GE HEALTHCARE

# eBike III basic

# eBike III comfort

WITH AND WITHOUT NIBP

SERVICE MANUAL

2018111-336 REVISION B

# Manual Information

- GE Medical Systems Information Technologies GmbH considers itself responsible for the effects on safety,reliability, and performance of the equipment, only if:
  - assembly operations, extensions, readjustments, modifications, or repairs are carried out by ergoline GmbH or by persons authorized by GE Medical Systems Information Technologies GmbH,
  - the electrical installation of the relevant room complies with the applicable national and local requirements,
  - and the instrument is used in accordance with the intended use and the instructions for use.

- This manual contains service information; operating instructions are provided in the operator's manual of the instrument.

- This manual is in conformity with the instrument at printing date.

- The Service Manual **eBike III** is valid for the following devices:

  2017911-301 EBIKE III BASIC
  2017911-303 EBIKE III BASIC WITH NIBP
  2017911-305 EBIKE III COMFORT
  2017911-307 EBIKE III COMFORT WITH NIBP

  Software Version GF 1.x and optional with Module "NIBP" and Supply and Service Items.

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# Revision History

This manual is subject to the GE Medical Systems Information Technologies change order service.
The revision code, a letter that follows the document part number, changes with every update of the manual.
The initial version of the manual has the letter B.

| Part No. | Revision Code | Date | Comment |
|---|---|---|---|
| 2018111-336 | Rev A | 2016-03 | Engineering Release |
| 2018111-336 | Rev B | 2016-04 | Initial Release |

# CONTENTS

# Electrical Safety

## Leakage currents

## Measuring equipment

The measuring equipment used for the electrical safety tests must be inspected and calibrated at regular intervals (refer to manufacturer of measuring equipment).
The measurement results must be documented.

**Warning**
**• Equipment Damage •**

- *The regulations about handling ESD sensitive components must be observed.*

## eBike III basic / comfort

The eBike III basic/comfort ergometers are protection class II equipment (no connection to protective ground). The necessary electrical safety tests for these devices together with the limit values are listed in the chapter titled **"eBike III basic/comfort – Preventive maintenance".**

**Warning**
**• Patient Hazard, Equipment Damage**

- *EN 62353 and/or IEC 60601-1 requirements must be satisfied during repair, modifications and inspections of medical electrical equipment.*
- *To ensure that equipment functions faultlessly and without presenting any hazard after service interventions, it must be subjected to the test procedures stipulated for the different device categories.*
- *A device is considered to be unsafe, when:*
  - *it cannot be repaired*
  - *the user does not wish to have the device repaired. In this case, the operator must be informed in writing of the hazard presented by the device. The same remark must be annotated on the service report and on the service invoice..*

## Technical Safety Inspections and Inspections of the Measuring Systems

The load unit is recommended to be inspected to the approved regional standards at intervals of 2 years by a GE Medical Systems Information Technologies authorized service technician, and calibrated or repaired if necessary.

Calibration instructions for the NIBP module can be found in this Service manual. Follow these instructions to display the BP values with the test setup according to EN 1060-1 and EN1060-3 or appropriate regional standard.

The measurement results must be documented.

**Warning**
**• Patient Hazard, Equipment Damage**

- *Use original spare parts only.*
- *For information about product changes, refer to the manufacturer's original documentation only.*
- *Observe the fuses' original ratings, characteristics and Ampere interrupting capacity.*
- *Parts of the device that ensure its safe operation must be neither damaged nor obviously unsuitable. This applies to insulation and insulating components in particular.*
- *Power cords must be visually inspected for signs of damage before connecting them to the power line.*

# eBike III basic / comfort

## Very important service note

**Warning**

- **Hazard, Equipment Damage**

- *When work at the bottom of the eBike III is required (e.g. access to electronic moduls, exchange of load unit or installation of COM module) the eBike III should be carefully placed on one side by grabbing it at the handlebar and the saddle.*
- *DO NOT tilt the eBike III forward to stand on the handlebar - this is an unsecure and instable position!*

## Preventive Maintenance

**Note**

- *eBike III basic / comfort is a protection class II device (no connection to protective ground).*
- *Preventive maintenance is recommended to be performed every 2 years.*

### Final checkout procedure / Functional test

1. Check the setup for stability, adjust with leveling device if required.
   **Expected result:** **No instability** **Pass/Fail**

2. Visually inspect the device:
   - inspect cables / power cord
   **Expected result:** **No damage or wear detected** **Pass/Fail**

3. Check cranks and pedals:
   - pedals have no signs for damage / wear
   - pedals securely fixed on cranks
   - crank screws securely fixed (torque 40 Nm ± 2 Nm) on axis

   **Expected result: Cranks and pedals OK** **Pass/Fail**

eBike III basic
- Check bellow on saddle for damage / wear / cracks
- Check handlebar adjustment (angle)
- Check saddle height adjustment
- Check that the clamping levers (saddle [height] and handlebar [angle] adjustment) are tight.
  Grease the thread of the saddle clamping lever.
  (Use of an universal high-performance lubricant such as OKS 470 is recommended.)

eBike III comfort
- Check handlebar adjustment (angle)
- Check that the clamping lever is tight.
- Check electrical saddle adjustment: adjust minimum and maximum saddle height;
  then return saddle to mid-level
- Check correct indication of saddle height display
- Check that the clamping lever for handlebar adjustment (angle) is tight

**Expected result: Adjustments work and levers are tight, thread properly greased** **Pass/Fail**

4. Using the power cord, connect the device to the mains power line and place the power switch in the ON position
   Wait for self test to end:
   - check LCD for error messages (refer to „Turning the System On" on page 60)
   - check the software version in the service menu for correct version GF 1.x
     (refer to „Software update" on page 78)
   - check the "error log file" in service menu (refer to „Error log" on page 67)

   **Expected result: Device powers on without errors, FW is correct version, no errors logged** **Pass/Fail**

5. Check speed indication (rpm) is displayed on LCD and the additional speed indication on the patient display.
   Check noise level of idling drive unit (for example, for grinding noises or noise from the bearing)

   **Expected result: Speed displayed on both displays and no noticeable noise** **Pass/Fail**

6. Units with NIBP module:
   - Check cuff tubing and tubing connections, microphone connectors
   - Check blood pressure measurement on test subject at rest (refer to the „eBike III operators manual")
   - Check blood pressure readings are displayed on LCD

   **Expected result: BP values are displayed and in proper range** **Pass/Fail**

7. Set manual load (see „Manual Load" on page 66), change load (for example, 50 W, 100 W)
   - Check load level and load indication

   **Expected result: Load is set and changes as expected** **Pass/Fail**

8. If ergometer is remote controlled from ECG recorder or PC-ECG system:
   - Check connecting cable
   - Check load control via ECG recorder or PC ECG system
   - Check remote start if applicable

   **Expected result: Ergometer can be controlled by external unit** **Pass/Fail**

## Electrical Safety

Perform electrical safety checks when indicated - current leakage test results meet requirements.
All indicated electrical safety checks require a pass/fail indication for steps performed.
Record the measurement values in your debrief.

| Step | | Condition (1) | UUT - ON (2) | Result | Leakage Current limits |
|---|---|---|---|---|---|
| **Earth Leakage Current** | | | | | |
| 1. | Forward Polarity | N/A | | | |
| 2. | Neutral open, Forward Polarity | N/A | | | |
| 3. | Neutral open, Reverse Polarity | N/A | | | |
| 4. | Reverse Polarity | N/A | | | |
| **Enclosure Leakage Current** | | | | | |
| 1. | Forward Polarity | NC | _____ µA | Pass/Fail | 100 µA |
| 2. | Neutral open, Forward Polarity | SFC | _____ µA | Pass/Fail | 500 µA |
| 3. | Ground open, Forward Polarity | N/A | | | |
| 4. | Ground open, Reverse Polarity | N/A | | | |
| 5. | Neutral open, Reverse Polarity | SFC | _____ µA | Pass/Fail | 500 µA |
| 6. | Reverse Polarity | NC | _____ µA | Pass/Fail | 100 µA |
| **Patient Leakage Current to Ground (3)** | | | | | |
| 1. | Forward Polarity | NC | _____ µA | Pass/Fail | 100 µA |
| 2. | Neutral open, Forward Polarity | SFC | _____ µA | Pass/Fail | 5000 µA |
| 3. | Ground open, Forward Polarity | N/A | | | |
| 4. | Ground open, Reverse Polarity | N/A | | | |
| 5. | Neutral open, Reverse Polarity | SFC | _____ µA | Pass/Fail | 5000 µA |
| 6. | Reverse Polarity | NC | _____ µA | Pass/Fail | 100 µA |
| **Ground Continuity** | | | | | **Resistance** |
| 1. | AC mains power cord ground prong to exposed metal surface (ground lug) | N/A | | | |

(1) NC = Normal Condition
SFC = Single Fault Condition
N/A = Not Applicable
(2) UUT = Unit Under Test
(3) Test applies for eBike III with blood pressure unit only - measuring point is the microphone connector

## Checkout procedure after repair

After replacing a FRU or performing certain tasks, it is necessary to also inspect the unit and perform a series of checks to ensure the unit is functioning properly. The following tables identify the inspections and checkout procedures to perform.

To use the tables, locate the relevant FRU or task in the first column and note the required checkout procedure(s) for the item(s). Then locate the corresponding instructions in the sections following the tables.

## FRU repairs (exchange)

| FRU | P/N | Functional Checkout Procedure Details | Electrical safety checks |
|---|---|---|---|
| Plastic cover parts | 2018111-300<br>2018111-303<br>2018111-304<br>2018111-326<br>2018111-327<br>2018111-328 | 1,2,3,5,6,24 | 42 |
| Saddle | 2018111-022 | 1,11,12,15,16 | |
| Saddle clamp lever | 2018111-148 | 1,11,12,15,16 | |
| Saddle tube | 2018111-144<br>2018111-310 | 1,2,3,5,6,11,12,1718,19,20 | 42 |
| Saddle guidance tube | 2018111-332 | 1,2,3,5,6,12,17,18,19,20,24,40 | 42 |
| Saddle motor | 2018111-337 | 1,2,3,5,6,8,10,12,1718,19,20,24,40 | 42 |
| Leg leveler(s) | 2018111-021 | 1,23,24 | |
| Wheel set(s) | 2018111-311 | 1,7,23,24 | |
| Pedal(s) / crank(s) | 2018111-301<br>2018111-302 | 1,28,41 | |
| Handle bar | 2018111-324 | 1,13,14 | |
| Handle bar clamp lever | 2018111-322 | 1,13,14 | |
| Drive unit | 2018111-306<br>2018111-307 | 1,2,3,8,9,10,21,22, 24,27,28,29,41 | 42 |
| Strain gauge module | 2018111-308 | 1,2,3,8,9,10,21,22, 24,27,28,29,39,41 | 42 |
| RPM sensor | 2018111-309 | 1,2,3,8,9,10,21,22, 24,27,28,29,39,41 | 42 |
| Power supply | 2018111-152 | 1,2,3,5,6,8,10,22, 24,27,28,29 | 42 |

| FRU | P/N | Functional Checkout Procedure Details | Electrical safety checks |
|---|---|---|---|
| Power switch | 2018111-305<br>2018111-339 | 1,2,3,5,6,8,10, 24,27,28,29 | 42 |
| LIU (PCB) | 2018111-312 | 1,2,3,8,9,10,21,22, 24,25,26,27,28,29,35,39 | 42 |
| SMU (PCB) | 2018111-314 | 1,2,3,8,9,10,21,22, 24,25,26,27,28,29,35,40 | 42 |
| Blood pressure components | 2018111-313<br>2018111-315<br>2018111-316<br>2018111-317<br>2018111-318 | 1,2,3,8,9,10,21,22, 24,26,30,31,32,33, 34,35,36,37,38 | 42 |
| Terminal cuff connector | 2018111-323 | 1,2,3,4,8,10, 24,26,32,33,34,36,37,38 | 42 |
| Control terminal w/o NIBP | 2018111-321 | 1,4,8,21,22, 24,25,26,27,29,35 | 42 |
| Control terminal with NIBP | 2018111-320 | 1,4,8,21,22, 24,25,26,27,29,30,31,32, 33,34,35,36,37,38 | 42 |

## NON FRU REPAIRS

| Repair | Functional Checkout Procedure Details | Electrical safety checks |
|---|---|---|
| Software update | 4,21,22, 24,26,27,30,32,33,34 | |
| Load calibration (recommended every 2 years) | 1,2,3,21,22, 24,26,27,39 | |
| Electrical safety checkout (recommended every 2 years) | 1,2,3,4,5,6,21,22,24,26 | 42 |

## Functional Checkout Procedure Details

### Visual / functional checks

| | | |
|---|---|---|
| 1. | External surfaces passed inspection? | **pass/fail** |
| 2. | Plastic cover screws complete and fixed? | **pass/fail** |
| 3. | Plastic caps on housing screws complete? | **pass/fail** |
| 4. | Terminal foil, LCD and LED passed inspection? | **pass/fail** |
| 5. | AC Power cord passed inspection? | **pass/fail** |
| 6. | AC power cord strain relief mounted and cable secured | **pass/fail** |
| 7. | Casters passed inspection? | **pass/fail** |
| 8. | All board connectors and cable connectors connected and secured? | **pass/fail** |
| 9. | All PCBs fixed with screws on electronic carrier? | **pass/fail** |
| 10. | All harnesses' and internal wiring has been secured? | **pass/fail** |
| 11. | Bellow on saddle passed inspection? | **pass/fail** |
| 12. | Saddle fixture on saddle tube passed inspection? | **pass/fail** |
| 13. | Handlebar adjustment (angle) passed inspection? (refer to „Handlebar - Adjust fixture (inclination)" on page 37) | **pass/fail** |
| 14. | Clamping lever handlebar angle adjustment passed inspection? | **pass/fail** |
| 15. | eBike III basic only: Mechanical saddle height adjustment passed inspection? | **pass/fail** |
| 16. | eBike III basic only:Clamping lever saddle height passed inspection (tight; thread of lever is greased)? | **pass/fail** |
| 17. | eBike III comfort only: Saddle motor keys at terminal functional? | **pass/fail** |
| 18. | eBike III comfort only: Electrical saddle adjustment passed inspection? | **pass/fail** |
| 19. | eBike III comfort only: Check correct indication of saddle height display | **pass/fail** |
| 20. | eBike III comfort only: Check if saddle tube moves tightly and without any mechanical wobble in saddle tube guidance. | **pass/fail** |
| 21. | Check software (firmware) is at correct version GF 1.x (refer to „Software update" on page 78) | **pass/fail** |
| 22. | Check and clear the "error log file" in service menu (refer to „Error log" on page 67) | **pass/fail** |
| 23. | Check stable position on floor, check leveler adjustment | **pass/fail** |

### Operational Checks

| | | |
|---|---|---|
| 24. | Power-up self-test passed (no error messages on LCD)? | **pass/fail** |
| 25. | LCD contrast ok? (refer to „Contrast" on page 62) | **pass/fail** |
| 26. | eBike successfully communicates with ECG device? (refer to „Connectivity and installation eBike III to GE ECG devices" on page 81) | **pass/fail** |
| 27. | Check load level and load indication on LCD | **pass/fail** |
| 28. | Set manual load (see „Manual Load" on page 66), change load (for example, 50 W, 100 W) Check noise level of idling drive unit (for example, for grinding noises or noise from the bearing) | **pass/fail** |
| 29. | Check speed indication (rpm) displayed on LCD and the additional speed indication on the patient display. | **pass/fail** |
| 30. | Blood pressure measurement successfully initiated by ECG device? | **pass/fail** |
| 31. | Blood pressure values successfully communicated to ECG device | **pass/fail** |
| 32. | Check cuff tubing and tubing connections, microphone connectors | **pass/fail** |
| 33. | Check blood pressure measurement on test subject at rest | **pass/fail** |
| 34. | Check blood pressure readings on LCD | **pass/fail** |

### Tests and Calibration Checks

| | | |
|---|---|---|
| 35. | System configuration and settings correct? (refer to „System Config." on page 66) | **pass/fail** |
| 36. | NIBP test successfully passed? (refer to „NIBP Test" on page 76) | **pass/fail** |
| 37. | NIBP calibration successfully performed? (refer to „NIBP Calibration" on page 77) | **pass/fail** |

38. Check and clear the "NIBP error log file" in service menu
    (refer to „Error log" on page 67) **pass/fail**
39. Dynamic load calibration with test bench successfully performed?
    (refer to „Dynamic Load Calibration" on page 72) **pass/fail**
40. Electrical saddle adjustment: adjust minimum and maximum saddle height
    (refer to „Saddle Calibration" on page 64) **pass/fail**
41. Check torque values for screws **pass/fail**

**Electrical Safety Checks**

42. Current leakage and ground continuity test results meet requirements?
    Perform electrical safety checks when indicated (refer to „Electrical Safety" on page 10).
    All indicated electrical safetychecks require a pass/fail indication for steps performed.
    Record the measurement values. **pass/fail**

## Test procedure "RPM / Load"

**Note**

- *Unless regulatory requirements of the country define a different test procedure or test intervall, it is recommended to perform the test "RPM / load" at least every 2 years.*

**Note**

- *An external calibration device for dynamic load testing is needed to perfom the following test procedures ("ergoline ergotest 550" - order direct from Ergoline P/N 705890) or equivalent device.*
- *Please refer to the operator manual of the used calibration device.*

### Test preparation

1. Dismount **BOTH (!)** pedal cranks of the eBike III - see "Dismount pedal cranks" under section „Dismount pedal cranks" on page 41.
2. Follow the operator manual from the manufacture of calibration device being used to connect the calibration device with the axis of the eBike III.
3. If supported by the calibration device, connect the eBike III interface (RS-232 or USB) with the calibration device.
4. Connect the calibration device to the PC / notebook setup containing the software and configuration to work with the device."
5. Start the test software of the calibration device.

### RPM test protocol

1. Apply a load of 100 W to the eBike III
   (-either by command of the test software or manually on the eBike III (see „Manual Load" on page 66).
2. Perform the following RPM tests step by step. Note the results in the table or use the printed protocol of the calibration device to document the test.

| Step | Target RPM | Actual RPM | Deviation max. | Pass / Fail |
|---|---|---|---|---|
| #1 | 30 | | ± 1 rpm | |
| #2 | 40 | | ± 1 rpm | |
| #3 | 50 | | ± 1 rpm | |
| #4 | 100 | | ± 1 rpm | |
| #5 | 120 | | ± 1 rpm | |

## Load test protocol

1. Perform the load test (RPM is set by the calibration device / load of the eBike III is set either by command of the test software or manually on the eBike III -see „Manual Load“ on page 66) step by step.
2. The actual load is measured and displayed by the calibration device software. Note the results in the table or use the printed protocol of the calibration device to document the test.

| Step | RPM set | Target Load | Actual Load | Deviation max. | Pass / Fail |
|---|---|---|---|---|---|
| #1 | 40 | 25 | | ± 3 Watt | |
| #2 | 40 | 50 | | ± 3 Watt | |
| #3 | 40 | 100 | | ± 5 Watt | |
| #4 | 70 | 200 | | ± 10 Watt | |
| #5 | 90 | 300 | | ± 15 Watt | |
| #6 | 100 | 500 | | ± 25 Watt | |

## Test procedure "Blood pressure (NIBP)"

**Note**

- *Unless regulatory requirements of the country define a different test procedure or test interval, it is recommended to perform the test "Blood pressure (NIBP)" at least every 2 years.*

**Note**

- *A calibrated NIBP measure instrument set is needed to perfom the following test procedures.*
- *Please refer to the operator manual of the used device.*

### Test preparation

1. Power eBike III on and enter service menu / NIBP test (-see „Calibration of Blood pressure unit" on page 75).
2. Connect the calibration equipment with the eBike III cuff connector.

### Leak–tightness test

1. Use the connected test equipment to apply the target pressure (see table below) to the eBike III cuff connector, wait until the pressure in the system has stabilized (approx. 5 sec).
2. After 1 min check the actual pressure and note the pressure drop in the table

| Step | Target Pressure | Actual pressure drop | Pressure drop max. | Pass / Fail |
|---|---|---|---|---|
| #1 | 50 mmHg | mmHg / min | < 6 mmHg / min | |
| #2 | 300 mmHg | mmHg / min | < 6 mmHg / min | |

### Accuracy test

1. Use the connected test equipment to apply the target pressure (see table below) to the eBike III cuff connector, wait until the pressure in the system has stabilized (approx. 5 sec).
2. Check the actual pressure displayed on the eBike III display and note the value in the table.

| Step | Target pressure | Displayed pressure (eBike III) | Deviation max. | Pass / Fail |
|---|---|---|---|---|
| #1 | 0 | | ± 3 mmHg | |
| #2 | 50 | | ± 3 mmHg | |
| #3 | 100 | | ± 3 mmHg | |
| #4 | 150 | | ± 3 mmHg | |
| #5 | 200 | | ± 3 mmHg | |
| #6 | 250 | | ± 3 mmHg | |
| #7 | 300 | | ± 3 mmHg | |

# Tools

The following tools (metric) are recommended to disassemble the eBike III devices:

**Flat bladed screwdrivers:**

| | |
|---|---|
| *1 pc.* | *1.0 x 0.18 mm* |
| *1 pc.* | *4.5 x 0.8 mm* |

**Philips screwdrivers:**

| | |
|---|---|
| *1 pc.* | *PH 2* |
| *1 pc.* | *PH 3* |

**Fork wrenches:**

| | |
|---|---|
| *1 pc.* | *10 mm* |
| *1 pc.* | *13 mm* |
| *1 pc.* | *14 mm* |
| *1 pc.* | *17 mm* |
| *1 pc.* | *19 mm* |

**Pliers**

| | |
|---|---|
| *1 pc.* | *side cutter* |
| *1 pc.* | *flat nose pliers* |

**Special tools**

| | |
|---|---|
| *1 pc.* | *crank extractor (P/N 2005737-001)* |
| *1 pc.* | *round pin, max. 3 mm, minimum length 15 mm* |
| *1 pc* | *torque wrench (10 - 100 Nm)* |
| *1 pc.* | *calibrated NIBP measurement instrument set* |
| *1 pc.* | *external calibration device for dynamic load testing ("ergoline ergotest 550" - order direct from Ergoline P/N 705890) or equivalent device* |

**Allan keys:**

| | | |
|---|---|---|
| *1 pc.* | *2.5 mm* | *straight and elbow* |
| *1 pc.* | *3 mm* | *straight and elbow* |
| *1 pc.* | *4 mm* | *straight and elbow* |
| *1 pc.* | *5 mm* | *straight and elbow* |
| *1 pc.* | *6 mm* | *straight and elbow* |
| *1 pc.* | *8 mm* | *straight and elbow* |
| *1 pc.* | *extension for Allen key 8 mm (drive unit exchange)* | |

**Socket wrenches:**

| | |
|---|---|
| *1 pc.* | *10 mm* |
| *1 pc.* | *13 mm* |
| *1 pc.* | *14 mm* |
| *1 pc* | *TORX T30* |

# Electronic modules / Assembly

## Overview

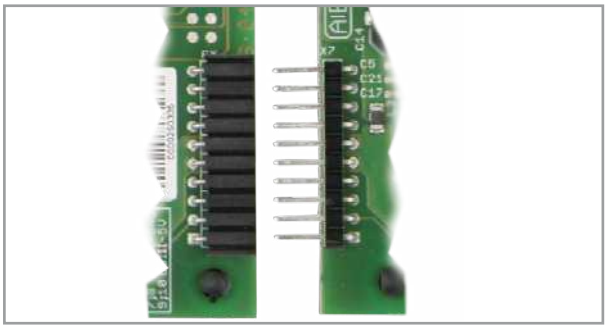
### Description of electronics and cabling

The electronics of the eBike III are based on a modular concept.
Each module has its own processor with appropriate software.

