

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

Operation Instructions

Electro-Stimulator 9c3i. Pro PENS

The Pantheon Research Electro-Stimulator is a carefully engineered electro-acupuncture stimulator, designed specifically for the clinical requirements of the doctor performing percutaneous electrical stimulation with needles. This equipment is the finest available. It is highly reliable in function, very long lasting, effective in treatment, comfortable to the patient, and versatile in performance.

This is the sixth generation design of the Electrostimulator, and the reliability of it is very high. As a result, we offer a two year warranty. If you have any problem with the equipment within two years, we will fix it or provide a replacement.

For 20 years, the Electrostimulator family of equipment has been used extensively to treat patients for many syndromes including pain, addictions, and it has been used for analgesia during surgery. Dentists have used it widely for dental acupuncture, and for TENS stimulation. Veterinarians also are using the 6c.Pro and 8c.Pro for their work with animals. The Pantheon Stimulator is a very popular electro-therapeutic device that was designed to be more effective with its multiple unique features and special waveforms.

The 9c3i.Pro is more comfortable than other stimulators, due to its specially designed electro-acupuncture electrical waveform. This waveform is very fast, .4 milliseconds, and is equal in the positive and negative components. It does not efficiently stimulate the nerve cells that sense pressure or heat, and thus feels very comfortable, even at high stimulation levels. Patients appreciate this. It is also considered that the bipolar and symmetrical waveform is more physiologically compatible, as the tissues and nerves will be equally polarized and re-polarized with each electrical impulse.

The 9c3i Pro Electro-Stimulator has at least ten features that are **unique** to it alone. These include:

1. Unprecedented frequency accuracy of 99.94%.
2. Special electro-acupuncture waveform for milliampere current stimulation
3. Three totally separate and independent frequency controls with full mode features
4. One year warranty
5. Adjustable and calibrated mixed frequency
6. Built in alligator clip lead tester
7. Safety output controls : the machine cannot be turned ON if the output switches are not turned OFF
8. Output tester
9. Automatic battery tester
10. Pantheon MicroClips, the smallest alligator clips in the world

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

Features Explanations

The first MODE knob on the left, actually controls the POWER to the rest of the machine. So this knob must be turned ON first. This knob is turned on, and then the other MODE knobs, the remaining two mode switches, will operate to control the remaining two sections of the machine. So always turn on the first mode knob, the one to the far left, first thing.

(A) MODE Knob

The Mode knob is located on the lower side of the machine face, and is labeled as MODE. The available means of operation or modes are CONT, DISC, MIXED. These stand for continuous, discontinuous, mixed (also called intermittent or dense disperse). These will each be explained subsequently.

CONT: Continuous frequency

This selection setting provides a continuous output of electrical pulses, an unbroken series that continues until the machine is turned off. The basic frequency, or pulse rate, is determined by the Continuous knob.

When the CONT. position is selected, the stimulator is turned ON, and the machine is operational. Electrical impulses will be available at the output jacks on the top front of the machine, and the treatment can commence if the clips are attached to the patient and plugged into the output jacks. It is important that prior to connecting a patient to a clip lead, that the machine be turned to CONT., and the stimulation Level control knobs be turned all the way to the left, pointing to "0" (you will feel a click at "0").

DISC: Discontinuous frequency.

The output varies between the selected frequency, and no output, and the change occurs every three seconds. This is providing periodic and regular interruptions to the regular stimulation.

MIXED: Mixed Frequency

The electrical impulses will vary intermittently. Each three seconds, the frequency of the pulses will change from the setting indicated on the Continuous knob, to the setting indicated on the MIXED knob. Thus, the MIXED setting allows two variable frequencies to be provided, both of which are selectable.

BATT. Test - Manual Battery test

This position will manually test the battery strength. If the battery is good, that is, if it has a voltage above 6 volts, the diagnostic light (labeled as Diag. will light green after 4 seconds. If the battery is not good, the diagnostic light will be red. This will be a solid green, or a solid red.

