



# *Trane catalytic air cleaning system*

*A smart system that filters, deodorizes and oxidizes.*



# *Enjoy fresher, cleaner and purer air with Trane Catalytic Air Cleaning System*



Stand in your building's lobby and take a deep breath. You have followed all building codes. Your ventilation system is bringing outside air into your building. But does it feel fresh? Is it as clean as you want it to be?

Outside air can contain contaminants. People bring germs into the building. And

any new furnishings added to the building often introduce odor and volatile organic compounds (VOCs).

Even though your HVAC system has filters, you may still be circulating germs, viruses, VOCs and other gases that are too small to be captured.

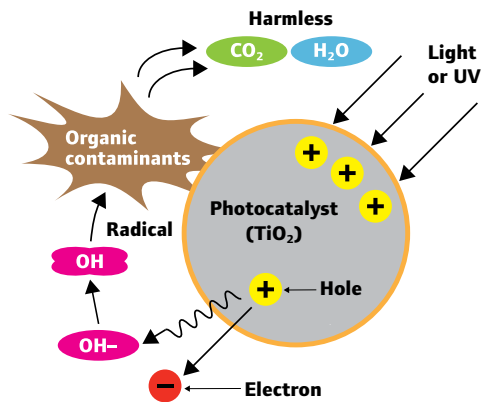
Equipping your air handler with a Trane Catalytic Air Cleaning System (TCACS) can help reduce biological organisms such as spores, bacteria and even the tiniest viruses.

It can also reduce irritating odors from organic compounds such as fumes from paint, glue and cleaning chemicals, and capture airborne particulates like dust and mold.

**Airborne contaminants are captured, sterilized and vaporized.**

More than an air filter, Trane Catalytic Air Cleaning System (TCACS) cleverly integrates not two but three technologies into one system. This one-of-a-kind system filters, deodorizes, and oxidizes all organic contaminants. What this means is fresher, cleaner and purer air - in every breath.

Go on, take a deep breath!



*Photo Catalytic Oxidation: UV photons energize a photo-catalyst media panel, creating highly reactive hydroxyl radicals. Hydroxyl radicals convert organic compounds into simpler compounds and ultimately into water and carbon dioxide.*

## Catalytic air cleaning explained.

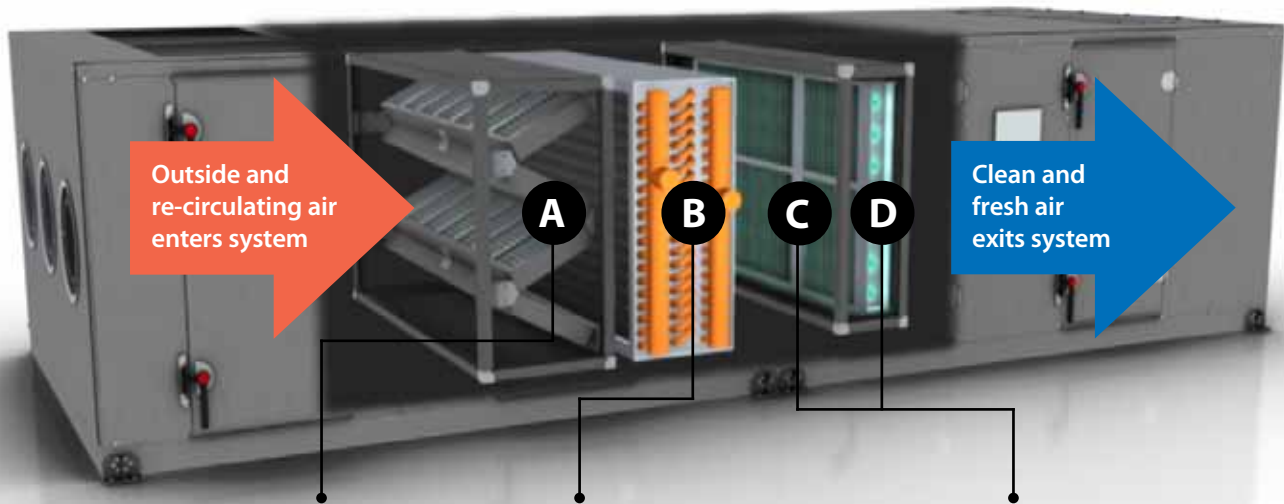
Airborne contaminants are captured, sterilized and vaporized.

