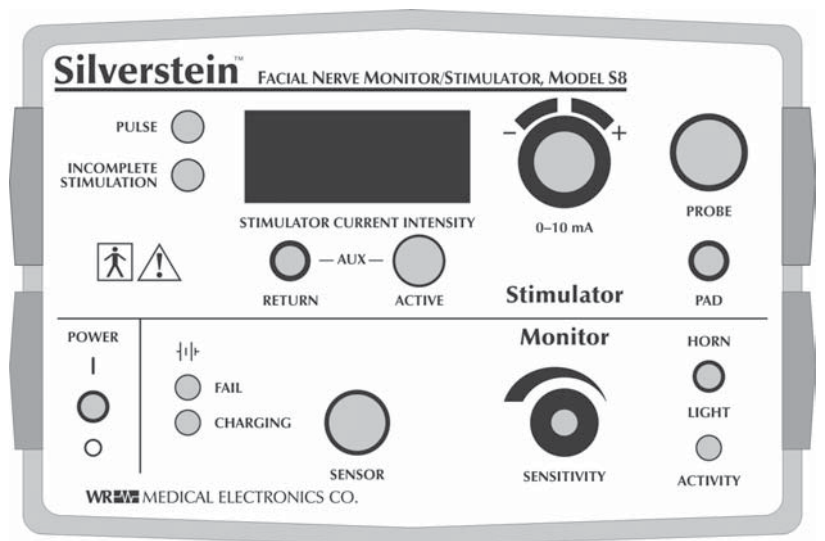


SILVERSTEIN™

FACIAL NERVE STIMULATOR/MONITOR MODEL S8



Instructions for Use, Version 3.0

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Silverstein Facial Nerve Monitor/Stimulator, Model S8, *Instructions for Use*, version 3.0, item number 3035, revised 03/08/05, manual pages component number 920-W0-23035.

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COMMENTS OR QUESTIONS?

We would appreciate receiving any suggestions, comments, or questions that would help us to improve this manual. Please forward comments to the address above.

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WARNINGS AND CAUTIONS



WARNING: Simultaneous contact of the stimulator probe and high frequency surgical equipment, such as an electrocautery device, to a patient may result in burns at the site of the stimulator electrodes and possible damage to the stimulator. Remove probe from operating site when using electrocautery or electrosurgery devices and keep electrode pad physically separated and electrically isolated from electrocautery or electrosurgery units.

WARNING: Simultaneous connection of a patient to a h.f. surgical equipment and to an electromyograph or evoked response equipment may result in burns at the site of the electrical stimulator or biopotential input part electrodes and possible damage to electrical stimulator or biological amplifiers.

WARNING: Operation in close proximity, approximately 1 meter, to shortwave or microwave therapy equipment may produce instability in the STIMULATOR CURRENT INTENSITY display and in the stimulator output. Activity artifacts may also occur when these types of devices are energized.

WARNING: Portable and mobile RF communication devices may affect the Silverstein Facial Nerve Monitor/Stimulator. This device may also be interfered with by other equipment even if it complies with Cisper limits. In the event that any equipment is adversely affecting this device, remove the offending equipment from the area.

WARNING: Patients with an implanted electronic device, such as a cardiac pacemaker, should not be subjected to stimulation unless specialist medical opinion has first been obtained.

WARNING—PARALYZING DRUGS: A fairly high concentration of Xylocaine injected in close proximity to the facial nerve can reduce the nerve's responsiveness to the stimulating current and/or paralyze the nerve so that the muscle does not respond to electrical stimulation. However, it has been found that solutions containing one percent or less of Xylocaine injected in normal quantity and not unduly close to the nerve do not appear to affect the function of the Model S8. Succinylcholine can also cause muscle paralysis and prevent the facial muscles from contracting during stimulation.

WARNING: Battery charger must not be plugged into device when electrodes are connected to patient.

WARNING: Avoid accidental contact between connected but unapplied applied parts and other conductive parts including those connected to protective earth.

WARNING: Avoid trans-thoracic stimulation, for example maintenance of anode and cathode stimulating sites in close proximity.

CAUTION: Federal law restricts this device to sale by or on the order of a physician (or properly licensed practitioner).

CAUTION: The Silverstein Facial Nerve Monitor/Stimulator and SACS Cable are to be operated only by trained personnel under the direction of a physician.

