

Technical Information

Installation, Operation, and Maintenance Manual

Parker Balston® Zero Air Generators HPZA-3500, HPZA-7000, HPZA-18000, HPZA-30000

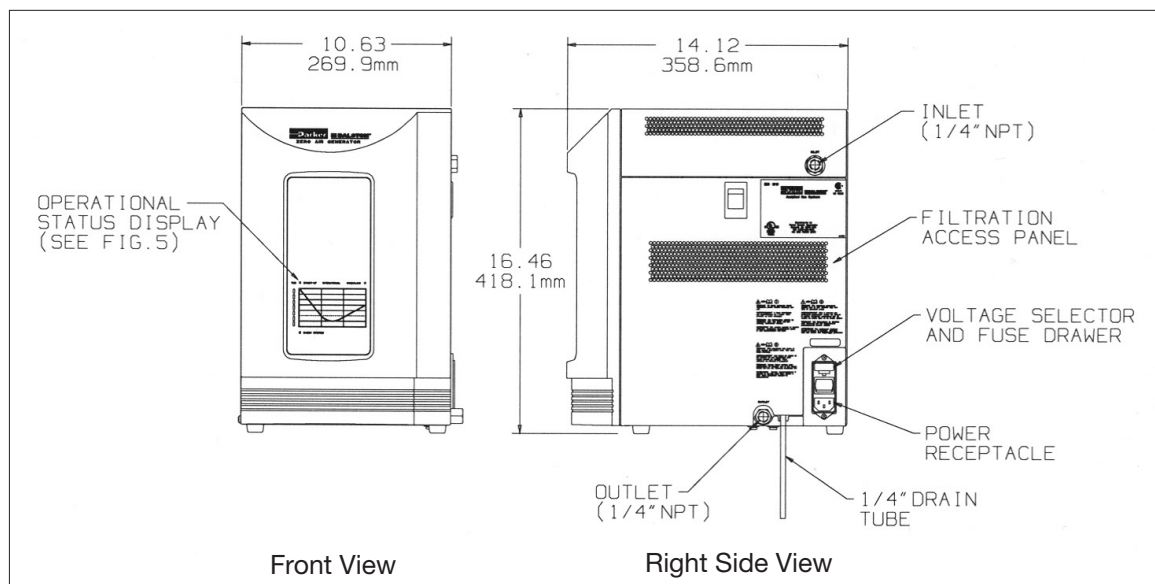


Figure 1 - Parker Balston Zero Air Generators

These instructions must be thoroughly read and understood before installing and operating this product. Failure to operate this product in accordance with these instructions could present a safety hazard to the user and will void the safety certification of the product. Modification of the unit will result in voiding the warranty. If you have any questions or concerns, please call the Technical Services Department at 800-343-4048, 8AM to 5PM Eastern Time or email at balstontechsupport@parker.com (North America only). For other locations, please contact your local representative.

Please save product packaging for future use.

General Description

The Parker Balston HPZA Series Zero Air Generators (Figure 1) are completely engineered systems which replace the use of inconvenient high pressure gas cylinders as a source of hydrocarbon-free air. The HPZA-30000 generators purify on-site compressed air to a total hydrocarbon level of less than 0.1 ppm (measured as methane). The HPZA-3500, HPZA-7000, and HPZA-18000 generators purify on-site compressed air to a total hydrocarbon level less than (or equal to) 0.05 ppm, when operated at or below the unit's maximum flow rate. Zero-grade air from a Parker Balston Zero Air Generator may be used as a source of fuel air for Flame Ionization Detectors (FID's) or as a zero reference for any instrument which measures hydrocarbon concentration.

The Parker Balston Zero Air Generators have been certified to the electrical safety requirements as specified by the IEC, CSA and UL standards. These units bear both the CSA and UL markings on the product label. Product supplied to EC carry the CE mark (220/230/240 VAC units only) and comply to EMC standards.

Engineered System

The Parker Balston Zero Air Generator is comprised of four functional component groups: prefiltration, hydrocarbon removal, cooling, and final filtration (see Figure 2).

