

optibike basic / optibike plus

Training Ergometer

Operator's Manual

201000557000 • Version 2023-11-16 / Rev 05 • English



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This manual was written with the utmost care. Should you still find details that do not correspond with the system, please let us know and we will correct the issue as soon as possible.

We reserve the right to modify the design and technical features and are not bound by the information and illustrations provided in this manual.

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This manual will not be automatically updated. Please contact the manufacturer for the latest document revision.

This manual also describes optional components that are not included in the standard scope of delivery of this product.

The document "Cleaning, and Disinfecting ergoline Medical Devices" (Part No. 201000641000) in its most recent version is also part of this manual. This document is exclusively made available for download from the ergoline website www.ergoline.com.

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1 General Information


- The medical device bears the CE marking CE-0123 (notified body: TÜV SÜD Product Service GmbH), indicating its compliance with the provisions of the Medical Device Regulation (EU) 2017/745 and meets the general safety and performance requirements set out in Annex I of Regulation (EU) 2017/745.
The CE marking covers only the accessories listed in chapter 12 *Accessories*.
The device is a class IIa product pursuant to Annex VIII of the Regulation (EU) 2017/745).
- The device fulfills the requirements of the standard EN 60601-1 "Medical electrical equipment, Part 1: General Requirements for Safety" as well as the interference protection requirements of standard EN 60601-1-2 "Electromagnetic Compatibility – Medical Electrical Devices".
The radio-interference emitted by this device is within the limits specified in EN 55011, class B.
- This manual is an integral part of the device. It should be available to the device operator at all times. Close observance of the information given in the manual is a prerequisite for proper device performance and correct operation and ensures patient and operator safety. Please note that information pertinent to several chapters is given only once. Therefore, carefully read the manual once in its entirety.
- Observance of the safety information protects from injuries and prevents inappropriate use of the device. All device users and persons responsible for assembly, maintenance, inspection, and repair of the device must read and understand the content of this manual, before using the device or working with it. Paragraphs with special symbols are of particular importance.
- If unauthorized individuals open the control terminal, damaging the calibration sticker, any warranty claim shall become void.
- This manual reflects the device specifications and applicable safety standards valid at the time of printing. All rights are reserved for devices, circuits, techniques, software programs, and names appearing in this manual.
- On request ergoline will provide a Field Service Manual.
- The ergoline quality management system complies with the standard EN ISO 13485: 2016.
- The safety information given in this manual is classified as follows:

Danger




indicates an imminent hazard. If not avoided, the hazard will result in death or serious injury.

Warning



indicates a hazard. If not avoided, the hazard may result in minor injury and/or product/property damage.

Caution



indicates a potential hazard. If not avoided, the hazard may result in minor injury and/or product/property damage.
- To ensure patient safety, the specified measuring accuracy, and interference-free operation, we recommend using only original ergoline accessories. The user is responsible if accessories from other manufacturers are used.
- ergoline is responsible for the effects on safety, reliability, and performance of the device, only if
 - modifications and repair are carried out by ergoline GmbH or by an organization expressly authorized by ergoline GmbH to carry out these tasks
 - the device is used in accordance with the instructions given in this operator manual.
- Before use, adjust the saddle height to fit the patient size. An incorrect saddle height will cause the patient to adopt an ergonomically incorrect posture, which leads to transient pain.
- Before use, adjust the handlebar to the patient. An incorrect handlebar setting will cause the patient to adopt an ergonomically incorrect posture, which leads to transient pain.
- Before starting a test, check that the settings are correct for the patient.
- All reportable incidents involving the ergometer shall be reported to the manufacturer and the competent authority of the country where the user resides.

Warning



- *This device should not be used adjacent to or stacked with other devices as this could result in incorrect operation. If adjacent or stacked use is necessary, this device and the other devices should be observed to verify normal operation.*
- *The use of accessories, transducers, and cables other than those specified or provided by the manufacturer may result in increased electromagnetic emissions or decreased electromagnetic immunity and incorrect operation.*
- *Portable RF communications equipment (including accessories such as antenna cables or external antennas) should be used no closer than 30 cm (12 inches) to any part of the [ME device or ME system], including cables, specified by the manufacturer. Otherwise, degradation of the performance of the device could result.*

2 Safety Information

Danger



Explosion Hazard

The device is not designed for use in areas where an explosion hazard may occur.

Explosion hazards may result from the use of flammable anesthetics, skin cleansing agents, or disinfectants.

Warning



Patient Hazard, Equipment Damage

Do not expose the medical device to direct sunlight to prevent system components from reaching inadmissible high temperatures.

Do NOT use the medical device outdoors. Furthermore, the device has no additional protection against the ingress of humidity. Humidity inside the device may cause equipment malfunctions and increases the risk of an electric shock.

Additionally, the device should not be operated in the vicinity of power systems, because they may impair equipment functions.

The medical device may only be used in combination with accessories approved by ergoline GmbH.

Personal Injury

Before using the ergometer, the user must ascertain that it is in correct working order and operating condition. The cables and connectors, in particular, must be checked for signs of damage. Damaged parts must be replaced immediately.

Equipment Malfunction

Only the special shielded cables supplied by ergoline may be used to connect the device to other pieces of equipment.

Equipment Malfunction

Cellular telephones may not be used in the immediate vicinity of the ergometer, because they might interfere with the proper functioning of the ergometer.

Electromagnetic interference most probably exists when the watt reading is unstable. If the displayed value changes frequently even though the speed is above 30 RPM, this may be due to electromagnetic interference.

Note



Only the removal of the power cord will result in an all-pole disconnection of the device from the power line.

Warning



Shock Hazard

- When the device is connected to other equipment or if a medical system is created, it must be ensured that the added leakage currents do not present a hazard. In case of questions, please contact your ergoline dealer or the ergoline GmbH Service Department.

- For use, the ergometer must always be connected to electrical installations that fulfill the local requirements.
- To prevent the risk of electric shock, connect the device only to a power line with protective conductor.

Patient Hazard

- To prevent personal injury by an electric shock or due to a defective medical device, do not place objects containing liquids on top of the medical device.
- In case of liquid ingress into the device, immediately disconnect it from the power line and inform your dealer or contact the ergoline GmbH Service Department.
- If
 - faults
 - defects
 - illegible warnings
 are identified and/or suspected, immediately put the medical device out of operation for reasons of safety. In this situation, the medical device needs to be clearly labeled to prevent it from use. Immediately inform your dealer or the ergoline GmbH Service Department in writing.
- As a general rule modifications to the medical device are not allowed, unless
 - the modifications are carried out by ergoline GmbH, authorized specialists, or
 - ergoline GmbH has reviewed and approved the modification.
- To prevent personal injury, please observe the following points:
 - Do not transport the ergometer during use.
 - Do not transport the ergometer while someone is sitting on it.
 - Before transporting the ergometer, observe its own weight (see type plate).
- At the maximum load level of the ergometer, the temperature at the saddle may reach 41.5°C.
- The ergometer may only be used on a dressed and fully conscious patient.

Warning



Patient Hazard

The German Medical Device Operator Ordinance (MPBetreibV, § 4) demands that users

- must be trained in the use of the medical device
- must be familiar with the routines for handling and assembly of the ergometer
- must be familiar with and observe the safety rules and regulations for operation of this type of equipment
- must be informed about any other pertinent rules and regulations (e.g., safety instructions)
- must be informed about the potential hazards arising from the use of this type of equipment
- must make sure that no unauthorized changes are carried out.

Patient Hazard

The medical device is only intended for use by trained and appropriately qualified staff.

Caution



Additional equipment connected to medical electrical equipment must comply with the respective standards (e.g., EN 60950 for data processing equipment).

Furthermore, all configurations must meet the requirements of the applicable medical systems standards (see 3rd edition of EN 60601-1).

Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible for the system's compliance with the requirements for medical electrical systems. Please note that local laws take precedence over the standards mentioned above.

In case of questions, please contact your local dealer or ergoline GmbH.

Note



Applied Parts

Applied parts are components that come into physical contact with the human body (e.g., sphygmomanometers).

Note



Stability

Ensure the stability of the ergometer. If the maximum permitted patient weight is exceeded, the stability of the ergometer can no longer be guaranteed. The device may become unstable as a result.

2.1 Indications, Contra-indications and Exclusions, Criteria for Termination

Indications

- Asymptomatic subjects
 - diagnosis of latent disease and of possible risks in sport
 - assessment of physical performance ability and counseling before the start of training, monitoring and guidance of training
 - assessment of performance capacity and physical performance ability in occupational medicine
- Patients with ...
 - diagnosis of cardiovascular and pulmonary disease
 - evaluation of symptoms: dyspnea, chest pain, palpitations, dizziness (syncope)
- Follow-up assessment during training (for patients as well):
 - recommendations on the extent and intensity of training
 - in accordance with the above, the diagnostic objectives are the assessment of performance, development, suitability, and structure; stress is caused by external parameters and effort by "internal" ones as a response of the subject's organs to the task.

Contra-indications and exclusions

- Absolute
 - any acute or severe chronic cardiorespiratory disease causing marked functional impairment (e.g., severe congestive heart failure, severe burns, cardiomyopathy, severe arrhythmias, thromboses, malignant hypertension, or pulmonary hypertension)
 - any acute or severe disease of other organ systems, e.g., nephritis, poorly controlled diabetes mellitus, or electrolyte disturbances
 - febrile infections
 - musculoskeletal and neuromuscular disorders that preclude safe and adequate test performance
- Relative
 - known obstructive left main coronary artery stenosis
 - moderate to severe aortic stenosis with uncertain relation to symptoms
 - tachyarrhythmia or bradyarrhythmia with uncontrolled ventricular rate
 - moderate to severe valvular heart disease
 - acquired advanced or complete heart block
 - hypertrophic obstructive cardiomyopathy with severe resting gradient

- recent stroke or transient ischemic attack
- age or mental impairment leading to inability to cooperate
- resting hypertension with systolic or diastolic blood pressures > 200/110 mmHg
- uncorrected medical conditions, such as significant anemia, important electrolyte imbalance, and hyperthyroidism
- ventricular aneurysm

Criteria for termination

- Subjective symptoms
 - dizziness
 - incoordination
 - progressive chest pain
 - shortness of breath
 - pain in the legs or disability to perform the test
- Objective signs
 - ECG changes
 - progressively severe arrhythmias
 - progressive intracardiac conduction disturbance
 - progressive repolarization disorder
 - hemodynamic changes
 - progressive drop in blood pressure
 - insufficient rise in blood pressure
 - excessive rise in blood pressure
 - abnormal findings during auscultation of the lungs (e.g., breath sounds such as cawing, wheezing)

Complications secondary to exercise testing

- Cardiac
 - Bradyarrhythmias
 - Tachyarrhythmias
 - Acute coronary syndromes
 - Heart failure
 - Hypotension, syncope, and shock
 - Death (rare; frequency estimated at 1 per 10.000 tests, perhaps less)
- Non-cardiac
 - Musculoskeletal trauma
 - Soft-tissue injury
- Miscellaneous
 - Severe fatigue (malaise), sometimes persisting for days
 - Dizziness
 - Body aches
 - Delayed feelings of illness

2.2 Intended Use

The medical device is an ergometer used to apply stress to a patient's cardiovascular and musculoskeletal systems and for exercise training.

2.3 Clinical Benefit

In cardiac rehabilitation and secondary prevention programs with the medical device, patients benefit from training by improving their physical capacity and, at the same time, by reducing the probability of recurrence of medical conditions such as cardiovascular diseases, metabolic disorders, cancers, pulmonary diseases or diseases resulting from a sedentary lifestyle. Furthermore, the medical device can be used as a diagnostic device in stress ergometry and exercise testing.

2.4 Intended User/Operator

Only the intended users are allowed to use the ergometer.

Intended users/operators are, among others, healthcare professionals thoroughly instructed on the basis of the operator manual, such as

- physicians
- healthcare providers
- therapists

The group of intended users does not include persons whose mental and physical capabilities and skills have an adverse effect on their ability to use the medical device in accordance with its intended purpose.

2.5 Intended Patient Group

The intended patient group includes all persons

- with a maximum weight of 160 kg
- whose body height and age makes them eligible for exercising on the ergometer. Due to various ergonomic aspects, it is not possible to provide exact data for body height and age.
- whose medical condition has been checked by a medical specialist who judged them to be suitable for the application described in the intended use.

2.6 Biocompatibility

The parts of the product described in this manual, including all accessories that come in contact with the patient during the intended use, fulfill the biocompatibility requirements of the applicable standards if applied as intended.