To communicate between different modules, the CAN bus is used, which is a stable and standardized protocol that is used in the automotive industry.

The connection between different modules is made by direct adaptation of the different PCBs or by use of standard shielded CAT-5 patch cables.

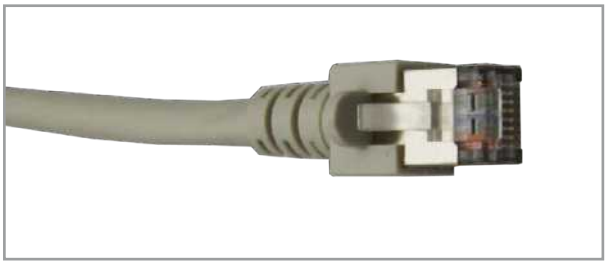
The direct connectors and cables carry the power lines (24 volt) and the CAN bus signal lines.



PCB direct connector system

### abbreviations (Electronic modules / PCBs)

| | |
|---|---|
| DTU | Display terminal unit |
| LIU | Load regulation and interface unit |
| BPU | Bloodpressure unit |
| SMU | Saddle motor unit<br>(also used as handlebar motor unit)) |
| DMS | Torque sensor |
| LCD | Display |



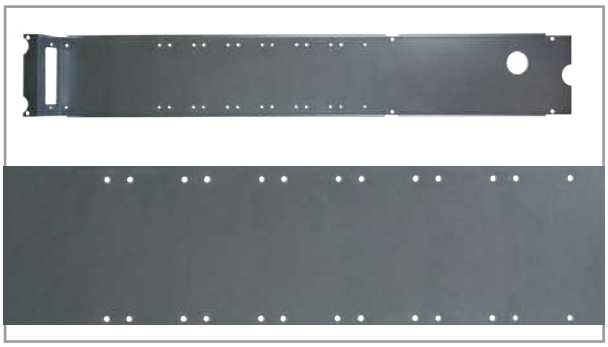
Standard connecting cablel (CAT-5 patch cable, shielded)

## Electronic carrier

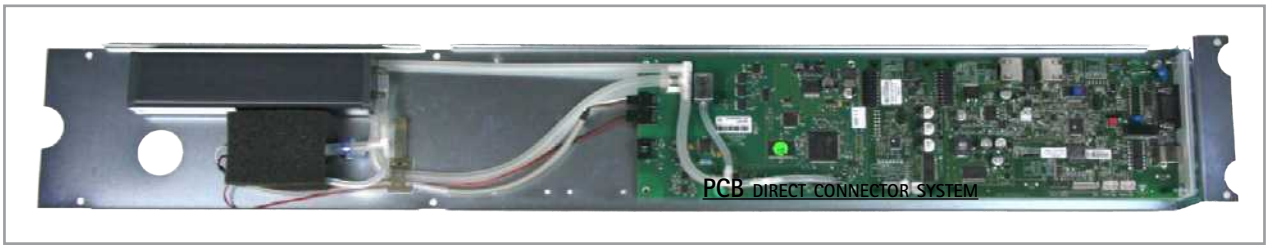
### Description

All electronic boards are mounted on a special metal sheet integrated in the bottom plate of the eBike III ergometers.

This metal sheet contains a grid of holes to mount all possible combinations of electronic boards (e.g. LIU, SMU, BPU).



Metal sheet carrier with mounting holes (grid)

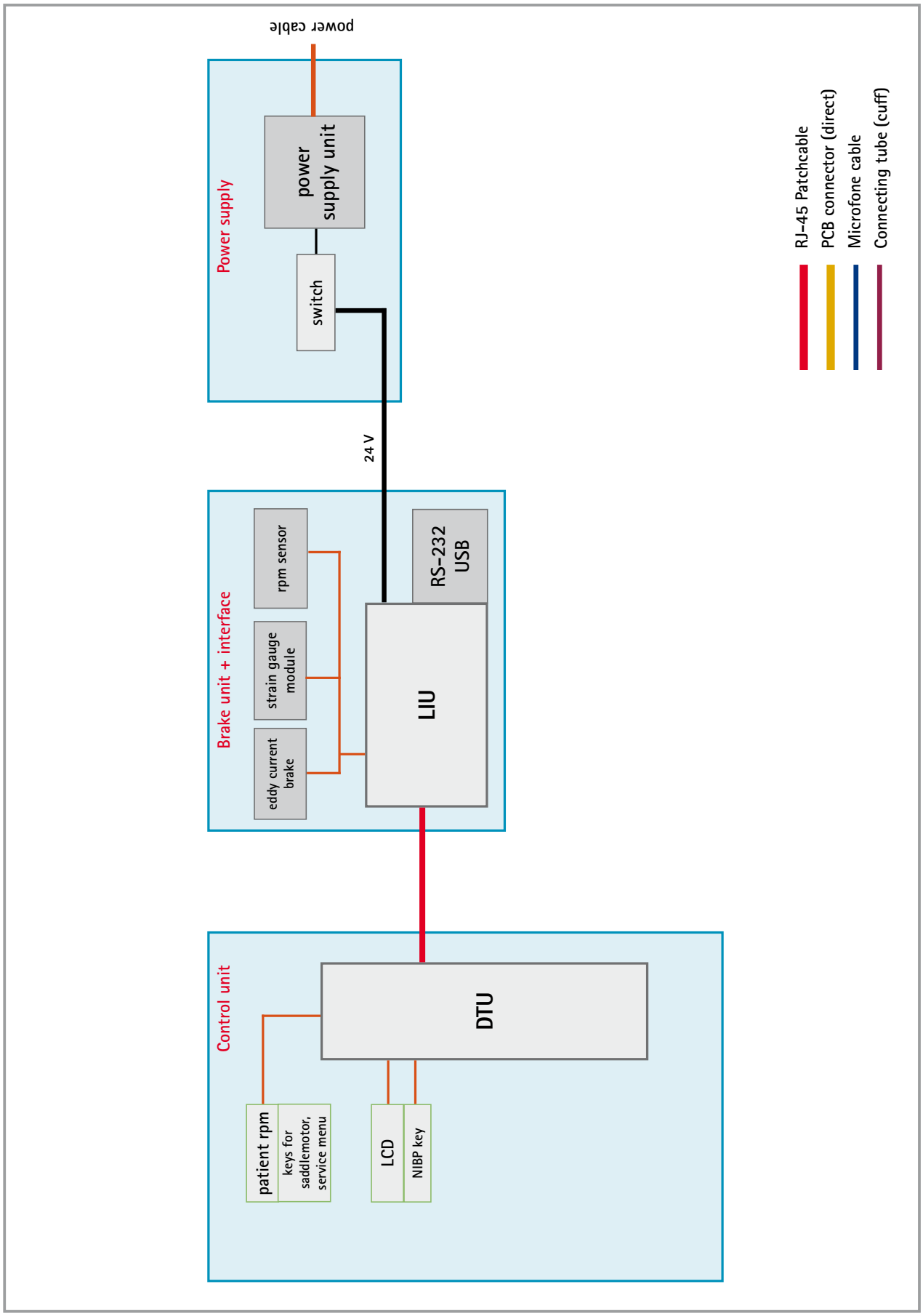



Metal sheet carrier, assembled (BPU, SMU, LIU)

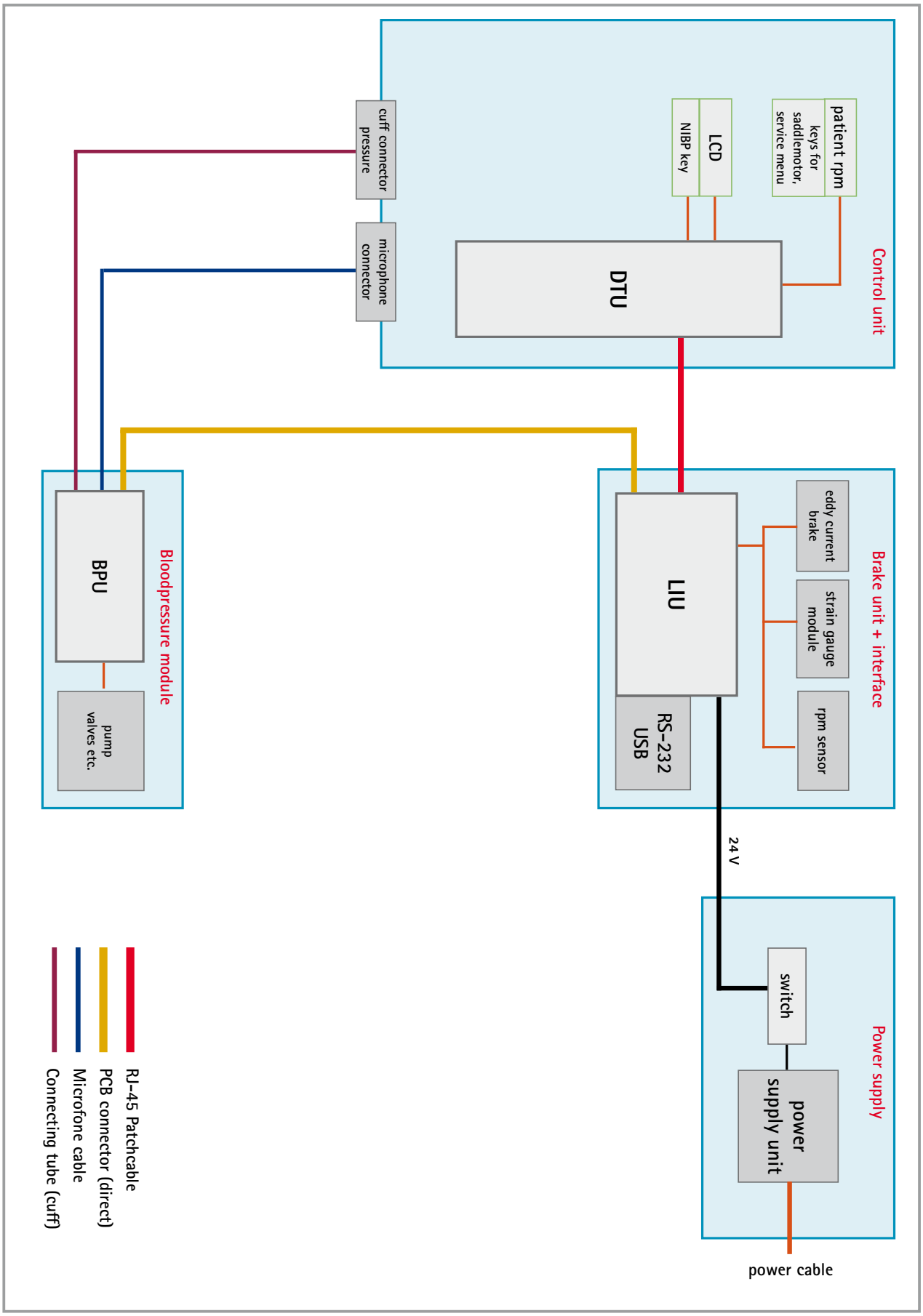
### Dismounting of the electronic assembly group

1. Grab the eBike at handlebar and saddle and carefully lay it **sideways on one side**.
2. Remove six screws (see picture) and flip the carrier plate carefully aside.
3. Remove the connecting cables from the corresponding boards.
4. The PCBs are mounted on spacers, screwed from outside of the metal sheet carrier.
5. After removing these screws, the PCBs can be removed.
6. After replacing a board, installation is performed by following the steps in reverse order.

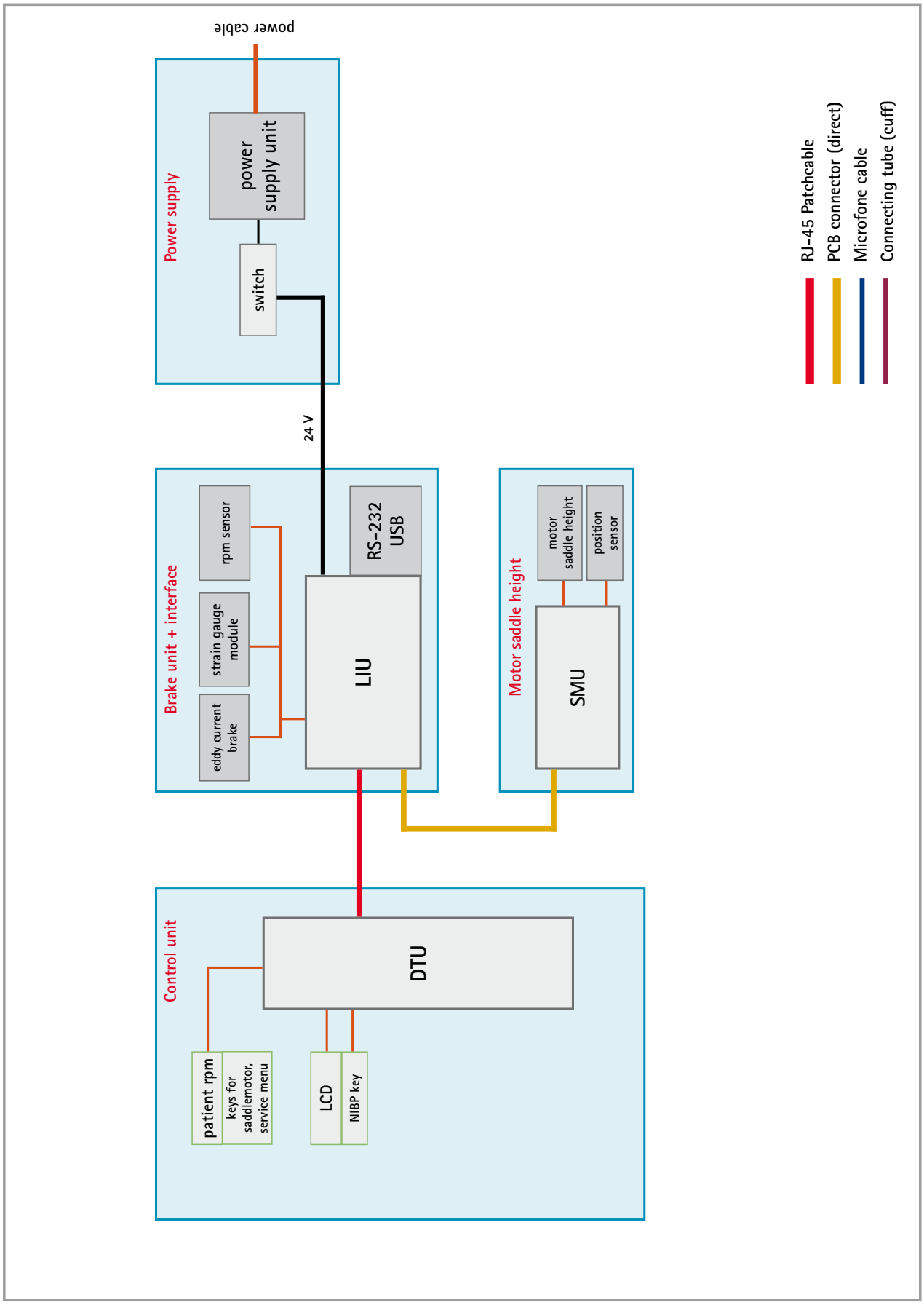
# Block diagrams bike ergometer electronics eBike III



