acticare


Electrotherapy
pain relief system

# User Manual

# Need Help?

If you need advice about any aspect of your Acticare device please email us at:
UK and Europe uk@acticare.com
Australia and NZ aus@acticare.com
or consult our website www.acticare.com for support telephone numbers.

Calls may be recorded for quality control purposes.

Common problems are listed in the troubleshooting guide in section 10.

## Key to Symbols used in this Manual

**Contra-indications.** These notes describe situations where you should not use Acticare TSE.

**Warnings and Cautions.** Make sure you understand these before using Acticare TSE.

**Important Note.** This symbol appears next to key points of note.

acticare TSE ®

CE 0120


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## Warranty information

Bioinduction Ltd warrants Acticare TSE and its fast charge cradle free from defects in workmanship and materials for one year from the date of invoice.

Electrodes, batteries, carry cases, lead wires and other accessories are warranted to be free from defects in workmanship or materials at the time of delivery.

Bioinduction Ltd will repair or replace, at its discretion, any product found to be defective within the warranty period.

This warranty does not apply to any product which has been damaged due to misuse, or that was repaired or altered other than by the manufacturer.

acticare TSE

# Introduction

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## Welcome to Acticare TSE!

Congratulations, you have invested in an Acticare TSE device to help manage your pain without increasing your intake of drugs. If you are eager to get started, you only need follow the instructions on the enclosed “Quick Start Guide”.

Acticare TSE provides effective relief from persistent pains anywhere on the body. In a January 2005 study of 150 patients who used Acticare TSE for a period of two months, more than 3 out of 4 said that they had 50% or more pain relief, despite an average duration pain of 9 ½ years. In addition to providing pain relief, TSE improves mood, relieves stress and can aid natural sleep.

TSE is an accumulative therapy and therefore it is important that you treat yourself regularly for at least a week, preferably two, before you assess your level of relief. Although TSE may reduce pain, in many cases it does not completely eliminate pain.

Acticare TSE should only be used to treat diagnosed pains. If you have any new symptoms always consult your doctor. Also, do not vary your intake of any prescribed medication without consulting your doctor.

TSE is safe to use in the home, but should not be used if you are epileptic, pregnant or have a cardiac pacemaker.

Many people find that by using TSE they have good relief from pain for the first time in many years, which leads to a recovery of mobility. If this is your experience, please take care not to “overdo it” but instead ease yourself gradually back into a more active lifestyle.

## About “TSE”, “TENS” and “RF”

Acticare TSE can deliver two different types of electrotherapy called “TSE”, “TENS” and “RF”.

### “TSE” stands for:

Transcutaneous (through the skin) Spinal Electroanalgesia (electrical pain relief). TSE is a unique and powerful form of electrotherapy available only on Acticare devices.

### “TENS” stands for:

Transcutaneous (through the skin) Electrical Nerve Stimulation. TENS is a commonly available form of electrotherapy used widely by physiotherapists and doctors. TENS treatments normally produce a tingling sensation and work by stimulating the peripheral nerves.

### "RF" stands for:

Radio-Frequency. This is a form of TSE where the pulses are delivered in short bursts rather than individually and is similar in concept to pulsed radio frequency treatment used widely in pain clinics.

## The History of TSE and Acticare

Electrical stimulation of the spinal cord for pain relief dates back to 1967, when electrodes were implanted in the spinal cord to block the sensation of pain. This technique is called Spinal Cord Stimulation (SCS). Spinal Cord Stimulation is often effective against longstanding pain, but has the disadvantage that surgery is required to implant the electrodes.

In 1991, inspired by the success of SCS, Drs Alex Macdonald and Tim Coates discovered Transcutaneous Spinal Electroanalgesia (TSE). They were granted patents on the technology in 1995 and 1997.

TSE uses very short electrical pulses applied to the spinal cord via the skin. These pulses are only a few millionths of a second in duration, but of relatively high voltage. The pulses pass through the skin and tissues to the spinal cord. They are too short to cause any more than a very mild tingling sensation in nerves under the skin, so the therapy is well tolerated by most people.

TSE has been used as a form of electrical pain relief since its discovery in 1991. No serious side effect or interaction with medication has been reported despite being used in over 100 NHS hospitals and by thousands of patients in their homes.

TSE will work alongside drug therapy without harmful interactions or side effects and is complimentary to physiotherapy, osteopathy and acupuncture. TSE has also been clinically proven to improve mood and aid relaxation.

## How Does TSE differ from TENS?

Transcutaneous Electrical Nerve Stimulation (TENS) is a popular and successful treatment for the relief of common aches and pains. There are however a few limitations to its use. Effectiveness may reduce over a period of time and the period of post-stimulation relief tends to be brief. Also, TENS electrodes must be placed over the painful region and correct placement often requires experimentation.

One benefit of TSE is that the electrode locations are standardised. Two surface electrodes are always placed over the spinal cord wherever the painful regions are. Because the spinal cord is the body's conduit for pain signals, TSE can relieve multiple pains in different parts of the body at once. Furthermore, the effect of TSE tends to be cumulative over time in about 50% of patients.

In order to penetrate deep tissues, TSE pulses are of higher voltage and higher power than TENS. But because of their very short duration, TSE pulses produce less stimulation of the peripheral nerves and therefore little or no tingling sensation which some patients find uncomfortable.

The Acticare TSE device looks very similar in size and shape to a regular TENS device, but its size is deceptive: under typical treatment conditions it delivers ten times the power.

# Important Information

## Indications

Acticare TSE is intended to be used for the symptomatic relief of chronic pains of all types, to help improve mood and aid natural sleep.

## Contraindications

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**Cardiac pacemakers** Not to be used by persons fitted with a cardiac pacemaker.

**Epilepsy** Not to be used by persons who suffer from an epileptic condition.

**Transthoracic Stimulation (Chest)** Do not apply the electrodes across the chest. This can cause electrical current to enter the chest and may lead to irregularities in heart beat.

**Cranial Stimulation (Head)** Do not apply the electrodes across the head.

**Skin and vascular problems** Do not apply the electrodes over infected areas of skin, skin eruptions, dermatological conditions, open wounds or damaged or broken skin or on areas of the body where there is a loss of normal skin sensation.

**Unknown Cause** Do not use to relieve undiagnosed pains, until cause has been established by a clinician.

**Carotid Sinus (Neck Stimulation)** Avoid using any electrode placement that stimulates the carotid sinus region at the front of the neck. In rare cases, spasm of the laryngeal and pharyngeal muscles may occur when the electrodes are placed across the neck or mouth. This may be strong enough to cut off the airway causing breathing difficulty.

## Warnings

**Pregnancy** The safety of using electrotherapy at anytime during pregnancy or birth has not been established.

**Drowsiness** This device can cause drowsiness or light-headedness. During use, or after use if feeling drowsy, never operate potentially dangerous machinery such as power tools, automobiles, etc.