The Parker Balston Zero Air Generator is equipped with an operational status LED display (Figure 5) on the front panel to show hydrocarbon concentration as a function of time and flow rate. A "Check System" light and an "Overflow" light have been included to alert the operator to any operational situations which require attention.

Bulletin TI-HPZA-3500H

Prefiltration

Two stages of high efficiency coalescing prefiltration are incorporated into the Parker Balston Zero Air Generator to protect the catalyst bed from potential oil and particulate contamination. The pre-filters are located on the right side of the unit, behind the removable filtration access panel. They remove liquids and particulate matter, from the incoming air supply, to 0.01 micron. These filters are equipped with float drains which automatically open to empty any liquids from inside the filter housing. The drains are connected to 1/4" O.D. plastic tubing which discharges to atmosphere on the right side of the generator (see Figure 1).

Hydrocarbon Removal

The catalyst module is a stainless steel vessel filled with catalyst and assembled with a cartridge heater and controller. During operation, hydrocarbons are oxidized into carbon dioxide and water vapor. The heater controller operates the catalyst bed at the required temperature for optimal oxidation. If the heater should fault during operation, the red "Check System" light will be illuminated.

Cooling

The Parker Balston Zero Air Generator is equipped with a coiled copper aftercooler and fan (except model HPZA-3500) to cool the hot outlet air from the hydrocarbon removal module.

Final Filtration

The final filter on the Parker Balston Zero Air Generator is a Parker Balston Grade GS membrane filter which removes particulate contamination to 0.01 micron (absolute).

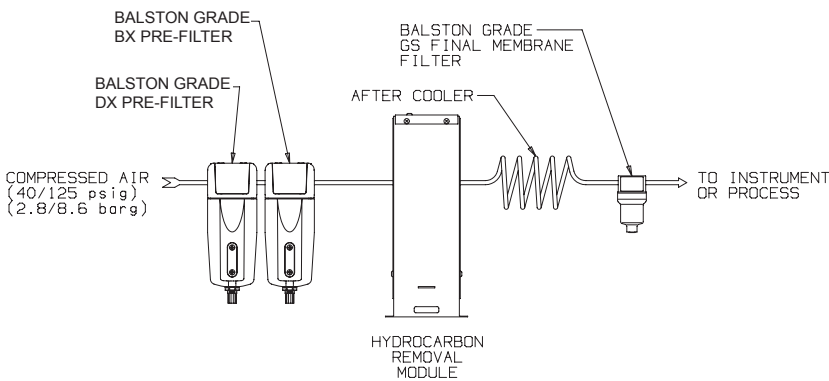


Figure 2 - Flow Schematic

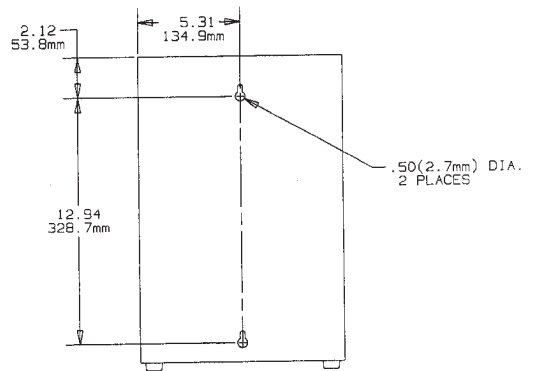


Figure 3 - Mounting Dimensions

Installation

All installation procedures for Parker Balston Zero Air Generators should be performed by suitable personnel using reasonable care. See Figure 4 for Recommended Installation Schematic.

General

The Parker Balston Zero Air Generator is a free-standing benchtop or wall mountable unit. When mounting the generator on the wall, use mounting hardware which is adequately sized to support the weight of the generator. The generator should be mounted to the wall (or similar mounting surface) in a vertical position according to National Electrical Code (NEC) and local building code guidelines. The mounting dimensions are shown in Figure 3.

A shut-off valve and a pressure regulator should be installed directly upstream from the Parker Balston Zero Air Generator. The shut-off valve isolates the unit from the air line for maintenance and troubleshooting tasks. The pressure regulator controls the inlet air pressure and should be set to maintain a constant pressure between 40 psig and 125 psig (2.8 barg and 8.6 barg). Maintaining a constant inlet air pressure will minimize any system pressure fluctuations. Parker Balston offers a pressure regulator, complete with a pressure gauge, as an accessory (P/N 72-130-V883).

