

# User Manual

## **Invacare SOLO<sub>2</sub><sup>TM</sup> Transportable Oxygen Concentrator**



**Model TPO100  
Model TPO100B**

Dealer: This manual **MUST** be given to the end user.

User: **BEFORE** using this product, read this manual and save for future reference.



For more information regarding Invacare products, parts, and services, please visit [www.invacare.com](http://www.invacare.com)



**Yes, you can.®**

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**⚠ WARNING**

**DO NOT USE THIS PRODUCT OR ANY AVAILABLE OPTIONAL EQUIPMENT WITHOUT FIRST COMPLETELY READING AND UNDERSTANDING THESE INSTRUCTIONS AND ANY ADDITIONAL INSTRUCTIONAL MATERIAL SUCH AS USER MANUALS, SERVICE MANUALS OR INSTRUCTION SHEETS SUPPLIED WITH THIS PRODUCT OR OPTIONAL EQUIPMENT. IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS, CAUTIONS OR INSTRUCTIONS, CONTACT A HEALTHCARE PROFESSIONAL, DEALER OR TECHNICAL PERSONNEL BEFORE ATTEMPTING TO USE THIS EQUIPMENT - OTHERWISE, INJURY OR DAMAGE MAY OCCUR.**

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**⚠ ACCESSORIES WARNING**

**INVACARE PRODUCTS ARE SPECIFICALLY DESIGNED AND MANUFACTURED FOR USE IN CONJUNCTION WITH INVACARE ACCESSORIES. ACCESSORIES DESIGNED BY OTHER MANUFACTURERS HAVE NOT BEEN TESTED BY INVACARE AND ARE NOT RECOMMENDED FOR USE WITH INVACARE PRODUCTS.**

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*NOTE: Updated versions of this manual can be found at [www.invacare.com](http://www.invacare.com).*

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# SPECIAL NOTES

Signal words are used in this manual and apply to hazards or unsafe practices which could result in personal injury or property damage. Refer to the following table for definitions of the signal words.

SIGNAL WORD	MEANING
DANGER	Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Caution indicates a potentially hazardous situation which, if not avoided, may result in property damage or minor injury or both.

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## NOTICE

The information contained in this document is subject to change without notice.

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## DANGER

**DO NOT SMOKE** while using this device. Keep all matches, lit cigarettes, candles or other sources of ignition out of the room in which this product is located and away from where oxygen is being delivered.

**NO SMOKING** signs should be prominently displayed. Textiles and other materials that normally would not burn are easily ignited and burn with great intensity in oxygen enriched air. Failure to observe this warning can result in severe fire, property damage and cause physical injury or death.

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**CAUTION**

Within the US:

“Caution: Federal law restricts this device to sale or rental by or on order of a physician, or any other practitioner licensed by the law of the State in which he/she practices to use or order the use of this device.”

The use of oxygen therapy in certain circumstances can be hazardous and seeking medical advice before using this device is advisable.

Invacare recommends an alternate source of supplemental oxygen in the event of a power outage, alarm condition or mechanical failure. Consult your physician or equipment provider for the type of reserve system required.

This equipment is to be used as an oxygen supplement and is not considered life supporting or life sustaining.

Outside the US:

“Caution: Statutory law can restrict this device to sale or rental by or on order of a physician, or any other practitioner licensed by the law of the government agency in which he/she practices to use or order the use of this device.”

Invacare recommends an alternative source of supplemental oxygen in the event of a power outage, alarm condition or mechanical failure. Consult our physician or equipment provider of r the type of reserve system required.

This equipment is to be used as an oxygen supplement and is not considered life supporting or life sustaining.

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## Disposal of Equipment and Accessories

This product has been supplied from an environmentally aware manufacturer that complies with the Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/CE. This product may contain substances that could be harmful to the environment if disposed of in places (landfills) that are not appropriate according to legislation.

Follow local governing ordinances and recycling plans regarding disposal of the device or components normally used in operation. The device does not generate waste or residue in operation. **DO NOT** dispose of the device or the battery module in the normal waste stream. The lithium battery module should be returned to your dealer/provider for recycling. Any accessories not part of the device **MUST** be handled in accordance with the individual product marking for disposal.



Recycle



DO NOT dispose of in household waste

## SECTION I—GENERAL GUIDELINES

In order to ensure the safe installation, assembly and operation of the transportable oxygen concentrator these instructions **MUST** be followed.

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### **⚠ WARNING**

This section contains important information for the safe operation and use of this product.

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### **⚠ DANGER**

Risk of electric shock. **DO NOT** disassemble. Refer servicing to qualified service personnel. No user serviceable parts.

**TO REDUCE THE RISK OF BURNS, ELECTROCUTION, FIRE OR INJURY TO PERSONS**

A spontaneous and violent ignition may occur if oil, grease, greasy substances, or petroleum based products come in contact with oxygen under pressure. These substances **MUST** be kept away from the transportable oxygen concentrator, tubing and connections, and all other oxygen equipment. **DO NOT** use any lubricants unless recommended by Invacare.

Avoid using while bathing. If continuous usage is required by the physician's prescription, the concentrator **MUST** be located in another room at least 7 ft (2.1 m) from the bath.

**DO NOT** come in contact with the concentrator while wet.

**DO NOT** place or store product where it can drop into water or other liquid.

**DO NOT** reach for product that has fallen into water. Unplug **IMMEDIATELY**.

Keep the oxygen tubing, cord, and unit out from under such items as blankets, bed coverings, chair cushions, clothing and away from heated or hot surfaces, including space heaters, stoves and similar electrical appliances.

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**⚠ DANGER**

**Avoid creation of any spark near medical oxygen equipment. This includes sparks from static electricity created by any type of friction.**

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DO NOT move or relocate concentrator by pulling on the cord.

A product should NEVER be left unattended when plugged in. Make sure the transportable oxygen concentrator is Off when not in use.

Outdoor use of the transportable oxygen concentrator MUST be conducted with battery power only.

## **Operating Information**

The transportable oxygen concentrator can only be used in conjunction with PAP, Bi-Level or other such devices when in continuous flow mode.

If the transportable oxygen concentrator is not working properly, if it has been dropped or damaged, or dropped into water, call equipment provider/qualified technician for examination and repair.

If you feel ill or uncomfortable, or if the unit does not signal an oxygen pulse and you are unable to hear and/or feel the oxygen pulse while in pulse flow mode or you cannot hear or feel flow when in continuous flow mode, consult your equipment provider and/or your physician IMMEDIATELY. NEVER drop or insert any object or liquid into any opening. DO NOT use extension cords with AC power adaptors provided.

For optimum performance, Invacare recommends that each concentrator be on and running for a minimum of 5 minutes. Shorter periods of operation may reduce maximum product life.



The transportable oxygen concentrator is designed only to be used with a humidifier while using continuous flow mode. Use of this device with a humidifier in pulse flow mode may impair performance and/or damage the equipment.

When your automobile is turned Off, disconnect the car accessory power supply and remove the transportable oxygen concentrator from the automobile. NEVER allow the transportable oxygen concentrator to be stored in a very hot or cold automobile or in other similar, high or low, temperature environments. Refer to Typical Product Parameters on page 14.

DO NOT operate in temperatures below 41° F (5°C) or above 104° F (40° C) for extended periods of time.

Invacare recommends that the battery module be removed from the unit when the unit is not intended to be used for extended periods of time.

DO NOT connect the concentrator in parallel or series with other oxygen concentrators or oxygen therapy devices.

Invacare recommends that the transportable oxygen concentrator not be used for extended periods in the rain.

Close supervision is necessary when this product is used near children or physically-challenged individuals.

Additional monitoring or attention may be required for patients using this device who are unable to hear or see alarms or communicate discomfort.

Be aware that electrical cords and/or tubing could present a tripping hazard.

A change in altitude may affect total oxygen available to you. Consult your physician before traveling to altitudes above 10,000 ft (3046 m) to determine if your flow settings should be changed.

## Maintenance

The transportable oxygen concentrator was specifically designed to minimize routine preventive maintenance. Only professionals of the healthcare field or persons fully conversant with this process such as factory trained personnel should perform preventive maintenance or performance adjustments on the oxygen concentrator.

## Radio Frequency Interference

This equipment has been tested and found to comply with EMC limits specified by IEC/EN 60601-1-2. These limits are designed to provide a reasonable protection against electromagnetic interference in a typical medical installation.

Other devices may experience interference from even the low levels of electromagnetic emissions permitted by the above standards. To determine if the emissions from the transportable oxygen concentrator are causing the interference, turn the transportable oxygen concentrator Off. If the interference with the other device(s) stops, then the transportable oxygen concentrator is causing the interference. In such rare cases, interference may be reduced or corrected by one of the following measures:

- Reposition, relocate, or increase the separation between the equipment.
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) is connected.

