chattanooga™

Vectra® Neo Clinical Therapy System

Service Manual

Service Instructions For:

- Vectra Neo Clinical Therapy System Part #6000

Optional Accessories:

- Stim 1_2 Module - PN 70000
- Ultrasound Module - PN 70002
- Stim 3_4 Module - PN 70003
- Stim 1_2 + EMG Module - PN 70004
- Laser Module - PN 70005
- Neo Cart - PN 70001

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FOREWORD

This manual is intended for users of Vectra® Neo Clinical Therapy System. It contains general information on operation, precautionary practices, and maintenance. In order to maximize use, efficiency, and the life of the system, please read this manual thoroughly and become familiar with the controls, as well as the accessories before operating the system.

In addition to the above information, this manual contains care and installation instructions for the optional Cart, Channel 1/2 Electrotherapy module, Channel 1/2 Electrotherapy module + sEMGmodule, Channel 3/4 Electrotherapy module, Laser module, and Ultrasound module for the users of the Vectra® Neo Clinical Therapy System.

Specifications put forth in this manual were in effect at the time of publication. However, owing to DJO's policy of continual improvement, changes to these specifications may be made at any time without notification on the part of DJO.

Before administering any treatment to a patient, the users of this equipment should read, understand and follow the information contained in this manual for each mode of treatment available, as well as the indications, contraindications, warnings and precautions. Consult other resources for additional information regarding the application of electrotherapy, ultrasound, and laser.

PRECAUTIONARY INSTRUCTIONS

The precautionary instructions found in this section and throughout this manual are indicated by specific symbols. Understand these symbols and their definitions before operating this equipment. The definition of these symbols are as follows:

⚠ CAUTION

Text with a "CAUTION" indicator explains possible safety infractions that have potential to cause minor or moderate injury or damage to the equipment.

⚠ WARNING

Text with a "WARNING" indicator explains possible safety infractions that will potentially cause serious injury and equipment damage.

⚠ DANGER

Text with a "DANGER" indicator will explain possible safety infractions that are imminently hazardous situations that would result in death or serious injury.

Text with a "DANGEROUS VOLTAGE" indicator serves to inform the user of possible hazards resulting in the electrical charge delivered to the patient in certain treatment configurations of TENS waveforms.

Warning; Laser beam

Explosion Hazard - Text with an "Explosion Hazard" indicator will explain possible safety infractions if this equipment is used in the presence of flammable anesthetics, mixture with air, oxygen, or nitrous oxide.

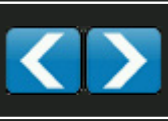
Wear eye protection

NOTE: Throughout this manual, "NOTE" indicators provide helpful information regarding the particular area of function being described.

GENERAL TERMINOLOGY

The following are definitions for the terminology used throughout this manual. Study these terms to become familiar with them for ease of system operation, and control functionality of the Vectra® Neo Clinical Therapy System.

SYSTEM SOFTWARE SYMBOLS

	Back Arrow
	Home
	Increase/Decrease Parameter
	Scroll Up or Down in a text box
	Select
	Page up
	Page down
	Customize
	Save Data
	When pressed will print the screen contents or Patient Treatment Results Report to the USB Flash drive
	Indicates a USB Flash drive is Installed
	Patient Remote/Laser Interrupt Switch Icon Indicates the Accessory is plugged in

	Stim
	Electrode Placement
	Ultrasound
	Combo
	sEMG
	Laser
	CPS
	Custom Protocols
	Patient Data
	Anatomical Library

DESCRIPTION OF DEVICE MARKINGS

The markings on the unit are assurance of its conformity to the highest applicable standards of medical equipment safety and electromagnetic compatibility. One or more of the following markings may appear on the device:

Refer to Instructional Manual Booklet 

Equipment capable of delivering output values in excess of 10 mA r.m.s. or 10V r.m.s. averaged over any period of 5s 

Testing Agency 

Dangerous Voltage 

Electrical Type B 

Electrical Type BF 

Laser 

Ultrasound 

Stim 

Start 

Stop 

Pause 

Intensity 

Lock/Unlock 

ON/OFF 

Laser Stop Switch 

This unit is considered to be a Class 3B laser product and thus emits visible and invisible laser radiation (IR). Avoid direct eye exposure to the Laser beam. The symbol to the right is located on the back of the applicator and indicates the active radiant surface (the area on the applicator that emits infrared laser energy and the direction of the beam of light) 

MRI Unsafe (device, its components and accessories are not to be present in an MRI or CT environment) 

PRODUCT DESCRIPTION

The Vectra® Neo Clinical Therapy System is a modular system used with or without an optional Cart, allowing for the inclusion of Channel 1/2 Electrotherapy module with or without sEMG, Channel 3/4 Electrotherapy module, Laser module and Ultrasound module.

To maximize functionality and life of Vectra® Neo, be sure to:

- Stay current with the latest clinical developments in the field of electrotherapy, ultrasound, laser therapy, sEMG and sEMG + electrotherapy.
- Observe all applicable precautionary measures for treatment.
- Keep informed of appropriate indications and contraindications for the use of the Vectra® Neo Clinical Therapy System.

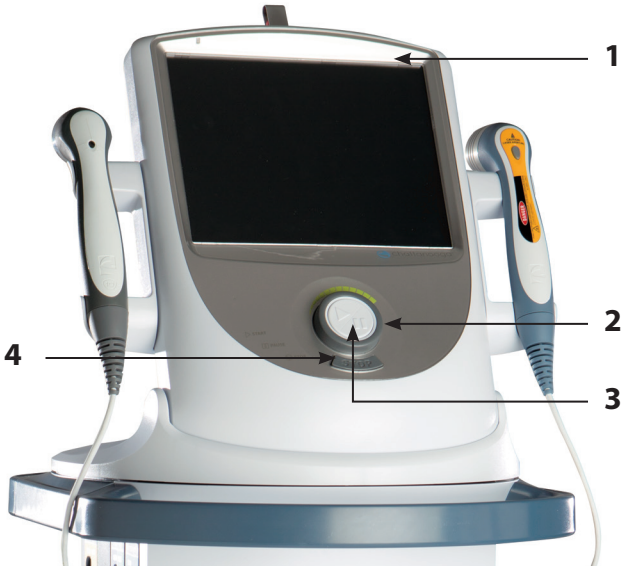
NOTE: This equipment is to be used only under the prescription and supervision of a licensed medical practitioner.

OPERATOR INTERFACE

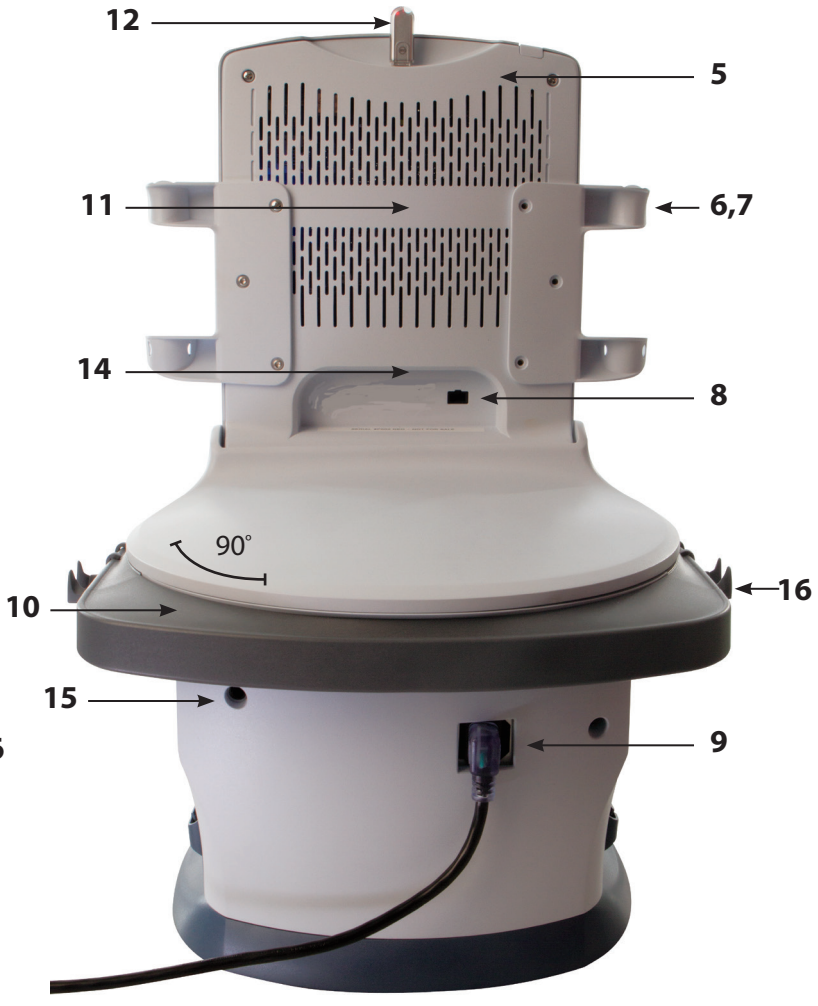
The Vectra® Neo Clinical Therapy System Operator Interface contains all the functions and controls necessary for operator access to all operator utilities, modalities, and parameters for modification and system set up.

1. Color Display
2. Intensity Dial (Gray outer ring)
3. Start/Pause button
4. Stop button
5. ON/OFF switch
6. Ultrasound Applicator holder, left and right sides
7. Laser Applicator holder, left and right sides
8. Patient Remote/ Laser Interrupt Switch port
9. Mains Power Cord
10. Rear Access Panel
11. Serial Label
12. USB Flash drive Port (Flash drive not included)
13. Tilt Screen
14. Swivel function
15. Laser Interlock Port and Icon
16. Leadwire holders

Front Controls



Rear Access Panel



Side Holders

⚠ CAUTION

- Read, understand, and practice the precautionary and operating instructions. Know the limitations and hazards associated with using any electrical stimulation, Laser device or ultrasound device. Observe the precautionary and operational decals placed on the unit.
- All modalities should be routinely checked before each use to determine that all controls function normally, especially that the intensity control does properly adjust the intensity of the ultrasonic power output in a stable manner. Also, determine that the treatment time control does actually terminate ultrasonic power output when the timer reaches zero.
- DO NOT use sharp objects such as a pencil point or ballpoint pen to operate the buttons on the control panel.
- This unit should be operated at 10°C to 45°C and 0% to 90% Relative Humidity. The unit should be transported and stored at 0°C to 60°C and 0% to 95% Relative Humidity.
- Handle Ultrasound Applicator and Laser Applicator with care. Inappropriate handling may adversely affect its characteristics.
- Before each use, inspect Ultrasound Applicator for cracks, which may allow the ingress of conductive fluid.
- Inspect Applicator cables and associated connectors before each use.
- Device is designed to comply with electromagnetic safety standards. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. Harmful interference to other devices can be determined by turning this equipment on and off. Try to correct the interference using one or more of the following:
  - Reorient or relocate the receiving device
  - Increase the separation between the equipment
  - Connect the equipment to an outlet on a different circuit from that to which the other device(s) are connected and consult the factory field service technician for help.
  - Consult your authorized DJO dealer for help.
- Do not operate this unit when connected to any unit other than DJO devices or accessories specifically described in user or service manuals.
- Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous exposure to Laser energy.
- DO NOT disassemble, modify, or remodel the unit or accessories. This may cause unit damage, malfunction, electrical shock, fire, or personal injury.

⚠ CAUTION

- Failure to use and maintain the Vectra® Neo Clinical Therapy System, its modules, and its accessories in accordance with the instructions outlined in this manual will invalidate the warranty.
- DO NOT permit foreign materials, liquids or cleaning agents to enter the unit, including, but not limited to, inflammables, water, and metallic objects from entering the unit, to prevent unit damage, malfunction, electrical shock, fire, or personal injury.
- If you have difficulty operating the unit after carefully reviewing this user manual, contact your DJO dealer for assistance.
- DO NOT remove the cover. Doing so may cause unit damage, malfunction, electrical shock, fire, or personal injury. There are no user-serviceable parts inside the unit. If a malfunction occurs, discontinue use immediately and consult dealer for repair service.
- Use of parts or materials other than DJO's can degrade minimum safety.
- The Vectra® Neo Clinical Therapy System is not designed to prevent the ingress of water or liquids. Ingress of water or liquids could cause malfunction of internal components of the system and therefore create a risk of injury to the patient.
- DO NOT operate the Vectra® Neo Clinical Therapy System within the vicinity or environment as any microware and RF shortwave diathermy system.
- DO NOT operate the Vectra® Neo Clinical Therapy System within the vicinity or environment as an ultrasonic diathermy system. The Ultrasound (diathermy) Module of the Vectra® Neo Clinical Therapy System does not require separation distance.
- DO NOT use electrodes with an active area less than 19 cm^2, as there will be a risk of suffering a burn injury. Caution should always be exercised with current densities more than 2mA/cm^2. Consult the Electrode Current Density table in Appendix 3.

⚠ WARNING

- U.S.A. Federal Law restricts these devices to sale by, or on the order of, a physician or licensed practitioner. This device should be used only under the continued supervision of a physician or licensed practitioner.
- Be sure to read all instructions for operation before treating patient.
- Make certain the unit is electrically grounded by connecting only to a grounded electrical service receptacle conforming to the applicable national and local electrical codes.
- Care must be taken when operating this equipment around other equipment. Potential electromagnetic or other interference could occur to this or to the other equipment. Try to minimize this interference by not using other equipment in conjunction with it.
- The safety of TENS waveforms for use during pregnancy or birth has not been established.
- TENS is not effective for pain of central origin. (This includes headache.)
- TENS waveforms have no curative value.
- Electronic monitoring equipment (such as ECG monitors and ECG alarms) may not operate properly when electrical stimulation is in use.
- TENS is a symptomatic treatment, and as such, suppresses the sensation of pain which would otherwise serve as a protective mechanism.
- Inspect the plastic lens of the laser head for blemishes, deformation, pitting, scratches, discoloration, and cleanliness before each use.
- Do not drop the applicator or unit on hard surfaces or submerge in water. These actions will damage the applicator and unit. Damage resulting from these conditions is not covered under the warranty.
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure to Laser energy.
- This device should be kept out of the reach of children.
- Use of other accessories other than those specified in this User Manual may increase electrical emissions and decrease electrical immunity of the device.
- Contaminated electrodes, leadwires, and gel can lead to infection.
- Use of electrode with degraded hydrogel can result in burn to the skin.
- DO NOT operate this unit in an environment where other devices are being used that intentionally radiate electromagnetic energy in an unshielded manner.
- Use of electrode on multiple patients can lead to infection.
- Clean applicators after each use, otherwise it can lead to cross contamination and infection.
- When the Laser Module is not in use, it should be protected against unqualified use.
- Do not treat through clothing.
- Stop treatment immediately if patient experiences discomfort or pain.
- Do not apply laser on an area of skin that has lotion or ointments applied as burns may occur.

⚠ WARNING

- The color of skin, age of lesion, depth of lesion, sensitivity of the patient, tissue type and medications that increase sensitivity to light may affect therapy.
- Powered muscle stimulators should be used only with the leads and electrodes recommended for use by the manufacturer.
- In the event of all 300-Level or a 200-Level error message that cannot be resolved, immediately stop all use of the system, and contact the dealer or DJO for service. Errors and Warnings in these categories indicate an internal problem with the system that must be tested by DJO or a Trained Technician before any further operation or use of the system.
    - Use of a system that indicates an Error or Warning in these categories may pose a risk of injury to the patient, user, or extensive internal damage to the system.
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure to ultrasonic energy.
- Before administering any treatment to a patient you should become acquainted with the operating procedures for each mode of treatment available, as well as the indications, contraindications, warnings and precautions. Consult other resources for additional information regarding the application of each mode of treatment.
- Disconnect the system from the power source before attempting any maintenance, installation, removal or replacement procedures to prevent electrical shock and possible damage to system.
- Keep electrodes separated during treatment. Electrodes in contact with each other could result in improper stimulation or skin burns.
- The Vectra® Neo Clinical Therapy System may be susceptible to Electro-Static Discharge (ESD) at greater than ±4 kV when first grasping either the Ultrasound or Laser applicator. In the event of such a discharge, the Vectra® Neo Clinical Therapy System may experience communication loss with the installed modules. The Vectra® Neo Clinical Therapy System will terminate all active outputs (stim, ultrasound, laser), automatically place the unit in a safe state, and issue an error message 301 or 307.
    - To recover from an error message 301 or 307, turn the unit off and on using the ON/OFF switch located at the top of the display. Once the system restarts, re-initiate all treatments that were interrupted.
- To prevent of Electro-Static Discharge (ESD) at greater than ±4 kV:
    - Grasp and hold the Ultrasound or Laser applicator prior to starting treatment. If the applicator must be put down prior to completion of treatment, stop the current treatment first and then place the applicator in the holder.
    - Maintain humidity in the use environment to at least 50% relative humidity.
    - Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, DJO recommends implementing additional controls to maintain relative humidity to at least 50%.
    - Communicate these ESD-precautionary procedures to healthcare staff, contractors, visitors and patients.

⚠ WARNING

- The laser head must be cleaned with a disinfectant cleaner (i.e. Virex® II 256) or germicidal cloth (i.e. PDI Sani-Cloth® Plus/Hb) between each therapy session. Ensure no liquids enter into the laser head while cleaning. Do not use any chlorine-based cleaners on the laser head.
- Do not use laser on or over a tattoo.
- Long term effects of chronic electrical stimulation are unknown.
- Stimulation should not be applied over the anterior neck or mouth. Severe spasm of the laryngeal and pharyngeal muscles may occur and the contractions may be strong enough to close the airway or cause difficulty in breathing.
- Stimulation should not be applied transthoracically in that the introduction of electrical current into the heart may cause cardiac arrhythmia.
- Stimulation should not be applied over swollen, infected, and inflamed areas or skin eruptions, e.g., phlebitis, thrombophlebitis, varicose veins, etc.
- Stimulation should not be applied over, or in proximity to, cancerous lesions.
- Electrotherapy output current density is related to electrode size. Improper application may result in patient injury. If any question arises as to the proper electrode size, consult a licensed practitioner prior to therapy session.
- The Vectra® Neo Clinical Therapy System optional modules and associated accessories are designed for use only with the Vectra® Neo Clinical Therapy System.
- Remove the Ultrasound or Laser Applicator by pulling the cable connector only. DO NOT remove by pulling the cable.
- Output current density is related to electrode size. Improper application may result in patient injury. If any question arises as to the proper electrode size, consult a licensed practitioner prior to therapy session.
- Do not apply the Ultrasound Applicator to the patient during the Head Warming period. Applicator must remain in Applicator Hook during the Head Warming period.
- Some patients are more sensitive to laser output (i.e., patients taking medications that increase sensitivity to light) and may experience a reaction similar to a heat rash.
- Before each Laser use, clean the plastic lens with a clean cloth. Make certain to apply with a clean cloth. Failure to clean the lens between patient therapy sessions could cause beam fragmentation, which may reduce the effectiveness of the treatment.
- Medical electrical equipment needs special precautions regarding EMC. Portable and mobile RF communication equipment can be affected by other medical electrical devices. If you believe interference is occurring, please consult page 69, Electromagnetic Compatibility, to assist in removing the interference.
- Common RF emitting devices (e.g., RFID) and electromagnetic security systems (e.g., metal detectors) may interfere with the operation of the Vectra® Neo Clinical Therapy System. The Vectra® Neo Clinical Therapy System has been tested in the presence of these types of devices and while no adverse event occurred, the device should not be operated within the vicinity or environment as another RF emitting device.

