BIOMECHANICAL DIAGNOSTICS AND THERAPY

CON-TREX®:
Neuromuscular Diagnostics and Therapy Systems

Computer-Supported Test and Training Systems (CTT):
Motor Controlled Feedback System for the Spine/Trunk

PHYSIOMED Strength Line:
Strength Training Units

PHYSIOMED Cardio Line:
Cardiovascular Training Units

PHYSIORUN:
Treadmill System with Gait Correction Training

COBS:
System for Coordination, Balance and Sensorimotor Effects

TECHNOLOGY FOR THERAPY
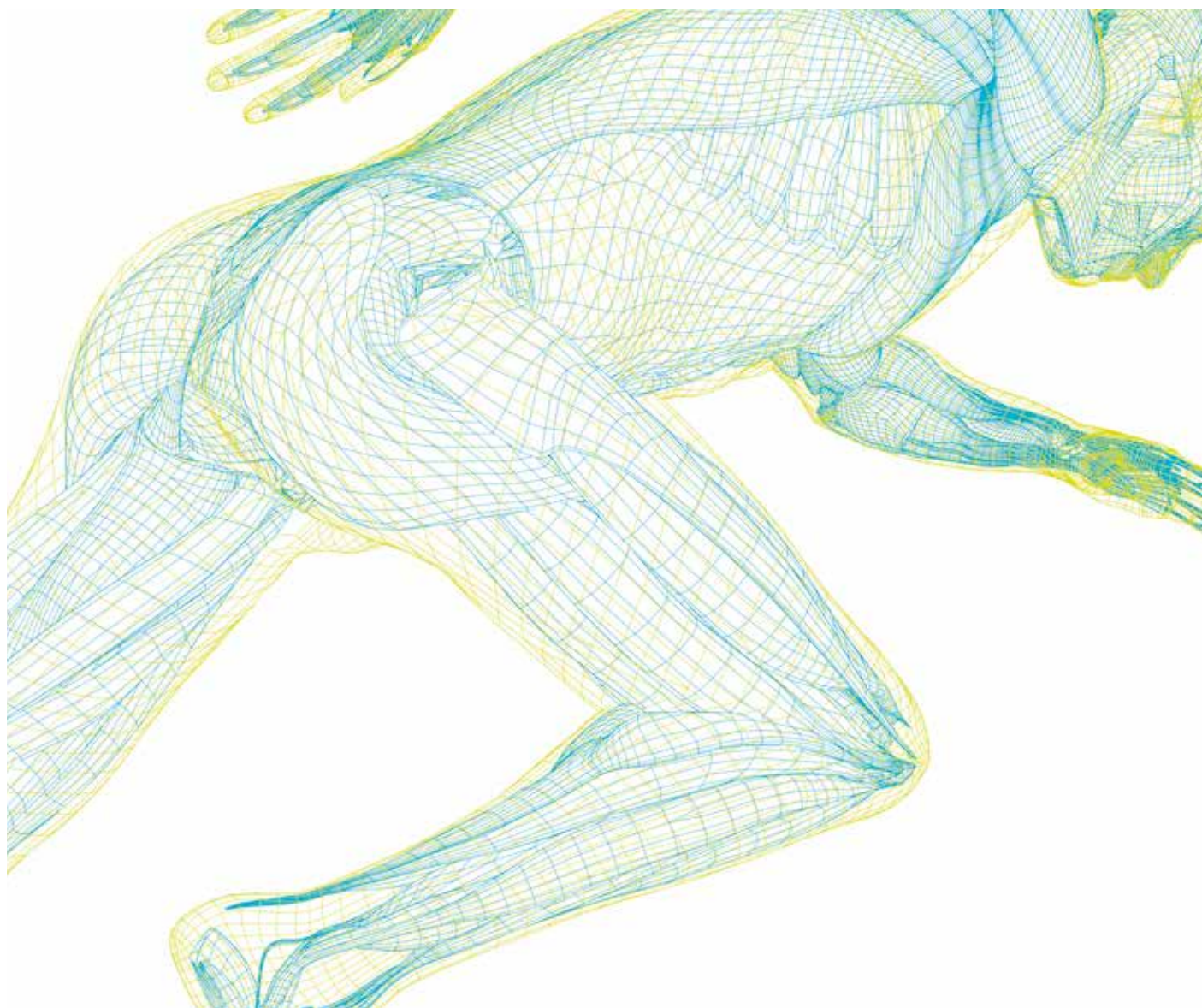
PHYSIOMED ®

TECHNOLOGY FOR THERAPY

Dear Readers,

PHYSIOMED has been developing and selling medical equipment for physical and biomechanical therapy and diagnostics for more than forty years - with increasing success. And not without reason. Excellent quality, sustainability, after sales service and maximum function are not mere words to us. We also work tirelessly to take rehabilitation and sports medicine to the next technical level. Here we are also taking completely new approaches – mostly in cooperation with leading universities.

Our biomechanical product range comprises conventional as well as innovative diagnostics and therapy systems. They all share our high standards of user safety, precision and reproducibility in diagnostics, as well as differentiated therapy through innovative developments. For example, our neuromuscular diagnostic and therapy system CON-TREX® is distinguished by maximum measurement accuracy, but also by unique features such as the ballistic mode or gravity-corrected measurement. With the computer-supported test and training systems (CTT) CENTAUR and PEGASUS, we offer novel controlled diagnostics and feedback concepts for the back and trunk region. For the areas of MTT and cardio training, now we likewise offer a complete range of instruments. Our PHYSIORUN treadmills with weight relief, expander technology and correction options open up a wide range of possibilities for walking, running and gait therapy. Last but not least, the proven COBS platform gives you an efficient instrument with a wide range of diagnostics, therapy and training options in the fields of balance, coordination and sensorimotor training with real-time feedback.

Our greatest achievement is winning your trust!

Dr. Jens Reinhold
CEO
PHYSIOMED ELEKTROMEDIZIN AG

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PORTRAIT

PHYSIOMED ELEKTROMEDIZIN AG is one of the world-wide leading producers of high quality equipment for traditional and innovative physical therapy and biomechanical diagnostics and treatment. The PHYSIOMED name stands for outstanding product quality, cutting-edge technological solutions, and excellent value for money. The German supplier focuses on equipment in the fields of sport performance, rehabilitation, aesthetic and veterinary medicine.

Besides physical therapy forms like electro-, ultrasound-, vacuum application, laser-, shortwave-, microwave-, traction-, cryo-, magneto-, shockwave therapy, DEEP OSCILLATION®, MAGCELL® and vocaSTIM®, PHYSIOMED has also made a name for itself with excellent biomechanical diagnostics and treatment systems:

- **CON-TREX®** – biomechanical neuromuscular test and training units especially dedicated to isokinetic use
- **PEGASUS** – unit for diagnostics and treatment of spine and trunk musculature
- **CENTAUR** – smart test and training system especially for the stabilizers of the trunk

In addition, PHYSIOMED also offers in its new product portfolio solutions for medical training therapy (MTT) and gait training. The PHYSIOMED Strength and Cardio Line is a required add-on for rehabilitation centres in which patients regain and maintain their health condition.

The PHYSIORUN treadmill is available in two versions, for the sport as well as the medical field. Optionally the unique robowalk® system allows for an efficient gait correction and therapy of the patient.

PHYSIOMED currently exports its products to more than 80 countries worldwide. At the same time, the company, which is engaged in international research, maintains numerous cooperative efforts with universities and the continuous exchange of information with renowned scientists and leading physicians. Our products' outstanding performance, suitability for daily use and high level of innovation are based on our experience since 1973 and continuous communication with practicing therapists. We make every effort to keep our products safe for the patient and the therapist, and to do this we make sure our safety functions go beyond official legal requirements. Our safety features serve as new benchmarks, such as the triple security system built in our isokinetic CON-TREX® systems or the real-time feedback used on our computer-supported test and training systems (CTT).

Headquarters of PHYSIOMED ELEKTROMEDIZIN AG in Laipersdorf near Schnaittach

CON-TREX®

Biomechanical testing, training and therapy modules

CON-TREX® modules are biomechanical testing, training and therapy machines for rehabilitation, sport and research. They work in isokinetic, isometric and isotonic movement modes as well as with continuous passive motion (CPM), freely definable position profiles and feedback. The CON-TREX® modules are a system that detects the user's movements, uses this information to "make decisions" and provides visual and sensory feedback to the patient. The characteristics of an individual movement (evaluation) can be precisely measured, and feedback provided.

CON-TREX® modules enable the analysis of both the static and dynamic strength of a joint and the resulting targeted functional muscle-strength training and improvement to coordination skills with possible monitoring and correction during training or therapy. Depending on the direction of motion, the following muscular load types exist in dynamic modes: concentric/concentric, concentric/eccentric, eccentric/concentric and eccentric/eccentric. Unique to CON-TREX® are the combined load types: con/CPM, CPM/con, CPM/ecc and ecc/CPM.

