



NitroFlow60 and NitroFlow60D

Installation, Operation, and Maintenance Manual

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

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 Nitroflow60 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 balstontechsupport@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.

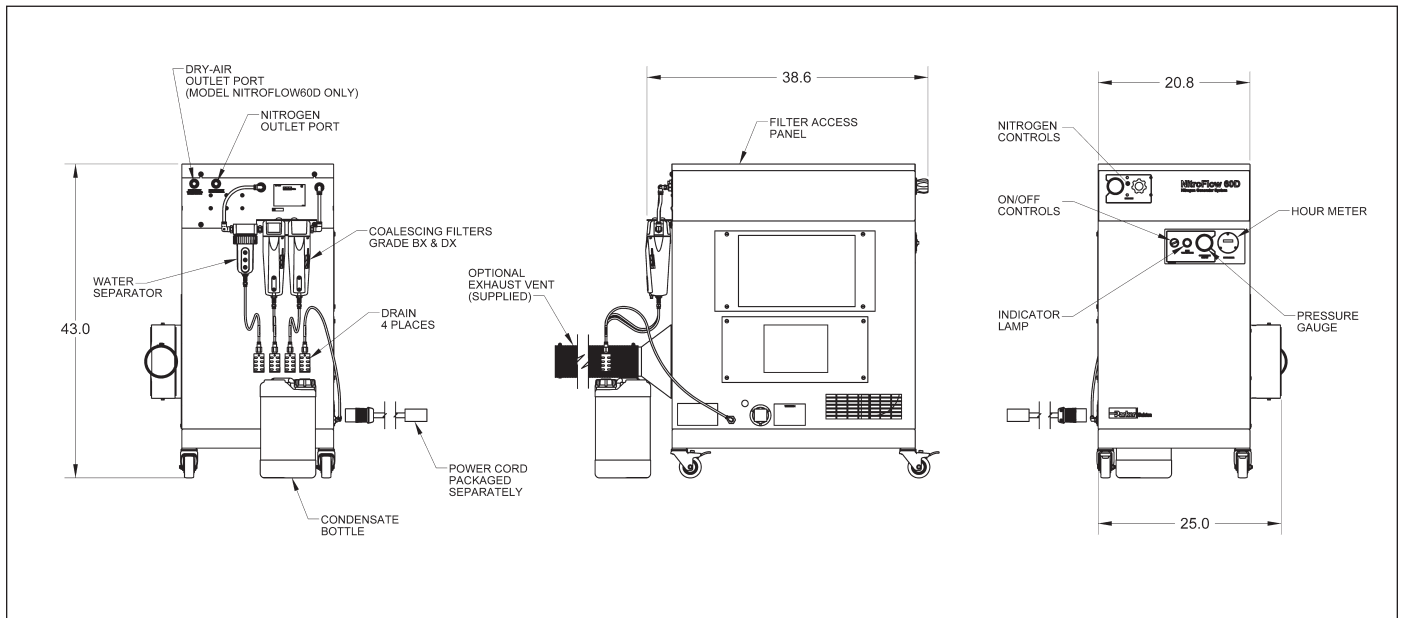


Figure 1 Model NitroFlow60 & NitroFlow60D Nitrogen Generator

General Description

The NitroFlow60 Nitrogen Generator System Series are available in two models (Figure 1):

- (1) NitroFlow60 Nitrogen Generator System(No Dry Air output)
- (2) NitroFlow60D Nitrogen Generator System(Dry Air output)

The integrated system is engineered to produce pure nitrogen gas and clean, dry -40°F dew point air gas from compressed 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 removes contaminants and separates the compressed air into the two gases.

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 NitroFlow60 generator contains the necessary components to produce reliable, oil-free compressed air, pure nitrogen, and dry air gases. The system consists of five functional technologies: (1) compressed air, (2) liquid water removal, (3) prefiltration, (4) oxygen/carbon dioxide/water vapor removal, and (5) final filtration. The nitrogen generator flow schematic (figure 2) shows the airflow through the intake filter, compressor pump, aftercooler, receiver tank, and check valve. The compressed air then flows through a water separator and prefiltration where additional water (liquid and vapor) is removed. After filtration, the compressed air flow passes through a 3-way pneumatic valve, an activated carbon prefilter, nitrogen module, pressure regulator, and post carbon filter, providing the nitrogen gas. The second flow path passes through a back pressure regulator to maintain a 100% duty cycle of the compressor. The third flow path passes through a dryer membrane providing dry air. Dry air available on NitroFlow60D series only.

