

Parker Zero Air Generator Model 76-98 N200



Figure 1 - 76-98 N200 Zero Air Generator

These instructions must be thoroughly read and understood before installing and operating this product. If you have any questions or concerns, please call the Technical Services Department at 800-343-4048 from 8AM to 5PM Eastern Standard Time (North America only).

Please save product packaging for future use.

Component Description

General Description

The Parker 76-98 N200 Zero Air Generator is a completely engineered system which replaces the use of inconvenient high pressure gas cylinders as a source of hydrocarbon-free air. The generator purifies on-site compressed air to a total hydrocarbon level less than or equal to 0.05 ppm when operated at a flow rate of 10 SCFM. The zero grade air may be used as a source of fuel air for Flame Ionization Detectors (FID's) or as a zero reference for any instrument that measures hydrocarbon concentration.

Engineered System

The 76-98 N200 is composed of four functional component groups: prefiltration, hydrocarbon removal, cooling, and final filtration.

Prefiltration

Two high efficiency coalescing filters remove water, oil and particulate contamination from the compressed air supply. The filters are equipped with automatic float drains to eliminate any liquids that have accumulated in the filter housings.

Hydrocarbon Removal

An oxidation catalyst is used to convert hydrocarbons (including methane) into carbon dioxide and water. The catalyst is housed in a temperature-controlled assembly that optimizes oxidation and removes hydrocarbons from the compressed air, to less than 0.05 ppm. The minimum effective life of the catalyst module is three years.

Cooling

The generator is equipped with a heat exchanger, a coiled copper after-cooler, and a fan to cool the air exiting each catalyst tower.

Final Filtration	The final filter on the 76-98 N200 is a Balston Grade BX filter that remove particulate contamination to 0.01 µm. This final filter insures that the outlet air is virtually particle-free.
Controls/Diagnostics	<p>The generator is equipped with three LEDs located on the front panel to monitor the operational status of the unit. It is also equipped with two pressure gauges to monitor the inlet and outlet pressure.</p> <p>Start-up - The “Ready” light blinks during the 3-hour start-up period. At the beginning of the 3 hour start-up period, the catalyst heater temperature will be below its setpoint; therefore, the yellow “Service System” lights will be illuminated and the alarms will sound.</p> <p>Ready - The “Ready” light stays illuminated constantly after completion of the 3-hour start-up. The outlet flow rate must not exceed 10 SCFM to ensure a hydrocarbon concentration _____ < 0.05 ppm.</p> <p>Service System 1 - The “Service” light (yellow) illuminates and an alarm will sound if there is a temperature fault in the left catalyst tower. The “Service” light will blink and an alarm will sound if the pressure drop across the catalyst tower exceeds 3 psig.</p> <p>Service System 2 - The “Service” light (yellow) illuminates and an alarm will sound if there is a temperature fault in the right catalyst tower. The “Service” light will blink and an alarm will sound if the pressure drop across the catalyst tower exceeds 3 psig.</p>

Installation

NOTE: All installation, operation and maintenance activities for the 76-98 N200 Generator should be performed by suitable personnel using reasonable care.

General	The generator is strapped to a skid. Cut the shipping straps with a pair of shears. Be careful not to damage the generator. Lift the cardboard wrapper over the generator and remove the foam corners. Remove the board from the back of the skid to use as a ramp. Push the generator off the skid.
Location	<p>Install the generator in a clean, well-ventilated area. A minimum clearance distance of 18 inches on each side and on the top of the unit is required to provide adequate ventilation for the generator. The generator should be located in an area where the ambient temperature is between 60°F and 90°F (16°C and 32°C) to ensure optimal operation. Do not install the unit outdoors.</p> <p>There is no limitation on the distance between the generator and the analyzer it is supplying as long as the tubing size, cleanliness and pressure drop are taken into account.</p> <p>The 76-98 N200 requires a source of clean, dry compressed air for optimal operation. The</p>

Compressed Air

dew point of the compressed air should be 60°F (15°C) or less and at a pressure between 75 psig and 100 psig (5.2 barg and 6.9 barg). The compressor must be able to supply a flow rate of 10 SCFM. The outside diameter of the air supply line should be 3/8" to minimize pressure drop along the line to the generator.