## Polarized Plug Instruction

As a safety feature, this appliance may have a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician. DO NOT attempt to defeat this safety feature.

## SECTION 2—PACKAGING AND HANDLING

### Unpacking

1. Check for any obvious damage to the carton or its contents. If damage is evident, notify the carrier, or your local dealer.
2. Remove all loose packing from the carton.
3. Carefully remove all the components from the carton. The transportable oxygen concentrator packaging contains the following items (as shown below). If any parts are missing, please contact your equipment provider.
  - Transportable oxygen concentrator
  - Battery module (TPO100B)
  - Operator's manual
  - AC power adapter
  - DC power cable
  - Attachable pull cart

*NOTE: Retain all containers and packing materials for storage or return shipment.*

### Inspection

Inspect/examine exterior of the oxygen concentrator and accessories for damage. Inspect all components.

### Storage

1. Store the repackaged oxygen concentrator in a dry area.
2. DO NOT place objects on top of packaged concentrator.

## **SECTION 3—TECHNICAL DESCRIPTION**

The Invacare transportable oxygen concentrator is to be used by patients with respiratory disorders who require supplemental oxygen. The device is not intended to sustain or support life.

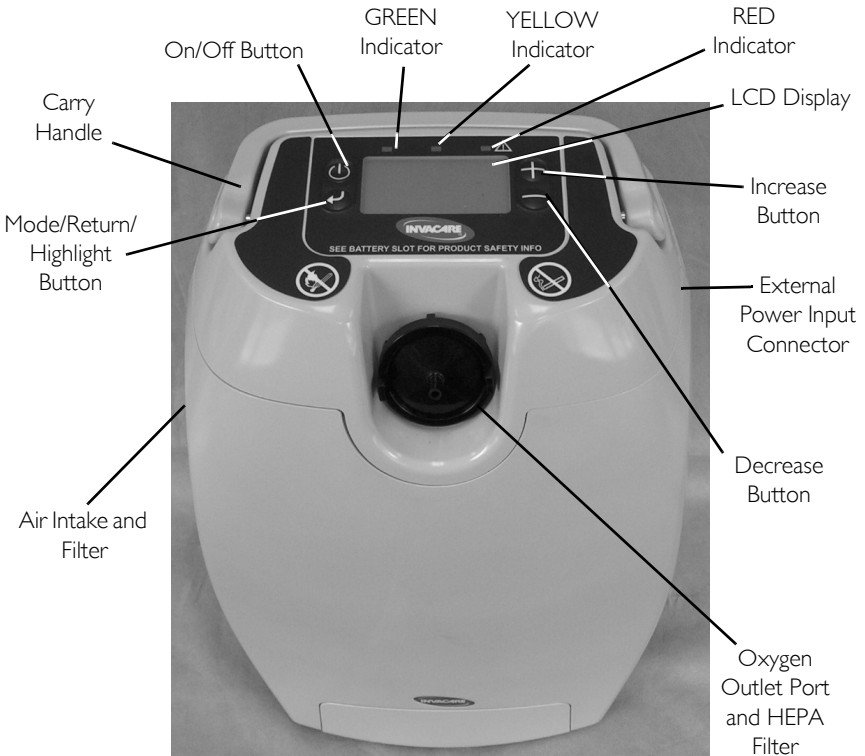
The oxygen concentration level of the output gas ranges from 87% to 95.6%. The oxygen is delivered to the patient through the use of a nasal cannula. The transportable oxygen concentrator provides two modes of operation; pulse flow and continuous flow. In pulse flow, when the demand for oxygen is detected, the oxygen is delivered with pulse flow settings of 1 through 5. In continuous flow, oxygen is continuously flowing with settings from 0.5 LPM to 3.0 LPM.

The Invacare transportable oxygen concentrator uses a molecular sieve and pressure swing adsorption methodology to produce the oxygen gas output. Ambient air enters the device, is filtered and then compressed. This compressed air is then directed toward one of two nitrogen adsorbing sieve beds. Concentrated oxygen exits the opposite end of the active sieve bed and is directed into an oxygen reservoir where it is delivered to the patient in specific volumes during the inhalation portion of a detected breath.

The Invacare transportable oxygen concentrator is capable of operation by the patient in a home environment, in an institutional environment or in a vehicle or other mobile environment. Device standard power options include an AC to DC switching power supply operating from AC power outlet (120 VAC/ 60 Hertz or 230VAC/50 Hertz nominal), a DC supply operating from accessory outlets typically found in a mobile vehicle type environment (12 VDC nominal) and a rechargeable battery module.

## SECTION 4— FEATURES












Please review the figures below to familiarize yourself with the locations of the transportable oxygen concentrator features and controls.



*NOTE: The battery pack is not shown. This item is located on the back side of the unit.*

**FIGURE 4.1** Features

# SECTION 5—TYPICAL PRODUCT PARAMETERS

	Direct Current
	Type BF equipment
	Attention - Consider Accompanying Documents
	DO NOT smoke
	No open flame
	Class II, Double Insulation
	Power On/Off
	DO NOT dispose of in household waste
	Recycle
	DO NOT use oil or grease
	Keep dry in transport or storage
<b>IPX1</b>	Protected against dripping water in upright position (AC and DC power input)
<b>IPX2</b>	Protected against dripping water in upright and tilted positions (battery power only)
<b>NO AP/APG</b>	Not suitable for use in the presence of a flammable anaesthetic mixture

## SECTION 5—TYPICAL PRODUCT PARAMETERS

<b>POWER INPUT:</b>	24 VDC @ 7.5 Amp or 11-16 VDC @ 10.0 Amp max (12.6 VDC Nom.)
<b>EXTERNAL POWER SUPPLY INPUT:</b> AC POWER SUPPLY:  DC POWER SUPPLY:	120 VAC, 50/60 Hz @ 2.5 amps 230 VAC, 50/60 Hz @ 1.25 amps  11-16 VDC, (12.6 VDC Nom. @ 10.0 Amp max)
<b>SOUND LEVEL:</b>	< 40 dBA weighted @ 2 LPM continuous and all pulse settings (1-5)
<b>ALTITUDE:</b>	Up to 10,000 ft (3046 m) above sea level Titration recommended for use above 10,000 ft (3046 m)
<b>OXYGEN CONCENTRATION:*</b> *BASED ON AN ATMOSPHERIC PRESSURE OF 14.7 PSI (101 KPA) AT 70°F (21°C) NOMINAL	87% to 95.6%, after initial warm-up period (approximately 5 minutes) at all flow rates
<b>CONSERVER TRIGGER SENSITIVITY:</b> FACTORY SET - NO ADJUSTMENT PRESSURE ACTIVATED	≤ 0.20 cmH <sub>2</sub> O max pressure drop  All settings - using 7 ft (2.1 m) cannula
<b>CONSERVER TRIGGER DELAY:</b> FACTORY SET - NO ADJUSTMENT	35 mSec max  Nominal value - using 7 ft (2.1 m) cannula
<b>CONSERVER BOLUS DELIVERY:</b> FIXED MINUTE VOLUME	Setting 1: 400 cc Setting 2: 800 cc Setting 3: 1200 cc Setting 4: 1600 cc Setting 5: 2000 cc  Total cc's ± 75 cc delivered per minute
<b>CONSERVER BREATH RATE CAPACITY:</b>	Up to, and including, 35 BPM without reduction of bolus minute volume
<b>CONTINUOUS FLOW SETTINGS:</b>	0.5 through 3.0 LPM @ 0 psi 0.5 LPM increments All settings are ± 0.2 LPM (2.0 LPM max w/Ext DC Power Cable)

## SECTION 5—TYPICAL PRODUCT PARAMETERS

<b>MAXIMUM RECOMMENDED FLOWRATE WITH 7KPA (1.01 PSI) BACKPRESSURE:</b>	3.0 LPM	
<b>PRESSURE RELIEF ACTIVATION:</b>	20 psi ± 5 psi (137.8 kPa ± 34.5 kPa)	
<b>MAX OUTLET PRESSURE @ 3.0 LPM CONTINUOUS:</b>	12.0 psig	
<b>DIMENSIONS:</b> (WITHOUT CART)	16.5 in high x 11 in wide x 8 in deep (41.9 cm high x 27.9 cm wide x 20.3 cm deep)	
<b>WEIGHT:</b> (UNIT WITHOUT CART)	< 20 lbs (9.09 kg)	
<b>BATTERY DURATION:</b> (TIMES ARE APPROXIMATE)	<b>Pulse Mode</b>	<b>Continuous Mode</b>
	Setting 1 = 4.5 hrs	Setting 0.5 LPM = 4.5 hrs
	Setting 2 = 3.5 hrs	Setting 1 LPM = 3.5 hrs
	Setting 3 = 3.0 hrs	Setting 2 LPM = 2.5 hrs
	Setting 4 = 2.5 hrs	Setting 3 LPM = 1.5 hr
	Setting 5 = 2.5 hrs	
<b>BATTERY RECHARGE TIME:</b>	5 hours Recharge time increases if battery is charging while unit is running.	
<b>HUMIDITY RANGE:</b> OPERATING HUMIDITY: TRANSPORT AND STORAGE:	15% to 60% non condensing Up to 95% non condensing	
<b>STANDARD TEMPERATURE RANGE</b> (ALL POWER SOURCES) OPERATING TEMPERATURE: TRANSPORT AND STORAGE TEMPERATURE:	41°F to 95°F (5°C to 35°C) -2°F to 140°F (-20°C to 60°C)	
<b>EXTENDED TEMPERATURE RANGE:</b> (USING AC OR DC POWER) OPERATING TEMPERATURE: AC SUPPLY: DC SUPPLY:	95°F to 104° (35°C to 40°C) Unlimited use all settings, all modes Unlimited use all settings with pulse mode Limited to 2.0 LPM, or less, with continuous mode	