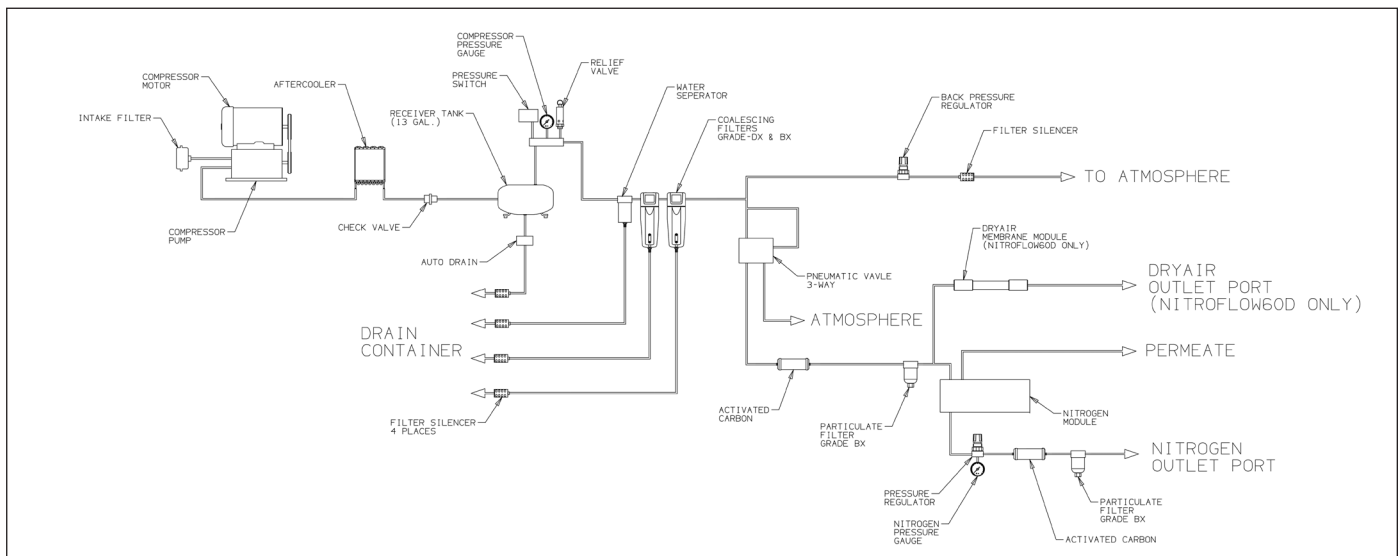


Figure 2, Nitrogen Generator Flow for NitroFlow60 and NitroFlow60D

Compressor Pump

The oil-less rotary scroll compressor is based on the theory of scroll compression. It offers high reliability and quiet operation. The scroll set consists of two identical spirals; offset 180° with respect to the other so the scrolls mesh. One scroll is orbited around the fixed scroll, trapping and compressing gas pockets as the pockets move to the center of the fixed scroll. The compressed gas is discharged from the pump through the center outlet.

Compressor After Cooler

The air-cooled aftercooler on the scroll compressor is a series of cooling fins and a high output fan. The cooling features allow the scroll compressor to operate at lower temperatures and extend bearing, tip seal and grease life. The aftercooler cools the temperature of the discharge air. The temperature of the discharge air is lowered, producing trapped water in the tank. The water is then discharged through the automatic electric drain valve and collected in a disposal container.

Water Separator

The NitroFlow60 generator series 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 service instructions, 2F101H, for maintenance instructions.

Prefilters

Two stages of high efficiency coalescing prefiltration are incorporated into the design of the NitroFlow60 to remove water and particulate contamination to 0.01 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.

Inlet Carbon Module and Filter

An activated carbon module is located before the nitrogen module to remove any chlorinated hydrocarbon contaminants that may exist in the room air. A particulate filter is located after this carbon module to remove any carbon contaminants.

Nitrogen Module

The NitroFlow60 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.

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 and flow rate of 4 slpm. Available with NitroFlow60D only.

Outlet Carbon Module and Filter

There is one final activated carbon module and particle filter located at the outlet gas that protects the gas purity from environmental contaminants to assure medical/research grade is entering the instrument.

Diagnostics

There are two diagnostic indicator lights on the Parker Balston NitroFlow60 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 NitroFlow60 Generator System Series (NitroFlow60 and NitroFlow60D) should be performed by trained personnel using reasonable care to avoid injury or damage.

The NitroFlow60 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).



Figure 5



Figure 6



The generator is for indoor use only. Do not install outdoors. The ambient temperature of the air surrounding the generator should not exceed 90°F (32°C) or be below 60°F (15°C). If the generator is located in a totally enclosed room without ventilation, an exhaust fan with access to outside air must be installed. 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 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 NitroFlow60 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 NitroFlow60 Generator Series requires one electrical power outlet: a dedicated grounded 208 to 254VAC, 60Hz, single phase, minimum 30 Amp circuit breaker with a NEMA 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 NitroFlow60 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 a minimum 20 amperes 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 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 34 on page 22.

System	Comments	Region
NitroFlow60NA	230V-60Hz, cordset has U.S. plug	North America
NitroFlow60DNA	230V-60Hz, cordset has U.S. plug	North America
NitroFlow60WD	230V-50Hz, cordset matched to region	Rest of world
NitroFlow60DWD	230V-50Hz, cordset matched to region	Rest of world
NitroFlow60JA200	230V-50Hz, cordset has a JA PSE plug	Japan
NitroFlow60DJA200	230V-50Hz, cordset has a JA PSE plug	Japan

Notes

Cordset Rating

- "D" designation indicates additional dry air supply for chip cube requirements
- JA-200 versions include an external step-up transformer and gages indicating pressure in kPa
- WD(World Design) requires assignment of appropriate cordset, see table below

A03-0430	NA.....	30A, 250V
A03-0344	EU, IND, UK (ROW 230V,50Hz).....	32A, 250V
A03-0345	AU.....	32A, 250V
A03-0407	JA.....	30A, 250V
A03-0347	CHINA.....	32A, 250V



Figure 7, NEMA L6-30R 30AMP/250V Receptacle for Model: NA (North America)



Figure 8

Piping

There are six plastic tubing connections for the NitroFlow60 generator: (1) nitrogen outlet gas connection; (1) dry air outlet gas connection (NitroFlow60D only); (4) drain connections. Press the tubing into the quick-connect fittings. Assure tubing is fully inserted (about 1/2"). Tubing is provided in the installation kit. For remote locations, additional length tubing is provided.

