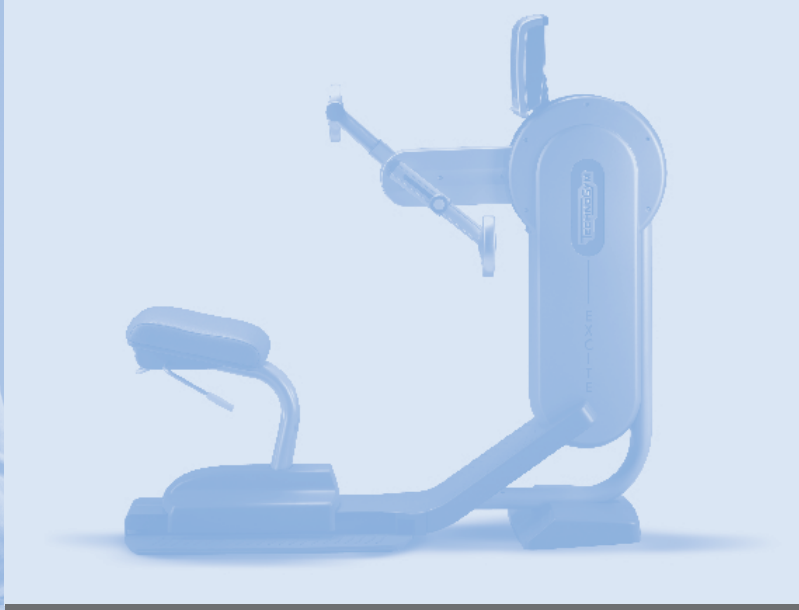

EXCITE® TOP

COMPLETE UPPER BODY TRAINING

GUIDE TO USE AND BENEFITS

TECHNOGYM
The Wellness Company®

Compiled by the Technogym® Medical-Scientific Research Department

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1.0 The benefits of cyclic training of the upper limbs.

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The fitness & wellness sector has made great advances in the search for complete mental and physical wellbeing, and Technogym® is taking a leading role in this regard. Nevertheless, the industry is still underestimating the importance of cyclic training of the upper limbs and torso. It is a scientific fact that the inclusion of cyclic upper body exercise as a regular component in every workout programme not only improves the cardiovascular system, it is also a rapid and effective way of toning the shoulder and torso muscles, improving physical appearance and correcting posture. In addition to this general benefit, warming up the shoulders and upper limbs is extremely useful in both fitness and sports activities, helping prevent injury and improve performance.

1.1 Cardiovascular exercise.

A truly complete cardiovascular training programme should always involve cyclic exercise that alternates between upper and lower body activity[1], so as to obtain **the best benefits and to prevent muscle fatigue.** In addition, cyclic exercise with the arms above heart level is an excellent means of increasing the heart's contractile capacity and therefore aerobic capacity[2].

1.2 Provide variation to burn more calories.

While a traditional aerobic workout may be boring, **alternating the upper and lower limbs** is undoubtedly **more enjoyable and stimulating** and delivers the same overall caloric expenditure. This prevents premature exhaustion of the muscles of any one area, enabling **longer overall exercise duration.** Moreover, muscle recovery is such that the exercises can be repeated in sets, thus allowing **greater total caloric expenditure**[3]**.**

1.3 More visible improvements in less time.

Toning the shoulder and torso muscles is the quickest and most effective way of improving the shape and look of our bodies, by redressing the loss of muscle mass which naturally occurs with age, for example. Cyclic exercise with the upper limbs, which involves repeated concentric contractions, is a safe **and direct method of toning all the muscles of the trunk, shoulders and arms.** The same effect can also be achieved using weights, but requires extensive exercise with slow contractions and many sets and repetitions.

1.4 Correct warm up and improved upper body performance.

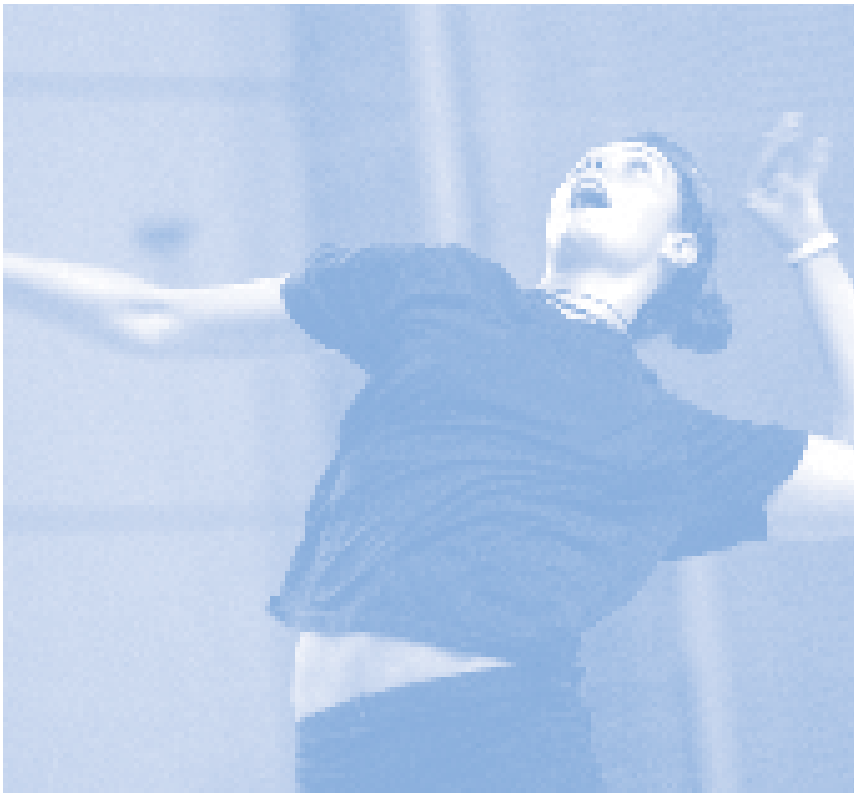
Although the shoulder joint is most prone to damage when working with weights, many people fail to warm it up correctly. In fact, it is vital to adequately prepare the muscles and joints of the arm and shoulders prior to engaging them in strength or power exercises, especially at high intensities. **A proper warm-up has positive effects on both training results and athletic performance, besides lowering the risk of injury**[4].

• In the gym.

The majority of strength exercises, whether using free weights or machines, are performed with the upper body. It is therefore essential to to adequately prepare all the relative joints and muscles at the start of every workout, by integrating them into a conventional warm-up which normally only prepares the lower limbs. Being able to do this very quickly and **easily without the need for prior instruction** or continuous **supervision** will ensure that this type of exercise is more readily accepted and adopted by all gym users.