⚠ DANGER

- **Stimulus delivered by the TENS waveforms of this device, in certain configurations, will deliver a charge of 25 microcoulombs (µC) or greater per pulse and may be sufficient to cause electrocution. Electrical current of this magnitude must not flow through the thorax because it may cause a cardiac arrhythmia.**
- **Patients with an implanted neurostimulation device must not be treated with or be in close proximity to any shortwave diathermy, therapeutic ultrasound diathermy or laser diathermy anywhere on their body. Energy from diathermy (shortwave, microwave, ultrasound and laser) can be transferred through the implanted neurostimulation system, can cause tissue damage, and can result in severe injury or death. Injury, damage or death can occur during diathermy therapy even if the implanted neurostimulation system is turned off.**
- **Handle, clean and dispose of components and accessories that have come in contact with bodily fluids according to National, Local and Facility rules, regulations and procedures.**

- **This unit is considered to be a Class 3B Laser product and thus emits visible and invisible Laser radiation (IR). Avoid direct eye exposure to the Laser beam. The symbol to the left is located on the back of the applicator and indicates the active radiant surface (the area on the applicator that emits infrared Laser energy and the direction of the beam of light).When the unit is on, not all wavelengths are visible to the naked eye. Therefore, when performing any operational or functional check, always wear DJO laser protective eyewear.**
- **The solvents of adhesives and flammable solutions used for cleaning and disinfecting should be allowed to evaporate before the unit is used.**
- **DO NOT connect the unit to an electrical supply without first verifying that the power supply is the correct voltage. Incorrect voltage may cause unit damage, malfunction, electrical shock, fire, or personal injury. Your unit was constructed to operate only on the electrical voltage specified on the Voltage Rating and Serial Number Plate. Contact your DJO dealer if the unit is not properly rated.**

- **Laser protective eyewear should be worn during laser treatment by the operator and patient to block infrared light energy from the eyes during treatment.**
- **DO NOT point the Laser beam directly into human or animal eyes. The lens of the eye does not detect the invisible, coherent Laser beams, potentially resulting in permanent retinal damage.**

- **Device is not designed to be used in oxygen rich environment, Explosion hazard if the device is used in the presence of flammable anesthetic mixture with air, oxygen, or nitrous oxide.**

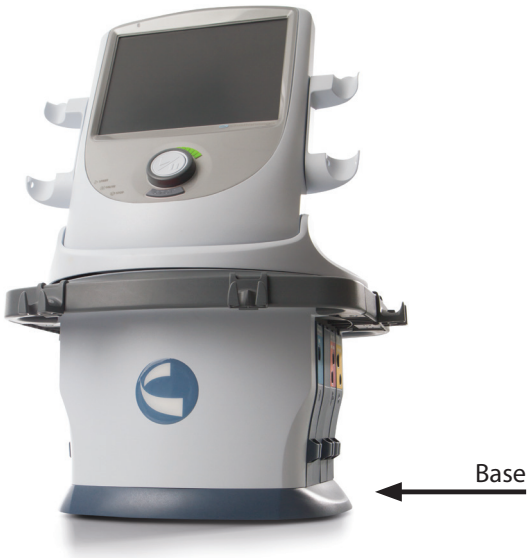
COMPONENTS

Throughout these instructions the terms "left" and "right" referring to the machine sides are from the perspective of a user standing in front of the unit.

The Vectra® Neo Clinical Therapy System allows installation of optional modality modules by the user. Specifically designed for use with the Vectra® Neo Clinical Therapy System, these modules configure the system to meet virtually every therapeutic need that a clinician may have. The components of the Vectra® Neo Clinical Therapy System are shown below.

NOTE: The Vectra® Neo Clinical Therapy System, when ordered as a Tabletop System, without cart, is assembled with Base, as shown below. The only assembly required is the installation of the desired Modules, described on page 20.

Head



Cart

Modules

- Stimulation Channel 1/2
- Stimulation Channel 1/2 + sEMG
- Stimulation Channel 3/4
- Laser
- Ultrasound

Leadwires

The available leadwires are shown below. If the user orders Stimulation Channel 1/2 module, the box will include the blue and green leadwires. Stimulation Channel 3/4 is the cranberry and orange leadwires. If both modules are ordered, the box contains all four colored leadwires. Stimulation modules channel 1/2 with sEMG includes blue and green sEMG leadwires.

Leadwire Holders

Powercord

MODULE SLOTS

1. Laser

2. Stimulation (1 & 2) / Stimulation (1&2) + sEMG

3. Ultrasound

4. Stimulation (3 & 4) – opposite side

Side Module Slots – Left Side

Side Module Slots – Right Side

To remove module, take right side off face plate and push module from right side

MODULE KIT CONTENTS

Electrotherapy Module Channels 1/2 – PN 70000

- Stimulation module
- Clip lead wire
- Lead wires
- DURA-STICK® 2 in (5 cm) Round Disposable Electrodes (1 pack of 4)
- Faceplates (to cover module after inserted into main unit)
- IFU

Ultrasound Module - PN 70002

- Ultrasound module
- Faceplates (to cover module after inserted into main unit)
- IFU

Electrotherapy Module Channels 3/4 – PN 70003

- Stimulation module
- Clip lead wire
- Lead wires
- DURA-STICK® 2 in (5 cm) Round Disposable Electrodes (1 pack of 4)
- Faceplates (to cover module after inserted into main unit)
- IFU

Electrotherapy Module Channels 1/2 + sEMG – PN 70004

- Stimulation module (2 channel Stimulation with sEMG)
- Clip lead wire
- sEMG Leadwires
- DURA-STICK® 2 in (5 cm) (2 packs of 4) Round Disposable Electrodes
- Faceplates (to cover module after inserted into main unit)

Laser Module – PN 70005

- Laser module
- Protective Eyewear, 2 pair
- Kit Interlock
- Patient Remote/Laser Interrupt Switch
- Faceplates (to cover module after inserted into main unit)
- IFU

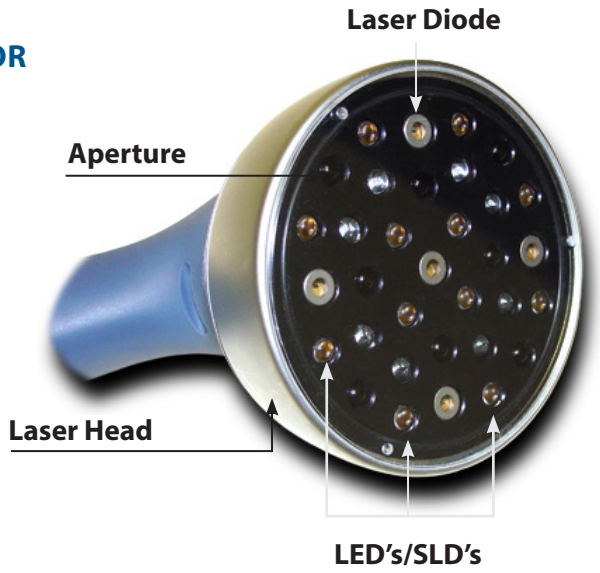
ULTRASOUND APPLICATOR

1. Applicator Head
The component of the applicator that makes contact with the patient during Ultrasound or Combination therapy.

2. Applicator
The assembly that connects to the system and incorporates the Applicator.

3. LED
The component of the applicator that indicates if the Applicator is coupled or uncoupled on the treatment area. Coupling is not available on the 1cm² applicator.

LASER APPLICATOR



LED Indicator (Output Power)

LED Indicator (Output Power) This orange light illuminates when Laser energy is being distributed by the applicator.

PATIENT REMOTE/LASER INTERRUPT SWITCH

The Vectra® Neo Patient Remote/Laser Interrupt Switch buttons are described below. By default, the remote is not assigned to any treatment. When assigned, the buttons function as follows:

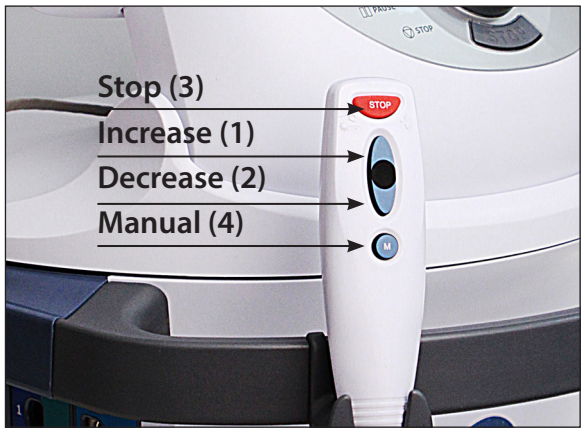
▲	**Increase Intensity (1)**
▼	**Decrease Intensity (2)**
STOP	**STOP/Pause Treatment (3)**
M	**Manual Stimulation (4)**

Intensity Up (Electrical Stimulation Treatments Only) - Increases the intensity of the assigned stim treatment; button is not active if stim treatment is unassigned. Button is not active and has no function for ultrasound or laser treatments.

Intensity Down (Electrical Stimulation Treatments Only) - Decreases the intensity of the assigned stim treatment; button is not active if stim treatment is unassigned. Button is not active and has no function for ultrasound or laser treatments.

STOP/Pause (All Treatments) - pauses treatment

M (Manual Stimulation) (Electrical Stimulation Treatments Only) - Provides one cycle of stimulation. Can only be operated when the clinician enables manual mode on the base unit (head). This mode is clinician monitored and is not for use when the patient is unattended. Button is not active and has no function for ultrasound or laser treatments.



NEO LEG TO CART ASSEMBLY/ADJUSTMENT

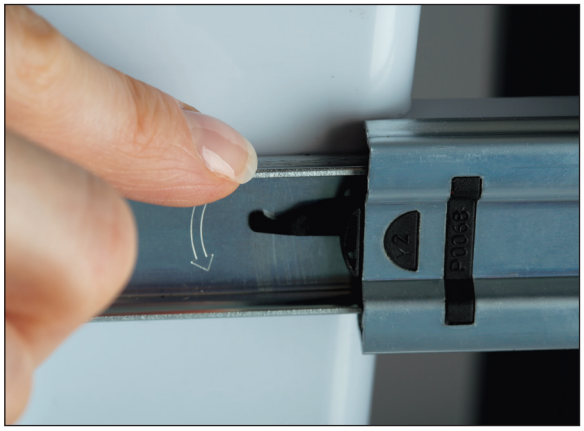
The Neo Cart is shipped without the legs attached. To install or adjust the leg assemblies onto the Neo Cart, follow these steps:

Neo Leg to Cart assembly/Adjustment

Tools Required:

- 3/16" Hex Key Wrench (provided)
- Flat Washer ¼" Internal diameter, quantity 6, (provided)
- Socket Head Cap Screw ¼-20 x 1-1/4", quantity 6 (provided)

1. Remove the bottom drawer from the Cart. Pull the drawer open. Press the plastic tabs on both drawer slides simultaneously in opposite directions, as shown. Completely pull the drawer out.



HEAD TO CART ASSEMBLY INSTRUCTIONS

2. There are two Cart height adjustments. Standard shown on the left and lowered, shown on the right. For initial installation, determine the desired height. Locate three Allen-style bolts for each leg, left and right and insert, by hand, in their respective slots. Use the Allen wrench to secure the legs.

   NOTE: To Adjust Height at a later time, simply remove the Allen-style bolts, re-position the legs and re-insert the bolts.

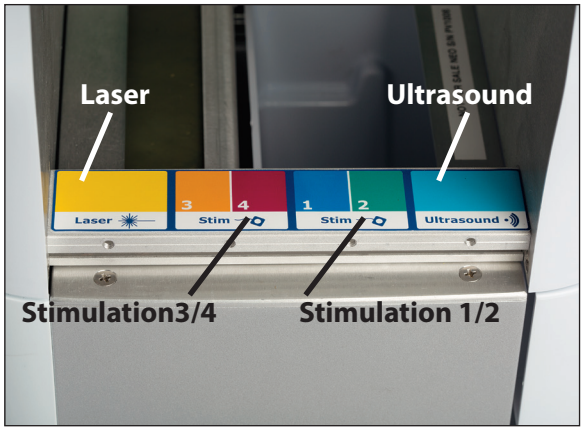
3. Reinstall the Bottom Drawer.

MODULE INSTALLATION

All modules are installed from the left side (when facing the screen) of the Neo head unit and are each installed in the same manner. Each has color-coded lead wires that correspond to the appropriate colored labeling on the modules. Module-specific Installation instructions are shown after the generic instructions. To install the modules in the Vectra® Neo Clinical Therapy System, follow the steps shown.

Tools required (not included): #2 Phillips screwdriver and standard slotted screwdriver.

The System is programmed to automatically recognize the new Module(s), therefore, no software installation is required.



1. Ensure that the power cord is removed from the device.

2. Remove the blank faceplate over the slot from the left and right sides of the Neo head. (The example displays the Ultrasound module.)
3.
4.
5.
6.
7.
8.

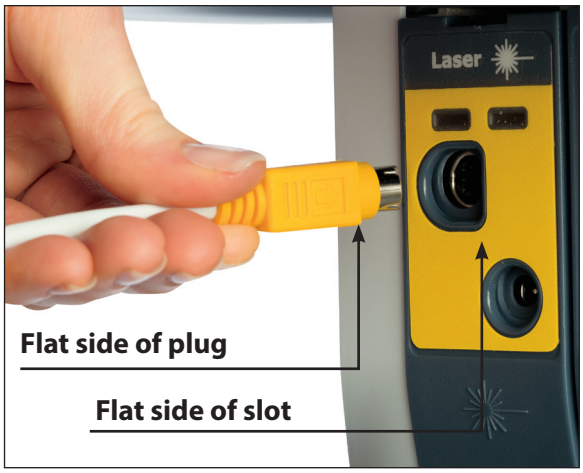
MODULE-SPECIFIC INFORMATION

Ultrasound Cable Insertion

Shown below is the Ultrasound Cable Insertion location.

INSERTING PLUGS

When inserting the plugs for the Ultrasound and Laser modules, be sure to align the flat side of the plug with the flat side of the slot and push in gently. This is to avoid bending the pins in the plug.



PATIENT REMOTE/LASER INTERRUPT SWITCH INSTALLATION

To operate the Patient Remote/Laser Interrupt Switch, plug the remote into the device on the Rear Access Panel receptacle, as shown below:

⚠ CAUTION

- **Patient Remote/Laser Interrupt Switch is to be used under supervision of a physician or licensed practitioner only.**

Complete the following steps to assign the remote to a treatment:

1. When the remote is plugged into the unit, a Remote ON/OFF toggle icon is displayed on the Treatment review screen in the upper right corner. Shown below:

2. Press the Remote ON/OFF toggle icon to assign or unassign the remote to the selected treatment. The remote can be assigned to only one treatment at a time however the remote can be reassigned as needed.

When not in use, the Patient Remote/Laser Interrupt Switch can be stored by hooking it onto the leadwire holder clips in the same manner as leadwires and cables, as demonstrated. Shown below.

INSTALLING THE LASER INTERLOCK (DOOR INTERRUPT SWITCH)

The Laser Interlock is an optional safety device designed to interrupt Laser therapy if the door to the therapy room is opened. The laser interlock kit consists of a switch resistor and a jack. Customers must supply the necessary cable that complies with local and international codes. Use only qualified electricians to install the Laser Interlock Kit.

The diagrams to the right provide installation guidelines for therapy room with single and multiple doors.

Operation of the Laser Interlock
Laser Interlock works as an interrupt switch once it is installed and connected to the Vectra® Neo Clinical Therapy System with Laser module.

Laser Interlock monitors the state of the door(s) of the therapy room and only allows start of Laser treatment if all of the doors are closed.

If any door is open it will not allow user to start the Laser treatment and if treatment is already started and someone opens the door, it interrupts the system to stop the Laser treatment.

⚠ WARNING

- **Disconnect the system from the power source before attempting any maintenance, installation, removal or replacement procedures to prevent electrical shock and possible damage to system.**
- **The laser interlock must be installed by a professional or qualified electrician. Serious eye injury can result if the device is not properly installed. Also, when installing the device for multiple doors, the resistance total may not exceed 4800 ohm.**

Diagram for Therapy Room with One Door.

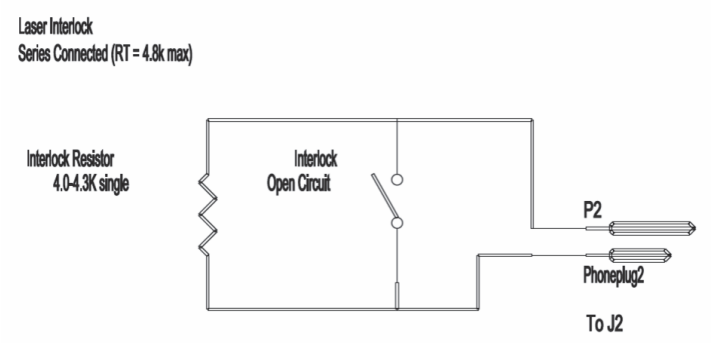
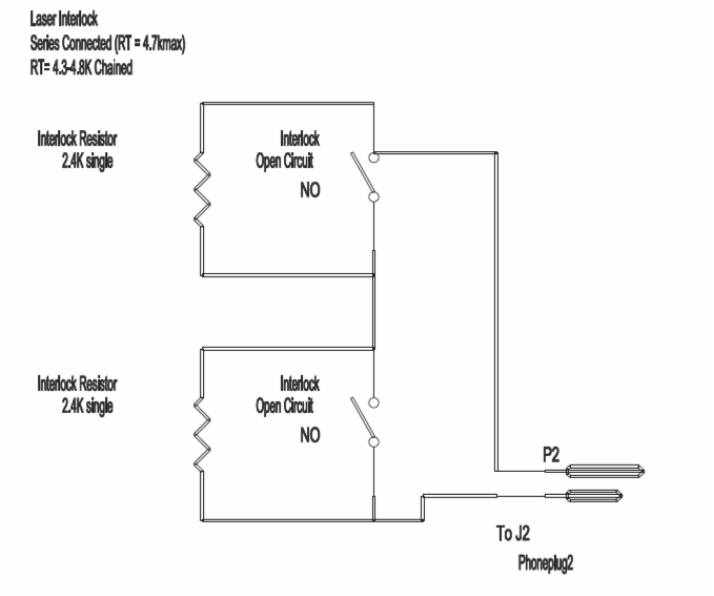


Diagram for Therapy Room with Multiple Doors.



THERAPY SYSTEM START-UP

Complete the following steps for initial setup of the Vectra® Neo Clinical Therapy System:

1. Plug the Power cord into the back of device. Plug the other end of the cord into an electrical outlet.

   NOTE: The Power Cord may be unplugged from the back of the cart in an emergency situation.

2. Press the Power button located on the top left portion of the LCD casing, as shown below:

3. Select desired function on the Home Screen (shown below).

SYSTEM SPECIFICATIONS AND DIMENSIONS

	Width	Depth	Height	Weight
Module	11.12" (28.2448 cm)	6.34" (16.1036 cm)	1.43" (3.6322 cm)	1lb (0.453592 kg)
Head @ 45 degree with Base (Tabletop)	15.89" (40.3606 cm)	15.89" (40.3606 cm)	22.05" (56.007 cm)	20.7lb (9.389362 kg)
Cart Lowered (with casters)	23.94" (60.8076 cm)	26.19" (66.5226 cm)	27.41" (69.6214 cm)	29.4lb (13.33562 kg)
Cart Raised (with casters)	23.94" (60.8076 cm)	26.19" (66.5226 cm)	30.15" (76.581 cm)	
Head and raised cart with screen @ 90deg	23.94" (60.8076 cm)	26.19" (66.5226 cm)	52.85" (134.239 cm)	48.9lb (22.18067 kg)

POWER (COMBINATION AND ELECTROTHERAPY UNITS)

Input ..... 100 - 240 V AC, 2.5A to 1.25A, 50/60 Hz
Electrical Class ..... CLASS I
Mode of Operation..... Continuous

Electrical Type (Degree of Protection)

Ultrasound .....TYPE B
Laser .....TYPE B
Electrotherapy .....TYPE BF
Electrotherapy & sEMG .....TYPE BF
Ultrasound & Electrotherapy .....TYPE B

NOTE: All waveforms except High Voltage Pulsed Current (HVPC) have been designed with a 200 mA current limit. VMS™, VMS™ Burst and all TENS waveform output intensities are measured, specified, and listed to peak, not peak to peak.

GENERAL SYSTEM OPERATING AND STORAGE TEMPERATURE

Operating conditions
The device will meet its requirement under the following conditions:
Temperature: ..... 10° C to 45° C
Relative Humidity:..... 0% to 90%
Atmospheric Pressure: ..... 700hPa to 1060hPa

Transport and storage conditions
The device will remain in proper condition under the following conditions:
Temperature: ..... Above 0° C freezing to +60°C
Relative Humidity:..... max 95%
Atmospheric Pressure:..... 700hPa to 1060hPa

ULTRASOUND SPECIFICATIONS

Frequency ..... 1 MHz, ± 5%; 3.3 Mhz, ±5%
Duty Cycles ..... 10%, 20%, 50%, Continuous
Pulse Repetition Rate ..... 100 Hz ±20%
Pulse Duration .....1 mSec, ±20%; 2 mSec, ±20%; 5 mSec, ±20%
Output Power

10 cm^2 Crystal ..... 0-15 W at 1 MHz, 0-10 W at 3.3 MHz
5 cm^2 Crystal ..... 0-6W @ 1 and 3.3 MHz
2 cm^2 Crystal ..... 0-3 W @ 1 and 3.3 MHz
1 cm^2 Crystal ..... 0-1.5 W @ 3.3 MHz

Amplitude.....0 to 2.5 W/cm^2 in continuous and pulsed modes
Output accuracy..... ± 20%, 10% of maximum
Temporal Peak to Average Ratio:.....2:1, ± 20%, at 50% Duty Cycle
.....5:1, ± 20%, at 20% Duty Cycle
.....9:1, ± 20%, at 10% Duty Cycle
Beam Nonuniformity Ratio..... 5:1 maximum
Beam Type..... Collimating
IPXX Rating for Unit..... IPX0
IPXX Rating for Applicator..... IPX7
Treatment Time ..... 1 to 30 min

Effective Radiating Areas					
		ERA High		ERA Low	
Description	ERA (cm^2)	cm^2	%	cm^2	%
10 cm^2 Crystal	8.5	10	+18%	7	-18%
5 cm^2 Crystal	4	5	+25%	3	-25%
2 cm^2 Crystal	1.8	2	+11%	1.4	-22%
1 cm^2 Crystal	0.9	1	+11%	0.4	-55%

Head Warming Feature

The Head Warming feature of a Vectra® Neo Clinical Therapy System utilizes Ultrasound output, resulting in warming of the Applicator to increase patient comfort.

