

# OPERATION MANUAL



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# Table of Contents

1. Introduction	3
2. Intended Use, Warnings, Cautions and Notes	5
2.1 Intended Use	5
2.2 Contraindications	6
2.3 Warning Messages	6
2.4 Caution Messages	8
2.5 Notes	9
3. Product Warranty	11
4. Principles of Operation	12
4.1 Control Unit	12
4.2 Electronic Control Board	13
4.3 Reservoir	13
4.4 Heating Element	14
4.5 Water Delivery System	14
4.6 Hand Piece Assembly	14
4.7 Operation Overview	15
4.8 Safety Features	17
5. EARIGATOR® Use and Cleaning	18
5.1 Control Unit Parts	18
5.2 Hand Piece Parts (Patient Applied Part)	20
5.3 Unit Markings	20
5.4 Display Panel	22
5.5 Getting the Unit Ready for Use	22
5.6 Cerumen Removal with EARIGATOR®	26
5.7 Nozzle Use	30
5.8 Sleep Mode	32
5.9 Draining the Reservoir	32
5.10 Reservoir Cleaning	33
5.11 Catch Basin Cleaning	34
5.12 Handpiece Lens Cleaning	34
5.13 Disposable Nozzle Tips	34
6. Troubleshooting	36
7. Product Specifications	38

# EARIGATOR® OPERATION MANUAL

# 1. Introduction

The EARIGATOR® is an ear cleansing instrument that draws water from a reservoir and pumps the water through a hand piece and nozzle at a controlled temperature, pressure and flow rate. In addition, a custom catch basin provides water overflow collection. The instrument has two main components: a control unit and hand piece assembly. The EARIGATOR® offers safety, efficiency and controls superior to products currently used to remove cerumen (ear wax).

# **E**ARIGATOR® **O**PERATION **M**ANUAL

## 2. Intended Use, Warnings, Cautions and Notes

As you read the manual, pay special attention to the warning, caution, and note messages. They identify safety guidelines and other important information as follows:



**WARNING**

Describes a hazard or unsafe practice that can result in severe bodily injury or death.



**CAUTION**

Describes a hazard or unsafe practice that can result in minor bodily injury or property damage.



**NOTE**

Provides information important enough to emphasize or repeat.

### 2.1 Intended Use

EARIGATOR® is intended to be used solely for irrigation of the ear canal with water, without any penetration.

## 2.2 Contraindications

A proper patient history MUST be taken before using the EARIGATOR®

The EARIGATOR® should not be used when:

- The patient has undergone ANY form of ear surgery.
- The patients has or has had a perforation in their ear drum.
- The patient has a grommet in their ear drum.
- The patient has had a middle ear infection within the past six weeks.
- The patient has acute otitis externa or tenderness of the pinna
- The patient has a cleft palate (repaired or not).

## 2.3 Warning Messages



**WARNING**

- This device should only be used by physicians or trained technicians.
- For safe use, all instructions given in this manual must be followed.
- To avoid risk of electric shock, the EARIGATOR® must only be connected to a supply mains with protective earth.
- The EARIGATOR® should not be used on a patient unless the “Ready” blue LED light on the display panel is “ON”.
- Use only clean, room temperature, tap water and never

add water over 37 °C (98 °F) to the reservoir.

- To avoid electrical shock, disconnect the electrical supply before changing the fuse.
- For continued protection against risk of fire, replace the fuse only with those of the same type and rating.
- If the power cord is damaged, only replace it with a Nupur supplied, properly rated, hospital grade power cord.
- Do not position the EARIGATOR® where it is difficult to reach the power cord or power entry module.
- If you suspect that the EARIGATOR® unit is functioning incorrectly, discontinue use and contact Nupur or your Equipment Provider.
- Repairs and adjustments must be performed only by Nupur trained personnel that are fully acquainted with this equipment. Service done by inexperienced, unqualified personnel, or installation of unauthorized parts could cause personal injury, void the product warranty, or result in costly repairs. Contact Nupur or your Equipment Provider if the unit fails to meet performance specifications.
- No modification of this equipment is allowed.

