



**FIELD CONTROLS**  
*Improving Indoor Environments*

## **TRIO™ ELECTRONIC AIR PURIFIER**

**A HEALTHY HOME SYSTEM® IN-DUCT SOLUTION.**

**BREAKING GROUND IN AIR TREATMENT FOR THE WHOLE HOUSE.**



## BACKGROUND

Field Controls has been an HVAC manufacturer since 1927 and is an innovative leader in residential Air Treatment. We introduced the UV-Aire® product line over 20 years ago, and it is now the most comprehensive product line for in-duct, residential HVAC application. As we continued to push for and effective products to improve Indoor Air Quality, we analyzed the home as its own ecosystem and how best to address air quality. For this, we developed the Healthy Home System® of products to provide "Clean, Fresh and Pure" indoor air.

The TRIO™, an innovative and comprehensive product, was developed as a three-in-one approach to provide a "Healthy Home System" in one package. The fundamentals of the TRIO include filtration, UV-C purification, and PRO-Cell® patented, catalytic VOC reduction. Despite the success of the product and the technology, we still were not satisfied.



# OBJECTIVE

In late 2019 (before the onset of the COVID-19 pandemic), while allergies, asthma and other respiratory illnesses continued to rise, our product development team was chartered with a singular mission:

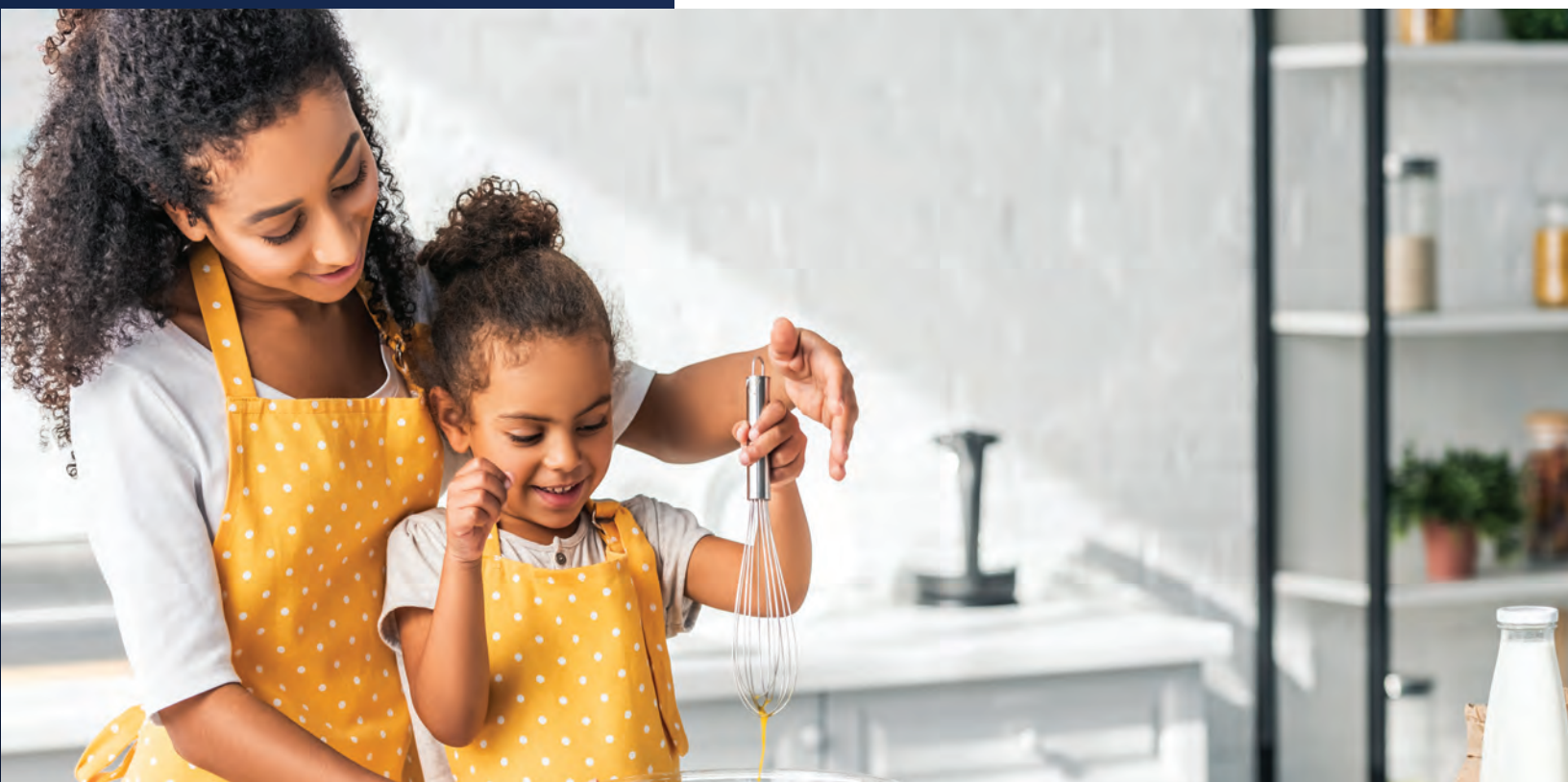
*“Develop the best whole house, electronic air purification system available.”*

