



new energies for the body

Sport



The XFormer/EXE sports section features a total of 34 programs split up into 6 groups: Endurance, Strength resistance, Hypertrophy, Strength, Power, Active recovery - a complete set of protocols designed to affect all muscle characteristics, with the possibility of regulating work intensity at any time, thereby catering for a range of needs, from those of the sports professional to those of people who simply want to stay in shape.

Furthermore, XFormer/EXE, by means of the special recording unit provided, follows your workout just like a real personal trainer. Accurate workout charts will tell you which muscles to train and for how long, according to the results you want to achieve. All you have to do is decide when to perform your workouts and discover the fantastic benefits provided by XFormer/EXE every time you practise your favourite sport.

MUSCLE AND PROGRAM TABLE FOR EACH SPORT

Before beginning an electrostimulation workout session, it will be best to clear up a number of basic concepts relating to sports workout. Each sport envisages the improvement of certain physical qualities that can also be trained by means of electrostimulation sessions. It is therefore best to select the programs best suited to the

Sport	Programs	Muscle groups
SOCCER	Strength Strength resistance	Quadriceps - Buttocks - Calves
BASKET	Strength resistance Power	Quadriceps - Buttocks - Calves - Triceps of arm Deltoids
VOLLEY	Power	Quadriceps - Buttocks - Calves - Large Pectoral Latissimus dorsi
RUGBY	Strength Hypertrophy	Quadriceps - Buttocks - Calves - Large Pectoral Latissimus dorsi - Abdominals
TENNIS	Power	Quadriceps - Buttocks - Calves - Large Pectoral Latissimus dorsi - Abdominals
ALPINE SKIING	Strength Power	Quadriceps - Buttocks - Calves
CROSS-COUNTRY SKIING	Endurance	Quadriceps - Buttocks - Calves - Triceps of arm Latissimus dorsi
CYCLING	Endurance Strength resistance	Quadriceps - Buttocks - Calves
RUNNING	Endurance	Quadriceps - Buttocks - Calves
Combat sport BOXING - JUDO - MARTIAL ARTS	Strength Power	Quadriceps - Buttocks - Calves - Large Pectoral Latissimus dorsi - Triceps of arm - Abdominals
GOLF	Strength Power	Quadriceps - Abdominals - Large Pectoral Buttocks - Deltoids
RIDING	Strength resistance	Quadriceps - Biceps of thigh - Adductors - Buttocks Lumbar muscles- Abdominals
BODY BUILDING	Strength Hypertrophy	All main muscles

practised sport. The chart below shows the XFormer/EXE workout programs most suitable for each specific sport, the characteristics this develops and the main muscles involved.

Characteristics of sports programs

The sports sector has been the real protagonist of the enormous success reaped by electrostimulation, especially during the course of the last decade. As we already said in the short historical account, it was as a result of the pioneering work done by Kotz in the seventies on Russian athletes that muscle system stimulation began to be considered a natural way of integrating traditional training. Initially, it was only used at competitive level, but later spread into the normal daily physical exercise of large numbers of people.

The usefulness of electric stimulation in training stems from its ability to perform a very precise workout on muscles, in some cases with results comparable to those obtained with normal exercise, in other cases with even superior results, thanks to the possibility of focusing on specific muscle fibres that could not otherwise be adequately stimulated.

All scientific studies on electrostimulation have shown that muscles treated with electric impulses tend to become larger. The reason for this is that the single fibres become thicker and therefore increase their capacity to contract and strengthen. Increase in size alone however does not mean that the muscles have acquired specific qualities. The protocols developed for XFormer/EXE provide electrostimulation programs suitable for developing all the potential needed to practice different types of sports, exactly as happens through workout in a gym or on the field. It should not be forgotten however that a workout programme with important goals must be performed regularly, following methods and work stages established together with an athletics coach.

By altering the intensity of the current and the duration of the contractions, the appliance permits developing all the basic characteristics of the muscle system.

Endurance

Under this title, work programs are grouped together aimed at increasing resistance to conditions of prolonged effort, such as to extend to the limit the oxygenation capacity of the fibres and thereby increase the muscle's natural aerobic endurance.

The electric stimulations of the Endurance protocols are of medium intensity, with very short recovery intervals. Work loads are therefore considerable, applied for prolonged periods of time, suitable for replacing long traditional endurance workout sessions, often responsible for exhausting workouts on tendons and the bone structure. Frequencies in these cases go from 10 to 25 Hz, with recoveries of just 1 Hz from 3 to 7 seconds.

It must also be remembered that training to withstand prolonged effort also calls for a gradual increase in workout intensity during the various workout sessions; never such however as to tetanise the rapid and intermediate fibres, and able only in part to tetanise the red fibres.