Drains

The generator drain tube is a black nylon 1/4" 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 1/4" tubing connecting the drain outlets to the same provided disposal container (see Figure 9). Blue silencers are provided for each drain line.

Outlet Gases

The two outlet gas ports consist of two 1/4" NPT bulkhead fittings (NitroFlow60D only. See Figure 10). The non dry-air version consists of one 1/4" NPT bulkhead fitting and a cap on the second outlet port. Parker Balston recommends minimum 3/8" 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.



Figure 9



Figure 10

Recommended Accessories



A03-0286 voltage step-down transformer - If your facility supply voltage is 255V or higher, then the use of this transformer is required.



A03-0281 voltage step-up transformer - If your facility supply voltage is 195V or lower, then the use of this transformer is required.

Operation

Start-up

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 11



Figure 12

Rotate, clockwise, the Power On (see Figure 11) on the front panel of the generator. The generator will start and the green LED will illuminate. The pressure gauge indicates compressor pressure. The pressure slowly increases to a maximum set pressure of 125 psig (8.6 barg). Full pressurization will occur within 10 minutes.

Rotate the nitrogen regulator knob to set the desired outlet pressure as indicated by the nitrogen output gauge (see Figure 12)

Operation



During normal operation, the generator's power switch is illuminated green. The compressor pressure gauge indicates a pressure between 115 to 120 psig (7.9 to 8.2 barg). If the pressure drops below 115 psi, then the nitrogen flow is too high. **Maximum nitrogen pressure should not exceed 100 psi at the maximum flow rate of 60 slpm.** The compressor operates on a 100% duty cycle (pump on continuously).

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. Compressor drain operate 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 13): 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 faulty 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 output pressure gauge should read 115 psig to 120 psig during normal operation.

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



Figure 13



Figure 14

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 the power returns.

Shutdown

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

Maintenance

Maintenance tasks for the NitroFlow60 and NitroFlow60D 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 according to the following schedules (refer to the replacement parts section for the part numbers when ordering); Schedule 1 is servicing the compressor and Schedule 2 is servicing the generator.

**Schedule 1
 Compressor**

Schedule 1 (refer to figures 15 and 16)		
Replace	Quantity	Hours ¹
Intake Filter	2	8700 hours
Belts	2	8700 hours
Tip Seal Set	1	8700 hours
Grease	1	8700 hours
Pump	1	30,000 hours
Discharge Pipe Sleeve	1	8700 hours

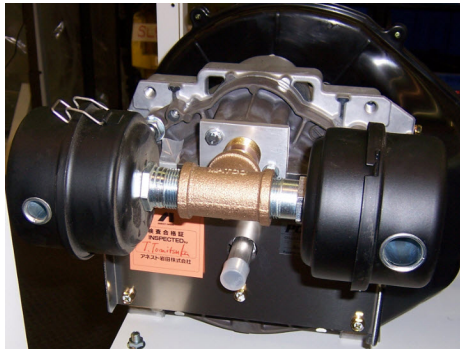


Figure 15

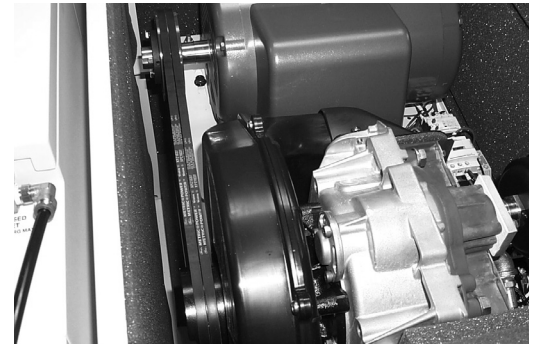


Figure 16

**Schedule 2
 Nitroflow60 and
 Nitroflow60D
 Generator**

Schedule 2 (refer to figure 17)		
Replace	Quantity	Hours ¹
Filter Element (P/N 100-18-DX)	1	8700 hours
Filter Element (P/N 100-18-BX)	1	8700 hours
Filter Silencer (P/N 75117)	1	8700 hours
Filter Element (P/N 100-09-BX)	2	8700 hours
Carbon Module (P/N B04-0525)	2	8700 hours

¹ Frequency hours for NitroFlow60 and NitroFlow60D are recorded by an hour meter.
 Note: The meter indicates 00000.0 hours. The hour meter does not reset.