CON-TREX® modules support strengthening of direct muscle activity or in its synergistic chain, promote muscle empowerment, muscle elongation, proprioception and restoration of lost neuromuscular functions (relative to the healthy side). Furthermore it allows direct observation of the therapeutic activity in real time, offering an objective criterion for the development of the process. With the CON-TREX® modules, modifications can be implemented and adapted to the various joints during examination or treatment.

The CON-TREX® dynamometer technology by definition ensures precision in isokinetic dynamometry by assessing the dynamically exerted muscular strength over a defined range of motion at a constant and programmable speed. Its unprecedented precision sets new benchmarks if it comes to providing quality in diagnostic and therapeutic work.

It is worth mentioning that currently isokinetic tests are legally accepted as objective measurements indicating existing joint and muscle deficits. At present, they are usually a valid criteria for the determination of parameters to define the patient's degree of disability. It functions play-free and with a 100 % digitally controlled drive system. The controls are optimised to be simple in usage and easy to clean, while making sure that the risk of injury is kept to a minimum. The entire drive and controls system can be adapted at any time to future trends in physiotherapy thanks to the easy software upgrade and smoothly updated to the latest computer technologies.

In its ballistic mode, the dynamometer can take into account the effects of gravity and correct them. It comprises a unique system of controls. In this mode, inertia is compensated and the expected motional development is calculated beforehand and the generated „inner strength" is continuously equalised. To this user, this means the following: the motion can be executed functionally, realistically and for longer at the desired target speed – particularly with minimal effort, at high motion speeds or when large body segments are being moved. CON-TREX® ballistic mode enables both isokinetic and isotonic work.

By another feature, the active compensation for gravitational force, external forces influencing the treated body segments can be continuously offset or reduced.

CON-TREX®: Neuromuscular Diagnostic and Therapy Systems

Areas of application of CON-TREX® in rehabilitation, sport and research

CON-TREX® can be used in diagnostic and preventative therapy for injuries to the musculoskeletal system in out-patient rehabilitation and in the clinic. It is mainly used in scientific research, performance optimisation and high-performance sports and facilitates the careful and specific analysis of problems and thus the highly efficient training of top athletes. Thanks to its versatile measuring capabilities and the intuitive exercise software, CON-TREX® is excellently suited to the following applications:

ORTHOPAEDIC REHABILITATION AND TRAUMATOLOGY

CON-TREX® enables the diagnosis and prevention of damages or injuries to the musculoskeletal system in out-patient rehabilitation and in clinical use.

DIAGNOSIS AND REHABILITATION OF MUSCULOSKELETAL DEFICIENCIES
Muscular dysbalances can disrupt the ideal sequence of movements and may have damaging effects on the joints or, depending on the type of sport, can even be desirable or required. CON-TREX® helps to record, detect and analyse these dysbalances. In addition, CON-TREX® machines can be used to efficiently eliminate or produce muscular dysbalances. One particular benefit is in the fact that the tested movement can be trained at the same time.

JOINT REPLACEMENT
CON-TREX® machines can be used in the area of geriatric rehabilitation after artificial joint replacement in particular. Even at very low available muscular strength patients can actively train and improve their muscularity at a sensible speed of motion. This means that the loss of strength is kept to a minimum and the mobility of the joints either remains the same or is improved.

NEUROLOGICAL REHABILITATION

If performance is diminished for neurological reasons, for example, after a brain injury or a stroke, rehabilitation work focuses on restoring coordination and control of the work done by the muscles. The German Society for Neurology demands the early functional mobilisation of patients who are after having suffered a stroke. CON-TREX® is suited to this task thanks to its exercise and training function in a continuously passive motion mode: The affected patient's limb is moved by CON-TREX® while the patient can simultaneously attempt to autonomously control and move the limb. CON-TREX® simultaneously visualises the ongoing performance of the patient, that is, training can be followed in real-time on the monitor and even the smallest of advances is immediately reproduced on the screen. This adds to the patient's motivation to increase the effectiveness of the rehabilitation through their active cooperation. This can only be achieved to a limited extent using „classic" training methods. Feedback training, especially with a submaximal load, not only enables efficient correction of muscular deficiencies, but is also an excellent method of improving coordination abilities.

OPTIMISED PERFORMANCE IN COMPETITIVE SPORTS

CON-TREX® machines are used in competitive sport, most of all when it comes to objectively evaluating physique and optimising the progression of training of competitive and top-level athletes. Various strength tests which can be carried out at regular intervals provide both trainers and athletes with precise feedback on the effectiveness of their training methods. Within the framework of motion analyses for the optimisation of motion sequences specific to particular sports, precise problem analyses can also be generated using combined EMG evaluations. When rehabilitating top athletes after injuries, CON-TREX® machines facilitate highly efficient training sessions and contribute towards the sensible use of the injury period.

SCIENCE AND RESEARCH

Thanks to the high levels of precision of CON-TREX® machines, the objective evaluation of every patient's data at the highest validity rates possible is given. CON-TREX® archives all relevant system parameters which could be of importance to scientific evaluation. In addition, the unique ballistic mode ensures the smooth execution of both motion sequence and measurement. This active gravity compensation facilitates both absolute and relative observation of the values. When used in science and research, the CON-TREX® machines set previously unequalled high standards in regard to accuracy of measurement and reproducibility of the collected parameters.

Ballistic mode and active compensation for gravitational force

Smart unique selling features for improved therapeutic results

BALLISTIC MODE
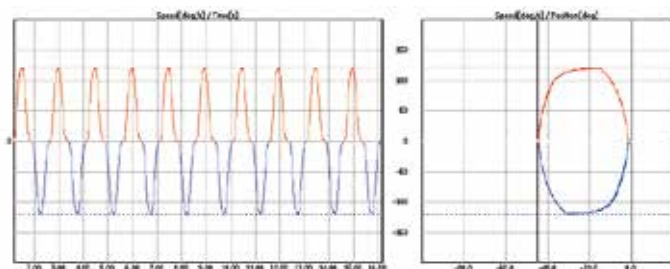
In isokinetic ballistic mode, the patient can efficiently achieve the desired target speed in extension and flexion and can work for longer at this desired target speed. The symmetry of the progression curves shows this emphatically.

In isokinetic classic mode, the patient, as can be seen in the illustration, does not achieve the specified target speed of 120°/sec in the flexion. The progression curves show a clear asymmetry.

The ballistic mode of CON-TREX® allows isokinetic as well as isotonic work. The main difference between isotonic ballistic and classic mode is in the performance of acceleration. Ballistic mode accelerates quickly, even with little available force, and to higher speeds and r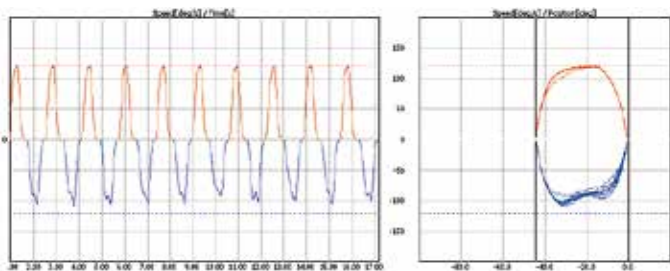amps with a final stop. The isokinetic ballistic mode allows the user to perform training activities at more functional speeds that are closer to real life. In patients with a limited range of joint motion, muscle weakness or also in the presence of spastic activity, the isokinetic ballistic mode facilitates the moment of inertia and supports the movement in patients who are unable to generate a lot of force when starting the movement.

The ballistic control mode allows greater acceleration and hence faster movement by means of movement prediction. This results in substantial reduction of the influence of inertia by use of CON-TREX ballistics. The ballistic mode allows complete training and evaluation of your patients and athletes at optimum speeds of movement.

ACTIVE COMPENSATION FOR GRAVITATIONAL FORCE DURING TRAINING AND DIAGNOSIS

Patients with little strength are often unable to move individual segments of their bodies without assistance. This means that active compensation for these static weight influences is required. While the movement is being performed, the dynamometer can continuously reduce the external forces or even compensate for them completely; this produces a „gravity-free"' situation for the patient where every movement can be performed with minimal expenditure of force.

CON-TREX® software also offers the option of merely measuring the forces acting on the movement, without active compensation. When evaluating data, the measured values can then be displayed as „gravity-corrected".

ADVANTAGES OF BALLISTIC MODE AND ACTIVE COMPENSATION FOR GRAVITATIONAL FORCE

Ballistic mode allows patients in early functional rehabilitation to actively train even at very low available muscular strength and improve their muscularity at a sensible speed of motion. In general, exercise can be performed at higher absolute speeds*. Performance diagnosis, training and rehabilitation are also possible at high functional movement speeds. In addition, the ballistic movement itself is far closer to the functional movement than with classical systems. Despite these complex types of control, the force can be applied in the direction of the movement (concentric), counter to the direction of movement (eccentric), or as a combination of both types of movement.

*Renowned institutes at German universities confirm that patients using CON-TREX® systems attain up to 30 % higher movement speed than with conventional isokinetic training equipment.