The TCACS is far more than an air filter. It is a sophisticated system that integrates three technologies:

1. High-efficiency particle filtration
2. Germ-killing ultraviolet light
3. Photo-catalytic oxidation process

**TCACS converts VOCs and biological contaminants into water and carbon dioxide.**

## Air handler design with TCACS



| Process                     | A  | B  | C & D   |
|-----------------------------|--|--|---|
| Component                   | MERV*13 air filter   | Cooling coil   | Combination of <b>C</b> photo catalytic oxidation (PCO) and <b>D</b> ultraviolet germicidal irradiation (UVGI)  |
| Features                    | A high-efficiency particle filter.   | Chilled water or refrigerant heat exchanger.   | A high-intensity UVGI area with a mesh panel coated with titanium dioxide (TiO <sub>2</sub> ).  |
| Actions                     | Captures 90% of the larger airborne biocontaminants and other particles (1-3 micro sizes) and 75% of the small ones (0.3-1 micro sizes).<br><small>*MERV = minimum efficiency reporting value of a particulate air filter rated in the ASHRAE Std 52.2</small> | <ol style="list-style-type: none"> <li>1. Cools down warm air to lower humidity level through condensation so air becomes more comfortable and drier.</li> <li>2. Drains out collected moisture from the unit, reducing growth of mold and other micro-organisms.</li> </ol> | <ol style="list-style-type: none"> <li>1. UVGI as part of PCO, penetrates into micro bio organisms that stay on coil and drainpan surfaces and damage their DNA bonds.</li> <li>2. At the same time, the UVGI photons energies the TiO<sub>2</sub> (photo-catalyst) to produce hydroxyl radicals, one of the most powerful oxidizing agents in nature to oxidize the remaining micro bio organisms that still stay in the air stream or those that survived and passed through UVGI.</li> <li>3. The hydroxyl radicals also oxidize gases volatile organic compounds and odors.</li> <li>4. It oxidizes and converts them into harmless minute carbon dioxide and water vapor.</li> </ol> |
| Target particles or climate | Mold spores and pollen.  | Temperature and humidity.  | Odors, VOCs, fungi, bacteria and viruses.   |

## Catalytic air cleaning employed.

Here are some of the common installation plans for catalytic air cleaning system:

- For hotel guestroom

This system draws OA, processes and commissions it to bring CA into the hallway and to the fan coils above the ceiling of each guest room. The fan coil brings down the temperature further to cool the room. The bathroom exhaust fan operates to meet hotel codes.

- For public areas such as airport, casino, assembly hall and lobby, restaurant and large commercial office