The 76-98 N200 will be damaged by a variety of solvents and elements stored or used near the compressor inlet. Chlorinated solvents and chloro-fluorocarbons will damage components downstream from the catalyst module, as will high levels of NO_x and SO₂. High concentrations of sulfur, lead, phosphorous, and other heavy metals will contaminate the catalyst.

Recommended Piping

The 3/8" female NPT inlet and outlet ports are located on the right side of the generator (see Figure 1). Inlet tubing and fittings should be clean and rated for 125 psig minimally. A manual shut-off valve and pressure regulator should be installed directly upstream from the generator inlet port. The valve can be used for isolating the compressed air from the generator during routine maintenance or troubleshooting activities. The pressure regulator is needed to ensure that the inlet air pressure is constant and regulated to between 75 psig and 100 psig (5.2 barg and 6.9 barg).

The outlet tubing downstream from the generator should be clean stainless steel or pre-cleaned refrigeration-grade copper tubing, and rated for a minimum of 125 psig (8.6 barg). Do not use plastic or rubber tubing downstream from the generator. These materials may out-gas and can re-contaminate the zero air stream. Use PTFE tape on all NPT fittings. Thread-sealing compounds will contaminate the zero air stream.

If pre-cleaned copper tubing is not available, standard copper tubing may be used if properly cleaned. To clean the tubing, connect one end to a clean inert gas supply such as N₂ or He. Flow the gas through the tubing for approximately 10 minutes. While the inert gas is still flowing through the tube, heat the external portion of the tube using a propane torch. Hold the torch approximately 4 inches from the tubing and move it at the slow rate of about 1/2" per second following the same direction as the gas flow. This procedure removes waxes and oils used in the manufacturing of the tubing.

The drain port is located on the bottom of the generator's chassis. The 1/4" diameter plastic drain line attached to the compressed air prefilter assembly is coiled inside the generator. Remove the left side panel and push the drain line through the drain port (Figure 2). Pipe the drain line to a container appropriate for water and trace compressor oil disposal.

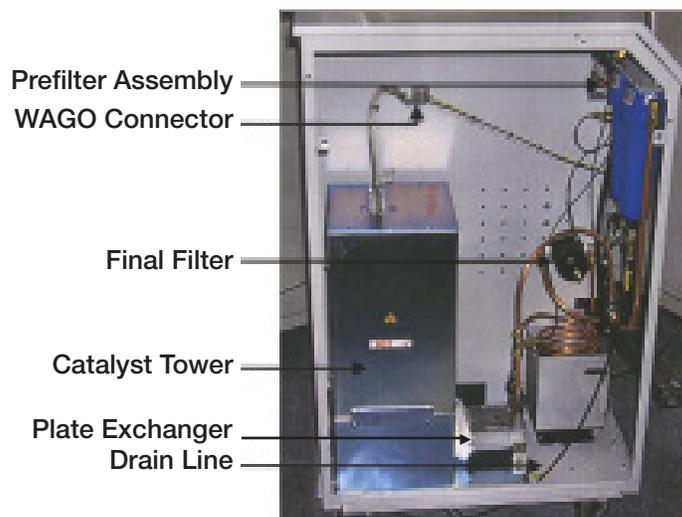


Figure 2 - Location of prefilters, catalyst tower #1, final filter #1, and drain line.

