

The Ultimate Virus-killing Device for AC Buses



Product introduction and application

2020.3



Challenges from the environment



SONGZ air conditioner intelligent air purification and disinfection system



Product features and advantages



Third party test report



Product application examples



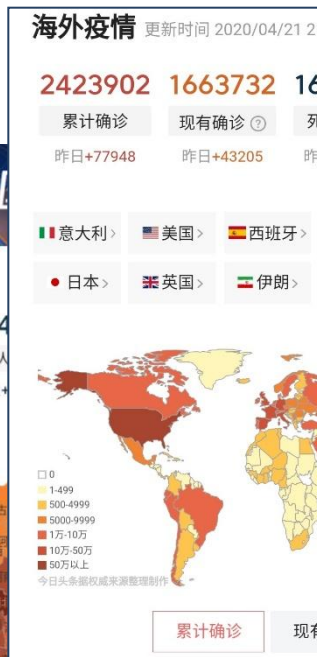
1.Challenges from the environment

The harmonious coexistence of man and nature has always been our topic of concern. But reality always “maliciously” reminds us that the environment around us is no longer so safe.

In addition to the frequent occurrence of PM2.5 explosions, annual seasonal flu, and the residual volatile odor gas (VOC) on industrial products, such as common problems, the new coronavirus outbreak during the Spring Festival this year, in just a few days Wanton sweeping across China, spreading all over the world in a few months, the severe situation is even more severe than the SARS 17 years ago!

Whether it is “man-made destruction” or “revenge of nature”, all of this is warning us:

Environmental governance needs urgent action, and air purification is urgent!





2、SONGZ air conditioner intelligent air purification and disinfection system

Based on domestic bus thermal management system for more than 20 years, SONGZ is a professional manufacturer of various types of bus thermal management systems and high-efficiency energy-saving air-conditioning products for customers. As the whole country made concerted efforts to win the critical moment of epidemic prevention and control, SONGZ took immediate action to develop and perfect SONGZ Air Conditioning Intelligent Air Purification and Disinfection System 2.0 to help all OEMs improve air safety and quality together!

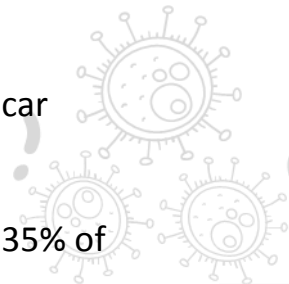


SONGZ air conditioner intelligent air purification and disinfection system Version 2.0

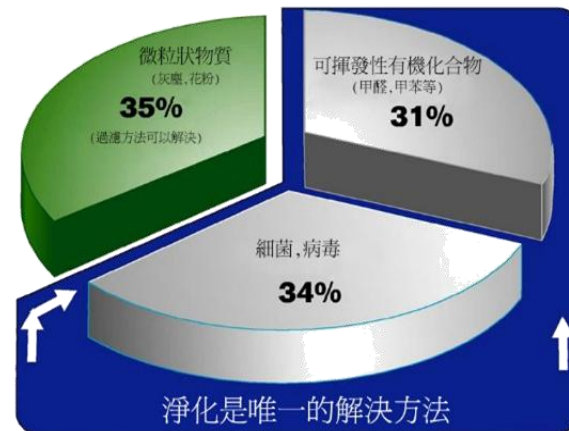


2.1 Main sources and causes of air pollution in cars

1. Bacteria is the second largest source of pollution in the car after micro particles.
2. Filtration and dust collection technology can only solve 35% of air problems in the air.
3. The remaining 65% of air disinfection and purification problems need to use other purification technologies.
4. Broad-spectrum disinfection and purification of the air in the car can only be solved by comprehensive technical means