With Head Warming enabled, ultrasound is emitted without pressing the Start button while an ultrasound treatment is being setup. The Applicator LED will not illuminate during the Head Warming period. US Channel will indicate "Head Warming".

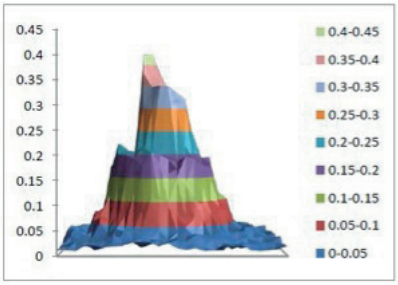
Output..... 0 - 50% Cycling of maximum power
Frequency ..... 3.3 Mhz
Applicator Temperature..... 29.4 °C - 43.3 °C (85 °F - 110 °F)

ULTRASOUND SPATIAL PATTERN

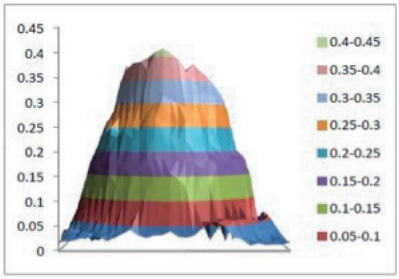
The following charts represent the distribution of the ultrasonic radiation field and the orientation of the field with respect to each applicator (Y-plane represents voltage in Vrms and X-plane represents applicator head surface in 1mm resolution).

1 cm^2 Crystal (model 27733)

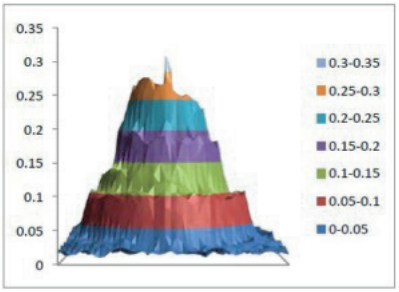
2 cm^2 Crystal (model 27734)



5 cm^2 Crystal (27735)



10cm^2 Crystal (model 27736)



LASER SPECIFICATIONS

Power

Output Type ..... Infrared Lamp (Laser)
Laser Class..... 3B

Laser Technical Specifications

Pulse Frequencies..... 8 Hz - 10000 Hz and continuous
Wavelengths..... 670-950 nm (dependent on applicator)
Output..... 100-1440 mW (dependent on applicator)
Output accuracy..... +/- 20% of nominal

LASER APPLICATOR TECHNICAL SPECIFICATIONS

For all single diode and cluster laser and LED applicators, the expected increase in the measured quantities after manufacture added to the values measured at the time of manufacture is ± 20%.

The software incorporates a cooling function that forces the user to cool the laser cluster prior to the next treatment.

The software will calculate the cooling time needed when treatment times exceed 3 minutes per application. For a 3 minute treatment, it will force a 15 second cool down period before the next treatment can begin. For a 4 minute treatment, it will force a 2 minute cool down period before the next treatment can begin. The software extrapolates for times between 3 and 4 minutes.

A message will display on the screen informing the user that the probe is cooling down and the time period required. After 5 seconds, this message will disappear. If the user attempts to use the probe before the cool down period is completed, the message will re-display to signify that the applicator is still in cool down mode. After the cool down period is complete, a message displays that informs the user that the unit is ready for use.

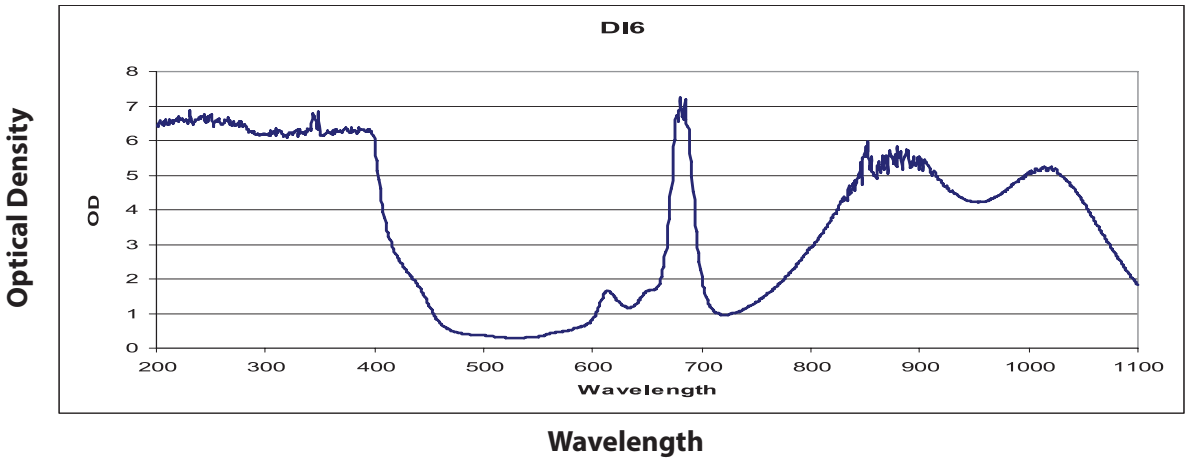
Model #	Description	Diode Type	Wavelength(s) (nm)	Output Power (mW)	Power Density (W/cm^2)	Treatment Area (Spot Size) (cm^2)	Nominal Ocular Hazard Distance (NOHD-in meters)	Divergence a1 (rad)	Divergence a1 (rad)
27799	Single 670nm LED	LED	670	10	0.012	0.785	0.386	0.698	N/A
27802	33-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x12 880 nm (25mW) LED x8 950 nm (15mW) LED x8 850 nm (50mW) Laser x5	690	0.022	31.2	3.110	0.097	0.543
27803	Single 850nm Laser	GaAlAs	850	40	0.05	0.785	2.488	0.097	0.543
27804	Single 850nm Laser	GaAlAs	850	150	0.191	0.785	8.800	0.097	0.543
27805	Single 820nm Laser	GaAlAs	820	300	0.382	0.785	15.240	0.097	0.543
27807	33-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x12 880 nm (25mW) LED x8 950 nm (15mW) LED x8 850 nm (100mW) Laser x5	940	0.03	31.2	6.221	0.097	0.543
27808	33-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x12 880 nm (25mW) LED x8 950 nm (15mW) LED x8 850 nm (200mW) Laser x5	1440	0.045	31.2	12.443	0.097	0.543
27809	33-Diode cluster LED	LED	670 nm (10mW) LED x12 880 nm (25mW) LED x13 950 nm (15mW) LED x8	565	0.018	31.2	0.386	0.698	N/A

LASER APPLICATOR TECHNICAL SPECIFICATIONS (CONTINUED)

Model #	Description	Diode Type	Wavelength(s) (nm)	Output Power (mW)	Power Density (W/cm^2)	Treatment Area (Spot Size) (cm^2)	Nominal Ocular Hazard Distance (NOHD-in meters)	Divergence a1 (rad)	Divergence a1 (rad)
27810	9-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x4 850 nm (50mW) Laser x5	290	0.038	7.55	3.110	0.097	0.543
27811	9-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x4 850 nm (100mW) Laser x5	540	0.071	7.55	6.221	0.097	0.543
27812	9-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x4 850 nm (200mW) Laser x5	1040	0.137	7.55	12.443	0.097	0.543
27813	13-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x7 950 nm (15mW) LED x3 850 nm (50mW) Laser x3	265	0.035	7.55	3.110	0.097	0.543
27814	13-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x7 950 nm (15mW) LED x3 850 nm (100mW) Laser x3	415	0.054	7.55	6.221	0.097	0.543
27816	13-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x7 950 nm (15mW) LED x3 850 nm (200mW) Laser x3	715	0.094	7.55	12.443	0.097	0.543
27815	19-Diode cluster Laser/LED	GaAlAs LED	670 nm (10mW) LED x6 880 nm (25mW) LED x7 950 nm (15mW) LED x6	325	0.043	7.55	0.386	0.698	N/A
27840	Single 850nm Laser	GaAlAs	850	100	0.127	0.785	6.221	0.097	0.543
27841	Single 85 nm Laser	GaAlAs	850	200	0.254	0.785	12.440	0.097	0.543

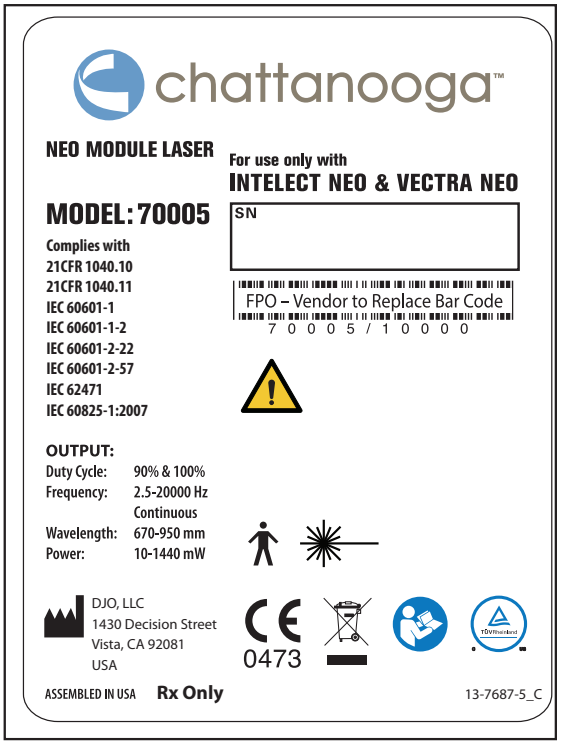
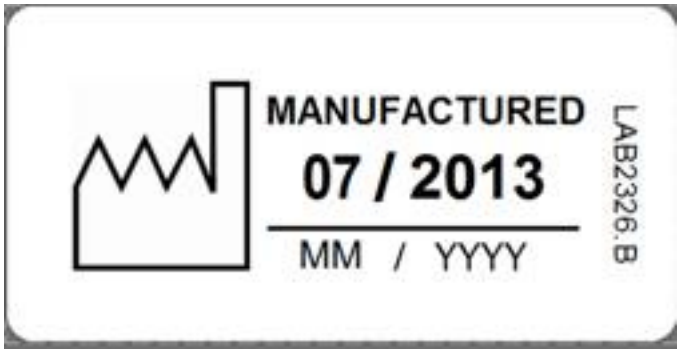
LASER PROTECTIVE EYEWEAR SPECIFICATIONS

The graph below illustrates optical density in relation to wavelength. Each unit is shipped with laser protective eyewear that is L3 rated and approved as well as EN207 compliant.



Useful Range
Optical Density 5+.....190-400 nm
Optical Density 3+.....625-830 nm
Optical Density 3+.....815-1050 nm

LASER LABELS

This serial decal label is affixed at the rear of the system.	
The device is labeled with the date of manufacturer.	
The Laser applicator handle label includes important safety information.	
The LED applicator handle label includes important safety information.	

WAVEFORMS

IFC (Interferential) Traditional (4 Pole)

Interferential Current is a medium frequency waveform. Current is distributed through two channels (four electrodes). The currents cross each other in the body at the area requiring treatment. The two currents interfere with each other at this crossing point, resulting in a modulation of the intensity (the current intensity increases and decreases at a regular frequency).

Output Mode ..... Electrodes
Carrier Frequency..... 2000-10,000 Hz
Beat Frequency..... 1-200 Hz
Sweep Time.....15 sec
Sweep Low Beat Frequency ..... 1-200 Hz
Sweep High Beat Frequency..... 1-200 Hz
Scan Percentage..... Static, 40%, 100% Manual
Amplitude..... 0-100 mA (CC with carrier freq ≤ 5000 kHz)
..... 0-90 mA (CC with carrier freq > 5000 kHz)
..... 0-64 mA (CC with carrier freq ≤ 5000 kHz)
..... 0-45 mA (CC with carrier freq > 5000 kHz)
Treatment Time .....1-60 Minutes
Available on Channel.....1&2, 3&4 Option

TENS- Symmetrical Biphasic

The Symmetrical Biphasic waveform has a short pulse duration and is capable of strong stimulation of nerve fibers in the skin and in muscle. This waveform is often used in portable muscle stimulation units, and some TENS devices.

Output Mode ..... Electrodes
Output Intensity..... 0-73 mA (CC) 0-36 V (CV)
Phase Duration..... Adjustable 20-1,000 µsec
Frequency ..... 1-250 Hz
Mode Selection ..... CC or CV*
Burst Frequency ..... 0-10 bps
Frequency Modulation ..... 0-250 Hz
Amplitude Modulation ..... Off, 40%, 60%, 80% and 100%
Treatment Time ..... 1-60 min

DANGER

- **Stimulus delivered by the TENS waveforms of this device, in certain configurations, will deliver a charge of 25 microcoulombs (µC) or greater per pulse and may be sufficient to cause electrocution. Electrical current of this magnitude must not flow through the thorax because it may cause a cardiac arrhythmia.**

TENS- Asymmetrical Biphasic

The Asymmetrical Biphasic waveform has a short pulse duration. It is capable of strong stimulation of the nerve fibers in the skin as well as of muscle tissue. This waveform is often used in TENS devices.

Output Mode ..... Electrodes
Output Intensity.....0-93 mA (CC) 0-46V (CV)
Phase Duration..... Adjustable 20-1,000 µsec
Frequency ..... 1-250 Hz
Mode Selection ..... CC or CV*
Burst Frequency ..... 0-10 Hz
Frequency Modulation ..... 0-250 Hz
Amplitude Modulation ..... Off, 40%, 60%, 80% and 100%
Treatment Time ..... 1-60 minutes

TENS - HAN

The HAN Waveform provides optimal parameters with a precisely controlled sequence of Dense-and-Disperse (DD) modes of stimulation where 2 Hz is alternating with 15 or 70 Hz, each lasting for 3 seconds.

Output Mode ..... Electrodes
Output Intensity..... 0-100 mA (CC)
Phase Duration .....180 µsec
Mode Selection .....CC*
Burst Frequency ..... 0-2 Hz
Frequency of Modulation ..... 80 Hz
Cycle TimeBurst of 8 pulses at 80 Hz(at a frequency of 2 Hz) for 3 seconds to 80 Hz continuous (no burst) for 3 seconds, repeated
Treatment Time ..... 1-60 min
Available on Channels..... 1, 2, 3, or 4
*CC= Constant Current

VMS™

VMS is a symmetrical biphasic waveform with a 100 µsec interphase interval. Because the pulse is relatively short, the waveform has a low skin load, making it suitable for applications requiring high intensities, such as in muscle strengthening protocols.

Output Mode ..... Electrodes
Output Intensity..... 0-114 mA (CC) 0-56 V (CV)
Channel Mode .....Single, Reciprocal, Co-Contract
Phase Duration.....20-400 µsec
Mode Selection ..... CC or CV*
Anti-Fatigue ..... Off or On
Set Intensity .....Individual Channel Intensity Setting in Reciprocal and Co-Contract modes
Cycle Time ..... Continuous or User Defined
Frequency ..... 1-200 pps
Ramp.....0-5 sec
Treatment Time ..... 1-60 min
Available on Channels..... 1, 2, 3, or 4

VMS™ Burst

VMS Burst is a symmetrical biphasic waveform delivered in a burst format. Because the pulse is relatively short, the waveform has a low skin load, making it suitable for applications requiring high intensities, such as muscle strengthening protocols.

Output Mode ..... Electrodes
Output Intensity..... 0-65 mA (CC) 0-32 V (CV)
Channel Mode .....Single, Reciprocal, Co-Contract
Phase Duration.....20-400 µsec
Mode Selection ..... CC or CV*
Anti-Fatigue ..... Off or On
Set Intensity .....Individual Channel Intensity Setting in Reciprocal and Co-Contract modes
Cycle Time ..... Continuous or User Defined
Frequency ..... 1-200 bps
Ramp.....0-5 sec
Treatment Time ..... 1-60 min
Available on Channels..... 1, 2, 3, or 4

VMS™ FR

The VMS-FR version of the VMS waveform is a physiologically based channel interaction in which one channel stimulates the agonist and the other the antagonist of the muscle group that is being exercised. VMS is a symmetrical biphasic waveform with a 100 µsec interphase interval. Because the pulse is relatively short, the waveform has a low skin load, making it suitable for applications requiring high intensities, such as in muscle strengthening protocols.

Output Mode ..... Electrodes
Output Intensity..... 0-100 mA(CC) 0- 100 V (CV)
Burst Duration .....200 - 5000 ms
Phase Duration .....20-400 µsec
Mode Selection ..... CC or CV*
Channel Intensity..... Setting in Reciprocal and Co-Contract modes
Cycle Time .....Continuous, 5/5, 4/12,10/10, 10/20, 10/30, 10/50
Frequency ..... 20-80 pps
Treatment Time ..... 1-60 min
Available on Channels.....1&2, 3&4
*CC= Constant Current
CV= Constant Voltage

IFC Premodulated (Traditional 2 Pole)

Premodulated Current is a medium frequency waveform. Current comes out of one channel (two electrodes). The current intensity is modulated: it increases and decreases at a regular frequency (the Amplitude Modulation Frequency).

Output Mode ..... Electrodes
Output Intensity..... 0-100 mA (CC) 0-96 V (CV with carrier freq ≤ 5000 kHz)
.....0-68 V (CV with carrier freq > 5000 kHz)
Carrier Frequency.....2,000-10,000 Hz
Beat Fixed (Sweep Off) ..... 1-200 Hz
Sweep Low Beat Frequency ..... 1-200 Hz
Sweep High Beat Frequency..... 81-200 Hz
Cycle Time ..... Continuous or User Defined
Mode Selection .....CC or CV*
Treatment Time ..... 1-60 Min
Available on Channel..... 1, 2, 3, or 4

DC (Direct Current)

DC Current is a direct current flowing in one direction only. The current can be continuous or interrupted.

Output Mode ..... Electrodes
Output Intensity.....0-72 mA
Polarity Reversity .....Positive, Negative
Polarity Reversity ..... On or Off
With Polarity Reversal On, Polarity will change at 50% of treatmet time.
Cycle Time ..... Continuous or User Defined
Mode Selection .....CC*
Treatment Time ..... 1-60 min
Available on Channels.....1 & 2, 3 & 4 Option

*CC = Constant Current

Russian

Russian Current is a sinusoidal waveform, delivered in bursts or series of pulses. This method was claimed by its author (Kots) to produce maximal muscle strengthening effects without significant discomfort to the patient.
Output Mode ..... Electrodes
Output Intensity..... 0-100 mA (CC) 0-90 V (CV)
Channel Mode .....Single, Reciprocal, Co-Contract
Duty Cycle 10%, 20%, 30%, 40%, 50%
Mode Selection .....CC or CV*
Anti-Fatigue ..... Off or On
Cycle Time ..... Continuous or User Defined
Burst Frequency (Anti-Fatigue Off) ..... 20-100 pps
Ramp.....0-5 sec
Treatment Time ..... 1-60 min
Available on Channels..... 1, 2, 3, or 4
*CC= Constant Current
CV= Constant Voltage

High Voltage Pulsed Current (HVPC)

The High Voltage Pulsed Current (HVPC) has a very brief pulse duration characterized by two distinct peaks delivered at high voltage. The waveform is monophasic (current flows in one direction only).

Output Mode ..... Electrodes
Output Intensity..... 0-500 V
Polarity .....Positive or Negative
Ramp.....0-5 sec
Display..... Peak Current or Volts
Sweep High Frequency ..... 20-120 pps
Sweep Low Frequency..... 10-110 pps
Frequency ..... 10-120 pps
Cycle Time ..... Continuous or Useer Defined
Treatment Time ..... 1-60 Min
Available on Channels..... 1, 2, 3, or 4

Microcurrent

Microcurrent is a monophasic waveform of very low intensity. The physiological working mechanism of this effect is as yet not clearly understood. It is thought to stimulate tissue healing by stimulating the 'current of injury', a current which naturally occurs in healing tissue.

