

LOW FREQUENCY STIMULATOR-T.E.N.S.

(KM-500T)



KMG K. M. G (KuMyung) Rev.2 2008,11,20

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1. Introduce

-Purpose of Use

This device is muscular atrophy and pain relieve using and built in for user convenience. device generates low frequency signals ranging from 1~1000[KHz] and has various built-in auto mode programs which are designed to automatically control the frequency/stimulation type according to the preset mode. First-time users can easily operate the device with a few button settings or use the manual mode to freely operate the frequency/stimulation type as the user intends.

- LCD display window is used
 - LCD display window is used to provide a sophisticated design for medical device and for users to easily judge the current status while using the device
- Frequency generated via a digital method
 - By generating low frequency signals through a digital method, the frequency output is more stabilized.
- Various built-in auto mode programs
 - Automatic frequency mode is built-in for user convenience. Auto mode can be set with a few button touches.
- Two independent frequency outputs(for two-person use)
 - There are two frequency outputs separated circuit-wise and the two channels can each start/stop and operate independently regardless of the mode.
- Automatic saving of most recently used setting
 - The most recently used setting for the operating time and mode are automatically saved so the setting is maintained even when the power is turned ON/OFF.
- Voice Guide
 - Previously, only beep sounds were generated for the guiding sounds. This device generates voice guides such as “Hello”, “Thank you for using” for more user-friendly use of the device.
- Use of suction electrodes
 - By using suction electrodes, areas which were previously difficult to contact can be attached simply. Also, the contact force has improved to provide more smoother low frequency stimulation to the treatment area.
 - Low frequency output and suction electrode operation are functionally separated, so the suction electrode can be used independently.

2. Precautions

-Precaution of Install

- Before use, certainly be sure to read through the use instruction then use.
- Definitely remove a wetness in the hands before touch the instrument then use.
Get rid of a wetness or dust etc at the connecting part of the operating panel.
- Move the equipment to the proper place where humidity/flammability is none.
- Do not get installed to the place where the electromagnetic wave is strong.
- Make sure that the equipment is grounded, and the electricity rating is AC 220[V], 60[Hz].
Connect the electricity. Study operating manual.

-Precaution of Patient

- Do not use for following : Those who have cardiac problems, are pregnant, are high-fevered, have an injury on the contact area, and are diagnosed by the physician to be unfit.
- Make sure that the vacuum level of the suction electrode is not too strong.
- Do not use on patients with transplanted electronic devices without the approval of a physician.
- Always check on the patient condition when device is in use.
- Adjust the treatment time and level according to the individual's physical strength and responsiveness.
- Do not use near the head, face or heart.
- Immediately stop use when trouble/defect is found.
- Use according to the prescription or instruction of a physician.

-Precaution of Use

(1) Precautions for the use

- ① Avoid over-using the equipment more than the time necessary for diagnosing and prescribing.
- ② Check the condition of a patient and the equipment.
- ③ When there is a disorder of the equipment or an abnormal condition of a patient, take proper measurements such as stopping the equipment while the patient is in safe condition.
- ④ Only an expert is allowed to operate the equipment.
- ⑤ When there is a malfunction, indicate the situation at a proper place and let an expert to fix it.
- ⑥ Do not use the equipment other than the purposes what the equipment must operate for.

(2) Methods of proper storage of the equipment

- ① Keep the equipment away from moisture.
- ② Store the equipment at a place where air pressure, temperature, humidity, ventilation, sunlight dust and air containing salt can't affect on it.
- ③Cautions are required under the circumstances of slant, vibration and shock.(operating included)

- ④ Keep the equipment away from a place where there are chemicals or gas.
- ⑤ Regular check ups on the equipment and components are required.
- ⑥ When reusing the equipment after not operating it for a while, make sure to check up the cleanness and safety of the equipment.
- ⑦ Maintain a cleanliness status making the aspiration pad to sterilize by a 70% isopropyl alcohol before and after use.

