

PRO-Cell™ Catalytic Air Purification



PACKAGED & CUSTOM SOLUTIONS



FIELD CONTROLS



FIELD CONTROLS **AIR**

Field Controls Air

Field Controls has been a leader in air quality and control since 1927. We offer a broad spectrum of innovative HVAC products; from components that improve heating and cooling equipment efficiency to systems that dramatically improve indoor air quality. Field Controls is now proud to offer commercial air quality systems that incorporate our patented PRO-Cell™ technology for VOC and microbial reduction.

This guide will introduce you to our comprehensive, state-of-the-art system, that is customizable and scalable for new and retrofit HVAC installations. We offer packaged modular solutions as well as customizable panels that can be configured for virtually any commercial application.

Thank you for your consideration.

Sincerely,

Patrick T. Holleran
President
Field Controls, LLC



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Solutions for Business and Industry

PACKAGED AND CUSTOM

Packaged Solutions

The Trio includes high efficiency filtration, high intensity UVC, and a single PRO-Cell™ module for up to 5 tons capacity.

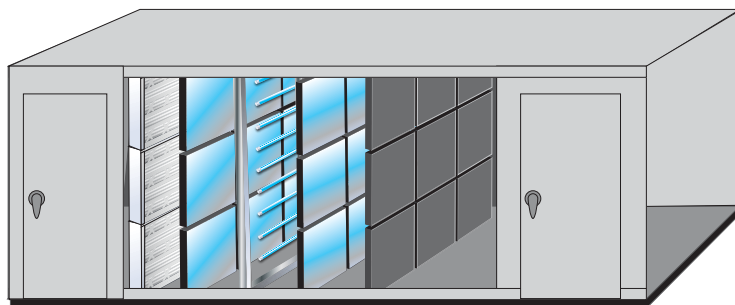
The Cube offers all the features of the Trio, plus multiple PRO-Cell™ modules in series for total air purification capacity up to 6 tons.

Both of these systems can be used singularly or installed in multi-unit bundles for larger commercial applications. (See our Packaged Solutions and Bundled Solutions sections.)



Custom Solutions

Scalable PRO-Cell™ systems can be installed in most commercial applications. Combining banks of pre-filters, UVC lights, PRO-Cell™ panels and post-filters can efficiently clear the air of odors, smoke and germs in any large facility. (See our Custom PRO-Cell™ Panel Systems section.)



Commercial Applications

Airports, casinos, hospitals, IVF labs, nail salons, veterinary clinics, manufacturing plants, and more. Each has special air quality needs and challenges. Field Controls offers a comprehensive solution that is scalable, customizable, and robust. Our advanced, patented PRO-Cell™ technology combines high output UVC germicidal irradiation with a state-of-the-art photocatalytic oxidation process that reduces VOCs and odors. When combined with high efficiency filtration, you have a complete solution for clean, pure, odor-free air and a healthier, more people-friendly environment.

FRESH, CLEAN, PURE AIR

Hospitals

Reduces germs, viruses, VOCs, and spread of airborne diseases



Casinos

Reduces smoke & odors



Photocatalytic Oxidation

Patented PRO-Cell™ honeycomb **reduces odors and gases,** and **destroys ozone and formaldehyde.**

Commercial Offices

Reduces absenteeism caused by VOCs and germs



In Vitro Fertilization labs

Keeps environment safe for embryos



UVC Germicidal Lamp

UVC germicidal lights **neutralize** airborne microbes such as **bacteria, viruses, mold, and fungi.**

Medical Facilities

Reduces germs



Airports

Removes jet fuel fumes, VOCs



High Efficiency Filtration

Traps tiny particles including **mold, bacteria, dust, dander, and pollen.**

Manufacturing Process

Manage odor pollutants



Retail Stores

Removes VOCs



Photocatalytic Oxidation

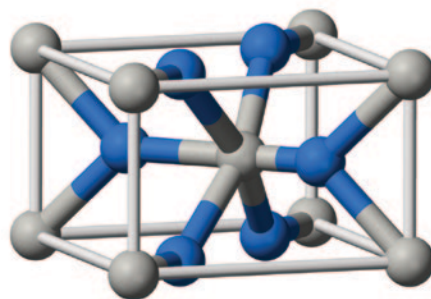
DEFINITION

What is Photocatalytic Oxidation?

Photocatalytic Oxidation (PCO) is a reaction that occurs when Titanium Dioxide (TiO_2) is exposed to ultraviolet (UV) light rays. When VOCs, gaseous contaminants, and odors come into contact with the PRO-Cell™ surface, they are converted to odorless, harmless water vapor and Carbon Dioxide. The titanium dioxide catalyst is activated by UV light which neutralizes biological contaminants such as bacteria, viruses, mold and fungi. When used properly, PCO is a powerful air sanitizer ideal for controlling air quality.