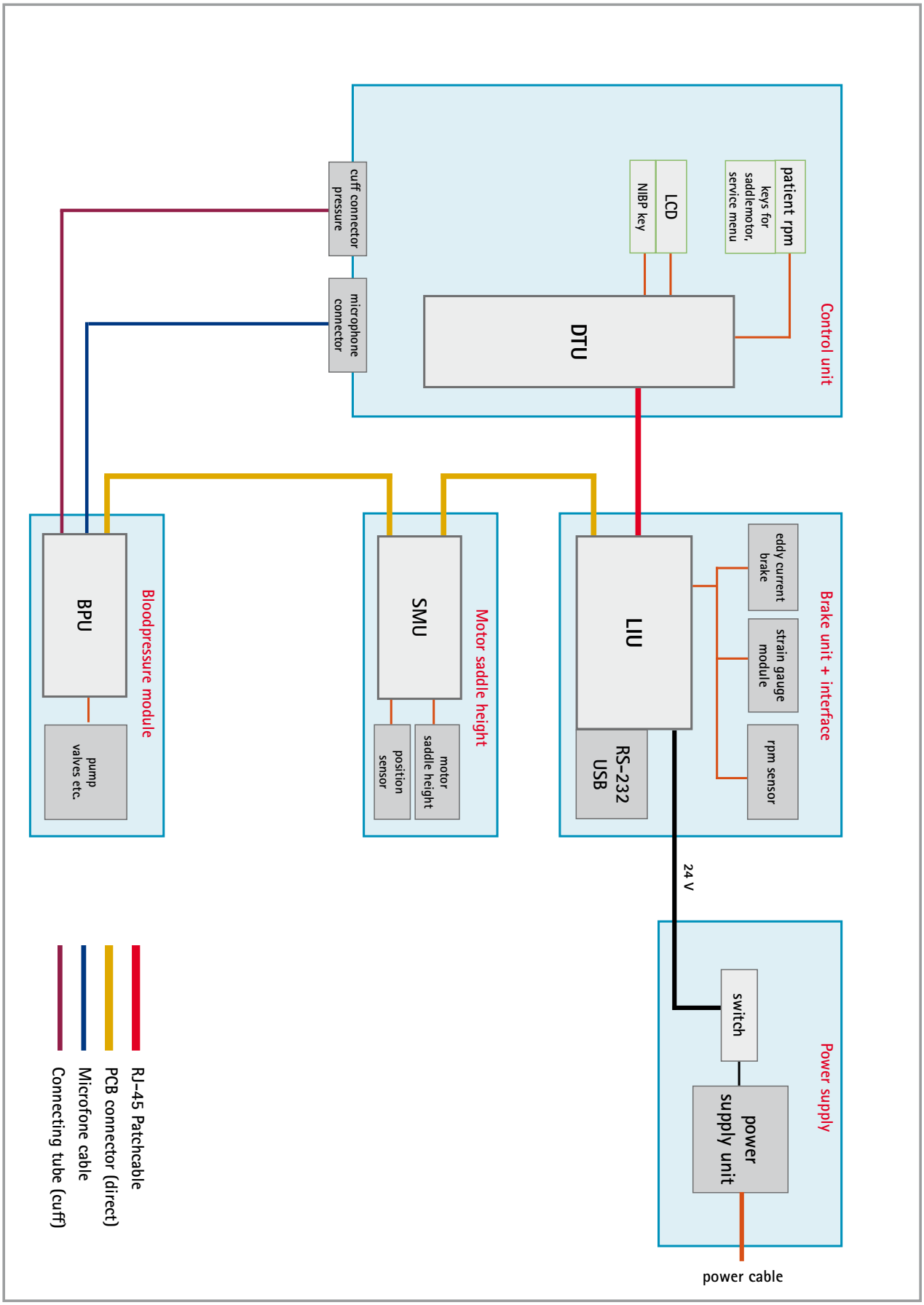

eBike III basic




eBike III basic with bloodpressure unit

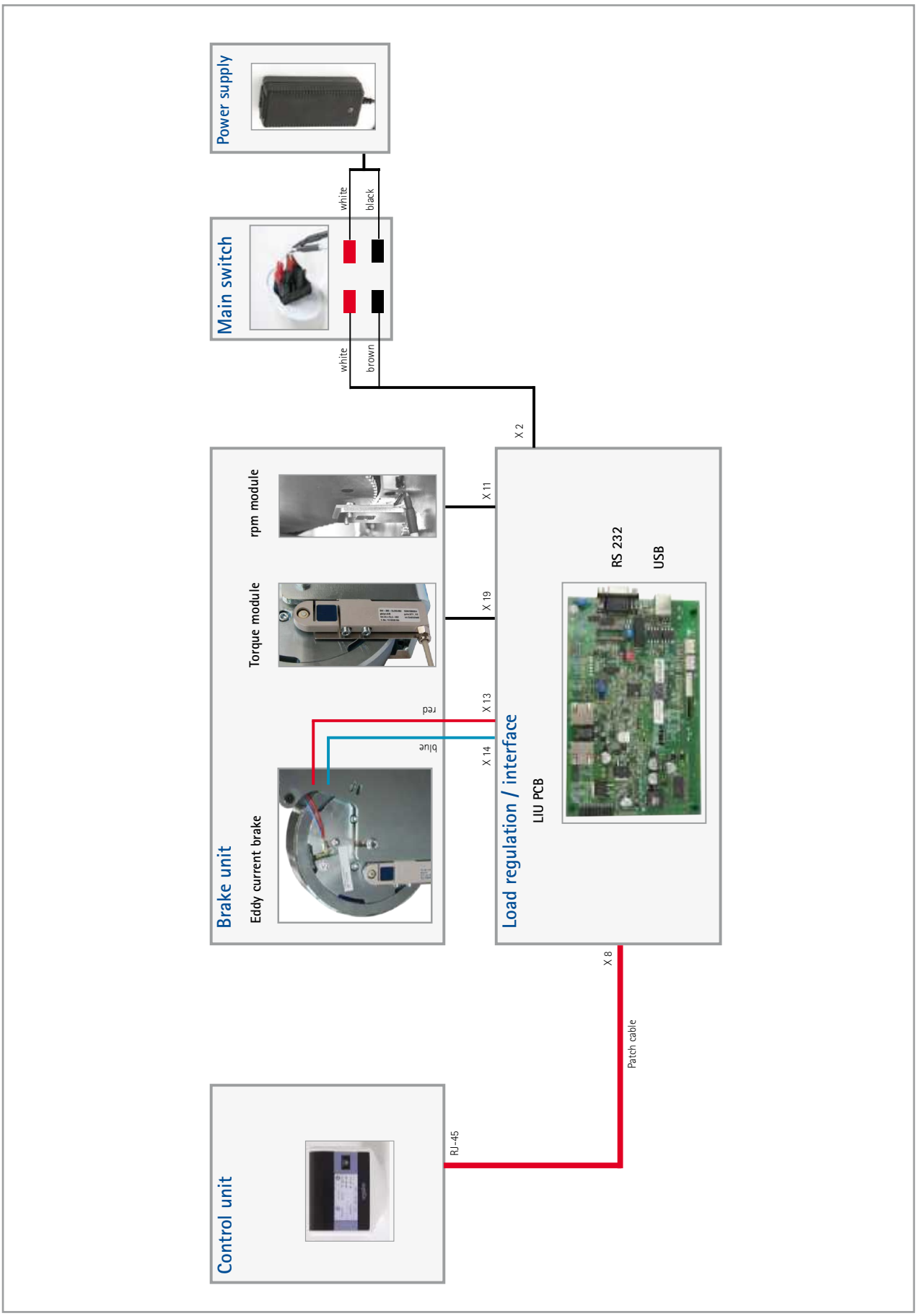



eBike III comfort

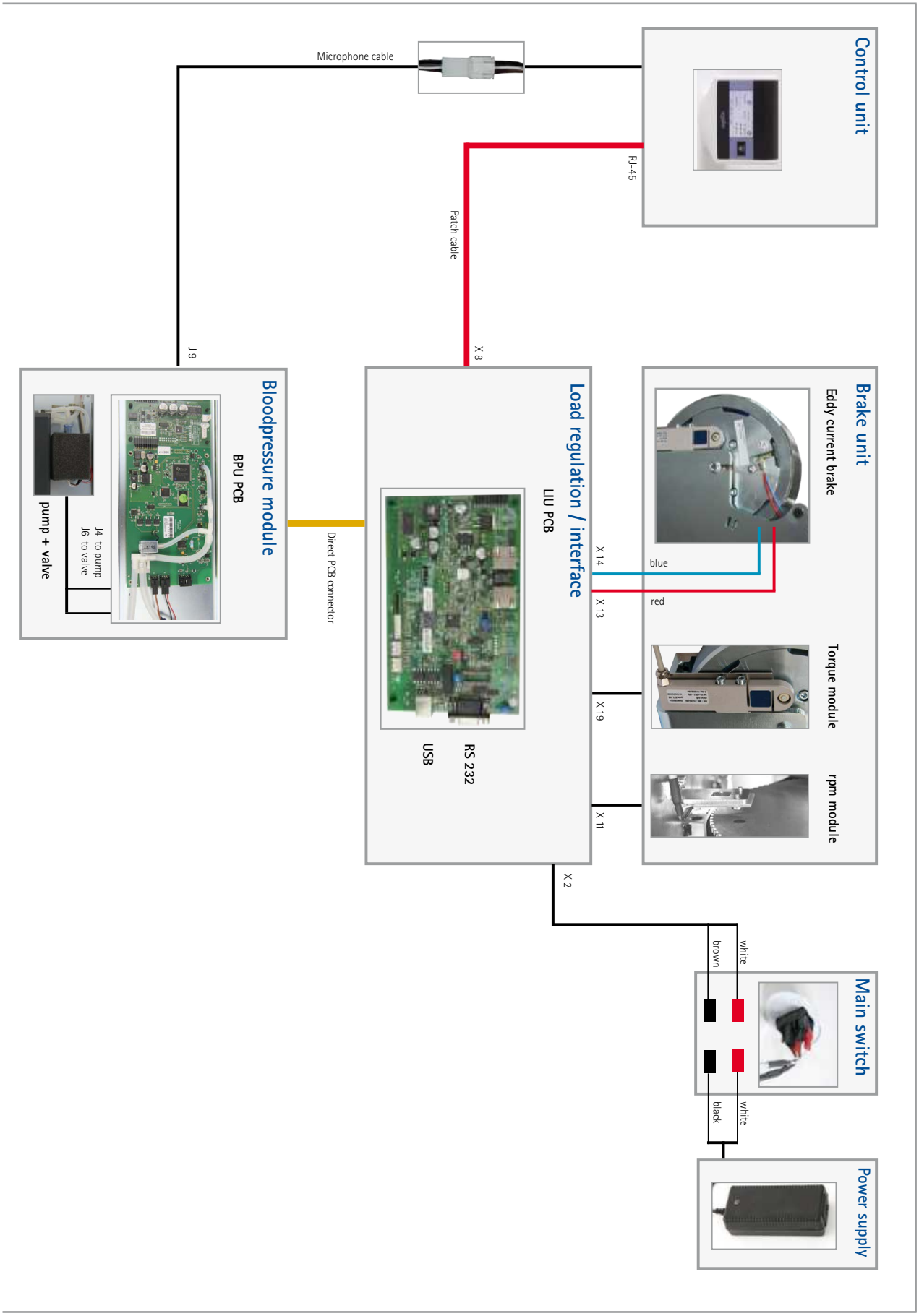



eBike III comfort with bloodpressure unit

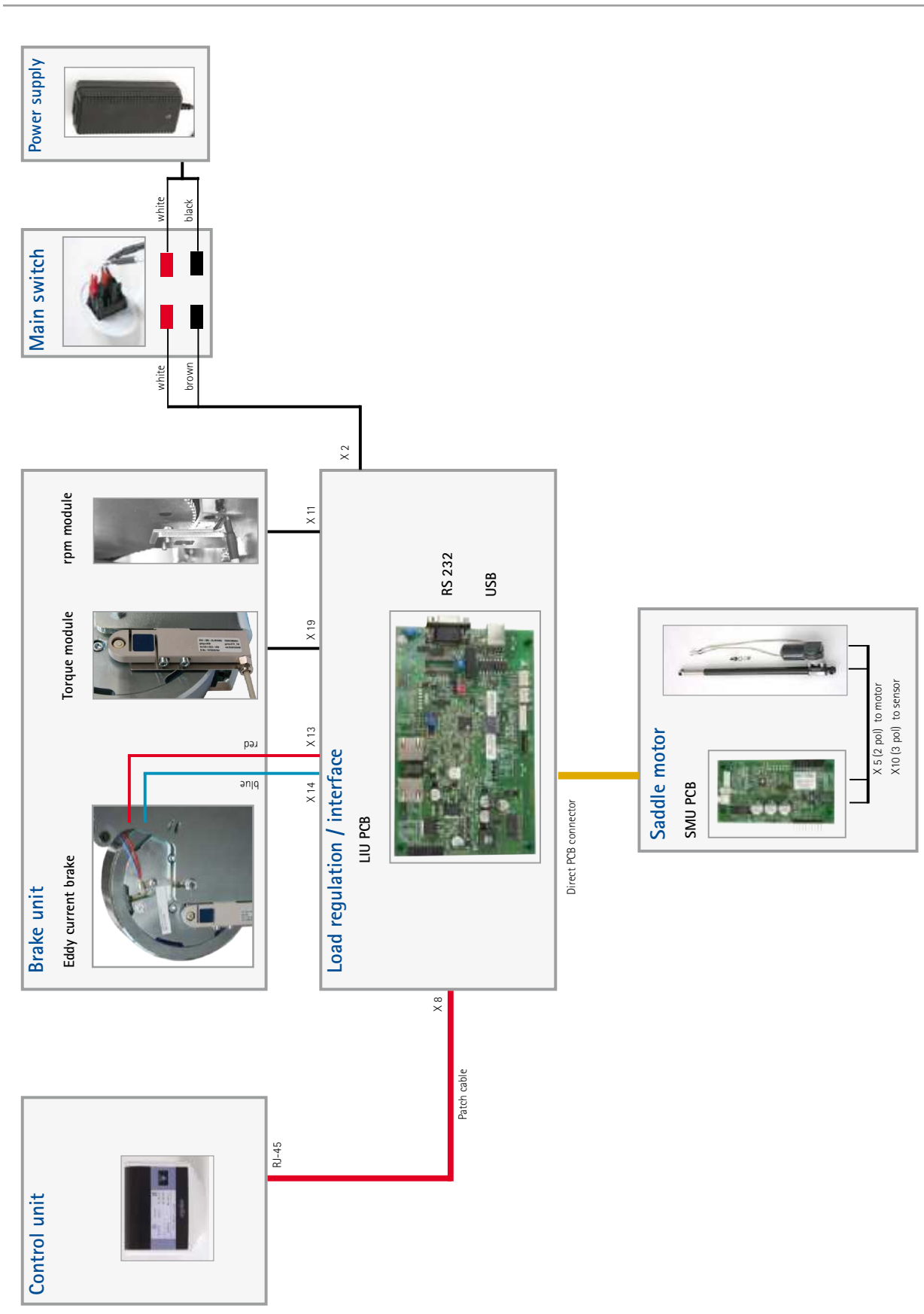
# Wiring diagrams bike ergometer eBike III



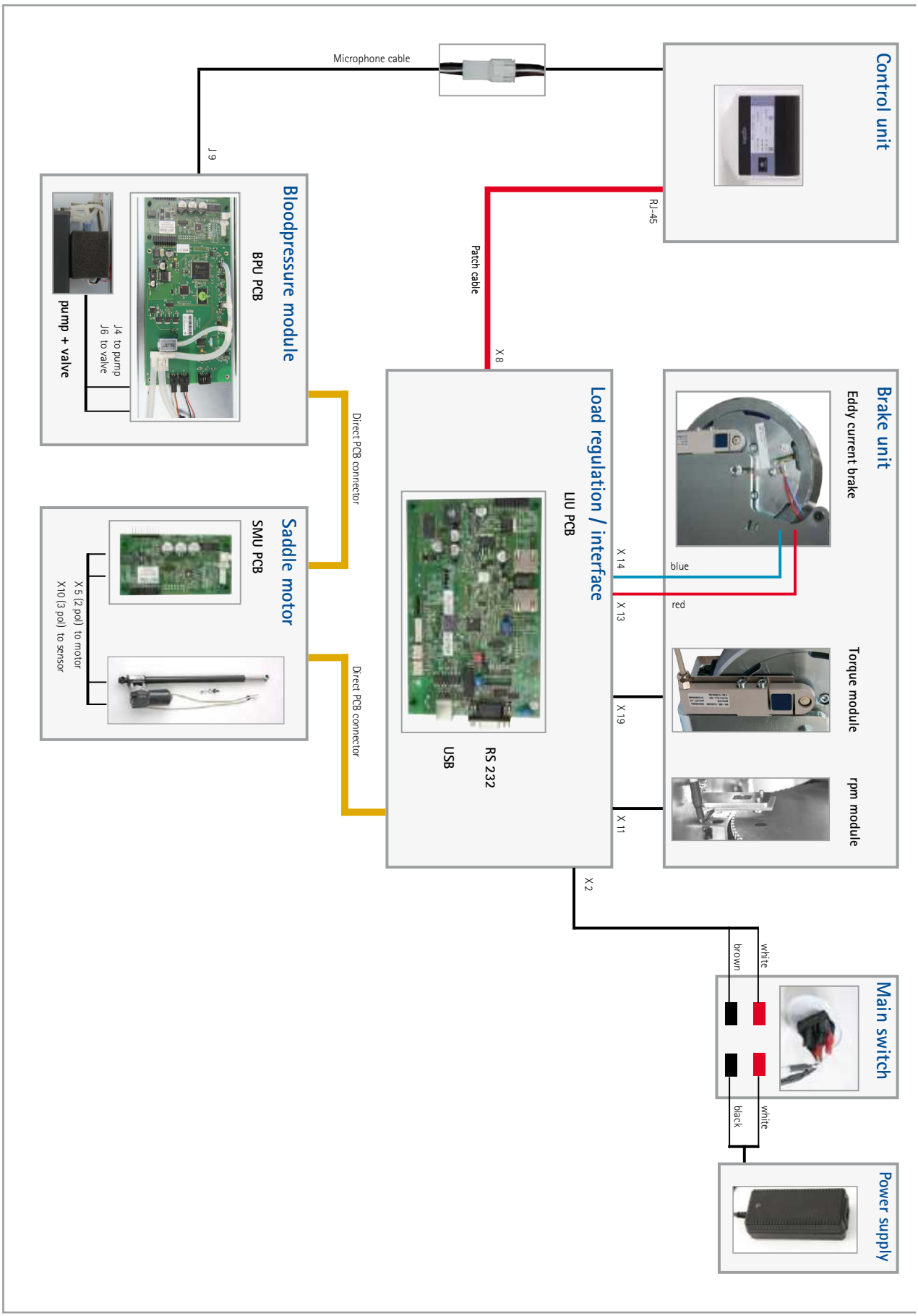

eBike III basic




eBike III basic with bloodpressure unit




eBike III comfort




eBike III comfort with bloodpressure unit

## Control units

### DTU – Control unit

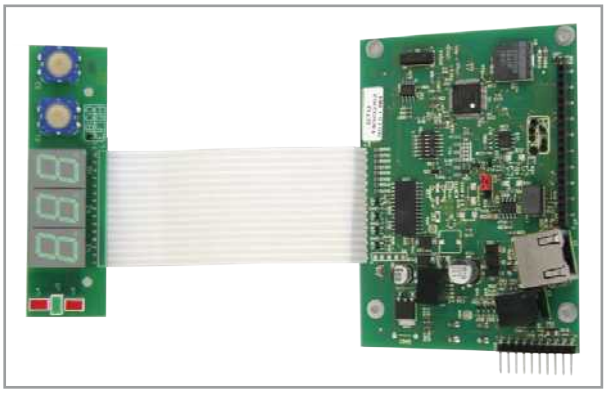
The DTU board of the control unit is the "mainboard" of the eBike III electronics.

The DTU together with the LCD is mounted inside the housing of the control unit.

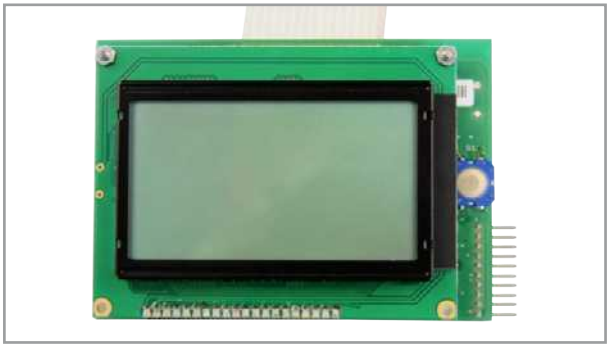

Control unit

**Note**

- *The housing of the control unit* CANNOT *be opened!*
- *For repairs / upgrades the complete control unit has to be replaced.*



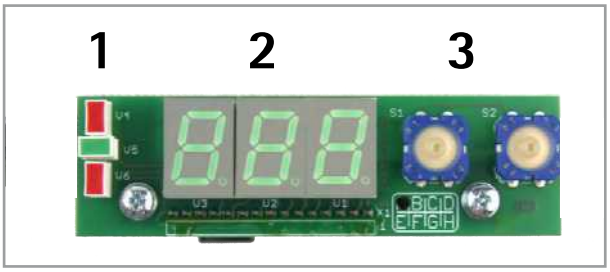
DTU board (top view) with patient RPM display



DTU with LCD

## DTU – Patient display

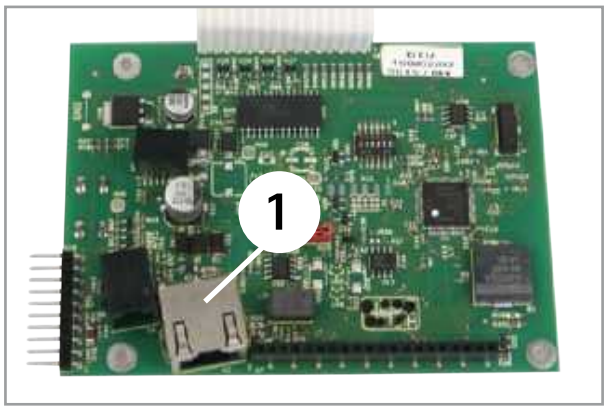
The patient display for rpm and the push buttons for service menu control are internally connected by a flat cable and screwed into the housing.




DTU patient display / buttons for saddle height

*1 LED for rpm zones*
*2 Display for rpm*
*3 Push buttons for saddle height (eBike III comfort) and service menu control*

## DTU – Connectors




DTU

*1 RJ-45 connector (patch cable to LIU)*

## Load regulation and interface

### LIU – Load regulation and interface board

The electronics of the LIU-PCB stabilizes the actual load of the eddy current brake with given accuracy.
The signal of the rpm sensor (non-contact hall sensor) and the feedback signal of the strain gauge module are analyzed and the actual brake force adjusted.

In addition, the processor of the LIU board generates the interface signals (RS-232 and USB) to external devices (e.g. PC-ECG or ECG recorders).

Both signals (RS-232 and USB) are galvanically isolated (opto couplers).

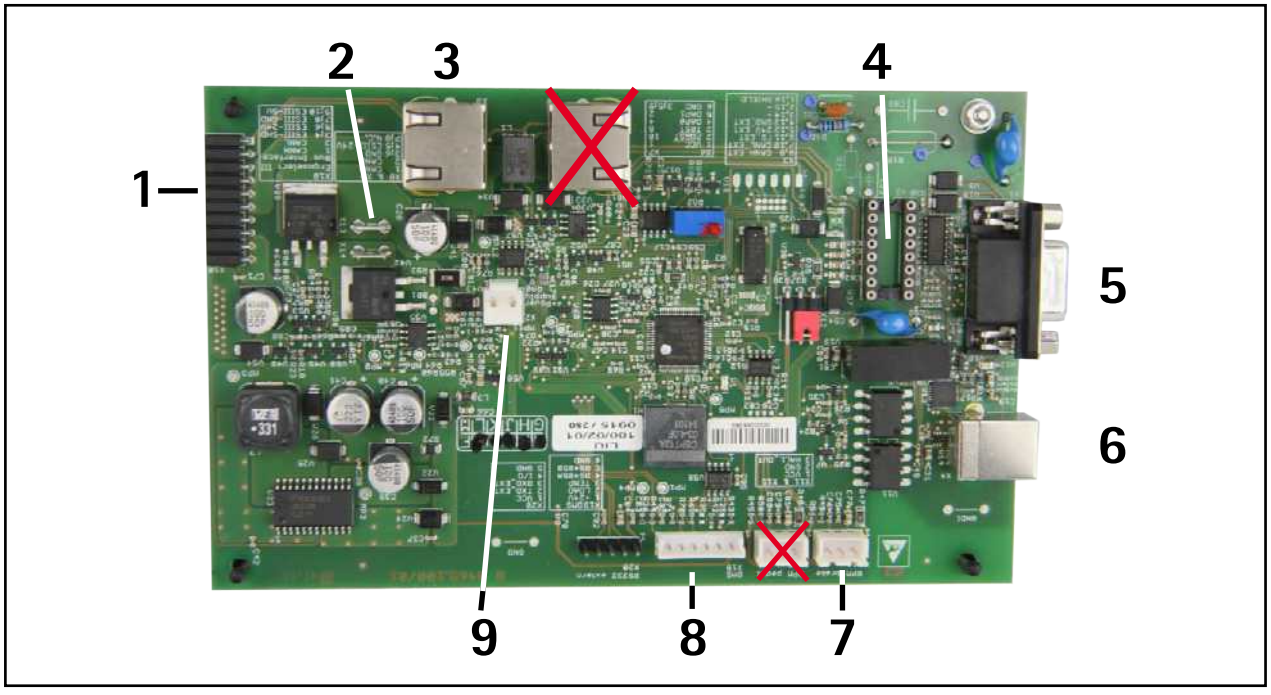
The LIU board is mounted directly on the electronic carrier plate in the bottom of the ergometer.

The power supply (24 Volt) is connected to the LIU and fed into the bus system.

The connection between DTU (control unit M) and LIU is made by a patch cable (RJ-45 jacks); the other boards are connected to the LIU by direct connectors.

LIU board

1 *direct connector for internal BUS system*
2 *connector to eddy current brake*
3 *RJ-45 connector for internal BUS system (DTU)*
4 *jumper for connecting the external COM module*
5 *RS-232 interface connector (galv. isolated)*
6 *USB interface connector (galv. isolated)*
7 *connector rpm sensor*
8 *connector DMS module (torque sensor)*
9 *connector power supply 24 V (from main switch)*



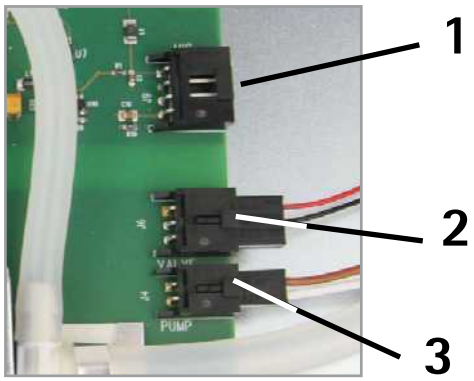
## NIBP blood pressure unit

### Assembly

The NIBP module consists of several components.

The complete measurement electronics, the deflating valve and the power drivers for the pump are placed on the BPU board (see picture).

