EN-MOTION

Treadmill

User Manual

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ENRAF NONIUS

EN-MOTION

Treadmill

User Manual
(for version V001)

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1 Product description

We greatly appreciate your purchase of the EN-Motion treadmill*. This device incorporates cutting-edge technologies. Extra attention has been paid to reliability, safety, ease of use and durability.

The EN-Motion is a training device which can be used for rehabilitation and fitness purposes. The EN-Motion is not suitable for diagnostic purposes. Supplementary equipment must be used for this, such as an ECG unit, blood-pressure meter, cardiac monitor and pulsimeter. If the treadmill is used for training less physically able people, a qualified person (doctor/physiotherapist) must be present. He or she must be capable of interpreting the relevant values properly and supervising the person using the equipment. The EN-Motion may only be used with heart-rate control for training purposes.

> To ensure the correct, safe use of your EN-Motion, it is important for you to read the instructions in this manual thoroughly before using the treadmill!

The following typographic conventions are used in this manual:
- *Italics* are used for text which appears in the display
- **Bold** is used to refer to menu options and the names of buttons

You have chosen wisely with your purchase of the EN-Motion treadmill. We are sure that you will enjoy working with the treadmill for many years to come. Should you have any further questions after reading this manual, please consult your supplier.

* This manual describes the basic functions of the standard version of the EN-Motion treadmill. As regards functionality, the EN-Motion 'Plus' is the same as the standard version. The 'Plus' version differs only in respect of the (electrically) height-adjustable side supports.

2 Product liability

A law on Product Liability has become effective in many countries. This Product Liability law implies, amongst other things, that once a period of 10 years has elapsed after a product has been brought into circulation, the manufacturer can no longer be held responsible for possible shortcomings of the product.

To the maximum extent permitted by applicable law, in no event will Enraf-Nonius or its suppliers or resellers be liable for any indirect, special, incidental or consequential damages arising from the use of or inability to use the product, including, without limitation, damages for loss of goodwill, work and productivity, computer failure or malfunction, or any and all other commercial damages or losses, even if advised of the possibility thereof, and regardless of the legal or equitable theory (contract, tort or otherwise) upon which the clgoal is based. In any case, Enraf-Nonius's entire liability under any provision of this agreement shall not exceed in the aggregate the sum of the fees paid for this product and fees for support of the product received by Enraf-Nonius under a separate support agreement (if any), with the exception of death or personal injury caused by the negligence of Enraf-Nonius to the extent applicable law prohibits the limitation of damages in such cases.

The opposing party (product's user or its representative) shall disclgoal Enraf-Nonius from all clgoals arising from third parties, whatever nature or whatever relationship to the opposing party.

3 General instructions

Before using the EN-Motion for the first time, it is important for you to read this manual thoroughly. Above all, you must ensure that this manual is always available to all the relevant staff.

When using the EN-Motion, pay particular attention to the following:
1. You must acquaint yourself with the safety instructions (section 4) and contra-indications (section 7).
2. The device may not be used in the vicinity (i.e. at a distance of less than 2 metres) of a short-wave device.
3. The patient must always be in full view of the therapist.
4. The device may not be used in so-called "wet rooms" (hydrotherapy rooms).
5. Do not use the treadmill out of doors.

Repairs not carried out by service technicians authorised by Enraf-Nonius and/or the use of non-original (spare) parts and/or ancillary materials will cause the guarantee to lapse and may even be hazardous.

The manufacturer shall not be liable for the consequences of the use of the device other than as described in this manual.

4   Safety instructions

The safe implementation of the procedures described requires sufficient knowledge of the human locomotor system and physiology, alongside technical experience and knowledge of the safety precautions.

The terms *Warning*, *Caution* and *Please note* are used in this manual to bring important issues to the attention of the reader.

- *Warning* means danger to the user or the technician.
- *Caution* means an action which may damage the device.
- *Please note* indicates a statement which deserves more attention than the general text, but which does not signify the danger implicit in *Warning* or *Caution*.

The order in which the steps of a procedure are carried out is important for the safe operation of the device and for preventing injury or harm.
It is therefore important not to change the specified order in which the steps of a procedure are carried out.

4.1   Legal aspects
This manual and the information contained therein are the property of Enraf-Nonius B.V. (Rotterdam, the Netherlands). Enraf-Nonius cannot be held liable for personal injury or damage to equipment caused by:

- Ignoring or failing to comply with actions such as those marked *Warning* or *Caution*, for example.
- Any deviation from the procedures described.
- The performance of actions which are not described in this manual.
- Ignorance of general safety precautions which apply when working with equipment and electricity.
- The use of the equipment other than as described in this manual.

4.2   Warnings (general)
- The safety belt with magnetic contact must be worn by the walker/runner during the use of the treadmill. Your treadmill will not start unless the magnetic contact is placed in the holder.
- If you are experiencing any pain, you must not train on the device and must consult the relevant therapist. In addition, should you experience pain in your chest or nausea, dizziness or shortness of breath, immediately stop the training session and consult your doctor before continuing.
- Incorrect training may cause injury; supervision by a competent medical practitioner is therefore required.
- The correct biomechanical position of the user is essential.
- The use of automated functions, such as Heart-Rate Training, Autospeed and Fitness tests, is prohibited if the health and condition of the runner/patient do not allow for them and if the therapist/doctor has not authorised the function in question. Non-compliance with this rule may lead to serious injury and health risks and may even result in death.
- Do not wear clothing which may become trapped between parts of the treadmill, such as the rollers of a (moving) band.
- Special attention is required during the use of the inclination system and the electrically height-adjustable side supports; ensure that parts of the body or items of clothing cannot become caught between the moving parts of these systems.
- Never allow children to use the treadmill without supervision.
- Never start the treadmill at a high speed and then try to jump onto it!
- The EN-Motion may only be used or operated by one person at any one time. During use, no more than 1 person may stand on the treadmill at any one time.
- The maximum permitted user weight is 235 kg.
- Unplug the device from the electricity supply before moving the treadmill to a different location.
- Do not remove the covers of the motor or the rollers. The device must be serviced by a service technician who has been appointed or authorised by the manufacturer.
- Always remain at a sufficient distance from a device which is being used by others for training purposes. The therapist must ensure that children who are not using the treadmill are kept at a minimum distance of 3 metres from the treadmill.

- Good air circulation is required to prevent the build-up of excessive heat within the device; for this reason, no items of clothing etc. may be placed on the cover of the motor compartment.
- The EN-Motion is subject to special EMC regulations and must be installed and maintained in accordance with the EMC information as specified elsewhere in this user manual (see section 12, technical specifications).
- Portable and mobile radio-frequency devices may affect your EN-Motion.
- Your EN-Motion may not be used in the immediate vicinity of other equipment. Should this nonetheless prove necessary, the proper functioning of the treadmill must be demonstrable and evident.
- Maintain your EN-Motion treadmill in accordance with the stated guidelines (see section 10).

4.3 Warnings with regard to extertion tests

Before performing a test under paramedical training supervision, a number of important conditions must be met. These conditions are:

- The participant must receive clear information about the test. The paramedic states the purpose of the test, how long the test is going to take, what clothing and footwear the person must wear, what is going to happen and what is expected of the person concerned.
- There must be sufficient attention to the standardisation of the conditions: Temperature (16-24 ˚C) and humidity (40-60%).
- The paramedic must be adequately trained in field of exertion physiology, the recognition of signs of overload (cardiocirculatory, cardiorespiratory and orthopaedic). He or she must possess a resuscitation certificate (including the periodic refresher lessons). The presence of a disaster plan is recommended.
- The person involved may only participate in the test if medical screening has taken place, both cardiocirculatory and cardiorespiratory as well as orthopaedic. For maximum exertion tests, an anamnesis, physical examination and ECG (at rest and under exertion) are recommended as screening beforehand. For healthy people, the completion of a Physical Activity Readiness Questionnaire (PAR-Q) may be sufficient. The screening with this questionnaire must be undertaken again at the start of each testing (day). For an example of the PAR-Q see Addendum A
- The equipment used must be well maintained and calibrated to obtain reliable measurements.
- Prior to the test, a proper standardised warming-up activity must be performed if this has not been included in the measurement protocol of a test.
- During and after a test has finished there must be a proper check of the tested person. The person involved must at all times be able to break off from the test.

4.4 Caution

The device is mains-powered. Only use parts supplied or recommended by Enraf-Nonius. An incorrect supply voltage may damage the device or lead to increased emissions from or reduced immunity for the EN-Motion. Damage may result if this instruction is not followed.

4.5 Please note

- **Emergency stop (optional accessories)**: the treadmill will stop automatically as soon as the emergency stop button is pressed. In this case, the programme can only be resumed by first returning to the main menu and resetting the training programme in question (see also 8.2.11 'Emergency stop').
- Should your EN-Motion treadmill develop a fault, please contact your supplier or Enraf-Nonius B.V. (Rotterdam, the Netherlands). Repairs and installations may only be carried out by a service technician who has been authorised by Enraf-Nonius.
- Repairs not carried out by service technicians authorised by Enraf-Nonius and/or the use of non-original (spare) parts and/or ancillary materials will cause the guarantee to lapse.

5 Installation

5.1 Installation (general)
- Remove the packaging, also unpacking any extra parts. Check the entire unit for possible damage caused during transit.
- Before using the treadmill, first carefully read the information in this manual and the installation manual which is included in the packaging.
- Place the treadmill on a level, hard surface. If a soft surface cannot be avoided, measures must be taken to prevent the treadmill from wobbling during use.
- The treadmill must be set up where it is to be used, on a level surface. To ensure optimal use, the treadmill must be stable. This can be achieved by first rotating the six adjustable legs at the bottom of the frame (figure 1, no. 5) inwards. If the treadmill is still not stable, start unscrewing one of the four outer adjustable feet. As soon as the outer adjustable feet are making good contact with the underlying surface, lock them into position by tightening the nuts. Then unscrew the small inner adjustable feet until they touch the ground and lock them into position. Connect the mains cable, ensuring that it will not end up under the adjustable feet when the treadmill is used at an inclination. The device must then be calibrated.
- To do this, the service technician will perform several procedures from the service menu (see **System settings**).
- The device must be set up in a place where no liquids can enter the treadmill. Should any liquids nonetheless penetrate into the housing, unplug the device from the electrical socket (where applicable). Have the device checked by an authorised expert.
- Do not set up the device near a source of heat such as a radiator.
- The use of the EN-Motion must not be obstructed by other objects. Keep a distance of at least 1 m free around the appliance.
- Avoid exposure to direct sunlight, excessive dust, moisture, vibrations and impacts.
- The device may not be used in so-called "wet rooms" (hydrotherapy rooms).
- Always use original accessories and parts stipulated by the manufacturer for this device.

  Installation of (optional) accessories:
- Emergency stop (optional): for less physically able users, an extra-large emergency stop (article number 1665.800) is available. Attach the emergency stop to one of the handles using the clamp connection, at any desired location. Then connect the emergency stop to the operating console by inserting the cable connector into the input underneath the sensor unit.
- Side supports: to make it easier to step on and off the rear of the treadmill, optional side supports can be supplied (set of 2, article number 1665.803). For further details, see the installation manual for the side supports.
- Mounting assistance: a ramp (optional) has been developed for wheelchair patients. This can be ordered using article number 1665.801. The ramp can quickly and easily be slotted into the relevant recesses at the rear of the treadmill while it is at a negative angle of inclination. For further details, see the installation manual for the ramp.

Warning: only fit the ramp when the band is at a standstill (i.e. is NOT in motion)!

5.2 Connecting the device
- The incoming electrical supply must satisfy the local requirements for rooms used for medical purposes.
- First check that the mains voltage and frequency, as stated on the data plate, correspond to those of the mains supply.

5.3 Connecting the mains cable
- Insert the connector of the mains cable supplied into the power input (figure 2).
- Plug the mains cable into an earthed wall socket.

5.4 Power up and self-test
- Switch on the device using the On/Off switch (figure 2).
- When it is switched on, the device will perform a self-test.

Check that the **LCD screen illuminates** and that a bleep is audible at the end of the test.
Contact your supplier if this is not the case.

5.5   Checking the running surface

After the treadmill has been switched on, you must check whether the running surface is correctly centred. As long as the band does not come into contact with the motor cover while it is moving, the band is properly aligned. Differences in the underlying surfaces may mean that it is first necessary to align the running surface (see section 10.3.1 'Aligning the running surface').

5.6   System settings

The factory setting for the instructions displayed in the information screen is English.
All the display values are set to SI units (metric) in the factory. The units and/or language can be modified by changing the default settings in the system menu (see section 9.7 'System settings').

5.7   Relocation and transportation

When relocating or transporting the EN-Motion (for example in order to clean the floor beneath the treadmill), pulling on the side supports (where applicable) and/or the running surface is not permitted.

5.8   Electromagnetic interference

- If the treadmill is used in the immediate vicinity (i.e. at a distance of 2 metres or less) of short-wave equipment which is in operation, instability of the information in the operating console of the EN-Motion may occur.
- In order to avoid electromagnetic influence, we would advise connecting the EN-Motion and the short-wave equipment to different mains supply groups.
- Ensure that the mains cable of the short-wave equipment does not pass near the EN-Motion or the patient.

In the case of persistent disturbance caused by electromagnetic interference, contact your supplier.

6   Intended use

The EN-Motion treadmill is a device for (medical) training therapy and can be used in the rehabilitation sector for (post-operative) training and for the treatment of diseases such as COPD, Obesity and CVA.

The EN-Motion can also be used for the prevention of cardiovascular disease, diabetes and osteoporosis. Regular physical activity can also help with weight loss and weight control.

The EN-Motion is not suitable for diagnostic purposes. Supplementary equipment must be used for this, such as an ECG unit, blood-pressure meter, cardiac monitor and pulsimeter. If the treadmill is used for training less physically able people, a qualified person (doctor/physiotherapist) must be present. He or she must be familiar with the principles, advantages and limitations of Medical Training Therapy (MTT) and must be capable of interpreting the relevant values properly and supervising the person using the equipment. After sufficient instruction and under the supervision of the doctor/therapist in charge of the patient, the EN-Motion treadmill may also be operated by the patient.

The EN-Motion may only be used with heart-rate control for training purposes; this requires special attention from the doctor/therapist in charge of the patient (see comments in section 4 and section 7).

The EN-Motion can be used for:
- Improving the gait/training
- Improving endurance and increasing energy levels
- Improving the cardiorespiratory system
- Improving the muscle functions (muscles which are used when walking and running)
- Prevention of cardiovascular diseases, hypertension and high cholesterol
- Prevention of type 2 diabetes
- Prevention of osteoporosis
- Reducing the risk of falling in the elderly
- Reducing symptoms of depression and anxiety disorders and improving the patient's state of mind
- Reducing the body fat percentage
- Weight loss and weight control

7 Indications and contra-indications

The section describes the indications and contra-indications for cardiorespiratory training and for measuring cardiorespiratory endurance (exertion or fitness tests).

7.1 Cardiorespiratory training

7.1.1 Indications for cardiovascular training
Cardiovascular training is indicated if the following goals are set :
- Increasing/maintaining muscle strength.
- Increasing/maintaining stamina.
- Increasing/maintaining mobility/flexibility.
- Improving co-ordination.

7.1.2 Absolute contra-indications for cardiovascular training
- recent cardiac infarction, suspected infarction, pronounced resting stenocardia;
- pronounced resting insufficiency;
- serious dysrhythmia and asequence;
- pronounced aortic stenosis;
- active trombophlebitis, recent embolism;
- malignant hypertonia;
- myocarditis, endocarditis, pericarditis;
- major aneurysm of the heart or large vessels;
- acute infectious disorders, acute illnesses.

7.1.3 Relative contra-indications for cardiovascular training
- serious exercise coronary insufficiency;
- stimulus and conduction disorders;
- metabolic derangement;
- moderately severe aortic stenosis;
- hypertonic regulatory disorders;
- hypertrophia;
- respiratory insufficiency;
- minor aneurysm of the heart or large vessels.

7.2 Exercise testing

7.2.1 Indications for exertion tests – Measurement of sub-maximal aerobic power
- Determination of the day-to-day function – ascertaining whether the day-to-day activities fall within the level of physical functioning
- Identification of certain deficiencies in fitness - stamina of the muscles and power may constitute a greater limitation to day-to-day living than the aerobic power
- The determination of a baseline before commencing an intervention programme
- The determination of the effectiveness of an exercise programme
- Assessing the progress of a progressive disease (cystic fibrosis, Duchenne muscle dystrophy p.e.)
- Exertion as a provocation test
- Exertion as a diagnostic test
- Uncover changes that are not observed at rest
- The strengthening of pathophysiological changes
- A non-invasive exertion test may be used to determine whether an invasive test is required
- Determination of the severity of heart abnormalities
- Determination of the functional success of a surgical correction
- Measurement and differentiation of symptoms
- Pain in the chest (asthma after heart infarct)
- Shortness of breath, coughing
- Rapid tiredness
- Maintaining motivation and therapy belief during an intervention programme

Source: Zwiren & Manos (1998) en T.Takken 2004

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7.2.2 Explanation of contra-indications

Absolute contra-indication means that an exertion test cannot be performed responsibly.
A relative contra-indication means that performing a test may produce possible complications. The benefits of the test must be weighed against the risks. These contra-indications have been drafted by the American College of Sports Medicine.

Source: Kenney 1995, Zwiren & Manos (1998), T.Takken 2004

7.2.3 Absolute contra-indications for exertion tests

- A recent significant change in the ECG at rest that suggests an infarct or an acute heart condition
- A recent complicated heart infarct experienced (except if the patient is without pain and stable)
- Non-stable angina
- Uncontrolled ventricular arrhythmia
- An uncontrolled arterial arrhythmia which adversely affects heart function
- A third degree AV heart blockade without pacemaker
- Acute congestive heart failure
- Severe stenosis of the aorta
- Suspected or diagnosed with aneurysm ready to explode
- Active or suspected myocarditis or pericarditis
- Venous thrombosis or intracardial thrombi
- Recent systemic or pulmonary embolism
- Acute infection
- Severe emotional angst
- Tightness of the chest at rest or a forced expiratory volume (FEV1) or a peak expiratory flow less than 60% of the expected value
- Acute renal disease or hepatitis
- Insulin dependent diabetes without taking the prescribed medications or children with a high concentration of ketone bodies
- Acute rheumatic fever with carditis
- Severe vascular pulmonary disease
- Poorly compensated heart failure
- Severe aorta or mitral stenosis
- Hypotrophic cardiomyopathy combined with unconsciousness

7.2.4 Relative contra-indications for exertion tests

- Diastolic blood pressure at rest >115 mmHg or systolic blood pressure > 200 mmHg
- Moderate valvular heart condition
- Diagnosed with abnormalities in the electrolytes (hypokalemia, hypomagnesia)
- Fixed-rate pacemaker
- Frequent or complex ectopia
- Ventricular aneurysm
- Uncontrolled metabolic disease (diabetes mellitus, thyrotoxicosis or myxoedema)
- Chronic infectious disease (mononucleosis, hepatitis, aids for example)
- Neuromuscular disease, conditions of the locomotor apparatus or rheumatic conditions that are exacerbated by movement
- Advanced or complicated pregnancy

Source: Kenney 1995, Zwiren & Manos (1998), T.Takken 2004

7.2.5 Absolute indications for terminating an exertion test
- Drop in systolic blood pressure > 10 mmHg with respect to the rest value despite an increase in load, in combination with other signs of ischemia
- Moderate to severe angina
- Increase in symptoms of the nervous system (ataxia, dizziness or near fainting)
- Signs of poor perfusion (cyanosis or becoming pale)
- Technical difficulties in the measurement of ECG or systolic blood pressure
- The test person wishes to stop
- Chronic/persistent ventricular tachycardia
- ST elevation (> 1.0 mm) without the occurrence of diagnostic Q waves.

7.2.6 Relative indications for terminating an exertion test

- Drop in systolic blood pressure > 10 mmHg with respect to the rest value despite an increase in load, without other signs of ischemia
- Changes in ST or QRS complex, for example a significant ST segment depression
  (> 2 mm or horizontal or downwards ST segment depression) or a clear axis change
- Arrhythmia other than chronic ventricular tachycardia
- Tiredness, shortness of breath, cramps in leg muscles, heavy breathing or claudication
- Development of a bundle branch block or intraventricular conduction disturbance which cannot be distinguished from ventricular tachycardia
- An increasing pain in the chest
- Hypertensive response during exertion with a systolic blood pressure of > 250 mmHg and/or a diastolic blood pressure of >115 mmHg

Source: Gibbons et al (1997), T.Takken 2004

8 Operation (general)

This section summarises the various components and controls (§ 8.1) and explains the function buttons (§ 8.2) and different information screens (§ 8.3).

8.1 Controls/components

8.1.1 Most important features (figure 1)
[1] Control panel
[2] Emergency stop, moveable (optional)
[3] Handles
[4] Height-adjustable side supports ('Plus' model only)
[5] Adjustable feet
[6] Running surface
[7] Ramp (optional)
[8] Side supports (optional)
[9] Sensor unit + magnetic belt with magnetic contact
[10] Motor compartment
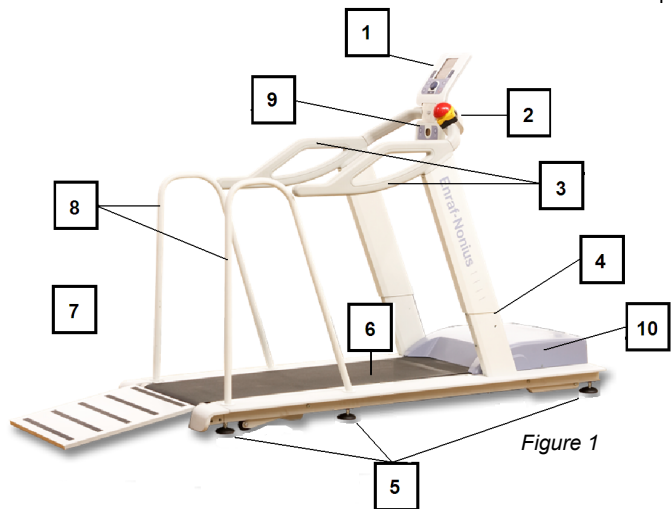
Figure 1

8.1.2 Front (figure 2)
[1] On/off switch
[2] Connection for 230V mains cable + fuse holder
[3] Data plate
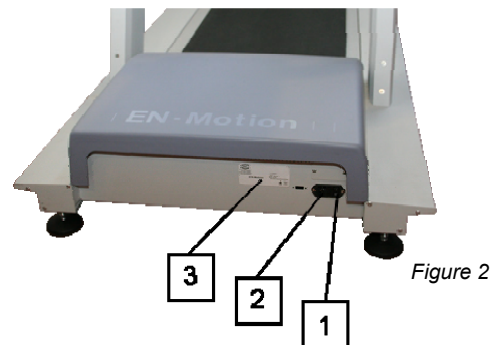
Figure 2

8.1.3 Control panel (figure 3)
[1] LCD information screen
[2] Speed buttons
[3] VIEW button (change screen button)
[4] PAUSE button
[5] OK button (confirm button)
[6] STOP button
[7] Central controller (rotary knob)
[8] AUTOSPEED button + indicator lamp (LED)
[9] Slot for SD card
[10] Inclination buttons
[11] Smart-card reader
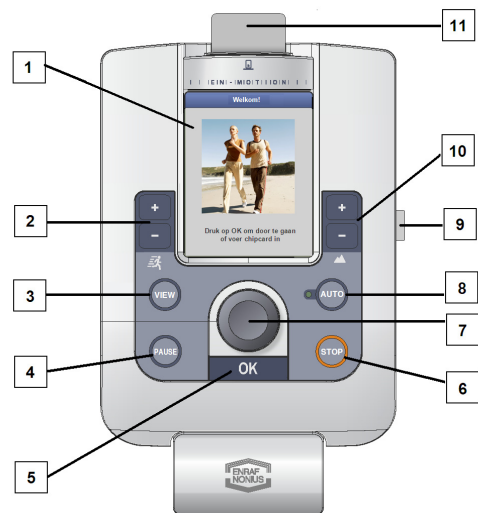
Figure 3

8.1.4 Sensor unit (figure 4)
[1] Buttons for operating height-adjustable side supports (only EN-Motion 'Plus' model)
[2] Sensor
[3] Magnetic contact (for safety belt)

Figure 4

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8.2 Use of the function buttons

8.2.1 Speed buttons

The speed buttons are on the left-hand side of the control panel. The speed is displayed at the bottom left of the information screen [1] and shows how fast you are running or walking. The minimum band speed is 0.4 km/h. The maximum speed which can be set is 18 km/h. The speed can be set or changed by pressing the **speed buttons [2]**. Pressing the **+ button** increases the speed in increments of 0.1 km/h. The **– button** decreases the s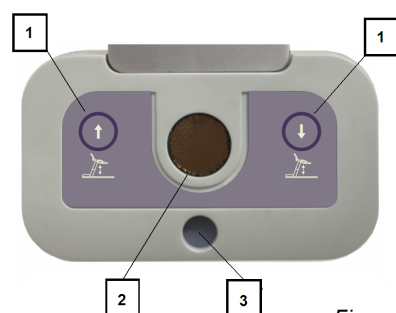peed in increments of 0.1 km/h. If you press and hold down one of the speed buttons, the speed will increase or decrease continuously. The speed shown is the actual speed.

Speed buttons [2]

Figure 5

You can increase or decrease the speed at any time. However, the change in speed will take place with a small delay. For safety reasons, the band speed will increase gradually. A *flashing arrow* next to the speed displayed (figure 6) indicates that the band has not yet reached the newly selected speed. An increase in speed is indicated by an arrow pointing upwards. A decrease in speed is shown by an arrow pointing downwards.

A flashing arrow indicates that the band is increasing (↑) or decreasing (↓) in speed.

Figure 6

8.2.2 VIEW button (change screen button)

Apart from providing access to the *Default settings* (see 'System settings'), the **VIEW button [3]** does not yet have a specific function. This feature has been provided with future expanded functions in mind, such as the ability to alternate between screens with different layouts and in order to show details of the current training session.