+



● Titanium atoms
● Oxygen atoms

Titanium Dioxide (TiO_2)

=

Photocatalytic Oxidation

Deactivates

Biologicals

- Bacteria
- Viruses
- Fungi

Eliminates

VOCs

- Paint
- Pesticides
- Chemicals
- Solvents

Reduces

Odors

- Cigarettes
- Garbage
- Kitchens
- Bathrooms

PRO-Cell™ - Photocatalytic Oxidation to a Higher Power

Our patented PRO-Cell™ Technology takes PCO to a new level of effectiveness and efficiency. The unique honeycomb aluminum substrate increases surface area and catalytic output exponentially while magnifying the effectiveness of the UVC light. The PRO-Cell™ is maintenance-free and long lasting.



Current US Patents on PRO-Cell™ PCO Technology

US Patents	Explanation
6248235	Fluid purification system using metallic substrate coated with TiO ₂
6261449	Fluid purification system using UV, filter, and directing flow
6274049	Method of purifying air using UV, filter, and generating flow
467653S1	Application of patents to Trio Portable
6330947	Method of coating catalyst using ultrasonic energy
6508367B2	Method of coating catalyst using high temperature baking
6524457B1	Method of coating catalyst using electroplating



Patented application uses nano-sized Anatase TiO₂ infrared-bonded to honeycomb aluminum substrate.



This PRO-Cell™ wall is part of a commercial air system that helps keep the air smoke-free, odor-free, and clean in a 250,000 sq. ft. casino in southern California.

Packaged Solutions

CUBE

The Ultimate Commercial Air System

The Cube commercial air purifier is designed for applications or work environments where air quality is essential. High efficiency particle filtration is combined with up to three stages of PRO-Cell™ odor and VOC reduction. This multi-stage treatment effectively and efficiently cleans the air in a single pass for systems up to 6.0 tons. The Cube is designed for use in any environment where harmful odors, volatile organic compounds, viruses or other airborne contaminants are a concern. The Cube's effectiveness is multiplied in recirculating HVAC systems where the air quality improves with each pass.

System Options

Recirculating systems can be outfitted with an optional post filter to trap targeted gases or with an all-purpose charcoal filter to further control odors.

Exhausting systems can be outfitted with a third PRO-Cell™ module with specialized output to completely eliminate odors emitted outside the building.

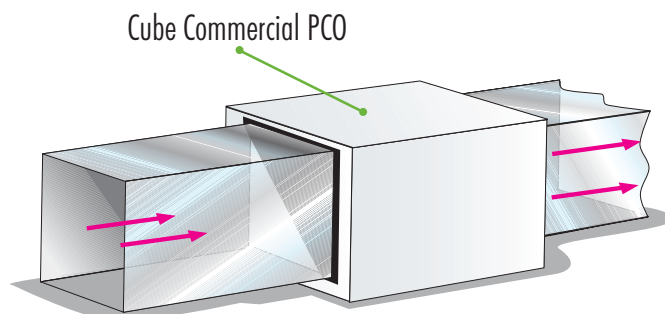
Standard configuration includes:

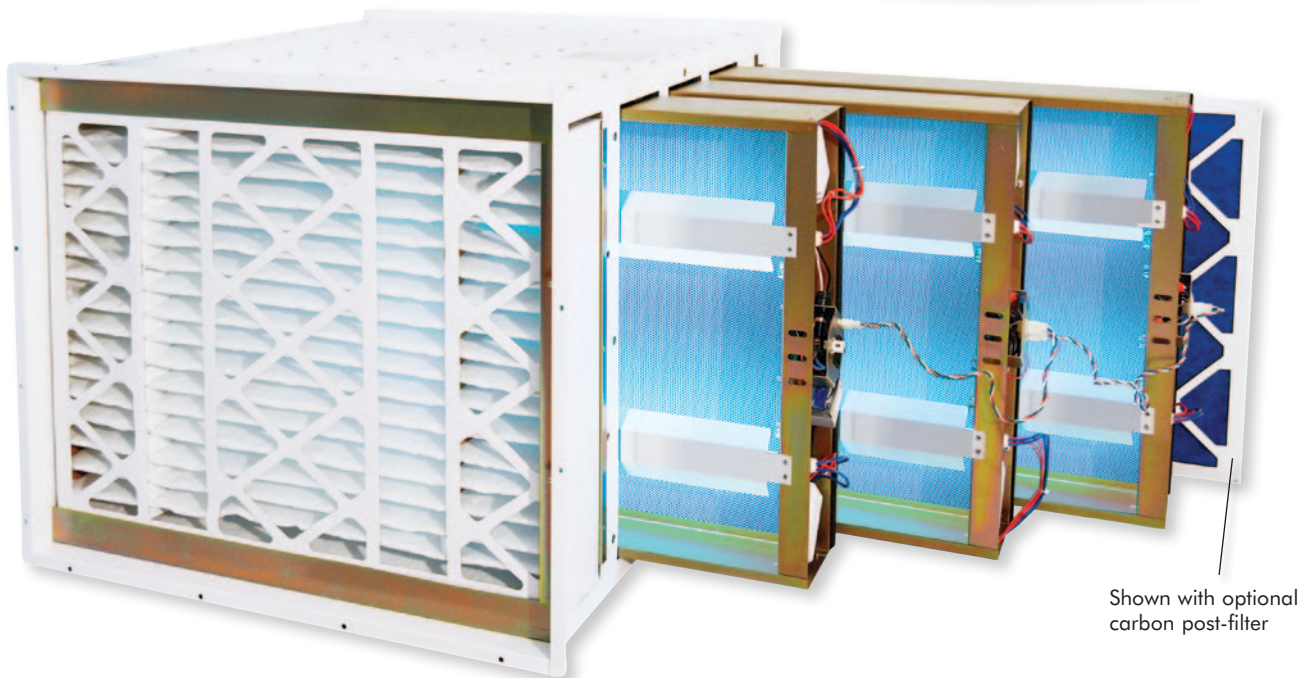
- One MERV 13 high efficiency filter
- Three patented PRO-Cell™ PCO modules
- One additional slot for a post-filter