3. Composition of Stimulator

This stimulator consists of a main body, two aspirators and a power cable. Details are as followed:



Main Body



aspirator, hose,
sponge Pad



Power Cable

– Components

- Main body : 1
- Low frequency ceramic cup : 4EA(1SET)
- Low frequency Pad : 4EA(1SET)
- Sponge for ceramic : 4
- Power cord : 1
- Operating manual : 1
- Hose for drainage : 1

4. Name of parts and Description of Function

- Front Section

- The front section is composed of the output terminal connecting the electrode cup, electrode suction level control volume and suction/drain time control volume.



- CH1 output terminal : Terminal to connect CH1 electrode pad. Outputs 1~1000[KHz] frequency.
- CH2 output terminal : Terminal to connect CH2 suction/drain electrode cup. Outputs 1~1000[KHz] frequency.
- VACUUM control volume : Controls the suction level of the electrode cup. Turning in the right direction increases the suction level.
- MODULATION control volume : Controls the suction/drain time. Turning all the way to the left continues the suction operation and otherwise, turning to the right controls in interval of 4~2 seconds.
- MODULATION lamp : Turns on during the suction operation and turns off during the drain operation or when the VACUUM operation is not being performed.

- Top Section

- The top section is the core control area of this device. The mode can be set using the buttons here and the mode status or progress status can be checked here. Based on the center, the left CH1 and right CH2 setting buttons are located symmetrically.



- SUCTION

- ▶  VACUUM key : Turns ON/OFF the suction operation of the electrode cup. VACUUM cannot be performed without pressing this button and since this operates separately from the low frequency output, the suction/drain operation can be performed without using low frequency.

- ▶  DRAIN key : This button is to drain the water from the internal water bucket which stores the water flowing into the main body during the electrode cup suction through the drain area at the back of the device. This button has been designed to perform the drain operation only when the button is pressed for over 1 second to prevent draining when pressing by accident. The drain operation is performed for 15 seconds and then automatically stopped. The device can not be operated during the drain operation.

-  TIME UP/DOWN key : This is the button to control the low frequency output time. If the time is set in a suspended state, the time will be automatically saved when the power goes off. If set during the low frequency output, it will extend the low frequency output time.

-  VOICE SOUND UP/DOWN key : Adjusts the volume of the guide voice such as “Hello”, “Thank you for using.”.

-  Hear Low Frequency Output Sound key : When this button is pressed during low frequency output, the low frequency output sound can be heard through the speaker. However, if the low frequency sound from both channels are heard at the same time, this may become noise, so this button is located in both CH1 and CH2 so only one channel can be selected to be heard at one time. If you do not want to hear the low frequency sound, press the button of the channel where the low frequency sound is coming from to turn off the sound.

- Pulse type selection key : This button is for selecting the pulse type. Type ① has high pressure while types ② and ③ output pressure are lower and feel smoother. Type ① is generally used.
 - ①  single pulse : General low frequency output. single output
 - ②  pulse type : Pulse is closely divided.
 - ③  pulse type : Similar to type ② but the pulse length is longer than type ②.

- Mode Setting
 - ▶  AUTO Mode : TAPP, PRESS, MASS, ROLL output in combination.
 - Pressed 1 time : Automatic output change from 10Hz to 200Hz frequency.
 - Pressed 2 times : Automatic output change from 1Hz to 50Hz frequency.
 - Pressed 3 times : Automatic output change from 1Hz to 40Hz frequency.
 - Pressed 4 times : Automatic output change from 10Hz to 20Hz frequency.
 - Pressed 5 times : Automatic output change from 10Hz to 100Hz frequency.

- ▶ **M2** PRES mode : Provides a strong pressuring feeling.
 - Pressed 1 time : Automatic output change from 50Hz to 500Hz frequency.
 - Pressed 2 times : Low frequency output with 50Hz frequency.
 - Pressed 3 times : Low frequency output with 100Hz frequency.
 - Pressed 4 times : Low frequency output with 500Hz frequency.
 - Pressed 5 times : Low frequency output with 1000Hz frequency.