美国疾病控制与预防中心
Centers for Disease Control and Prevention
对过敏症成因的分析结构图





2.1 Main sources and causes of air pollution in cars



甲醛

危害：
致癌物。引发鼻咽癌和白血病。



苯

危害：
致癌物。损伤造血机能，诱发白血病。



氨

危害：
致癌物。诱发肺癌，影响神经系统。



氢

危害：
损害呼吸系统，引发恶心、头疼等。



TVOC

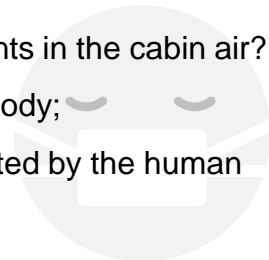
危害：
影响中枢神经和消化系统。损伤肝脏。



Bacteria, viruses

Odor, TVOC

Floating particles



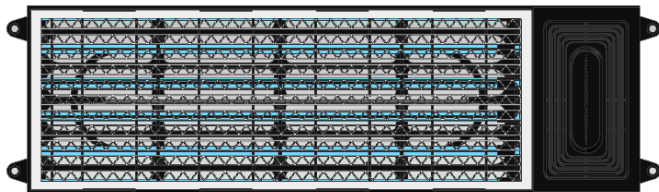
What are the sources of pollutants in the cabin air?

- Germs carried by the human body;
- Sweat, breath, body odor emitted by the human body;
- The smell of people eating, scattered food;
- Formaldehyde-type harmful gas pollutants and odors emitted from car interiors and plastic products;
- Germs present on the interior of the car interior, seats, armrests, floors, curtains, debris in the car, etc.;
- Various toxic and harmful pollutants and dust brought by outside air;
- Contaminants present in air circulation systems such as air conditioners, heaters and air ducts.

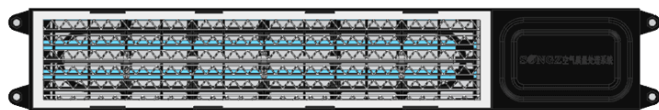




2.2 Product specifications and technical parameters



Suitable for single return air conditioner :
630mm×180mm×40mm



Suitable for double return air conditioner
: 630mm×100mm×40mm



SONGZ wind grille



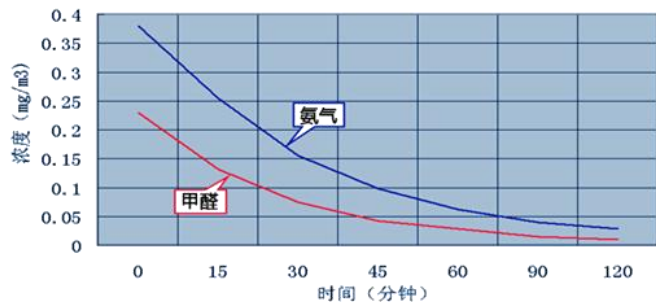
2.2 Product specifications and technical parameters

Pollutant project	Initial concentration of pollutants	Rated air volume(m ³ /h)	Working 1h removal rate (%)
Formaldehyde (HCHO)	0.96~1.44 mg/m ³	> 4800	90.4%
Toluene (C ₇ H ₈)	1.92~2.88 mg/m ³	> 4800	91.4%
Xylene (C ₈ H ₁₀)	1.92~2.88 mg/m ³	> 4800	93.0%
Total volatile organic compounds (TVOC)	4.8~7.2 mg/m ³	> 4800	92.2%
Particulates	0.70~0.85 mg/m ³	> 4800	99.9%
Microorganism	According to GB 21551.3	> 4800	99.9%
Test conditions: 12-meter large passenger car, 6 evaporator fans, maximum air flow operation, internal circulation			