- **Before sports training and competitions.**

Many sports (such as swimming, tennis, baseball, rowing, volleyball, basketball, handball, canoeing, water polo, boxing, wrestling, judo, rugby, squash, athletics, throwing disciplines, cricket and golf) demand optimum upper body performance and therefore require both general and specific training. **A short and thorough warm-up, performed systematically so as to remain focused** on the competition or technical aspects of training, **improves performance and reduces the occurrence of niggling muscle or joint injuries due to inadequate preparation**[5].



1.5 Save time with efficient, complete training.

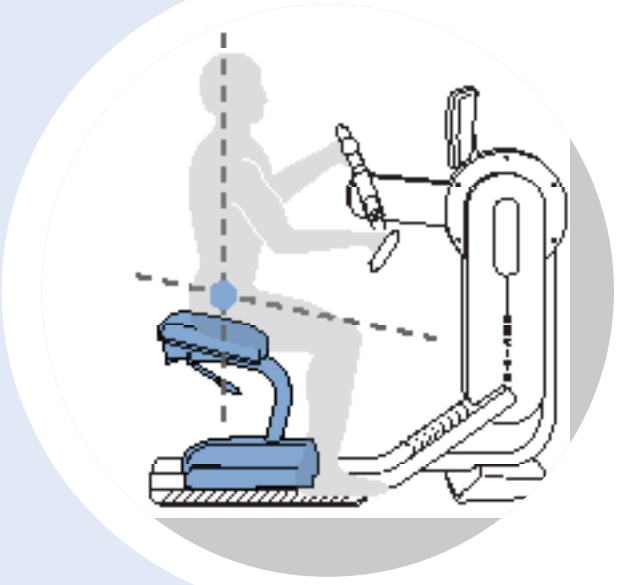
Every client would like to obtain the best results possible with short training sessions and the least possible time, but the combination of cardiovascular exercises plus toning often requires long training sessions due to the number of exercises and pauses between sets. Cyclic exercise of the upper limbs enables a complete workout to be performed in much less time. In addition to exercising the heart and burning calories, it simultaneously **tones muscles,** thereby incorporating all the components of a typical training session.

1.6 Improve your sports performance.

In a vast number of sports (including swimming, tennis, volleyball, baseball, handball, canoeing, water polo, wrestling, judo, boxing, cricket, rugby, squash and golf, to name but a few), **the improvement of upper body strength, power, endurance, tone and speed** coincides with improvements in performance, whether at pro or amateur level. A cyclic workout, oriented towards the specific discipline and technical training phase, represents **an effective, quick and balanced** method of sports training, whereas a non-specific workout with free weights or machines does not always meet the distinct requirements of these disciplines.

1.7 Improve posture.

Maintaining correct posture keeps us looking good and healthy and helps prevent any number of painful back conditions. In order to improve posture, it is essential to **perform balanced workouts which stimulate all the paravertebral muscles, the core and the shoulders.** This will redress imbalances in muscle tone caused by spending too much time sitting or standing in an awkward position. Cyclic upper body exercise, performed with a straight back and which activates the core stabiliser muscles[6], torso and shoulders, significantly helps to **improve and correct posture,** and also has a **preventive effect.**



With the innovative seat, users actively assume the correct spine alignment

1.8 Prevent shoulder and elbow problems.

The upper limbs are incredibly flexible in their movement and it is therefore extremely difficult to perfectly balance the work of the agonist and antagonist muscles in terms of intensity and duration. Inadequate preparation and repetitive stress can easily lead to shoulder or elbow problems.

Cyclic exercise with continuous concentric contractions, performed at a progressively increasing intensity and **in both rotation directions,** is the only form of exercise which provides a systematically **balanced** workout, in terms of function, intensity and duration, **for all of the** shoulder and arm muscles. **Not only does it increase the active stability of the shoulder,** it also prevents potential injury.

1.9 Effective rehabilitation of the upper limbs.

For the shoulder and elbow, post-trauma or post-op rehabilitation is a necessarily long and complex process. One of the reasons for this is to prevent possible relapses. In particular, rehabilitation of the shoulder through individual exercises is extremely complex and requires great concentration on the part of the patient. Concentric **cyclic exercise (either strength or resistance) performed without** sudden changes of direction and even at high speed, and which is **balanced and suitable** for that phase of the rehabilitation process, can lead to **drastically reduced recovery times and a return to optimal functionality.**

1.10 A cardiovascular exercise for all.

Many individuals affected by **temporary or permanent conditions (obesity, old age, arthritis/ fractures/sprains of the lower limbs or disability)** are unable to use cardio equipment which exclusively activates the joints of the lower limbs. In these cases **the only system** for improving or maintaining cardiovascular fitness is cyclic exercise involving the upper body.


TECHNOGYM

2.0 Excite™ Top: maximum versatility.

2.1 Resistance mode and recommended use.
2.2 Rotation speed.
2.3 Body position.
2.4 Lever adjustment.
2.5 Movement height.
2.6 Direction of rotation.
2.7 Position of handles.
2.8 Distribution of workload within cycle.

Excite™ Top is the essential new piece of equipment which - thanks to its innovative solutions and extreme versatility - makes it possible to perform a cardio workout that engages the torso and upper body muscles. By simply modulating the settings, Excite Top can be used to obtain fully personalised results based on the individual's needs and expectations.

2.1 Resistance mode and recommended use.

Excite™ Top offers several different resistance modes, each of which can be used for specific aims. The first three, with Constant Torque, Power and Heart Rate are used mostly for cardiovascular as opposed to muscular training. The fourth, on the other hand, with Constant Speed, is essentially devised for muscle training.

Constant Torque Training

Standard Mode for cardio conditioning for beginners, the elderly, cardiopaths.

The chosen level of difficulty determines the amount of force which must be applied to the handles in order to turn the levers. **When the speed of rotation increases** (RPM), the power (watts) produced and therefore **the cardiovascular intensity** of the exercise also increase. Vice versa, when speed decreases, so does physical effort.

The highly intuitive nature of this relationship **(more speed=more effort)** facilitates use of the machine by beginners, older users and those with heart problems, who can thus **increase or decrease exertion autonomously by varying speed as they desire.**

By varying speed, users can also enjoy workouts that allow slightly variable intensity, without having to use pre-set programmes or create new ones.

With equal perceived exertion, an increase in power produced indicates progress and improvement.