CAUTION: The Silverstein Facial Nerve Monitor/Stimulator is not explosion-proof and should not be used in the presence of explosive gases.

CAUTION—INSTRUMENT PERFORMANCE: Caution must be exercised because there is no guarantee that the monitor system will always respond to a nerve stimulus. Current setting, distance from nerve, position and placement of Cheek Muscle Sensor, muscle response, and other factors will affect operation of the monitor. The monitor is designed to assist in locating nerves. No guarantee of performance is intended or implied.

CAUTION: Do not use the SACS™ cable with electrically powered drills. Do not allow any active ends of the cable or active tools/probes which are not in use to touch conductive materials such as the operating table, microscope, etc. The ends of the cable are “active” whenever the cable is connected to the stimulator.

DEVICE INFORMATION

Sterilization

- Gas sterilize only: Cheek Muscle Movement Sensor (optional, see Preventive Maintenance and Cleaning on page 6), Remote Control Probe, and the SACS™ cable and clips.
- Gas or low-pressure steam: Surface Electrode Pad Cable.

Batteries

This unit uses two 8.4V, 2500mA or 2600mA Nickel-Cadmium (Ni-Cad) battery packs. Each pack contains seven 1.2V 2500mA or 2600mA cells. Replacement batteries and instructions are available from WR Medical Electronics Co. Batteries must be recycled or disposed of properly.

Service

Circuit diagrams, component parts lists, descriptions, and calibration instructions are available from WR Medical Electronics Co. Refer to the Service Information section, page 16, for additional service information.

System Classification (IEC601-1/ EN60601-1)

Type of protection against electric shock:	Type BF
Degree of protection against electric shock:	Class II
Degree of protection against moisture ingress (IEC529), S8 Main Unit (p/n 3910):	Ordinary IPXO
Degree of protection against moisture ingress (IEC529), Footswitch (p/n 3130):	IPX8
Degree of protection in the presence of a flammable anesthetic mixture with air or with oxygen or with nitrous oxide:	Not protected (unsuitable)
Mode of operation:	Continuous
Desktop Medical Switching Battery Charger (p/n 3442):	EN60601-1, IEC 601-1

Environmental Ratings

After exposure to transport and storage extremes, allow the system to acclimatize before operating. The system should not be subject to transport and storage extremes for longer than 15 weeks.

	Operating	Transport and Storage
Temperature:	+ 10°C to +35°C	-10°C to +50°C
Relative Humidity:	30% to 75%	10% to 95% (non-condensing)
Atmospheric Pressure:	700hPa to 1060hPa	500hPa to 1060hPa

Preventive Maintenance and Cleaning

- Clean the equipment after each use and before storing. Surfaces should be cleaned using a dry cloth. For stubborn stains, a lightly dampened cloth and a mild detergent may be used.
- After each use, the Cheek Muscle Movement Sensor should be wiped dry. The sensor may be wiped with alcohol but must not be immersed in liquids, as this would damage the sensing elements and may corrode the cables and connections. The sensor does not need to be sterilized because the patient's mouth is not a sterile field. However, if sterilization is desired, gas is the preferred method. It must not be steam autoclaved.
- Never immerse any surface or component in water, and always ensure surfaces are dry before coupling to patient or storing. The cables should be carefully coiled to prevent tangling or breaking.

Responsibility of the Supplier

WR Medical Electronics Co. accepts responsibility for the effects of safety, reliability and performance of the equipment only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are conducted by persons authorized by WR Medical Electronics Co.
- The electrical installation of the room complies with local regulations.
- The equipment is used in accordance with the Instructions for Use.

Electromagnetic Compatibility

The system has been independently tested and found to comply with IEC601-1-2/EN60601-1-2.

Emissions are limited to CISPR 11 Class A Group 1 (industrial environment). Some care may be needed to minimize disturbance to sensitive receivers. Immunity from external disturbances is assured for operation in normal residential and clean industrial environments. If in doubt, consult WR Medical Electronics.

Safety and Information Symbols

Symbols that appear on the equipment have the following meaning:



Attention, consult accompanying documents



Type BF Applied Part — F Type patient contact part isolated from other parts of the equipment such that patient leakage currents cannot exceed allowed limits in NORMAL and SINGLE FAULT CONDITION



Footswitch



Battery



Variability



Variability with a preset starting point



Power off



Power on



0413

Environmental Protection and Disposal of Equipment

No natural rubber latex is used in the manufacturing of this equipment or accessories.

