



INOGEN ONE G4 OXYGEN CONCENTRATOR

TECHNICAL MANUAL

96-06917-00-01

Revision C

GUIDANCE TO AUTHORIZED SERVICE AND REPAIR CENTERS

This Manual applies to the following Inogen, Inc. products:

- Inogen One G4 Oxygen Concentrator, model #IO-400
- Inogen One AC Power Supply, model #BA-401
- DC Power Cord, model #BA-306
- Battery, model #BA-400
- Battery, model #BA-408

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1. INFORMATION FOR PROVIDERS OF THE INOGEN ONE G4

Thank you for choosing to provide your patients with the Inogen One G4 oxygen concentrator. We are pleased to offer you and your patients one solution for your many oxygen needs.

This Technical Manual will familiarize you with provider-specific information regarding the Inogen One G4 Oxygen Concentrator and its accessories. Before reading this Technical Manual, please read and review the Inogen One G4 Patient Manual for description and indications for use of the device.

Be sure to thoroughly read all of the information in this manual in its entirety. If you have any additional questions, please see the list of contacts at the end of this Technical Manual.

Instructions included in this Technical Manual are intended to help assure that patients are given proper guidance in the use and function of the Inogen One G4 and its accessories. Proper care in relaying this information will not only enhance the user's experience with the Inogen One G4, but will also protect the patient, prolong the life of the device, and help you avoid unnecessary service calls and complaints from users.

1.1. Caution and Warning Statements

You will see Warnings and Cautions throughout this Technical Manual. To ensure effective Oxygen Therapy and proper operation of the Inogen One G4 Oxygen Concentrator, you must observe them carefully.

 WARNING	A WARNING indicates that the personal SAFETY of the Patient may be involved. Disregarding a warning could result in a significant injury. Be sure that patients understand all warning statements.
CAUTION	A CAUTION indicates that a precaution or service procedure must be followed. Disregarding a caution could lead to a minor injury or damage to the equipment. Be sure that patients understand all caution statements.
NOTE	A NOTE indicates specific information to improve ease of use or maintenance of the equipment.
DESIGN NOTE	A DESIGN NOTE indicates specific information regarding the design of the Inogen One G4 and/or accessories. This information is included in this manual to provide you with a greater working understanding of the device. This information is not required to operate or maintain the Inogen One G4.

In many cases, warnings and cautions have been included in the Inogen One G4 User Manual.

2. SETTING UP A PATIENT ON INOGEN ONE G4

2.1. Indications for Use

The Inogen One G4 Oxygen Concentrator is used on a prescriptive basis by patients requiring supplemental oxygen. It supplies a high concentration of oxygen and is used with a nasal cannula to channel oxygen from the concentrator to the patient. The Inogen One Oxygen Concentrator may be used in a home, institution, vehicle and various mobile environments.

CAUTION	Availability of an alternate source of oxygen is recommended in case of power outage or mechanical failure. Several certifying bodies for Home Health Care Providers require that back-up oxygen be available to the patient.
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CAUTION	Oxygen demand of some patients, particularly those with high breathing rates and high flow settings, may exceed the capabilities of the Inogen One G4. Inogen suggests that each patient be titrated to assure that the Inogen One G4 is an appropriate solution for their needs.
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2.2. System Components

The following are standard components of the Inogen One G4 system:

- Inogen One G4 Oxygen Concentrator
- AC Power Supply
- DC Power Cord
- Single (4-cell) Battery
- Carry Strap
- Carry Bag
- Cannula

Patient Set-Up. To properly set up a patient on the Inogen One G4 System, you may need to provide:

- Pulse Oximeter (for titration, not included)
- Extra cannulas (not included)
- Extra output filters (not included)

2.3. Using the Inogen One G4

To quickly configure the Inogen One G4 for patient use:

1. Slide the battery onto the bottom of the system until the latch clicks into place.
2. Place the concentrator in a well-ventilated location so that air intake and exhaust vents have clear access.
3. Connect the AC power cord to the AC power supply and plug into the closest AC outlet.
4. Connect the power supply to the Inogen One G4.
5. Attach the cannula to the nozzle fitting on the top of the concentrator.
6. Plug into closest AC outlet.
7. Turn on the Inogen One G4 by pressing the on/off button.
8. Use the + (increase flow) or – (decrease flow) buttons to adjust the Inogen One G4 to the flow setting prescribed by the physician or clinician.