Output Mode ..... Electrodes
Output Intensity..... 0-1000.0 µA
Polarity ..... Positive, Negative or Alternating
Treatment Time ..... 1-60 Min
Available on channels ..... 1, 2, 3, or 4

THERAPY SYSTEM TESTING

A. General

1. The following information is intended to aid in troubleshooting the major components of the Vectra® Neo Clinical Therapy System to "Board Level" only. These tests are FACTORY standard testing procedures and methods used at the factory before shipment of any Vectra Neo Clinical Therapy System.
2. Due to the complex nature of the technology utilized by DJO, the recommended troubleshooting techniques are to determine "Bad Board" and board replacement only. No board component level troubleshooting is recommended nor will information or parts be supplied by DJO. Any board component level troubleshooting performed will be at sole risk and liability of the Service Technician performing such troubleshooting techniques.
3. Once a particular PC Board has been determined as bad, refer to the appropriate Removal and Replacement Section of this Manual for proper replacement.

B. Special Tools, Fixtures, & Materials Required

1. Certain tests require the use of special tools and fixtures. These will be listed at the particular test where they are required. Testing with any other special tool or fixture other than those stated could give erroneous readings or test results. Always perform the tests exactly as stated to ensure accurate results.
2. Certain special tools or fixtures required may be obtained through DJO Service Department.
3. Scope and other standard test equipment settings will be listed for each test performed to aid in performing the test to FACTORY standards and ensure proper readings.
4. The troubleshooting and repair of the Vectra Neo Clinical Therapy System Modules, and Accessories should be performed only by authorized technicians trained and certified by DJO, LLC.

C. Equipment Required

1. Oscilloscope and Probes
2. ESTI-2 Load Test Fixture
3. Digital Multimeter
4. Patient Remote Control (Optional Accessory)
5. Ultrasound Applicators (Accessories)
6. Dielectric Withstand (Hi-Pot) and ground resistance tester

   NOTE:

   Adjust Dielectric Withstand tester to indicate fault with 120 k Ohm Load across the output when at specified test voltage.
8. Milliohm Meter
9. Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter
10. Audio Signal Generator, B-K Precision, Model 3001
11. Dissolved Oxygen Test Kit. Used to test oxygen level of degassed water
12. Degassed Water (<5 ppm) for Ultrasound Power Meter

D. Recipe(s) for Degassed Water

1. Boil Distilled Water for 30 minutes. Place water in a non-porous container and immediately cover with cellophane. Allow to cool to room temperature of approximately 70 °F (21 °C). May be refrigerated to aid cooling time.
2. Bring Distilled Water to a boil. Place the container under vacuum for 5 to 10 minutes.

NOTE:

Two liter soft drink bottles are ideal storage and transport containers for degassed water as they are designed to keep oxygen out. Do not allow aeration of degassed water during transport or filling of the power meter.

Do not use Tap water or Distilled water in the Ultrasound Power Meter. Use only Degassed Water in order to obtain correct test results. The chart below illustrates the oxygen content of Degassed, Tap and Distilled Water.

WATER TYPE	ppm of Oxygen
Degassed per recipe 1 or 2	Less than 5 ppm
Tap Water	Up to 35 ppm
Distilled Water	Up to 20 ppm

E. Full Functional Tests

Perform the tests found in this section to verify Full Functionality of new Therapy Systems and related Modules and accessories.

VISUAL INSPECTION

Visually inspect the Vectra® Neo Clinical Therapy System. A visual inspection can, to an experienced technician, indicate possible abuse of the unit and internal problems.

LEAKAGE TESTS

Conduct all necessary leakage tests as required per "Chapter 7 Electrical Equipment" of the 1999, or later, edition of the NFPA (National Fire Protection Association) "Health Care Facility" standards. **[Need this confirmed by Engineering.]**

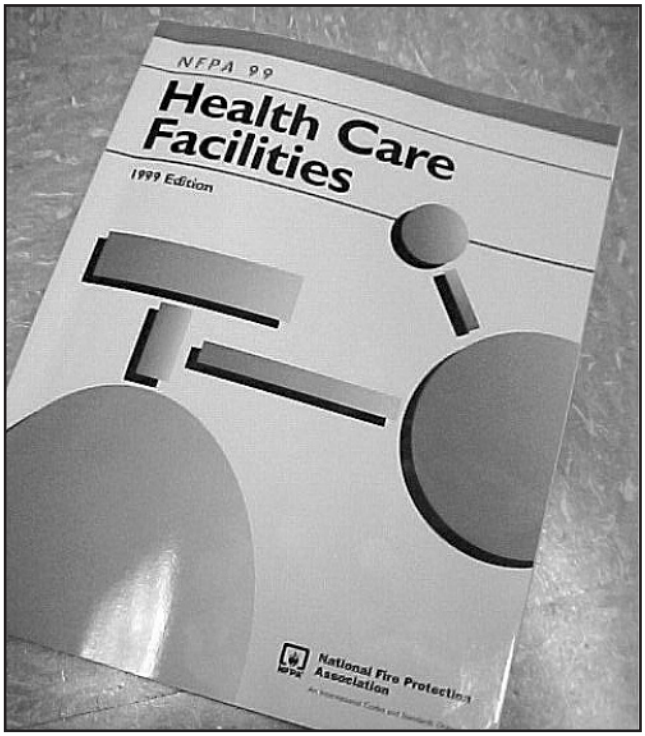
UNIT STARTUP AND FAN TESTING

A. Test

1. Place System face up on work surface or on Vectra® Neo Clinical Therapy Cart.
2. Connect power cord to unit and plug into an approved power receptacle.
3. LIsten for fan,
4. Turn system on.
5. Place hand at the back of system, at Mains Power Cord, to verify fan is blowing out. **See Figure 1.**

B. Test Results

1. Unit will not Start= Unit Failed Test
   a) Bad fuse.
   b) Possible bad Main Power Switch.
   c) Possible bad Power Supply.
   d) Possible bad power outlet or Power Cord.
2. Home Screen does not display= Unit Failed Test.
   a) Possible bad display.
   b) Possible bad Control Board.
   c) Possible bad Power Supply.
   Visually check power LED. LED Should illuminate White. Turn system off with power switch. Power LED should illuminate as Blinking White. If Power LED illuminates White with system On and Blinking White with system Off, the Power Supply is good. Replace Control Board or Display.
3. Fan not blowing outward= Unit Failed Test
   a) Fan Blowing Inward.
   Fan wired wrong. Rewire or replace fan.
   b) Possible bad Control Board.
   1) Possible bad Fan.
   2) Possible bad Power Supply.
   3) Possible bad Control Board.



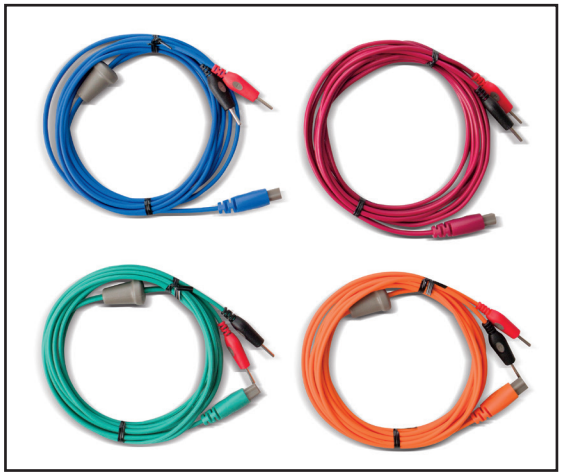
⚠ WARNING

- **Unit falling dielectric withstand or leakage tests could indicate serious internal proglems.**
- **Do not place unit back into service. Send unit to factory for repair. Do not attempt repair.**

FIGURE 1

STIMULATOR TEST SYSTEM SETUP

The following tests for Stimulator Outputs will be performed on Channels 1 and 2. The performance of these same tests will apply to the Channel 3 and 4 Electrotherapy Module for four channel therapy systems.



A. Equipment Required

1. ESTI-2 Load Test Fixture
2. Calibrated Oscilloscope and Probes

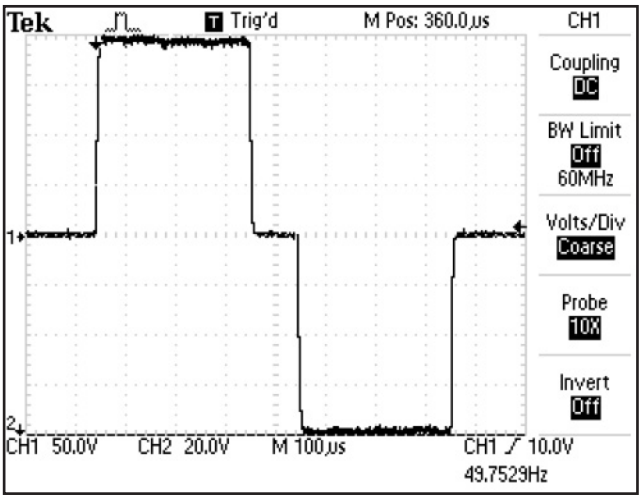
B. System Set Up

1. Install known good Lead Wires to Channels 1 and 2 on the system or Channels 3 and 4.
2. Connect Lead Wires from the system to the ESTI-2 Load Test Fixture- Channel 1 or 3 to Channel 1 IN and Channel 2 or 4 to Channel 2 IN.
3. Connect Scope Probes to the Channel 1 To SCOPE and Channel 2 To SCOPE Tabs on the ESTI 2 Load Test Fixture respectively.
4. Place ESTI-2 Load Switch in the 1 K position.
5. Install power cord into system and plug into proper power supply. Turn system On.

VMS™ MODE TEST

A. VMS™ Mode Test Procedures

1. Set Scope; Time- 100 µS, Channel- 50 V, and Trigger- DC
2. Press Electrotherapy Button.
3. Press VMS Button and then press Customize Button.
4. Under "Channel Mode" category, press "Co-Contracted" option.
5. Under Cycle Time, press On.
6. Under Phase Duration, press the Increase Arrow until 300 is displayed.
7. Turn Dial clockwise until 200 is displayed.
8.. Press Start Button.
9. Compare waveform on scope to figure on right.
10. Press Stop Button. Then press Home Button.
11. Press the Home Button. Move Lead wires to Channels 3 and 4 on 4 Channel Systems. **Repeat steps 2 through 11.**



B. VMS™ Mode Test Results

1. Waveform is the same between scope and figure on the right.

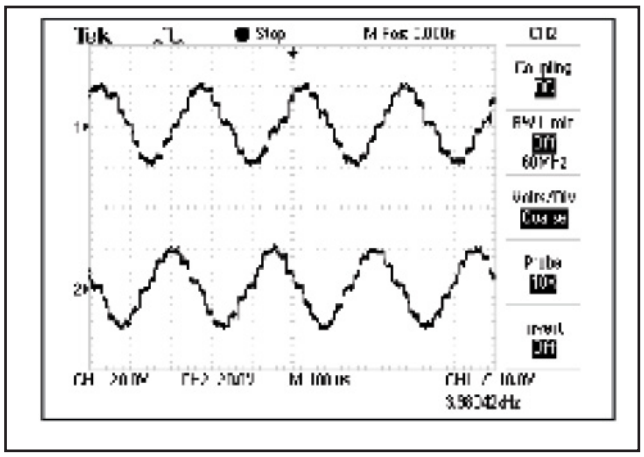
   Unit passed test.

2. No waveform or considerably different waveform.

   Unit failed test. Replace appropriate Stim Module.

INTERFERENTIAL MODE TEST

It is assumed that the unit is ready for tests as described in **STIMULATOR TEST SYSTEM SETUP Section**. If not, set up Unit per **STIMULATOR TEST SYSTEM SETUP Section** parts A and B prior to performing tests.



A. Interferential Mode Test Procedures

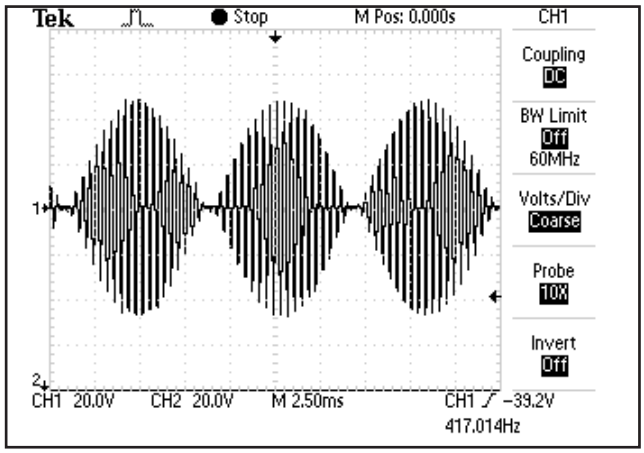
1. Set Scope; Time- 100 µS, Channel- 50 V, and Trigger- DC
2. Press Electrotherapy Button.
3. Press Interferential Button.
4. Rotate Intesity Dial clockwise until 50 is displayed.
5. Press Start Button
6. Compare waveform form on scope to image on the right.
7. Press "Pause".
8. Verify that the amplitude displayed in the Intensity box and inside the Channel 1 and 2 icons drops to zero (0). Verify that "Paused" is displayed inside the top of "Channel 1" and "Channel 2" icons.
9. Press Stop Button.
10. Press the Home Button. Move Lead wires to Channels 3 and 4 on 4 and repeat steps **2 through 9**.

B. Interferential Mode Test Results

1. Waveform is the same between scope and figure on the right, amplitude dropped to zero when paused and "Paused" displayed beside channel icons.
   Unit passed test.
2. No waveform or considerably different waveform.
   Unit failed test. Replace appropriate Stim Module.
3. Amplitude failed to "zero" when paused.
   Unit failed test. Replace appropriate Stim Module.
4. "Paused" did not display when unit paused.
   Unit failed test. Replace appropriate Stim Module.

PREMODULATED MODE TEST

Set up System per **STIMULATOR TEST SYSTEM SETUP Section** prior to performing test.



A. Premodulated Mode Test Procedures

1. Set Scope; Time- 2.50 mS, Channel- 20 V, and Trigger- DC.
2. Press Electrotherapy Button.
3. Press Premod Button.
4. Rotate Intensity Dial clockwise until 50 is displayed.
5. Press Start Button.
6. Compare waveform form on scope to image on the right.
7. Press Stop. Then press Home Button and move scope probes to Channel 2 and repeat steps **2 through 6.** Repeat test on channels 3 and 4.

B. Premodulated Mode Test Results

1. Waveform is the same between scope and figure on the right.

   Unit passed test.
2. No waveform or considerably different waveform.

   Unit failed test. Replace appropriate Stim Module.

RUSSIAN MODE TEST

Set up System per **STIMULATOR TEST SYSTEM SETUP Section** prior to performing test.

A. Russian Mode Test Procedures

1. Set Scope; Time- 5 mS, Channel- 50 V, and Trigger- DC
   NOTE:

   A test of the Optional Patient Interrrupt Switch is provided within the Russian Mode Test. If you do not have the Optional Patient Remote/Laser Interrupt Switch, skip **steps 2, and 11**.
2. Install Patient Remote/Laser Interrupt Switch. **See Figure 1.**
3. Press Electrotherapy Button
4. Press Russian Button. Press Customize Button.
5. Under "Channel Mode" category, press "Co-Contracted" option.
6. Under Cycle Time, press On.
7. Rotate Intensity Dial clockwise until 100 is displayed.
8. Press Start Button.
9. Compare waveform on scope to **Figure 2**.
10. Verify that both Channels reach 100.
11. Press STOP on the Patient Remote/Laser Interrupt Switch. Verify that the treatment stops. **See Figure 3.**
12. Press Stop Button. Press Home Button and move scope probes to Channel 3 and 4 on 4 Channel Systems. Repeat **steps 2 through 11.**

B. Russian Mode Test Results

1. Waveform is the same between scope and **Figure 2**, amplitude reached 100. **See Figure 3.** Unit passed test.
2. No waveform or considerably different waveform. Unit failed test. Replace appropriate Stim Module.
3. Amplitude failed to reach 100 on both Channels. Unit failed test. Replace appropriate Stim Module.

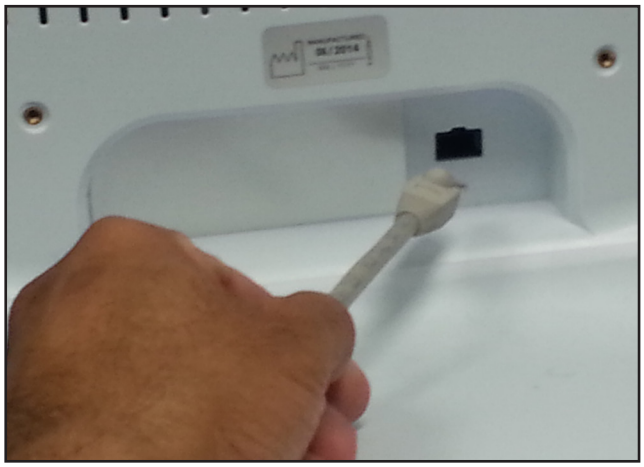


FIGURE 1

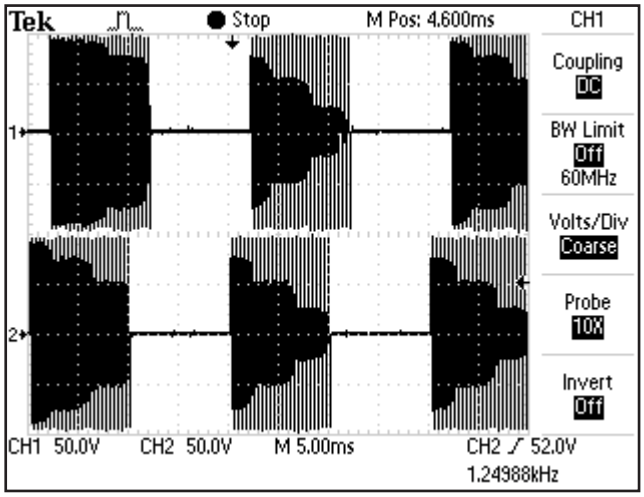


FIGURE 2

FIGURE 3

MICROCURRENT MODE TEST

Set up System per **STIMULATOR TEST SYSTEM SETUP Section** prior to performing test.

Place ESTI-2 Load Switch in the 10 K Micro position only for the Microcurrent Mode Tests. **See Figure 1.**

A. Microcurrent Mode Test Procedures

1. Set Scope; Time- 500 µS, Channel- 5.0 V, and Trigger- DC
2. Press Electrotherapy Button
3. Press Microcurrent Button and press Customize Button.
4. Under Frequency Button, press the Increase Arrow Button until 1000.0 Hz is displayed.
5. Press the Up Arrow Button until 1000.0 Hz is displayed.
6. Under "Polarity" press "Alternating".
   NOTE:
   The Frequency value will continue to ramp and rotate due to Alternating Polarity being selected. This is normal.
7. Press the Return Arrow.
   NOTE:
   1000.0 Hz should be displayed within the Electrotherapy box information. If not, repeat **steps 4 through 6.**
8. Rotate Intensity Dial until 1000 is displayed.
9. Press Start Button.
10. Compare waveform on scope to **Figure 2 and Figure 3.**
    NOTE:
    The output will alternate between positive and negative on the scope.
11. Press Stop Button and then press Home Button.
12. Select the next channel to be tested by pressing the desired Channel Button at the buttom of the screen. Repeat **steps 2 through 11** for each channel.

B. Microcurrent Mode Test Results

1. Waveform is the same between scope and **Figure 2 and Figure 3.**
   Unit passed test.
2. No waveform or considerably different waveform.
   Unit failed test. Replace appropriate Stim Module.

