
# NitroFlow TG2

Installation, Operation, and Maintenance Manual

Parker Balston

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# Explanation of Warning Symbols

| Symbol | Description |
|---|---|
|  | Caution, refer to accompanying documents for explanation. |
|  | Refer to the caution note indicated for explanation. |
|  | Caution, risk of electric shock. |
|  | Refer to the warning note indicated for explanation. |

# Parker Balston
# NitroFlow TG2 Generator Series

Installation, Operation, and Maintenance Manual

**These instructions must be thoroughly read and understood before installing and operating this product. Any modification of the product will void the warranty.** Failure to operate this product in accordance with the instructions set forth in this manual and other safety governing bodies could jeopardize the safety of the operator and void the safety certification of this product. Retain these instructions for future reference.

If you have any questions, please call the Technical services department at 1-800-343-4048, 8AM to 5PM Eastern Time or e-mail at gsftechsupport@parker.com. For other locations, please contact your local representative.

Please refer to page 2 for an explanation of the caution/warning symbols used throughout this manual.

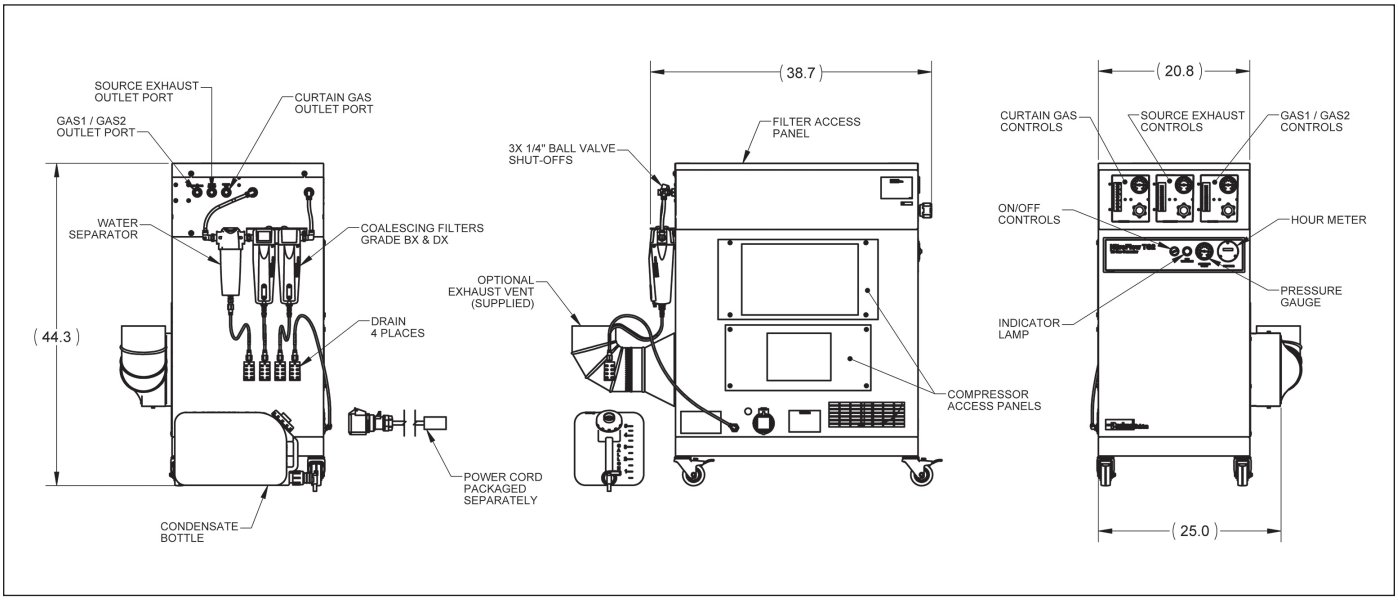



Figure 1 NitroFlow TG2 Nitrogen Generator

## General Description

The integrated system is engineered to produce pure nitrogen gas, hydrocarbon free air, and clean, dry -40°F dew point air delivered by a carefully matched scroll compressor. The system is housed in two fully integrated cabinets: the lower cabinet produces the compressed air using an oil-less rotary scroll compressor. The upper cabinet separates the compressed air into the three gases: nitrogen, and hydrocarbon free dry air.

## Regulatory Compliance

The generator is certified to the electrical safety requirements as specified by the IEC, UL, and CSA standards. These units bear the CSA marking on the product. Product supplied internationally also carries the CE mark. The product meets EMC compliance. Internal pressure receivers are CRN and ASTM certified or CE certified.

## Integrated System

The Nitroflow TG2 generator contains the necessary components to produce hydrocarbon free, dry air and nitrogen. The flow schematics (Figure 2A and 2B) show all of the major components of the system. The system can be broken down into 7 stages: compressed air, liquid water removal, pre-filtration, oxygen/water vapor removal, hydrocarbon removal, water vapor removal, and final filtration.

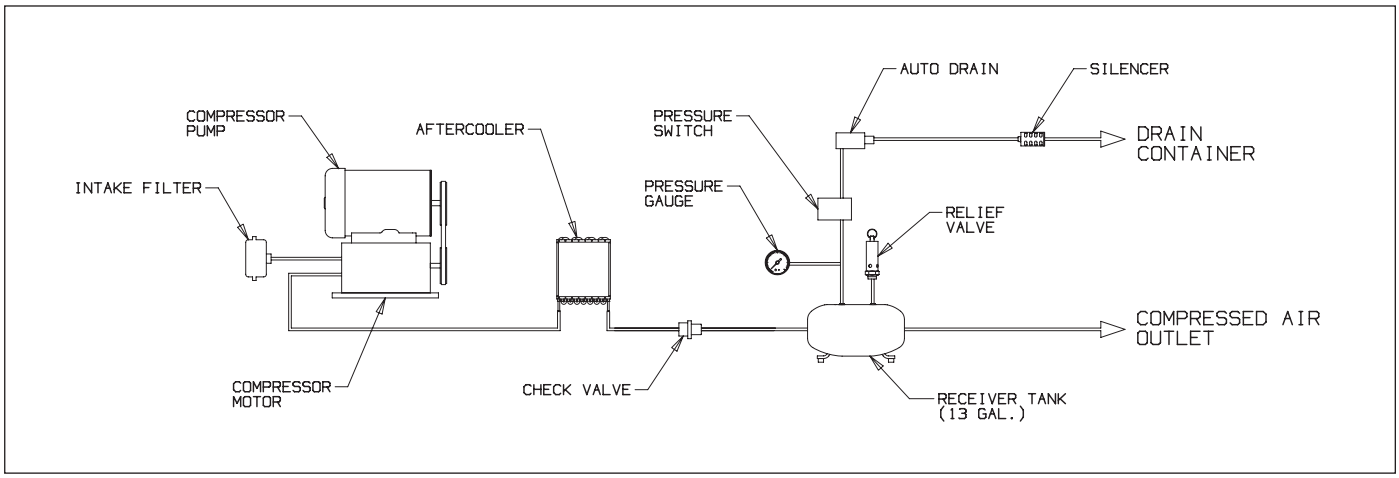



**Figure 2A, Compressor Flow Schematic**

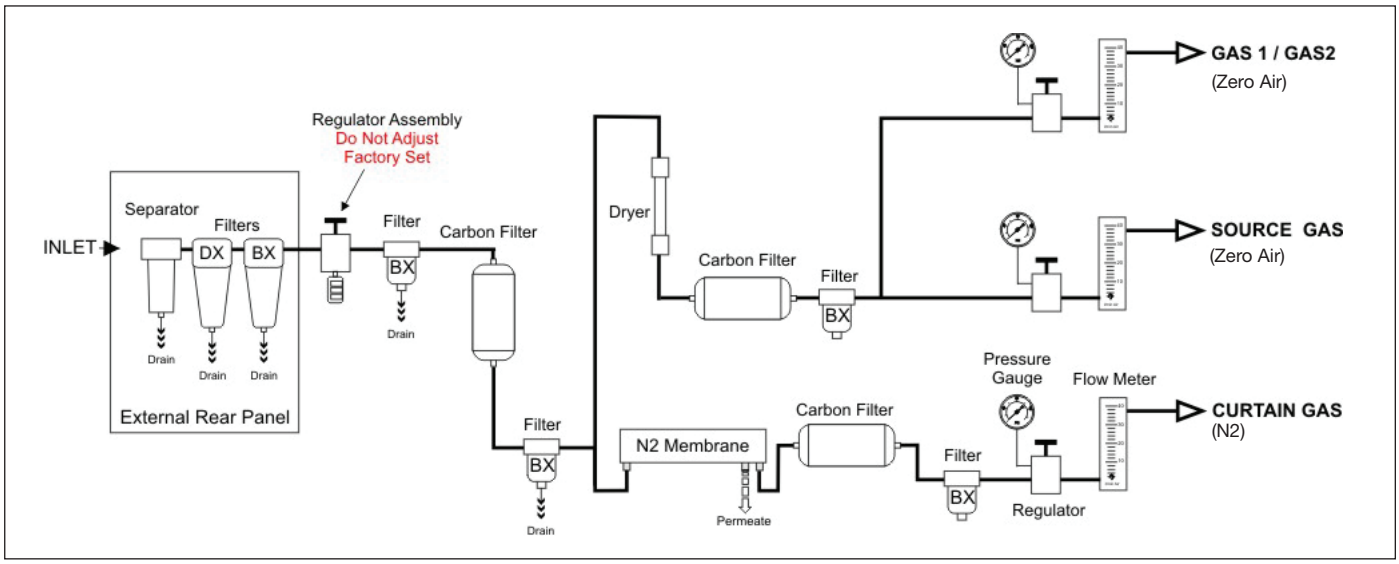



**Figure 2B, Nitrogen Generator Flow for NitroFlow TG2**

## Compressor Pump

The design of the oil-less rotary scroll compressor offers high reliability and quiet operation. The scroll consists of two sets of identical spirals that are offset 180 degrees from each other. As one scroll orbits around the other fixed scroll, air is trapped, compressed, and is then directed into the center where it is discharged from the pump.