If you have questions in this matter, please contact ergoline GmbH or an ergoline representative.

2.7 Applicable Laws, Regulations, and Directives

If you have questions regarding laws, regulations or directives related to the product, please contact ergoline GmbH.

3 Symbols



Type B applied part.



Observe the information given in the operator manual.



Protection class II equipment.



This symbol indicates that the waste of electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately.

Consult Operator's Manual!



Order number.



Serial number.



Scheduled date of the next inspection (e.g., March 2024).



Toggle switch ON (voltage).



Toggle switch OFF (voltage).

IP21

Devices rated IP21 are protected against insertion of fingers and solid objects with a diameter greater than 12 mm. They are also protected against the harmful ingress of dripping water (vertically falling drops).

CE 0123

CE mark per the Medical Device Directive 93/42/EEC of the European Union.
Notified body: TÜV SÜD Product Service GmbH,
Ridlerstr. 65, 80339 München, Germany.



Nationally Recognized Testing Laboratory
NRTL label for the USA and Canada.



Do not lean against device: tipping hazard.



This symbol indicates that the equipment is a medical device.



This symbol indicates the overall weight of the medical device.



Manufacturer's identification.



Date of manufacture.
The number found under this symbol is the date of manufacture in the YYYY-MM-DD format.



Transport and storage label:
top.



Transport and storage label:
keep dry.



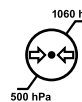
Transport and storage label:
fragile.



Transport and storage label:
approved temperature range.



Transport and storage label:
approved humidity, non-condensing.



Transport and storage label:
approved pressure range.



Transport and storage label:
do not stack.

4 Setup and Mains Connection

In order to obtain help with

- putting the ergometer into operation by a non-expert person or non-expert organization
 - operation or
 - maintenance
- of the ergometer, please contact your dealer or ergoline.

If

- faults
- defects
- illegible warnings

are identified and/or suspected, immediately put the medical device out of operation for reasons of safety.

In this situation, the ergometer needs to be clearly labeled to prevent it from use. Immediately inform your dealer or the ergoline GmbH Service Department in writing.

4.1 Controls and Indicators

- 1 Control terminal*
- 2 Hand grip*
- 3 Clamping lever* (adjustment of handlebar angle)
- 4 Saddle*
- 5 Clamping lever* (saddle height adjustment)
- 6 Power switch (toggle switch [I/O])
- 7 Leveling feet to adjust the ergometer to uneven floors
- 8 Sockets for power cord and connection cables (underside of ergometer)
- 9 Pedal*
- 10 Castors

* = applied parts as defined in IEC 60601-1

To safely terminate operation of the ergometer after use, turn it off with the power switch.



Figure 4-1: Operating controls of the optibike basic/optibike plus

4.2 Mounting the Control Terminal

The control terminal can be installed with the display facing either the patient or the operator.

It is recommended to install the terminal with the display and control keys towards the operator and the speed read-out towards the patient.

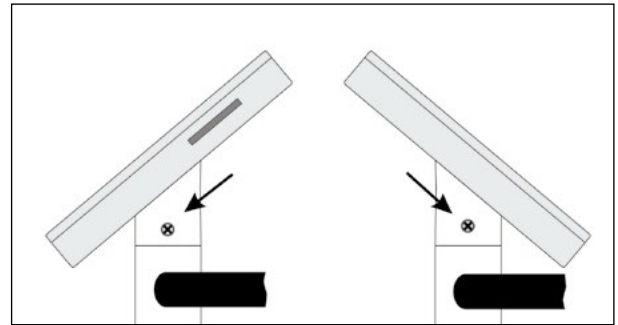


Figure 4-2: Different orientations of the control terminal

4.3 Transport

For short distances, the ergometer can be lifted at the saddle and rolled away on its castors.

To cover greater distances, however, we recommend the following method:

- Disconnect the power cord from the wall outlet.
- Rotate the handlebar towards the front and tighten the clamping lever.
- Stand in front of the ergometer, grasp the handlebar and tilt the ergometer towards you until it is standing only on the two castors and is balanced.
- It is now possible to transport the ergometer.
- When you have reached the new location, lower the ergometer very carefully. Otherwise it can be severely damaged.

Caution



Equipment Damage

Avoid strong vibrations of the ergometer during transport.



Figure 4-3: Transporting the optibike basic/optibike plus

4.4 Setup

Place the ergometer on a level floor.

The ergometer must be set up in a secure and stable position; the two leveling feet at the back make for easy adjustment to uneven floors. Extend the foot concerned until the ergometer no longer wobbles.

In case of delicate flooring, it is recommended to place a mat under the ergometer to protect the flooring from damage by the feet.

The ergometer has 2 castors at the front for transport.

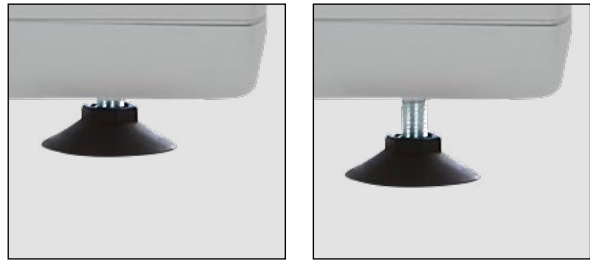


Figure 4-4: Leveling feet to adjust the ergometer to uneven floors

4.5 Connecting the Power Cord

- Rotate the handlebar of the ergometer towards the front.
- Tilt the ergometer carefully towards the front until it rests on the handlebar.



Figure 4-5: Assembly position of the ergometer

- Connect the power cord on the underside of the ergometer.
- Insert the power cord into the strain relief and screw the strain relief to the frame. Make sure that the plastic pin engages in the corresponding hole.
- Return the ergometer carefully to its upright position and adjust the handlebar.
- Plug the power cord into a wall outlet.

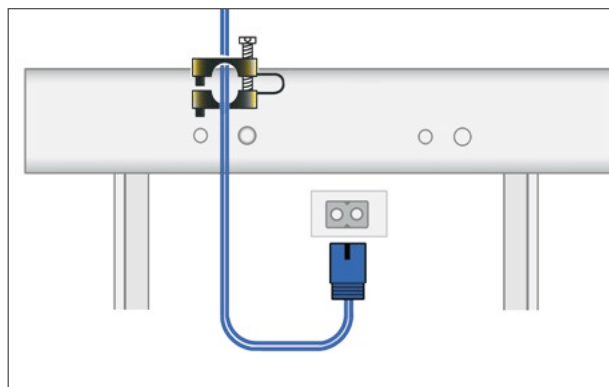


Figure 4-6: Power cord in strain relief mounted to frame

Warning



- *Arrange the power cord properly.*
- *Lay the power cord flat on the floor.*
- *Keep the power cord away from the pedals.*

Caution



Equipment Damage

Before connecting the ergometer to the power line, check that the line voltage corresponds to the ratings on the type plate.

The type plate is located on the back of the device, at the bottom.

Note



Disconnection from Power Supply

Only the removal of the power cord will result in an all-pole disconnection of the device from the power line.

Ensure that the power plug is readily accessible at all times.

5 Preparing the Patient

5.1 Handlebar Adjustment

To adjust the handlebar angle, open the clamping lever ① by turning it counter-clockwise.

Choose a handlebar angle that allows the patient to sit up straight and comfortably. Tighten clamping lever ① hand tight by turning it clockwise. Then tighten the clamping lever another 1/4 turn clockwise so that the clamping is secure.

Caution



Before use, adjust the handlebar to the patient. An incorrect handlebar setting will cause the patient to adopt an ergonomically incorrect posture, which leads to transient pain.



Figure 5-1: Handlebar adjustment

① Clamping lever



Figure 5-2: Secure the clamping lever

Before allowing the patient to lean on the handlebar, check the clamp as follows:

Danger



- *With the ergometer standing firmly, check that the handlebar is tight by trying to push the handlebar downwards from above. Adjust the clamping force of the clamping lever if necessary.*

*The handlebar is not designed to support the full body weight!
Risk of falling!*



5.2 Saddle Adjustment

The saddle height of the optibike basic/optibike plus is adjusted manually with a clamping lever.

When the pedal is in its lower position, there should be a 10° angle between the axis formed by the upper body and the thigh.

If necessary, adjust the handlebar to a position where it is comfortable to reach for the patient while sitting upright.

Caution



Before use, adjust the saddle height to fit the patient size. An incorrect saddle height will cause the patient to adopt an ergonomically incorrect posture, which leads to transient pain.

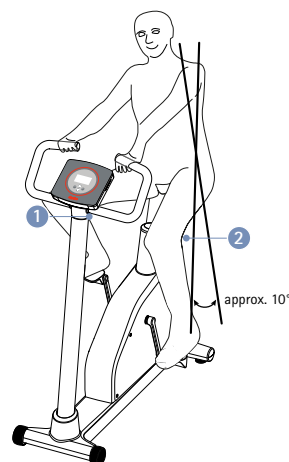


Figure 5-3: Adjusting saddle and handlebar

- 1 Adjusting the handlebar angle
- 2 Adjusting the height of the saddle

Open the clamping lever 2 by turning it counter-clockwise. Then you are able to adjust the saddle height.

Adjust the appropriate saddle height. Ask the patient to stand next to the saddle. Position the saddle at the level of the patient's hip. Tighten clamping lever 2 hand tight by turning it clockwise. Then tighten the clamping lever another 1/4 turn clockwise so that the clamping is secure.



Figure 5-4: Tightening the clamping lever

Warning



- Do not choose saddle height settings above the "max." mark.
- Do not exceed the maximum height marked on the scale to avoid any risk of falling!
- At the maximum load level of the ergometer, the temperature at the saddle may reach 41.5°C.
- The ergometer may only be used on a dressed and fully conscious patient.



max.
▼

Before allowing the patient to sit down on the saddle, check the secure fixation of the saddle as follows:

Danger



With the ergometer standing firmly, check that the saddle is securely clamped by trying to push it downwards from above. Adjust the clamping force of the clamping lever if necessary.



6 Control Terminal of optibike basic

The patient/end user has unrestricted access to all functions.



Figure 6-1: optibike basic control terminal

6.1 Turning the System On

You turn on the ergometer by pressing the power switch.

The ergometer runs a self-test. Subsequently, the main menu displays.



Figure 6-2: Self-test screen

Note



- Instruct the patient not to pedal while the ergometer is being turned on and during the self-test.
- The device can be configured to default to one of the operating modes.

If this option is selected, the start screen of the selected operating mode (e.g., for training with a constant load) will be displayed instead of the main menu.

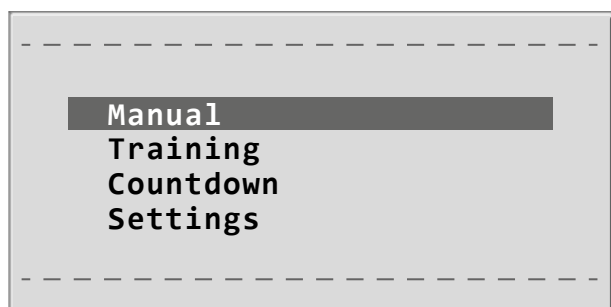






Figure 6-3: Main menu – Manual

The ergometer software is controlled with 4 keys:

-  With this key you select a menu item and confirm the selection.
-  With this key you display the main menu or return to the previous menu level.
-  With these keys you scroll up and down through the menu items.
- 

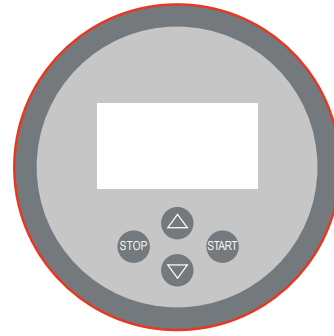


Figure 6–4: optibike basic – keypad and display

6.2 Operating Modes

The optibike basic / optibike plus ergometer supports the following operating modes:

Manual

The ergometer is controlled manually, i.e., the user performs all load changes via the keypad (see chapter 6.3 *Manual* on page 20).

Training

The optibike ergometer supports various training modes. Up to 10 different protocols can be configured and saved (see chapter 6.4 *Training* on page 21).

Countdown

The duration of the training and the initial load are known parameters in this mode. They can be preconfigured (see chapter 6.6 *Settings* on page 26). The "Countdown" timer counts down to zero.

Settings

Used to configure the ergometer.

6.3 Manual

Use the softkeys (Δ ∇) to position the bar cursor on **Manual** and confirm the selection with the **Start** key.

In this operating mode the user controls the entire exercise test by selecting the load levels.