## 2.4 Caution Messages



- When transporting or storing the EARIGATOR®, precautions should be taken to avoid exposure to temperature extremes (below 2°C/35°F or above 49°C/120°F). If exposure to such temperatures has occurred, allow the unit to reach room temperature before you turn it on. Never store the unit below freezing (0°C/32°F) unless all water has been drained out of the system (see Section 5.8 Draining the Reservoir for draining instructions).
- Always use clean, room temperature, tap water only.
- The nozzles are single use only. After each use, always dispose of the nozzle in the trash before using it on another patient or putting the hand piece back in the cradle.
- When in use, place the hand piece either in the hand piece holder, or cart hand piece holder (if this accessory is purchased) to avoid contaminating the water reservoir. See pictures later in this manual (Section 5.6 Nozzle Use).
- Always empty all water out of the system prior to any long term storage of the unit (see Section 5.8 Draining the Reservoir for draining instructions).
- Use only Nupur supplied nozzles with the EARIGATOR®.

## 2.5 Notes



### NOTE

- The hand piece should always remain at, or above, the water reservoir. Water may leak out of the hand piece if placed below the reservoir.
- When not in use, always place the hand piece securely in the hand piece cradle.
- To disconnect power from the unit, remove the power cord from the power entry module on the rear of the unit.
- The EARIGATOR® may not function properly if placed in an area with high electromagnetic interference. Ensure that the the EARIGATOR® is placed in an area away from potential sources of high interference.
- The single use nozzles can be disposed of in regular trash in accordance with any local laws.
- The EARIGATOR® unit can be recycled by shipping it back to Nupur Technologies or disposed of in accordance with local laws. The unit is RoHS compliant and does not contain any hazardous materials.

# EARIATOR® OPERATION MANUAL

### 3. Product Warranty

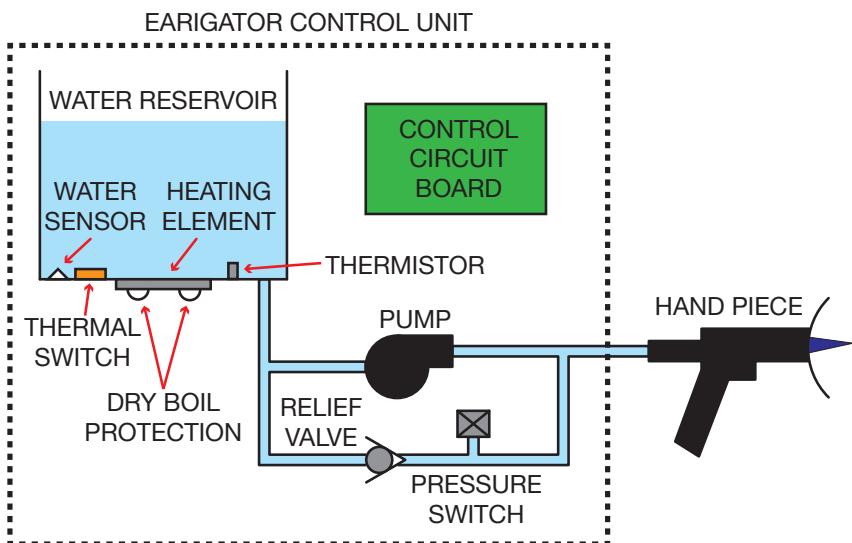
Nupur Technologies, LLC (“Nupur”) warrants the EARIGATOR® cerumen management system to be free from defects in parts and workmanship for one year (or otherwise, if specified on the invoice provided) from the date of delivery to the original purchaser, under normal use and operation. Nupur’s obligations under this warranty are limited to the repair or replacement of any such item of equipment (or part thereof) shown to be defective or, at Nupur’s option, to refunding the purchase price of any such defective item of equipment.

Each item of equipment for which a warranty claim is asserted shall, at the request of Nupur, be returned on a freight prepaid basis with proof of purchase date to the Nupur factory at the expense of the purchaser. Replacement parts shall be warranted for the unexpired portion of the original warranty or 90 days, whichever is longer. This warranty does not extend to any items or parts subjected to misuse, accident, improper maintenance, or application, or which have been repaired or altered outside of the Nupur factory without the express prior written authorization of Nupur.

THE FOREGOING WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IN FACT OR IN LAW, INCLUDING WITHOUT LIMITATION THE WARRANTY OF MERCHANTABILITY OR THE WARRANTY OF FITNESS FOR PARTICULAR PURPOSE. IT IS EXPRESSLY UNDERSTOOD THAT PURCHASER’S SOLE AND EXCLUSIVE RE COURSE FOR DEFECT IN PARTS IS LIMITED TO ENFORCEMENT OF NUPUR’S OBLIGATION AS SET FORTH ABOVE, AND NUPUR SHALL NOT BE LIABLE TO PURCHASER OR OTHERS FOR LOSS OF USE OF THE EQUIPMENT OR FOR OTHER SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

## 4. Principles of Operation

The EARIGATOR® is an ear cleansing instrument that draws water from a reservoir and pumps the water through a hand piece and nozzle at a controlled temperature, pressure and flow rate. In addition, a custom catch basin provides water overflow collection. The instrument has two main components: a control unit and a hand piece assembly.