- ▶ **M3** MASS mode : This output provides a massaging feeling.
 - Pressed 1 time : Automatic output change from 100Hz to 1000Hz frequency.
 - Pressed 2 times : Low frequency output with 100Hz frequency.
 - Pressed 3 times : Low frequency output with 250Hz frequency.
 - Pressed 4 times : Low frequency output with 500Hz frequency.
 - Pressed 5 times : Low frequency output with 1000Hz frequency.

- ▶ **M4** ROLL mode : By lowering the right output when the left output becomes higher and lowering the left output when the right output becomes higher, this mode provides a feeling of rubbing right and left.
 - Pressed 1 time : Automatic output change from 7Hz to 500Hz frequency.
 - Pressed 2 times : Low frequency output with 20Hz frequency.
 - Pressed 3 times : Low frequency output with 100Hz frequency.
 - Pressed 4 times : Low frequency output with 250Hz frequency.
 - Pressed 5 times : Low frequency output with 500Hz frequency.


- ▶ **M5** TAPP mode : Pulse output of low frequency is used to give a patting feeling.
 - Pressed 1 time : Automatic output change from 1Hz to 10Hz frequency.
 - Pressed 2 times : Low frequency output with 1Hz frequency.
 - Pressed 3 times : Low frequency output with 3Hz frequency.
 - Pressed 4 times : Low frequency output with 7Hz frequency.
 - Pressed 5 times : Low frequency output with 10Hz frequency.

– BALANCE volume : The output of the electrode flowing to the left/right can differ depending on the area in contact and degree of contact, and this volume adjusts the left/right output balance.

– INTENSITY volume : When turning in clockwise direction from the zero position, a "tick" sound will be heard and the low frequency output will start. When turning in the counter clockwise direction, a "tick" sound will be heard and the low frequency output will be stopped.

• Back Section



- Power socket: Connects the power plug.(Supplies AC200V, 60Hz).
- Grounding terminal : Connects the grounding in the building.
- Drain : Used to drain the water bucket inside the device. The drain operation is performed under the following conditions.
 - ▶ “  DRAIN” key is pressed to manually drain
 - ▶ The water bucket inside the device has become full and is automatically drained
- ※ All drain operations drain for 15 seconds and then the internal drain valve is automatically closed.

• Status Description

The current status is displayed at the bottom of the LCD. The following describes the status meanings .

- “**MODE SET**” : Waiting state of mode setting. Nothing is being done in this state and the user can select the mode to use here.
- “**MODE RUN**” : This is displayed during low frequency output.
- “**TIME OVER**” : When the output time preset by the user is over, the “TIME OVER” message is displayed and the output is stopped.
- “**OVER CURR**” : This is the state in which the output surpasses 55[mA] and becomes overloaded during low frequency output. If in this state, the output is automatically stopped and the alert sound is generated.
- “**ZERO CHK**” : When the INTENSITY volume is not at the zero position when the main power is turned on or the start key is pressed, the alert sound is generated.
- “**OVr WATER**” : This message is displayed when the water bucket inside the device is full. The water is automatically drained through the drain at the back of the device. If the low frequency output was being performed, then it will automatically be stopped.
- “**DRN WATER**” : This message is displayed when the DRAIN key is pressed to manually drain the water bucket.

5. How to use


1) How to use

- ① Turn on the power switch at the front side of the main body.
- ② Make sure that every switch indicates zero or "0".



- ③ Connect the blue connector (A A') and the red connector (B B') to the suction hose terminal at the main body.