By pressing the **Start** key, you initiate the manual training.

By pressing the Δ ∇ keys, you increase and reduce the load.

The manual training can be aborted or terminated at any time with the **Stop** key.

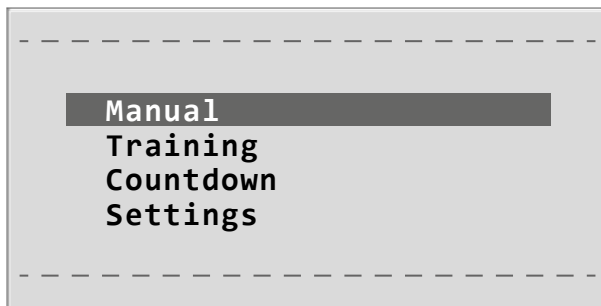


Figure 6-5: Main menu – Manual



Figure 6-6: Start screen

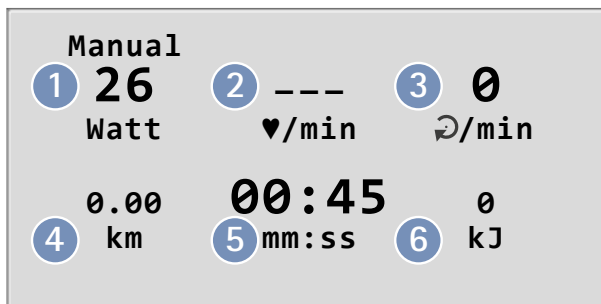


Figure 6-7: Screen display during the training

- ① Current load (watts)
- ② Current heart rate (bpm)
- ③ Pedal speed (RPM)
- ④ Covered distance (km)
- ⑤ Duration of the training (min:sec)
- ⑥ Expended energy (kJ/kCal)

6.4 Training

6.4.1 Introduction

The optibike ergometer supports various training modes. Up to 10 different protocols can be configured and saved.

For the actual training session, the training protocols can easily be retrieved and started.

Each training session begins with a warm-up phase. You can configure the duration of the warm-up phase and the load (e.g., 3 minutes at 25 watts).

The next step is the training phase (see below) which is followed by the "recovery phase". The duration and the load can be configured for both phases.

Concerning the actual training phase, a distinction is made between the different training modes.

Training at a constant load ("Constant" mode)

In this mode, you will exercise for a defined period of time and with a fixed load.

The ergometer only maintains the watt reading at the set value – your heart rate will be displayed, but the load will **NOT** be adapted to this value.

Pulse-controlled training ("Pulse" mode)

For this training mode, it is necessary to wear the supplied chest strap. The strap captures the heart rate and sends it to the ergometer.

At the ergometer, you set your training heart rate (please ask your doctor, coach, or therapist) and the duration of the training.

During the training session, the ergometer permanently checks the heart rate and compares it with the set training heart rate. If the heart rate is below this value, the load will be increased; if the heart rate is too high, the ergometer will automatically reduce the load.

Caution



Health Hazard

Before starting to exercise with the ergometer, please consult with your doctor whether you are fit for an ergometer training with optibike.

Discuss the training protocol best suitable for you with your doctor and ask for advice concerning your training pulse and maximum load (watts).

The form sheets provided at the end of the manual can be used to note down the recommended training parameters. Take the form sheet with you when you see your doctor.

If you feel dizzy or sick during the training, stop exercising immediately!

Inappropriate or excessive training may be dangerous for your health!

Note



Health Hazard

No training protocols are configured in a new optibike.

Select the "Manual" mode when testing the ergometer for the first time (see chapter 6.3 Manual on page 20).

The training protocols can be defined under "Settings" (see chapter 6.6 Settings on page 26).

6.4.2 Training at a Constant Load ("Constant" Mode)

Use the softkeys (Δ ∇) to position the bar cursor on **Training** and confirm the selection with the **Start** key.

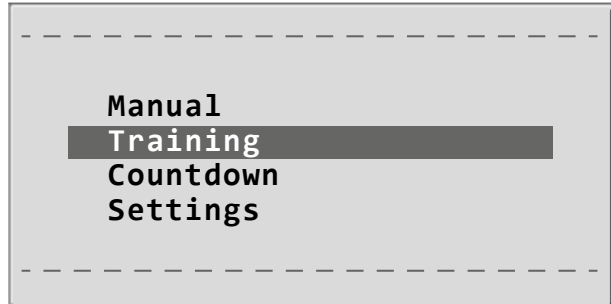


Figure 6-8: Main menu - Training

Use the softkeys (Δ ∇) to position the bar cursor on the protocol "1 - Constant" and confirm the selection with the **Start** key.

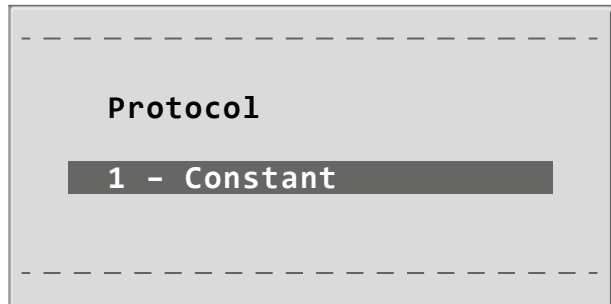


Figure 6-9: Selecting the training protocol

The training protocol is initiated with the **Start** key.

The training consists of five phases:

1. Warm-up phase (Wrmup)
2. Increase load
3. Training (Trg.)
4. Reduce load
5. Recovery phase (Recov)

The duration of phases 2 and 4 is 3 minutes each (fixed). The current training phase is indicated on the display ①.

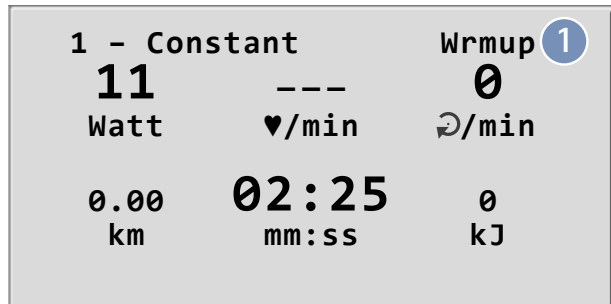


Figure 6-10: Training start (warm-up phase)

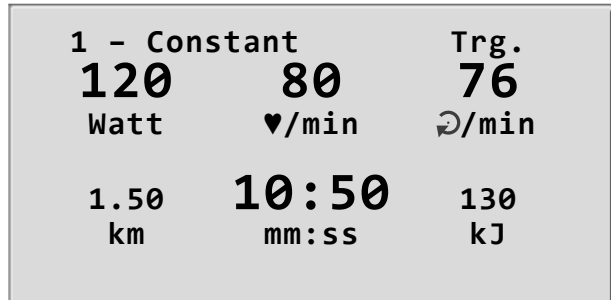


Figure 6-11: Screen display during training

Terminating the Training Session

When the set training phase is over, the ergometer automatically advances to the recovery phase, i.e., the load is reduced to the recovery load defined in the training protocol.

At the end of the recovery phase, the training session is over.

With the **Stop** key, you return to the main screen.

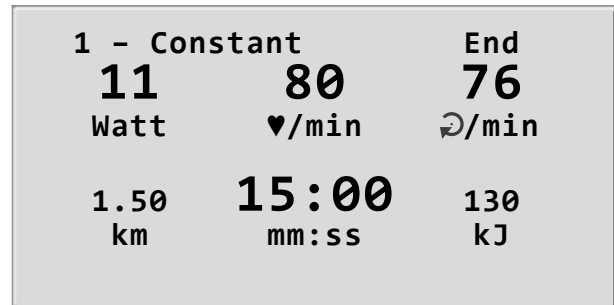


Figure 6-12: Recovery phase

Note



You can advance to the recovery phase at any time by pressing the **STOP** key. Pressing the **STOP** key again will terminate the training.

Note



During the training, if the speed drops below 30 RPM, the Watt reading starts blinking on the display.

6.4.3 Pulse-Controlled Training ("Pulse" Mode)

Use the softkeys (Δ ∇) to position the bar cursor on **Training** and confirm the selection with the **Start** key.

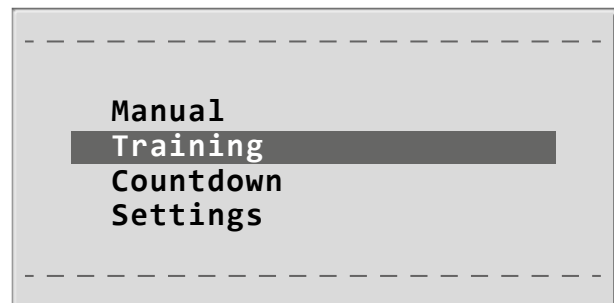


Figure 6-13: Main menu - Training

Use the softkeys (Δ ∇) to position the bar cursor on the protocol "2 - Pulse" and confirm the selection with the **Start** key.

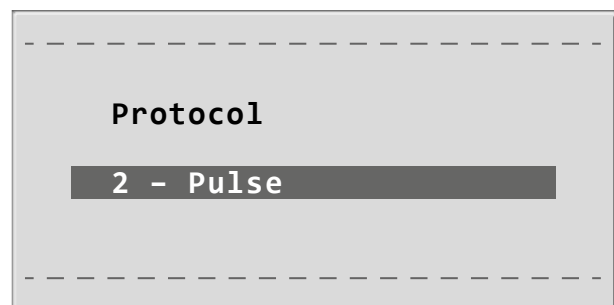


Figure 6-14: Selecting the training protocol

6 Control Terminal of optibike basic

The training protocol is initiated with the **Start** key.

The training consists of five phases:

1. Warm-up phase (Wrmup)
2. Increase load
3. Training (Trg.)
4. Reduce load
5. Recovery phase (Recov)

The duration of phases 2 and 4 is 3 minutes each (fixed).
The current training phase is indicated on the display ①.

During the training session, the ergometer permanently checks the heart rate and compares it with the set training heart rate. If the heart rate is below this value, the load will be increased; if the heart rate is too high, the ergometer will automatically reduce the load.

Terminating the Training Session

When the set training phase is over, the ergometer automatically advances to the recovery phase, i.e., the load is reduced to the recovery load defined in the training protocol.

At the end of the recovery phase, the training session is over.

With the **Stop** key, you return to the main screen.

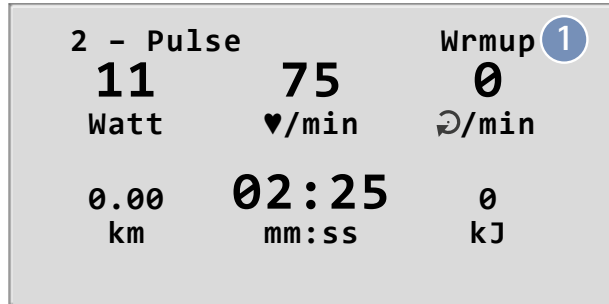


Figure 6-15: Training start (warm-up phase)

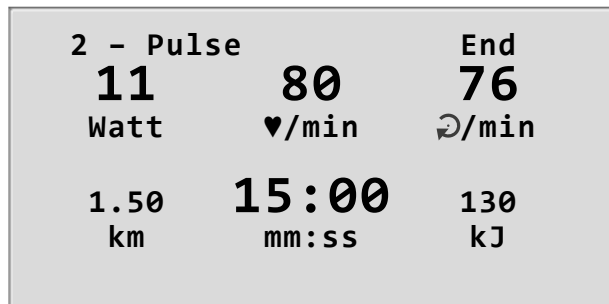


Figure 6-16: Recovery phase

Note



You can advance to the recovery phase at any time by pressing the **STOP** key. Pressing the **STOP** key again will terminate the training.

Note



During the training, if the speed drops below 30 RPM, the Watt reading starts blinking on the display.

6.5 Countdown

Use the softkeys (Δ ∇) to position the bar cursor on **Countdown** and confirm the selection with the **Start** key.

The duration of the training and the initial load are known parameters in this mode. They can be preconfigured (see chapter 6.6 *Settings* on page 26). The "Countdown" timer counts down to zero. The load can be adapted during the training.