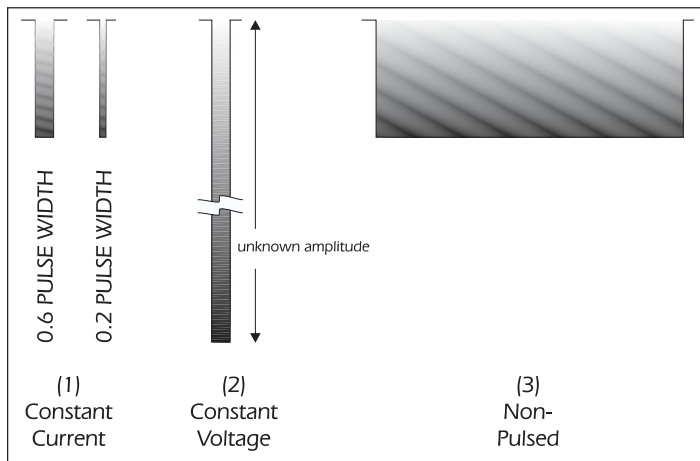
At the end of service, consult local regulations for disposal of batteries and other system parts.

TECHNICAL SPECIFICATIONS

¹ Defined as the pulse frequency setting in seconds minus the pulse width setting in seconds.

- **Current output:** 0.0 to 10.0 milliamperes (mA) measured across a $1K \pm 1\%$ resistive load. Tolerance at 0.0 indicated, with a residual current of 0.05 mA, is ± 0.005 mA. Tolerance at 10.0 mA is ± 0.4 mA.
- **Pulse width:** 0.0002 seconds ± 20 microseconds
- **Pulse off time:** 0.1998 seconds¹
- **Pulse frequency:** 0.200 seconds (5 Hertz) ± 5 milliseconds
- **Dial accuracy:** Linear down to 0.15 mA, residual current of 0.05 mA at 0.0 indicated
- **Battery life:** Approximately 15 hours between charges
- **Size:** 10 x 10.25 x 5.5 inches (25.4 x 26.04 x 13.97 cm)
- **Weight:** 6.1 pounds (2.76 kg)

Current Characteristics



The Model S8 is safer than most constant-voltage or non-pulsed-DC stimulators because it delivers pulsed, constant-current stimulation. To illustrate, the amount of energy transmitted to the patient is proportional to the amplitude of current (in milliamperes, or mA) and the duration of the pulse. Constant-voltage units can deliver excessive current, because these units automatically deliver an unlimited amount of current (subject to circuitry limitations) to meet the voltage chosen by the operator. In some cases this can damage nerve tissue. Likewise, non-pulsed-DC-stimulation may damage nerve tissue because they allow non-pulsed current to be transmitted through the nerve as long as the probe tip touches the nerve. The Model S8 allows stimulation to be applied directly on nerve tissue without risk of overstimulation.

Figure 1

- 1) Constant current, pulsed: 0.6 milliamperes (mA) is used primarily in clinical settings, and 0.2 mA in surgical settings. The Silverstein Model S8 uses constant current, with a pulse width of 0.2 mA.
- 2) Constant voltage: amplitude is unknown.
- 3) Non-pulsed: current transmitted as long as the probe touches the tissues.

Output Parameters

The Silverstein Model S8 provides a square-wave pulse, which is adjustable from 0.05 milliamperes (mA), residual current, to 10.0 mA, maximum current, by using the buttons on the Remote Probe or the dial on the front panel. Current intensity refers to the amplitude of the individual pulses, not to the average level of current. There is no current between pulses.

Nerve response to electrical stimulation is a function of current intensity through the nerve rather than of applied voltage. Consequently, precise control of current intensity is essential for quantitative evaluation of nerve response. In the Model S8, the voltage is automatically adjusted (utilizing a constant current output) to compensate for any changes in the patient-stimulator circuit resistance so that the current is constant at any given setting of the STIMULATOR CURRENT INTENSITY display.

SYSTEM COMPONENTS

Specific component lists may vary, depending on what was ordered. Retain the packing list to place reorders. If you have questions, contact WR Medical Electronics Co.