Power	<p>A 120 VAC, 20-amp, 50/60 Hz power supply line is required to operate the generator.</p> <p>There is no power switch on the generator. To turn the generator on, plug the female end of the electrical cord into the power receptacle on the right side of the generator and plug the opposite end into a nearby three-pronged earth-grounded receptacle. (Note: Do not use a Ground Fault Circuit Interrupter (GFCI) in conjunction with generator.)</p>
Operation	
<p>NOTE: The warm-up period for the generators is 3 hours after the compressed air supply and power supply to the generator have been turned on. Please consult the trouble-shooting guide if a fault is detected.</p>	
Diagnostics	<p>Start-up (Green) - The “Ready” light will blink for the first 3 hours of operation. During this time, the air exiting the generator will contain hydrocarbon levels in excess of specification. Since the catalyst heater temperature is below its setpoint at the beginning of the start-up period, the yellow service systems lights will be illuminated and the audible alarms will sound.</p> <p>Ready (Green) - The “Ready” light will stop blinking and remain illuminated at the completion of the 3-hour start-up period even if there is a system fault.</p> <p>Service System 1 (Yellow) - The “Service” light illuminates and an alarm will sound if the temperature fault in the left catalyst tower. The “Service” light will blink and an alarm will sound if the pressure drop across the catalyst tower exceeds 3 psig. Please consult the trouble-shooting guide if a system default is detected.</p> <p>Service System 2 (yellow) - The “Service” light illuminates and an alarm will sound if there is a temperature fault in the right catalyst tower. The “Service” light will blink and an alarm will sound if the pressure drop across the catalyst tower exceeds 3 psig. Please consult the trouble-shooting guide if a system default is detected.</p>
Start-up	<p>Open the inlet air supply valve, adjust the inlet pressure to between 75 psig and 100 psig (5.2 barg and 6.9 barg) using a customer installed pressure regulator. Adjust the outlet flow to \leq 10 SCFM (see ACCESSORIES section for recommended installation). Plug the generator into the appropriate power receptacle. After the compressed air is connected and the generator is plugged in, the 76-98 N200 will take three hours to start up.</p>
Operation	<p>At the completion of the start-up period, the generator is ready to be brought on line and supply zero grade air to downstream analytical equipment. A flow control device must be installed downstream from the generator to prevent demand in excess of the generator’s maximum flow rate.</p>
Shutdown	<p>Disconnect the power cord from the power supply and turn off the compressed air supply to shut down the generator.</p>

Maintenance



Before servicing the 76-98 N200, isolate the unit from the compressed air and electrical power supplies. Allow the generator to cool for at least 5 hours before servicing.

Suitable personnel using reasonable care should perform all maintenance-

The primary maintenance tasks for the 76-98 N200 are changing the pre-filter and final filter cartridges (annually), and replacing the hydrocarbon catalyst module (3 years). A summary of the replacement part numbers and recommended service frequency is shown at the end of this Maintenance section. See Figure 4 for the location of the pre-filters. See Figure 3 for the location of the catalyst module and final filter. Additional coalescing pre-filter cartridges and particulate filter cartridges may be ordered through your local representative. If necessary, the 76-98 N200 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 generator as this could present an electrical hazard.

Prefilter Cartridge Replacement

If the hydrocarbon catalyst module is not being replaced, there is no need to allow the generator to cool. Close the customer installed inlet air supply valve, and depressurize the filters. Unplug the generator.

Remove both the right and left side panels of the generator to access the pre-filters. Remove the screw in the upper right and left corners of the frame, then remove the front panel. To remove the filter cartridge from the assembly, disconnect the drain, loosen the collar, lower the bowl away from the filter head, and unscrew the filter retainer from the base of the cartridge. Insert the new filter cartridge (P/N 100-12-DX or 100-12-BX) and reassemble the housing in the reverse order (See Figures 3 and 4). Make sure that the correct grade filter cartridge (DX or BX) has been installed in its housing.

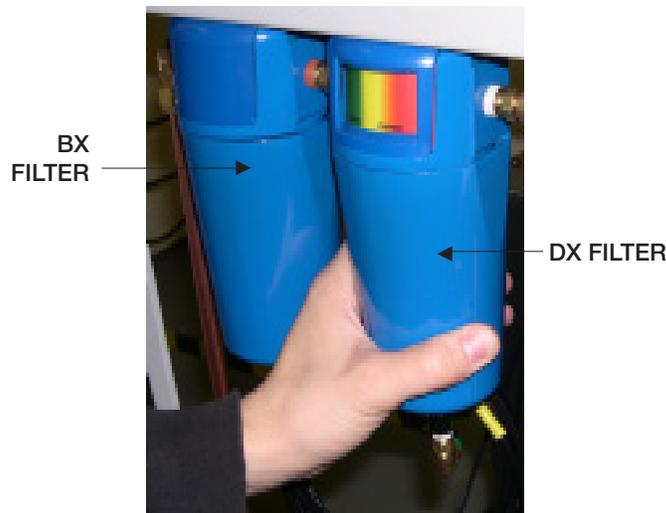


Figure 3 - Loosen and remove the pre-filter collar using your hand. Pull down on the bowl to remove it.



Figure 4 - Using your hand remove the blue retaining nut from the cartridge

**Catalyst Module &
Final Filter
Replacement**



NOTE: The unit should be allowed to cool for at least 5 hours prior to catalyst module replacement.