To do this, the team set out to improve on our TRIO™’s solution of Filtration, UV-C and PRO-Cell technologies to deliver a Best-In-Class air purification system.

In our Air Treatment lab, the team evaluated current Field Controls models along with top competitor products to chart a baseline of performance. They met weekly to review the data and generate design changes that would improve performance in particulate capture, germicidal reduction VOC elimination and pressure drop reduction.

## THE TRIO WOULD BE FOCUSED ON RESIDENTIAL, WHOLE HOUSE, HVAC INSTALLATIONS WITH THE INTENT TO:

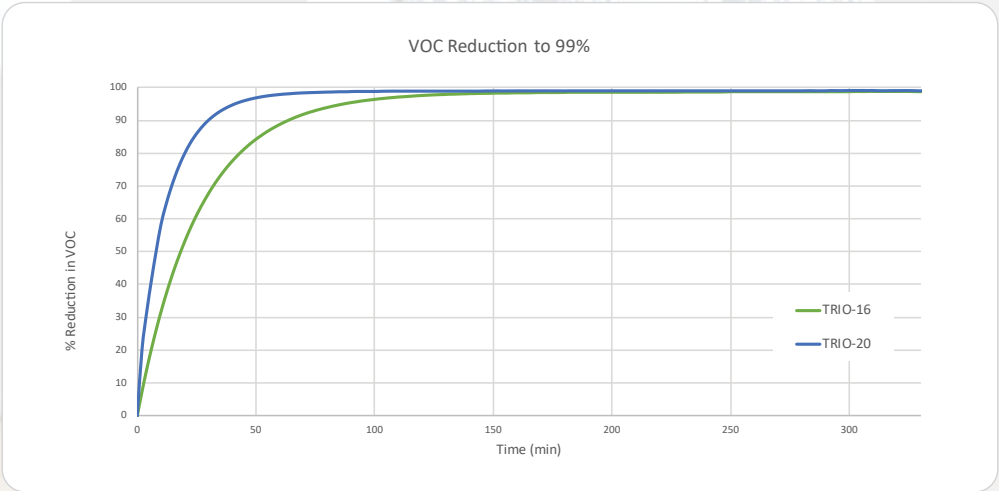
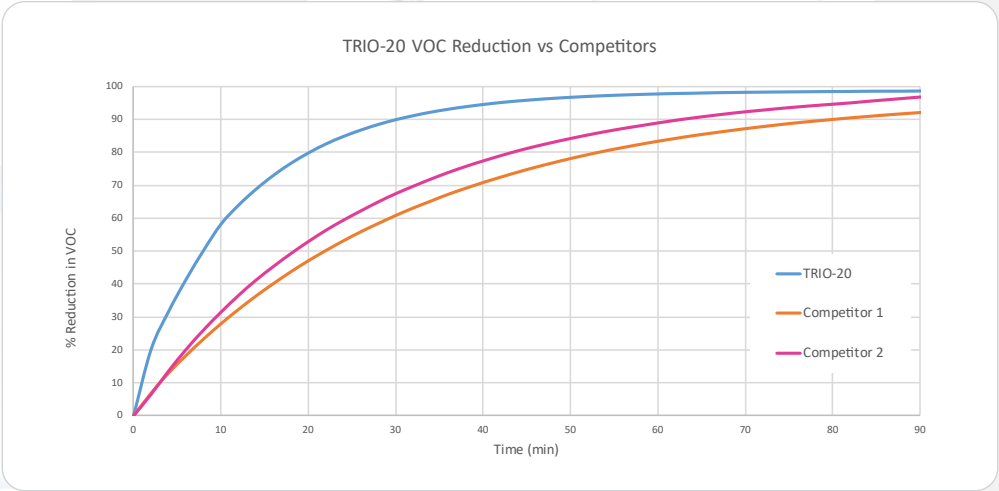
- Provide a minimum of MERV 13 filtering
- Include an infused carbon layer to absorb odors
- Reduce the pressure drop through the unit, overcoming contractor concerns with undersized air ducts
- Utilize high-performance UV-C to reduce airborne viruses and excite the catalyst
- Maximize the performance of the titanium catalyst with ideal substrate geometry
- Optimize cabinet configuration for installation ease, aesthetics, and reliability
- Minimize leakage through the cabinet to support pressure door testing and HVAC efficiency
- Provide options for:
  - Automatic system fan control to ensure pure air is delivered year round
  - Monitoring and signaling filter and UV-C lamp replacement requirements