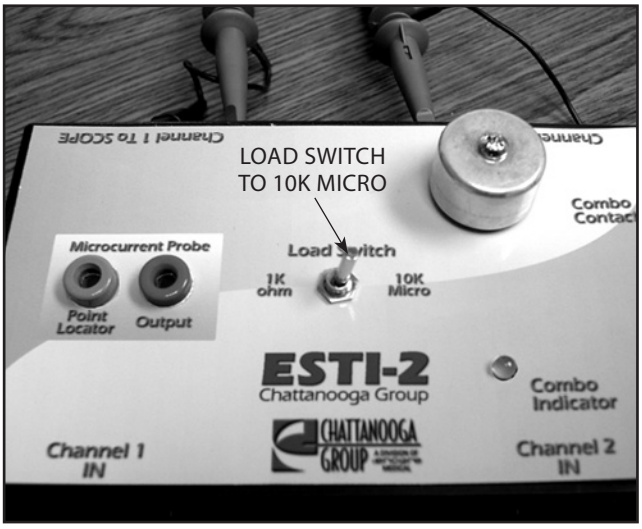


FIGURE 1

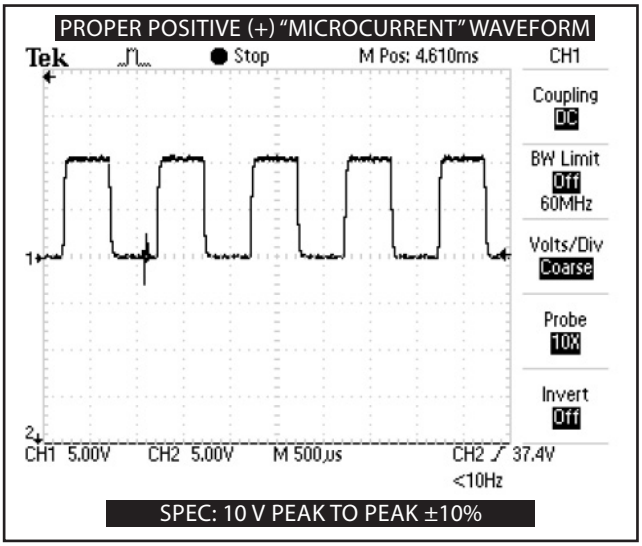


FIGURE 2

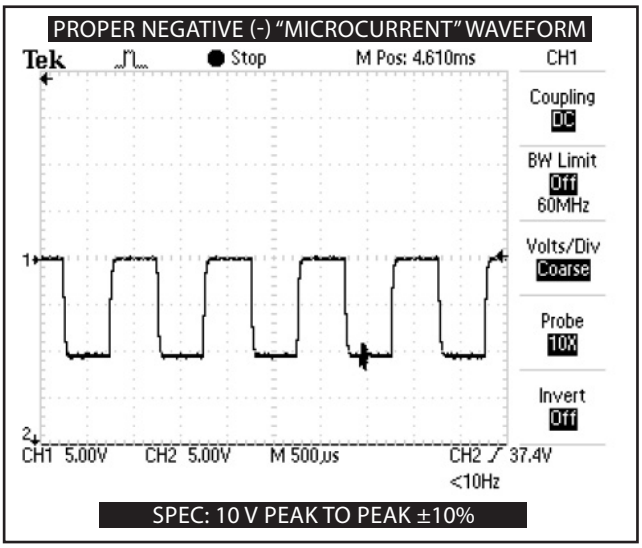


FIGURE 3

HIGH VOLTAGE PULSED CURRENT (HVPC) MODE TEST

Set up System per **STIMULATOR TEST SYSTEM SETUP Section** prior to performing tests.

A. High Voltage Pulsed Current (HVPC) Mode Test Procedures

1. Set Scope; Time- 25 µS, Channel- 50 V, and Trigger- DC.
2. Press Electrotherapy Button
3. Press High Volt Button.
4. Rotate Intensity Dial clockwise until 250 Volts is displayed.
5. Press Customize Button.
6. Change the Display selection to Peak Current.
7. Press Start Button.
8. Compare waveform on scope to **Figure 2.**
9. Press Customize Button.
10. Under "Polarity" select Positive.
11. Compare waveform on scope to **Figure 2.**
12. The numbers displayed for amplitude must not exceed 1.5 Amps. See **Figure 3**.
13. Press Stop Button.

B. High Voltage Pulsed Current (HVPC) Mode Test Results

1. Waveforms on scope the same as **Figures 1 and 2** and Amps do not exceed 1.5.

   Unit passed test.
2. No waveform or considerably different waveform.

   Unit failed test. Replace appropriate Stim Module.
3. Amps exceed 1.5.

   Unit failed test. Replace appropriate Stim Module.

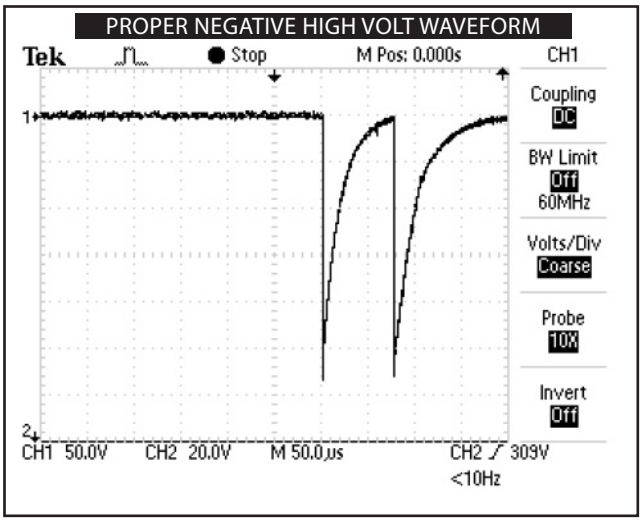


FIGURE 1

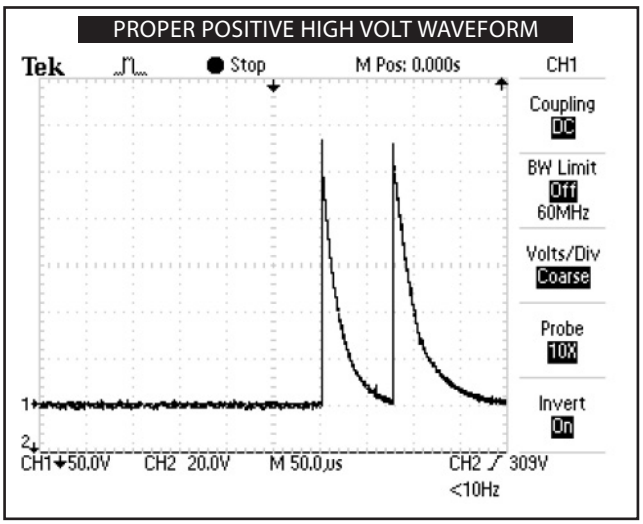


FIGURE 2

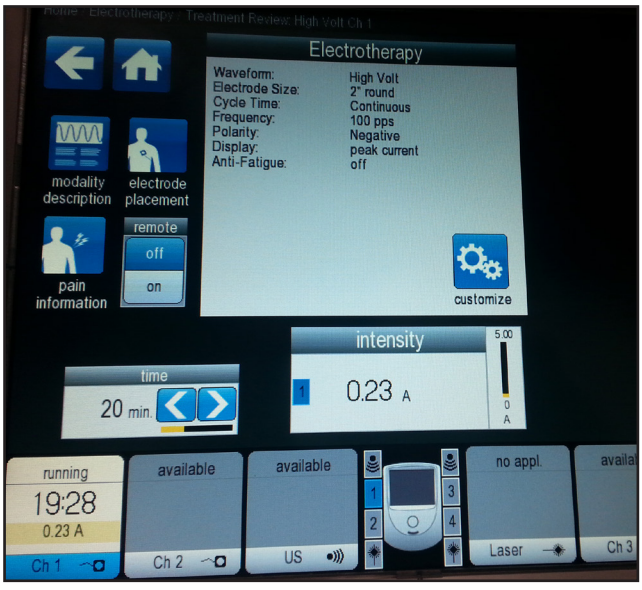


FIGURE 3

ULTRASOUND TESTS

A. Equipment Required

1. Degassed Water
2. Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter.
3. Dissolved Oxygen Test Kit. Used to test oxygen level of degassed water.
4. Ultrasound Applicator.

ULTRASOUND APPLICATOR IDENTIFICATION TEST

A. Ultrasound Applicator Identification Test Procedures

1. Without Applicator installed, turn unit on.
2. Look at the "Ultrasound" channel icon at the lower Left Hand corner of screen. It should read "No Appl." **See Figure 1.**
3. Plug the Ultrasound Applicator into Applicator connector. **See Figure 2.**
   Watch Applicator LED while connecting to System. The LED should flash Green five times.
4. Look at the "Ultrasound" channel icon. It should read Available. **See Figure 2.**
5. Press Utilities Button.
6. Press the US Warming Button until On is displayed.
7. Press the Back Button. Turn System Off and Back On with Main Power Switch. After System boots, view the Ultrasound icon, US Warming should be visible. **See Figure 3.**

B. Ultrasound Applicator Identification Test Results

1. Unit operates as described in **steps 2, 4, and 7**. Unit passed test.
2. "Appl. Not Cal." displays in Ultrasound channel icon.
   a) Applicator not calibrated or needs re-calibration.
   b) Possible bad Applicator. Re-test with known good Applicator.
3. "No Appl." displayed after ten seconds of Applicator being connected to System.
   a) Possible bad applicator. Re-test with known good Applicator.
   b) Possible bad internal connection at Ultrasound Module.
   c) Possible bad Ultrasound Module.
   d) Possible bad Control Board.

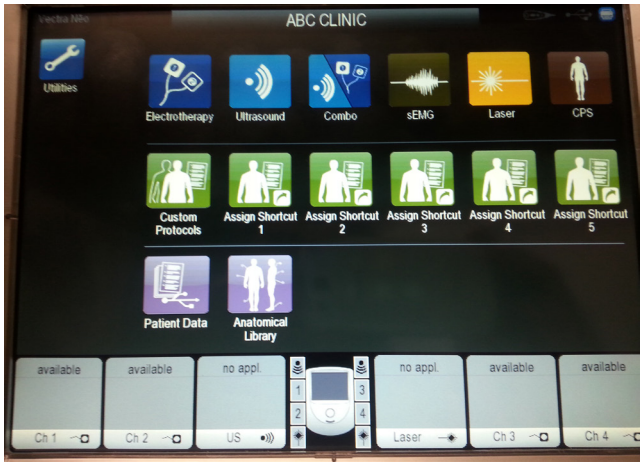


FIGURE 1

FIGURE 2

FIGURE 3

ULTRASOUND APPLICATOR OUTPUT TEST

Perform this test using the Vectra® Neo Clinical Therapy System.

A. Ultrasound Applicator Output Test Procedures

1. Set up Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter per Operator's Instructions and fill test reservoir with Degassed Water.
2. Place an Applicator into the Power Meter retainer. Make certain the Sound Head is completely submerged in the degassed water and centered directly over the Stainless Steel Cone. **See Figure 1.**
3. "Zero" meter.
4. Press Ultrasound Button. Press Customize Button.
5. Press Duty Cycle Button until 100% is displayed within the Duty Cycle icon.
6. Press Display Button until "Watts" appears within the Display icon.
7. Press Start Button.
8. Rotate Intensity Dial clockwise until the appropriate "Watts" is displayed per **Figure 2**.
9. Compare Power Meter readings to **Figure 2** to all settings for the respective Applicator being tested as shown in **Figure 2**.
10. Press Frequency Button until 3.3 MHz is displayed within the Frequency icon. Repeat test and compare readings to **Figure 2**.

NOTE:
The Applicator LED should constantly illuminate green during the Applicator Output tests.

B. Ultrasound Applicator Output Test Results

1. Output ranges fall within the specified ranges as listed in **Figure 2**.

   Unit passed test.
2. Readings fall outside specified ranges of **Figure 2**.
   a) Possible bad Degassed Water in Power Meter.
   b) Possible use of Power Meter other than Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter.
   c) Possible bad or out of calibration Applicator.
   d) Possible bad internal connection at Ultrasound Module.
   e) Check Ultrasound Module internal connections.
   f) Replace Ultrasound Module.
   g) Replace Control Board.

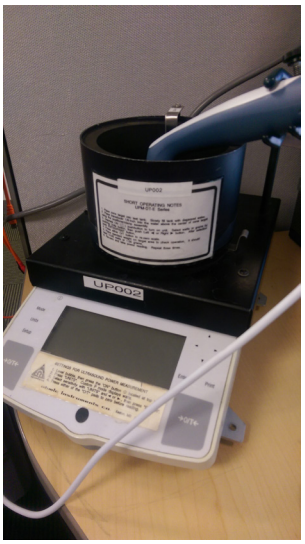


FIGURE 1

⚠ WARNING

- **Use only degassed water in power meter for testing ultrasound applicators. Use of other types of water will cause false test results.**
- **Do not aerate water when filling power meter.**

APPLICATOR OUTPUT SPECIFICATIONS		
APPLICATOR SIZE	DAILY CYCLE SETTINGS	OUTPUT POWER
1 cm²	0%	0.15 ± 20%
	20%	0.3 ± 20%
	50%	0.75 ± 20%
	100% (continuous)	1.5 ± 20%
2 cm²	10%	0.3 ± 20%
	20%	0.6 ± 20%
	50%	1.5 ± 20%
	100% (continuous)	3 ± 20%
5 cm²	10%	0.6 ± 20%
	20%	1.2 ± 20%
	50%	3 ± 20%
	100% (continuous)	6 ± 20%
10 cm²	10%	1.5 ± 20%
	20%	3 ± 20%
	50%	7.5 ± 20%
	100% (continuous)	15 ± 20%

* 1 MHz Only

FIGURE 2

ULTRASOUND DUTY CYCLE TEST

This test is performed using the Vectra® Neo Clinical Therapy System.

A. Ultrasound Duty Cycle Test Procedures

1. Set up Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter per Operator's Instructions and fill test reservoir with Degassed Water.
2. Place an Applicator into the Power Meter retainer. Make certain the Sound Head is completely submerged in the degassed water and centered directly over the Stainless Steel Cone. **See Figure 1.**
3. "Zero" meter.
4. Press Ultrasound Button. Press Customize Button.
5. Press Duty Cycle Button until 100% is displayed within the Duty Cycle icon.
6. Press Display Button until "Watts" appears within the Display icon.
7. Press Start Button.
8. Rotate Intensity Dial clockwise until the appropriate "Watts" is displayed per **Figure 2**.
9. Compare Power Meter readings to **Figure 2** to all settings for the respective Applicator being tested as shown in **Figure 2**.
10. Press Frequency Button until 3.3 MHz is displayed within the Frequency icon. Repeat test and compare readings to **Figure 2**.

B. Ultrasound Applicator Output Test Results

1. Duty Cycles fall within the specified ranges as listed in **Figure 2**.

   Unit passed test.
2. Readings fall outside specified ranges of **Figure 2**.
   a) Possible bad Degassed Water in Power Meter.
   b) Possible use of Power Meter other than Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter.
   c) Possible bad or out of calibration Applicator.
   d) Possible bad internal connection at Module.
   e) Check Ultrasound Module internal connections.
   f) Replace Ultrasound Module.
   g) Replace Control Board.

FIGURE 1

⚠ WARNING

- **Use only degassed water in power meter for testing ultrasound applicators. Use of other types of water will cause false test results.**
- **Do not aerate water when filling power meter.**

APPLICATOR OUTPUT SPECIFICATIONS		
APPLICATOR SIZE	DUTY CYCLE	OUTPUT RANGE
5 cm^2	10%	0.6 ± 20%
	20%	1.2 ± 20%
	50%	3 ± 20%
	100% (Continuous)	6 ± 20%
10 cm^2	10%	1.5 ± 20%
	20%	3 ± 20%
	50%	7.5 ± 20%
	100% (continuous)	15 ± 20%

* 1 MHz Only

FIGURE 2

COMBO OPERATION TEST

This test is performed using the 5 cm^2 Applicator.

Select Channel 2 and set up System per **STIMULATOR TEST SYSTEM SETUP Section parts A and B** prior to performing tests.

Connect Vectra® Neo Clinical Therapy Applicator to the System. **See Figure 1.** Applicator LED will flash green five times.

FIGURE 1

A. Combo Operation Test Procedures

1. Set Scope; Time- 50 µS, Channel- 50 V, and Trigger- DC.
2. Press Combo Button. Press Combo HV Button.
3. Press Customize under Ultrasound.
4. Press Watts under Display Tab.
5. Press US under Intensity Tab and rotate Intensity Control clockwise until 3.0 Watts is displayed.
6. Go back and press Customize under Electrotherapy.
7. Press Volts under Display Tab.
8. Press Estim under Intensity Tab and rotate Intensity Control clockwise until 250 Volts is displayed.
9. Press Start Button.
10. Touch the Ultrasound Applicator to the Combo Contact on the Esti-2 Load Test Fixture. The Combo Indicator on the Esti-2 should illuminate. **See Figure 2**.
11. Compare Waveform on scope to Figure 3.

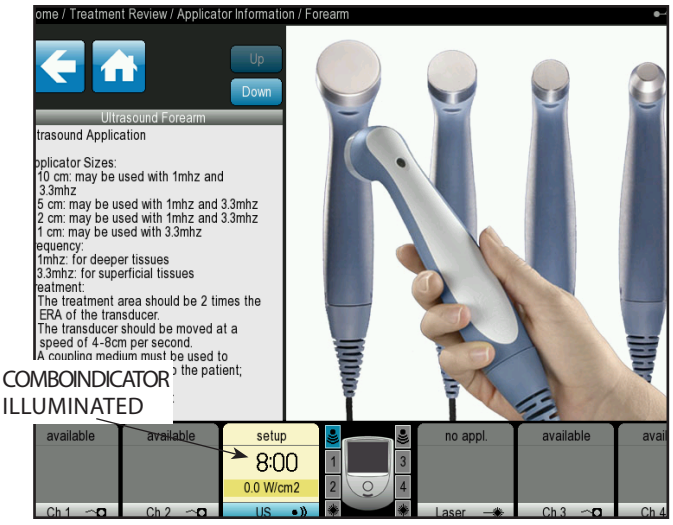


FIGURE 2

B. Ultrasound Applicator Output Test Results

1. Waveform on scope the same as **Figure 3** and the Combo Indicator illuminates.

   Unit passed test.

2. No waveform or considerably different waveform.

   Unit failed test. Check appropriate Stim Module.

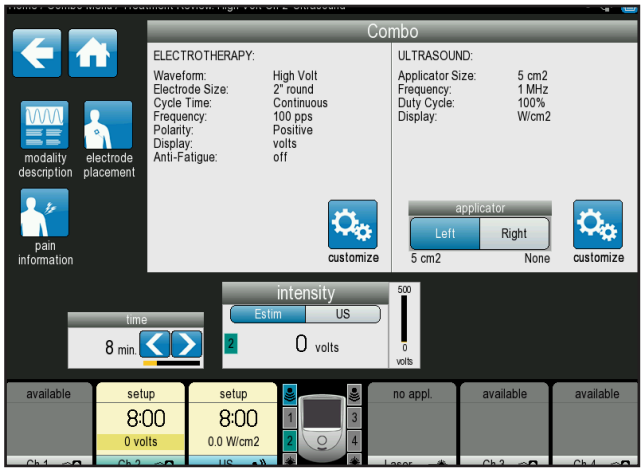


FIGURE 3

SEMG AND SEMG + ELECTRICAL STIMULATION TESTS

Perform this test on all Channels with sEMG. However, only one channel at a time can be tested with the Test Equipment described in this section.

A. Test Equipment Required

1. It will be necessary to build an Attenuator for this test. See **Figure 1** for schematic of the required Attenuator.
2. Calibrated Audio Signal Generator, B-K Precision, Model 3001.
3. Test leads for Audio Generator to Attenuator.
   NOTE: Audio Signal Generator must produce a sine waveform.
4. Known good set of sEMG Lead Wires.

B. sEMG Test Procedures

1. Set up Audio Signal Generator as follows:
   a) Plug the Audio Signal Generator Test. Leads into Generator SYNC Ports.
   b) Set the FREQ. RANGE Hz to X1.
   c) Turn the amplitude knob up to maximum.
   d) Set the WAVEFORM to Sine waveform.
   e) Set the ATTEN to O.
   f) Set the FREQUENCY DIAL to 100.
   g) Turn Audio Signal Generator On. **See Figure 2** for b-g.
2. Turn System On. View Home Screen for the presence of the sEMG and the sEMG + Stim icons. **See Figure 3.** If icons are not visible, stop test and make necessary repairs to the sEMG Module and System.