SAFETY FEATURE

The safety feature prevents accidental shocking of a patient. It works as follows: If all the level control knobs are not turned to "0", the machine cannot be turned ON.

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

If any level control knob is above “0” and the machine is turned on by turning the MODE knob to Cont, Disc, Mixed, Batt. Test, you will hear a beeper sound and the diagnostic light will be red. The machine will not function.

EACH level control knob must be turned to “0” (you can feel a click at “0”), then you can change the MODE knob and the machine will operate normally.

(C) Continuous – Frequency HZ

This knob controls the basic frequency or pulse rate of the electrical pulses that are produced by the electro-stimulator. Frequency, or hertz, is the number of times per second that the electrical impulse travels from the machine to the patient.

The electro-stimulator has an extended frequency range. This is click stop selectable to specific therapeutic frequencies including .5,1,2,4,15,30,60,80,100,200 cycles per second.

These frequencies are produced during the selection of the CONT. position of the MODE knob, and during the ON period of the DISC. selection, and during one of the frequency periods of the MIXED selection.

(D) MIXED – Mixed Frequency

This is the same in function to the Continuous frequency knob, but controls the frequencies when the MODE knob is turned to MIXED. These are the adjustable, calibrated mixed frequencies. These frequencies are the same in choice as the Continuous knob, but are operating only on the alternate 3 second cycle of the MIXED mode.

(E) LEVEL CONTROL KNOBS

The nine knobs on the top of the electro-stimulator machine are the controls for the level of electricity distributed to the patient. This can also be called the “strength”, the voltage or amplitude. Simply, as you turn this up more and the patient is connected, he/she feels it more.

These knobs are not connected to each other, and are independent. If you adjust one, you will not cause the others to be effected. This is very important as a feature. They should be turned down, after each treatment, and prior to each treatment. A treatment should never begin without these knobs all being turned all the way to the left, or “0”. You can feel a click when you have completely turned the knobs to “0”. Then, as the needles are hooked up, the knobs can be slowly turned to the right, or turned up.

A very smooth adjustment is built into the level controls. If you move the knob slowly, the perception of electrical stimulation felt by the patient will very gradually increase. This allows you to carefully adjust the proper amount of power to give each pair of acupuncture points.

Please refer to your clinical application information on how much stimulus is therapeutic. Typically, the level control knobs will be turned up, until the patient reports slight discomfort, and then they will be backed off, or turned down slightly.

The level control knobs control both the milliamperes and the microcurrent outputs at the same time.

(F) OUTPUT TESTER - located on the left corner of top panel

You may test the output of any milliamperes output. This tells you that there is a stimulus coming out of the machine and that the output jacks are operating. Occasionally, you need to determine if both the clip leads

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

and the outputs are operating. You may suspect the operation of either. With the Clip lead tester and output tester, you can check both. This is very useful.

Simply insert the alligator clip plug into any output channel. Turn on the MODE knob to Continuous. Then turn up the level control knob of the corresponding output channel.

Attach the clips of the alligator clips to the Output Test connectors. The red and black lead can go on either connector. If the output is working, that is, if there is an output, then the diagnostic green light will light up with each electrical impulse. Thus, the diagnostic green light will be pulsing at the same time as the PULSE green light.

G) DIAGNOSTIC LIGHT FUNCTIONS

The diagnostic light is labeled “DIAG.” on the front panel.

The following is a summary of the diagnostic light functions:

Testing Feature	Appearance of Light (H)
1) Safety is ON, and machine will not operate (due to output level controls being above “0”)	Solid RED and beep
2) OUTPUT TEST (working)	Blinking GREEN and Pulse light YELLOW
3) Automatic Battery Test	Slow blinking red (need to replace battery) and hear a beep
4) Manual Battery Test	Solid green if battery good (solid red light if bad)
5) Clip lead tester	Solid green if clip lead is good (no light if bad)

(I) Pulse Light

Light pulses with each electrical impulse sent from the output channels through the wires to the needles.

