MAX 30 Oxygen Concentrator
Installation & Maintenance Manual

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USING THIS MANUAL

This guide is intended for operators and users of NIDEK Medical Products. It includes information on our warranty, policy, features, functions, proper set-up and installation, operation and preventive maintenance of our device.

The following symbols are used throughout this guide.

	ON (Mains Power switched on)
	OFF (Mains Power switched off)
	Type B Device
	Class I Electrical Protection
	DO NOT EXPOSE TO OPEN FIRE
	DO NOT USE OIL OR GREASE
	Technical Information
	Consult the accompanying documents
	Keep in a vertical position
	Fragile – Handle with care
	Sound-Listen for Sound
	General Warning
	Timer-
	QMS certified to Annex II of 93/42/EEC by the approved organization 0413

Initial Inspection

The crate should be opened and inspected immediately upon delivery. Unpack the device at once and perform a visual inspection to determine if it is dented, bent or scratched. Also check to make sure the power cord is attached and that the control panel has not been damaged in any way during shipment.

At **Nidek Medical Products (NMP)**, we are committed to using shipping companies with good reputations for taking care in the handling of freight and providing service in the event of damage.

TYPICAL APPLICATIONs

Oxygen Concentrator

Small Clinic

Fish Farms

Ozone Production

Glass Blowing

Welding

Laboratory Use

Aquaculture

Veterinary Clinic

Warranty

Nidek Medical Products, Inc. (***NMP***). warrants to the original dealer-purchaser of a NMP MAX 30 Oxygen concentrator, that it shall: 1) Conform to Nidek Medical's specifications, subject to ANSI tolerances, at the time of manufacture and 2) be free of defects in material and workmanship for a period of twelve (12) months from the date of delivery.

To make claim under this warranty, the Purchaser must: 1) Give Nidek Medical written notice of the breach of warranty, within ten (10) days after discovery of such breach; 2) immediately upon discovery of the claimed breach, discontinue all use of the enricher; and 3) upon the request of Nidek Medical, return the concentrator or the applicable component part, freight prepaid, to Nidek Medical's plant of manufacture or such other location as designated by Nidek Medical. If it is determined by Nidek Medical that the concentrator or the applicable component is in breach of warranty, Nidek Medical, at its option, will repair or replace it without charge.

The cost of returning the concentrator or component part to the Purchaser after repair or replacement will be paid by Nidek Medical. If, however, any concentrator or component part returned by the Purchaser because of an alleged breach of warranty is found by Nidek Medical not to be in breach of warranty, then the concentrator or component part will be returned to the Purchaser, shipping charges collect, and the Purchaser agrees to pay a service charge to Nidek Medical to cover the cost of handling and testing the concentrator or component part. Dealer labor costs for removal and replacement of parts under warranty are not covered and are the responsibility of the dealer.

This warranty is void if the concentrator or any component part thereof has been damaged by accident, abuse, misuse, neglect, alteration, improper service, repair by other than authorized personnel or other causes not arising out of defects in material or workmanship. Wear of components in normal operation, and failures resulting there from, as determined by Nidek Medical, are excluded from this warranty.

This warranty is not assignable by the Purchaser.

NIDEK MEDICAL MAKES NO OTHER WARRANTIES OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO THE CONCENTRATOR OR ITS COMPONENT PARTS AND ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED BY NIDEK MEDICAL. Nidek Medical's non-exclusive liability with respect to the concentrator shall be to repair or replace (at Nidek Medical's sole option) the concentrator or any of its component parts that prove to be defective in materials or workmanship during the warranty period. Normal maintenance required during the warranty period is not included in this warranty. No claim of any kind whatsoever against Nidek Medical with respect to the concentrator or its component parts whether or not based in contract, warranty, negligence, strict liability in tort, or any other theory of law, shall be greater in amount that the purchase price of the concentrator. Without limiting the generality of any of the foregoing, Nidek Medical shall in no event be liable for any special, indirect, incidental, or consequential damages.

Nidek Medical Oxygen Concentrator products shall not be used for breathable or medical oxygen applications; unless they are assembled with the appropriate support equipment, tested, and operated in compliance with either American, Canadian or ISO norms for hospital oxygen systems

If the Nidek Medical Oxygen Concentrator product is planned to be used to supply oxygen to a high pressure filling station, please refer to:

- CGA publications that can be found at http://www.cganet.com
- ISO 10083 that can be found at http://www.iso.org

GENERAL SAFETY GUIDELINES

Only persons who have read and understood this entire manual should be allowed to install and operate the Max 30 Oxygen Concentrator (hereafter known as the *device*).

The WARNINGS below indicate a potentially hazardous situation. If conditions are not avoided a situation could occur that results in serious injury or death.

- Oxygen is not a flammable gas, but it accelerates the combustion of materials. Do not use in explosive atmosphere. To avoid risk of fire and explosion the concentrator should be kept away from Flames, Heat sources, Incandescent sources, Smoking Materials, Matches, Oil, Grease, Solvents, Aerosols, etc. Do not allow oxygen to accumulate on upholstery or other fabric such as bedding or personal clothing. If concentrator is operating while not connected to patient, position cannula so that the gas flow is diluted in the ambient air.
- Improper patient connection to and use of the cannula may result in injury including strangulation. Avoid situations that might cause the cannula or hose to become entangled about the patient's neck.
- Use of other accessories not described in this User's Guide are not recommended. Patient benefit may be diminished.
- No modification to the equipment is allowed. To do so may affect patient benefit.
- Contraindications; those who continue to smoke (because of the increased fire risk and the probability that the poorer prognosis by smoking will offset the treatment benefit).
- Device must have power to operate. In the event of power loss and for continued operation a backup source is recommended.
- DO NOT disassemble due to danger of electrical shock. Refer servicing to qualified service personnel.
- To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth. If not available, contact a qualified electrician. Do not defeat this safety feature.

The CAUTIONS below indicate a potentially hazardous situation. If conditions are not avoided a situation could occur that results in property damage or minor injury or both.

- Use the power cord provided, and check that the electrical characteristics of the power socket used match those indicated on the manufacturer's plate on the rear panel of the device.
- We recommend against the use of extension cords and adapters, as they are potential sources of sparks and fire.
- The ***device*** has an audible alarm to warn the user of problems. In order that the alarm may be heard, the maximum distance that the user can move away from it must be determined to suit the surrounding noise level.
- The ***device*** must only be used for oxygen therapy and only on a medical prescription. The indicated daily duration and flow must be followed, otherwise it may present a risk to the health of the patient.
- Do not position ***device*** so that it is difficult to access the mains power cord, so that it accessible for disconnect.
- Do not use in a specifically magnetic environment (MRI, X-ray, etc.). May cause device malfunction.
- Note: Medical Device Regulations require users and service providers to report to the manufacturer any incident that could, if repeated, result in injury to any person.