Figure 7

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8.2.3 PAUSE button

The training can be paused temporarily (for example, to tie your shoelace or have a drink). You can do this by pressing the **PAUSE button [4]** during the training session. A message (figure 9) will appear on the screen and the band will gradually come to a standstill.

To resume the training, press the **OK button [5]**. A screen (figure 10) will appear, showing that the training is being resumed. The pause screen will also show the selected running speed and incline.
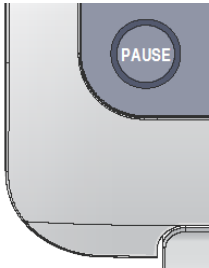

| Figure 8 | Figure 9 | Figure 10 |

Comment: if you press the STOP button once again while you are pause mode, the training session will end permanently and the results screen will appear.

8.2.4 OK button (confirm button)

In order to confirm an action, for example continuing to the next screen or entering personal details, you must press the **OK button [5]**. The information screen clearly states in text form which actions need confirming by means of the OK button.

The **OK button** is also the button used to start a training session (with the exception of *Quick start*). Once you have pressed the button, the band will start moving. The speed at which the band moves depends on the selected function and selected (maximum) speed. In the case of *Quick start*, the speed must be selected manually using the **speed buttons [2]**.

OK/confirm button [5]

Figure 11

8.2.5 STOP button

The treadmill can be stopped by pressing the **STOP button [6]** once. The band speed will gradually decrease until it comes to a standstill. The training session will then come to a permanent end.

The *Results screen* showing the relevant parameters (such as distance covered, calories burned etc.) will then appear. If desired, the results may be recorded on one of the score forms (see appendices 2 to 6). The details can then be entered at a later date into an electronic patient record, for example.
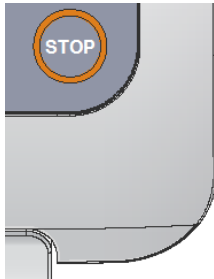
STOP button [6]
- 1x press = stop/end

Figure 12

Comment: the treadmill can also be brought to a standstill by activating the:
- Safety belt with magnetic contact (see 8.2.10)
- Emergency stop (optional accessories; see 8.2.11)
- Autostop function (see 8.2.12)

8.2.6 Central controller (rotary knob)
Using the **central controller [7]**,
- you can select the desired menu functions (for example *Quick start*)
- you can enter the values for the various parameters (for example *Weight*)
- you can choose between several different options available in a screen (for example *Male/Female*).
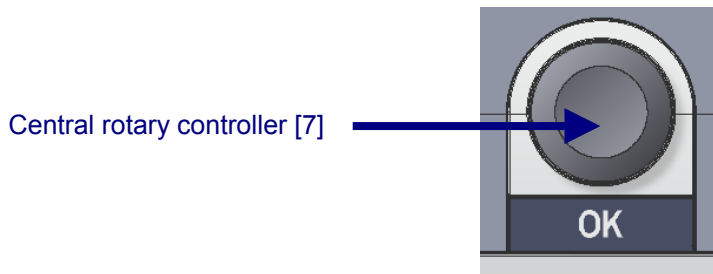

Central rotary controller [7]

Figure 13

8.2.7 Autospeed button + indicator lamp
The activation of the **Autospeed function [8]** means that the band speed will automatically adjust to the pace of the person using the treadmill. If this person is unable to maintain a previously selected speed (and is therefore at risk of ending up at the back of the running surface), the band speed will automatically decrease. If the person is able to walk or run faster, the band speed will automatically increase. A green LED to the left of the **AUTO button** indicates that the Autospeed sensor is activated (figure 14). For certain programmes and exertion tests, Autospeed forms part of the standard test protocol. See 9.6 for a detailed description of the Autospeed function.

Indicator lamp (LED)
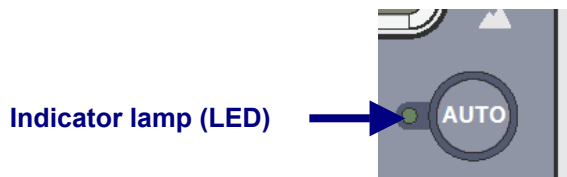
Figure 14

8.2.8 Inclination buttons
The buttons for adjusting the incline (fig. 15) are on the right of the control panel. The selected incline can be either positive (uphill) or negative (downhill). The range is expressed as a percentage, with max. +15% (positive) and max. -10% (negative). The selected incline is displayed at the bottom right of the information screen. For safety reasons, the treadmill will adjust gradually to the selected incline. A flashing arrow indicates that the band has not yet reached the selected angle. An increasing angle of inclination is indicated by an arrow pointing upwards. A decreasing angle of inclination is indicated by an arrow pointing downwards. During the gradual adjustment process, the current angle of inclination will be shown.

18

Figure 15

← **Inclination buttons [10]**

The incline can be selected or changed at any time using the **inclination buttons [10]**. Pressing the **+ button** increases the angle by +0.5%. The **– button** decreases the angle of inclination. Starting from 0 (zero), a negative angle of inclination (downhill) can be selected by 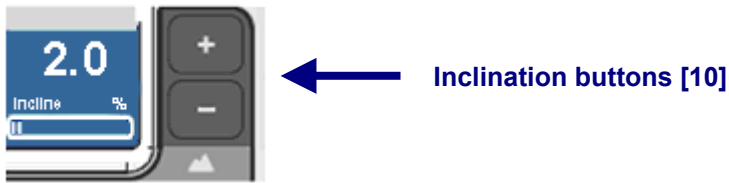pressing the **– button**. Pressing and holding down an inclination button will change the incline continuously, i.e. more quickly.

8.2.9   Height-adjustable side support buttons (only EN-Motion 'Plus' model)

Using the two buttons **[1]** on the sensor unit, you can easily adjust the height of the side supports. Pressing the left-hand button (up arrow) will automatically raise the side supports (electrically). The right-hand button will lower the side supports. The side supports can be adjusted over a distance of 30 cm.
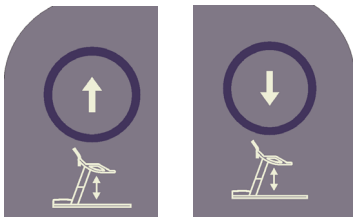

Figure 16

8.2.10 Safety belt with magnetic contact

This safety feature consists of a belt with an attached cord [3]. A magnet has been placed at the end of the cord. In the event of danger (for example, if the patient stumbles or is in danger of falling), the contact between the magnet and the control panel will be broken. The treadmill will then stop automatically. The safety belt must be worn by the runner when using the treadmill. A message on the screen will draw the attention of the user or therapist to the fact that the band has been stopped by means of an emergency stop.

Please note: the magnetic contact has been designed to interrupt the power supply of your treadmill when it is activated. The treadmill will not restart until the magnet has been placed in position once again.

8.2.11 Emergency stop button (optional)

The **emergency stop [2]** is an optional accessory which is used to quickly bring the band to a standstill. In principle, the emergency stop can be attached to the handles at any desired location (see the installation and instruction manual for the emergency stop). Pressing the red button will activate the emergency stop. At the same time, a message will appear on the information screen (see figure 18). The band can only be restarted by first returning to the Main menu and reselecting the desired training. The emergency stop is connected to the sensor unit (via the input at the bottom of the sensor unit).
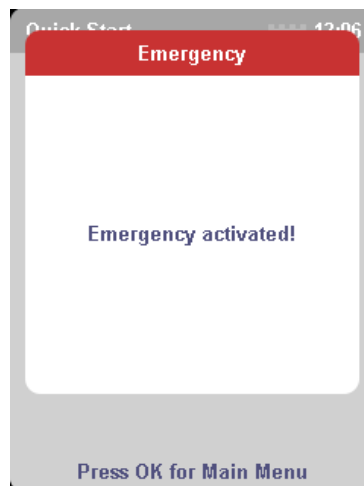

Figure 17

Figure 18

8.2.12 The AUTOSTOP function

The AUTOSTOP function is an extra safety feature which uses the **sensor [2]** built into the sensor unit. The sensor detects whether the user is on the running surface of the band. If the user steps off the band while it is still moving, the sensor will also detect this and the band will automatically come to a (temporary) standstill. A message will also appear on the screen stating that the AUTOSTOP function is active (see fig. 19). If the user returns to the running surface of the treadmill within 30 seconds, the training can be resumed by pressing the **OK button**. The user can also bring the training to a permanent end by pressing the **STOP button** within 30 seconds. As soon as the 30-second period has expired, the treadmill will automatically display the Results screen. You can activate or deactivate the AUTOSTOP function in the System settings menu (see section 9.7).

Comment: during *Fitness tests* (even though the AUTOSTOP function is active), it is not possible to resume the training session. The band will immediately come to a definitive standstill and a message will appear on the information screen (fig. 21).
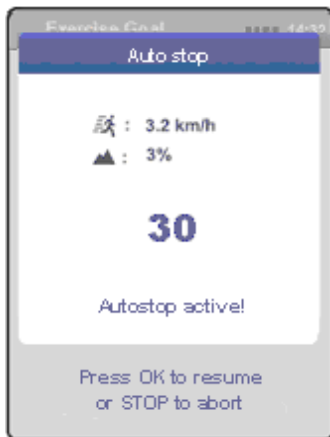
Figure 19

Figure 20
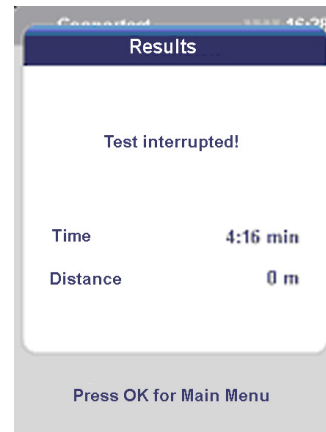
Figure 21

8.3 The LCD information screen

During the operation of the treadmill, various information screens are displayed in the window. These can largely be divided into 3 groups according to function: navigation screens, daa screens and warning screens.

Navigation screens guide the user through choosing between the various functions and entering details such as length or weight. Text at the bottom of each navigation screen clearly states which action is required. Navigation screens will only appear while the band is not yet moving.
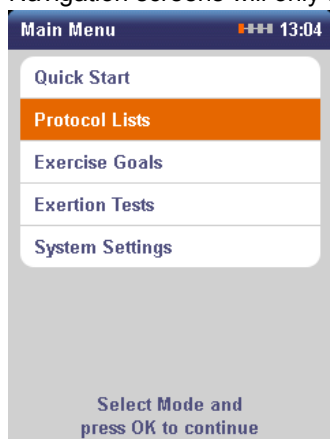
Sample 'Navigation screens'
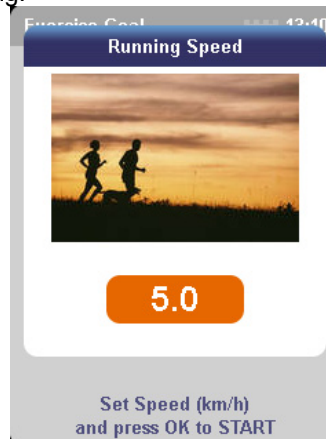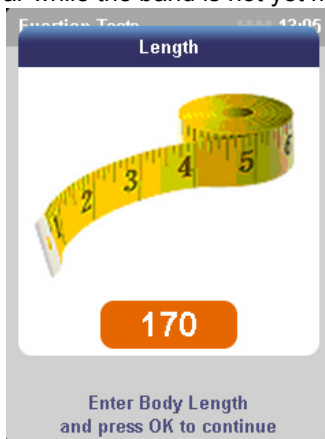
Data screens may be displayed in the window both during and after the termination of the training session. A data screen contains relevant information (parameters) about the selected training session or test.
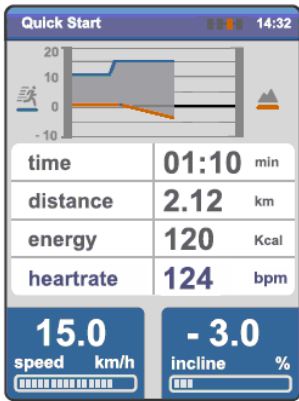
Sample 'Data screens'

Warning screens alert the user, both before and during the training session, to any errors and critical situations. A warning screen with a red bar indicates that special attention is required. A screen with a blue bar, on the other hand, is less urgent.
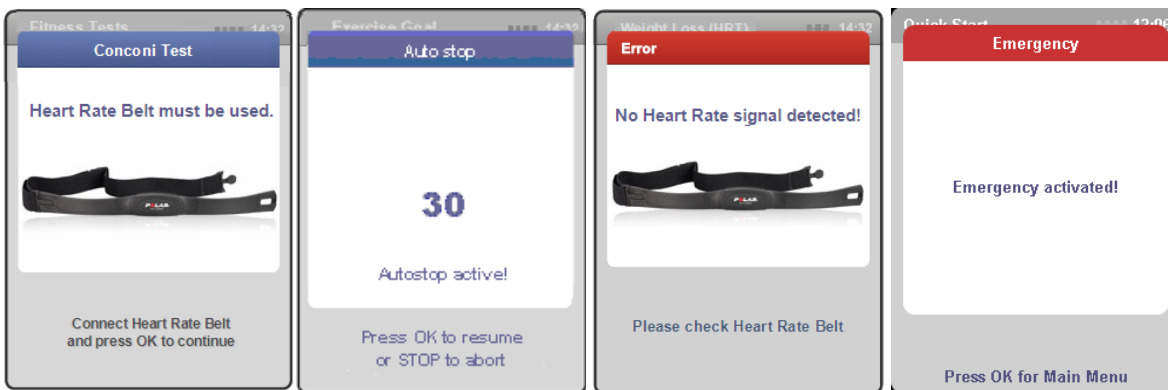
Sample 'Warning screens'

9 Operation (step-by-step)

9.1 Overview of training/therapy options

In principle, the treadmill session should be configured by the therapist.

However, the treadmill is so easy and intuitive to use that – after sufficient instruction and checking by the therapist – this can also be done by the user.

The treadmill is operated via buttons on the operating console (see figure 3). The bottom section of the LCD window displays step-by-step instructions stating which action is required.

9.1.1 Initial screen (standby screen)
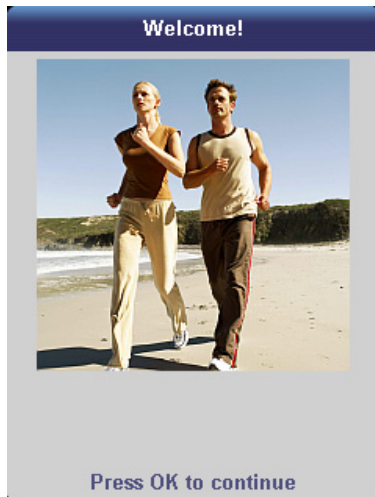
After the treadmill has been switched on, the *Welcome screen* will appear. Press **OK** to continue to the *Main menu.*

Comment: if the Main menu is called up and no further action is taken, the Welcome screen will automatically appear after 30 seconds.

9.1.2 Main menu
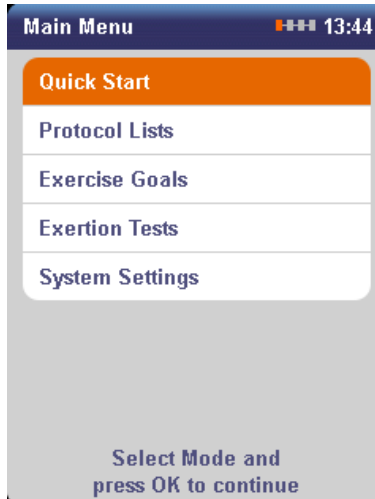
The *Main menu* provides access to all the functions of the device. Select the desired function or therapy using the **central controller**. A selected function can be identified by an orange bar. Confirm the selected function by pressing **OK**.

You can choose from the following 5 functions:

1. Quick start
2. Protocol lists
3. Exercise goals
4. Exertion tests
5. System settings

9.2 Quick start

The easiest (and quickest) way to start the treadmill is to use the Quick start function. The Quick start function is also highly suitable for getting your patients used to working on a treadmill or for use as a warm-up. Quick start training can also be used with automatic speed adjustment (see section 9.6 for a detailed explanation of the AUTOSPEED function).
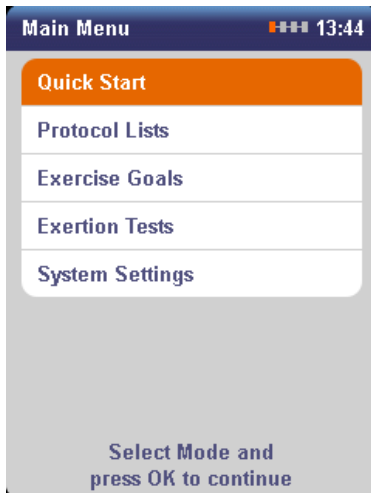
Select the *Quick start* function using the **central controller** and press **OK**.

The speed and/or angle of inclination must be entered manually.

Now adjust the speed and inclination using the **+ and – buttons.**
The band will start to move.

*Comment: pressing the **+ speed button** directly from the main menu will also activate the Quick start feature. This is by far the quickest way to start your training session.*
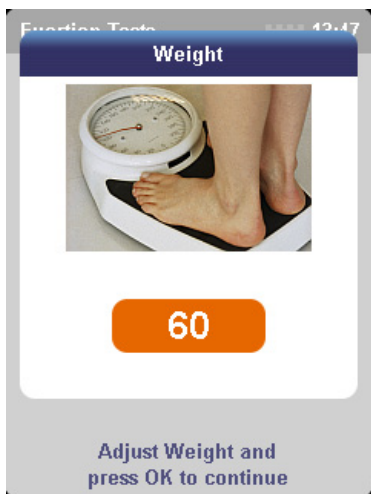
If you would also like the calories burned to be calculated (automatically) with the Quick start feature, you must specify this in the System settings menu (see section 9.7.2.e). The body weight of the runner/patient will be used to calculate the energy consumption during the training session.

If this function has been activated, the data screen displayed on the left will first appear before the training session can start.

Enter the weight of the runner/patient using the **central rotary knob** and press **OK**.
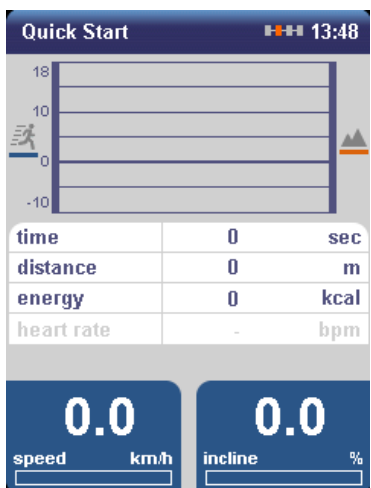
As soon as the band starts to move, the screen will change to **Data View mode**.

With *Quick start*, the values for *time* and *distance* will increase during the training session.

A heart-rate belt may be used to display the user's current heart rate.
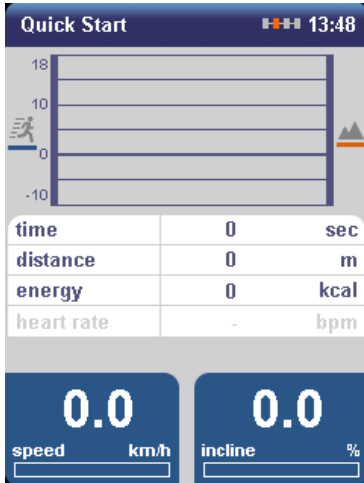
During the training session, the variations in speed and angle of inclination are displayed graphically at the top of the screen. The current values for the parameters time, distance, energy and heart rate are also displayed. The current speed and selected incline are shown at the bottom of the screen.

Comment: if no weight has been entered and/or no Polar heart-rate belt is worn before the Quick start training commences, these values will not be displayed. In this case, 'energy' and 'heart rate' will be greyed out.

9.2.1 Use of the PAUSE button

Press **PAUSE** to temporarily interrupt the training session. The screen shown on the left will appear, and at the same time the speed of the band will gradually decrease until it comes to a complete standstill.

Comment: from the pause mode, pressing the STOP button once again will bring the training session to a permanent end and the results screen will be displayed.

Resuming the training session
Press **OK** to restart the band. A screen showing that the band speed is gradually increasing will appear. This screen will automatically disappear as soon as the band has reached the selected speed.

9.2.2 Ending the training
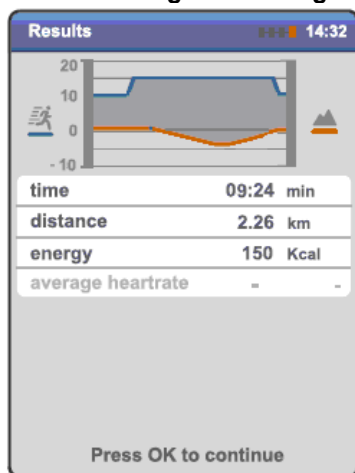
Press **STOP** to end the training session. The band will gradually come to a standstill and the Results screen will appear.

Please note: the details displayed will not be saved! You can record the details on the results form (see appendix) if you wish. This allows the details to be entered later in an electronic patient record, for example.

Pressing **OK** will return you to the Main menu.

Please note: an incline, if selected, will automatically be brought back to 0% at the same time!

9.3 Protocol lists

The *Protocol lists* (training programmes) menu function allows you to offer the user a complete range of interval training programmes. These include changes of speed and/or inclination, which automatically follow a fixed pattern. An extremely effective training session also involves climbing (going uphill). This is more effective than running/jogging on a flat terrain and easier on your joints!

The *Protocol lists* function is divided into 2 groups: *preprogrammed and personal protocols*.

Please note: the protocols do NOT HAVE heart-rate training programmes*! However, if a POLAR heart-rate belt is connected, the current heart rate is nonetheless shown. If the heart rate exceeds 85% of the max. HR **, this is indicated by means of an audible and visual signal. In this case, the speed and/or inclination must be reduced manually until the heart rate is below the maximum value.

*   For targeted training using heart-rate zones, you must select one of the heart-rate training programmes (HRT). See section 9.4.4.

**   Based on the formula: 220 – age

9.3.1 Preprogrammed protocols

You can choose from 14 *preprogrammed protocols*. Each protocol consists of three phases: warming up, the actual training and cooling down.

Protocols available:
- Downhill Interval programmes (I, II, III):   running or walking downhill
- Dual Hill Interval programmes (I, II, III):   two hills
- Endurance Interval programmes (I, II, III):   endurance with slight speed changes
- Uphill Interval programmes (I, II, III):   running or walking uphill
- Speed Interval programmes (Vario I and Vario II):   programmes with speed changes

The difficulty level of the programmes is shown in the form of Roman numerals, with I being the easiest and III the hardest. During the training, the difficulty level can be adjusted at will by changing the speed and/or angle of inclination.

Warning: it is your responsibility to ensure that the selected programme is appropriate for the health and condition of the user/patient. Depending on the selected programme and the condition of the user, certain programmes may involve quite significant exertion. We therefore highly recommend the use of a heart-rate meter. If you have any doubts, first arrange for the patient to perform an exertion test or choose another form of training. Failure to comply with this stipulation may cause serious injury and health risks and may even lead to death.
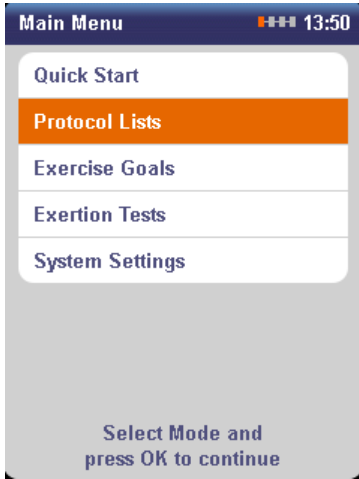
Select the *Protocol lists* function using the **central controller** and press **OK**.

An option menu will appear.
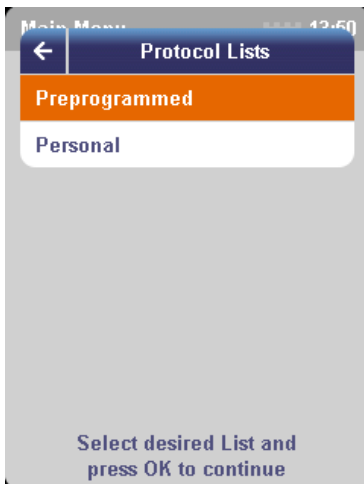
Select the *Preprogrammed* list using the **central controller** and press **OK**.

Now enter your *personal details* before selecting from the list of *preprogrammed protocols*. The details will be used for fine-tuning the training and for calculating and presenting the personal training results.
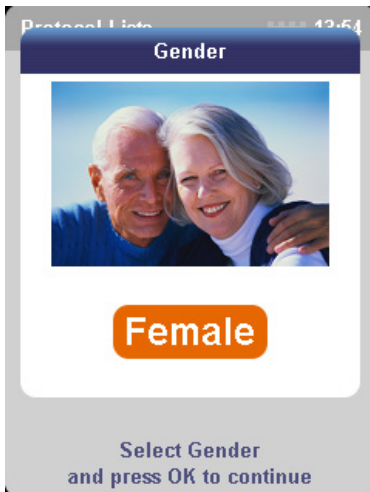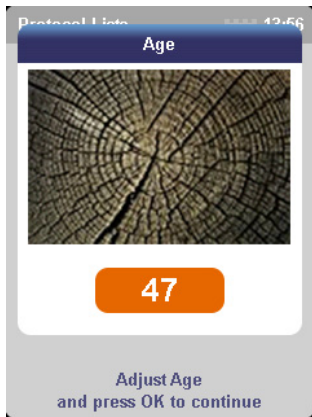
Select the *gender* (m/f) using the **central controller** and press **OK**.

Age

47

Adjust Age
and press OK to continue

Enter the *age* using the **central controller** and press **OK**.

Length

170

Enter Body Length
and press OK to continue

Enter the *height* (cm) using the **central controller** and press **OK**.

Weight

60

Adjust Weight and
press OK to continue

Enter the *weight* (kg) using the **central controller** and press **OK**.

All the personal details have now been entered.