(J) Continuous Frequency Indicator light

This yellow light will be ON when the position of the continuous freq. knob is determining the output pulse frequency. When the MODE knob is on the “cont.” selection position, this light will always be ON. When the MODE knob is on “mixed”, this light will be “ON” one half of the time, at three second

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

intervals, and the MIXED frequency indicator light will be on the other half of the time. When the MODE knob is on “disc”, this light also is on half of the time, at three second intervals.

(K) Mixed Frequency Indicator light

This yellow light appears ON when the MODE knob (A) is set on “mixed”. It will light for half the time while the other half of the time, the Continuous Freq Indicator (J) will be ON, alternating in 3 second intervals.

The current level is adjusted by the level control knobs (E). The level control knobs are labeled 0 through 6. This will correspond with the microcurrent level 0 microamperes to 600 microamperes. Thus, the level control knob set at a level of 3 will yield a microcurrent output level of 300 microamperes.

(L) CLIP LEAD TESTER

You may test the integrity or conductivity of your alligator clip leads with the Clip Lead Tester. This is located on the top side panel (where the outputs are located), bottom row, far right. It is labeled Clip Lead Tester. To use this, insert the plug of the alligator clip to be evaluated, into the Clip Lead Tester port or jack. Then, switch the MODE knob (A) to Battery Test. With the alligator clip plug inserted into the Clip Lead Tester, the diagnostic light should be OFF. However, just touch the metal alligator clip leads together, and the green diagnostic light (H) will come ON. This indicates that the alligator clip lead is good, and conducts electricity.

(M) AUTOMATIC BATTERY TESTER

The diagnostic light (H) will blink red, slowly, when the battery is below 6 volts. This will happen automatically, and will occur when the battery is low, and the MODE knob (A) is on a selected function other than OFF. If the battery is extremely low, below operational level, then the automatic battery tester cannot operate.

(N) BATTERY CHARGING AND USING THE BATTERY CHARGER

When the battery is low, or you have used the battery tester and discovered the battery to be low, then it needs to be recharged. This machine uses an advanced Nickel Metal Hydride battery, and this battery can be recharged hundred of times, and is very powerful. The battery is internal to the machine.

To recharge the battery, simply insert the battery charger into the front panel port that is labeled BATT CHARGER, and plug your battery charger into the wall outlet. The battery will begin charging, and the charger will also automatically shut off when it is complete. This normally would be in about 6 hours. It is very simple. The battery charger is a good one, and automatically adjusts the battery charging rate, and stops when the battery is fully charged. So no problems.

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

MicroClip Description and Operations

MicroClips are designed to achieve a solution to some simple yet important problems associated with electro-acupuncture stimulation. Typical alligator clips are too large for use with needles inserted into delicate skin tissue. They will bend and pull needles out of skin and are awkward. The jaws of the alligator clips are also imprecise in making electrical contact with fine needles. MicroClips solve both these problems.

MicroClips are made from three primary components, the clips, the wire, and the plug. Each is designed to provide a light, reliable, and long lasting device.

The plug is the component that fits into the stimulator. The wire connects to the plug, and this is provided with a strain relief heat shrink, this prevents the movement of the wire during flexing, and prevents breakage at the plug.

The wire is 28 gauge biomedical wire, and is designed to be light, yet strong.

The micro clip itself is the smallest clip commercially available. This clip gives a strong attachment action to the needle, is long lasting because of its simplicity and strength, and because it does not have "alligator teeth".

Standard alligator clips suffer from having teeth that must mesh together to contact the needle. These teeth become unstable over time, and it is usually evidenced by an inability to grab the needle. Under these circumstances, the needle will slip, and make intermittent contact with the needle, which can cause a shock to the patient as the electrical contact is broken suddenly remade.