RECOMMENDED DURATION OF TRAINING SESSION: 10-20 MINUTES

Levels 1-5: suitable for beginners, children, elderly or deconditioned users and those in early rehabilitation.
Levels 5-10: for only moderately active, not particularly strong users.
Levels 10-15: for active users with adequate muscle strength.
Levels 15-20: for very fit users with good strength
Levels 20-25: for athletes and users with great strength and power who train the upper body regularly.
Higher levels (25-30): for athletes of sporting disciplines that mostly rely on the upper body, with very high levels of strength or power.

Constant Power Training

More expert users and athletes.

The power which has to be produced is set at the start of the workout and remains constant, irrespective of the speed of rotation. It follows that with a low number of repetitions per minute (RPM) the system will increase the braking force and as a result, more force will have to be applied to the handles; vice versa, with a higher speed less force will be required on the handles. Thus, the exercise will work the muscles harder at lower speeds and less so at higher speeds. **At lower speeds the exertion** will be **perceived by the muscles most of all,** though the heart will also have to work hard, while **higher speeds** will produce a **sensation of more general fatigue.**

The scarcely intuitive nature of the speed-effort ratio (less speed=greater exertion) and consequent difficulty, in the event of excessive fatigue, in avoiding slowing down, which results in greater energy expenditure, makes this particular mode unsuitable for the elderly and those with heart problems. On the other hand, it is particularly suitable for more expert users and athletes who are mainly interested in performance and mechanical power output. Progress in training is indicated by the possibility of setting higher power values with the same perceived exertion.

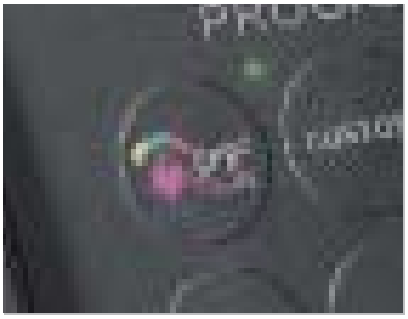
Constant Power — **Constant Speed**

Constant Pulse Rate Training (CPR)

For precise monitoring of exercise intensity.

In the previous modes, the set parameter consists of a workload index which is "external" to the body and which does not always coincide with actual physical exertion. In CPR mode, on the other hand, **the set value** is **Heart Rate, which indicates** the "internal" load, that is to say **the individual intensity of the exercise** which a user must actually perform. The system increases or decreases the braking force in order to reach and maintain the set Heart Rate so that the intensity of the exercise remains constant at all times.

This mode is therefore **ideal when it is necessary to ascertain and accurately monitor the intensity of the exercise,** to avoid workouts that are unintentionally too mild or too intense (the elderly, cardiopaths, the obese). Moreover, it is **also** recommended **for** those intent on **improving their level of fitness** in a scientific manner and monitoring their progress accurately. This is done by increasing the Target Heart Rate when the previous workout is perceived as too easy (as often happens with beginners) or by adopting the Heart Rate as a reference value and verifying the power generated (as can happen with the fittest users).



Considering the difference in muscular mass involved during exercise **on TOP compared to on the treadmill or bike, the maximum achievable Heart Rate is lower** than that for these ergometers (the percentage difference varies from one individual to another).

Constant Speed Training

Expert users and athletes.

This function makes it possible to maintain a constant speed of rotation of the levers, irrespective of the force applied. Once a given rotation speed is set, when the user increases or decreases the force applied to the handles the system automatically and proportionately increases or decreases braking force so that the speed of rotation remains unchanged.

This mode is recommended for expert users and athletes who wish to perform **an intense exercise** for the arms **at a pre-set speed**, without encountering any undesired changes upon applying more force (typically swimmers, rowers, canoeists, grinders). In addition, this function is very useful **for continuing to exercise one upper limb only** when the other limb needs to be rested completely or moved passively or gently, for example **during an injury or rehabilitation.**

2.2 Rotation speed.

Variation in speed determines the level of the cardio effect, for a toning or strengthening workout. In principle, with equivalent power, the higher the speed, the greater the cardiovascular activity and the lesser the muscular activity; vice versa, and within certain limits, as speed decreases, cardiovascular engagement decreases while muscular activity intensifies.

Average Speed **60/80RPM – for standard use.**

There is no such thing as an average speed applicable to all, since this is influenced by an individual's percentage composition of fast and slow twitch muscle fibres. However, in a healthy, normal individual we can suppose a speed of around 60/80 RPM to be a good approximation.

Low Speed — Below 60 RPM – for specific applications.

With low speed, the contraction time of muscle groups involved increases, offering the following benefits:

1 **Good toning** due to prolonged engagement of muscle fibres

2 **Improvement of maximum strength** of muscles involved since the slower the speed, the greater the percentage of maximum strength that can be developed. As a result of these characteristics, the most common type of fatigue encountered at slow speeds is muscle fatigue. With high resistance and adequate duration, the heart muscle is also exercised.

3 **Optimum rehabilitation** since at low speed the movement is more effectively controlled and the user is able to distribute the load over the entire movement, engaging all the muscles of the shoulders and core.

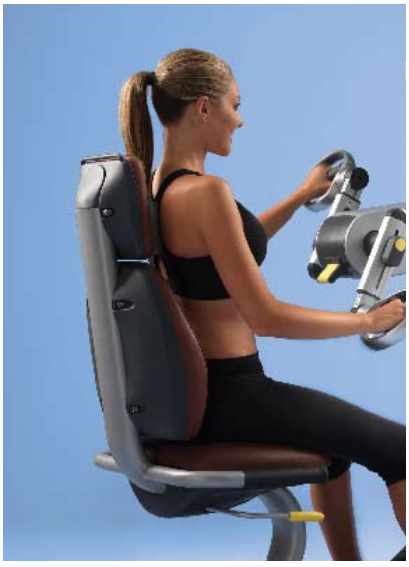
High Speed — Above 80 RPM – for sports use.

With high speed, the time available for muscle contraction decreases, so the percentage of maximum applicable force decreases as speed increases. When session duration is sufficient, the exercise consitutes more of **a cardiovascular workout** than a strength workout.

Dynamic involvement of the arms increases, as does isometric contraction of the trunk muscles, engaging only the most biomechanically favourable sectors.

2.3 Body position.

By adopting a seated or standing position **it is possible to vary the involvement of the leg muscles and core stabiliser muscles.** When possible, therefore, it is **advisable to alternate** the two positions, both over the course of sessions and within any one session[7].