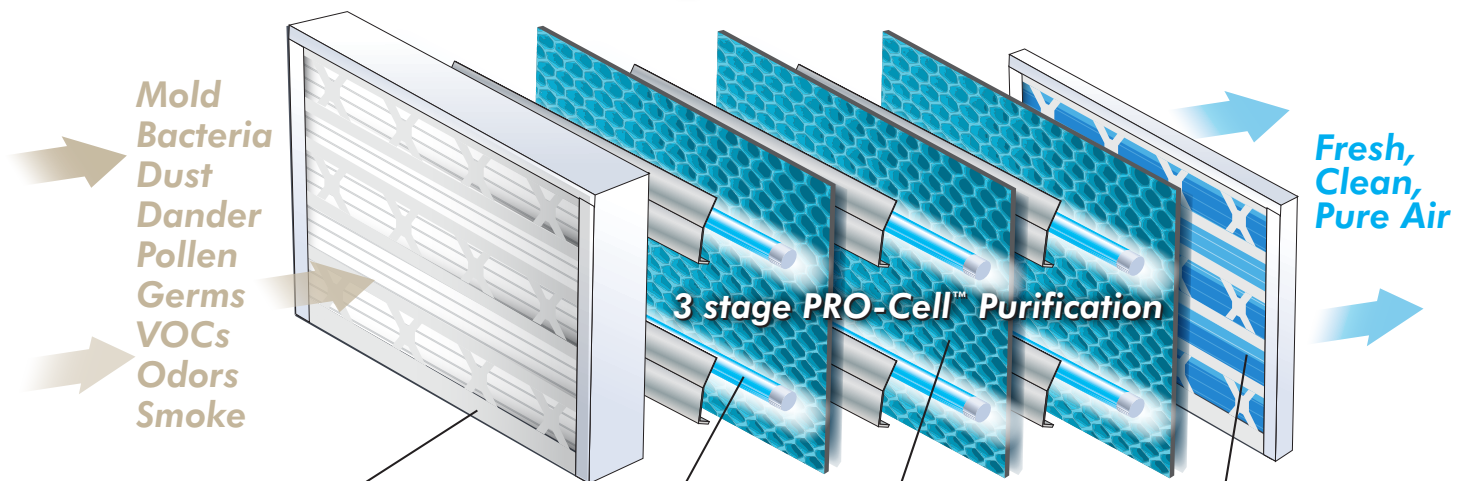
Typical commercial applications include:

- Printing Companies
- Nail & Hair Salons
- In Vitro Fertilization Clinics
- Schools
- Clean Rooms
- Laboratories
- Medical Clinics
- Pet Stores
- Vet Hospitals
- Fabric and Carpet Stores
- Health Clubs
- All Environments with Inks, Solvents, and VOC-Generating Chemicals





Shown with optional carbon post-filter



1 High Efficiency Filter

- MERV 13 high efficiency 4" pleated pre-filter
- Traps particles as small as .3 micron including mold, bacteria, dust, dander, and pollen

2 UVC Germicidal Lamps

- Two high output UVC germicidal lamps per module
- Three ultraviolet germicidal treatment zones are standard
- Neutralizes airborne microbes such as bacteria, viruses, mold, and fungi
- UVC magnifies PRO-Cell™ performance up to 200%

