

GENESIS AIR 2008 PCP COMPOUNDS



INSTALLATION AND OPERATIONS MANUAL

PLEASE READ AND SAVE THESE INSTRUCTIONS!



INTRODUCTION

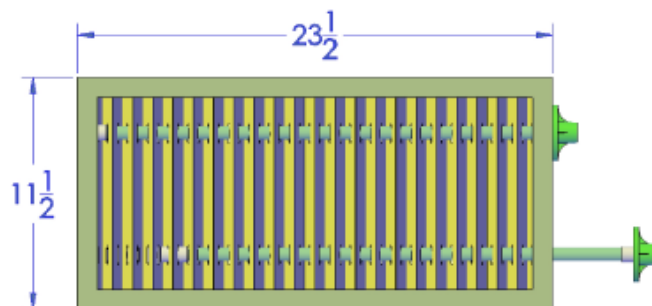
The Populated Catalyst Panel (PCP) Compound is used to reduce the levels of Volatile Organic Compounds (VOC's) and viable airborne biological contaminants in airstreams, such as Air Handling Units (AHU's), Roof-Top Units (RTU's) or in the ductwork. The PCP Compound is a "scalable" technology, it may be engineered for any size air stream using combinations of standard sizes, or by designing custom units for the non-standard pathways, including stand-alone units, such as the Genesis Air 2008B series and 2008DT-FP. The Compound is comprised of 1-3 PCP Standards joined together. All Genesis Air products incorporate 3-step GAP technology: MERV Filtration, UVGI Lamps and Photocatalysis.

UL REQUIREMENTS

- 105°C minimum supply connections
- For catalyst marked "XXXX", 50°C/122°F maximum ambient temperature. For those marked "XXXX-E", 80°C/176°F maximum ambient temperature.
- Suitable for air-handling units
- Access above ceiling may be required
- The health aspects associated with the use of this product and its ability to aid in disinfection of environment air have not been investigated by UL.
- Use only First Light type T5 lamps specified by the PCP Compound.
- **Warning:** The electrical supply circuit connected to this UV appliance must be routed through an electrical interlock switch placed on the HVAC system duct access panels and doors to prevent accidental UV exposure when servicing the air ducts or equipment.
- **Caution:** Equipment Damage Hazard. Ultraviolet light can cause color shift or surface degradation and sometimes structural degradation of non-metallic components. Select mounting location that prevents exposure to plastic flexible duct components, polyurethane foam insulation material, rubber hoses, wiring insulation, filtration media, etc. If mounting options are limited, items above should be protected with ultraviolet resistant material such as aluminum foil, aluminum duct tape, or metallic shields.

DIMENSIONAL DATA

The standard sizes for the PCP Standards are found in the chart below. The first dimension is the measurement of the panel across the lamps; the second measurement is along the lamps (see figure).



12 x 24 PCP STANDARD

All dimensions are nominal; actual dimensions are listed in the table below. All PCP Standards are 6" deep nominal; actual dimension is 5 13/16". The catalyst is pleated at one pleat per inch.

The lamps are spaced 6” from each other on all models, then centered over the width of the panel.

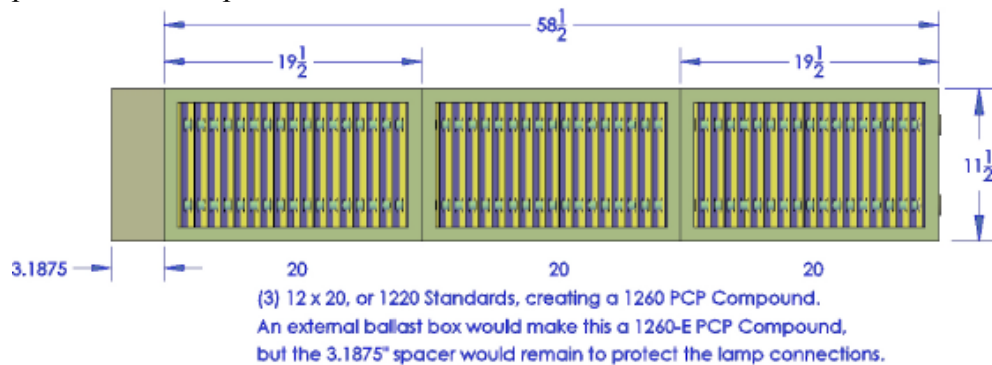
All PCP Standards are rated at 500 fpm. As residence time is the most critical factor in designing a viable solution, do not exceed 500 fpm. The maximum CFM allowed per unit based on the FPM are given in the table below.