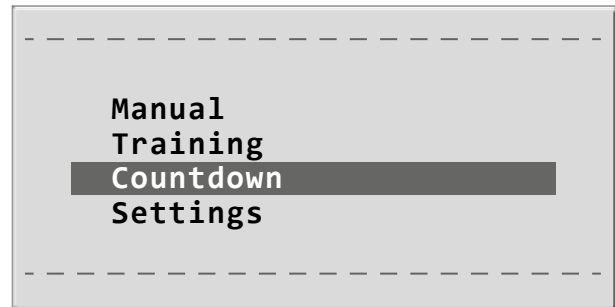


Figure 6-17: Main menu - Countdown

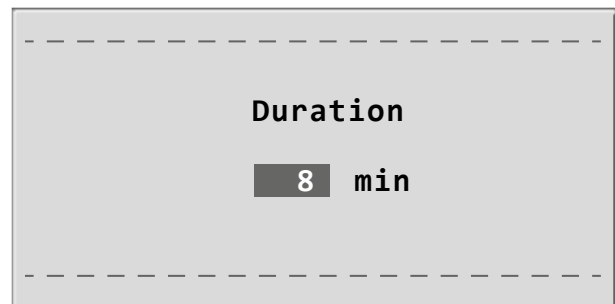


Figure 6-18: Setting the countdown timer

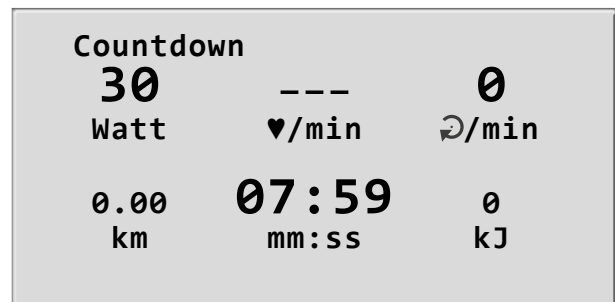


Figure 6-19: Countdown

Terminating the Training Session

The training can be terminated manually at any time with the **End** key.

The load will immediately drop to 0 watt.

There is no recovery phase in the manual mode.

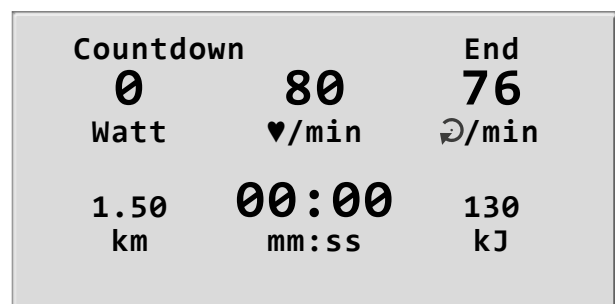


Figure 6-20: End of the training session

6.6 Settings

Some of the device settings are configurable to meet specific requirements. The settings will be saved and remain stored even when the ergometer is switched off.

Use the softkeys (Δ ∇) to position the bar cursor on **Settings** and confirm the selection with the **Start** key. The configuration menu displays.

When all changes have been made, you can exit the configuration menu with the **Start** key.

Use the softkeys (Δ ∇) to position the bar cursor on the parameter to edit and confirm the selection with the **Start** key.

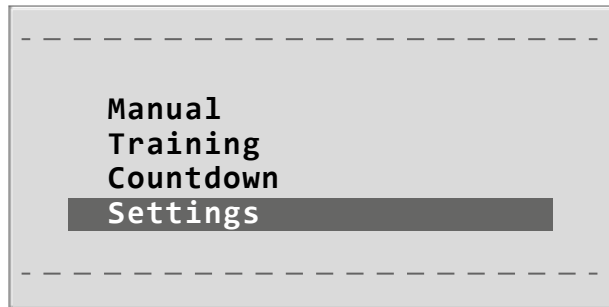


Figure 6-21: Main menu - Settings

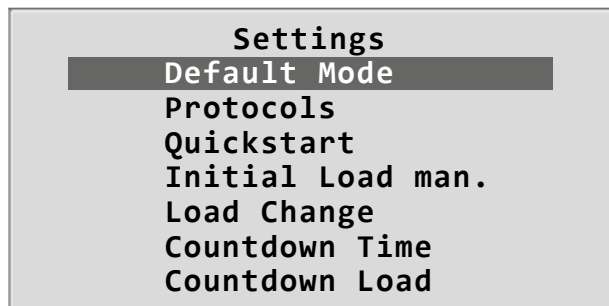


Figure 6-22: Settings menu

6.6.1 Default Mode

In this menu you choose the default mode activated when the ergometer is turned on. When first turned on after delivery, the ergometer will display this menu.

Use the softkeys (Δ ∇) to position the bar cursor on the default mode to be set and confirm the selection with the **Start** key.

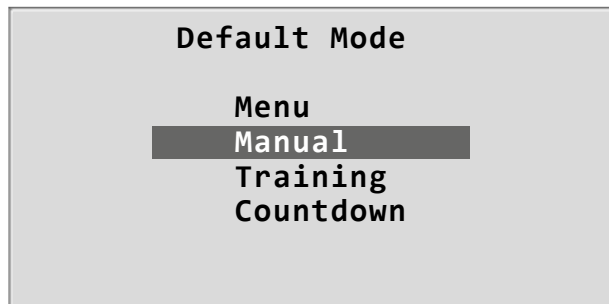


Figure 6-23: Selecting the default mode

6.6.2 Protocols

The training protocols can be configured as needed. A distinction is made between constant-load protocols ("Constant" mode) and pulse-controlled protocols ("Pulse" mode).

Use the softkeys (Δ ∇) to position the bar cursor on the protocol to edit and confirm the selection with the **Start** button.

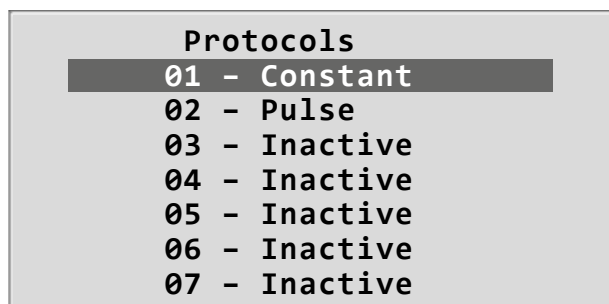


Figure 6-24: Selecting the training protocol to edit

Use the softkeys (Δ ∇) to select the parameter to edit.

Protocol 01	
Select	Constant
Wrmup Time	1 min
Wrmup Load	11 W
Trg.Time	3 min
Trg.Load	16 W
Recov.Time	2 min
Recov.Load	13 W

Figure 6–25: Selecting the parameter to edit

After confirming with **Start**, the corresponding value is highlighted and can be adapted with the softkeys (Δ ∇).

Pressing **Start** will save the new value.

Protocol 01	
Select	Constant
Wrmup Time	1 min
Wrmup Load	11 W
Trg.Time	3 min
Trg.Load	16 W
Recov.Time	2 min
Recov.Load	13 W

Figure 6–26: Editing the parameter value

6.6.3 Quick Start

When the "Quick Start" function is activated, a manual training session will start automatically only after the pedal speed exceeds 30 rpm.

Quick Start
On
Off

Figure 6–27: Activating the Quick Start mode

6.6.4 Initial Load for a Manual Training

In this menu, the initial load for a manual training session is defined.

Initial Load man.
26 Watt

Figure 6–28: Setting the initial load for a manual training session

6.6.5 Load Change

Here you determine the increments for each load change. Depending on your choice, each key press will change the load by +/- 1, 5, 10 or 25 watts.

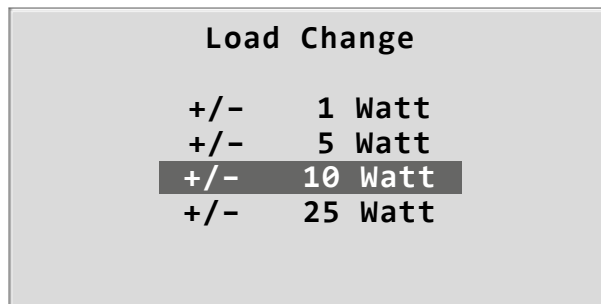


Figure 6–29: Selecting the increment for manual load changes

6.6.6 Countdown Time

In this menu, you define the duration of a training session in the "Countdown" mode. During the training, the timer starts with the specified time and counts down to zero.

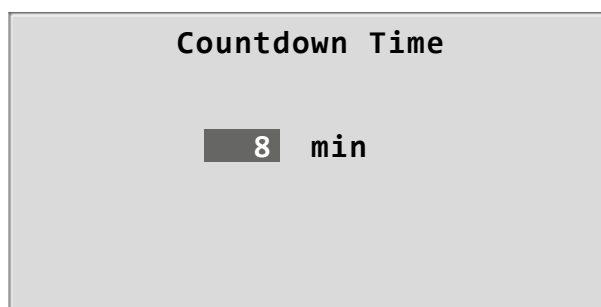


Figure 6–30: Setting the countdown timer

6.6.7 Countdown Load

In this menu, you define the load for a training session in the "Countdown" mode.



Figure 6–31: Setting the countdown load

6.6.8 Energy

In this menu, you select the unit of measurement for calculation of the energy expenditure. The two options are kJ and kCal.

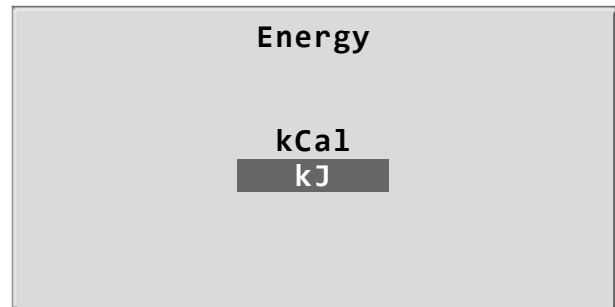


Figure 6-32: Selecting the energy unit of measurement

6.6.9 Contrast

The display contrast is adjustable in the range from 0 to 100 %.

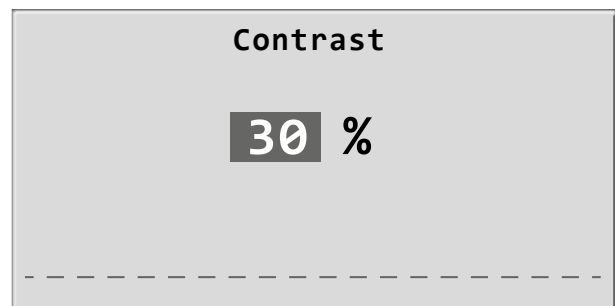


Figure 6-33: Adjusting the display contrast

6.6.10 HR Belt

If the test subject wears a chest belt to measure the heart rate during the training, the corresponding chest belt number must be entered here. You will find the number on the back of the chest strap housing. It is the unique identifier for this particular belt.

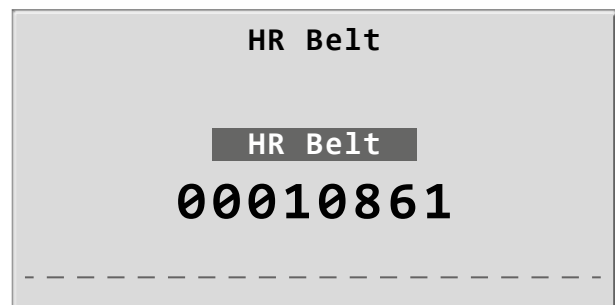


Figure 6-34: Adjusting the HR Belt number

6.6.11 Language

The texts can be displayed in different languages.



Figure 6–35: Language menu

6.6.12 Software Version

Select this option to view the installed software version.



Figure 6–36: Display of the installed software version

7 Control Terminal of optibike plus

7.1 Turning the System On

The patient/end user has unrestricted access to all functions.

You turn on the ergometer by pressing the power switch (toggle switch [I/O]).

Note



- The control terminal is equipped with a backup battery, type: CR 2032 / 3 V 230 mAh. The battery may only be replaced by authorized specialists or upon consultation with the ergoline Service Department.
- The replacement procedure is explained in detail in the Field Service Manual.
- Please contact ergoline, if you would like to receive a copy of the Field Service Manual.

Warning



- The device will not work when the battery polarity is not observed. The device may heat up, the batteries may leak and destroy the device.
- If short-circuiting of the batteries occurs, they may become very hot and cause burn injuries.
- Use only high-quality, leak-proof batteries with the stated specifications.
- Do not dispose of used batteries with your domestic waste. Take batteries to a designated collection point for waste batteries or hazardous waste. Please contact your local authority.

The ergometer runs a self-test. Subsequently, the main menu displays.

Note



Instruct the patient not to pedal while the ergometer is being turned on and during the self-test.