Product Information

Features and Applications

The ***NMP*** Model **MAX 30** extracts oxygen from the atmosphere using Pressure Swing Adsorption (PSA) technology. It concentrates oxygen up to **93% (± 3 %)** purity which can be applied in various ways.

Features

Easy to use
Just connect to an electrical outlet, turn the Master Switch **ON/OFF** power switch to the **ON** position and press the START button on the front display panel and set the desired flow rate.

Dependable
Its internal air compressors, filtration system, molecular sieve, storage tanks and flow control system are designed for **24/7** operation.

Durable
With oxygen-clean brass tubing and valves, the **MAX 30** can operate even in environments as described under the specifications page.

Safe
A built-in oxygen pressure regulator maintains oxygen outlet pressure at 50 **psi (3.4 bar)**. Each of the compressors on the **MAX 30** has **0.38 hp** and have a built-in safety relief valve to prevent excessive pressures in each compressor.

Pressure Swing Adsorption (PSA) Technology

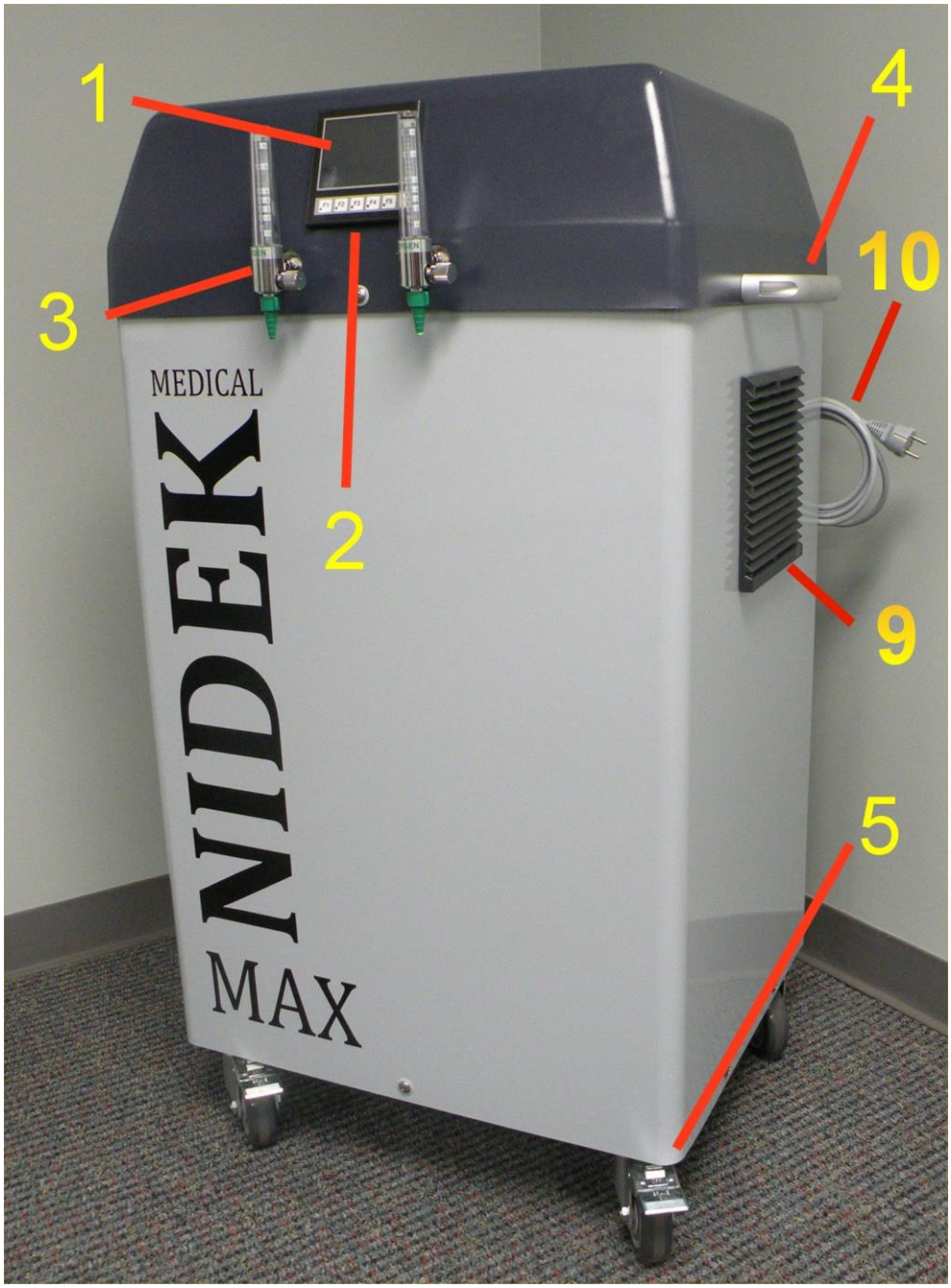
An ***NMP*** Oxygen Concentrator is an on-site oxygen generating machine capable of producing oxygen on demand in accordance with your requirements. In effect, it separates the oxygen (21%) from the air it is provided and returns the nitrogen (78%) to the atmosphere through a waste gas muffler. The separation process employs a technology called **Pressure Swing Adsorption (PSA)**. At the heart of this technology is a material called Molecular Sieve (synthetic zeolite). This sieve is an inert, ceramic-like material that is designed to adsorb nitrogen more readily than oxygen. Each of the two beds that make up each of the enricher contains this sieve. The process is described below.

- **Stage 1** Compressed air is fed into the first molecular sieve bed. Nitrogen is trapped, while oxygen is allowed to flow through.
- **Stage 2** When the sieve in the first bed becomes full of nitrogen, the airflow is then directed into the second bed.
- **Stage 3** As the second bed separates the oxygen from the nitrogen, the first bed vents its nitrogen into the atmosphere.
- **Stage 4** Compressed air is once again fed into the first bed and the process is repeated continuously. A constant flow of oxygen is produced

This air separation process is reliable and virtually maintenance-free.
The molecular sieve will last indefinitely, as long as it does not become contaminated with water or oil vapors. This is why regular filter element replacement is crucial to trouble-free operation. The filter elements are inexpensive and require semi-annual maintenance.

