

# Air Purification Solution (APS)



# The key to improving ridership is right under your nose.

In the wake of a societal shift toward a hybrid working model, mass transit usage remains below pre-pandemic levels. So, it's never been more important to make riding mass transit as attractive as possible. And one way to do this is to be sure that your vehicles' indoor air is largely free of offensive odors.

## Do your buses pass the smell test?

Riders respond emotionally to their experience, and unpleasant odors are among the barriers to public transit use.<sup>1</sup> The Thermo King Air Purification Solution (APS) effectively reduces odors on board without additional maintenance costs.

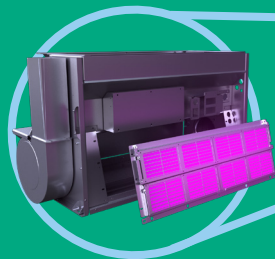
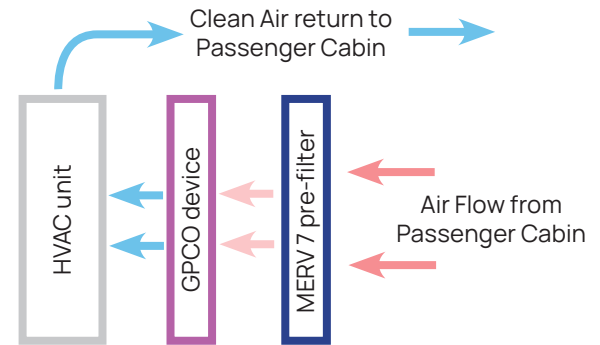
### Here's how it works.

Specifically designed for transit buses with high airflow conditions, our APS is a fully contained system located within the existing bus HVAC unit. As air is circulated from the passenger cabin into the bus HVAC system, it passes first through a MERV 7 pre-filter to remove particulates.

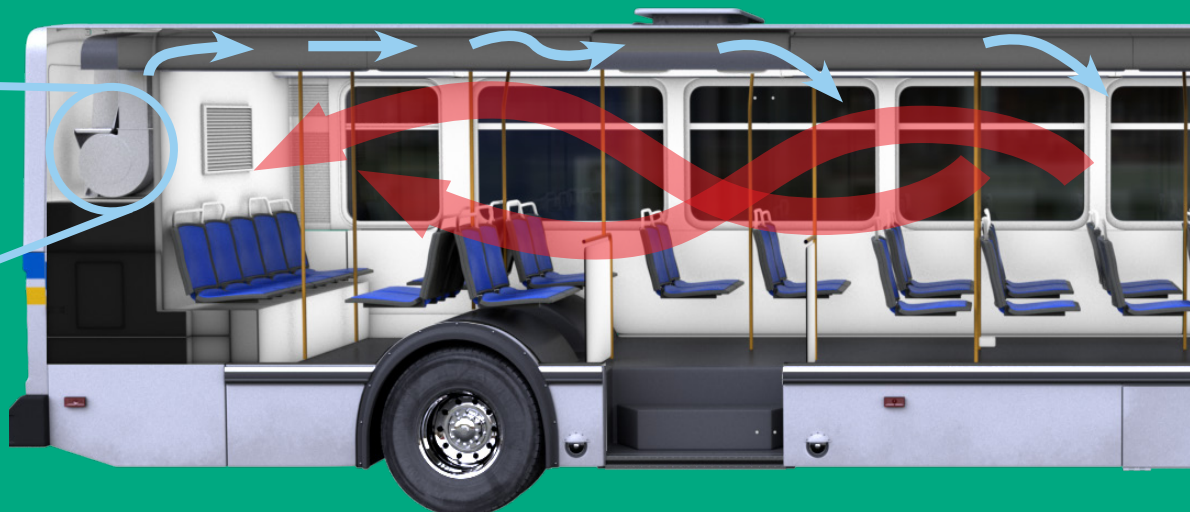
It then moves through a graphene-enhanced photocatalytic oxidation (GPCO) device, which deactivates harmful viruses, bacteria and odor-causing volatile organic compounds (VOCs). The cleaned air is sent back into the passenger cabin, allowing for continuous air exchanges in the cabin. The Thermo King APS processes 100% of the airflow passing through the bus's HVAC system.



The Thermo King Air Purification Solution is shown to reduce the concentration of odor-causing VOCs by 80% over 20 minutes.<sup>2</sup>



Integrated into the existing bus HVAC unit, the APS does not interfere with passenger space.