Following is a discussion of the main components of the EARIGATOR®. The intent is to describe rather than detail the components and their function.

### 4.1 Control Unit

The control unit, a tabletop instrument, houses the electronic control board, water reservoir, heater and water delivery system (pump, pressure relief valve, pressure switch and water delivery tubing).

## 4.2 Electronic Control Board

The electronic control board monitors system inputs and provides signals that control the unit. The water temperature is maintained at  $37 \pm 2^\circ\text{C}$  ( $98 \pm 3^\circ\text{F}$ ) by activating the heating element in response to feedback from a thermistor mounted in the water reservoir. The flow and pressure of the water is regulated in response to the trigger position of the hand piece. A water level indicator monitors the water level. A switch in the hand piece cradle determines whether the hand piece is placed in the cradle or not. The system can only activate the heater if the hand piece is placed in the cradle.

If the displayed water temperature is over  $39^\circ\text{C}$  ( $101^\circ\text{F}$ ) or under  $35^\circ\text{C}$  ( $95^\circ\text{F}$ ) and the hand piece is out of the cradle, the electronic control will not allow flow of water to the patient. This prevents dispensing of water that is too hot or too cold.

The control board displays water temperature on a two-digit display. It can also activate a blue “Ready” LED, a yellow “Place Hand Piece in Cradle” LED and a red “Water Low” LED when system conditions are appropriate.

## 4.3 Reservoir

The reservoir is constructed of plastic and is accessible for filling and cleaning. It holds approximately 4 liters (1 gallon) of water. A funnel shaped cradle on top of the reservoir holds the hand piece. While the hand piece is in the cradle, the lens guard keeps foreign particles out of the water supply.

Housed in the reservoir is the heating element, thermal safety switch, thermistor and a water level detector. The thermal safety switch will turn off the heater at a water temperature of  $43 \pm 5^\circ\text{C}$  ( $110 \pm 8^\circ\text{F}$ ).

## 4.4 Heating Element

The heating element heats the water to 37°C (98°F) within approximately five to ten minutes depending on how much water is in the reservoir and the starting temperature. The electronic controls regulate the energy provided to the heater. If the primary electronic control (thermistor) fails with the heater energized, a thermal safety switch opens, turning off the heater.

## 4.5 Water Delivery System

The water delivery system consists of a pump, pressure relief valve, pressure switch and tubing to the hand piece connection.

The pump assembly pumps the water from the reservoir to the nozzle at a variable rate up to 1.25 liters (1/3 gallon) per minute and at a variable pressure up to  $0.8 \pm 0.1$  bar ( $12 \pm 2$  psi) at the exit point of the nozzle. The pressure relief valve provides means for diverting water over  $1 \pm 0.2$  bar ( $15 \pm 3$  psi) pressure back to the pump. An additional pressure switch cuts off the power to the pump when the pressure reaches  $1.25 \pm 0.25$  bar ( $18 \pm 2$  psi). Flow rate and pressure is proportional to the hand piece trigger position.

## 4.6 Hand Piece Assembly

The hand piece assembly consists of the hand piece, nozzle, lens/splash guard, means for generating a regulated water flow (actuated by the trigger), means for illumination of the ear, and control signal/water tubing.

The hand piece is ergonomic in design and balanced for ease of operation. It interfaces with the water delivery system via flexible, blue tubing, about 2 meters (6 feet) long and with the electronic control board via an electric cable inside the black tubing. LED bulbs housed in the lens/splash

guard provide illumination.

The disposable nozzle is removable from the hand piece and is one patient use. It has a custom close-tolerance geometry unique to the EARIGATOR® that is specifically designed to create the proper flow and pressure required for cerumen removal.

The lens/splash guard is mounted at the end of the hand piece. The lens/splash guard serves two functions: it protects the physician's clothing from becoming wet during the procedure, and it illuminates and magnifies the area of the ear that is being cleaned.

As the hand piece trigger is depressed, the flow rate and pressure increase until water flows at the maximum specified flow rate/pressure.

When the hand piece is placed in the hand piece cradle, the water is heated to body temperature. The water is re-circulated through the hand piece and back into the reservoir during heating to keep the water throughout the system at a constant temperature.

## 4.7 Operation Overview

Following is a discussion of the operation and features of the EARIGATOR®.