Location

The Parker Balston Zero Air Generator should be installed in an area relatively free from excessive dust and dirt, where the ambient temperature is between 60°F and 100°F (16°C and 43°C). **Do not install the generator outdoors.** There is no limit to the distance between the generator and the point of use as long as tubing type, size, cleanliness, and pressure drop are taken into consideration. Approximately 6" of space should be allowed along the top and sides of the generator to ensure proper ventilation.

Utilities

Compressed Air - The Parker Balston Zero Air Generator requires a source of clean, dry compressed air (40 psig-125 psig/2.8 barg-8.6 barg) for optimal operation. The air should be as close to instrument quality as possible and supplied at a flow rate and pressure above those required at the point of use. The temperature and/or dewpoint of the supply air should be at room temperature (or lower), and the air should be relatively free of compressor oil, hydrocarbons, and particulate matter. Contamination of the catalyst bed may occur if it is exposed to certain compounds (warning below). To prevent premature contamination of the catalyst module, the inlet to the compressed air supply compressor should be vented outdoors.



Chlorinated hydrocarbon compounds and chlorofluorocarbons (or freons) will permanently contaminate the hydrocarbon catalyst module in the Zero Air Generator. Extreme care should be taken when specifying an air supply for the generator to ensure that these compounds are not present in the air supply nor likely to get into the compressor providing air to the generator.

The hydrocarbon catalyst module can also be contaminated by high concentrations of lead, sulfur, or phosphorous compounds, heavy metals, and long chain polymers. Care should be taken to avoid introducing these compounds into the Zero Air Generator. Specifically, assure that none of these compounds are stored near the inlet to the compressor supplying the system with compressed air. The intake for the compressor should be vented to the outdoors.

If the compressed air supply source is subject to halogenated hydrocarbon exposure, an auxiliary activated carbon scrubber (P/N 76080) should be installed directly upstream from the generator.

Connect the compressed air supply to the 1/4" NPT (female) inlet port on the right side of the generator (see Figure 1).

Power - The Parker Balston Zero Air Generator may be operated by a 120 VAC, 220 VAC, 230 VAC, or 240 VAC, 50/60 Hz power supply. **Main supply voltage fluctuations must be within $\pm 10\%$ of the nominal main supply voltage.** The generator is shipped with a tag at the power receptacle which specifies the factory setting of the voltage selector. For optimal performance of the generator, the operator should set the voltage selector to match the local power supply. To change the setting on the voltage selector, simply remove the selector/fuse drawer from the receptacle using a small screwdriver, turn the selector so the desired voltage shows in the window, and reassemble. To connect the generator to the power supply, simply plug the female end of the electrical cord into the receptacle on the right side of the generator, and the opposite end into a three-pronged earthed power receptacle. **Parker does not recommend the use of a ground fault circuit interruptor with this unit.**



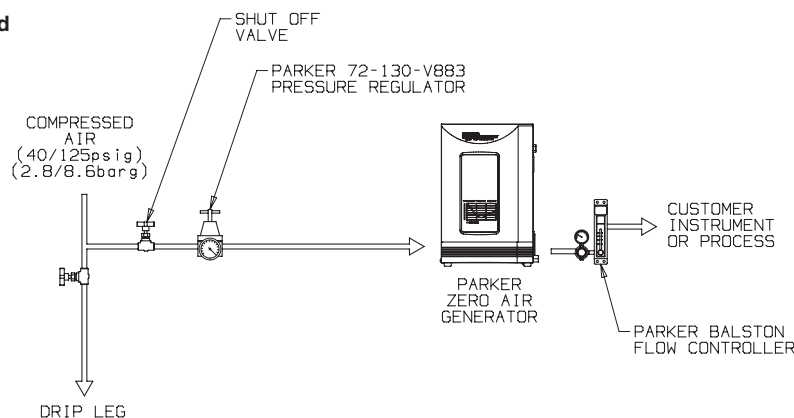
Before plugging power cord into power receptacle, check the voltage selector setting. The voltage setting must match the local power supply voltage. (Note: "NA" versions of the generator are designed for 120 VAC operation only.)