Part Number	Item	Single Use or Reuse	Sterile	Repairable ¹
3910	Silverstein™ Facial Nerve Stimulator/Monitor, Model S8 (main unit)	Reuse	None ²	Yes
3129	Cheek Muscle Movement Sensor	Reuse	ETO	No
3210	Remote Control Probe	Reuse	ETO	No
3186EU	Monopolar Surgical Stimulating Probe, Disposable	Single	ETO	No
3194	Surface Electrode Pad (Ground) Cable	Reuse	ETO or steam	No
3146EU	SACS™ Kit (Silverstein Adapter for Continuous Stimulation)	Reuse	ETO	No
3214	Theratrode™ III Disposable Electrode Pads ³ (Pkg. of 30)	Single	N/A	No
3148	Carrying Case	N/A	N/A	No
3130	Foot Switch	Reuse	None ²	Yes
3035	Instructions for Use, version 3	N/A	N/A	No
3006 ⁴	Video Tape	N/A	N/A	No
3442	Battery Charger - Desktop Medical switching power supply	N/A	N/A	No
0309	Hospital Grade Power Cord ⁵	N/A	N/A	No

1 See page 16 for replacement or servicing information.

2 See Preventive Maintenance and Cleaning on page 6.

3 General purpose clear tape adult ECG electrode. This electrode is approx. 1.75 inches round with a snap connector attached to Ag/AgCl conductive adhesive gel.

4 Part numbers for video: 3006 VHS/NTSC; 3007 PAL; 3008 VHS/SECAM.

5 NEMA5-15 or power cord for country of destination.

DEVICE OPERATION

POWER SWITCH

Located in the lower left corner, this switch turns the main unit on and off.

Monitor Controls

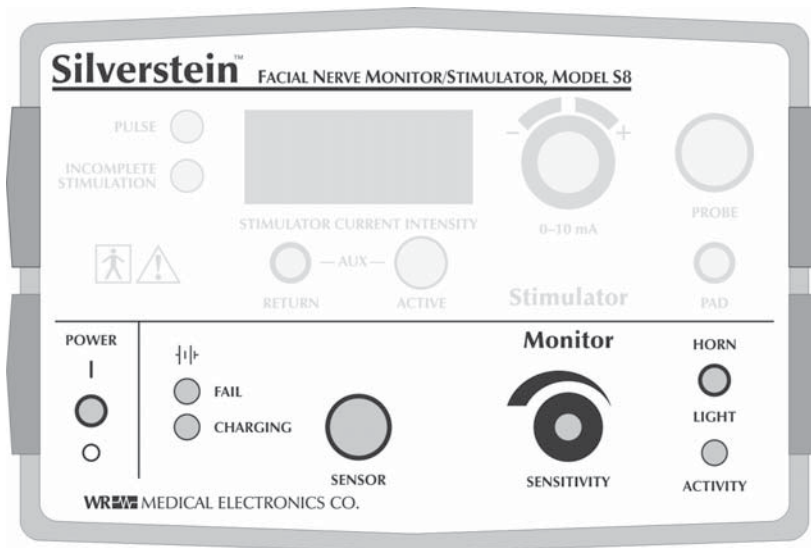


Figure 2
Front Panel: Monitor

SENSITIVITY DIAL

When the monitor's SENSITIVITY dial is fully counter-clockwise, the monitor is most sensitive. To desensitize, turn the knob clockwise.

ACTIVITY LIGHT

The yellow ACTIVITY light illuminates to signal the surgeon that the Cheek Sensor circuit was activated (when LIGHT is selected on the HORN/LIGHT switch).

HORN/LIGHT SWITCH

The HORN/LIGHT toggle switch is used to select an aural or visual signal, at the option of the surgeon. In cases where other equipment in the room has a similar aural signal, or where the operating environment may be too

noisy to hear the audible tone, the visual signal may be selected. The sound level may be adjusted by turning the dial on the rear panel (see figure 4).



Figure 3
Cheek Sensor

CHEEK MUSCLE MOVEMENT SENSOR

The Cheek Muscle Movement Sensor is inserted into the mouth and is attached to the cheek of the intubated patient on the same side as the intended surgical procedure. The plug on the end of the Cheek Muscle Sensor cable is plugged into the SENSOR jack on the instrument panel. A sensor should be connected to the SENSOR jack at all times that the monitor is in use. If a sensor is not connected, the audible tone or activity indicator light may give false indication due to pickup of stray electrical noise or signals. (See the Operational Notes, page 13, for further discussion.) The Cheek Muscle Sensor is quite delicate and should be treated with care. Pulling on wires, repeated bending, especially sharp bends, can cause broken wires or intermittent false signals.