The user lifts the hand piece out of the cradle, opens the lid, and fills the reservoir with approximately 4 liters (1 gallon) of tap water. The tap water should be cool to lukewarm and not exceed 37°C (98°F), as the instrument has no capability to cool the water. The user then turns the instrument on.

The electronic control checks the cradle switch to see if the hand piece is in the cradle. If not, the control system lights the yellow "Place Hand Piece in Cradle" LED and also stops

the flow of water through the nozzle. If the hand piece is in its cradle, the electronic control activates the heater to bring the water temperature to  $37 \pm 2^{\circ}\text{C}$  ( $98 \pm 3^{\circ}\text{F}$ ). While in the cradle, water will circulate through the hand piece back into the reservoir through a port in the cradle so that the water has a constant temperature throughout the system.

The current water temperature is shown on the two digit display panel. This tells the user that power is on and the heater is bringing the water up to operational temperature. When the water reaches  $37 \pm 2^{\circ}\text{C}$  ( $98 \pm 3^{\circ}\text{F}$ ) the blue “READY” LED turns on. The electronic control monitors the water temperature via the thermistor that enables precise temperature feedback. If, with the hand piece out of the cradle, the water temperature becomes out of tolerance then the electronic control will not allow delivery of water and the yellow “PLACE HAND PIECE IN CRADLE” LED will be lit.

When the user picks up the hand piece, the electronic control turns the illumination on if the unit is ready for use. The illumination remains on until the hand piece is set back in the cradle. Upon actuation of the trigger, the pump drives water through the nozzle at the specified temperature, pressure and flow rate. As the user depresses the trigger, a proportionate flow of water begins. The flow rate and pressure increase as the user depresses the trigger. With the trigger fully depressed, the water is at a full specified stream of flow, 1.25 liters/minute (1/3 gal/minute) and 0.8 bar (12 psi).

During the procedure, water overflow from the ear collects in a catch basin. This basin holds the volume of water it takes to clean a typical ear. The patient holds the basin and lets it rest comfortably next to their neck.

If the hand piece is placed in the cradle and the unit is not

used for 10 minutes then the unit will enter the sleep mode, designated by “SL” on the two digit display. This will shut off the pump and heater. The unit will remain in sleep mode until the water temperature drops below 32°C (89.6°F). If the water temperature drops below 32°C (89.6°F), the unit will automatically reactivate bringing the water temperature to  $37 \pm 2^\circ\text{C}$  ( $98 \pm 3^\circ\text{F}$ ) within 5 minutes.

Upon next use, if the water temperature is between 30 - 35°C (86 - 95°F) then the operator can depress the hand piece trigger and unit will be reactivated. Removing the hand piece from the cradle and then placing it back into the cradle will also wake the unit from sleep mode. When the water temperature reaches  $37 \pm 2^\circ\text{C}$  ( $98 \pm 3^\circ\text{F}$ ) the blue “READY” LED indicator will illuminate.

## 4.8 Safety Features

The unit will not dispense water under 35°C (95°F) or above 39°C (101°F), as measured by a thermistor.

In case of thermistor failure, there is also a temperature switch which will turn off the pump if the water temperature is detected at  $43^\circ\text{C} \pm 5^\circ\text{C}$  ( $110^\circ\text{F} \pm 8^\circ\text{F}$ ).

The heating element is protected against over heating in a dry condition.

A pressure relief valve set to  $1 \pm 0.2$  bar ( $15 \pm 3$  psi). There is also a pressure switch to turn off the pump if it senses pressure of  $1.25 \pm 0.25$  bar ( $18 \pm 2$  psi).

There is a water level detector that turns off the pump if the water drops below a certain level in the reservoir.

The power entry module is fused to provide surge protection.