The hydrocarbon catalyst module should be changed approximately every 3 years or when the yellow "Service" light stays on for more than 1 hour. Contact the local representative for ordering information and pricing for the replacement catalyst module.

Tools required to change the catalyst module and filter are: a Phillips-head screwdriver, a 1/8" flat head screwdriver, and two 11/16" wrenches (or adjustable wrenches). The replacement procedure is as follows:



- 1 Close the (customer installed) inlet air supply valve between the compressor and the generator. Depressurize the unit.
- 2 **To prevent electrical shocks and burns, unplug the generator from the wall receptacle.**
- 3 Remove the Phillips head screws at the top corners of both the right and left side panels; remove the panel.
- 4 Remove the screws located inside the upper right and left corners of the rear panel; remove the panel.
- 5 To change the cartridge in the final filter, unscrew the 1/8" compression nut from the tie nut using a 7/16" wrench. Unscrew the tie nut using a 1" wrench. Pull off the bowl, then pull off the element retainer. Replace the filter, put the element retainer back on. Before replacing the bowl, make sure the o-ring is seated in the groove of the head. Screw the tie nut back on, followed by the compression nut (Figures 5 and 6).
- 6 Locate the 4 wires that exit the catalyst module. Remove each wire from the Wago connector using a 1/8" flat head screwdriver. Push the screwdriver into the slot above the wire while pulling the wire out of the connector (see Figure 2).
- 7 Disconnect the two tubing connections of the plate exchanger at the COLD IN and HOT OUT with 11/16" wrenches.
- 8 Remove the 3 Phillips head screws that fasten the catalyst module to the frame.
- 9 Lift the catalyst module up to remove it from the frame; replace with the new module.
- 10 Fasten the new module to the frame using the 3 Phillips head screws and reconnect the tubing connections.
- 11 Place the wires from the catalyst module into the Wago connector (Figure 2). Make sure the wires are placed in the correct slots.
- 12 Open the air supply valve and check for leaks at the tubing connections using a bubble type leak detection solution. Tighten tubing connections if leaking.
- 13 Replace the left, right and front side panels.
- 14 Plug the generator back into the wall receptacle.

Occasionally, the fuse in the generator may burn

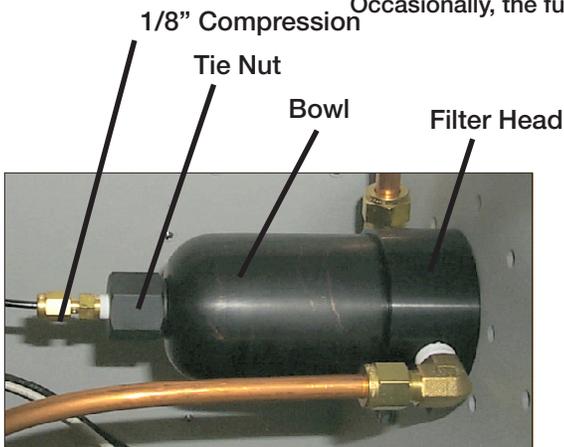


Figure 5 - To change the filter element, use a 7/16" wrench to remove the compression nut. Use a 1" wrench to unscrew the tie nut. Pull off the bowl.

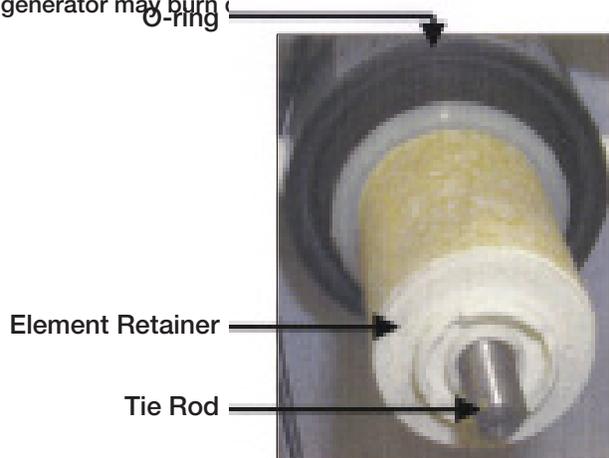


Figure 6 - Pull the element retainer off the tie rod to change the filter. When replacing the bowl, make sure the o-ring is sitting in the groove in the head.

Fuse Replacement

qualified electrician is permitted to change the fuse. Please call Parker Hannifin Corporation for instructions.

