1. INTRODUCTION

Device Description & Principles of Design

The Perfect EMS is a dual channel TENS & EMS unit with digital controls for easy use. A choice of six pre-set programmes and four manually adjustable programmes are available. The operation of the controls is described in detail in Sections 8 to 11.

The TensCare Perfect EMS is a dual channel TENS & EMS unit.
It has:

• Two independent strength controls for use with 2 pads or 4
• 90mA output over 1KOhm load
• Pre-set modes including Warm Up, Endurance, Power and Bulk
• Manual TENS programs giving range of 1-120Hz
  in steps of 1; 50-250uS in steps of 50
• Manual EMS programs giving range of 1-80Hz
  in steps of 1; 50-350uS in steps of 10
• Program timer of up to 90 minutes
• Program Retention and Usage Memory
2. HOW “TENS” WORKS

TENS stands for Transcutaneous Electrical Nerve Stimulation. TENS blocks nerve signals and stimulates the release of endorphins - your body’s own natural defences against pain. TENS is safe, drug-free and has been used successfully by thousands of pain sufferers.

TENS sends gentle stimulation through the skin which works in TWO ways:

Pain Gate

TENS stimulates the sensory nerves, which carry touch and temperature signals. These nerves go to the same connections in the spine as the nerves carrying pain. A strong sensory signal will block the pain signal travelling up the spine to the brain. This is known as closing the “Pain Gate” and takes effect quite quickly after the unit is switched on. You can use TENS several times a day, for as long as you need to.
**Endorphin Release**

At low frequency settings, and slightly stronger outputs, TENS drives the motor nerves to produce a small, repetitive muscle contraction. This is seen by the brain as exercise and this promotes the release of endorphins – your body’s own natural pain killer. The relief builds up and normally takes about 40 minutes to reach a maximum level which can last for hours after the machine is switched off.

By using TENS you can expect to achieve a significant reduction in pain, if not complete relief from pain.

- TENS is effective for pain from a very wide range of causes.
- It doesn’t appear to provide relief from internal pain other than period pain.
- You can use low frequency (<10 Hz) programmes on acupuncture points, to achieve similar effects to acupuncture.
- With neurogenic pain (caused by inflamed nerves) such as shingles and neuralgia, TENS may initially increase the pain. We recommend that you only use TENS for these conditions under medical supervision.
• You can safely use TENS as long as it gives you pain relief. The effect may wear off after a few hours (this is called “accommodation”). If this happens, take a break of an hour or so before trying again. The Endorphin Release settings should not be used for more than about 40 minutes. Like any exercise, settings that cause muscle movement may cause aching muscles if used too long.

3. HOW ‘EMS’ WORKS
EMS stands for Electrical Muscle Stimulation and has successfully been used in medical rehabilitation and training in competitive sports. EMS produces intensive and effective muscular contraction, generating extraordinary training effects and rapidly enhancing performance.
In rehabilitation, EMS is a well-established method for treatment of a broad field of musculoskeletal diagnoses. Electrical stimulation of an intact peripheral nervous system may create motor responses in patients with impaired or lost ability for voluntary muscle activity.

EMS is commonly used for:
Neuromuscular Facilitation, Muscle Re-education, Muscle Training, Prevention/Slowing of Atrophy/Hypotrophy, Preventing Postoperative Muscle Weakness, Reduction of Spasticity, Maintaining or Increasing Range of Motion,
Training of Partial Peripheral Nerve Damage with Signs of Reinnervation, Treatment of Scoliosis, Incontinence Treatment.

EMS is a complement to other physical therapy and should always be combined with active mobility, strength, coordination and functional training.

In training, the technology for electrotherapy is used for all kinds of muscular exercise - warm-up, strength, speed, power, resistance, endurance, recovery and also for rehabilitation. EMS is well known and works as an excellent complement to regular training.

Advantages of EMS

Use of EMS may lead to faster progress in the patient’s treatment program. The method is simple and appropriate for treatment in the clinical setting as well as for self-treatment at home.

Successful athletes all over the world have discovered the advantages of electrical muscle stimulation, such as an increase of the local circulation and the size of the muscle fibres. EMS also helps to raise the intake of oxygen as well as improving the metabolic exchange and the consumption of energy of the user.
How EMS Works

Muscular activity is produced by the central and peripheral nervous systems transmitting electrical stimuli to the muscles of our body. EMS uses external electrical impulses that work through the skin to stimulate the nerves supplying a specific muscle group.

The muscle reacts in different ways depending on the strength of current, duration and frequency of the electrical impulse.

Muscles are made up of two different types of fibre:
1. Red fibre is slower contracting and aerobic working.
2. White fibre is faster acting and capable of anaerobic working.

The proportions of red and white fibres depend on the way the muscle is used.

Fibre can be converted from one type to the other, depending on the signals it receives. This is known as the Trophic effect.

Different frequencies have different effects; low frequencies (1-10 Hz) coupled with long impulse times, for example, have a purifying and relaxing effect through individual contractions, whereby the circulation in the treated muscle is simultaneously improved and removal of metabolic end products is supported (lymphatic drainage). The oxygen supply to the muscle is improved.
In contrast, by means of a rapid succession of contractions (fibrillation), medium frequencies (20-50 Hz) can put a high level of strain on the muscle, thus promoting the muscular structure.