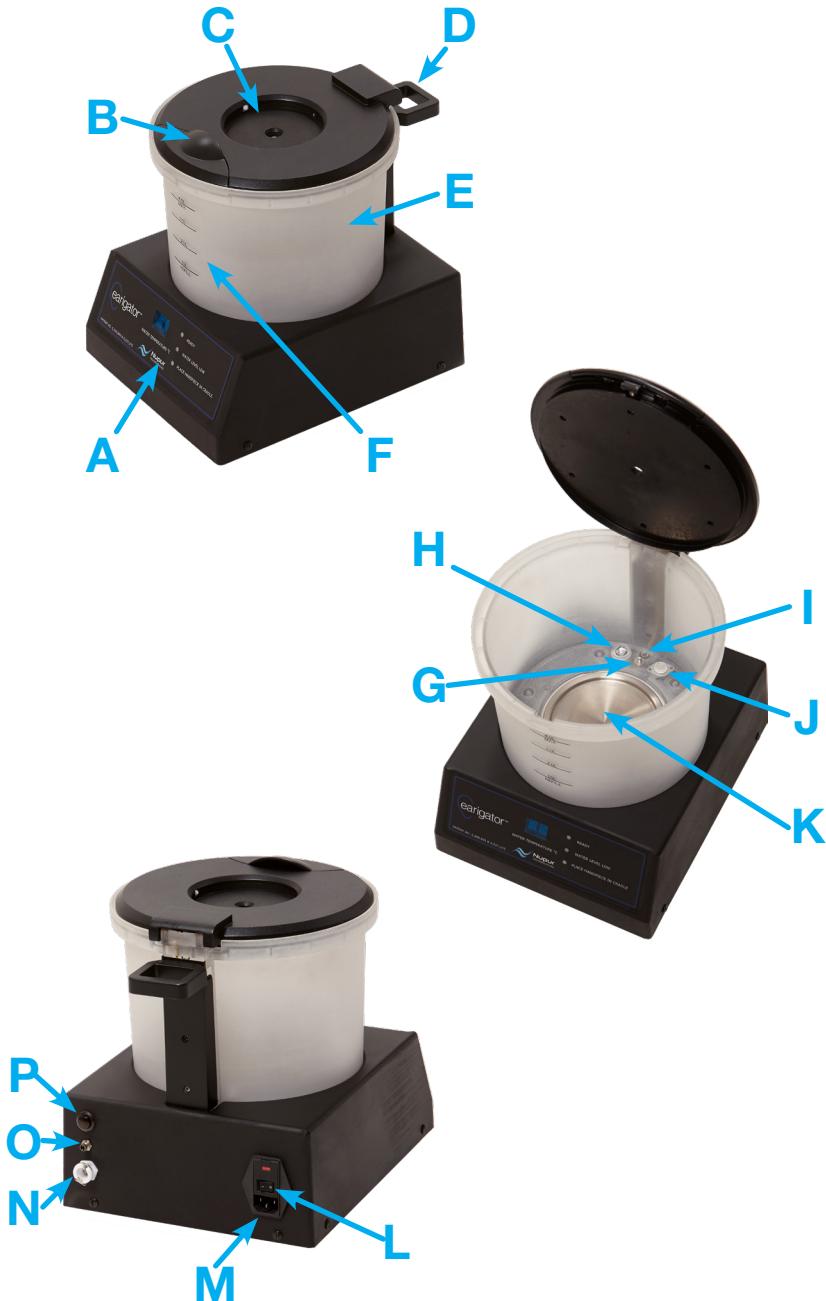
## 5. EARIGATOR® Use and Cleaning

Before using, become familiar with the important parts of your EARIGATOR®.

### 5.1 Control Unit Parts

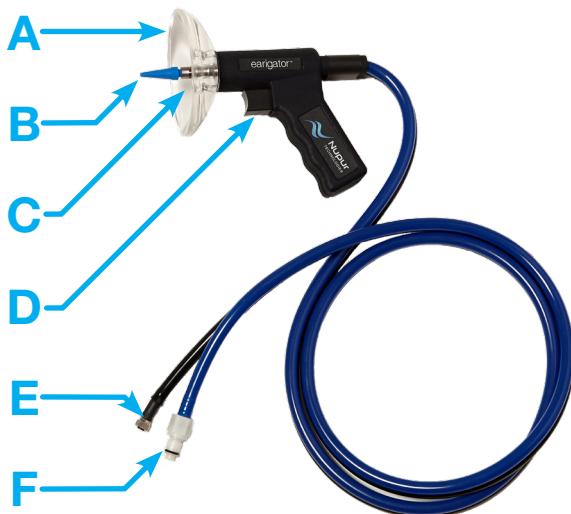
- A. Display panel
- B. Lid opening latch
- C. Hand piece cradle
- D. Hand piece holder
- E. Water reservoir
- F. Water level markings
- G. Thermistor
- H. Water level detector
- I. Drain port
- J. Thermal safety switch
- K. Heating element
- L. ON/OFF switch, fuse holder
- M. Power cord receptacle
- N. Water line connection
- O. Control signal connection
- P. Drain button

# EARIGATOR® OPERATION MANUAL



## 5.2 Hand Piece Parts (Patient Applied Part)

- A. Lens/Splash guard
- B. Nozzle
- C. LED bulbs
- D. Trigger
- E. Control signal cable connection
- F. Water tubing connection