For further information regarding the use of the Inogen One G4, please consult the User Manual.

2.4. Selecting the Proper Flow Setting

2.4.1. Bolus Volumes Specification

All oxygen conserving devices (OCD's) function differently, and therefore it is prudent to titrate patients for any new conserving device. Delivery timing, bolus volume, and oxygen concentration all contribute to a patient's fraction of inspired oxygen (FiO₂), and therefore to the OCD's efficacy at maintaining the patient's blood oxygen saturation.

As an oxygen concentrator, the Inogen One G4 does not contain a finite stored volume of oxygen, such as with compressed gas or liquid cryogenic systems. The Inogen One G4 can provide oxygen to the patient as long as a source of electricity is available. Because the oxygen is being produced as it is used, supply of oxygen is *rate-limited*. The Inogen One G4 delivers up to 630 ml/min of 90% (+6%/-3%) oxygen.

At each flow setting, the Inogen One generates a specific amount of oxygen (210ml per setting), and the on-board OCD attempts to deliver all of this product to the patient. This is equivalent to a conserving ratio of 4.76 at all flow settings and breathing rates. Slower breathing patients will receive larger boluses, and faster breathing patients will receive smaller boluses.

DESIGN NOTE	This method of bolus volume determination is similar to what is experienced by a patient using a continuous flow concentrator – actual alveolar oxygen inspiration is more closely linked to flow setting than to breathing rate.
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The following table summarizes the nominal bolus volumes (+/- 3ml or 10%) delivered by the Inogen One G4 at 20C and sea level:

Flow setting	Flow Rate (ml/min)	10 BPM (ml/bolus)	20 BPM (ml/bolus)	25 BPM (ml/bolus)
1.0	210	21.0	10.5	8.4
2.0	420	42.0	21.0	16.8
3.0	630	63.0	31.5	25.2

DESIGN NOTE	Bolus Volume is tuned to provide the correct bolus volume when delivered through a nasal cannula such as the Salter Labs 1600SOFT. If bolus volumes are measured without a cannula or with a different type of nasal cannula, bolus volumes will vary from values stated in the table above.
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2.4.2. Trigger sensitivity

The conserver will trigger when the negative pressure at the internal sensor reaches -0.12 cm H₂O (+/- 20%). This low trigger sensitivity allows for breath detection of very

shallow breathing, but may also result in the occasional trigger due to motion of the cannula or motion of the concentrator. The trigger sensitivity may vary.

2.4.3. Flow Setting Selection Relative to Physician Prescription

Inogen has labeled each of the three settings to provide a *guideline* for matching the setting of the device to the continuous flow prescription issued by the physician. Actual correlation is dependent upon the patient's breathing rates, inspiratory tidal volume, and other physiologic factors. Inogen suggests that each patient be titrated (a) while sedentary, and (b) while active or ambulatory.

3. SERVICING THE INOGEN ONE G4

3.1. Maintenance by the Provider

3.1.1. Authorized Repair Centers

The Inogen One G4 is only intended to be repaired by authorized repair centers. If a repair is required, please contact Inogen to locate your nearest authorized repair center. If you would like to become an authorized repair center, please contact Inogen for access to certification training, service instructions, component part lists and the necessary repair equipment.

3.1.2. Cleaning and Processing for Reuse

Reprocessing between patient use is required. Refer to the following guidance on the process to clean and disinfect for reuse.

The following supplies are recommended:

- Nitrile Gloves or equivalent
- Safety Glasses
- Disinfecting wipes or Spray designed to kill bacteria and viruses
- Compressed Air (30 psi / 207 kPa, for blowing off parts)
- Particulate Respirator (N95 rated)

The following safety precautions should be followed when cleaning and processing a concentrator for reuse:

1. The cleaning process should be performed in a well-ventilated area.
2. Wear nitrile gloves, safety glasses, and a particulate respirator when cleaning and disinfecting the concentrator.
3. Avoid touching your face during and after cleaning the concentrator to prevent transfer of contaminants.
4. Immediately after cleaning remove gloves and wash hands.

The following steps should be performed to clean and disinfect the concentrator:

1. Put on personal protective equipment (PPE).

2. Disinfect by wiping down exterior surfaces with disinfecting wipes or spray. Avoid getting moisture in or around the battery connectors, power jack, or vents. Follow manufacturer's instructions for application and surface dwell times.