The MicroClip will always grip the needle firmly, as it does not have teeth. It has a smooth, lightly curved surface with lightly serrated grooves

It is important to place the needle half way into the jaws of the clip. If the needle is placed completely into the rear of jaws of the MicroClip, the needle will slip. The rear of the clip jaws spread apart, and will not grip the needle.

It is important for the "care and feeding" of MicroClips that the wire not be bent sharply or kinked, that they not be stepped upon, and that they be handled gently.

The Pantheon Electrostimulator has a built in clip lead tester on the bottom front panel of the device. Using this tester, you can test the integrity of the clips for conductivity.

Our clips are under full warranty for 3 months, and we will gladly replace them if malfunctioning during that time period. We are also happy to attempt the repair of MicroClips at any time after the 3 month period with a parts and mailing charge associated with the repair.

These clips are very superior to normal alligator clips, and are capable of having a long functional life. They are the most delicate component of electro-acupuncture equipment, and take a little care and soft touch, but the payoff is longer lasting equipment. Thank you for your purchase of our MicroClips, and if we can be of any service, please call immediately. We want to assist you in making MicroClips an advantage in your electro-acupuncture applications.

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

General Protocol for Performing Electro-Acupuncture

- Clean body points with alcohol
- Insert needles and acquire qi or apply TENS pads.
- Adjust electro-stimulator for desired frequency and waveform type:
 - For needle stimulation, set side switch to Acupuncture
 - For TENS stimulation, set side switch to TENS
- Make sure Mode knob (A) is set to OFF and all four level control knobs (E) are at zero.
- Plug clip or TENS leads into the electro-stimulator
- Attach MicroClips or alligator clips to the needles for acupuncture / lead wires to the TENS pads for TENS application.
- Ask patient if everything is still comfortable.
- **Only 8c.Pro:** Set the MINUTE TIMER (B) to the desired time limit. If 10 min, just leave as is.
- Turn the MODE knob (A) on the electro-stimulator to the desired mode: Continuous, Discontinuous or Mixed (double-check that the level control knobs (E) are clicked off to zero) At this point the TIMER (on 8c.Pro only) has begun its countdown.
- Tell patient which pair of points will be stimulated first, what they can expect to feel and what responses they should give. For example, “We’ll start with these points ...here ... and here. I’m going to slowly turn up the intensity, and I want you to tell me when you first start to feel ... a light tapping or tickling sensation” (for very slow frequencies) or “a light buzzing or tingling sensation” (for higher frequencies).
- **SLOWLY** turn up intensity with the Level Control knob (E) until the patient feels electrical stimulus.
- If using stronger stimulation, ask the patient to tell you when the stimulus gets strong but still comfortable. It should not be painful. Also remind them to tell you if it gets sharp. **SLOWLY** increase the intensity until the patient tells you it is strong enough for them.
- Repeat the process for each channel used.

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

- The intensity felt by the patient will generally diminish over time, so, if necessary, **SLOWLY** increase until the patient says it's strong enough again.

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

When ready to stop treatment:

- **Only on 8c.Pro:** When the timer turns off, a beeper will sound off.
- Turn each level control knob channel down **part way**. Then turn each level control knob channel all the way down until it clicks off.
- Turn MODE knob to OFF
- Disconnect clips or lead wires from the needles/TENS pads (You may also remove the needles/TENS pads, then unclip)
- Remove needles/TENS pads if you haven't already
- Unplug wires from the electro-stimulator.
- Store or hang all wires straight when not in use. Tightly coiling or wrapping wires around machines will lead to premature breakage and wire failure. Periodically check wires with clip lead tester to ensure their safe use and patient comfort.