External Components Drawing

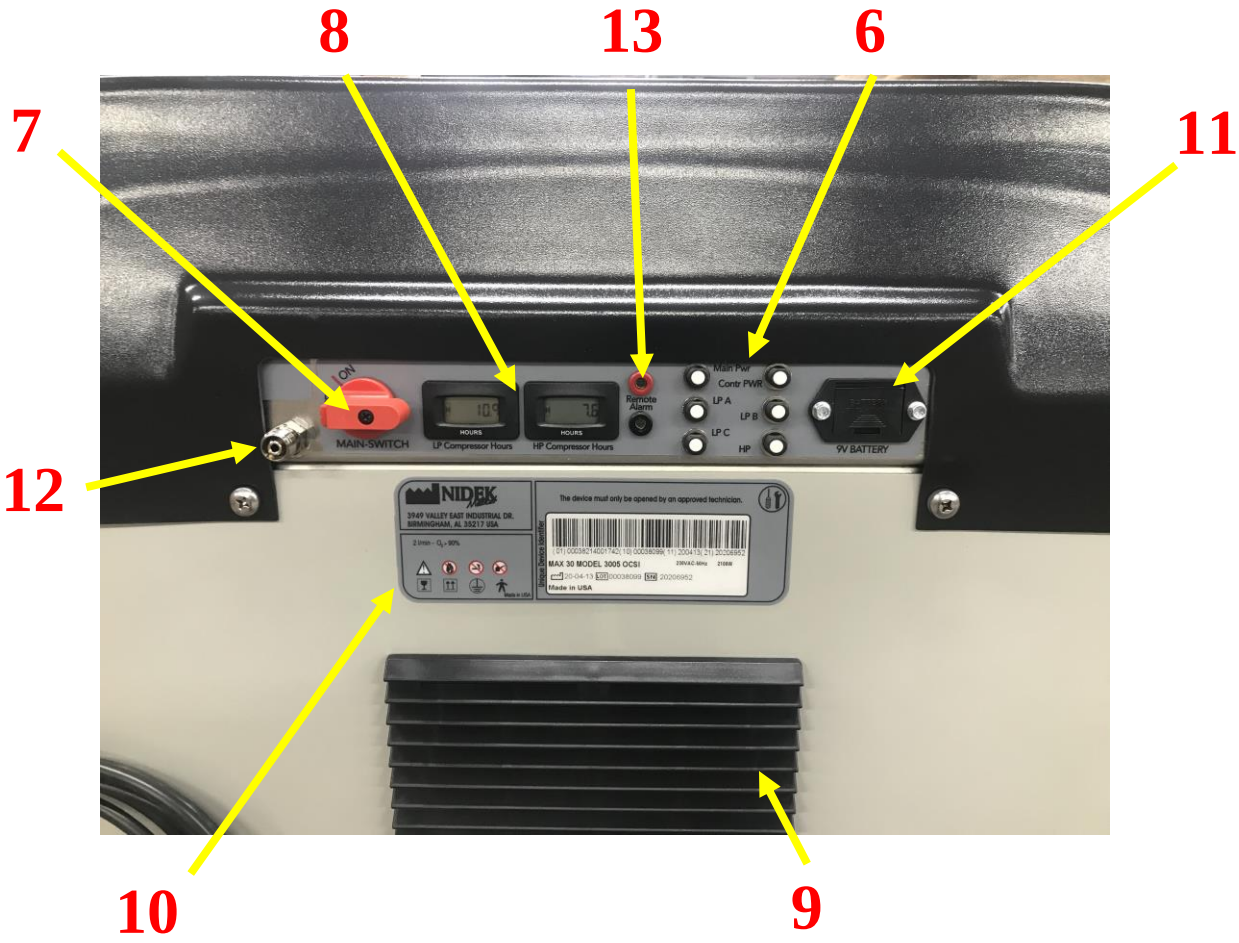
Front View



1.	**Human Machine Interface (HMI)**	**9.**	**Filter Holder**
2.	**Control Buttons**	**10.**	**Power Cord**
3.	**Flow Meters**		
4.	**Handles**		
5.	**Casters**		

External Components Drawing

Back View



6	Circuit Breakers	7.	Master Power Switch
8.	Hour meters	9.	Filter Holder
10.	Manufacturers Device Label	11.	9V Battery Holder
12.	Output to Remote Tank	13.	Remote Alarm Contacts

External Components Drawing

Human Machine Interface

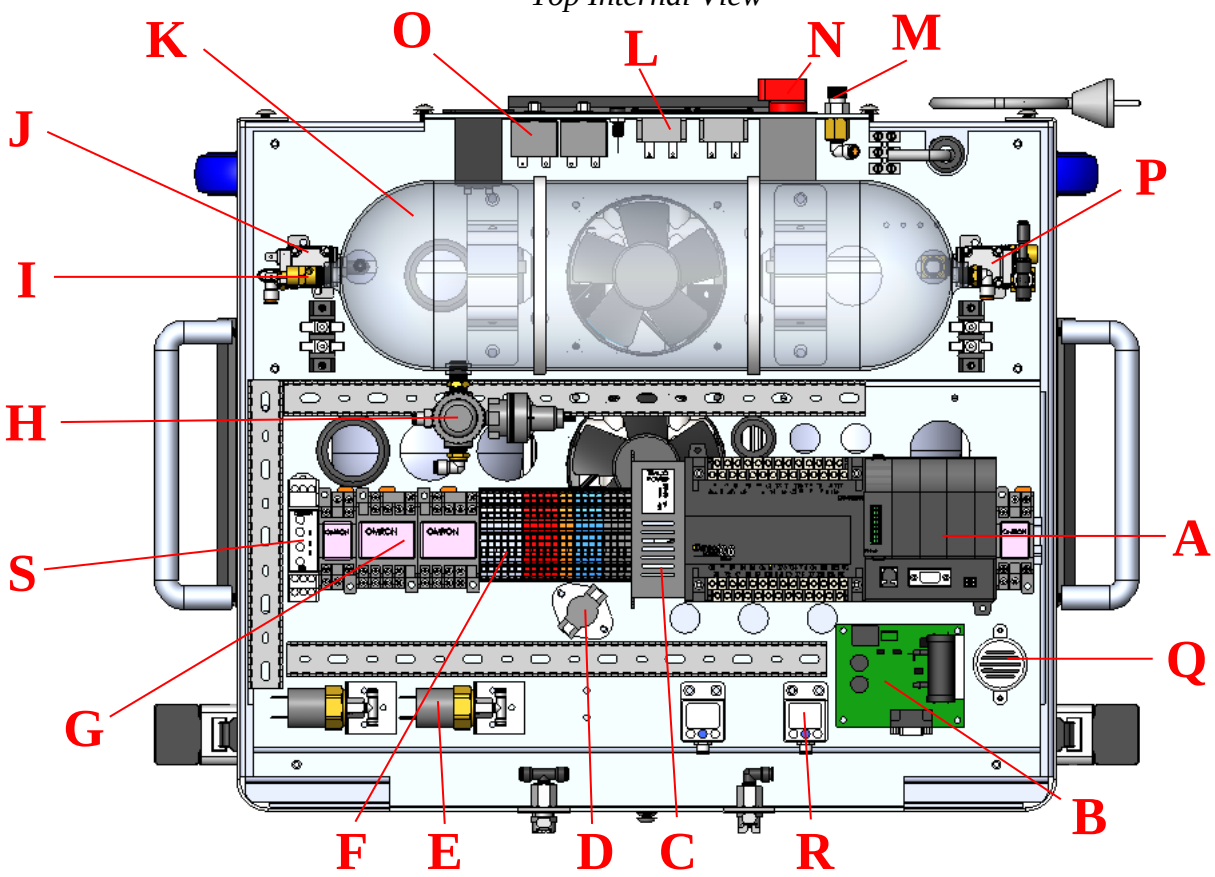
15. **Start Button**
16. **Stop Button**
17. **Utility Screen Button**
18. **Home Button**