Nominal Size	Actual Size	Nominal Area, ft ²	Frame Opening Area, ft ²	Maximum Recommended Airspeed, FPM	Maximum Recommended Nominal CFM	Maximum Recommended Adjusted CFM
12 x 9	11.5 x 9	0.750	0.583	500	375.00	291.67
12 x 12	11.5 x 11.5	1.000	0.766	500	500.00	382.81
12 x 13	11.5 x 12.75	1.083	0.857	500	541.67	428.39
12 x 16	11.5 x 15.5	1.333	1.057	500	666.67	528.65
12 x 17	11.5 x 17	1.417	1.167	500	708.33	583.33
12 x 20	11.5 x 19.5	1.667	1.349	500	833.33	674.48
12 x 21	11.5 x 20.625	1.750	1.431	500	875.00	715.49
12 x 24	11.5 x 23.5	2.000	1.641	500	1000.00	820.31
16 x 9	15.5 x 9	1.000	0.806	500	500.00	402.78
16 x 12	15.5 x 11.5	1.333	1.057	500	666.67	528.65
16 x 13	15.5 x 12.75	1.444	1.183	500	722.22	591.58
16 x 16	15.5 x 15.5	1.778	1.460	500	888.89	730.03
16 x 17	15.5 x 17	1.889	1.611	500	944.44	805.56
16 x 20	15.5 x 19.5	2.222	1.863	500	1111.11	931.42
16 x 21	15.5 x 20.625	2.333	1.976	500	1166.67	988.06
16 x 24	15.5 x 23.5	2.667	2.266	500	1333.33	1132.81
20 x 9	19.5 x 9	1.250	1.028	500	625.00	513.89
20 x 12	19.5 x 11.5	1.667	1.349	500	833.33	674.48
20 x 13	19.5 x 12.75	1.806	1.510	500	902.78	754.77
20 x 16	19.5 x 15.5	2.222	1.863	500	1111.11	931.42
20 x 17	19.5 x 17	2.361	2.056	500	1180.56	1027.78
20 x 20	19.5 x 19.5	2.778	2.377	500	1388.89	1188.37
20 x 21	19.5 x 20.625	2.917	2.521	500	1458.33	1260.63
20 x 24	19.5 x 23.5	3.333	2.891	500	1666.67	1445.31
24 x 9	23.5 x 9	1.500	1.250	500	750.00	625.00
24 x 12	23.5 x 11.5	2.000	1.641	500	1000.00	820.31
24 x 13	23.5 x 12.75	2.167	1.836	500	1083.33	917.97
24 x 16	23.5 x 15.5	2.667	2.266	500	1333.33	1132.81
24 x 17	23.5 x 17	2.833	2.500	500	1416.67	1250.00
24 x 20	23.5 x 19.5	3.333	2.891	500	1666.67	1445.31
24 x 21	23.5 x 20.625	3.500	3.066	500	1750.00	1533.20
24 x 24	23.5 x 23.5	4.000	3.516	500	2000.00	1757.81

Note: This chart represents all Genesis Air PCP Standards. These Standards are the building blocks of the PCP Compound units. Using these, Genesis Air has 97 different sizes of compounds available for installations. For a complete list of available PCP Compounds, please contact your local Genesis Air sales representative.

For the PCP Compounds “XXXX-E”, the external ballast tray(s) are remotely located using 3’, 6’ or 10’ cords to power the lamps. Contact the factory if greater lengths are necessary.