Sitting position **recommended for hips, swimming, rowing, canoeing, kayaking.**

When sitting, either on the traditional seat with backrest or the innovative ergonomic seat, **the arms and trunk perform the majority of the work.** The seated position keeps the pelvis in a fixed position, so stabilization of the trunk, and any rotation of the latter (proportionately greater when the levers are longer), is entirely dependent on the oblique abdominal and paravertebral muscles. Since the symmetry of the movement is more restricted at trunk level, the user spontaneously balances the muscular action around the axis of the spinal column, both antero-posterior and latero-lateral.

This position is therefore recommended **for increasing workload on hips, both for aesthetic and functional** purposes, and for those sports which require trunk rotations. The angle of the **ergonomic seat**, with the pelvis tilted slightly forward, maintains the physiological curvature of the spine while keeping all the muscles functionally active, with significant **benefits for posture.** In addition, if the correct alignment of the various cervical-dorsal-lumbar sections of the spinal column is maintained for the entire session, it is particularly useful for preventing or redressing poor posture. The seated position should be preferred for dry training for those sports where performance depends largely on the upper body and/or is carried out sitting.

Standing Recommended for rapid, complete training, judo, wrestling, rugby, boxing, martial arts.

In the upright position, the **hip and leg muscles are involved in an isometric movement:** glutes, quadriceps, hamstrings, adductors, periarticular muscles of the hips. **The muscles that control trunk flexion-extension,** which mainly include the rectus abdominus and paravertebral muscles, as well as all the deep stabilizer muscles of the spine, are also significantlly engaged.

1 This mode simultaneously **works** on **the whole body** in a posturally balanced way and is recommended for those who wish to save time by performing a more complete workout in relatively little time.

2 It can also be used for **global postural exercise** involving the relative positions of the pelvis with the trunk and legs.

3 It is particularly suitable for those who do combat or contact sports

Feet aligned Recommended for posture, deconditioned, sedentary users.

Feet are positioned symmetrically to the machine, at a comfortable distance apart, and the knees should be slightly bent. This position helps develop lifting-lowering strength **(deltoids and upper trapezius which lower arms)** and forces the user to balance **the symmetry of the antero-posterior and latero-lateral movement around the spinal column.**

This mode offers less marked development of strength in terms of arms and trunk, especially the muscles responsible for pushing-pulling (pectoral-dorsal). It is recommended **for targeted correction of posture** in subjects who are relatively weak in terms of upper body and arm strength, typically sedentary **individuals**.

Feet staggered

Recommended for experts users and athletes, combat sports, tennis, throwing disciplines, handball, rugby.

Feet are positioned one in front of the other, the chest forward. The distance **between the front and back foot dictates the intensity of engagement of** the various muscles in the legs. The knees can be bent at the desired angle: the more bent the knees, the greater the isometric exercise for the thighs. **Feet** can be **parallel or turned inwards**: when parallel, the rectus femoris of the back leg and the hamstrings muscle of the front leg are worked hardest; when turned inwards, the load is shifted to the adductors. As regards arms, this mode favours the forward pushing movement of the arm corresponding to the back leg, and the pulling movement of the other arm.

Since this is a position which determines **highly asymmetric exercise** of the leg and trunk muscles, **it must be alternated** with the contralateral leg during the same session. Allowing **development of great strength**, it is recommended for expert users and athletes in general, and especially for those who do sports which involve **whole body torsions**.

Trunk leaned forward

Muscular activity: thrust action of pectoral and tricep muscles.

While standing or sitting, by moving the pelvis further back and lowering the rotation axis slightly, the user can perform a workout with the upper body leaning forward at the desired angle, exploiting part of his/her bodyweight to push the levers. This mode automatically **favours the thrust action performed by pectoral and tricep muscles.**

Trunk leaned backward

Muscular activity: pulling by dorsal muscles.

While standing or sitting, by moving the pelvis forward and raising the rotation axis slightly, the user can perform a workout with the upper body leaning back at the desired angle, holding on therefore to the levers. This mode automatically **favours** the **pulling action of the dorsal and bicep muscles.**

2.4 Lever adjustment.

Adopting different lever lengths from the standard setting makes it possible to obtain a differential workout for shoulders, rotary torso muscles and postural muscles.

Short Levers **Recommended for rehabilitation and posture.**

As the length of the levers is shortened, it becomes harder to generate the same force or power as is generated with longer levers. The use of the rotary torso muscles and the engagement of the shoulder muscles and joints is restricted in favour of a **substantial, continuous and isometric contraction of the chest muscles** and paravertebrals, obtaining a corrective postural workout.

This mode is therefore **recommended for rehabilitation of the shoulder**, when it is advisable to use **progressively longer levers, and to improve posture.**

Long Levers

Recommended for training for aesthetic and functional purposes of the hip muscles.

As the length of the levers is increased, the exercise and muscular contraction become **more dynamic.** Likewise, the movement and engagement of the shoulder muscles and joints increases, as does the **involvement of the rotary torso muscles** (adbominal oblique and intervertebral muscles).

It is thus recommended **for engaging the shoulders to their maximum potential** with sweeping movements **and for exercising the hip muscles**, for both aesthetic and functional purposes, for training in very dynamic sports.

Levers of Different Lengths

In special cases, the two levers can be adjusted to different lengths. In the case of current or recent injury of an upper limb, the machine can be used to keep the healthy limb in shape using an ample movement while **resting the other arm by means of a more modest rotation.**

Levers Linked

While in traditional mode the two levers are symmetrically staggered compared to the centre of rotation, making the user perform trunk rotations, linking the levers **promotes the flex and stretch movement of the trunk**, with greater engagement of the **rectus abdominus** and the **spinal extensor muscles**. Ideal for training for similar movements (e.g. butterfly stroke, this mode is recommended for strengthening the trunk flexor-extensor muscles and for **preventing** acute **back problems** caused by poor muscle tone (e.g. lumbago).

2.5 Movement Height.

The height of the rotation axis is adjustable and can be set higher or lower than the standard position in order to increase or decrease the workload for shoulders and the heart.

Higher **Recommended for athletes, athletic movements, significant cardiac workload.**

Raising the height of the the axis **increases the workload for the arms**, and in particular **for the shoulders**, since it requires the humerus to be lifted even higher with respect to the shoulder blade. This position also significantly increases the counter-pressure **workload of the heart** as it pushes blood into muscles working above it. This workload, demonstrated by higher heart rates, therefore increases proportionately to the amount of movement performed above heart height.

This mode is therefore recommended for **athletes** seeking an intensive workout for shoulders, and for reproducing particular movements with similar bio-mechanical characteristics (e.g. volleyball, tennis, baseball, javelin, swimming) or for those seeking an intensive cardio workout, and in any case only for individuals with no orthopedic or cardiological contraindications.