CON-TREX® human kinetics

CON-TREX® human kinetics is an excellent application for managing, testing and training of patient and subject data and for reliable data processing ensuring proper reporting

CON-TREX® HUMAN KINETICS: INTELLIGENCE AT THE HEART OF THE SYSTEM

CON-TREX® human kinetics software integrates on a regular time base the newest relevant findings in biomechanics, training theory, rehabilitation and other relevant research areas. First and foremost, the high-performance CON-TREX® human kinetics programs control the settings, loading and the testing and training protocols. Online Help texts are shown continuously to enhance user comfort. Second, as a standard feature, CON-TREX® human kinetics offers a wide range of task-specific reports and evaluations with graphic presentation. CON-TREX® human kinetics also offers feedback in training mode - real time visual feedback processed in curve form.

IDEAL TOOL FOR:

» Assessment of high-speed parametres of movement
» High-intensity power trainings
» Rehabilitation of musculosceletal disorder
» Neurorehabilitation

FEEDBACK TRAINING

The chart shows an example of highly successful movement monitoring: the measured force values (blue and red lines) for almost all the movements are within the target specification (shaded area).
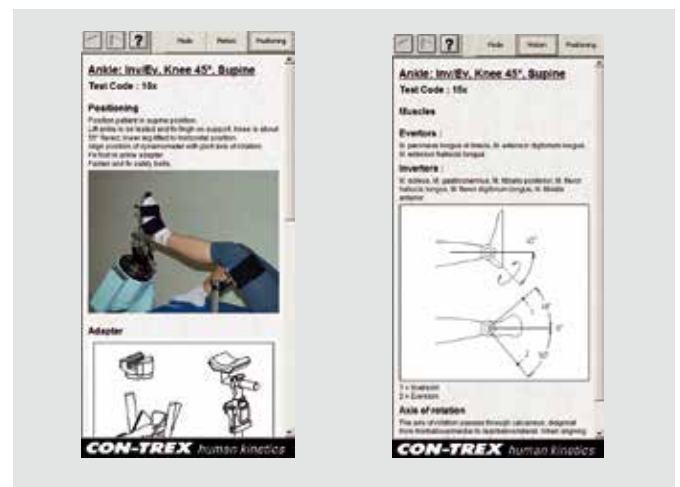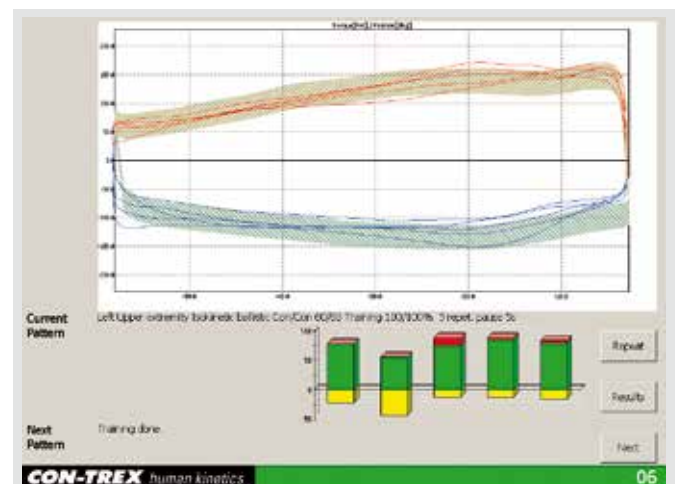
Online Help texts are shown continuously to enhance user comfort. CON-TREX® human kinetics offers a wide range of task-specific reports and evaluations with graphic presentation. CON-TREX® human kinetics also offers feedback in training mode – real time visual feedback processed in curve form.

Movement modes	Load types
Isokinetic mode, Classic and ballistic	con/con, con/ecc, ecc/con, ecc/ecc
Isotonic mode, Classic and ballistic	con/con, con/ecc, ecc/con, ecc/ecc
Isometric mode	pull, push
Continuous Passive Motion (CPM)	at constant speed
Combined load types	con/CPM, CPM/con, CPM/ecc, ecc/CPM
Specific position-related profiles such as complex movement simulations	to reproduce realistic physiological loads, e.g. walking

CON-TREX® was investigated in following scientific papers:

Reliability and validity

Caruso J., Brown L.E., Tufano J.J. (2012): The reproducibility of isokinetic dynamometry data. Isokinet Exerc Sci 20:239–53. doi:10.3233/IES-2012-0477.

Cotte T., Ferret J.M. (2003): Comparative study of two isokinetic dynamometers: CYBEX NORM vs. CON-TREX® MJ. IOS Press Isokinetics and Exercise Science 11(1), 37-43.

Guilhem G., Giroux C., Couturier A., Maffiuletti N.A. (2014): Validity of trunk extensor and flexor torque measurements using isokinetic dynamometry. J Electromyogr Kinesiol http://dx.doi.org/10.1016/j.jelekin.2014.07.006.

Maffiuletti N.A., Bizzini M., Desbrosses K., Babault N., Munziner U. (2007): Reliability of knee extension and flexion measurements using the Con-Trex isokinetic dynamometer. Clin Physiol Funct Imaging 27, 346-353.

Müller S., Baur H., König T., Hirschmüller A., Mayer F. (2007): Reproducibility of isokinetic single- and multi-joint strength measurements in healthy and injured athletes. Isokinetics and Exercise Science 15, 295-302.

Müller S., Mayer P., Baur H., Mayer F. (2011): Higher velocities in isokinetic dynamometry: A pilot study of new test mode with active compensation of inertia. IOS Press, Isokinetics and Exercise Science 19, 63–70 63, DOI 10.3233/IES20110398.

Müller S., Stoll J., Müller J., Mayer F. (2012): Validity of isokinetic trunk measurements with respect to healthy adults, athletes and low back pain patients. Isokinet Exerc Sci 20, 255–66. doi:10.3233/IES-2012-00482.

Müller J., Müller S., Stoll J., Fröhlich K., Baur H., Mayer F. (2014): Reproducibility of maximum isokinetic trunk strength testing in healthy adolescent athletes. Sports Orthop. Traumatol. 30, 229–237.

Clinical and scientific application

Baray A.L., Philippot R., Farizon F., Boyer B., Edouard P. (2014): Assessment of joint position sense deficit, muscular impairment and postural disorder following hemi-Castaing ankle ligamentoplasty. Orthop Traumatol Surg Res 100 (6 Suppl), 271-4. doi:10.1016/j.otsr.2014.02.014. Epub 2014 Aug 22.

Baray A.L., Philippot R., Neri T., Farizon F., Edouard P. (2016): The Hemi-Castaing ligamentoplasty for chronic lateral ankle instability does not modify proprioceptive, muscular and posturographic parameters. 24(4), 1108-15. doi:10.1007/s00167-015-3793-3.

Baur H., Müller S., Hirschmüller A., Huber G., Mayer F. (2006): Reactivity, stability and strength performance capacity in motor sports. Br J Sports Med 40, 906-911.

Baur H., Müller S., Pilz F., Mayer P., Mayer F. (2010): Trunk extensor and flexor strength of long-distance race car drivers and physically active controls. J Sports Sci 28: 1183–1187.

Edouard P., Castells J., Calmels P., Roche F., Degache F. (2010): Cardiovascular and metabolic responses during isokinetic shoulder rotators strength testing in healthy subjects. ISSN 0959-3020/10 Isokinetics and Exercise Science 18, 23–29 23 doi:10.3233/IES-2010-0363 IOS Press 23-29.

Edouard P., Bankolé C., Calmels P., Beguin L., Degache F. (2013): Isokinetic rotator muscles fatigue in glenohumeral joint instability before and after Latarjet surgery: a pilot prospective study. Scand J Med Sci Sports 23(2), 74-80. doi:10.1111/sms.12011. Epub 2012 Nov 1.

Edouard P., Degache F., Oullion R., Plessis J.Y., Gleizes-Cervera S., Calmels P. (2013): Shoulder strength imbalances as injury risk in handball. Int J Sports Med 34(7), 654-60. doi:10.1055/s-0032-1312587. Epub 2013 Feb 26.

Francis P., Toomey C., Mc Cormack W., Lyons M., Jakeman P. (2016): Measurement of maximal isometric torque and muscle quality of the knee extensors and flexors in healthy 50- to 70-year-old women. Clin Physiol Funct Imaging 28, n/a–n/a. doi:10.1111/cpf.12332.

Hirschmüller A., Konstantinidis L., Baur H., Müller S., Mehlhorn A., Kontermann J., Grosse U., Südkamp N.P., Helwig P. (2011): Do changes in dynamic plantar pressure distribution, strength capacity and postural control after intra-articular calcaneal fracture correlate with clinical and radiological outcome? Injury 42, 1135–43. doi:10.1016/j.injury.2010.09.040.