**Symptomatic treatment** This device may suppress sensations of pain that would otherwise serve as a protection mechanism.

**Keep out of reach of children** This device is not recommended for use on children except under clinical guidance.

**Metallic Implants** Consult a clinician before using TSE if you have a metallic implant in your spine or neck. Not recommended for use by persons with metallic rods in the spine, where these rods lie between electrode locations.

**Tumours** Use only under the guidance of a clinician.

**Neurological damage** Use only under the guidance of a clinician for persons with neurological conditions such as MS, stroke and cognitive defects.

**Electronic equipment** Electronic monitoring equipment such as cardiac alarms may not function properly if used simultaneously with this device.

**External use** Only for external use. Not for internal use.

## Warnings

**Spinal Cord Stimulators** This device is not recommended for use in persons with an implanted spinal cord stimulator.

**High frequency Surgical Equipment** Simultaneous connection of a patient to high frequency surgical equipment may cause burns at the site of electrodes and possible damage to the device.

**Microwave or Radio frequency sources** Operation close (less than 1m) to sources of short-wave radio or microwave equipment is not recommended.

**Damage from liquids** Do not allow Acticare to come into contact with water or other liquids. Do not use in the bathroom.

**Flammable atmospheres** Do not use this device in the presence of flammable gases or liquids, such as when refueling an automobile.

**Connections** Do not connect Acticare TSE to anything other than the approved charger cradle and electrode lead wires.

**Uncomfortable stimulation** Do not operate at a level at which the stimulation is uncomfortable; reduce the intensity to a comfortable level.

**No curative value** This device is effective for the treatment of chronic pain but has no curative value.

**Long-term effects** The long-term effects of of electrical stimulation have not been established.

## Adverse reactions

**Skin irritation under electrodes** This usually resolves itself within a few days. A hypo-allergenic electrode material is available for sensitive skin.

**Electrode reactions** can arise from high intensity stimulation or mono-phasic currents that are available in advanced modes. Use the default biphasic modes and/or reduce stimulation level.

**Adverse reactions** to electrotherapy are rare but reported cases include the following: general malaise, nausea, vomiting, dizziness, fainting, migraine or headache, epileptic seizure, eczema, tinnitus, numbness, loss of muscle tone and balance, swelling or redness. If affected, discontinue use and seek medical advice.

## Limitation of Liability

To the maximum extent permitted by law, Bioinduction Ltd, its subsidiaries, suppliers or resellers (collectively "Bioinduction") accepts no liability for any damages arising from the use of or inability to use the product including but not limited to indirect, incidental or consequential damages.

In any event, Bioinduction's entire liability shall not exceed the purchase price of the product, with the sole exception of death or personal injury caused by the negligence of Bioinduction but only to the extent that applicable law prohibits the limitation of damages in such cases. The purchaser indemnifies Bioinduction from all claims arising from third parties.

Bioinduction will not be held liable for any loss resulting from incorrect information provided by its personnel, errors or omissions in this manual and other documentation.

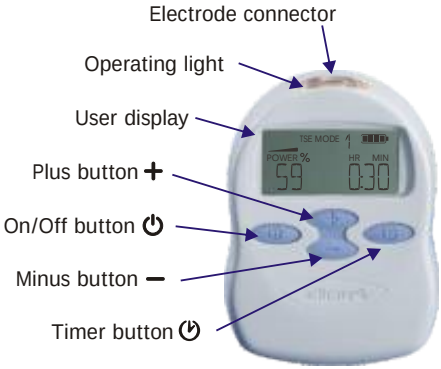
By using the product the purchaser agrees to be bound by these terms, otherwise purchasers should return the product unused within 14 days of receipt requesting a refund.

## Identifying the components of Acticare TSE


To protect your Acticare TSE during transport, we recommend that you pack the device and charger in the pockets in the bag as illustrated.



## Features of the Acticare TSE unit




Front View


Back View

## Display Symbols and Their Meaning

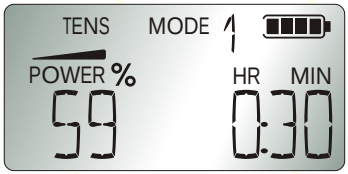
### Mode Indication

Shows which treatment and the number of the preset mode the device is using:

| | |
|---|---|
| TSE | Transcutaneous Spinal Electroanalgesia |
| TENS | Standard and high frequency TENS |
| RF | Pulsed radio-frequency |
| ADV | Advanced mode |

### Battery:

Indicates the amount of charge left in the batteries. Scans when charging.




Example Screen

### Intensity setting:

Shows the intensity (voltage) setting as a percentage from 0% (off) to 100% (max).

Flashes when power output is at maximum safety limit.

### Treatment timer:

Shows the remaining treatment time in hours and minutes and in seconds for the last minute of treatment.

## Installing the batteries

Your device is supplied with four AA rechargeable Nickel Metal Hydride (NiMH) batteries which must be installed before use.

1. Open the battery cover by squeezing the blue catch into the belt clip as shown.

2. Insert four new AA batteries making sure the polarity is correct. The correct polarity is indicated by symbols in the battery compartment.

3. Close the battery cover. Check that it is secure. If the batteries are correctly installed the battery symbol  will be displayed on the screen.

## Charging the batteries

The supplied fast charge cradle provides a full charge in 2½ hours. To charge batteries, plug the device into the charger stand as shown below. Make sure you push the device fully into the cradle to ensure proper contact. An intermittent beeping means that the device is not pushed completely in.

The battery symbol will scan to indicate that the battery is charging. If the battery is not charging check to make sure the charger is plugged in and the socket is switched on. When the batteries are fully charged the battery symbol shows full.


Battery Low


Battery Full

Acticare TSE cannot be used for treatment when it is on the charger stand. Placing Acticare TSE on the charger stand during a treatment causes the device to switch off.

## Battery Lifetime

Under typical operating conditions freshly charged batteries should last for 1-2 hours. The amount of charge left in the batteries is shown on the battery indicator when the device is switched on.

Typically, NiMH batteries need replacing after 6 months of continuous use although you may need to replace them sooner if you are experiencing poor performance.

## Using Non-Rechargeable Batteries

Acticare TSE can be used with AA sized alkaline batteries. You may find this useful if travelling abroad, but you should note that with the high power TSE modes, alkaline batteries may be exhausted in a couple of hours.

## Storing Acticare TSE

If you plan to store your unit for a period of longer than a month, we recommend that you remove the batteries from the unit. This

Never attempt to recharge standard alkaline batteries. Do not plug anything into the base of Acticare TSE except for the dedicated Acticare charger stand.

# Treating Yourself with TSE

## Getting started with TSE

Getting started with TSE is easier than TENS since there are only two electrode placements to consider. Correct electrode placement is one of the major reasons that users of TENS experience difficulties in early use. To get started, follow the steps summarised in the flowchart below and described in detail over the next few pages.