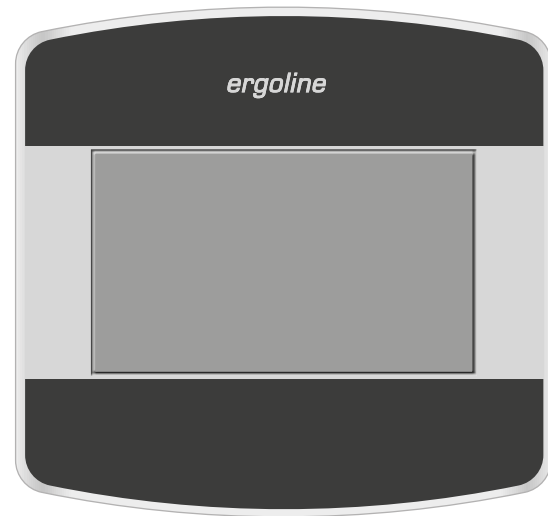


Figure 7-1: Control terminal T

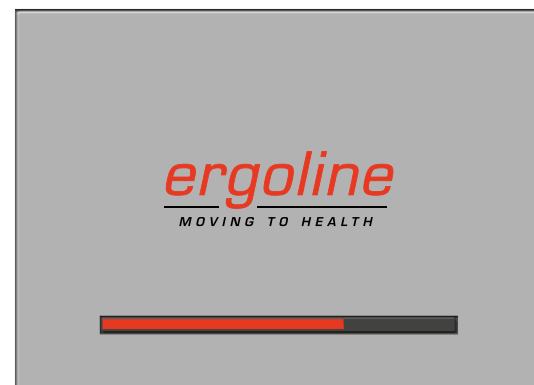


Figure 7-2: Self-test screen

The ergometer software is controlled from the touch panel.

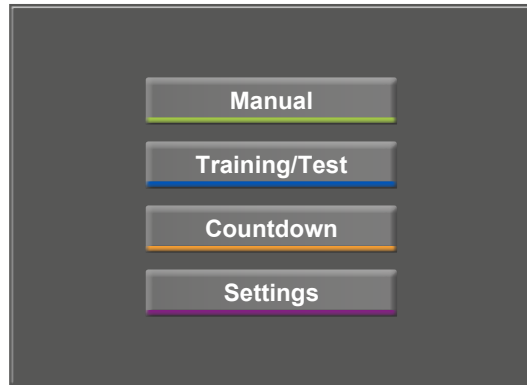


Figure 7–3: Main menu

7.2 Operating Modes with Control Terminal T

Ergometers with control terminal T support the following operating modes:

Manual

The ergometer is controlled manually, i.e., the user performs all load changes via the display.

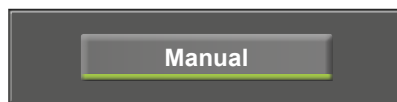


Figure 7–4: Manual mode

Training/Test

Ten user-configurable training/test protocols are available (see chapter 7.6.8 *Training/Test* on page 42).

A POLAR® or *ergoline* HR receiver is integrated in the ergometer and provides the relevant data for heart-rate controlled training sessions. The test subject's performance can be assessed on the basis of these protocols.

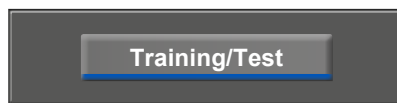


Figure 7–5: Training/Test mode

Countdown

The duration of the training and the initial load are known parameters in this mode. They can be preconfigured (see 7.6.13 and 7.6.14). The "Countdown" timer counts down to zero. The load can be adapted during the training.



Figure 7–6: Countdown mode

Settings

Used to configure the ergometer.

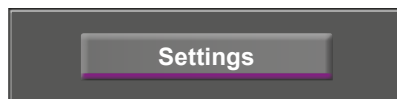


Figure 7–7: Settings mode

7.3 Manual

In this mode the ergometer is entirely controlled by the user.

Before the session is started, the parameters for an optional heart rate chest strap can be entered (see chapter 7.6.9 *HR Belt Number* on page 43).

The heart rate belt required for the training is selected with the numeric keys. The heart rate belt numbers are defined in the *Settings* menu (see chapter 7.6.9 *HR Belt Number* on page 43).

Pressing the **Start** key initiates the training, the [+ 10 W] and [- 10 W] keys are used to control the load. The increment for the load change can be set in the configuration menu between +/- 1 W and +/- 25 W (see chapter 7.6.3 *Load Change* on page 39).

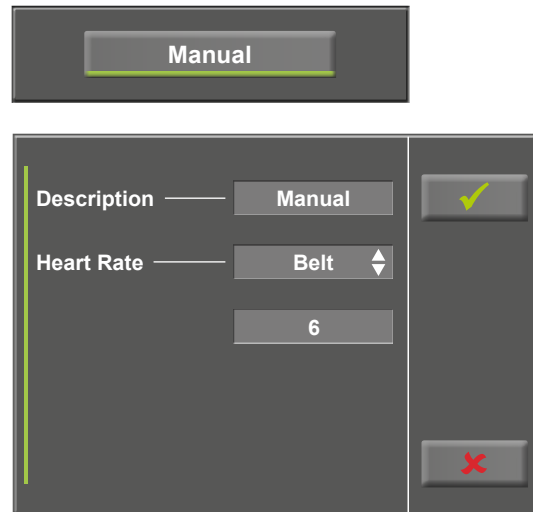


Figure 7-8: Information on the assigned HR belt

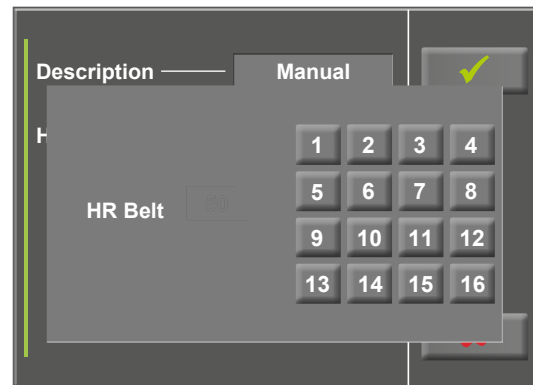


Figure 7-9: Selecting the heart rate belt

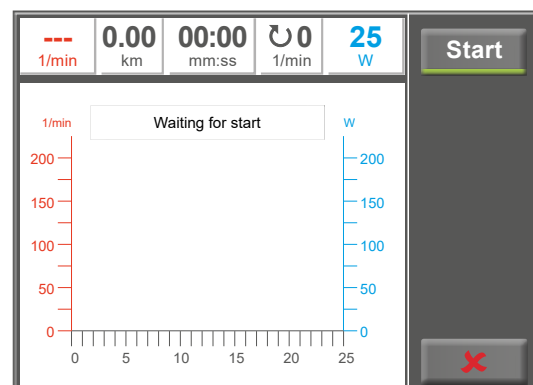


Figure 7-10: Starting a manual test

Terminating the Training Session

The training can be terminated manually at any time with the **Stop** key.

The load will immediately drop to 0 watt.

There is no recovery phase in the manual mode.

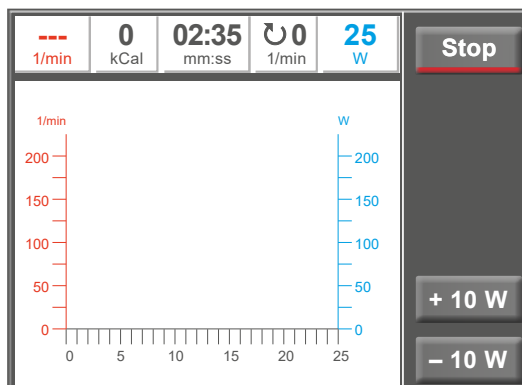


Figure 7 – 11: Terminating a manual test

7.4 Training/Test

7.4.1 Selecting the Training/Test Protocol

Up to 10 different protocols are available in the *Training/ Test* menu (see chapter 7.6.8 *Training/Test* on page 42).

To edit the parameters of a training / test protocol, press the key of the training or test protocol.

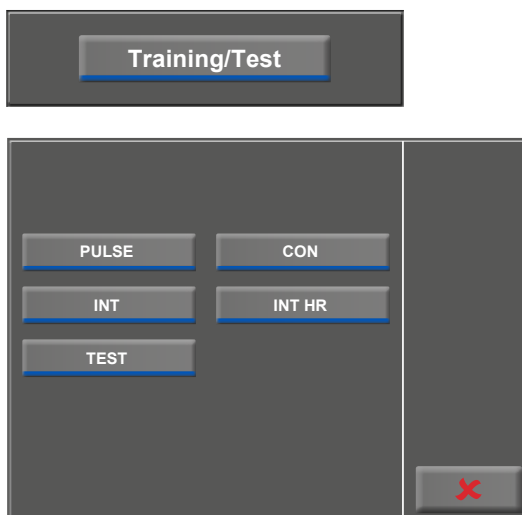


Figure 7 – 12: Selecting the training/test protocol

7.4.2 Editing Parameters

The preconfigured parameters (light gray fields) can now be edited by touching the display or by repeatedly tapping the arrow key [↕].

If you need to input characters (numbers or letters), a numeric keypad or a keyboard will be displayed.

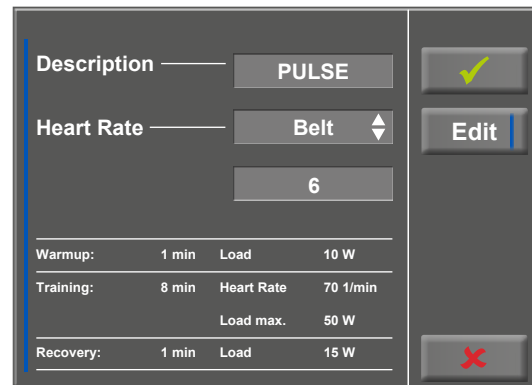


Figure 7-13: Editing parameters – screen 1

With the [↓] (arrow down, [↓2.] or [↓3.]) key, you advance to the next menu level where more parameters can be configured. With the [↑] (arrow up, [↑1.] or [↑2.]) key, you return to the previous screen.

With the [✓] key, you confirm the input.

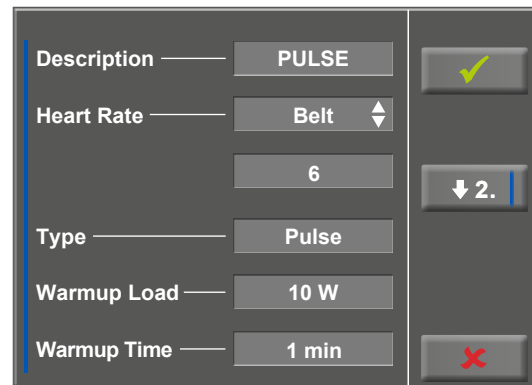


Figure 7-14: Editing parameters – screen 2

The individual parameters are defined via the numeric keypad.

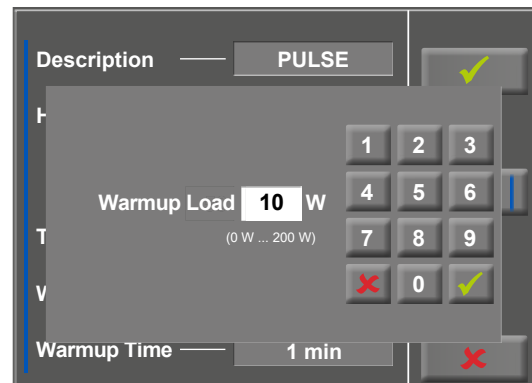


Figure 7-15: Editing parameters – screen 3

7.4.3 Starting the Training Session

The training session is started with the **Start** key. The "Waiting for start" message disappears, the timer starts, and the load defined in the training parameters is activated.

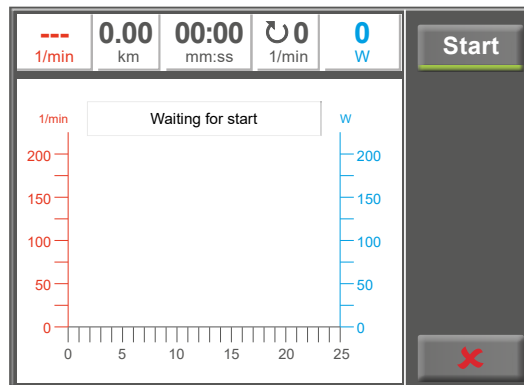


Figure 7 – 16: Starting the training session

7.4.4 Warm-up Phase

During the training session, the most relevant values will be shown on the display in numeric form (see illustration on the right). Additionally, the load and heart rate (from the chest strap) are represented in graphic form. The heart rate curve is shown with a bolder trace to allow the two curves to be differentiated.