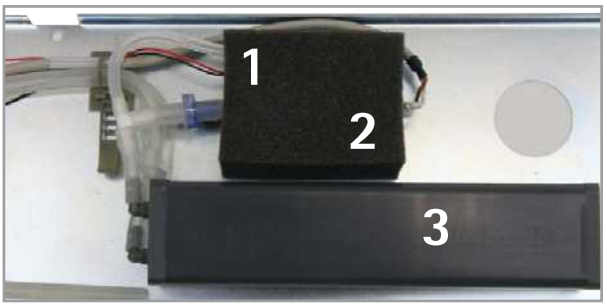
BPU Measuring electronic board




BPU Measuring electronic board

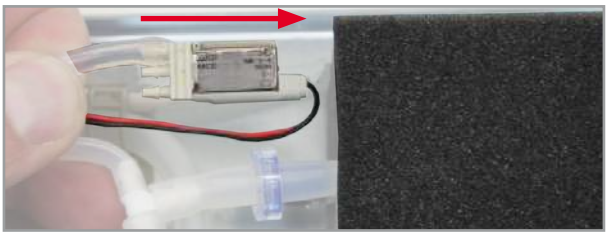
*1 microphone connector (J 9)*
*2 measuring valve connector (J 6)*
*3 pump connector (J 4)*

The pump and the measuring valve are placed on a separate sound and vibration absorbing foam carrier.



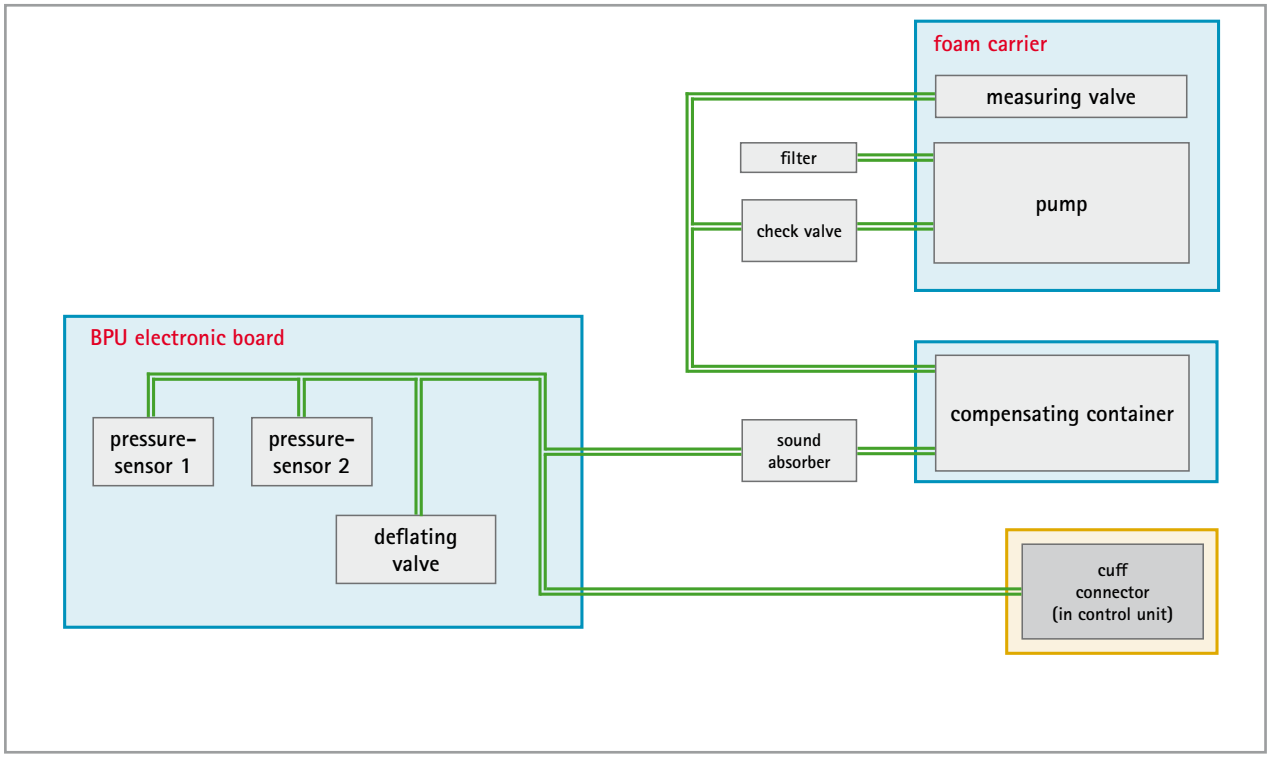

Foam carrier for measuring valve (1) and pump (2) (with compensating container 3)

When replacing the measuring valve, the silicon tube has to be connected with the upper hose nipple of the valve and the cable bended to a loop. The carefully slip the valve back into the foam carrier.

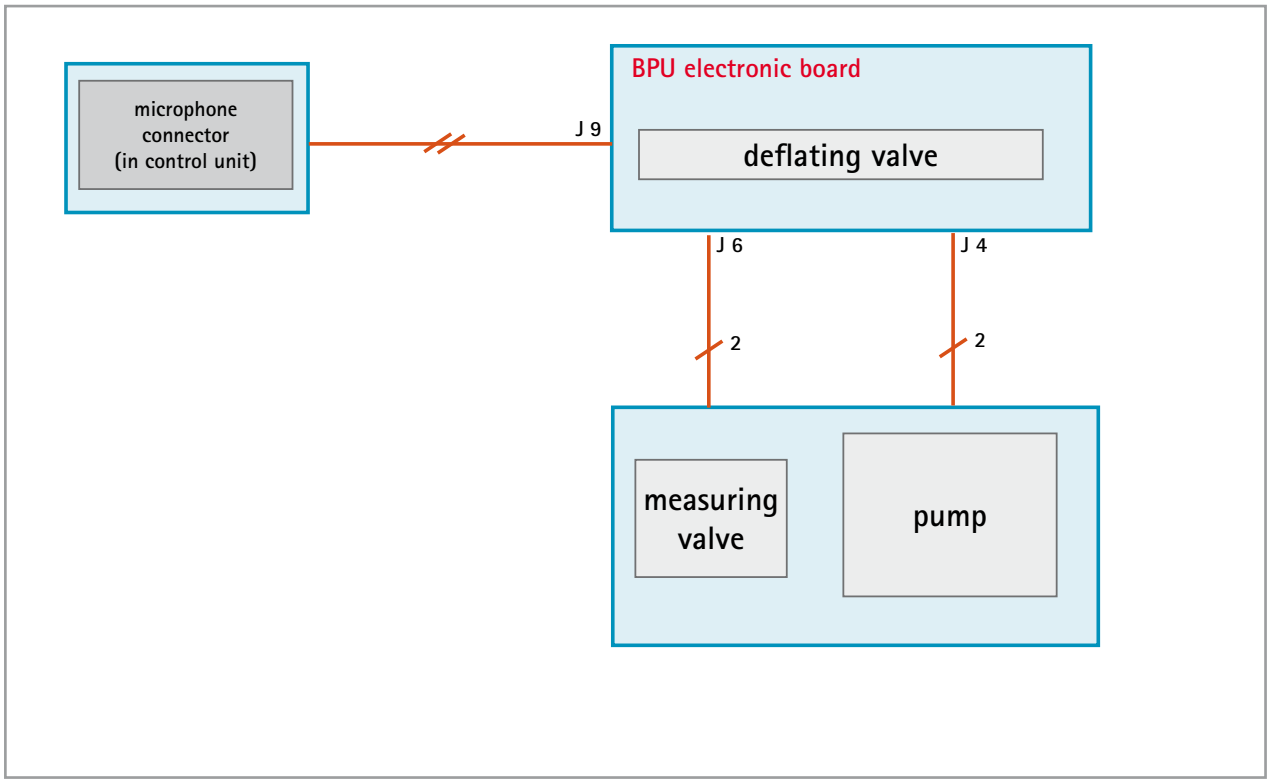


Replacing the valve

## Placement of pressure tubes (schematic)




## Block diagram of cabling of the bloodpressure unit



## BPU – Blood pressure board

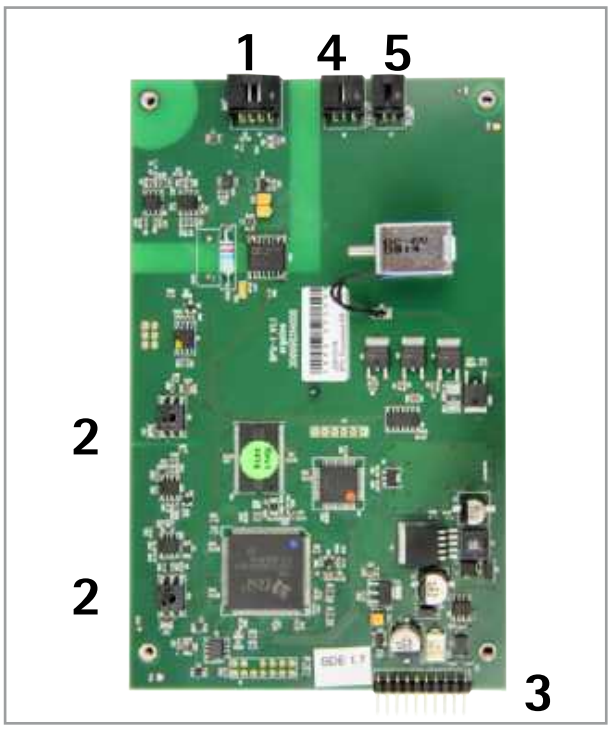
The BPU electronics is responsible for analyzing the microphone signals, controlling the valves and the pump.

The input of the microphone (1) is galvanically isolated, see upper left in picture.

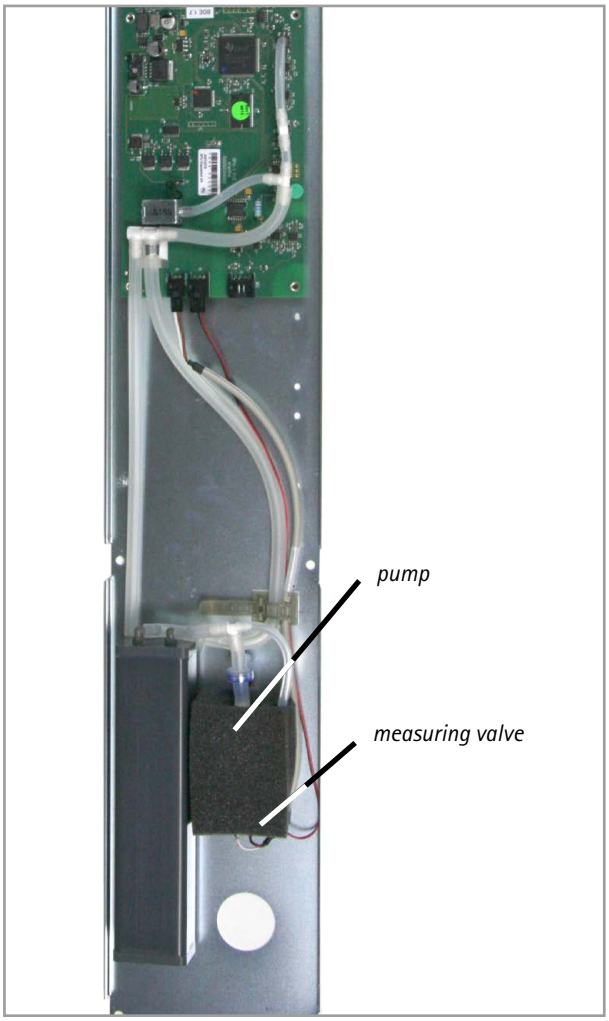
A redundant surveillance system (with two pressure sensors (2) ) continously monitors the actual cuff pressure and the pump time.

The BPU board is connected to other PCBs by use of the direct bus connector (3).

The measuring valve is connected to J6 (4) and the pump to J4 (5).




BDE– blood pressure measuring board




Ergometer blood pressure unit, complete

**Note**

- *The BPU is ALWAYS the last module last module placed in the "PCB chain" on the electronic carrier.*
- *The SMU board is mounted between BPU and LIU.*

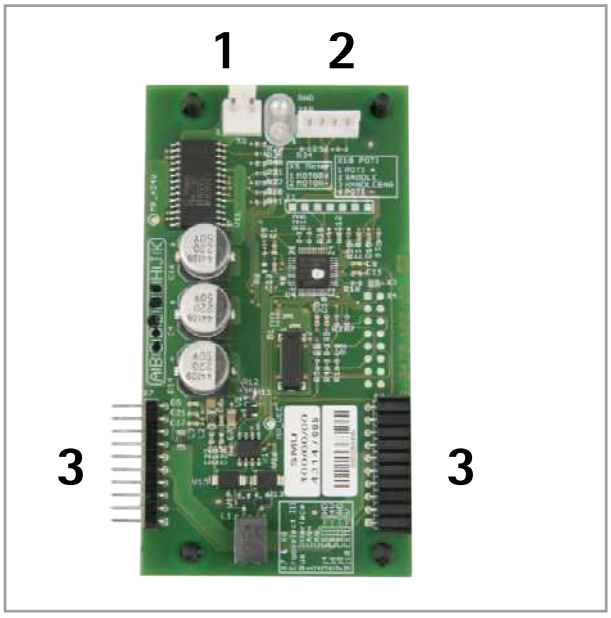
## Miscellaneous modules

### SMU – saddle height motor

The control of the saddle motor is performed by the SMU board.

The SMU has one connector for the motor (1) and another coded connector (2) for the position sensor (actual motor position).
Motor and sensor are connected with special cables.

The SMU board is connected directly to the LIU **(3)** or BPU.




SMU board (top view)

# Mechanical assembly

## Controls and Indicators

1 *Control unit*

2 *Speed readout for patient*

3 *Connectors (for blood pressure cuff)*

4 *Adjustment of handlebar angle*

5 *Castors*

6 *Baseplate (small)*

7 *Leveling feet to adjust the ergometer to uneven floors*

8 *Sockets for power cord and connection cables (underside of ergometer)*

9 *Power switch (toggle switch [I/O])*

10 *Saddle adjustment with clamping lever*


eBike III basic

1 *Control unit*

2 *Speed readout for patient*
*keys for saddle height motor adjustment*

3 *Connectors (for blood pressure cuff)*

4 *Adjustment of handlebar angle*

5 *Castors*

6 *Baseplate (large)*

7 *Leveling feet to adjust the ergometer to uneven floors*

8 *Sockets for power cord and connection cables (underside of ergometer)*

9 *Power switch (toggle switch [I/O])*


eBike III comfort

## Mounting the Handlebar

### Handlebar – Adjust fixture (inclination)

1. Use an allen key to adjust the 2 screws.
2. Open the handlebar lever.
3. Start with a quarter turn clockwise for both screws.
4. Close the lever and check if the handlebar is secure.

5. The force of the lever can be adjusted by turning the screw inside the lever.
6. Open the handlebar lever.
7. Turn the screw clockwise (a quarter turn) using a flat screwdriver.
8. Close the lever and check if the handlebar is secure.

### Handlebar – Dismounting / mounting

1. Open the handlebar lever and turn the handlebar downwards.
2. Remove the allen screw from the lever.

3. Using a flat screwdriver, loosen the screw inside the handlebar lever by turning the screw counterclockwise.

4. Unscrew the lever out of the terminal adapter by turning the lever counterclockwise.

5. Remove the washer.

6. Remove the two allen screws and remove the rear part of the terminal adapter.

7. The handlebar can be changed.

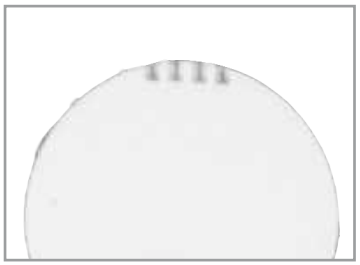
8. Follow the steps in reverse order to secure the handlebar.

# Remove Ergometer Housing

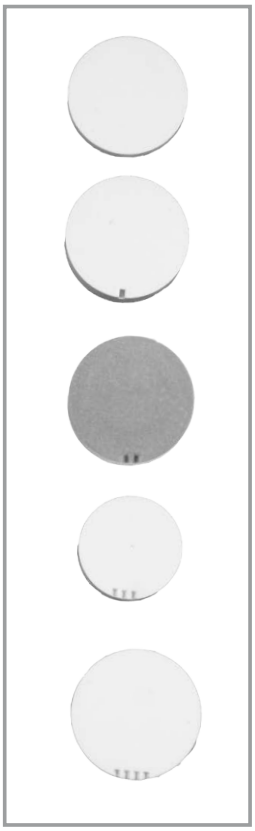
## Plastic screw seals (caps)

The screws fixing the plastic housing parts of the eBike III basic and eBike III comfort are covered by small plastic caps.

Due to the different screw sizes there are 5 different caps used. The different caps are marked with small slots from cap type 0 (no slot) up to cap type 4 (4 slots) - see picture.



Plastic cap with marking slots (type 4)



cap type 0
*handlebar housing*

cap type 1
*eBike III basic*
*eBike III comfort*

cap type 2
*eBike III comfort*

cap type 3
*eBike III comfort*

cap type 4
*eBike III basic*

The caps can only be removed by destroying them.

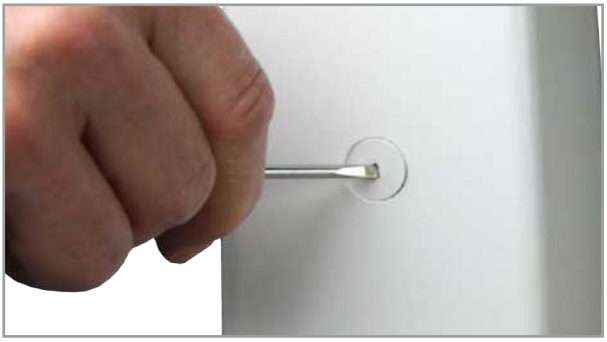
Before removing plastic parts of the housing, be sure to have spare plastic caps available (PN 2018111-335).

## Dismounting the Handlebar pole housing

1. Remove the two plastic caps (type 0) on both sides of the handlebar pole housing

eBike III

2. Using a small screwdriver, cut into the plastic caps covering the screws and remove the caps (the caps will later be replaced by spare ones; P/N 2018111-335).



3. Remove the screws with an allen key tool.

4. The two parts of the handlebar pole housing can be carefully removed.

5. Follow the steps in reverse order to reassemble the handlebar pole housing.

## Dismount pedal cranks

1. Carefully lift the protective cover off the crank, using a small flat screw driver.

2. Plug the crank extractor onto the screw of the crank.

3. Loosen the screw with a wrench (17 mm).
4. Remove the screw and the lock washer.

   (When mounting the cranks after repair use a torque wrench to tighten the screw with a **torque of 40 Nm**.)

5. Turn the crank extractor and securely tighten the screw completely (!!) into the winding of the crank screw.

6. Use a wrench (17 mm) to remove the crank by screwing the bolt onto the axis.

## Remove housing of the eBike III basic

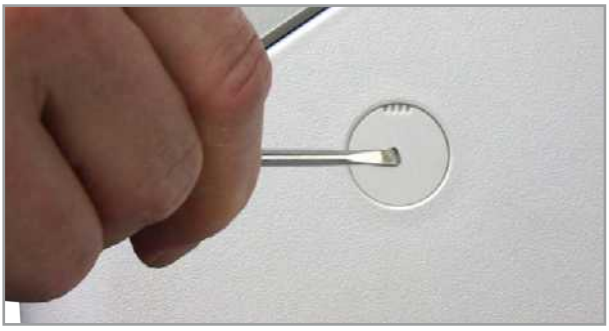
### Remove top cover

1. Remove the saddle.
   (When mounting the saddle after repair use a torque wrench to tighten the screw with a **torque of 25 Nm**.)

2. Remove the lever for saddle height by turning it counterclockwise.

3. Remove the two plastic caps (cap type 4) on both sides.

4. Using a small screwdriver, cut into the plastic caps covering the screws and remove the caps
   (the caps will later be replaced by spare ones;
   P/N 2018111-335).



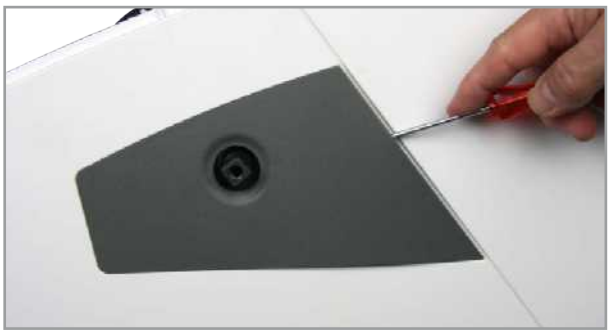
5. Remove the two allen screws underneath the plastic caps.