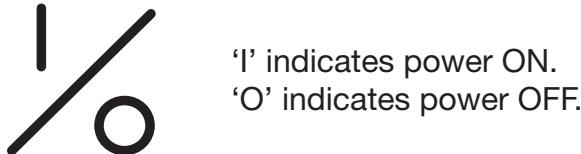
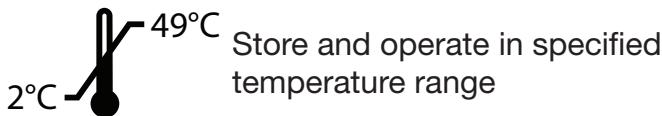
## 5.3 Unit Markings



Patient applied part connection



Read operating manual before use



Single use only, dispose of after use.



CE conformity marking.



USA and Canada conformity marking.



European authorized representative.

## 5.4 Display Panel

The display panel shows the water temperature and has three LED lights that indicate the state of the unit to the user as follows:

“READY” (BLUE) LED is ON when the unit is ready for operation.

“PLACE HAND PIECE IN CRADLE” (YELLOW) LED is ON when the water temperature is too low to use and the hand piece is not in the cradle. Placing the hand piece in cradle activates the heater and the pump for recirculation of water through the hand piece until the water reaches use temperature.

“WATER LOW” (RED) LED is ON when the water level is too low. Add water, place hand piece in cradle and wait for ready light to come on before using the EARIGATOR®.

## 5.5 Getting the Unit Ready for Use

The step by step procedure to get the unit ready for use is as follows:

1. Connect the hand piece to the control unit by connecting the control signal and water connections to the appropriate connections on the rear of the control unit.

**NOTE**

When inserting the male water connection, press it into the female receptacle on the back of the unit until there is a click. The connection is now locked in place. To remove, press the metal pad on the top of the female receptacle while simultaneously pulling the male connector out.

**NOTE**

The control signal connection is “keyed.” Make sure to line up the black button of the male connector to the indentation on the female receptacle. Do not force the connection. The five pins in the female receptacle need to fit into the five slots of the male connector. There is a slight click when the connector is properly engaged. To remove the connector, depress the black button and pull out simultaneously.

2. With the ON/OFF switch in the OFF position (“0”), insert the power cord into the power cord receptacle on the back of the unit.
3. Pour clean, room temperature, tap water into the reservoir. Do not overfill.

**WARNING**

Do not fill the reservoir with water hotter than 37°C (98°F).

**CAUTION**

Do not overfill the reservoir, above the 4.0 liter (1 gal) MAX line.

**NOTE**

Generally, cleaning two ears uses about 1 liter of water. The reservoir holds up to 4 liters. It is recommended to refill the reservoir when the water level reaches the 1.0 liter REFILL line. Fill the unit with cool to room temperature water. Each liter of water takes approximately 2 to 3 minutes to heat up to use temperature.

4. Place the hand piece in the cradle. Make sure the hand piece is completely engaged.
5. Plug the unit into a grounded outlet.
6. Turn the ON/OFF switch of the unit to the ON (“|”) position. Heating will begin and water will circulate through the hand piece back into the reservoir. Wait until the “READY” blue LED light on the display panel turns “ON”.

**NOTE**

If the hand piece is removed from the cradle when the system is not ready, the yellow “PLACE HAND PIECE IN CRADLE” light on the display panel will light up. The unit will not operate until the hand piece is properly seated in the cradle.

## EARIGATOR® OPERATION MANUAL



Earigator with hand piece in cradle and attached to the back of the unit.

## 5.6 Cerumen Removal with EARIGATOR®

1. Place cart with EARIGATOR® in front of sitting patient for easy access to right and left ear.
2. Drape the patient with a plastic cape and tuck several tissues at neck to absorb any excess water.
3. Instruct the patient to hold catch basin firmly at neck to receive drainage.
4. Examine ear with an Otoscope to visualize the ear canal and cerumen (any ear pathology or abnormal findings should be checked by a physician).



**WARNING**

Do not use the EARIGATOR® on patients who have undergone ear surgery or have a perforation in their ear drum.

5. Explain to patient that they will feel a slow stream of warm water at first, and then an increasing stream with some pressure increase.
6. Place tip of the EARIGATOR® into ear canal. Visualize the canal and cerumen through the magnifying lens and LED illumination. Pull up the Pinna with the other hand. Depress trigger slightly for light flow. This will acclimatize patient to the sensation. Depress trigger further for an increasingly stronger stream until the trigger is completely depressed.