Otherwise the “XXXX” model has the ballast mounted directly to the Standard panels inside the 3 3/16” spacer. See example below.



LAMPS

Genesis Air lamps do not produce ozone! The lamps provide a minimum intensity of 775 microwatts/cm² (5 milliwatts per square inch) at 10.77 centimeters (4.24”) to activate the catalyst effectively. To maintain tested performance, lamps may not be substituted with another manufacturer’s products. These lamps provide UV-C wavelengths @ 254 nm. All lamps must be replaced every 16 months (12000 hrs) to maintain intensity requirements. Genesis Air lamps contain trace amounts of mercury, encapsulated within the lamp and therefore reducing risk to the consumer or ecosphere.

LAMP SERVICE

ALL UNITS MUST BE POWERED DOWN BEFORE REPLACING LAMPS.
ALL MAINTENANCE PERSONNEL MUST WEAR UV PROTECTIVE SAFETY GLASSES. ALL EXPOSED SKIN MUST BE PROTECTED BY UV RESISTANT CLOTHING.

GENERAL

To operate effectively, the lamps must be replaced every 16 months, as the intensity of the lamps decreases over time. The catalyst must be energized by the lamps to create the field of hydroxyl radicals that is required to remove VOC’s and biologicals. Without the proper lamp output, VOC’s and biologicals will not be reduced!

INSPECTION

- **To inspect the lamps, the lamps must be powered. Wear UV resistant face shields and personal protective equipment!**
- On all units, inspect the green mounting sleeves (GreenSleeve) on the unit. If the lamps are lit, they will emit a bright green glow.
- If any lamp is unlit, power off the unit. Unplug the wiring harness from the lamp and plug the harness onto a lamp known to be operational. Power on the unit. If the new lamp does not light, the problem could be in the ballast. Keep in mind that the safety switch will not allow the lamps to light if the filter grille door is open. **THIS IS NOT CONSIDERED POWERING DOWN THE UNIT!** A pressure-kill box is an accessory that provides electricians with single point to wire to and two safety devices. One will kill power to the lamps when pressure drops below a setpoint, and the other kills power to the lamps when an access door is opened. A safety bypass, also included, will allow power to bypass the safeties to power the lamps for visual inspection.
- If the new lamp lights, the old lamp is faulty. Proceed to removal.

REMOVAL

- **Power the Genesis Air unit down using the kill switch or breaker to unit.**
- **Caution! The lamps may be hot! Wear gloves to protect hands.**
- Unplug the harness from the faulty lamp.
- Unscrew the GreenSleeve from the base of the unit and remove lamp with sleeve from the unit.

DISPOSAL

- In most states, UVGI lamps may be disposed of in the same manner as fluorescent lamps. While UVGI lamps contain a trace amount of mercury, the quantity is so minute that disposal is not yet regulated by federal standards (established by the EPA). Individual states and provinces may have established disposal standards. Please adhere to your local regulations.

INSTALLATION

- Installation is the reverse of removal.
- Push socket onto lamp pins until socket butts against lamp.

CATALYST

- **ALL UNITS MUST BE POWERED DOWN BEFORE SERVICING.**
- **ALL MAINTENANCE PERSONNEL MUST WEAR UV PROTECTIVE FACE SHIELDS. ALL EXPOSED SKIN MUST BE PROTECTED BY UV RESISTANT CLOTHING.**

GENERAL

Genesis Air recommends catalyst replacement every fifteen years to provide an efficient system. As debris and contaminants accumulate on the catalyst, the effectiveness of the catalyst is decreased. The catalyst must be inspected periodically for build up of particulate.

INSPECTION

- Power down the unit undergoing inspection.
- Locate the Genesis Air PCP Compound in question.
- Visually inspect each catalyst wearing UV protective clothing and face shields. If the catalyst appears clean and free of particulate, proceed to the next unit. If the catalyst cannot be seen, continue to next item.
- Remove some of the lamps. With a flashlight, visually inspect the catalyst through the holes.
- If the catalyst appears clean and free of particulate, replace lamps and proceed to the next AHU. Otherwise, proceed to removal.