Piping Components - The inlet and outlet ports for the Parker Balston Zero Air Generator are 1/4" NPT (female) and located on right side of the unit. Inlet tubing and fittings should be clean and rated for 125 psig (8.6 barg), minimally. The tubing and fittings used downstream from the Zero Air Generator should be clean stainless steel or pre-cleaned refrigeration-grade copper (1/4" O.D. x .030" wall) and rated for 125 psig (8.6 barg). **Do not use plastic tubing downstream from the generator.** Outgassing from plastic may contaminate the zero-grade air. Use only PTFE tape on all inlet and outlet NPT fittings. (Thread sealing compounds may contaminate the zero air.)

If pre-cleaned copper tubing is unavailable, standard copper tubing may be cleaned by the customer. First, connect the tubing to a supply of clean inert gas (N_2 , He). Next, initiate the gas flow through the tubing (5-10 cc/min.). Finally, heat the tubing with a propane torch, moving the flame at a rate of approximately 1/2 in./sec. in the direction of flow. This procedure removes waxes and oils used in the manufacture of copper tubing.

Note: The use of plastic piping components or copper piping components which are not refrigeration grade will result in the Zero Air Generator failing to meet purity specifications.

Figure 4 - Recommended Installation



Drain Lines - The 1/4" diameter plastic drain line on the right side of the generator (behind the filtration access panel) should be piped away to an appropriate disposal container. The liquid in this drainage will consist of water and compressor oil which should be disposed of properly.

Recommended Accessories

Pressure Regulator - To control the supply air pressure to the Zero Air Generator, a pressure regulator is needed. The **72-130-V883 Pressure Regulator** is a pressure regulator with 1/2" NPT inlet and outlet ports, assembled with a pressure gauge. For more information, please contact your local representative and request the Gas Management Supplies Catalog.

Flow Controller - If the output capacity of the Zero Air Generator is exceeded, the hydrocarbon content of the emergent gas may not meet specified levels. To ensure zero air purity, install a flow controller designed for high purity applications downstream from the generator (if one is not integral to the GC design). The **Parker Balston W-FM Flow Controllers** provide accurate flow rate control of the zero air stream. To determine which flow controller best meets the needs of the application, please contact your local representative and request the Gas Management Supplies Catalog.

76080 Halogenated Hydrocarbon Scrubber - If the compressed air supply to the generator is subject to contamination from halogenated hydrocarbons, install a halogenated hydrocarbon scrubber directly upstream from the generator. Exposure of the generator to halogenated hydrocarbons will damage the catalyst module and void the warranty. For additional information, request the Analytical Gas Supplies catalog from your local representative.

Operation

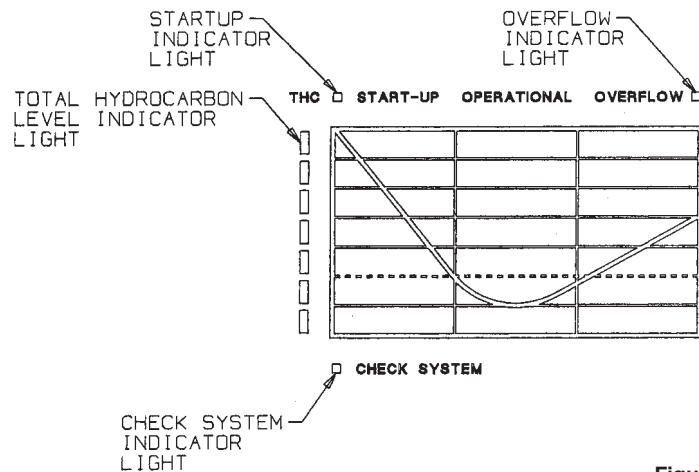


Figure 5 - Front Panel Display

Start-up

Open the inlet compressed air supply valve (customer supplied, see Installation section) and adjust the inlet pressure to be between 40 psig and 125 psig (2.8 barg and 8.6 barg) using a (customer installed) pressure regulator. Adjust the outlet flow using a (customer installed) flow controller. Set the flow to the required flow rate for the instrument or application (see Specifications section at the end of this bulletin for generator flow capacities). **Check delivery system for leaks.** Finally, turn the generator on using the power switch on the right side of the unit.