Maximum Speed

5.0

Set max. Speed (km/h)
and press OK to continue
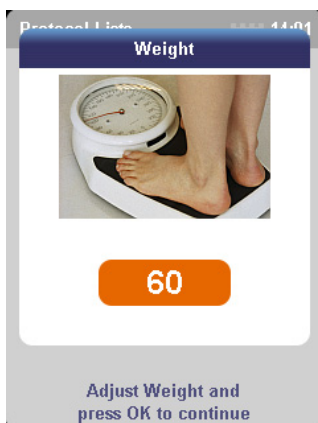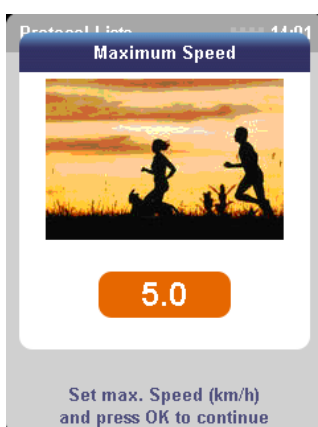
Then enter the *maximum* speed (km/h) using the **central controller** and press **OK**.

Comment: do not enter an excessively high maximum speed. You must be certain that the selected speed can be reached without the heart rate increasing too quickly.
In a medical environment, the supervisor must ensure that this is adhered to.
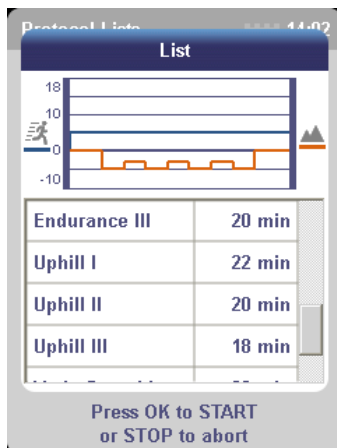
Select the desired programme from the *List* using the **central controller** and press **OK**.

The treadmill will now start automatically and gradually accelerate until the desired speed has been reached *.

After the warming-up phase, the inclination will automatically increase (uphill) or decrease (downhill).

You can adjust the *speed* and inclination using the **+ and – buttons** (the inclination can only be adjusted if the angle ≠ 0%).

* The ENDURANCE and VARIO SPEED programmes have speed changes.
Depending on the programme selected, the initial speed will be up to 30% lower than the chosen maximum speed.
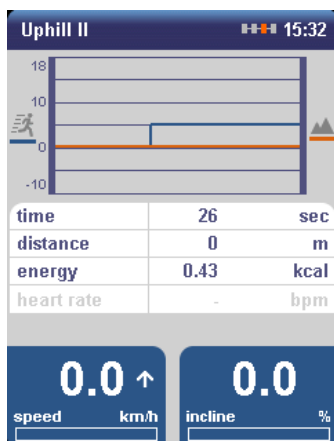
As soon as the training session has started, progress will be displayed by means of a moving time bar at the top of the screen.

The bar corresponds to the following time intervals:
- in the first minute: 1-minute block
- 2nd to 12th minute: 3-min. blocks
- 12 to 60 minutes: 6-min. blocks
- 60 to 300 minutes: 30-min. blocks
- after 300 minutes (5 hours), blocks of 60 minutes (1 hour) will follow.

The maximum session time is 24 hours.
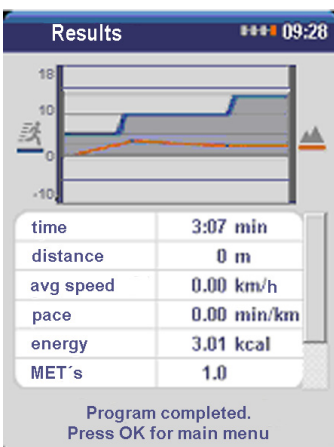
After the last phase (cooling-down) has been completed, an audible signal will sound and the *Results screen* will appear.

The training has now ended.

Note the results and record them on the results form if desired (see appendix).

Press **OK** to return to the *Main menu*.

9.3.2 Personal protocols

As well as working with fixed protocols, you can define and save a maximum of 30 *personal exercise protocols* (see System settings, point 9.7.3). These protocols can then be retrieved using the 'Protocol lists – personal protocols' menu.
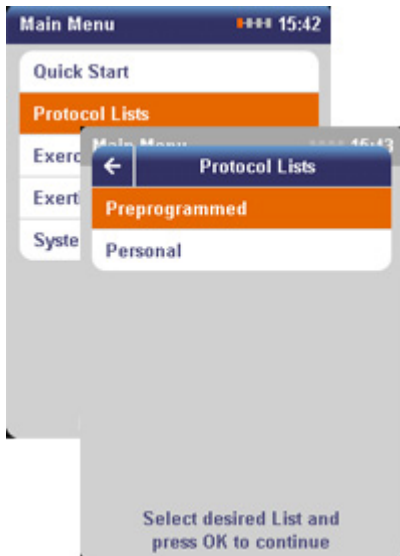
Select the *Protocol lists* function using the **central controller** and press **OK**.
An option menu will appear.

Then select the *Personal* list using the **central controller** and press **OK**.
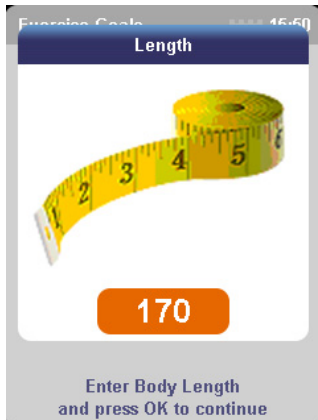
First complete the *Personal details* screens and press **OK**.

The list of saved personal protocols will appear (P1 to P30).
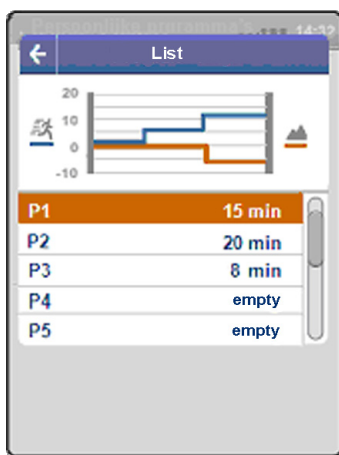
Select the desired programme from the *List* using the **central controller** and press **OK**.

The treadmill will now start automatically and gradually accelerate until the desired maximum speed has been reached *.

You can adjust the *speed* and inclination using the **+ and − buttons** (the inclination can only be adjusted if the angle ≠ 0%).
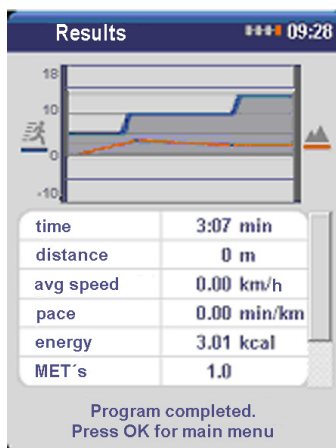
After the training has been completed, an audible signal will sound and the *Results screen* will appear.

Note the results and record them on the results form if desired (see appendix).

Press **OK** to return to the *Main menu*.

9.4   Exercise goals

This function allows you to offer your patient a range of targeted training options. You can choose from the following Exercise goals:

1. *Time* (for example training to improve your performance in the Cooper test, a 12-min. endurance test)
2. *Distance* (for example a training session with the goal of increasing the distance covered)
3. *Energy* (training session goaled at 'burning' 300 Kcal, for example)
4. *Weight loss* (for example helping an obese patient to lose a few kilos)
5. *Condition improvement* (for example to improve the physical condition of a patient after a period of immobilisation)

With Exercise goals 1, 2 and 3, a POLAR heart-rate belt may be connected in order to display the current heart rate. If the heart rate exceeds 85% of the max. HR *, this is indicated by means of an audible and visual

signal. In this case, the speed and/or inclination must be reduced manually until the heart rate is below the maximum value. For Exercise goals 4 and 5, a POLAR heart-rate belt must be connected.

* based on the formula: 220 – age

Please note: Exercise goals 4 and 5 involve heart-rate controlled training (HRT = Heart-Rate Training)! Read the instructions in point 9.4.4 thoroughly before using these cardio-training programmes.

Warning: it is your responsibility to ensure that the selected goal is appropriate for the health and condition of the user/patient. If you have any doubts, first arrange for the patient to perform an exertion test or choose another form of training. Failure to comply with this stipulation may cause serious injury and health risks and may even lead to death.

9.4.1 Exercise goal: time
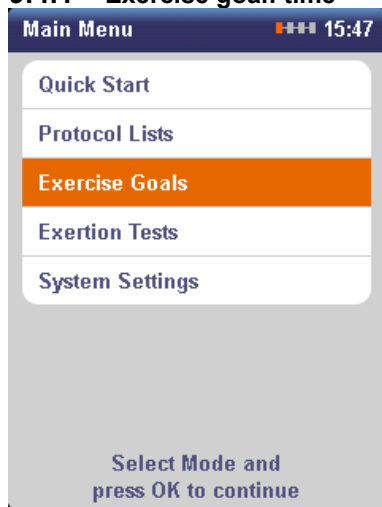
Select the *Exercise goals* function using the **central controller** and press **OK**.

First enter your *personal details* before selecting from the list of available *Exercise goals*.

The details will be used for fine-tuning your training and for calculating and presenting your personal training results.
.

Select the *gender* (m/f) using the **central controller** and press **OK**.

Enter the *age* using the **central controller** and press **OK**.

Enter the *height* (cm) using the **central controller** and press **OK**.

Enter the *weight* (kg) using the **central controller** and press **OK**.

All the personal details have now been entered.

Main Menu   ▐◈◈◈ 15:47

- Quick Start
- Protocol Lists
- **Exercise Goals**
- Exertion Tests
- System Settings

Select Mode and
press OK to continue
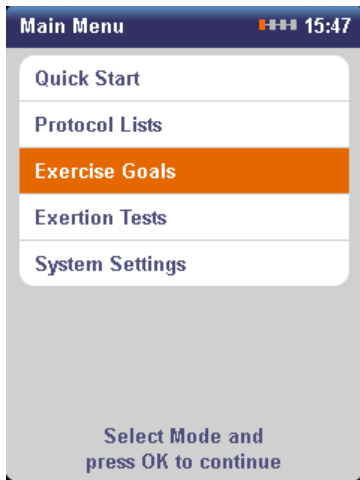
The list of *Exercise Goals* will appear.

You can select from:
- Time (endurance session for a selected number of minutes)
- Distance (covering x no. of km)
- Energy (burning x no. of calories)
- Weight loss (fat burning)
- Condition improvement (improving the physical condition or preventive training)

Select the Exercise goal *Time* using the **central controller** and press **OK**.

Exercise Goal   15:53
Time

12

Set time in min,
and press OK to continue
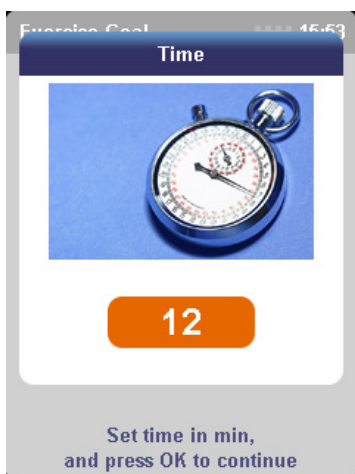
Enter the desired *time (min.)* using the **central controller** and press **OK**.

The minimum time is 1 minute and the maximum is 1440 minutes (24 hours). The time can be entered in increments of 1 minute.

Exercise Goal   15:53
Running Speed

7.5

Set Speed (km/h)
and press OK to START

Enter the desired *speed (km/h)* using the **central controller**.

Press **OK** to *START* the band.

Comment: do not enter an excessively high speed. You must be certain that the selected speed can be reached without the heart rate increasing too quickly.
In a medical environment, the supervisor must ensure that this is adhered to.

Time   ▐◈◈◈ 15:54

11:52 min

0 m

♡ -

| **0.0** | **0.0** |
| speed   km/h | incline   % |

The treadmill will now start automatically and gradually accelerate until the selected speed has been reached.

You can adjust the *speed* and inclination using the **+ and – buttons**.

During the training session, the most important parameters will be displayed:
- **time** (remaining until the goal is reached)
- distance covered
- speed
- inclination
- current heart rate (if a heart-rate belt is worn)

ENRAF
NONIUS

31

Results   ▐▐▐ 16:12

time	3:22	min
distance	0	m
avg speed	0.00	km/h
pace	0.00	min/km
energy	3.36	kcal
MET's	1.0	
avg. power	3.9	W
VO2 max	3.5ml/min.kg	
HF-min	0	bpm
HF-max	0	bpm

Press OK for Main Menu

After the goal has been reached, an audible signal will sound and the *Results screen* will appear.
The training has now ended.

Note the results and record them on the results form if desired (see appendix).

Press **OK** to return to the *Main menu*.

9.4.2 Exercise goal: distance

Exercise Goal

- Time
- **Distance**
- Energy
- Weight Loss (HRT)
- Improve Condition (HRT)

Select Goal and
press OK to continue

First select the *Exercise Goals* function from the main menu using the **central controller** and press **OK**.

Then enter the *Personal details* (gender, age, height and weight) and press **OK**.

The list of *Exercise Goals* will appear.

Select the exercise goal *Distance* using the **central controller** and press **OK**.

Distance

1.5

Set distance in km,
and press OK to continue
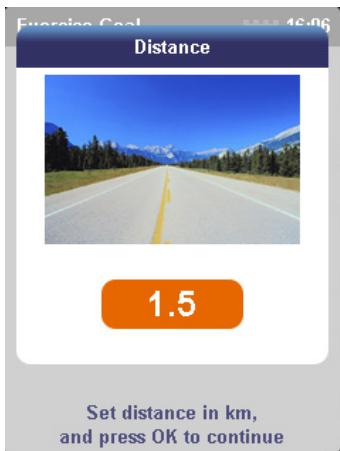
Enter the desired *distance (km)* using the **central controller** and press **OK**.

The minimum distance is 0.1 km and the maximum distance is 100 km (in increments of 0.1 km = 100 m).

Running Speed

4.5

Set Speed (km/h)
and press OK to START

Enter the desired *speed (km/h)* using the **central controller**.

Press **OK** to *START* the band.

Comment: do not enter an excessively high speed. You must be certain that the selected speed can be reached without the heart rate increasing too quickly.
In a medical environment, the supervisor must ensure that this is adhered to.

Distance ▉▉▉ 16:11

2:43 min

1500 m

♡

0.0 | **0.0**
speed km/h | incline %
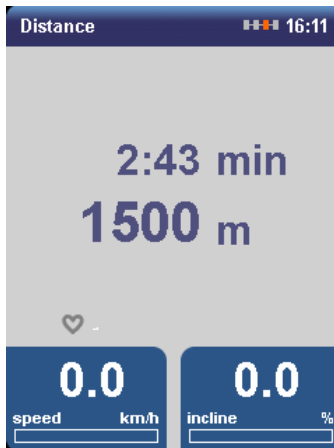
The treadmill will now start automatically and gradually accelerate until the selected speed has been reached.

You can adjust the *speed* and inclination using the **+ and – buttons**.

During the training session, the most important parameters will be displayed:
- **distance** (remaining until the goal is reached)
- time (which has expired)
- speed
- inclination
- current heart rate (if a heart-rate belt is worn)

After the goal has been reached, an audible signal will sound and the *Results screen* will appear.
The training has now ended.

Results ▉▉▉ 16:12

time	3:22	min
distance	0	m
avg speed	0.00	km/h
pace	0.00	min/km
energy	3.36	kcal
MET's	1.0	
avg. power	3.9	W
VO2 max	3.5ml/min.kg	
HF-min	0	bpm
HF-max	0	bpm

Press OK for Main Menu

Note the results and record them on the results form if desired (see appendix).

Press **OK** to return to the *Main menu*.

9.4.3 Exercise goal: energy

Exercise Goal

Time

Distance

Energy

Weight Loss (HRT)

Improve Condition (HRT)

Select Goal and press OK to continue

First select the *Exercise Goals* function from the main menu using the **central controller** and press **OK**.

Then enter the *Personal details* (gender, age, height and weight) and press **OK**.

The list of *Exercise Goals* will appear.

Select the exercise goal *Energy* using the **central controller** and press **OK**.
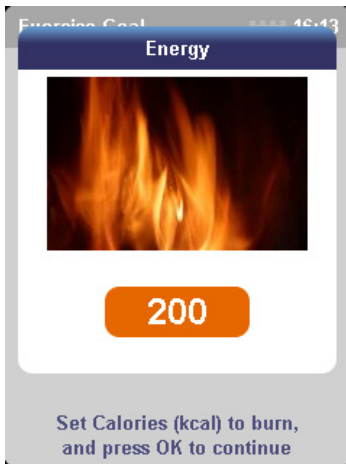
Enter the *number of calories to be burned (kcal)* using the **central controller** and press **OK**.

The minimum unit is 1 kcal and the maximum is 10,000 kcal (in increments of 1 kcal).
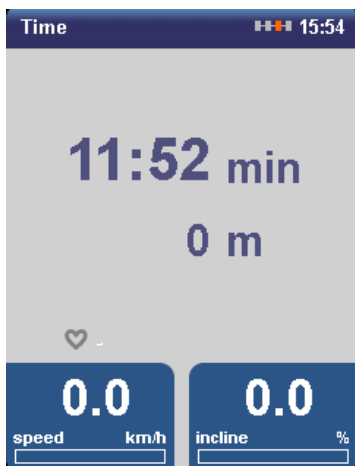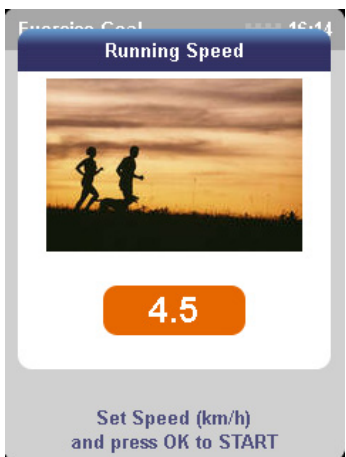

Enter the desired *speed (km/h)* using the **central controller**.

Press **OK** to *START* the band.

Comment: do not enter an excessively high speed. You must be certain that the selected speed can be reached without the heart rate increasing too quickly.
In a medical environment, the supervisor must ensure that this is adhered to.
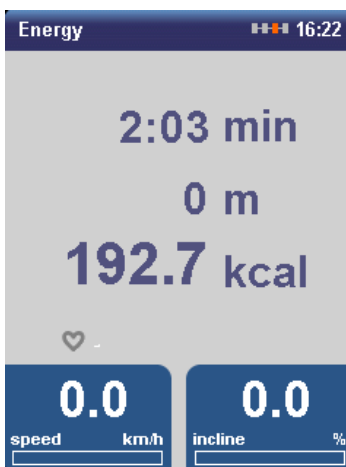
The treadmill will now start automatically and gradually accelerate until the selected speed has been reached.

You can adjust the *speed* and inclination using the **+ and – buttons**.

During the training session, the most important parameters will be displayed:
- **calories** (still to be burned until the goal is reached)
- time (which has expired)
- distance covered
- speed
- inclination
- current heart rate (if a heart-rate belt is worn)

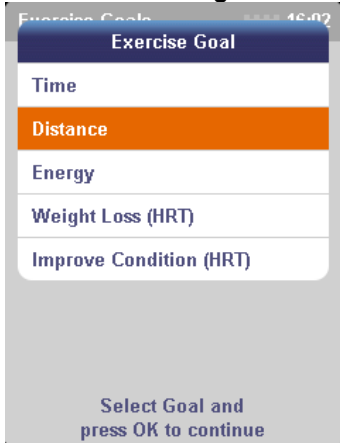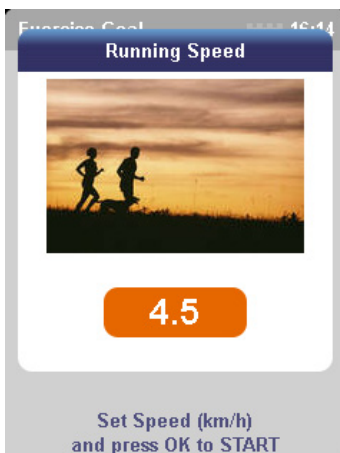| Results	▐▐▐ 16:25	
time	10:18	min
distance	0	m
avg speed	0.00	km/h
pace	0.00	min/km
energy	10.30	kcal
MET's	1.0	
avg. power	3.9	W
VO2 max	3.5ml/min.kg	
HF-min	0	bpm
HF-max	0	bpm

Press OK for Main Menu

After the goal has been reached, an audible signal will sound and the *Results screen* will appear.
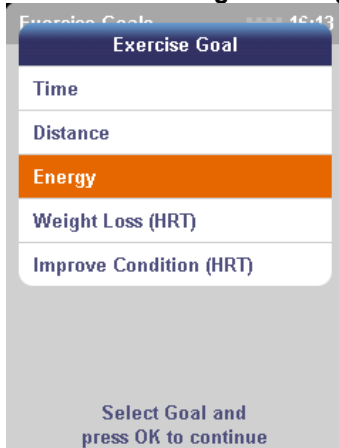The training has now ended.

Note the results and record them on the results form if desired (see appendix).

Press **OK** to return to the *Main menu*.

9.4.4 Heart-rate training (HRT programmes)

- Read the instructions in sections 4 and 7 thoroughly.
- Ensure that the heart-rate monitor (POLAR® belt) is fitted properly.
- If you experience nausea, dizziness or increasing chest pain, immediately stop the training and consult a doctor.
- Before a heart-rate training session, the doctor/therapist must instruct the patient in the use of this function.
- With the use of the POLAR® chest strap, there must be sufficient distance (min. 1.5 m) between different users. If this is not the case, the heart rate shown may not be accurate as a result of interference.
- Do not activate a HRT programme if interference is noted or suspected.

For heart-rate training, a heart-rate belt MUST be connected (see: Use of the chest strap).
If this is not the case, a message on the screen will draw the user's attention to this fact (see figure 22).
The user will automatically be shown a message once a heart-rate signal has been received (figure 23).
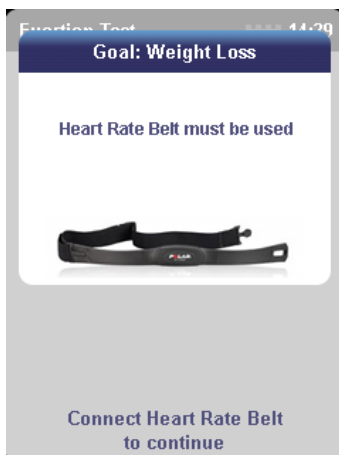
Figure 22
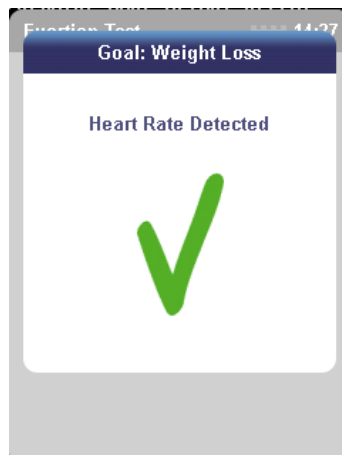
Figure 23

HRT (Heart-Rate controlled Training) means that the heart rate is automatically kept within the same Target Training Zone by means of adjustments to the speed and/or inclination.
The user's current heart rate is shown continuously on the display.

The Target Training Zone is calculated on the basis of the formula: 220 – age*. This provides the max. HR (theoretical maximum heart rate). The heart-rate training will be carried out at a specific percentage of the max. HR. This percentage depends on the selected training goal (weight loss or condition improvement). For weight loss, the zone is between 65% and 75% of the max. HR (see figure 24). For condition improvement, the zone is between 75% and 85% (see figure 25). The indicator (orange arrow) shows the centre of the zone and can be adjusted at will (up or down) using the central controller.

ENRAF
NONIUS

Generally speaking, the indicator should not be adjusted as the age of the user has already been entered in a previous screen and the displayed percentage of 70% (weight loss) and 80% (condition improvement) is in accordance with the ACSM guidelines.
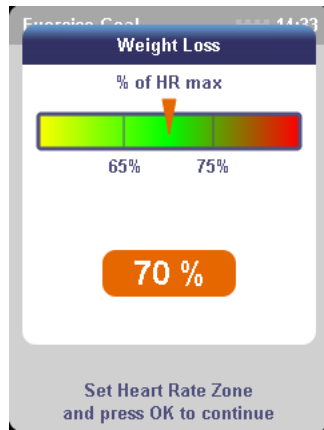
Figure 24
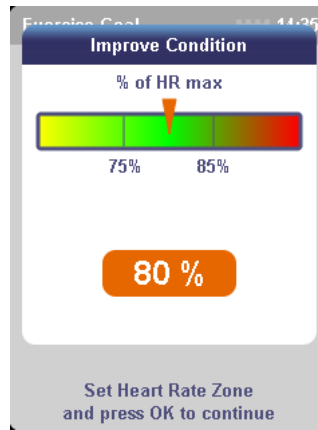
Figure 25

* As defined by the American College of Sports Medicine (ACSM) in "Guidelines for Exercise Testing and Prescription".
Example: for a 40-year old user who has selected the HRT programme 'weight loss' (in this case, the indicator will be at 70%), a lower limit of 117 bpm will be used. This corresponds to 65 per cent of the max. HR and is calculated as follows: (220-40)*.65=117. The upper limit of 75% corresponds to a target heart rate of 135 bpm.

Comment: the width of the zone is always kept at 10%.
Conclusion: if the indicator is set to 65%, the zone will be between 60% and 70%.

We therefore refer to the heart-rate value between the minimum and maximum selected heart rate as the heart-rate zone. The HRT programmes consist of a warm-up, interval training and a cool-down. During the warm-up, the treadmill will start at a speed of 2 km/h and the heart rate will gradually be increased to the lower limit of the zone. After the warm-up, the treadmill will automatically accelerate to ensure that the user reaches the desired heart-rate zone.
If the maximum selected speed has been reached but the user is not yet in the heart-rate zone, the inclination will automatically increase. If the heart-rate zone is exceeded during the training session, the inclination will automatically be decreased and the speed reduced, placing less strain on the user and allowing the heart rate to fall. In principle, to use an HRT programme without an incline, the maximum speed must be set at maximum (i.e. 18 km/h). The programme will then mainly be controlled by speed adjustments.
The HRT programme ends with a cooling-down phase, during which the heart rate is brought down to the lower limit of the zone once again.