## Compressor After Cooler

A high output fan cools the compressor cabinet as it blows over a series of fins on the after-cooler. The compressor operates at a lower temperature, thus increasing bearing, tip seal, and grease life. As the fan blows across the after-cooler, the air temperature is decreased and water is condensed in both the after-cooler and in the receiver tank. The water is discharged through the automatic electric drain valve that is connected to a disposal container.

**Water Separator**

The NitroFlow TG2 generator incorporates a water separator to remove liquid water from the compressed air before it reaches the prefilters. The liquids are collected in the supplied disposal container. Refer to the included installation and maintenance instructions.

**Prefilters**

Two stages of high efficiency coalescing pre-filters are incorporated into the design of the Nitroflow TG2 to remove water and particulate contamination to 0.1 micron. The generator is equipped with float drain valves to automatically discharge any liquids which have accumulated in the filter bowls. The liquids are collected in the supplied disposal container. These filters protect the membrane and associated components from contamination.

**3-way Pneumatic Valve**

A 3-way pneumatic valve is located after the prefilters to release any leftover liquid water that may be present on startup.

**Hydrocarbon Removal**

An activated carbon module is located upstream of both the nitrogen module and the dryer module to remove any hydrocarbon contaminants that may exist in the room air. A particulate filter is located after this carbon module to remove any carbon particles.

**Nitrogen Module**

The NitroFlow TG2 generator has a hollow fiber membrane module which converts compressed air into high purity nitrogen. The membrane module has no moving parts assuring years of maintenance-free operation.

**Outlet Carbon Module and Filter**

There is one activated carbon module and particulate filter after the nitrogen membrane to remove any contaminants present in the nitrogen stream.

**Dryer Membrane**

The water vapor in the compressed air passes through the hollow fibers of the membrane for removal, resulting in dry air. A small portion of the dry air is redirected along the fibers to sweep out additional water vapor laden air and vented to atmosphere in the cabinet. A dew point of -40°F is achieved at a pressure of 100 psig.

**Outlet Carbon Module & Filter**

An activated carbon module is located downstream of the membrane dryer to remove any volatile organic compounds that may be present in the air stream. A filter is located after this carbon module to remove any carbon particles.

**Diagnostics**

There are two diagnostic indicator lights on the Parker Balston NitroFlow TG2 System:

**High Temperature LED (red):** The “High Temperature” LED indicator illuminates when the compressor pump has reached its maximum temperature. The compressor will shut down by a thermal switch opening, preventing power to the motor. Compressor restarts automatically as soon as the over-temperature condition is corrected.

**Power On LED (Green):** This indicates the compressor is operating.

# Installation

**Unpacking**

All installation, operation, and maintenance activities for the NitroFlowTG2 Generator System should be performed by trained personnel using reasonable care to avoid injury or damage.

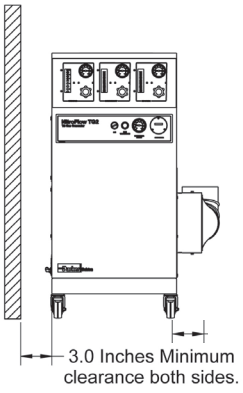
The NitroFlow TG2 system has casters and is packed in a wooden shipping container. The installation kit, consisting of plastic tubing, tube fittings, and a plug is packed in a box inside the wooden container. Remove the wire L-shaped fasteners from the sides of the container (see Figure 3). Do not attempt to lift the generator from the container. Remove and locate the plywood ramp (see Figure 4). Release the locked casters. Move the generator down the ramp. Move the generator and installation kit to its installation location.

**Figure 3**

**Figure 4**

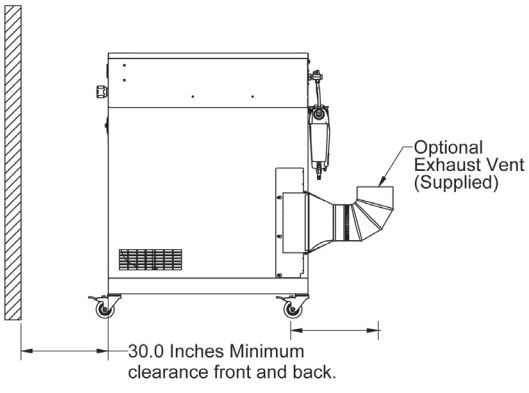
## Location

Location of the generator with proper ventilation is critical. Install the generator in a clean, well ventilated area. To provide adequate ventilation and servicing for the generator, a minimum clearance distance of 30 inches in front and in the rear is required (see Figure 5). Fresh intake ventilation for the generator enters from the bottom and sides, while warm exhaust air exits from the right, rear side. A minimum of 3 inches clearance is required on both sides of the generator (see Figure 6).




Front View

**Figure 5**




Side View

**Figure 6**

**The generator is for indoor use only. Do not install outdoors.** The generator must be installed in a climate controlled room. The ambient temperature of the air surrounding the generator should not exceed 85°F (29°C) or be below 60°F (16°C). **The relative humidity of the ambient should not exceed 43% at 85°F**. Do not locate the generator where hot exhaust air from other heat generating sources may be drawn into the generator. The area should be free of excessive dust, toxic or flammable gases, solvent fumes, and moisture. An exhaust vent attachment is available to route exhaust away from the generator(see Figure 5). The diameter of the exhaust vent ducting must be six inches. An in-line duct fan, capable of exhausting 226 CFM, is required for ducting greater than 15 feet. See Accessory Parts table on Page 17 for details.

The Parker Balston NitroFlow TG2 Generator Series creates minimal noise during operation. The noise generated is about 49dB at one meter. Periodically there is an air discharge noise from the drain port eliminating accumulated fluids in the prefilters and receiver tank. The noise and heat generated by the unit should be considered when selecting an installation location. A silencer kit is included for the drain discharge noise. There is also a pump “burp” noise lasting a few seconds each time the generator is shut down. This is the compressor depressurizing the pump during shutdown.

## Utilities

**For the NA Model:** The NitroFlow TG2 Generator Series requires one electrical power outlet: a dedicated grounded 208 to 254VAC, 60Hz, single phase, minimum 30Amp circuit breaker with a NEMA 6-30R or L6-30R receptacle (see Figure 7). **Parker requires purchasing a step-down transformer if your facility voltage is 255 or higher or a step-up transformer if your voltage decreases below 208VAC.** See the accessory section on page 17. Main supply voltage fluctuations must be within ±10% of the nominal main supply voltage.

**For the JA and WD Models:** The NitroFlow TG2 Generator Series, rated at 230V, 50 Hz, single phase, 13A fully loaded installation requires the following electrical setup:

1. The supply line should be dedicated to the generator. No other equipment should operate using the same line.
2. The service should be capable of carrying 20 amperes. The wire gauge should be sized accordingly.
3. The service should be protected by up to a minimum 20 Amp circuit breaker. The value is based on the application/equipment requirements as well as the electrical components’ tolerance and uncontrollable external variables.

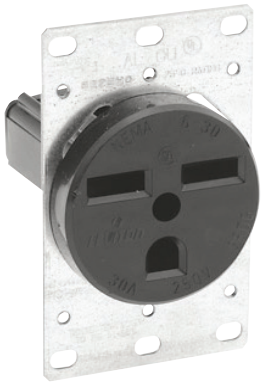
The following table describes the necessary mains cordset based on region. **Do Not Replace the provided cordset with an inadequately rated cordset. The plug on the cordset is the mains disconnect.**

The electrical schematic for the generator is shown in Figure 31 on page 23.