Hirschmüller A., Andres T., Schoch W., Baur H., Konstantinidis L., Südkamp N.P., Niemeyer P., (2017): Quadriceps Strength in Patients With Isolated Cartilage Defects of the Knee: Results of Isokinetic Strength Measurements and Their Correlation With Clinical and Functional Results. Orthopaedic Journal of Sports Medicine 5:232596711770372. doi:10.1177/2325967117703726.

Liebensteiner M.C., Platzer H.P., Burtscher M., Hanser F., Raschner C. (2012): The effect of gender on force, muscle activity, and frontal plane knee alignment during maximum eccentric leg-press exercise. Knee Surg Sports Traumatol Arthrosc 20, 510–516. DOI 10.1007/s00167-011-1567-0.

Mueller J., Mueller S., Stoll J., Baur H., Mayer F. (2014): Trunk Extensor and Flexor Strength Capacity in Healthy Young Elite Athletes Aged 11–15 Years. Journal of Strength and Conditioning Research 28, 1328–34. doi:10.1519/JSC.0000000000000280.

Mueller S., Mueller J., Stoll J., Cassel M., Hirschmüller A., Mayer F. (2017): Back Pain in Adolescent Athletes: Results of a Biomechanical Screening. SMIO 01, E16—E22. doi:10.1055/s-0042-122713.

Mueller S., Mueller J., Stoll J., Engel T., Mayer F. (2017): Back pain risk factors in adolescent athletes: suitability of a biomechanical screening tool? British Journal of Sports Medicine 51, 364–5. doi:10.1136/bjsports-2016-097372.205.

Rahm S., Spross C., Gerber F., Farshad M., Buck F.M., Espinosa N. (2013): Operative treatment of chronic irreparable Achilles tendon ruptures with large flexor hallucis longus tendon transfers. Foot Ankle Int 34(8), 1100-10. doi:10.1177/1071100713487725. Epub 2013 Apr 26.

CON-TREX® MJ

Multijoint module for testing and training the major joints

With the control module PM and a wide range of adapters which are needed for the scheduled tasks, the CON-TREX® MJ multijoint module is a versatile, rotatory testing, training and therapeutic system to test and train all major joints of the upper and lower limbs in the open kinetic chain. The highly flexible mechanism with excellent operator guidance makes objective and reproducible test results possible in every work mode. The mechanical design of the CON-TREX® MJ is extremely user-friendly: the position of the seat, the seat length, and the inclination of the backrest can be electronically adjusted at the touch of a button. The upholstered seat and backrest offer a maximum of comfortable seating even during long training sessions and are easy to clean.

Training while sitting or standing, measurements in the prone or supine position: CON-TREX® MJ offers maximum flexibility in every case. It enables the analysis of both the static and dynamic strength of a joint and the resulting targeted functional muscle-strength training and improvement to skills of coordination with possible monitoring and correction during training or therapy.

TECHNICAL DATA

Dimensions (L x W x H): 203 x 73 x 151 cm
Weight: 350 kg
Nominal voltage: 230 VAC, internally adjustable to 200 V and 215 V
Nominal frequency: 50/60 Hz
Nominal current rating: 10 A
Patient weight allowance: 200 kg
Torque accurancy: 0.5 % of full scale

CON-TREX® TP 500

Back module for trunk flexor and extensor muscles

CON-TREX® TP is a special back module, ideal for the testing and training of straight trunk musculature with its flexor and extensor muscles. It is connected to the CON-TREX® MJ system, the measuring range of version TP 500 being designed for rehabilitation and leisure.

The many customisation options, easy positioning and numerous different load types of CON-TREX® human kinetics software make possible various testing and therapeutic applications of the trunk.

Together with the various load modes operated by the PM control module, the freely definable scope of motion in the range between −15 ° and +105 ° enables the therapeutic handling of numerous problems related to longitudinally-running trunk musculature. The height of both the footplates and knee rests can be electroni-

cally adjusted to facilitate easier positioning of the patient. The kneerests are synchronised with the footplates. Just one finger is all it takes to easily change the position of even those heavier-set patients already standing in the machine.

TECHNICAL DATA

Dimensions (L x W x H): 141 x 77 x 152 cm
Weight: 220 kg

CON-TREX® LP

Leg press for testing and training the lower limbs in closed kinetic chain

The CON-TREX® LP leg press is a testing and training machine for the entire leg extensor and flexor chain. It can provide metered, measurable forces from a few N to 6000 N at speeds of up to 1 m/sec. Separate footplates allow unilateral training (on the left or right), bilateral training with both legs, or alternating mode. The adjustable footplate fixtures can be varied for selective testing and improvement of ankle joints in various positions. The inclination of the backrest can be electrically lowered to the horizontal position, the seat angle is synchronized with the adjustment of the backrest. The low seat height facilitates placement of patients with reduced mobility.

The high level of precision of the metered, measurable forces and the exceptional properties of the motion monitor through the drive system produce an extremely versatile area of application on a minimum workspace of just 1.8 x 2.5 meters including the control module.

Due to the functional motion, the entire muscle chain of the lower limbs is strengthened, while the coordination is simultaneously improved and the joint stability increased. The optimally adjusted load and strain of the (atrophied) musculature beyond the entire radius of motion can bring about a very sharp increase in the muscle strength and a significant improvement to coordination. All of this occurs without any excessive strain on the joint, especially in physiologically awkward positions.

TECHNICAL DATA

Dimensions (L x W x H): 238 x 73 x 127 cm	
Weight: 300 kg	
Nominal voltage: 230 VAC, internally adjustable to 200 V and 215 V	
Nominal frequency: 50/60 Hz	
Nominal current rating: 10 A	
Patient weight allowance: 200 kg	
Torque accurancy: 1.0 % of full scale	

CON-TREX® WS

Work simulation for the analysis and practice of the complex motion patterns of working environments, sports or activities of daily living (ADL)

CON-TREX® WS was developed to imitate motions of working environments, sports and everyday domestic life. In order to be able to follow the unique and often extremely complex patterns of movement, the height of the dynamometer can be electronically adjusted from down close to the ground to up over the patient's head. For realistic simulation of unusual movements the CON-TREX® WS can be rotated and swivelled. The possibility of reproducible assessment of work capacity is thus provided. Various movements from the everyday life of a craftsman (such as screwing, lifting objects, butting levers or sawing) can be simulated and trained. In addition to preparing for difficult working conditions (such as working overhead), CON-TREX® WS can be used to compose a specific and highly effective muscular workout. In practice, a minimum working area of only 2 x 2 meters is sufficient.

TECHNICAL DATA

Dimensions (L x W x H): 95 x 50 x 228 cm	
Weight: 200 kg	
Nominal voltage: 230 VAC, internally adjustable to 200 V and 215 V	
Nominal frequency: 50/60 Hz	
Nominal current rating: 10 A	
Patient weight allowance: 200 kg	
Torque accurancy: 0.5 % of full scale	

CON-TREX®: Neuromuscular Diagnostic and Therapy Systems

Movement Patterns

The CON-TREX® modules facilitate the performance of various movement patterns

With the anatomically matched and continuously adjustable adapters, the various modules allow practice of virtually all single-joint and multi-joint patterns of movement. Isolated as well as free movement tests provide a reliable basis for assessment and therapy.