1 <https://www.sciencedirect.com/science/article/abs/pii/S0967070X21000846>

2 Independent third-party testing conducted on a transit bus using D-limonene, a lemon scent VOC

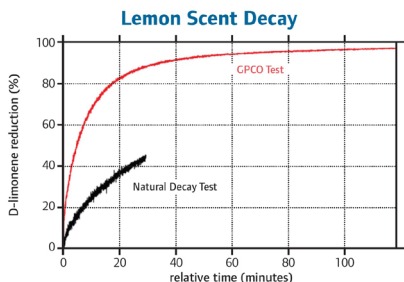


# Proven by third-party testing

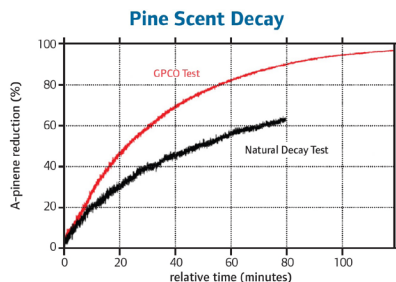
An independent research lab evaluated the effectiveness of the Thermo King APS on an actual transit bus.

The study tested two different strong-smelling VOCs: D-limonene (lemon scent) and A-pinene (pine scent). Each VOC was injected into the bus and tested against the rate of natural decay.

Results showed that our solution **reduces odors** in a relatively short period of time.



With the APS activated, the lemon scent VOC was reduced by 80% after 20 min, compared to 35% without it.



With the APS activated, the pine scent VOC was reduced by 80% after 60 min, compared to 55% without it.

## The pandemic is over, but pathogens remain

The “new normal” includes a general heightened awareness around contagion. Riders understand that exposure to crowds can increase their risk of contracting seasonal flus and other common illnesses.

With the Thermo King APS on board, you can provide improved indoor air through its outstanding antipathogen capabilities. Designed to CDC and ASHRAE guidelines, our solution is **98% effective against viruses in 20 minutes.**<sup>3</sup>

It also helps deactivate many bacteria and helps filter out common contaminants. In fact, our APS removes formaldehyde from the passenger space at a rate that exceeds the performance of many competitive technologies.

## Good for your budget and the planet

Designed to plug-and-play with Thermo King bus HVAC systems, our APS is compatible with most of our units, including legacy models. Typically, it can be installed in about an hour, and there’s no additional maintenance needed outside of routine filter changes.

With an expected life of 50,000 hours, the Air Purification Solution will work quietly in the background for years to help eliminate odors and provide a more comfortable environment for your passengers. Be assured that you’ll have dealer service and parts support for the life of the transit bus.

If your organization has EHS goals, you’ll appreciate that our system is designed to use UV-A LED bulbs. They’re safer than the mercury-based UV-C lights found in competing solutions, and because UV-A lights contain no hazardous materials, they do not require special disposal procedures.



## Safety and Compliance

Regulations have been enacted governing the hazardous components commonly used in air purification systems. Designed to operate safely and effectively, the Thermo King APS meets the following standards:

### California Air Resources Board (CARB)

Our solution reduces formaldehyde and produces no ozone, thus complying with California Air Resources Board regulations. This compliance allows for buses equipped with the Thermo King APS to be sold and/or operated in the State of California.

### UL 2998

Covers air cleaners which potentially generate ozone, are rated at 600 volts or less, are intended to remove or aid removal of dust or other particles and pollutants from the air and are intended for use in accordance with the National Electrical Code, ANSI/NFPA 70.

### UL-900 flammability

An evaluation of the flammability and smoke density of air filter units.

### Environmental Rating IP44

Certifies that our product is protected against solid objects that are bigger than 1mm and water splashing from all directions.

<sup>3</sup> Outcome based on testing using MS2 Bacteriophage, a common surrogate for the SARS-CoV-2 virus which causes COVID-19



Thermo King – by Trane Technologies (NYSE: TT), a global climate innovator – is a worldwide leader in sustainable transport temperature control solutions. Thermo King has been providing transport temperature control solutions for a variety of applications, including trailers, truck bodies, buses, air, shipboard containers and railway cars since 1938. For more information, visit [thermoking.com](https://thermoking.com) or [tranetechnologies.com](https://tranetechnologies.com).