Lower **Recommended for rehabilitation, "at risk" subjects, elderly, obese and cardiopathic users.**

Lowering the axis significantly **decreases the workload** of the muscles and joints of **the shoulders**, as well as that of **the heart**. Shoulders can therefore be exercised, intensely if so desired, but without any risk of exacerbating underlying problems.

The lower position of the axis is therefore ideal for workouts for those individuals at risk of shoulder injury and for shoulder joint **rehabilitation** . It is also electively recommended for **elderly, obese and cardiopathic users.**

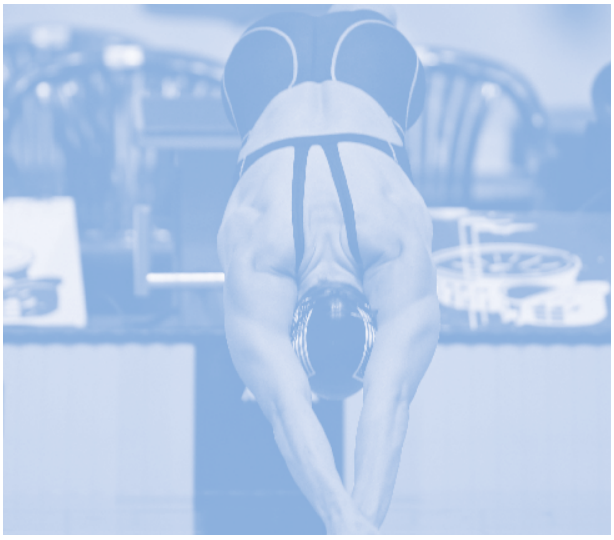
2.6 Direction of rotation.

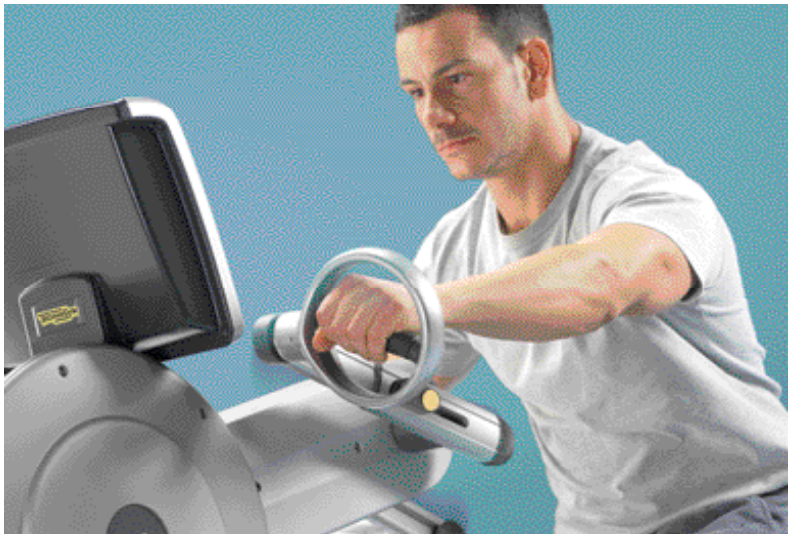
The two directions of rotation **are very different**, also from a metabolic point of view, and involve the recruitment of different, complementary muscle groups. For a truly complete workout involving all the muscles of the trunk and shoulders, it is therefore **best to alternate rotation,** with times dictated by individual needs and aims.

Forward Rotation **Recommended for deconditioned, non-expert users, athletic movements, swimming, boxing, grinding.**

This is the most traditional and instinctively natural mode, whereby the user performs pushing up and pulling down movements. This mode normally **activates the larger muscles, namely the pectorals** for push **and the latissimus dorsi** for traction, thus producing **greater energy expenditure.**

This direction is ideal for the initial approach with particularly deconditioned, non-expert users. It is recommended for intensive training for athletic movements with similar bio-mechancial action (e.g. swimming, boxing, grinding).





Backwards rotation **Muscular activity:**

deltoids and upper trapezius muscles.

This mode tends to **activate smaller muscles**, making it impossible to produce and sustain any great output. It is ideal for those who want to tone the muscles used to lift the arms **(deltoids and upper trapezius)**.

The muscles engaged in "backward" rotation mode are weaker, faster and have less endurance. Intensity and **exercise times** are necessarily **inferior**, varying from individual to individual depending on perception of exertion.

2.7 Position of handles.

The revolving handles, available only on Excite™ Top, make it possible to **faithfully reproduce an athletic movement, to adapt the exercise to the personal tastes** of the user and to **differentiate** the involvement of **the shoulder and arm muscles** . Consequently it is **preferable to adopt more than one position**, even during the same session. In general, in order to ensure a more flowing movement and to reduce wrist strain, it is best to have the elbow facing the same direction as the handle (e.g.: handles horizontal = elbows pointing outwards; handles at 90° = elbows pointing downwards; and so on). Moving from the horizontal position with the palms downwards so that with palms facing upwards and elbows downwards, the engagement of the abductors and adductors of the arms (deltoid, trapezius, latissimus dorsi) and the pectorals progressively decreases, while the flexor-extensor muscles (biceps and triceps) become more involved. Although possible, the simultaneous use of two different handle positions is only recommended in special cases and for particularly adept users.

Handles horizontal

abductors and adductors.

Since it produces the greatest lateral lift of the humerus, it is this grip which most stimulates the abductors (deltoid and upper trapezius) and the adductors of the arms.

Handles at 45°

pectorals.

This is the most natural and instinctive grip. It favours the push-pull action, pushing in particular, engaging the pectoral muscles.

Handles at 90°

triceps and biceps, latissimus dorsi.

It favours the pulling action by the latissimus dorsi but principally works the triceps during forward rotation and the biceps during backward rotation.

Handles at 135°

biceps and triceps.

This grip favours the engagement of the biceps in backward rotation and the tricpes in forward rotation.

Handles at 180°

biceps and triceps, elbows, wrists.

This grip requires considerable engagement of the elbows and wrists and essentially works the biceps in backward rotation and the triceps in forward rotation.

2.8 Distribution of subjective workload within cycle.

The dynamics of the rotation can be varied subjectively in order to **differentiate distribution of muscle workload** within the cycle, engaging different muscles and structures to a greater or lesser extent as desired. Alternating different workload modes within the same session, also on a rotational basis, all some muscle groups to rest and recover to a certain degree. By thus delaying the onset of localized fatigue, the user is able to prolong the workout, obtaining better cardiovascular conditioning and greater calorie expenditure.