Movement Patterns MJ

Thanks to its flexible system, the CON-TREX® MJ allows adjustment close to the joints with maximum stability. The adapters are perfectly adjustable to the anatomical situation of the subject. Isolated joint tests as well as free movements are possible with the wide range of accessories.
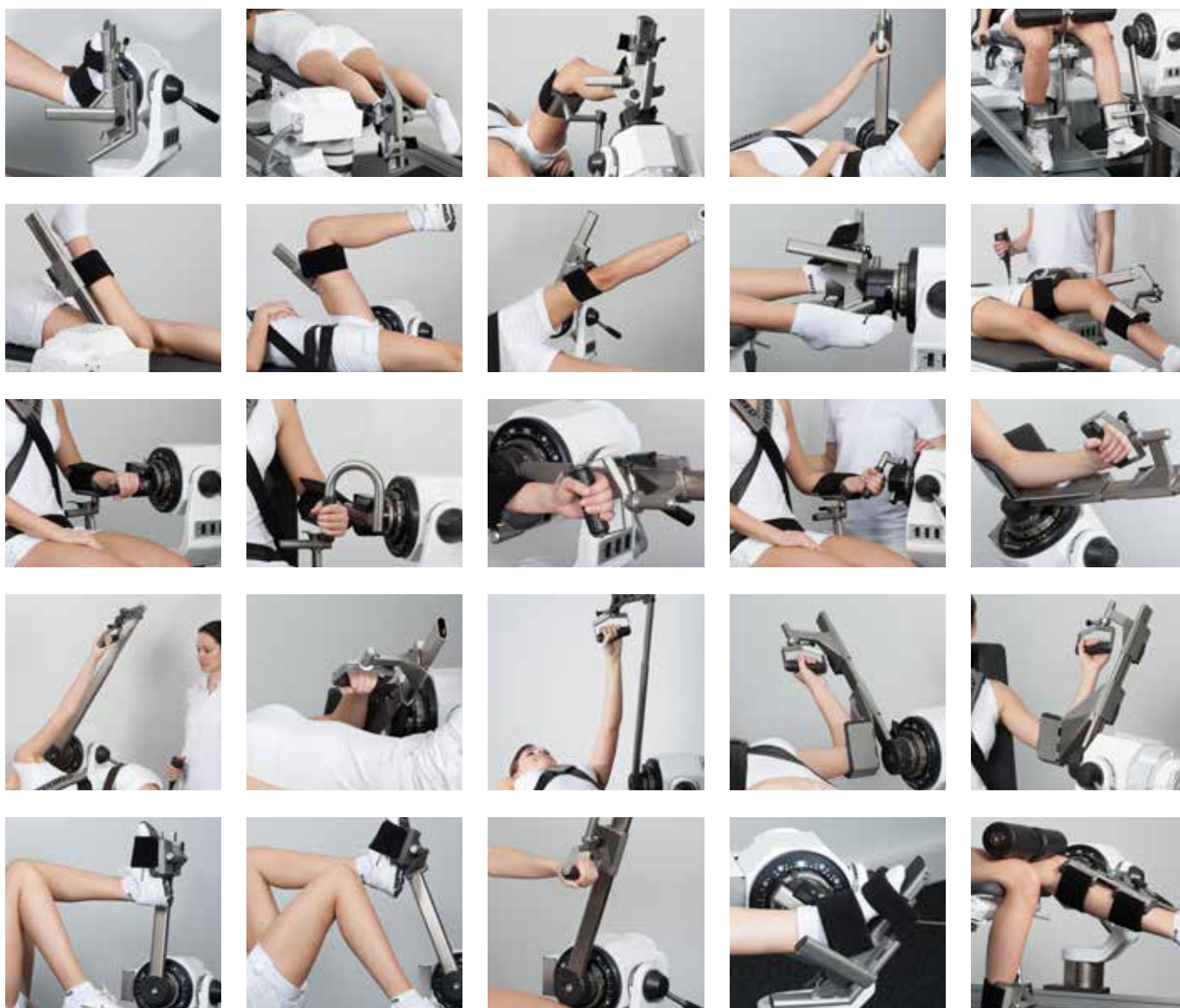
Movement Patterns LP

The CON-TREX® LP is universally designed for functional testing and training of the leg extensor and flexor chain. Both in the alternating, single-sided or double-sided mode, rigid or flexible foot plates can be used.

Movement Patterns WS

With the CON-TREX® WS, a wide variety of functional as well as of natural movement patterns can be performed for therapy and diagnostics related to activities of daily life and work.

Computer-Supported Test and Training Systems (CTT)

The future of neuromuscular testing and training for spine and trunk.

Musculoskeletal diseases (problems) cause economic loss in the billions. The increase in efficiency of treatments in the framework of Medical Training Therapy (MTT) and targeted prevention are effective evaluation for the reduction of effort and improvement of results.

The securing of the efficiency of the therapeutic and preventative testing and evaluation of the MTT is completely dependent on the quality of the diagnosis and the thus resulting targeted dosage of physical strain. The physical strain is the trigger for the active-adaptive reactions, which are the basis of the regenerative processes. This therapeutic approach is only effective if the quality of diagnosis, dosability and control of the physical strain exposition is guaranteed.

MOST COMMON CAUSES OF APPLICATIONS

The impairment of performance of the motion function and the resulting problems are in the majority of cases (for the back in 85 per cent of cases) a result of developing deficiencies in the control programmes of the sensorimotor function. This can lead to neuromuscular imbalances or neuromuscular deficits of the joint motor function. Muscular imbalances and deficits are also the causes of diminished flexibility of the joint stabilising musculature. Thus a permanent overload is created, which in turn can lead to pain, sometimes recurrent or chronic. The causes for the emergence of neuromuscular imbalances and deficits can be found in our modern way of living:
» Immobility: Cause of muscular deficits
» Bad/Wrong Posture: Cause of muscular imbalances

TREATMENT AIMS

The most important treatment aims are:
» Identify existing neuromuscular imbalances and deficits and coordinative deficits of the skeletal musculature (sensorimotor function) and
» Treat these by targeted strain in the framework of a medically controlled functional training (MTT)

SPECIFICATION FOR AN APPROPRIATE LABORATORY

The functional complexity of the musculoskeletal system requires a number of specific devices, being similar to a biomechanical lab.

The following computer-supported test and treatment systems are the basis of such a laboratory:

1. PEGASUS
   Seated test- and training system for the spine (neuromuscular and sensorimotor function)

2. CENTAUR
   Functional test- and training system for the spine in standing position (sensorimotor and neuromuscular function)

EACH OF THESE DEVICE SYSTEMS:

» Realizes a three dimensionality of the musculature by real 3D testing and training.
» Visualizes the neuromuscular imbalances and deficits:
   - Neuromuscular imbalances are identified by measuring the strength and the range of motion in the anatomical main planes and by comparison of the results.
   - Neuromuscular deficits are identified by measuring the strength in all anatomical planes and are compared with reference values.
   - Neuromuscular imbalances and deficits are trained by defining appropriate strain on the skeletal sensorimotor function giving defined and well-dosed load.
» Allows an exact definition of the physical strain by using feedback training with sine curves:
   - Capture of individual data
   - Definition of training structure
   - Control of the trainings by online feedback methods
   - Display of results, documentation and archiving

PEGASUS

Neuromuscular testing and feedback training unit

STRENGTH AND MOBILITY:
### MEASURED PRECISELY, STRENGTHENED SPECIFICALLY

The complexity of the back requires an equally complex system for the precise diagnosis and treatment of back problems. These requirements are ideally met by the computer-supported test and training system (CTT) PEGASUS in a very time-efficient way. The range of motion and the strength profiles of the spine-stabilizing musculature are measured in all anatomical planes. Thus mobility and strength deficits and imbalances are identified. On the basis of these results a specific, highly efficient training (maximum strength, strength endurance, strength coordination and mobility training) of the sensorimotor systems of the lumbar spine can be realized. Thereby existing muscular imbalances and performance deficits are tackled and the natural mobility and resilience of the spine reestablished and retained.

DIAGNOSIS AND TREATMENT OF THE THORACIC AND LUMBAR SPINE JOINT MOTOR FUNCTION: CTT PEGASUS WITH BIOMC SOFTWARE

» Measurement of the range of motion of the spine, especially in the thoracic and lumbar segments. The measurement can be conducted simultaneously or successively in the anatomic planes. That way, it is possible to objectify existing deficits of the range of motion, define treatment targets and document the recovery progress.
» Measurement of the strength capacity in any measuring point of the anatomic planes of the thoracic and lumbar spine joint motor function. Any specific measuring point is exactly reproducible. The measuring position can be locked; the measured values (of the chosen effective directions) are stored and displayed as polar (radar) and column charts.
» Execution of a specific training (treatment) of the sensorimotor systems of the thoracic and lumbar spine joint motor function under isometric and isotonic working conditions. The training aims at reducing existing muscular imbalances and deficits and at restoring and improving the natural range of motion and resilience of the spine in those segments.
» A complex test for the identification of functional imbalances and deficits only takes 15 minutes.
» Networking of the device and storage of data for an efficient execution of tests and training.

CTT PEGASUS
Three dimensional computer-supported
test and training system
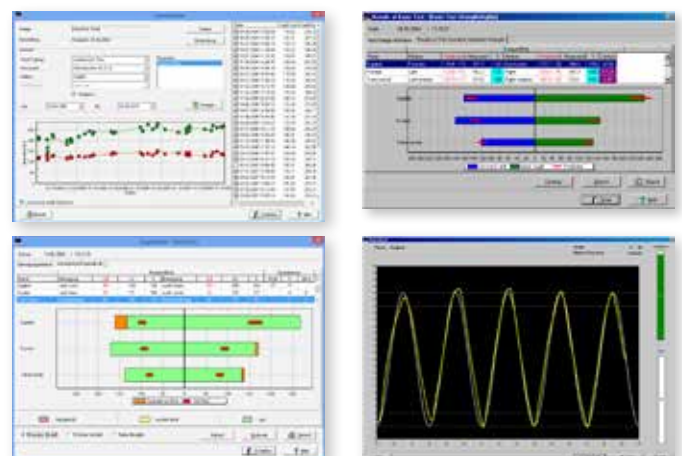
CENTAUR

Unit for testing and training of the stabilizing core muscles by computer controlled tilting and rotating

STRENGTHEN THE BACK, KEEP THE POSTURE

The majority of back problems are the result of functional imbalances and deficits of the torso sensorimotor function, which CTT CENTAUR identifies and treats. With this device the global torso musculature can be specifically strengthened and its coordination trained. Furthermore, for the first time it is possible to directly train the local, deeper lying muscles (stabilizer). CTT CENTAUR works on the basis of the following active principles:

» By a coordinated tilt of the body, the torso needs to be stabilized against gravity.
» By tilting and rotating the body is put into an instable position so that the balance analyser sends impulses to the deeper lying muscles.
» Due to the upright posture during the training, the muscles are strengthened in the position in which they have to do the most supporting work.
» The precisely reproducible application of strain allows for a targeted and exactly documentable therapy and training.