Utility Screen

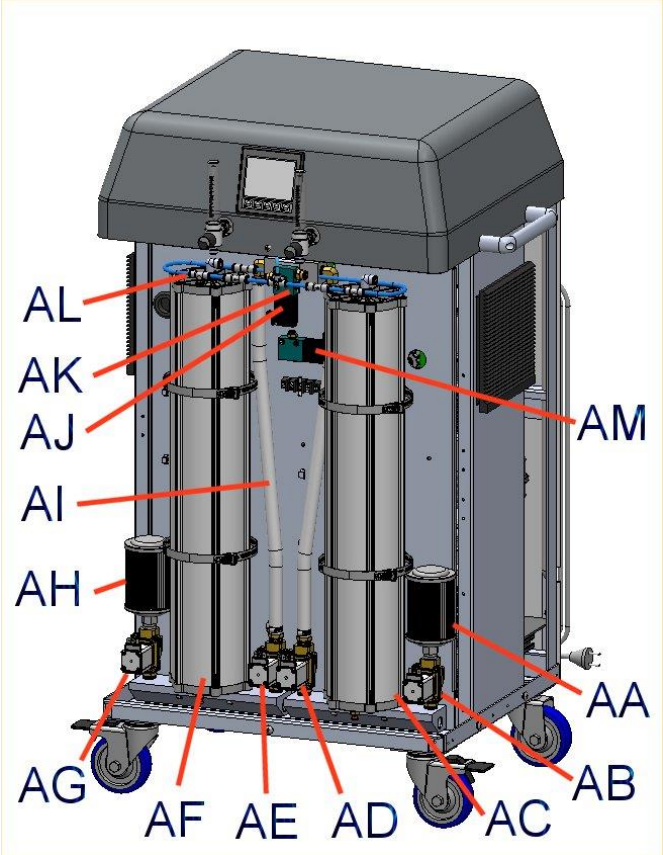
External Components Description	
Oxygen Concentrator Controls & Display(1 &2)	This display provides the controls on how to operate the unit and shows pertinent information about unit operation.
Flow Meters (3)	This flow meter shows the output of the unit while it is operating. The oxygen outlet is located on the bottom of the Flow Meter
Handles (4)	Used to facilitate moving unit.
Casters (5)	Used to relocate unit
Circuit Breakers (6)	The circuit breakers that opens if there is an electrical overload in the system. The main system reset is on the back of the machine. There is also a circuit breaker for each of the individual compressors.
Master Power Switch (7)	This switch controls master power to machine**.** The display will illuminate when the master power switch is in the **ON** position.
Hour meter (8)	The two hour meter shows how long the unit and the high pressure compressor has been operating. This helps indicate when service intervals are due. It is resettable to identify time between service intervals, but the accumulated time can not be modified.
Filter Holder (9)	The filter holders are located on each side and the rear of the unit and the filter elements should be cleaned every two weeks or sooner if in a dusty and dirty environment. Replacement Filter Element part # 9600-1053.
Power Cord (10)	The power cord used on **230 VAC 50 Hz or 60 Hz** electrical systems comes with a three-pronged grounded plug, (EURO or other as requested). Disconnection of this power cord from the mains source is used to isolate the mains power from the device if needed.
Device UDI Label (11)	Provides Identifying information on the unit.
9V Battery Holder (12)	Provides alarm for loss of power, should sound when ever unit is turned on to show that the battery is good.
Output to Remote Tank (13)	Output and Return connection to auxiliary tank.
Remote Alarm Contacts (14)	Contact closure in Unit to drive external alarm signal.
Start Button (15)	Press to starts the unit, there will be a short delay until units starts.
Stop Button (16)	Press to stop the unit.
Utility Button (17)	Displays the monitoring screen to allow troubleshooting
Home Button (18)	Returns to the main screen.

Internal Components Drawing

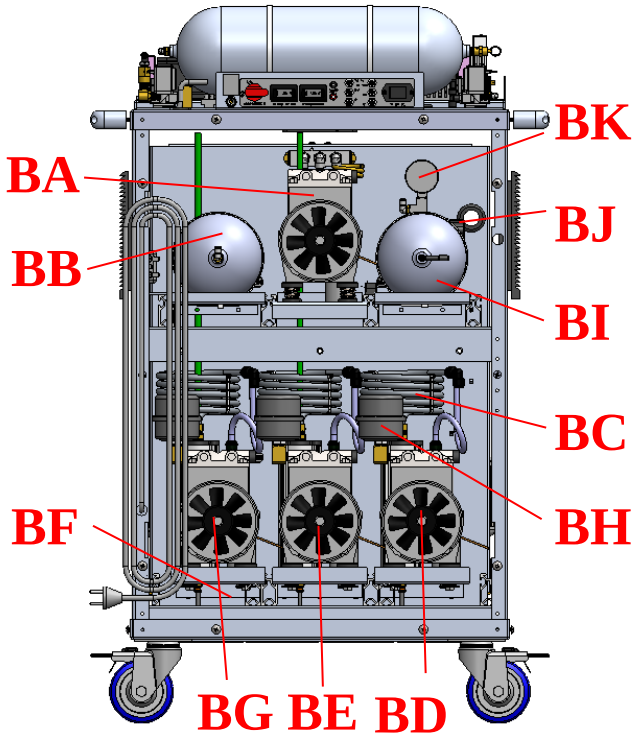
Top Internal View



Front Internal View



Back Internal View



Top View Parts Description

A. PLC

B. OCSI Board

C. Power Supply

D. Temperature Switch

E. Pressure Switch (2)

F. Terminal Blocks

G. Control Relays (3)

H. Front Outlet Pressure Regulator

I. High Pressure Relief Valve

J. Booster Isolation Valve

K. Oxygen Storage Tank

L. Hourmeters (2)

M. Bypass to Remote Tank

N. Master Power Switch

O. Circuit Breakers (6)

P. Booster Unloader Valve

Q. Buzzer

R. Pressure Sensor (2)

S. Over-Current Relay

Front View Parts Description

AA. B Sieve Bed Silencer

AB. B Sieve Bed Waste Valve

AC. B Sieve Bed

AD. B Sieve Bed Supply Valve

AE. A Sieve Bed Supply Valve

AF. A Sieve bed

AG. A Sieve Bed Waste Valve

AH. A Sieve Bed Silencer

AI. Supply Hoses (2)