The pads are normally placed near the muscle motor nerve and the unit transmits a stimulus through the skin, with a choice of specific therapeutic patterns. The correct positioning of the pads is important (please see pages 33-38).

4. SIDE EFFECTS
There are no known side effects to TENS use and long-term TENS use is not harmful. If you are using TENS for long periods of time, ensure you allow the skin underneath the pads to breathe by moving the pads every so often.

If you are using EMS for long periods of time, allow adequate rest time between sessions to allow your muscles time to relax. If you experience muscle aching, simply reduce the strength of the machine or allow your muscles to rest until the aching disappears.
5. CONTENTS
This pack contains:

- Perfect EMS Pain Relief Unit
- Pack of 4, 50x50mm, Self-Adhesive Electrode Pads (E-CM5050)
- Belt Clip
- 2 x AA 1.5V (Type LR6) Alkaline Batteries
- 2 x Lead Wire (L-CPT)
- Instruction Manual
- Storage Pouch

6. INSTALLATION OF BATTERIES

i) Remove belt clip by sliding down
ii) Remove battery cover by pulling on tag

iii) Insert batteries
Ensure that the batteries are inserted the right way as shown in battery compartment and that the ribbon is behind them

iv) Replace battery cover and belt clip.

LOW BATTERY

When the batteries are running low, a low battery indicator will show on the screen and it is important to change the batteries as soon as possible.

RECHARGEABLE BATTERIES
The unit will work with rechargeable batteries.
STORAGE
Remove batteries from your TENS machine if the unit is unlikely to be used for a long period. Some types of battery may leak corrosive fluid.

DISPOSAL OF BATTERIES
Always dispose of batteries safely.
Do not throw batteries onto a fire. Risk of explosion.

BATTERY LIFE
Batteries should last for around 12 hours at full power. If battery leakage occurs and comes in contact with the skin or eyes, wash thoroughly with plenty of water and consult your GP.

**Warning:**
Keep batteries out of reach of small children.
If battery leakage occurs and comes in contact with skin or eyes, wash thoroughly with water and consult your GP.
Do not attempt to recharge alkaline batteries.

7. BELT CLIP
A belt clip is provided to allow you to attach the Perfect EMS to your clothing. Slide the clip along the back of the unit until it locks in position.

You can also hang the unit from your neck using the holes on each shoulder of the unit. For safety, use thread or wool that will snap easily if the unit snags on something.
8. THE PROGRAMMES
The Perfect EMS has six different, specially developed EMS programmes (A-F), two manual EMS programmes (G-H) and two manual TENS programmes (S-T).

There is no one TENS setting for a particular condition and the best choice varies from one person to another, even if they have the same type of pain. Each user needs to select both the programme and the positioning of the pads that is best for them. You may need to try a few positions/programmes before finding the one that suits you.

The following grid summarises the programmes available:

<table>
<thead>
<tr>
<th>Prog</th>
<th>Muscle</th>
<th>Aim</th>
<th>Stage</th>
<th>Frequency Hz</th>
<th>Pulse Width µS</th>
<th>Work sec</th>
<th>Rest sec</th>
<th>Ramp sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>All</td>
<td>Warm Up</td>
<td>All</td>
<td>10</td>
<td>300</td>
<td>Continuous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Large</td>
<td>Endurance</td>
<td>All</td>
<td>10</td>
<td>250</td>
<td>5</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>Large</td>
<td>Power</td>
<td>Start</td>
<td>25</td>
<td>250</td>
<td>5</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Large</td>
<td>Bulk</td>
<td>Improve</td>
<td>25</td>
<td>250</td>
<td>5</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Small</td>
<td>Endurance</td>
<td>Advanced</td>
<td>20</td>
<td>100</td>
<td>5</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Small</td>
<td>Power</td>
<td>Start</td>
<td>50</td>
<td>100</td>
<td>3</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>H</td>
<td>Manual</td>
<td>EMS</td>
<td>Selectable Range 1-110</td>
<td>Selectable 50-350</td>
<td>1-40</td>
<td>1-40</td>
<td>0-5</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Manual</td>
<td>TENS</td>
<td>Pain Relief</td>
<td>1-120</td>
<td>Selectable 50-250</td>
<td>Continuous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Manual</td>
<td>TENS</td>
<td>Pain Relief</td>
<td>1-120</td>
<td>Selectable 50-250</td>
<td>2 Hz Burst</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

USAGE
TENS can be used for as long as is necessary. Continuous treatment is fine but electrode pads should be repositioned regularly (at least every 12 hours) to allow
the skin to be exposed to the air. Endorphin Release works better when the strength is high enough to cause small muscle contractions. Best results are achieved at between 20 and 40 minutes. Longer use may cause muscle ache.

If you are using EMS for long periods of time, allow adequate rest time between sessions to allow your muscles time to relax. If you experience muscle aching, simply reduce the strength of the machine or allow your muscles to rest until the aching disappears.