6. Remove the allen screw at the rear side of the top cover.

7. The top cover can be lifted and carefully removed.

## Remove inlays

1. Using a small flat screwdriver, lift the inlay panel, and carefully release the panel.



**Note**

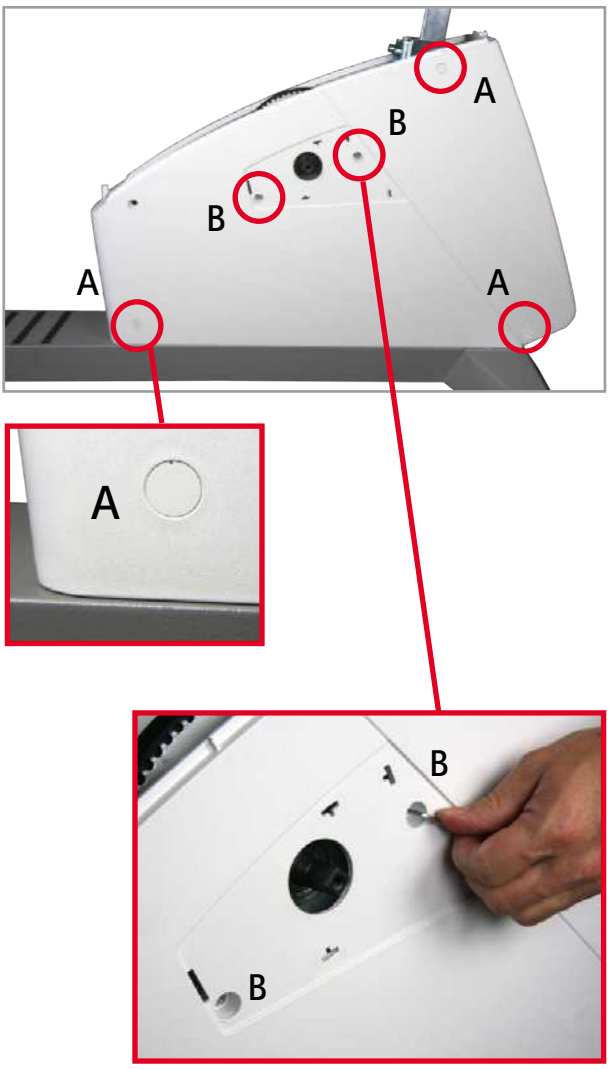
- *Avoid scratching the main plastic housing!*

2. Continue to carefully loosen the remaining tabs until the panel can be removed completely.

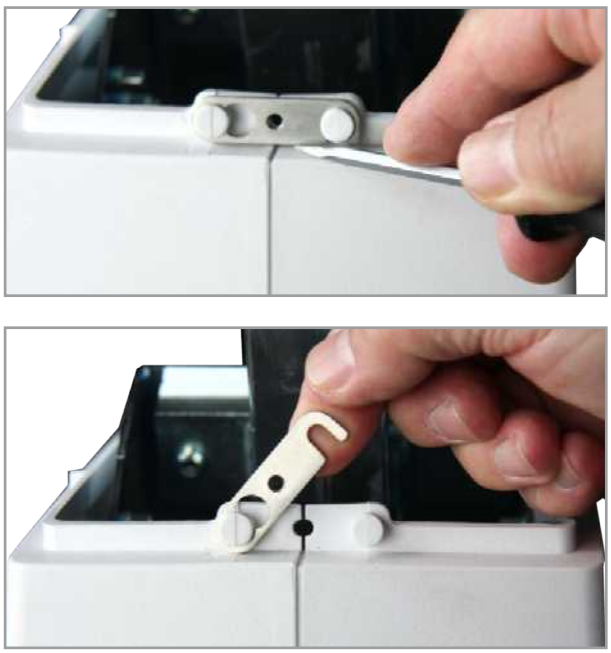
## Remove sides of the housing

1. Using a small screwdriver, cut into the plastic caps (cap type 1) covering the screws and remove the six caps (3 on each side); the caps will later be replaced by spare ones (P/N 2018111-335)
(see picture: items "A").

2. Remove the three allen screws in the main side parts (see picture: items "A") and the two allen screws under the removed inlays (picture: items "B") on both sides.

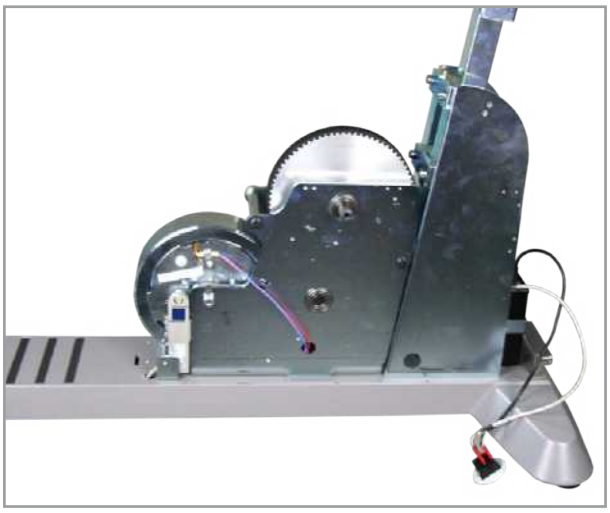



3. Unlock the metal bracket connecting both sides covers of the housing by lifting it with a flat screwdriver.



4. The side covers of the housing can be removed by lifting up the panels from the aluminum bottom plate (see detail).

5. The drive unit, saddle mechanics, and power supply are accessible.



6. Follow the steps in reverse order to assemble the eBike III basic housing.

## Remove housing of the eBike III comfort

### Remove top cover

1. Remove the allen screw from the front part of the top cover.

Using a small screwdriver, cut into the plastic cap (cap type 3) covering the screw and remove the cap on both sides; the caps will later be replaced by spare ones (P/N 2018111-335).

2. Using two allen keys, remove the long screw securing the top cover to the housing brackets.

3. The top cover can be easily removed.

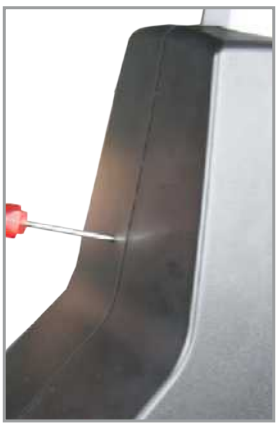
## Remove housing brackets

1. Using a small screwdriver, cut into the two plastic caps (top: cap type 2, bottom: cap type 1) covering the screws and remove the caps on both sides.
   The caps will later be replaced by spare ones (P/N 2018111-335).

**Note**

- *The top plastic cap (cap type 2) is not symmetric - when reassembling the bracket housing, the indication mark of this cap (two notches) has to be positioned at the top!*

2. Insert a small screwdriver or a round 3 mm pin into the small holes (front and rear of bracket top) to unlock the housing.

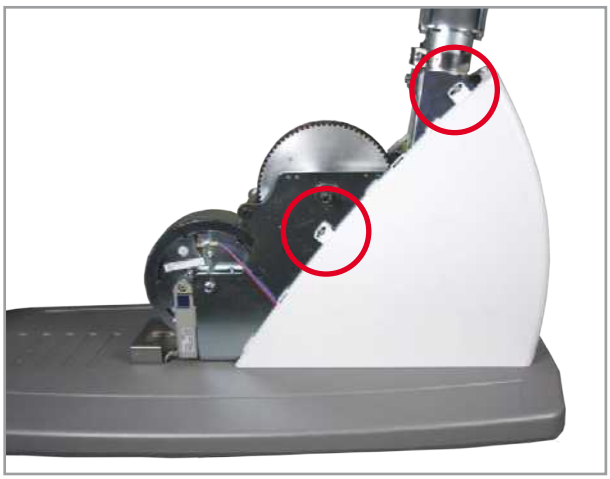


3. Remove the two metal brackets connecting the two sides of the housing brackets.

4. Starting at the bottom, release the housing panels from the brackets in the side housing covers and remove.

## Remove housing side panels

1. Remove the four screws securing the housing panels to the metal chassis.



2. Lift the housing covers to release the covers from the brackets in the aluminium base and remove.

3. The drive unit, saddle mechanics, and power supply are accessible.

4. Follow the steps in reverse order to assemble the eBike III comfort housing side panels.

## Saddle pillar exchange (eBike III basic)

1. Follow the steps in "Remove housing of the eBike III basic" on page 42

2. Loosen the limiting screw for the saddle pillar with an Allen key.

3. Remove the lever.

4. Loosen the Philips screw.

5. Remove the clamping plate and the threaded plate.

6. The saddle pillar can be pulled out.

7. Follow the steps in reverse order to assemble the saddle pillar.

## Saddle motor (eBike III comfort)

1. Follow the steps in "Remove housing of the eBike III comfort" on page 46.

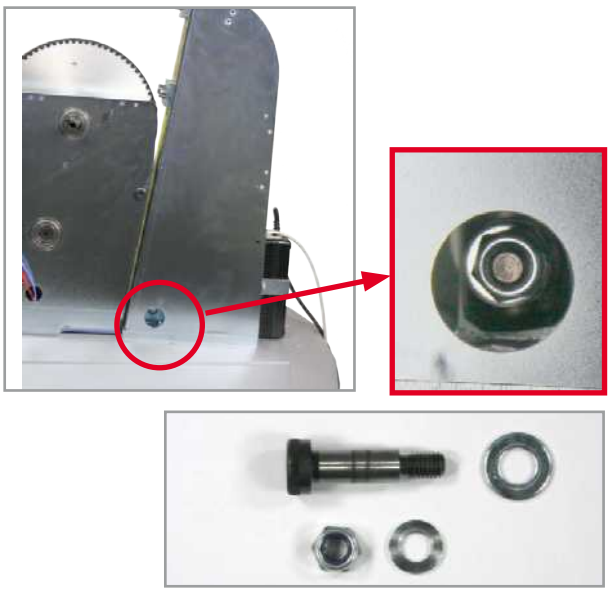
2. Disconnect the two connection cables of the saddle motor from PCB Interface SMU.

3. Remove the saddle.

4. Loosen and remove the bottom fixation of the saddle motor; screw and nut are accessible via a hole at the bottom.. Use a socket wrench and an Allen key from the counter side to dismount the screw.

**Note**

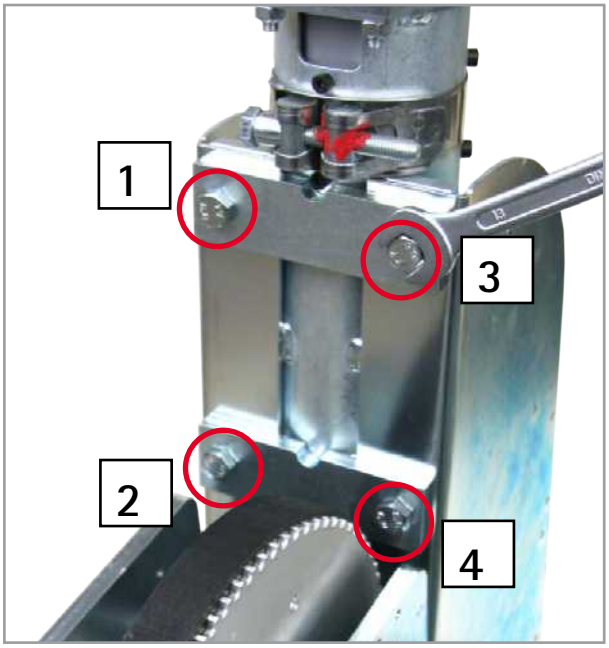
*Try to position the saddle at mid-level setting before removing the saddle motor.*



5. Unscrew the four screws of the saddle guide tube with a fork wrench (13mm):

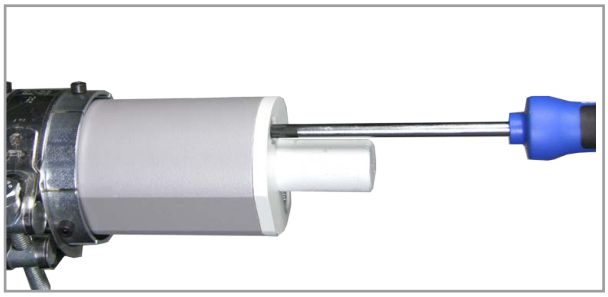
   Start by removing screws (1) to (3) (see picture).

   Loosen screw (4) and move the guide backwards until the screw releases and can be removed.

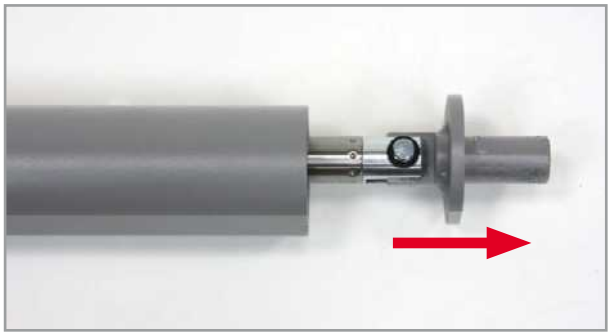


6. Remove the complete saddle motor unit from the ergometer.

7. Loose both TORX screws at the top



8. Push the saddle motor inside the saddle tube to allow the cylindrical pin to be removed from the saddle shaft.



9. Pull the saddle motor out of the saddle guide tube.

10. Follow the steps in reverse order to install the new motor.

## Strain gauge module exchange

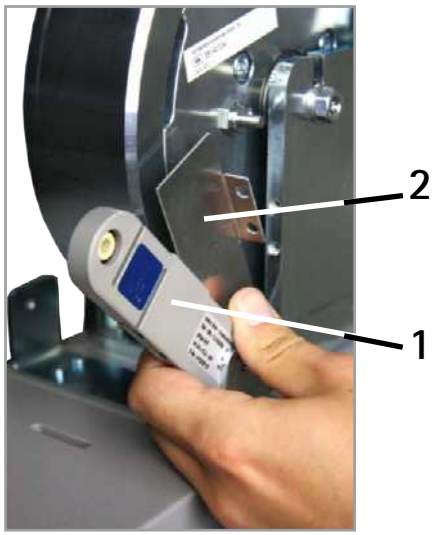
1. Follow the steps in

   "Remove housing of the eBike III basic" on page 42
   or
   "Remove housing of the eBike III comfort" on page 46.

2. Disconnect the cable of the strain gauge module from the LIU electronics (the electronic housing is located underneath the bottom plate).
   Remove the toroid ferrite off the cable.

3. Remove the two allen screws securing the strain gauge module.

4. Remove the strain gauge module (1) and the heat sink (2) and carefully pull the cable through the hole in the bottom plate.




5. When installing the new module carefully allign the module and the heat sink in parallel to the eddy current brake.

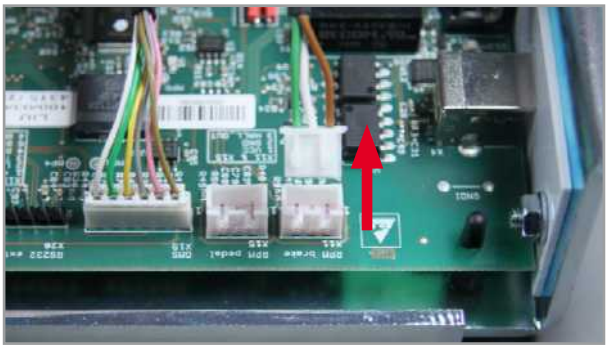
6. When securing the module in place, carefully tighten the two screws; excessive force may damage the module.

7. Lead the connecting cable through the hole in the bottom plate.
   Lead the cable through the toroid ferrite and reconnect it to the LIU electronic board.

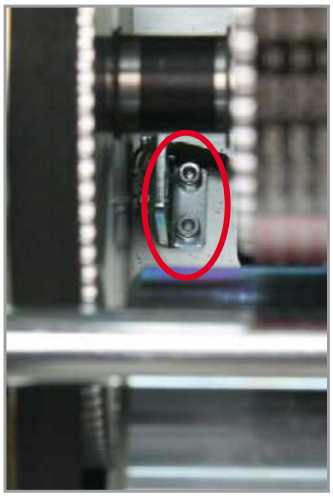
## RPM MODULE EXCHANGE

1. Follow the steps in
   "Remove housing of the eBike III basic" on page 42
   or
   "Remove housing of the eBike III comfort" on page 46.

2. Disconnect the cable of the RPM module from the LIU electronics (the electronic housing is located underneath the bottom plate).



3. Use a long, flexible, magnetic Allen key to remove the two Allen screws securing the RPM module from the bottom plate.

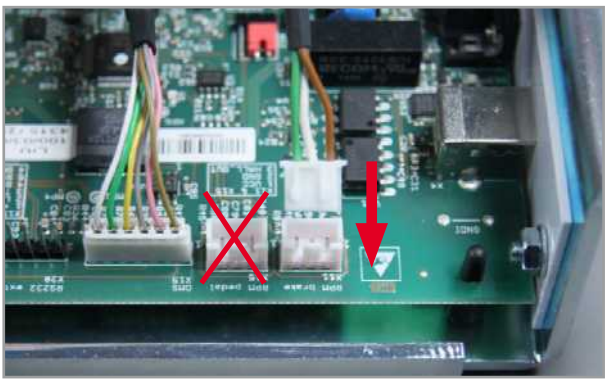


4. Carefully remove the RPM module through the hole in the bottom plate.

5. Insert the new RPM module carefully through the hole in the bottom plate into the load unit.

6. From the top of the load unit carefully tighten the two Allen screws..

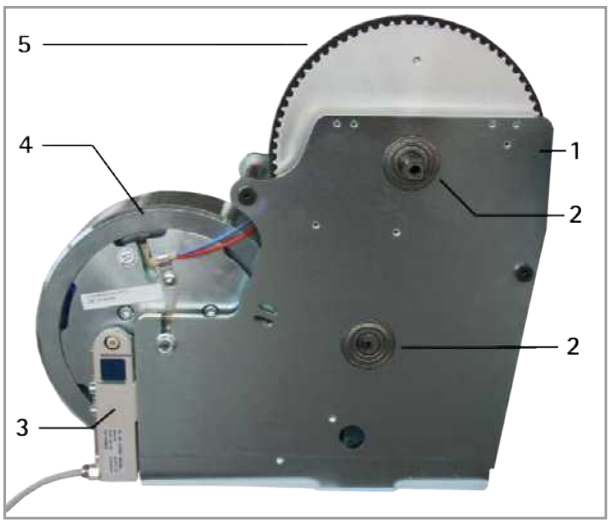
7. Connect the cable to the appropriate connector on the LIU board (marked as "RPM brake").



## Load unit

### Assembly

The eBike III ergometers are equipped with an identical load unit (brake unit) with an eddy current brake of 1000 Watt.




Assembly of the load unit

1 *Galvanized steel housing*
2 *Precision bearings*
3 *Calibrated strain gauge module*
4 *Eddy current brake (1000 W)*
5 *Special drive belt*

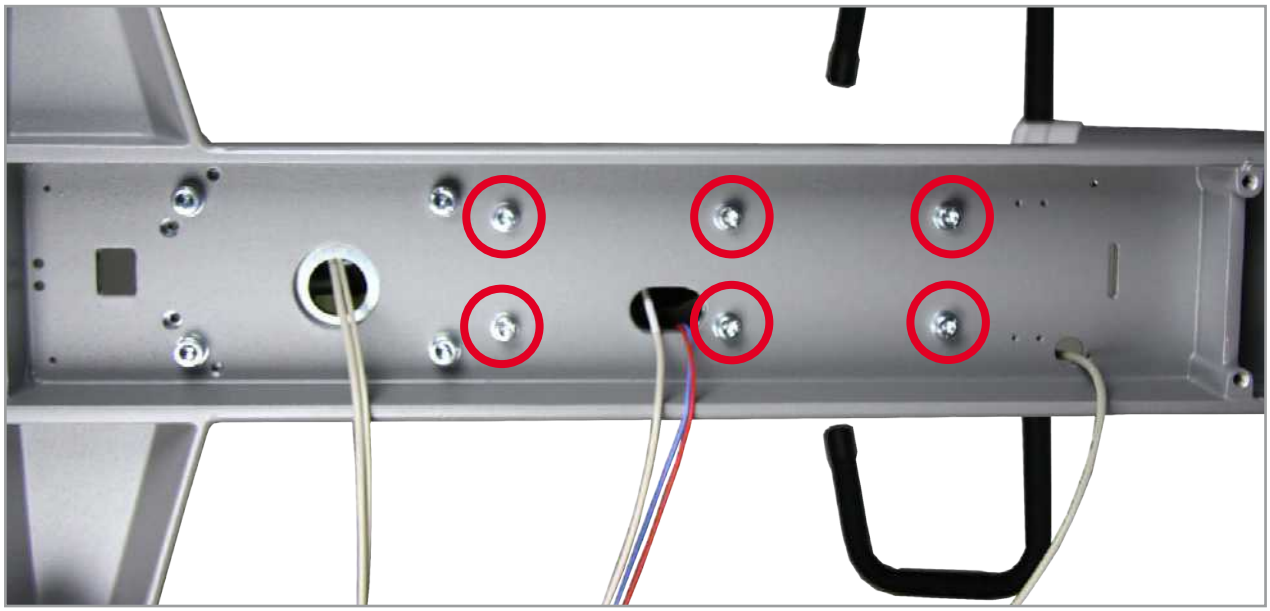
### Load unit replacement

1. Grab the eBike at handlebar and saddle and carefully lay it **sideways on one side**.

2. Disconnect all cables from the electronic boards.

3. The load unit is secured with six Allen key screws on the ergometer chassis.
   Brace the load unit from falling over and then using a socket wrench, loosen the screws.

Use a torque wrench to tighten the screws of the new load unit with a torque of 25 Nm.



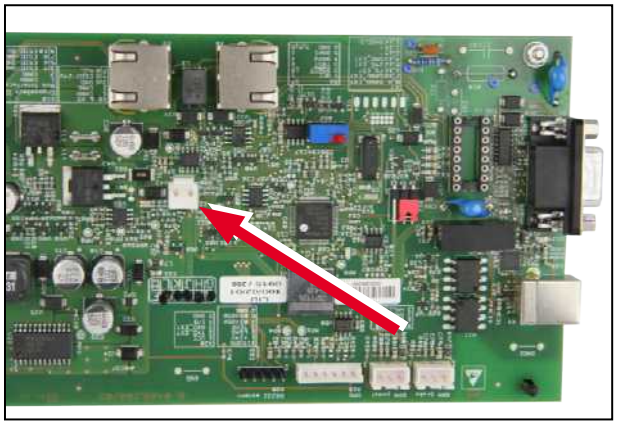
## Power switch replacement

1. The power switch is mounted between the two rear parts of the ergometer housing.

2. Follow the steps in
   "Remove housing of the eBike III basic" on page 42
   or
   "Remove housing of the eBike III comfort" on page 46.

3. Remove the cables from the defect power switch and place them on the appropriate contacts of the new switch.

   If the cable between switch and LIU board has to be replaced, open the electronic carrier (underneath the eBike), disconnect the power cable from the LIU board and replace it with the spare cable included in the package..



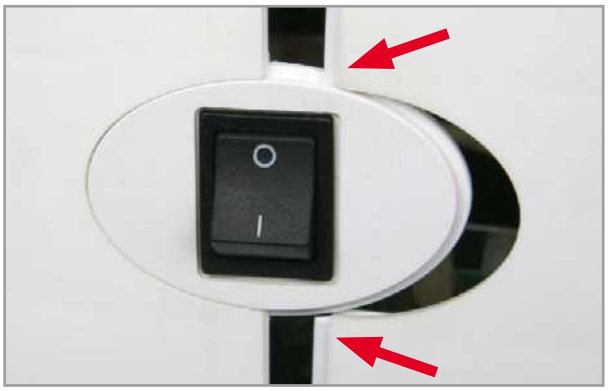
Power connector (from main switch) on LIU board

4. Secure the cables with a cable strap

When reassembling the housing:

5. Slide the plastic cover of the power switch in the appropriate slot in one side part of the housing.

6. During assembly of the side parts take care, that the plastic cover of the main switch fits into the corresponding slot of the other side part.



