

ARPRx100

Operations Manual

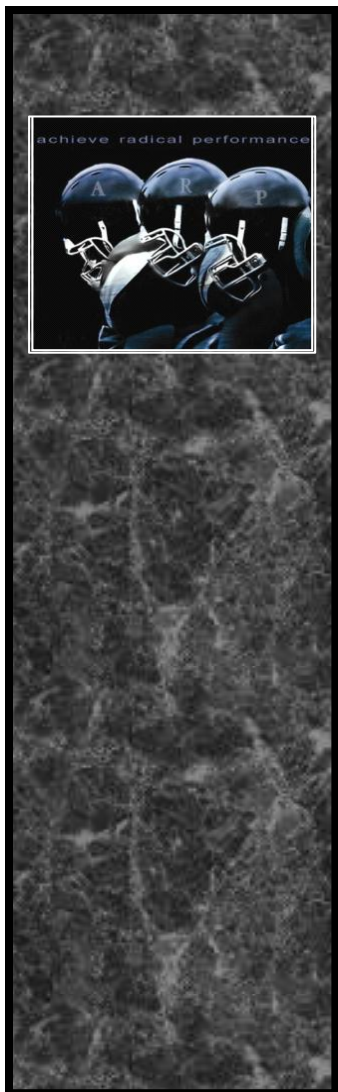
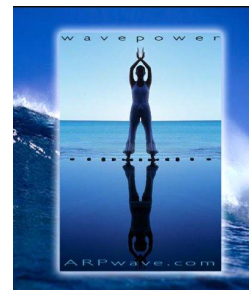


Table of Contents

1

2

Introduction.....	3
Features & Benefits.....	3
Indications for Use	3
Training	3
Device Classification & Markings	4
Contraindications, Warnings, & Precautions.....	5
Cautions	6
ARP Rx100 Specifications	7
Operation.....	8
Terminology.....	9
Description of the Operator Controls	9
Operation of Display Screens	10
Power Supply / Battery Instructions	18
Pad Placement Instructions / Techniques.....	20
Sponge and Pad Information	22
Care & Maintenance	23
Service & Parts.....	24
Troubleshooting Guide.....	25
Warranty Information.....	28



Exclusive Distributor Of Rx100

ARPwave, LLC

7721 145th St. West
Apple Valley, MN 55124-7516 USA
Phone: +1 952-431-9708
Fax: +1 952-431-9723
www.ARPwave.com

ARP Manufacturing, LLC

7270 S. Fraser St.
Centennial, CO 80112 USA
Phone: +1 303-713-0605
Fax: +1 303-713-0581



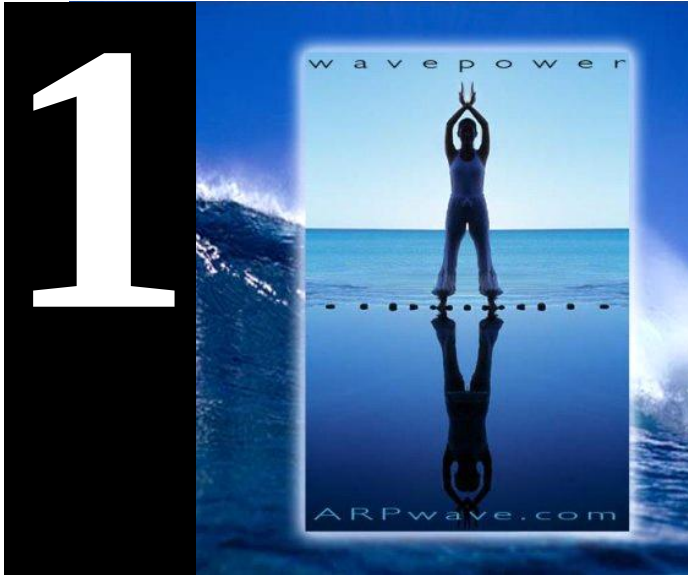
Patent Nos. D603,971 S; 9,302,102
ISO 13485:2016

001086 REV I

CONFIDENTIAL MATERIAL DO NOT DUPLICATE

7/30/2019

This page intentionally blank



Introduction

The Accelerated Recovery Performance (ARP) Rx100 provides solutions to problems associated with traditional electrical therapeutic stimulation. ARP Rx100 also offers the potential for applications not possible with traditional methods. ARP Rx100 is a powered muscle stimulator which introduces electrical signals to the body through conductive electrode pads to provide therapeutic treatment for a variety of conditions.

WHAT IS THE ARP Rx100?

ARP Rx100 uses a signal with simultaneous high and low frequencies as a multi-phase signal with polarity.

It is important for the therapist to understand the advanced penetration effects.

Features & Benefits

The ARP Rx100 features a blend of two signals: a main pulse and a background signal. The waveform resulting from these two elements provides a stimulation of the body area being treated. Patient participation is another benefit of the treatment system, resulting in self-directed therapy. Electro-stimulation therapy has been found to be beneficial for a variety of conditions.

Indications for Use

The ARP Rx100 is restricted for use by or under the order of a licensed practitioner for the following:

- Relaxation of muscle spasms
- Prevention and retardation of disuse atrophy
- Increase of local blood circulation
- Muscle re-education
- Maintaining or increasing range of motion of limbs

Training

Application techniques for specific regions of the body are available through ARPwave Technical Support.

Call +1 952-431-9708 for details.

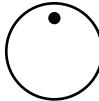
Device Classification & Markings

Classification

- *ARP Rx100* patient electrodes are classified in accordance with IEC 60601-1 as Type BF applied parts (see Markings below).
- *ARP Rx100* is classified as ordinary equipment (not protected against ingress of water).
- *ARP Rx100* is not suitable for use in the presence of flammable anesthetics.
- *ARP Rx100* complies with the EMC requirements of IEC 60601-1-2.

Markings

The following markings are found on the *ARP Rx100*:

Marking	Description	Meaning
	Attention—Consult Accompanying Documents	The operator must read, understand, and follow all instructions in the accompanying documents, including all warnings, cautions, and precautions, before using the device.
	Type BF Equipment	This symbol indicates that the patient applied parts (electrodes) are Type BF (floating from electrical ground), which offers a specific level of safety.
	Standby/On	The dot indicates that the power switch switches the DC input power ON (•) and OFF (no symbol) for part of the equipment only. Note: to disconnect the external power supply input, unplug the AC Mains plug of the supplied AC Adapter from the AC receptacle.

Contraindications, Warnings, & Precautions ⚠️

Caution: Federal (USA) law restricts this device to sale by or on the order of a practitioner licensed by the law of the State in which he or she practices to use or order the use of the device.

Contraindications ⚠️

ARP Rx100 should not be used:

- On patients with implanted electrical devices
- Over known cancers
- On pregnant women

Warnings ⚠️

ARP Manufacturing makes the following warnings:

- If you are in the care of a physician, consult with your physician before using this device.
- Do not apply stimulation over your neck because this could cause severe muscle spasms resulting closure of the airway, difficulty in breathing, or adverse effects on heart rhythm or blood pressure.
- Do not apply stimulation across the chest because the introduction of electrical current into the chest may cause rhythm disturbances to your heart, with could be lethal.
- Do not apply stimulation over painful areas. If you have painful areas, you should consult your physician before using this device.
- ARP Rx100 should not be used over swollen, abraded, infected or inflamed areas on skin eruptions, e.g. phlebitis, thrombophlebitis, or varicose veins. It should only be used on areas of intact skin.
- Do not apply stimulation over, or in proximity to, cancerous lesions.

- Do not apply stimulation in the presence of electronic monitoring equipment (e.g., cardiac monitors, ECG alarms), which may not operate properly when the electrical stimulation device is in use.
- Do not apply stimulation when the patient is in the bath or shower.
- Do not apply stimulation while sleeping.
- Do not apply stimulation while the patient is driving, operating machinery, or during any activity in which electrical stimulation can put the patient at risk of injury.
- Do not use ARP Rx100 with an external power source during storms.
- If ARP Rx100 is used on persons who have communicable diseases, the sponges should not be used by, or shared with, other patients.

Precautions ⚠️

ARP Manufacturing further states that precautions should be observed in the presence of the following:

- Long term effects of chronic electrical stimulations are unknown.
- ARP Rx100 should not be applied transcranially (across the head) since the effects of stimulation of the brain are unknown. Electrodes should not be placed on opposite sides of the head.
- The safety of electrical stimulation during pregnancy has not been established.
- You may experience skin irritation or hypersensitivity due to the electrical stimulation or electrical conductive medium.
- Adequate precautions should be taken in the case of persons with suspected or diagnosed heart problems.
- Adequate precautions should be taken in the case of persons with suspected or diagnosed epilepsy.

- Use caution if there is a tendency to bleed internally following acute trauma or fracture.
- After recent surgical procedures muscle contractions may disrupt the healing process.
- Use caution when applying over a menstruating uterus.
- Use caution when sensory nerve damage is present by a loss of normal skin sensation.
- Keep this device out of reach of children.
- Use this device only with the leads, electrodes, and accessories recommended by the manufacturer.