9. PROGRAMME SETTINGS

The effect of Electrical Stimulation on the body depends on the following current settings:

**Pulse Waveform**

This describes the time function of the excitation current which may be either monophasic or biphasic. With monophasic pulse trains, the current flows in one direction. With biphasic pulses, the excitation current alternates its direction (the current flows back and forth).
The Perfect EMS uses only biphasic pulse trains as they reduce strain on the muscle, leading to less muscle fatigue as well as safer application and also reduce the risk of skin irritation under the electrode pads.

**Pulse Frequency**

Frequency indicates the number of individual pulses per second and is indicated in Hz (Hertz = pulses per second). It can be calculated by working out the inverse value of the periodic time. Different types of muscle fibres react preferentially to different frequencies. Slow-response fibres tend to react to lower pulse frequencies up to 15Hz, while fast-response fibres only respond to frequencies over approximately 35Hz. With pulses of approximately 45~70Hz, there is permanent tension in the muscle (tetany) combined with premature muscle fatigue. Higher pulse frequencies can therefore preferably be used for elasticity and maximum strength training.

Think of weight lifting: a higher pulse frequency corresponds to higher weights.
For TENS:
A frequency of 110Hz is good at blocking pain signals. 
A low frequency of 4 or 10Hz allows for the release of endorphins, the body’s natural pain relief mechanism.

Pulse Width

Pulse width is used to indicate the duration of an individual pulse in microseconds (millionths of a second). 
Pulse width also determines the penetration depth of the current. In general, a greater muscle mass requires a greater pulse width. A higher Pulse Width is also more likely to activate pain nerves, so there is a fine balance between maximum muscle stimulation and tolerable sensation.

EMS: 50μS for small muscles like the face, up to 350μS for large muscles.
TENS: 50 to 250μS. The pain relief effect does not seem to be very dependent on Pulse Width, so the choice depends mainly on comfort. Generally a setting of 200μS is effective.
Pulse Strength

Setting the strength is dependent on each individual user and is determined by a number of parameters such as application site, skin circulation, skin thickness as well as quality of electrode contact. The actual setting should be effective but should never produce any unpleasant sensation such as pain at the site of application. In TENS programmes, you should always be aware of a strong tingling sensation, but any setting which leads to pain must be avoided.

With prolonged application, you may need to increase strength as nerves get used to the stimulation and become less sensitive (known as accommodation).

In EMS programmes, the object is to produce powerful muscle contractions. The strength of the current should be increased to about three times the level at which you can first feel the tingling, or to as high as you can stand without causing pain.

You will probably feel that electrical contraction is more powerful than a voluntary contraction, because the current also stimulates your sensory nerves. The signals have a pain-relieving effect. You may find the sensation uncomfortable to start with, so that you may not get up to therapeutic strength at the start of treatment.
The strength can be increased during the course of the treatment, as you become accustomed to the sensation. Voluntary muscular activity is more effective than stimulation and it may improve progress if you combine voluntary contraction with stimulation. The powerful muscle contractions caused by electrical stimulation give rise to training aches, which usually disappear within a week. After treatment tingling sensations may continue or your skin may feel numb, this is normal.

**WORK** is the time in seconds that muscle is stimulated (not including Ramp time). The Perfect EMS offers a range of work periods from 1 - 40 seconds.

**REST** is the time in seconds at zero strength in between stimulation (i.e. when the muscle is at rest). The Perfect EMS offers a range of rest periods from 1 - 40 seconds. The EMS programmes use an Active Rest – low frequency pulses help to clear metabolites in between Work periods.

**Work/Rest Ratio.** If you are working muscles you need to allow a rest period to allow metabolites to clear. At settings above 20Hz, you should allow at least twice as long a Rest as the Work time. Thinking of weight lifting again: with higher pulse frequency (large weight) use a high Strength, short Work time, and long Rest time to simulate a small number of repetitions.
**RAMP** is the time in seconds taken to move up and down between zero and the set stimulation strength (i.e. the time taken to move between the Work stimulation and the Rest period). The Perfect EMS offers Ramp periods from 0 – 5 seconds.

![Image](image.png)

**Constant and Burst Modes**
The TENS programmes offer a choice of modes. **Constant** mode is when the sensation is continuous versus **Burst** mode when the sensation comes in bursts (on and off). Burst gives a combination of Pain Gate and Endorphin Release but the squeezing feeling may not be as comfortable.

### 9.2 MANUAL TENS PROGRAMMES (S-T)
In TENS Manual programmes (S-T) you can select and change the following parameters using the ‘**T**’ timer button:

<table>
<thead>
<tr>
<th>Parameter to Change</th>
<th>Display Symbol Flashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY</td>
<td>Hz</td>
</tr>
<tr>
<td>PULSE WIDTH</td>
<td>µS</td>
</tr>
<tr>
<td>CONSTANT/BURST</td>
<td>C/B</td>
</tr>
<tr>
<td>Treatment Timer (minutes)</td>
<td>min</td>
</tr>
</tbody>
</table>
After using programmes S-T, when you turn the device off and turn it on again, all parameters will be remembered. Strength will resume at 50% of that last used.