- ④ Make sure that suction cups, and stainless steel electrode and sponges are clean.
- ⑤ When using the aspirator, put the watered sponge into the low frequency cup after squeezing it so it doesn't contain too much water.
- ⑥ Keep the part to be stimulated clean and check the condition of skin.
- ⑦  Push suction mode button and check whether the suction works normally.
- ⑧ Attach the aspirator to the part to be stimulated.
The electrode allocation method can either be 2 or 4 terminals.
- ⑨ Operate the equipment under the operating order described below.
After the operation finishes, initialize the equipment in a reverse order.
- ⑩ Keep the aspirator clean with 70% of isopropyl alcohol after the use.

2) Operating order

(1) Fixed frequency stimulation

Fixed frequency stimulation operates for the case when repeated stimulation of low frequency is needed. The stimulation is classified into MODE2, MODE3S, MODE1 and MODE4 according to the output signal. The way of using it is described below.

- ① Turn on the power switch. Zero Start alarm would sound if the output controlling volume was not set up on zero point.
- ② Select one among M1~M4 using the memory button.
- ③ Set up the time by pushing UP/DOWN button of TIME.
- ④ Select suction mode of CH1 or CH2. Push once for ON, and another for OFF.
- ⑤ Turn air pressure controlling volume to the necessary level.
- ⑥ Turn suction period controlling volume to start.

- ⑦ Attach the aspirator to the necessary part.
- ⑧ Turn INTENSITY volume to start the output of low frequency.
- ⑨ Turn the same volume at the level of necessary output strength.
- ⑩ When stopping the equipment, turn the INTENSITY volume as low as possible.
- ⑪ Stop SUCTION function of CH1 or CH2. Push once for OFF.
- ⑫ Pull out the electricity cord when the equipment is not used.

(2) Automatic mode(built-in programmed stimulation)

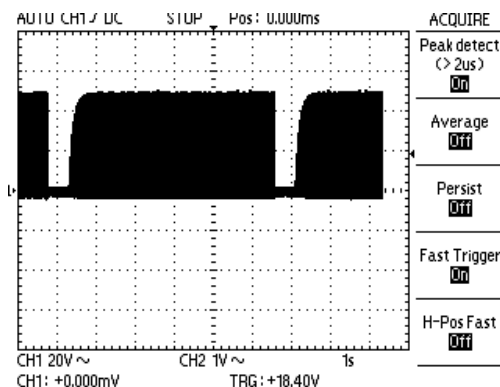
Built-in programmed stimulations indicates stored stimulation patterns in advance for the easy use of effective stimulation. The program can be found in AUTO #1.

▶ AUTO mode : Output MODE2, MODE3, MODE1, MODE4 complexly.

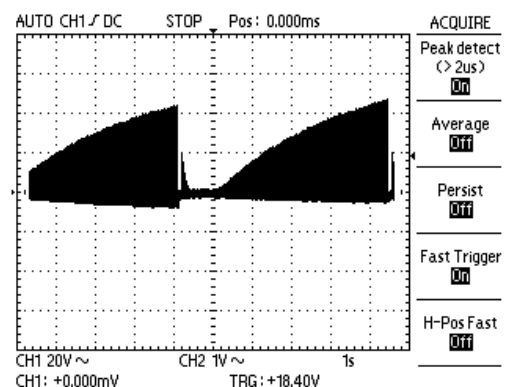
- ① Turn on the power switch. Zero Start alarm would sound if the output controlling volume was not set up on zero point.
- ② Select M1 by pushing memory button.
- ③ Set up the time by pushing UP/DOWN button of TIME.
- ④ Select suction mode of CH1 or CH2. Push once for ON, and another for OFF.
- ⑤ Turn air pressure controlling volume to the necessary level.
- ⑥ Turn suction period controlling volume to start.
- ⑦ Attach the aspirator to the necessary part.
- ⑧ Turn INTENSITY volume to start the output of low frequency.
- ⑨ Turn the same volume at the level of necessary output strength.
- ⑩ When stopping the equipment, turn the INTENSITY volume as low as possible.
- ⑪ Stop SUCTION function of CH1 or CH2. Push once for OFF.
- ⑫ Pull out the electricity cord when the equipment is not used. Set up modes.