During the 45 minute warm-up, the yellow "Start-Up" LED will remain illuminated, and the yellow "THC" LEDs will illuminate sequentially until the generator reaches the specified hydrocarbon removal level. After the warm-up period, the green "THC" LEDs will illuminate, showing a hydrocarbon level of <0.1 ppm. At this point, the Parker Balston Zero Air Generator is ready to be brought on line and supply zero-grade air to downstream analytical equipment.

Note: If the "Start Up" LED goes dark, and the green "THC" LEDs do not illuminate, the yellow "Overflow" LED will illuminate. This indicates a downstream zero air demand which exceeds the capacity of the generator. Please see the Troubleshooting section at the end of this bulletin.

Operation

The Parker Balston Zero Air Generator is designed to operate continuously, 24 hours per day, as long as the compressed air or power supply is not interrupted. The LED indicator lights on the front panel of the Parker Balston Zero Air Generator give the operator instantaneous feedback regarding

system function. The “Start-Up” (yellow) and “THC” (yellow and green) LEDs show system operational status; the “Overflow” (yellow) and “Check System” (red) LEDs show the need for operator attention or system maintenance.

During normal operation, the display on the Parker Balston Zero Air Generator will have the green “THC” LED illuminated. If the “Overflow” LED, “Start-Up” LED, “Check System” LED, or yellow “THC” LEDs illuminate during routine operation, please consult the Troubleshooting Guide at the end of this bulletin.

The “Check System” LED will blink occasionally during normal operation. The blink rate will increase as the system approaches 3 years of operation. At that time, the catalyst module should be replaced.

If the “Check System” LED is solid red, please consult troubleshooting guide on page 7.

To prevent excess demand on the Parker Balston Zero Air Generator, use a flow control device downstream from the unit. If the flow capacity of the generator is exceeded, the “Overflow” LED and a yellow “THC” LED will illuminate, indicating that hydrocarbon content exceeds 0.1ppm .

Note: To ensure hydrocarbon content of less than 0.05 ppm (Models HPZA-3500, HPZA-7000, and HPZA-18000), a flow control device must be installed downstream from the generator to prevent downstream demand in excess of the generator’s maximum flow rate.

Shutdown

To shut down the Parker Balston Zero Air Generator, simply turn the power switch to the off position and turn off the compressed air supply to the generator.

Maintenance



All maintenance procedures for Parker Balston Zero Air Generators should be performed by suitable personnel using reasonable care.

Prior to servicing the Parker Balston Zero Air Generator, turn off the compressed air and power supplies to the generator, and ensure that the system is depressurized.

To ensure consistent product performance and reliability use only genuine Balston replacement parts and filter cartridges.

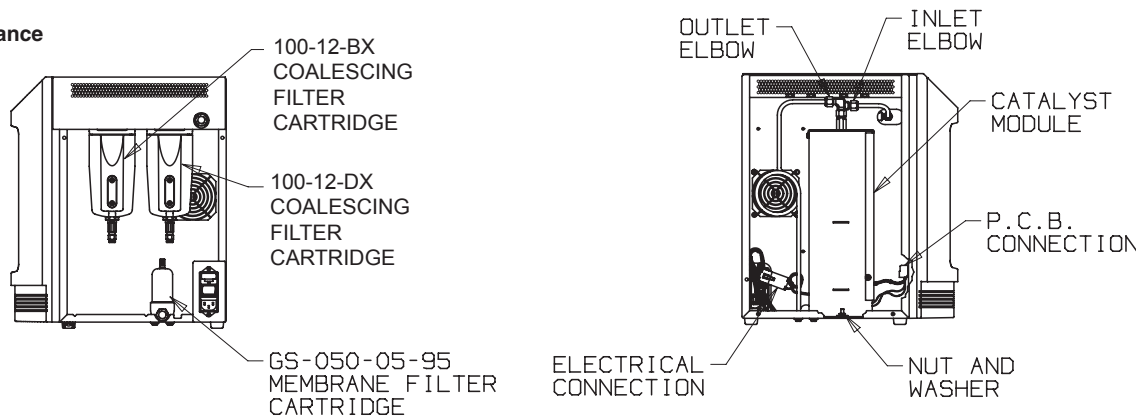
The primary maintenance tasks required by the Parker Balston Zero Air Generator are changing the prefilter cartridges (annually), replacing the final membrane filter cartridge (annually), and replacing the catalyst module (when the “Check System” LED illuminates or blinks). A summary of the replacement part numbers and recommended service frequency is shown at the end of this Maintenance section. See Figure 6 for the locations of the various maintenance items.