While treating yourself with TSE, you can continue to go about your daily routine, but because TSE can sometimes cause drowsiness we recommend that you do not drive if affected.

5

**Plug the lead wire** into the top of the device and connect to two electrodes.

↓

**Stick the electrodes** on your skin in one of the two positions shown on page 12 depending on where your pain is.

↓

**Turn on** Acticare TSE by pressing and releasing the ON / OFF ⏻ button.

↓

**Commence treatment** by pressing and holding down the + button to increase the treatment intensity until you feel a light tingling sensation or reach 100%. Typical settings are 50% with electrodes on the neck and 100% with electrodes on the back in TSE 1 (the default mode).

↓

**Treatment ends** when the timer finishes counting down and the message "Treatment Complete" is displayed.

## TSE modes

Acticare TSE has three standard TSE therapy modes and two burst TSE modes called "RF". First time users should use TSE 1 therapy mode for pain relief. Acticare TSE comes set in TSE 1 mode as standard so you should not need to change these settings on first use. When the device is switched on the set mode is displayed on the screen for one second (to change TSE mode, see opposite).

| Name | Therapy | Recommended For |
|---|---|---|
| TSE 1 | Normal TSE | All first time users, all conditions. |
| TSE 2 | Powerful TSE | Severe or long-lasting conditions where TSE 1 has not helped. |
| TSE 3 | Long pulse TSE | Low mood, fatigue and conditions where TSE 1 & 2 have not helped. |
| RF 1/2 | Burst mode TSE | Acute pain and conditions where regular TSE has not helped. |

## Selecting treatment time and intensity

With TSE, there is no one treatment time appropriate for everybody and every condition. Because the effects of TSE tend to accumulate over time, we recommended that you use the therapy every day for two weeks before assessing the degree of relief.

**First time use:** Start off with a 30 minute treatment using the default TSE mode called TSE 1. Set the treatment intensity so that you feel a mild tingling at first, which will usually dissipate as the treatment progresses.

If at the end of this first treatment you have not experienced any relief, immediately restart the treatment for another 30 minutes using a higher intensity with a continuous tingling sensation.

Many people find that they experience relief after 30-60 minutes, with one or two sessions per day. However, you can use TSE for as long as you need to gain relief, it is not possible to “overdose”.

Finding the best treatment time: Pain relief with TSE is often cumulative, so in regular use it is possible for users to experiment with gradually reducing the length of repeated treatments.

However, if you do not have relief during a session, either increase the length of treatment by up to 30 minutes or increase the intensity.

After following the above guidelines for two weeks, you should settle on a treatment time that is both effective and convenient.

Long term use: A typical user experiences relief with TSE using 30 minute treatments. Some only need 20 minute treatments, whereas others with long-standing and severe pains may require 3 hour treatments.

If there is no relief even using 3 hour treatments, repeat the two week schedule using the more powerful TSE mode TSE 2.

If TSE 2 is ineffective, try TSE 3 or either of the RF modes. TSE 3 produces a quite strong tingling sensation because of its longer pulses and may also be applied peripherally over the area of pain like a high-powered TENS machine.

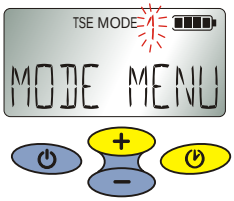
## Changing Therapy Modes.

As supplied the Acticare device is set in TSE Mode 1. You can change it to any one of three TSE, six standard TENS, two High Frequency TENS (HFT) modes, two pulsed radio-frequency (RF) modes or the advanced mode (ADV) by following the steps below. A full list of preset modes is shown on page 26.

Turn on Acticare by pressing and releasing the on/off button ⏻.

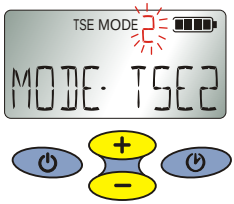
Hold down the TIMER ⏲ button and momentarily press the plus + button at the same time.

The display flashes “MODE MENU” as confirmation.




If you see the timer screen instead of the mode menu, you did not press + & ⏲ together. Press ⏲ to exit & try again.

Use the + or − keys to cycle through the available modes.




Press and hold the TIMER ⏲ button for one second to exit and save the new setting.

5

## STEP 1. Connect the electrodes and lead wire

Connect a pair of self-adhesive electrodes to the device using the lead wire as described below.

1. Before connecting the lead wire for the first time, pull the wires apart so that the electrodes can be positioned someway apart from one another. To do this, slide down the clear plastic sheath on the lead wire and pull apart the pins as shown in the picture.


1

2. Connect the metal pins to the electrodes while they are still on the backing sheet.


2

3. Connect the lead wire to the Acticare TSE device. Note that the connector can only be inserted into the device in one orientation. For the right orientation, match up the key shape of the connector with the key shaped hole in the device.


3

4. When you are ready to begin treatment peel the electrodes off the backing sheet using the electrode material, not the lead wire. Pulling on the lead wire can reduce the lifetime of your electrodes.


4

Electrode life is considerably shortened by use on dirty or oily skin; it is best to clean the electrode application area with soap and water, then rinse and thoroughly dry before each session.

Do not use worn-out self-adhesive electrodes as this can cause weak stimulation and skin irritation. With normal use (one treatment per day) electrodes begin to lose their stickiness after one month. Replace with new electrodes when this occurs.

## STEP 2. Place the electrodes on your skin

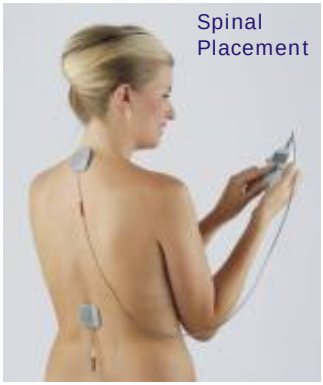
Place the electrodes in the locations described below depending on the site of your pain. For pains in both areas of the body, alternate the electrode placements between treatments.

### For all pains below the shoulders:

Spinal Placement. Place one electrode at the base of the neck. Place the other electrode in the middle of the lower back as shown. Make sure that the electrodes are directly over the spine. If you are using TSE 3 for low mood, always use the spinal placement.

### For pains in the head, neck, upper chest and arms:

Neck Placement. For TSE 1 and 2 and RF modes only, place electrodes either side of the neck as shown. There should be a hands-width gap between the electrodes. Remove any metallic necklaces when using the neck placement.



Spinal Placement

Neck Placement

Do not use neck placement at intensity settings that cause intense tingling sensations.

### Alternate Neck Placement

If you find the basic neck placement uncomfortable, try this alternate neck placement with the pads on the top of the shoulders as shown.