If no heart-rate signal is detected during the training, a message will appear on the display (see figure 26). As soon as the heart-rate signal is detected once again, a message (figure 27) will first appear on the screen, after which the current heart rate will be shown on the display as normal.
If no signal is received for 30 seconds, the speed will drop back to 2.0 km/h.
After 2 minutes without a signal, the training will come to an end.
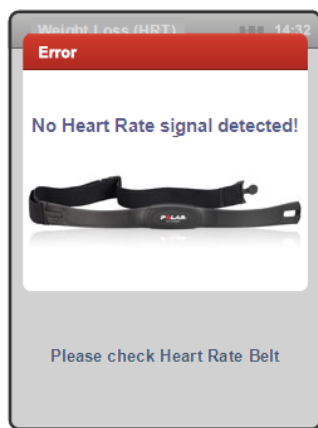
Figure 26
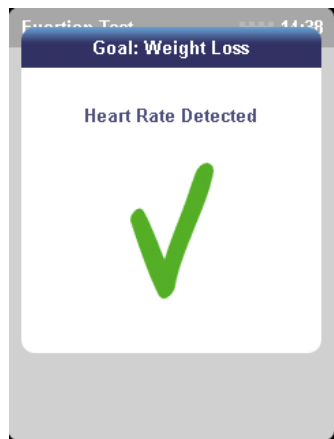
Figure 27

Comment: do not enter an excessively high speed. You must be certain that the selected speed can be reached without the heart rate increasing too quickly. In a medical environment, the supervisor must ensure that this is adhered to.

Use of the chest strap

The Polar® heart-rate monitor system consists of a lightweight transmitter belt, worn round the chest, and a receiver which is mounted in the control panel of the EN-Motion. By means of two electrodes, the transmitter detects each heart beat and transmits it to the receiver. During the training session, the heart-rate value will appear at the bottom of the information screen.

Fitting the chest strap:

1. Attach the transmitter to the elastic band.

2. The chest strap must fit comfortably and firmly around the chest.

3. Moisten the grooved rear surface of the transmitter, where the electrodes are located.

4. Check whether the transmitter section is properly positioned, i.e. straight and with the Polar logo in the centre.

The chest strap works best if the transmitter is worn next to bare skin. If you would prefer to wear the chest strap over a top, you will also need to moisten the section of the top beneath the grooved areas.

A heart-rate monitor (POLAR® belt) MUST be used with the following functions:
- Exercise goals 'Condition improvement' and 'Weight loss' (HRT programmes)
- Conconi test (exertion test).

With all other functions, a heart rate monitor (POLAR® belt) MAY be connected if desired.
The POLAR® belt allows the current heart rate to be shown during the training session.

9.4.4.a   Weight loss (HRT)
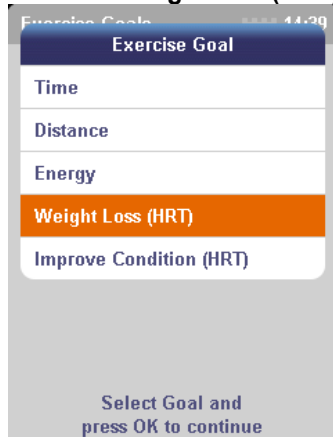
First connect a heart-rate monitor (POLAR® chest strap).

Select the *Exercise goals* function from the main menu using the **central controller** and press **OK**.

Then enter the *Personal details* (gender, age, height and weight) and press **OK**.

The list of *Exercise goals* will appear.

Select the Exercise goal *Weight loss (HRT)* using the **central controller** and press **OK**.
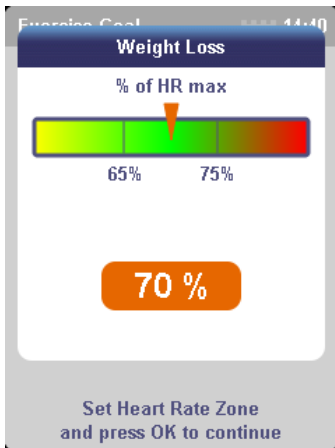
Once the 'Heart rate detected' message has disappeared, the heart-rate zone indicator will appear.

If desired, adjust the heart-rate zone (% of max. HR) using the **central controller** or press **OK** to continue.

Comment: in principle, the indicator should not be adjusted as the age of the user has already been entered in a previous screen and the displayed percentage of 70% (and thus the zone) is in accordance with the ACSM guidelines.

If required, adjust the *time (min.)* using the **central controller** or press **OK**.

The recommended training time (and also the default setting) is 30 minutes.

The minimum time which can be selected is 1 minute and the maximum is 1440 minutes (in increments of 1 minute).

Enter the *maximum speed (km/h)* using the **central controller**.

Press **OK** to *START* the band.

Comment:
The minimum speed which can be selected is 2 km/h and the maximum is 18 km/h.
Only select the maximum speed (18 km/h) if HRT without inclination is required.

The treadmill will now start at a speed of 2 km/h (warm-up) and gradually accelerate until the heart-rate zone has been reached. The speed and/or inclination are then automatically adjusted in order to keep the heart rate within the zone.

During the training session, the most important parameters will be displayed:
- time (which has expired)
- distance covered
- current heart rate
- speed
- inclination

Results			
time	5:56	min	
distance	0	m	
avg speed	0.00	km/h	
pace	0.00	min/km	
energy	5.93	kcal	
MET's	1.0		
avg. power	3.9	W	
VO2 max	3.5ml/min.kg		
HF-min	1	bpm	
HF-max	125	bpm	

Press OK for Main Menu

After the goal has been reached, an audible signal will sound and the *Results screen* will appear.
The training has now ended.

Note the results and record them on the results form if desired (see appendix).

Press **OK** to return to the *Main menu*.

9.4.4.b Condition improvement (HRT)
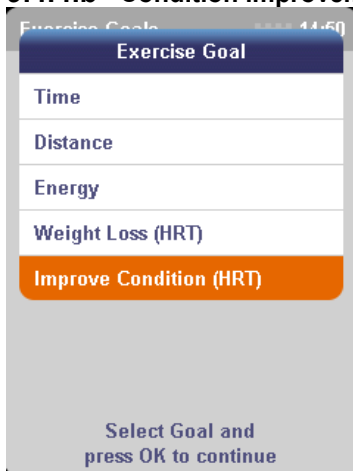
Exercise Goal

Time

Distance

Energy

Weight Loss (HRT)

Improve Condition (HRT)

Select Goal and
press OK to continue

First connect a heart-rate monitor (POLAR® chest strap).

Select the *Exercise goals* function from the main menu using the **central controller** and press **OK**.

Then enter the *Personal details* (gender, age, height and weight) and press **OK**.

The list of *Exercise goals* will appear.

Select the Exercise goal *Condition improvement (HRT)* using the **central controller** and press **OK**.
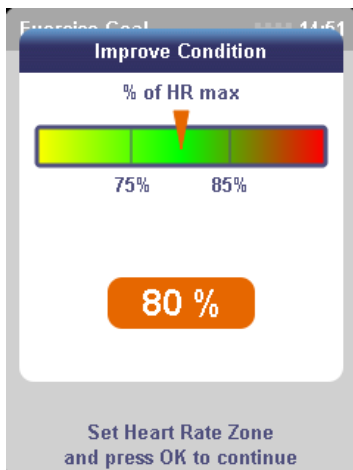
Improve Condition

% of HR max

75%   85%

80 %

Set Heart Rate Zone
and press OK to continue

Once the 'Heart rate detected' message has disappeared, the heart-rate zone indicator will appear.

If desired, adjust the heart-rate zone (% of max. HR) using the **central controller** or press **OK** to continue.

Comment: in principle, the indicator should not be adjusted as the age of the user has already been entered in a previous screen and the displayed percentage of 80% (and thus the zone) is in accordance with the ACSM guidelines.

If required, adjust the *time (min.)* using the **central controller** or press **OK**.

The recommended training time (and also the default setting) is 30 minutes.

The minimum time which can be selected is 1 minute and the maximum is 1440 minutes (in increments of 1 minute).

Enter the *maximum speed (km/h)* using the **central controller**.

Press **OK** to *START* the band.

Comment:
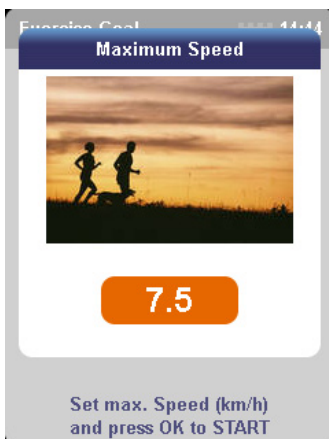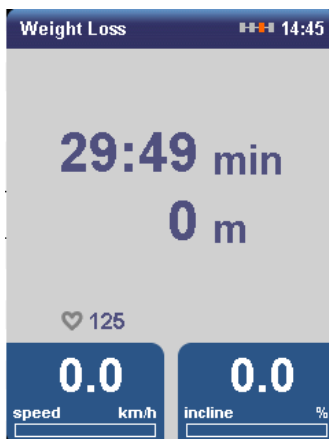*The minimum speed which can be selected is 2 km/h and the maximum is 18 km/h.*
Only select the maximum speed (18 km/h) if HRT without inclination is required.

The treadmill will now start at a speed of 2 km/h (warm-up) and gradually accelerate until the heart-rate zone has been reached.

The *speed* and/or *inclination* are then automatically adjusted in order to keep the heart rate within the zone.

During the training session, the most important parameters will be displayed:
- time (which has expired)
- distance covered
- current heart rate
- speed
- inclination

After the goal has been reached, an audible signal will sound and the *Results screen* will appear.
The training has now ended.

Note the results and record them on the results form if desired (see appendix).

Press **OK** to return to the *Main menu*.

|		
time	5:56	min
distance	0	m
avg speed	0.00	km/h
pace	0.00	min/km
energy	5.93	kcal
MET's	1.0	
avg. power	3.9	W
VO2 max	3.5ml/min.kg	
HF-min	125	bpm
HF-max	125	bpm

Press OK for Main Menu

9.5 Exercise tests

This part of the user manual describes the implemented cardiorespiratory test protocols for the EN-Motion treadmill. During the implementation of these tests, a great deal of attention has been paid to reliability, safety and ease of use. In order for you to use your EN-Motion treadmill correctly and safely, it is important for you to read the instructions in points 4.3 and 7.2 before use.

Exercise tests form an essential component of personalised training programmes. They contribute to the proper evaluation of the training results, and good coordination between load and load capacity makes the training more effective. This increases the patient's confidence in the therapy, as well as the motivation of the user.

You can choose from one of the following tests:
1) *Conconi test*
2) *Cooper test*
3) *6-minute walking test (6MWT)*
4) *2-km UKK walking test*
5) *Claudication test*

9.5.1 Conconi test

The Conconi test is a simple way of measuring the heart rate and speed of the anaerobic threshold, as well as the maximum heart rate and speed. This test usually takes the form of a running test, but other sports, such as cycling, are also suitable. The speed and exertion levels are gradually increased during the Conconi test. The heart rates are detected using a heart-rate meter. Based on the speed increase and the heart rates, the relationship between these factors is determined.

The test begins at the speed which you have entered (see below). The initial speed is low. At the beginning of the test, the heart rate increases in proportion to the increase in speed. Every 200 metres, the speed is gradually increased by 0.5 km/h until the person is no longer able to maintain the required speed. According to Conconi, an Italian professor, the anaerobic threshold is reached at the point at which this linear relationship between the heart rate and the speed changes.

You can estimate the aerobic threshold on the basis of the anaerobic threshold. Research has shown that the aerobic threshold is around 20 beats below the anaerobic threshold. You can continue with the test until the maximum heart rate has been reached.

Performing the Conconi test

You must perform the test in an environment in which the speed can be increased in a controlled manner.
To ensure the reliability of the results, it is important to increase the speed by the same increment at each load level. The EN-Motion treadmill is an excellent tool for keeping the speed at the right level. The progression of the test must be planned with care: the initial speed, the increase in speed and the maintenance of the speed. A good warm-up before the test is crucial; the warm-up must be the same for each test. Before you perform the test, you must determine the starting speed of the test. Using your best 10-km time, the Conconi Test Pace Calculator can determine the starting speed of the test. Before the test it is better not to smoke, eat a heavy meal or carry out strenuous physical exertion. Do not use alcohol or stimulants before the test. Do not eat anything during the 2 to 3 hours before the test. Wear suitable clothing and sturdy shoes. Warm up before the test. The test starts at 115 BPM! Measure your heart rate. End the test when you have reached your maximum heart rate or when you cannot continue any longer! Cool down after the test and stretch your muscles.

At the end of the test, the results screen will show the relevant measured values.
With the traditional method of determining the Conconi point, the heart rate and the load (running speed) are compared after the completion of the test. The point at which the relationship between the heart rate and the increase in load (exertion) ceases to be linear is then determined. From this point onwards, although the load increases, the heart rate does not (in other words, the energy for the extra work is supplied anaerobically).

With the modified Conconi test as performed on the EN-Motion, the increase in heart rate is continuously examined in relation to the increase in speed during the test (instead of afterwards). The heart rate is measured every 40 metres and compared with the heart rate of 60 seconds previously (i.e. in a virtual window). If the difference between these two values is less than 3 beats per minute, it is regarded as a potential Conconi point. If three of these points are measured in succession, the first point is regarded as the definitive Conconi point.
The advantage of the modified Conconi test is that a point is found during the test, rather than afterwards.

Performing the Conconi test on the EN-Motion treadmill
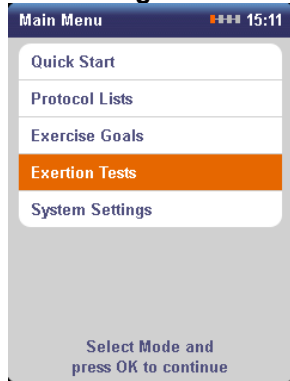
Ensure that the user has warmed up properly and that the heart-rate belt is connected.

Select the *Exertion tests* function using the **central controller** and press **OK**.

Now enter your personal details before selecting from the list of available exertion tests.

These details are used to calculate and present the personal test results.

Select the *gender* (m/f) using the **central controller** and press **OK**.

Enter the *age* using the **central controller** and press **OK**.

Enter the *height* (cm) using the **central controller** and press **OK**.

Enter the *weight* (kg) using the **central controller** and press **OK**.

All the personal details have now been entered.
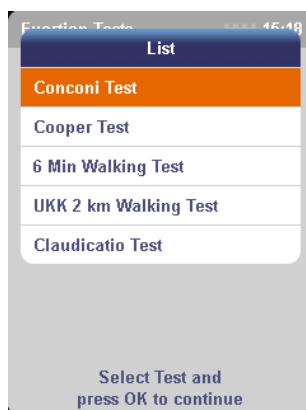
The list of *Exertion tests* will appear.

Select the *Conconi test* using the **central controller** and press **OK**.
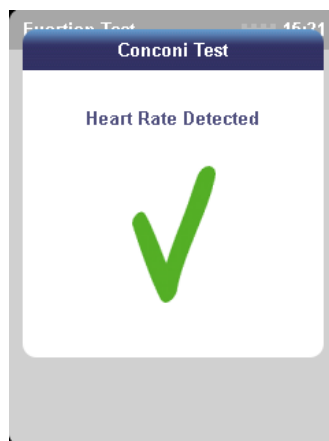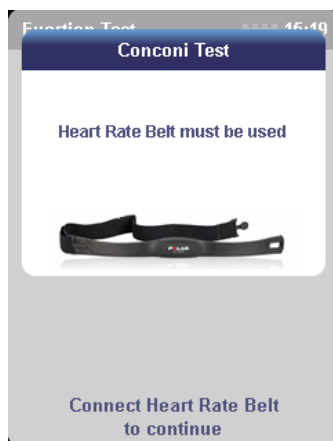
Please note: the use of a heart-rate meter is required. The EN-Motion will automatically detect whether or not you are using one. If this is not the case, an information screen will alert you to this fact. As soon as a heart-rate meter has been connected and a heart-rate signal has been detected, this will be confirmed by means of a message on the screen.

Test Speed

6.0

Set starting Speed (km/h) and press OK to START test
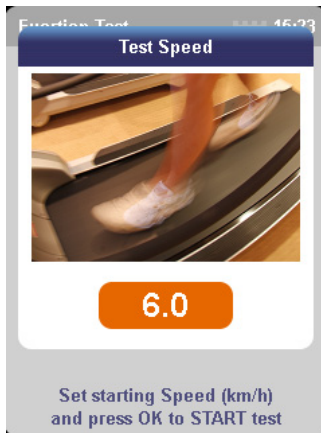
Enter the *starting speed (km/h)* using the **central controller**.

This is the speed at which the band will start. Do not enter an excessively high speed. You must be certain that the selected speed can be reached without the heart rate increasing too quickly. This is because the test begins at 115 BPM. *In a medical environment, the supervisor must ensure that this is adhered to.*

Press **OK** to *START* the test.

Conconi Test 15:40

time	14	sec
distance	0	m
heart rate	125	bpm

0.0 speed km/h   0.0 incline %
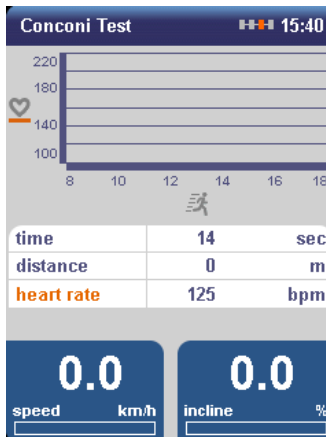
The band will now begin to move at the starting speed. Every 200 metres, the speed will automatically increase by 0.5 km/h.

Every 200 metres, the heart rate and speed will be displayed in the graph.

During the training session, the most important parameters will be displayed:
- time (which has expired)
- distance covered
- current heart rate
- speed

Results 14:26

Conconi HR	0	b
at speed	0.00	km
VO2 max	3.5	ml/min.
time	8:02	n
distance	0	
avg speed	0.00	km

Test completed. Well done!
Press OK for Main Menu
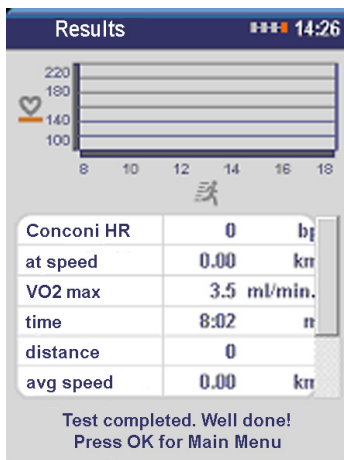
End the test by pressing the **STOP button** as soon as the maximum heart rate (anaerobic threshold, Conconi point) has been reached, or when the person can no longer maintain the required speed.
Allow the person taking the test to cool down and stretch.

After the test has ended, the *Results screen* will appear. Note the results and record them on the results form (see appendix) so that they can be added to the patient record at a later date.

Press **OK** to return to the *Main menu*.

9.5.2 Cooper test

This test was developed by the American Dr. Kenneth Cooper. After a good warm-up, the person taking the test must run as far as possible in 12 minutes. It is important to run at a steady pace. For this reason, on the EN-Motion the Cooper test is carried out with automatic speed adjustment (Autospeed). The Cooper test is a reasonably strenuous exertion test and is not suitable for people in poor health. The person must cool down properly at the end of the test. The distance run is compared against standard values (see the tables below).

Cooper test table ADULTS						
Ref.	Condition	Gender	< 30 years	30-39 years	40-49 years	50 years >
- -	Bad	male	<1600	<1500	<1400	<1300
		female	<1500	<1400	<1200	<1100
-	Moderate	male	1600-2000	1500-1900	1400-1700	1300-1600
		female	1500-1800	1400-1700	1200-1500	1100-1400
+ / -	Average	male	2000-2400	1900-2300	1700-2100	1600-2000
		female	1800-2200	1700-2000	1500-1900	1400-1700
+	Good	male	2400-2800	2300-2700	2100-2500	2000-2400
		female	2200-2700	2000-2500	1900-2300	1700-2200
+ +	Very Good	male	>2800	>2700	>2500	>2400
		female	>2700	>2500	>2300	>2200

Cooper test table BOYS								
Ref.	Condition	12 years	13 years	14 years	15 years	16 years	17 years	18 years
- -	Bad	<2050	<2100	<2125	<2175	<2250	<2275	<2325
-	Moderate	2075-2275	2125-2300	2150-2350	2200-2400	2275-2450	2300-2500	2350-2550
+ / -	Average	2300-2425	2325-2450	2375-2500	2425-2550	2475-2575	2525-2675	2575-2725
+	Good	2450-2550	2475-2600	2525-2650	2575-2725	2600-2775	2700-2825	2750-2900
+ +	Very Good	>2575	>2625	>2675	>2750	>2800	>2850	>2925

Cooper test table GIRLS								
Ref.	Condition	12 years	13 years	14 years	15 years	16 years	17 years	18 years
- -	Bad	<1650	<1675	<1700	<1725	<1750	<1800	<1825
-	Moderate	1675-1775	1700-1800	1725-1825	1750-1850	1775-1900	1825-1925	1850-1975
+ / -	Average	1800-1900	1825-1950	1850-1975	1875-2000	1925-2025	1950-2050	2000-2100
+	Good	1925-2125	1975-2150	2000-2175	2025-2200	2050-2225	2075-2250	2125-2275
+ +	Very Good	>2150	>2175	>2200	>2225	>2250	>2275	>2300

Based on the distance covered during the Cooper test, a rough estimate of the maximum oxygen uptake (V02max) can be made.

The maximum oxygen uptake capacity determines how much oxygen a person is able to utilise during maximum exertion. The higher this figure, the better the oxygen supply to the muscles. The better the oxygen supply, the lower the energy consumption and the more efficiently the person will move.

Maximum oxygen uptake tables

Below is an overview of the VO2max capacity for men and women.

VO2max MEN							
Age	Very bad	Bad	Reasonable	Average	Good	Very good	Excellent
20-24	< 32	32-37	38-43	44-50	51-56	57-62	> 62
25-29	< 31	31-35	36-42	43-48	49-53	54-59	> 59
30-34	< 29	29-34	35-40	41-45	46-51	52-56	> 56
35-39	< 28	28-32	33-38	39-43	44-48	49-54	> 54
40-44	< 26	26-31	32-35	36-41	42-46	47-51	> 51
45-49	< 25	25-29	30-34	35-39	40-43	44-48	> 48
50-54	< 24	24-27	28-32	33-36	37-41	42-46	> 47
55-59	< 22	22-26	27-30	31-34	35-39	40-43	> 43
60 >	< 21	21-24	25-28	29-32	33-36	37-40	> 41

VO2max WOMEN							
Age	Very bad	Bad	Reasonable	Average	Good	Very good	Excellent
20-24	< 27	27-31	32-36	37-41	42-46	47-51	> 51
25-29	< 26	26-30	31-35	36-40	41-44	45-49	> 49
30-34	< 25	25-29	30-33	34-37	38-42	43-46	> 46
35-39	< 24	24-27	28-31	32-35	36-40	41-44	> 44
40-44	< 22	22-25	26-29	30-33	34-37	38-41	> 41
45-49	< 21	21-23	24-21	28-31	32-35	36-38	> 38
50-54	< 19	19-22	23-25	26-29	30-32	33-36	> 36
55-59	< 18	18-20	21-23	24-27	28-30	31-33	> 33
60 >	< 16	16-18	19-21	22-24	25-27	28-30	> 30

Performing the Cooper test on the EN-Motion treadmill
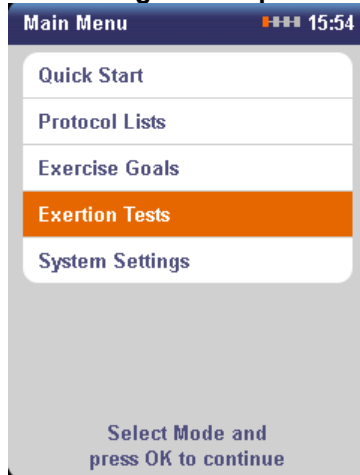
Ensure that the user has warmed up properly. The test can be carried out with or without a heart-rate meter (see below).

Select the *Exertion tests* function using the **central controller** and press **OK**.

Now enter your personal details before selecting from the list of available exertion tests.

These details are used to calculate and present the personal test results.

Select the *gender* (m/f) using the **central controller** and press **OK**.

Enter the *age* using the **central controller** and press **OK**.

Enter the *height* (cm) using the **central controller** and press **OK**.

Enter the *weight* (kg) using the **central controller** and press **OK**.

All the personal details have now been entered.
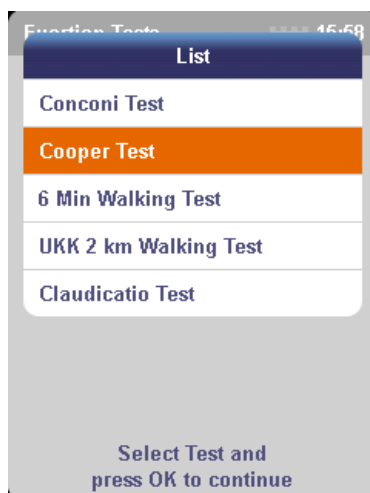
The list of *Exertion tests* will appear.

Select the *Cooper test* using the **central controller** and press **OK**.

Comment: The Cooper test can be performed both with and without a heart-rate meter. For safety reasons and in order to present essential test parameters (such as max. HR, VO2max etc.), we would always advise you to use a heart-rate meter.

Cooper Test

Heart Rate Belt can be used

Connect Heart Rate Belt
or press OK to continue
without HR-monitoring

Cooper Test

Heart Rate Detected

✔

To perform the test *with heart-rate measurement*, first connect the chest strap. The EN-Motion will automatically detect whether a heart-rate meter is connected and whether a heart-rate signal has been detected.