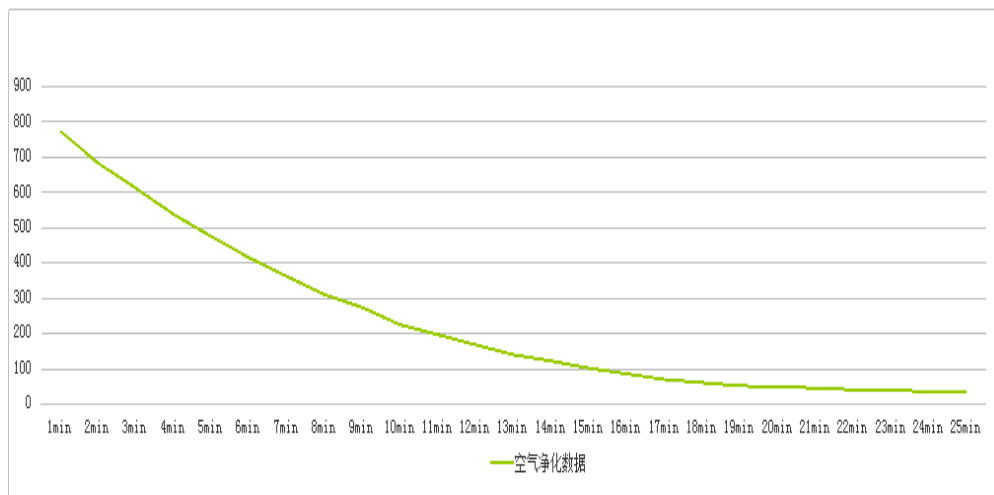
VOC

Strong ions have a very strong redox ability, can oxidize and decompose formaldehyde, methane, ammonia and other volatile odor gases (VOC) in the vehicle into carbon dioxide, water and oxygen. The removal rate reaches 95% after 1 hour of operation.





2.2 Product specifications and technical parameters



Air quality test graph



PM2.5

On-sit test: After 25 minutes of in-depth purification, PM2.5 was reduced from 759 $\mu\text{g}/\text{m}^3$ (six-grade heavy pollution) to 33 $\mu\text{g}/\text{m}^3$ (first-class air quality), and the air quality was significantly improved.



2.2 Product specifications and technical parameters

Ozone concentration	Sterilization rate at 0.05PPM concentration		Sterilization rate at 0.1PPM concentration	
operating hours	15 minutes	30 minutes	15 minutes	30 minutes
Staphylococcus aureus	75.1%	86.3%	81.8%	98.2%
E.coli	83.5%	93.8%	92.7%	98.6%
Typhoid bacillus	91.2%	95.5%	95.9%	99.4%
Natural colonies	93.7%	99.8%	98.6%	99.9%
Test conditions: Use 0.05ppm and 0.1ppm O3 concentration to test its sterilization effect and sterilization rate in a 200L closed container.				



O3 sterilization effect test



Sterilization, anti-virus

1. In the co-existence mode, the ozone generation amount is 0.05ppm, which is far less than the safety value of 0.15ppm. The sterilization rate reaches 99% after 30 minutes of operation.
2. Ultraviolet does not have penetrating power and does not cause any harm to the human body when it is not directly irradiated; there is a photocatalyst layer, grille filter layer and grille door panel between the ultraviolet sterilization lamp and the cabin to prevent direct exposure to passengers , Can be used safely.

Remarks: GB3095-2012 Ambient Air Quality Standard stipulates that ozone will exist for more than 8 hours, and the content will exceed 0.15ppm to affect health.

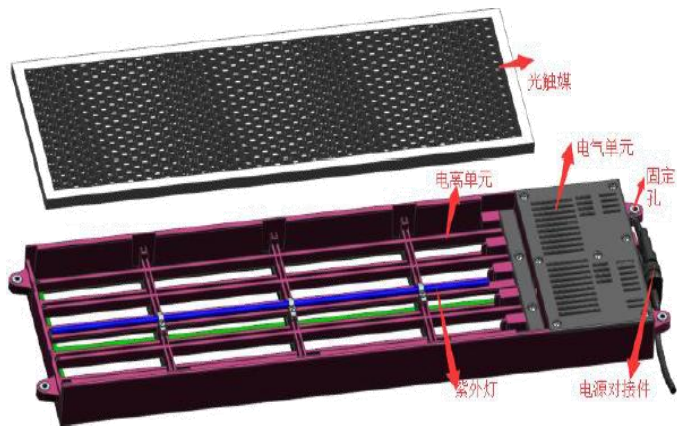


3. Product features and advantages



Four core technologies

Air quality improvement				
Items	Electrostatic dust collection (PM2.5)	UV lamp	ionizer	Photocatalyst filter
Sterilization	×	√	√	√
Remove VOC	√	×	√	√
PM2.5	√	×	×	×





3. Product features and advantages

Strong ion photocatalytic polymerization technology, human-machine coexistence, disinfection and sterilization.