### Peripheral electrode placement:

If you have a recent or acute injury, particularly if it is localized, you may find that you get best results with the electrodes placed so that they span the painful area, rather than using the standardized neck or back placements described above. For instance, if the pain is in your arm or leg, place one electrode directly over the point of pain and the second electrode further up the limb and on the other side, so that current flows through the tissues. Use the high power TSE2 or RF modes, as they cause little or no sensation while blocking pain signals. If you are unsure about where to place the pads you can also use TSE and RF modes with the pad placements indicated in the TENS section on pages 16-18.

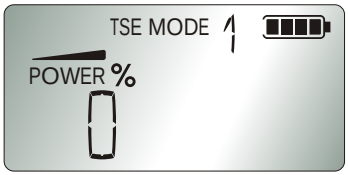
Never apply the electrodes across the head or chest, or to the front of the neck since this can cause breathing difficulty if the stimulation is strong enough to cause muscle contraction. Never use the Neck Placement with any TENS mode. Only use with TSE at a level at which a tingling sensation is very mild or just perceptible.

## STEP 3. Turn Acticare TSE on

Once you have placed the electrodes in the correct place you are now ready to turn Acticare TSE on and begin treatment

Press and release the ON/OFF ⏻ button to turn on the device. If using TSE for the first time, we recommend TSE 1.

Always check that the correct mode is set when you switch on, this is displayed at the top of the screen.






## STEP 4. Commence treatment

When prompted by the message “PRESS + TO BEGIN TREATMENT”, press the plus + key to increase the treatment intensity until you feel a light tingling sensation or reach 100%. Each press of the + key increases the intensity by just 1%, holding the key down causes the intensity to increase gradually without the need for repeated presses.

Typical intensity settings are 50% with electrodes on the neck and 100% with electrodes on the back in the default mode, TSE 1.

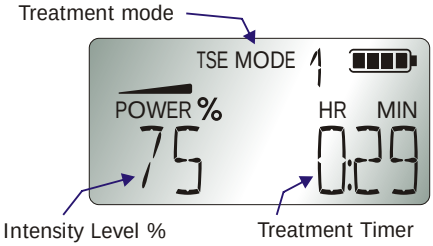
The orange light on the top of the unit will turn on to show that the treatment has begun. The last used treatment time (or factory default of 30 mins) is also shown.

The intensity is displayed as a percentage from 0-100% at the bottom left of the screen.

If the POWER bar flashes, this indicates the device is providing full current, which may happen at less than 100% intensity if your skin resistance is low. This is not a problem, but there is no need to increase the intensity level beyond this setting.

Most people do not feel any sensation with TSE 2, so it is fine to increase the output level to 100%. You are likely to feel a light tingling sensation using TSE 1 and TSE 3.

If the sensation becomes uncomfortable, press the – key until it is comfortable again.




Typical Running Screen

With TSE treatments, we recommend that you set the intensity level to a light tingling sensation or 100% if there is no sensation.

Caution. With TSE 1 and TSE 2 especially, the electrodes may get warm and/or there may be some reddening of the skin during treatment. If this happens, check that they are properly stuck to your skin and reduce the intensity by about 25%.

## STEP 5. Completion of treatment

Your treatment has ended when the timer has finished counting down and the message “TREATMENT COMPLETE” is displayed. The device will bleep to let you know when treatment is over.

You can end a treatment before the timer has finished by turning off the device.

To turn off the device hold down the ON/OFF ⏻ button for 1 second.

After every treatment, we recommend that you return the electrodes to their backing sheet and store them in the sealable bag to prevent them from drying out. Always stick the electrodes to the correct side of the backing sheet as marked.

If the message “CHECK LEADS AND PADS” is displayed, check that the electrodes and lead wires are correctly connected to the device. Check also that the electrodes are properly stuck to the skin. Once electrodes have been properly connected you can increase the power to the desired level.

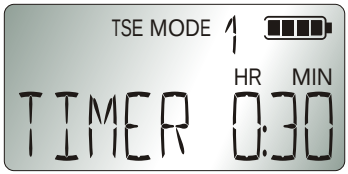
See section 10 “Troubleshooting” for more information.

## Adjusting the treatment timer

Whenever you start a treatment, the Timer automatically uses the last treatment time. You can however adjust the Timer at any time before or during a treatment.

See page 9 for advice about deciding your treatment time.

To change the treatment timer, press the TIMER ⏻ button to display the Timer screen.




Timer Setting Screen

Press + or – to increase or decrease the timer to your desired time. You can select times between 10 minutes and 3 hours, or timer off. If the timer is set to “OFF” the treatment will run until stopped manually.

Press the TIMER ⏻ button for 1 second to confirm your setting. Acticare TSE will go back to the Running screen with your new treatment time shown.

## STEP 1. Select the TENS mode to use

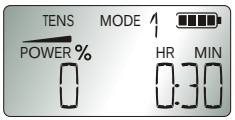
Acticare TSE has eight different TENS therapy modes as summarised in the table below. If you are using TENS for the first time it is recommended that you start with TENS1.

**To change between therapy modes:**

Follow the instructions on page 10.

| Name | Type and Sensation | Technical Description | Recommended For |
|---|---|---|---|
| TENS1 | Constant tingling | 100Hz, 50µS pulse width | Most types of chronic and acute pain |
| TENS2 | Constant pulsing | 5Hz, 200µS pulse width | For chronic pains such as back pain and arthritis. Don't use on damaged muscles |
| TENS3 | Burst mode “tapping” | 100Hz, 100µS pulse width, 0.1 sec bursts five times per second | For chronic pains such as back pain and arthritis. Don't use on damaged muscles |
| TENS4 | Burst mode “gripping” | 100Hz, 100µS pulse width, 0.5 sec bursts once per second | For chronic pains such as back pain and arthritis. Don't use on damaged muscles |
| TENS5 | Modulated fast wave | 100Hz, 50µS pulse width, 3 sec modulation period | Most types of chronic and acute pain |
| TENS6 | Modulated slow wave | 100Hz, 50µS pulse width, 6 sec modulation period | Most types of chronic and acute pain |
| TENS7 | High frequency tingling | 500Hz, 20µS pulse width | Severe acute and chronic pains |
| TENS8 | High frequency tingling and pulsing | 500Hz, 20µS pulse width 0.05 sec bursts ten times per second | Severe acute and chronic pains |

The current therapy mode is displayed at the top of the screen. You should always check you are in the desired mode prior to treatment.



## STEP 2. Setup your treatment

Follow the instructions for “Treating Yourself with TSE” in section 5 with the following exceptions:

### 1. Treatment Time

There is no one TENS treatment time suitable for everybody so it is recommended that your first treatment time is kept short, approximately 20 minutes. Once you become familiar with your response to TENS try increasing treatment periods up to 1 hour in length.