**WARNING**

Stop immediately if patient complains of pain. Have the physician examine ear. It may have been due to ear pathology that may not have been visible and remained undiscovered. In this case, the physician should remove cerumen manually with a curette under microscope.

7. Use slight circular motion to loosen cerumen.
8. To avoid water contamination, store the hand piece in the hand piece holder on the back of the control unit between use on each ear of a single patient. See Section 5.6 for example images. Only place the handle in the hand piece cradle on top of the unit with either a clean nozzle or no nozzle attached.



Clinician using the EARIGATOR® on a patient.



Any time the Lid is opened, particularly for refilling, place the Hand Piece in the Hand Piece Holder as shown in the picture below. This prevents the Hand Piece from falling off of the Hand Piece Cradle and protects from potential damage.



Earigator with hand piece in the hand piece holder on the back of the unit.



After placing the Hand Piece in the Hand Piece Holder and before opening the Lid, clean and dry any water drops spilled on and around the Hand Piece Cradle using a piece of paper towel as shown in the following figure. Open the Instrument Lid and add required amount of water in the Reservoir.



Cleaning spilled water from the Hand Piece Cradle



Using the hand piece holder, or optional cart hand piece holder, keeps the hand piece at, or above the water level in the reservoir. If the hand piece is allowed to drop below the reservoir level, water can flow out of the reservoir through the hand piece onto the floor.

## 5.7 Nozzle Use

The nozzles are disposable and single patient use. After each patient, dispose of the nozzle by unscrewing it counter-clockwise. Insert a new nozzle by inserting the nozzle into the hand piece receptacle and turning clockwise until the nozzle stops. Do not over tighten.



Only use nozzles supplied by Nupur. These nozzles are unique to the EARIGATOR® and provide for proper flow. Using an improper nozzle could cause damage to the patient's ear.



When using the EARIGATOR®, the clinician can use either the hand piece holder, or the optional cart hand piece holder, to temporarily hold the hand piece while treating a patient. This avoids the potential of contamination if the hand piece is placed back in the hand piece cradle. See pictures on the next page.



Using the hand piece holder, or optional cart hand piece holder, keeps the hand piece at, or above the water level in the reservoir. If the hand piece is allowed to drop below the reservoir level, water can flow out of the reservoir through the hand piece onto the floor.



Examples of where to place the hand piece while treating a patient. This avoids contamination of the water reservoir by a dirty disposable nozzle.

## 5.8 Sleep Mode

If the hand piece is placed in the cradle and the unit is not used for 10 minutes then the unit will enter sleep mode and shut off the pump and heater. This is indicated by “SL” being displayed on the front panel. The unit will remain in sleep mode until the water temperature drops below 32°C (90°F), at which point the unit will automatically reactivate, bringing the water temperature to  $37 \pm 2^\circ\text{C}$  ( $98 \pm 3^\circ\text{F}$ ).

While in sleep mode, the operator can depress the hand piece trigger to reactivate the unit. Removing the hand piece from the cradle and then placing it back into the cradle will also wake the unit from sleep mode. After reactivation, when the water temperature reaches  $37 \pm 2^\circ\text{C}$  ( $98 \pm 3^\circ\text{F}$ ) the blue “READY” LED indicator will illuminate. The system should indicate that it is ready for use within 1-2 minutes of exiting sleep mode.

## 5.9 Draining the Reservoir

To drain the unit, remove the hand piece from the cradle and direct the flow of water into a sink. Press the drain button on the rear of the unit, located above the hand piece connection ports. Hold the drain button in until the reservoir is empty and the flow stops.



To prepare the unit for long term storage, or storage at temperatures below 0°C (32°F), make sure that all water is drained from the unit. To ensure that all water is drained, carefully tip the control unit back approximately 2.5 cm (1 in) while pressing down the drain button. This will clear all of the water out of the water reservoir and the internal water tubing.

## 5.10 Reservoir Cleaning

The reservoir should be cleaned at least once every week.

1. Fill unit with more than 1 liter (4 cups) of diluted hydrogen peroxide (3-5% concentration).



**CAUTION**

Do NOT use higher than 10% concentration hydrogen peroxide to clean the EARIGATOR® until it is properly diluted to a lower concentration. This WILL damage the seal surrounding the heating element.



**CAUTION**

Do NOT use chlorine based cleaning agents to clean the EARIGATOR®. This WILL damage the seal surrounding the heating element.