Mode types

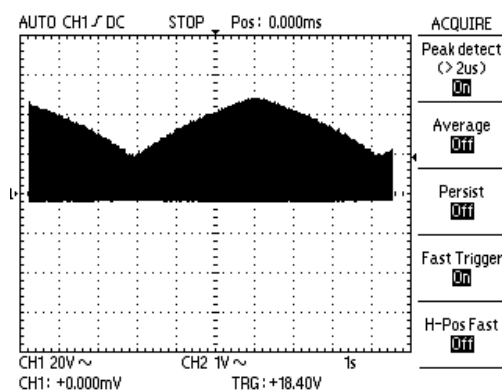
- ▶ MODE2 : Output standard frequency without amplitude changes.
- ▶ MODE3S : Repeat sending and pausing electric current without amplitude changes.
- ▶ MODE1 : Repeat gradual increase of amplitude and pause.
- ▶ MODE4 : Repeat gradual increase and decrease of amplitude. When frequency on the left increases, the one on the right decreases, and vice versa. This process is repeated.



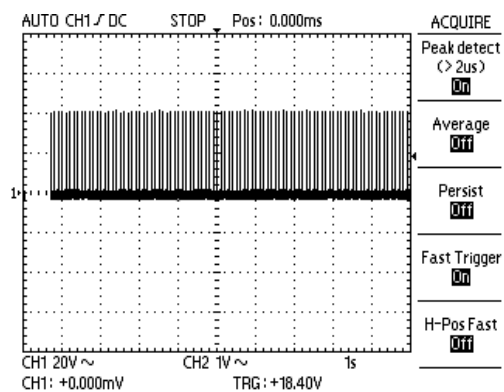
MODE2 [PRESS]



MODE3 [MESSAGE]



MODE4 [ROLLING]



MODE5 [TAPPING]

AUTO MODE (Built-in programmed)

▶ AUTO Mode : MODE2, MODE3, MODE1, MODE4 output in combination

▶ **M1** MODE2 Mode

- Pressed 1 time : Automatic output change from 1Hz to 10Hz frequency.
- Pressed 2 times : Low frequency output with 1Hz frequency
- Pressed 3 times : Low frequency output with 3Hz frequency
- Pressed 4 times : Low frequency output with 7Hz frequency
- Pressed 5 times : Low frequency output with 10Hz frequency

▶ **M2** MODE3 mode

- Pressed 1 time : Automatic output change from 50Hz to 500Hz frequency.
- Pressed 2 times : Low frequency output with 50Hz frequency.
- Pressed 3 times : Low frequency output with 100Hz frequency.
- Pressed 4 times : Low frequency output with 500Hz frequency.
- Pressed 5 times : Low frequency output with 1000Hz frequency.

▶ **M3** MODE1 mode

- Pressed 1 time : Automatic output change from 100Hz to 1000Hz frequency.
- Pressed 2 times : Low frequency output with 100Hz frequency.
- Pressed 3 times : Low frequency output with 250Hz frequency.
- Pressed 4 times : Low frequency output with 500Hz frequency.
- Pressed 5 times : Low frequency output with 1000Hz frequency.

▶ **M4** MODE4 mode

- Pressed 1 time : Automatic output change from 7Hz to 500Hz frequency.
- Pressed 2 times : Low frequency output with 20Hz frequency.
- Pressed 3 times : Low frequency output with 100Hz frequency.
- Pressed 4 times : Low frequency output with 250Hz frequency.

- Pressed 5 times : Low frequency output with 500Hz frequency.

