

# MS 400

## Low Volt AC Muscle Stimulator

### User's Manual



LSI International

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## CAUTION

Federal Law restricts this device to sale by or on the order of a Physician, Chiropractor, or other practitioner licensed by the law of the state in which he/she practices to use or order the use of the device.

## MS400

The MS400 is an Electrical Muscle Stimulation Device

### Indications:

Electrical Muscle Stimulator Devices may be used for:

- 1) Relaxation of muscle spasm.
- 2) Prevention of retardation of disuse atrophy.
- 3) Increasing local blood circulation.
- 4) Muscle re-education.
- 5) Immediate postsurgical stimulation of calf muscles to prevent venous thrombosis.
- 6) Maintaining or increasing range of motion.

EMS DEVICES SHOULD ONLY BE USED UNDER MEDICAL SUPERVISION FOR ADJUNCTIVE THERAPY FOR THE TREATMENT OF MEDICAL DISEASES AND CONDITIONS.

### Electrodes and Conductive Media:

LSI recommends the use of LSI Silver self-adhesive electrodes provided with the unit.

Water soaked sponges should be used between the electrodes and the patient when carbon/rubber electrodes are used. The sponges should be monitored during treatment so that the desired dampness can be maintained. Do not let the sponges become too dry during treatment.

### Contraindications:

- 1) Current must not be applied to the Carotid Sinus (neck) region.
- 2) Current must not be used on patients who have a demand-type cardiac pacemaker.
- 3) Current must not be used to cause current to flow transcerebrally (through the head).
- 4) Current must not be used whenever pain syndromes are undiagnosed, until etiology is established.
- 5) Electrical Muscle Stimulation devices should not be used on cancer patients.
- 6) Do not apply electrodes transthoracically.

### Warnings:

- 1) The safety of Muscle Stimulator devices for use during pregnancy or delivery has not been established.
- 2) Muscle Stimulator devices are not effective for pain of central origin (this includes headache).
- 3) Muscle Stimulator devices should be used only under the continued supervision of a Physician.
- 4) Muscle Stimulator devices have no curative value.

- 5) The user must keep the device out of the reach of children.
- 6) Electronic monitoring equipment (such as ECG monitors and ECG alarms) may not operate properly.
- 7) Current must not flow through the thorax because it may cause cardiac arrhythmia.
- 8) Long term effects of chronic electrical stimulation are unknown.
- 9) Adequate precautions should be taken in persons with suspected heart problems.
- 10) Adequate precautions should be taken in persons with known or suspected epilepsy.
- 11) Severe spasm of the laryngeal and pharyngeal muscles may occur when the electrodes are positioned over the neck or mouth. The contractions may be strong enough to close the airway or cause difficulty in breathing.
- 12) EMS devices should not be used over swollen, infected or inflamed areas or skin eruptions, e.g., phlebitis, varicose veins.