## The following table describes the cordset required for each region:

* Note: JA-200 versions include an external step-up transformer.

| System | Region | Description | Cordset Rating | Part Number |
|---|---|---|---|---|
| NitroflowTG2NA | North America | 230V-60Hz cordset, US plug | 30A, 250VAC | A03-0430 |
| NitroflowTG2NA | North America | 230V-60Hz cordset, US twistlock | 30A, 250VAC | A03-0410 |
| NitroflowTG2WD | EU,India,UK | 230V, 50Hz cordset | 32A, 250VAC | A03-0344 |
| | Australia | 230V, 50 Hz cordset | 32A, 250VAC | A03-0345 |
| | China | 230V, 50 Hz cordset | 32A, 250VAC | A03-0347 |
| NitroflowTG2JA200 | JA | 230V, 50 Hz cordset, with JA PSE plug | 20A, 250VAC | A03-0408 |



NEMA L6-30R

30AMP/250V Receptacle
for Model : NA (North America)

**Figure 7a**

**Figure 7b**

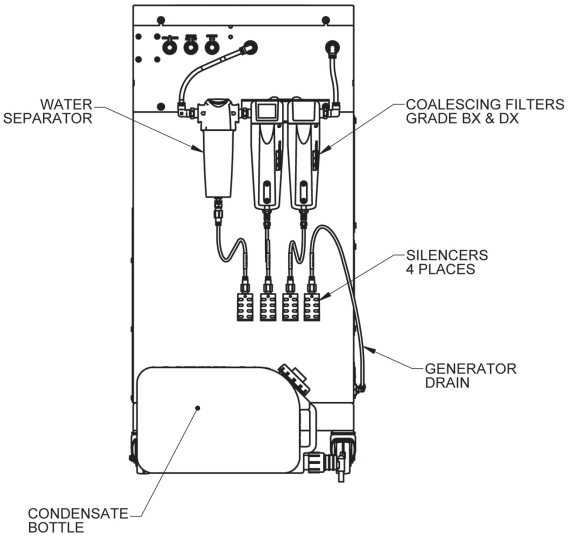



**Figure 8**

## Piping

There are seven plastic tubing connections for the NitroFlow TG2 generator: (1) nitrogen outlet gas connection; (2) dry air outlet gas connections; (4) drain connections. Press the tubing into the quick-connect fittings. Assure tubing is fully inserted (about ½"). Tubing is provided in the installation kit. For remote locations, additional length tubing is provided.

## Drains

The generator drain tube is a black nylon ¼" tubing connecting the drain outlet to the provided disposal container (see Figure 8). A blue silencer is provided for the discharge end of the tubing to reduce the discharge noise. Periodically check the built in strainer to ensure it has not clogged.

The pre-filter and water separator drain tubes are also a black nylon ¼" tubing connecting the drain outlets to the same provided disposal container (see Figure 8). Blue silencers are provided for each drain line.

## Outlet Gases

The three outlet gas ports consist of three ¼" NPT bulkhead fittings. Parker Balston recommends minimum ¼" PFA plastic tubing with a minimum pressure rating of 125 psig (8.6 bar). Check all piping connections for leaks using a bubble-type leak detecting solution.

## Recommended Accessories

**A03-0412 voltage step-down transformer - If your facility supply voltage is 255V or higher, then the use of this transformer is required.**

**A03-0411 voltage step-up transformer - If your facility supply voltage is 208V or lower, then the use of this transformer is required.**

# Operation

## Start-up/Restart

Check that the power cord of the generator is properly connected to the generator receptacle. Rotate clockwise to lock. Check that the power cord of the generator is connected to the proper power supply outlet.


**Figure 9**
Generator Controls

Ensure all 3 gas outlets at the back of the generator are not connected to pipework and are closed using the yellow shut off valves on the back of the NitroFlow TG2. Rotate the Power Switch on the front panel of the generator (see figure 9) to ON by turning it clockwise. The generator will start and the green LED will illuminate. The Compressor Output pressure gauge will slowly increase to a maximum set pressure of 137psig (9.4 barg). Full pressurization will occur within 10 minutes. Allow the system to run for 90 minutes to reach full operating temperature. Using the regulators on the front of the unit, adjust the outlet pressure on each gas line to 20psi and open the 3 gas outlets slightly using the yellow shut off valves at the back of the generator allowing the system to vent to atmosphere for approximately 1 hour (note: venting to atmosphere at 20psi is not too loud and will allow the desired purge. Opening the valves fully will “overflow” the generator and it will not maintain pressure). Connect the gas lines to the back of the generator and allow them to purge the length of pipework to atmosphere for another 15 minutes. Close the 3 gas outlets using the yellow shut off valves. Connect the now purged lines to the application and slowly re-open the yellow shut off valves to pressurize the gas lines. **This procedure should also be followed any time the generator is fully up to operating temperature and then powered off for more than 30 minutes.**

## Operation

During normal operation, the generator’s power switch is illuminated green. The compressor pressure gauge indicates a pressure between 125 to 130 psig (8.6 to 8.9 barg). If the pressure drops below 125 psi, then the outlet flow is too high. Set the 3 regulators to the specified values by the instrument. The flow rate for each gas is displayed by the flow meter designated for each gas. Refer to the flow label on the top of the NitroFlow TG2 cabinet for the correct flow reading at standard conditions. **Do not remove the cover while the system is pressurized.**

The generator has its own automatic water drain system. The 3 filters located on the back of the generator are equipped with pneumatic drains that open when the water level reaches a predetermined point. The compressor drain operates every 10 minutes, opens for 2 seconds; the two internal filter bowls also drain every 10 minutes.

## Diagnostics

The generator cabinet has two LED indicators (see Figure 9): Power ON, and High Temperature. The green LED remains illuminated during normal operation. The other LED indicator, “High Temperature” remains unlit if the compressor is functioning properly. Red illumination of the High Temperature LED signals a fault condition and warns the operator that the unit requires servicing.

The compressor has an hour meter to record the accumulated operating time of the compressor for preventative maintenance scheduling of the serviceable components. The meter indicates 00000.0 hours. The hour meter is not re-settable.

The compressor inlet pressure gauge indicates the range of system pressure during operation, normally between 125 psig and 130 psig.

See the Troubleshooting section of this manual on pages 17-20 to resolve any abnormal or faulty conditions.

## Pressure Interruption

If the compressed air pressure decreases less than 90 psig (6.2 barg), the nitrogen output purity level will decrease. Once pressure is restored, purity level will be restored.

## Power Interruption

If the electrical power is interrupted, the generator will start automatically when power returns**.** Please see Start-up/Restart procedure on previous page.

## Shutdown

For normal or emergency shutdown, pull out the plug on the cordset to disconnect the main power (see Figure 1). Full depressurization takes 1 hour. **Do not remove cover while system is pressurized.**

## Maintenance

Maintenance tasks for the NitroFlow TG2 Generator should be performed by trained personnel familiar with the service and safety precautions of electromechanical devices to avoid injury or damage. **Safety risks that may affect the service personnel are identified with the necessary protective measures described.**

**Parker highly recommends service be performed by a Parker trained technician only. Call the factory about PMP, the Preventative Maintenance Program. The service personnel will verify the safe state of the generator after the maintenance or repair is completed.**

Prior to servicing the generator, turn off the system and disconnect the cordset from the power supply. Allow the system a minimum of 1 hour to depressurize. See shutdown section above.

To ensure product performance and reliability, periodic preventative maintenance must be performed. The three tables on page 10 detail the maintenance schedules for both the compressor and purification components, as well as the part numbers for replacement parts and maintenance kits.

## Replacement Parts/ Maintenance Kits

| | | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Part Code | Description | 5K | 10K | 15K | 20K | 25K | 30K | 35K | 40K |
| PM kits for 50 Hz systems | | | | | | | | | |
| MKNITROFLOWTG2-1 (50 Hz systems) | 5K hr compressor maintenance (50Hz) | X | | X | | X | | X | |
| MKNITROFLOWTG2-3-50 (50 Hz systems) | 10K hr compressor /generator maintenance (50Hz) | | X | | X | | | | X |
| MKNITROFLOWTG2-4 (50 Hz systems) | 30K hr compressor /generator maintenance (50Hz) | | | | | | X | | |
| MKNITROFLOWTG2-6 (50 Hz systems) | Replacement belts (50Hz) | | | | | | | | |
| MKNITROFLOWTG2-8 | Grease gun | | | | | | | | |
| PM kits for 60 Hz systems | | | | | | | | | |
| MKNITROFLOWTG2-2 (60 Hz systems) | 5K hr compressor maintenance (60Hz) | X | | X | | X | | X | |
| MKNITROFLOWTG2-3-60 (60 Hz systems) | 10K hr compressor/generator maintenance (60Hz) | | X | | X | | | | X |
| MKNITROFLOWTG2-5 (60 Hz systems) | 30K hr compressor/generator maintenance (60Hz) | | | | | | X | | |
| MKNITROFLOWTG2-7 (60 Hz systems) | Replacement belts (60Hz) | | | | | | | | |
| MKNITROFLOWTG2-8 | Grease Gun | | | | | | | | |

## Compressor Component Maintenance

(refer to figures 11-34 and 44-47)

| Service Interval | Replacement Part | Quantity |
|---|---|---|
| 5,000 hours | Intake Filter | 1 or 2* |
| 5,000 hours | V-Belts | 2 |
| 5,000 hours | Tip Seal Set | 1 |
| 5,000 hours | Grease | 1 |
| 5,000 hours | Discharge Pipe Sleeve | 1 |
| 10,000 hours | Timer drain valve assembly | 1 |
| 30,000 hours | Pump | 1 |
| 30,000 hours | Check Valve | 1 |
| 30,000 hours | Intake Filter | 1 or 2* |
| 30,000 hours | V-Belts | 2 |

* depending on style

## Purification Component Maintenance

(refer to figures 10, 36-43)

Service intervals are determined by an hour meter located on the front panel of the generator.
The meter indicates 00000.0 hours.
The hour meter does not reset.