Replacement prefilter cartridges, final filter replacement cartridges, and catalyst modules may be ordered through a local representative. For convenience, a one year supply of these replacement cartridges has been assembled into a maintenance kit (P/N MK7840). The kit contains one first stage coalescing prefilter cartridge (P/N 100-12-DX), one second stage coalescing filter cartridge (P/N 100-12-BX), and one Grade GS final membrane filter (P/N GS-050-05-95).



If necessary, the Zero Air Generator may be wiped clean with a dry cloth on an as needed basis. Do not use water, aerosols, or other cleaning agents to clean the units. Use of any liquid detergent to clean the generator could present an electrical hazard.

Figure 6 - Maintenance Items



**Filter
Cartridge
Replacement**

The Grade DX and Grade BX prefilters integral to the Parker Balston Zero Air Generator are located on the right side of the generator, behind the removable panel (see Figure 6). The filter cartridges inside the prefilter housings should be changed on an annual basis to maintain efficient operation of the system. The filter cartridges housed in the prefilters are removed by unscrewing the collar from the head of the filter assembly, lowering the bowl of the assembly, and removing the element retainer disc at the base of the cartridge. Insert the new filter cartridges (100-12-DX and 100-12-BX), and re-assemble in reverse order. (**Note:** The filter housings are labeled for Grade DX and Grade BX filter cartridges. Please install replacement cartridges in the correct housing.)

The final membrane filter in the Parker Balston Zero Air Generator is also easily accessible from the right side of the unit. The membrane filter should also be changed each year, or as needed to maintain flow and minimize pressure drop. The membrane filter cartridge is removed by unscrewing the filter bowl from the filter head and sliding the spent cartridge off the support core. Replace the GS membrane cartridge (GS-050-05-95) and re-assemble.

The time required to service all three stages of filtration integral to the Parker Balston Zero Air Generator is approximately 15 minutes.

**Catalyst
Module
Maintenance**

To prevent electrical shock, disconnect the generator from the power supply prior to servicing the catalyst module.

Allow unit to cool for at least 2 hours before removing the cover to service the catalyst module.

The catalyst module in the Parker Balston Zero Air Generator should be changed (when the "Check System" LED is illuminated or blinking) to maintain the hydrocarbon removal specification for the unit. Contact the local representative for ordering information and pricing for a replacement catalyst module.

The tools required to change the catalyst module are: a Phillips head screwdriver, an 11/32 nut driver, and two 7/16" or adjustable wrenches. The procedure for replacing the catalyst module is as follows (see Figure 6 for component locations):

- 1 Switch off the power to the unit, unplug from the power receptacle, close the (customer installed) inlet air valve, and allow the unit to cool (2 hours, minimum) and depressurize.
- 2 Remove the cover from the Zero Air Generator.
- 3 Using two wrenches (one as an anchor), disconnect the module inlet and outlet fittings at the elbow. **Leave both elbows on the module** (see Figure 6).
- 4 Remove the washer and kep nut (11/32) at the base of the module.
- 5 Remove the spent module from the Zero Air Generator and disconnect the electrical connector and the PCB connector (see Figure 6).
- 6 Re-connect the replacement catalyst module by reversing the removal procedure. Hand tighten nuts on to ferrules and finish tightening with a wrench 1-1/2 turns for a tight seal. Prior to turning the zero air generator on, check for leaks by opening the compressed air supply to the unit. Use a soap or leak detecting solution to check the integrity of the piping and fittings.
- 7 Replace cover, without capturing any electrical wiring, and commence operation as detailed in the Start-Up section of this manual. The "Check System" indicator light on the front of the generator will flash for 2 to 3 minutes after start-up, until the circuit board and the catalyst module have been initialized. After the initialization period, the generator will commence operation from the warm-up stage. (**Note:** if the "Check System" indicator light continues to blink after 5 to 10 minutes, please contact the factory.)