Contraindications for Electro-Acupuncture

- Use with pacemakers (potential cardiac problems)
- Transcranial stimulation (epileptic possibility with 10 – 13 hz)
- Current across the spine, horizontally
- Stimulation across the chest region
- Stimulation over the neck region to prevent laryngospasm
- Profound analgesia induced by E-A puts patients at risk of self injury, must be advised or restricted from strenuous physical activity after treatment.
- Use with imbedded neural stimulators
- Lower body points during pregnancy, especially during third trimester
- High frequency or high amplitude application may induce stress, which is contraindicated in cases of hypertension
- E-A can over sedate older patients causing risk of falling asleep after treatment. Patient should be driven to and from clinic.
- Excess E-A can produce tolerance by depleting central serotonin.
- Benign and malignant tumors

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

Why buy the Pantheon Research Electro-Acupuncture Stimulators?

- 1) Pantheon Research Electro-Acupuncture Stimulators are the only **US made** devices on the market. We are therefore accessible to our clients for technical support service, and high quality is built into the products.
- 2) Our equipment is sold with a **one year warranty**, which covers parts and labor. Since we are in the U.S., repairs can be made easily and returned promptly to the customer.
- 3) Pantheon Research can **offer customer service** directly. Customers are welcome to call us with questions about the machines, and we will answer all questions about technical issues. Clinical applications of electro-acupuncture are frequent topics of inquiry, and we make an attempt to assist with these questions. We are not acupuncturists, and make no claims to authority in expertise with clinical applications. We can refer customers to reference materials and provide reference materials to distributors.
- 4) Our Electro-stimulator line of devices is **extremely reliable**. They are well built, well thought out, engineered to a high standard, and are dependable. They can be expected to have a very long functional life. Consequently, they are an asset to a business that offers electro-acupuncture therapy. They can be relied upon to function after years of use, and to be safe and effective with patients.
- 5) Pantheon Research Electro-stimulators are built with **advanced features** and unique features unavailable in other machines. It is important that acupuncturists have equipment with the features provided by the Pantheon equipment.

Features *unique* (not available on any other machine) to Pantheon Research Electro-Acupuncture Stimulators

- 1) **Frequency accuracy of 99.94%**. That is a less than .06% error. No other electro-acupuncture equipment manufacturer can make this claim for the entire range of frequencies within a specific device. Scientific research requires the highest standards of accuracy and integrity.
- 2) **Safety Mechanism**. All outlets must be turned OFF before the power can be turned ON. This ensures no surprise or pain to your patient should the outlets still be on from a previous treatment.
- 1) **Self diagnostic features**. For the safety of your patients and the effectiveness of your treatments, you can: test the operation of the clips and lead wires; check and validate the functioning of a specific outlet; be alerted when the battery is low and needs replacing
- 2) **Ergonomic Design**. Redesigned for better readability and operational comfort.
- 3) **Battery Power**. Less power is required for E-Stim operation, resulting in longer battery life.
- 4) **Most effective waveform for treatment**: Our “acupuncture waveform” selectable by switch, is a *symmetrical biphasic* waveform. This is the best waveform to use with needle electro-acupuncture (see appendix notes by Pomeranz). This is the most effective physiologically. It is also the **most comfortable**, and delivers the least pain and discomfort to the patient. To sensitive patients, this waveform is a real advantage in treatment as it is very comfortable.

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

- 5) **Calibrated frequencies:** In all Pantheon models specific therapeutic frequencies are switch selectable and are calibrated to scientific accuracy of 99.94%. Frequencies range from .5 Hz to 200 Hz.
- 6) **Mixed Mode frequency is fully calibrated and adjustable:** The mixed mode, or dense disperse, causes the machine to alternate between frequencies every three seconds, switching back and forth between two separate frequencies. Each of these discrete frequencies is selectable.
- 7) **Clip Lead tester:** The clip lead tester solves a problem no other machine can; testing the integrity and usefulness of an alligator clip assembly. It will test if a wire and clip assembly is working.
- 8) **Great features with small size:** The Pantheon Electro-stimulators have the most professionally useful features providing electro-acupuncture therapies to patients yet are small enough to easily fit on a treatment table or to be carried.
- 9) **MicroClips:** We are the exclusive providers of the Pantheon Research MicroClip. This is the smallest, most reliable electrical clip available on the world market. It is ¼ the weight of a standard alligator clip. It does not use teeth to grip a needle; consequently, it is highly reliable when gripping a needle.