### 2. Treatment Intensity

Unlike TSE treatments, TENS treatments can produce a strong tingling sensation. When setting up your TENS treatment, increase the intensity until you feel a strong but comfortable level of sensation. You may need to increase the intensity during treatment to maintain the same level of sensation as your body becomes tolerant to the TENS stimulation.

After TENS treatments you may feel a tingling sensation or numbness around the area of the electrodes. This is normal.

### 3. Care of electrodes

Electrode life is considerably shortened by use on dirty or oily skin; it is best to clean the electrode application area with soap and water, then rinse and thoroughly dry before each session.

### 4. Electrode Positioning

With TENS treatments it is important to place the electrodes in the correct position depending on where you are experiencing pain. Choosing the correct electrode positioning for TENS often requires experimentation to get a good result and you may require professional advice from your doctor, physiotherapist or TENS nurse. Otherwise refer to the maps on the following pages as a starting point.

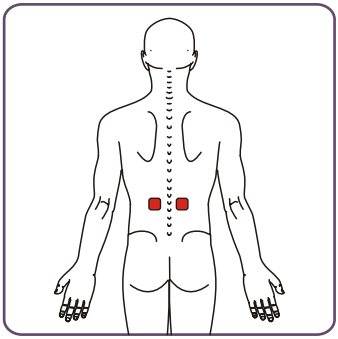
Never apply the electrodes across your head or chest when using TENS stimulation.



## Electrode Placements for TENS

### Lower Back Pain

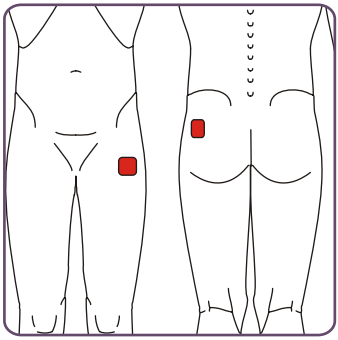
Place electrodes either side of the spine slightly above the position of the pain.



## Electrode Placements for TENS (cont)

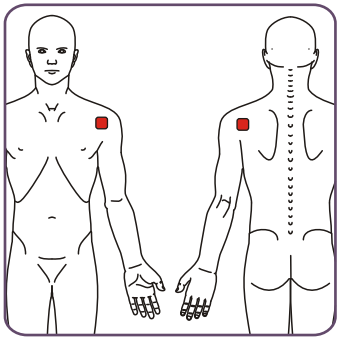
### Hip Pain

Place electrodes so that the painful area is between them.



### Shoulder Pain

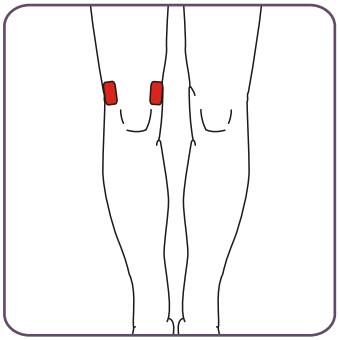
Apply electrodes to the front and back of the painful shoulder.





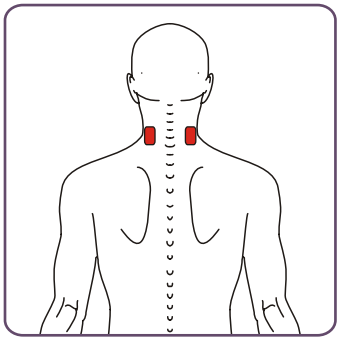
### Knee Pain

Place electrodes either side of the knee. For best results avoid placing the electrodes on the knee cap.



### Neck Pain

Place electrodes on the back of the neck no higher up than the nape of the neck.

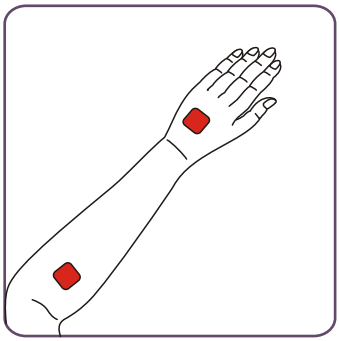


Never place TENS electrodes on the side or front of the neck.

## Electrode Placements for TENS (cont)

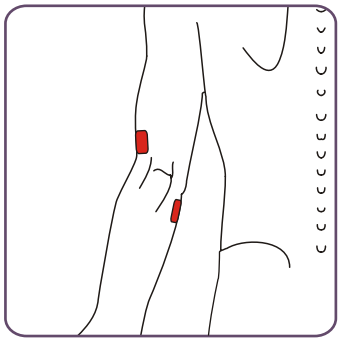
### Arthritis of fingers and hands

Place one electrode on the top of the hand and the second close to your elbow on the inside of the forearm.



### Elbow Pain

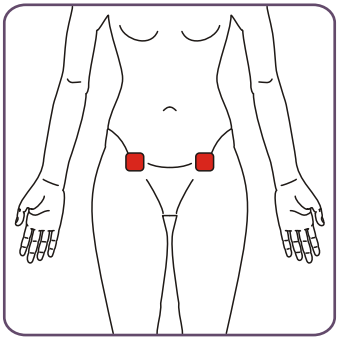
Place electrodes either side of the elbow, one slightly above and one slightly below the joint.





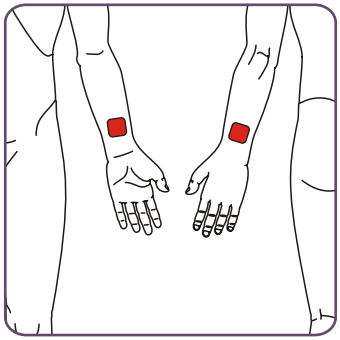
### Menstrual Pain

Place the electrodes over the tummy area or across the lower back.



### Nausea and Travel Sickness

Place electrodes on the front and back of one forearm just above the wrist.



# Settings Menu

## To enter the Settings menu:

Hold down the TIMER button and momentarily press the minus – button at the same time. The display flashes "SETT MENU" for one second.

To make changes: Press the TIMER button to advance through the options until the parameter you want to change is displayed.

Press + or – to set the value of the parameter to your desired setting.

To exit Settings and save your changes: Press and hold the TIMER button for 1 second.

To exit Settings without saving: Press the – and TIMER buttons together.

The following parameters can be changed in the Settings Menu:

| Parameter | Screen Name | Valid Options | Description |
|---|---|---|---|
| Language | L | English, French, German | Allows selection of language for help messages. |
| Pad Detect | PAD | ON, OFF | Disables detection of disconnection of leads and pads. This is useful for patients with hairy skin who experience false disconnect messages. |
| Clock | CLK | ON, OFF | Controls time and date display when the device is switched off. |
| Year | YEAR | 2004 - 2034 | Sets year. |
| Month | MONTH | Jan - Dec | Sets month. |
| Date | DATE | 1 - 31 | Sets day of month. |
| Hour | HOUR | 0 - 23 | Sets current time (hours). |
| Minute | MIN | 0 - 59 | Sets current time (minutes). |
| Pain diary | DIARY | ON, OFF | For clinician use. Allows level of relief to be recorded using Visual Analogue Scale (VAS) scoring which can be uploaded for analysis. Consult www.acticare.com for details. |
| Serial port | COM | ON, OFF | For clinician use. Controls serial communications port. |
| Buzzer | BUZ | ON, OFF | Controls buzzer, disables end of treatment alarm. |

## Replacing electrodes

Electrodes typically have a lifetime of 30 uses. This means that they should be replaced every month if used once per day. With heavy use, or if used with oily or hairy skin, electrodes may need replacing sooner.