| Service Interval | Replacement Part | Quantity |
|---|---|---|
| 10,000 hours | Carbon Module (P/N B06-0264) | 1 |
| 10,000 hours | Filter Silencer (P/N 75117) | 1 |
| 10,000 hours | Filter Element (P/N BZ100-180-DXE) | 1 |
| 10,000 hours | Filter Element (P/N BZ100-180-BXE) | 1 |
| 10,000 hours | Filter Element (P/N BZ100-090-BXE) | 4 |
| 30,000 hours | Carbon Module (P/N B06-0264) | 2 |
| 30,000 hours | Carbon Module (P/N B06-0265) | 1 |
| 30,000 hours | Filter Silencer (P/N 75117) | 1 |
| 30,000 hours | Filter Element (P/N BZ100-180-DXE) | 1 |
| 30,000 hours | Filter Element (P/N BZ100-180-BXE) | 1 |
| 30,000 hours | Filter Element (P/N BZ100-090-BXE) | 4 |

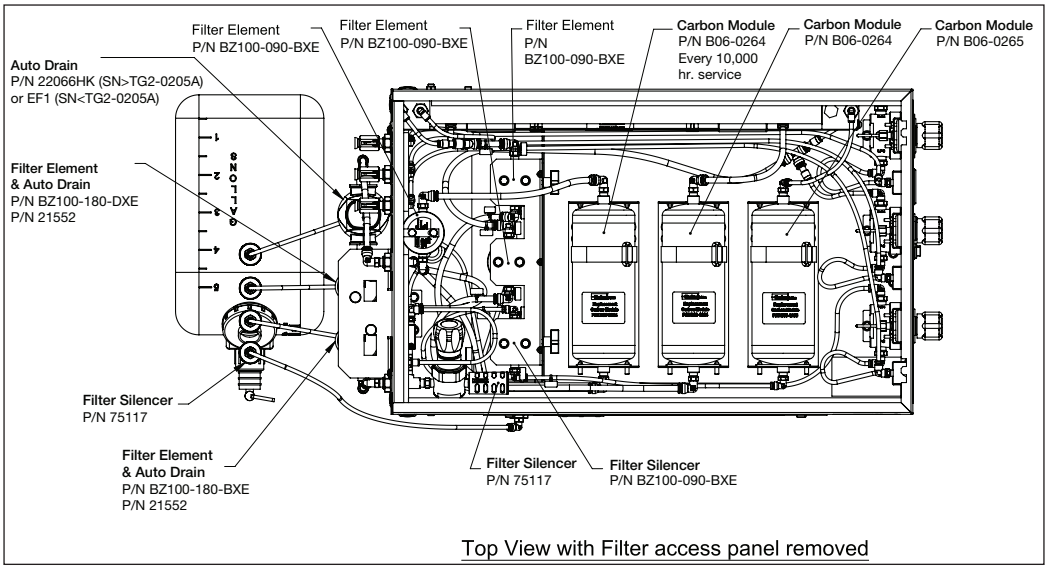



**Figure 10**

## Cleaning

**If necessary, wipe the generator with a clean, dry cloth on an as-needed basis. Do not use water, aerosols or other cleaning agents on the unit. Use of any liquid detergent to clean the unit could pose an electrical hazard.**

## 5,000 Hour Service Instructions

### Intake Filter

1. Remove the upper side compressor access panel (see Figure 1).
2. By hand, push-in and rotate one intake filter cap to remove. Undo latch to remove second intake filter cap (see Figure 11).
3. Replace the old filter elements with a new one, reverse steps to reassemble.

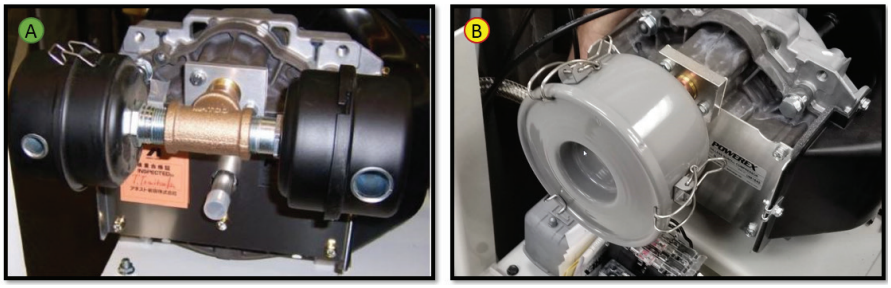



**Figure 11**

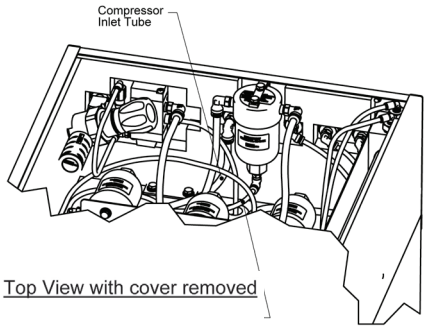



**Figure 12**

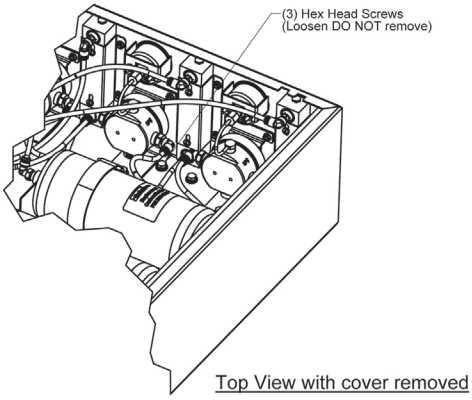



**Figure 13**

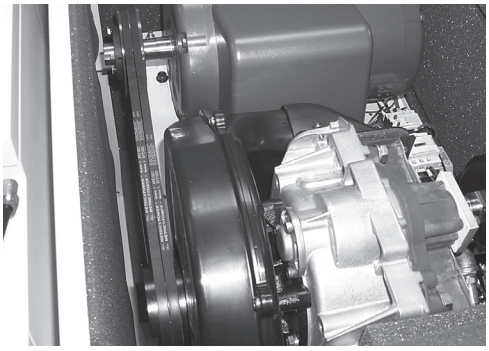


**Figure 14**

### Belts

1. Remove the top panel on the unit by removing two screws at the rear with a phillips head screwdriver and pulling top panel to the rear.
2. Remove the black nylon tube from the drain port of the filter housing by pushing the collet of the fitting towards the body of the fitting, and pulling on the tube to release it (see Figure 12).
3. Remove the compressed air inlet tube from the elbow (see Figure 12).
4. LOOSEN (do not remove) three hex head screws located at the front of the cabinet (See Figure 13).
5. Disconnect the water separator tube & prefilter tubes from the rear of the generator (See Figure 8).
6. Remove two screws from the rear panel with a phillips head screwdriver.
7. Pull cabinet to the rear and lift off of compressor cabinet. Be cautious of exterior pre-filters.
8. Check belt tension (see figure 14) using a belt tension gauge or the deflection method. Tension gauge should indicate minimum 45 lbs. If using the deflection method, 3.0-3.38 lbs force at mid span should yield 7/32” belt deflection.
9. When making adjustments to the belts, make sure that pulley misalignment is no more than 1/16” and that both pulleys are not misaligned by more than 1/16” also (see Figure 15)
10. Adjust tension if required by adjusting motor bracket. Replace belts if needed.

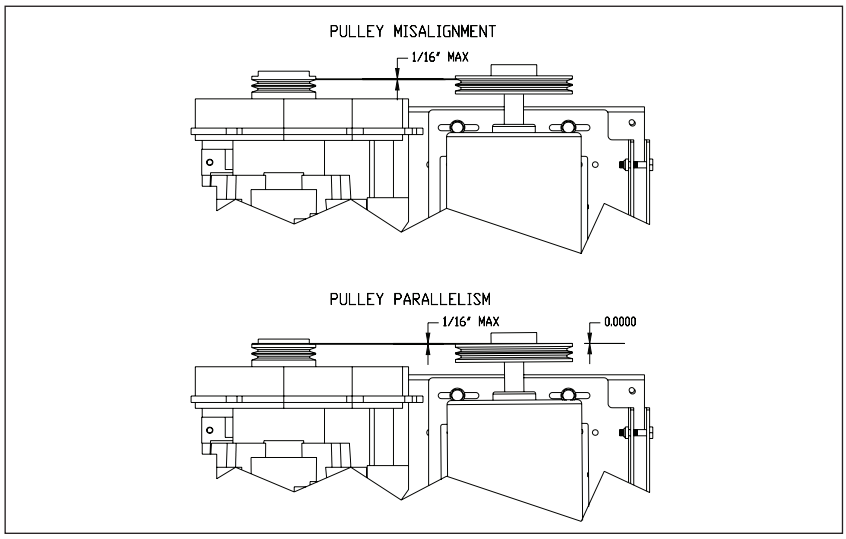



**Figure 15, belt diagram**

## Grease Orbital Scroll Compressor Bearings

1 Remove the plastic dust cap from the pump (see Figure 16).

2 Rotate the compressor pulley until the grease fitting is visible in the dust cap hole.

3 Using a grease gun extension adapter to engage the grease fitting, supply the proper amount of grease according to the grease delivery Table 1, Figure 16.

Note: Pump grease gun before feeding to eliminate air from the needle adapter. Each pump equals 0.65 grams of grease. The volume of grease is less after the 2nd pump since some grease remains in the extension adapter.