NOTE	The use of Nocolyse (OxyPharm) surface disinfectant system has been approved for use in Europe. Not approved in United States.
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3. Cleaning. If visibly soiled, clean exterior surfaces using a soft cloth dampened with a mild liquid detergent (such as Dawn™ in US) and water. Then gently wipe dry. Avoid getting moisture in or around the battery connectors, power jack, or vents. If items have scuff marks or other such surface discoloration, use multi-surface sponge cleaner may be used.
4. Hard-Surfaces: (concentrator shell, batteries, power supplies, carts, pulse oximeter, etc.): Disinfect and clean entire outer surface as necessary per above.
5. Cords: Uncoil or untie cord(s). Disinfect entire length of cord(s) and connectors at each end. Clean as necessary per above.
6. Disposables: If the disposable item has been opened or is dirty it is to be discarded; otherwise, it does not need to be disinfected. Clean as necessary per above.
7. Carry Bags: Disinfect entire outer and inner surfaces of carry bag. If the carry bag is dirty and/or emits excessive odor, it is to be discarded. Clean as necessary per above.
8. Literature: Literature does not need to be disinfected; if dirty, discard.
9. Packaging Materials: Packaging materials do not need to be disinfected; if dirty, discard.
10. Once cleaned and disinfected, remove Particle Filters and blow off accessible internal areas with compressed air to remove any visible debris.
11. Blow off Particle Filters with compressed air to remove any visible debris.
12. Disinfect any accessible area behind the Particle Filters with disinfecting towels. Avoid getting moisture on the electronics (USB port and motherboard). Replace the Particle Filters as necessary.
13. Disinfect batteries and power supplies by wiping down the exterior of them with disinfecting towels or spray.
14. Remove and replace Output Filter per section 3.1.6 below.
15. Unit is now ready for reuse.
16. Remove PPE and wash hands with soap and water for a minimum of 20 seconds.

NOTE	Do not disassemble the Inogen One G4 or any of the accessories or attempt any maintenance other than tasks described in this Technical Manual unless you have completed a training course through Inogen. Disassembly of the Inogen One G4 or any of the accessories without proper training certification will void the product warranties. Contact
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	Inogen for information about receiving proper training and certification for service of the Inogen One G4 and accessories.
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3.1.3. Suggested Materials for Regular Maintenance

To perform regular field maintenance (by a technician) on the Inogen One G4 System, you may need:

- Inogen One G4 Particle Filter (RP-405)
- Output Filter Replacement Kit (RP-404)
 - Includes spanner wrench and two output filters
- Inogen One G4 Column Pair (RP-406)
- Inogen One G4 Batteries (BA-400, BA-408)
- Nasal Cannula (Salter Labs 16SOFT or equivalent)
- External Oxygen Analyzer (such as Salter Labs PrO2 Check)

NOTE	During a normal field maintenance visit, the technician may elect to turn off the concentrator for approximately 30 minutes. If the patient requires oxygen during this period, Inogen recommends making arrangements to bring an extra oxygen supply.
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3.1.4. Accessing Information Screen

To check usage from the device, press and hold the mode Button (bell symbol) for 5 seconds while the unit is running normally. The concentrator's display will show the hour meter, the unit's serial number, and the software version installed on the device.

3.1.5. System Inspection

At the start of any maintenance visit:

1. Be sure to ask the patient if they have experienced any difficulties in operating the equipment.
2. Be sure to ask the patient if they have observed any malfunctions or changes in characteristics of the equipment.
3. Visually inspect the device and accessories for cracks or other damage.
4. Feel the sides of the device for vibration and listen for unusual noises, rattles, or other signs that the device requires service.

CAUTION	Discovery of cracks or other types of external damage may be indicative of other internal damage that may not be visible. If such external damage is discovered, be certain to inquire as to how it occurred, and whether any changes in the device have been noticeable since its occurrence. If you have any concern over the safety of the device, arrange for equipment servicing.
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3.1.6. Output Filter Replacement

This filter is intended to protect the user from small particles in the product gas flow. The Inogen One G4 includes an output filter conveniently located behind the removable cannula nozzle fitting. Inogen suggests that this filter be replaced between patients.