Caution

ARP Manufacturing, LLC further states that caution should be observed in the presence of the following:

Because of the vasodilation effects of electrical stimulation, people with unknown conditions (epileptic, cardiac, cerebral, and vascular conditions, etc.) may experience untoward effects such as dizziness, nausea, profuse perspiration, or fainting. If this occurs, cease application immediately and seek a physician to ascertain the underlying cause(s) of said untoward effects.

This device should not be used at extreme temperatures below 32° F (0° C) or above 100° F (38° C) or especially near fire. If this occurs, the device will need to warm up or cool off for approximately one hour before it is used again. The device can be stored at temperatures from 0° F (-18° C) to 110° F (43° C). Exposure to temperatures outside this range will void the warranty.

The *ARP Rx100* is normally used indoors. It can be used outdoors but should not be exposed to rain, snow, condensing fog, or condensing humidity, and should not be subjected to long-term exposure to direct sunlight.

Adverse Reactions

ARP Manufacturing, LLC makes known the following adverse reactions:

- Patients may experience skin irritation and burns beneath the stimulation electrodes applied to the skin.
- Patients may experience headache and other painful sensations during or following the application of electrical stimulation near the eyes and to the head and face.
- Patients should stop using the device and should consult with their physicians if they experience adverse reactions from the device.

ARP Rx100 Specifications

Main Pulse frequency — 40 to 500 pulses per second (PPS); adjustable.

Main Pulse duration — 460 μ s.

Background Pulse frequency — 10 kHz carrier signal.

Background Pulse duration — 25 μ s.

Output Power — Between 0 and 2.5 watts.

Balance — Output Power can be divided between 2 output channels in any proportion.

Polarity — Direction of electron flow is reversible.

Battery — Lithium-Ion Battery.

External Power Supply — 100/240 volts, 50/60 Hz input; 15 volt DC output

The signal generated by the *ARP Rx100* consists of a 10 kHz carrier signal (background pulse) that is expressed continuously over a lower frequency main pulse that can be varied between 40 and 500 PPS (Hz). Both main and background pulses have a characteristic RC charge/discharge spike shape. The effective frequency of the waveform is 10 kHz, regardless of the PPS setting. When power is delivered to the patient during an application, the power output of the *ARP Rx100* will be reduced from its no-load levels in direct proportion to the load impedance presented by the body of the patient (refer to the following table).

Maximum Output Voltage vs Load Resistance

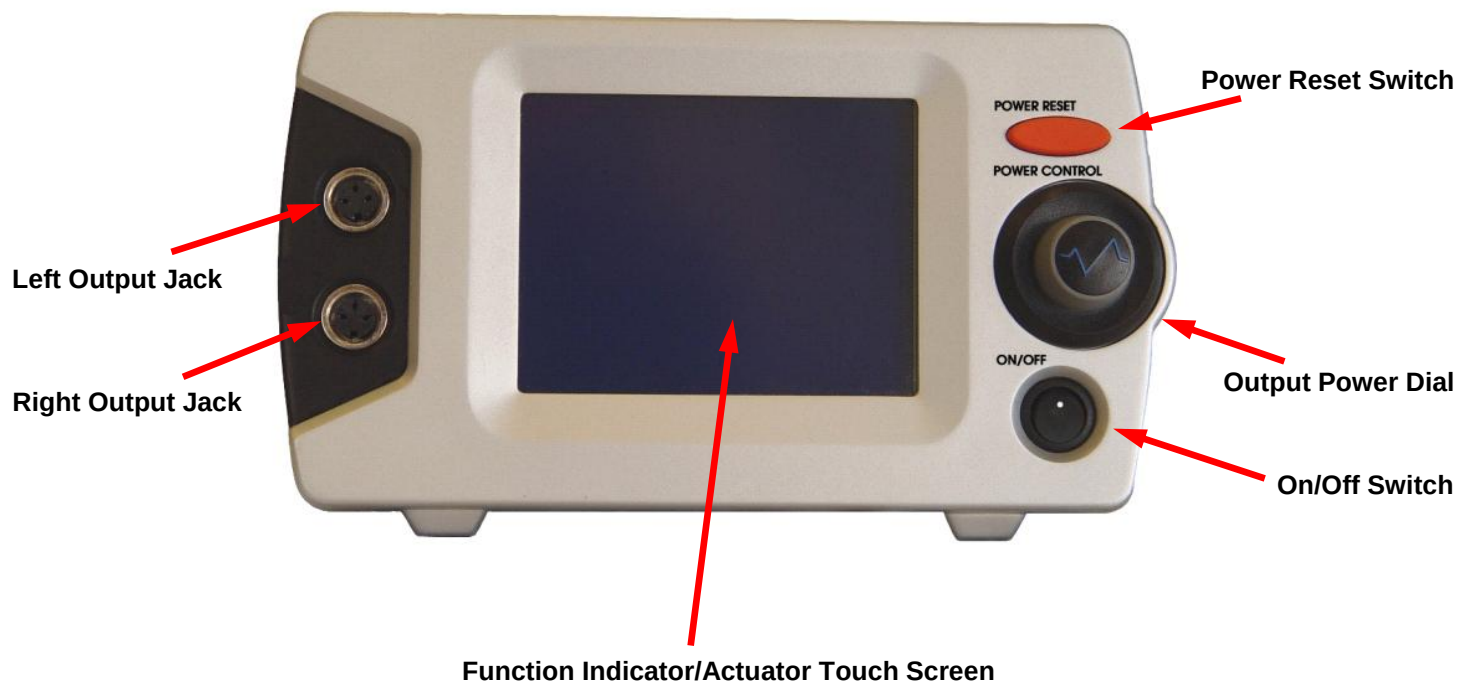
Load Resistance	Output Voltage
500 Ω	31 Vrms
2 k Ω	49 Vrms
10 k Ω	62 Vrms

(Note: Divide Output Voltage by Load Resistance to determine output current.)



Operation

- Terminology
- Description of the Operator Controls
- Operation of Display Screens
- Power Supply / Battery Instructions
- Pad Placement Instructions / Techniques
- Sponge & Pad Instructions
- Care & Maintenance
- Service & Parts
- Troubleshooting Guide
- Warranty Information

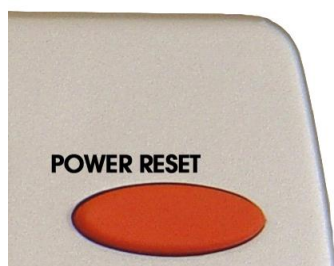


Terminology

All special terms or terms with more than one common usage used in this manual are defined below. This definition as stated in this section represents the intended meaning of the term throughout this manual.

- **Background Only mode** — *Background pulse stimulation is present, without Main pulses, when the Duty Cycle is set to 0/on, 1/off and the Duty Cycle indication is BKGD.*
- **Continuous mode** — *Main pulse stimulation is present at all times when the Duty Cycle is set to 1/on, 0/off and the Duty Cycle indication is CONT.*
- **Duty cycle** — *Variable amount of the time the main pulse is generated, determined by the Duty Cycle On and Off settings.*
- **Electrode pads** — *Pliable, conducting pads used to deliver electrical energy to the body areas being stimulated.*
- **Frequency** — *Number of main pulses per second.*
- **Intermittent mode** — *Method of operation when Duty Cycle is set for less than continuous mode.*
- **Normal mode** — *Main pulses turn on gradually unless Sub-second mode is activated.*
- **Polarity** — *Indicates direction of electron flow.*
- **Power** — *Effective stimulation intensity, which is determined by amplitude and frequency.*
- **Sub-second mode** — *In this mode, Duty Cycle On times of less than one second can be selected, and Main pulses turn on immediately instead of gradually.*

Description of the Operator Controls



Power Switch

The on/off power switch is a front panel rocker switch which connects (•) and disconnects the power produced by the power supply from the remainder of the circuit. All previously operator-entered values will reset to default.

Note: The power switch does not isolate the system from the VAC supply mains. You must unplug the power supply from the wall outlet in order to isolate the system from the VAC supply mains.

Power Reset

The Power Reset button serves as an emergency stop button that can be used to remove power from the output jacks, even if both the ZERO control and the RESET control fail to do so. Pressing the power reset button will remove power to the patient by bringing the power output to zero and bringing the timer to zero. Power produced by the power supply remains on for the rest of the circuit, and previously operator-entered values, except time, remain the same.

Output Power Dial

The output power dial controls the output power of the ARP Rx100. This dial adjusts the power for any combination of electrode pads. You must press and release the dial to activate it before you can adjust the output power. Once the dial is activated, turning it in a clockwise direction increases the output power, and turning it counter-clockwise will reduce power. The faster the dial is turned the faster the increase or decrease of power is felt. Conversely, by slowing the knob rotation, power will increase or decrease more slowly. If the dial is not turned for a period of four seconds, it is automatically deactivated.

Note: You must start the Timer before adjusting output power. If the Timer is not running, activating and turning the dial will have no effect.