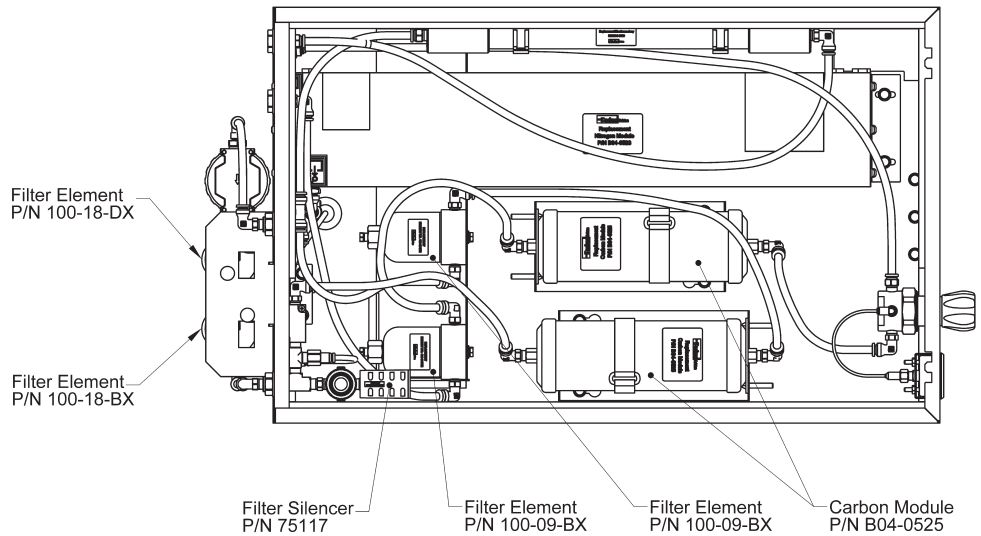


Figure 17, Maintenance Items

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.

Schedule 1 Instructions

- 1 Remove the upper side panel (see Figure 15).
- 2 By hand, push-in and rotate one intake filter cap to remove. Undo latch to remove second intake filter cap (see Figure 20).
- 3 Replace the old filter elements with a new one, reverse steps to reassemble.

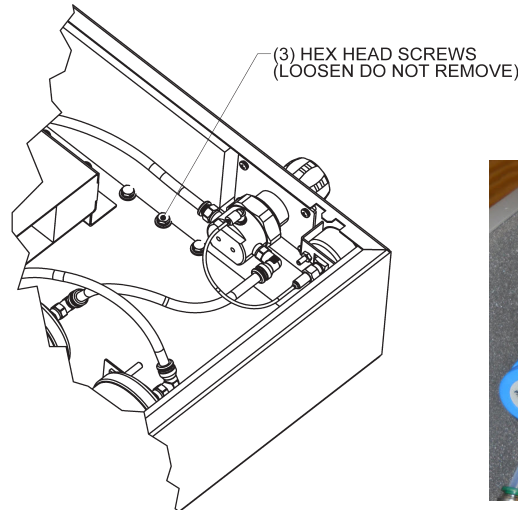
Intake Filter

Figure 18



Figure 19

Compressor Inlet Tube

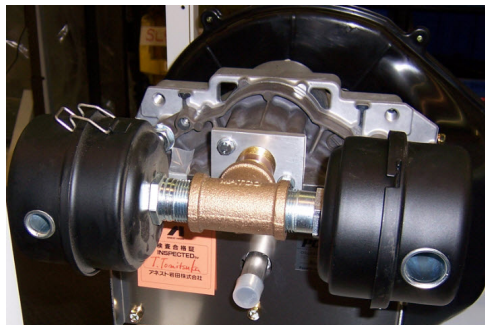


Figure 20

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 generator cabinet on the unit by removing two screws with a phillips head screwdriver.
 - a. LOOSEN (do not remove) three hex head screws located at the front of the cabinet (figure 18).
 - b. Remove compressed air inlet tube from generator cabinet (see Figure 19).
 - c. Pull cabinet to the rear and lift off of compressor cabinet. Be cautious of exterior pre-filters.
- 3 Check belt tension (see figure 16) 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.
- 4 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 21)
- 5 Adjust tension if required by adjusting motor bracket. Replace belts if needed.

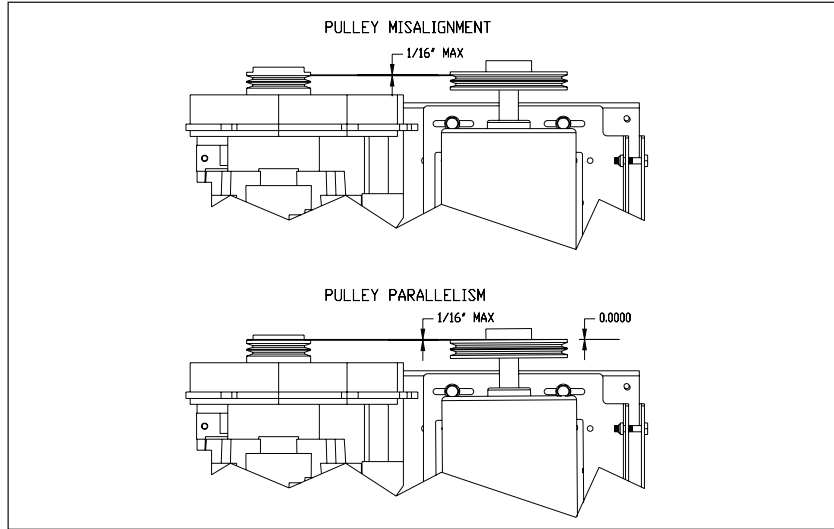


Figure 21, belt diagram

**Grease Orbital
 Scroll Compressor
 Bearings**

- 1 Remove the plastic dust cap from the pump (see figure 22).
- 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 22.