3 PRO-Cell™ PCO

- Patented PRO-Cell™ panels that clear the air of smoke, odors, and VOCs
- Transforms odors, smoke, and volatile organic compounds (VOCs) into harmless, odorless water vapor and carbon dioxide
- Maintenance free PRO-Cell™ core

4 Optional Carbon Filter

Cube								
Model	PRO-Cell™ Surface Area (sq. in.)	Sizing (tons)	Voltage	Lamp Wattage	MERV 13 Filter (inches)	MERV 13 Efficiency Particulate Reduction at .30 microns	Dimensions (inches)	Lamp Life Efficiency
Cube	30,240	6.0	120	6 at 25	20 H x 25 W x 4 D	92.30%	23 H x 31 W x 29 D	2 years

Bundled Solutions

TRIO

The Custom Trio Commercial Air Purification System with PCO Technology and Filtration

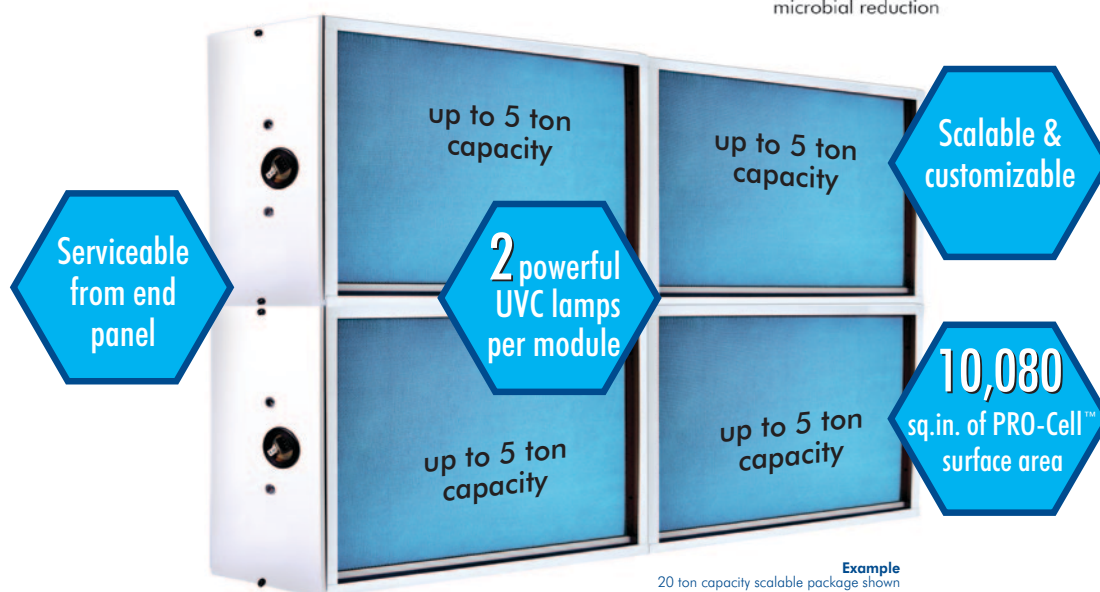
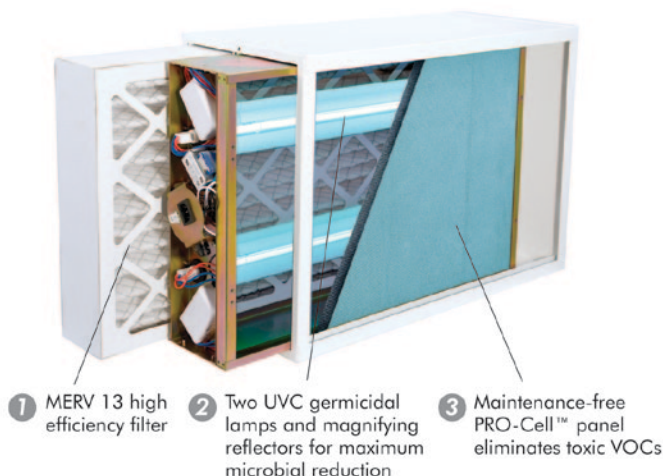
The Trio is a 3-in-1 package that is scalable and customizable for commercial applications up to 20 tons. Each Trio module contains a four inch MERV 13 high efficiency filter, two 22 inch UVC germicidal lamps, and 10,080 square inches of our patented PRO-Cell™ honeycomb. Each module is sized for a typical 5 ton installation. The units can be paired and bundled as illustrated for increased air cleaning power.