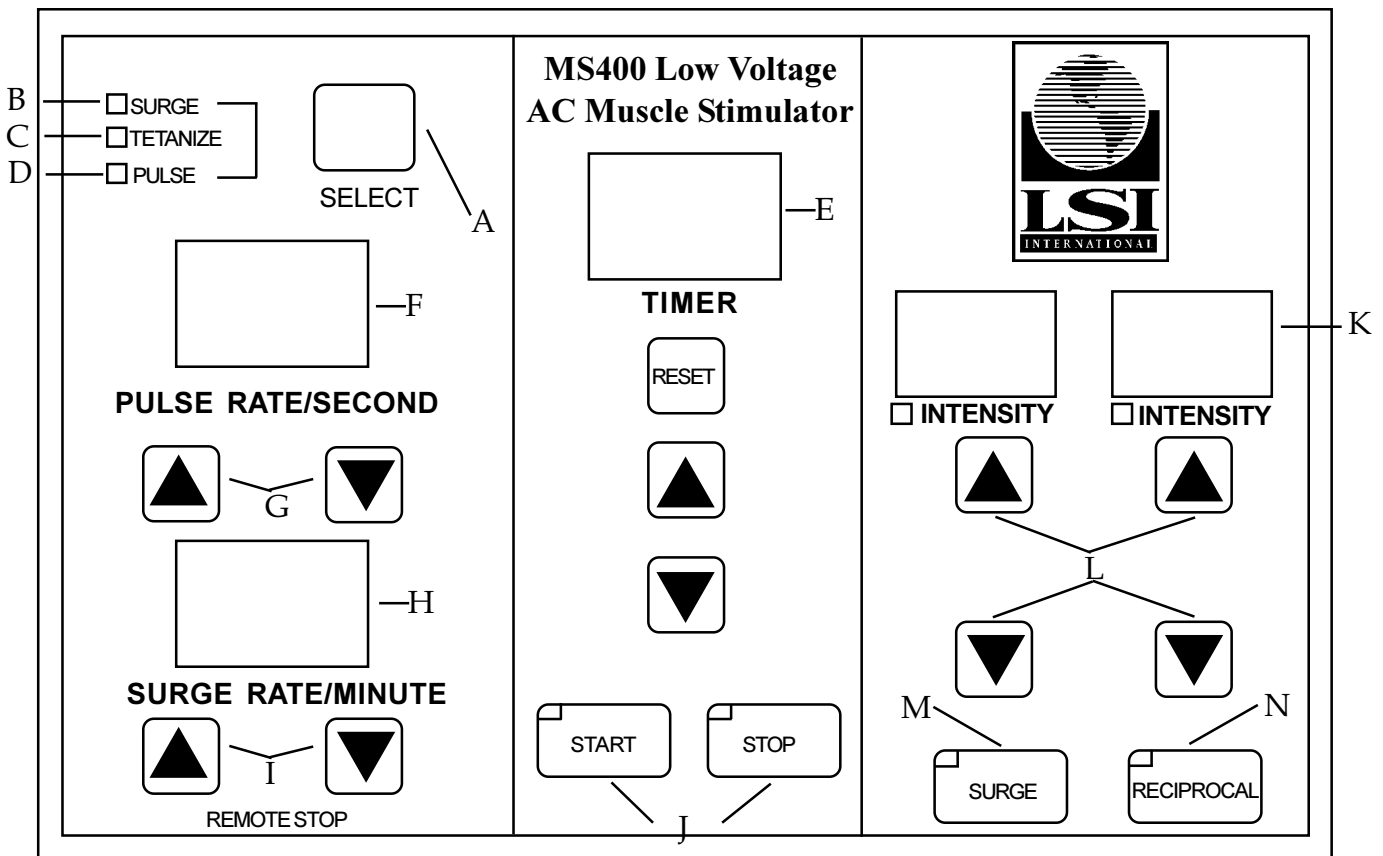
### **PRECAUTIONS:**

- 1) Precautions should be observed when there is a tendency to hemorrhage following acute trauma or fracture.
- 2) Precautions should be observed following recent surgical procedures when muscle contraction may disrupt the healing process.
- 3) Precautions should be observed when using EMS over the menstruating uterus.
- 4) Precautions should be observed when using EMS where sensory nerve damage is present by a loss of normal skin sensation.
- 5) Do not use in general area where high powered frequency transmitting units are being operated.
- 6) Shortwave diathermy should not be turned on or used at the same time, as it may interfere with the proper operation of the MS400.
- 7) Do not use the same power outlet or line with whirlpool, traction machines, and any other heavy electrical machines or motors.
- 8) In carpeted areas where static electricity is present, it may be necessary to use a conductive mat to discharge the operator.
- 9) This unit requires a grounded outlet. If you have any doubts as to the quality of the electrical wiring in your clinic, please have it checked out and verified by a professional.

Some patients may experience skin irritation or hypersensitivity due to electrical stimulation or electrical conductive medium. The irritation can usually be reduced by use of an alternative conductive medium, or alternative electrode placement.

Skin irritation and burns beneath the electrodes have been reported with the use of electrical stimulation.

The smallest size of electrodes that can be safely used with these devices must have an area of one square inch or greater.



### FEATURES

- A - SELECT: Press to select surge, tetanize or pulse mode.
- B - SURGE: Light on indicates surge mode selected.
- C - TETANIZE: Light on indicates tetanize mode selected.
- D - PULSE: Light on indicates pulse mode selected.
- E - TIMER: Indicates treatment time remaining.
- F - PULSE RATE/SECOND: Indicates pulse rate per second.
- G - PULSE RATE/SECOND CONTROLS: While in pulse or tetanize mode, pulse rate per Second is controlled by up or down arrows.
- H - SURGE RATE/MINUTE: While in surge mode, indicates surge rate per minute.
- I - SURGE RATE/MINUTE CONTROLS: When in surge mode, surge rate per minute is controlled by up or down arrows.
- J - START/STOP: Start and stop controls.
- K- INTENSITY: Indicates output intensity.
- L - INTENSITY CONTROLS: Output intensity is controlled by up and down arrows.
- M - SURGE: Activates surge mode.
- N - RECIPROCAL: Activates reciprocal mode.