9.3 MANUAL EMS PROGRAMMES (G-H)
In EMS Manual programmes (G-H) you can select and change the following parameters using the ‘T’ timer button:

<table>
<thead>
<tr>
<th>Parameter to Change</th>
<th>Display Symbol Flashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY</td>
<td>Hz</td>
</tr>
<tr>
<td>PULSE WIDTH</td>
<td>μS</td>
</tr>
<tr>
<td>RAMP TIME (seconds)</td>
<td></td>
</tr>
<tr>
<td>WORK TIME (seconds)</td>
<td>W</td>
</tr>
<tr>
<td>REST TIME (seconds)</td>
<td>R</td>
</tr>
<tr>
<td>Treatment Timer (minutes)</td>
<td>min</td>
</tr>
</tbody>
</table>

Simply click the ‘T’ timer button until your required parameter symbol flashes on the display. Then use the CH1 ▲ or CH1 ▼ to increase or decrease the values. After using programmes G-H, when you turn the device off and turn it on again, all parameters will be remembered. Strength will resume at 50% of that last used.
10. CONTROLS AND DISPLAY

ON / OFF

Programme Selected
Channel 2 Strength
Keypad Lock
Timer Clock
Channel 2 Strength UP
Channel 2 Strength DOWN

Channel 1 Strength
Time Selected (minutes)
Programme Selector
Channel 1 Strength UP
Channel 1 Strength DOWN
Timer & Manual Setting Selector

SCREEN DISPLAY
W = “Work Mode”
R = “Rest Mode”
= “Low Battery Warning”
To turn the unit ON, press the ON/OFF button on the top of the unit and hold for at least 3 seconds until the display shows.

To turn the unit OFF, press the ON/OFF button on the top of the unit and hold for at least 3 seconds until the display turns off.

The unit will turn OFF automatically:
- When the timer reaches zero.
- If it is left at zero strength for more than 5 minutes.

The unit will start with the program you used last and at 50% of the strength you were last using.

At first use, or after changing batteries, the display shows that the unit is automatically set in Programme A at zero strength.
STRENGTH CONTROLS

The **buttons** marked CH1 ▲, CH1▼, CH2▲, CH2▼ are strength controls.

![CH1 and CH2 buttons](image)

The left hand buttons change strength in the left hand lead *(CH1)* and the right hand buttons change the right hand lead *(CH2)*.

To increase strength in steps of 1, press and release the top part of the two channel buttons, marked ▲. The strength levels are shown on the LCD.

⚠️ The strength control buttons will not operate until the unit is properly connected to you. If the Perfect EMS detects a disconnection in either channel it will automatically return the strength in that channel to zero and flash ‘CH 00’.

The Perfect EMS has **90 levels of strength**. Rather than making multiple presses, if you hold down either of the ▲ buttons for >2 seconds the strength will change continuously until you release the button. You may not feel any sensation over the first few presses. Continue pressing until the sensation is strong but comfortable. Further increases during use may be necessary if your body becomes accustomed to the
sensation.
To decrease the strength, press and release the lower part of the buttons marked CH1 ▼ or CH2 ▼. Pressing a strength button automatically starts a WORK period.

**PROGRAMME CONTROL**

The button marked ‘P’ is the programme control.
The Perfect EMS has six different, specially developed EMS programmes (A-F), two manual EMS programmes (G-H) and two manual TENS programmes (S-T).

When the unit is first switched on it automatically enters Programme A.

Each time you press and release the ‘P’ button, the programme changes and the programme letter is shown on the LCD.

Each time you change the programme, the strength level reverts back to zero. This is a safety feature to alleviate any sudden feeling of a surge, as each programme gives a different sensation.
TREATMENT TIMER

The ‘T’ button can be used to set the session duration and to select manual parameters for adjustment. When you switch the unit on, it is automatically set at Continuous, (displayed as ‘C’) in all programmes except B, C & H, which means that the unit will continue functioning until you switch it off.

When you press the ‘T’ button, the ‘min’ symbol will flash. You can set session times of 10, 20, 30, 45 or 90 minutes with the CH1 ▲ and CH1 ▼ buttons. Press ‘T’ again to save your selection.

The display shows the session duration next to the clock symbol. The unit automatically counts down the minutes set and switches off when this reaches zero.

LOW BATTERY

An empty battery symbol will show when you need to change the batteries. The unit will shut down approximately 2 minutes after this.
KEYPAD LOCK
If you do not press any keys for 30 seconds, the keypad will lock so that only the keys marked ▼ will work. This is to avoid accidental changes in settings. To unlock, hold down either the CH1 ▼ or CH2 ▼ button for a few seconds until the lock symbol disappears from the display.

OPEN CIRCUIT CUTOUT
If the Perfect EMS is not correctly connected to your body, the strength in the channel which is not properly connected will automatically reset to zero. This is to prevent sudden changes if a broken connection is re-made. If this occurs, check the lead wire connections and ensure all pads are in complete contact with the skin.
MEMORY
The Perfect EMS has a memory with three functions:

1) Programme Retention
When you switch the unit on, it will automatically start in the programme which was being used when it was switched off and at 50% of the strength that was last used.

2) Usage
Press ‘T’ and ‘CH2 ▼’ together and hold down for 3 seconds. The display will show the number of times the unit has been used and the duration of use in hours.

![Display showing usage](image)

Press the same buttons again to return to normal controls and display.