## Power supply unit replacement

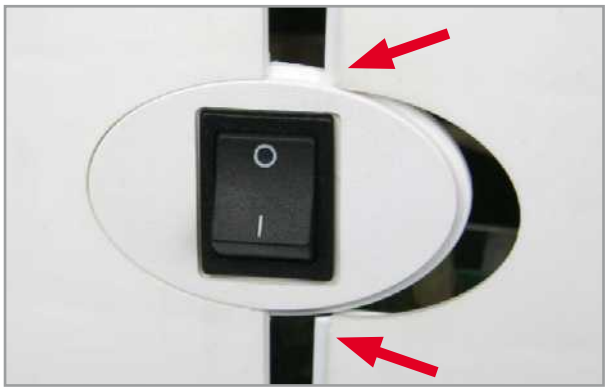
1. The power supply is mounted in the rear of the ergometer.
2. Remove the mounting bracket (2 screws).
3. Replace the power supply unit and secure the mounting bracket again.

4. Remove the power supply cable from the main switch and connect the cable of the new power supply accordingly
5. Secure the cables with a cable strap

When reassembling the housing:

6. Slide the plastic cover of the power switch in the appropriate slot in one side part of the housing.

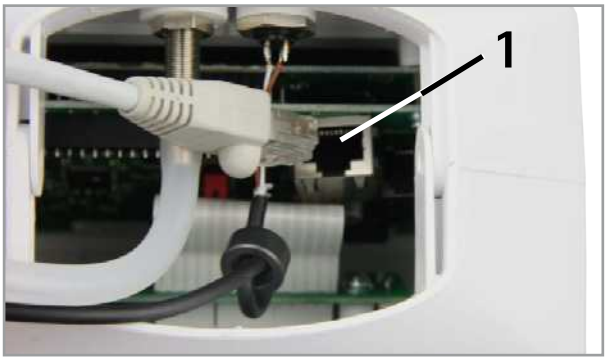
7. During assembly of the side parts take care, that the plastic cover of the main switch fits into the corresponding slot of the other side part.



## Remove Control unit

1. To remove the control unit, loosen both Phillips-head screws on the side of the control terminal.

2. Remove the control terminal from the support.



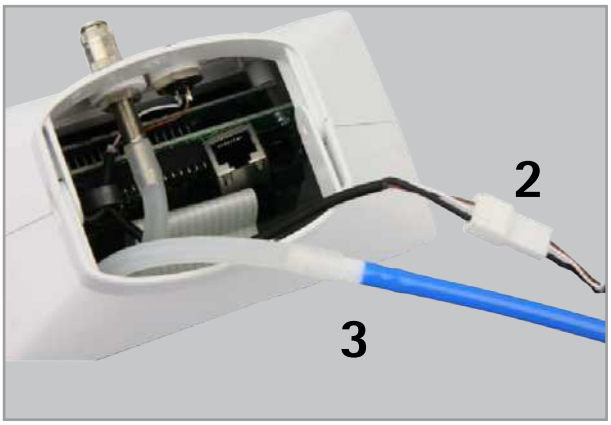

3. Disconnect the patch cable (1) from the DTU board.

**Note**

- *The housing of the control unit CANNOT be opened!*
- *For repairs / upgrades the complete control unit has to be replaced.*

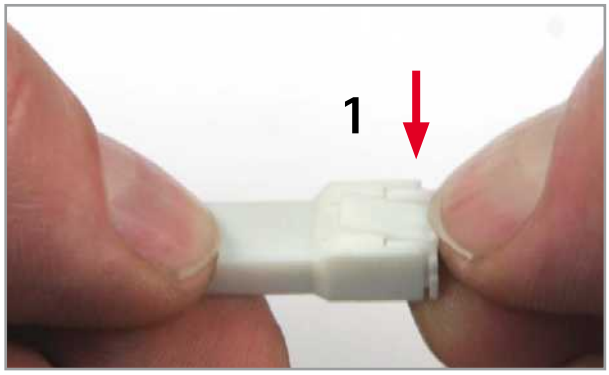
**eBike III with blood pressure measurement**

- Disconnect microphone cable (2) and cuff hose (3) (see following instructions and pictures)

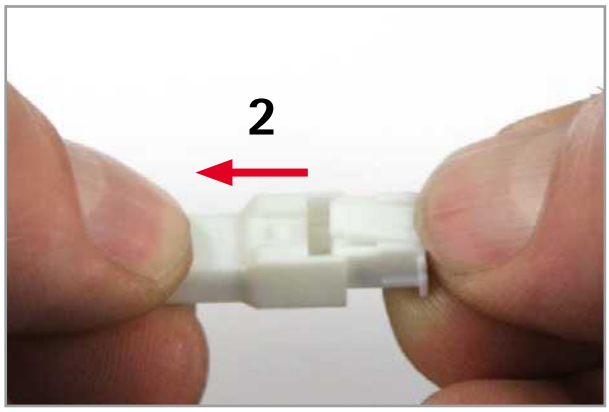


4. Disconnect the microphone cable at the 3 pole connector (see picture):

Press the small clip downwards (1),



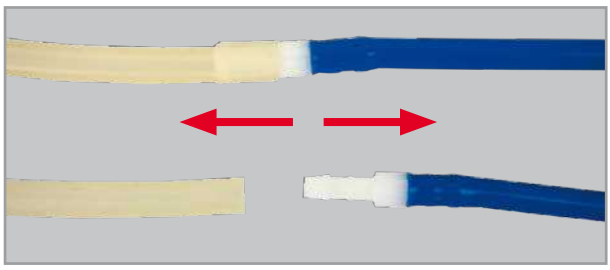

and pull out the connector carefully (2) with clip pressed downwards.




**Warning**

*Do not pull at the microphone cable to disconnect the microphone connector - the cable will be damaged..*

5. Disconnect the blue hose at the hose connector (see picture).



# Software Control terminal


## Turning the System On

The ergometer is powered on by pressing the power switch to the ON position.
The ergometer runs a self-test. The Self-Test screen is displayed.


Self-test screen

**Note**

- *Instruct the patient not to pedal while the ergometer is powering and during the self-test.*
- *Apply the blood pressure cuff to the patient AFTER the ergometer has been powered on and the self-test completed.*
- *If an error message appears displays after the self-test, please refer to the Addendum / Error Messages section for instruction.*

## Settings Control Terminal

The control unit is controlled remotely by a host device (for example, CASE, CardioSoft).
No setup is required by the user.

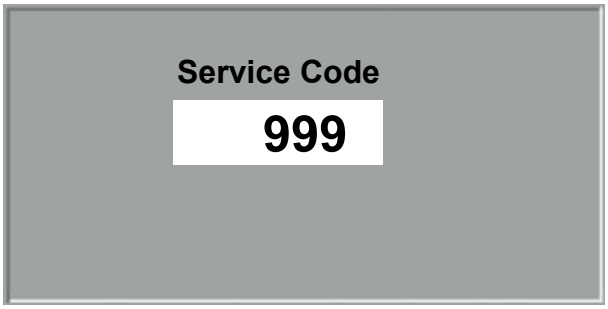
All configuring is done through the service menu only.

## Service menu

To activate the service menu, the ergometer has to be powered off and on again.

As soon as the self test displays on the ergometer LCD, press the two arrow keys simultaneously:


To prevent settings from being changed in error, the service menu is "protected" with a password.
Select "999" with the arrow keys and confirm by pressing NIBP.




Password for service menu

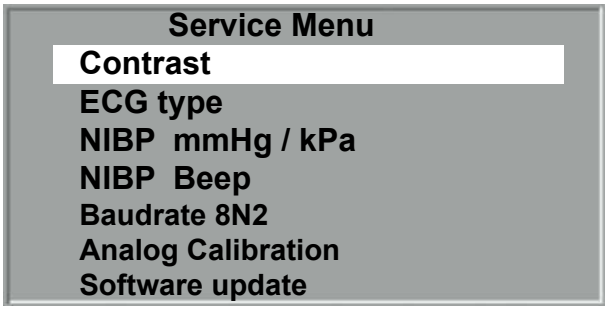
The service menu with the following parameters displays:

- Contrast
- ECG type
- NIBP mmHg / kPa
- NIBP Beep
- Baudrate 8N2
- Analog Calibration
- Software Update
- Dynamic Load Calibration
- Saddle Calibration
- NIBP Calibration
- NIBP Test
- System Config.
- Error log
- Manual load
- Reset DMS values

**Note**

- *The service menu in the ergometers is available in english only.*
- *Depending on the actual ergometer configuration, not all settings are enabled.*
- *Leaving the service menu is only possible by powering the device off.*
- *The following descriptions are not in the same order as in the service menu.*

Navigate through the menus by using the arrow keys (saddle height) to position the cursor bar.
Confirm the selection by pressing NIBP (to the right of the LCD).

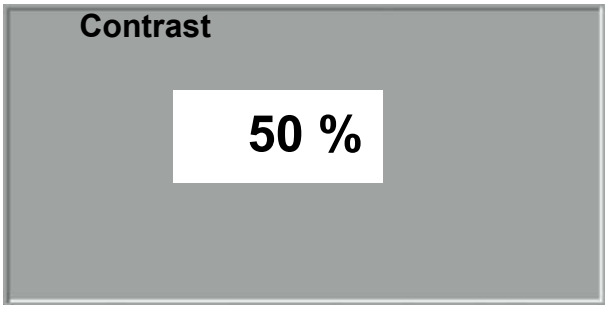



Selection of parameters in service menu

Select the desired parameter using the arrow keys and confirm by pressing NIBP.

## Contrast

The contrast of the LCD can be adjusted between 0 to 100 %.

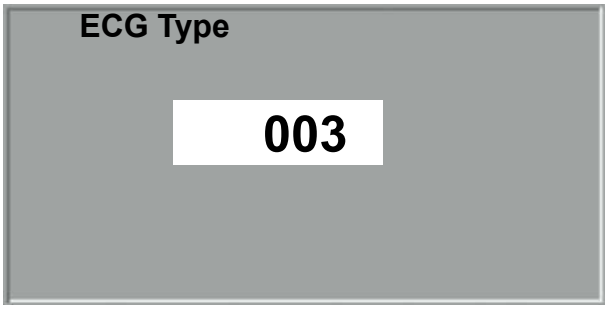



Adjusting the display contrast

## ECG Type

The selected ECG Type determines the communication method with the ECG recorder, PC-based ECG system, etc.

To prevent settings from being changed in error, the menu is protected with a password.
Using the arrow keys, enter "003" and confirm the entry by pressing NIBP.

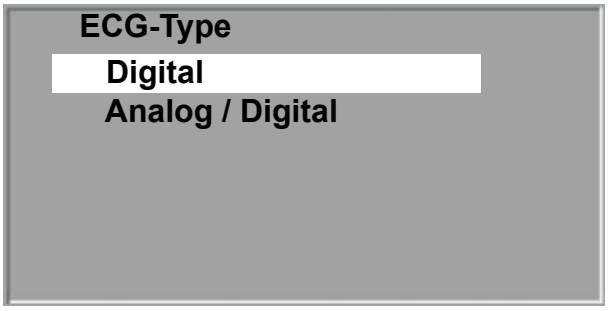



Entering the EKG Type password

All eBike III ergometers support the following communication modes:

- Digital (default)
  The communication with the ergometer is entirely controlled with digital commands.
- Analog / Digital (optional)
  An analog voltage controls the load - blood pressure measurements can be initiated with digital commands.

  To use the "Analog/Digital" communication mode, the eBike III ergometers have to be equipped with the optional „COM-Modul (PN 201118-340)".




Selecting the ergometer communication mode

Select the communication mode and confirm by pressing NIBP.

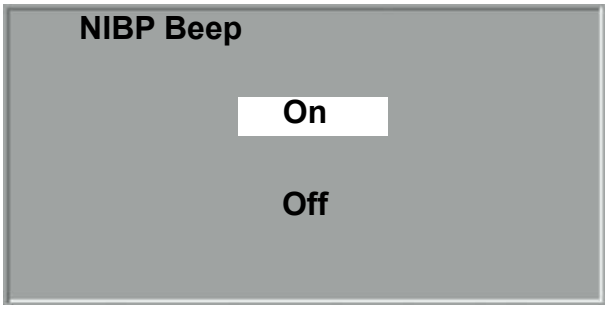
**Note**

- *The ECG Type needs to be selected only when the ergometer is connected to an ECG unit. The selection is part of the installation procedure.*

## NIBP Beep

The tone signal for the systolic pulse (during NIBP measurement) can be set to on or off.

Select the desired setting and confirm by pressing NIBP.




Beep during BP measurements

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## NIBP mmHg / kPa

The units for the NIBP values displayed can be changed.

Select the desired units and confirm by pressing NIBP.


Unit selection for NIBP values

## Dynamic Load Cal.

To perform a dynamic load calibration, a calibrated dynamic test bench is needed.

The dynamic calibration of the load unit is described in the session "„Dynamic Load Calibration" on page 72.

## Software Update

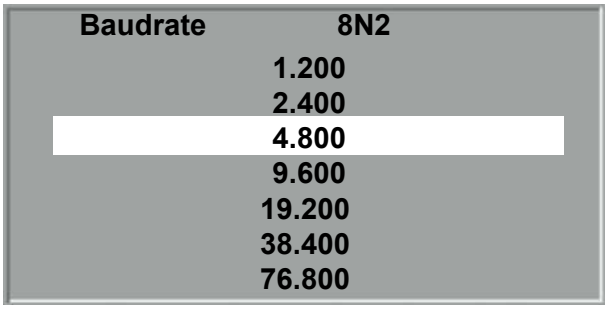
For a description of a software update of the ergometer (firmware) see the session „Software update" on page 78.

## Baudrate 8N2

The baudrate can be selected between 1200 Baud and 115000 Baud.

Default value for standard ergometers is 4800 Baud.

Select the desired parameter using the arrow keys and confirm by pressing NIBP.



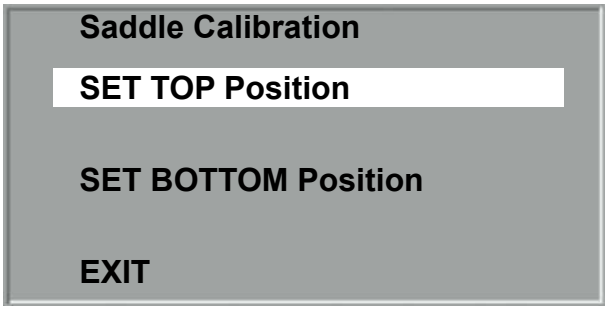

Selection of serial baudrate

## Saddle Calibration

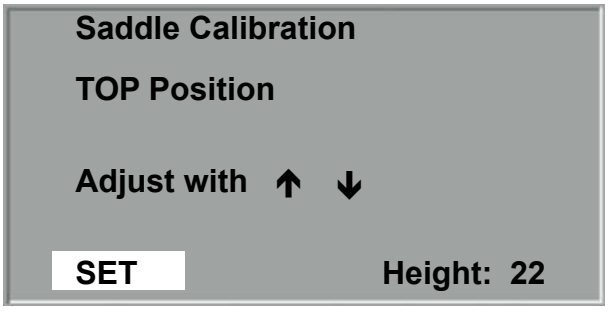
**(eBike III comfort only)**

This parameter is used to adjust the electrical saddle motor (display scale 1-40).

Select "SET TOP Position" and confirm by pressing NIBP.

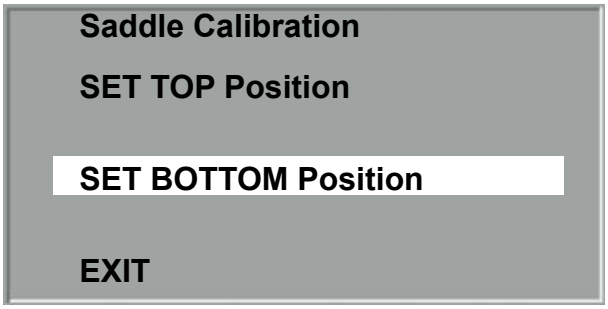



Use the arrow keys to move the saddle to the desired top position (99 cm ± 0,5 cm above bottom plate; see picture) and confirm "SET" by pessing NIBP.

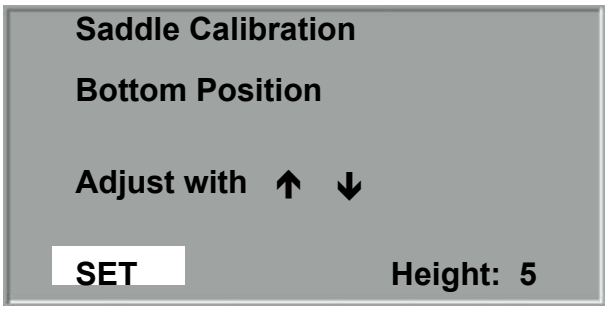



Calibration of saddle height TOP Position

Select „SET BOTTOM Position“ and confirm by pressing NIBP.

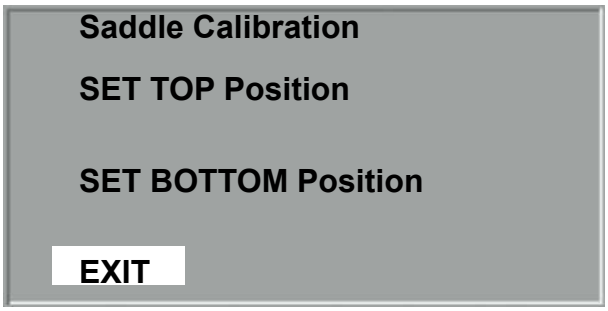


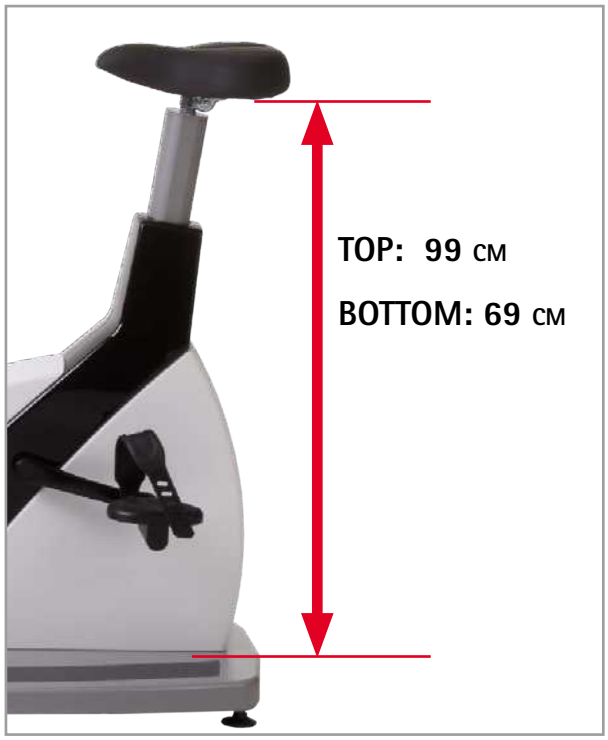

Use the arrow keys to move the saddle to the desired bottom position (69 cm ± 0,5 cm above bottom plate; see picture) and confirm “SET“ by pessing NIBP.




CALIBRATION OF SADDLE HEIGHT BOTOM POSITION

Select “EXIT“ and confirm by pressing NIBP to return to the service menu



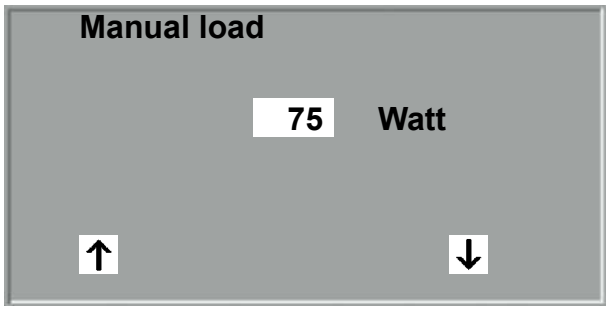



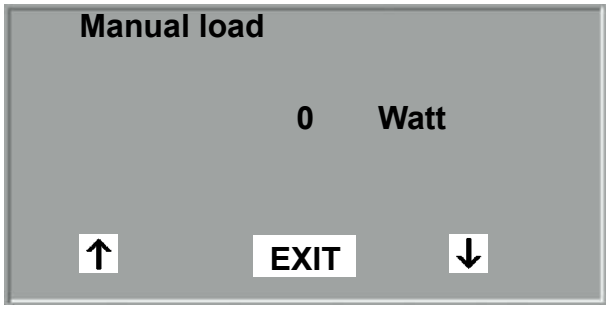

## Manual Load

A manual load can be set between 1 - 999 Watt.

Use the arrow keys and set the desired value by pressing NIBP.

Pressing NIBP at 0 Watt (EXIT) returns to the service menu.



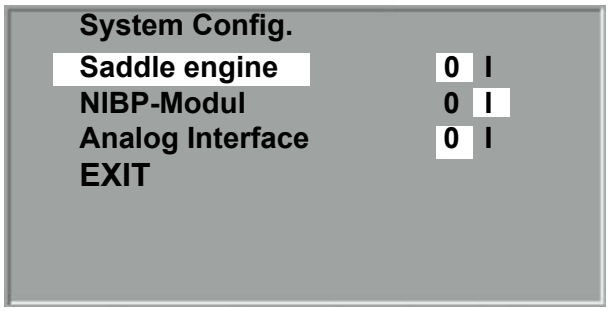




## System Config.

The hardware configuration of the ergometer is defined in this setup.

Select the module / option and change the setting to I if the module is integrated in the actual ergometer.

The last selection "EXIT" returns to the service menu.