BATTERY FAIL LIGHT

The FAIL light indicates that the battery level is too low for operation of the device. Do not use instrument if FAIL light is illuminated.

Charging the Batteries

When the unit is on and the battery FAIL light is illuminated, the Ni-Cad batteries will require charging. To charge, turn the unit off, plug the battery charger into a 100-240VAC receptacle and plug the small round connector into the back of the unit. The batteries will charge only when the unit is off. The green CHARGING light on the front panel should illuminate. The unit will be fully charged in 30-36 hours. **Do not charge longer than 36 hours.** The charging circuit is disabled if the battery charger is plugged into the connector and the unit is on.



- **NOTE:** The output voltage of the charger must be +24VDC center positive. The output current of the charger must not be less than 0.4A and must not be greater than 2A. Plug is Switchcraft 760 or equivalent.

FOOT SWITCH

The Foot Switch may be used to disable the ACTIVITY light or the horn. Heat from the cautery equipment can cause a spontaneous nerve impulse, which might result in a muscle contraction. Simply plug the pedal into the FOOT SWITCH jack on the rear panel and depress the foot pedal when muting is desired.

Stimulator Controls

PULSE LIGHT

When the instrument is on, the clear PULSE light (to the left of the CURRENT INTENSITY display) flashes with each pulse of the stimulating current, indicating that the instrument is on and that the stimulator section is functioning. Between stimulating or monitoring activity, turn the instrument off to conserve battery power.

INCOMPLETE STIMULATION LIGHT

The INCOMPLETE STIMULATION light provides a way to verify that stimulating pulses are being correctly administered to the patient. The INCOMPLETE STIMULATION light illuminates when the full amount of the specified current (as displayed on the STIMULATOR CURRENT INTENSITY display) is *not* being administered to the patient. The light will go off when the full amount of the specified current *is* being administered to the patient. For example, if the current intensity display reads 0.60, and the INCOMPLETE STIMULATION light is off, then 0.60 milliamperes of current are being delivered.

- **Note:** If the INCOMPLETE STIMULATION light is on, the stimulator may still be delivering current, and may still be capable of stimulating a nerve. A fractional amount of the stimulating current being delivered to the patient may be sufficient to evoke a nerve response (and because it would be a percentage of what is indicated in the display, the indicator would be illuminated). See the Incomplete Stimulation and Resistance section, page 14, for further discussion.

STIMULATOR CURRENT INTENSITY DISPLAY

This backlit digital display indicates current intensity and gives the current reading in milliamperes (mA). The current intensity can be adjusted from 0.0 to 10.0 mA using the buttons on the Remote Probe or the dial on the front panel. At a reading of 0.0 there is a residual current of about 0.05 mA.

CURRENT INTENSITY DIAL

This is one of two ways to control the current as shown on the CURRENT INTENSITY display. See also the Remote Probe section, below.

PAD JACK

When a monopolar probe or the Remote Probe is used, a surface electrode (“ground”) pad must be used to complete the electrical path through the patient. Plug the cable for the surface electrode pad into the jack labeled PAD directly below the connector for the probe.