The heart rate axis is the red axis on the left, the load axis is the blue axis on the right.

With the **Stop** key, the user can directly enter the recovery phase from any phase of the training session.

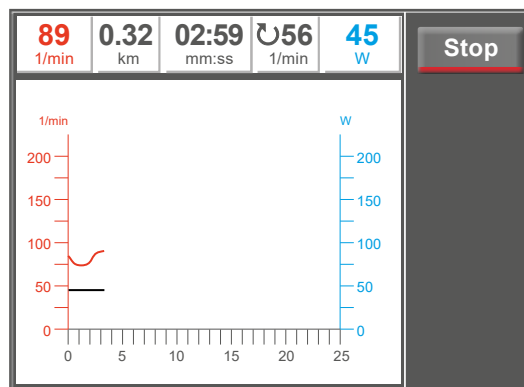


Figure 7 – 17: Warm-up phase

7.4.5 Training Phase

Figure 7 – 18 shows an interval training (see chapter 7.6.8 *Training/Test* on page 42).

With the **Stop** key, the user can directly enter the recovery phase from any phase of the training session.

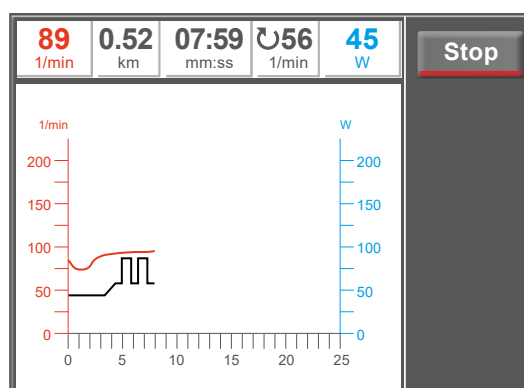


Figure 7 – 18: Training phase

7.4.6 Recovery Phase

The message *Recovery phase* is displayed during the recovery phase.

The training is terminated with the **Stop** key.

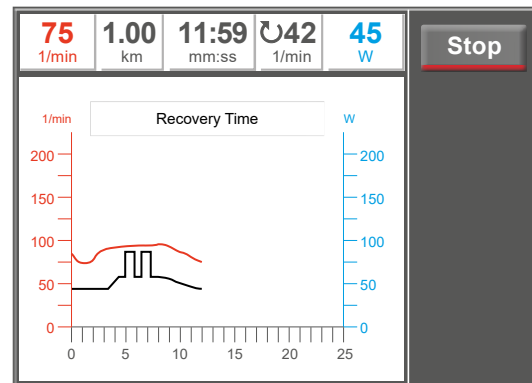


Figure 7-19: Recovery phase

7.4.7 Terminating the Training Session

On completion of the training session, the message *End* is displayed and an audio signal can be heard. The signal traces are stopped. The heart rate reading continues to be updated.

With the **Stop** key, you return to the training protocol menu.

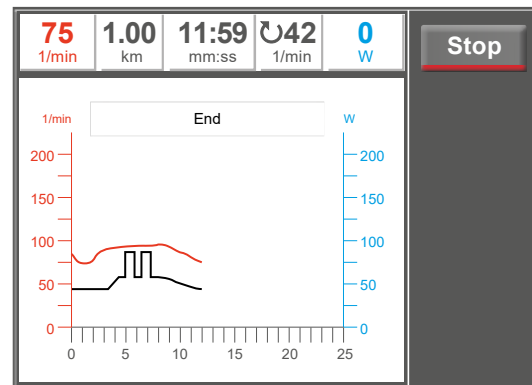


Figure 7-20: Terminating the training session

7.5 Countdown

In this mode, the preconfigured parameter "Time" can be modified. It is also possible to select the heart rate belt.

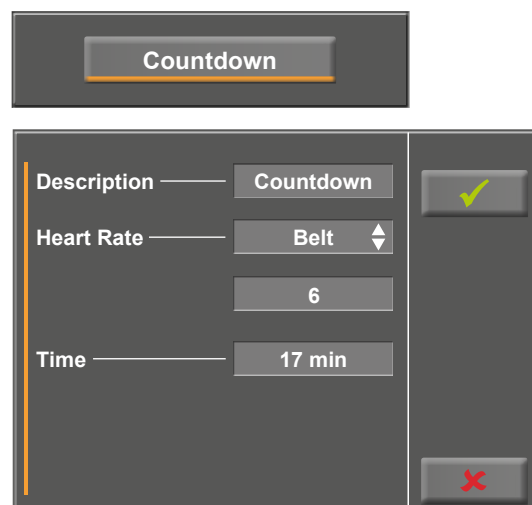


Figure 7-21: Editing parameters – screen 1

The duration of the training session can be defined via the numeric keypad.

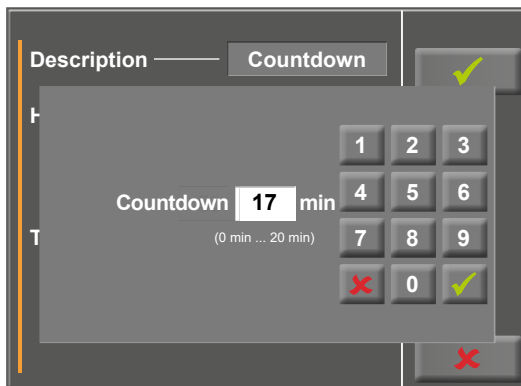


Figure 7 – 22: Editing parameters – screen 2

7.6 Settings

The [Settings] key opens the configuration menu. Different setups can be configured in this menu.

To edit parameters or settings, touch the corresponding menu item on the display.

Confirm changes with the [✓] key, press the [✕] key to quit a menu.

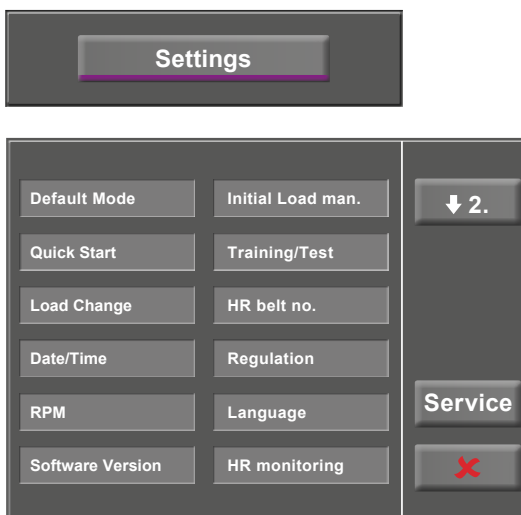


Figure 7 – 23: Settings menu – screen 1

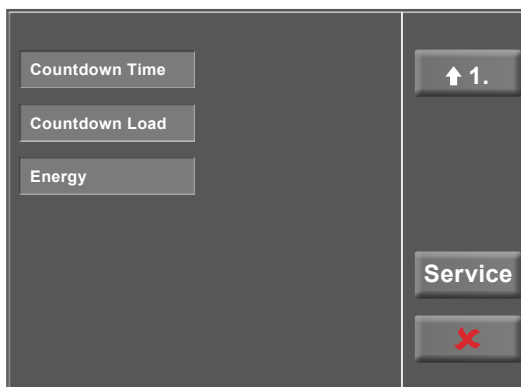


Figure 7 – 24: Settings menu – screen 2

7.6.1 Default Mode

Here you select the operating mode to be activated when the ergometer is turned on

- Menu
- Countdown
- Training/Test
- Manual

Select the desired mode and confirm with the [✓] key.

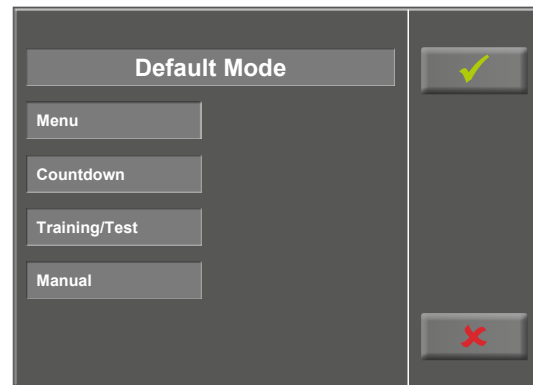


Figure 7-25: Selecting the default mode

7.6.2 Quick Start

When the "Quick Start" function is activated, a manual training session will start automatically only after the pedal speed exceeds 30 rpm.

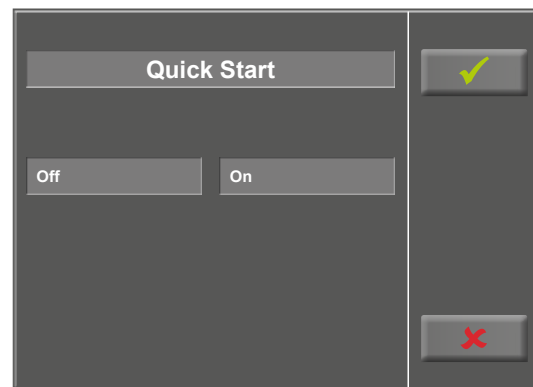


Figure 7-26: Activating the Quick Start mode

7.6.3 Load Change

With this function, the increments for load changes are adjusted.

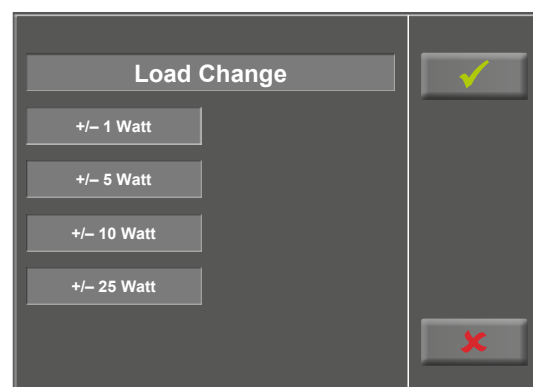


Figure 7-27: Adjusting the load change increments

7.6.4 Date/Time

By touching the respective fields, the date and time are adjusted.

Day, month, year as well as hours, minutes and seconds are entered via the numeric keypad.

The inputs are confirmed with the [✓] key.

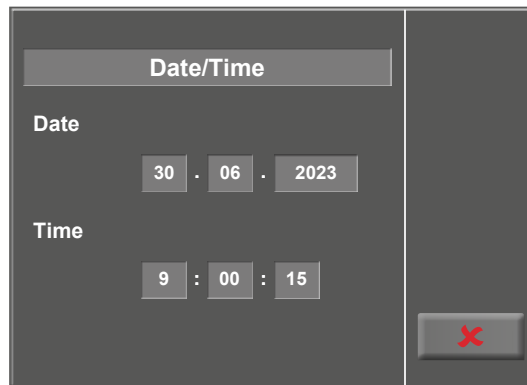


Figure 7–28: Adjusting date and time – screen 1

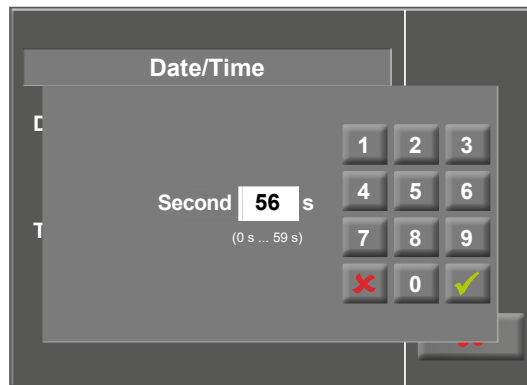


Figure 7–29: Adjusting date and time – screen 2

7.6.5 Speed (RPM)

In this menu, you determine the limits for the RPM indication.

The 3 LEDs on the control panel show the patient whether the pedal speed is high, low or correct.

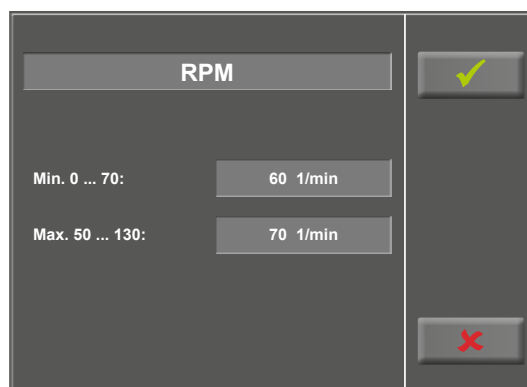


Figure 7–30: Adjusting RPM limits – screen 1

After touching the light gray field to the right of *Min.* or *Max.* (see figure 7–37), the value can be entered via the numeric keypad.