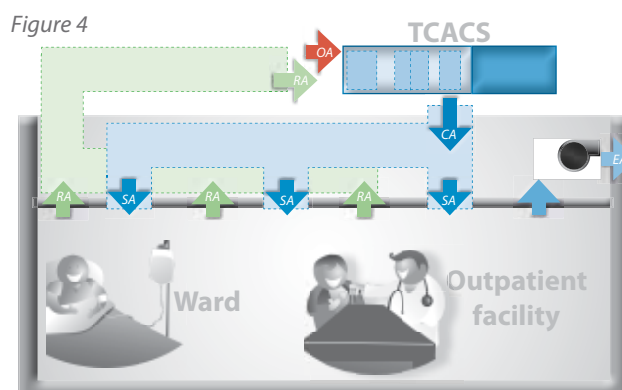
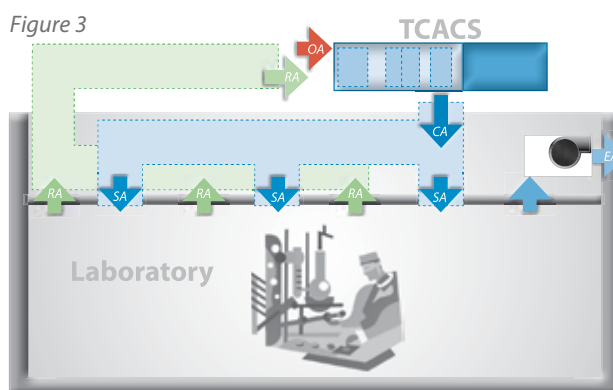
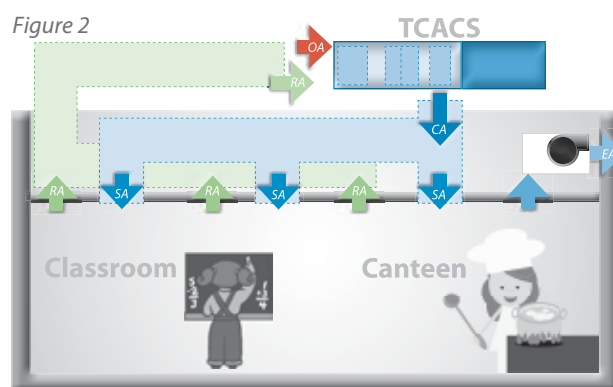
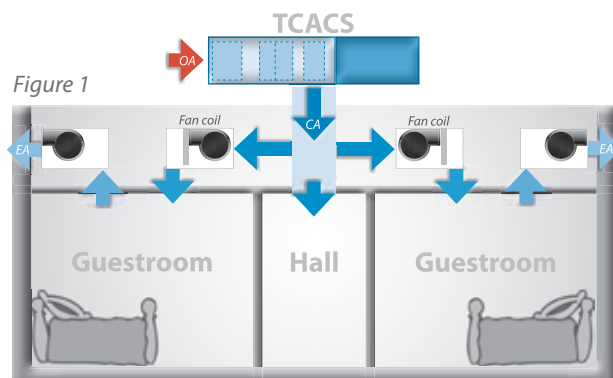
This system draws mixed air from outside and re-circulating paths, processes and commissions it to bring CA directly into the spaces through SA diffuser above the ceiling. The exhaust fan operates to meet local codes.

- For pharmaceutical and food processing rooms as well as laboratory

This system draws mixed air from outside and re-circulating paths, processes and commissions it to bring CA directly into the spaces through SA above the ceiling. The exhaust fan operates to meet local codes. In systems where 100% OA is required, RA will be eliminated and exhaust fan will operate to exhaust 100% of the room air.

- For diagnostic, treatment or patient's waiting room in healthcare

When central system is used to condition the patient's waiting room to reduce cross-infection and odor or diagnostic and treatment rooms to reduce the potentially large discharges of possible water droplet nuclei into the room air, the system draws mixed air from outside and re-circulating paths, processes and commissions it to bring CA directly into the spaces through SA diffuser above the ceiling. The exhaust fan operates to meet local codes.



Abbreviations:  
CA = clean air    OA = outside air  
RA = return air    SA = supply air



# World-class service, world-class environment

## Hotel application

A key success factor for this industry is creating an environment that enhances customer comfort and satisfaction to encourage repeat patronage. Indoor air quality and safety are thus crucial factors.

There are different approaches to air conditioning of the guestrooms. The common approach is to use ventilation or outdoor air handler equipped with TCACS that conditions the outside air and then supplied to each of the fan coil units located above the ceiling of each guestroom - as shown in figure 1. Some designers may prefer to supply the fresh air from the air handler to the hallway and then use packaged terminal unit in the room instead of fan coil.