# PERFORMANCE TESTING:

The following are key test results that confirm we have met our objectives to develop the Best-In-Class Air Purifier including pressure drop reduction to make the TRIO a top performer for Add On Replacement applications that demand superior high performance Air Purification.

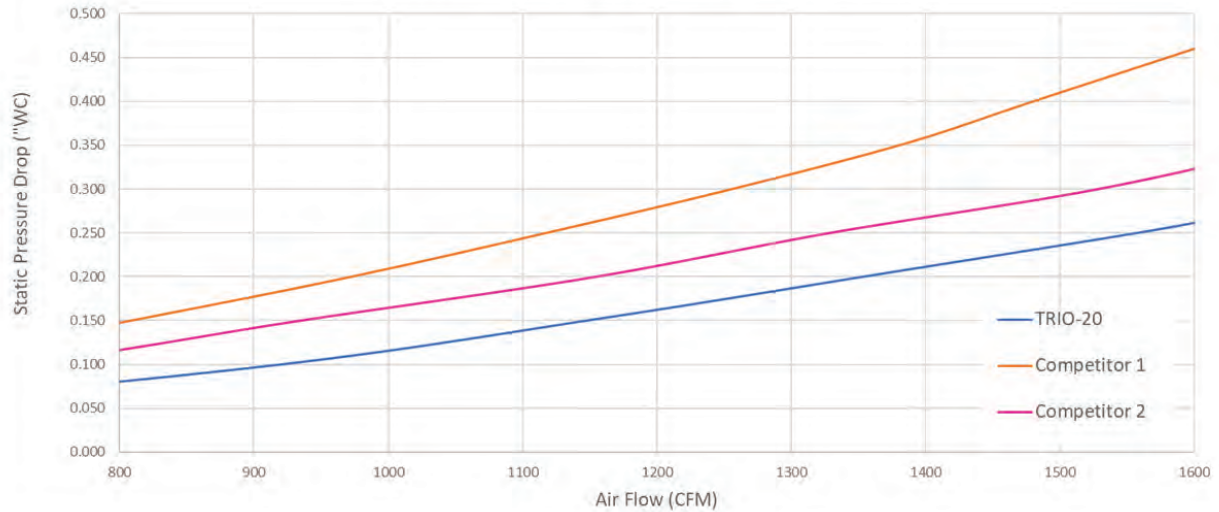
## VOC REDUCTION:



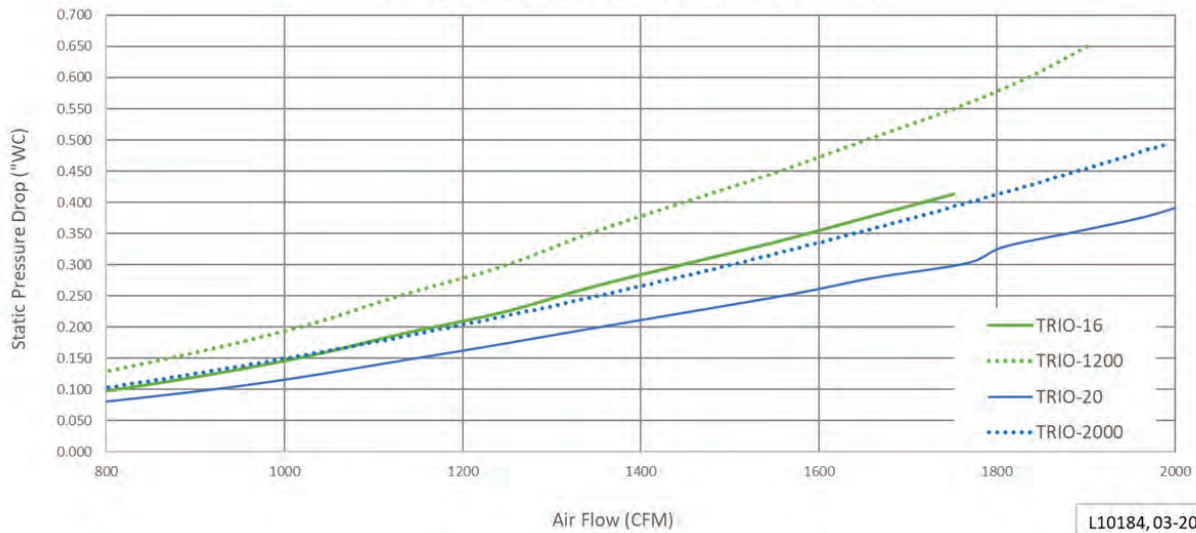
VOC Reduction (% Reduced)						
Minutes	15	30	45	60	75	90
TRIO-20	71%	90%	96%	98%	98%	98%
Competitor 1	40%	61%	76%	83%	89%	92%
Competitor 2	45%	67%	82%	89%	94%	97%