Standard configuration includes:

- One MERV 13 high efficiency filter
- One patented PRO-Cell™ PCO module



Patented



Trio									
Model	PRO-Cell™ Surface Area (sq. in.)	Sizing (tons)	Voltage	Lamp Wattage	Static Pressure Performance	MERV 13 Filter (inches)	MERV 13 Efficiency Particulate Reduction at .30 microns	Dimensions (inches)	Lamp Life Efficiency
Trio-1200	8,065	1.5 to 3.0	120	2 at 25	.30 in WC @ 1,200 cfm	16 H x 25 W x 4 D	92.30%	17 H x 25 W x 10 D	2 years
Trio-2000	10,080	2.5 to 5.0	120	2 at 25	.32 in WC @ 1,600 cfm	20 H x 25 W x 4 D	92.30%	21 H x 25 W x 10 D	2 years

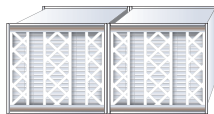
The custom Cube bundled configuration

A single Cube is capable of total air purification up to six tons. Cubes can be ganged or bundled together to handle up to 36 ton capacity. Each module contains one MERV 13 high efficiency filter to capture particulates and three PRO-Cell™ modules that contain two UVC germicidal lamps and 10,080 square inches of active photocatalytic activated surface area.

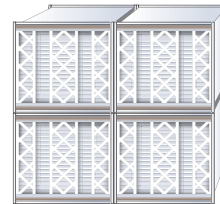


Two Cubes were bundled to purify the air in this IVF lab in Chapel Hill, NC.

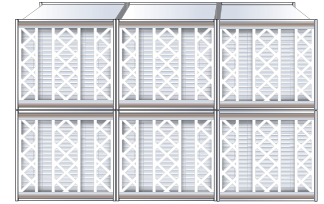
Bundled Configurations



Two



Four



Six

Scalable & customizable

up to 6 ton capacity

up to 6 ton capacity

up to 6 ton capacity

up to 6 ton capacity

MERV 13 High Efficiency filtration in each module

Serviceable from end panel

120,960 sq. in. of PRO-Cell™ surface area

Optional Post-Filter

PRO-Cell™ magnifies the power of the UV

6 powerful UVC lamps in each Cube

Maintenance-free PRO-Cell™

Example
24 ton capacity scalable package shown

Scalable Panel System for Large Installations

The Field Controls PRO-Cell™ Panel System consists of an array of UVC germicidal lamps in close proximity to one or two banks of PCO panels. An optional carbon filter bank is available downstream. These PCO panels are ideal for large commercial applications and can be scaled to greatly reduce VOCs, odors, germs, and particulates in any size system. The Field Controls PCO Panel System installs in the air handling unit or HVAC ductwork, completely out of sight.

This system is completely customizable, scalable, and is ideal for large commercial HVAC ductwork.