Because of the higher current level with TSE, standard carbon rubber TENS electrodes are not suitable. Always use the recommended electrodes available direct from us. These have an integral metallic conductor for superior current distribution.

## Care of electrodes

Always store electrodes on their backing sheet in their sealed bag between treatments. When not in use do not leave electrodes exposed to the air, even if on their backing sheet. This may cause them to dry out prematurely.

To prevent cross contamination do not share electrodes.

Electrode life is considerably shortened by use on dirty or oily skin; it is best to clean the electrode application area with soap and water, then rinse and thoroughly dry before each session.

Dry electrodes may be re-moistened by rubbing a few drops of water into the sticky surface.

## Cleaning Your Acticare TSE Unit

Clean the outside of the unit as required with a damp cloth. Do not use strong detergents or immerse the unit, lead wires, or electrodes in any liquid.

Be careful not to force any liquid into the gaps where the buttons meet the outer casing.

## Replacing batteries

The rechargeable Nickel Metal Hydride (NiMH) batteries installed in Acticare TSE may need replacement if the time between charges has decreased considerably.

Because batteries are chemical products, performance deteriorates not only with use but also during prolonged storage. Normally, the batteries will last around 6 months (or 250 cycles) if used under proper conditions.

Disposing of a battery in fire can cause the battery to rupture.

Replace with good quality AA size NiMH batteries of at least 1600mA/hour capacity.

Never use the charger stand with non-rechargeable batteries installed.

## Spares Service

The following spares are available from our helpline or our website: www.acticare.com.

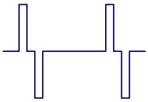
| Item | Order Code |
|---|---|
| Electrode Pads (pack of 4) | C00207 |
| Blue Electrode Pads for sensitive skin (pack of 4) | C00220 |
| Rechargeable batteries (pack of 4 AA size) | C00200 |
| Lead wire | C00206 |
| Long lead wire | C00251 |
| Acticare TSE carry bag | C00208 |
| Acticare TSE user manual | C00201 |
| Charger cradle: | |
| UK Version | A00007 |
| European Version | A00008 |
| North American Version | A00009 |
| Australian Version | A00010 |

# Advanced Therapy Mode

Only for use by doctors and therapists experienced in electrotherapy.

Advanced Mode allows the user to control the type of the waveform generated by Acticare TSE by programming a series of parameters that describe the wave shape and frequency. This mode is very flexible, it allows the device to be configured to provide a wide range of stimulation modalities such as Neuromuscular Stimulation and Electro-Acupuncture, at frequencies from 1Hz to 500,000Hz.

### There are three basic forms of wave generated by Acticare:



1. Biphasic a square waveform with equal positive and negative pulses

2. Monophasic a square waveform with single positive pulses

3. Twin peak a square waveform with two repeated positive peaks

### Pulse amplitude.

The maximum voltage produced by Acticare TSE is 250V, but this is reduced as the programmed pulse width increases to prevent excessive levels of stimulation at longer pulse widths. The peak voltage at 100% output into 500ohms is indicated in the table.

| Pulse width | Peak Voltage |
|---|---|
| 0.5 - 2µS | 250V |
| 3 - 5µS | 200V |
| 6 - 10µS | 160V |
| 20µS | 130V |
| 50µS | 90V |
| 100 - 200µS | 70V |

The instantaneous output charge in normal operation is limited to 25µC per pulse to prevent dangerous shock. The maximum average current is also limited to 20mA. These limits are not changeable by the user.

### To Setup an Advanced Waveform

1. Enter the Therapy Mode menu by holding down the TIMER button and momentarily pressing the plus + button at the same time. The display will flash MODE MENU as confirmation.

2. Select advanced mode “ADV” using the + and – keys.

3. Press TIMER to scroll through the waveform parameters. Use the + and – keys to set values for each of the parameters (available parameters are shown in the table opposite).

4. Exit the Therapy Mode menu and save your selection by pressing and holding the TIMER button.

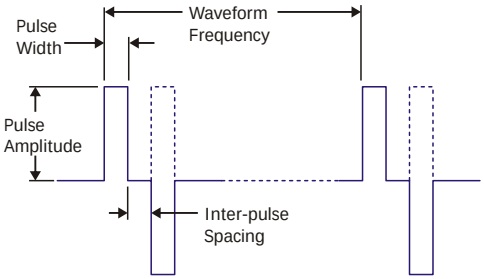
If the message “INVALID” is displayed when you exit, this means the waveform specified is not possible for Acticare TSE to produce. This may occur for one of three reasons:

i. The sum of the pulse width (PULS) and inter-pulse space (SPAC) you have specified is longer than the time available at your desired frequency (FRQ). You should reduce the pulse width (PULS) or decrease the frequency (FRQ).

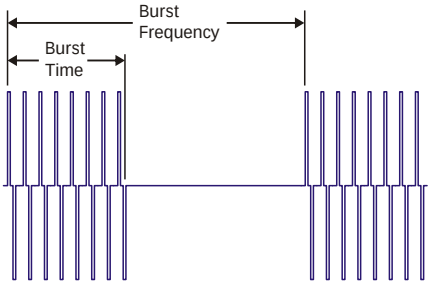
ii. The burst time (BT) you have specified is too long for the burst frequency (BF). You should reduce the burst time or decrease the burst frequency.

iii. You are attempting to use waveform frequencies below 100Hz in Burst mode, this is not possible with Acticare TSE.