## SECTION 5—TYPICAL PRODUCT PARAMETERS

<b>EXTENDED TEMPERATURE RANGE:</b> (USING BATTERY) OPERATING TEMPERATURE:	95°F to 104° (35°C to 40°C)	
	<b>Pulse Mode</b>	<b>Continuous Mode</b>
	Settings 1, 2 and 3 = unlimited use	0.5 thru 1.5 LPM = unlimited use
	Setting 4 = 45 minutes	2.0 thru 2.5 LPM = 45 minutes
	Setting 5 = 30 minutes	3.0 LPM = 30 minutes

### Regulatory Listing

ETL certified complying with:	EN 55011: 1998
	CISPR 11: 2003
	IEC 60601-1: 2005
	IEC 60601-1-2: 2.1 Ed.
	IEC 61000-3-2: 2005
	IEC 61000-3-3: 2005
	UL 60601-1, 1st ed.
	CSA 601.1 M90
	ISO 8359

# SECTION 6—OPERATING INSTRUCTIONS

## Location

### **WARNING**

NEVER block the air opening of the product or place it on a soft surface, such as a bed or couch, where the air opening may be blocked. Keep the openings free from lint, hair and the like. Keep unit at least 3 in (7.6 cm) away from walls, draperies, furniture, and the like.

Locate and position the transportable oxygen concentrator in a well ventilated space so that the air intake and the air exhausts are not obstructed.

## Recommendations for Optimal Performance

Operating Temperature:	41°F to 95°F (5°C to 35°C)
Relative Humidity:	15% to 60%
Transport/Storage Temperature:	-2°F to 140°F (-20°C to 60°C) Allow unit to warm, or cool, to operating temperature range before using.
Electrical:	No extension cords.
Altitude:	Up to 10,000 ft (3046 m) above sea level.
Tubing and Cannula:	7 ft (2.1 m) crush resistant cannula (DO NOT pinch).
Environment:	Smoke, pollutant and fume free. No confined spaces (example: no closets).
Time of Operation:	Up to 24 hours per day when connected to AC or DC power.

## Filters

Air enters the transportable oxygen concentrator through an air intake filter located on the left side of the unit. This filter prevents hair and other large particles in the air from entering the unit. Before you operate the transportable oxygen concentrator, make sure the filter is clean, dry and properly positioned.

To clean/replace the air intake filter, refer to [Cleaning, Care, And Maintenance](#) on page 32.

## Powering the Transportable Oxygen Concentrator

### **⚠ WARNING**

Use only Invacare specified power supplies with the transportable oxygen concentrator. Use of other non approved power supplies with the transportable oxygen concentrator can cause damage and/or injury and will void the warranty.

When using the DC Power Cable to either operate or charge the transportable oxygen concentrator, the car/boat/motor home engine should be operating.

*NOTE: The battery module requires full charging prior to first use. Refer to Charging the Battery on page 21.*

*NOTE: For this procedure, refer to FIGURE 6.1 on page 20.*

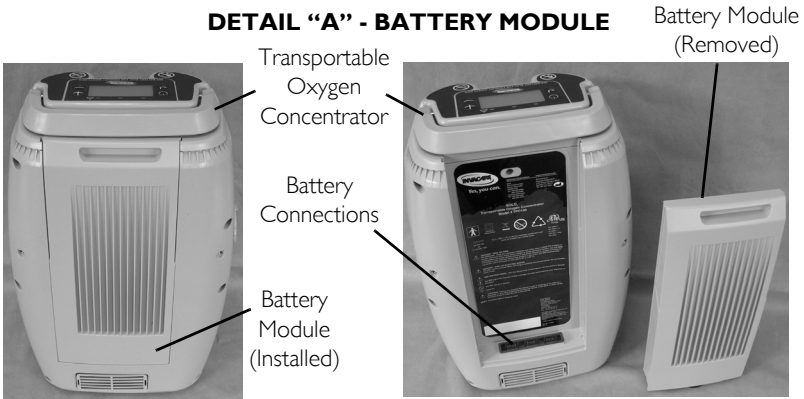
1. The transportable oxygen concentrator allows the freedom to choose from the following power sources:
  - The replaceable battery module. The transportable oxygen concentrator comes equipped with a rechargeable lithium battery module that is not user serviceable. When fully charged, it supplies power for up to 4.5 hours, depending on the setting.
  - An AC power adapter allows the transportable oxygen concentrator to be connected to a 100-240 volt 50/60 hertz outlet (i.e. wall outlet of your home). The power adapter converts AC voltage to a DC voltage that can be used to power the transportable oxygen concentrator. Use of the AC power adapter will allow the transportable oxygen concentrator to operate and simultaneously recharge the battery module. To use, connect the AC power adapter to the transportable oxygen concentrator as shown in (DETAIL "C"). Connect the other end to the AC power outlet.
  - A DC power cable allows the transportable oxygen concentrator to be connected to an automobile's (boat, motor home, etc....) 12-volt DC outlet. Use of the DC power cable will allow the transportable oxygen concentrator to be operated and simultaneously recharge the battery module (depending on the flow setting). To use, connect the DC power cable to the transportable oxygen concentrator as shown in (DETAIL "C"). Connect the other end to the DC power source.

*NOTE: Continuous flow is limited to 2.0 LPM or less with the DC power cable.*

## SECTION 6—OPERATING INSTRUCTIONS

2. To operate from external power (AC or DC) please follow the steps below:
  - A. Turn off the transportable oxygen concentrator.
  - B. Connect the external power supply (DC power cable or AC power adapter) to the transportable oxygen concentrator.
  - C. Perform one of the following:
    - Plug the other end of the AC power adapter into a wall outlet.
    - Plug the other end of the DC power cable into the auto accessory outlet and start the engine.
  - D. Turn the transportable oxygen concentrator on.

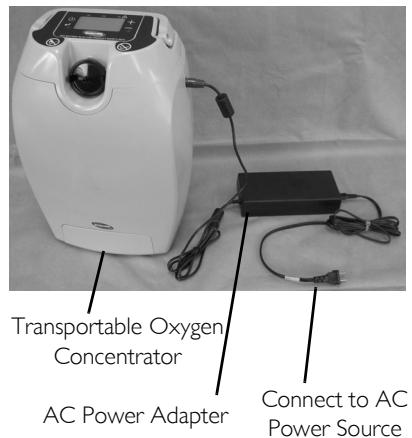
### DETAIL "A" - BATTERY MODULE



### DETAIL "B" - DC POWER CABLE



### DETAIL "C" - AC POWER ADAPTER



**FIGURE 6.1** Powering the Transportable Oxygen Concentrator

## Installing the Battery Module

*NOTE: For this procedure, refer to FIGURE 6.1 on page 20.*

1. Raise unit handle to upright position.
2. With battery pack label facing toward the transportable oxygen concentrator, slowly lower battery module straight down into battery recess located on back side of the transportable oxygen concentrator.
3. Approximately halfway down, ensure side ribs on battery module have engaged with matching slots on back side of the transportable oxygen concentrator.
4. Continue lowering battery module into place, pressing firmly to ensure contact with battery connections located on the transportable oxygen concentrator.

*NOTE: DO NOT slam or force battery module into place, damage to battery connections may occur.*

5. Ensure battery module has engaged. Battery gauge and percentage will no longer read zero. Refer to Checking Battery Charge Level on page 22.

## Charging the Battery

*NOTE: For this procedure, refer to FIGURE 6.1 on page 20.*

1. To charge the battery module, make sure the module is fully seated on the unit.
2. Perform one of the following:
  - Connect the DC power cable (DETAIL “B”).
  - Connect the AC power adapter (DETAIL “C”).
3. Turn off the unit for fastest charge time. Charging times are extended if unit is operating.