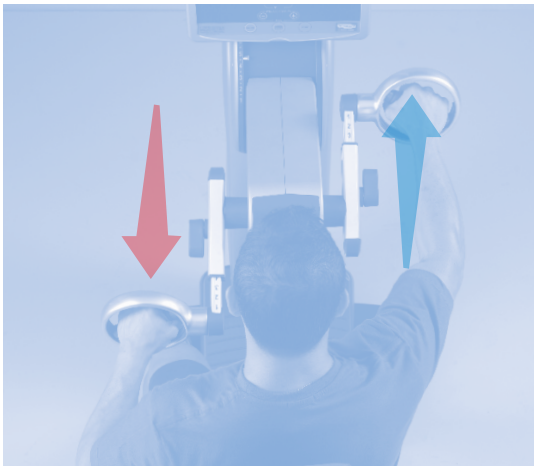
Uniform

Although it may appear simpler, the most uniform distribution of workload within the cycle **actually requires greater concentration**. This exercise mode, more than any other, ensures proper balance between all muscle components without putting strain on any joint structures.

It is therefore the workload mode recommended for beginners and for all cases of shoulder joint rehabilitation and recovery which do not require any special measures.

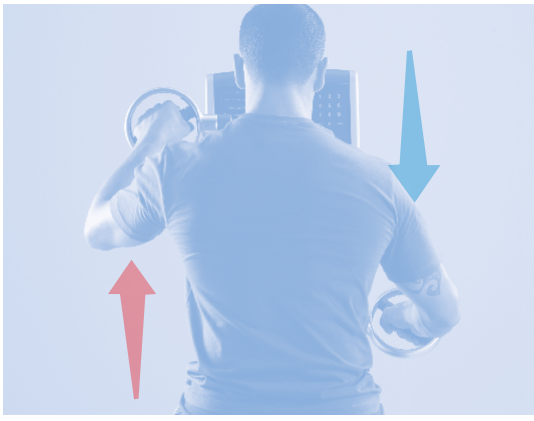
Push-pull

The user must try to channel the majority of muscle power output into the movement, which is alternated on the two sides and consists of pushing one arm away from the body, working the **pectoral/tricep muscles**, while pulling the other arm back, working almost exclusively the **dorsal muscles**. If desired, workload can be concentrated exclusively in the pushing movement, or in pulling.



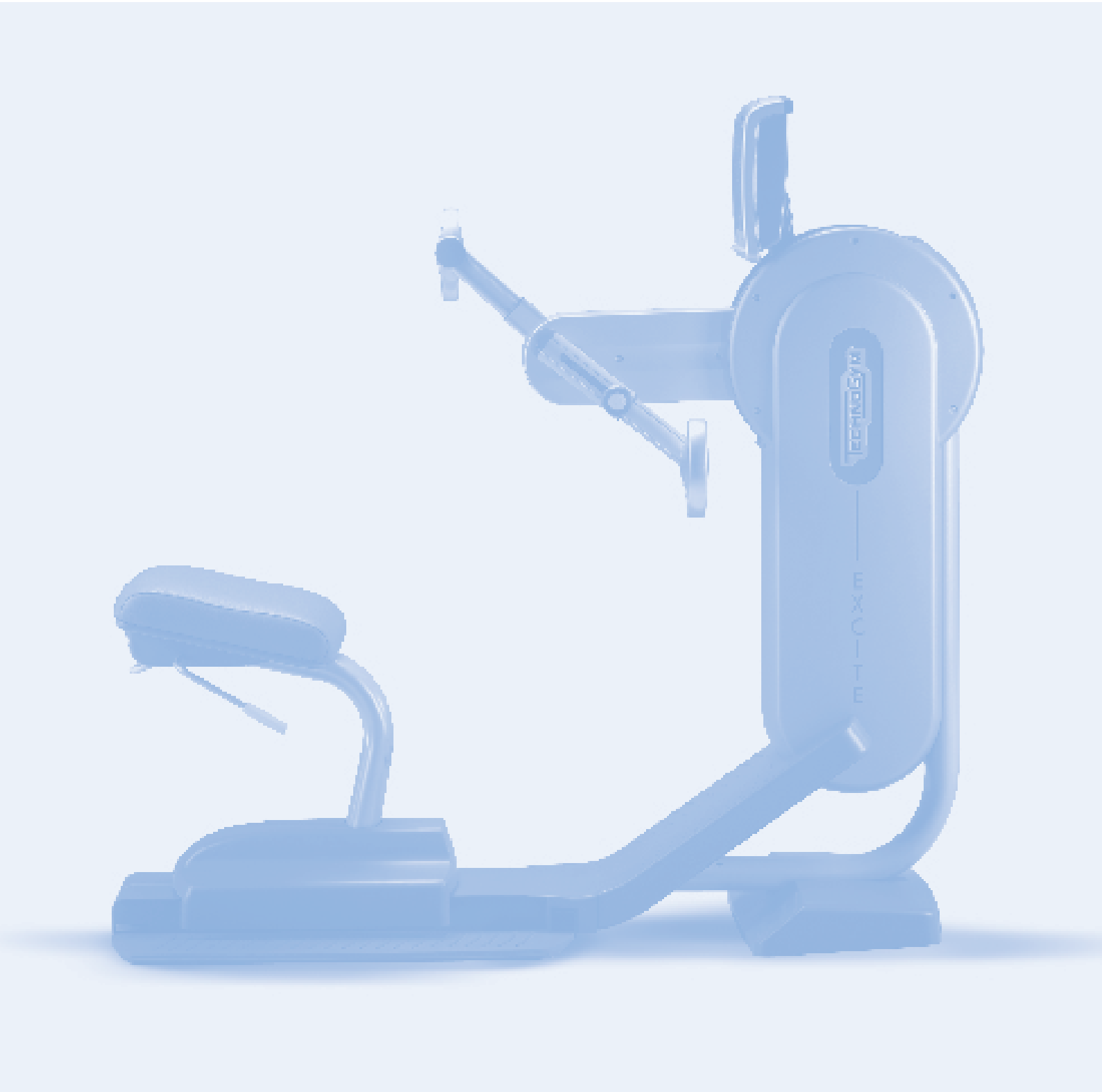
Lifting-lowering

Concentrating muscle power output in the alternating action of lifting one arm while lowering the other, favours the development of the **deltoid/upper trapezius muscles** and the **adductors of the arms**. In the event only one of these muscle groups requires a more intense exercise, the user must concentrate muscular engagement in one phase only, either lifting or lowering.



Right-left

Occasionally, there may be the need to differentiate the intensity of muscle power output between the two sides, **restricting the use of an injured arm** or an arm which is undergoing **rehabilitation** while continuing to exercise the other as normal. In such cases, the user need simply differentiate the muscle engagement of the two sides in accordance with suitable ratio.