EFFECTIVE PREVENTION, REHABILITATION AND TRAINING WITH CTT CENTAUR:

» Three-dimensional computer-supported training for the muscles of the lumbar spine segment including those on the side and the stomach muscles.
» Determination of neuromuscular imbalances and deficits in the lumbar spine segment.
» Targeted training to improve existing neuromuscular imbalances and deficits.
» Conditioning of the musculature as precondition of the general stabilising of the back and as basis for any further training.
» Controlled activation of the autochthonic back musculature.
» Neuromuscular training by activating the balance analyser.
» Functional training by synergetic demand on the balance analyser and the sensorimotor systems of the lumbar, thoracic and cervical spine.
» Cardio-pulmonary training by straining and relieving the blood vessels in tilt.
» Isometric training device.
» Networking of the device and data transfer for an efficient execution of tests and training.

CTT CENTAUR
Three dimensional computersupported
test and training system
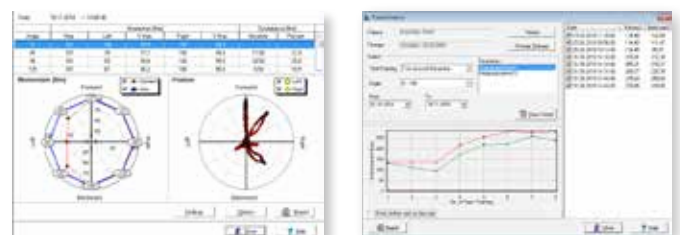
PHYSIOMED Strength Line

Dual system stack weight and functional resistance products for neuromuscular training.

Neuromuscular training is a crucial part of medical training therapy and medical rehabilitation training. In addition to physiotherapy and physical therapy, strength training with weight-assisted devices is a form of therapy that serves to give individuals the necessary co-ordination and neuromuscular function to optimally reintegrate themselves into work, everyday life and sports.

With the PHYSIOMED Strength Line, a range of strength training devices has been developed in Germany that convinces with its appealing design and space-saving architecture. With a force measuring and documentation device, isometric measurements can be carried out easily on almost all strength-training devices. The system is simple, flexible and cost-effective. In this manner, quality assurance of a therapy course can be documented optimally. As a medical device of class I according to Directive 93/42/EEC, the PHYSIOMED Strength Line is an essential supplement for training therapy.

Strength Training Units

Leg Press

Lower extremity training in closed kinetic chain

The Leg Press is used to train the femoral, gluteal and stabilizing dorsal muscles in closed chain. Practice can be carried out in sitting and in recumbent position, allowing high therapeutic variety. Thanks to the adjustable footplate, the patients' needs can be additionally addressed.

FEATURES

Backrest adjustable from sitting to lying position (gas-spring-supported)

Adjustable shoulder pads

Deep entry for comfortable access

5-way adjustable large step plate with adjustable and removable heel support

Ideally suited for explosive exercises

Smooth-running low-noise sledge

TECHNICAL DATA

Weight set: 165 kg (5 × 5 kg; 5 × 8 kg; 10 × 10 kg)

Dimensions (L x W x H): 217 × 97 × 183 cm

Weight: 446 kg

Leg Extension/Curl

Combination training for hamstrings and quadriceps

The Leg Extension / Curl is a combination device that allows both the anterior and the posterior thigh muscles to be trained in the open system. Translational displacement in the extension movement can be reduced by a position of the lower leg cushion very close to the knee. The adjustable seating unit enables optimum positioning in the axis of movement.

FEATURES

For combined training of the anterior and posterior thigh muscles in a seated position

Individually adjustable leg roll for training with optimal biomechanics

Movement amplitude of the lever arm adjustable by means of locking bolts

Easy seat cushion adjustment and adjustable back support for ideal pivot positioning

TECHNICAL DATA

Weight set: 90 kg (5 × 3 kg; 5 × 5 kg; 5 × 10 kg)

Dimensions (L x W x H): 115 × 104 × 163 cm

Weight: 293 kg

Abduction/Adduction

Hip ab- and adduction in sitting and lying position

The combination device for leg abduction and adduction allows performance of these movements on one device. The adjustable backrest allows the therapist to influence the muscles involved, in order to be able to work effectively with the patient already in the early stages of rehabilitation.

FEATURES

For strengthening of the thigh abductors and adductors
Starting position individually adjustable
Leg support adjustable to leg length
Backrest inclination-adjustable

TECHNICAL DATA

Weight set: 80 kg (10 × 3 kg; 10 × 5 kg)
Dimensions (L x W x H): 108 × 118 × 164 cm
Weight: 312 kg

Trunk Extension/Flexion

Combination training of trunk and back muscles

The combination device for trunk flexion and extension strengthens the straight and oblique muscles of the back and abdomen in the sitting position. By adjusting the backrest cushion in two planes, the product can be optimally adapted to the patient's anthropometry.

FEATURES

For strengthening of the straight and oblique upper abdominal and dorsal muscles
2-axle adjustment of the seat position for optimal biomechanics
Movement amplitude of the lever arm adjustable by means of locking bolts
Continuously adjustable training arm
Easy lockable start position adjustment and leg fixation

TECHNICAL DATA

Weight set: 105 kg (5 × 3 kg; 10 × 5 kg; 5 × 8 kg)
Dimensions (L x W x H): 168 × 98 × 163 cm
Weight: 320 kg

Trunk Rotation

Bilateral trunk training for the stabilizing muscles of the spine

Trunk rotation is a movement of great importance for stabilisation of the spine, which is achieved by strengthening of the oblique abdominal muscles and small stabilising dorsal muscles. Via the movement of the lower body, the rotation can be performed in a manner controlled by the patient.

FEATURES

For strengthening of the rotators and the oblique abdominal muscles

Fixation by continuously adjustable pelvic cushions

Easy entry thanks to fold-down leg cushion

Fine-adjustable resistance permits optimum loading stimulation

Adjustment of the preload via foot release

TECHNICAL DATA

Weight set: 45 kg (15 × 3 kg)

Dimensions (L x W x H): 164 × 68 × 165 cm

Weight: 336 kg

Rowing/Chest Press

Combination training of shoulder, thoracic and pectoral muscles

The combination device for rowing and chest press is a space-saving product for implementing a functional movement for strengthening the back, shoulder and chest muscles. The intelligent solution of the rotating mechanism of the back and breast cushion helps the patient to stabilise optimally.

FEATURES

For strengthening of the back, shoulder and chest muscles

Seat height continuously adjustable by means of gas spring

Breast cushion not adjustable, becomes backrest after turning

Starting position of the lever selectable with 3 locking positions

2 horizontal and one vertical handle position

TECHNICAL DATA

Weight set: 90 kg (5 × 3 kg; 5 × 5 kg; 5 × 10 kg)

Dimensions (L x W x H): 176 × 94 × 165 cm

Weight: 314 kg

Pulldown/Dip

Combination training for lat pulldown and dips

The upper extremities of the shoulder and arm extensor muscles are strengthened with the Pulldown / Dips combination device. The linear movement concept allows guided and controlled implementation.

FEATURES

For strengthening of the upper extremities, in particular of the shoulder and arm extensor muscles

Linear exercise concept

Flexible handle variants allow biomechanical optimal movement

Multiple adjustment in positioning dips and pulldown

Seat height continuously adjustable by means of gas spring

Easy handling and simple operation

TECHNICAL DATA

Weight set: 90 kg (5 × 3 kg; 5 × 5 kg; 5 × 10 kg)

Dimensions (L x W x H): 120 × 80 × 195 cm

Weight: 360 kg

Butterfly/Pressback

Combination training of shoulder, shoulder blade and pectoral muscles

The Butterfly/Pressback is a combination device for strengthening of the back, shoulder and chest muscles. The settings can be adjusted from the seated position.

FEATURES

For strengthening of the back, shoulder and chest muscles

Gas-spring-supported seat adjustment

Width adjustment of the training arms

Movement amplitude and starting point of the training arms adjustable

Easily adjustable armrest for optimum positioning

TECHNICAL DATA

Weight set: 80 kg (5 × 3 kg; 5 × 5 kg; 5 × 8 kg)

Dimensions (L x W x H): 115 × 122 × 163 cm

Weight: 314 kg

Cable Column Explosive

Pulley system for functional resistance training

To complement the therapy supported by strength-training devices, an explosive cable pulley system with the Explosiv pulley device is important for implementing functional exercises and movements involving small muscle parts. The multiple deflection of the weight permits selecting a very low initial load.

FEATURES

Ratio 1:3 and 1:6

TECHNICAL DATA

Weight set: 65 kg (5 × 3 kg; 10 × 5 kg)
Dimensions (L x W x H): 45 × 36 × 223 cm
Weight: 110 kg

Cable Column Vertical

Lat pull system for functional training

The pull-down movement with the vertikal pull device allows a functional performance that can be easily combined with a training bench or various unstable seating positions. The direct force transmission allows 1:1 weight transfer.