Settting of ergometer configuration

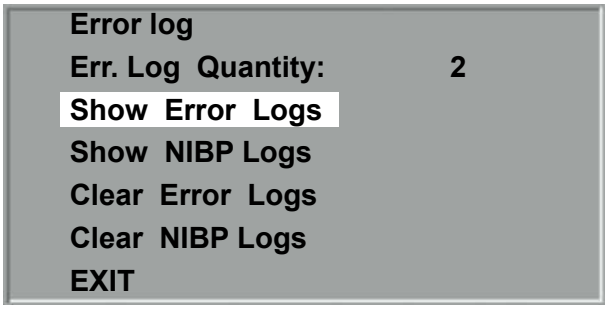
**Note**

- *"Analog Interface" is set to "I" only if a MAC5500 is connected to the eBike III.*
  *In conjunction with this setting, a special adapter (COM module PN 2018111-340) has to be installed to add an analog interface to the eBike III.*

## Error log

The software of the eBike III ergometers stores internal error messages in a special memory area (Error Logs) and also stores statistics for the quality of the blood pressure measurements (NIBP Logs).

These error messages can be checked and cleared in this menu.




Error log memory

To display the stored error messages select „Show Error Logs" and confirm with by pressing NIBP.

The first error message is displayed:

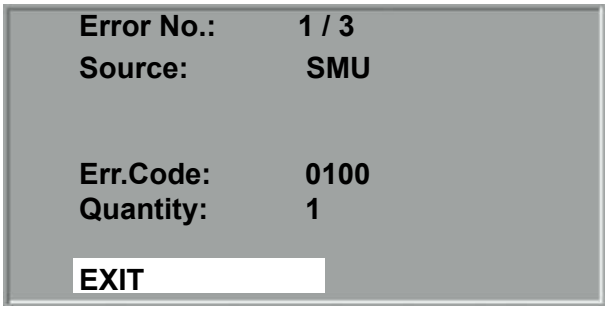
**Source:** The unit generating the error

**Err.Code**: Corresponding error code of the software

**Quantity**: Number of occurences of this error

Using the arrow keys, the following error messages can be displayed.

Press the NIBP (Exit) to close the error log displayed.



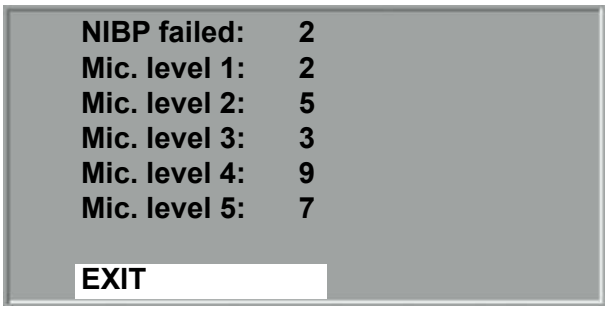

Displaying a single error

To display the bloodpressure statistics, select „Show NIBP Logs" and confirm by pressing NIBP.

The statistics are displayed:

**NIBP failed:** Number of failed measurements

**Mic.Level 1...5**: Number of measurements with the shown microphone signal strength (5 = best signal)




Error log memory NIBP

## NIBP Test / NIBP Calibration

This menu is enabled, if the ergometer is equipped with an automatic NIBP module and this module is activated.

Test and calibration of the NIBP module is described in session „Calibration of Blood pressure unit“ on page 75..

---

## Analog Calibration

This function is used to allign the analog remote signals (input and output) to the corresponding ECG devices.

The eBike III ergometers have to be equipped with the optional „COM Module (PN 201118-340)“. This module is connected with a small cable to the 9-pin DSUB connector and fixed to the chassis with a plastic velcro tape.

In addition, a jummper connector has to be installed on the LIU board.

The COM module handles one analog input and five analog output signals from/to external devices.

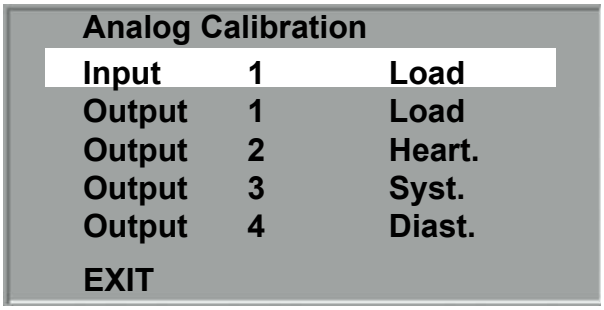
**Note**

- *To align the analog load signals, the corresponding ECG recorder should be connected as a reference voltage source.*
- *Disconnect the RS232 or USB cable, if connected.*
- *The alignment of the analog signals can be controlled after exiting the service menu (e.g. by starting a remote controlled stress test).*


Signal assignment of analog connector (COM module)

| | |
|---|---|
| *Pin 1:* | *INPUT Load* |
| *Pin 2:* | *reserved - do not connect* |
| *Pin 3:* | *reserved - do not connect* |
| *Pin 4:* | *OUTPUT BP heartrate* |
| *Pin 5:* | *OUTPUT Load* |
| *Pin 6:* | *OUTPUT Diastole* |
| *Pin 7:* | *OUTPUT rpm* |
| *Pin 8:* | *OUTPUT Systole* |
| *Housing:* | *Signal GND* |

Select the analog signal to be aligned and confirm by pressing the NIBP key.




Alignment of analog input / output signals

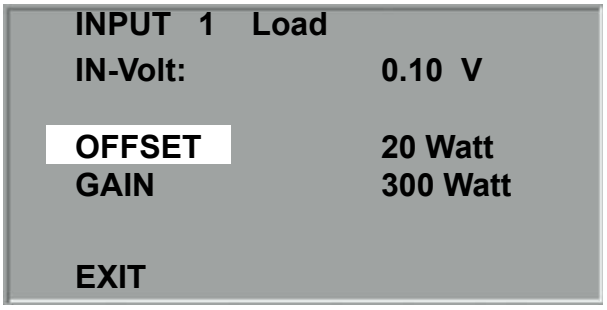
## Alignment "Input: Analog Load control"

IN-Volt: displays the voltage at the analog input

Set the ECG recorder output to a low load value (for example 20 Watt).

The corresponding voltage is displayed (IN-Volt). Wait until the voltage has settled.

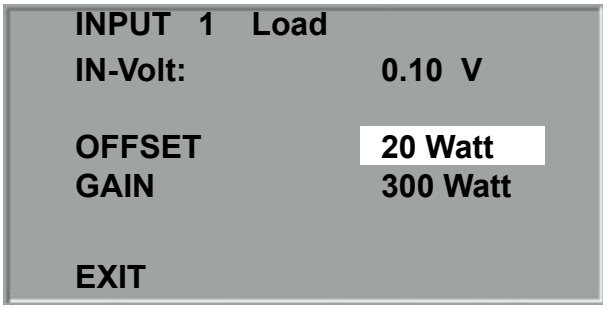
Select "OFFSET" and confirm by pressing NIBP.




Alignment of analog input „load"

Use the arrow keys to set the load value to the ECG recorder vaue (for example 20 Watt) and confirm by pressing NIBP.

The setting is stored in the ergometer.

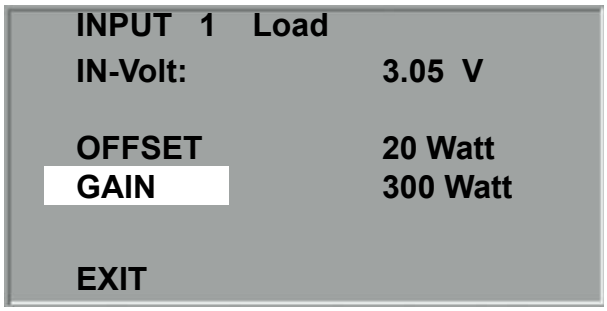



Offset Alignment of analog input „load"

Set the ECG recorder output to a high load value (for example300 Watt).

The corresponding voltage is displayed (IN-Volt). Wait until the voltage has settled.

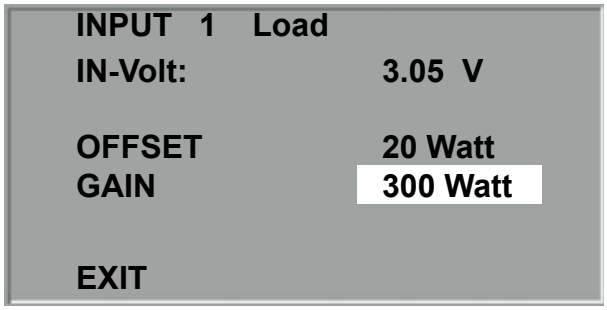
Select "GAIN" and confirm by pressing NIBP.




Alignment of analog input „load"

Use the arrow keys set the load value to the ECG recorder vaue (for example 300 Watt) and confirm by pressing NIBP.

The setting is stored in the ergometer.




Gain alignment of analog input „load"

Setting range:

**OFFSET**: range from 20 to 1000 Watt in 10 Watt steps
**GAIN**: range from 20 to 1000 Watt in 10 Watt steps

## Alignment "Ouput: Analog Load value"

**Note**

- *Analog outputs are not used with standard connection to CardioSoft / Case / MAC/ 2000 / MAC 5500*

The output voltage representing a special load value of the ergometer is defined with this setting.

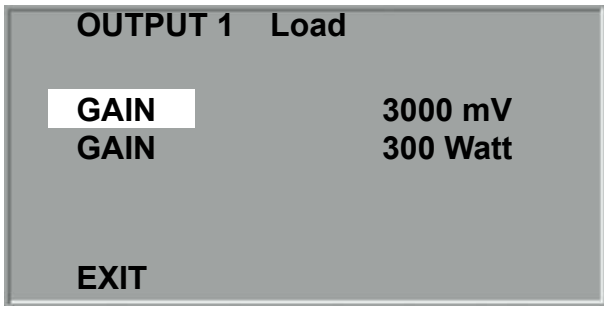
It is possible to adjust the voltage and / or the load value.

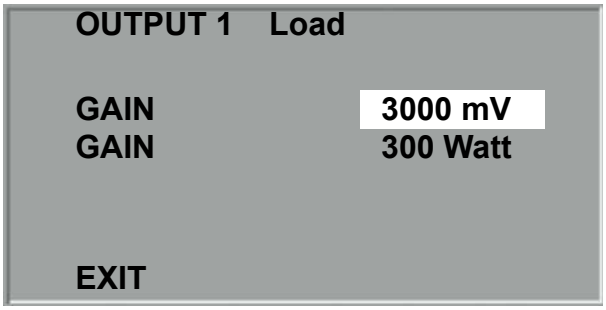
Select the parameter using the arrow keys and confirm by pressing NIBP

Use the arrow keys to set the load value and confirm by pressing NIBP.

Setting range:
**GAIN**:(voltage) 20 mV to 10000 mV in steps of 2 mV

**GAIN** (load) 20 to 999 Watt in steps of 10 Watt




Alignment of analog output „load"

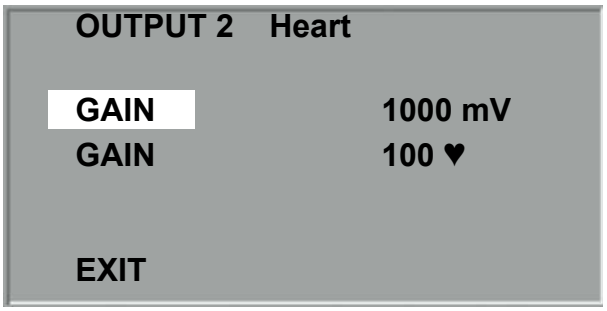
## Alignment "Output: Analog Heartrate"

The output voltage representing a special heart rate is defined with this setting.

It is possible to adjust the voltage and / or the heartrate value.

The setting is performed as described previously under **Alignment "Ouput: Analog Load value"**

Setting range:
**GAIN** (voltage): 500 to 2000 mV in 2 mV steps
**GAIN** (heartrate): 50 to 250 bpm in 10 bpm steps



## Alignment "Output: Analog Systole"

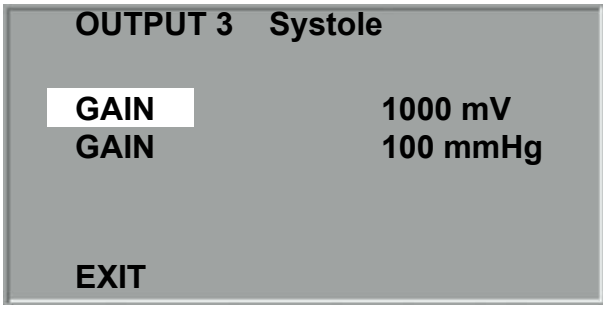
The output voltage representing the systolic value is defined with this setting.

It is possible to adjust the voltage and / or the systolic value.

The setting is performed as described previously under **Alignment "Ouput: Analog Load value"**

Setting range:

| | |
|---|---|
| **GAIN** (voltage): | 500 to 2000 mV in 2 mV steps |
| **GAIN** (systole): | 50 to 250 mmHg in 5 mmHg steps |




## Alignment "Output: Analog Diastole"

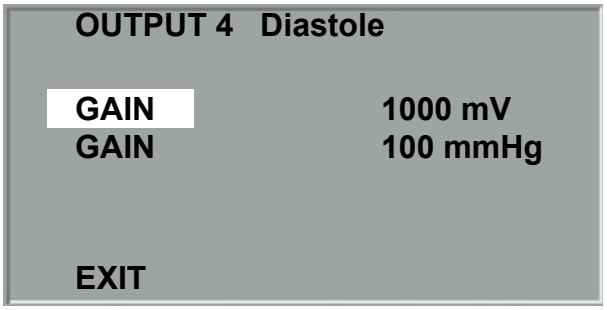
The output voltage representing the diastolic value is defined with this setting.

It is possible to adjust the voltage and / or the diastolic value.

The setting is performed as described previously under **Alignment "Ouput: Analog Load value"**

Setting range:

| | |
|---|---|
| **GAIN** (voltage): | 500 to 2000 mV in 2 mV steps |
| **GAIN** (diastole): | 50 to 250 mmHg in 5 mmHg steps |




## Alignment „Output: RPM"

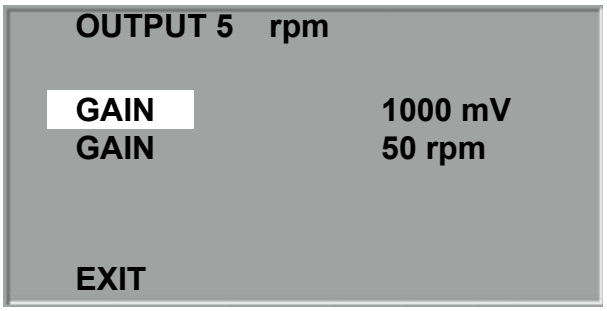
The output voltage representing the actual rpm value is defined with this setting.

It is possible to adjust the voltage and / or the rpm value.

The setting is performed as described previously under **Alignment "Ouput: Analog Load value"**

Setting range:

| | |
|---|---|
| **GAIN** (voltage): | 200 to 1000 mV in 2 mV steps |
| **GAIN** (rpm): | 30 to 130 rpm in 5 rpm steps |



# Alignment / Calibration

## Dynamic Load Calibration

- Dismount **BOTH (!)** pedal cranks of the eBike III - see "Dismount pedal cranks" under section „Dismount pedal cranks" on page 41.

- Follow the operator manual from the manufacture of calibration device being used to connect the calibration device with the axis of the eBike III.

When a dynamic calibration is performed, the measured actual load values are entered into the ergometer software.

The ergometer calculates the exact characteristic load curve for regulating the eddy current brake.

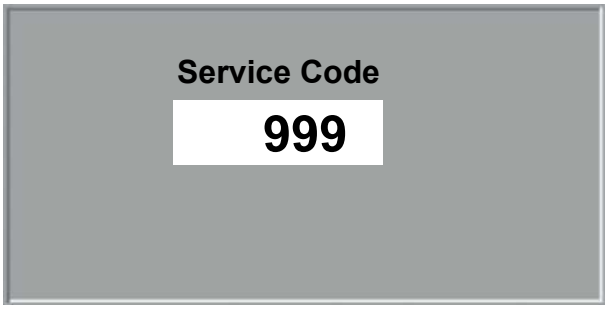
The following load / rpm combinations have to be measured during the calibration process:

- offset at no load / no rotations
- 50 Watt at 50 rotations / min
- 50 Watt at 110 rotations / min
- 400 Watt at 110 rotations / min

To activate the service menu the ergometer has to be switched off and on again.

As soon as the self test appears on the ergometer display, press the two softkeys synchronously:


To prevent settings from being changed by chance, the service menu is „protected" by a password.
Select „999" with the arrow keys and confirm with NIBP.




Password for service menu

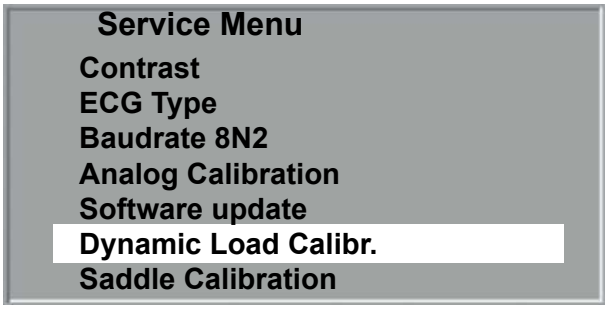
Navigate through the menus by using the arrow keys (saddle height) to position the cursor bar.
Confirm the selection by pressing NIBP (to the right of the LCD).

**Note**

- *This session describes the dynamic load calibration of the eBike III as a manual „step-by-step" procedure.*

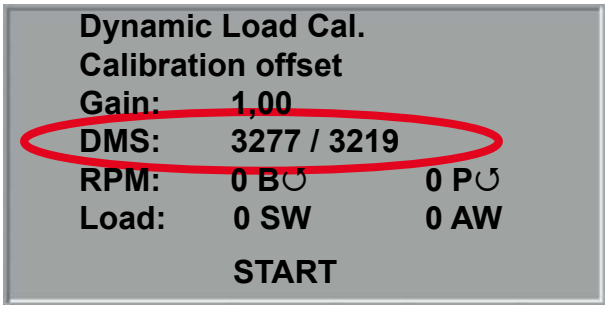
- *When using the ergoline calibration bench ("ergoline ergotest 550" - order direct from Ergoline P/N 705890), an automatic dynamic load calibration is possible - please refer to the operator manual of the ergotest 550 device*

Select „Dynamic load calibration“ and confirm with NIBP



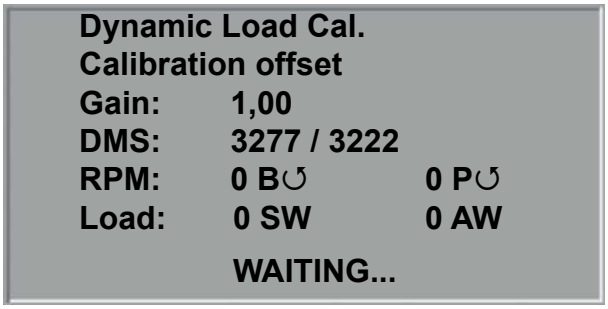

SELECTION OF PARAMETERS IN SERVICE MENU

- Start the offset calibration process with NIBP
- The line „DMS“ shows:
  stored DMS value / actual DMS value



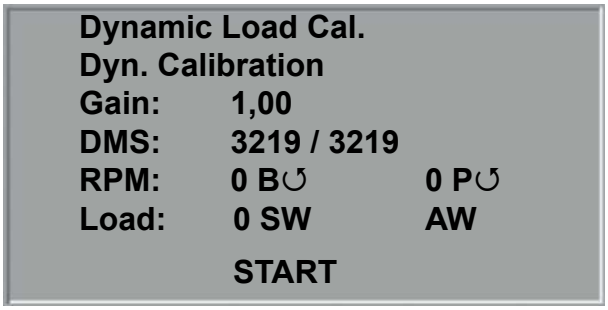

DYNAMIC LOAD OFFSET CALIBRATION – WAITING FOR START

- By pressing NIBP (START) the actual value is averaged for 5 sec and stored



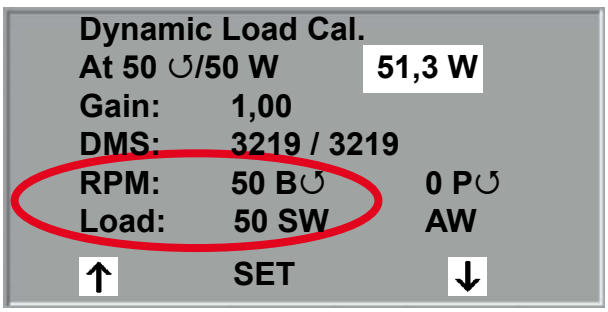

DYNAMIC LOAD OFFSET CALIBRATION – AVERAGING

- Press NIBP (START) to start calibration step #1
- The eBike III automatically sets the load to 50 Watt
- Set the calibrator unit to 50 rpm
- The line „RPM“ shows the measured rotations/min (issued by the calibrator unit)
  [the value „P↻“ is not used in the eBike III]
- The line „Load“ shows the target load in Watt- automatically set by the eBike III (e.g. 50 Watt)
  [the value „AW“ is not used in the eBike III]



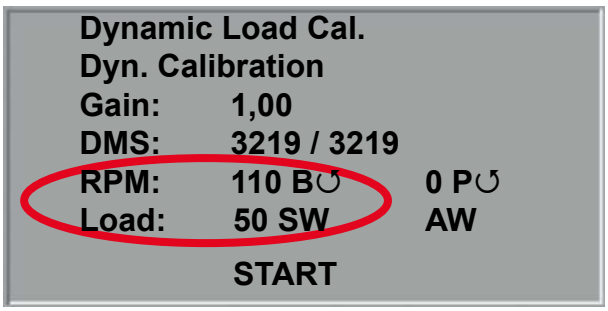

DYNAMIC LOAD CALIBRATION STEP 1 – WAITING FOR START

- Wait approx. 20 seconds, until the load display is stable
- By using the arrow keys, input the actual measured load value of the calibrator (e.g. 51,3 Watt)
- Store the value with SET.