4 Replace the plastic dust cap.

| **Table 1 - Grease Delivery** | **SLAE03E** | |
|---|---|---|
| **Bearing** | **1st Pump** | **2nd Pump** |
| Orbit Scroll Bearing | 5 times | 4 times |
| Pin Crank Bearing (Orbit Scroll side) | 4 times | 4 times |

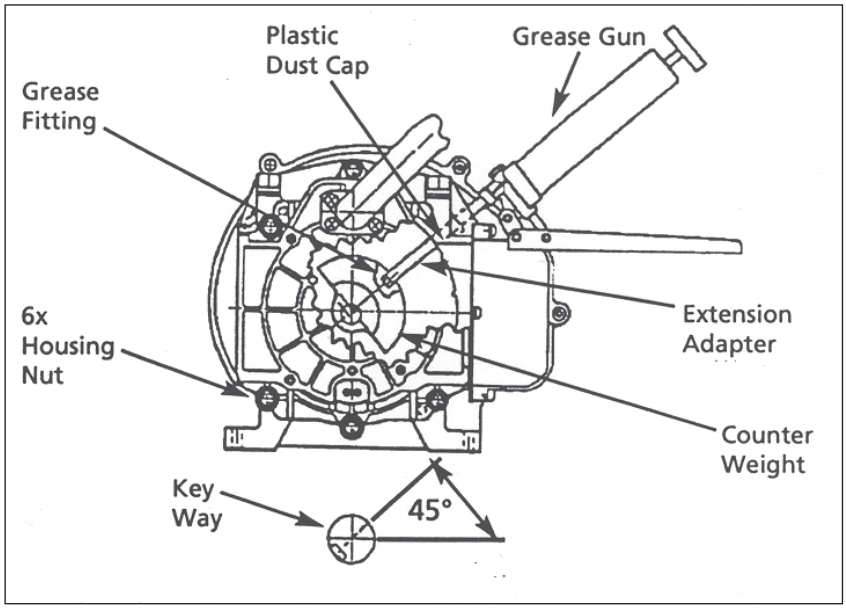
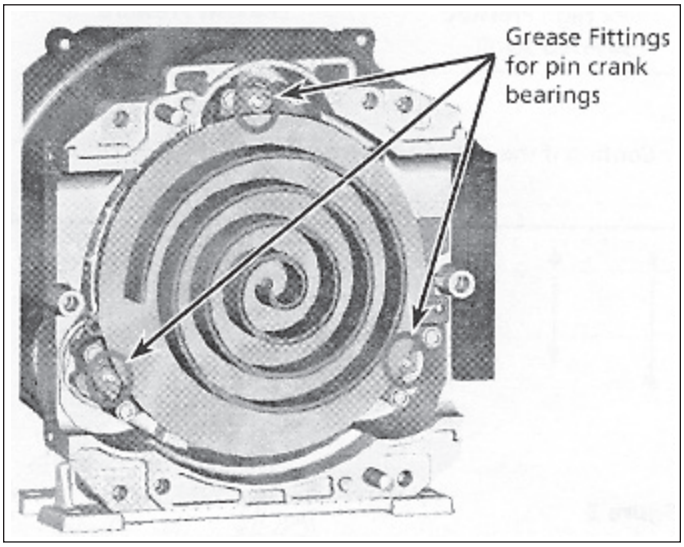



**Figure 16 Grease and Orbit Scroll Bearing**

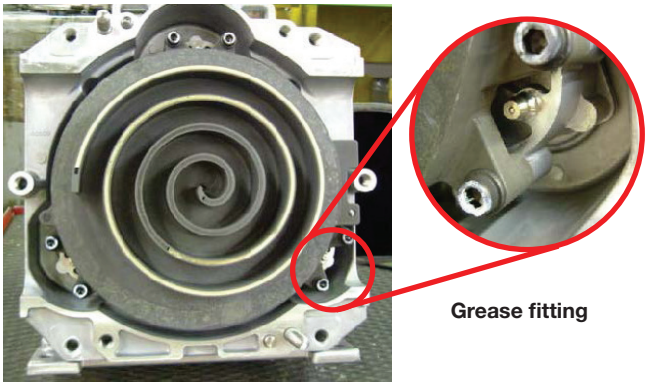
## Grease Pin Crank Bearing

1. Remove the side compressor access panel (see Figure 1).
2. Remove the fan duct.
3. Remove the nuts, bolts, and then the fixed scroll.
4. Grease three pin crank bearings according to Table 1 and Figure 17.
5. Replace fixed scroll and fan duct. Torque bolts, initially 17 inch-lbs., then finally 175 inch-lbs.

**Figure 17**




**Figures 18 & 19**



**Grease fitting**

**Note:** The grease fitting located in the center of the pin crank bearing feeds only the orbit scroll side bearing. Use a needle adapter to supply grease to the housing side bearing. Pump grease gun to eliminate any air in the needle adapter. Hold grease gun for 5 to 10 seconds after feeding grease to prevent grease blowback from the grease fitting.

## Replace Tip Seal

1. Remove the six housing nuts (see Figure 16).
2. Remove the stationary scroll housing.
3. Remove the old tip seals from both the orbiting and stationary scroll housings (Figures 20-23).

**Figure 20** LP Tip Seal

**Figure 21** HP Tip Seal

**Figure 22** Dust Seal

**Figure 23** Backup Tube

4. Remove the old dust seal and backup tube from both housings.
5. Blow off any dust from both housings. (Figure 24)

**Figure 24**

**Figure 25**

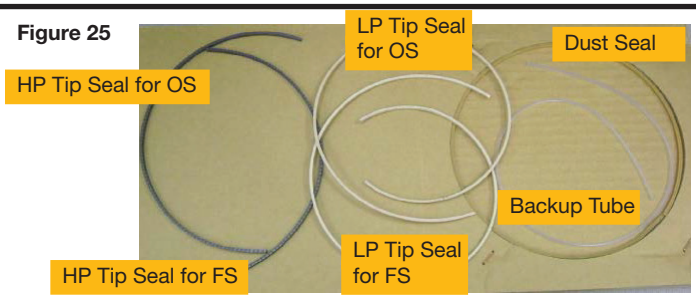
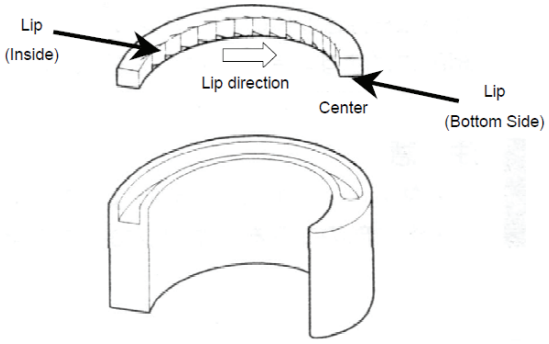



**Figure 26**

**Figure 27**




6 Install the new high pressure (shorter one) tip seal starting from the center of the scroll, outward inside the seal channel. (Figures 25 - 27)

**Note:** The side and bottom lip notches of the tip seal face INWARD and DOWNWARD in the channel.

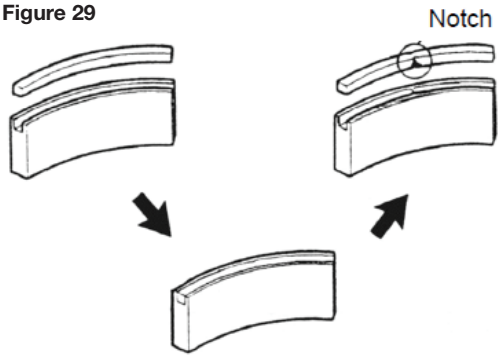
7 Install the new low pressure (longer one) tip seal in the same way. Note: Make sure there is no gap between the high and low pressure seals. (Figures 28, 29)

**Note:** Make sure there is no gap between the high and low pressure seals.

**Caution! Do not attempt to remove the orbit scroll from the housing.**

**Figure 28**

**Figure 29**




8 After installing half of the low pressure seal, **carefully** remove the seal from the channel to make sure the seal is properly locking onto the channel indentations located just past the high pressure seal.