TECHNOGYM
EXCITE

3.0 Special functions of Excite™ Top.

3.1 Warm up.
3.2 Test.

In addition to the traditional Technogym functions, Excite™ Top offers several unique functions and protocols.

3.1 Warm Up.

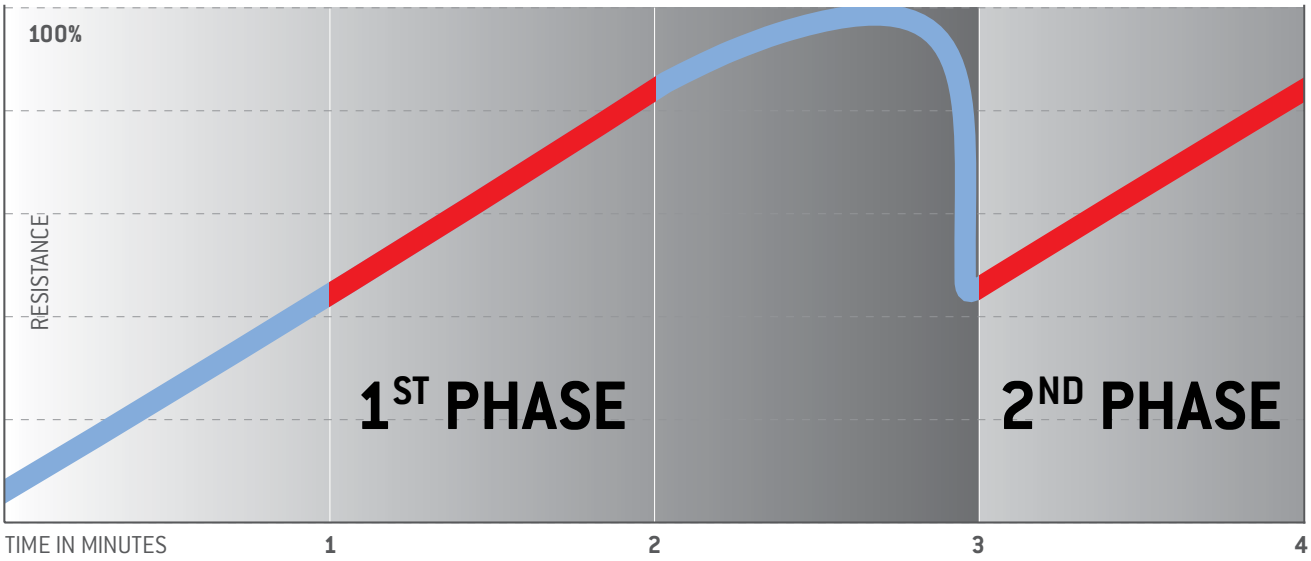
One unique feature of Excite™ Top is the "Warm up" function, designed and patented by Technogym Medical-Scientific Research Department, **to be used before every training session and competition.**

The default duration of the programme is 4 minutes, however it can be programmed to last for between 2 and 10 minutes, depending on the type of user. It consists of **two phases which differ in terms of direction of rotation, duration and resistance**; in the first phase, which lasts 3/4 of the total time, the user rotates the levers forwards, while in the second, which lasts the remaining 1/4 of the total, the levers must be rotated backwards. It is only the use of both rotation directions that provides an optimum warm up engaging all the muscle and joint structures of the shoulders and arms in a balanced manner.

Resistance increases progressively in both directions of rotation. In the first phase, with forward rotation, resistance starts from a minimum value (which in any case depends on the set level) and increases slowly but progressively until it reaches the maximum value (corresponding approximately to the intensity an individual normally opts to sustain in a 10-20 minute workout). In the second phase, with backward rotation, resistance starts from 50 % of the maximum value achieved in the first phase and increases progressively until it reaches 70% of this maximum value.

The relative ratios of duration (3:1) and resistance (100%:70%) of the two phases have been studied to ensure **ideal distribu-**

Increase in resistance during WARM UP based on selected level.



tion of workload for the different types of muscles involved in the two directions of rotation (smaller and having less endurance in backward rotation).
In both phases, the warm up begins with very low resistance values in order to ensure **optimum initial lubrication** of joints by synovial fluid. This fluid, production of which is stimulated by movement, nourishes and lubricates the articular cartilage, keeping it functioning efficiently and preventing wear which leads to arthritis.
The gentle, continuous increase in resistance in both phases allows **ideal muscle warm up** through a progressive increase in muscle contraction intensity, which enables optimum muscle performance and maximum reduction of the risk of acute injury.
It is very important to perform the warm up on Top before beginning any other activity that will involve the upper limbs and/or trunk, either in the gym or any other sports setting, be it training or competition.
In addition, by selecting levels above those of warm up, the Warm Up programme can also be used **for actual workouts**, repeating the standard protocol a number of times to reach the desired duration.

3.2 Test.

FITNESS TEST

The Fitness Test is a protocol developed by Technogym Medical-Scientific Research Department **for an indirect estimate of $V\dot{O}_2$ max**. Based on the calculation of the ratio between mechanical power output and heart rate, measured at medium-low intensity, this **submaximal** test **can be performed by anyone** because it does not involve pushing users to maximal Heart Rate values.

$V\dot{O}_2$ MAX

Maximum aerobic capacity, or $V\dot{O}_2$ max (maximal oxygen consumption) is the maximum capacity of the aerobic metabolism, essentially an indicator of the efficiency of the cardiovascular system. Its value indicates the maximum amount of oxygen that an individual is able to extract from the atmosphere for the metabolic reactions that use it to produce energy. It can be expressed as an absolute value (l/min), i.e. irrespective of body weight, as a relative value (ml/min/kg), i.e. in relation to body weight, or in METS, i.e. as multiples of the average resting metabolism (1 MET=3.5 ml/min/kg). Since the value of $V\dot{O}_2$ max depends on activated muscle mass, with arm ergometers, where there is less muscle mass available compared to that measurable with a treadmill or bike, lower values are reached compared to these latter activities. Based on data obtained in the submaximal phases, the software extrapolates the theoretical value $V\dot{O}_2$ max , expressed as an absolute value (in l/min), relative value (in ml/min/kg of user weight), and as METS (multiples of resting metabolism) and indicates the recommended workout level.