With the [✓] key, the input is confirmed, with the [✗] key, it is discarded.

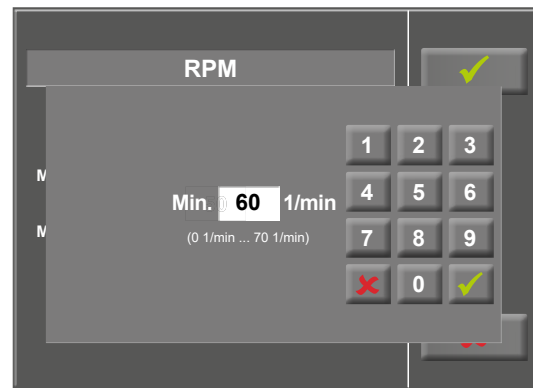


Figure 7–31: Adjusting RPM limits – screen 2

7.6.6 Software Version

This menu shows the software version and the date of the next technical inspection of the measuring system (MTK).



Figure 7–32: Display of the software version

7.6.7 Initial Load for a Manual Training

In this menu, the initial load for a manual training session is defined.

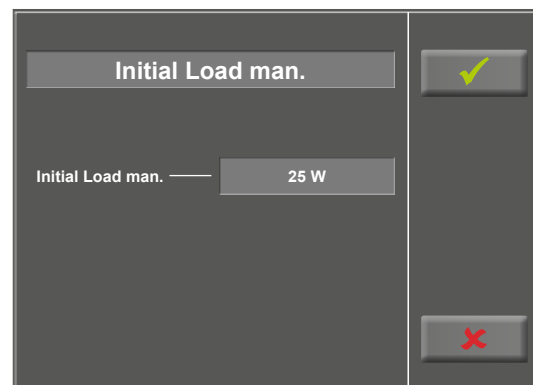


Figure 7–33: Initial load, manual training – screen 1

7 Control Terminal of optibike plus

After touching the light gray field to the right of *Initial Load man.* (see figure 7 – 40), the value can be entered via the numeric keypad.

With the [✓] key, the input is confirmed, with the [✕] key, it is discarded.

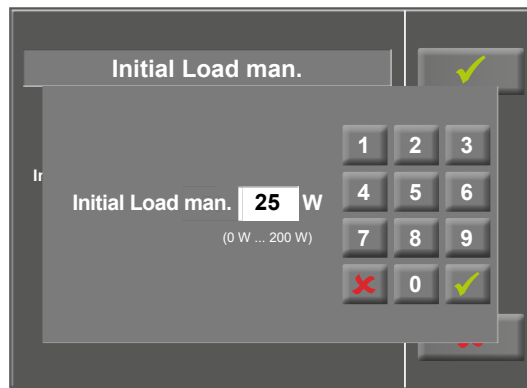


Figure 7 – 34: Initial load, manual training – screen 2

7.6.8 Training/Test

The optibike controls the entire training session, including the *warm-up, training, and recovery phases.*

Up to 10 different training protocols can be configured and saved.

The following training and test modes are available:

- Pulse-controlled training
- Constant-load training
- Interval training
- Interval HR training
- Ramp test
- PWC Test 1 (130 bpm)
- PWC Test 2 (150 bpm)
- PWC Test 3 (170 bpm)

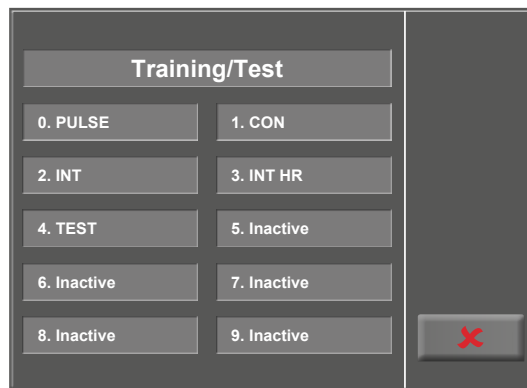


Figure 7 – 35: Training/test protocol menu

Protocol	Basic Load [W]	Duration [sec]	Load Change [W]	Stage Time [sec]	Recovery Load [W]	Recovery Time [min]
Ramp test	0	120	25	10	25	99
PWC-130 (*)	25	0	25	120	25	99
PWC-150 (*)	50	0	25	120	25	99
PWC-170 (*)	50	0	50	120	25	99

(*) The protocol advances to the recovery phase as soon as the target heart rate (130/150/170) is reached.

7.6.9 HR Belt Number

If the test subject wears a chest belt to measure the heart rate during the training, the corresponding chest belt number must be entered here. You will find the number on the back of the housing. It is the unique identifier for this particular belt.

With the [▼ 2.] and [▲ 1.] keys, you toggle between the screen displays.



Figure 7–36: Adjusting the HR belt number – screen 1



Figure 7–37: Adjusting the HR belt number – screen 2

7.6.10 Regulation

Load control

This option only applies to the pulse-controlled training mode "Pulse".

You define how promptly the load will be adapted to changes in the heart rate.

gradual:

The load changes very slowly in response to a change in the heart rate.

Choose this option if the heart rate increases very quickly in response to a higher load.

normal (default):

The load changes with a medium response time.

steep:

The load changes very quickly in response to a change in the heart rate.

Choose this option if the heart rate increases very slowly in response to a higher load.

Duration: load +

With this setting, you set the time after which the training phase configured in the training protocol will start (default: 3 minutes).

The actual training phase begins at the end of the warm-up phase either

- after the set training heart rate has been reached,
- after the maximum load has been reached, or
- when the period of time set in this menu has elapsed.

Duration: load -

This value defines the period of time in which, after completion of the training phase, the ergometer reduces the load from the last training load to the configured recovery load (default: 3 minutes).



Figure 7 – 38: Defining the regulation parameters

7.6.11 Language

Here you choose the language for the user interface.



Figure 7-39: Selecting the language

7.6.12 HR Monitoring

These parameters are required for the "Interval HR" training mode.

If the heart rate exceeds the "Heart rate" value (see chapter 7.4 *Training/Test* on page 34) by the "Threshold" value for the duration of the "Delay", the load for the subsequent interval will be reduced.

- by a relative value [%] or
- by an absolute value [W]

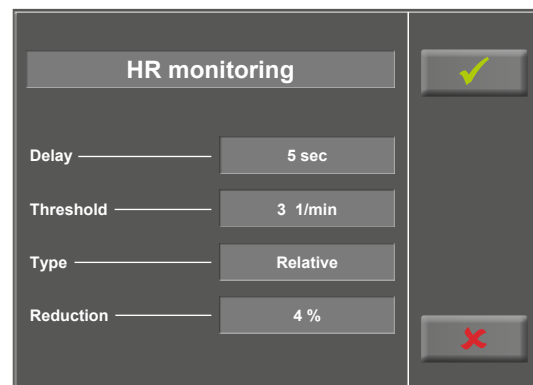


Figure 7-40: Defining the heart-rate monitoring parameters

7.6.13 Countdown Time

In this menu, you define the duration of a training session in the "Countdown" mode. During the training, the timer starts with the specified time and counts down to zero.

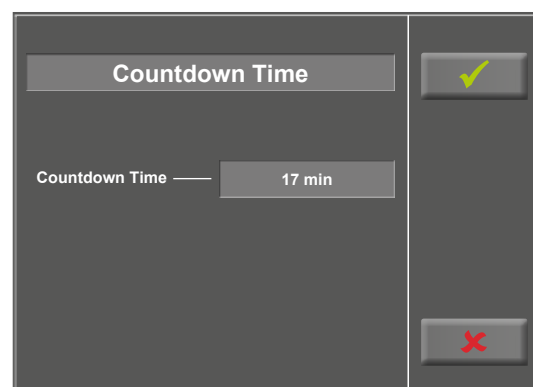


Figure 7-41: Setting the countdown timer

7.6.14 Countdown Load

In this menu, you define the load for a training session in the "Countdown" mode.

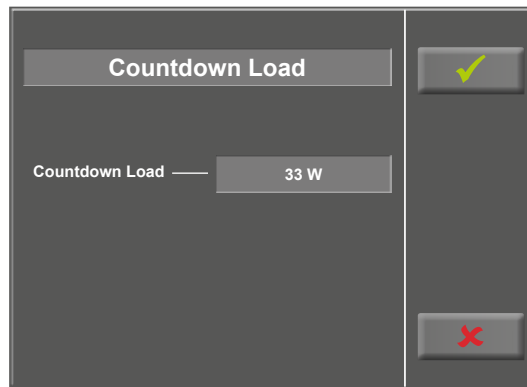


Figure 7 – 42: Setting the countdown load

7.6.15 Energy

In this menu, you select the unit of measurement for calculation of the energy expenditure. The two options are kJ and kCal.



Figure 7 – 43: Selecting the energy unit of measurement

8 Cleaning, Disinfection and General Hygiene Measures

The document "Cleaning and Disinfection ergoline Medical Devices" (Part No. 201000641000) in its most recent version is also part of this manual. This document is exclusively made available for download from the ergoline website www.ergoline.com.

9 Maintenance

Only qualified technicians authorized by ergoline are allowed to carry out maintenance, servicing, technical inspections of the measuring system, and technical safety inspections.

These interventions may only be carried out when the ergometer is not in use.

On request, ergoline GmbH will provide circuit diagrams, component lists, descriptions, calibration instructions, and other information that support the maintenance personnel when they repair those parts of the medical device which the manufacturer identified as repairable by maintenance personnel.

The parts of the medical device which the manufacturer identified as repairable by maintenance personnel are listed in the Field Service Manual.

9.1 Checks Before Each Use

Before each use, visually inspect the device for signs of mechanical damage. If you detect damage or impaired functions which may result in a hazard to the patient or the operator, the device must be repaired before it can be used again.

9.2 Technical Safety Inspections, Inspections of the Measuring System

The inspection of the measuring system and the technical safety inspection must be completed every two years according to the rules of the art by a Service Engineer authorized by ergoline GmbH.

The date of the next inspection is indicated on the inspection sticker attached next to the type plate on the ergometer.

9.3 Disposal

The product described in this operator manual must not be disposed of as unsorted municipal waste but must be collected separately.



Please contact your authorized manufacturer ergoline GmbH for information concerning the disposal of your equipment. There is no proof of disposal. Proper disposal is documented by ergoline GmbH.

Consult Operator's Manual!

10 System, Error, and Failure Messages


Displayed error	Error description	Troubleshooting
Device cannot be switched on.	Device cannot be switched on with the power switch.	<ul style="list-style-type: none"> • Check that the power cord is properly plugged into the power outlet. • Check that the power cord is properly plugged into the device. • Check that voltage is applied to the power outlet (connect another functioning device). If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
Wrong SW config.	The software configuration of some of the PC boards is not compatible with the configuration of the overall software.	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
To high rotation	The pedal speed of 130 revolutions/min was exceeded.	The error message disappears after 5 seconds. If the error message does not disappear after 5 seconds, switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
Load out of limit	The load is outside the tolerance limits.	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
DMS Offs. invalid	The offset value of the torque sensor is outside the tolerance limits.	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
DMS Gain invalid	The gain of the torque sensor is outside the tolerance limits.	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
+24V out of range	The 24 V DC voltage supply is outside the tolerance range.	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
Brake not releas.	The torque sensor is not recognized.	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
Safety state mode	Safety circuit violated.	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.

Displayed error	Error description	Troubleshooting
Setup not ready	Setup aborted	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.
CAN zykl. Timeout	CAN bus fault	Switch the device off and on again. If the error persists, please contact the ergoline GmbH Service Department or a service partner authorized by ergoline.