3) Memory Reset
To reset the memory to zero, hold down the ‘T’ and ‘CH1 ▼’ buttons together for 3 seconds. The screen will flash with both of the above values shown as ‘0’.

Number of uses
Time used in hours
11. USING THE MANUAL PROGRAMMES (G,H,S,T)

In Programmes **G & H** you can independently adjust:
- **Frequency** in Hz
- **Pulse Width** in µS
- **Ramp** in seconds
- **Work Rest** in seconds
- **Timer** in seconds.

In Programmes **S & T** you can independently adjust:
- **Frequency** in Hz
- **Pulse Width** in µS
- **Mode** Continuous or Burst
- **Timer** in seconds.

To adjust these parameters, simply:

a) Press ‘T’ to change the parameters:

The ‘Hz’ symbol will flash next to the number at the lower centre of the screen.
b) Press CH1 ▲ and CH1 ▼ to adjust the frequency:
   You can select:-
   1-80 Hz in programmes G and H and
   1-120 Hz in programmes S and T

c) Press ‘T’ again to save your change and advance to the next setting μS (pulse width):
   You can select:-
   50-350μs in programmes G and H and
   50-250μs in programmes S and T

d) Press ‘T’ again to select Ramp: (Mode in S and T)
   You can select 0-5 seconds

e) Press ‘T’ again to select Work Time:
   You can select 1-40 seconds

f) Press ‘T’ again to select Rest Time:
   You can select 1-40 seconds

g) Finally, you can select the Treatment Timer (clock symbol):
   Continuous, 10, 20, 30, 45, 60 or 90 minutes

h) Press ‘T’ once more to return to the main screen to begin using your Perfect EMS.

When NO symbols are flashing, you can press CH1 ▲ or CH2 ▲ to increase the strength.

**See Section 8 and 9 for more information on the choice of settings available.**
12. CONNECTING LEAD WIRES

Insert the lead wire plugs into the base of the unit.

**Attaching the electrode pads to lead wires**
Push the pin ends firmly into the pigtail ends of the electrode pads.

The lead wires may be damaged by rough handling and should be treated with care.

**Lead wire colour coding**
The ends of the lead wire are black (-ve) or red (+ve). This coding is provided for some professional uses. For most TENS applications, you can ignore the colour coding.
13. POSITIONING OF ELECTRODE PADS
13.1. TENS ELECTRODE PAD PLACEMENT

• TENS works one vertebra at a time. You need to stimulate the sensory nerves that enter the spine at the same level as the nerve carrying your pain. Since you don’t know exactly where your nerves are, the simplest thing is to apply the pads around or near to the source of the pain.
• TENS best activates the nerves if it travels along the nerve rather than across it. So place one pad farther from the spine than the source of the pain and place one pad closer.
• The nerves wrap around the limbs and torso, so you may have to try a few positions before you get the best effect.
• If the pain is in, or close to, your spine you can place one pad either side of the spine.
• You may feel more sensation in one pad than the other. This is normal – it depends on where the pads are placed in relation to your nerves.
The following pictures show some typical pad positions for a range of common complaints.
NOTES:

• For symptoms not illustrated, seek advice from your doctor or physiotherapist.
• The electrode pads must always be used in pairs (two pads on each channel), so that the signal can flow in a circuit.
• Always check unit is switched OFF before attaching or removing pads.
• The Perfect EMS resets the strength to zero if the pad or lead is disconnected from your body. This is to prevent sudden changes in sensation when the pad is re-connected.
• For areas that are difficult to reach, why not ask a friend to help you attach the pads?
ELECTRODE PAD POSITIONS

Neck & Shoulder

Low Back Pain

Tension

Sciatica

Shoulder Pain

Knee Pain

Elbow Pain

Ankle Pain

Headache/Nausea

Leg Pain

See section 17 for information on where you should not place electrode pads.
13.2. EMS Electrode Pad Placement

Electrode placement for EMS is very important for obtaining the best results. Place two electrodes over the bulk of the muscle, with one electrode over the muscle’s motor point. The motor point is the area on the skin that is located closest to the motor nerve’s entry into the muscle – about 1/3 of the way down the muscle from the spine. Here, it is easiest to trigger a contraction by electrical stimulation (see images on pages 37-38).

Experiment by moving the electrode across the skin until you locate the point over the muscle that gives the cleanest contraction. In the examples on the following pages, the pads are marked **+ve (red)** and **-ve (black)** to match the red and black leads. The positive (red connector) electrode should be closest to the spine.

Large muscle groups may require stimulation with two channels, that is, four electrodes simultaneously. The electrode pads must always be used in pairs, so that the signal can flow in a circuit.

**NOTE:** Always check that the unit is switched **OFF** before attaching or removing pads.

Use 50x50mm square electrode pads for all areas except the face, where smaller 25x25mm diameter electrodes
may be necessary (these can be purchased as a separate accessory - see Section 18).

When exercising smaller muscles, take care to adjust the strength slowly as the motor nerves may be more sensitive and using smaller electrodes increases the current density.

**Example EMS Electrode Pad Positions**

**Eye care**
You can use Programme F to stimulate the muscles around the eyes to reduce wrinkles and puffiness associated with the signs of aging. You will notice the muscles working straight away from the slight twitching. The activation of the muscles stimulates the circulation. This relaxing skin care also contributes to an increase in well-being, making you appear more awake and content.