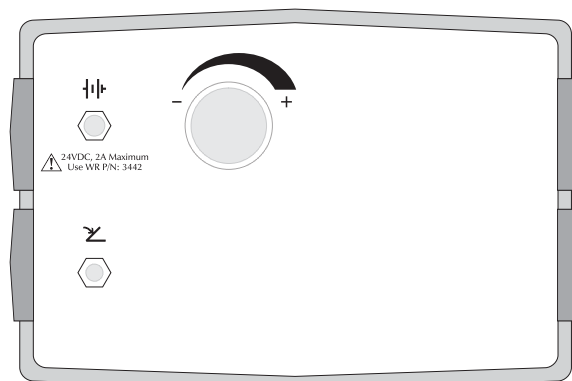


Figure 4
Rear Panel

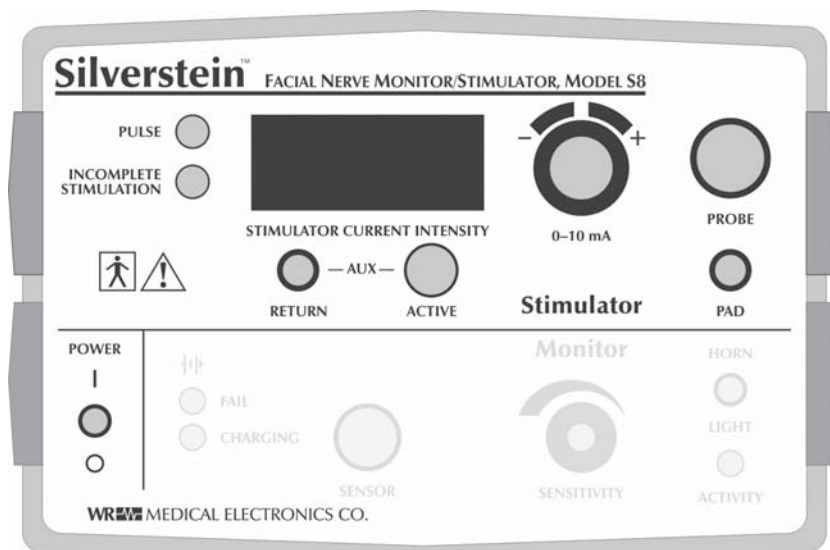


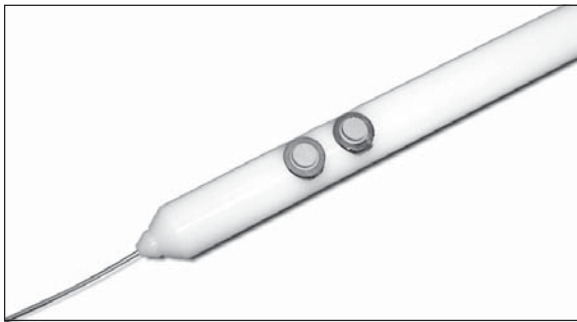
Figure 5
Front Panel: Stimulator

PROBE JACK

Connect the Remote Probe to the front panel at the connector labeled PROBE: First align connectors, insert plug, and rotate locking collar on plug.

AUXILIARY JACKS — RETURN AND ACTIVE

Monopolar and bipolar probes may be used with the Silverstein, and are plugged into the AUX jacks. Current to these probes can be controlled using either the Remote Probe, or the dial on the front panel. If the Remote Probe is used to control current, use caution as the tip is “active” whenever it is plugged in. The AUX binding posts accept banana plugs, spade lugs, alligator clips, or bare wire. Either plug can be connected to either AUX jack (RETURN or ACTIVE). Shorting the probe tips or AUX jacks together will not harm the instrument. No reference electrode (ground) pad is required when a bipolar stimulating probe is used. Surgical instruments having a black non-reflective coating are not suitable for applying the stimulating current because of the high electrical resistance of the coating.



Remote Probe

The Remote Probe has a 0.55mm flexitip that is fixed in place. This is flush-tipped, insulated to the end, and can be bent to any angle. This probe is reusable and can be sterilized by methods listed in Sterilization Guidelines, page 5.

The Remote Probe has two buttons for controlling current output. The front button is up, the rear button is down. Never simultaneously press both up and down buttons.

Connect the Remote Probe at the connector labeled PROBE on the front panel.

Figure 6

Remote Probe

Tilt Stand (Handle)

The tilt stand can be rotated to raise the front panel of the instrument for better visualization by the surgeon. It can also be rotated to the rear of the instrument to allow placement on a stack of monitoring equipment. To rotate, simultaneously pull both stand-out hubs (on either side of the unit) and rotate the handle underneath the instrument.

Operational Notes

MONITOR SENSITIVITY AND ACTIVITY ARTIFACTS

The Silverstein Model S8 is highly sensitive and has been designed to pick up the slightest vibrations and contractions of the cheek muscle. The sensitivity of the instrument is primarily determined by how the Cheek Muscle Sensor is installed and by physiological factors of the patient. It is impossible to quantify how small of a contraction could be detected, but the instrument has the capability (under certain conditions) to pick up the expansion of tissue due to blood flow. This has been demonstrated in the lab and has been reported by surgical personnel.