Scalable 24" x 24" PCO
Panel System

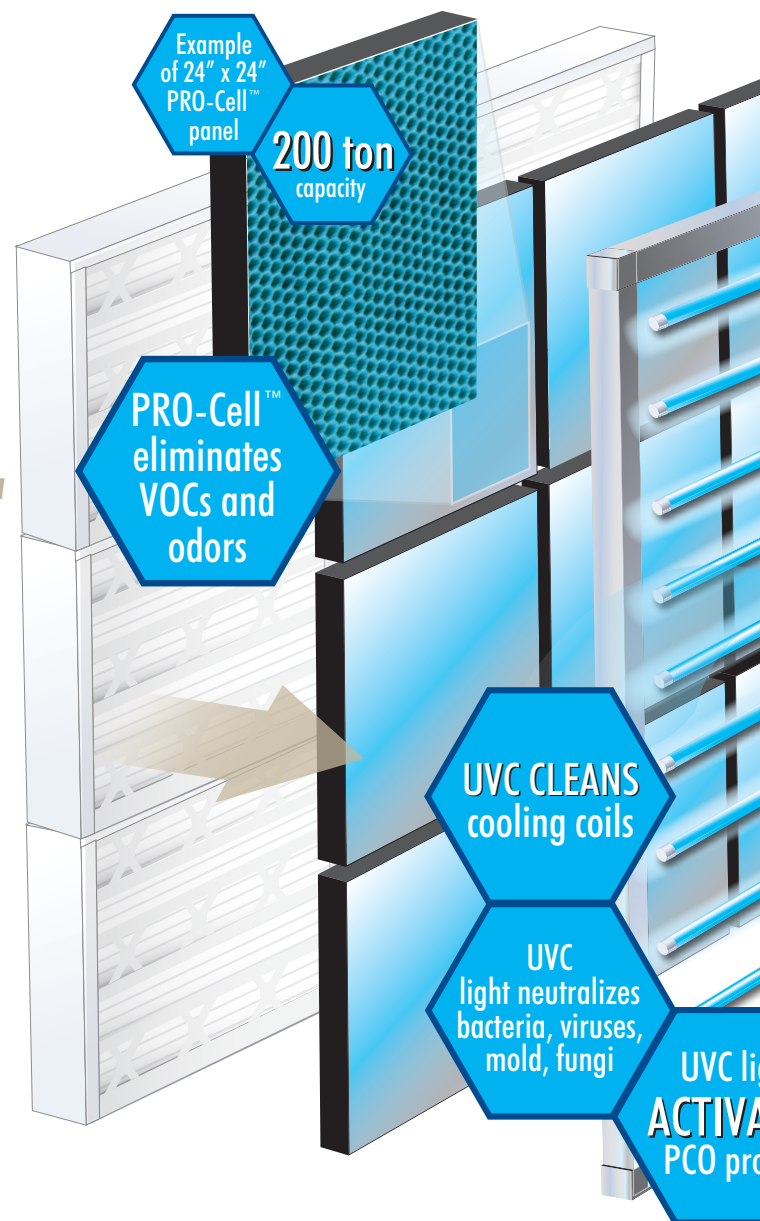
Standard Sizes

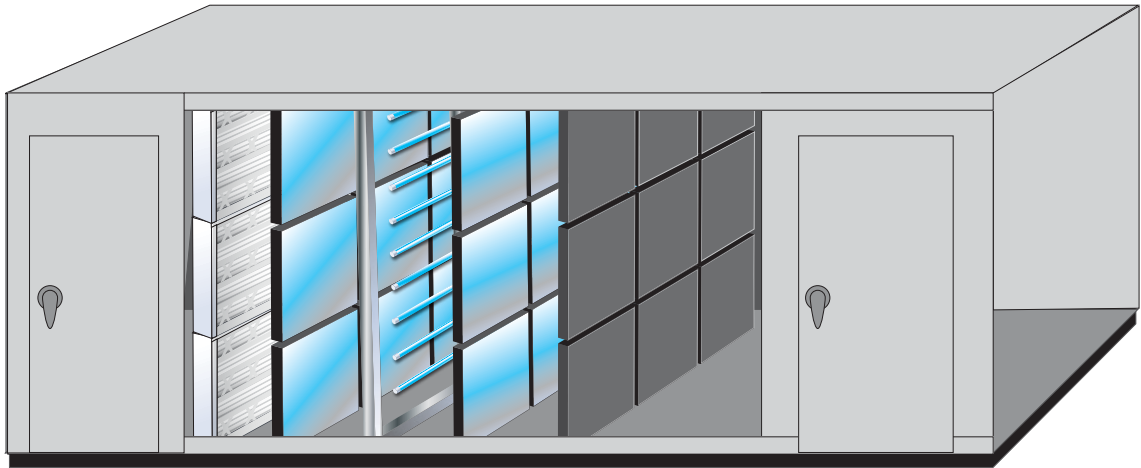
- 12 x 24 x 1
- 24 x 24 x 1

Custom Sizes Available

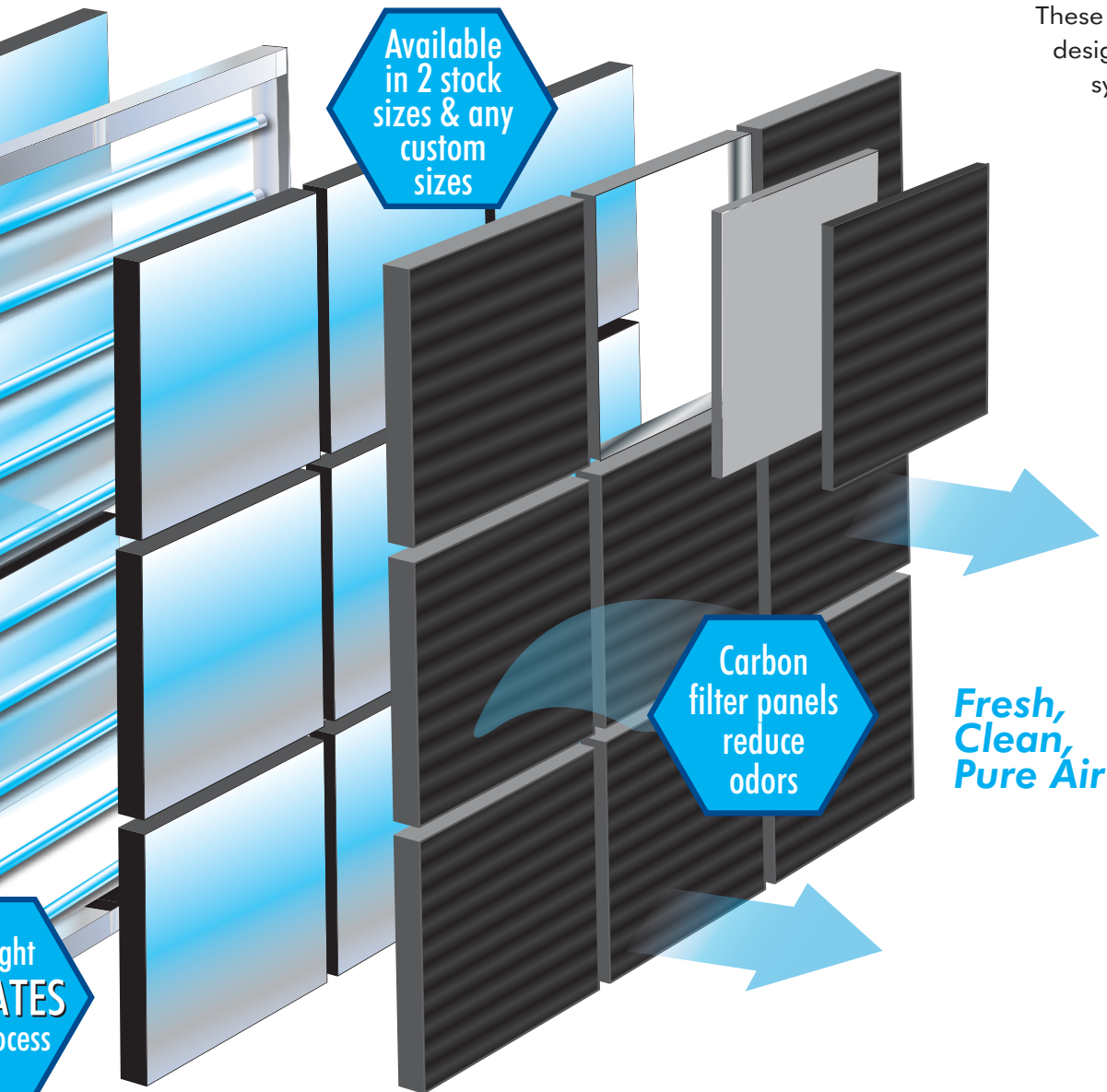
(per square inch)