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

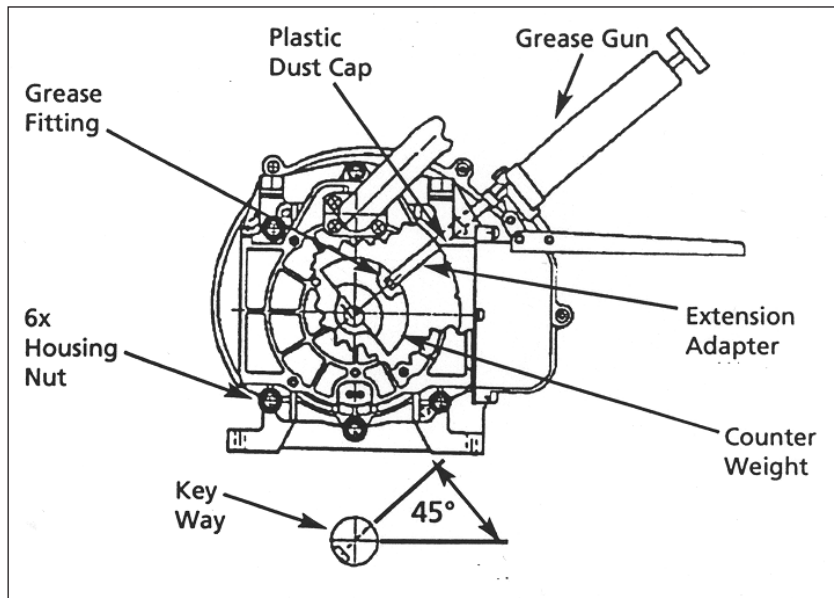


Figure 22 Grease and Orbit Scroll Bearing

Grease Pin Crank Bearing

- 1 Remove the side service panel (see figure 15).
- 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 23.
- 5 Replace fixed scroll and fan duct. Torque bolts, initially 17 inch-lbs., then finally 175 inch-lbs.

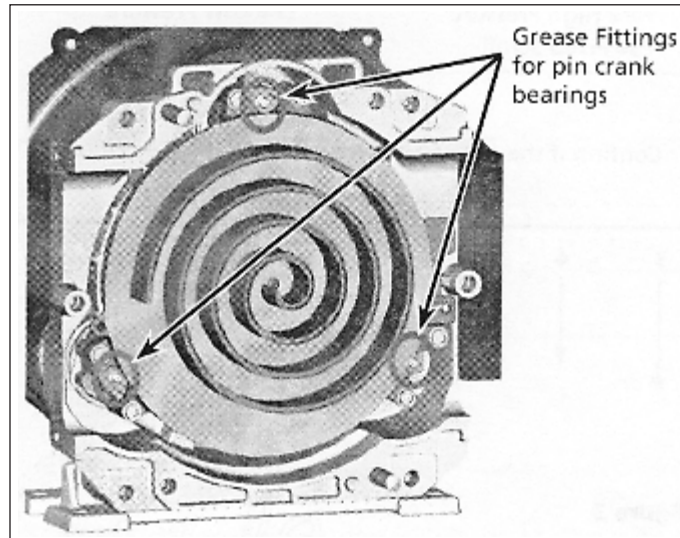


Figure 23

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 22).
 - 2 Remove the stationary scroll housing.
 - 3 Remove the old tip seals from both the orbiting and stationary scroll housings.
 - 4 Remove the old dust seals from both housings.
 - 5 Blow off any dust from both housings.
 - 6 Install the new high pressure (shorter one) tip seal starting from the center of the scroll, outward inside the seal channel.
- 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.
- 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.**

- 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.
- 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.

12 Place dust seal over the backup tube.



Caution! The backup tube must meet at the bottom of the housing in the six o'clock position. The dust seal must meet on the right side of the housing at the three 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.

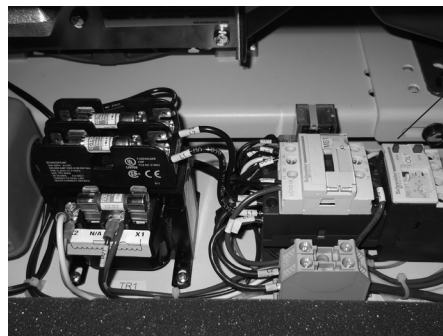
15 Tighten the six housing nuts to 265 in-lbs, using torque wrench.

Fuse Replacement



There are three fuses located in the compressor cabinet (see figure 24). **Before servicing the fuses, turn the generator off and disconnect the power cord from the power supply.**

To access the fuses, remove the upper side panel (see Figure 15), 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.**



Reset Button

Figure 24



Figure 25 Water Separator DX BX

Schedule 2 Instructions

These instructions describe the replacing of the two coalescing pre-filters, the two carbon modules, and two particulate filters in the NitroFlow60 Generator System Series.