Proprietary strong ion technology, combined with UVC ultraviolet, active oxygen, negative ion and photocatalytic polymerization technology, comprehensively and quickly kill viruses and bacteria, and prevent the spread of disease. The sterilization rate is 99.9%, and the dust removal rate is 99.9%. It can effectively remove harmful gases such as formaldehyde, benzene, ammonia, and various odors, smoke, and odors in the vehicle cabin. It has a working mode of human-machine coexistence, disinfection without dead ends, and pollution.



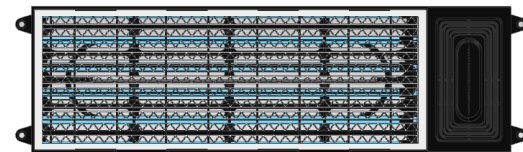
Supplement air negative oxygen ions to eliminate travel fatigue.

6 million negative oxygen ions, refresh the air, activate cells, enhance human immunity and eliminate travel fatigue.



Air purification, decomposition of harmful gases, maintenance-free and no consumables.

Installed inside the air conditioner grille, small size does not occupy additional space, through the chain reaction to strongly decompose the polluted gas in the cabin, eliminate PM2.5, PM10 suspended particles, keep the air environment in the car fresh and healthy, no consumables during use, Maintenance free.





Product features and advantages



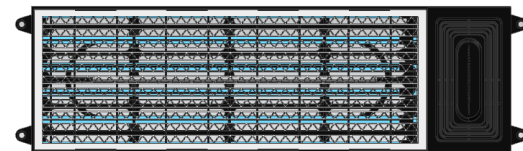
Remote monitoring, safety warning, intelligent control.

It can be connected to the CAN line of the whole vehicle, and the air quality sensor data can be monitored in real time on the dashboard, and the intelligent switching and real-time safety warning of the purifier's working mode can be realized according to the air quality; the return window has its own independent display (display PM2.5 particle concentration, temperature, humidity and air quality index, optional), allows passengers to intuitively understand the pollution status of the vehicle environment through the display, making the product more higher-class and practical in appearance.



High working efficiency, low power consumption, minimal impact on vehicle energy consumption or cruising range.

"Dynamic polarization" mode guarantees long-lasting and stable purification efficiency, the dust holding capacity is several times higher than the filter of the same specification; matched with the power supply system of the passenger vehicle, the power consumption of the disinfectant purifier module of the 12-meter bus is only 10W, safe and energy-saving, suitable Equipped with ordinary and electric buses.





3.2 Core competitiveness

Product Power	SONGZ air purifier	Integrated purification function
Does it require ventilation?	Ventilation by fans	No vent
Air purification method	<ol style="list-style-type: none"> 1. Strong ion air purification system 2. Enhanced ozone module (optional) 3. Integrated electrostatic dust removal 4. Integrated photocatalyst filter 5. Integrated UV sterilization 	<ol style="list-style-type: none"> 1. Vehicle UV lamp sterilization 2. Spraying disinfectant solution
Core competitiveness	<ol style="list-style-type: none"> 1. Overall integration, small size, very few changes to the vehicle 2. Can effectively remove all kinds of bacteria, viruses, dust and toxic and harmful gases 3. The overall cost of the purifier is low. If you want to install an enhanced ozone module, you only need to add an additional cost of more than 100 RMB. 4. The air purification function can be turned on when carrying passengers. The air purifier itself will generate a small amount of O3 (about 0.02ppm, within a safe range) to achieve real-time sterilization effect. 5. When anti-virus is needed for the whole vehicle, before the vehicle is turned on or when there is no one in the car, the enhanced ozone mode is turned on, and it will automatically stop after 15 minutes, which is highly efficient and energy-saving. 6. When the cooling, heating and ventilation modes are not turned on, the fan of the sterilization system is started automatically for 5 minutes and stopped for 20 minutes. 	<ol style="list-style-type: none"> 1. Large changes to the whole vehicle, it is necessary to install extra ultraviolet lamps in the vehicle, and a whole set of disinfection water spray system needs to be installed. The rectification project is large and the cost is high. 2. Bacteria and viruses can be cleaned, but there is no good treatment for dust and toxic and harmful gases. 3. Air purification and disinfection are not allowed when carrying passengers. If do and after disinfection, then air exchange is required, and this efficiency is lower.