To perform the test *without heart-rate measurement*, press **OK**.

Code Required!

🔒

X X

Enter Access Code

Code Accepted

✔

The Cooper test is performed using *Autospeed.*

If the *Autospeed* function is set to 'secured' in the default settings, the access code must first be entered before the Autospeed function becomes active (see § 9.6 and § 9.7).

If it is not secured, the *Autospeed* function will be activated immediately.

Test Speed

Auto Speed

Press OK and start running
Speed will adjust automatically
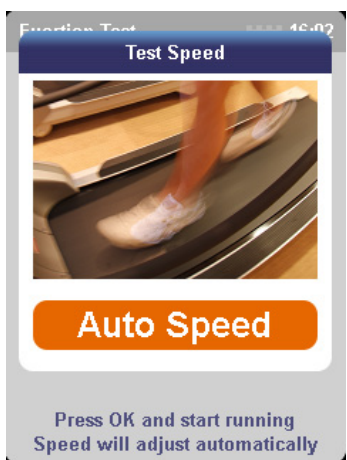
A screen will then appear stating that the test will be performed in *Autospeed* mode.

The advantage of this is that the patient/user is able to concentrate fully on running, and the band speed will automatically adjust to the pace of the user.
It is therefore not necessary to manually increase or decrease the speed during the test.

Press **OK** to *START* the test.

Comment: this test can also be performed without Autospeed. To do so, you must set the test speed manually using the central rotary knob. Do this before pressing OK.

Cooper Test 16:24

11:33 min
0 m

♡ 125

0.0	0.0
speed km/h	incline %

During the test, the most important parameters will be displayed:
- time (remaining until the goal is reached)
- distance covered
- current heart rate (if a heart-rate belt is worn)
- speed

**Test completed.
Press OK to continue**

After the test has ended, a screen which gives the user an indication of his or her fitness level will appear.

It is possible to distinguish between the following levels:
- - -   poor
- -   moderate
- -/+   reasonable/average
- +   good
- ++   very good

For a detailed overview of the test results, you must press **OK**.

Results	**15:00**	
time	12:00	min
distance	3434	m
norm min	2300	m
norm max	-	m
fitness index	++	
VO2 max	64.7ml/min.kg	
HF-min	110	bpm
HF-max	110	bpm
HF-avg	110	bpm
avg speed	17.17	km/h

**Test completed. Well done!
Press OK for Main Menu**

After the test has ended, the *Results screen* will appear.

Note the results and record them on the results form (see appendix) so that they can be added to the patient record at a later date.

Allow the person taking the test to cool down and stretch.

Press **OK** to return to the *Main menu*.

Results

Test Interrupted!

Time	4:16 min
Distance	0 m

Press OK for main menu
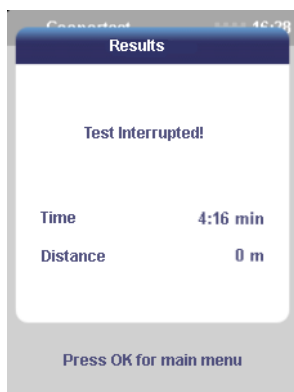
Comment: pressing the **STOP button** will bring the test to a premature end and the screen shown on the left will be displayed instead of the *Results screen*.

Press **OK** to return to the *Main menu*.

9.5.3   6-minute walking test (6MWT)

Exertion tests are no longer reserved for top athletes, but are also useful for patients with chronic diseases. For example, the 6MWT can be used with the elderly and patients with rheumatic diseases, but is mainly suitable for patients with a poor functional status, such as patients with serious heart and lung diseases.

The 6MWT is an intensive exertion test which can be used to establish and evaluate the functional exertion capacity of a patient. The six minutes are derived from halving the well-known Cooper test, which lasts twelve minutes (Butland e.a., 1982; Cooper, 1968). Walking has been selected as the intensity level as this is already fairly intensive for many chronically ill patients (Paap e.a., 2002).

In most cases, the 6MWT is a submaximal test. In some patients, however, mainly patients with serious heart and lung diseases, you must bear in mind that the test may range from very intensive to maximal. Amongst the elderly, the 6MWT tends to be a submaximal rather than a maximal exertion test. The exertion required usually corresponds to the performance of daily activities.

The test has proved reliable in a large number of patient groups (Sadaria and Bohannon, 2001). The 6MWT has mainly been validated and tested for reliability in COPD patients and patients with heart failure (Sadaria and Bohannon, 2001; Solway e.a., 2001).
In patients with better functional status, other walking or cycling tests are more suitable, as these reflect the maximal aerobic exertion capacity better than the 6MWT. However, the 6MWT can still be used, for example

as is the case with rheumatic diseases such as fibromyalgia, arthrosis and rheumatoid arthritis (Gowans e.a., 1999; Pankoff e.a., 2000a, b; Foley e.a., 2003; Lelieveld e.a. in print; Takken e.a., 2003; Minor and Kay, 1997), but the test then becomes more of a functional exertion test than a maximal exertion test.
The reliability of the 6MWT makes it a widely applicable tool for establishing the functional exertion capacity of a patient. A guideline has even been drawn up for this test by the American Thoracic Society (ATS, 2002).

The test can be carried out in the physiotherapy sector safely, easily and in a properly standardised manner. A guideline exists for the implementation of the test as well as the encouragement provided during the test.

The results of the 6MWT can be used for both evaluation and training advice and provide a good picture of the amount of ADL activities carried out by patients. Based on the results, it is possible to effectively estimate the correct training intensity for endurance training. This intensity (expressed as the walking speed or heart rate) is a useable training intensity to be maintained during training sessions. Carrying out the test frequently (every 4 to 6 weeks) allows you to ensure that a patient's training intensity is tailored to his or her capacity. The training incentive becomes more geared towards to the patient's exertion tolerance as a result.

Performing the 6MWT
The patient must walk for six minutes at a speed which he or she has chosen (on the EN-MOTION, this takes place with automatic speed adjustment), trying to cover as gre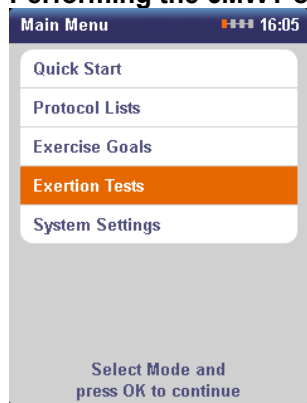at a distance as possible without running. During the test, a heart-rate meter and pulse oximeter can be used to establish the physiological response during the test. The distance achieved is the total distance covered, measured at the end of the six minutes. After six minutes, the results will appear in the results screen.
The result partly depends on the motivation of the person taking the test; the encouragement must therefore be standardised, so that it is the same for each patient and each measurement (ATS, 2002; Guyatt e.a., 1984). Standard values exist for the 6MWT for healthy adults aged between 40 and 85. Using these standard values, the outcome of the 6MWT can be interpreted by expressing the patient's result as a percentage based on their age, gender, height and weight. A score below 82% of the predicted result is regarded as deviant (Wasserman e.a., 1999).

Sample calculation
In the case of a 55-year old female (height 168 cm, weight 75 kg) walking 420 metres in 6 minutes, we can use these details to calculate a standard value. This gives us a result of 654 metres. She therefore scores 64% of the predicted result.

Performing the 6MWT on the EN-Motion treadmill

The test can be carried out with or without a heart-rate meter (see below).

Select the *Exertion tests* function using the **central controller** and press **OK**.

Now enter your personal details before selecting from the list of available exertion tests.

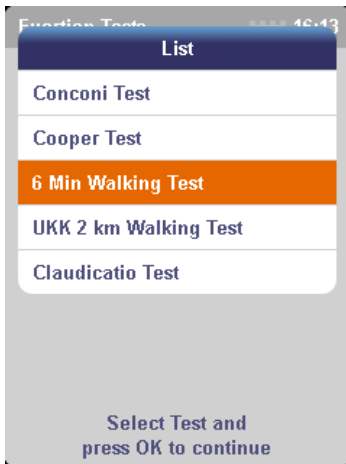These details are used to calculate and present the personal test results.

Select the *gender* (m/f) using the **central controller** and press **OK**.

Enter the *age* using the **central controller** and press **OK**.

Enter the *height* (cm) using the **central controller** and press **OK**.

Enter the *weight* (kg) using the **central controller** and press **OK**.

All the personal details have now been entered.

The list of *Exertion tests* will appear.

Select the *6-minute walking test* using the **central controller** and press **OK**.

Comment: the 6MWT test can be performed both with and without a heart-rate meter. For safety reasons and in order to present essential test parameters (such as max. HR, VO2max etc.), we would always advise you to use a heart-rate meter.
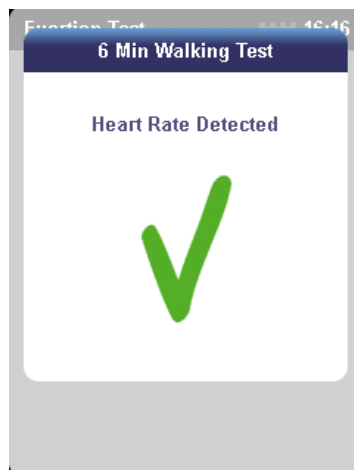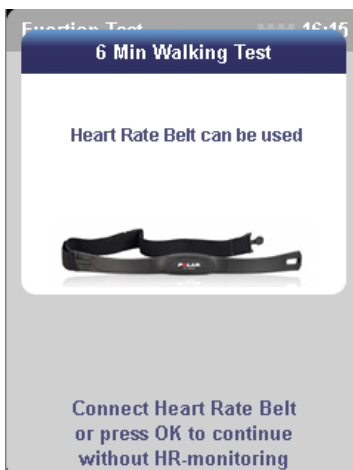
To perform the test *with heart-rate measurement*, first connect the chest strap. The EN-Motion will automatically detect whether a heart-rate meter is connected and whether a heart-rate signal has been detected.

To perform the test *without heart-rate measurement*, press **OK**.

The 6MWT test is performed using *Autospeed.*

If the *Autospeed* function is set to 'secured' in the default settings, the access code must first be entered before the Autospeed function becomes active (see § 9.6 and § 9.7).

If it is not secured, the *Autospeed* function will be activated immediately.

A screen will then appear stating that the test will be performed in *Autospeed* mode.

The advantage of this is that the patient/user is able to concentrate fully on walking, and the band speed will automatically adjust to the pace of the walker.
It is therefore not necessary to manually increase or decrease the speed during the test.

Press **OK** to *START* the test.

Comment: this test can also be performed *without Autospeed*. To do so, you must set the test speed manually using the central rotary knob. Do this before pressing OK.
.

During the test, the most important parameters will be displayed:
- time (remaining until the goal is reached)
- distance covered
- current heart rate (if a heart-rate belt is worn)
- speed
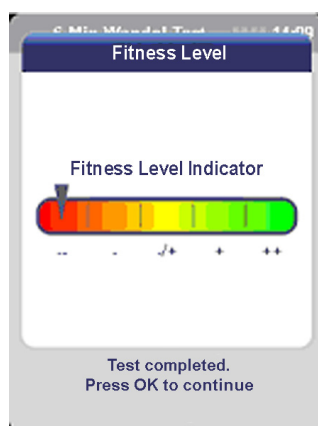
After the test has ended, a screen which gives the user an indication of his or her fitness level will appear.

It is possible to distinguish between the following levels:
- - poor
- moderate
-/+ reasonable/average
+ good
++ very good

For a detailed overview of the test results, you must press **OK**.

After the test has ended, the *Results screen* will appear.

Note the results and record them on the results form (see appendix) so that they can be added to the patient record at a later date.

Allow the person taking the test to cool down and stretch.

Press **OK** to return to the *Main menu*.
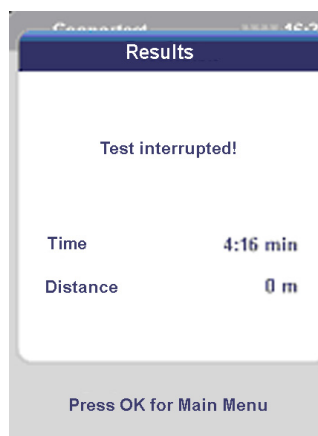
Comment: pressing the **STOP button** will bring the test to a premature end and the screen shown on the left will be displayed instead of the *Results screen*.

Press **OK** to return to the *Main menu*.

9.5.4   2-km UKK walking test

The UKK walking test is a condition test which was developed at the UKK* Institute in Finland with the goal of measuring the physical condition of adults. It is a submaximal test. This means that people taking the test do not have to exert themselves to the maximum.

The 2 km should be covered *walking* (i.e. not running), as quickly as possible and at a consistent pace at which the test subject is still able to talk. The heart rate should be around 80% of the maximum heart rate (i.e.: 80% of 220 – age). If the test is carried out properly, the heart rate will remain roughly constant during the test. At the end of the test, the heart rate and walking time will be recorded. A different (and better) option is to measure the heart rate using a heart-rate meter at different points during the test (for example 500m, 1000m, 1500m and 2000m) and to take the average of the readings.

Research at the UKK Institute has shown that the 2-km walking test is suitable for nearly everyone aged between 20 and 65. The test is not recommended for children. People over 65 may take the test if they are healthy and perform regular physical exercise. The test does not offer accurate results for very active people in good shape, as it tends to underestimate their condition.

This test makes it possible to establish a person's condition in a relatively safe and easy way. The test is less reliable for overweight people, and also for people with serious conditions or handicaps for whom strenuous walking would not be advisable. The test is also less useful for people who do a lot of training.

* UKK stands for Urho Kaleva Kekkonen (the Finnish president from 1956-1981). The institute in Tampere was named after him.

Performing the 2-km UKK walking test
When performing the UKK walking test for the first time, it is advisable to do so under the supervision of qualified personnel. After this, the test may also be performed independently.
Before carrying out the test, the health of the participant must be assessed. For realistic, reliable results, you must ensure standardised test conditions, the right supervision, the right measuring technology and accurate test data.

Follow the instructions below to prepare for and perform the walking test:
- Before the test it is better not to smoke, eat a heavy meal or carry out strenuous physical exertion. Do not use alcohol or stimulants before the test. Do not eat anything during the 2 to 3 hours before the test.
- Wear suitable clothing and sturdy shoes.
- Warm up before the test.
- Measure your heart rate. As it makes it easier to walk at the correct steady pace, a heart-rate meter is recommended.
- Walk normally for exactly 2 km at a consistent pace, as quickly as you can without endangering your health. Do not speed-walk or run. With the EN-Motion, the test is carried out using automatic speed adjustment. This means there is no need to select or change the speed manually.
- Stop the heart-rate measurement after the test. Cool down thoroughly and stretch.
- The EN-Motion treadmill records the walking time down to the nearest second and measures the heart rate immediately at the end of the test. Because of the learning effect, it is advisable to regard the first attempt as a practice test.

Test results

With the EN-Motion, the following test results are generated automatically and shown in the results screen:

- Walking time (shows how long you took to complete the test).
- Heart rate (shows the heart rate in beats per minute at the end of the test).
- Fitness index: this index shows the condition of the test participant, compared to the average condition of others in the same age and gender group.

Fitness index	Interpretation	Result displayed as:
Less than 70	Much lower than average	- -
Between 70 and 90	A little below average	-
Between 90 and 110	Average	- / +
Between 110 and 130	A little above average	+
Higher than 130	Much better than average	++

**Interpreting the test results**

The test results can be presented as maximum oxygen uptake (ml/min/kg) or as a fitness index. The results are based on age, body mass index, walking time and heart rate at the end of the test. A fitness index of 100 corresponds to the average maximum oxygen uptake in the age and gender group of the test participant. Values below 100 mean that the condition is below average; values above 100 mean that the condition is above average. If you perform the test on a regular basis, you will be able to measure your progress. The less good your condition, the more easily and quickly your condition will improve when you train regularly. The test result provides an indication of how you should alter your training routine.

The table below provides an overview of the recommended training frequency and duration for each condition level:

Index	Index classification	Training frequency	Duration
< 70	Considerably below average	2–5 times a week	20–30 min
70–89	Below average	3–4 times a week	30–40 min
90–95	A little below average	3–4 times a week	30–40 min
96–105	Average	3–4 times a week	30–40 min
106–110	A little above average	3–4 times a week	30–60 min
111–130	Above average	Every other day	45–60 min
>130	Considerably above average	Every other day	60 min.

As the UKK walking test measures the condition of the heart and the blood circulation, the recommendations above refer to aerobic training. If your fitness index is lower than 90, you will need to increase your training frequency to 3–4 times a week. Your training session should last around 30–40 minutes and your heart rate must be at the same level as during the walking test. If your fitness index is 90–110, you should train every other day for 30 minutes to 1 hour at a heart rate which is 10–20 beats per minute higher than it was during the walking test. If your fitness index is above 110, you may continue with your current training regime.

Performing the 2-km UKK walking test on the EN-Motion treadmill
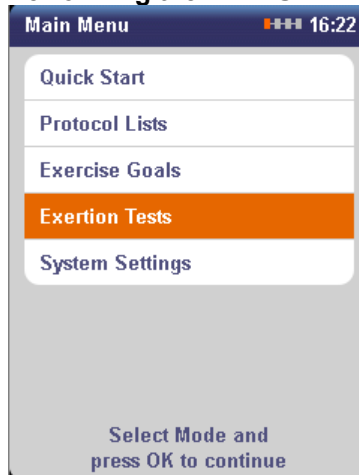
Ensure that the user has warmed up properly and that the heart-rate belt is connected (see below).

Select the *Exertion tests* function using the **central controller** and press **OK**.

Now enter your personal details before selecting from the list of available exertion tests.

These details are used to calculate and present the personal test results.

Select the *gender* (m/f) using the **central controller** and press **OK**.

Enter the *age* using the **central controller** and press **OK**.

Enter the *height* (cm) using the **central controller** and press **OK**.

Enter the *weight* (kg) using the **central controller** and press **OK**.

All the personal details have now been entered.
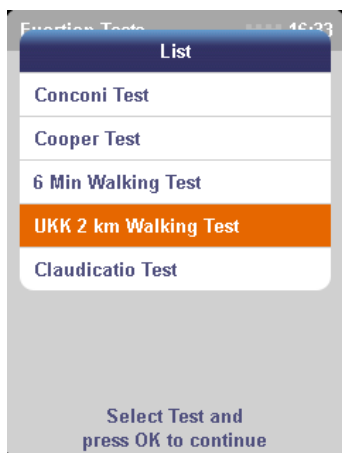
The list of *Exertion tests* will appear.

Select the *UKK 2-km walking test* using the **central controller** and press **OK**.
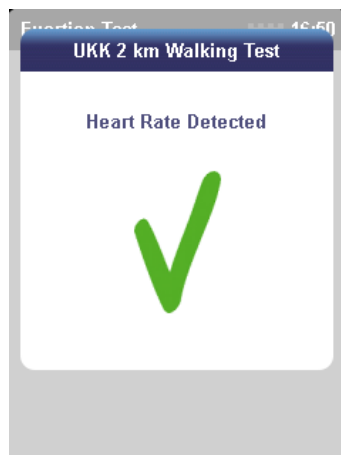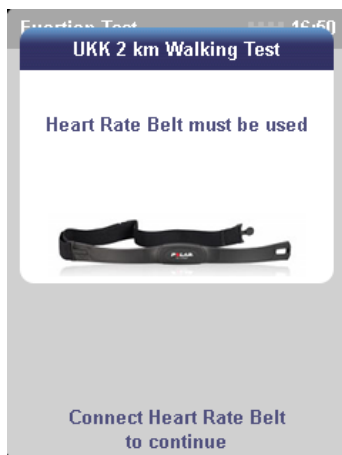
Please note: *the use of a heart-rate meter is required. The EN-Motion will automatically detect whether or not you are using one. If this is not the case, an information screen will alert you to this fact. As soon as a heart-rate meter has been connected and a heart-rate signal has been detected, this will be confirmed by means of a message on the screen.*

Code Required!

X X

Enter Access Code

Code Accepted

The UKK 2-km walking test is performed using *Autospeed*.

If the *Autospeed* function is set to 'secured' in the default settings, the access code must first be entered before the Autospeed function becomes active (see § 9.6 and § 9.7).

If it is not secured, the *Autospeed* function will be activated immediately.

Test Speed

Auto Speed

Press OK and start walking
Speed will adjust automatically

A screen will then appear stating that the test will be performed in *Autospeed* mode.

The advantage of this is that the patient/user is able to concentrate fully on walking, and the band speed will automatically adjust to the pace of the walker.
It is therefore not necessary to manually increase or decrease the speed during the test.

Press **OK** to *START* the test.

Comment: this test can also be performed *without Autospeed*. To do so, you must set the test speed manually using the central rotary knob. Do this before pressing OK.

UKK 2 km Walking Test 10:49

25 sec
2000 m

♡ 125

| 0.0 | 0.0 |
| speed km/h | incline % |

During the test, the most important parameters will be displayed:
- time (which has expired)
- distance (still to go until the goal is reached)
- current heart rate (if a heart-rate belt is worn)
- speed

ENRAF NONIUS

Fitness Level

Fitness Level Indicator

-- - -/+ + ++

Test completed.
Press OK to continue

After the test has ended, a screen which gives the user an indication of his or her fitness level will appear.

It is possible to distinguish between the following levels:
- -   poor
-       moderate
-/+   reasonable/average
+   good
++   very good

For a detailed overview of the test results, you must press **OK**.

Results   ▪▪▪▪ 14:10

6:00 min
525 m

time	3:18 min
distance	0 m
norm min	- m
norm max	- m
fitness index	--
gait speed	0.00 m/s

Test completed. Well done!
Press OK for main menu

After the test has ended, the *Results screen* will appear.

Note the results and record them on the results form (see appendix) so that they can be added to the patient record at a later date.

Allow the person taking the test to cool down and stretch.

Press **OK** to return to the *Main menu*.

Results

Test interrupted!

Time   0 sec

Distance   0 m

Press OK for Main Menu

Comment: pressing the **STOP button** will bring the test to a premature end and the screen shown on the left will be displayed instead of the *Results screen*.

Press **OK** to return to the *Main menu.*

9.5.5   Claudication test

Claudicatio intermittens is a peripheral vascular disease, often caused as a result of atherosclerosis. The modifiable risk factors (which may influence the prognosis) for cardiovascular diseases are smoking, diabetes mellitus, hypertension, hyperlipidaemia, physical inactivity and excess weight. Non-modifiable risk factors include gender and age. If several risk factors are present at the same time, their influence is increased.

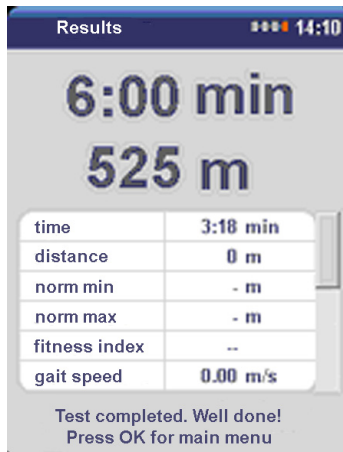In the case of claudicatio intermittens, the patient experiences pain or an unpleasant sensation in the legs, often unilaterally. The symptoms (cramp, a burning or constricted feeling, tiredness) usually occur in the calf. They tend to occur after the patient has walked a certain distance, walked quickly or walked uphill; they tend to disappear once again when the patient is at rest. The symptoms are caused by poor arterial blood circulation to the working muscles during physical activity. The localisation of the arterial obstruction determines the muscles in which the arterial blood supply is insufficient. The consequence is that the walking distance decreases significantly, leading to the restriction of the pain-free and maximum walking distance and time.

The treadmill test is performed in order to establish whether there is an objective decrease in the maximum walking distance. The results of the treadmill test are related to what is required in terms of work, household activities, leisure activities and from the point of view of preventing cardiovascular diseases.

The literature describes 2 types of treadmill tests:
- treadmill test with a *constant load* (constant speed of 3.2 km per hour and a fixed inclination of 7.5%).
- treadmill test with a *progressive load*: the inclination is gradually increased, while the speed remains constant (for example the inclination is increased by 3.5% every 3 minutes or by 2% every 2 minutes, while the speed is set at 3-3.5 km/h). Tests of this kind are also referred to as 'graded' tests.

Cachovan et al. investigated the reliability of the treadmill test when determining the pain-free walking distance and the maximum walking distance. A distinction was made between treadmill tests with a constant load and those with a progressive load. The reproducibility of both types of tests appears good. Research by Gardner et al. has shown that the progressive load test on the treadmill is more reliable when it comes to determining the seriousness of the peripheral arterial obstruction.

In order to provoke the claudication symptoms, a treadmill test with a progressive ('graded') load is used in practice. The Claudication test is performed at a constant speed of 3.2 km per hour and an inclination which is increased by 2% every 2 minutes.

The Claudication test focuses on measuring:
- the pain-free time and/or distance (= the time/distance at which the pain starts).
- the maximum time or distance (= the time/distance at which the patient *has to* stop).
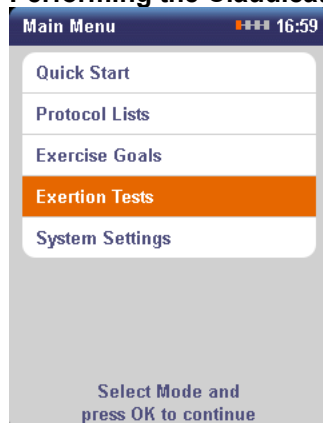These parameters provide an indication of the seriousness of the condition.

When performing exertion tests, it is advisable to carry out a practice test (on a different day) before the actual test. This practice test allows the patient to become familiar with the test procedure, test protocol and the implementation of the test. Carrying out a practice test can considerably increase the reliability of the result.

During the test, the physiotherapist must remain alert to the occurrence of any complications, such as cardiac strain and leg pain without a vascular cause. Physiotherapists are expected to recognise the signs of excessive exertion without a cardiac or vascular cause.