**Note:** The indentations are machined into the seal channel to prevent the low pressure seal from moving.

9 Blow off any dust caused by removing the seal from the channel.

10 Install the low pressure seal completely and cut excessive material. (Figures 30-32)

**Note:** Make sure the side and bottom lip notches are facing INWARD and DOWN into the seal channel.

**Note:** The lip notches must not be distorted in the seal or torn off.

11 Install backup tube in the dust seal channel.

**Figure 30**

**Figure 31**

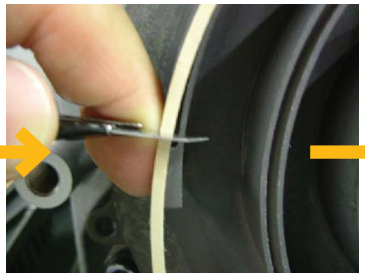
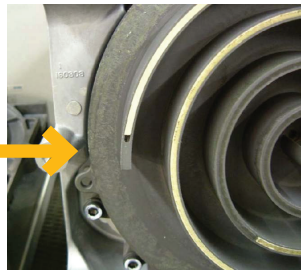


**Figure 32**



**12** Place dust seal over the backup tube. (Figures 33, 34)

**Caution! The backup tube and dust seal must meet at the bottom of the housing in the six o'clock position.**

**13** Install the stationary scroll housing onto the orbiting scroll housing and reassemble the unit.

**14** Tighten the pulley bolt (M8) to 265 in -lbs, using a torque wrench.

**15** Tighten the six housing nuts to 265 in-lbs, using torque wrench.

**Figure 33** without dust seal

**Figure 34** with dust seal

## Fuse Replacement

There are three fuses located in the compressor cabinet (see Figure 35). **Before servicing the fuses, turn the generator off and disconnect the power cord from the power supply.**

To access the fuses, remove the upper compressor access panel (see Figure 1), and locate the fuse blocks. Both lines 1 and 2 are fused separately. Remove both line fuses with a small screwdriver. Replace either one or both fuses as required. **To maintain safety, use only fuses of the size and type specified in the Specifications section of this manual.**

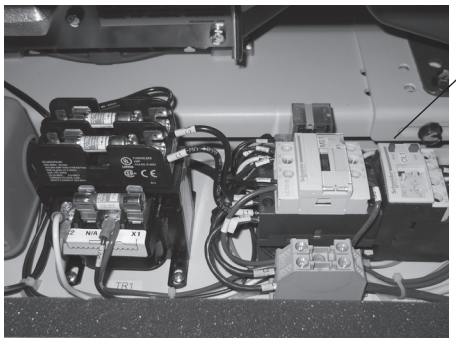



**Figure 35**


**Figure 36**

## 10,000 Hour Service Instructions

These instructions describe the replacing of the two coalescing pre-filters, two carbon modules, and two particulate filters in the NitroFlow TG2 Generator System Series.

**Generator must be set to "OFF" and pressure gage must read zero before filter replacement.**

## Coalescing Filters

**Generator must be set to "OFF" and pressure gage must read zero before filter replacement.**

**1** The replacement elements are B100-18-DXE (first stage) and BY100-18-BXE (second stage). It is very important to install the proper grade filter into the proper housing. Take extra care to install in the proper sequence (see Figure 36). From the rear, DX on left, BX on right.

**2** Twist the bowl loose from the head of the assembly, counter clockwise, and remove carefully so as not to damage or lose the o-ring (see Figure 37).

**3** Unscrew the element retainer at the base of the element, and replace the spent element with a new one (see Figure 38).

**4** Reverse the steps to reassemble. Make sure the o-ring is sealed in the groove before reinstalling the bowl.

**Figure 37**

**Figure 38**

## Carbon Modules

During the 10,000 hour service interval only the inlet Carbon Module (B06-0264) closest the rear of the generator is replaced (see figure 10). All three carbon modules are replaced during the 30,000 hour service. Please note that the carbon modules will only mount to the brackets in one orientation.

**Figure 39**

1. Remove the top panel from the NitroFlow TG2 Generator Series by removing two screws with a phillips head screwdriver and pulling top panel to the rear.
2. Disconnect the plastic tubing from the press fittings on the inlet and outlet ports of the module
3. Release the hook and loop strap that clamps the module to the unit (see Figure 39). Slide the module out of the bracket.
4. Replace with a new carbon module, noting the correct orientation.
5. Slide the new module into the bracket fully and re-attach the hook and loop strap.
6. Re-insert inlet and outlet tubing. Use a soap or a leak detecting solution to check for leaks when pressurizing (re-starting) the unit.

**Generator must be set to "OFF" and pressure gage must read zero before filter replacement.**

## Particulate Filters

1. Using a 1" wrench, remove the tie nut at the base of the bowl (see Figure 40).
2. Twist the bowl loose from the head of the assembly and remove carefully as not to damage or lose the o-ring (see Figure 41).
3. Pull off the element retainer at the base of the filter, and replace the spent filter element with a new one (see Figure 42).
4. Reverse the steps to re-assemble. Make sure the o-ring is sealed in the groove before reinstalling the bowl. Hand tighten, plus 1/4 turn using the 1" wrench.

**Figure 40**

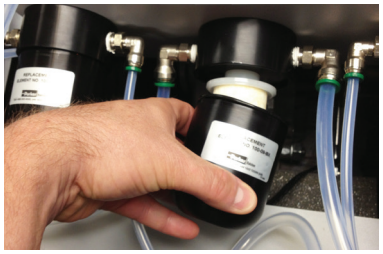


**Figure 41**

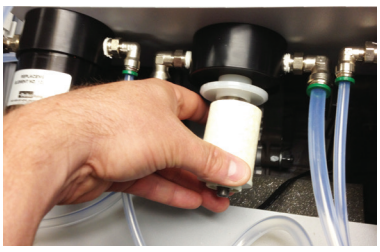


**Figure 42**

## Filter Silencer

1. Unscrew the existing filter silencer from the base of the back pressure regulator by rotating the silencer counterclockwise (see figure 43).
2. Carefully thread and screw the new filter silencer into place by rotating clockwise until snug.

**Figure 43**

## Timed Solenoid Drain

1. Remove the main side access panel by removing T-25 Torx head screws.
2. Ensure that the tank is fully depressurized by pressing the “TEST” button on the drain timer (see figure 47).
3. Disconnect the power cord from the generator power receptacle.
4. Remove the 2 bolts holding the small power cord receptacle/drain bulkhead panel in place (see figure 44).
5. Disconnect the drain tube from the quick disconnect fitting on the drain inlet (see figure 46).
6. Remove the Phillips head screw holding the electrical connector onto the timer. Note: this connector will be reused with the new drain assembly (see figure 47).
7. Remove drain assembly from bulkhead fitting and then the quick disconnect fitting from drain inlet. Note: both the bulkhead and quick disconnect fittings will be reused with the new drain assembly. Parker recommends the use of Teflon plumbers tape on the treads of these fittings during reassembly.
8. Reverse steps to install the new drain taking care to position both the timer/coil and quick disconnect fitting in the same orientation as they were with the old drain. Note: you may need to loosen the 14mm valve top nut to reposition the timer/coil.
9. Ensure the new timer settings match those on the old timer, 2 seconds and 10 minutes.
10. Ensure that the ball valve on the new drain is open by slowly turning the black knob in-line with the drain body.
11. Reconnect power and test the generator and drain operation

**Figure 44**

**Figure 45**

**Figure 46**

**Figure 47**

# System Specifications

| System Specifications | NitroFlow TG2 |
|---|---|
| CSA Certification Standard | CAN/CSA C22.2 No. 61010-1 |
| IEC Standard | IEC 61010-1 |
| UL Standard | UL 61010 |
| IEC 61010 Installation | Category II |
| IEC 61010 Pollution | Degree 2 |
| Impact Code | IK08 |
| EMC Compliance | EN61326-1/CISPR 11 |
| Curtain Gas (N2) Purity | 99.999% Organics, >96->93% N2 depending on flow |
| Curtain Gas Max. Flow/Pressure | 30 SLPM/80 PSIG (5.5 barg) |
| Gas 1 / Gas 2 Purity[2] | <0.1 PPM Total Hydrocarbons / -40°F (-40°C) ATM Dew Point |
| Gas 1 / Gas 2 Max. Flow Pressure | 34 SLPM/110 PSIG (8.2 barg) |
| Source Gas (Dry Air) Purity | <0.1 PPM Total Hydrocarbons / -40°F (-40°C) ATM Dew Point |
| Source Gas Max. Flow Pressure | 34 SLPM/110 PSIG (8.2 barg) |
| Suspended Liquids | None |
| Particles > 0.01 Micron | None |
| Phthalates | None |
| Sound Level | <49 dB(A) at 1 meter |
| Min./Max. Compressor Operating Pressure | 130/137 PSIG (8.9 to 9.4 barg) |
| Min./Max. Ambient Temp. | 60°F/85°F (16°C-29°C) |
| Max. Ambient Relative Humidity | 43% at 86°F – see chart on page 17 |
| Altitude | 2000M (for higher altitude, see chart on page 18) |
| Heat Dissipation | 10246 BTU/Hour |
| Electrical Requirements[1] - 60 Hz | 208-254VAC, 60 Hz, 1 Phase, 16A |
| Electrical Requirements[1] - 50 Hz | 230VAC, 50 Hz, 1 Phase, 13A |
| Power Consumption - 60 Hz | 16A@230VAC, 3680 Watts |
| Power Consumption - 50 Hz | 13A@230VAC, 2990 Watts |
| Start-Up Time | 10 Minutes |
| Compressor Outlet - Tank Drain | 1/4” Tube |
| Ports - Filter Drains (2) | 1/4” Tube |
| Ports - Water Separator | 1/4” Tube |
| Ports - Nitrogen Outlet | 1/4” NPT |
| Ports - Dry Air Outlet | 1/4” NPT |
| Ports - Hydrocarbon Free Air | 1/4” NPT |
| Fuses - Primary FU1, FU2 | 10.3 x 38.1mm, Type T, 600V, 1.25A |
| Fuses - Secondary FU3 | 6.3 x 31.7mm, Type T, 250V, 1.25A |
| Dimensions | 33.5”L x 20.75”W x 45.25”H |
| Product Weight | 427 lbs (194 kgs) |
| Shipping Weight | 637 lbs (289 kgs) |

[1] Main supply voltage fluctuations not to exceed ± 10% of nominal voltage.
[2] Hydrocarbons other than methane.