Use the Output Filter Replacement Kit to replace the Output Filter:

1. Use the Cannula Barb Tool (included in RP-404) to access the output filter. The tool has two prongs which mate with two indentations located on the surface of the metal cannula barb fitting on the Inogen One G4.
2. Carefully remove the cannula fitting by unscrewing it in the counter-clockwise direction.
3. The filter, a thin white disk, will be visible in the recess once the hose barb is removed.
4. Remove the filter, and inspect the recess to make sure it is free of debris.
5. Install a replacement filter.
6. Carefully screw the cannula barb fitting back into the recess (clockwise) until it bottoms out on the filter gasket. Take care to squarely screw the nozzle fitting into the threads, and not to over tighten.

CAUTION	Failure to inspect and replace the product filter may result in the filter becoming clogged or obstructed over time, and in reduced delivery of oxygen to the patient.
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3.1.7. Oxygen Purity Check

The oxygen concentration can be checked using the Salter Labs PrO2 Check ultrasonic oxygen analyzer. The concentrator should be run for 10 minutes before measuring the oxygen concentration. If the concentrator has not been used for more than 2 weeks, the concentrator should be run for a minimum of 30 minutes to allow for adjustments to the operating parameters prior to measuring the oxygen concentration.

3.1.8. Data Log

Operating data from your Inogen One G4 concentrator are periodically recorded to flash memory located within the device. Data is stored for a period of approximately 6-12 months; new data replaces the oldest data as it is collected.

Additionally, the device records errors and system information at the time of the error which is useful in diagnostics.

The following information is a list of recorded parameters that can be used to evaluate the device and its usage:

- Real Time Clock
- Life Clock
- Flow Setting
- Breaths per Minute
- Low, Medium, and High Priority Errors
- Ambient Pressure
- System Temperature
- Battery Status
- Charging Status

3.1.9. Data Download

To download data from the Inogen One G4, you will need a micro USB cord and the Inogen field service communication program.

To collect data:

- a) With the Inogen One G4 off, unscrew the access panel screw on the back side of the device and remove the access panel. This will allow access to the micro USB port.
- b) Insert the micro USB cord into the micro USB port behind the access panel. Plug the other end into the PC.
- c) Plug external power into the concentrator.
- d) Select the appropriate port from the drop down menu on the field service communication program.
- e) Press the button titled "Download Data Log".
- f) When the data is transferred, the concentrator LCD will read "Data Transfer: Success". The data will be saved as a .txt file in the same location as the communication program.
- g) If the LCD screen reads "Failure", make sure the communication port is recognized by the PC.
- h) The text file can then be uploaded to the product data log site on Gemini.

3.2. Maintenance by the Patient

3.2.1. Cannula Replacement

The nasal cannula should be replaced on a regular basis. A single lumen cannula of 4 to 25 feet in length must be used. Inogen has certified its performance data with the Salter Laboratories 16SOFT cannula.

CAUTION	Do not use total cannula tubing length exceeding 25 feet with the Inogen One G4 unless proper saturation has been verified by a clinician.
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3.2.2. Particle Filter Cleaning and Replacement

On the side of the Inogen One G4, ambient air passes through a particle filter that removes dust fragments. This particle filter must be cleaned on a weekly basis to ensure adequate air flow through the device. If the particle screen is not cleaned frequently, the life expectancy of the concentrator will be shortened due to higher internal operating temperatures.

Particle filters should be cleaned using a mild liquid detergent (such as Dawn™) and water solution; be sure the filter is rinsed in water and allowed to air dry before reuse. Additional replacement filters may be obtained from Inogen. There are other types of filters inside the Inogen One G4 that provide additional filtration. Maintenance of these filters is not required under normal operating conditions.

3.2.3. Column Change Procedure

There are two columns in the concentrator as a single metal assembly that can be seen on the underside of the device. These columns should be removed and replaced when column service is required (indicated by “Change Columns” message). Ensure adequate time is allotted to complete all steps without disruption when performing this maintenance.

1. Turn off the concentrator by pressing the power button.
2. Remove the battery from the concentrator.
3. Lay the concentrator down on its side so that the underside is visible.
4. Press the latch button away from the columns to unlock the column assembly.
5. While holding the latch open, slide the column assembly out of the device by pulling on the column pull handle.
6. Remove the columns completely from the concentrator.

Installation of the new columns:

7. Remove the dust caps from the new column assembly. Make sure there is no dust or debris where the dust caps were located.
8. Insert the new column assembly into the concentrator.