**NOTE**

If only a higher concentration of hydrogen peroxide is available, use water to dilute it to an acceptable level (3-5%) before adding it to the EARIGATOR®.

2. Run the unit normally with the unit ON and the hand piece in the cradle. If the unit indicates an over-temperature “HI” condition, add 0.5 liters (2 cups) of cold tap water.
3. After the blue “READY” light comes on, drain the unit.
4. Fill the unit with clean water and again drain using the drain button. Do this twice.
5. Either store the unit, or fill the unit with clean tap water

if planning to use in next few days. The unit is ready for use again.

## **5.11 Catch Basin Cleaning**

The catch basin is reusable and must be cleaned after each use. The catch basin can simply be wiped down with one of the following disinfectants and then rinsed with clean water after each use.

Several known compatible disinfectants are:

- Isopropyl Alcohol
- Bleach
- Ammonium Chloride based wipes (eg. Lysol Wipes, PDI Super Sani-Cloth® Germicidal Disposable Wipes or Monk Disinfectant Wipes)

## **5.12 Handpiece Lens Cleaning**

The lens on the handpiece should be cleaned using a mild antibacterial soap after each use. Do not use alcohol (including wipes) as this can adversely affect the lens, causing cracks.

## **5.13 Disposable Nozzle Tips**

The disposable handpiece nozzles are one time use only. Discard them after using them on a patient.

# **E**ARIGATOR® **O**PERATION **M**ANUAL

## 6. Troubleshooting

The troubleshooting chart below lists common problems that may occur when you use your EARIGATOR® unit. If the following solutions do not correct your problem, contact Nupur or your Equipment Provider for further assistance.

PROBLEM	PROBABLE CAUSE	SOLUTION
Unit does not turn on	Power cord not firmly connected to the unit or the wall outlet  Unit not connected to a “live” electrical outlet	Make sure that the power cord is plugged into the unit and the electrical outlet.  Make sure that the unit is plugged into a “live” outlet.  Test same outlet with a working item such as a lamp.
Unit does not turn on	Unit fuse blown	Replace the fuses, located on the back of the unit above the power cord receptacle but below the ON/OFF switch. Contact Nupur or your Equipment Provider for fuse specifications.
Unit stops and then starts up.	Power cord not secure at the unit's receptacle or power outlet	Make sure the power cord is completely connected at the unit's receptacle and power outlet.
Water flow from hand piece will not stop	Hand piece control cable connection is loose or not connected	Make sure the black hand piece control cable is securely attached to the back of the base unit.

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
Display panel displays “HI” during operation	Water temperature error likely due to the temperature being too high	Add cold water to the unit to bring the water temperature back to below 39°C (101°F).
Water will not heat	The mechanical thermal switch has been tripped due to an over temperature condition and has not properly reset	Fill the unit with ice water above the 1L/REFILL mark. Wait 5 minutes then turn on the unit and allow the water to heat until the unit indicates that it is READY.
Pump starts and stops rapidly	Pressure safety switch is activated	Check the nozzle for occlusion or replace nozzle.
Any other problem or if another solution fails to resolve the issue	Internal problem	Contact Nupur or your equipment provider

## 7. Product Specifications

Operating Temperature:	37 ± 2°C (98 ± 3°F)
Operating Pressure:	0.8 ± 0.1 bar (12 ± 2 psi)
Water Flow Rate:	1.25 liters/minute (0.33 gallons/min)
Warm-Up Time:	5-10 minutes (dependent on water volume and initial temperature)
Water Capacity:	4 liters (1 gallon)
Weight:	10 lbs (without water)
Dimensions:	32L x 27W x 40H cm (12L x 10W x 16H in)
Electrical Requirements:	100-120 VAC, 50/60 Hz, 10 A (model NT0001-1)  220-240 VAC, 50/60 Hz, 5 A (model NT0001-2)
Fuses:	Bussmann or equivalent S500-10-R, 10 Amp, 100-120 VAC  S500-5-R, 5 Amp, 220-240 VAC
Power Consumption:	900 W maximum
Storage Temperature:	2-49°C (35-120°F)  Note: storage can be lower if all of the water is drained out of the system (see Section 5.8)

## EARIGATOR® OPERATION MANUAL

Display/Indicators:	Water temperature Unit ready for use Low water level Place hand piece in cradle
Other features:	Safety over temperature shut off at: $43^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ( $110^{\circ}\text{F} \pm 8^{\circ}\text{F}$ ) Safety over pressure shut off at: $1.25 \pm 0.25$ bar ( $18 \pm 2$ psi) Low water level shut off Isolated low voltage supply



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