4. Third party test

检测

TEST REPORT

产品名称: 松芝空气净化

NAME OF SAMPLE

委托单位: 上海加冷松芝汽车

CLIENT

检测类别: 委托检测

CLASSIFICATION OF TEST

威凯检测技术有限公司

Vikan Certificate

威凯检测技术有限公司

检测

TEST REPORT

产品型号: SZAP008-II

委托单位: 上海加冷松芝汽车股份有限公司

地址: 上海市闵行区莘庄工业园区莘庄路 6999 号

生产单位: —

样品数量: 1

样品识别: 1-1

检测方式: 委托单位送检

检测日期: 2020-04-03

检测依据: 参照企业技术要求

检测: 杨望飞

审核: 胡刚

批准: 杨望飞

日期: 2020-04-03

威凯检测技术有限公司

检测

TEST REPORT

产品型号: WTS2020-5804

委托单位: 上海加冷松芝汽车股份有限公司

地址: 上海市闵行区莘庄工业园区莘庄路 6999 号

生产单位: —

样品数量: 1

样品识别: 1-1

检测方式: 委托单位送检

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威凯检测技术有限公司

检测

TEST REPORT

产品型号: WTS2020-5804

委托单位: 上海加冷松芝汽车股份有限公司

地址: 上海市闵行区莘庄工业园区莘庄路 6999 号

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日期: 2020-04-03



威凯检测技术有限公司

№: WTS2020-5804

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附表 1 测试结果汇总表

序号	检测项目	测试方法	检测结果
1	PM _{2.5} 去除率(1h)	企业技术要求(见备注)	99.9%
2	甲醛去除率(1h)		90.4 %
3	甲苯去除率(1h)		91.4%
4	TVOC 去除率(1h)		92.2%
5	二甲苯去除率(1h)		93.0%

NO	Test items	Results
1	Removal rate (1h)	99.9%
2	Formaldehyde removal rate (1h)	90.4%
3	Toluene removal rate (1h)	91.4%
4	Removal rate (1h)	92.2%
5	Xylene removal rate (1h)	93.0%



5. Product application examples

5.1 The purification system is pre-installed with the new bus



This system uses proprietary strong ion car air disinfection and purification technology, which has strong disinfection and sterilization, effectively reduces PM2.5, removes smoke and odor, decomposes harmful gases, improves cabin air quality, supplements air vitamins (negative oxygen ions), etc. Multiple functions, at the same time, it can achieve intelligent remote monitoring and control, allowing drivers and passengers to stay away from viral germs, cabin odors, and air pollution, and enjoy the natural fresh air during the journey.

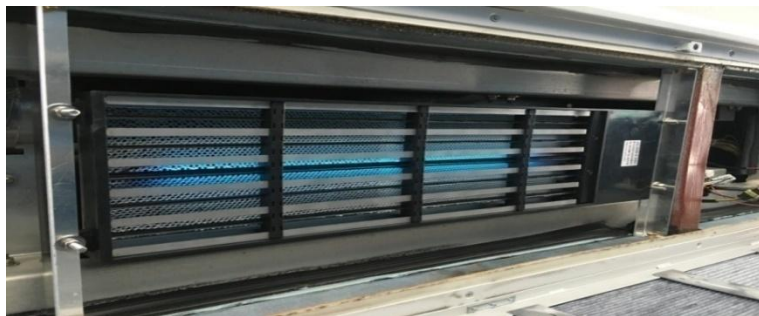
At present, it has been supplied in batches on higher-class models of OEMs such as Xiamen Jinlong and Zhengzhou Yutong.