Mold
Bacteria
Dust
Dander
Pollen
Germs
VOCs
Odors
Smoke





These panels can be custom designed to fit virtually any system - new or retrofit.



Test Results

- 93.6% Viral and Bacterial Reduction Efficiency
- 80% Volatile Organic Compound (VOC) Reduction
- 93.7% Particle Reduction (1.0 Micron)
- Destroys Ozone and Formaldehydes

Tested and approved by:

- Chalmers University of Technology, Gothenburg, Sweden
- Alpha, Scientists in Reproductive Medicine, USA
- Sandia Laboratory & National Renewable Energy Laboratory
- Hong Kong Polytechnic University Department of IAQ
- US Department of Defense



Through Duct Test Chamber - State of the art computerized monitoring allows for adjustable airflow, scheduled monitoring of CO₂, VOCs, Ozone, and more.

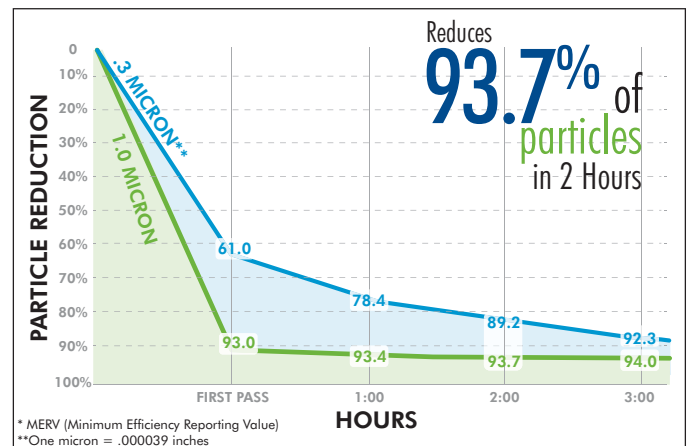
Safe Air Purification – Destroys & Eliminates harmful Ozone!



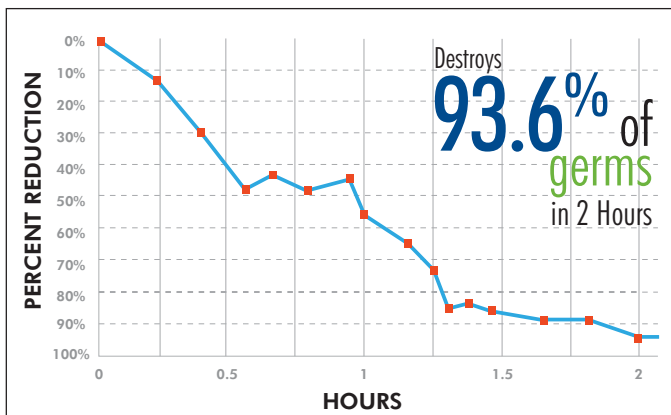
Field Controls Healthy Home System™ products **do not generate ozone**. The fact is, Field Controls' germicidal lamps convert ozone back into safe, healthy oxygen.