*NOTE: DC power input may not be sufficient to charge battery at all settings if unit is operating.*

*NOTE: If the battery is completely discharged, it will fully charge in approximately 4 to 5 hours. During regular use of the transportable oxygen concentrator, it is recommended to recharge the battery, even if only partially depleted, as often as possible.*

## Battery Time Management

Time away from home is almost limitless by combining the use of the AC power supply, DC power cable and battery modules. To ensure the batteries maintain their optimal charge level, utilize the AC power supply whenever you have access to electric power. Utilize the DC power supply whenever you are in a vehicle.

### Checking Battery Charge Level

The installed battery charge level can be checked as follows without operating the unit:

- When using battery or the DC power cable, momentarily press the On/Off button. The Standby screen will display for a short period of time.
- When using the AC power adapter the Standby screen is displayed.

When the unit is operating, the Standby screen is periodically displayed.

### Prolonging Battery Life

#### Do's

- Fully charge the battery module overnight when you first receive your transportable oxygen concentrator.
- The battery pack can be charged at any time. The battery does not have to be fully discharged before attempting to charge. Try to keep your battery modules fully charged when using the unit.
- Always ensure the battery module is recharged as soon as possible after it becomes fully discharged. The battery may permanently degrade if left fully discharged for an extended length of time.
- Check the status of battery module once a month if you are not using your unit regularly. The battery should be maintained at 2 segments (approximately 50%) worth of charge.
- Heat is the worst enemy of a battery. Allow plenty of air to circulate around the transportable oxygen concentrator so that the battery is kept as cool as possible.

#### Don'ts

- DO NOT use or leave the battery module in excessive heat or cold.
- DO NOT store or leave the battery module in car trunks, etc. for extended periods of time.
- DO NOT store the battery module fully charged (4 segments on the unit's battery gauge) if you are going to store your unit for any time greater than 2 weeks. Recharge or discharge the battery module to only 2 segments (50% charge) only. Storing a battery with a full charge may degrade its useful life.
- DO NOT leave your battery module plugged into the transportable oxygen concentrator when the transportable oxygen concentrator is not in use. The battery will lose charge while plugged into the transportable oxygen concentrator even with the unit turned off.

## Connecting/Positioning the Nasal Cannula

### CAUTION

To ensure proper breath detection and oxygen delivery, Invacare recommends using a 7 ft (2.1 m) cannula. Tubing length not exceeding 25 ft (7.6 m) can be used with continuous flow.

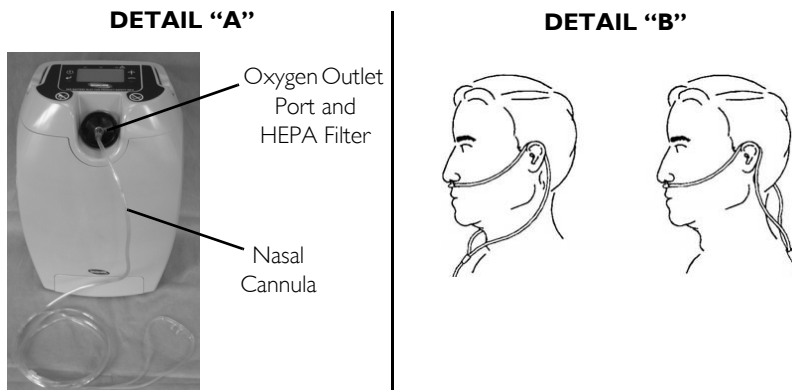
*NOTE: For this procedure, refer to FIGURE 6.2.*

*NOTE: The tubing/cannula must be connected to the transportable oxygen concentrator oxygen outlet as shown below.*

*NOTE: Replace the nasal cannula on a regular basis. Check with your equipment provider or physician to determine how often the cannula should be replaced.*

*NOTE: DO NOT share cannulas between patients.*

1. Connect the nasal cannula to the transportable oxygen concentrator oxygen outlet port (DETAIL "A").
2. Place the cannula over your ears and position the prongs in your nose as instructed by your health care provider or cannula manufacturer (DETAIL "B").



**FIGURE 6.2** Connecting/Positioning the Nasal Cannula

## Connecting the Humidifier

(if so prescribed and only with Continuous Flow Mode)

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### **⚠ WARNING**

DO NOT use a humidifier while in Pulse Mode.

DO NOT overfill humidifier.

DO NOT reverse the oxygen input and output connections. Water from the humidifier bottle will travel through the cannula back to the patient.

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*NOTE: For this procedure, refer to FIGURE 6.3 and FIGURE 6.4 on page 25.*

*NOTE: Connect the humidifier only if prescribed. Use the humidifier only in Continuous Flow Mode.*

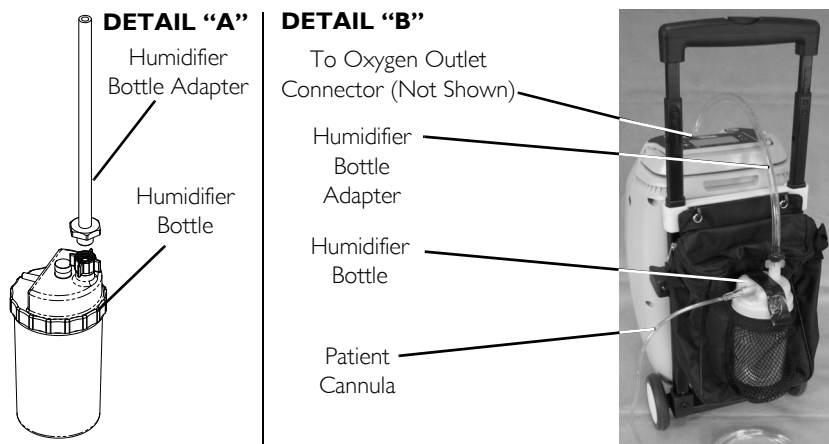
1. Remove cap from bottle.
2. Fill humidifier with distilled water to the level indicated by the manufacturer. Replace the humidifier cap and securely tighten.



**FIGURE 6.3** Filling the Humidifier

3. Attach the humidifier bottle adapter to the humidifier bottle by turning the wing nut on the humidifier bottle counterclockwise until it is securely fastened. See DETAIL “A” in FIGURE 6.4.
4. Place the humidifier bottle/adapter assembly in the outside pocket of the accessory bag. Attach the accessory bag to the pull cart as shown in FIGURE 6.4.
5. Rotate the bottle within the pocket so that the humidifier adapter hose is away from the body of the transportable oxygen concentrator.
6. Attach oxygen tubing from the humidifier bottle/adapter assembly to oxygen outlet connector on the concentrator. See DETAIL “B” in FIGURE 6.4.
7. Attach the cannula/patient supply tubing to the humidifier bottle outlet. See DETAIL “B” in FIGURE 6.4.
8. After assembly, ensure that oxygen is flowing through the cannula.





**FIGURE 6.4** Humidifier Attachment

## Transportable Oxygen Concentrator Front Panel and LCD Display

*NOTE: For this procedure, refer to FIGURE 6.9 on page 30.*

The front panel consists of LED indicators (red, yellow and green), control/adjustment buttons and a LCD display.

### Indicators and Audible Alarm

There are three indicator LEDs located just above the LCD display - green, yellow and red. The indicators could be on steady or blinking at different rates depending on the specific operating condition, including any warning or alarm.

*NOTE: For detailed explanation and descriptions of the warnings and alarms, see [Warnings and Alarms](#) on page 37 or [Troubleshooting](#) on page 35.*

#### Green Indicator

The Green indicator is on when the unit is operating normally and providing good (>85%) oxygen purity.

#### Yellow Indicator

The Yellow indicator is typically on, or blinking, when there is a warning or non-optimal condition present. The transportable oxygen concentrator could still be operating, but some user action may be required to return to normal operation.

#### Red Indicator

The Red indicator is typically lit, or flashing, when there is an alarm that requires the immediate attention of the user. Alarms typically result in the unit stopping with no delivery of oxygen.

### **Breath Detect Indication**

(Pulse Mode Only) The GREEN indicator light will blink off each time an inhalation is detected and the transportable oxygen concentrator outputs a measured pulse of oxygen.

### **Audible Alarm**

The transportable oxygen concentrator is equipped with an audible alarm. The audible alarm will activated in conjunction with Indicators and LCD Display to annunciate Alarms and Warnings.

The transportable oxygen concentrator will also issue a steady beep when all power sources are removed. The beeping will stop after 10-20 minutes or once a power source is connected.

The transportable oxygen concentrator will briefly turn on all three lights and the LCD display and check for stuck buttons upon power up. It will then output a brief audible beep to indicate the unit is operational.

### **Control/Adjustment Buttons**

There are four buttons located surrounding the LCD display. They are used to turn the unit on/off, to proceed to the next screen, to select and highlight adjustable settings and to adjust those settings.