AJ. Equalizing Valve

AK. Discharge Check Valve (2)

AL. Balancing Orifice

AM. Unloading Valve

Back View Parts Description

BA. Booster Pressure Compressor

BB. Low Pressure Storage Tank

BC. Moisture Separator/ HX (3)

BD. Low Pressure Compressor C

BE. Low Pressure Compressor B

BF. Cooling Fans (8)

BG. Low Pressure Compressor A

BH. Compressor Inlet Filter (3)

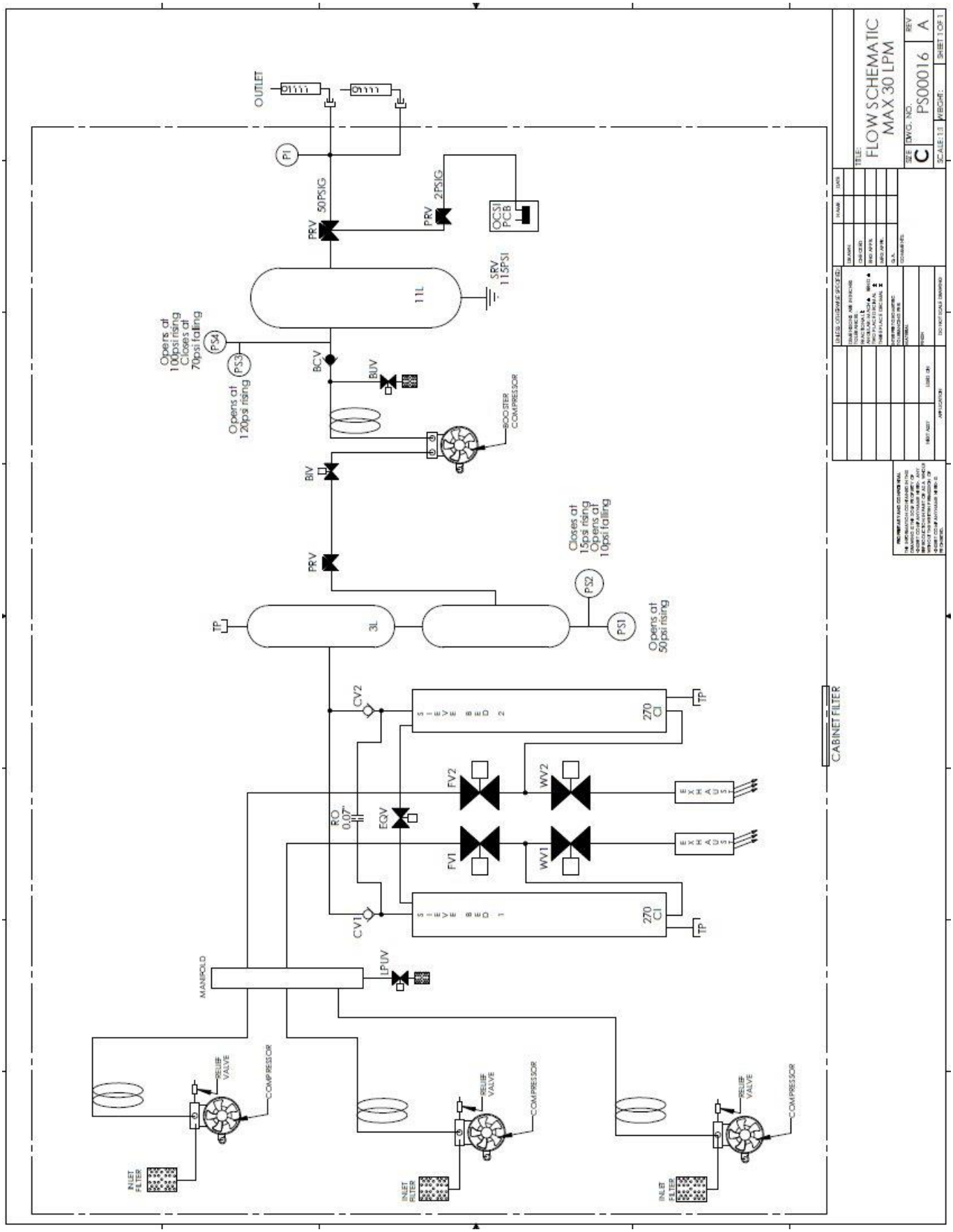
BI. Low Pressure Storage Tank

BJ. Low Pressure Regulator

BK. Pressure/Vacuum Gauge

Internal Components Description	
Sieve Beds (AC & AF)	These sieve beds contain the molecular sieve that performs the air separation process, as well as the process control valves and oxygen storage tank. They are spring loaded to prevent settling and should never need to be opened. If the sieve becomes contaminated, the beds can be easily replaced.
Pressure Regulator (H)	The pressure regulator controls the pressure delivered to the oxygen outlet. It should be set in a way so that the pressure does not exceed **50 psi (3.4 bar)**.
Oxygen Monitoring Circuit Board (B)	This circuit board monitors the operation of the unit. It continuously monitors the output of the unit to ensure it is operating within an acceptable range.
Compressor Inlet Filter (BH)	The compressor inlet filter keeps dust and dirt from entering the compressor and needs to be changed twice a year in normal environments to maintain performance. In especially dirty and oily areas, it should be changed more often. Four times a year is recommended.
Air Compressor (BD, BE & BG)	The air compressor supplies the feed air to the sieve beds. It should work as designed for a minimum of 10,000 hours and may last 20,000 hours in some cases. It is suspended by four springs to dampen vibration that should not require replacement.
Heat Exchanger/ Moisture Separator (BC)	The heat exchanger moisture separator delivers the feed air from the air compressor to the modular bed. Significant moisture removal occurs before the air enters the sieve beds, improving performance.
PLC (A)	The Programmable Logic Controller (PLC) provides the logic that operates the unit.
Terminal Strip Assembly (F)	The terminal strip distributes electrical power as required to the compressors and control components of the machine.
Cooling Fans (BF)	Multiple cooling fans pull air thru 3 cabinet filters to provide overall cooling to the unit.
Oxygen Pressure Switch (E)	The oxygen pressure switches provide a safety function to shut the unit off if pressure exceeds maximum values.
Oxygen Pressure Sensor (R)	The oxygen pressure sensor controls operation of the booster compressor.
Oxygen Storage Tank (K)	The oxygen storage tank, provides a small buffer to allow the unit to operate smoothly on high demand applications, it provides product equal to approximately 6 seconds of operation.