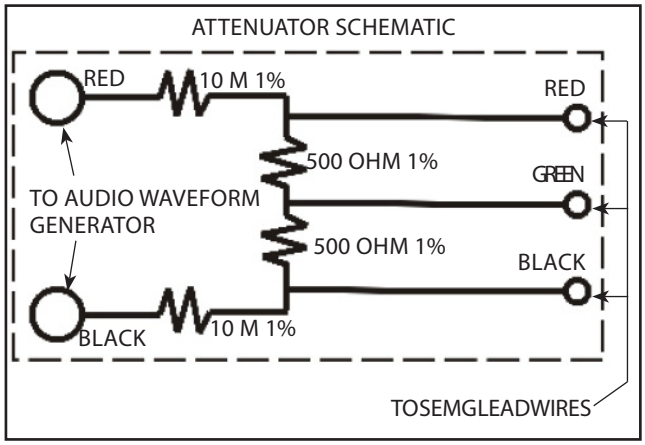


FIGURE 1

FIGURE 2

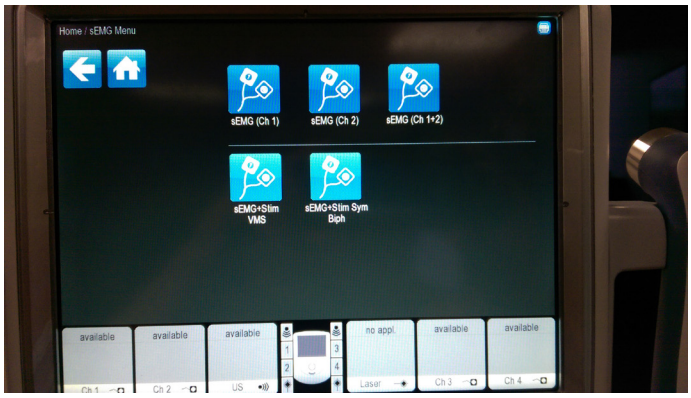


FIGURE 3

SEMG AND SEMG + ELECTRICAL STIMULATION TESTS (CONTINUED)

3. If icons are present, connect known good sEMG Lead Wire to Channels 1 and 2. **See Figure 4.**
   NOTE:
   Only one Channel at a time can be tested for sEMG.
4. Connect the Channel 1 sEMG lead wires into the Attenuator. Make certain each sEMG Lead is connected to its respective color on the Attenuator. **See Figure 5.**
5. Press the sEMG Button on Home Screen.Channel 1 should read 7 or less. **See Figure 6.**
6. If Channel 1 reads less than 7, repeat **steps 2 through 6** on Channel 2. If any Channel being tested reads greater than 7, replace the sEMG Module and re-test.
   NOTE:
   The reading on the Channel not being tested may vary in its reading. This is insignificant as it is not under load.

FIGURE 4

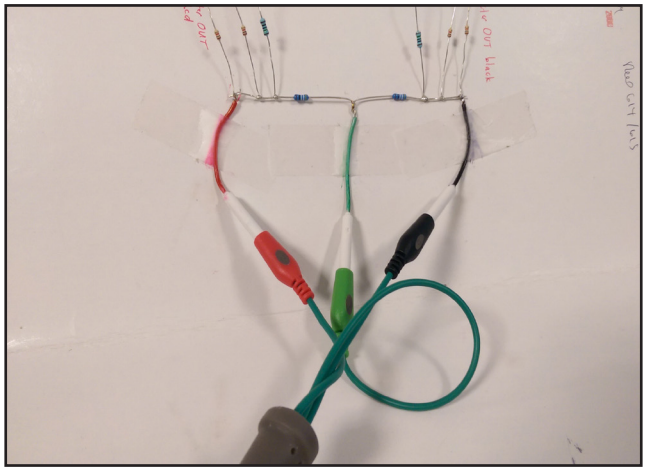


FIGURE 5

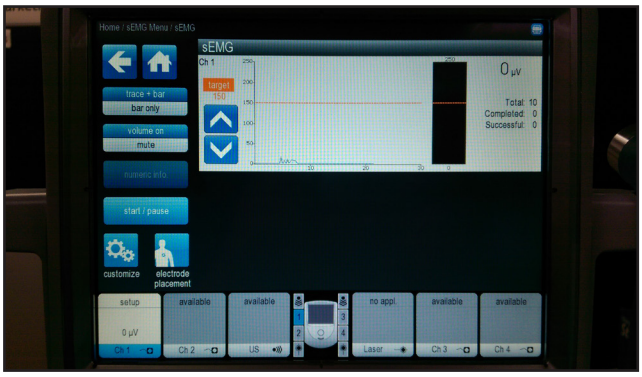


FIGURE 6

SEMG AND SEMG + ELECTRICAL STIMULATION TESTS (CONTINUED)

7. Make certain the Audio Signal Generator is set up per **sEMG TEST PROCEDURES steps 1, a) through 1, g).** Connect the Audio Signal Generator Test Leads from the Generator SYNC Ports to the Attenuator (make certain test leads are connected red to red and black to black). **See Figure 7.**
8. Connect the sEMG Lead Wire to Channel 1.
9. View the System sEMG Screen. Channel 1 should read between 604 and 738. **See Figure 8.**
   Test all sEMG Channels. If any Channel being tested reads below 604 or greater than 738, replace the respective sEMG Module and re-test.
   NOTE:
   The reading on the Channel not being tested may vary in its reading. This is insignificant as it is not under load.

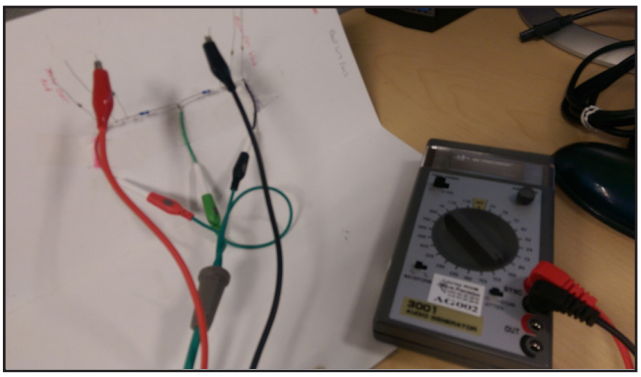


FIGURE 7

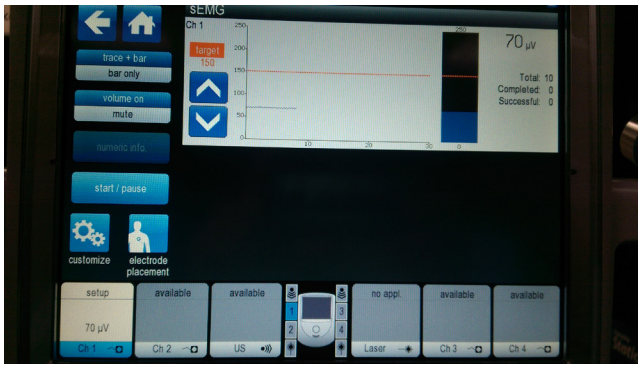


FIGURE 8

C. sEMG Test Results

If any sEMG Channel fails any part of the tests as described in **sEMG TEST PROCEDURES, steps 2 through 9**, then the module fails the test.

1. Make certain the sEMG Module is completely seated in system housing and all contacts between Stim Board and sEMG Module are making proper contact.
2. Replace the respective sEMG Module and re-test.
3. Replace the respective Stim Module and re-test.
4. Replace the Control Board and re-test.

SEMG AND SEMG + ELECTRICAL STIMULATION TESTS (CONTINUED)

D. sEMG + Stim Tests

1. To Check Stim Output, conduct the Electrical Stimulator Tests.
2. Set up Signal Generator and Attenuator as described in **sEMG TEST PROCEDURES.**
3. Select sEMG on Therapy System Home Screen.
4. Choose sEMG + Stim Sym Biph
5. Press the Customize button.
6. Press Edit Stim button
7. Rotate Treatment Intensity Knob until 5.0 mA CC is displayed. Then press the Back button.
8. Press Start sEMG + Stim button.
9. The Audio Signal Generator and the attenuator should trigger the stim function of the Therapy System and Running will display in the selected channel. **See Figure 9.**

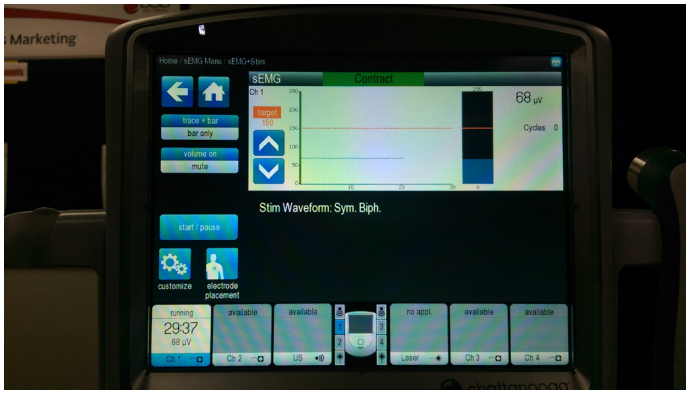


FIGURE 9

E. sEMG + Stim Test Results

1. Stim function is triggered. System passed test.
2. Stim function is not triggered. System Failed Test Replace appropriate Stim Module.

   NOTE:

   Test all sEMG Channels for proper triggering of Stim function.

TROUBLESHOOTING CODES

The Vectra® Neo Therapy System incorporates information, warning, and error messages to inform the user of problems or potential problems with the system, modality, or accessories. The numbering sequence is: 100-level messages are general use information messages. Use the following Troubleshooting Chart to define the code and locate the probable cause and possible remedies before contacting your dealer or the DJO office.

100-level messages are informational, 200-level messages are warnings, and 300-level messages are errors

Code Number	Type Message	Probable Cause	Possible Remedies
100	Information	Attempting to save a treatment to USB flash drive with a blank patient ID	Type in or select a Patient ID prior to saving treatment to USB flash drive
101	Information	Attempting to save a Custom protocol with a blank protocol name	Ensure protocol name is not blank prior to saving the protocol
102	Information	Attempting to save a Sequence with a blank sequence name	Ensure sequence name is not blank prior to saving the protocol
103	Information	Attempting to save the Clinic Name with a blank name	Ensure Clinic name is not blank prior to saving the Clinic name
104	Information	Attempting to delete a factory sequence	Factory sequences (names begin with a "*") cannot be deleted
105	Information	Attempting to delete a factory protocol	Factory protocols (names begin with a "*") cannot be deleted
106	Information	Attempting to save a Custom protocol or Sequence after system memory has reached the maximum allowed (200)	Delete unused User protocols or sequences
107 108 109	Information Information Information	Attempting to access protocols or sequences and none are found in the system	1. Custom protocols: No Custom protocols have been saved in the system. Refer to the Custom protocols section 2. Sequences: No User sequences have been saved in the system. Refer to Sequencing section
110	Information	Ultrasound applicator became unplugged during a treatment	Ensure ultrasound applicator is securely connected to the unit prior to starting an ultrasound treatment
111	Information	No ultrasound applicator is plugged into the unit	Ensure desired ultrasound applicator is securely connected to the unit prior to selecting an ultrasound treatment
112	Information	Attempting to select a treatment but available channels for desired modality are currently in use	Complete existing treatment before attempting to start another treatment on the same channel
113	Information	Attempting to select an sEMG treatment but sEMG channels are currently in use	Complete existing treatment before attempting to start another treatment on the same channel
114	Information	Attempting to select an sEMG treatment but sEMG but no sEMG is installed in the unit	Cannot select an sEMG when sEMG is not installed on the unit
115	Information	Attempting to select a Laser treatment while another treatment is running	Laser treatments cannot be run concurrently with another treatment. Complete existing treatment(s) before attempting to select a laser treatment
116	Information	No laser applicator is plugged into the unit	Ensure desired laser applicator is securely connected to the unit prior to selecting a laser treatment
117	Information	Laser applicator became unplugged during a laser treatment	Ensure desired laser applicator is securely connected to the unit prior to selecting a laser treatment
118	Information	Incorrect Laser PIN was entered	Enter the correct laser PIN when prompted prior to starting a laser treatment
119	Information	Attempting to select a laser treatment but no laser module is installed in the unit	1. If laser module is installed in the unit, ensure module is securely inserted 2. If laser module is not installed, contact the dealer or factory representative to purchase one
120	Information	Attempting to start a Laser treatment but the remote control is not plugged into the unit	Prior to starting a laser treatment, the remote control must be plugged into the unit and given to the patient to allow use as an emergency stop

TROUBLESHOOTING CODES (CON'T)

Code Number	Type Message	Probable Cause	Possible Remedies
121	Information	Attempting to select an electrotherapy treatment but no Stim module is installed in the unit	1. If a stim module is installed in the unit, ensure module is securely inserted into the unit 2. If a stim module is not installed, contact the dealer or factory to purchase one
122	Information	Attempting to select a Combination treatment but no Stim module #1 (channels 1 and 2) is installed in the unit	1. If a stim module#1 is installed in the unit, ensure module is securely inserted into the unit 2. If a stim module#1 is not installed, contact the dealer or factory to purchase one
123	Information	Attempting to select an Ultrasound or Combination treatment but no Ultrasound module is installed in the unit	1. If ultrasound module is installed in the unit, ensure module is securely inserted into the unit 2. If ultrasound module is not installed, contact the dealer or factory to purchase one
124 125 126	Information Information Information	Attempting to perform an action requiring the USB flash drive but no USB flash drive is plugged into the unit or USB flash drive cannot be accessed correctly	1. Ensure valid USB flash drive is firmly inserted into the unit or 2. Try a different USB flash drive
127 128 129 130	Information Information Information Information	Attempting to perform an action requiring a particular file on the USB flash drive but the file does not exist on the flash drive	1. Ensure USB flash drive contains the correct file for the desired function 2. Ensure valid USB flash drive is firmly inserted into the unit or 3. Try a different USB flash drive
132	Information	Attempting to perform a Print Screen to the USB flash drive while a treatment is running	The Print Screen function is not allowed while a treatment is running. Wait for treatment to complete and then try again.
133	Information	Attempting to import protocols from the USB flash drive while a treatment is running	The Protocol Import function is not allowed while a treatment is running. Wait for treatment to complete and then try again.
203	Warning	Error reading a protocol from internal storage	1. Reset the Therapy System by turning the power switch Off and On 2. If problem persists after resetting the unit the Restore the Default Protocols in the Utilities screen. Refer to the Utilities Section 3. If problem persists, discontinue use of the device and contact the dealer or factory for technical service
210 211 212 213	Warning Warning Warning Warning	Laser application is out of calibration	1. Discontinue use of this laser applicator and contact the dealer or factory for technical service to have the laser applicator recalibrated 2. If problem exists on multiple laser applicators then discontinue use of laser and contact the dealer or factory for technical service
216	Warning	Error reading a protocol from internal storage	1. Restore the Default Protocols in the Utilities screen. Refer to the Utilities Section 2. If problem persists, discontinue use of the device contact the dealer or factory for technical service
233 234 235	Warning Warning Warning	Electrotherapy bad electrode contact, overcurrent, or shorted leads condition has been detected	1. Ensure proper electrode placement use guidelines are followed 2. Check electrode lead wire connections both at the unit and at the electrode 3. Replace electrodes 4. Replace lead wires

TROUBLESHOOTING CODES (CON'T)

Code Number	Type Message	Probable Cause	Possible Remedies
Any 200-level code not listed above	Warning	Immediately stop all use of the system and contact the dealer or DJO for service. Warnings in these categories indicate an internal problem with the system that must be tested and corrected by DJO or a Trained Technician before any further operation or use of the system. Use of a system that indicates a Warning in these categories may pose a risk of injury to the patient, user, or extensive internal damage to the system.	
Any 300-level code	Error	Immediately stop all use of the system and contact the dealer or DJO for service. Errors in these categories indicate an internal problem with the system that must be tested and corrected by DJO or a Trained Technician before any further operation or use of the system. Use of a system that indicates an Error in these categories may pose a risk of injury to the patient, user, or extensive internal damage to the system.	

300 Level Errors

Number	Type	Possible Cause	Possible Remedies
300	Error	No module detected in unit on power up	1. Ensure at least one module is installed in unit 2. Ensure module(s) are firmly seated in unit 3. Check cables between Control PCB and Backplane PCB 4. Replace Control PCB 5. Replace Backplane PCB
301	Error	Stim Module communication write error	1. Replace Stim Module 2. Check cables between Control PCB and Backplane PCB 3. Replace Control PCB 4. Replace Backplane PCB
302	Error	Stim Module channel processor nut running	Replace Stim Module
303	Error	Stim Module bad data read error	1. Replace Stim Module 2. Check cables between Control PCB and Backplane PCB 3. Replace Control PCB 4. Replace Backplane PCB
304	Error	Ultrasound Module communication write error	1. Replace Ultrasound Module 2. Check cables between Control PCB and Backplane PCB 3. Replace Control PCB 4. Replace Backplane PCB
305	Error	Ultrasound Calibration error	1. Ensure ultrasound applicator is firmly plugged into the right ultrasound applicator port 2. Replace the ultrasound applicator 3. Replace the Ultrasound PCB
306	Error	Module communication write error	1. Replace applicable Module 2. Check cables between Control PCB and Backplane PCB 3. Replace Control PCB 4. Replace Backplane
307	Error	Module communication write error	1. Replace applicable Module 2. Check cables between Control PCB and Backplane PCB 3. Replace Control PCB 4. Replace Backplane
308	Error	Internal error	Log steps to reproduce the error and contact DJO R&D
309	Error	Internal error	Log steps to reproduce the error and contact DJO R&D
311	Error	Error initializing internal EEPROM on powerup	Replace Control PCB
312	Error	Tester module not detected	Replace Control PCB

ULTRASOUND CALIBRATION

A. Tools and Equipment Required

1. Vectra® Neo Clinical Therapy System and the Intelect Vet Combination Therapy System and all Vectra Genisys, Intelect Legend XT and the Intelect Vet Ultrasound Applicators associated with the System being serviced.
2. Ohmic Instruments UPM DT 10 or DT 100 Ultrasound Power Meter, set to "watts".
3. Degassed Water. **Refer to page 37** for Degassed Water Recipes.

⚠ WARNING

- **Use only degassed water in power meter for calibrating ultrasound applicators.**
- **Use of other types of water will cause false readings and bad test results**
- ***See page 37* for degassed water recipes.**
- **Use of other brands or types of tools, equipment, fixtures, materials, and supplies other than those specifically listed in "A. Tools and Equipment Required" above will give bad test and calibration results.**
- **If proper equipment is not available or can not be obtained, send the ultrasound applicators to the factory for calibration.**

B. Ultrasound Applicator Calibration Procedures

1. Enter the Technical Utility Screen by pressing the Utilities button of the Therapy System and pressing the Stop, Start, and Power Buttons simultaneously. **See Figure 1.**
2. Set up Power Meter per Ohmic User Manual. Position the Ultrasound Calibration in the Power Meter.
3. Press the Ultrasound Calibration Button. **See Figure 2.**
4. Press the Head Size Button until the size applicator being calibrated is displayed. **See Figure 3.**
5. Press the Start Button, **refer to Figure 3.** Follow the instructions displayed on the Therapy System.
6. Repeat this procedure for each Ultrasound Applicator associated with the Vectra® Neo Clinical Therapy System.

FIGURE 1

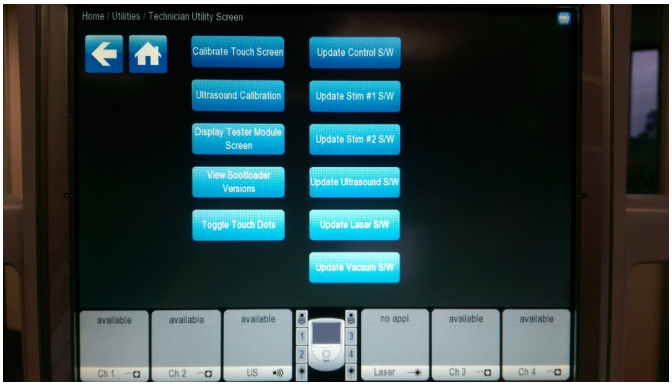


FIGURE 2

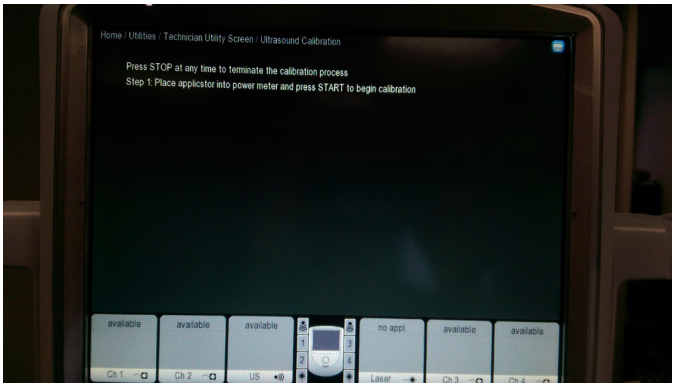


FIGURE 3

TOUCH SCREEN CALIBRATION

A. Calibrating With the Unit Off

1. With the Vectra® Neo Clinical Therapy System off, press and hold the Stop and Start Buttons at the same time. **See Figure 1.**
2. Press the Power Button to turn the system off. Continue to hold until the Touch Screen Calibration turns on.
3. Follow the instructions on the screen.

B. Second Method of Touch Screen Calibration

1. Turn Unit On.
2. Press the Utilities Button.
3. Press the Power, Start, and Stop Buttons simultaneously to bring up the Technician Utility Screen. **See Figure 2.**
4. Press Calibrate Touch Screen.
5. Follow the instructions on the screen.