#### **On/Off Button**

To turn the transportable oxygen concentrator on or off, press and hold the On/Off button for a period of 2-3 seconds, not to exceed 5 seconds. Releasing the button too soon will not allow the unit to do either. If the button is held too long when turning on the unit, the Stuck Button alarm could be activated.

#### **Mode/Return/Highlight Button**

Pressing button for 1-2 seconds in the Standby screen (FIGURE 6.5 on page 27) will switch to Normal Operating screen (FIGURE 6.6 on page 27).

Pressing this button for 1 second in the Normal Operating screen will toggle between the continuous and pulse modes.

Pressing this button for 2-3 seconds in the Normal Operating screen will display the LCD Adjustment screen. In the LCD Adjustment screen pressing this button for 1 second will switch columns on the screen. To save changes and exit the LCD adjustment screen the highlight bar needs to be positioned in the left column, then press this button for 2-3 seconds to return to the Normal Operating screen. If the screen switches without pressing and holding the button for 2-3 seconds the changes made in the LCD Adjustment screen will not be saved.

#### **Increase and Decrease Buttons**

When the highlight bar is on the setting name, these buttons are used to select the next setting in the list. When the highlight bar is on the setting value, these buttons will change the value to the next value available.

## LCD Displays

*NOTE: For this procedure, refer to FIGURE 6.9 on page 30.*

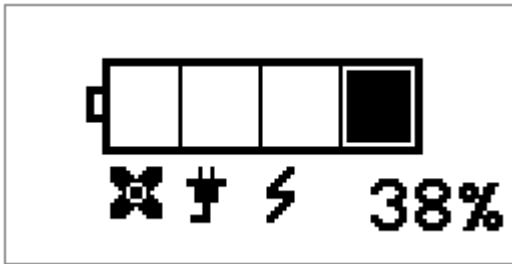
There are four different “Display” screens and two “Adjustment” screens available through the LCD display that, along with the Warning and Alarm screens, provide full control and information to the user.

### Standby Screen

When the external AC power supply is attached and providing power, the unit will show the Standby screen.

When the unit is off and either the Battery or the DC Power are present, a momentary push of the On/Off button will display this screen briefly.

This screen is periodically displayed during normal operation.



**FIGURE 6.5** Standby Screen

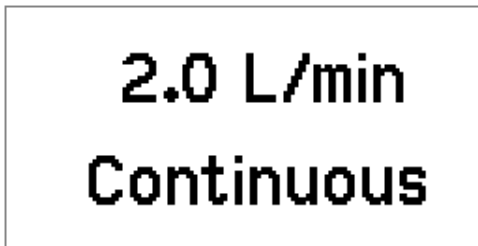
The Standby screen provides both a battery gauge and a percentage of remaining charge. It can also display the Fans Operating, External Power On and Battery Charging icons when applicable.

### Normal Operating Screen

When operating normally, the Mode & Flow display informs the user of the current operating mode and the setting for that mode.

The display shows the current/last mode of operation selected. The mode of operation can be either Continuous Flow or Pulse Dose. It will also show the current/last output flow level selected.

This screen will alternate with the Standby screen every 20 seconds. In this fashion the user will be able to see all the important information at a glance.



**FIGURE 6.6** Normal Operating Screen

### Mode & Flow Adjustment Screen

This screen allows the user to change the current mode of operation and output flow. To access this screen, when the transportable oxygen concentrator is operating and either the Normal Operating screen or the Standby screens are shown, press and hold the Mode/Return/Highlight button, Up/Increase, or Down/Decrease button for approximately 2 seconds (screen should change to Mode & Flow Adjust).

### Saving Mode Changes

Once the Mode & Flow screen is displayed, press and hold the Mode/Return/Highlight button for one second to change the mode. Wait for the screen to flash three times for the changes to take effect. See the section on Control/Adjustment buttons.

### Saving Flow Changes

Once the Mode & Flow screen is displayed, press and hold the Up/Increase, or Down/Decrease button until desired setting is achieved. Wait for the screen to flash three times for the changes to take effect. See the section on Control/Adjustment buttons.

### LCD Adjustment Screen

This screen is used to adjust the brightness and contrast of the LCD. When available, this screen can also be used to change screen language.



**FIGURE 6.7** LCD Adjustment Screen

Once this screen is displayed, use the Mode/Return/Highlight and the Increase/Decrease buttons to move the highlight bar and make changes. See the section on Control/Adjustment buttons.

### Saving Changes to LCD

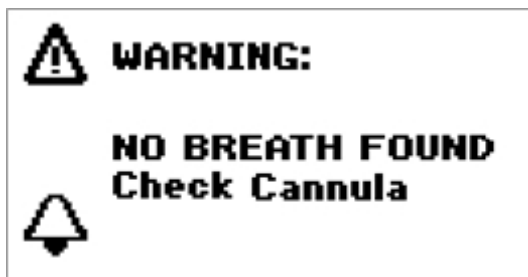
When making changes to values on the LCD Adjustment screen the change is stored only by using the return/highlight button to move back to highlighting the setting name.

If no button is pressed for 20 seconds and the highlight bar has not been returned to the setting name, the display will return to the Normal Operating screen automatically without saving the change.

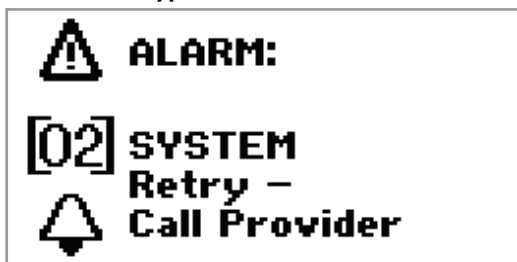
## Warning & Alarm Screens

On occasion, even when operating normally, the internal monitoring of the transportable oxygen concentrator will need to provide a warning, or alarm, message to the user. These messages are usually shown in conjunction with the audible alarm and Indicator LEDs. Samples of both the Warning and the Alarm screens are shown below.

Typical Warning Screen

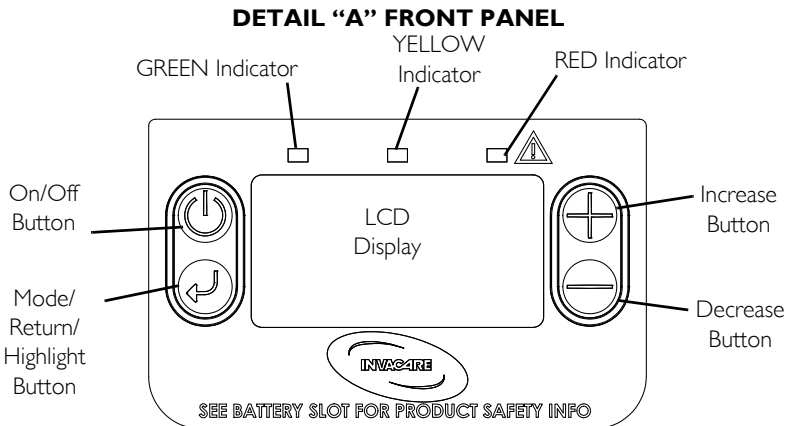


Typical Alarm Screen



**FIGURE 6.8** Warning & Alarm Screens

*NOTE: For a detailed explanation and description of the transportable oxygen concentrator warnings and alarms please see [Warnings and Alarms](#) on page 37 and/or [Troubleshooting](#) on page 35.*



**DETAIL “B” - LCD DISPLAY ICONS**

ICON	NAME	DESCRIPTION
	Attention	The ATTENTION icon is displayed during a warning or alarm screen. It signifies that it requires your attention and reference to this manual is required.
	Audible Alarm	The AUDIBLE ALARM is displayed during a warning or alarm screen.
	External Power	The EXTERNAL POWER icon appears whenever the AC Adapter or DC Cable is being used to provide power to the transportable oxygen concentrator.
	Battery Charging	The CHARGING icon appears whenever external power is present and it is sufficient to provide battery pack charging. If the charging icon is not displayed, the unit is not charging the battery.
	Battery Gauge Four Segments	The BATTERY GAUGE icon has four segments that fill black with each additional 25% of charge. A single blackened segment means that there is 25%, or less, charge remaining. Three blackened segments means that there is up to 75% charge remaining. A full charge would result in all four segments being blackened (filled in).
## %	% Charge Remaining	The CHARGE REMAINING percentage provides a numeric value for the remaining battery power.
	Seek Backup Oxygen	The SEEK BACKUP OXYGEN symbol is displayed during an alarm that results in shutdown of the unit due to loss of all power and/or unit failure.
	Cooling Fans Operating	The COOLING FAN icon is displayed whenever the cooling fans are on.