## Basic Waveform Parameters




## Burst Parameters




## Available Parameters

Each parameter may be independently set to produce any desired waveform. For example a 50µS Biphasic TENS pulse repeated at 250Hz with bursts of 1 sec on, and 1 sec off would require the following parameters: MODE: BIPH, PULS: 50µS, SPAC: 0µS, FRQ: 250Hz, BT: 1000mS, BF: 0.5Hz.

| Pulse Width PULS | Interpulse Spacing SPAC | Waveform Frequency FRQ | Burst Time BT | Burst Freq BF |
|---|---|---|---|---|
| 0.5µS | 0.0µS | 1Hz (Not valid in burst modes) | Off | 0.25Hz |
| 1.0µS | 0.5µS | 5Hz (Not valid in burst modes) | 10µS | 0.5Hz |
| 1.5µS | 1.0µS | 10Hz (Not valid in burst modes) | 20µS | 1Hz |
| 2µS | 1.5µS | 25Hz (Not valid in burst modes) | 1mS | 2Hz |
| 3µS | 2µS | 50Hz (Not valid in burst modes) | 2mS | 5Hz |
| 4µS | 3µS | 100Hz | 5mS | 10Hz |
| 5µS | 4µS | 250Hz | 10mS | 20Hz |
| 6µS | 5µS | 500Hz | 20mS | 50Hz |
| 8µS | 6µS | 750Hz | 50mS | 100Hz |
| 10µS | 8µS | 1kHz | 100mS | 250Hz |
| 20µS | 10µS | 2.5kHz | 250mS | 500Hz |
| 50µS | 20µS | 5kHz | 500mS | 1kHz |
| 100µS | 50µS | 10kHz | 1000mS | 2kHz |
| 200µS | 100µS | 20kHz | 2000mS | |
| | 200µS | 50kHz (Device safety limit prevents continuous output at these frequencies - use burst modes with short bursts.) | | |
| | 1mS | 100kHz | | |
| | 2mS | 200kHz | | |
| | | 500kHz | | |

**Warning.** Only use the Monophasic and Twin Peak waveforms with medical advice. These waveforms result in a net flow of current from one electrode to the other electrode. The result may be reddening or, in severe cases, burns under the electrodes due to ionic transport.

### Scientific Notation

| | |
|---|---|
| Hz | Hertz (cycles per second) |
| µS | Microseconds |
| mS | Milliseconds |
| µC | Micro coulombs (unit of charge) |

Waveform time in µS = 1,000,000 ÷ Waveform frequency (FRQ)
Waveform frequencies of 50Hz and below are not available for burst modes.

# Troubleshooting

| Message / Symptom | Possible causes | Solution |
|---|---|---|
| "Check Leads and Pads" on display. | The electrodes are not properly stuck to the skin.<br><br>Badly connected lead wire.<br><br>Very hairy skin. | Make sure that the lead wire is properly connected to both the device and the electrodes. Ensure that the electrodes are firmly stuck to the skin. Replace electrodes if required. If skin is very hairy, cut short underneath the electrodes and try again.<br>If none of the above works, disable Pad Detect in settings (section 7). |
| "Low Batt". | Batteries are flat. | Recharge batteries. |
| Blank screen. | Batteries are flat or not correctly inserted. | Recharge batteries and check orientation. |
| "Error 01- 02" then shutdown. | Device is too warm to operate (above 60C). | Allow device to cool before use. |
| "Error 03-04-05-06-08" then shutdown. | Internal error. | Turn device off then on. If error persists reset device (see instructions opposite). |
| "Error 07" then shutdown. | Output shorted (i.e. leads or electrodes touching) or safety limit reached. | Check output lead or pads are not touching. Turn device off then on. If error persists reset device. |
| Non-responsive or locked up display. | Internal fault. | Follow instructions opposite for device reset. |
| Display does not come on even though batteries are inserted. | Weak or dead batteries.<br><br>Batteries installed the wrong way around. | Recharge batteries.<br><br>Check that batteries are inserted the right way around. |
| Electrodes become hot during use. | Poor adhesion with skin.<br><br>Power set too high. | Check electrodes are not peeling away.<br><br>Reduce power level by 25%. |
| Power bar flashing. | The device is operating at its current limit. | This is sometimes caused by electrodes being close together. Otherwise there is no action required. The current limit is a safety feature that ensures that excess current does not flow even if your skin resistance is low. |

| Message / Symptom | Possible causes | Solution |
|---|---|---|
| Device appears to be operating but no output. | Lead wire connection. | Check connectors are fully pushed home. |
| | Mode with no sensation. | This is normal, it is common not to feel any sensation with pulse widths less than a few microseconds. |
| Device in charger cradle but not charging &/or beeping continuously | Very low battery. | Leave overnight to slow charge. |
| | Mains not connected. | Check power socket. |
| | Batteries too hot. | Allow device to cool (batteries must be less than 40C to fast charge). |
| | Device not fully home. | Push fully home (until it stops beeping). |
| Batteries do not retain charge or battery meter goes straight from full to empty. | Old or damaged batteries. | Fit new batteries. |

## Resetting Acticare TSE

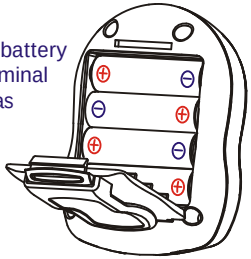
Some faults may be resolved by restoring factory settings and resetting Acticare TSE.

1. Restore factory settings. Start with the device off and hold the TIMER key while pressing the ON/OFF key. The device should display all segments followed by the software revision before starting up normally.

2. Reset Acticare TSE. Open the battery cover by squeezing the blue catch in the belt clip (refer to page 7 for detailed instructions). Remove one battery. After five seconds, replace the battery.

If the batteries are correctly installed the battery symbol will be displayed on the screen. If not check that the batteries are inserted with the positive terminals correct as

Check that battery positive terminal alternates as illustrated



illustrated; the symbols inside the battery case indicate correct placement. The positive end of the battery is the one with the pip and marked with a "+".

If none of the above resolves your problem, you can email us at: support@acticare.com, visit our website at: www.acticare.com or call our customer service line.

## Specifications

| Parameter | Specification |
|---|---|
| Average current limit | 20mA @ 250VDC bus |
| Maximum charge per pulse | 25µC per pulse under normal operation<br>75µC with single component failure |
| Waveform type | Biphasic, monophasic or twin peak square wave |
| Treatment Timer | 10 mins to 3 hours |
| Pulse width | 0.5µS to 100µS |
| Output frequency | 1Hz to 500kHz |
| Power source | Four AA batteries<br>(rechargeable NiMH 1.2V or alkaline 1.5V) |
| Electrical protection rating | Type BF equipment. Do not attempt to connect to mains power except through approved charger stand. |
| Weight | 235gms |
| Dimensions | 100x72x38mm |

## Environmental

| | |
|---|---|
| Ambient Operating Conditions: | |
| Temperature | 10C to 50C<br>(battery charging 10C to 40C) |
| Relative humidity | 30-75% (non-condensing) |
| Atmospheric pressure | 0.86-1.06 hPa |
| Shipping and Storage Conditions: | |
| Temperature | -40C to 70C |
| Relative humidity | 10-100% (non-condensing) |
| Atmospheric pressure | 0.50-1.06 hPa |

All electrical specifications are +/- 10% into a 500 ohm load

## Specification - Charger Cradle

| Parameter | Specification |
|---|---|
| Input voltage | |
| Europe / UK / Australian Versions | 230-240VAC 50-60Hz |
| North American Version | 115VAC 60Hz |
| Output voltage | 6V @ 1000mA |