Resistance to sustained effort

Protocols of this type aim at increasing muscle resistance to a prolonged maximum effort, so that the fibres work in anaerobic conditions with consequent secretion of lactic acid. They are able to replace workout sessions that normally involve a considerable waste of energy and time.

The muscle fibres involved in developing resistance to sustained effort are prevalently the red ones with slow reactivity, which normally come into action when the effort tends to be prolonged or repeated, enabling the athlete to withstand extreme conditions of tiredness.

The electric stimulation that reaches the fibres is 40-60 Hz, frequencies very similar to those used for strength development. Resistance is in fact increased by operating on the recovery procedures - each rest phase must be equal or lower than the duration

of the contractions, gradually reducing the useful recovery seconds from 8 to 5. In this phase as well, a very low-frequency impulse will always keep the fibres in slight workout condition, to drastically reduce oxygenation and help the natural secretion of lactic acid.

Hypertrophy

This is definitely the most directly observable phenomenon, clearly visible even after just a few electrostimulation sessions performed using dedicated programs.

The effect is due to the particular work conditions undergone by the muscle fibres. Deep and repeated contractions reduce the oxygenation of the cells and cause an increase in the production of lactic acid. On being submitted to these work loads, the cell metabolism triggers special hormone and fibre-thickening processes, which results in a real growth of muscle mass.

The currents applied by XFormer/EXE through programs dedicated to muscle hypertrophy feature frequencies between 50 and 75 Hz for at most 10 seconds, separated by 2 Hz recoveries for 10-12 seconds.

Strength

This is the basic characteristic required in most sports. The electrostimulation sessions aimed at developing strength can integrate normal gym workout or replace this for a certain period of time, for instance during the winter months.

Electric impulses aimed at developing strength involve type II muscle fibres, meaning the white fibres distinguished by a high contraction speed. The frequency of the impulses emitted by XFormer/EXE goes from 50 to 75 Hz and is able to cause contractions lasting about 4-5 sec that ensure the muscle reaches maximum strength limit. These extreme impulses are alternated with rest periods lasting up to 25 seconds that allow the muscle to correctly recover and during which a current of just 2 Hz

helps increase oxygenation without tiring the stimulated part. The best results in terms of increase in strength can be obtained by gradually increasing the intensity of the applied current. This enables the muscle to gradually adapt to higher work loads, as long as the times necessary to strengthen the fibres and ensure physiological recovery are complied with.

Power

The work protocols dedicated to developing explosive muscle power or strength almost only affect the white fibres and ensure maximum levels for the type of workout dedicated to strength.

This is a specific type of workout required for every sport where muscles are called upon to express utmost strength in very short times.

The applied impulses are the limit ones normally withstood by muscles and can reach 100-120 Hz. Current flow never lasts for more than 3.5 seconds, followed by periods of recovery of at least 30 seconds, required to restore the biological potential of the fibres after intense effort. The oxygenation current dispensed during the rest phase must be very low - even just 1 Hz - to allow the muscle to fully relax.

As in the case of strength development, for power as well, maximum work loads must be achieved through gradual workout sessions, proportionate to the state of training and specific characteristics of the person.

Active recovery

This is an extremely important function tied to the muscle metabolism. After each intense activity, the muscle used tends to contract and drastically reduce response to

subsequent stimulations. This phenomenon is scientifically called "muscle fatigue" and can, if the effort is prolonged, cause persistent shortening of muscle fibres with a strong production of lactic acid.

The active recovery programs affect the time required to eliminate lactic acid and oxygenation of the contracted fibres and re-establish muscle elasticity in a very short space of time.

Normally, to be successful, this type of electrostimulation must be applied between 15 minutes and 3 hours after the athletic effort.

STRETCHING AND ELECTROSTIMULATION

The word stretching indicates a preparation technique for lengthening the muscle fibres and tendons and making them more elastic. Used initially for training professional athletes, stretching has shown itself useful in all occasions for exercising the muscle system, at any level.

In the case of electrostimulation as well, stretching has shown itself to be very important in two stages: before the session and after exercising the muscle.

Preparing the muscle for contraction, meaning to best perform the work it has to do, is advisable in order to increase its response to subsequent stimulations and upgrade performance, thanks to better oxygenation.

After workout, especially if this has been dedicated to developing strength, stretching plays an equally important role. As in the case of traditional sports activities, a muscle stimulated to increase its power tends to shorten, increasing on the one side its potential, but always with the risk of not exploiting it to the full. Considering stretching always affects fibre distension and the ability of fibres to react, it allows the muscle system to express all the strength it has acquired.