Operation of Display Screens

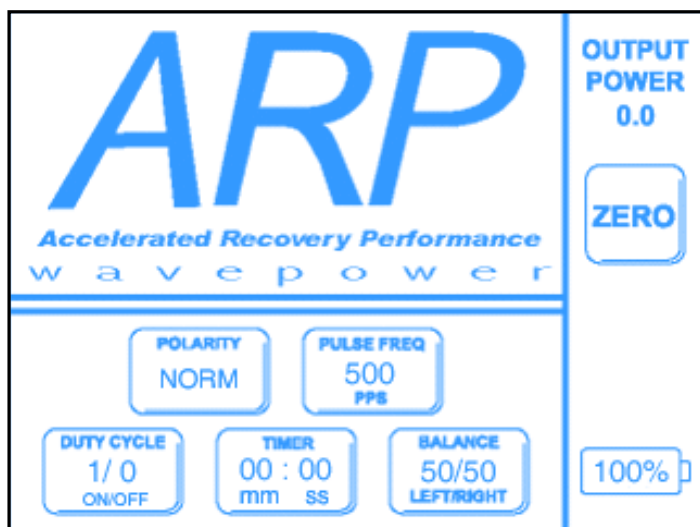


Figure 1

All of the remaining control and display functions of the ARP Rx100 appear on a touch screen display. Control functions are implemented through touch pad controls. For example, in Figure 1 at left, the square area labeled “ZERO” is a control that is used to reset the output power to zero. A light touch is sufficient to activate these touch pad controls.

Some controls will auto-repeat if you press and hold them. For example, the minutes “+” and “-” controls in the TIMER screen (see Figure 2, below left, and Figure 3) will auto-repeat when you press and hold them, allowing you to quickly increase or decrease time values. Other controls that auto-repeat are the “+” and “-” controls in the DUTY CYCLE screen (see Figures 5 and 6), the “+” and “-” controls in the MAIN PULSE FREQUENCY screen (see Figure 8), and the ◀ and ▶ controls in the BALANCE screen (see Figure 9).

Startup Screen

The STARTUP screen (Figure 1 at left) is the first complete screen to appear after power is turned on. The controls on this screen can be used as soon as the screen appears. If any of the five controls in the lower section of the display are pressed, the corresponding screen will appear. (For example, if the POLARITY control is pressed, the POLARITY screen will appear.) If no controls are pressed, the TIMER screen will appear after about 10 seconds with a time value of 00:00 (see Figure 2).

If the STARTUP screen does not appear, and the touch screen goes blank, the battery does not have enough charge to power the unit. You must either charge the battery or use the external power supply (AC adapter). See page 18 for information about the external power supply, and page 19 for battery charging instructions.

Note that Sub-second mode (see page 12) is not active when power is first turned on.

Timer Screen (Zero Time Value)

When the TIMER screen first appears after the ARP Rx100 is turned on, the Time value is 00:00. As long as the Time value is 00:00, the SYSTEM control appears at the lower right of the display, and the remaining time credits appear at the top of the screen, and there are no START or RESET controls. The SYSTEM control is used to activate the SYSTEM screen (see “SYSTEM CONTROL” on page 11). As soon as the “+” control is pressed to increase the Time value to a time greater than 00:00, the SYSTEM control and the remaining time credits disappear, and the START and RESET controls appear (see Figure 3).

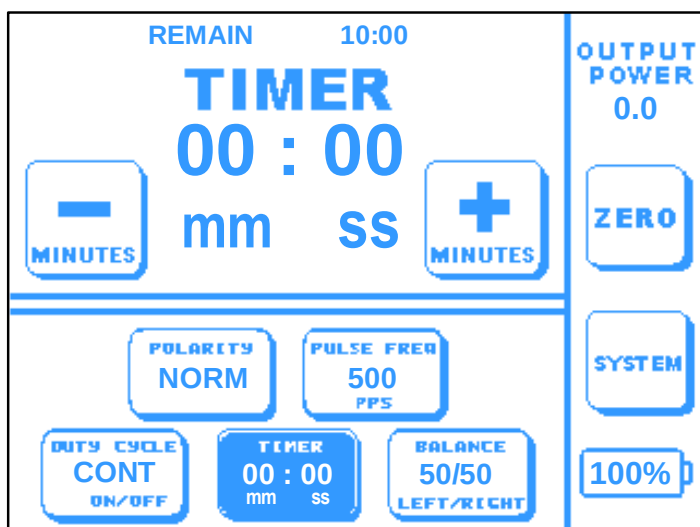


Figure 2

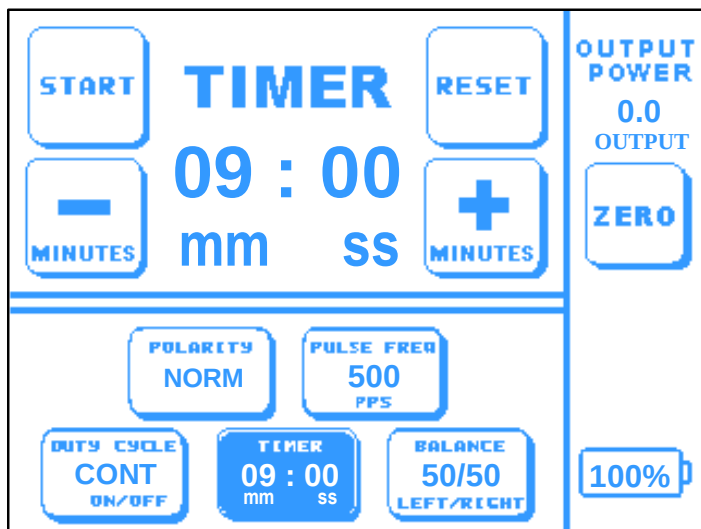


Figure 3

Timer Screen (Non-Zero Time Value)

The timer needs to be set first, since this function allows power to be delivered to the patient. The Time value may be increased or decreased in one-minute intervals by pressing the minutes “+” or “-” controls. (These controls will auto-repeat when you press and hold them.) The maximum time that the ARP Rx100 accepts is 99 hours and 59 minutes; if the “+” control is pressed again, the Time value will roll over to “00:00”.

Once some time has been entered, press the START control (at the upper left in Figure 3) to start the Timer. The START control changes to STOP when the timer is running, so the same control is used to stop the Timer (i.e. the timer may be started and stopped by alternately pressing the “START / STOP” control).

If the Time value needs to be set to zero, press either the RESET control or the ZERO control, or push the red power reset button on the front of the machine.

Power cannot be delivered to the patient unless the timer has been started and the word “OUTPUT” appears under the OUTPUT POWER indicator. After you start the Timer you must adjust the output power using the output power dial, as described on page 9. When the timer reaches “00:00”, power to the patient leads ceases and the unit resets the power output setting to zero.

If the ARP Rx100 stops supplying power to the output jacks, it may be because the time credits have been exhausted. Check the display of remaining time credits (at the top of the Timer screen when the Time value is zero). If the displayed time credits are zero, the SYSTEM screen needs to be activated so that additional time credits can be requested (see “SYSTEM CONTROL” below).

If another function is requested, the small TIMER control in the lower section of the display will stay at the value inputted and also shows real-time information.

System Control

The SYSTEM control (at lower right in Figure 4 at left) appears when the machine is first turned on, and whenever the Time value is zero. Press the SYSTEM control to activate the SYSTEM screen. The SYSTEM screen is used to activate or deactivate Sub-second mode, to request additional time credits, and to restore default machine settings. See “SYSTEM SCREEN” on page 14 for more information.