CAUTION	Do not leave the column ends exposed after the dust caps are removed; they should be inserted into the concentrator as soon as the dust caps have been removed to minimize environmental exposure and maximize lifespan.
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9. Push the column assembly into the device until the spring-loaded latch button fully returns to the closed position.
10. Plug in external power. **Do not power on** the concentrator.
11. Press and hold the plus (+) and minus (-) buttons for 5 seconds. The screen will display “sieve reset”.
12. Press the Mode button (bell symbol) once and screen will display “sieve reset successful”.
13. Press the power button to turn on the concentrator and use normally.

NOTE	Column change instructions are only to be used when maintenance is required. Column should only be removed during this maintenance procedure.
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3.2.4. Surface Cleaning

The outside case should be cleaned using a cloth dampened with a solution of mild liquid detergent (such as Dawn™) and water. Avoid getting water in or around the battery connectors, power jack, or vents.

3.2.5. Battery Care and Maintenance

The Inogen One G4 Lithium Ion Battery requires special care to ensure proper performance and long life. Use only Inogen One G4 Batteries with the Inogen One G4 Oxygen Concentrator.

DESIGN NOTE	The Inogen One G4 Oxygen Concentrator adjusts its oxygen production rate to match the oxygen demand specified by the user flow setting. When the device is used at lower settings, its battery life is extended. Additionally, at lower flow settings, the concentrator does not generate as much heat and noise, draw as much electric current from external power supplies, and many system components do not wear as quickly.
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3.2.5.1. Initial Battery State

The Inogen One G4 batteries are shipped partially charged. The battery can be used immediately; however, we recommend the battery be charged upon receipt to ensure adequate run time.

3.2.5.2. Normal Charging

The battery is operating properly when a battery icon is displayed on the LCD screen.

The Inogen One G4 batteries can be partially charged and discharged without damaging the battery packs.

3.2.5.3. Battery Operating Conditions

The Inogen One G4 battery powers the Inogen One G4 Oxygen Concentrator from 1 to 3 hours using the standard 4-cell pack (BA-400) under most environmental conditions. To maintain maximum run-time of the battery, users should avoid running the battery in temperatures less than 40°F (4°C) or higher than 95°F (35°C) for extended periods of time.

The number of cycles that the battery will last is highly dependent upon the temperature at which the battery is charged. Inogen recommends that batteries not be charged in room temperatures exceeding 75°F (24°C).

DESIGN NOTE	The BA-400 and BA-408 will typically achieve 500 charge/discharge cycles while retaining 80% of their original capacity if proper battery care is taken.
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3.2.5.4. Battery Time Remaining Clock

The Inogen One G4 continuously displays battery time remaining. It may be necessary to inform the user that this displayed time is only an estimate, and the actual time remaining may vary from this value.

To avoid running out of battery power unexpectedly, users should regularly monitor the displayed battery time remaining and/or carry a back-up power supply (extra charged battery or AC Power Supply).

3.2.5.5. Storage

Instruct patients to remove the battery from the Inogen One G4 when it is not in use to avoid inadvertent discharge. Leaving a battery attached to an idle Inogen One G4 for prolonged periods will result in battery damage that will severely shorten the expected life of the battery.

DESIGN NOTE	When the concentrator is off but the battery installed, the battery will continue to provide a small amount of power to the concentrator's microprocessor. This power draw could empty a full battery over an extended period of time.
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CAUTION	Leaving a Battery in the Inogen One G4 while the device is unused will irreversibly damage the battery. After such storage, the battery may not be able to recharge or its life cycle and/or capacity will be greatly diminished. A full battery can be damaged in as little as 20 days if left in the concentrator while not plugged in.
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Instruct users to avoid storing the Inogen One G4 battery in extreme temperatures, below -4°F (-20°C) or above 158°F (70°C), for any amount of time. They should avoid leaving batteries in automobiles, where these temperatures can be regularly exceeded. Storage of the Inogen One G4 battery in a cool, dry location will help to maximize the longevity of the battery.

3.3. Expected Service Requirements

The following table is provided as an estimate only and assumes nominal environmental conditions for temperature, humidity, and air pollution. Any smoking around the device will severely shorten its life expectancy. Please refer to product warranty coverage terms.