**FIGURE 6.9** Transportable Oxygen Concentrator Front Panel and LCD Display

## Using the SOLO<sub>2</sub> Transportable Oxygen Concentrator

1. Turn the transportable oxygen concentrator On by pressing the On/Off button for approximately 2-3 seconds.
2. Breathe normally through your nose. Breathing through your mouth may result in less effective oxygen therapy.

*NOTE: In pulse dose mode, the transportable oxygen concentrator will put out a measured pulse of oxygen each time it detects a breath.*

3. Turn the transportable oxygen concentrator Off by pressing and holding the power On/Off button for approximately 2-3 seconds.

*NOTE: When turning off the transportable oxygen concentrator, if there is power available, the unit fans will continue to operate for 5 minutes to cool the compressor and extend the life of the unit.*

*NOTE: The time required for the transportable oxygen concentrator to reach maximum oxygen concentration after being turned On is approximately 5 minutes.*

## SECTION 7—CLEANING, CARE, AND MAINTENANCE

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### **WARNING**

Turn Off the transportable oxygen concentrator and unplug the power cord before cleaning.

DO NOT allow any cleaning agent to drip inside the air inlet and outlet openings, or the battery pack.

DO NOT spray or apply any cleaning agent directly to the cabinet.

---

### **CAUTION**

DO NOT clean the cabinet, carry bag, or filter with alcohol and alcohol based products (isopropyl alcohol), concentrated chlorine-based products (ethylene chloride), and oil-based products (Pine-Sol®, Lestoil®) or any other harsh chemical agents. Only use mild liquid dish detergent (such as Dawn™).

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## Cabinet

Periodically clean the transportable oxygen concentrator cabinet when dirty as follows:

1. Use a damp cloth, or sponge, with a mild detergent such as Dawn dish washing soap to gently clean the exterior case.
2. Allow the unit to air dry, or use a dry towel, before operating the unit.

## Air Intake Filter

---

### **CAUTION**

DO NOT operate the transportable oxygen concentrator without the air intake filter installed.

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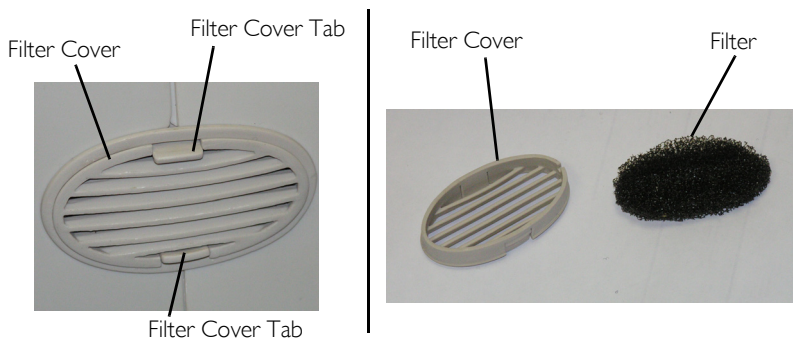
*NOTE: For this procedure, refer to FIGURE 7.1.*

1. Clean the air intake filter at least once a week depending on environmental conditions.
  2. Squeeze the thumb tabs on the inlet filter grill and remove from the unit.
  3. Lift out the filter.
  4. Use a vacuum cleaner or wash with a mild liquid dish detergent (such as Dawn™) and water. Rinse thoroughly.
-



5. Thoroughly dry the filter and inspect for fraying, crumbling, tears and holes. Replace filter if damage is found.
6. Reinstall the air intake filter and snap the filter cover back in place.

*NOTE: Use only Invacare part number 1156863 as the air intake filter for your transportable oxygen concentrator.*



**FIGURE 7.1** Air Intake Filter

### Cleaning the Cannula

*NOTE: To clean the oxygen cannula, follow the instructions provided by the manufacturer. If none are provided, follow these steps:*

1. Clean the cannula once a week or as needed.
2. Wash the cannula in soapy water and rinse it with a solution of ten parts water and one part vinegar.
3. Rinse thoroughly with hot water and hang to dry.

### Cleaning the Humidifier

*NOTE: To clean the oxygen humidifier, follow the instructions provided by manufacturer. If none are provided, follow these steps:*

1. Clean the humidifier every day.
2. Wash it in soapy water and rinse it with a solution of ten parts water and one part vinegar.
3. Rinse thoroughly with hot water.



## SECTION 8—TROUBLESHOOTING GUIDE

*NOTE: In all cases, if the situation continues, change to another source of oxygen and contact your equipment provider.*

### Troubleshooting

<b>TRANSPORTABLE OXYGEN CONCENTRATOR DOES NOT TURN ON, OR DOES NOT STAY ON</b>		
<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
Concentrator does not operate when On/Off button pressed  OR	On/Off button was not held down long enough.	Try to power up the unit again while continuing to press the On/Off button until the front panel lights and LCD begin to illuminate. This takes typically 2-3 seconds.
LCD and front panel lights DO NOT illuminate upon start-up  OR	Battery is discharged (or improperly connected to the unit).	Ensure the battery module is completely inserted. Connect transportable oxygen concentrator to either AC or DC power and retry.
All LCD and front panel lights go dark.	Battery pack has performed a self-protect shutdown when there was no External Power.	Wait one minute and retry. Change to an alternate battery pack.

<b>GREEN INDICATOR DOES NOT BLINK WITH EACH BREATH</b>		
<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
No Breath Detect indicator	Unit is set for Continuous Flow operation.	No action required. Breath Detect Indicator is for Pulse Mode only

<b>NO EXTERNAL POWER SYMBOL SHOWN ON STANDBY SCREEN</b>		
<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
With AC or DC power plugged into the unit, no external power icon is displayed.	Power source is no good, or there is a loose connection.	Try another power outlet and check connections to unit.



## SECTION 8—TROUBLESHOOTING GUIDE



<b>NO CHARGING SYMBOL SHOWN ON STANDBY SCREEN</b>		
<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
With the unit turned Off and AC or DC power plugged into the unit, no charging icon is displayed.	Power source is no good, or there is a loose connection.	Try another power outlet and check connections to unit.
	Battery is outside the allowed temperature range for charging.	Allow unit to cool down to less than 95° F (35° C), or warm up to 50° F (10° C).
	Battery module is not fully seated.	Ensure the battery module is completely inserted.
	Standby screen is not being displayed.	Press the On/Off button to display the Standby screen when using DC power.

<b>UNIT IS BEEPING WITH NO LIGHTS OR DISPLAY</b>		
<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
All power sources are missing.	Battery pack has been removed and there is no external power	Install any battery pack available.
	While operating without a battery, the external power is lost.	Beeping will last 10-15 minutes if no power source is provided.



## Warnings and Alarms



*NOTE: In all cases, pressing and holding the On/Off button for 2-3 seconds will turn off and reset the unit.*



LCD DISPLAY:	INDICATORS:
 <b>WARNING:</b>  <b>NO BREATH FOUND</b> <b>Check Cannula</b> 	<b>Triple audible beep every 10 sec</b> <b>YELLOW indicator Flashing.</b>
DESCRIPTION:	SOLUTIONS:
<b>(Only possible with Pulse Mode)</b> Transportable oxygen concentrator has not detected a breath for a predetermined time period.	1. Verify the cannula is connected, not kinked, properly positioned and you are breathing through your nose.
ACKNOWLEDGEMENT REQUIRED:	
Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens. This warning will be turned off for a minimum of 5 minutes.	



LCD DISPLAY:	INDICATORS:
 <b>WARNING:</b>  <b>BREATH RATE HIGH</b> <b>Reduce Activity</b> 	<b>Single audible beep every 15 sec</b> <b>YELLOW indicator On.</b>
DESCRIPTION:	SOLUTIONS:
<b>(Only possible with Pulse Mode)</b> Your breathing rate has begun to exceed the capacity of the transportable oxygen concentrator.	1. Immediately reduce your activity level to get your breath rate to slow down. 2. Temporarily switch to Continuous Flow Mode.
ACKNOWLEDGEMENT REQUIRED:	
A sufficient reduction of your breath rate will automatically turn off the warning. Alternately, press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens. This warning will be turned off for a minimum of 5 minutes.	

**SECTION 8—TROUBLESHOOTING GUIDE**



<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>WARNING:</b>  <b>LOW BATTERY</b> <b>Battery below 25%</b>  	<b>Double audible beep every 15 sec</b> <b>YELLOW indicator On.</b>
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
Remaining battery capacity has fallen to 25%. Battery requires charging.  Battery gauge is empty	1. Connect transportable oxygen concentrator to either the AC or DC power, or use an alternate charged battery module.
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens.	