FEATURES

With hoist and lat pull bar
Ratio 1:1

TECHNICAL DATA

Weight set: 65 kg (5 × 3 kg; 10 × 5 kg)
Dimensions (L x W x H): 45 × 36 × 248 cm
Weight: 90 kg

Training Bench Design

Bench for resistance training with cable column or free weight

The Design training bench is a bipartite training bench whose inclination can also be adjusted to offer versatile possibilities in combination with a rowing machine or with dumbbells.

FEATURES

For universal use

Backrest adjustable from 0 ° to 85 °

Seat angle adjustable by foot release from -9 ° to + 10 °

TECHNICAL DATA

Dimensions (L x W x H): 126 × 50 × 56 cm

Weight: 51 kg

Trunk Lift Machine

Body weight training for the trunk and back muscles

The trunk lifter is optimally suited for strengthening of the dorsal muscles. Especially in combination with a rowing machine or small appliances (dumbbells, balls, etc.), demanding exercises can be implemented.

FEATURES

For strengthening of the dorsal muscles

Angle adjustment by foot release

Height-adjustable padding

Inclination adjustment from 45 ° to 75 °

TECHNICAL DATA

Dimensions (L x W x H): 133 × 67 × 108 cm

Weight: 45 kg

Crunch Machine

Body weight training for the trunk

The chest cruncher allows the straight and oblique abdominal muscles to be strengthened; its load can be adjusted by means of a gas spring.

FEATURES

For training and strengthening of the straight and oblique abdominal muscles

Inclination adjustable from +13 ° to -10 °

Height adjustment of the footrest from 35 to 55 cm

TECHNICAL DATA

Dimensions (L x W x H): 161 × 48 × 107 cm

Weight: 62 kg

PHYSIOMED Cardio Line

Particularly for the endurance sector, PHYSIOMED offers a certified cardio device line for the medical field.

Both in clinical and in therapeutic use, the products are used for warming up as well as for the cardiovascular training of the patients.

Grid-independent operation avoids tripping over cables and allows completely flexible installation of the devices. The accuracy of the hybrid brake system regulates the power range in both the low and high range in a speed-dependent and -independent manner. The clearly laid out, large and user-friendly display works with multi-colour background lighting and comprises a coded pulse receiver. Various packages allow a variety of options with extended therapy and testing possibilities. The steel frame offers high stability and structural safety in order to tolerate user weights of up to 150 kg, optionally up to 250 kg, as a certified product. The products developed in Germany and manufactured according to DIN EN ISO 20957-1 SA, DIN EN ISO 20957-5 SA, DIN EN 60601-1, DIN EN 60601-1-2 meet the standards according of Directive 93/42/EEC.

PHYSIO Cycle 600

Classic cycle ergometer

The PHYSIO Cycle 600 bicycle ergometer is the ideal testing and training device for medical use.

FEATURES

Highly user weights tolerated

Free passage for patients with limitations

Optimally adjustable seat position

Grid-independent use

TECHNICAL DATA

Calibrated drive unit

Hybrid brake system (HBS)

Mono belt drive, self-adjusting and quiet

Power range: 15 – 500 watts speed-independent, 15 – 1000 watts speed-dependent, increments @ 5 watts

Speed range: 20 – 120 rpm

Permissible user weight: 150 kg, optional user weight increase to 200 kg

Dimensions (L x W x H): 120 × 65 × 155 cm

Weight: 63 kg

PHYSIO Comfort 600

Recumbent ergometer

The PHYSIO Comfort 600 bicycle ergometer with fixed backrest is an ideal training device for obese patients and those with seating restrictions.

FEATURES

Continuously adjustable seat position

Grid-independent use

TECHNICAL DATA

Hybrid brake system (HBS)

Mono belt drive, self-adjusting and quiet

Power range: 15 – 500 watts speed-independent, 15 – 1000 watts speed-dependent, increments @ 5 watts

Speed range: 20 – 120 rpm

Permissible user weight: 150 kg, optional user weight increase to 250 kg

Dimensions (L × W × H): 152 × 67 × 132 cm

Weight: 105 kg

PHYSIO UBC 600

Upper body cycle

The upper body ergometer PHYSIO UBC 600 allows training both in sitting and in standing positions, as well as endurance training for the upper extremities.

FEATURES

Continuous height adjustment of the drive unit for use in sitting and standing position and by wheelchair users

Grid-independent use

TECHNICAL DATA

Low-noise induction brake system IBS

25 – 500 watts speed-independent

Belt drive – self-adjusting and quiet

Calibratable

One-piece powder-coated steel frame

Power range: 25 – 500 watts speed-independent, 25 – 1000 watts speed-dependent, increments @ 5 watts

Speed range: 20 – 120 rpm

Permissible user weight: 150 kg, optional user weight increase to 200 kg

Dimensions (L x W x H): 120 × 80 × 160 cm

Weight: 124 kg

PHYSIO Cross 600

Elliptical training ergometer

The elliptical cross trainer PHYSIO Cross 600 is an ergometer that exercises large muscle groups in an upright position.

FEATURES

Gentle elliptical pedalling movement

Grid-independent use

TECHNICAL DATA

Calibrated drive unit

Hybrid brake system HBS

Mono belt drive, self-adjusting and quiet

Power range: 100 – 500 watts speed-independent, 100 – 1000 watts speed-dependent, increments @ 5 watts

Speed range: 20 – 80 rpm

High quality sliding and ball bearings for long-term use

Permissible user weight: 150 kg, optional user weight increase to 200 kg

Dimensions (L × W × H): 204 × 65 × 165 cm

Weight: 103 kg

Treadmill and gait training

Active gait correction with the treadmill

Walking and running is a basic human need, in order to be able to perform daily activities in everyday life, but also to achieve individual goals in the field of sports.

With the PHYSIORUN treadmill, PHYSIOMED offers two treadmills for sports (PHYSIORUN Sport) as well as for the medical field (PHYSIORUN Trainer), which are very low in maintenance and excel by high running stability, versatile configurability, powerful drive and timeless design.

With an elastic expander technology, the robowalk® system, the treadmill can be integrated into a system solution for gait therapy. This novel therapy method allows starting therapy in the early phase of rehabilitation, in order to optimally influence the gait pattern through resistance and gait correction training.

Treadmill System with Gait Correction Training

PHYSIORUN Trainer
(optional mit robowalk®)

Treadmill for medical use

The medically approved and low-maintenance treadmill PHYSIO-RUN Trainer is particularly well suited for walking and running training with patients. The stable frame, the proven drive technology and the customer-specific configurability offer patients and therapists a high degree of ergonomics and safety combined with excellent functionality.

robowalk®
The novel active therapy method of expander technology upgrades the treadmill PHYSIORUN to a locomotion system. By means of elastic expander cables and foot cuffs, the patient's gait is corrected, assisted and additionally trained. By adjusting the tension angle of the tensile load / resistance load, either vertically or horizontally, various load settings as well as movement corrections are possible. The system solution comprises the treadmill

PHYSIORUN Trainer, the robowalk® systems at the front and the rear, the safety bar with fall arrest cable and optionally armrests with three joints.

TECHNICAL DATA

Dimensions of running surface L × W: 150 × 50 cm
Speed: 0.5 – 18.0 km / h
Slope: 0.0 – 20.0 %
Drive motor: 2.2 kW (3 hp)
Control: UserTerminal with keyboard, display and interface
42 programs / profile
User weight: 200 kg
Classification: Medical device of risk class IIb according to Directive 93/42/EEC
Dimensions (L × W × H): 210 × 85 × 130 cm
Weight: 230 kg

PHYSIORUN Sport

Treadmill for sport and health use

The low-maintenance PHYSIORUN Sport treadmill is particularly well suited for the fitness and sports area due to its smooth running, various functions and powerful drive. The modern construction also achieves a pleasant and natural feeling of running.

TECHNICAL DATA

Dimensions of running surface L × W: 150 × 50 cm	
Speed: 0.5 – 18.0 km / h	
Slope: 0.0 – 20.0 %	
Drive motor: 2.2 kW (3 hp)	
Control: UserTerminal with keyboard, display and interface	
42 programs / profile	
User weight: 200 kg	
Dimensions (L × W × H): 210 × 85 × 130 cm	
Weight: 211 kg	

Motor learning with COBS Feedback

Evaluation and feedback device for innovative training of coordination, balance and strength (COBS).

Useful therapy and training of locomotor functions in rehabilitation and sports. COBS feedback is an informative RESPONSE and THERAPEUTIC TRAINING device for locomotor functions such as coordination, balance, posture and strength.

EVALUATION AND FEEDBACK IN REHABILITATION AND SPORTS

Many patients do not have sufficient perception of their own movement (proprioception) to such an extent that they require external feedback. Similarly, athletes often depend on external feedback to improve their coordinative skills. This combines elements that assist the control and voluntary modification of biological processes facilitated by information about them.