The treadmill test is not only a tool for establishing whether there is an abnormal reduction in the exertion capacity. The test is also used to examine how the patient deals with the symptoms and whether a subjective reduction in the exertion capacity exists on the basis of inadequate pain coping or on the basis of fear (of physical activity). In the case of inadequate pain coping, the patient is afraid of (the harmful consequences of) the pain. In addition to inadequate pain coping, a fear of exertion may also exist. The fear of exertion may inhibit the physical capacity.

The treadmill test also offers the possibility of measuring the ECG, blood pressure and subjective pain (ACSM scale for pain in peripheral vascular disease, also known as the four-point scale) during the test.

Performing the Claudication test on the EN-Motion treadmill

The test can be carried out with or without a heart-rate meter (see below).

Select the *Exertion tests* function using the **central controller** and press **OK**.

Now enter your personal details before selecting from the list of available exertion tests.

These details are used to calculate and present the personal test results.

Select the *gender* (m/f) using the **central controller** and press **OK**.

Enter the *age* using the **central controller** and press **OK**.

Enter the *height* (cm) using the **central controller** and press **OK**.

Enter the *weight* (kg) using the **central controller** and press **OK**.

All the personal details have now been entered.

The list of *Exertion tests* will appear.

Select the *Claudication test* using the **central controller** and press **OK**.

Comment: the Claudication test can be performed both with and without a heart-rate meter. For safety reasons and in order to present essential test parameters (such as max. HR, VO2max etc.), we would always advise you to use a heart-rate meter.
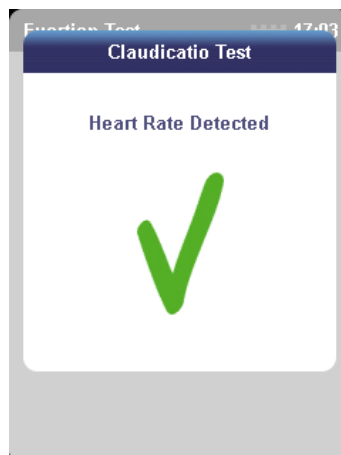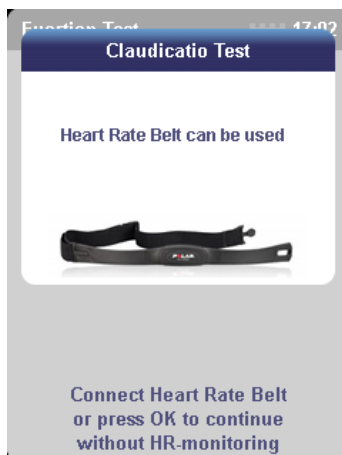
To perform the test *with heart-rate measurement*, first connect the chest strap. The EN-Motion will automatically detect whether a heart-rate meter is connected and whether a heart-rate signal has been detected.

To perform the test *without heart-rate measurement*, press **OK**.
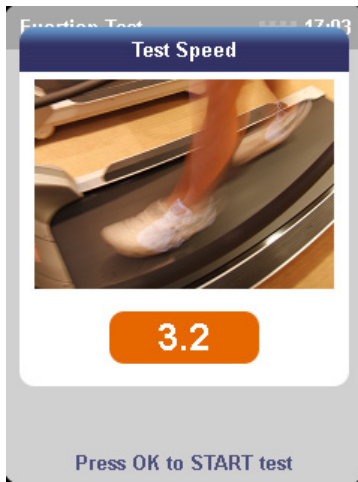
The Claudication test will be performed at a speed of 3.2 km/h.

However, the speed can be adjusted using the **central controller**.

Press **OK** to START the test.
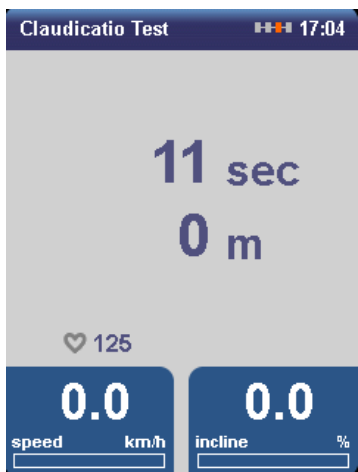
The band will start to move. Every 2 minutes, the inclination will automatically increase by 2%. The speed remains constant.

During the test, the following parameters will be displayed:
- time (which has expired)
- distance covered
- current heart rate (if a heart-rate belt is worn)
- speed
- inclination
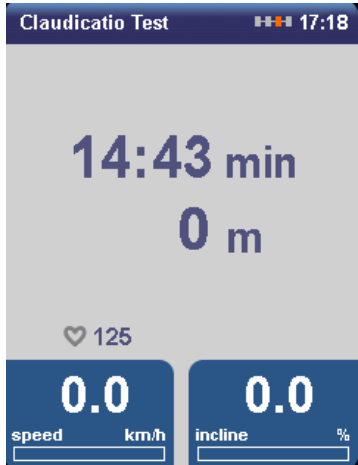
As soon as the test subject indicates that the pain has started (= pain-free walking distance and time) press **OK once**.

The pain-free distance *(PF distance)* and the pain-free time *(PF time)* are now saved. This is shown visually by the distance covered changing to orange.

The test must be ended manually as soon as the maximum time or walking distance has been reached (= the time/distance at which the patient *has to* stop). Press the **STOP button** to do so.

After the test has ended, the *Results screen* will appear.

Note the results and record them on the results form (see appendix) so that they can be added to the patient record at a later date.

Press **OK** to return to the *Main menu*.

9.6 Use of the AUTOSPEED function

The Autospeed function can be used with the *Quick start* and *Exercise goals* functions (with the exception of HRT programmes). In the case of some exertion tests, Autospeed is the default setting for implementing the test protocol (unless the function has been deactivated entirely via the system settings menu).

There are 3 ways of activating the Autospeed function:
1. Directly from the *Welcome menu* and/or the *Main menu* (i.e. before the training session starts). The training has not yet been selected and the band is NOT YET IN MOTION.
2. Likewise before the start of the training session, but this time from a *submenu.* The training (for example *Quick start* or *Exercise goals*) has therefore already been selected but the band is NOT YET IN MOTION.
3. During the training session (therefore after having selected the training from the main menu and entered the speed manually), the band is therefore IN MOTION.

9.6.1 Directly from the Welcome menu and/or the Main menu
(i.e. before the training session starts). The training has not yet been selected and the band is NOT YET IN MOTION.

This means: first **SELECT AUTOSPEED**, then **SELECT TRAINING TYPE (training session)** from the main menu and only then **START THE BAND** (using the Autospeed function).

Step 1   *SELECT AUTOSPEED*
         Press the **AUTO button**. The indicator lamp will start to flash (green).
         Depending on the security mode (see *System settings*), the following will appear:
         a)   a screen showing a padlock (if security = 'on')
         b)   a screen with 5 response profiles (if security = 'off')

Screens if security = ON:

First enter the access code by pressing the **AUTO button** and **VIEW button** *simultaneously* and holding them down for 2 seconds.
A pop-up window will appear stating that the code has been accepted. After 2 seconds, this screen will disappear automatically and the *Response profiles* screen (see below) will appear.

A response profile determines how fast and to what extent the band speed will *automatically* increase and decrease. Speed changes vary from very slow to very fast, as the user requires.
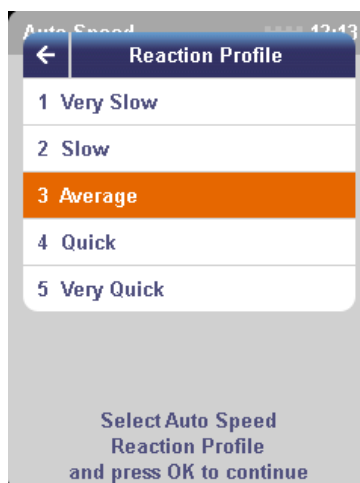
Screens if security = OFF:

The response profiles screen will appear *immediately* after the **AUTO button** has been pressed.

Select the desired profile using the **central controller** (you can choose from profiles 1 to 5; factory setting = profile 3) and press **OK**.

Comment: select the 'back arrow' (at the top left of the screen) to return to the Main menu.

Set max. Speed (km/h)
and press OK to continue
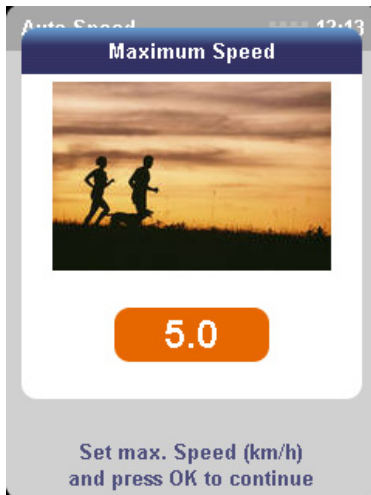
A new screen, *Maximum speed* (for Autospeed), will appear.

The maximum speed is an extra safety feature (a kind of 'speed limiter') which prevents the band accelerating unintentionally to the maximum speed (18 km/h).

Enter the desired maximum speed using the **central controller** and press **OK** (default setting = 5 km/h).

The *Main menu* will appear and the indicator lamp will now illuminate constantly, to show that the Autospeed function is ready (on stand-by).

Steps 2 and 3   SELECT TRAINING SESSION AND START THE BAND (Quick start example) .

From the *Main menu*, select the *Quick start* function and press **OK** to start the training session.

A screen showing the flashing text 'START WALKING' indicates that the training session will take place with automatic speed adjustment (Autospeed). The band will now start to move.

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*Comment: if 'Calories burned' has been activated (see 9.2 Quick start), a screen in which you must enter the user's weight wil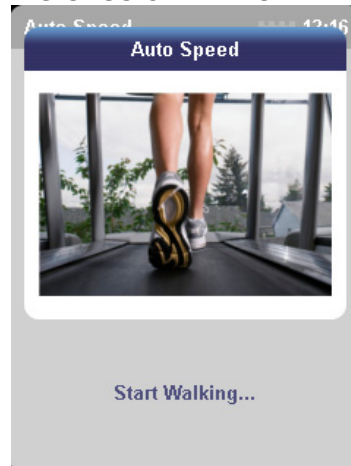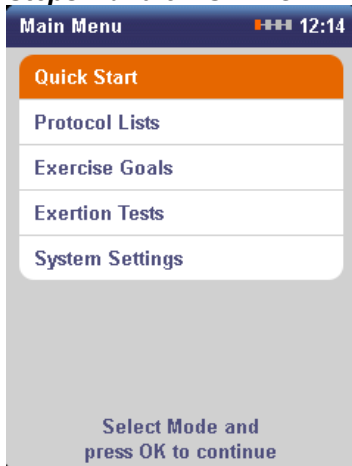l first appear after you have confirmed the selection of the Quick start function. Then press **OK** to start the training session.*

9.6.2   Likewise before the start of the training session, but this time from a *submenu*
The training (for example *Quick start* or *Exercise goals*) has therefore already been selected but the band is NOT YET IN MOTION.

This means: first **SELECT TRAINING SESSION AND ENTER SETTINGS**, then **SELECT AUTOSPEED** and only then **START THE BAND** (using the Autospeed function).

Step 1   SELECT TRAINING SESSION AND ENTER SETTINGS
From the *Main menu*, select the desired function (for example Quick start) and press **OK**.
The so-called *data screen* will appear (unless 'Calories burned' has been activated; in this case, first enter the weight). *Do NOT yet start the band!*

Step 2   SELECT AUTOSPEED
Press the **AUTO button**. The indicator lamp will now start to flash (green).
If the security function is switched off, the response profiles screen will also appear.
If the security function is activated, however, the padlock screen will first appear. In this case, first enter the code. Then select the desired profile and press **OK**.
Now enter the desired m*aximum Autospeed speed*.

Step 3   START THE BAND
Press **OK** to start the band automatically. A screen showing the flashing text 'START WALKING' indicates that the training session will take place with automatic speed adjustment (Autospeed). The band will now start to move. The indicator lamp will now illuminate constantly, to show that the Autospeed function has been activated.

9.6.3   During the training session
Here, you will already have selected a training session from the main menu and entered the speed manually. The band is therefore IN MOTION.

This means: first **SELECT TRAINING SESSION AND ENTER SETTINGS,** then manually **START THE BAND START** and *while you are walking or running* **ACTIVATE AUTOSPEED**.

Step 1   *SELECT TRAINING SESSION AND ENTER SETTINGS (Quick start example)*
Select the desired function (for example Quick start) from the main menu and press **OK**.
The so-called *data screen* will appear (unless 'Calories burned' has been activated; in this case, first enter the weight).

Step 2   *START THE BAND*
Start the band by pressing the **+ speed button**. Press the button until the desired speed has been reached and then release it.

Step 3   *ACTIVATE AUTOSPEED*
While you are walking or running press the **AUTO button**. If the function is secured, the access code must first be entered (see 9.7.2). The indicator lamp will illuminate continuously and the treadmill will immediately enter Autospeed mode. The user will be shown a (flashing) message on the screen *('Autospeed active')* for a few seconds. This message will disappear automatically after a few seconds.

Please note: it is not possible to select a response profile! Speed changes will take place automatically in accordance with the factory setting for the response profile (see 9.7.2).

9.6.4   Changing the Autospeed settings during the training session
During the training session, the following Autospeed settings can be changed:
1   the maximum Autospeed speed (the 'speed limit')
2   the response profile
3   the function can be activated and deactivated.

1   CHANGING THE MAX. AUTOSPEED SPEED DURING THE TRAINING SESSION
The maximum speed ('speed limiter') can be adjusted (increased or decreased) *while walking or running on the treadmill* by manually pressing the speed buttons (+ button to increase the speed and – button to decrease the maximum speed).

2   SELECTING A DIFFERENT RESPONSE PROFILE DURING THE TRAINING SESSION
For safety reasons, it is not possible to change the response profile while walking or running on the treadmill. The band must first be brought to a standstill.
- To do so, press the PAUSE button. The pause screen will appear and the band will come to a standstill.
- Then press the AUTO button. The indicator lamp will flash and the response profiles screen will appear.
- Select a different profile and press OK to resume the training session.
- A screen showing the flashing text 'START WALKING' indicates that the training session will resume with automatic speed adjustment (Autospeed). The band will start to move once again.

3   DEACTIVATING THE FUNCTION WHILE USING THE TREADMILL
- Press the AUTO button. The indicator lamp will go off.
- The current band speed will be retained and can be adjusted manually using the +/- speed buttons.

9.7 System settings

The *System settings* function allows you to change some of the values set by the manufacturer.
These are the settings:
- *Language*
- *Default settings*
- *Personal protocols*
- *Calibration*
- *Service*
- *System information*

If you would like to change the values (presets) selected by the manufacturer, you can use this menu to change the settings. The following settings can be called up and changed without an access code:
- *Language*
- *Calibration*
- *System information*

The other settings are secured and can only be changed by the therapist or supervisor. You must carry out a special procedure to open the presets menu; this is to prevent changes being made by unauthorised parties.
- *Default settings*
- *Personal protocols*
- *Service*

In principle, the latter setting may only be called up by a service technician authorised by the manufacturer, in the event of a technical fault or maintenance.

Secured settings are indicated by means of an icon (padlock).

9.7.1 Language
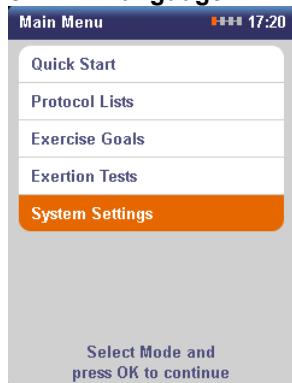
From the main menu, select the *System settings* function using the **central controller** and press **OK**.
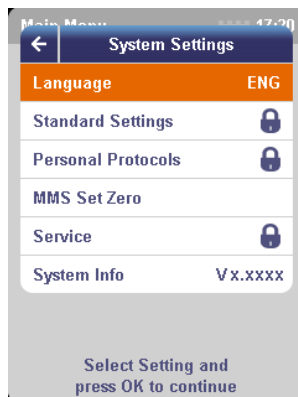
Select the *Language* setting using the **central controller** and press **OK**.

The list of available languages will appear (in alphabetical order).

Select the desired *Language* using the **central controller** and press **OK**.

The language you have chosen will be selected and you will automatically return to the *System settings* menu.

Then press **STOP** or select **<back>** (arrow at the top left) to return to the main menu.

Comment:
It is not necessary to restart the system.

9.7.2 Default settings

The following functions/settings can be found under *Default settings*:
- Autospeed
- Autostop
- Units
- Date & time
- Quick start – energy
- Screen clarity
- Loudspeaker volume

Access to the *Default settings* menu is secured to prevent changes being made by unauthorised parties. After the correct access code has been entered, the default settings menu will appear.

Accessing the secure menu
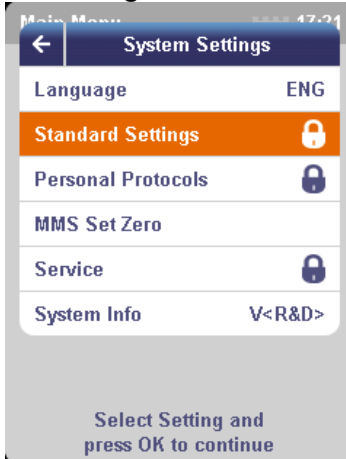
From the menu, select the *Standard settings* function using the **central controller** and press **OK**.

First enter the access code by pressing the **PAUSE** and **VIEW buttons** *simultaneously* and holding them down for 2 seconds.

After 2 seconds, this screen will automatically disappear and the screen with the following *Standard settings* will appear:
- Auto speed
- Auto stop
- Units
- Date & time
- Quick start – energy
- Screen clarity
- Loudspeaker volume

9.7.2.a Auto speed

System Settings	13:15
← Standard Settings	
Auto Speed	⊙
Auto Stop	⊙
Units	
Date & Time	
Quick Start - Energy	⊙
Screen Brightness	60%
Speaker Volume	60%
Select Setting and press OK to continue	
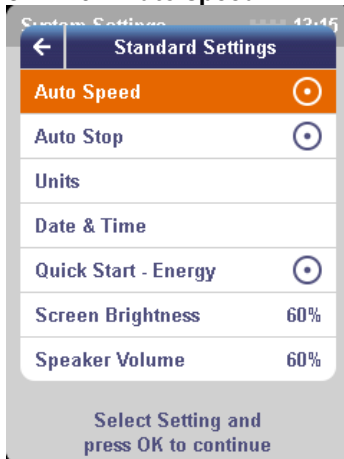
Select the *Auto speed* function using the **central controller** and press **OK**.

In the menu screen which opens, you can change the settings which relate to the Autospeed function. These are as follows:
- Function
- Security
- Zero position
- Response profile

Function

Standard Settings	13:15
← Auto Speed	
Function	⊙
Protection	⊙
Hold Position	55 cm
Reaction Profile	3
Select Setting and press OK to continue	
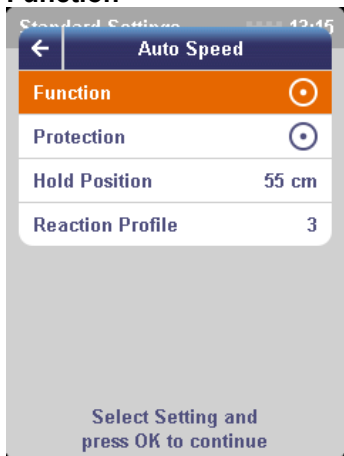
The default setting is: *function = ON*

However, the Auto speed function can be completely deactivated under *Function*.
In this case, the **AUTO** button will no longer have a function.

To deactivate the function, select *Function* and press **OK**.
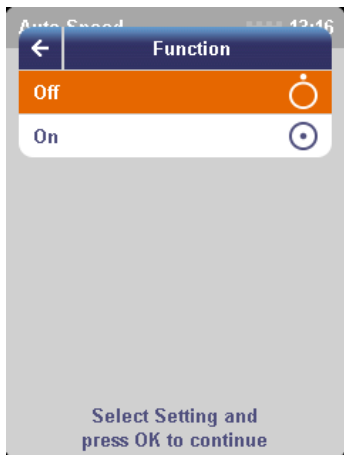
Auto Speed	13:16
← Function	
Off	○
On	⊙
Select Setting and press OK to continue	

Then select the *Off* setting using the **central controller** and press **OK**.
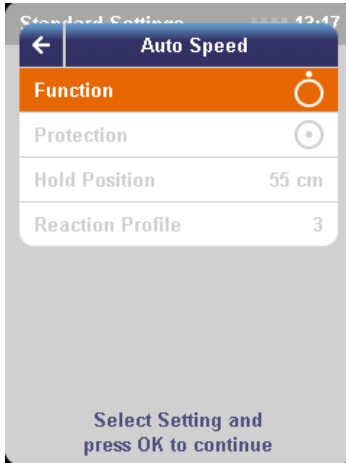
You will automatically return to the *Auto Speed* menu.

The icon at the right of the menu bar indicates that the Autospeed function has now been completely deactivated. The other settings which relate to this function will also no longer be selectable (greyed out)!

Protection
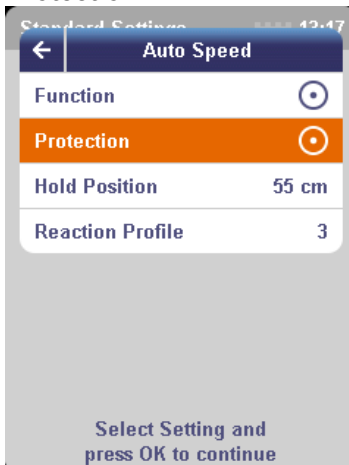
The default setting is: *Protection = ON*

The purpose of the *protection* function is to ensure that patients/clients are unable to use Autospeed by themselves (i.e. not without the therapist having authorised the use of Autospeed).

However, the *protection* function can also be deactivated. This means that Autospeed can be activated directly by each patient/client!

To deactivate the security function, select *Protection* and press **OK**.
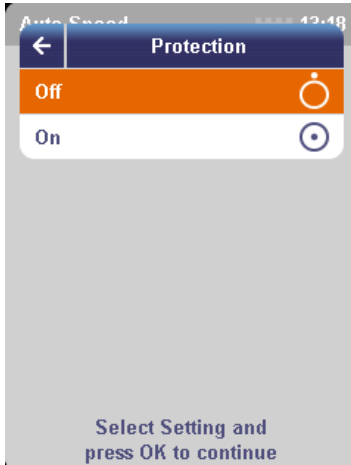
Then select the *Off* setting using the **central controller** and press **OK**.

The *protection* function has now been deactivated.
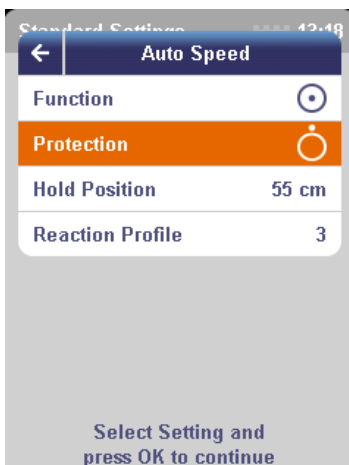
You will automatically return to the *Autospeed* menu.

The icon at the right of the menu bar indicates that the security function has been deactivated.

Hold position

Standard Settings	13:19
← **Auto Speed**	
Function	⊙
Protection	⊙
Hold Position	**55 cm**
Reaction Profile	3

Select Setting and
press OK to continue
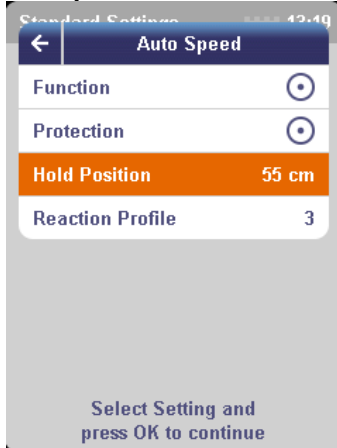
The default setting is: *hold position = 55 cm*

The *hold position* specifies the distance from the sensor to the position of the patient on the band. This determines the zone in which *no* speed changes (faster or slower) take place.
It is also referred to as the zero position. The *hold position* can be changed (nearer the sensor or further away from the sensor).

To change the distance from the sensor, select *hold position* and press **OK**.

Auto Speed	13:19
Hold Position	


```
           53 cm
50 [████░░░░░░░░░░░░] 60
```

Adjust Hold Position
and press OK to continue
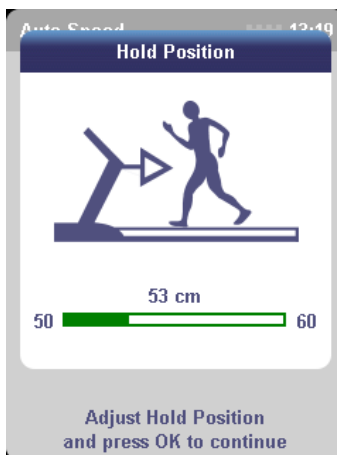
Then adjust the distance using the **central controller** and press **OK**.

Standard Settings	13:20
← **Auto Speed**	
Function	⊙
Protection	⊙
Hold Position	**53 cm**
Reaction Profile	3

Select Setting and
press OK to continue

You will automatically return to the *Autospeed* menu.

The modified *hold position* distance will be displayed at the right of the menu bar.

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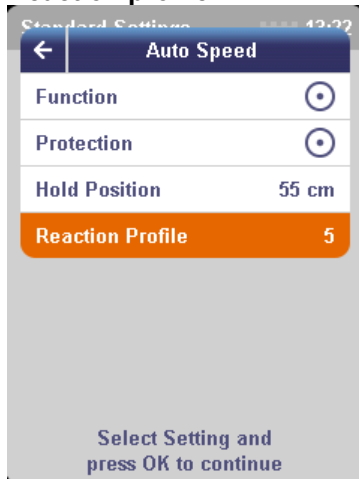
Reaction profile

A *Reaction profile* determines how fast and to what extent the band speed will *automatically* increase and decrease. Speed changes vary from very slow to very fast, as the user requires.