▶ Operating Step AUTO MODE

– Selection Mode

▶ **M1** MODE2 Mode

- Pressed 1 time : Automatic output change from 1Hz to 10Hz frequency.
- Pressed 2 times : Low frequency output with 1Hz frequency
- Pressed 3 times : Low frequency output with 3Hz frequency
- Pressed 4 times : Low frequency output with 7Hz frequency
- Pressed 5 times : Low frequency output with 10Hz frequency

▶ **M2** MODE3 mode

- Pressed 1 time : Automatic output change from 50Hz to 500Hz frequency.
- Pressed 2 times : Low frequency output with 50Hz frequency.
- Pressed 3 times : Low frequency output with 100Hz frequency.
- Pressed 4 times : Low frequency output with 500Hz frequency.
- Pressed 5 times : Low frequency output with 1000Hz frequency.

▶ **M3** MODE1 mode

- Pressed 1 time : Automatic output change from 100Hz to 1000Hz frequency.
- Pressed 2 times : Low frequency output with 100Hz frequency.
- Pressed 3 times : Low frequency output with 250Hz frequency.
- Pressed 4 times : Low frequency output with 500Hz frequency.
- Pressed 5 times : Low frequency output with 1000Hz frequency.

▶ **M4** MODE4 mode

- Pressed 1 time : Automatic output change from 7Hz to 500Hz frequency.
- Pressed 2 times : Low frequency output with 20Hz frequency.
- Pressed 3 times : Low frequency output with 100Hz frequency.
- Pressed 4 times : Low frequency output with 250Hz frequency.
- Pressed 5 times : Low frequency output with 500Hz frequency.

▶ **M5** AUTO mode : MODE2, MODE3, MODE1, MODE4 output in combination

- Pressed 1 time : Automatic output change from 10Hz to 200Hz frequency.
- Pressed 2 times : Automatic output change from 10Hz to 200Hz frequency.
- Pressed 3 times : Automatic output change from 1Hz to 40Hz frequency.
- Pressed 4 times : Automatic output change from 10Hz to 20Hz frequency.
- Pressed 5 times : Automatic output change from 10Hz to 100Hz frequency.

6. Troubleshooting

• Description of LED display window status

The current status is displayed in the top part of the LED. The status meanings are shown in the following.

- “**MODE SET**” : Waiting state of mode setting. Nothing is being done in this state and the user can select the mode to use here.
- “**MODE RUN**” : This is displayed during low frequency output.
- “**OVER CURR**” : This is the state in which the output surpasses 55[mA] and becomes overloaded during low frequency output. If in this state, the output is automatically stopped and the alert sound is generated.
- “**-- ” TIME FND**” : When the low frequency output is overloaded, surpassing the maximum output, the output is automatically stopped and the alert sound is generated.
- “**ZERO CHK**” : When the INTENSITY volume is not at the zero position when the main power is turned on or the start key is pressed, the alert sound is generated.
- “**OVR WATER**” : This message is displayed when the water bucket inside the device is full. The water is automatically drained through the drain at the back of the device. If the low frequency output was being performed, then it will automatically be stopped.
- “**DRN WATER**” : This message is displayed when the DRAIN key is pressed to manually drain the water bucket.
-Voice output level : 0, 1, 2, 3 Step of voice control is available.

7. Electrical and Mechanical Characteristics

(1) Voltage : AC 220V, 50/60Hz

(2) Power consumption : 55VA

(3) Output current : Maximum 55mA (in 500Ω non-inductive load resistance)

(4) Output voltage : Maximum 60Vp-p (in 500Ω non-inductive load resistance)

(5) Output frequency : (1Hz ~ 1000Hz)

- Pulse shape definition : symmetrical trapezoidal waveform

(6) Mode

Waveform shape	Characteristic
M1	The amplitude gradually increases and then returns to the initial value. This is repeated.
M2	Outputs the basic waveform without amplitude changes.
M3	Repeats applying the electric current and then pausing without amplitude changes.
M4	Amplitude changes are gradually increased and then decreased periodically. This is repeated.