Use small 25x25mm round electrodes (these can be purchased as a separate accessory - see Section 18). In order to prevent triggering unpleasant sensations, you should increase the current strength very carefully.
Stomach / Hips
Weight reduction is effectively aided by training the stomach muscles. With the Perfect EMS, you can select singular muscles for direct stimulation. The stomach contains several different individual muscles and the central stomach muscle is responsible for giving you a slim stomach and a good upper body posture.

Buttocks
The bottom is equipped with a very strong set of muscles. Unfortunately, unwanted fat and cellulite zones are often to be found in this area and are very difficult to combat. Muscular training is one way of improving shape. The picture shows the possible electrode positions for building muscles.
Upper Arms
Our upper arms often have little shape, usually caused by a lack of movement and muscular work. The Perfect EMS can be used to carry out muscle training. In this case, it is all about stimulation of the circulation of blood. You have the option of treating the front side or the reverse side of both upper arms depending on where the need is greatest.

Chest and Shoulders
Building chest and shoulder muscle improves posture and movement in the upper body as a whole.
**Legs - Thighs and Calves**

It is usually a lack of trained muscles in the legs which disturbs us most, particularly in conjunction with areas of cellulite in the thigh area. Targeted muscle training for the front and back of the thigh and calves is very simple to perform.
EMS ELECTRODE PLACEMENT CHART - FRONT

O.O  M. orbicularis oculi
z.m  M. zygomaticus major
o.f  M. occipito frontalis, pars frontalis
L.L  M. levator latii
s.c.m.  M. sternocleido-mastoideus
d.  M. deltoideus
b.  M. biceps brachii
fl.  Underarm flexors:
     M. flexor carpi radialis et ulnaris
     M. flexor digitorum superficialis
     M. palmaris longus
p.m.  M. pectoralis major
r.a.  M. rectus abdominis
s.  M. sartorius
r.f.  M. rectus femoris
v.l.  M. vastus lateralis
v.m.  M. vastus medialis
p.l.  M. peroneus
     (fibularis) longus
t.a.  M. tibialis anterior
s.s.    M. supraspinatus
i.s.    M. infraspinatus
t.      M. triceps brachi
ex.     Extensors on the underarm:
                           M. extensor carpi radialis
                           M. extensor carpi ulnaris
                           M. extensor digitorum
b.f.+st. M. biceps femoris
                           + M. semitendinosus
g.c.    M. gastrocnemius
                           (+ M. soleus)
14. GENERAL PAD ADVICE

- The electrode pads supplied are reusable but are for single patient use.
- In order to obtain the best conductivity through the pads, always ensure that they are in good condition and tacky.
- Before use, make sure your skin is clean and dry.
- Peel the electrode pads from their protective plastic shield by holding and lifting one corner of the pad and pulling. Do NOT pull on the pigtail lead wire of the pad.
- After use always replace the pads on the plastic sheet provided and place in the re-sealable plastic bag.
- If the pads dry out then it is best to buy a replacement pack of electrodes. In an emergency it may be possible to restore some of the tackiness of the pad by adding a tiny drop of water on each pad and spreading around.
  If too much water is added the pads will become too soft. If this occurs, simply place the pads sticky side up in a refrigerator for a few hours.
- In very hot weather the gel on the pads may become soft. In such cases place the pads, still on their plastic liners and in their bag, into a fridge until they return to their normal condition.
- The pads provided are latex–free.
- Replace pads when they lose their stickiness.

Poor connection may cause discomfort and skin irritation.
• Storage life of an unopened pack of electrodes is 2 years. This may be affected by very high temperatures or very low humidity.

15. TROUBLESHOOTING
If your machine is not working properly please check the following:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No display</td>
<td>Flat Batteries</td>
<td>Replace batteries</td>
</tr>
<tr>
<td></td>
<td>Batteries inserted incorrectly</td>
<td>Check</td>
</tr>
<tr>
<td></td>
<td>Damaged springs in battery</td>
<td>Contact supplier</td>
</tr>
<tr>
<td></td>
<td>compartment</td>
<td></td>
</tr>
<tr>
<td>Low battery display</td>
<td>Low batteries</td>
<td>Replace batteries</td>
</tr>
<tr>
<td>No sensation</td>
<td>Incorrect connection</td>
<td>Have you applied both electrode pads (per lead wire) to ensure a complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>circuit? Are the leads properly connected to the machine and the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>electrode pads?</td>
</tr>
<tr>
<td></td>
<td>Not strong enough</td>
<td>Steadily increase strength. Most users will feel something at a setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>below 20</td>
</tr>
</tbody>
</table>
15. TROUBLESHOOTING (CONT.)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output will not increase above zero</td>
<td>Open circuit cut-out operating. <strong>Either:</strong> Electrodes not connected to body or faulty/damaged <strong>OR</strong> Lead wires faulty/damaged.</td>
<td>Ensure the electrodes are attached to your body correctly. Try using the second lead. Purchase replacement electrodes or leads if necessary.</td>
</tr>
<tr>
<td></td>
<td>(Lead wires can break at the bend where they leave the machine giving no or intermittent output)</td>
<td></td>
</tr>
<tr>
<td>Sudden change in sensation</td>
<td>If you disconnect and re-connect a few minutes later, the signal will feel quite a lot stronger</td>
<td>Always return strength to zero after disconnecting the lead or electrode pads.</td>
</tr>
</tbody>
</table>

If the above review has failed to resolve your problem, or to report unexpected operation or events, call TensCare on 01372 723 434 or your local dealer (address on back cover) for advice.