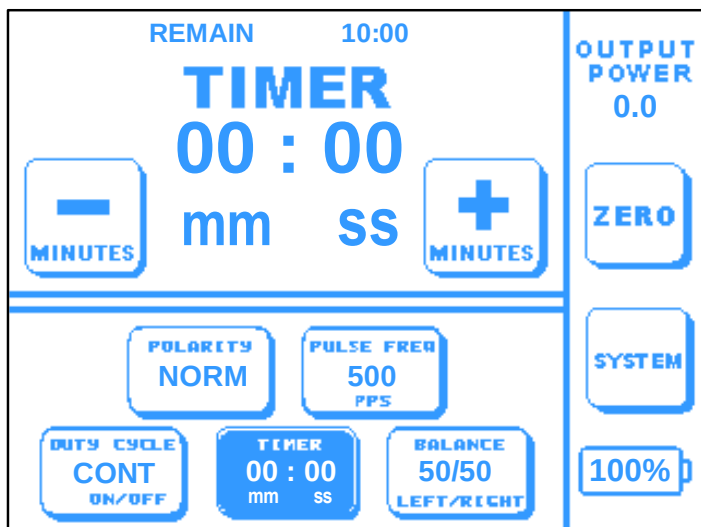


Figure 4

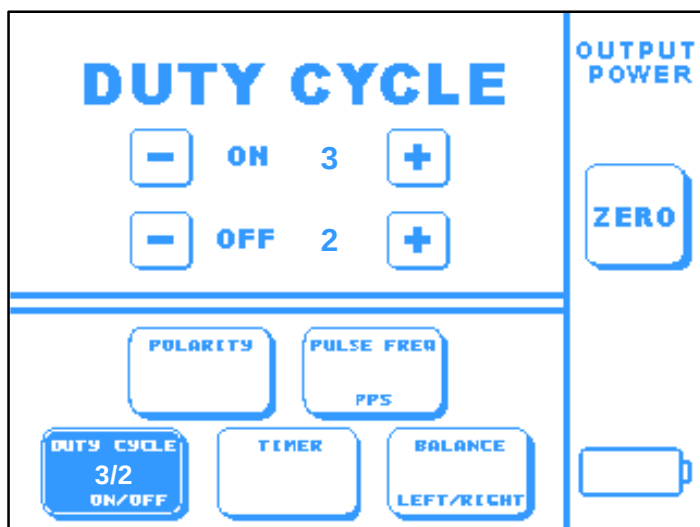


Figure 5

Duty Cycle Screen

The main pulse duty cycle results from the ON time and OFF time settings in the DUTY CYCLE screen (Figure 5 at left). Press the DUTY CYCLE control in the lower section of the display (the blue control at left) to activate this screen. To adjust the main pulse ON or OFF period, press the corresponding “+” or “-” controls. (These controls will auto-repeat when you press and hold them.) In the Normal mode (when Sub-second mode is not active), both ON and OFF periods may be adjusted from 0 to 20 seconds in 1-second increments, but you cannot set both ON and OFF to zero at the same time. For example, you can set the duty cycle for 3/2 (3 seconds ON time and 2 seconds OFF time), and the output will continuously pulse this way until set to another value. A setting of 1/0 (1 second ON and 0 seconds OFF) will turn the main pulse ON continuously, indicated by CONT (Continuous mode) in the DUTY CYCLE control and ON time display (this is the default duty cycle setting). A setting of 0/1 will turn the main pulse OFF leaving only the Background pulses, indicated by BKGD (Background Only mode) in the DUTY CYCLE control and ON time display.

The DUTY CYCLE screen will stay activated for approximately ten seconds and will revert to the TIMER screen if not used. However, the small DUTY CYCLE control in the lower section of the display will stay at the value inputted.

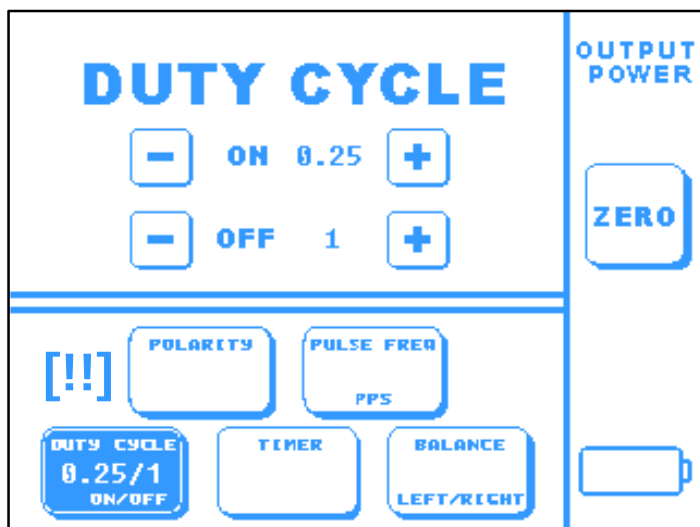


Figure 6

Sub-Second Mode

When Sub-second mode is active it is possible to select Duty Cycle ON periods of less than 1 second. OFF periods may be adjusted from 1 to 20 seconds (but not zero) as described above. You can select sub-second ON periods of 0.25, 0.50, and 0.75 second, as well as ON periods of 1 to 20 seconds in 1-second intervals. When Sub-second mode is activated the Duty Cycle ON period is initially set to 0.25 second. Sub-second mode is indicated by two exclamation points surrounded by square brackets, above the DUTY CYCLE control (as shown in Figure 6 at left).

Note that in Sub-second mode you cannot select an ON period of 0 second, so Background Only mode is not available. When the ON period is 0.25 second and you press the ON “-” control, the Duty Cycle changes to CONT (Continuous mode) rather than BKGD (Background Only mode). When the Duty Cycle is CONT, you must press the ON “+” control to select a non-continuous On period. You cannot select Continuous mode by selecting an OFF period of 0 (zero) second.

Because selection of sub-second ON periods requires quicker switching of Main pulses on and off, Main pulses are turned on and off immediately in Sub-second mode, rather than turning on gradually as they are when Sub-second mode is not active.

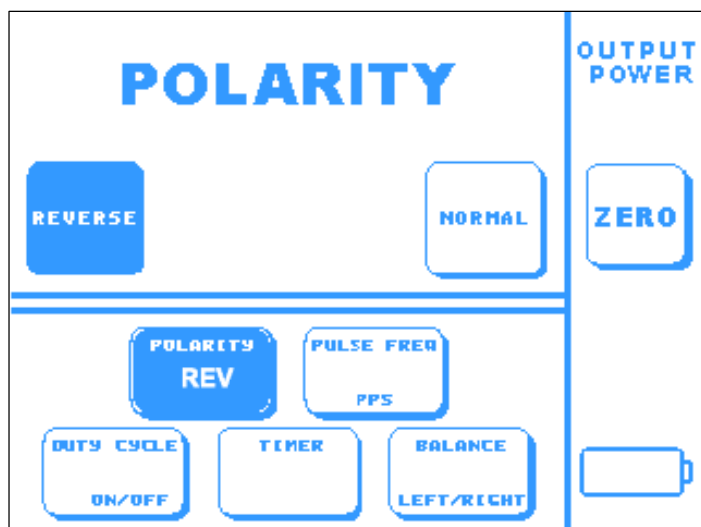


Figure 7

Polarity Screen

The POLARITY screen (Figure 7 at left) is used to change the polarity of the output signal from Normal to Reverse and back, as needed. Press the POLARITY control in the lower section of the display to activate this screen. If the polarity of the output is Normal, for example, press the REVERSE control to reverse the polarity of the voltage applied to the pads. The output power will reduce to the “Off” level, then gradually increase back to same output level (at the opposite polarity) in order to avoid any unnecessary discomfort to the patient. In Normal polarity the black pad is negative and the red pad is positive, conforming to standard electrical conventions. (The default polarity setting is Normal.)

The POLARITY screen will stay activated for approximately ten seconds and will revert to the TIMER screen if not used. However, the small POLARITY control in the lower section of the display will stay at the value inputted.

ARP Rx100 Tip

Before changing polarity, the power level should be lowered, yet perceptible by the user.

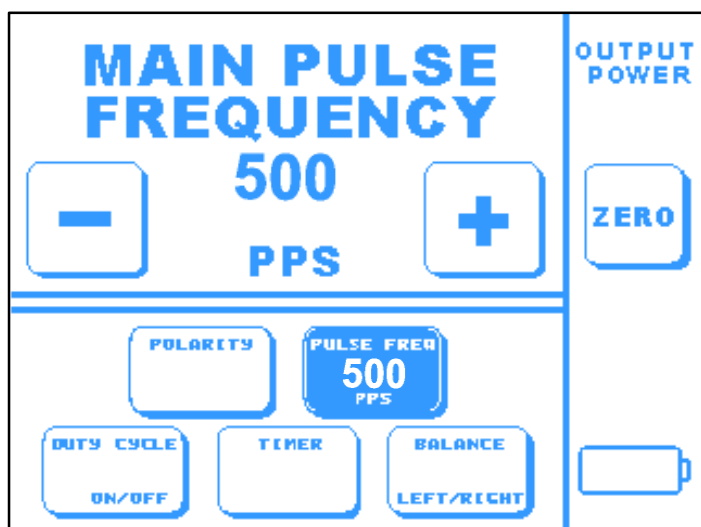


Figure 8

Main Pulse Frequency Screen

The MAIN PULSE FREQUENCY screen (Figure 8 at left) is used to adjust the frequency of the main pulse over a range from 40 to 500 pulses per second (PPS). Press the PULSE FREQ control in the lower section of the display to activate this screen. The default setting is 500 PPS. Press the “+” control to increase the main pulse frequency; press the “-” control to decrease the frequency. (These controls will auto-repeat when you press and hold them.) For example, to change the main pulse frequency setting from 500 PPS to 300 PPS, press and hold the “-” control until the setting equals 300.

The MAIN PULSE FREQUENCY screen will stay activated for approximately ten seconds and will revert to the TIMER screen if not used. However, the small PULSE FREQ control in the lower section of the display will stay at the value inputted.