5. Product application examples

5.1 The purification system is pre-installed with the new bus

Actual loading example



Actual loading example



Features:

Purify and deodorize

Remote monitoring

Return air inlet integration

Strong spectrum

disinfection

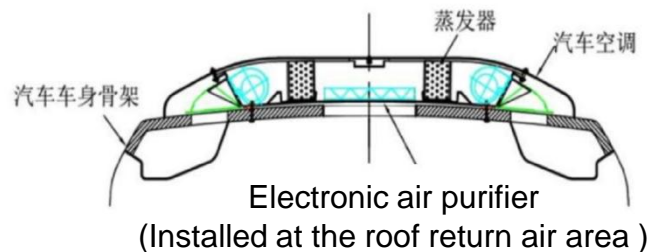
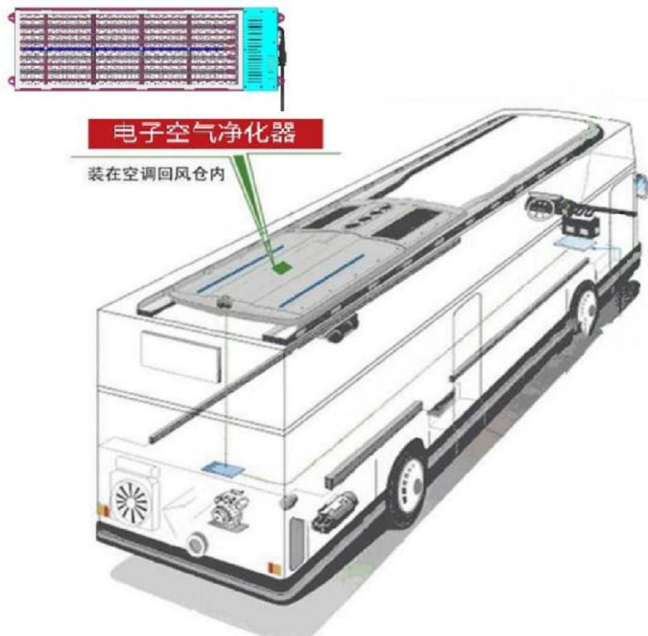
Maintenance-free and no

consumables



5. Product application examples

5.1 The purification system is pre-installed with the new bus



Optional working mode:
Man-machine coexistence disinfection and
purification mode,
Powerful disinfection and sterilization mode

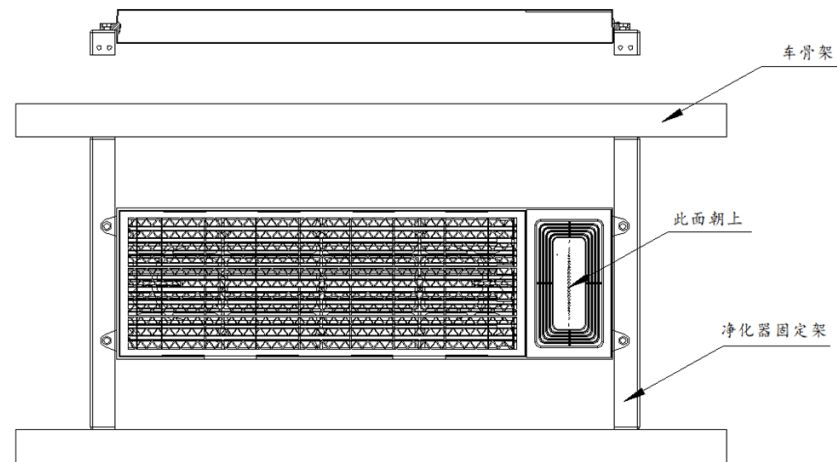


5. Product application examples

5.2 The purification system is installed on the offline vehicle.

Purification system installation bill of materials (single return air)

NO	Name	specification	Quantity (unit)	Brand
1	Strong ion air purifier	650*180 24V/7.2W	1	SONGZ
2	Fixing bracket	3003 H24 3.0 GB/T 3880.1	2	Design by clients
3	Bolt	M6*30	4	SONGZ
4	Nuts	M6	4	SONGZ
5	Flat Washers	φ6	4	SONGZ
6	Standard spring washer	φ6	4	SONGZ
7	Cross recessed countersunk head tapping screws	ST6.3*19	4	SONGZ
8	Power adapter cable for Air purification	/	1	SONGZ
9	Terminal	/	2	SONGZ



Installation schematic diagram
on the offline vehicle

The installation is simple and convenient,
and it is convenient to modify and install.



5. Product application examples



**In the future, we hope to cooperate with more OEMs,
Work together to improve the environment during people travel and improve the air quality in the
vehicle cabin !**



Fighting the epidemic, SONGZ is in action.