If you detect a blood pulse, turn the SENSITIVITY dial clockwise to desensitize the instrument. Generally, use the instrument on the most sensitive setting possible.

Activity artifacts sometimes signify a problem and other times can be ignored. It is imperative that their causes and meanings are understood. Artifacts may be caused by the following:

- Movement of the drapes, operating table, or tubes near the face or in the mouth.
- Adjustment of the stimulus output current. The horn will sound when the current is being adjusted on some or all sensitivity levels. This is a normal occurrence and does not indicate a fault with the unit. This occurs because the monitor is so sensitive it can detect the loss of electrons from the Ni-Cad battery pack (due to current draw by the motorpot).
- Energizing of electrocautery. Artifact sometimes occurs when cautery is energized. Use the Foot Switch pedal provided with the instrument to disable the horn. The light position (on the HORN/LIGHT switch) may also be used. When locating nerves, be sure that interfering equipment is off. Since the cheek can contract only as a result of nerve impulses, and since Cheek Muscle Sensor picks up contractions only as a result of impulses (natural or artificial stimulation), most artifacts can be ignored—with this exception:
 - In some cases the exposed nerve will spontaneously fire impulses when it is directly manipulated with a surgical instrument, bumped with a tool, or irrigated with cold fluids. If the spontaneous impulses are large enough, they will cause a contraction that will be detected by the Cheek Muscle Sensor.

Checking the Sensor Circuit

You may test the functioning of the monitoring circuit and audible signal by lightly touching the Cheek Muscle Sensor. When the SENSITIVITY dial is set to maximum, the sensor will be so sensitive that if you set it on a flat surface and blow on it, you will set it off. You should be able to touch the patient's cheek lightly and get a response.

- **Note:** As stated on page 4, only solutions containing one percent or less of Xylocaine injected in normal quantity and not unduly close to the nerve do not appear to affect the function of the Model S8. Higher concentrations can reduce the nerve's responsiveness to the stimulating current.

INCOMPLETE STIMULATION AND RESISTANCE

The INCOMPLETE STIMULATION light verifies whether stimulating pulses are being correctly administered to the patient. The light will go out when the full amount (as shown on the display) is administered.

The most common cause of the stimulator not delivering the full amount of specified current is high resistance being encountered somewhere between the stimulator output (or “active”) and the stimulator return (or “ground”). High circuit resistance may be caused by a variety of factors, including marginal probe contact with patient tissue, poor contact between the stimulator return electrode (“ground pad”) and patient skin, attempting to stimulate through an area that does not conduct well (such as dry bone), or the stimulating probe or stimulator return cable not being plugged in.

- **Note:** *If the INCOMPLETE STIMULATION light is on, the stimulator may still be delivering current, and may still be capable of stimulating a nerve. A fractional amount of the stimulating current being delivered to the patient may be sufficient to evoke a nerve response (and, because it would be a percentage of what is indicated in the display, the indicator would be illuminated). This is because the stimulation pulse intensity may be at its highest output voltage as a result of high circuit resistance, and the stimulator circuit is unable to deliver the specified amount of current. This mode of stimulating is not harmful to the patient in any way, but the surgeon will not be able to determine the exact amount of current being delivered to the patient.*

If this should occur, the stimulator intensity should be turned down while the stimulator probe is in contact with the patient until the INCOMPLETE STIMULATION light turns off. At this point, the specified current level shown on the display will be administered. The INCOMPLETE STIMULATION light going out will also show correct probe contact with patient tissue.

Many people falsely believe that they should increase the current intensity in order to get the INCOMPLETE STIMULATION indicator to turn off. Note that the lower the specified current, the greater the range of circuit resistance that can be accommodated by the stimulator circuit. This is due to the relationship of voltage, resistance, and current as defined by Ohms Law.

TESTING FOR STIMULUS OUTPUT

The unit may be tested for output by touching the probe to the metal snap on the surface electrode pad. If the amber INCOMPLETE STIMULATION light goes out, the instrument is working properly.

Another simple way of verifying that the incomplete stimulation indicator is working correctly is to place something conductive (such as a paper clip or wire) between the RETURN and ACTIVE connectors (use the AUX jacks). The INCOMPLETE STIMULATION indicator should go out when the conductive object is in place, and should light when it is removed.