System Specifications

Maximum Flow Rate	10 SCFM
Total Hydrocarbon Content	<0.05 ppm
Min/Max Inlet Pressure	75 psig/100 psig (5.2 barg/6.9 barg)
Pressure Drop at Max Flow Rate	2 psig
Max Inlet Hydrocarbon Content	100 ppm (methane)
Min/Max Ambient Temperature	60°F - 100°F (16°C - 38°C)
Max Relative Humidity	80%
Altitude	2000 m
Start-up Time	3 hours
Electrical Requirements	120 VAC, 60 Hz
Current Rating	20 Amps
Fuse Type	250V, 20A, Type T (Time delay) on electrical panel 250V, 100mA, Type T (Time delay) on circuit board
Inlet/Outlet Port sizes	3/8" NPT
Physical Dimensions	25"w x 25"d x 41"h (64cm x 64cm x 104cm)
Shipping Weight	180 lbs. (82 kg)

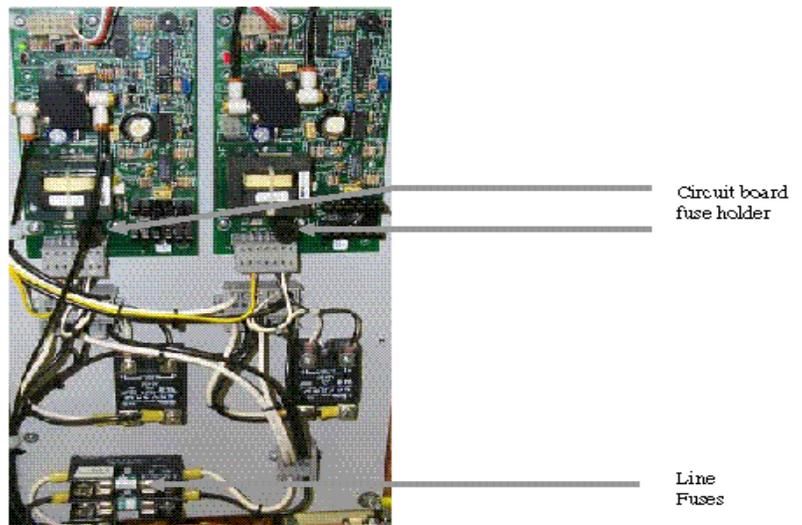
Optional Accessories

Description	P/N
Pressure Regulator	11130-130
Filter Maintenance Kit	MK100-12-N200
Catalyst Module Maintenance Kit	B03-0209-N200

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.

Figure 7 - Electrical panel



Troubleshooting

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



Warning: Any troubleshooting or service activity which requires removal of the generator cover should be done using extreme caution. Exposed AC may be present.

Symptom	Course of Action
No Power	Check power cord connections Check circuit breaker in electrical panel Check generator's fuses: -Unplug the generator from electrical outlet -Remove both the right and left side panels. Remove the screw in the upper right and left corners of the frame and remove the front panel. -Check the fuses on the electrical panel -Check the fuses on the circuit board -Change fuses if necessary Warning: for continued protection against risk of fire, replace only with fuse of specified rating.
Service System Light Illuminated Constantly and Alarm On; High Hydrocarbon Content in Air	Replace catalyst module
Service System Light Blinking and Alarm On	Verify outlet flow rate 10 SCFM Check tubing connections for leaks Check filter downstream of catalyst tower, change if dirty
Loud Hissing Noise, Low Inlet Pressure	Check drain on prefilters -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 housing and rinse with warm water. -Replace automatic drain (P/N 21552)

Notes

1 To arrange for system service, contact the Technical Services Department at 1-800-343-4048, 8AM to 5PM Eastern Time. For other locations, please contact your local representative.

Don't Forget To:

- 1 Complete and mail your registration card.
- 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. (For locations outside North America, please contact your local representative).

Serial Numbers

The serial number for the unit is engraved on the bottom of the label on the front cover. 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.



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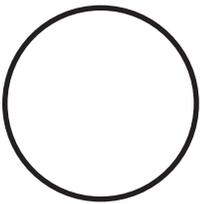
Explanation of Warning Symbols

Symbol

Description



Caution, refer to accompanying documents for explanation.



Refer to the caution/warning note indicated for explanation.



Caution, risk of electric shock.



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