Process Flow Diagram



Process Flow Description

Once the incoming air is filtered and compressed in the **MAX 30** unit, it is directed into one of the two sieve beds. As the air enters the bed, the nitrogen is adsorbed by the sieve and the oxygen passes through as product gas to the storage tank at a pressure around 20 psi (1.3 bar). Each bed produces oxygen until the sieve in that bed is saturated with nitrogen. When this occurs, the feed airflow is directed to the other bed, which continues the production process. While the second bed is producing oxygen, the first bed is releasing into the atmosphere the nitrogen it adsorbed, under very low pressure through a waste gas silencer.

From the storage tank, a pressure regulator balances the amount oxygen product gas being pulled out through the booster compressor at 2 psi while the booster is running. The oxygen product gas passes through a booster compressor designed to raise the operating pressure. Oxygen at the higher pressure passes into the booster storage tank. This storage tank serves as a reservoir for the oxygen prior to entering flow meter. A regulator maintains the oxygen output at 50 psi (3.4 bar). From the storage tank the oxygen passes through a bypass OCSI monitor where a digital display of the concentration is produced. The booster compressor will automatically de-energize when the maximum pressure is reached. The booster will not run if the pressure in the storage tanks is not about 15 psi.

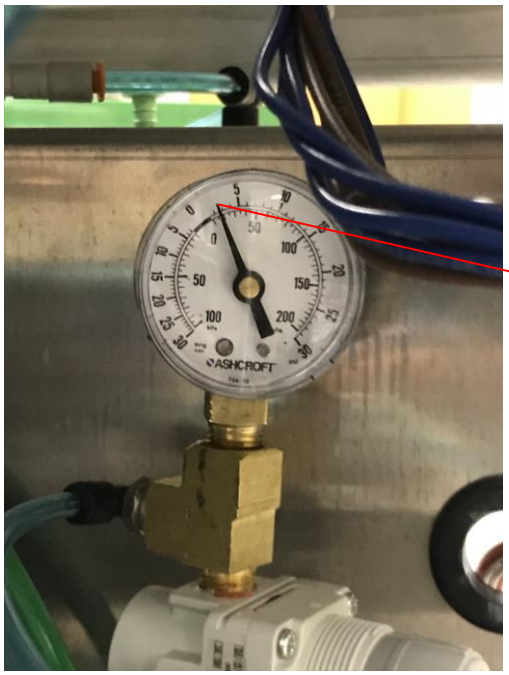
OCSI Display:

The OCSI board monitors the output of the machine to make sure the oxygen concentration is within acceptable conditions. Output of the machine will be up to 30LPM of dry oxygen at 50psi (3.4 bar) discharge pressure. The board will use an ultrasonic sensor to determine the purity of the oxygen as it exits the sieve beds. The board will monitor the purity level and alarm if the purity falls below 90%. If the purity falls below the set point the red indicator on the display will be illuminated and the buzzer will alarm continuously until the either the purity returns to above the set point or the unit/machine is turned off. On startup the indicator will show green when purity has exceeded the set point. The board should never require calibration.

Low Pressure Regulator:

The low pressure regulator located next to the booster compressor and behind the right storage tank must be set to 2 psi to ensure proper operation of the booster compressor. The flow of oxygen enriched product gas through the booster is set by this regulator. If the regulator is set too low, the booster compressor can pull too much product gas out of the sieve beds, which may result in a loss of oxygen purity. If the regulator is set too high (above 5 psi while the booster is running), the regulator will lower the amount of product gas available to the booster, which may cause it to stall at higher pressures. A pressure/vacuum gauge located after the low pressure regulator is necessary to ensure that it is set to the optimal pressure. Turning the knob on the regulator clock wise will increase the pressure, according to the gauge. The knob can be pushed towards the base of the regulator in order to lock the pressure setting. If the knob will not move while attempting to adjust the regulator, lift the knob away from regulator base in order to unlock it. Once the regulator has been set, push the knob back towards the regulator base to lock it back in place.

LP Regulator (Side View)



LP Regulator and Gauge
(Front View)

Unit Specifications

Performance

Oxygen Volume/Pressure	63 SCFH @ 50 psi 30 LPM or @ 3.4 bar
Oxygen Purity	93% (± 3%) [United States Pharmacopeia (USP) XXII oxygen 93% Monograph]
Oxygen Dew point	- 60° F (-51° C)
Feed Air Requirement	None, compressors included
Response Time	Approximately **5** minutes to attain maximum purity after initial start-up or extended shut-down, or longer if a supplemental tank is used.

Physical

Oxygen Outlet Fitting	1/8" NPT Male Insert
Sound Levels	60 dBA @ 1 m
Dimensions	24 x 21 x 44 in (W x D x H) 610 x 530 x 1120 mm (W x D x H)
Weight	200 lb (91 kg)

Power Requirement

Standard (International)	230 VAC, 50/60 Hz, Single Phase, 11 A

Oxygen Flow Rate

63 SCFH / 30LPM

Safety Precautions

It is very important that you read the precautions below and make yourself aware of the hazards of oxygen in general. While it can be handled and used very safely, it can also be mishandled or applied incorrectly causing dangerous situations.

Oxygen is a fire hazard. It can be very dangerous as it vigorously accelerates the burning of combustible materials. To avoid fire and/or the possibilities of an explosion, oil, grease or any other easily combustible materials must not be used on or near the oxygen concentrator. **DO NOT SMOKE NEAR THE UNIT**. The unit should be kept away from heat and flames. Individuals who have experience handling oxygen systems should become the designated operators of the oxygen concentrator within your facility.

In sensitive applications, it is important to have a backup supply of oxygen since the concentrator does not come with any reserve storage tank and requires electrical power to operate. ***Therefore, during power outages oxygen will not be produced.***

Do not use extension cords to bring power to the concentrator. The current drawn into the unit is high and could overheat some extension cords. It is also important to use only a properly grounded outlet.

High pressure oxygen may present a hazard. Always follow proper operating procedures, and ***open valves slowly***. Rapid pressurization may result in personal injury. Safety glasses and hearing protection are required when venting oxygen under high pressure.

Ensure that the oxygen outlet stream is not directed toward anyone's clothing. Oxygen will embed itself in the material and one spark or hot ash from a cigarette could ignite the clothing vigorously.