## MS400

### INSTRUCTIONS FOR USE

- 1) Turn unit on by activating on/off switch on back of unit prior to placing electrodes on patient.
- 2) Select surge, tetanize or pulse modes by pressing “Select” key.
- 3) In the tetanize or pulse mode, you may adjust the pulse ratio by pressing the up or down arrows. In the surge mode, the pulse rate is fixed at 50. In the surge mode, the surge rate per minute is preset at 5, however, this can be adjusted by pressing the up or down arrows under “Surge Rate/Minute”.
- 4) The timer is preset to 10 minutes at the factory, however, it can be adjusted by use of the up and down arrows in the timer section. The preset time may also be adjusted. To do so, adjust the time indicated by use of the up or down arrows. When the desired time is indicated, hold the RESET key down for 5 beeps. When the RESET key is released, the new time will become the preset.
- 5) After turning the unit on and selecting the desired mode of operation, attach the electrodes to the patient.
- 6) Press START to activate the output and slowly increase output intensity until desired level of stimulation is reached.
- 7) When in surge mode, after the desired level of stimulation is attained, press the surge key under the Intensity controls. The MS400 will now gently surge on and off at the surge rate per minute previously selected. The output intensity may now only be modified during the on portion of the surge cycle.
- 8) To stimulate opposing muscle groups, the Reciprocal mode may be used. The following steps should be followed:
  - a) Select surge mode from surge, tetanize and pulse option.
  - b) Attach electrode from channel 1 to desired muscle and electrodes from channel 2 to opposite muscle group.
  - c) Press START.
  - d) Press RECIPROCAL. The intensity light for channel 1 will now flash indicating you can increase channel 1 intensity at desired level. Increase intensity to desired level.
  - e) Press RECIPROCAL again. The output for channel 1 will cease and the light for channel 2 will flash indicating you can increase channel 2 intensity to desired level. Increase channel 2 to desired level.
  - f) Press RECIPROCAL a third time. Channel 1 and 2 will now alternate stimulation in the SURGE mode. Intensity may only be increased or lowered while the appropriate channel is in the stimulation cycle.

- 9) When the timer reaches “00”, the output will cease.
- 10) The MS 400 is also supplied with a remote stop control. When the remote stop control is pressed, all output from the device will cease.

### MAINTENANCE AND TROUBLESHOOTING

Maintenance of the MS400 is limited to the periodic cleaning of the unit and the patient applied accessories with a damp cloth or sponge and a solution of mild soap and water. Any other cleaning solution may potentially damage the finish of the unit and/or the efficiency of the leads and electrodes.

If the MS400 unit does not seem to be operating properly, check the line cord and fuse, turn the unit on and check for the proper operation.

The MS400 contains no user repairable parts and servicing and repair should be referred to the authorized service personnel only. For servicing information contact:

LSI INTERNATIONAL  
8849 BOND  
OVERLAND PARK, KS 66214  
(913) 894-4493 OR  
(800) 832-0053

## MS400

### TECHNICAL SPECIFICATIONS

Power Source-	110/220 VAC 60 Hz
Wave Form-	Asymmetrical alternating current (A.C.)
Output Voltage-	110V peak into 1K ohm load 28V peak into 100 ohm load
Output intensity-	56 microcoulombs maximum charge per pulse into 100ohm load
Pulse Width-	200 microseconds at 50% V maximum
Frequency range-	1-80 pulse per second
Surge Duration-	4-10 surges per minute
Line Leakage-	10 microamperes max
Timer-	0-99 minutes
Output channels-	Two
Unit Dimensions-	4.25" high 10.00" wide 8.00" deep 3.25 pounds

### ACCESSORIES

#### Kit 1

- 1 each owner's manual
- 1 each power cord
- 2 each lead wire (DIN PIN jack, 0.80 mm pin connector, 72")
- 1 each patient remote stop
- 4 each 3" carbon rubber electrodes
- 4 each 3" sponges
- 1 each 48" nylatex wrap

#### Kit 2

- 1 each owner's manual
- 1 each power cord
- 2 each lead wire (DIN PIN jack, 0.80 mm pin connector, 72")
- 1 each patient remote stop
- 4 each packages of small self-adhesive electrodes

WARRANTY

LSI Low Volt Muscle Stimulators are warranted for 2 years after initial purchase date. Warranty covers parts and labor on the device. LSI will repair or replace defective parts or workmanship without cost during warranty period. Freight charges to and from the factory are not covered under this warranty. Damage due to misuse, negligent operation or shipping is not covered under this warranty.

LIMITATIONS AND EXCLUSIONS

This warranty does not apply to any equipment which has been tampered with in any way, or which has been misused or damaged by accident of negligence, or which has the serial number removed, altered or effaced. Accessories for the unit are warranted for the first ninety days from purchase.

FOR WARRANTY SERVICE

Liability under this warranty covers servicing of the unit returned to the factory. To implement the warranty, first notify LSI International concerning suspected defects. Then, if so instructed, ship the unit to LSI International by normal UPS delivery.

For authorization to return your unit or to inquire about possible malfunctions, call LSI International at 913-894-4493 or 1-800-832-0053.

DO NOT SENT YOUR UNIT TO THE FACTORY WITHOUT FIRST SECURING AUTHORIZATION TO DO SO AND OBTANING A RETURN AUTHORIZATION NUMBER.

SERIAL NUMBER: \_\_\_\_\_ SOLD TO: \_\_\_\_\_

DATE SOLD: \_\_\_\_\_

\_\_\_\_\_

This warranty is non-transferable.

LSI INTERNATIONAL, INC.  
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Overland Park, KS 66214