Whichever methods you choose, TCACS can be easily installed without the hassle of system redesign or replacement, thereby ensuring the best environment for your guests - at all times.



Guestroom



Lobby



Conference room



Restaurant

Odors from organic compounds such as fumes from paint, glue and cleaning chemicals commonly used in a hotel's daily maintenance and periodical upgrading are conveniently reduced by TCACS.

# *A better world starts from young*



## **Educational institution application**

Schools have four times as many occupants per square foot as offices, and they contain a host of pollution sources, including lab chemicals, cleaning supplies, chalk dust and molds. Installing TCACS in the existing HVAC system in a school can reduce airborne spread of diseases and therefore, absenteeism.

## **Healthcare application**

There is no argument on how critical indoor air quality (IAQ) is to hospitals. In reality, proper IAQ is an important factor in patient recovery. It is the issue of cross contamination and bacterial concentration that assumes critical importance in HVAC design. The fundamental reason behind this is the presence of airborne pathogens.

Investing in the design characteristics of healthcare facilities and educational institutions can promote better health, enhance safety and reduce environmental stressors.

*"As hospital leaders continue to seek ways to improve quality and reduce errors, it is critical that they look around their own physical environment with the goal of ensuring the hospital contributes to, rather than impedes, the process of healing." - Carolyn Clancy, M.D. US Director*



Diagnostic department



Outpatient facility



Classroom



Library



## Catalytic air cleaning enjoyed.

Why TCACS is your logical choice:

- Improved indoor environmental quality**  
 The TCACS **reduces biological organisms** such as spores, bacteria and even the tiniest viruses. It also **removes irritating odors** and **captures airborne particulates** like dust and mold.
- Low maintenance**  
**Maintaining the TCACS is simple;** you change the MERV 13 filter as you would with a normal HVAC system. The UV lights require a change only once in every 18 months.
- Self renewal design**  
 The TCACS media panel is uniquely designed to continuously renew itself and has an **expected lifespan of 15 years** under normal use.
- Operating consistency**  
 As a Trane system, the factory-engineered and installed TCACS comes with the full package of renowned Trane system reliability and high performance.
- Higher productivity**  
 As any CEO or president knows, people are the greatest asset of any company. Studies show that breathing cleaned air can help us think quicker and revitalize the body. TCACS **reduces airborne spread of diseases** and therefore, absenteeism.
- Energy saving**  
 By combining three technologies in one system, TCACS helps building owners **save in every aspect** - material, space, operating cost, manpower, etc.
- Improved building value**  
 With enhanced comfort in guestrooms, retail units or meeting rooms, your **building value naturally increases** allowing you to command higher tenancy and rental premiums.



Fitness center



Retail premises



Casino



Train station

*If your building has a high density of occupants or high traffic zones - such as schools, fitness centers, healthcare facilities, theaters, airports, etc. - you can make a difference in their productivity and comfort by adding TCACS to your air handler.*



## Trane Catalytic Air Cleaning System

Wondering how you can improve the comfort level and energy efficiency of your buildings or home?

The TCACS is available on many Trane air moving products. Ask your Trane representative for more information. We will be happy to discuss all your indoor air quality improvement options and help design the best solution for you.

Trane is committed to excellence and quality in both its products and people. **We listen so we can offer precise and customized solutions** that suit your market's needs.

Every Trane system is strictly produced according to the most stringent engineering guidelines, with the company certified to ISO9001 standards. More than just an air-conditioning systems supplier, **Trane is a total solutions provider.**



Ingersoll Rand (NYSE:IR) is a world leader in creating and sustaining safe, comfortable and efficient environments in commercial, residential and industrial markets. Our people and our family of brands—including Club Car®, Hussmann®, Ingersoll Rand®, Schlage®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings, transport and protect food and perishables, secure homes and commercial properties, and increase industrial productivity and efficiency. We are a \$13 billion global business committed to sustainable business practices within our company and for our customers.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