## Cautions

1. The generator should be installed in an area with adequate ventilation to reduce the flammability of the oxygen-rich permeate stream. The system should not be located in an area where the permeate stream poses the risk of explosion or combustion
2. **Nitrogen is nontoxic and largely inert. It can act as a simple asphyxiant by displacing oxygen in air. Inhalation of nitrogen in excessive concentrations can result in unconsciousness without any warning symptoms such as dizziness and fatigue**.
3. The maximum operating pressure of the system is 137 psig (9.4 barg). Operating the generator at pressures above 137 psig (9.4 barg) will result in damage to the pump and membrane.
4. The drain lines should be piped away to the provided collection container (open to atmospheric pressure) to avoid any possible re-entrainment of liquid in the air which feeds the generator.
5. Changes in inlet pressure or outlet flow demand will alter the gas purity.
6. **Install the generator in a room where the ambient temperature and humidity are below 85°F at 43% RH.**

| Accessory Parts | Part Number |
|---|---|
| Voltage Step-Down Transformer | A03-0412 |
| Voltage Step-Up Transformer | A03-0411 |
| Exhaust Ventilation Kit | B04-0575 |
| Bottle Drain Kit | B04-0540 |
| In-line Duct Fan (120V) | A03-0378 |
| Exhaust Duct Kit | B04-0693 |

**Maximum Relative Humidity at Different Temperatures**

| Temperature (°F) | Relative Humidity (%) |
|---|---|
| 86 | 43 |
| 80 | 51 |
| 75 | 60 |
| 70 | 71 |
| 65 | 84 |
| 60 | 100 |

**Compressor Output Pressure at Different Altitudes**

| Altitude | Max Compressor Pressure at Full Flow | Max Outlet Pressure |
|---|---|---|
| 0 – 3,280 ft (0 – 1000 m) | 125 psig | 115 psig |
| 3,281 – 8,200 ft (1,001 – 2,500 m) | 125 psig | 115 psig |
| 8,201 – 13,100 ft (2,501 – 4,000 m) | 116 psig | 106 psig |
| 13,101 ft (4,001 m) | N/A | N/A |

## Troubleshooting

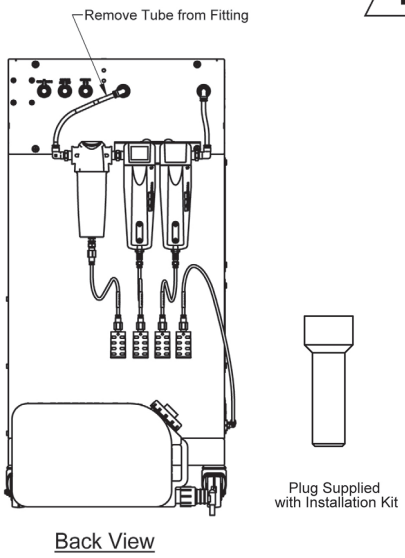



**Figure 48**

**Disconnect the electrical power and depressurize the generator before attempting any troubleshooting activities according to the shut down steps in the operation section. Only trained personnel using reasonable care should perform any troubleshooting activities.**

Determine whether the trouble is with the compressor or the gas generator. Disconnect the plastic tubing from the compressor fitting (see Figure 43). Once removed, place supplied plug into fitting. Check that the compressed air source builds full pressure and cycles off within two minutes.

If the compressor air supply is confirmed, remove lower side panel and relieve tank pressure using auto tank drain test button. Proceed to the NitroFlow TG2 generator Troubleshooting section (page 20), and begin troubleshooting the NitroFlow TG2 generator. Otherwise, refer to the Compressor Troubleshooting section (pages 19, 20), and begin troubleshooting the compressor.

## Compressor Troubleshooting

| Symptom | Probable Cause | Corrective Action |
|---|---|---|
| **POWER ON light (green) does not appear** | • Power not plugged in supply outlet | • Plug in power cord |
| | • Power switch is not ON | • Switch POWER to ON |
| | • Blown fuse or tripped OFF circuit breaker at customer provided power supply | • Replace fuse or switch disconnect ON |
| | • Blown fuse at primary side of transformer | • Replace fuse on primary side. Be sure to use the same type and size |
| | • LED power switch has failed | • Replace switch |
| **POWER ON light is on but motor will not start** | • Motor overload has tripped | • Determine fault and reset overload (Blue button) |
| | • Wrong or low voltage | • Check incoming power supply and unit power rating |
| | • Starter failed | • Replace contractor assembly |
| | • Motor failed | • Replace motor |
| **Compressor is running but will not make pressure** | • Auto drain valve is open continuously | • Replace auto drain valve |
| | • Drive belts broke or are too loose | • Replace drive belts and (or) tighten to specification |
| | • Clogged intake filter elements | • Replace intake filter element per instructions |
| | • Pressure relief valve has opened | • Pressure switch needs replacing or motor contacts welded shut |
| | • Excessive tip seal wear | • Replace tip seals per instructions every 5,000 hrs |
| | • Motor running wrong direction | • Correct power connections |
| **Excessive noise or vibration** | • Drive belts are loose | • Tighten belts to specification |
| | • Drive belt has separated or flat spot | • Replace drive belt |
| | • Cooling fan touching guard | • Adjust guard |
| | • Motor bearing has failed | • Replace motor |
| | • Re-greasing procedure not performed at 5,000 hr intervals | • Removal of stationary scroll is required for pump inspection |
| | • Pump damaged | • Repair or replace pump |
| | • Intake filters loose on pump | • Tighten intake filters |

## Compressor Troubleshooting

| Symptom | Probable Cause | Corrective Action |
|---|---|---|
| **TEMPERATURE HIGH light is on, Compressor shuts down** | • Room temp is above 90°F | • Add ventilation or air conditioning to room |
| | • Inlet air duct is obstructed | • Remove obstruction or reposition unit to allow for cooling air |
| | • Cooling air fan not running | • Check electrical connection at fan<br>• Replace cooling air fan |
| | • Re-greasing procedure not performed at 5,000 hr intervals | • Re-grease |
| | • Aftercooler fins dirty, clogged | • Clean aftercooler |
| | • Excessive tip seal wear | • Replace tip seals per instructions every 5,000 hrs |
| | • Intake filter damaged | • Check, replace filter |
| | • Compressor is dirty | • Clean unit |
| **Compressor shuts down on temperature malfunction** | • Temperature switch has unplugged | • Plug in temperature switch |
| | • Temperature switch has failed | • Replace temperature switch |
| **Compressor turns on/off rapidly** | • Receiver tank has high level of water | • Replace electric tank drain |
| | • Compressor check valve has failed | • Replace check valve |
| | • Defective pressure switch | • Replace pressure switch |
| **Safety valve blows off** | • Pressure switch has failed to open | • Replace pressure switch |
| | • Motor starter contacts welded shut | • Replace motor starter |
| **Motor overload has tripped** | • Motor has failed | • Replace motor |
| | • Improper wiring | • Check wiring |
| | • Wrong overload setting | • Check overload setting |
| | • Low voltage | • Check incoming power supply |
| | • Pump has failed | • Fix or replace pump |

## NitroFlow TG2 Generator Troubleshooting

| Symptom | Probable Cause | Corrective Action |
|---|---|---|
| **No pressure** | • Compressor is not ON | • Turn on compressor |
| | • Regulator is closed | • Open pressure regulator |
| | • System leaks at fitting connections | • Check for leaks at connections |
| **No or Low Flow** | • Internal leak | • Check for leaks |
| | • External leak | • Check for leaks |
| | • Compressor not at pressure | • See compressor section |
| | • Particulate filter plugged | • Replace filter |
| | • Membrane rupture | • Replace membrane |
| **Low Output Pressure** | • Flow demand greater than rated capacity | • Reduce flow demand |
| **Low Nitrogen Purity** | • Flow demand greater than 30 LPM | • Reduce flow demand |
| | • Nitrogen Module Malfunction | • Replace module |
| | • High relative humidity | • Move to area where RH is less than 43% at 85°F – see table |
| | • Water carryover due to water separator float drain malfunction | • Replace water separator float drain |
| | • Water carryover due to filter float drain malfunction | • Replace filter float drain |
| | • Spent carbon modules | • Replace carbon modules |
| **Change in Dewpoint** | • Internal leak | • Check for leaks |
| | • Water carryover due to water separator float drain malfunction | • Replace water separator float drain |
| | • Water carryover due to filter float drain malfunction | • Replace filter float drain |
| | • High relative humidity | • Move to area where RH is less than 43% at 86°F – see table |
| | • Total flow demand greater than 68 SPLM for the Gas 1/ Gas 2 and source gas outlets | • Reduce flow demand |

## Don't Forget To:

1. Complete and mail or fax in your warranty 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 (North America only) or email at balstontechsupport@parker.com with any questions. For other locations, please contact your local representative.

The serial number for the unit is attached to the back panel. 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: wear components 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 in North America.

**COMPRESSOR LIMITED WARRANTY**

COMPRESSOR 3 YEAR / 10,000 HOUR EXTENDED PARTS LIMITED WARRANTY - Compressor Manufacturer warrants each Compressor Pump or Scroll Air-End against defects in material or workmanship from the date of purchase for a period of **Three years or 10,000 hours**, whichever may occur first. This warranty applies to the exchange of part(s) of the compressor pump or air-end found to be defective by an Authorized Service Center.