16. CLEANING

Clean the case and lead wires at least once a week by wiping with a damp cloth and a solution of mild soap and water. Wipe dry.

*Do NOT* immerse your TENS machine in water.
*Do NOT* use any other cleaning solution than soap and water.
17. CONTRAINDICATIONS, WARNINGS & CAUTIONS

CONTRAINDICATIONS

- Do not use if you have a heart pacemaker or have a heart rhythm problem. TENS or electrical stimulation in the direct vicinity of a pacemaker may affect some models. If TENS or electrical stimulation is applied on the front of the neck this can affect your heart rate. Very strong TENS or stimulation across the chest may cause an extra heartbeat.

- Do not use if you have epilepsy. TENS may affect seizure threshold.

- Do not use if you are pregnant or attempting to become pregnant. It is not known whether TENS or electrical stimulation may affect foetal development.

- Do not use on the abdomen in the later stages of pregnancy. Stop use immediately if you experience unexpected contractions.

- Do not use when driving, operating machinery, or similar actions needing fine control. Loose pads, damaged leads, or sudden changes in contact may cause brief involuntary muscle movements.

- Do not use to mask or relieve undiagnosed pain. This may delay diagnosis of progressive condition.

- Do not use if you have cognitive disabilities, i.e.; Alzheimer’s disease or dementia.
In this manual:

A **Warning** is used when failure to follow the instructions may result in serious injury or death.

A **Caution** is used when failure to follow instructions may result in a minor or moderate injury, or damage to the device or other property.

**Notes** are used to provide clarification or recommendation.

**WARNINGS:**

- **Warning:** The device should not be used while walking, driving, operating machinery, or any other activity in which involuntary muscle contraction may put you at risk of injury.
- **Warning:** If you have active cancer, consult with your clinician before use due to concerns for stimulation potentially spreading cancerous cells.
- **Warning:** Caution should be used if you have suspected or diagnosed epilepsy as electrical stimulation may affect seizure threshold.
- **Warning:** Caution should be used if you have a bleeding disorder as stimulation may increase blood flow to the stimulated region.
CAUTIONS:

Caution: Observe caution when using the Perfect EMS at the same time as being connected to monitoring equipment with body worn electrode pads. *It may interfere with the signals being monitored.*

Caution: Strong electromagnetic fields (electrosurgery/microwave cookers /mobile phones) may affect the correct operation of this unit — see Section 22. If it appears to behave unusually, move it away from these devices.

Caution: Use caution following recent surgical procedures. *Stimulation may disrupt the healing process.*

Caution: Observe caution when using the Perfect EMS at high strength settings. *Prolonged use at high settings may cause muscle injury or tissue inflammation.* The Perfect EMS is capable of delivering outputs in excess of 10 mA (RMS) or 10 V averaged over any period of 1 s”.

Caution: Not suitable for children under 5 years of age. Long cord - risk of strangulation in infants.
Do **NOT** place electrode pads:

On broken skin
   *The pads could encourage infection.*

On skin which does not have normal sensation
   *If the skin is numb, too great a strength may be used, which could result in skin inflammation.*

On the front of the neck
   *Could cause the airway to close, giving breathing problems. May cause sudden drop in blood pressure (vasovagal response).*

Over the eyes
   *May affect eyesight or cause headaches.*

Across the front of the head
   *Effect on patients who have had strokes or seizures is not known.*
   *May affect sense of balance.*
   *The effects of stimulation of the brain are unknown.*

Near malignant tumours
   *In vitro experiments have shown that electricity can promote cell growth.*

**Do not:**

Ignore any allergic reaction to the electrode pads:
   *If a skin irritation develops stop using TENS, and try a different type of electrode.*
   *Alternative pads specially made for sensitive skin are available, see Section 18.*
TO KEEP YOUR DEVICE IN GOOD WORKING ORDER, OBSERVE THE FOLLOWING ADDITIONAL CAUTIONS

⚠️ Do not immerse the Perfect EMS unit in water or place it close to excessive heat. *It may cease to operate correctly.*

⚠️ Do not attempt to open up the Perfect EMS unit. *This will invalidate the guarantee.*

⚠️ Do not use this device with leads, electrodes and accessories other than those recommended by the manufacturer. *Performance may vary from specification and will invalidate the warranty.*

⚠️ Keep the unit away from sources of high magnetic fields such as TV’s, microwave ovens and hi-fi speakers as these may affect the LCD screen.

⚠️ Keep the device away from a fireplace or radiant heater as the heat may affect the device.

⚠️ Keep the device away from nebulizer or steam kettle as the moisture may affect the device.

⚠️ Keep the device away from sunlight as long-term exposure to sunlight may affect the rubber causing it to become less elastic and crack.