Service Item	Estimated Service Requirement Frequency
Battery	500 full cycles to 80% capacity
Compressor	20,000 run hours
Columns	12 to 24 months
Valves	25,000 run hours
Particle Filter	20,000 run hours with regular cleaning
Cooling Fan	25,000 run hours

4. INOGEN ONE G4 SYSTEM SPECIFICATIONS

Dimensions:	5.91”L (15.01cm) / 2.68”W (6.8 cm) / 6.45”H (16.3 cm) 5.91”L (15.01 cm) / 2.68”W (6.8 cm) / 7.15”H (18.2 cm) with single battery
Weight:	2.8 lbs (1.27 kg.) (includes single battery)
Noise:	40 dB on setting 2
Warm-Up Time:	2 minutes
Oxygen Concentration:	90 +6/-3%
Flow Control Settings:	3 settings; 1-3
Power:	AC Power Supply Input: 100-240 V, 50-60 Hz, 1.5 A Output: 19 V, 3.42 A DC Power Cable Input: 13.5-15.5 V, 10 A Rechargeable Battery: 12.0-16.8 V
Environmental Ranges Intended for Use:	Temperature: 41 - 104°F (5 - 40°C) Humidity: 0% to 95%, non-condensing Altitude: 0 - 10,000 ft. (0 - 3048 m)
Environmental Ranges Intended for Storage:	Temperature: -13 - 158°F (-25 - 70°C) Humidity: 0% to 95%, non-condensing Altitude: 0 - 10,000 ft. (0 - 3048 m)

4.1. Classifications

Mode of Operation:	Continuous
Type of Protection Against Electrical Shock:	Class II
Degree of Protection Against Electrical Shock:	Type BF Not intended for cardiac application
Degree of Protection Against Ingress of Water:	IP 22
Degree of Safety for Application in Presence of Anesthetic Gases:	Not suitable for such applications

5. INOGEN ONE G4 ERRORS

5.1. DEFINITIONS

- 5.1.1.** Alert LED: The alert LED is positioned above a warning symbol () on the user interface panel and is used to indicate when an error is occurring.
- 5.1.2.** Breath Detect LED: The breath detect LED is used to indicate proper bolus delivery.
- 5.1.3.** Error Recall: The most recent error can be recalled on the LCD screen by pressing and holding the plus (+) button for 5 seconds while the unit is in standby. The previous error will be displayed on the LCD Screen for 15 seconds. All errors will be stored except No Breath Detect and Battery Low errors.
- 5.1.4.** Adaptive Auto Pulse Mode: If the unit is experiencing a no breath detect condition (a breath has been detected since startup, and no breath has been detected in the past minute) the unit will start auto pulsing at a rate of 17 breaths per minute. The bolus sizes will be commensurate with a breathing rate of 17 BPM. This mode will stop as soon as a normal breath has been detected.

5.2. WARNINGS

Indicator	Condition	Action/Explanation
Concentrator does not turn on using AC power	AC power supply not providing power.	Check if concentrator runs normally on battery. Check for the presence of a Green LED on the power supply. If a Green LED is present on the power supply, inspect the cord, barrel plug, and receptacle on the concentrator for damage and replace if necessary. Try unplugging and plugging it back in. If no LED is present on the power supply, try a different AC outlet or replace the power supply.
Concentrator runs on battery power when plugged into the CLA in a car	Low Input Voltage from car OR Blown car fuse	Ensure that the car is running and that the input to the system is greater than 12V DC. Cigarette lighter outlet must be capable of 10A load. The power outlet should be rated at 120 W 12V. Try an alternate DC cord or power outlet in the car or have a dedicated power outlet installed by an auto mechanic.
A battery is installed but the battery icon does not appear on the LCD screen	The concentrator cannot communicate with the battery	Turn off the concentrator and remove the battery and remove the power plug from the concentrator. Reinstall the battery and the power plug. Verify that the battery charges or indicates battery full. If the battery does not charge or indicate it is fully charged while the concentrator is in standby mode, try a different battery. If the concentrator will not respond to a known good battery, replace the concentrator.

5.3. LOW PRIORITY ERRORS

The following low priority error messages are accompanied by a **double beep** and a **solid yellow LED**.