(7) Timer : maximum 60 minutes

Electrical sound(buzzer) is generated when digital timer stops

(8) Pressure Suction : maximum pressure is $\pm 15\%$ inside of 385 mmHg

(9) Suction/pressure interval : Minimum : 1 Second Suction, 1 Second Pressure (20%)
Maximum : 2 Second Suction, 2 Second Pressure (20%)

(10) Dimension : 400mm×300mm×210mm

(11) Weight : 9.5[kg]

8. Repair and A/S

! Before requesting maintenance

- This device has been strictly tested in the factory, but if thought to have trouble/defect, please contact the distributor.
- In case of trouble/defect due to breakdown or unknown cause, do not repair yourself but request to the distributor or sales office for maintenance.
- When requesting maintenance, please include the following explanation.

Location to send the product after maintenance(address, name, telephone number, map of location).

**CAUTION : Do not disassemble or repair and remodel other than the
medial device manufacturer
(Device repaired/remodeled by the unauthorized can not receive A/S.)
The device may catch fire or operate abnormally and injure people.**

9. Items

(1) Product Name : Low Frequency Stimulator(A16010), Model Name : KM-500T

(2) Manufacturer : KMG(KuMyung)

(3) Manufacturer Address : 2/5F Samsan B/D, 419, Hasinbeonyeong-ro, Saha-gu, Busan

(4) Factory Telephone Number : +82-51-804-2213

(5) Product License No. : No.06-566

(6) Manufacture No : No 1780

(7) Date of Manufacture : LT

(8) Electrical Voltage & Watt : AC 220[V], 60[Hz], 55VA

(9) Purpose of use : Device for easing muscular pains by applying current to the body through electrodes

- Weight and Packaged Unit :

Weight	Approximately 9.5kg
Packaged Unit	1 set

- Other technical information of medical device including device characteristics
 - Electrical rating : AC 220V, 60Hz, 55VA
 - Protection method against electrical shock and degree of protection : Class 1, BF-type device
 - Other necessary information : Mentioned in attached document(User Manual)
 - Attachment area : outside of product
 - This device is for medial use.
- (10) Voltage Limit : Max 60Vp-p (500[Ω]Non-inductive resistance)
Current limit : Output Current Max 55[mA](500[Ω]Non-inductive resistance)
Waveform : Pulse group, pulse
Output frequency : 1~1,000[Hz]
Timer : 1~60 minutes (remembers preset time)
- (11) Quantity : 1SET (12) Weight : approximately 10Kg
- (13) How to use and cautions on use : Refer to attached document(User Manual)
- (14) Protection method against electrical shock and degree of protection : Class 1, BF-type device
- (15) This device is for medical use.

10. product Warranty

<Warranty Regulation>

The warranty period for the main body of the device is one year from the date of purchase. Accessories are excluded.







In the case of trouble/defect, include this product warranty in the product when requesting maintenance to the purchased store or manufacturer.

Please take care as maintenance fees will be charged in the following situations during the warranty period.

- Trouble due to mishandling
- Trouble due to product remodeling or maintenance from places other than the designated A/S shops.
- Trouble and loss due to natural disasters such as fire, earthquake and flood damage.
- External cause of trouble, that is caused from somewhat other than the product
- Not mentioned in the product warranty

- ※ These regulations are valid for use inside the country.
- ※ These regulations are not to restrict the customer's rights.
- ※ The customer shall pay the transportation fees or other costs occurred for maintenance.

Product Warranty

Product Name	Low Frequency Stimulator	Model Name	KM-500T
SN	LT		
Intended Use		Package	1Box 1Set
Voltage	230V, 50/60Hz	Power Consumption	55VA
	CAUTION – Refer to accompanying documents.		
	KMG Co.,Ltd. 2/5F Samsan B/D, 419, Hasinbeonyeong-ro, Saha-gu, Busan		
			
			

- ※ Please confirm the purchase location during purchase to be entitled to free maintenance and support
- ※ Other Information :