<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>WARNING:</b>  <b>START TEMP HI/LO</b> <b>Allow fans to warm/cool</b>  	<b>Single audible beep every 15 sec</b> <b>YELLOW indicator On.</b>
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
Unit is too hot, or too cold, to allow it to operate.  Unit will run internal fans to help lower, or raise, internal temperature.  Fans will turn off after 10 minutes regardless of temperature.	1. Move unit to warmer, or cooler, surroundings. Allow unit to cool down to less than 95° F (35° C), or warm up to 50° F (10° C). Use AC or DC power.  2. Clean intake filter.  3. Use back-up oxygen while waiting.  4. Turn unit Off, then On again to retry.
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
While the unit is warming / cooling the alarm screen will remain active. The unit will turn completely off (battery mode) or return to the standby screen (AC & DC mode), whenever the desired temperature is reached or 10 minutes of cooling has expired.	

LCD DISPLAY:	INDICATORS:
 <b>WARNING:</b>  <b>LOW FLOW OUTPUT</b>  <b>Check Cannula</b>	<b>Triple audible beep every 10 sec</b> <b>YELLOW</b> indicator <b>Flashing</b>
DESCRIPTION:	SOLUTIONS:
<b>(Only possible with Continuous Flow Mode)</b> Output flow is more than 0.3 LPM below the flow setting.	1. Verify the cannula is not kinked. 2. Replace outlet filter, if necessary. 3. Turn unit Off. Wait one minute, then retry.
ACKNOWLEDGEMENT REQUIRED:	
Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens. This warning will be turned off for a minimum of 15 minutes.  If the warning is issued and acknowledged a second time, the warning will be deactivated until the unit is turned off.  Call your provider and report the problem if the warning continues with next use.	

LCD DISPLAY:	INDICATORS:
 <b>WARNING:</b>  <b>LOW O2 PURITY</b>  <b>See Manual</b>	<b>Single audible beep every 15 sec</b> <b>YELLOW</b> indicator <b>On</b> .
DESCRIPTION:	SOLUTIONS:
The oxygen output purity has fallen to a value between 73% and 85% ( $\pm 1\%$ ).	1. Verify unit is in recommended environmental temperature. Refer to <a href="#">Typical Product Parameters</a> on page 14. 2. Clean intake filter and ensure both intake and exhaust are not blocked 3. Turn unit Off, then On again to retry.
ACKNOWLEDGEMENT REQUIRED:	
Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens.  If the warning is issued and acknowledged a second time, the warning will be deactivated until the unit is turned off.  Call your provider and report the problem if the warning continues with next use.	




**SECTION 8—TROUBLESHOOTING GUIDE**



<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>WARNING:</b>  <b>CANNOT CHARGE</b>  <b>Allow battery to cool</b>	<p><b>Single audible beep every 15 sec</b>  <b>YELLOW indicator On.</b></p>
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
<p><b>(Only possible when External Power is applied)</b>          Battery is too hot, or cold, to allow for the battery to charge.</p>	<ol style="list-style-type: none"> <li>1. Move unit to warmer, or cooler, surroundings. Allow unit to cool down to less than 95° F (35° C), or warm up to 50° F (10° C). Use AC or DC power.</li> <li>2. Remove battery and only use AC or DC power.</li> <li>3. Turn unit Off, then On again to retry.</li> </ol>
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
<p>Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens.</p> <p>If the warning is issued and acknowledged a second time, the warning will be deactivated until the unit is turned off.</p> <p>Call your provider and report the problem if the warning continues with next use.</p>	

<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>WARNING:</b>  <b>EXT PWR LOW</b>  <b>See Manual</b>	<p><b>Triple audible beep every 10 sec</b>  <b>YELLOW indicator Flashing.</b></p>
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
<p>External DC Power is lower than optimal. Excessive current draw could be present. Warning will continue every 3 minutes as long as condition exists.</p>	<ol style="list-style-type: none"> <li>1. Make sure that car (boat or motor home, etc.) is running.</li> <li>2. Make sure DC Power Cable is firmly connected at both ends.</li> <li>3. Switch to external AC or battery power.</li> </ol>
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
<p>Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens</p>	








## SECTION 8—TROUBLESHOOTING GUIDE




LCD DISPLAY:	INDICATORS:
 <b>ALARM:</b>  <b>STUCK BUTTON</b> <b>Check buttons –</b>  <b>Retry</b>	<b>Continuous audible beep</b> every half second <b>RED</b> indicator <b>On</b> . <b>GREEN</b> indicator is <b>Off</b> .
DESCRIPTION:	SOLUTIONS:
<p>A stuck button is being detected upon power up.</p>	<ol style="list-style-type: none"> <li>1. With the unit turned Off, press each control button looking for a stuck button.</li> <li>2. Turn On the unit while ensuring that you are not continuing to hold the Power On/Off button once the indicator lights and LCD begin to illuminate.</li> <li>3. <b>ONLY</b> press the On/Off button during startup.</li> </ol>
ACKNOWLEDGEMENT REQUIRED:	
Press and hold the On/Off button to power down the unit and restart. Call your provider and report the problem if alarm continues.	




LCD DISPLAY:	INDICATORS:
 <b>ALARM:</b>  <b>LOW BATTERY</b> <b>Find New Power</b> 	<b>Triple audible beep every 10 sec</b> <b>YELLOW</b> indicator <b>Flashing</b> .
DESCRIPTION:	SOLUTIONS:
<p>Remaining battery capacity has fallen to 15%. Battery requires charging.            Battery gauge is empty.  <b>Loss of power is imminent.</b></p>	<ol style="list-style-type: none"> <li>1. Connect transportable oxygen concentrator to either AC or DC power, or use an alternate charged battery module.</li> <li>2. If no other power source is available, Change to another source of oxygen if alternate power is not available.</li> </ol>
ACKNOWLEDGEMENT REQUIRED:	
Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens	

**SECTION 8—TROUBLESHOOTING GUIDE**




LCD DISPLAY:	INDICATORS:
 <b>ALARM:</b>  <b>BATT. DEPLETED</b> <b>Unit Shutting Down</b> 	<p><b>Ten audible beeps every 10 sec</b>  <b>RED indicator Flashing Fast.</b></p>
DESCRIPTION:	SOLUTIONS:
<p>Remaining battery capacity has been completely used. Battery requires charging.  <b>Unit is turning off!</b></p>	<ol style="list-style-type: none"> <li>1. Connect transportable oxygen concentrator to either AC or DC power, or use an alternate charged battery module.</li> <li>2. If no other power source is available, Change to another source of oxygen.</li> </ol>
ACKNOWLEDGEMENT REQUIRED:	
<p>None required. Unit turns off within 30 seconds. Find alternate power and restart normally.</p>	




LCD DISPLAY:	INDICATORS:
 <b>ALARM:</b>  <b>UNIT TEMP HI/LO</b> <b>Allow fans to warm/cool</b> 	<p><b>Triple audible beep every 10 sec</b>  <b>YELLOW indicator Flashing.</b></p>
DESCRIPTION:	SOLUTIONS:
<p>Unit is too hot, or too cold, to allow it to continue to operate.  Unit will continue to run internal fans to help lower, or raise, internal temperature.  Fans and unit will turn off after 10 minutes regardless of temperature.</p>	<ol style="list-style-type: none"> <li>1. Move unit to warmer, or cooler, surroundings. Allow unit to cool down to less than 95° F (35° C), or warm up to 50° F (10° C). Use AC, or DC, adapter for power.</li> <li>2. Clean intake filter.</li> <li>3. Turn unit Off, then On again to retry.</li> <li>4. Change to another source of oxygen while waiting</li> </ol>
ACKNOWLEDGEMENT REQUIRED:	
<p>While the unit is warming / cooling the alarm screen will remain active. The unit will turn completely off (battery mode) or return to standby screen (AC &amp; DC mode), whenever the desired temperature is reached or 10 minutes of cooling has expired.</p>	




LCD DISPLAY:	INDICATORS:
 <b>ALARM:</b>  <b>OPERATING</b> <b>Retry –</b>  <b>Call Provider</b>	<b>Continuous audible beep</b> every half second. <b>RED</b> indicator is <b>On</b> . <b>GREEN</b> indicator is <b>Off</b> .
DESCRIPTION:	SOLUTIONS:
Abnormal operating condition has been detected	1. Turn unit Off, then On again to retry. 2. Change to another source of oxygen if alarm continues.
ACKNOWLEDGEMENT REQUIRED:	
Press and hold the On/Off button to power down the unit and restart.	
Call your provider and report the problem if alarm continues.	