There are several onboard storage locations that might remain pressurized after the unit is shutoff, ***Ensure*** that this pressure is released prior to performing any service on the unit.

Pre-Installation

Before installing the ***NMP*** Oxygen Concentrator, it is necessary to consider the location, space available and power supply for the concentrator.

1) Locating the **MAX 30:**

- The oxygen concentrator should be located in an area that is indoors and remains between **40 F** (**5 C**) and **100 F** (**38 C**). **Setting the machine outdoors or in an area that is not normally within this temperature range will void the *NMP* Warranty.**
- There should be a distance of at least **12 in** (**20 cm**) between the unit and any side or back wall in the room that it will be located. It should also not be located any closer than **24 in. (60 cm)** from the discharge of any other operating units. This ensures proper airflow into the concentrator and minimizes any restriction.

2) Space Available for the **MAX 30:**

- If the **MAX 30** unit is going to be set up in a room that is small, (less than **2000 ft^3**or **56.6 m^3**), that room should be well ventilated (at least **8** air changes in the room per hour). The concentrator will be discharging nitrogen into the atmosphere of the room and a nitrogen build up could be dangerous to people entering the room. If the concentrator is placed in a small closet, the air in that closet will become enriched with nitrogen. As the concentrator continues to run, it would become more and more difficult for it to separate the oxygen from the air because oxygen will make up a smaller and smaller fraction of the air that is fed into the

3) Power Supply for the **MAX 30:**

- The oxygen concentrator should be positioned within **8 ft** (**2.2 m**) of the electrical outlet that will power it. The reason for this is that the motor draws a large current during the first few seconds of start-up. **It is also very important for this reason NOT to use any extension cords with the unit.** They could overheat and melt, possibly causing a fire. Caution should be exercised to ensure the mains power cord is accessible in the event the unit needs to be disconnected from the mains supply.

Required Operating Conditions

Location of Machine:

The standard oxygen concentrator is intended for use indoors in a commercial or light industrial setting. The enclosure meets **NEMA 1** protection guidelines, which provides a degree of protection against dust and falling dirt. It is classified as **IPX1** in accordance with 60529-1:2001, which provides for a degree of protection from spillage and falling water.

Feed Air/Ambient Air Quality:

The life of any PSA oxygen concentrator is directly related to the air quality that is fed into it. Hot, humid, dirty, oily air deteriorates and degrades the performance of the molecular sieve. In order to preserve the effectiveness and extend the life of the concentrator, precautions must be taken to ensure that the air provided is cool, dry, clean and oil-free. Changing the inlet air filter is a simple and easy way to provide the unit with some protection. It is advisable to set up the unit in an air-conditioned or a well-ventilated area. The room should also be free of toxic gases and high concentrations of hydrocarbons, especially carbon monoxide. Humid, oily areas should be avoided as installation sites as much as possible.

Ambient Air Temperature:

The machine is designed for use over a temperature range of **40 F** to **104 F** (**5 C** to **40 C**). Since hot air has the ability to hold much more water in the form of humidity than cool air, operating the units in hot areas will reduce the effective life of the molecular sieve. Acceptable humidity is between 15 % and 95 % for both operations and storage.

Note: Operation outside of this temperature range will not be warranted by ***NMP***. The device may be stored at between **-20° C and 60° C**

Electrical Power:

The power for the control circuitry of the oxygen concentrator is a single-phase electrical supply of **230 VAC** and about **11 A** at a frequency of **50 Hz or 60Hz** depending on model. This equates to approximately **2100 W** of power. It is required that a **15 A** circuit be dedicated to each **MAX 30** unit. Additionally, the unit must be connected to this circuit using only the supplied power cord, and without additional extension cords.

Positioning:

The unit must be stored, transported and operated in an upright position only, with no obstruction blocking airflow around the unit.

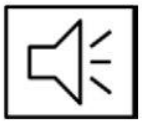
Set-up & Installation

Although every **MAX 30** unit is thoroughly tested and checked before it is shipped from our facility, the following checks are necessary to ensure that none of the internal components have been damaged in shipment. This check should take less than five minutes to perform. *(Refer to '**Initial Inspection'** on Page 2 before reading the instructions below)*

Make a visual inspection of the machine and make sure all parts are properly attached. *(Refer to '**Components**' section)*

Connect the unit into an electrical outlet. A receptacle plug of local configuration will need to be attached first if the supplied plug is not acceptable.

Turn the **ON/OFF** switch to the **ON** position and make sure that the display light is illuminated. Press the START Button on the display unit.



After a brief delay, listen for the sound of multiple compressors to start operating, if you do not hear it within ten minutes, shut the machine down immediately and call ***NMP*** for assistance.

The oxygen flow will continue to increase on the flow meter until the unit is up to operating pressure at which time the flow meter will indicate correctly. If this does not occur, check to make sure that none of the hose connections have come loose. Call ***NMP Technical Service Department*** at ***+1(205) 856-7200,*** if no loose connections are found and trouble persists.

Operating Instructions

Start-up

- Once the system has been installed in accordance with the set-up and installation instructions, it may be operated. The following steps should provide some direction.
- Connect the oxygen outlet to the application
- After connecting it to an electrical outlet and making sure the master switch is in the **ON** position, press the start button on the display unit on the machine to the, wait for **5 to 10** minutes for the unit to come up to rated purity.
- As the unit is coming up to pressure and the correct purity the panel will remain “red” indicating unacceptable output. Once the purity and pressure are acceptable the display will change to “green” indicating it is ready for use. Once flow is established the digital display will indicate the purity of the output Oxygen and the flow meters will indicate the amount of Oxygen flowing to the output.
- Begin using Oxygen.

Shut-down

- To shut off the machine, press the stop button on the display unit. The compressors will quit immediately and the display will continue to show the unit status. If the unit will be off for an extended period then the master switch on the back of the unit can be placed in the off position.
- To shut off the machine, press the stop button on the display unit. The compressors will quit immediately and the display will continue to show the unit status. If the unit will be off for an extended period then the master switch on the back of the unit can be placed in the off position

Caution: **After unit is turned to off the oxygen flow will continue as the pressure in the unit bleeds down.**

Troubleshooting Guide

Problem	Sign	Cause	Solution
Machine not starting		Machine not plugged in Machine not turned on No power to the machine Circuit breaker has tripped Compressor under pressure Loose wire	Ensure that machine is plugged in. Ensure that switch is in the **ON** position. Ensure that there is power supply to the machine. Push in the reset button on the right hand side of the cabinet. Remove the head pressure that exists in the compressor outlet stream. Check that all wiring connections are secure.
Pressure Switch not Working	Machine not turning **ON/OFF** at target pressures	Faulty switch	Remove switch and return for replacement.
Low Oxygen Pressure		This may be a result of a leak in the system.	Use a leak testing solution to locate and repair any air leaks.
Oxygen purity has fallen below acceptable limits (50-87%)		This may be a result of a leak in the system. Beds Are Hydrated Dirty Filters	Use a leak testing solution to locate and repair any air leaks. Replace Beds Replace Filters
Oxygen purity is extremely low (<50%)		Sieve Beds “dusted”	Check for white dust around exhaust filters and sieve beds. Replace Beds

No flow of oxygen out of machine		Booster never turns on Rear outlet is open	See Below. Close rear outlet if not desired to be open
Booster isn't running		Low Pressure <15 psi Loose fittings/leaks Unloader stuck open	Check fittings around booster and storage tanks for leaks, especially the brass fittings. Check unloading valve to see if it is constantly venting.