REMOVAL

- **If the catalyst will be cleaned and reused, keep track of which unit the catalyst came from so they will be returned from where they were removed. This will prevent installation problems. Write or draw on the metal frames to help with installation.**
- Remove all lamps from the catalyst.
- Remove from the rack. You may need to contact the installer.

CLEANING

- If the catalyst needs cleaning, remove catalyst panel, then remove lamps. Proceed to a wash bay, mop sink or other washing area.

Objective	Location	Solution
Reduce contaminants before entering the AHU	1	<ul style="list-style-type: none"> • Example – fresh air intake located near heliport • Recommended for general IAQ to reduce TVOC and viable biologics entering unit • Ideal for Genesis Air PCP Compounds or 2008LB • Note: metal pre-filter required
Reduce contaminants leaving particular areas or offices from mixing into air stream	2	<ul style="list-style-type: none"> • Example – Funeral home body prep; coroner’s office; branch on common return with contamination problems (must have filter grille upstream) • Ideal for Genesis Air Compounds, 2008LB or 2008DT
Reduce contaminants entering unit in mixed air stream after filter bank	3	<ul style="list-style-type: none"> • Reduces viable biologics and particulate load • Ideal for Genesis Air Compounds • Renders captured contaminants non-viable • This placement is preferred when typical RH is 15% or more
Reduce risk of viable biohazards entering supply duct by prohibiting biologics and mold from accumulating on the cooling coil	4	<ul style="list-style-type: none"> • Example – Accessory filter section to bathe coils in UV-C light • Ideal for Genesis Air PCP Compounds • These units are a cost-effective solution if the end user is requesting UV-C lamps since PCP Compounds will reduce biolevels as well as prohibit buildup on surfaces • This location is preferred when typical upstream RH is below 15%
Lengthen HEPA life by reducing load of contaminate upstream of HEPA	5	<ul style="list-style-type: none"> • Reduces viable biologics and particulate load • Typical applications include clean rooms and operating suites • Ideal for Genesis Air PCP Compounds • Renders captured contaminants non-viable
Reduce contaminants before entering the supply distribution	6	<ul style="list-style-type: none"> • Ideal for Genesis Air PCP Compounds, 2008LB or 2008DT

HOW TO SIZE PCP COMPOUND UNITS

Use the Genesis Air PCP Compound Calculator (included on disc, or located on webpage) to determine size and number of panels in an AHU, RTU or ductwork. Input the required data and print out the configuration. “XXXX” Compounds are generally preferred over “XXXX-E” Compounds from an installation and maintenance standpoint, but keep in mind where the units are placed in the air handler (before or after heat coils) to maintain UL temperature integrity.

SPECIFICATION INSERT EXAMPLE AND AIR HANDLING UNIT SCHEDULE

2.7.3 Air Treatment System

System shall be a factory-fabricated and tested three-part integral assembly for treatment of air by: (1) particulate filtration using minimum MERV-13 rating per ASHRAE 52.1; (2) ultraviolet C-band germicidal irradiation (UVGI); and (3) photocatalytic oxidation (PCO). Particulate filters shall be located upstream of and adjacent to the UVGI lamps and PCO filters in the air handling unit's airstream. System shall be manufactured by Genesis Air, Inc., 5202 CR 7350 Ste D, Lubbock, Texas 79424, (806) 745-7000, or equal.

2.7.3.1 Particulate Filters

Units shall be classified according to requirements of UL 900, except high efficiency particulate air filters of 99.97 percent efficiency by the DOP Test method shall be as listed under the Label Service and shall meet the requirements of UL 586. Cartridge type particulate air filters shall be minimum 6 inches in depth, sectional, replaceable dry media type of the size indicated and shall have a MERV of 13 when tested according to ASHRAE 52.2. Initial resistance at 500 fpm shall not exceed 0.56 inches, water gauge. Filters shall be UL class 1. Media shall be pleated microglass paper media with corrugated aluminum separators, sealed inside the filter cell to form a totally rigid filter assembly. Fluctuations in filter face velocity or turbulent airflow will have no effect on filter integrity or performance. Each filter shall be installed with an extended surface pleated media panel filter as a prefilter in a factory preassembled side access housing, or a factory-made sectional frame bank, as indicated.