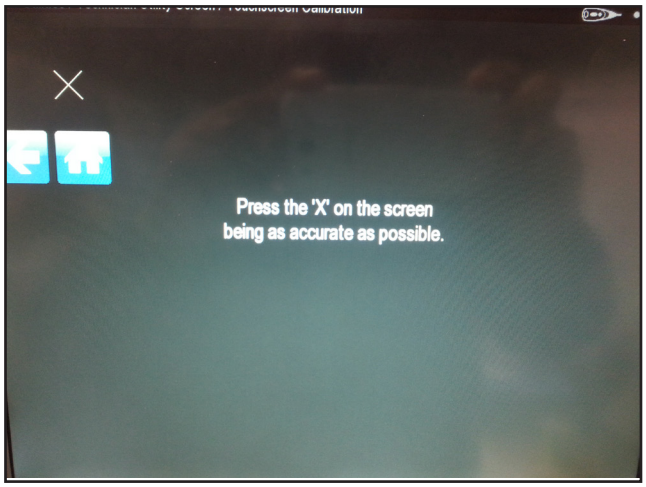


FIGURE 1

FIGURE 2

LASER PIN CODE

A. Reset Pin Code Back to 1111

1. Press the Utilities Button.
2. Press and hold the Stop and Power Buttons simultaneously, **refer to Figure 1.** Laser Pin will reset.
3. Release all buttons.

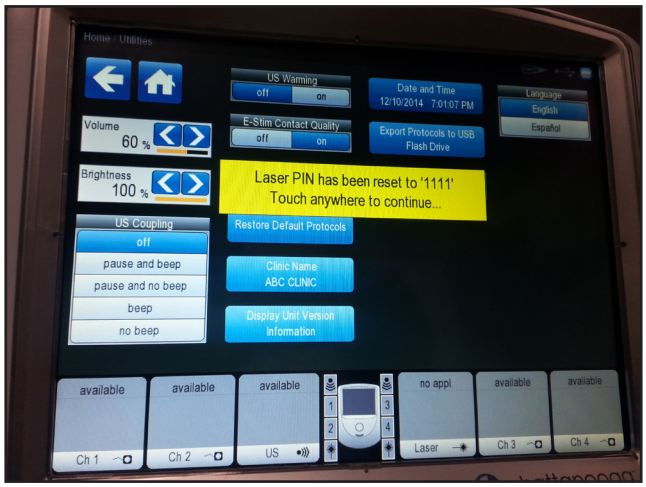


FIGURE 1

REPLACEMENT ACCESSORIES

The following provides users of the Vectra® Neo Therapy System the necessary information to order replacement accessories commonly used with the system. This list of replacement accessories is designed for use with the Vectra® Neo Therapy System. When ordering, provide the respective part number, description, and quantity desired.

ELECTRODES - Domestic	
Model Number	**Description**
42045	2.75″ x 5 (7 cm x 13 cm) Rectangle - 40/case
42159	1.5″ x 2.5″ Oval (40/Case = 10 packs of 4)
42160	2″ x 4″ Oval (40/Case = 10 packs of 4)
42170	1.25″ Round (40/Case = 10 packs of 4)
42171	2″ Round (40/Case = 10 packs of 4)
42172	1.5″ x 2.5″ Oval (40/Case = 10 packs of 4)
42173	3″ x 5″ Oval (20/Case = 10 packs of 2)
42174	2″ Square (40/Case = 10 packs of 4)
42175	2″ x 3.5″ Rectangle (40/Case = 10 packs of 4)
42176	2″ Square Blue Gel (40/Case = 10 packs of 4)
42177	1.5″ x 3.5″ Rectangle Blue Gell (40/Case = 10 packs of 4)
42178	2″ Square (40/Case = 10 packs of 4)
42179	2″ x 3.5″ Rectangle (40/Case = 10 packs of 4)
42180	2″ Round (40/Case = 10 packs of 4)
42181	2″ x 3.5″ Rectangle (40/Case = 10 packs of 4)
42182	2″ Round (40/Case = 10 packs of 4)
42183	2″ Square (40/Case = 10 packs of 4)
42185	sEMG (100/pk-Individual)

REPLACEMENT ACCESSORIES (CON'T)

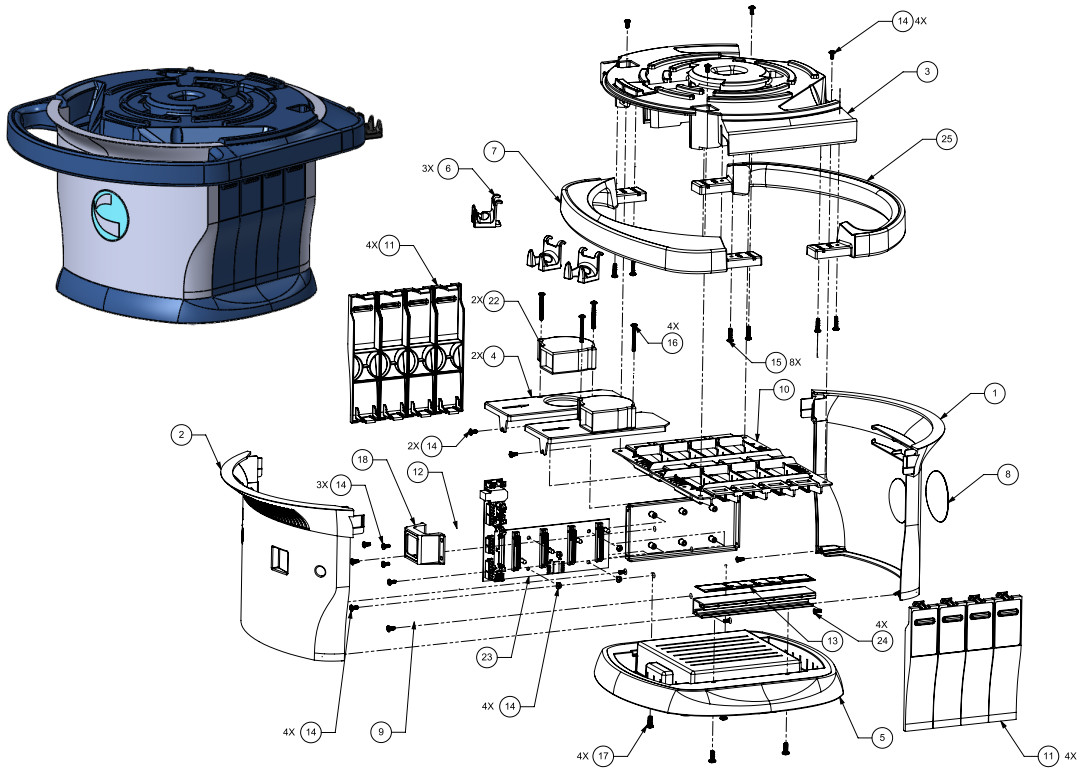
GENERAL ACCESSORIES	
Model Number	**Description**
70000	Electrotherapy Module Channels 1/2
70001	Neo Cart
70002	Ultrasound Module
70003	Electrotherapy Module Channels 3/4
70004	Electrotherapy Module Channels 1/2 + sEMG
70005	Laser Module
70008	PATIENT REMOTE/LASER INTERRUPT SWITCH
79977	HIGH VOLT PROBE KIT- Includes Probe and Sponge Applicator Tips (15 and 8 mm)
70010	STIM CH 1/2 LEADWIRE KIT STD, 72 in.
70011	STIM CH 3/4 LEADWIRE KIT STD, 72 in.
70012	STIM CH 1/2 LEADWIRE KIT XL, 90 in.
70013	STIM CH 3/4 LEADWIRE KIT XL, 90 in.
70014	STIM CH 1/2 + EMG LEADWIRE KIT
70020	Powercord US Black 6 FT

REPLACEMENT ACCESSORIES (CON'T)

LASER APPLICATORS AND EYEWEAR ACCESSORIES	
Model Number	**Description**
27840	Single 850nm Laser 100mW
27804	Single 850nm Laser 150mW
27841	Single 850nm Laser 200mW
27803	Single 850nm Laser 40mW
27805	Single 820nm Laser 300mW
27810	9-Diode cluster: 5-50mW laser diodes + 4 LED's
27811	9-Diode cluster: 5-100mW laser diodes + 4 LED's
27812	9-Diode cluster: 5-200mW laser diodes + 4 LED's
27813	13-Diode cluster: 3-50mW laser diodes + 10 LED's
27814	13-Diode cluster: 3-100mW laser diodes + 10 LED's
27816	13-Diode cluster: 3-200mW laser diodes + 10 LED's
27802	33-Diode cluster: 5-50mW laser diodes + 28 LED's
27807	33-Diode cluster: 5-100mW laser diodes + 28 LED's
27808	33-Diode cluster: 5-200mW laser diodes + 28 LED's
27799	Single 670nm LED 10mW
27815	19-Diode LED cluster, no laser
27809	33-Diode LED cluster, no laser
27525	Laser Protective Eyewear
27904K	Laser Interlock

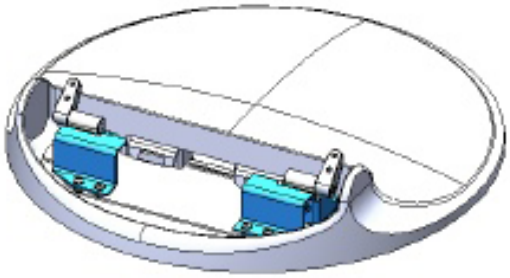
ULTRASOUND APPLICATORS AND GEL	
Model Number	**Description**
27333	Applicator Neo Vectra US, X-Small, 1 cm^2 applicator
27334	Applicator Neo Vectra® US, Small, 2 cm^2 applicator
27335	Applicator Neo Vectra® US, Medium, 5 cm^2 applicator
27336	Applicator Neo Vectra® US, Large, 10 cm^2 applicator
4248	Conductor™ Transmission Gel - 9 oz Bottle

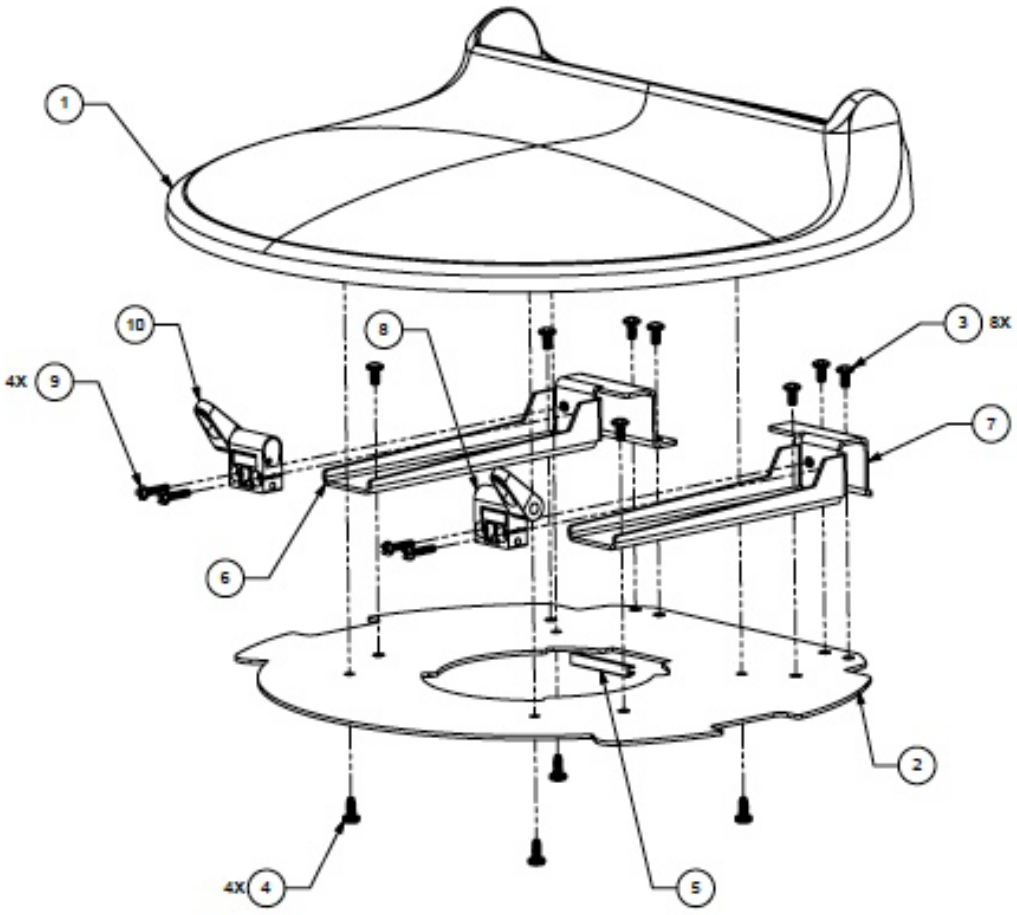
NEO BASE ASSEMBLY



ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY REQ'D
1	13-7593	COVER CHASSIS FRONT NEO	1
2	13-7594	COVER CHASSIS BACK NEO	1
3	13-7592	CLIP RAIL SIDES LEFT-RIGHT NEO	1
4	13-7705	FAN TRAY	2
5	13-6789	HUB BASE DESKTOP VERSION ASSEMBLY	1
6	13-7611	CLIP LEAD WIRE MANAGER NEO	3
7	13-7611	CLIP RAIL DESKTOP NEO	1
8	13-7645	LABEL, CHATTANOOGA LOGO ROUND	1
9	13-7564	POWER SUPPLY	1
10	12-6776	HUB CHASSIS ASSY	1
11	13-7583	COVER EMPTY MODULE BAY NEO	8
12	13-7686	POWER ENTRY IEC320 ASSY	1
13	13-7684	LABEL, MODULE BAY ID	1
14	13-7659-3	SCREW, 8-32x5/16", PH PNHD	17
15	13-7659-5	SCREW, 8-32x5/8", PH PNHD	8
16	13-7659-4	SCREW, 8-32x1-3/8", PH PNHD	4
17	13-7670-1	SCREW, 10-24X1/2" PH PNHD SS	4
18	13-7704	BRACKET IEC HUB CHASSIS	1
19	40-0133	FERRITE ASSY, SPLIT RND CLMP 180 OHMS	1
20	40-0116	WIRE HARNESS, POWER, PS TO BACKPLANE	1
21	40-0122	WIRE HARNESS IC CONN TO PS	1
22	40-0130	FAN WIRE HARNESS ASSY (TO PS)	2
23	27-0013	PCBA BACKPLANE	1
24	13-7669-1	SCREW UNDERCUT FLHD PH 8-32 X 3/8"	4
25	13-7596	CLIP RAIL CART NEO	1

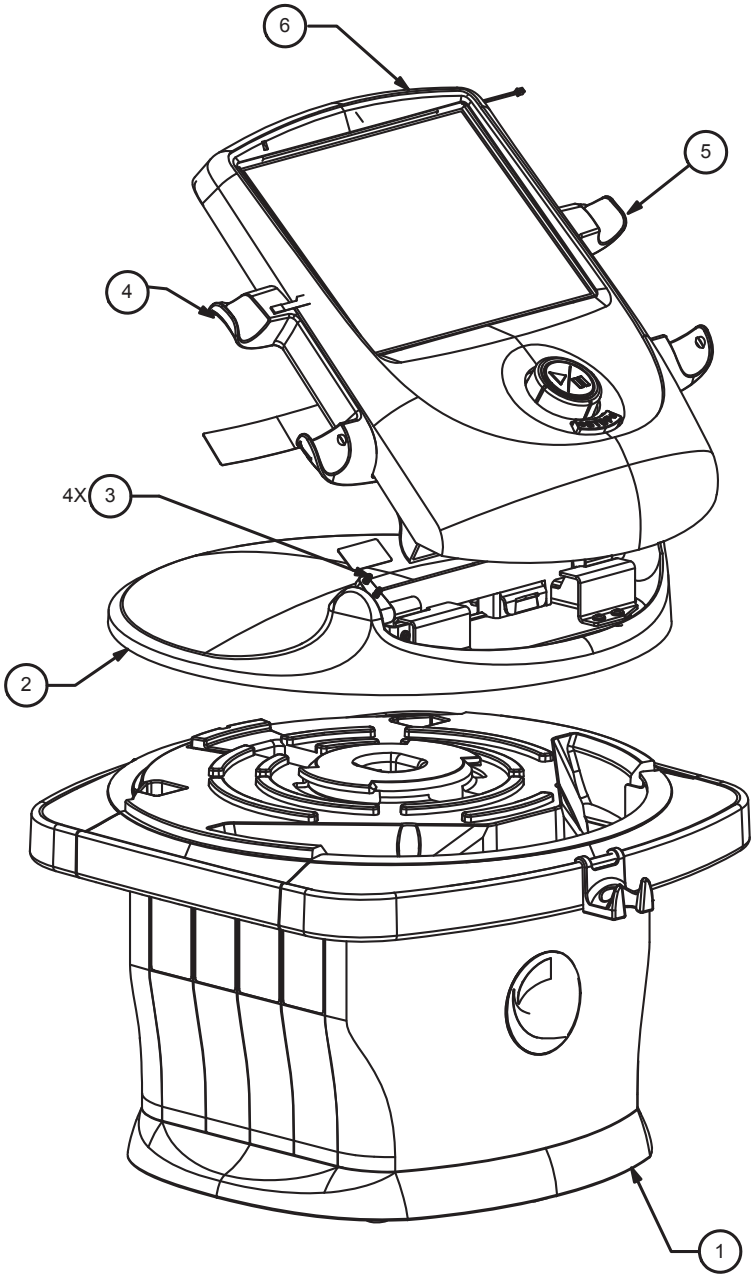
NEO DISPLAY SWIVEL ASSEMBLY





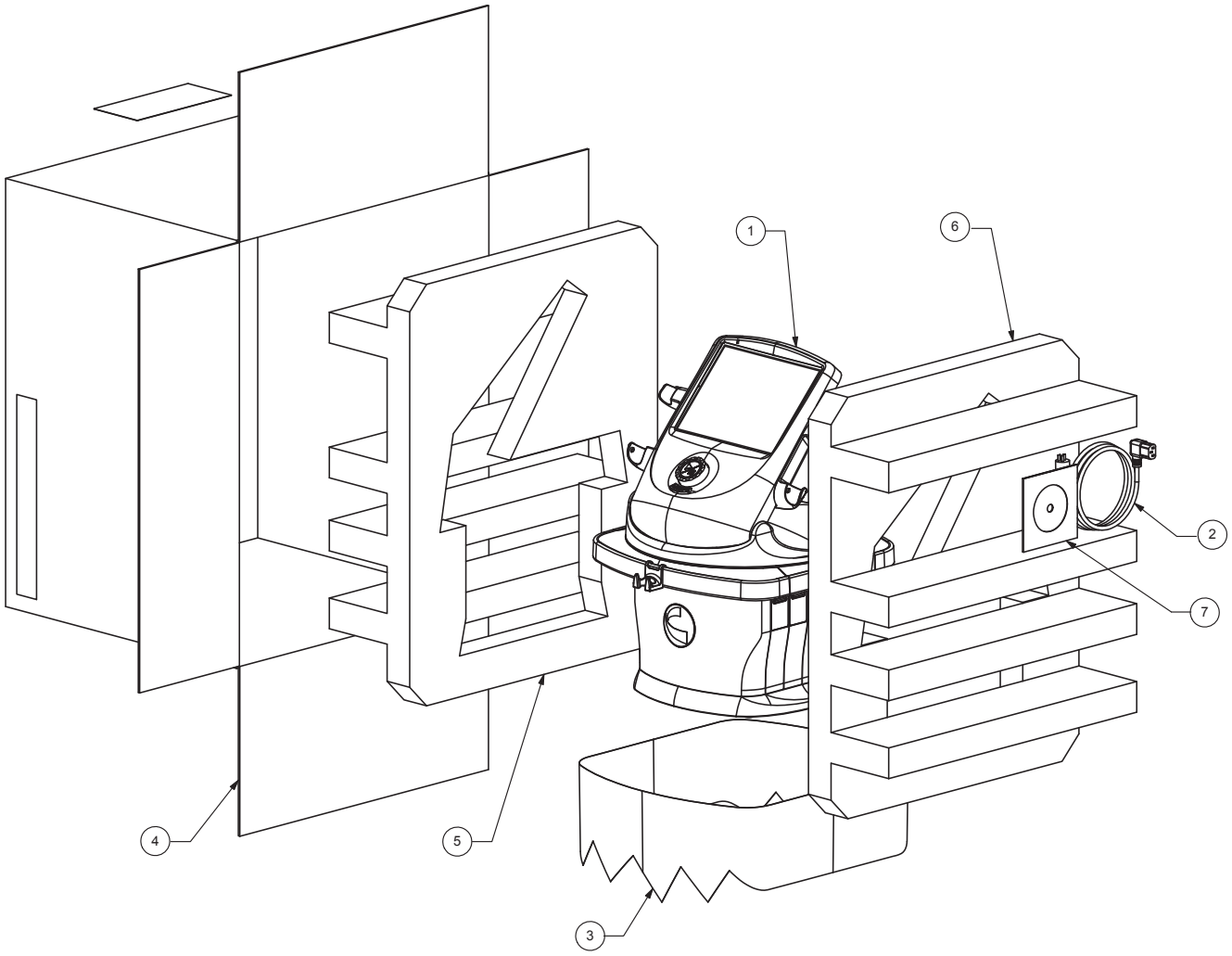
ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY REQ'D
1	13-7589	COVER SWIVEL NEO	1
2	13-7590	PLATE SWIVEL NEO	1
3	13-7659-3	SCREW, 8-32x5/16", PH PNHD	8
4	13-7658-1	SCREW, #8-16x3/8", TRI-SHANK, TORX, PNHD	4
5	13-7656	GROMMET EDGING	1.25"
6	13-7655	HINGE TILT BRACKET, RIGHT	1
7	13-7591	HINGE TILT BRACKET, LEFT	1
8	13-7563	HINGE ASSY, LEFT	1
9	13-7697-1	SCREW, 6-32x 5/8" PH PNHD	4
10	13-7562	HINGE ASSY, RIGHT	1