Preventive Maintenance

Air Filter Cleaning

The air filter elements (3) should be removed and cleaned in soapy water every two weeks or 20 hours of operation to reduce the dust and dirt contamination for inside of the unit.

Compressor Filter Element Replacement:

The air filter element provided with the **MAX 30** must be replaced every **six (6)** months on an average and more frequently in dusty environments. This element helps to maintain the quality of the feed air supply, preserve the molecular sieve inside the oxygen enricher and extend the life of the air compressor.

Failure to replace the filter element on schedule will result in the warranty becoming invalid.

Cabinet & Power Cord:

The cabinet and power cord should be occasionally wiped down with a sponge or clean rag and some soapy water. Avoid the use of ammonia or other strong chemical based cleaning solvents. This prevents dust and dirt from building up on the machine.

Air Compressor:

You should consider your air compressors an important part of your oxygen generating system. In addition to changing the air filter element, maintenance is relatively simple. The fans on either end should remain free of debris/dust. The air compressors should last **five (5) or six (6) years** or longer under normal operating conditions. The low pressure compressors should be rebuilt after 15,000 hours of operation. The booster compressor should be rebuilt after 6,000 hours of operation. Hour meters on the rear of the unit indicated hours on the low pressure (LP) compressors and booster (HP) compressor. As indicated by use, both will need to be rebuilt or replaced. Oxygen purity and flow rate along with feed air pressure delivered to the sieve beds will all be indicators that the air compressor has expended its life. Replacement in the field is possible, but returning the unit to ***NMP*** or an authorized service center is recommended.

OCSI Display Board

The OCSI board should never require calibration and can not be calibrated in the field. Calibration can be verified if needed periodically. Remove the back of the unit disconnect the hoses from the sensor on the large board, supply the board with calibration quality oxygen (99.99%) and check the display, if the display is reading 90.2% +/- 3% then it is within the calibration specifications, if it is outside the range it should be replaced

Technical Service Assistance

It is our intention to provide complete customer satisfaction. This manual is one way in which we hope to provide you with technical assistance.

If you do not find what you need in this manual or you have other questions about this equipment, please feel free to contact us directly. We look forward to serving your oxygen needs and invite your inquiries. We will respond to you as promptly as possible.

You can reach ***NMP*** through the following means:

By Telephone (Outside the United States):

Your local International Access Code (usually **0** or **00**), followed by The Country Code for the U.S. which is (**1**), followed by Our Area Code and Number (**205**) **856-7200**

By Fax (Within or outside the United States): +1(205) 856-0533

By E-Mail or Website:

info@nidekmedical.com
http://www.nidekmedical.com

By Mail:

Nidek Medical Products
3949 Valley East Industrial Dr
Birmingham, Alabama 35071 USA

By UPS, FedEx or Common Carrier: *(Address to return shipments)*

Nidek Medical Products
3949 Valley East Industrial Dr
Birmingham, Alabama 35071 USA

*Technical service personnel are available from **7:00 AM** to **4:00 PM** **CST** (GMT - 6).*
We also have a list of Distributors and Authorized Service Agents available upon request.

Appendix A
Spare Parts List

PART NAME	PART NUMBER	QUANTITY
Power Cord 16A Euro	9600-1038	1
Strain Relief for Power Cord	9600-1080	1
Hourmeter - Resettable	8400-5028	1
Master On-Off Switch	9800-1008	1
15 A Circuit Breaker	9800-1519	1
5 A Circuit Breaker	8400-1019	5
Pressure Switch/Sensor	9800-1521	1
Temperature Switch	9800-1507	1
Programmable Logic Controller	9800-1500	1
HMI	9600-1505	1
OCSI Board	9800-1810	3
24VDC Power Supply	9800-1505	1
24VDC Control Relay 4 Pole	9800-1509	3
24VDC Control Relay 2 Pole	9800-1512	
Sieve Bed Control Valves	9800-1200	4
Inline Check Valves	9800-1114	2
High Pressure Oxygen Regulator	9800-1157	1
Low Pressure Oxygen Regulator	8400-1060	2
Compressor Assembly (230 VAC, 50 Hz)	9251-1632	3
Compressor Assembly (230 VAC, 60 Hz)	9251-1532	
Low Pressure Compressor Rebuild Kit	7355-3670	
Booster Compressor Assembly (230VAC, 50/60Hz)	9800-1632	
Booster Compressor Rebuild Kit	7355-3678	
1/4" NPT 3-Way Isolation Valve 24VDC	9800-1205	3

1/4" OD Blue Oxygen Polyurethane Tubing - Per Foot	7854-6109	
PART NAME	**PART NUMBER**	**QUANTITY**
1/4" ID Braid Reinforced PVC Tubing - Per Foot	7854-6105	
3/8" OD Green Nylon Tubing - Per Foot (Low Temp Air)	7854-6107	
3/8” OD Clear FEP Tubing - Per Foot (High Temp Air)	7854-6106	
Inlet Air Filter Element	9600-1053	2
Exhaust Fan 230 V	8400-1024	10
Air Compressor filter (Change every 6 months)	9800-1012	2
Compressor Capacitor	9250-1322	3
Air Compressor Filter Element	9800-1027	3
Flowmeter (1-15LPM)	9800-1047	1
Product Filter	9250-1053	3
Caster 4”, Swivel & Locking	9800-1013	2
Caster 4”, Swivel	9800-1018	2
Moisture Separator	9251-1911	3
Compressor Outlet Fitting	9251-1052	3
Moisture Separator Inlet Fitting	9250-1163	3
Moisture Separator Outlet Fitting	9250-1167	3
Inline Orifice	9800-1121	3
Replacement Sieve Bed	0600-0500	2
Manual-Available Free on Website	2010-9800	

Appendix B
Maintenance Log

Date	Part	Reason for Maintenance	Authorized Service Technician Signature