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

Coalescing Filters

- 1 The replacement elements are B2104N-1B1-DX (first stage) and B2104N-0B1-BX (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 25). 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 26).
- 3 Unscrew the element retainer at the base of the element, and replace the spent element with a new one (see figure 27).
- 4 Reverse the steps to reassemble. Make sure the o-ring is sealed in the groove before reinstalling the bowl.



Figure 26



Figure 27



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

Carbon Modules

There are two carbon modules that require changing. Please note that the carbon modules will only mount to the brackets in one orientation (see figure 28).



Figure 28



Figure 29

- 1 Remove the top panel from the NitroFlow60 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. To remove the tubing from the press fitting, push the tubing into the fitting, hold the collar of the fitting back, and pull the tubing out of the fitting.
- 3 Release the hook and loop strap that clamps the module to the unit (see figure 29). Slide the module out of the bracket.
- 4 Replace with a new carbon module, noting the correct orientation (see figure 28).
- 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 Remove the top panel from the NitroFlow60 Generator Series by removing two screws with a Phillips head screwdriver.
- 2 Using a 1" wrench, remove the tie nut at the base of the bowl (see figure 30).
- 3 Twist the bowl loose from the head of the assembly and remove carefully as not to damage or lose the o-ring (see figure 31).
- 4 Unscrew the element retainer at the base of the element, and replace the spent element with a new one (see figure 32).
- 5 Reverse the steps to re-assemble. Make sure the o-ring is sealed in the groove before reinstalling the bowl. Hand tighten.



Figure 30

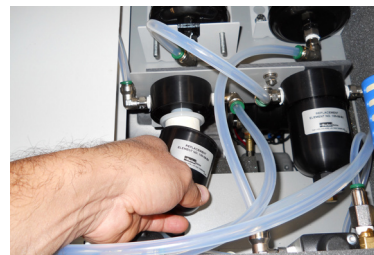


Figure 31



Figure 32

System Specifications

System Specifications	NitroFlow60	NitroFlow60D
CSA Certification Standard	CAN/CSA C22.2 No. 61010-1	CAN/CSA C22.2 No. 61010-1
IEC Standard	IEC 61010-1	IEC 61010-1
CENELEC Standard	EN 61010-1	EN 61010-1
UL Standard	UL 61010-1	UL 61010-1
IEC 61010 Installation	Category II	Category II
IEC 61010 Pollution	Degree 2	Degree 2
EMC Compliance	EN61326-1/CISPR 11	EN61326-1/CISPR 11
Nitrogen (N2) Purity	97%	97%
Nitrogen Max. Flow/Pressure	60 LPM/100 PSIG (6.9 Barg)	60 LPM/100 PSIG (6.9 Barg)
Dry Air Purity	-	-40° F (-40°C) ATM Dew Point
Dry Air Max. Flow/Pressure	-	4 SLPM/100PSIG (6.9 Barg)
Suspended Liquids	None	None
Particles > 0.01 Micron	None	None
Phthalates	None	None
Sound Level	49 dB(A) at 1 Meter	49 dB(A) at 1 Meter
Min./Max. Operating Pressure	115/120 PSIG (7.9/8.2 Barg)	115/120 PSIG (7.9/8.2 Barg)
Flow Capacity	See Pressure/Flow Charts	See Pressure/Flow Charts
Inlet Air Consumption	160 SLPM (5.7 scfm)	160 SLPM (5.7 scfm)
Min./Max. Ambient Temp.	60°F/90°F (16°C-32°C)	60°F/90°F (16°C-32°C)
Max. Ambient Relative Humidity	80%	80%
Altitude	2000M	2000M
Heat Dissipation	10246 BTU/Hour	10246 BTU/Hour
Electrical Requirements ¹ - 60 Hz	208-254VAC, 60 Hz, 1 Phase, 16A	208-254VAC, 60 Hz, 1 Phase, 16A
Electrical Requirements ¹ - 50 Hz	230VAC, 50 Hz, 1 Phase, 13A	230VAC, 50 Hz, 1 Phase, 13A
Power Consumption - 60 Hz	16A @ 230VAC, 3680Watts	16A @ 230VAC, 3680Watts
Power Consumption - 50 Hz	13A @ 230VAC, 2990Watts	13A @ 230VAC, 2990Watts
Start-Up Time	10 Minutes	10 Minutes
Compressor Outlet - Tank Drain	1/4" Tube	1/4" Tube
Ports - Filter Drains (2)	1/4" Tube	1/4" Tube
Ports - Water Separator	1/4" Tube	1/4" Tube
Ports - Nitrogen Outlet	1/4" NPT	1/4" NPT
Ports - Dry Air Outlet	-	1/4" NPT
Fuses - Primary FU1, FU2	10.3 x 38.1mm, Type T, 600V, 1.25A	10.3 x 38.1mm, Type T, 600V, 1.25A
Fuses - Secondary FU3	6.3 x 31.7mm, Type T, 250V, 1.25A	6.3 x 31.7mm, Type T, 250V, 1.25A
Dimensions	33.5"L x 20.75"W x 45.25"H	33.5"L x 20.75"W x 45.25"H
Product Weight	407 lbs (185 kgs)	407 lbs (185 kgs)
Shipping Weight	632 lbs (287 kgs)	632 lbs (287 kgs)

¹ Main supply voltage fluctuations not to exceed ± 10% of nominal voltage.