## PRESSURE DROP:

TRIO-20 Pressure Drop vs Competitors



TRIO-16 & TRIO-20 Pressure Drop Improvement



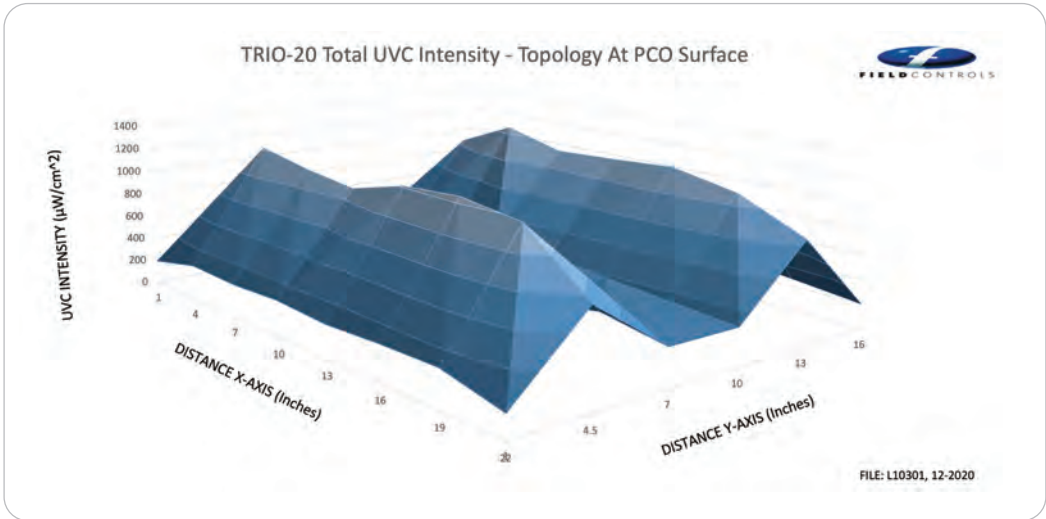
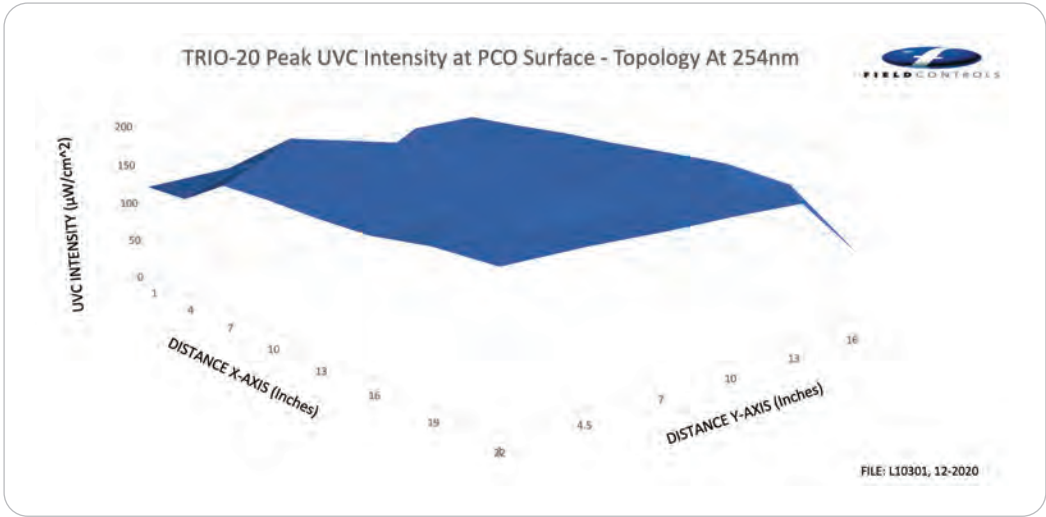
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### Pressure Drop

Air Flow (CFM)	800	1000	1200	1400	1600
TRIO-20	0.08	0.12	0.16	0.21	0.26
Competitor 1	0.15	0.21	0.28	0.36	0.46
Competitor 2	0.12	0.16	0.22	0.27	0.33



# UV INTENSITY:



## TRIO20 TOTAL UV INTENSITY MEASUREMENTS

UV intensity ( $\mu\text{W}/\text{cm}^2$ ) for UVC Bandwidth at increments across surface (inches)								
	1	4	7	10	13	16	19	22
1	190	287	272	295	268	293	303	188
4.5*	710	1217	1135	1080	1211	1243	1180	759
7	164	309	306	322	381	311	406	315
10	147	312	308	515	423	383	347	307
13*	495	1039	1252	1127	1152	1185	1084	843
16	250	345	311	325	314	314	262	204

Door Side

\* Indicates test measurement is directly above lamp.





## CONCLUSION

TRIO and TRIO HHS incorporate Best-In-Class features, outperforming the competition.

The TRIO breaks ground in air purification for the whole house. Test data shows that the TRIO's patented technology outperforms any other electronic air cleaner or air purifier on the market. The TRIO's low pressure drop and ozone-free design efficiently turns your HVAC appliance into a comprehensive air treatment system to protect you and your family.

### TRIO TECHNOLOGY APPLICATIONS

- In-duct single-family and multi-family residences
- Portable air purifiers for one-room applications
- Commercial applications up to 6 tons