Fuse Replacement



Occasionally, one or both of the fuses in the Zero Air Generator may burn out. The fuses are located in the power receptacle on the left hand side of the generator. **Before servicing the fuses, turn the generator off and disconnect the power cord from both the power supply and the generator power receptacle.**



To access the fuses, use a small screwdriver to remove the fuse holder located in the power receptacle of the generator. In the Zero Air Generator, both the phase and neutral are fused separately. As a result of this configuration, both fuses should be checked any time fuse replacement is warranted. Replace either one or both fuses as necessary and re-assemble. **To maintain the safety and performance integrity of the product, use only fuses of the size and type detailed in the specifications section of this bulletin.**



Ordering Information

Zero Air Generator	HPZA-3500	HPZA-7000	HPZA-18000	HPZA-30000
Replacement Prefilter, first stage	100-12-DX	100-12-DX	100-12-DX	100-12-DX
Replacement Prefilter, second stage	100-12-BX	100-12-BX	100-12-BX	100-12-BX
Replacement Final Filter	GS-050-05-95	GS-050-05-95	GS-050-05-95	GS-050-05-95
Replacement Catalyst Module	76810	76820	76811	76821
Maintenance Kit (1 yr)	MK7840	MK7840	MK7840	MK7840
Fuse (120 VAC)	13192	13192	13215	13215
Fuse (220 VAC)	13191	13191	13192	13192

Note: To ensure consistent product performance and reliability, use only genuine Balston replacement parts and filter cartridges.

Troubleshooting



All troubleshooting and service activities should be performed by suitable personnel using reasonable care.

Symptom	Course of Action
No Flow From Generator	Check drains on prefilters <ul style="list-style-type: none"> - Remove drain tubing and hold finger over drain opening to allow pressure to build within housing. - Close (customer installed) inlet air valve and depressurize generator. Re-open valve. - Remove bowl from filter and rinse with warm water. - Replace automatic drain, P/N 21552. Unplug generator, remove cover, and check for internal leaks.
Low Pressure At Outlet	Check inlet pressure. Pressure drop up to 4 psid (0.3 bar) is normal. Minimum inlet pressure is 40 psig (2.8 barg). Check flow demand and "Overflow" LED. Flow demands in excess of capacity may cause high pressure drop through generator. Check generator for leaks.
"Overflow" LED illuminated/ Yellow THC LEDs illuminated	Check downstream flow demand. If flow capacity of generator is exceeded, "Overflow" LED and yellow "THC" LEDs will illuminate. An excessive pressure drop (greater than 4 psig/0.3 bar) may accompany an overflow situation. If demand exceeds capacity, install a flow controller downstream from the generator.
No Power	Check power switch to ensure generator is turned on. Check that the generator cord is firmly connected to the wall receptacle and the power receptacle on the unit. Check the generator fuses <ul style="list-style-type: none"> - Unplug generator cord from wall and generator receptacle. - Using a small screwdriver, open the fuse drawer and check the fuses. - Change fuse if necessary Warning: for continued protection against risk of fire, replace only with fuse of specified rating. Check that voltage selector reading matches local electrical supply.
"Check System" LED Illuminated (solid)	Turn generator off and check all electrical connections inside. Re-start generator.
"Check System" LED blinking	Replace hydrocarbon removal module. Call local representative to order replacement module and request Return frequently Authorization for spent module.



If you have followed the above procedures and are still having trouble, please call Technical Support at 1-800-343-4048 or email at balstontechsupport@parker.com. (For other locations, please contact your local representative. Please have the serial number available.