The stimulus verification circuitry monitors the integrity of the patient/instrument circuit, including continuity of the probe and cable. When proper current is being delivered, the amber INCOMPLETE STIMULATION light will go out. It will flash at all other times—for example, when there are broken cables, disconnected cables, poor ground, poor probe contact, etc. (See also the above section, Incomplete Stimulation and Resistance.)

Verification of stimulation can also be obtained by touching the forearm or wrist area of a test subject, starting with a low current setting and increasing to a reasonable level (up to six or eight milliamps (mA) may be required due to the narrow pulse width of 0.0002 sec.). Use a non-sterile probe for this procedure so that sterile probes will be available for surgery.

The unit may also be tested on an oscilloscope using a 1K precision resistor across the output. The oscilloscope will then display the pulse amplitude directly in milliamperes (1 volt = 1 mA).

The active probe can be shorted to the surface electrode pad without damage to the circuitry.

Check the stimulator output with an oscilloscope monthly.

Operation Checklist

PRIOR TO USE

- Check the battery condition. If battery indicator is in fail mode, recharge it before use.
- Sterilize the Cheek Muscle Movement Sensor and Remote Probe. Cables, muscle sensor, and Remote Probe must be gas sterilized.
- Position the instrument in the operating room using the adjustable tilt handle.

SETUP LIST FOR MONITOR

(If using both the stimulator and monitor, follow steps in both lists.)

- Read all warnings and cautions before beginning. Read the Instructions for Use thoroughly. This list is only a summary.
- Position the main unit so that it is convenient for the person operating the device.
- Position the Cheek Muscle Movement Sensor on the operative side of the patient's cheek after patient has been anesthetized.
- Connect the sensor cable to the main unit.
- Turn the power switch to "on." Check the battery status again.
- Adjust the monitor sensitivity. Begin with the most sensitive position (fully counter-clockwise) and adjust the knob clockwise during the case to a lower sensitivity setting.
- Choose either HORN or LIGHT by moving the toggle switch.

SETUP LIST FOR STIMULATOR

(If using both the stimulator and monitor, follow steps in both lists.)

- Read all warnings and cautions before beginning. Read Instructions for Use thoroughly. This list is only a summary.
- Position the main unit so that it is convenient for the person operating the device.
- If using a monopolar probe or the Remote Probe, snap a surface electrode cable to a surface electrode pad. Affix the surface electrode pad to the contralateral shoulder. Plug the surface electrode cable into the main unit.
- If desired, attach the optional Foot Switch (used to mute the horn when electrosurgical devices are used).
- Connect any optional equipment to the main unit (such as the Silverstein™ Adaptor for Continuous Stimulation, SACS, used to electrify surgical tools so they essentially become stimulator probes).
- Attach the sterile Remote Probe or monopolar disposable probe to the main unit.
- Turn the power switch to "on." Check the battery status again.
- Adjust the current intensity prior to surgery. Begin at or around 2.5 mA when stimulating through bone.

SERVICE INFORMATION

Warranty

The Silverstein Model S8 is warranted to be free of defects in material and workmanship for a period of two years from purchase (90 days for batteries, probes, and cables). Warranty is void if the unit has been damaged by electrocautery. All warranty service is to be provided at the WR Medical factory.

Service

Service and technical questions are welcome. Because of the specialized circuitry of this instrument, the need for special test instruments, and our familiarity and experience with this instrument, we recommend that the instrument be returned to the factory for any necessary checking or servicing except routine battery replacement. To return a unit, ship the unit with its Remote Probe and Cheek Sensor via insured parcel post or insured UPS. Be sure to pack with plenty of padding to prevent damage during shipping. If shipping from overseas, please specify that the goods are USA-made, and are being returned for repair.

Ship to:

WR Medical Electronics Co.
Technical Service Department
123 Second Street North
Stillwater, MN 55082 USA

Repair Department:

Phone 651-430-1200
Toll-Free phone 800-635-1312 (US and Canada only)
FAX 651-430-8449

Customer Service:

Phone 651-430-1200
Toll-Free Phone 800-635-1312 (US and Canada only)
FAX 651-439-9733
Toll-free FAX 800-990-9733

Rental Program

Rental units are available at a minimal charge. Hospitals are required to issue a purchase order for rental and associated charges. The unit must be returned within 30 days.