⚠️ Keep the device away from lint and dust as long-term exposure to lint and dust may affect the sockets or cause the battery connector to develop a bad contact.

⚠️ Do not mix old, new or different types of batteries.
18. ACCESSORIES AND SPARES

Expected Service Life
- The machine will often last for more than 5 years, but is guaranteed for 2 years.
- Lead life depends greatly on use. Always handle the leads with care.
- Pads should last 12-20 applications, depending on skin condition and humidity.
- AA alkaline batteries should last at least 15 hours.

The following replacement parts may be ordered from the TensCare website at www.tenscare.co.uk or by calling +44 (0)1372 723 434.

E-CM5050   Pack of 4, 50x50mm electrode pads
E-696SS-4  Pack of 4, 50x50mm hypoallergenic electrode pads
E-CM25     Pack of 10, 25x25mm circular electrode pads
L-CPT      CPT Lead wire
B-AA       1.5V AA batteries
X- BC-PT   Replacement belt clip
X- BL-PTT  Replacement battery cover

19. GUARANTEE

Your TensCare device is guaranteed for two years from the date of purchase. If a fault develops, return the unit to TensCare at the address on the back cover of this manual, together with a copy of your invoice and details.
of the problem. The guarantee does not cover accessories (the batteries, electrode pads or lead wires).

Please note that the guarantee is invalidated if incorrect batteries have been fitted, or the unit has been immersed in water, maltreated or otherwise tampered with.

20. Disposal of Waste Electrical And Electronic Products (WEEE)
One of the provisions of the European Directive 2002/96/CE is that anything electrical or electronic should not be treated as domestic waste and simply thrown away. To remind you of this directive all affected products are now being marked with a crossed-out wheelie bin symbol, as depicted below.

To comply with the directive you can return your old electro-therapy unit to us for disposal. Simply print a postage-paid PACKETPOST RETURNS label from our website www.tenscare.co.uk, attach this to an envelope or padded bag with the unit enclosed, and post it back to us. Upon receipt we will handle your old device for components recovery and recycling to help conserve the world’s resources and minimise adverse effects on the environment.
21. TECHNICAL SPECIFICATION

Amplitude: 90mA zero peak to +ve in steps of approx. (over 1KOhm load) 1mA
Channels: Dual Channel
Waveform: Symmetrical square wave Bi-Phasic
Power: 2 x AA Alkaline LR6 batteries
Battery life: At least 15 hours at 50mA 300uS 50 Hz
Adjustable Timer: 10, 20, 30 45, 60, 90 min
Defaults to 20 min
Output plug: Fully shielded: Touch Proof
Weight: 80gm without batteries
Dimensions: 115 x 53 x 27mm
Safety Classification: Internal power source.
Type BF: Designed for continuous use. IP22.
No special moisture protection.

Environmental Specifications:
Operating:
- Temperature range: 5 to 40°C
- Humidity: 15 to 93% RH
- Atmospheric pressure 700hPa to 1060 hPa

Storage:
- Temperature range: -25 to +70°C
- Humidity: 93% RH non-condensing
- Atmospheric pressure 700hPa to 1060 hPa

Contact duration: At least 10 minutes
NB: The electrical specifications are nominal and subject to variation from the listed values due to normal production tolerances of at least 5%.
Symbols Used

Attention! Please follow the instructions in the User Manual.

TYPE BF EQUIPMENT: Equipment providing a degree of protection against electric shock, with isolated applied part. Indicates that this device has conductive contact with the end user.

This symbol on the unit means “Refer to Instruction Manual”.

Temperature Limitation: indicates the temperature limits to which the medical device can be safely exposed.

Lot Number: indicates the manufacturer’s batch code so that the batch or lot can be identified.

Humidity Limitation: indicates the humidity limits to which the medical device can be safely exposed.

Serial Number: indicates the manufacturer’s serial number so that a specific medical device can be identified.

Do not dispose in household waste.

Catalog Number: indicates the manufacturer’s catalog number so that the device can be identified.

This medical device is not water resistant and should be protected from liquids.
Atmospheric Pressure: indicates the atmospheric limits to which the medical device can be safely exposed.

Date of Manufacture: indicates the date which the medical device was manufactured. This is included within the serial number found on the device (usually in the battery compartment), either as “E/Year/Number” (YY/123456) or “E/Month/Year/Number” (MM/YY/123456).

This medical device is indicated for home use.

The first number 2: Protected against access to hazardous parts with a finger, and the jointed test finger of 12mmø, 80mm length, shall have adequate clearance from hazardous parts, and protected against solid foreign objects of 12.5mmø and greater.

The second number 2: Protected against vertically falling water drops when enclosure is tilted up to 15°. Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical.

22. EMC PRECAUTIONS
Wireless communications equipment such as wireless home network devices, mobile phones, cordless telephones and their base stations, walkie-talkies can affect this equipment and should be kept at least a distance d = 3,3 m away from the equipment.

(Note. As indicated in Table 6 of IEC 60601-1-2:2007 for ME EQUIPMENT, a typical cell phone with a maximum output power of 2 W yields d = 3,3 m at an IMMUNITY LEVEL of 3 V/m).