Optional Accessories

Model Number	Description
W-405-4032-000	Pressure Regulator
W-FM Series	Flow Controllers
76080	Halogenated Hydrocarbon Scrubber

System Specifications

	HPZA-3500	HPZA-7000	HPZA-18000	HPZA-30000
Max flow rate	3.5 lpm	7 lpm	18 lpm	30 lpm
CSA Certification Standard	CAN/CSA 22.2 No. 1010.1-92			<input type="checkbox"/>
IEC Safety Standard	IEC 1010-1: 1990 + A1 1992 + A2: 1995 / EN 61010-1: 1993			<input type="checkbox"/>
UL Safety Standard	UL 3101-1, First edition			<input type="checkbox"/>
	UL listed to U.S. and Canadian Safety Standards			<input type="checkbox"/>
Total hydrocarbon content	<0.05 ppm	<0.05 ppm	<0.05 ppm	<0.1 ppm
Min/Max inlet pressure	40 psig/125 psig 2.8 barg / 8.6 barg	40 psig/125 psig 2.8 barg / 8.6 barg	40 psig/125 psig 2.8 barg / 8.6 barg	40 psig/125 psig 2.8 barg / 8.6 barg
Min/Max ambient temperature	60°F (16°C)/100°F (38°C)	60°F (16°C)/100°F (38°C)	60°F (16°C)/100°F (38°C)	60°F (16°C)/100°F (38°C)
Max relative humidity	80%	80%	80%	80%
Max inlet hydrocarbon content	100 ppm	100 ppm	100 ppm	100 ppm
Pressure drop at max flow rate	4 psid (0.3 bar)	4 psid (0.3 bar)	4 psid (0.3 bar)	4 psid (0.3 bar)
Start-up time	45 min.	45 min.	45 min.	45 min.
Electrical requirements	120 VAC, 220 VAC, 230 VAC, 240 VAC, ±10% nominal, 50/60 Hz models available. See product label on generator for specifications.			
Current rating	1.0 amp at 220 VAC, 2.0 amp at 120 VAC		2.0 amp at 220 VAC, 4.0 amp at 120 VAC	
Shipping weight	41 lbs. (19 kg)	41 lbs. (19 kg)	41 lbs. (19 kg)	41 lbs. (19 kg)
Physical dimensions	11" w x 13" d x 16" h 27 cm x 34 cm x 42 cm	11" w x 13" d x 16" h 27 cm x 34 cm x 42 cm	11" w x 13" d x 16" h 27 cm x 34 cm x 42 cm	11" w x 13" d x 16" h 27 cm x 34 cm x 42 cm
Altitude	2000 m	2000 m	2000 m	2000 m
Fuse Type	Type T, 250 V, 1.0 amp at 220 VAC, 2.0 amp at 120 VAC		Type T, 250 V, 2.0 amp at 220 VAC, 4.0 amp at 120 VAC	

Don't Forget To:

- 1 To Activate your warranty go to <http://www.labgasgenerators.com/warrantyregistrations>
- 2 Keep your product certification in a safe place.
- 3 Call the Technical Services Department at **800-343-4048**, 8AM to 5PM Eastern Time with any questions, or email at balstontechsupport@parker.com. For other locations, please contact your local representative.

Serial Numbers

The serial number label for the unit is located behind the filter access panel, near the power receptacle. For your own records, and in case service is required, please record the following:

DATE IN SERVICE _____ SERIAL NO. _____

Please have the serial number available when calling for assistance.

WARRANTY (NORTH AMERICA ONLY)

(FOR INFORMATION CONTACT YOUR LOCAL REPRESENTATIVE)

Parker Hannifin guarantees to the original purchaser of this product, that if the product fails or is defective within 12 months from the date of purchase, when this product is operated and maintained according to the instructions provided with the product, then Parker guarantees, at Parker's option, to replace the product, repair the product, or refund the original price for the product. This warranty applies only to defects in material or workmanship and does not cover: ring and valve wear on compressors, routine maintenance recommended by the instructions provided with this product, or filter cartridges. Any modification of the product without written approval from Parker will result in voiding this warranty. Complete details of the warranty are available on request. This warranty applies to units purchased and operated in North America.

Symbol

Description



Caution, refer to accompanying documents for explanation.



Refer to warning note referenced for explanation.



Caution, risk of electric shock.

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