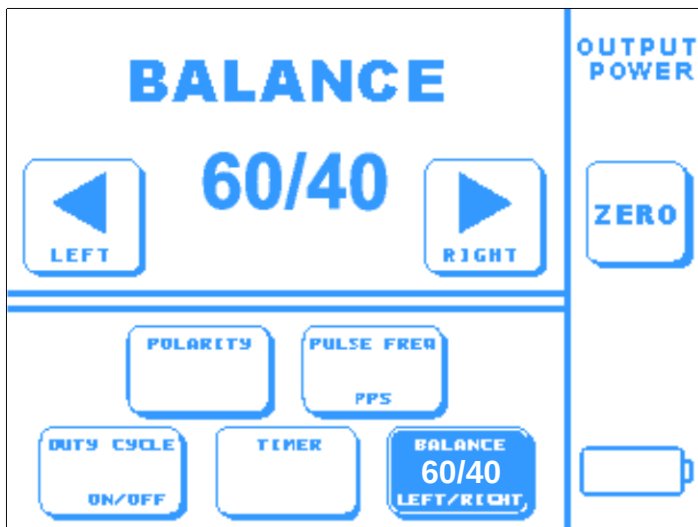


Figure 9

Balance Screen

The BALANCE screen (Figure 9 at left) is used to adjust the relative power delivered to the electrode pad-pairs, and to balance power between three or four pads. Press the BALANCE control in the lower section of the display to activate this screen. The default setting is 50/50 (50% output to the Left channel and 50% to the Right channel). Press the ◀ control to shift more output to the Left channel; press the ▶ control to shift more output to the Right channel. (These controls will auto-repeat when you press and hold them.) The sum of the Left and Right outputs must always total 100%, so increasing output to one channel will decrease it to the other channel by the same amount. For example, to increase the Left channel output from 50% to 60% (and reduce the Right channel output to 40%), press the ◀ control until the BALANCE screen reads 60/40.

For a two-pad configuration, simply plug the patient cord into either the Left or Right output jack and press the corresponding control to increase the output to 100% for that channel.

The BALANCE screen will stay activated for approximately ten seconds and will revert to the TIMER screen if not used. However, the small BALANCE control in the lower section of the display will stay at the value inputted.

System Screen

The SYSTEM screen (see Figure 10 at left) appears when the SYSTEM control (at lower right in Figure 4) is pressed. The SYSTEM screen is used to activate or deactivate Sub-second mode, to request additional time credits, and to restore default machine settings. The system screen also displays the time credits remaining (in the upper right part of the screen) as well as the device serial number and a firmware configuration or version number (in the lower left part of the screen).

See page 155 for activation or deactivation of Sub-second mode.

See page 16 for a detailed explanation of the Time Credit Request process.

See page 17 for restoring default machine settings.

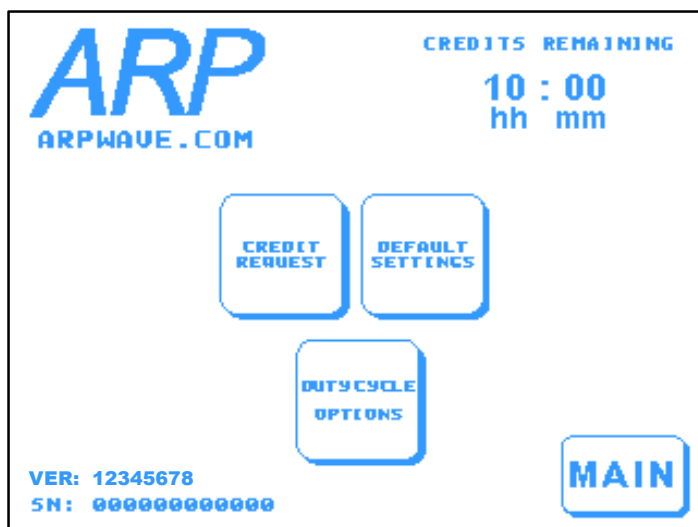


Figure 10

Activate / Deactivate Sub-second Mode

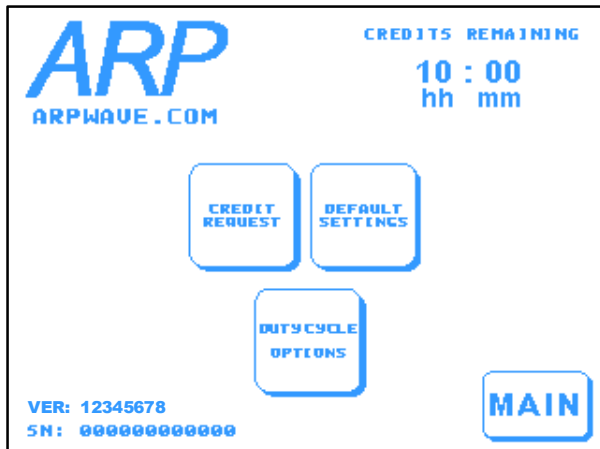


Figure 11 – System Screen

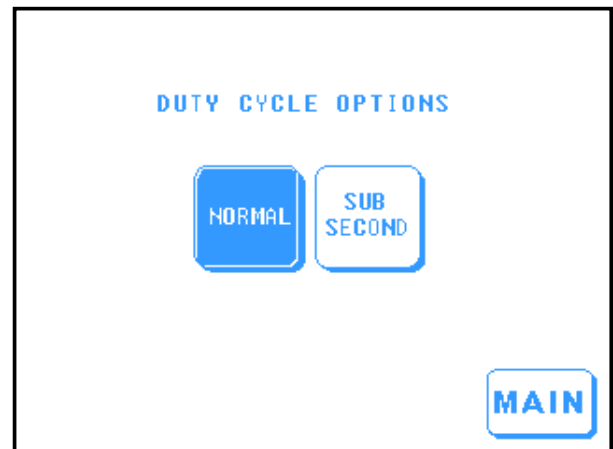


Figure 12 – Duty Cycle Options Screen
Normal

Press the DUTY CYCLE OPTIONS control in the SYSTEM screen if you wish to activate Sub-second mode. The DUTY CYCLE OPTIONS screen will appear, as shown in Figure 12 at right. If you reached this screen in error, simply press the MAIN control to return to the Timer screen.

When the Sub-second mode is not active, the NORMAL control is highlighted blue. Press the SUB SECOND control to activate Sub-second mode, or press the MAIN control to return to the Timer screen without activating Sub-second mode.

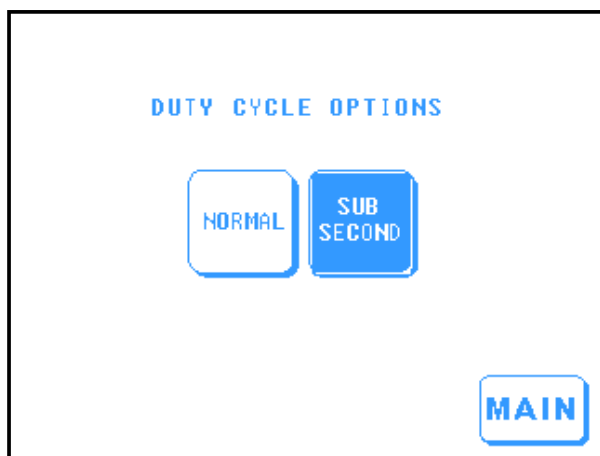


Figure 13 – Duty Cycle Options Screen
Sub-second

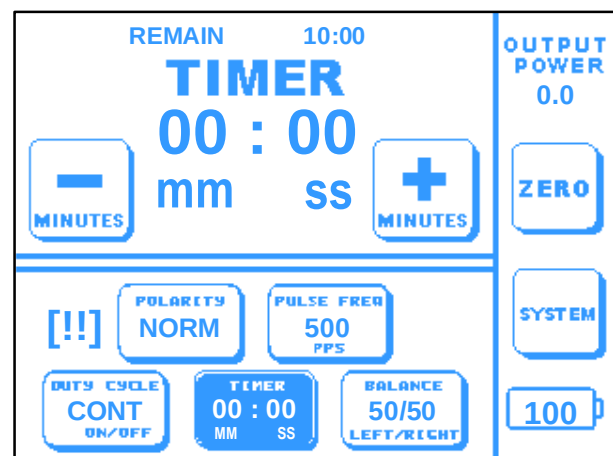


Figure 14 – Timer Screen

When the SUB SECOND control is highlighted blue it indicates that Sub-second mode has been activated. If you wish to deactivate Sub-second mode press the NORMAL control. When Sub-second mode is activated or deactivated as desired, press the MAIN control...

...and the TIMER screen will appear with a Time value of 00:00 (and a symbol above the DUTY CYCLE control if Sub-second mode is active).

Time Credit Request

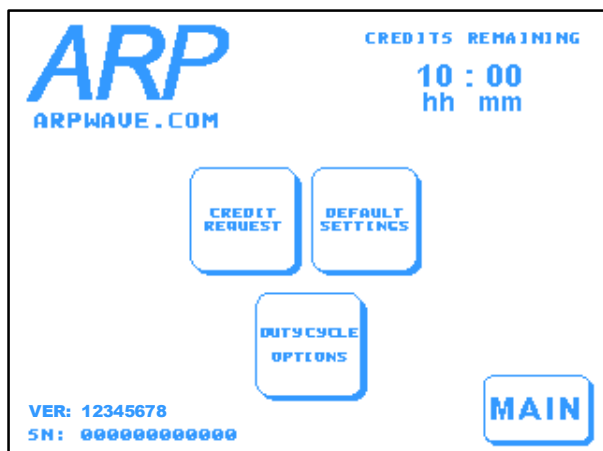


Figure 15 – System Screen

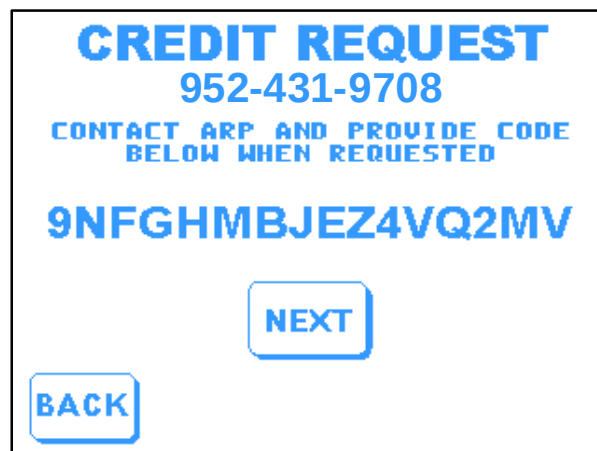


Figure 16 – Challenge Code Screen

Press the CREDIT REQUEST control to go to the CHALLENGE CODE screen, to obtain the challenge code for additional time.