11 Technical Specifications

11.1 Ergometer

Model	optibike basic/optibike plus																																														
Operating mode	<table border="1"> <thead> <tr> <th>Load</th> <th>Speed</th> <th>1st interval in minutes*</th> <th rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg);">followed by</th> <th>OFF time in minutes</th> <th>ON time in minutes</th> </tr> </thead> <tbody> <tr> <td>450 watts</td> <td>85 rpm</td> <td>25</td> <td>26</td> <td>4</td> </tr> <tr> <td>400 watts</td> <td>85 rpm</td> <td>30</td> <td>25</td> <td>5</td> </tr> <tr> <td>350 watts</td> <td>80 rpm</td> <td>35</td> <td>24</td> <td>6</td> </tr> <tr> <td>300 watts</td> <td>75 rpm</td> <td>40</td> <td>23</td> <td>7</td> </tr> <tr> <td>250 watts</td> <td>70 rpm</td> <td>50</td> <td>20</td> <td>10</td> </tr> <tr> <td>200 watts</td> <td>65 rpm</td> <td>70</td> <td>18</td> <td>12</td> </tr> <tr> <td>150 watts</td> <td>60 rpm</td> <td>100</td> <td>15</td> <td>15</td> </tr> <tr> <td>100 watts</td> <td>55 rpm</td> <td>∞</td> <td>–</td> <td>–</td> </tr> </tbody> </table>	Load	Speed	1st interval in minutes*	followed by	OFF time in minutes	ON time in minutes	450 watts	85 rpm	25	26	4	400 watts	85 rpm	30	25	5	350 watts	80 rpm	35	24	6	300 watts	75 rpm	40	23	7	250 watts	70 rpm	50	20	10	200 watts	65 rpm	70	18	12	150 watts	60 rpm	100	15	15	100 watts	55 rpm	∞	–	–
Load	Speed	1st interval in minutes*	followed by	OFF time in minutes		ON time in minutes																																									
450 watts	85 rpm	25		26		4																																									
400 watts	85 rpm	30		25		5																																									
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250 watts	70 rpm	50		20		10																																									
200 watts	65 rpm	70		18		12																																									
150 watts	60 rpm	100		15		15																																									
100 watts	55 rpm	∞		–		–																																									
Power supply	<p>~ 100 – 240 VAC / 50 – 60 Hz / 100 VA max. Removing the power cord results in a complete disconnection from the power supply (all poles).</p>																																														
Specifications of the internal backup battery	IEC: CR 2032 / 3 V 230 mAh																																														
Braking principle	Computer-controlled eddy current brake																																														
Load range	6 – 450 W, speed-independent																																														
Speed range	30 – 130 rpm																																														
Crank length	172 mm (adjustable length cranks available as optional accessories)																																														
Moment of inertia of the crank	14 kg · m ²																																														
Load accuracy	<p>Deviation of measured load: ≤ 5% or 3 watts, whichever is greater (DIN VDE 0750-238:2002-10)</p> <p>Deviation of measured speed: ≤ 2 rpm (DIN VDE 0750-238:2002-10)</p>																																														
Load increments	user-programmable																																														
Internal protocols	<p>Control terminal P (optibike basic):</p> <ul style="list-style-type: none"> • 10 user-programmable training protocols <p>Control terminal T (optibike plus):</p> <ul style="list-style-type: none"> • 10 user-programmable training/exercise test protocols • manual load control • 3 preconfigured performance tests 																																														
Permitted patient weight	160 kg max.																																														

Permitted patient height	<ul style="list-style-type: none"> • approx. 120 – 210 cm • children, if their height and weight is within the defined limits.
Handlebar adjustment	<ul style="list-style-type: none"> • for body heights between 120 cm 210 cm • continuous handlebar adjustment over 360°
Saddle adjustment	continuously, mechanical
Display	<p>Control terminal P with 93 x 70 mm LCD, 128 x 64 pixels</p> <p>Control terminal T with TFT LCD touch screen, 165 x 104 mm, 800 x 480 pixels</p>
Interfaces	<p>PORT 1 (DSUB-9-pole): Service port</p>
Dimensions, weight	<p>length: 1000 mm</p> <p>width: 440 mm (width of handlebar approx. 535 mm)</p> <p>height: 1280 mm</p> <p>weight: approx. 55 kg</p>
Safety standards	DIN IEC 60601-1, DIN EN 60601-1-2, DIN VDE 0750-238
Protection class	II 
Applied part	type B (ergometer)
Classification	class IIa to Annex VIII Medical Device Regulation (EU) 2017/745
RF emission	class B to DIN EN 55011/5.0 DIN EN 60601-1-2
Environment	<p>Operation:</p> <p>temperature: +5 °C to +40 °C</p> <p>Rel. humidity: 15 to 90%, no condensation</p> <p>atmospheric pressure: 700 to 1060 hPa (3000 m)</p> <p>Transport and storage:</p> <ul style="list-style-type: none"> • -25 °C without control of the relative humidity • +5 °C to +35 °C at a relative humidity of up to 90%, no condensation • > 35 °C to 70 °C at a water vapor pressure up to 50 hPa
Type of protection	IP21
Expected lifetime	5 years

11.2 Family of characteristics of the braking torque control range

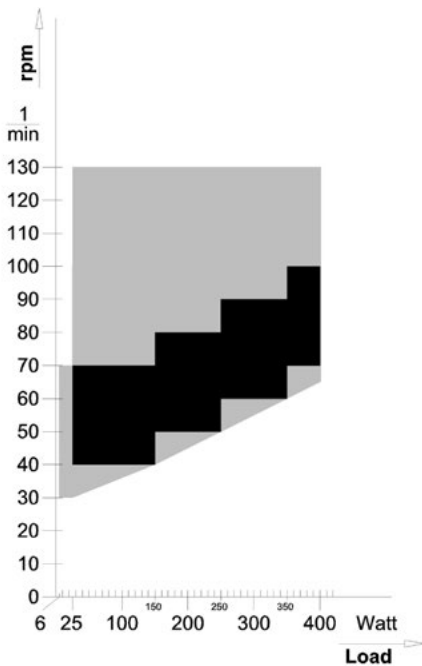


Figure 11 – 1: black: speed-independent range to DIN VDE 0750-0238
 black + gray: speed-independent range of the ergometer

11.3 Family of characteristics of the load periods according to IEC 60601-1

Load	Speed	1st interval in minutes*	followed by	OFF time in minutes	ON time in minutes
450 watts	85 rpm	25		26	4
400 watts	85 rpm	30		25	5
350 watts	80 rpm	35		24	6
300 watts	75 rpm	40		23	7
250 watts	70 rpm	50		20	10
200 watts	65 rpm	70		18	12
150 watts	60 rpm	100		15	15
100 watts	55 rpm	∞	–	–	

* The times refer to a cold start of the ergometer at a maximum ambient temperature of 40°C. This means that the temperature of the ergometer may not exceed the maximum allowed room temperature when starting the first interval. If operation of the ergometer continues after the indicated time interval, it is mandatory to observe the OFF and ON times.

optibike Training Protocol (Pulse-Controlled)

Name		First Name	
Age		Date of Birth	
Height		Weight	

Training mode:	PULSE	<i>Following the warm-up phase, the optibike automatically adjusts the load to a level at which the test subject's heart rate remains constant at the set training heart rate.</i>
Warm-up		
Duration (minutes)		Duration of the warm-up phase
Load (watts)		Load in the warm-up phase
Training		
Duration (minutes)		Duration of the training phase (w/o. warm-up/recovery)
Tr. HR (bpm)		Heart rate maintained by the optibike
Max. load (watts)		The optibike is allowed to increase the load to this maximum value as long as the test subject is below the training heart rate.
Recovery		
Duration (minutes)		Duration of the recovery phase
Load (watts)		Load in the recovery phase

Date	
-------------	--

optibike Training Protocol (Constant Load)

Name		First Name	
Age		Date of Birth	
Height		Weight	
Training heart rate (bpm)		Maximum heart rate (bpm)	

Training mode:	CONSTANT	<i>Following the warm-up phase, the optibike ramps up to the set load within about 3 minutes and maintains the load for the duration of the training.</i>
Warm-up		
Duration (minutes)		Duration of the warm-up phase
Load (watts)		Load in the warm-up phase
Training		
Duration (minutes)		Duration of the training phase (w/o. warm-up/recovery)
Tr. Load (watts)		Load that the optibike adjusts after the warm-up phase
Recovery		
Duration (minutes)		Duration of the recovery phase
Load (watts)		Load in the recovery phase

Date	
-------------	--

optibike Training Protocol (Interval Training)			
Name		First Name	
Age		Date of Birth	
Height		Weight	
Training heart rate (bpm)		Maximum heart rate (bpm)	

Training mode:	INTERVAL	<i>After warm-up the optibike switches regularly between interval 1 and interval 2.</i>
Warm-up		
Duration (minutes)		Duration of the warm-up phase
Load (watts)		Load in the warm-up phase
Training		
Duration (minutes)		Duration of the training phase (w/o. warm-up/recovery)
Duration-1 (seconds)		Duration of exercise interval 1
Load 1 (watts)		Load during interval 1
Duration-2 (seconds)		Duration of exercise interval 2
Load 2 (watts)		Load during interval 2
Recovery		
Duration (minutes)		Duration of the recovery phase
Load (watts)		Load in the recovery phase

Date	
------	--

12 Accessories

Part no.	Designation	Application	Information
705084	Horizontal seat adjustment	Ergonomics	optional
705308	Quick release adapter (w/o saddle)	Comfort	optional
705905	Pedal cranks, adjustable	Ergonomics	optional
705942	Pedal cranks, adjustable w/o tools	Ergonomics	optional
705944	Comfort pedal strap with ratchet	Pedal	optional
705786	Pedal, extra wide, with Comfort pedal strap	Pedal	optional
707001	Storage basket with holder	Comfort	optional
471107	Racing saddle with standard receptacle	Sports	optional
707003	Anti-tipping device for optibike basic / plus, silver-gray stabilizer plate	Stability	optional

13 Electromagnetic Compatibility EN 60601-1-2

Changes or modifications to this system not expressly approved by ergoline GmbH could cause EMC issues with this or other equipment.

This system is designed to comply with applicable regulations regarding EMC.

Its compliance with these requirements has been verified. It needs to be installed and put into service according to the EMC information stated as follows.

Warning



RF Interference

Use of portable phones or other radio frequency (RF) emitting equipment near the system may cause unexpected or adverse operation.

Caution



Equipment Malfunction


The equipment or system should not be used adjacent to, or stacked with, other equipment. If adjacent or stacked use is necessary, the equipment or system should be tested to verify normal operation in the configuration in which it is being used.

Guidance and Manufacturer's Declaration – Electromagnetic Emissions

The optibike basic / optibike plus ergometer is intended for use in the electromagnetic environment specified below. It is the responsibility of the customer or user to ensure that the optibike basic / optibike plus ergometer is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment – Guidance
RF emissions to EN 55011	Group 1	The optibike ergometer uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions to EN 55011	Class B	The optibike ergometer is suitable for use in all establishments, including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions to EN 61000-3-2	Class A	
Voltage fluctuations/flicker emissions to EN 61000-3-3	Complies	

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The optibike basic / optibike plus ergometer is intended for use in the electromagnetic environment specified below. It is the responsibility of the customer or user to ensure that the optibike basic / optibike plus ergometer is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic discharge (ESD) to EN 61000-4-2	± 8 kV contact ± 16 kV air	± 8 kV ± 16 kV	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 to EN 61000-4-4	± 2 kV for power supply lines ± 1 kV for input and output lines	± 2 kV passed	Mains power quality should be that of a typical commercial or hospital environment.
Surge to EN 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV N.A.	Mains power should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines to EN 61000-4-11	to EN 61000-4-11	passed	Mains power should be that of a typical commercial or hospital environment. If the user of the ergometer requires continued operation during power mains interruptions, it is recommended that the ergometer be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field to EN 61000-4-8	30 A/m 50 Hz	passed	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment. The ergometer has no components susceptible to magnetic fields.
Note: UT is the a.c. mains voltage prior to application of the test level.			

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The optibike basic/optibike plus ergometer is intended for use in the electromagnetic environment specified below. It is the responsibility of the customer or user to ensure that the optibike basic/optibike plus ergometer is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
<p>Conducted RF to EN 61000-4-6</p> <p>Radiated RF to EN 61000-4-3</p>	<p>3 V/6 V^{ISM} 150 kHz to 80 MHz</p> <p>10 V/m 80 MHz to 2.5 GHz</p>	<p>3 V/6 V^{ISM}</p> <p>10 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the ergometer, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance: $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P}$ for 80 MHz to 800 MHz $d = 2.3 \sqrt{P}$ for 800 MHz to 2.5 GHz</p> <p>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 meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey^{a)}, should be less than the compliance level in each frequency range^{b)}.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>Note 1: At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.</p>			
<p>a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile 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 ergometer is used exceeds the applicable RF compliance level above, the ergometer should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the ergometer.</p> <p>b) Over the frequency range from 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

Recommended separation distances between portable and mobile RF communications equipment and the optibike basic/optibike plus ergometer			
The optibike basic/optibike plus ergometer is intended for use in an electromagnetic environment, as specified below, in which radiated RF disturbances are controlled. The customer or the user of the optibike basic/optibike plus ergometer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the optibike basic/optibike plus ergometer 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 $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.7	3.7	7.37
100	11.7	11.7	23.3
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (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 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.			



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