LCD DISPLAY:	INDICATORS:
 <b>ALARM:</b>  <b>BATT. TEMP HI/LO</b> <b>Remove Battery</b>  <b>Use Ext. Power</b>	<b>Ten audible beeps every 10 sec</b> <b>RED</b> indicator <b>Flashing Fast</b> .
DESCRIPTION:	SOLUTIONS:
Battery pack is too hot, or too cold, to allow battery to continue to operate.	1. Remove battery and only use AC, or DC, adapter for power. Or, use an alternate battery pack. 2. Move battery to warmer, or cooler, surroundings. Allow battery to cool down to less than 95° F (35° C), or warm up to 50° F (10° C). 3. Turn unit off. Re-insert battery and retry. 4. Change to another source of oxygen if no other power source is available.
ACKNOWLEDGEMENT REQUIRED:	
Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens	

**SECTION 8—TROUBLESHOOTING GUIDE**




<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>ALARM:</b>  <b>LOW O2 PURITY</b> <b>See Manual</b>  <b>Call Provider</b>	<b>Continuous audible beep</b> every half second. <b>RED</b> indicator is <b>On</b> . <b>GREEN</b> indicator is <b>Off</b> .
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
The oxygen output purity has fallen to a value below 73% (± 1%).	<ol style="list-style-type: none"> <li>1. Verify unit is in recommended environmental temperature. Refer to <u>Typical Product Parameters</u> on page 14.</li> <li>2. Clean intake filter and ensure both intake and exhaust are not blocked</li> <li>3. Turn unit Off, then On again to retry.</li> <li>4. Change to another source of oxygen if alarm continues.</li> </ol>
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
Press and hold the On/Off button to power down the unit and restart.	
Call your provider and report the problem if alarm continues with next use.	

<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>ALARM:</b>  <b>SYSTEM</b> <b>Retry –</b>  <b>Call Provider</b>	<b>Continuous audible beep</b> every half second. <b>RED</b> indicator is <b>On</b> . <b>GREEN</b> indicator is <b>Off</b> .
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
Abnormal system condition has been detected	<ol style="list-style-type: none"> <li>1. Turn unit Off, then On again to retry.</li> <li>2. Change to another source of oxygen if alarm continues.</li> </ol>
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
Press and hold the On/Off button to power down the unit and restart.	
Call your provider and report the problem if alarm continues.	

<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>ALARM:</b>  <b>COMPRESSOR</b> <b>Retry –</b>  <b>Call Provider</b>	<b>Continuous audible beep</b> every half second. <b>RED</b> indicator is <b>On</b> . <b>GREEN</b> indicator is <b>Off</b> .
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
Abnormal compressor operation has been detected.	<ol style="list-style-type: none"> <li>1. Turn unit Off, then On again to retry.</li> <li>2. Change to another source of oxygen if alarm continues.</li> </ol>
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
Press and hold the On/Off button to power down the unit and restart.	
Call your provider and report the problem if alarm continues.	

<b>LCD DISPLAY:</b>	<b>INDICATORS:</b>
 <b>ALARM:</b>  <b>O2 SENSOR FAIL</b>  <b>Call Provider</b>	<b>Triple audible beep every 10 sec</b> <b>YELLOW</b> indicator <b>Flashing</b> .
<b>DESCRIPTION:</b>	<b>SOLUTIONS:</b>
Oxygen sensor feedback is out-of-range. Sensor failure is likely	<ol style="list-style-type: none"> <li>1. Turn unit Off, then On again to retry.</li> </ol>
<b>ACKNOWLEDGEMENT REQUIRED:</b>	
Press Return / Highlight button. Display will either show additional warnings / alarms or revert to normal operating screens.	
If the alarm is issued and acknowledged a second time, the audible alarm will be deactivated until the unit is turned off.	
Call your provider and report the problem.	

**SECTION 8—TROUBLESHOOTING GUIDE**

<p><b>LCD DISPLAY:</b></p>	<p><b>INDICATORS:</b></p>
<p>  <b>ALARM:</b>   <b>EXT PWR TOO LOW</b>  <b>Find New Power</b>   </p>	<p> <b>Continuous</b> audible <b>beep</b> every half second.  <b>RED</b> indicator is <b>On</b>.  <b>GREEN</b> indicator is <b>Off</b>.         </p>
<p><b>DESCRIPTION:</b></p>	<p><b>SOLUTIONS:</b></p>
<p>External DC Power is too low to allow continued operation. Excessive current draw present.</p>	<ol style="list-style-type: none"> <li>1. Make sure that car (boat or motor home, etc.) is running.</li> <li>2. Make sure DC Power Cable is firmly connected at both ends.</li> <li>3. Switch to external AC or battery power.</li> <li>4. Change to another source of oxygen if no other power source is available.</li> </ol>
<p><b>ACKNOWLEDGEMENT REQUIRED:</b></p>	
<p>Press and hold the On/Off button to power down the unit and restart.</p>	

## **SECTION 9—OPTIONAL ACCESSORIES**

The following optional accessories and replacement parts (as shown below) are also available:

- Transportable Oxygen Concentrator without Battery Module, model number TPO100
- Transportable Oxygen Concentrator with Battery Module, model number TPO100B
- Battery Module, model number TPO110
- Wheeled cart with handle, model number TPO120
- Air intake filter, part number 1156863
- AC power adapter, power cord style:
  - N. America, Japan - model number TPO130
  - Europe - model number TPO132
  - Australia, New Zealand - model number TPO134
  - UK, Hong Kong, Vietnam - model number TPO136
- DC Mobile power cable, model number TPO140
- Accessory Bag, model number TPO160
- Patient Outlet Filter, part number 1157081
- Patient Cannula 7 ft (2.1 m), model number M3120
- Humidifier Kit, model number TPO170  
(Recommended to be used with TPO160 Accessory Bag)

## LIMITED WARRANTY

**NOTE: THE WARRANTY BELOW HAS BEEN DRAFTED TO COMPLY WITH FEDERAL LAW APPLICABLE TO PRODUCTS MANUFACTURED AFTER JULY 4, 1975.**

This warranty is extended only to the original purchaser who purchases this product when new and unused from Invacare Corporation or a dealer. This warranty is not extended to any other person or entity and it is not transferable or assignable to any subsequent purchaser or owner. Coverage under this warranty will end upon any such subsequent sale or other transfer of title to any other person. This warranty gives you specific legal rights and you may also have other legal rights which may vary from state to state.

Invacare Corporation warrants its Transportable Oxygen Concentrator when purchased new and unused to be free from defects in materials and workmanship for a period of three years and the battery for a period of one year from date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty.

**DO NOT OPEN OR ATTEMPT TO SERVICE UNLESS SERVICE IS PROVIDED BY AN INVACARE-CERTIFIED TECHNICIAN;** otherwise, this will void any and all warranties. If within such warranty period any such product shall be proven to Invacare's satisfaction to be defective, such product shall be repaired or replaced, at Invacare's option, with refurbished or new parts. This warranty only applies to the labor for repairs performed by the Invacare Service Department. It does not apply to the labor performed by the purchaser or user. This warranty does not include normal wear and tear or shipping charges incurred in replacement part installation or repair of any such product. Product repairs shall not extend this warranty - coverage for repaired product shall end when this limited warranty terminates. Invacare's sole obligation and your exclusive remedy under this warranty shall be limited to such repair or replacement. Routine maintenance items, such as filters, are excluded from this warranty.

For warranty service, please contact Invacare's service department at the toll free number on the back page during normal working hours. Upon receiving notice of an alleged defect in a product, Invacare Corporation will issue a serialized return authorization. It shall then be the responsibility of the purchaser to return the entire unit or remove, at purchaser's cost, the defective component part(s) identified, pack the component part(s) in a manner to avoid shipping damage and to ship the component part(s) to either Invacare Corporation's plant or service center as specified by Invacare Corporation in advance. Defective component part(s) **MUST** be returned for warranty inspection using the serial number as identification within thirty days of return authorization date. **DO NOT** return products to our factory without prior consent. C.O.D. shipments will be refused; please prepay shipping charges.

**LIMITATIONS AND EXCLUSIONS: THE FOREGOING WARRANTY SHALL NOT APPLY TO PRODUCTS SUBJECTED TO NEGLIGENCE, ACCIDENT, IMPROPER OPERATION, MAINTENANCE OR STORAGE, SOOT OR SMOKE-FILLED ENVIRONMENTS, OR OTHER THAN NORMAL APPLICATION, USE OR SERVICE, OR TO PRODUCTS MODIFIED WITHOUT INVACARE CORPORATION'S EXPRESS WRITTEN CONSENT (INCLUDING, BUT NOT LIMITED TO, MODIFICATION THROUGH THE USE OF UNAUTHORIZED PARTS OR ATTACHMENTS) OR TO PRODUCTS DAMAGED BY REASON OF REPAIRS MADE TO ANY COMPONENT WITHOUT THE SPECIFIC CONSENT OF INVACARE CORPORATION OR TO PRODUCTS DAMAGED BY CIRCUMSTANCES BEYOND INVACARE CORPORATION'S CONTROL.**



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SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGE, OR LIMITATION OF HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSION AND LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY SHALL BE EXTENDED TO COMPLY WITH STATE/PROVINCIAL LAWS AND REQUIREMENTS.

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