Write down the challenge code and press the NEXT control. (Press BACK if you entered this screen in error.)

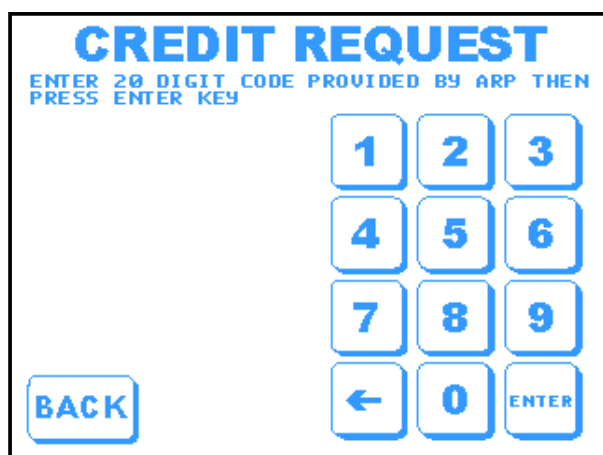


Figure 17 – Authorization Code Screen

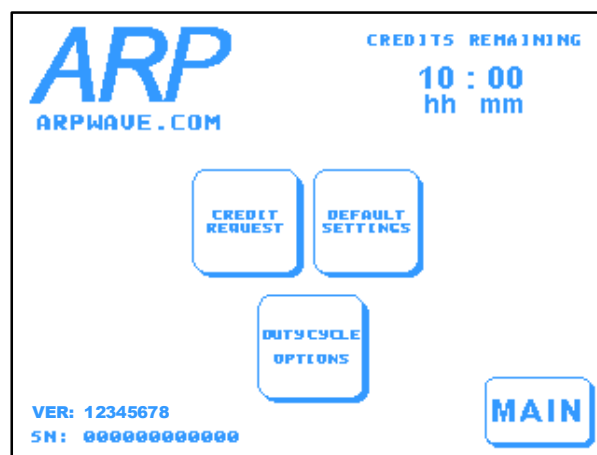


Figure 18 – System Screen

Call ARP and request the number of hours needed, and supply the challenge code. A 20-digit numeric code will be given to you. Enter this code (which will appear to the left of the keypad) using the keypad controls. Press the ENTER control when all 20 digits have been entered (press ← to backtrack if you enter a digit incorrectly). The SYSTEM screen will re-appear.

In a few seconds the hours that were requested will appear under “credits remaining”. Press the MAIN control and the TIMER screen will appear with a Time value of 00:00 (see Figure 14). You are now able to continue with the application.

Restore Default Settings

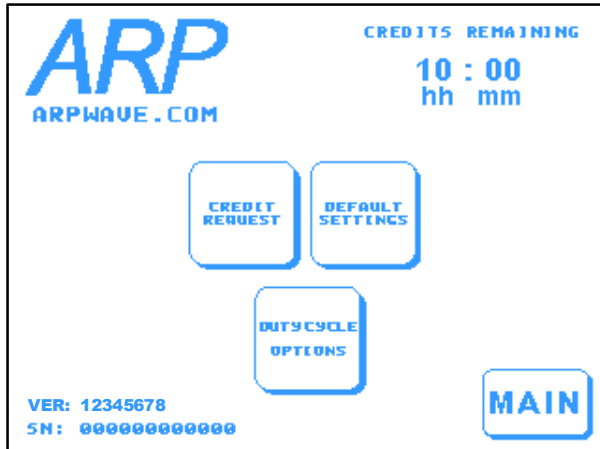


Figure 19 – System Screen

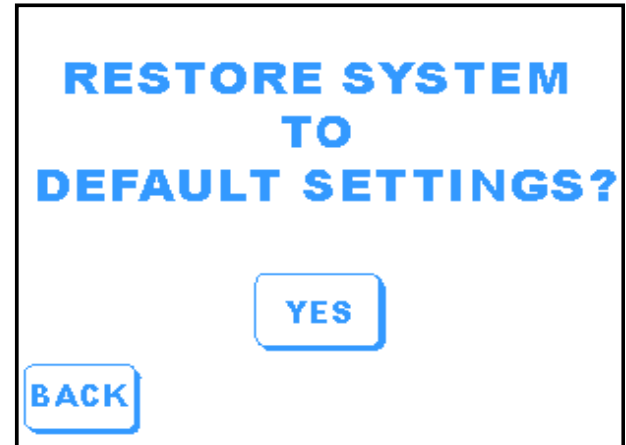


Figure 20 – Confirm Defaults Screen

The SYSTEM screen also provides the ability to return to the default settings with one touch. Simply press the DEFAULT SETTINGS control in the SYSTEM screen, and the CONFIRM DEFAULTS screen appears.

Press the YES control to confirm, and the default settings will be restored. Press BACK if you don't want to restore the default settings.

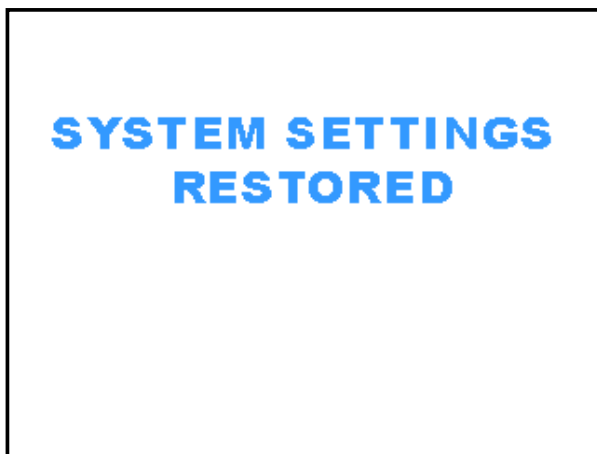


Figure 21 – Defaults Restored Screen

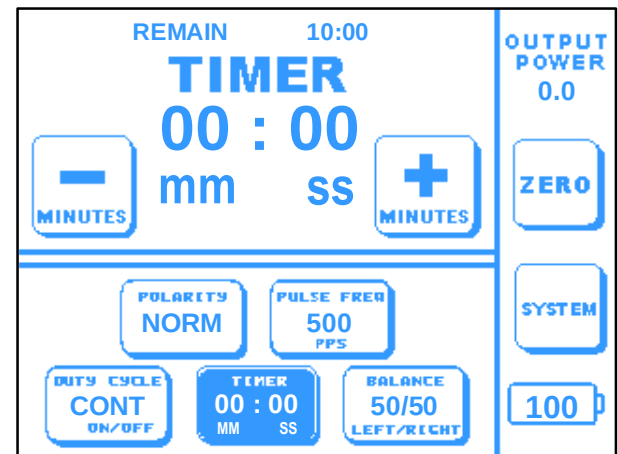


Figure 22 – Timer Screen

The ARP Rx100 displays the DEFAULTS RESTORED screen when the default settings have been restored. This screen will remain for a few seconds...

...then the TIMER screen will appear with a Time value of 00:00.

Power Supply / Battery Instructions

Power Supply



The AC Adapter

1. The power supply operates on 100V-240VAC, 50/60Hz.
2. Do not share the AC outlet with any other power-consuming equipment, such as a copy machine or shredder.
3. Do not place any objects on the power cord or power unit.
4. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
5. When the AC adapter is not used, unplug it from the AC outlet.
6. Use only the AC adapter supplied (part number 300769). Do not use any other AC adapter.
7. The AC adapter is for indoor use only and must be kept away from liquids.

The voltage indicator displays a percentage of voltage available for use. When the AC adapter power supply is used, the voltage indicator will always display 100%. When the lithium-ion battery is used, the percentage of power remaining displayed will stay near 100% until the battery nears depletion, and will suddenly start to drop at the end of the discharge cycle. The percentage will drop to a low value (e.g. 10% or so) when the battery is almost completely discharged. Shortly thereafter, the machine will simply cease to operate if the battery is not replaced with either another battery or the AC adapter.

Rear Panel

ARP Rx100 can be powered either by a lithium-ion battery (part number 306009), or by an external power supply (part number 300769), both supplied by ARPwave, LLC. No other power source may be used.