Display	Condition	Action/Explanation
Battery Low Attach Plug	The battery attached to the concentrator is depleted or bad	Charge the battery and try again. If the problem persists, try a new battery. If the concentrator will not respond to a known good battery, replace the concentrator.
Remove Battery To Cool	The battery temperature has exceeded the temperature limit for at least 30 minutes while battery is charging on concentrator.	Remove battery to cool. If charging is desired, charge the battery in the external charger while powering the unit with the external power supply. If the condition recurs, replace the concentrator.
Check Battery	The concentrator is not communicating with the battery	Turn off the concentrator and remove the battery and remove the power plug from the concentrator. Reinstall the battery and the power plug. Verify that the battery charges or indicates battery full. If the battery does not charge or indicate it is fully charged while the concentrator is in standby mode, try a different battery. If the concentrator will not respond to a known good battery, replace the concentrator.
Oxygen Low	Oxygen <82% for 10 minutes	The concentrator is producing oxygen at a slightly lower level. The unit will continue operating normally. If the error persists, replace the concentrator.
Sensor Fail	The O2 sensor is giving false readings	The unit will still operate normally but oxygen concentration can no longer be internally monitored. Shut down the concentrator and then restart. If the problem persists, replace the concentrator.
Service Soon	The compressor has reached its maximum speed	This message is to let the user know that the unit will require maintenance in the near future, and that they should alert their provider. The concentrator should be serviced within 30 days.

<p>Replace Columns</p>	<p>Oxygen is low because columns are nearing the end of their service life.</p>	<p>This message is to alert the user that the sieve bed columns will need to be replaced within 30 days, and that they should alert their provider.</p> <p>Once columns are replaced with new columns, reset the system software by performing the following reset operation:</p> <ol style="list-style-type: none"> 1. Turn off the concentrator and plug in external power. 2. Hold the plus (+) and minus (-) buttons down for 5 seconds. 3. When "Sieve Reset" appears on the LCD screen, press the mode button to confirm. This resets the system software. 4. Press the power button to resume normal use of the concentrator.
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5.4. MEDIUM PRIORITY ERRORS

The following medium priority error messages are accompanied by a **triple beep** and a **flashing yellow LED**.

Display	Condition	Action/Explanation
Oxygen Error	Oxygen <50% for 10 minutes.	The concentrator has stopped producing its normal amount of oxygen. If this error persists, replace the concentrator.
No Breath Detect Check Cannula	No breath has been detected recently.	<p>The concentrator will produce automatic pulses of oxygen at a constant breath rate.</p> <p>Check that the cannula is connected, that there are no kinks, and that the cannula is positioned properly in the user's nose. Once an adequate breath is detected, the unit will exit adaptive autopulse mode and the message will be cleared.</p> <p>The audible alert associated with this error will only occur when No Breath Detect mode is enabled. The user can disable this mode by holding down the mode button for 2 seconds until the LCD displays a bell with an X through it.</p>
Battery HOT Warning	The battery temperature has exceeded the temperature limit while the concentrator is running on battery power.	Move the concentrator to a cooler location or attach the unit to external power and remove the battery to cool. If this error persists, replace the concentrator.
O2 Delivery Error	System is not delivering boluses correctly.	Remove power and the battery and restart the concentrator. If error persists, replace the concentrator.
System Hot Warning	Concentrator has exceeded temperature limit.	Move the concentrator to a cooler location. Ensure air intake and outlet vents have clear access and particle filters are clean. If this error persists, replace the concentrator.

5.5. HIGH PRIORITY ERRORS

The following high priority error messages are accompanied by a **five beep pattern** and a **flashing yellow light** and the concentrator stops producing oxygen.

Display	Condition	Action/Explanation
Battery Empty Attach Plug	Battery is critically low while concentrator is running on battery power.	System will shut down quickly. Attach the power supply or exchange the battery and restart.
System Error	Various causes: High system voltage High accumulator pressure Low accumulator pressure Motor stall Other	Remove power and the battery and restart the concentrator. If the error repeats after several attempts, replace the concentrator.
System HOT	The system temperature is too high	Allow the concentrator to cool for 10 minutes. Clear anything obstructing the vents and restart the concentrator. If applicable, remove the concentrator from the carry bag and try again. If the error occurs immediately when started, replace the concentrator.
System COLD	The system temperature is too low.	Allow the concentrator to warm up in a room temperature environment for 10 minutes and then restart the concentrator. If the error persists, replace the concentrator.
Battery HOT	The battery temperature has exceeded the temperature limit while the concentrator is running on battery power.	Move the concentrator to a cooler location or attach the unit to external power and remove the battery to cool. If this error persists, replace the concentrator.

5.6. CONTACT for MORE INFORMATION

Inogen Website: Patient Issues: <http://www.inogenone.com>
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