Ozone is a **toxic gas** which can damage the lungs when inhaled. Even low amounts can cause chest pain, coughing, shortness of breath, and throat irritation. Ozone may also worsen chronic respiratory diseases such as asthma and compromise the ability of the body to fight respiratory infections. Visit the EPA's website for more information at www.epa.gov/iaq/pubs/ozonegen.html.

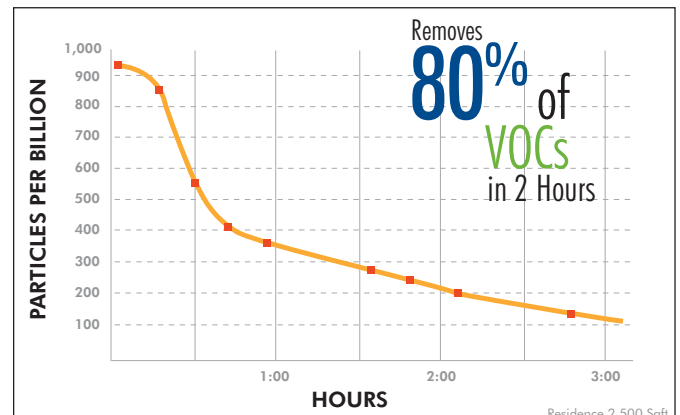
Beware of other manufacturers advertising ozone generating devices as air quality products. They often use misleading terms to disguise ozone such as "energized oxygen", "plasma", "activated oxygen", and "ionization". No matter what it is called, ozone is a known carcinogen and can be harmful to your health.



ULTRA-SUN TECHNOLOGIES - CORONA, CA



HONG KONG POLYTECHNIC UNIVERSITY - DEPARTMENT OF APPLIED BIOLOGY AND CHEMICAL TECHNOLOGY



Residence 2,500 Sqft

ULTRA-SUN TECHNOLOGIES - CORONA, CA

Casinos

"Our air quality has dramatically improved since installing the PRO-Cell™ System. Our customers have noticed the difference."

*-Casino Manager
San Diego, California*

Heavy concentrations of VOCs, such as cigarette smoke, produce a serious challenge for casino managers. Studies have shown that casino patrons stay longer and play more when the air quality in the casino is fresh and clean.

Leading casino operators are adding PRO-Cell™ technology to their existing air conditioning system to efficiently eliminate VOCs, smoke and cooking odors, as well as microbial contaminants. PRO-Cell™ panels, typically 24" x 24", are configured into a one inch thick PCO "wall" inside each roof-top air handling unit. A bank of UVC germicidal lamps is positioned before and/or after the PRO-Cell™ panels. Together, the lights and PRO-Cell™ panels work to clean the air of odor causing compounds such as airborne mold, bacteria and viruses. The entire configuration can be installed in a space as narrow as ten inches. Twenty-two such systems were used to purify the air in a 250,000 square foot casino in California.



In Vitro Fertilization Labs

"The air in our IVF lab has to be pristine...completely free of odors, VOCs, germs, and dust. It is truly a life or death situation."

*-In Vitro Fertilization Lab Manager
Chapel Hill, NC*

The In Vitro fertilization process is a delicate one and requires ultra-clean air. The presence of VOCs or germs can prevent the successful fertilization of an egg. IVF labs turn to the Field Controls Cube to filter and purify the air in their facility. A single Cube is capable of purifying the air handled by a six ton system. Up to six Cubes can be bundled together to handle up to 36 ton capacity. In Chapel Hill, North Carolina, we combined two units for twelve ton capacity in a new 6,000 square foot IVF lab. Each module contains one MERV 13 high efficiency filter to capture particulates and three PRO-Cell™ modules that contain two UVC germicidal lamps and 10,080 square inches of active photocatalytic activated surface area. Since the lab only operates during regular business hours, the Cube is dormant at night. It is activated in the morning when the staff arrives. Within 30 minutes, the air is quickly cleaned and the lab is ready for business.



Airports

"When one plane uses its engine to back away from the gate, the fumes from jet fuel can destroy the air quality in that concourse within seconds. We installed PRO-Cell™ technology to eliminate that danger."

*-Airport Manager
Southern California*

Jet engine exhaust, VOCs, and toxic gases are in the air in every airport in the world. In the past, airport managers have used exhaust fans and filters to try to stabilize the air. They are now adding PRO-Cell™ technology to reduce cost and eliminate jet fuel fumes. As with casinos, PRO-Cell™ panels and UVC light banks are added to new or existing air handling units to clean the air of jet fuel fumes, VOCs, and other toxins.





FIELD CONTROLS

fieldcontrols.com