² Motor change installed in compressor Serial Number (H)8/8/2012-5284488-610 and after; NITROFLOW60 Serial Number, N260-0019 and after.

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 125 psig(8.6 barg). Operating the generator at pressures above 125 psig(8.6 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.

Replacement Parts

NitroFlow60 Compressor Replacement Parts	Part Number
8,700/17,400 Hour Maintenance Kit 1 ⁽¹⁾	MKNITROFLOW60-1
17,400 Hour Maintenance Kit 2 ⁽²⁾	MKNITROFLOW60-2
26,100 Hour Maintenance Kit 3 ⁽³⁾	MKNITROFLOW60-3
V-Belts Kit 4 ⁽⁴⁾	MKNITROFLOW60-4
Primary Fuses	A03-0324 (Figure 24)
Secondary Fuses	A03-0323 (Figure 24)
NitroFlow60 Maintenance Parts	Part Number
8,700 Hour Maintenance Kit 5 ⁽⁵⁾	MKNITROFLOW60-5
Accessory Parts	Part Number
Voltage Step-Down Transformer	A03-0412
Voltage Booster Step-Up Transformer	A03-0411
Exhaust Ventilation Kit	B04-0575
Bottle Drain Kit	B04-0540
In-line Duct Fan	A03-0378

⁽¹⁾ Kit 1 includes: Intake Filters, V-Belts, Tip Seal Set, Discharge Pipe Sleeve, Grease, and Grease Gun

⁽²⁾ Kit 2 is an Auto Drain Valve Assembly

⁽³⁾ Kit 3 includes: Compressor Pump, Intake Filters, and V-Belts, and Check Valve

⁽⁴⁾ Kit 4 includes: (2) V-Belts

⁽⁵⁾ Kit 5 includes: (2) Coalescing Filters, (4) Filter Silencer, (2) Particulate Filters, (2) Carbon Modules

Troubleshooting



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 33). 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 NitroFlow60 generator Troubleshooting section (page 20), and begin troubleshooting the NitroFlow60 generator. Otherwise, refer to the Compressor Troubleshooting section (pages 18, 19), and begin troubleshooting the compressor.



Remove Tube from Compressor Fitting

Figure 33

Compressor Troubleshooting

Symptom	Probable Cause	Corrective Action
POWER ON light (green) does not appear	<ul style="list-style-type: none"> Power not plugged in supply outlet Power switch is not ON Blown fuse or tripped OFF circuit breaker at customer provided power supply Blown fuse at primary side of transformer LED power switch has failed 	<ul style="list-style-type: none"> Plug in power cord Switch POWER to ON Replace fuse or switch disconnect ON Replace fuse on primary side. Be sure to use the same type and size Replace switch
POWER ON light is on but motor will not start	<ul style="list-style-type: none"> Motor overload has tripped Wrong or low voltage Starter failed Motor failed 	<ul style="list-style-type: none"> Determine fault and reset overload (Blue button) Check incoming power supply and unit power rating Replace contractor assembly Replace motor
Compressor is running but will not make pressure	<ul style="list-style-type: none"> Auto drain valve is open continuously Drive belts broke or are too loose Clogged intake filter element Pressure relief valve has opened Excessive tip seal wear Motor running wrong direction 	<ul style="list-style-type: none"> Replace auto drain valve Replace drive belts and (or) tighten to specification Replace intake filter element per instructions Pressure switch needs replacing or motor contacts welded shut Replace tip seals per instructions every 8,700 hrs Correct power connections
Excessive noise or vibration	<ul style="list-style-type: none"> Drive belts are loose Drive belt has separated or flat spot Cooling fan touching guard Motor bearing has failed Re-greasing procedure not performed at 8,700 hr intervals Pump damaged Intake filters loose on pump 	<ul style="list-style-type: none"> Tighten belts to specification Replace drive belt Adjust guard Replace motor Removal of stationary scroll is required for pump inspection Repair or replace 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
	• Re-greasing procedure not performed at 8,700 hr intervals	• Replace cooling air fan
		• Re-grease
	• Aftercooler fins dirty, clogged	• Clean aftercooler
	• Excessive tip seal wear	• Replace tip seals per instructions every 5,000 hrs
Compressor shuts down on temperature malfunction	• Intake filter damaged	• Check, replace filter
	• Compressor is dirty	• Clean unit
	• Temperature switch has unplugged	• Plug in temperature switch
Compressor turns on/off rapidly	• Temperature switch has failed	• Replace temperature switch
	• Receiver tank has high level of water	• Replace electric tank drain
	• Compressor check valve has failed	• Replace check valve
Safety valve blows off	• Defective pressure switch	• Replace pressure switch
	• Pressure switch has failed to open	• Replace pressure switch
Motor overload has tripped	• Motor starter contacts welded shut	• Replace motor starter
	• 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

NitroFlow60 and NitroFlow60D 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
Low Output Pressure	• Flow demand greater than 60 LPM	• Reduce flow demand
Low Purity	• Flow demand greater than 60 LPM	• Reduce flow demand
	• Nitrogen Module Malfunction	• Replace module
	• High relative humidity	• Move to area where RH is less than 80%
	• Water carryover due to water seperator float drain malfunction	• Replace water seperator float drain
	• Water carryover due to filter float drain malfunction	• Replace filter float drain
	• Spent carbon modules	• Replace carbon modules

NitroFlow60D Only

Change in Purity	• Internal leak	• Check for leaks
	• Water carryover due to water seperator float drain malfunction	• Replace water seperator 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 80%
	• Flow demand greater than 4 SLPM	• 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 800-343-3038, 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.