The default profile (response profile 3 - average) can be changed by selecting *reaction profile* and pressing **OK**.
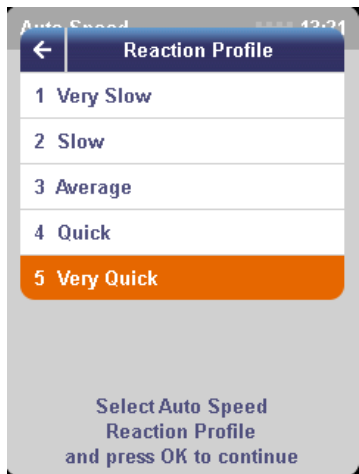
Then select a different profile (for example profile 5 – very fast) using the **central controller** and press **OK**.
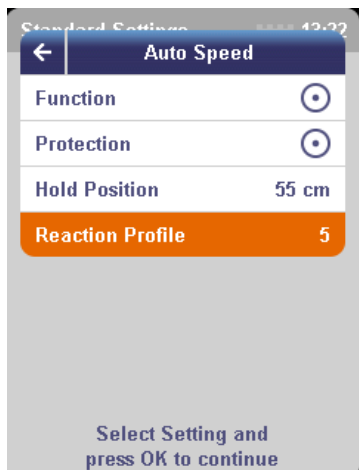
You will automatically return to the *Autospeed* menu.

The number of the new (default) *response profile* will be displayed at the right of the menu bar.

9.7.2.b Autostop

System Settings	13:23
← Standard Settings	
Auto Speed	⊙
Auto Stop	**⊙**
Units	
Date & Time	
Quick Start - Energy	⊙
Screen Brightness	60%
Speaker Volume	60%
Select Setting and press OK to continue	
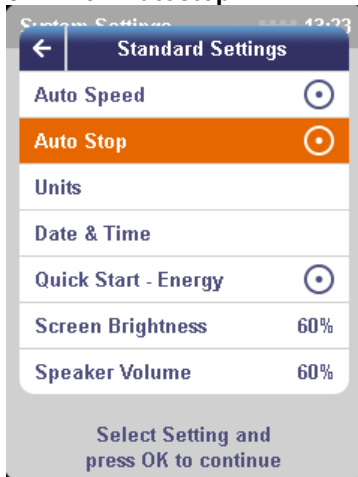
Select the *Auto Stop* function using the **central controller** and press **OK**.

In the menu screen which opens, you can change the settings which relate to the Autostop function. These are as follows:
- function
- shutdown time

Function

Standard Settings	13:23
← Auto Stop	
Function	**⊙**
Timeout	50 sec
Select Setting and press OK to continue	
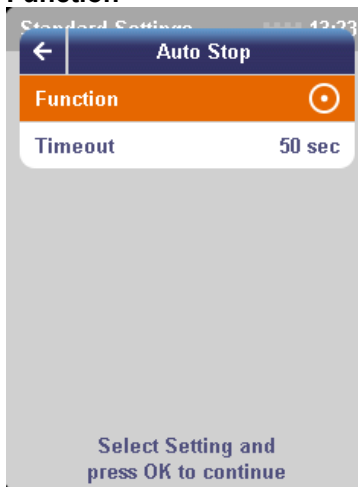
The default setting is: *function = ON*

However, the *Autostop* function can be completely deactivated under *Function.* This means that the band will *no longer* stop automatically if a user (who is not wearing a safety belt with a magnetic contact!) steps or falls off the band.

To deactivate the function, select *Function* and press **OK**.
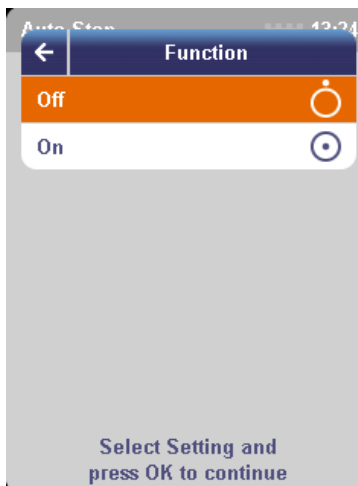
Auto Stop	13:24
← Function	
Off	**○**
On	⊙
Select Setting and press OK to continue	

Then select the *Off* setting using the **central controller** and press **OK**.

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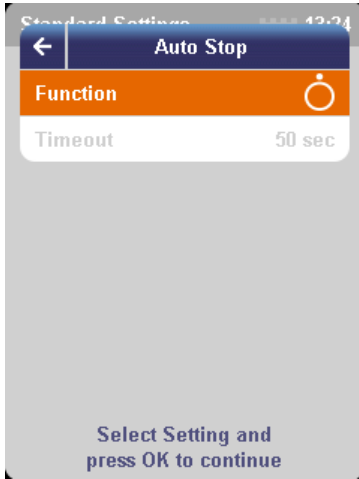
You will automatically return to the *Autostop* menu.

The icon at the right of the menu bar indicates that the Autostop function has now been completely deactivated. The other setting (shutdown time) is also no longer selectable (greyed out)!

Shutdown time
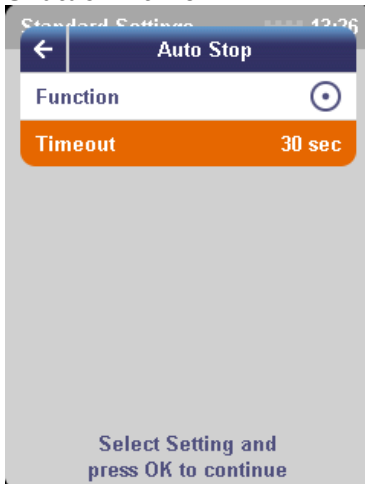
The default setting is: *shutdown time = 30 sec*

The *shutdown time* specifies the time within which the user may decide to resume the training session after the band has come to a standstill using Autostop.

The *shutdown time* can be changed (increased or decreased).

To change the time, select *shutdown time* and press **OK**.
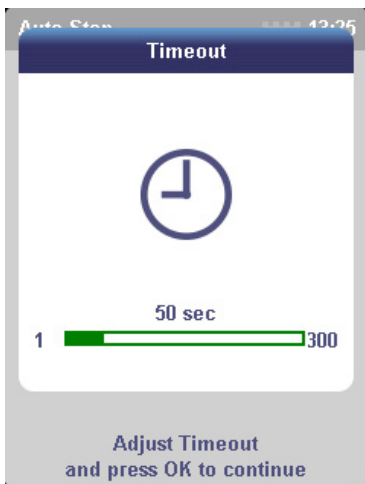
Then adjust the time using the **central controller** and press **OK**.
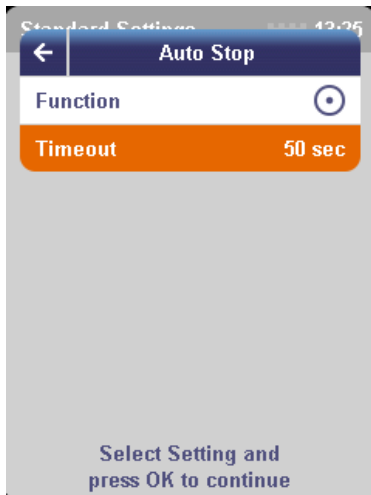
You will automatically return to the *Autostop* menu.

The modified *shutdown time* will be displayed at the right of the menu bar.

9.7.2.c   Units
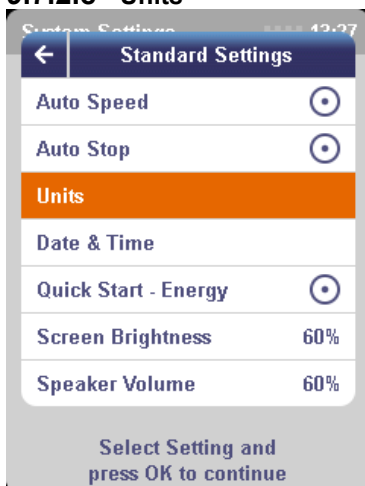
The *Units* submenu features the following parameters:
- distance
- energy
- weight
- height
- speed

To view or change the selected units, select *Units* using the **central controller** and press **OK**.
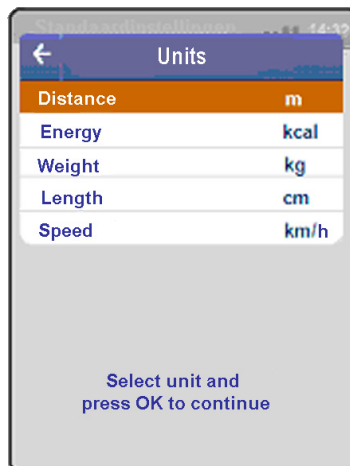
The default settings are:
Distance = m
Energy = kcal
Weight = kg
Height = cm
Speed = km/h

Select the desired unit using the **central controller** and press **OK**.
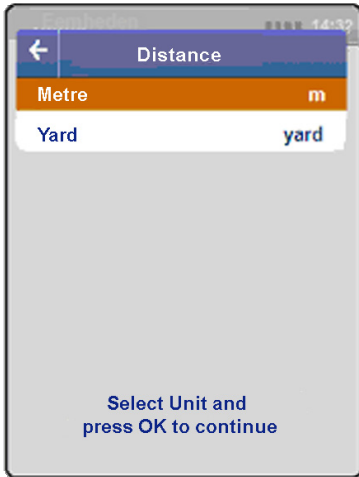
Select the desired unit using the **central controller** and press **OK**.

You will automatically return to the *Units* menu. The modified unit (in this case *metres*) will be displayed at the right of the menu bar.

In the same way, you can change the units for:
- *energy* (kcal or KJ)
- *weight* (kg or lbs)
- *height* (cm or inches)
- *speed* (km/h or mph)

9.7.2.d Date & time
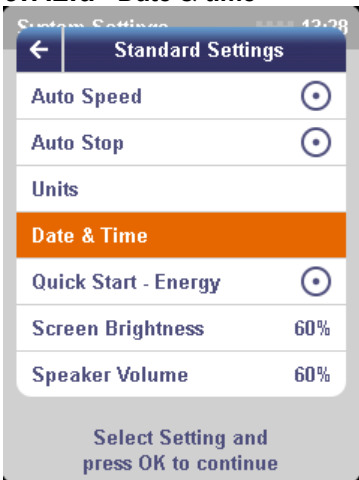
To view or change the selected date and time, select *Date & time* using the **central controller** and press **OK**.
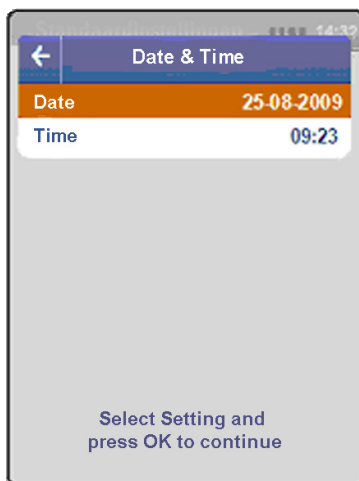
The selected date and time will be displayed at the right of the menu bar.

To change the date, select *Date* using the **central controller** and press **OK**.

Enter the day using the **central controller** and press **OK**.

Enter the month using the **central controller** and press **OK**.

Then enter the year using the **central controller** and press **OK**.

You will automatically return to the *Date & time* menu. The modified date will be shown at the right of the menu bar.

Use the same method to change the time.

9.7.2.e Quick start – energy
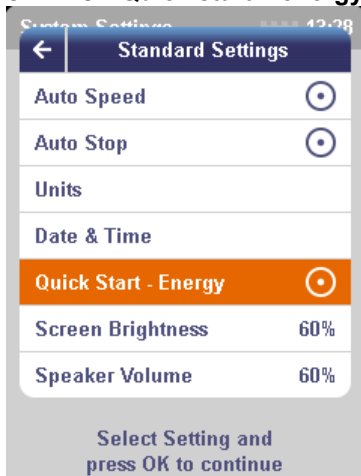
The default setting is:
Quick start – Energy = ON

This means that the *Quick start* function will automatically calculate the energy consumed (calories burned) during the use of the treadmill, based on the body weight of the user/patient (extra screen).

The automatic energy calculation can be deactivated by selecting *Quick start – energy* and pressing **OK**.
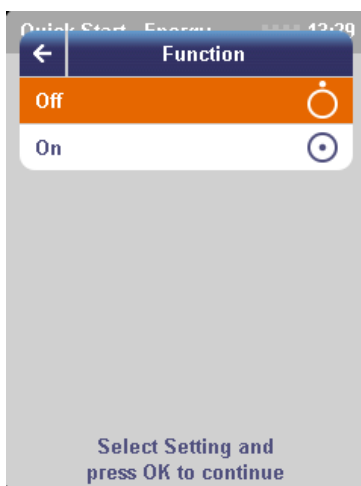
Then select the *Off* setting using the **central controller** and press **OK**.
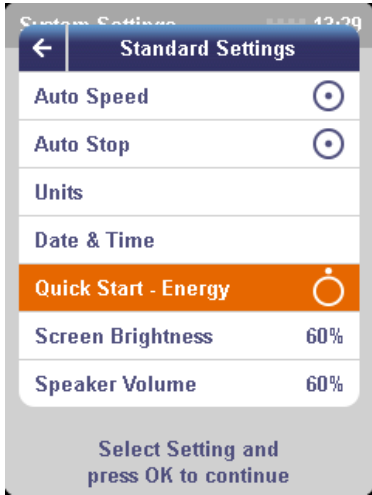
You will automatically return to the *Default settings* menu.

The icon at the right of the menu bar indicates that the Quick start – energy function has now been deactivated.

9.7.2.f   Screen Brightness
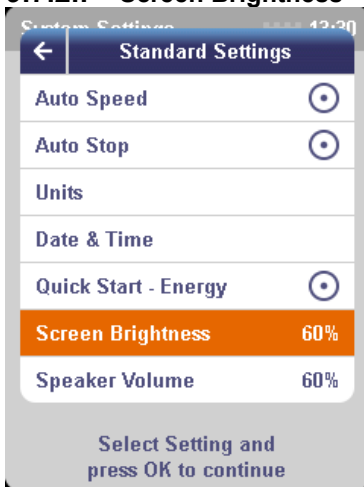
The default setting is:
Screen Brightness = 60%

Select the *Screen Brightness* setting using the **central controller** and press **OK** to change the screen contrast.
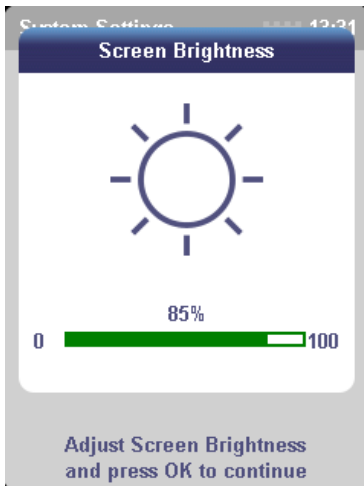
Change the *Screen Brightness* using the **central controller** and press **OK**.

The screen clarity will be reset and you will automatically return to the *Default settings* menu.

9.7.2.g Speaker volume
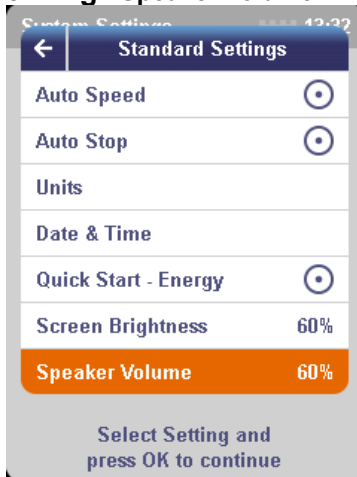
The default setting is:
Speaker volume = 100%

Select the *Speaker volume* setting using the **central controller** and press **OK** to change the volume of the built-in loudspeaker.
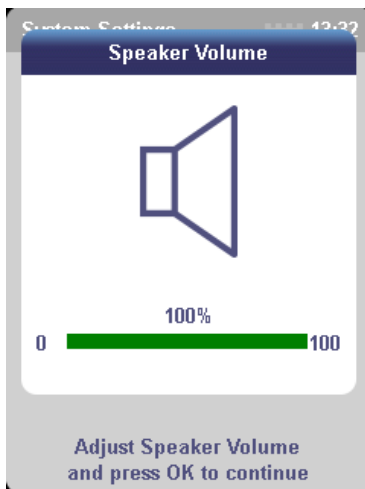
Change the *Speaker volume* using the **central controller** and press **OK**.

The volume of the built-in loudspeaker will be reset and you will automatically return to the *Default settings* menu.

9.7.3 Personal protocols

You can define and save a maximum of 30 personal exercise protocols (programmes).
Secure access to the Personal protocols menu prevents changes being made by unauthorised parties.

Accessing the secure menu
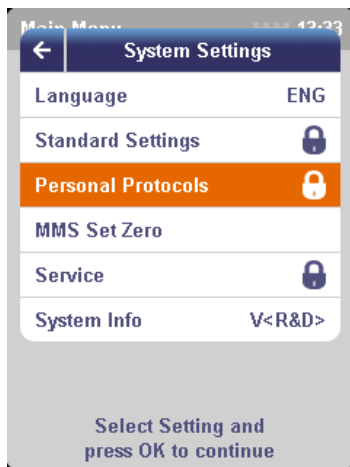
From the *System settings* menu, select the *Personal protocols* function using the **central controller** and press **OK**.

First enter the access code by pressing the **PAUSE** and **VIEW buttons** *simultaneously* and holding them down for 2 seconds.

Once the correct access code has been entered, a menu which you can use to:
- add
- edit
- delete

programmes will appear.

9.7.3.a Adding protocols
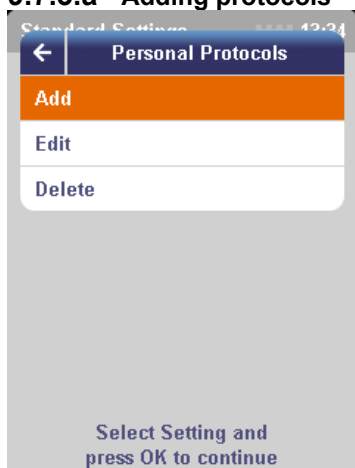
Select the *Add* function using the **central controller** and press **OK**.
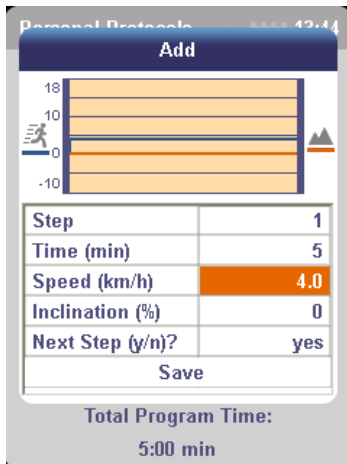
The cursor will mark programme phase 1.

Press **OK** to go to *time*.
Enter the desired time for programme phase 1 using the **central controller**.

Press **OK** and enter the *speed* using the **central controller**.

Press **OK** and enter the *inclination* using the **central controller**.

Press **OK** and specify whether you wish to programme the next phase (yes/no).

Select *yes* to programme the next phase. The cursor will automatically jump to phase 2.

Enter the desired time, speed and inclination for programme phase 2.

Press **OK** and specify whether you wish to programme the next phase (yes/no).

Select *no* if you do not wish to programme any further phases. The cursor will automatically jump to *save*. Press **OK** to continue.
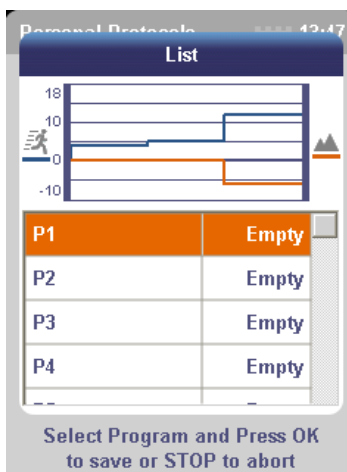
The list of protocols will appear.
Select the desired programme position (P1 to P30) using the **central controller** and press **OK** to save the programme.

Please note: the 'Add' function can only be used to add programmes! You can use this function until all the available programme positions (30) have been filled. This function can therefore not be used to edit or overwrite programmes (this must be done using the 'Edit' function).

A message on the screen will show that the programme has been saved.

You will automatically return to the *Personal protocols* menu.

9.7.3.b Editing protocols

Personal Protocols

Add	
Edit	
Delete	

Select Setting and
press OK to continue
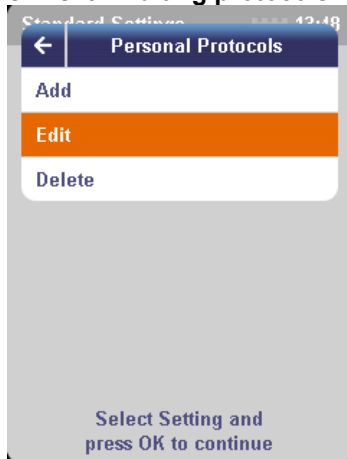
Select the *Edit* function using the **central controller** and press **OK**.

List

P1	15 min
P2	20 min
P3	8 min
P4	Empty

Press OK to select Program
or STOP to abort
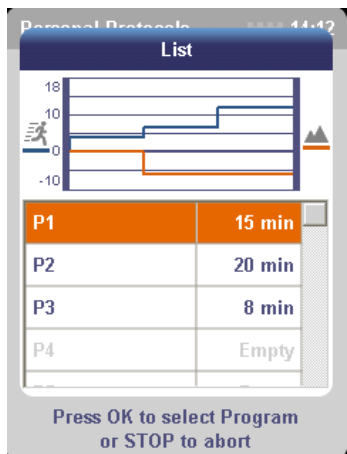
Use the **central controller** to select the programme to be edited and press **OK**.

Edit

Step	2
Time (min)	5
Speed (km/h)	6.5
Inclination (%)	-6
Next Step (y/n)?	yes
Save	

Total Program Time:
15:00 min
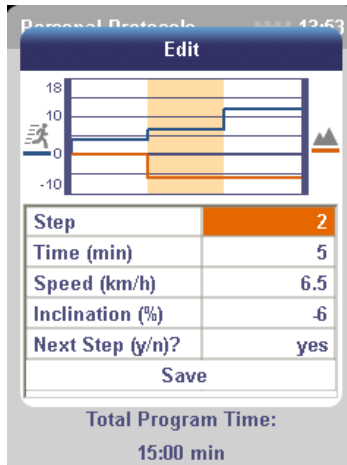
The cursor will automatically jump to *Phase*.

Select the programme phase to be edited using the **central controller** and press **OK**.

Change the time, speed and/or inclination using the **central controller** and press **OK**.

Edit

Step	2
Time (min)	5
Speed (km/h)	6.5
Inclination (%)	0
Next Step (y/n)?	yes
Save	

Total Program Time:
15:00 min
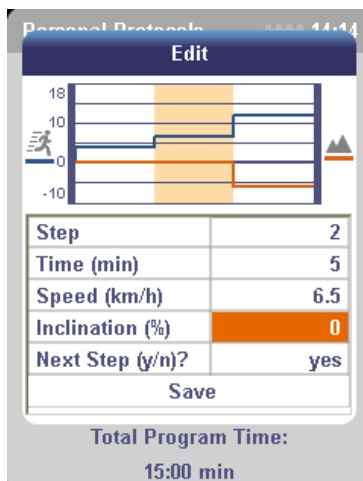
Under Next phase (y/n?) select *no* and press **OK**.

The cursor will automatically jump to *Save*.

Press **OK** to save the programme.
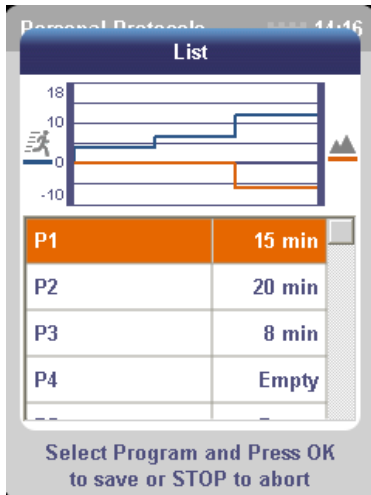
The list of protocols will appear.
You now have 2 options:

1) Press **OK** to save the programme in the same position (='overwrite').

or

2) Use the **central controller** to select a different (empty) position in which to save the programme and press **OK**.
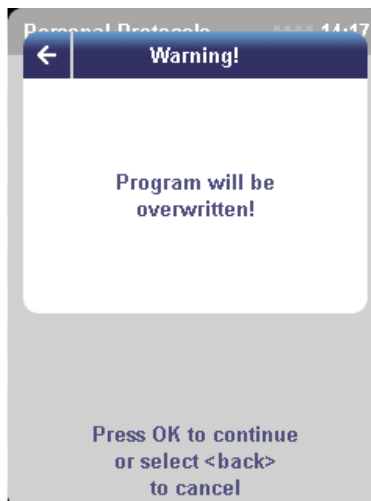
If you have chosen to save the programme *in the same position* ('overwrite'), a message on the screen will alert you to this fact.

Press **OK** to confirm this action.

(Select **<back>** and press **OK** to cancel the procedure. You will then return to the previous screen, the *Programme list*).
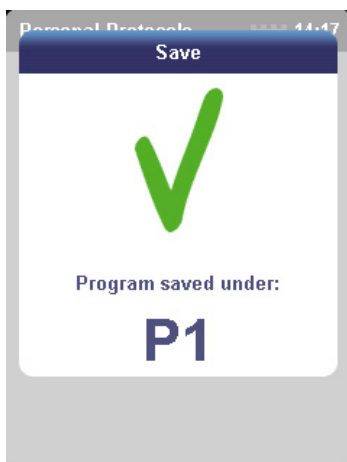
A message on the screen will indicate that the programme has been saved.

You will automatically return to the *Personal protocols* menu.

