
Communication type	RS-485 communication (DPT-802 ↔ ISC-801 ↔ Inverter)

## Differential Pressure Transmitter (DPT-802)



### Key features

This device is installed inside the Pressurized Smoke Control Zone, measures pressure data with a sensor, and transmits internal and external differential pressure data to the control unit (ISC-801).

Model	DPT-802
Power	DC 24V
Service Temp.	-20°C ~ 70°C
Display	3-digit 7 ~ Segment
Size	46mm(W) x 115.35mm(H) x 27.5mm(D)
Communication type	RS-485 communication
Minimum installation quantity	(ISC-801 ↔ DPT-802) 3 or more