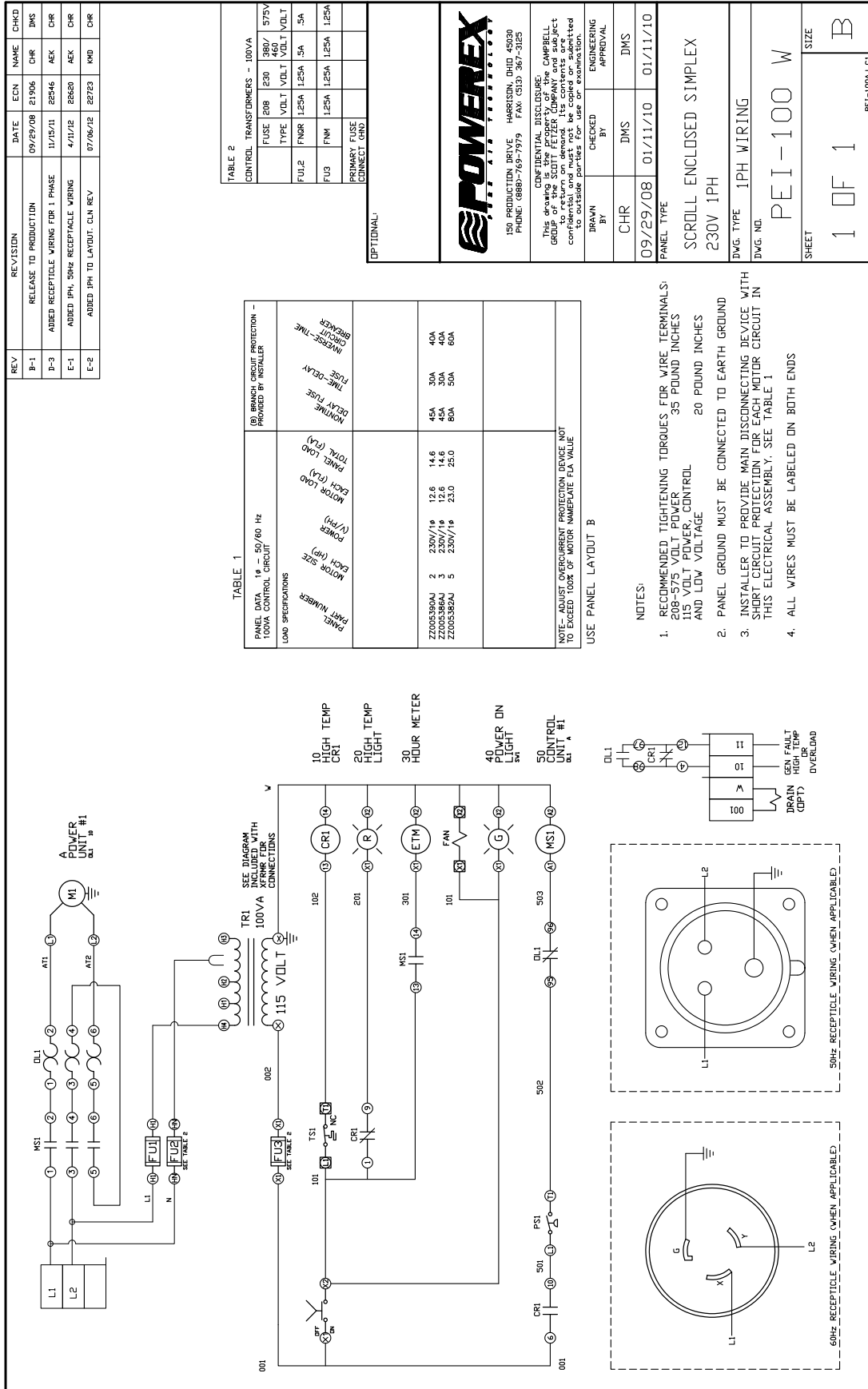


Figure 34

Flow Rates

Nominal conditions for the charts are Temperature 68°F (20°C) and Ambient Pressure 14.7 psi [1013 mbar(a)]. The maximum pressure for the nitrogen is 101.5 psi. Flow meter accuracy +/-0.5 (99% purity).

Nitrogen Purity	Nitrogen (SLPM) 4 bar (58 psi)	5 bar (72 psi)	6 bar (87 psi)	7 bar (101 psi)
99.5	9.34	12.5	15.7	18.9
99	13.2	17.6	22.5	26.8
98	19.0	25.0	32.5	39.0
97	24.2	32.1	42.0	50.4
96	29.6	39.4	51.2	60.0
95	35.4	47.7	60.0	-