2.7.3.2 VOC/Biological Filters

VOC/biological filters shall be photocatalytic oxidation (PCO) type using a titanium dioxide (TiO₂) catalyst. PCO filters shall be comprised of pleated media panels in the air stream, with ultraviolet C-band lamps placed through the panels to ensure proper spacing for adequate photon activation. PCO shall be located in an accessory section adjacent downstream from the particulate filter section. Holding frames for 24x24 and 24x12 inch panels shall be provided by the PCO manufacturer. Ballasts for UVC lamps shall be located out of the airstream in recessed framing channels or on the exterior of the air handling unit in NEMA enclosures.

2.7.3.3 Controls

Ultraviolet lamp ballasts shall be monitored by current switch sensors located with the ballasts in the accessory section or associated NEMA enclosure of the air handling unit that provide a signal to the Owner's EMCS. Access doors shall be monitored by pressure sensitive micro-switches that shall de-energize the UV lamps when the door is not fully closed, and shall provide an alarm signal to the Owner's EMCS.

PLAN MARK	DEPOSITION	ZONE	SINGLE-DUCT VAV AIR HANDLING UNIT SCHEDULE														AIR TREATMENT SYSTEM DATA											
			DESIGN				PRESSURE				FLOW				FILTER				PARTICULATE FILTER					VOC/BIOLOGICAL FILTER				
			AIR FLOW (CFM)	SUPPLY AIR (CFM)	CFP (IN W.G.)	BASE FPM	BASE (CFM)	MAX/FPM/WT	PRESS-ABS (IN W.G.)	PRESS-STAT (IN W.G.)	PRESS-DEL (IN W.G.)	PRESS-RET (IN W.G.)	PRESS-TOT (IN W.G.)	FLOW (CFM)	FLOW (CFM)	FLOW (CFM)	FLOW (CFM)	TYPE	RESISTANCE (IN W.G.)	FACE AREA (SQ. FT.)	DEPTH (IN W.G.)	TYPE	TREATMENT METHOD	PROPAN SOURCE	F.L. (IN W.G.)			
AHU-1	BUILDING EXTERIOR	WEST	12600	4300	2.50	1870	18.70	30	480/2/NO	0.30	76	55	589.1	111.1	101.2	44	56	101.3	CARBON	MERV 13	0.50	1.40	PANEL	PHOTOCATALYTIC DEGRADATION	UVC	0.10		
AHU-2	BUILDING EXTERIOR	CENTRAL	14700	1800	2.50	1554	17.20	30	480/2/NO	0.30	76	55	272.7	484.4	82.4	44	56	101.3	CARBON	MERV 13	0.50	1.40	PANEL	PHOTOCATALYTIC DEGRADATION	UVC	0.10		
AHU-3	BUILDING EXTERIOR	EAST	13600	3300	2.50	1491	14.31	30	480/2/NO	0.30	76	55	263.0	368.4	96.1	44	56	101.3	CARBON	MERV 13	0.50	1.40	PANEL	PHOTOCATALYTIC DEGRADATION	UVC	0.10		

GENESIS AIR QUICK REFERENCE

	2008DT-FP	2008DT	2008B	2008LB	2006D&L	2008GS	2008RGS	2008 PCP XXXX Compound	2008 PCP XXXX-E Compound	2008CU
Small spaces	x	x			x		x	x	x	x
Medium spaces	x	x		x		x	x	x	x	x
Large spaces			x	x		x		x	x	
Fan-powered	x		x		x	x	x			
Multiple panels standard					x	x				
Multiple panels optional			x	x				x	x	

Located in:

AHU/RTU								x	x	
Returns		x		x				x	x	x
Supplies		x		x				x	x	x
Trunk lines				x				x	x	
Stand-alone units	x		x		x	x	x			

CONTACT INFORMATION

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