To Use Battery Power:

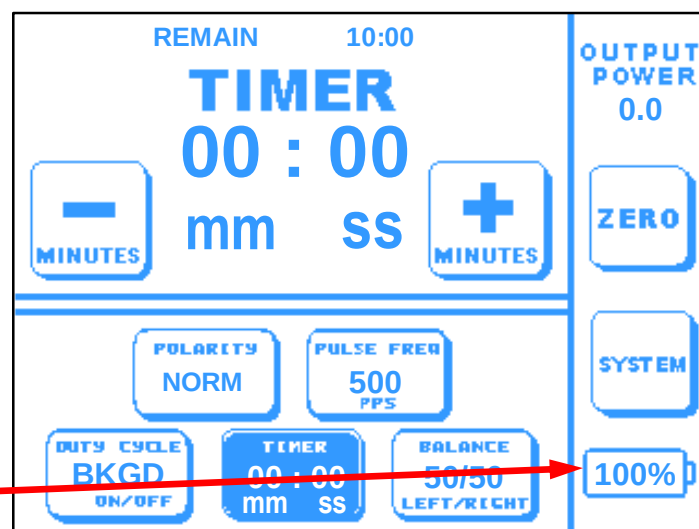
Slide the ARP lithium-ion battery into the back slot on the machine. Plug the battery into the female power jack in the back panel.

If external power is desired, unplug the battery and plug the external power supply connection into the power jack.

To Recharge Battery:

Remove the lithium-ion battery from the back of the ARP Rx100 unit by sliding the battery keeper button to the left and lifting the battery out, and charge it only with the approved lithium-ion battery charger (part number 003057) supplied by ARPwave, LLC. Do not attempt to use any other charger to charge the battery.

See next page for battery care and placement instructions.



Battery Charging

The *ARP Rx100* battery charger is designed to charge the battery completely in about 3 hours. The green charger light will blink on and off while charging the battery. When charging is complete the green light will stay on continuously.

Do not attempt to charge the lithium-ion battery with any other charger.

Although the battery may be allowed to completely discharge without harm, ARPwave recommends that, once the voltage indicator drops to 90%, you charge the battery as soon as it is convenient (you do not need to interrupt a treatment session). This is because the battery voltage stays near 100% until the battery is nearly depleted. At this point, recharge the battery with the ARP battery charger and if further *ARP Rx100* operation is desired, plug the *ARP Rx100* into the power supply. If the battery is allowed to discharge completely, the *ARP Rx100* will cease to operate.

These lithium-ion batteries will last for about 300 charge/discharge cycles on average. After 300 charge/discharge cycles installing a new battery is recommended. Depending upon the frequency of use, these batteries may last for years with proper use. Batteries that have reached end of life do not require any special disposition.



Slots on back to receive battery

Battery keeper button
(on top of housing)

Slide battery keeper button to the left, insert battery pack into slots on back, release the battery keeper button, and slide battery down until battery keeper latches.



Position plug into receptacle.



To remove battery, unplug battery from receptacle, slide battery keeper button to the left, and lift battery out.

SEE BATTERY FOR ADDITIONAL CAUTIONS



ARPwave, LLC Corporate Offices

7721 145th Street West
Apple Valley, MN 55124-7516 USA

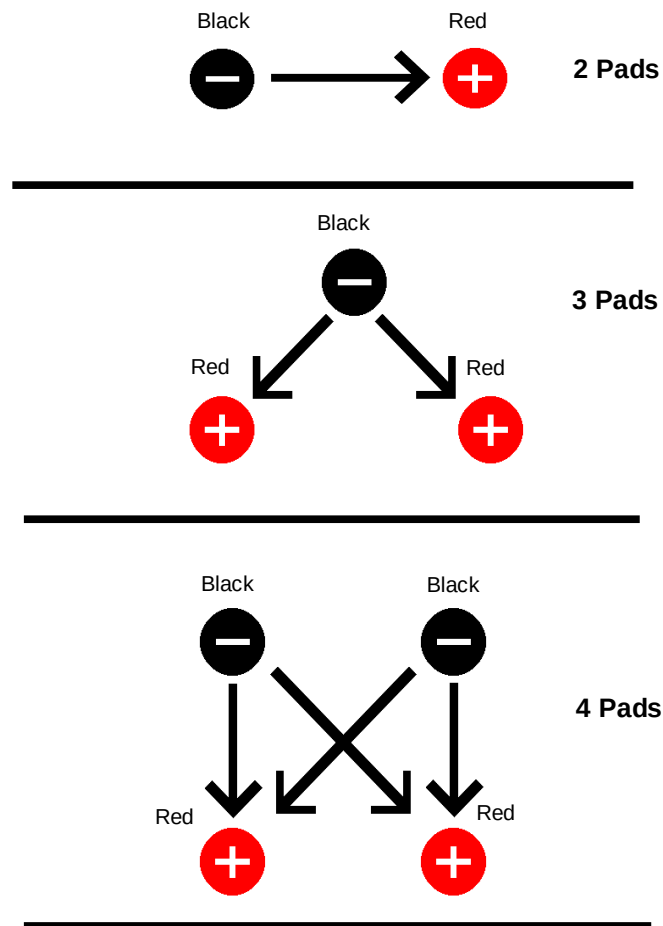
+1 952-431-9708 (phone)

+1 952-431-9723 (fax)

Pad Placement Instructions / Techniques

Electron Flow

Two, three, or four electrode pads may be used to introduce the electrical signal to the patient. If two pads (one black and one red) are used, the electrical signal is developed between the black and red electrodes. If all four pads are used, the signal is developed from each black pad to both red pads. If three pads (one black and two red) are used, operation is similar to that using four pads, with one black pad disconnected. A polarity reversal control is provided to change the direction of the signal current at the pads (see Figure 7 on page 13).



ARP Rx100's Signal Path, Normal Polarity

Connecting the Cables

When connecting the cables to the front panel, notice the **OUTPUT** plugs are colored. Notice that the blocks where the cable splits are colored the same color as the plug on that wire. Performance from each **OUTPUT** jack is identical.

There are a variety of pad placement techniques used for specific applications. Cable connections vary between 2-pad placements and 3- and 4-pad placements.

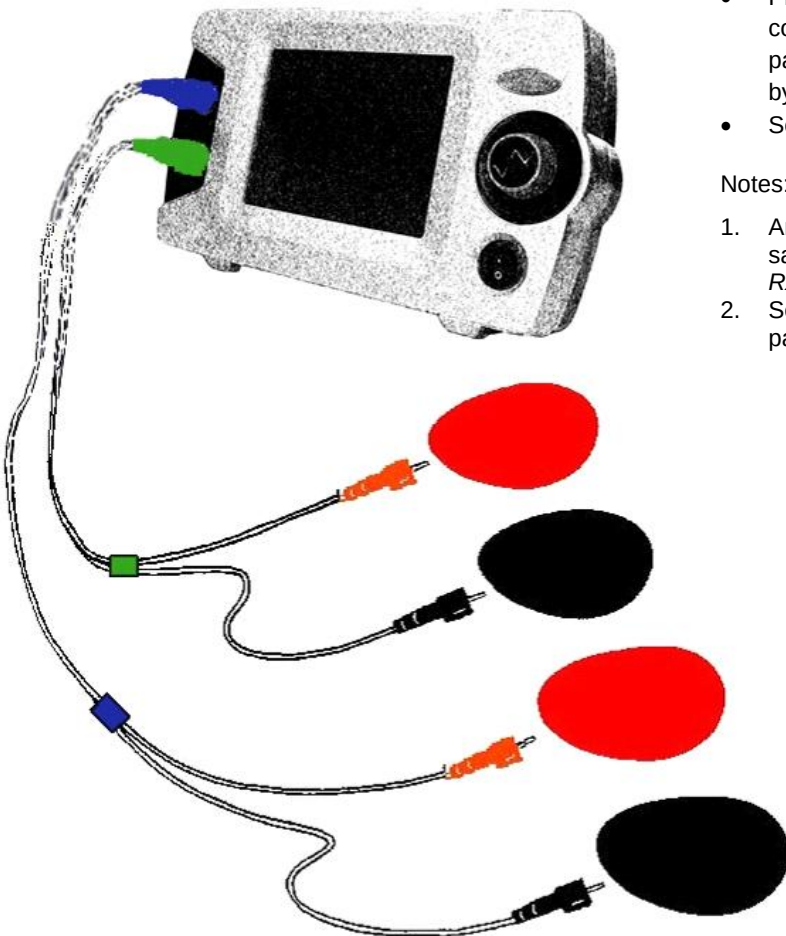
Placing the Pads

The ARP Rx100 is supplied with 2-, 3-, and 4-inch conductive pads and matching-size sponges. The smooth side of the pad (with the protruding cable connection) is the insulating side. The other side is rougher (more textured); this is the conductive side. The pad should be placed with the conducting (rough) side toward the body.

- Connect pads to the front panel using connecting cable(s).
- *Thoroughly* saturate sponge pads with water before placing on the electrode pad. (You can never get the sponge pads too wet, *but pads not wet enough will not function as designed.*)
- Place the pads at the desired locations, with the sponges compressed between the pads and the body (for suggested pad locations, refer to a specific application protocol provided by ARPwave, LLC).
- Secure pads with the straps provided.