The COBS Feedback device provides the patient with the real-time feedback they need in simple graphic and/or acoustic form. This encourages the processes of effective motor rehabilitation, whilst enabling an application according to the evolution of the patient. The COBS Feedback device enables the precise planning of therapy or training, orientating and directing it towards a target and documenting it immediately and reliably

OBJECTIVE ASSESSMENT OF SKILLS

On the basis of effective therapy or training planning and control, it provides accurate feedback of a person's motor skills, abilities and/or motor impairments. The measuring functions of COBS Feedback provide a qualitative and quantitative assessment of the following skills:

» Symmetry of movements
» Capability of load
» Strength
» Jumping power
» Coordination

» Reaction
» Anticipation
» Cognitive functions
» Equilibrium in frontal and sagittal plane

The COBS Feedback measurement functions allow an objective formulation of diagnosis. The COBS Feedback devices are physiotherapeutic feedback systems that also provide fast and reliable objective data on motor skills such as: balance, lifting ability, strength, coordination, speed.

Using the criteria, observation and interpretation of medical staff, COBS Feedback devices assist the qualification and quantification of the neuromotor skills that influence human performance, such as: body perception / proprioception, cognition, attention, reaction, anticipation and visual and acoustic perception.

OPTIMUM TRAINING

The preceding measuring findings give exact information about the deficient skills which require improvement by training. The COBS training software provides countless possibilities for customized and efficient training. Exercise options under ADL conditions ensure easy transfer of improved skills to everyday life.

Training with COBS Feedback encourages complete proprioceptive motor learning, which implies a series of factors, such as: the perception of static and dynamic movement, pattern recognition, stimulating conditions for motor execution, mediating and motivating variables, perception of space, three-dimensional perception of the body, constancy of size, perception of movement, apparent movement, range of change of movement and the perception of trajectories.

Neuromotor training and learning with the use of COBS Feedback implies a process of stable modification or change of the behaviour as a consequence of the practice.

Training with COBS Feedback presents a wide range of benefits, including: the provision of a dynamic postural record (active) in real time, painless procedure, immediate results, precise and quantifiable, registrable, safe, proprioceptive, with visual and audible feedback.

Optimal training with COBS Feedback enables direct observation of the therapeutic activity, both by the patient and the physiotherapist, whilst simultaneously encouraging the patient to quickly understand and learn the exercises given, maintaining their participation motivation, enabling them to see the objective evolution of the process and allowing the application of modifications to avoid errors or adapt to patient evolution.

AUTOMATIC DOCUMENTATION

Measuring results and training data are automatically saved by COBS. They represent an objective possibility for progress monitoring and quality control in training and rehabilitation as well as for long-term patient motivation.

Fields of application of COBS Feedback

Thanks to it´s versatile measuring possibilities and attractive training sofware, the COBS Feedback is well suited for the following indications:

NEUROLOGICAL PROPHYLAXIS AND REHABILITATION

In neurology the COBS Feedback offers matchless assessment and training possibilities for neuromuscular (re)learning in stroke rehabilitation, infant cerebral paralysis and peripheral paresis as well as in Parkinson´s disease. Some exercises can therefore also be carried out in a sitting position (e.g. with chair).

ORTHOPAEDIC REHABILITATION AND TRAUMATOLOGY

In orthopaedic rehabilitation the COBS Feedback is applied after endoprosthetic surgery, in back pain and in traumatology. It helps to regain joint stability and coordination for appropriate and equal load excertion, improved balance and prophylaxis against fall.

PEDIATRY

COBS Feedback can be applied efficiently for correction of kids skeleton problems such as e.g. skolioses and spine position problems caused by physical inactivity or accelerated growth.

SPORT

The COBS Feedback offers a wide range of possibilities for dynamic coordination, strength and balance training, including jumping power. With the optional goniometer set coordination can be efficiently combined with cognitive speed, anticipation and reaction training.

FITNESS

In fitness training the COBS Feedback can be used for the assessment of physical deficiencies and specific improvement of various fitness skills, including coordination, balance and strength. For fitness customers it represents extremely attractive and motivating exercise options, for fitness institution an interesting means for diversification.

COBS was investigated in following scientific papers:

Cisneros V., Carmona B., Domínguez N., Hernández D., Sánchez Y. (2015): Eficacia de la plataforma Cobs en trastornos de equilibrio, postura y marcha del adulto mayor. Revista Cubana de Medicina Física y Rehabilitación 2015;7(1):42-54.

Herrera P., Ordoñez J., Posada A. (2013): Efecto de un programa de fisioterapia mediante el uso de la Plataforma Cobs Feedback sobre el balance estático y dinámico de la población amputada pertenecientes a la selección Colombia de voleibol sentado. Universidad Nacional de Colombia Facultad de Medicina Pregrado de Fisioterapia Bogotá.

Ríos A., Cisneros V., Falcón J., Hernández D., Berbes L., Pazo P. (2015): Eficacia terapéutica de la plataforma Cobs en la calidad de vida de pacientes con enfermedad cerebrovascular. Revista Cubana de Medicina Física y Rehabilitación 2015;7(1):42-54.

Vélez M., Nolivos V., Alegría F. (2012): Ergonomic and individual risk evaluation. Universidad de las Américas. Quito, Ecuador.

COBS Platform Double

The COBS Platform Double offers all possibilities for measuring, attractive training and progress monitoring.

DOUBLE MEASURING PLATFORM

COBS Platform Double is an innovative multifunctional double measuring platform. The COBS platform (double) is divided into 3 activity levels, which are:

LEVEL 1: Clinical analysis of trace lines in real time (evaluation, diagnosis and qualitative and quantitative documentation)
LEVEL 2: Perceptual motor training (therapy and training planning)
LEVEL 3: Leisure training

The COBS platform (double) does not require predefined positioning and its applications therefore respond to a wide range of requirements. It can even be used to measure and practise several balance functions

ENTIRE BODY FUNCTIONAL MEASUREMENT

The load excerted by each leg (strength in Newton) is displayed visually on a PC monitor. Starting from different positions manifold movement functions (ADL functions) can be measured, e.g. sitting, climbing stairs or jumping. This way the functional status quo and impairments of the lower extremities and entire body can be measured and recorded. The initial patient protocol serves as a starting basis for subsequent training.

DIRECT FEEDBACK

Patients with impaired equilibrium will distribute their weight unevenly which becomes visible on the monitor. Coordination as well as joint instability, e.g. in traumatology, is measured by shifting weight from left to right or from toes to heels. The patient can observe and control the measurements on the monitor. The direct feedback is a motivating means for success in therapy and helps to increase the patient´s self confidence in everyday life.
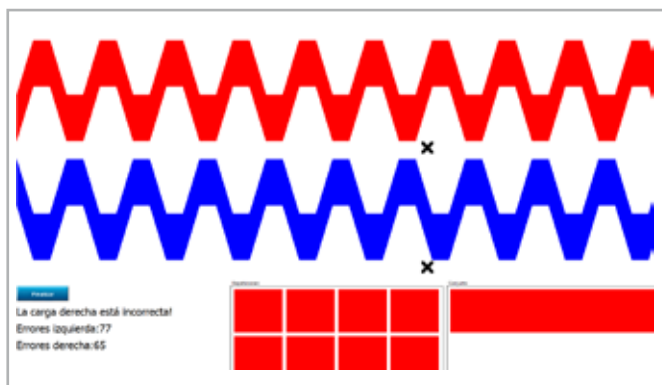
EFFECTIVE AND OBJECTIVE RESULT MONITORING

Versatile software possibilities allow for attractive customized balance, coordination, strength, reaction and anticipation training programmes. All parameters utilized during measurement and training can be stored and retrieved for later comparison. This allows for an effective and objective monitoring of the patient´s clinical progress or the sportsman´s training progress.

COBS Ball

The COBS Ball is a multifunctional tool for versatile feedback possibilities. It can be used individually or as an extention to the COBS Platform.

MEASURING FUNCTIONS

The variety of possible applications of COBS Ball reaches from measuring and analysing different functions of articulated joints as bending or stretching one´s knee or arm up to ADL movements, e.g. picking up a suitcase, rowing or doing pull ups and so on.

SOFTWARE GUIDED TRAINING

The training is guided by software which constantly coaches by visual and audible feedback, making sure that the exercises are performed correctly. This double feedback guarantees a maximum training success. With the large variety of exercises the training is still motivating and attractive even over a long period of time.

DIRECT COMPARISON

The direct comparison of different measurement lines, for example the strength of left/right arm or data starting a therapy and the results afterwards, gives a comprehensive and objective overview about the current condition and the progress in the course of a therapy.

QUALITY CONTROL BY MONITORING

Again all measurement- and training data can be presented and printed as a chart, graph or table. With this kind of documentation a therapist can prove the therapy progress of patients as part of an objective quality control.

DEALER MARK / STAMP

TECHNOLOGY FOR THERAPY

PHYSIOMED ®