## Standard TSE and TENS Therapy Mode Parameters

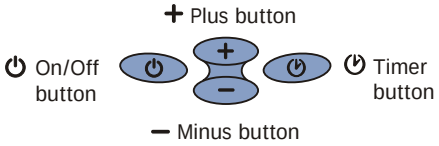
| Mode | Waveform Frequency FRQ | Waveform Type WAVE | Pulse Width PULS | Interpulse Spacing SPAC | Burst Time BT | Burst Freq BF |
|---|---|---|---|---|---|---|
| TSE1 | 2.5kHz | Biphasic | 1.5µS | 200µS | OFF | |
| TSE2 | 10kHz | Biphasic | 0.5µS | 0.5µS | OFF | |
| TSE3 | 250Hz | Biphasic | 4µS | 2000µS | OFF | |
| TENS1 | 100Hz | Biphasic | 50µS | 0µS | OFF | |
| TENS2 | 5Hz | Biphasic | 200µS | 0µS | OFF | |
| TENS3 | 100Hz | Biphasic | 100µS | 0µS | 100mS | 5Hz |
| TENS4 | 100Hz | Biphasic | 100µS | 0µS | 500mS | 1Hz |
| TENS5 | 100Hz | Biphasic | 10-50µS | 0µS | 3 sec modulation | |
| TENS6 | 100Hz | Biphasic | 10-50µS | 0µS | 6 sec modulation | |
| TENS7 | 500Hz | Biphasic | 20µS | 0µS | OFF | |
| TENS8 | 500Hz | Biphasic | 20µS | 0µS | 50mS | 10Hz |
| RF1 | 500kHz | Biphasic | 0.5µS | 0.5µS | 20µS | 1kHz |
| RF2 | 250kHz | Biphasic | 0.5µS | 1.5µS | 20µS | 2kHz |

See page 22 for diagrams of Waveform shapes and Burst parameters. Modulation modes produce a linear variation of pulse width between 10 and 50µS over the specified period.

## TSE and TENS modes - Peak Output into 500ohms

| Pulse width | Peak Voltage |
|---|---|
| 0.5 - 2µS | 250V |
| 3 - 5µS | 200V |
| 6 - 10µS | 160V |
| 20µS | 130V |
| 50µS | 90V |
| 100µS | 70V |

The Acticare TSE device has 4 buttons.

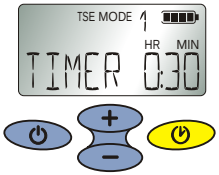



To turn the device on press ⏻.

To turn the device off press and hold ⏻ for one second.

To adjust the treatment timer

Press the ⏻ to enter timer setting mode

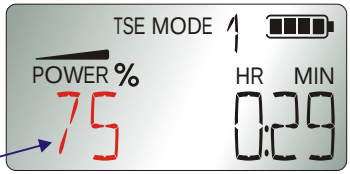



Use + & – to adjust time

Press and hold ⏻ for one second to save your new time.

To start treatment press the + button. Each press increases intensity by 1%. Hold the button down to increase quickly.

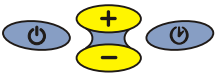
The treatment intensity is displayed as a percentage (highlighted in red in the diagram below).




Intensity Level %

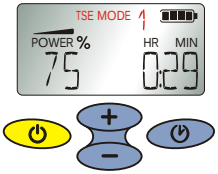
Set the treatment intensity at the level at which you first feel a slight tingle or 100%.

To increase or decrease treatment intensity during treatment, press the + or – buttons. Each press changes intensity by 1%. Hold the button down to change quickly.



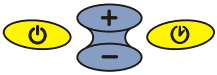
To stop treatment press and hold the − button to quickly reduce intensity. When the treatment level reaches 0% the treatment stops automatically. Alternately, you can stop treatment by turning the device off.

To check therapy mode turn the device on using the ⏻ key. The mode is displayed at the top of the screen at all times (highlighted in red in the diagram below).

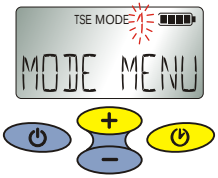



You should always check you are in the desired mode when you turn on Acticare TSE prior to treatment. The default mode is TSE1.

To restore factory settings. Start with the device off and hold down the timer ⏻ key while you turn the unit on with the on/off ⏻ key. The device should display all segments followed by the software revision number before starting up normally.



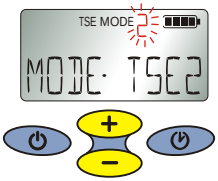
To change therapy mode hold down the TIMER ⏻ button and momentarily press the plus + button at the same time. The display should flash “MODE MENU” as confirmation.




If you see the TIMER setting screen this means you did not press both keys together. Press ⏻ to exit and try again.

Press + or − to select the mode you wish to use. Each press of + causes the menu to cycle through the available modes in this order:

- 3 “TSE” modes: TSE1-TSE3 (Page 9)
- 8 “TENS” modes: TEN1-TEN8 (Page 15)
- 2 “RF” modes: RF1-RF2 (Page 9)
- Advanced settings mode: ADV (Page 21).

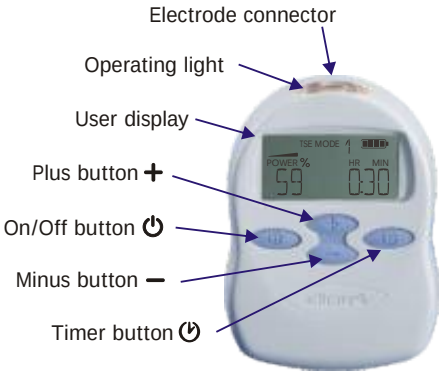



Press and hold TIMER ⏻ for 1 second to exit and save settings.

# Quick Reference

Before first use please read the warnings and contraindications contained in section 2.

## Key Features of Your TSE Device




## To treat yourself with Acticare TSE:

**Plug the lead wire** into the top of the device and connect to two electrodes.

**Stick the electrodes** on your skin in one of the two positions shown in the photos depending on where your pain is.

**Turn on** Acticare TSE by pressing and releasing the ON / OFF button.

**Commence treatment** by pressing and holding down the + button to increase the treatment intensity until you feel a light tingling sensation or reach 100%. Typical settings are 50% with electrodes on the neck and 100% with electrodes on the back in TSE 1 (the default mode).

**Treatment ends** when the timer finishes counting down and the message "Treatment Complete" is displayed.

## Electrode Placements for TSE

### For all pains below the shoulders:

Place one electrode at the base of the neck.

Place the other electrode in the middle of your lower back as shown.

### For pains in the head, neck, upper chest and arms:

Place electrodes either side of the back of the neck as shown.

Do not use this placement in TENS mode or any mode with a strong tingling sensation.

Quick reference continued inside back cover