Notes:

1. Any of the conductive pads provided by ARPwave can be safely used over the full output power range of the ARP Rx100.
2. See page 24 for information about ordering replacement pads, sponges, and straps



Sponge and Pad Information

Sponge Conducting Pads

The Sponge Conducting Pads are manufactured for the specific use with an electric modality such as the *ARP Rx100*. Other types of sponges will not provide equal conductivity over the application area. Use of typical sponge material could become harmful to the patient. We recommend using only the sponges manufactured for use with the *ARP Rx100*.

The Sponge Conducting Pads are recommended and intended for single patient, single use.

Electrode Pads

The Electrode Pads are recommended and intended for single patient, single use.

Care & Maintenance

Preventive Maintenance

Maintenance of *ARP Rx100* is simple, but important. The *ARP Rx100* should at all times be free of dust and other foreign material and fluids. It should be stored in a dry environment. As with all electronic devices, observe caution when operating the *ARP Rx100* around fluids.

Note: There are no user-serviceable parts inside the *ARP Rx100*. Any attempt to repair or replace any parts inside the *ARP Rx100* will void the warranty. See Warranty Information, page 28.

Cleaning the *ARP Rx100*

It is good practice to periodically clean all exterior surfaces (including display) of the *ARP Rx100* unit with a clean soft cloth moistened with alcohol. Do not immerse the unit in water.

Battery Maintenance

1. Store the battery in a cool, dry place and out of direct sunlight.
2. DO NOT drop the battery or subject it to strong jolts.
3. Always charge the battery soon after full use.
4. DO NOT use a charger other than the Accelerated Recovery Performance Battery Charger.
5. DO NOT use the battery for appliances other than specified.
6. DO NOT store the battery below -20° C or above 45° C (-4° F or 113° F).
7. DO NOT charge the battery below 0° C or above 40° C (32° F or 104° F).
8. DO NOT use an insufficiently charged or depleted battery.

Charging the Battery

1. Connect the AC Power Plug of the *ARP Rx100* Battery Charger to an AC Outlet.
2. Connect the battery charger plug to the battery.
3. See instruction on charger to determine when the battery is completely charged.

NOTE: The useful operation time of the battery will gradually decrease after repeated use and recharging. The battery is no longer serviceable if the operation time is too short even after a sufficient charge.

Exchanging the Battery

When the battery needs exchanging (replacing), perform the following procedures:

1. Unplug and remove the battery from back of *ARP Rx100* unit.
2. Attach a new or newly-charged battery.

Patient Cables

- The patient cable may be cleaned with alcohol and a soft clean cloth.
- The pins that connect to the conducting pads may be cleaned with steel wool.
- Replace the patient cable if it becomes damaged or is non-operational.
- Note: Repeatedly disconnecting and connecting the conductive pads will reduce their life.

Service & Parts

Technical Support

If you have any questions regarding the operation of **ARP Rx100** or advice on protocol techniques, please contact ARPwave at +1 952-431-9708. We are always glad to hear from you and will try our best to assist in any way we can.

Ordering Parts

To order parts and accessories for your unit, call ARPwave at +1 952-431-9708, or visit us at ARPwave.com to order online.

Accessory Part Numbers

Part Number	Description
030055	4" black electrode
030056	4" red electrode
030059	3" black electrode
030060	3" red electrode
030063	2" black electrode
030064	2" red electrode
040033	3" sponge pad
040034	4" sponge pad
040039	2" sponge pad
300640	Blue electrode cable
300649	Green electrode cable
005104	Electrode pads, adhesive (1 set), 2" x 4"
005101	3" x 24" elastic strap
300659	3" x 48" elastic strap
005102	6" x 48" elastic strap
003057	Battery charger
300769	DC power supply
306009	Lithium-Ion battery

Troubleshooting Guide

Problem	Cause	Action
No sensation in pad(s).	Power switch is OFF.	Turn power switch ON.
	Authorized time credits are exhausted (no time of use left).	Request additional time from ARPwave (see page 16).
	Wall plug-in power supply connections not secure. Power supply may be defective (RARE).	Secure all connections: unit to power supply box, and box to power cord. If power supply is deemed defective, return to ARPwave for replacement.
	Wall outlet is connected to a wall switch that is off.	Turn wall switch on, or use another outlet.
	No battery on unit (if using battery power source).	Attach battery and plug into DC receptacle on the back of the device.
	Conductive pads may be damaged or worn out.	Test by using another pad. Replace pads.
	A cable is disconnected or faulty.	Reset "Output Power" to zero, reconnect the cable to pad(s), and adjust "Output Power" slowly. Check cable connections at unit and pads. Test using another cable. Replace cable(s).
	Balance is set incorrectly.	Adjust Balance to bring power over to the proper jack.
	"Output Power" is at zero.	Make sure "Output Power" is turned up for the application.
	Patient not sensitive to the Main Pulse Frequency selected.	Turn down "Output Power", adjust frequency (lower), and slowly turn up "Output Power".
	Pads are touching each other.	Separate the pads.
	Sponge pads are not thoroughly saturated.	Saturate sponge pads thoroughly.
	Duty Cycle is OFF.	Set Duty Cycle to CONTINUOUS.
	Timer is not running.	Start Timer running before turning power up to deliver power to the patient.

Problem	Cause	Action
Sensation in pad(s) is intermittent.	Examine Duty Cycle control and make sure Duty Cycle is not set to cycle on and off.	Set Duty Cycle to CONT (continuous).
Patient discomfort after switching Polarity.	Output Power needs to be reduced somewhat prior to switching Polarity to reduce effect.	Turn "Output Power" down, switch Polarity, and return power setting to a level tolerable by patient.
Patient discomfort after changing Main Pulse Frequency	Output Power needs to be reduced somewhat prior to switching changing Main Pulse Frequency.	Turn "Output Power" down, switch Main Pulse Frequency, and return power setting to a level tolerable by patient.
The machine won't power on.	The battery is discharged.	Charge the battery or use the external power supply (AC adapter).
	The external power supply (AC adapter) is not plugged in.	Check the connection at the wall outlet.
	Poor connection at the input power jack.	Reposition the power plug.
The machine powers off (the touch screen goes blank) during a session.	The battery is discharged.	Charge the battery or use the external power supply (AC adapter).
	Poor or intermittent connection at the input power jack.	Reposition the power plug.
Main pulses turn on immediately instead of gradually.	Sub-second mode has been activated.	Follow the instructions on page 15 to deactivate Sub-second mode.

This Section for Operator to note issues:

Problem	Cause	Action

Warranty Information

ARPwave and ARP Manufacturing warrant that the ARP Rx100 is free from defects in material and workmanship.

This warranty period is two (2) years from the date of delivery to the original purchaser and is owner-specific. The first year of the warranty covers parts and labor while the second year of the warranty covers parts only. Repair or replacement will be made in a timely manner on receipt of the defective unit.

This warranty does NOT cover:

1. Replacement parts or labor furnished by anyone other than ARP Manufacturing, LLC
2. Defects or damage caused by labor furnished by anyone other than ARP Manufacturing, LLC or its appointed agents
3. Deliberate and/or intentional damage
4. Damage inflicted as a result of an act of God
5. Damage caused by unreasonable use
6. Damage caused by lack of necessary maintenance
7. Accessories such as cables, pads, sponges, straps, power supply, charger and battery
8. Damage caused by operator error or lack of proper training in the use of the equipment
9. Damage inflicted as a result of criminal action

This device should not be used at extreme temperatures below 32° F (0° C) or above 100° F (38° C). If this occurs, the device will need to warm up or cool off for approximately one hour before it is used again. The device can be stored at temperatures from 0° F (-18° C) to 110° F (43° C). Exposure to temperatures outside this range will void the warranty.

The ARP Rx100 is normally used indoors. It can be used outdoors but should not be exposed to rain, snow, condensing fog, or condensing humidity, and should not be subjected to long-term exposure to sunlight.

ARPwave and ARP Manufacturing shall not be liable for incidental or consequential damages to property or business except in those states where this exclusion is expressly disallowed.

To file a claim under this warranty, the owner must:

Provide the nature of the complaint in writing and submit to ARPwave by FAX at +1 952-431-9723, or by mail to 7721 145th St. West, Apple Valley, MN 55124-7516 USA.

ARPwave and ARP Manufacturing do not authorize any person, agent, or representative to create any additional or other obligation or liability in connection with the sale or use of ARP Rx100. Any such representation, granting, or agreement shall be null and void and shall have no effect whatsoever.



ARPwave, LLC

7721 145th St. West
Apple Valley, MN 55124-7516 USA
Phone: +1 952-431-9708
Fax: +1 952-431-9723
Website: www.ARPwave.com



ARP Manufacturing, LLC

7270 S. Fraser St.
Centennial, CO 80112 USA
Phone: +1303-713-0605
Fax: +1 303-713-0581



Exclusive distributor of Rx100

This page intentionally blank