9.7.3.c Deleting protocols
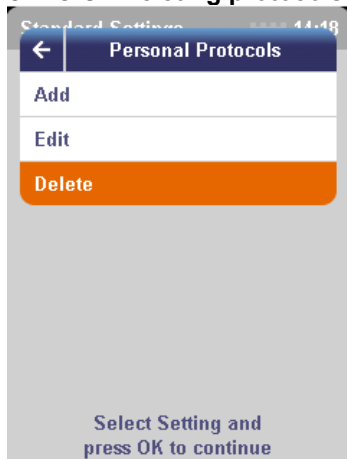
Select the *Delete* function using the **central controller** and press **OK**.
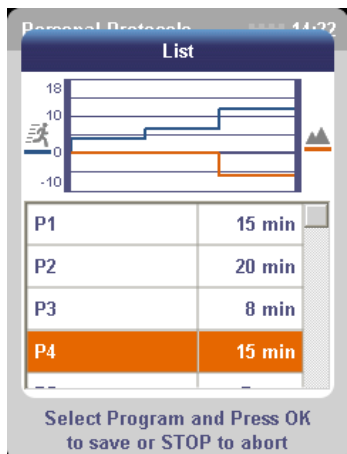
Use the **central controller** to select the programme to be deleted and press **OK**.
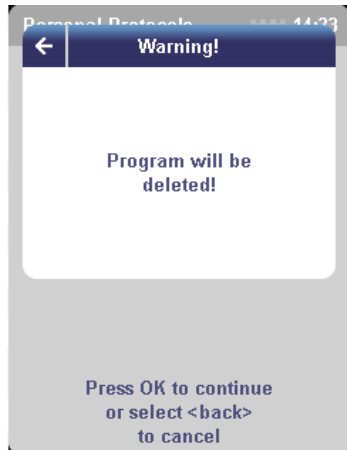
A message on the screen will alert you to the fact that the programme will be deleted permanently.

Press **OK** to confirm this action.

Select **<back>** and press **OK** to cancel the procedure. You will then return to the previous screen, the *Programme list*.
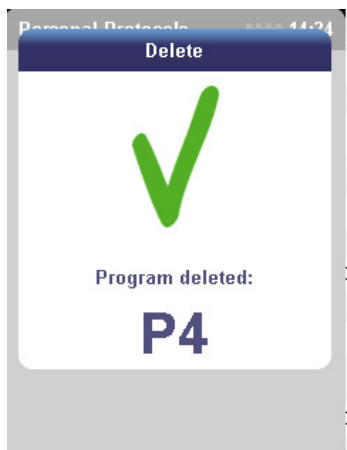
A message on the screen will indicate that the programme has been deleted.

You will automatically return to the *Personal protocols* menu.

9.7.4 Calibration

The treadmill has a calibration programme which guarantees to the user (i.e. business owner) a correct and accurate angle of inclination in respect of the underlying surface.

A surface which is not 100% level could cause a slight deviation in the inclination readout at 0%. The treadmill must therefore be calibrated at its definitive location in the exercise room. The programme is quick and easy to implement, taking just a few seconds.
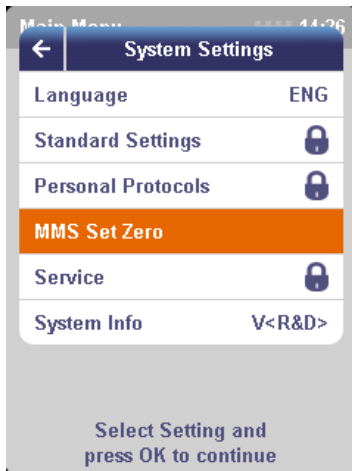
From the main menu, select the *System settings* function using the **central controller** and press **OK**.

Then select the *Calibration* function using the **central controller** and press **OK**.
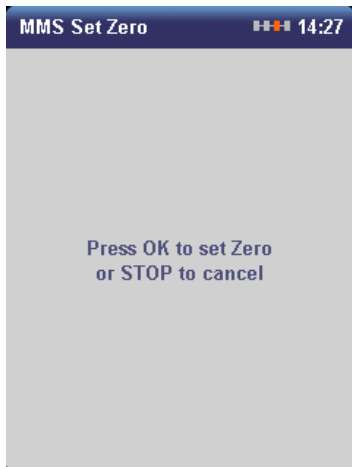
Start the calibration procedure by pressing **OK**.

Press **STOP** to return to the previous menu without implementing the programme.
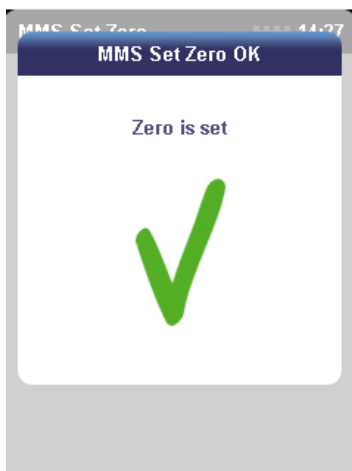
As soon as the calibration procedure is complete, a message will appear on the screen.

The message will disappear after a few seconds and you will automatically return to the *System settings* menu.

Then press **STOP** or select **<back>** (arrow at the top left) to return to the *main menu*.

The treadmill is now ready for use.

Comment: if an error message appears, check that the adjustable feet have been correctly aligned and that no objects (for example mains cables) are located under the treadmill.
After checking, carry out the calibration procedure once again.

9.7.5 Service

The *Service* setting is a secure setting which may only be accessed by a service technician who has been authorised by the manufacturer in the event of a technical fault or maintenance (see the EN-Motion Service Manual for further information about the use of this function).

Should your EN-Motion treadmill develop a fault, contact your supplier or Enraf-Nonius B.V. (the Netherlands).

9.7.6 System information

The *System information* menu contains information about the software versions of the various components (firmware). This function allows you to check quickly and easily whether your EN-Motion treadmill has the latest version before installing a firmware update.
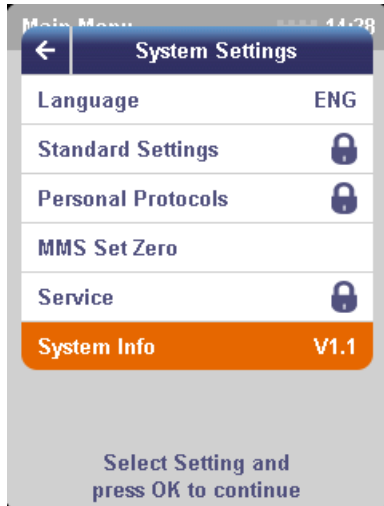
From the main menu, select the *System settings* function using the **central controller** and press **OK**.

The *System settings* screen will appear. The current software version will be displayed at the bottom right of this screen.

Press **OK**.

10 Cleaning and maintenance

This section covers the following subjects:
- Cleaning and maintenance tips
- Calibration/maintenance obligations
- End of service life and disposal of the device

10.1 Cleaning the device

First switch off the device and unplug it from the wall socket.
The frame, the handles and the operating console (including the buttons) may be cleaned with a damp cloth. Use lukewarm water, possibly with a domestic cleaning product (no abrasive products, alcohol solution or other aggressive cleaning agents). The running surface may be cleaned with a damp sponge; again, use lukewarm water for this. After cleaning, allow to dry thoroughly before using the treadmill once again. The EN-Motion has a maintenance-free band. It is therefore not necessary to wax the deck and running surface of your treadmill.

10.2 Maintenance

Taking good care of your treadmill and its surroundings minimises maintenance problems and servicing requirements.

We recommend the following preventive maintenance schedules:

10.2.1 Daily maintenance

- Switch off the treadmill using the On/Off switch and unplug it from the wall socket.
- Wipe down the running surface, deck, motor cover and console with a damp cloth. Never use solvents as these can damage the treadmill.
- Check the mains cable. If the cable is damaged, contact your supplier.
- Make sure that the cable does not pass beneath the treadmill or anywhere else it could get damaged.
- Check the tension and alignment of the running surface. Make sure that the running surface is not damaging other parts of the band through misalignment.
- Check the running surface and all other moving parts for wear or perceptible defects such as damage or small tears.
- Polar chest strap: after use, carefully clean the transmitter with a mild soap solution and rinse with clean water, then dry thoroughly.

10.2.2 Weekly maintenance

Clean the control panel and the exterior of the treadmill.
Check that the (emergency) stop function is working.
Clean beneath the treadmill by following the steps below:
- Switch off the treadmill using the On/Off switch and unplug it from the wall socket.
- Move the treadmill to a different position.
- Remove the dust which has collected beneath the treadmill using a broom or vacuum cleaner.
- Ditto for the running surface.
- Return the treadmill to its original position.

10.2.3 Regular maintenance

The regular maintenance depends on the intensity of use. Given an average use of 8 hours a day, 5 days a week, we would advise you to carry out the following maintenance on a regular basis (monthly):
- Check that all the mounting bolts are tightened properly.
- Check the various visible parts, such as the band and the running surface, for wear.
- If necessary, lightly lubricate the visible rotating parts with machine oil.

10.2.4 Annual maintenance

Each year, you should arrange for your device to be examined by a service technician who has been authorised by Enraf-Nonius (see also point 10.3).

In the event of possible damage or defects noted by you during one of the checks above, you must ensure that the device can no longer be used until the said damage or defects have been completely rectified.

10.3 Technical maintenance

We would advise you to have the device examined on an annual basis.
The check and/or maintenance must take place in accordance with the procedure described in the service manual for the equipment. This may be carried out by your supplier or by another party authorised by the manufacturer. It is also advisable to keep a record of all the maintenance activities which have been performed. In some countries, this is even compulsory.

Maintenance and repairs may only be carried out by an authorised party.
The manufacturer shall not be liable for the consequences of maintenance or repairs carried out by unauthorised parties.

The device may not be opened by unauthorised parties; this will cause the guarantee to lapse.

10.3.1 Alignment of the running surface

If the treadmill has been set up correctly (see 5.1 Installation) and the band still runs out of alignment, you will need to contact the supplier of the treadmill.

Users who have been instructed in the alignment of the running surface by a party authorised by the manufacturer may in this case adjust the band at their own risk.

10.4 End of service life

Your EN-Motion and accessories contain materials which can be reused and materials which are harmful to the environment. When it comes to disposing of the device and accessories at the end of their service life, specialist companies can dismantle these articles in order to remove the harmful materials and the reusable materials. This allows you to contribute to a better environment.

Please enquire as to the local rules for the disposal of the device and accessories.

11 Troubleshooting

Should your EN-Motion treadmill develop a fault, please contact the supplier of the device or Enraf-Nonius B.V. (the Netherlands). Repairs and installations should only be carried out by a service technician who has been authorised by Enraf-Nonius.

11.1 LEDs and/or displays fail to illuminate

- Ensure that the plug is properly inserted into the wall socket.
- Check that the wall socket is working.
- Check/replace the safety fuses in the power input.
- Check the clarity setting of the LED screen.

11.2 Error code on the display

The EN-MOTION has an internal check which means that it is self-monitoring. Should an error code appear on the display, you will need to contact the supplier of the device.

11.3 Motor overload/overheating
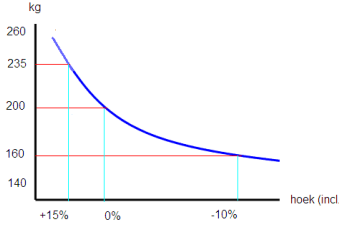
The inclination motors have a thermal safety feature.
This will kick in if the angle of inclination is increased or decreased very frequently in a short period of time.
You will then need to wait until the motor has cooled down sufficiently before using the treadmill again.
Under normal circumstances and with normal use, the thermal safety feature will almost never kick in.

12 Technical specifications

Power supply:	230V
Frequency:	50/60 Hz
Permitted voltage deviation:	10%
Drive:	DC-motor, 2.5 Hp
Motor power:	2000 W
Max. current consumption:	10 A
Fuses:	2 x 10 A (T)
Min. – max. speed:	0.4 – 18 km/h (in increments of 0.1 km/h)
Max. speed in Autospeed mode:	adjustable up to 18 km/h
Positive angle of inclination:	0% to +15% (in increments of 0.5%)
Negative angle of inclination:	0% to -10% (in increments of 0.5%)

Other training parameters

Time:	1 – 1440 min (in increments of 1 minute)
Distance:	0.1 – 100 km (in increments of 0.1 km = 100 m)
Energy	1 – 10,000 kcal (in increments of 1 kcal)
Heart rate:	60 to 220 bpm (beats per minute; in increments of 1 bpm)
Readout:	current heart rate readout
Heart rate detection:	Polar ® transmitter and receiver (built-in receiver)
Dimensions:	212 x 86 x 148 cm (L x W x H); height includes console
Effective running surface:	150 x 50 cm
Height of fixed side supports:	76 cm (distance from running surface to bottom of side supports)
	93.5 cm (distance from running surface to top of side supports)
Height of adjustable side supports: ('Plus' model):	min. 61 cm (distance measured from running surface to bottom of side supports)
	max. 108.5 cm (distance measured from running surface to top of side supports)
Range:	30 cm (electrically adjustable)
Step-up height:	11.5 cm ('Standard' and 'Plus' models)
Treadmill weight:	140 kg ('Standard' model), 155 kg ('Plus' model)
Max. permissible weight on running surface:	235 kg (see figure below)

Display:	LCD/TFT colour display (with backlight)
Training profiles (fixed programmes):	14
Training profiles (user-defined):	30
Guarantee:	2 years (except parts which are subject to wear, such as the rollers, running surface, platform under running surface etc.)

12.1 Supply voltage
Input: 230 V/50-60 Hz

12.2 Storage and transport conditions
Temperature: -10° to +50 °C
Humidity: 10 - 90% (without condensation)
Atmospheric pressure: 500 - 1060 hPa

Usage environment:
Temperature: +5° to +30° C
Humidity: 10 - 90% (without condensation)
Atmospheric pressure: 500 - 1060 hPa

The technical specifications are subject to changes.

12.3 Classification
The EN-Motion treadmill satisfies the requirements of the Medical Devices Directive (MDD 2007/47/EEC).

Medical Class: Class IIa
Electrical safety: IEC 60601-1
       IEC 60601-1+A1+A2
       IEC 60601-1-2
       IEC 60601-1-4+A1

The device has an earth connection and must be connected to an earthed wall socket. The leakage current and earth connection satisfy the requirements of IEC 60601-1.

Safety class according to IEC 60601-1:   class I type B

12.4 Installation requirements for the EN-Motion
The installation requirements for the EN-Motion are as follows:
Accessibility of the space:
- Doors at least 90 cm wide
- Preferably no stairs (depending on the model selected, the treadmill can weigh up to 155 kg)
- With lifts: before delivery, check the lift dimensions and capacity (the length of the treadmill is 212 cm)

For the installation, the following is required:
- An earthed plug socket. This product **must** be earthed. If the treadmill is not working properly or breaks down, the earth forms the path of least resistance for the current and reduces the risk of electric shock. This product has an earthed electrical cable and an earthed plug. The plug must be inserted into the correct type of socket which is properly earthed, installed in accordance with local rules and regulations.

12.5 Installation requirements for EN-Track (function available in mid-2010)
In order to use the EN-Motion treadmill in combination with EN-Track (software programme), you must have access to a computer on which the EN-Track software programme is installed. A smart-card reader is required in order to read and write to the smart cards.
You will need a printer in order to print out documents (reports).

EN-Track PC configuration:
- operating system: Windows XP/Vista
- hardware requirements: CD-ROM drive, (S)VGA monitor, USB interface
- EN-Track host PCs must be connected by means of cables (no WLAN)
The EN-Track installation kit (art. no. 1411.801) contains a CD-Rom with the EN-Track programme, a smart-card reader and a set of 10 smart cards.

Consult your EN-Track manual for further explanation regarding the use of the EN-Track programme.

12.6 Guideline and manufacturer's declaration – electromagnetic immunity

The EN-Motion is intended for use in the electromagnetic environment specified below. The customer or the user of the EN-Motion should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	$\pm$ 6 kV kV contact $\pm$ 8 kV air	$\pm$ 6 kV kV contact $\pm$ 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	$\pm$ 2 kV for power supply lines $\pm$ 1 kV for input/output lines	$\pm$ 1 kV for power supply lines not applicable	Mains power quality should be that of a typical computer room.
Surge IEC 61000-4-5	$\pm$ 1 kV line(s)to line(s) $\pm$ 2 kV line(s)to earth	$\pm$ 1 kV line(s)to line(s) $\pm$ 2 kV line(s)to earth	Mains power quality should be that of a typical computer room.
Voltage dips,short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 %U_T (>95 %dip in U_T) for 0,5 cycle 40 %U_T (60 %dip in U_T) for 5 cycles 70 % U_T (30 %dip in U_T) for 25 cycles <5 % U_T (>95 %dip in U_T) for 5 sec	< 5% U_T for 0,5 cycle < 5% U_T for 1 cycle 70% U_T for 25 cycles < 5% U_T for 5 sec.	Mains power quality should be that of a typical computer room. If the user of the EN-Motion requires continued operation during power mains interruptions, it is recommended that the EN-Motion be powered from an uninterruptible power supply.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3A / m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical computer room.
NOTE U_T is the a.c.mains voltage prior to application of the test level.			

12.7 Guidance and manufacturer 's declaration –electromagnetic immunity

The EN-Motion is intended for use in the electromagnetic environment specified below. The customer or the user of the EN-Motion should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the EN-Motion, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	$d = [3,5/3]\sqrt{P}$ $d = [3,5/3]\sqrt{P}$ 80 MHz to 800 MHz
Radiated RF IEC 61000-4-3	3 V/ m 80 MHz to 2,5 GHz	3 V/ m	$d = [7/3]\sqrt{P}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as deter-mined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a

Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the EN-Motion is used exceeds the applicable RF compliance level above, the EN-Motion should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the EN-Motion.

b

Over the frequency range 15 kHz to 8 MHz, field strengths should be less than 3 V / m.

12.8 Recommended separation distances between portable and mobile RF communications equipment and the EN-Motion

The EN-Motion is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the EN-Motion can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the EN-Motion as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter [W]	Separation distance according to frequency of transmitter [m]		
	150 kHz to 80 MHz $d = [3,5/V_1]\sqrt{P}$	80 MHz to 800 MHz $d = [3,5/E_1]\sqrt{P}$	800 MHz to 2,5 GHz $d = [7/E_1]\sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,37	0,37	0,74
1	1,17	1,17	2,33
10	3,69	3,69	7,38
100	11,67	11,67	23,33

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people

13 Ordering details

The EN-Motion treadmill is available in the following 2 models:

| 1 | 1665.901 | EN-Motion | – 230V (fixed side supports) |
| | 1665.911 | EN-Motion | – 115V (fixed side supports) |

| 2 | 1665.902 | EN-Motion *Plus* | – 230V (electrically height-adjustable side supports) |
| | 1665.912 | EN-Motion *Plus* | – 115V (electrically height-adjustable side supports) |

Standard accessories:
1665.750   EN-Motion User Manual (NL)
1665.802   Safety belt & magnetic contact

Optional accessories:
1665.800   Emergency stop
1665.801   50 cm ramp
1665.803   Side supports, height 92 cm (set of 2 side supports)
3496.839   Polar T31 transmitter
3496.840   Elastic chest strap for Polar T31

14 Conclusion

We hope that you will enjoy the use of your EN-Motion treadmill for many years to come.
We would also like to refer you to the many other high-quality products in our range.
If you have any questions or would like to receive our catalogue, please call your Enraf-Nonius representative or visit www.enraf-nonius.com.

Appendix 1

Sample PAR-Q

Physical Activity Readiness Questionnaire (PAR-Q)

For most people, physical exertion will not present any problems or risks. The Physical Activity Readiness Questionnaire (PAR-Q) has been developed to identify the small number of people for whom physical activity is less suitable or for whom it would be sensible to seek medical advice about the most suitable type of activities (ACSM, 1991).

1. Has a doctor ever said that you have any type of cardiovascular disease?
2. Do you regularly suffer from chest pain?
3. Do you regularly suffer from shortness of breath or dizziness?
4. Has a doctor ever said that you have high blood pressure?
5. Has a doctor ever said that you have a bone or joint problem, such as arthrosis, arthritis or rheumatism, which could be made worse by physical exertion?
6. Do you know of any other good reason why you should not take part in an activity programme?
7. Are you older than 65 and not used to strenuous physical exercise?

If someone answers 'yes' to one or more questions, the physical activity or test must be postponed. Medical consent must first be obtained.

Source: E. Hulzebos & H. van der Loo 2002
Physical Activity Readiness Questionnaire - PAR.Q (revised 2002)
Canadian Society for Exercise Physiology

G E N E R A L   S C O R E   F O R M

This form can be used to record the results of a Quick start, Protocol list or Exercise goal training session and to incorporate them at a later date into an electronic patient record, for example.

P E R S O N A L   D E T A I L S

Test date: …………………………………………………… **Patient ID** ……………………………………

Surname: …………………………………………………… **Initial(s)** ……………………………………

Address: ……

Town/city: ……

Email: …………………………………………………… **Tel.:** ……………………………………………

Age: …………… years   **Weight:** …………… kg   **Height:** …………… cm

Gender: ☐ f   ☐ m

T R A I N I N G   R E S U L T S

Time	……………	min.
Distance	……………	metres
Av. speed	……………	km/h
Pace	……………	min/km
Energy	……………	kcal
METs	……………	
Av. capacity	……………	W
VO2 max	……………	ml/min/kg
min. HR	……………	bpm
max. HR	……………	bpm
average HR	……………	bpm
% of max. HR	……………	%
BMI	……………	

Borg score (6-20) ……

6 M W T   S C O R E   F O R M

The 6-minute walking test is an intensive exertion test which can be used to chart and evaluate the functional exertion capacity of a patient. The test can be used in patients with various conditions, including heart and lung diseases, as well as those with rheumatic diseases and the elderly.

P E R S O N A L   D E T A I L S

Test date: ………………………………………………… **Patient ID** …………………………………

Name: ……………………………………………… **Initial(s)** …………………………………

Address: ……………………………………………………………………………………………

Town/city: ……………………………………………………………………………………………

Email: ……………………………………………… **Tel.:** …………………………………

Age: ………… years   **Weight:** ………… kg   **Height:** ………… cm

Gender: ☐ f   ☐ m

T E S T   R E S U L T S

Time	6:00 min.

Distance walked ………… metres

Norm min. ………… metres

Norm max. ………… metres

Pace ………… m/sec   **Fitness index**

1 min. average ………… metres

Av. speed ………… km/h

VO2 max ………… ml/min/kg

min. HR ………… bpm

max. HR ………… bpm

average HR ………… bpm

% of max. HR ………… %

Energy ………… kcal

BMI …………   **Borg score (6-20)** ……

UKK 2 KM TEST SCORE FORM

The UKK walking test is a submaximal condition test over a distance of 2 km, which is suitable for nearly everyone aged between 20 and 65. The test is not recommended for children. People over 65 may take the test if they are healthy and perform regular physical exercise. The test is less reliable for overweight people, and also for people with serious conditions or handicaps for whom strenuous walking would not be advisable. Nor does the test offer accurate results for people who train a great deal, as it tends to underestimate their condition. This test makes it possible to establish a person's condition in a relatively safe and easy way.

PERSONAL DETAILS

Test date: …………………………………………… Patient ID ……………………………

Name: …………………………………………… Initial(s) ……………………………

Address: ……………………………………………………………………………………

Town/city: ……………………………………………………………………………………

Email: …………………………………… Tel.: ……………………………

Age: ………… years   Weight: ………… kg   Height: ………… cm

Gender: ☐ f   ☐ m

TEST RESULTS

Distance	2 km

Time   ………… min.

Norm min.   ………… metres

Norm max.   ………… metres

Pace   ………… m/sec

1 min. average ………… metres

Av. speed   ………… km/h

VO2 max   ………… ml/min/kg

min. HR   ………… bpm

max. HR   ………… bpm

average HR   ………… bpm

% of max. HR   ………… %

Energy   ………… kcal

BMI   …………

Fitness index

-- - -/+ + ++

Borg score (6-20)   ……

COOPER TEST SCORE FORM

The Cooper test is a fairly strenuous exertion test which is not suitable for people in poor health. After a good warm-up, the person taking the test must walk as far as possible in 12 minutes at a steady pace. At the end of the test, the person must cool down properly. The distance walked is compared with standard (norm) values.

P E R S O N A L   D E T A I L S

Test date: …………………………………………… Patient ID ……………………………

Name: ………………………………………….. Initial(s) …………………………………

Address: …………………………………………………………………………………………

Town/city: …………………………………………………………………………………………

Email: …………………………………………… Tel.: ……………………………………

Age: ………… years   Weight: ………… kg   Height: ………… cm

Gender: ☐ f   ☐ m

T E S T   R E S U L T S

Time	12:00 min.

Distance walked ………… metres

Norm min. ………… metres

Norm max. ………… metres

Pace ………… m/sec

Fitness index

1 min. average ………… metres

Av. speed ………… km/h   -- - -/+ + ++

VO2 max ………… ml/min/kg

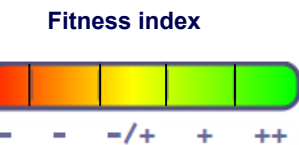min. HR ………… bpm

max. HR ………… bpm

average HR ………… bpm

% of max. HR ………… %

Energy ………… kcal

BMI …………   Borg score (6-20) ……

CLAUDICATION TEST SCORE FORM

The Claudication test is a treadmill test with a progressive ('graded') load used in order to provoke the symptoms of peripheral vascular disease, often caused as a result of atherosclerosis. The test is used to determine the pain-free and maximum walking distance in people suffering from diabetes mellitus, hypertension, hyperlipidaemia, physical inactivity and overweight. The results of the treadmill test are related to what is required in terms of work, household activities, leisure activities and from the point of view of preventing cardiovascular diseases.

P E R S O N A L   D E T A I L S

Test date: …………………………………………… Patient ID …………………………………

Name: ………………………………………………… Initial(s) …………………………………

Address: ……………………………………………………………………………………………………

Town/city: …………………………………………………………………………………………………

Email: ……………………………………………………… Tel.: ……………………………………

Age: ………… years   Weight: ………… kg   Height: ………… cm

Gender: ☐ f   ☐ m

T E S T   R E S U L T S

Total time   ………… min.
Distance (max.)   ………… metres
PF (pain-free) time   ………… min.
PF (pain-free) distance ………… metres

VO2 max   ………… ml/min/kg

min. HR   ………… bpm

max. HR   ………… bpm

average HR   ………… bpm

% of max. HR   ………… %

Av. speed   ………… km/h

Energy   ………… kcal

BMI   …………   Borg score (6-20)   ……