Additional features of the Electro-stimulators

- 1) **Independently controlled channels:** No output channel will interfere with another when being turned up or down. There is no “cross talk” between channels.
- 2) **Modes of operation include:** Continuous, mixed, and discontinuous
- 3) **Battery tester**
- 4) **Four clips provided with each machine:** Two alligator clips, and two MicroClips
- 5) **Battery included:** two Duracell batteries for extended battery life

Appendix

Discussion of Symmetrical biphasic waveform

Taken from Basics of Acupuncture, G. Stux and B. Pomeranz, 1998, Springer, pp. 272-273.

“Generally the red lead of each pair of wires is positive, and the black is negative. Pulses of electricity are applied to the needles in order to stimulate nerves, with the pulse width being from 0.1 to 1.0 ms in duration (Some stimulators have adjustable pulse width). More expensive, elaborate stimulators use biphasic pulses (negative

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

followed by positive or vice versa) in order to reduce polarization of each needle due to electrolysis. (The negative pulse cleans the electrode of electrolytes deposited by the preceding positive pulse.) **If the pulses are perfectly biphasic, then the net DC current is zero and no polarization occurs.** Polarization is a nuisance as it raises the electrode resistance over time, thus reducing the intensity of stimulation. Also, it can cause the needle to break off in the tissue.

Another advantage of biphasic pulses is that the two needles of each pair receive symmetrical stimuli (one needle being the mirror image of the other). Hence the red lead has a positive pulse followed immediately by a negative pulse, while the black lead has a negative pulse followed by a positive pulse. Since negative pulses cause an action potential on the nerve, it is important that both needles in a pair receive negative pulses, which is only possible in a biphasic stimulator. The intensity of stimulation is under the control of an intensity knob. In less expensive stimulators in which the biphasic pulses are not perfectly matched (the negative wave is not equal to the positive wave); the negative, black lead will give a stronger needle sensation than the positive, red lead. In order to achieve an optimum effect for acupuncture analgesia, the strongest tolerable intensity is required for DeQi (to activate type II and III muscle nerves). **If both leads of a pair deliver symmetrical, biphasic pulses then both needles will be optimally stimulated to give De Qi.** With less expensive devices, however, only one needle of a pair is adequately activated (the needle attached to the black lead).”

PANTHEON RESEARCH

INNOVATIVE BIOMEDICAL INSTRUMENTS

Electro-Acupuncture Resources

Recommended Internet Web sites

- **pubmed.gov**
This is Medline, in easy to use format. Doing a search on **ELECTROACUPUNCTURE** will yield 1163 citations.
- **Medicalacupuncture.org**
Website of the American Academy of Medical Acupuncture. This site has an online journal, and full articles can be accessed directly. It is a very interesting source. Also a full list of journals, organizations, and online resources is present.
- **Acubriefs.com**
A search on **ELECTROACUPUNCTURE** provides 1394 citations. This site accesses many traditional journals of acupuncture, and may be more thorough than Medline.
- **Acuall.org**
Sponsored by the National Acupuncture and Oriental Medicine Alliance.
- **Acupuncture.com**
Summarizes pertinent information from multiple resources.
- **Med.auth.gr/**
Includes web journals, articles, databases, and more.
- **medmatrix.org**
Clinical medical resources, including numerous medical journals.
- **www.nih.gov/pubs/cbm/acupuncture.html**
National Library of Medicine.
Current Bibliographies in Medicine-Acupuncture
- **Pantheonresearch.com**
Includes information on electro-acupuncture products and guidelines