MAXIMAL TEST

The Maximal Test estimates $V\dot{O}_2$ max by measuring the maximum mechanical power output generated, reached by gradually and progressively increasing workload. It is vital that the user, who will be pushed to his maximal work capacity, is in **perfectly good health.**

WINGATE

The Wingate Test is an "all out" 30 second maximal test **for evaluating the anaerobic metabolism** as a whole. It measures the **peak mechanical power** an individual is able to generate, **the total amount of work accomplished and acute fatigue resistance.**

ANAEROBIC METABOLISM

The anaerobic metabolism, that which does not rely on oxygen, consists of two metabolisms, the lactic acid metabolism (which produces lactic acid) and the alactic metabolism (which does not produce lactic acid), which together help provide the energy for brief but extremely intense exertion.


EXCITE
EXCITE

4.0 Suggestions.

4.1 Cardiovascular training.
4.2 Weight loss.
4.3 Toning.
4.4 Muscular hypertrophy.
4.5 Strength.
4.6 Power.
4.7 Speed.
4.8 Rehabilitation.

The following section provides a number of brief, practical suggestions for obtaining the best results according to set targets.

4.1 Cardiovascular training.

For good cardiovascular training, in the traditional sense i.e. training which produces a general improvement in heart function and vascular activity, cardio and via other methods, the workout must last at least 10 minutes; **a duration of 10-30 minutes are the most suitable**. For optimal results, after an initial familiarization period, **the intensity** should be **the maximum sustainable** level for the chosen duration, **without however** producing excessive **discomfort**. An excellent workout for the actual heart muscle itself can last even just a few minutes (5-10) at maximum intensity, but this is only recommended for athletes in peak condition.

In the event the early onset of local muscle fatigue prevents the user from continuing **the exercise, it is best to alternate**, or do circuits, **with different cardio machines** so as to use different muscle groups, rest tired ones, and maintain the general benefit.

Standard mode with constant torque (selecting the appropriate level) is recommended **for sedentary and deconditioned users**. Fitter, more experts users can also use the constant power mode. For those **individuals with** any history of problems relating to **the heart**, who in any case ought to carry out regular, controlled workouts, **CPR mode is recommended. The Target heart rate for the first session** must be very low (**50-60%** of max Heart Rate) and must only be increased in the absence of any symptoms whatsoever. **Forward rotation is recommended.**

4.2 Weight loss.

For weight loss purposes what matters most is **the total amount of cardio work** accomplished during **the session, which should last at least 30-40 minutes at medium-high intensity**, irrespective of whether or not there are interruptions. But it is also **very important to consider the increase in the resting metabolism**, which produces an increase in the amount of fat burned, **after completing** quite **an intense** workout. This increase can last for several minutes. **It is possible** therefore to **choose**, depending on individual preference or contraindications for some users, **between an exercise at low or medium-low intensity with a relatively long duration, or several exercises at medium-high intensity**, but with shorter sets and total duration (e.g. 3x10 minutes) with **long pauses** between sets (when the user can perform other types of exercise). To avoid the boredom of long duration, users are strongly recommended to alternate, or do circuits, with various cardio machines. The most appropriate **mode** is **constant torque** with **forward rotation.**

4.3 Toning.

For optimal toning, **each muscle contraction** must be **not very intense but very prolonged**, although not so long as to lead to premature muscle fatigue. The recommended mode is therefore **constant resistance with low rotation speed (30-50), performing several sets (5-10)**, each lasting **2-4 minutes**, with **partial rest** of muscle groups involved in between sets. It is advisable to **alternate direction of rotation.**

4.4 Muscular hypertrophy.

To produce an increase in muscle volume, muscle **contractions** must be **quite intense, submaximal and prolonged.** The recommended mode is **constant resistance with medium-low speed (50-60), performing several sets (8-10)**, **each lasting 0.5-1 minute**, with **complete rest** of muscle groups involved in between sets. It is advisable to **alternate direction of rotation.**

4.5 Strength.

• Long-lasting.
To improve the length of time for which a good percentage of maximal strength can be applied, the typical times and intensities of the athletic movement performed must be reproposed as accurately as possible. The recommended mode is **constant torque with medium or low speeds** as required, performing **only a few sets (3-6), with duration** increasing, decreasing, increasing-decreasing, or varying randomly (0.5-5 minutes), with **partial rest of muscle groups in between sets.**

• Maximal.
To improve maximum strength, the user must perform **maximal muscle contractions at very low speeds.** The ideal mode is **constant resistance** with **extremely low speed (30)**, **performing several sets (10-20)**, each lasting **20-30 seconds,** with **complete rest** of muscle groups involved in between sets.

• Fast.
To improve the possibility of also applying strength during rapid movements, the recommended mode is **constant speed or constant torque with a high speed (90-100), performing several sets (10-15)**, each lasting **10-20 seconds**, with **complete general rest** in between sets.

4.6 Power.

For those disciplines which can be classed as "power sports" it is useful to develop high strength values at the speeds specific to that particular sport. In principle the most appropriate **mode** is **constant resistance**, trying to achieve the **maximum speed permitted** at the chosen level, taking in to consideration of the target speed to be **reached. Between the various sets (5-10), each lasting 20-60 seconds,** there must be **complete recovery** of the muscles engaged.

4.7 Speed.

To attain the difficult goal of improving speed, the user must exercise fast muscle fibres above all. The recommended mode is **constant speed**, with the **highest speed settings.** While the user works to reach top speed, with these settings resistance is only actually perceived at some points of the movement. **A high number of sets (20-30) of maximal exercise, each lasting 5-10 seconds, must be performed**, with at least 2 minutes of complete general **recovery** in between sets.

4.8 Rehabilitation.

For post-traumatic or post-surgical rehabilitation, but also to avoid putting excessive strain on a painful limb, the recommended mode is **constant resistance or constant speed**; with constant resistance, the intensity of muscle power output can be modulated as required, while constant speed mode makes it possible to apply force only in permitted tracts (without overly slowing down the movement) and allows the healthy limb to continue applying high levels strength without altering the speed of execution. In general, it is preferable **to start from the lowest levels**, working continuously **for a few minutes at low speed with the levers set at minimum length** and, in the case of shoulder rehab, with the rotation **axis** set very **low**. Then, in subsequent sessions or rehab phases, the user can **progressively increase** not only the **level** and **time** of the exercise, but the **speed**, **lever length and height of rotation axis**. Right from the outset, when possible, it is advisable to **alternate the two directions** of rotation, but always in the order forward>backward, remembering to decrease the level in backward rotation mode. Because of the programme duration, intensity and reversible rotation function, **the Warm Up programme** is the ideal solution for all phases of rehab, for a general warm up **and for an actual workout mode**, as it can be repeated a number of times at progressively advanced levels and speeds.

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