COMPRESSOR 1 YEAR / 5,000 HOUR INLET TO OUTLET LIMITED WARRANTY - Compressor Manufacturer warrants each Compressor Unit, System, Pump, or Air-End against defects in material or workmanship from the date of purchase for a period of **One Year or 5,000 Hours,** whichever may occur first. This warranty applies to the exchange of defective component part(s) and labor performed by an Authorized Service Center.

Complete details of the Warranty are available on request.

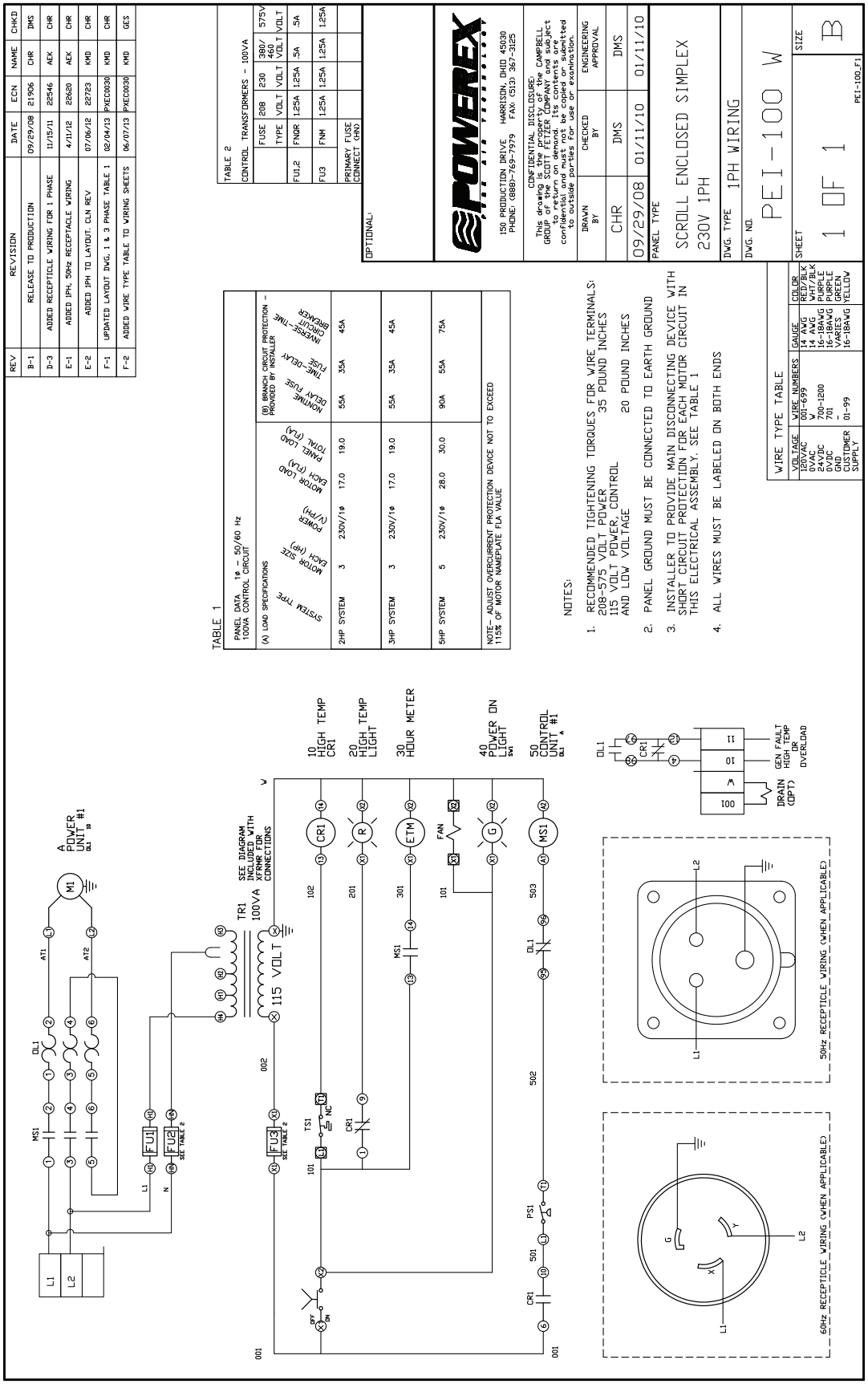

REV | REVISION | DATE | ECN | NAME | CHK'D
B-1 | RELEASE TO PRODUCTION | 09/29/08 | 21906 | CHR | DMS
D-3 | ADDED RECEPTICLE WIRING FOR 1 PHASE | 11/15/11 | 22546 | AEK | CHR
E-1 | ADDED 1PH, 50Hz RECEPTACLE WIRING | 4/11/12 | 23620 | AEK | CHR
E-2 | ADDED 1PH TO LAYOUT. CLN REV | 07/06/12 | 22723 | KMD | CHR
F-1 | UPDATED LAYOUT DWG. 1 & 3 PHASE TABLE 1 | 02/04/13 | PXEC0030 | KMD | CHR
F-2 | ADDED WIRE TYPE TABLE TO WIRING SHEETS | 06/07/13 | PXEC0030 | KMD | GES
TABLE 2
CONTROL TRANSFORMERS - 100VA
FUSE TYPE 208 VOLT 230 VOLT 380/460 VOLT 575V VOLT
FU1,2 FNQR 1.25A 1.25A .5A .5A
FU3 FNM 1.25A 1.25A 1.25A 1.25A
PRIMARY FUSE CONNECT (HN)
OPTIONAL:
POWEREX
150 PRODUCTION DRIVE HARRISON, OHIO 45030
PHONE: (888)-769-7979 FAX: (513) 367-3125
CONFIDENTIAL DISCLOSURE:
This drawing is the property of the CAMPBELL GROUP of the SCOTT FETZER COMPANY and subject to return on demand. Its contents are confidential and cannot be disclosed to outside parties for use or examination.
DRAWN BY CHR 09/29/08
CHECKED BY DMS 01/11/10
ENGINEERING APPROVAL DMS 01/11/10
PANEL TYPE
SCROLL ENCLOSED SIMPLEX
230V 1PH
DWG. TYPE 1PH WIRING
DWG. NO.
PEI-100 W
SHEET 1 OF 1
SIZE B
PEI-100_F1
TABLE 1
PANEL DATA, 1ø - 50/60 Hz
100VA CONTROL CIRCUIT
(A) LOAD SPECIFICATIONS
SYSTEM TYPE | MOTOR SIZE EACH (HP) | POWER (V/Ph) | MOTOR LOAD EACH (FLA) | PANEL LOAD TOTAL (FLA)
(B) BRANCH CIRCUIT PROTECTION - PROVIDED BY INSTALLER
MONITOR DELAY FUSE | TIME DELAY FUSE | INVERSE-TIME CIRCUIT BREAKER
2HP SYSTEM 3 230V/1ø 17.0 19.0 55A 35A 45A
3HP SYSTEM 3 230V/1ø 17.0 19.0 55A 35A 45A
5HP SYSTEM 5 230V/1ø 28.0 30.0 90A 55A 75A
NOTE- ADJUST OVERCURRENT PROTECTION DEVICE NOT TO EXCEED 115% OF MOTOR NAMEPLATE FLA VALUE
NOTES:
1. RECOMMENDED TIGHTENING TORQUES FOR WIRE TERMINALS:
208-575 VOLT POWER 35 POUND INCHES
115 VOLT POWER, CONTROL AND LOW VOLTAGE 20 POUND INCHES
2. PANEL GROUND MUST BE CONNECTED TO EARTH GROUND
3. INSTALLER TO PROVIDE MAIN DISCONNECTING DEVICE WITH SHORT CIRCUIT PROTECTION FOR EACH MOTOR CIRCUIT IN THIS ELECTRICAL ASSEMBLY. SEE TABLE 1
4. ALL WIRES MUST BE LABELED ON BOTH ENDS
WIRE TYPE TABLE
VOLTAGE | WIRE NUMBERS | GAUGE | COLOR
120VAC | 001-699 | 14 AWG | RED/BLK
0VAC | W | 14 AWG | WHT/BLK
24VDC/VDC | 700-1200 | 16-18AWG | VIOLET
0VDC | 701 | 16-18AWG | PURPLE
GND | - | VARIES | GREEN
CUSTOMER SUPPLY | 01-99 | 16-18AWG | YELLOW
A POWER UNIT #1
M1
MS1
DL1
AT1
AT2
L1
L2
FU1
FU2
SEE TABLE 2
N
TR1
100VA
115 VOLT
SEE DIAGRAM INCLUDED WITH XFMR FOR CONNECTIONS
FU3
TS1
NC
CR1
10 HIGH TEMP CR1
20 HIGH TEMP LIGHT
30 HOUR METER
ETM
FAN
40 POWER ON LIGHT
G
50 CONTROL UNIT #1
MS1
PS1
OFF
ON
DL1
GEN FAULT HIGH TEMP OR OVERLOAD
DRAIN (OPT)
60Hz RECEPTICLE WIRING (WHEN APPLICABLE)
50Hz RECEPTICLE WIRING (WHEN APPLICABLE)

**Figure 49**

Printed in U.S.A. Bulletin TI-NITROFLOWTG2-PKI-A 7/2019

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