NEO DESKTOP ASSEMBLY



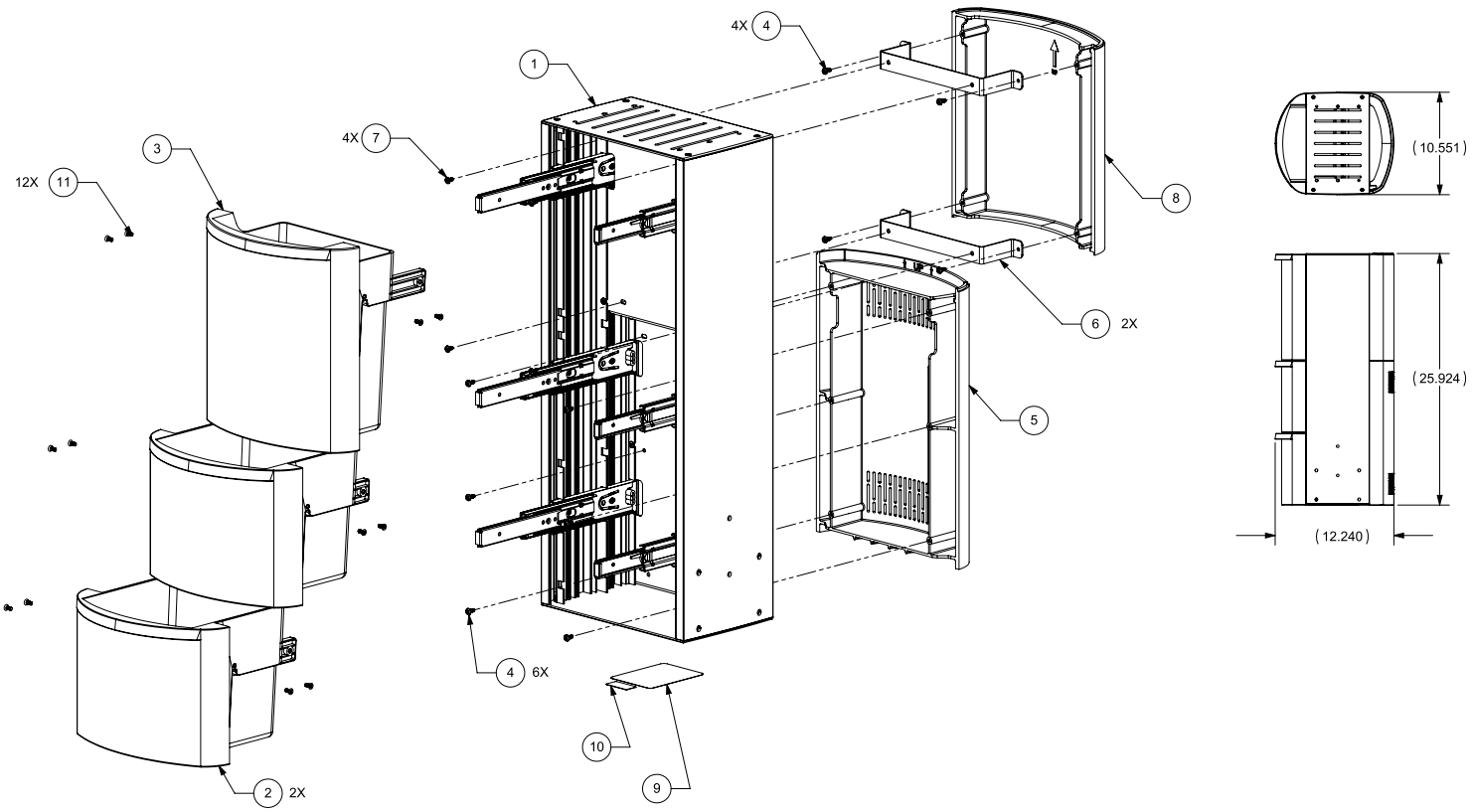
ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY REQ'D
1	12-6779	HUB ASSEMBLY, DESKTOP	1
2	12-6775	DISPLAY SWIVEL ASSEMBLY	1
3	13-7697-1	SCREW, 6-32X 5/8" PH PNHD	4
4	13-7609	LEFT CRADLE APPLICATOR	1
5	13-7610	RIGHT CRADLE APPLICATOR	1
6	12-6774-1	DISPLAY ASSY VECTRA NEO	1

NEO WITH PACKAGING



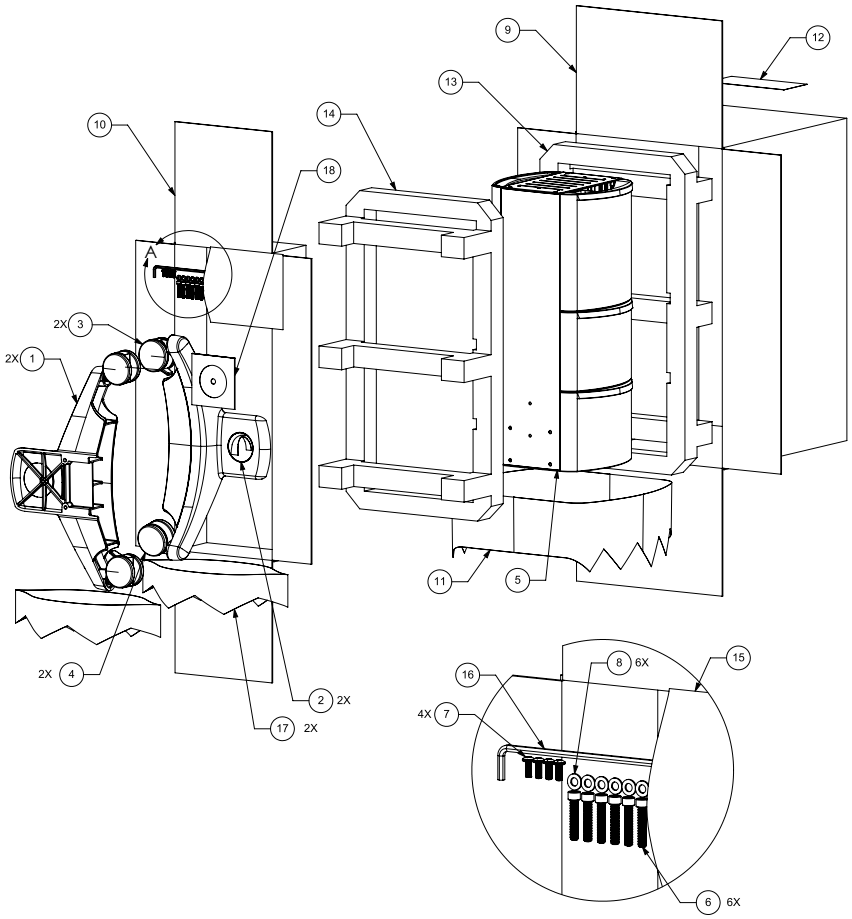
ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY REQ'D
1	6000	VECTRA NEO	1
2	40-0107	POWER CORD NEMA 5-15 MEDICAL GRADE	1
3	48095	POLYBAG 16 X 14 X 36 X .003	1
4	13-7680-1	CARTON HEAD UNIT NEO	1
5	13-7680-2	INSERT BOTTOM HEAD UNIT NEO	1
6	13-7680-3	INSERT TOP HEAD UNIT NEO	1
7	13-7647	IFU CD VECTRA NEO	1

NEO CART



ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY REQ'D
1	12-6780	CHASSIS CART VECTRA NEO	1
2	13-7624	DRAWER BIN SHORT NEO	2
3	13-7624	DRAWER BIN TALL NEO	1
4	13-7658-1	SCREW, #8-16x3/8", TRI-SHANK, TORX, PNHD	10
5	13-7618	COVER LOWER CART NEO	1
6	13-7635	COVER UPPER BACK BRACKET CART NEO	2
7	13-7659-3	SCREW, 8-32x5/16", PH PNHD	4
8	13-7619	COVER UPPER BACK CART NEO	1
9	13-7687-6	LABEL SERIAL NO CART NEO	1
10	30A102	LABEL, SERIAL NUMBER	1
11	13-7669-1	SCREW UNDERCUT FLHD PH 8-32 X 3/8"	12

NEO CART PACKAGING



ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY REQ'D
1	13-7640	CART LEG NEO	2
2	13-7645	LABEL, CHATTANOOGA LOGO ROUND	2
3	20898	CASTER 3" BLK W/LOCKING BRAKE	2
4	20899	CASTER 3" BLK W/O BRAKE	2
5	12-6787	NEO CART	1
6	13-7662-1	SCREW, #1/4-20x1-1/4", SOCHD CAP	6
7	13-7670-1	SCREW, 10-24X1/2" PH PNHD SS	4
8	13-7667	WASHER, 1/4" FLAT SS	6
9	13-7683-1	CARTON CART NEO	1
10	13-7683-2	CARTON, LEGS & WHEELS	1
11	48095	POLYBAG 16 X 14 X 36 X .003	1
12	13-2562-0-00000	LABEL THERMAL TRANSFER BLANK 3.875 X 8.375	1
13	13-7683-4	INSERT CART BOTTOM NEO	1
14	13-7683-3	INSERT CART TOP NEO	1
15	13-3386	POLY BAG LLDPE ZIPLOCK 7 X 8 X 2MIL	1
16	13-7715	ALLEN WRENCH 3/16" BALL POINT HEX L- KEY	1
17	13-4329	POLYBAG ZIPLOCK 16 X 24 X 2MIL	2
18	13-7718	IFU CD MODULES NEO	1

CLEANING THE VECTRA® NEO CLINICAL THERAPY SYSTEM

With the system disconnected from the power source, clean the system with a clean, lint-free cloth moistened with water and mild antibacterial soap. If a more sterile cleaning is needed, use a cloth moistened with an antimicrobial cleaner.

Do not submerse the system in liquids. Should the unit accidentally become submersed, contact the dealer or DJO Service Department immediately. Do not attempt to use a system that has been wet inside until inspected and tested by a Trained Technician.

Do not allow liquids to enter the ventilation holes in the optional modules. This could permanently damage the modules.

Cleaning the LCD Screen

Clean the Therapy System LCD with a clean, dry cloth, in the same way as cleaning the Computer Monitor Screen. Do not use abrasive materials or chemicals or liquids.

Cleaning Reusable Electrodes

Use distilled water on a damp cloth to wipe the surface regularly after usage.

CALIBRATION REQUIREMENTS

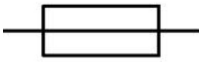
Annual factory calibration is required for all Ultrasound and Laser Applicators. Only the Applicators should be sent to the factory or a Trained Technician for this procedure.

NOTE: The unit was calibrated during the manufacturing process and is ready to be placed into service upon delivery.

DEVICE DISPOSAL

Council Directive 2012/19/EU concerning Waste Electrical and Electronic Equipment (WEEE) requires not to dispose of WEEE as municipal waste. Contact your local distributor for information regarding disposal of the unit and accessories.

FUSE INFORMATION



3.15 A 250V AC

INSTRUCTION FOR SOFTWARE UPGRADE

1. Obtain a USB flash-drive with upgrade file in root directory.
2. Power on Unit with flash-drive installed in USB port. Allow initialization to complete.
3. Enter utilities screen by pressing the "Utilities" button on the home screen.
4. On the utilities screen, press the "Display Unit Version Information" screen.
5. Press the "Upgrade Unit Software from USB" button to apply any upgraded software packages to the unit.

COPY OF MANUAL

To obtain a copy of the Vectra® Neo Clinical Therapy System User Manual, Item #13-7646 (CD Version, Item #13-7647), contact your local representative or DJO Global Customer Care.

WARRANTY REPAIR/OUT OF WARRANTY REPAIR

Service

When the Vectra® Neo Clinical Therapy System or any of the accessory modules require service, contact the selling dealer or DJO Service Department.

All Therapy System and accessory modules returned to the factory for service must include the following:

1. Written statement containing the following information:
   - RA Number – Obtain from DJO
   - Therapy System or Module Model Number
   - Therapy System or Module Serial Number
   - Contact Person with Phone and Fax Numbers
   - Billing Address (for Out of Warranty Repair)
   - Shipping Address (Where to Ship Unit after Repair)
   - Detailed Description of Problem or Symptoms

2. Copy of original invoice issued at purchase of the Therapy System or Module

3. Ship the unit to address specified by an authorized Service Technician

Service to these units should be performed only by a service technician certified by the Company.

Ultrasound Applicators require annual calibration, from the date placed in service, by the Factory or a Trained Technician.

Through the purchase of a Service Manual, DJO, LLC has made available circuit diagrams, component part lists, descriptors, or other information which will assist authorized technical personnel to repair those parts of the equipment which are designated by DJO, LLC as repairable.

Expected Life

Expected life of the applicator is 5 years and the control unit is 10 years. Yearly calibration of the device would extend the life of the device for as long as servicing is available by DJO or other factory certified personnel.

WARRANTY

DJO, LLC ("Company") warrants that the Vectra® Neo Clinical Therapy System, Channel 1/2 Electrotherapy Module, Channel 1/2 Electrotherapy+EMG Module, Channel 3/4 Electrotherapy Module, Laser Module, Ultrasound Module, and Vacuum Module ("Products") are free of defects in material and workmanship. This warranty shall remain in effect for two years (24 months) from the date of original consumer purchase. If these Products fail to function during the two year warranty period due to a defect in material or workmanship, at the Company's option, Company or the selling dealer will repair or replace the respective Product without charge within a period of thirty (30) days from the date on which the Product is returned to the Company or the dealer.

All repairs to the Product must be performed by a service center authorized by the Company. Any modifications or repairs performed by unauthorized centers or groups will void this warranty.

The warranty period for certain accessories is 90 days. Accessories consist of Lead Wires, Patient Remote/Laser Shutoff, and Electrodes.

The warranty period for the Therapy System Cart, Laser Applicators and Ultrasound Applicators is one year (12 months).

To participate in warranty coverage, this Product's warranty registration card (included with Product) must be filled out and returned to the Company by the original owner within ten (10) business days of purchase.

This Warranty Does Not Cover:

- Replacement parts or labor furnished by anyone other than the Company, the selling dealer or a Company service technician
- Defects or damage caused by labor furnished by someone other than Company, the selling dealer or a Company service technician
- Any malfunction or failure in the Product caused by product misuse, including, but not limited to, the failure to provide reasonable and required maintenance or any use that is inconsistent with the Product User's Manual

COMPANY SHALL NOT BE LIABLE IN ANY EVENT FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

To Obtain Service From Company or the selling dealer under this warranty:

1. A written claim must be made within the warranty period to the Company or the selling dealer. Written claims made to the Company should be sent to:

DJO, LLC
1430 Decision Street
Vista, CA 92081-8553 USA
T: 1-800-592-7329 USA
F: 1-760-764-5608

and

2. The Product must be returned to the Company or the selling dealer by the owner

This warranty gives you specific legal rights and you may also have other rights which vary from location to location.

The Company does not authorize any person or representative to create for it any other obligation or liability in connection with the sale of the Product.

Any representative or agreement not contained in the warranty shall be void and of no effect.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

COMMON TERMS

Applicator – Hand held assembly that delivers Laser energy and includes laser head, diode, and related electronics

Collimating – The shape of the Laser beam. It is neither focused or dispersed and resembles a column when applied

Continuous Mode – The output of the Laser is not interrupted during the treatment time

Dosage – Intensity measurement of the Laser energy over the treatment area. It is measured in Joules or Joules/cm2

Energy – Measured in Joules, energy equals the treatment time multiplied by the power. Energy density equals the power output multiplied by the treatment time, and divided by the spot size (cm2). This gives a more specific measurement of energy delivered

Frequency – Pulsed frequencies are selectable from 8 to 10,000 Hz

Laser Head – The clear lens applicator face contacts the patient's skin. It consists of laser diodes with or without LED's or SLD's (depending on the applicator)

Power – Measured in Watts (W), power wattage is directly proportional to treatment time and penetration of the Laser energy. High-powered diodes will reduce patients' treatment times and give a higher amount of energy at a deeper depth. Power output can be either continuous or pulsed

Power Density - Ratio of power divided by treatment time

Pulsed Mode - This is the ratio of the "On" time : "Total" time of the cycle, expressed as a percentage. The lower the percentage, the lower temporal average intensity. 100% is continuous Laser. Pulsed Mode is 90% on and 10% off
Note: Pulsed Mode is also equivalent to Duty Cycle

Spot Size - Area of the LED, SLD, or laser beam when it leaves the face of the lens

Treatment Area - Area of tissue affected by LED, SLD, or laser when wavelength, divergence angles, and depth of penetration are factored. This is the area used to calculate dosage Treatment Time – Measured in seconds, it is the suggested time per laser point that therapy is given

Wavelength – Wavelength is measured in nanometers (nm) and is the key component in obtaining effective therapy as different wavelengths cause different physiological effects. Superficial skin disorders are most effectively treated at wavelengths 600-700 nm, while deeper muscular or ligament lesions and joint conditions are best treated at higher wavelengths of 700-1000 nm.

SCREEN REPLACEMENT PROCEDURE

1. Tilt screen completely vertical.
2. Remove side wings. (6 screws)
3. Remove back cover and set aside. (6 screws)
4. Set aside ON/OFF plastic switch.
5. Remove main power connector and ribbon cable connector.
6. Tilt screen back approximately an inch and remove screws (4) holding screen to hinges.
7. On the new screen, remove the back cover. (6 screws)
8. On the defective screen, remove the screws (6) holding the control PCB.
9. Remove the three connectors. NOTE: Connector on right side of the PCB is fragile-- remove slowly without connector shifting to one side.
10. When all connectors have been removed, lift the PCB slowly and remove ribbon cable from rear, disconnecting it from the other PCB.
11. Transfer the control PCB to the new screen, plug the black ribbon connector to the screen PCB.
12. Plug the complex connector while holding the control PCB.
13. Fit the control PCB back to the screen, making sure that no cables are squeezed between the PCB and the casing.
14. Re-attach the screws (6) and the connection cables.
15. Re-attach the repaired screen to the hinges and re-attach the long screws (4).
16. Re-attach the power connector and the ribbon connector.
17. Re-attach the ON/OFF switch and re-attach the original back cover. (6 screws)
18. Re-attach the side wings. (6 screws)
19. Plug a module in the unit and start the unit by holding the Play and Stop buttons at the same time. Screen calibration should begin.
20. Once calibration is complete, the unit is operational.

NOTE: There should be 6 leftover screws.

INTENSITY KNOB ADJUSTMENT PROCEDURE

1. Remove PCB from housing.
2. Flip over PCB and press the two protruding lips.
3. Remove the center button and spring.
4. Check if the 4 internal lips are lined up with the turning knob.
5. Verify that all 4 internal lips are seated inside of the corresponding grooves. NOTE: If the lips are not lined up properly, the intensity knob will not work properly.
6. Replace the spring and re-insert the white button until in clips to the back of the PCB.
7. Re-attach the back of the PCB to the front housing and test the intensity knob.

NOTE: If the problem remains, replace the part: intensity dial assy, ref: 12-6777-SP)

CLIP RAIL REPLACEMENT PROCEDURE

1. Unscrew and remove handles (2).
2. Remove screws (2) and remove side covers.
3. Unscrew all screws and remove back cover and screen.
4. To remove the top, pull down on the clip and rotate the base until it disconnects.
5. Remove screws (5) attaching the rail clip, and remove the rail clip.
6. Replace old rail clip with new rail clip and re-assemble

DJO, LLC
1430 Decision Street
Vista, CA 92081-8553 USA
DJOGlobal.com

Vectra® Neo Service Manual
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