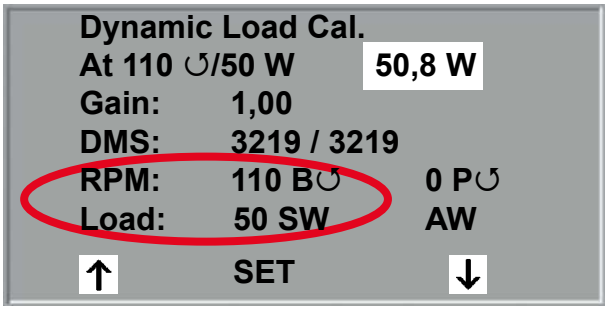

DYNAMIC LOAD CALIBRATION STEP 1 – INPUT LOAD VALUE

- Set the calibrator unit to 110 rpm.
- Press NIBP (START) to start calibration step #2
- Wait approx. 20 seconds, until the load display is stable



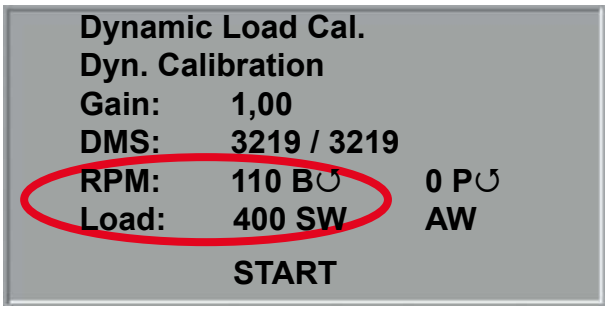

Dynamic load calibration step 2 – waiting for START

- By using the arrow keys, input the actual value of the calibrator (e.g. 50,8 Watt) at the ergometer.
- Store the value with SET.



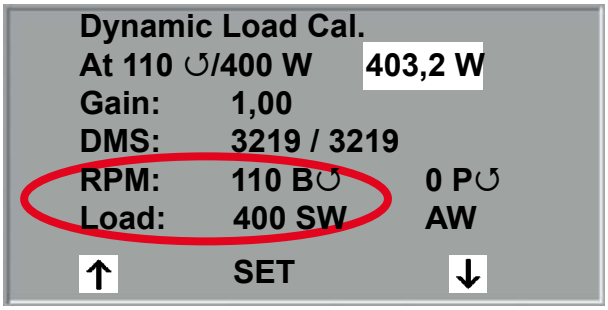

Dynamic load calibration step 2 – input load value

- The eBike III automatically sets the load to 400 Watt
- Wait approx. 20 seconds, until the load display is stable




Dynamic load calibration step 3 – waiting for START

- By using the arrow keys, input the actual value of the calibrator (e.g. 403,2 Watt) at the ergometer.
- Store the value with SET.

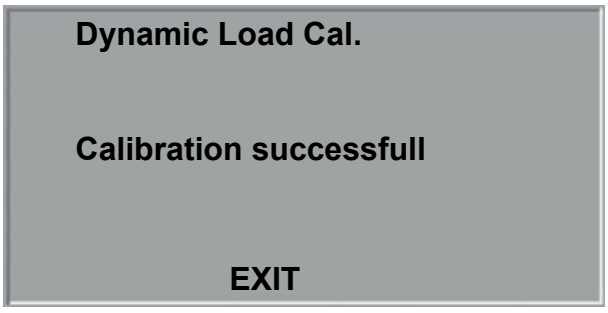



Dynamic load calibration step 3 – input load value

The successfull completion of the dynamic load calibration is confirmed.

- Stop the calibration unit.
- Press NIBP to exit the Calibration programm

Dismount the calibration unit and reassemble the cranks / pedals to the eBike.




Dynamic load calibration successfull

## Calibration of Blood pressure unit

Recommended components:

- Calibrated pressure measuring device (mmHg) (manometer)
- Compensating container with 500 ml volume (min.)
- Hand pump
- Adapter for eBike cuff connector
- Connecting tubes with t-adaptors

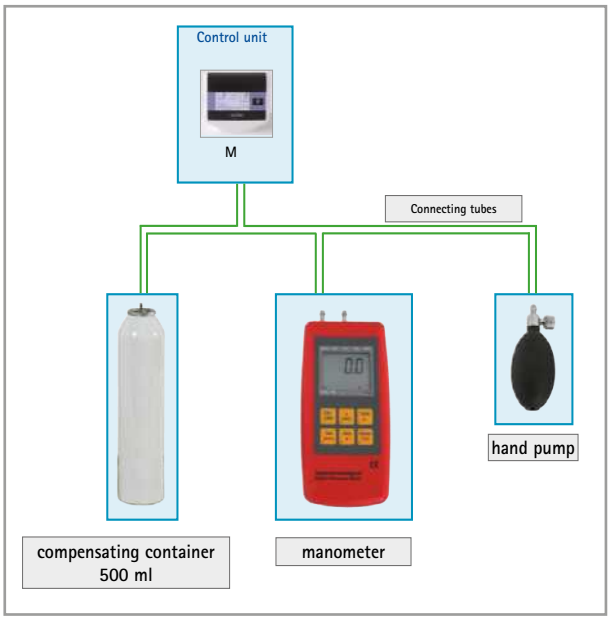

Calibrated pressure measuring device (mmHg)

Compensating container (example)

Hand pump

Adapter for eBike cuff connector

All the components are connected by tubes (one pressure system) and connected to the cuff connector of the ergometer control terminal (use cuff adaptor).




CALIBRATION SETUP NIBP

## NIBP TEST

This function is used to check the internal pressure system (pressure sensor, closeness, leakage etc.).

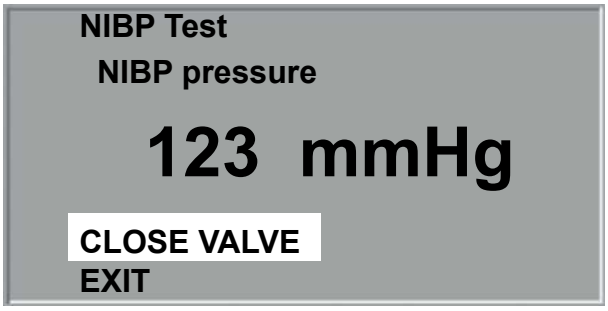
Select "NIBP Test" in the service menu and confirm by pressing NIBP.

Use the hand pump to apply a fixed pressure to the system.

The actual pressure value is displayed.

Compare the displayed ergometer value with the value of the manometer.

The maximum allowed deviation is +/- 3mmHg.




TEST OF THE INTERNAL NIBP PRESSURE SYSTEM

**Note**

- *If the applied pressure reaches 320 mmHg, the internal safety valve is opened.*
  *Select „Close valve" (and confirm by pressing NIBP) to continue with the NIBP-Test.*

Select EXIT (and confirm by pressing NIBP) to return to the service menu.

## NIBP Calibration

This function allows the calibration of the internal pressure measurement system.

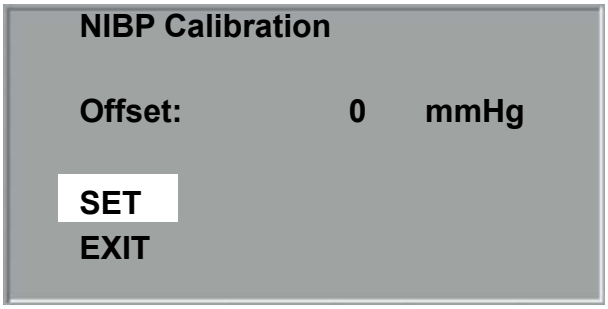
Select „NIBP Calibration" in the service menu and confirm by pressing NIBP.

### Offset calibration

During this calibration NO pressure should be present in the system.

The cuff connector (self closing) has to be opened (use cuff connector).

1. Remove cuff.
2. Connect the cuff connector with a short tube.
3. The actual pressure value is displayed.
4. Select SET and confirm by pressing NIBP.
5. The zero value is averaged and stored

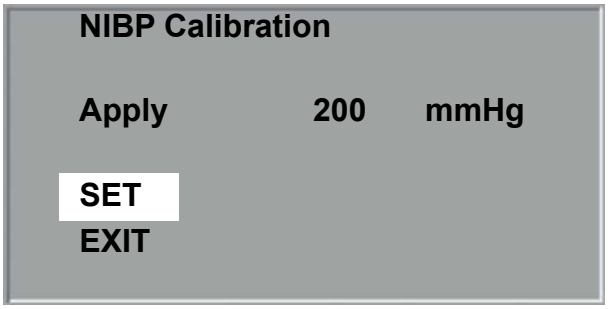



Pressure calibration – offset

### Calibration with 200 mmHg

Connect the complete measurement system (hand pump, manometer and compensating container) as described in „NIBP test".

6. Using the hand pump, apply a fixed pressure of 200 mmHg to the system (control by the external manometer).
7. Wait several seconds until the pressure is stable; correct the pressure if necessary.
8. Select SET and confirm by pressing NIBP.
9. The NIBP calibration is finished




Pressure calibration – gain

Select EXIT (and confirm by pressing NIBP) to return to the service menu.

# SOFTWARE UPDATE

To load a new version of the internal software into the eBike III ergometers; a PC or Laptop with USB or a serial port (RS-232) is needed.

To use the ergometer USB port, a special driver has to be installed on the PC (virtual COM driver).

**Note**

- *Always use the latest software version for the appropriate ergometer.*
- *Use only the PC update program included in the software package.*

Copy the complete software package onto the PC and uncompress it.

Connect the PC or Laptop with a serial cable or USB cable to the egometer (Port 1 oder USB).

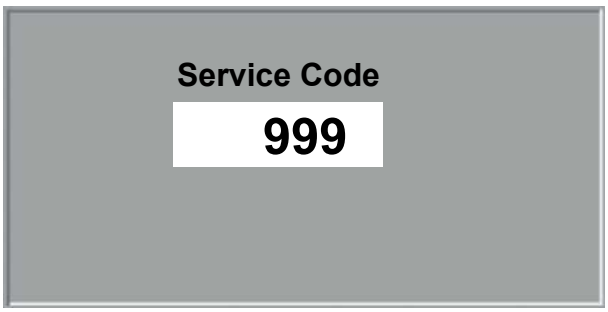
The software update is initiated in the service menu.

To activate the service menu, the ergometer has to be powered off and on again.


SELF-TEST SCREEN

As soon as the self test displays on the ergometer LCD, press the two arrow keys simultaneously:


To prevent settings from being changed in error, the service menu is "protected" with a password.
Select "999" with the arrow keys and confirm by pressing NIBP.




PASSWORD FOR SERVICE MENU

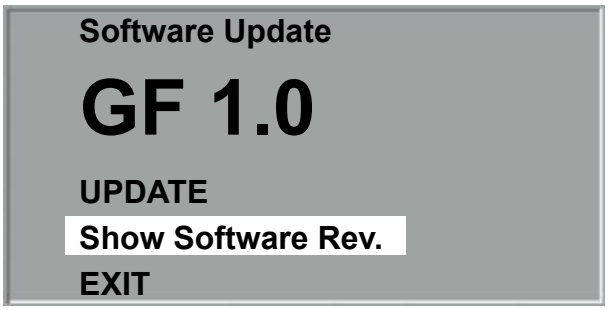
The complete handling of the menues is done using the arrow keys (saddle height) to position the bar cursor and the NIBP key (near the display) to confirm the selection.

The service menu displays.


Select "Software update" with the arrow keys and confirm by pressing NIBP.

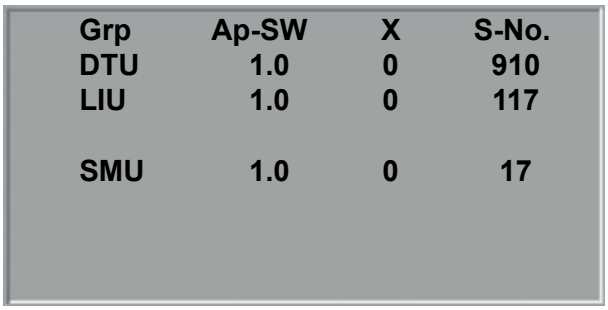
Selection of parameters in service menu

The current version of software installed is displayed.




Select "Show Software Rev." and confirm by pressing NIBP to display the installed software versions of the different electronic modules.

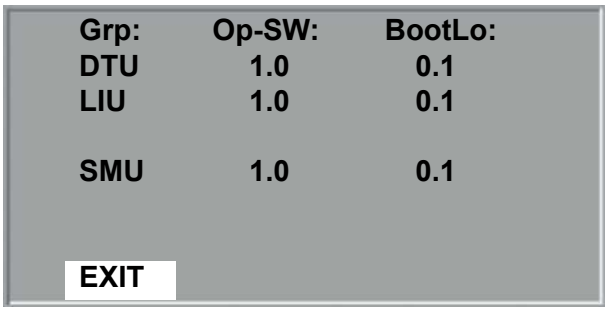
*Grp:* *name of the module*
*Ap-SW:* *current installed version*
*(if =0 no connection to module)*
*X:* *XCUT of software-version (always 0)*
*S-No.:* *serial number of PCB, if electronically available)*



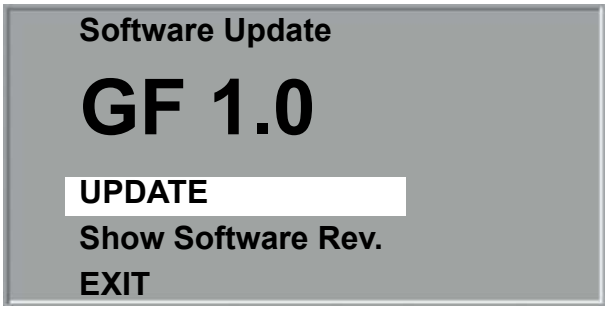

Press the NIBP key again to display the installed bootloader versions of the different electronic modules.

*Grp:* *name of the module*
*Op-SW:* *required software version*
*(has to be equal to the Ap-SW in previous display)*
*BootLo:* *actual bootloader version of PCB*

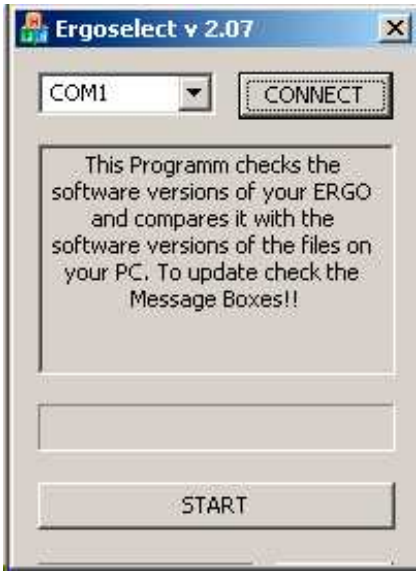
Press NIBP to exit the version display.




1. Start the software update by selecting „Update" and confirm by pressing NIBP.



2. Start the PC- update program by double-clicking ergoselect.exe .



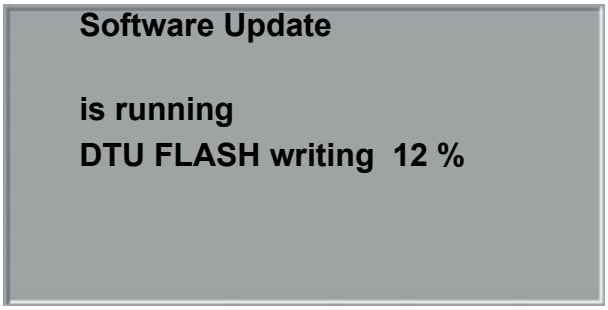

3. Adjust the serial (or virtual) COM-Port used for the connection with the ergometer.

4. Click CONNECT to establish the software connection.


As soon as the connection is established, the START button becomes active (or an error message displays).

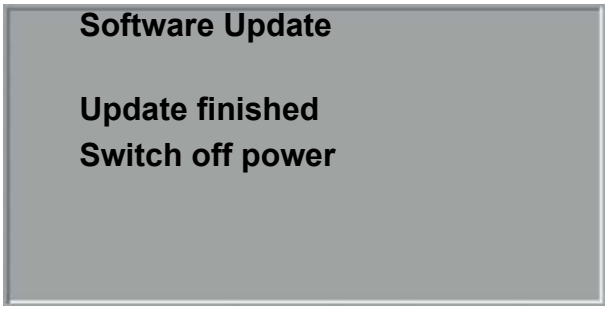
Initiate the update by pressing „START".

The update progress is displayed on the ergometer LCD and on the PC.




SOFTWARE UPDATE IN PROGRESS

After the update is performed, the ergometer has to be powered off and on again.




SOFTWARE UPDATE FINISHED

# Connectivity and installation eBike III to GE ECG devices

## eBike III to CASE


eBike III

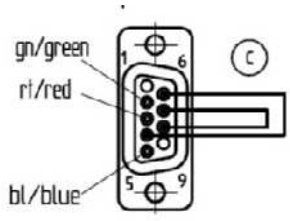

CASE

### Connections

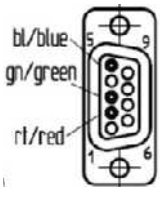
- cable: **22336203**
- eBike: **PORT 1 (RS-232)**
- CASE: **COM 1 or COM 2**

cable 22336203

### Cable PIN settings




eBike (DSUB-9 male)




CASE (DSUB-9 female)

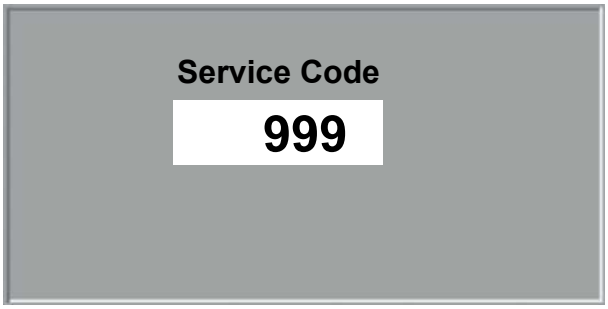
Pin 2 ⟷ Pin 3
Pin 3 ⟷ Pin 2
Pin 5 ⟷ Pin 5

## eBike III software setting

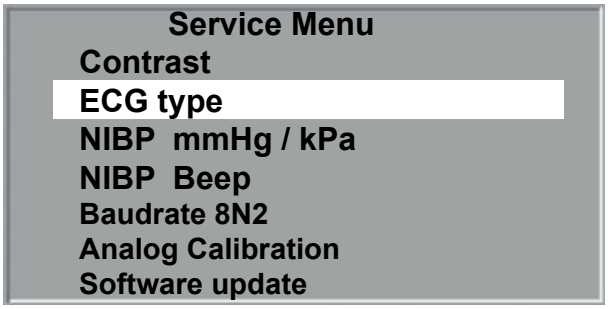
To activate the service menu, the ergometer has to be powered off and on again.

As soon as the self test displays on the ergometer LCD, press the two arrow keys simultaneously:

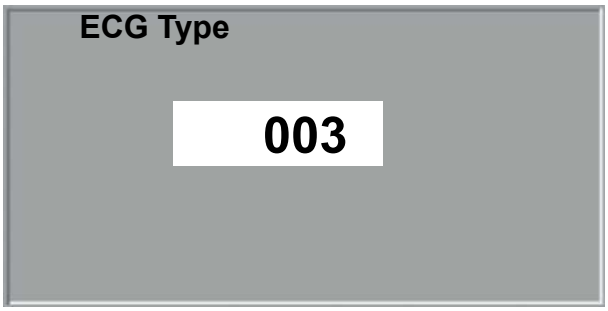

To prevent settings from being changed in error, the service menu is "protected" with a password.
Select "999" with the arrow keys and confirm by pressing NIBP.



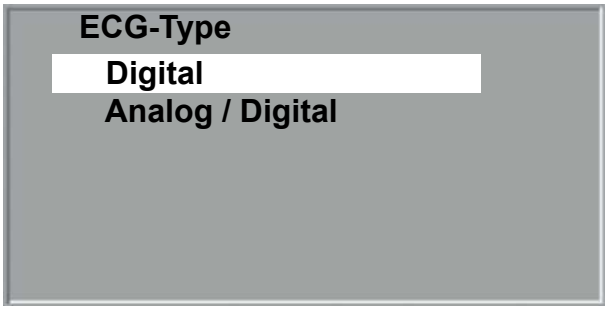

Select "ECG type" by using the arrow keys and confirm by pressing NIBP




To prevent settings from being changed in error, the ECG type menu is protected with a password.
Using the arrow keys, enter "003" and confirm the entry by pressing NIBP.




Select the ECG type "Digital" and confirm the selection by pressing NIBP.

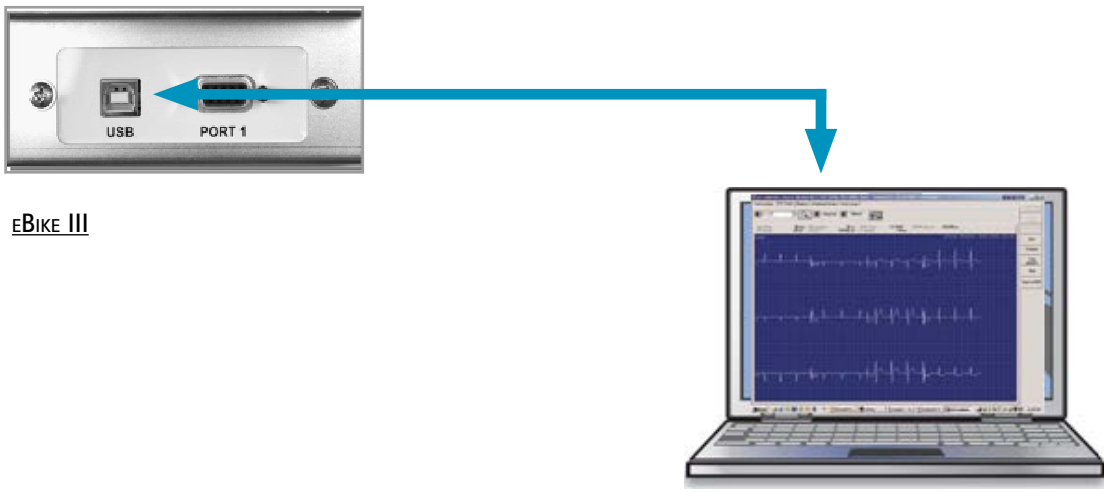



Power off the ergometer to leave the service menu.

## CASE software settings

Please refer to the manual of the CASE system.

## eBike III to CARDIOSOFT / CS




eBike III

CARDIOSOFT / CS

### Connections

- cable: **2017911-131**
- eBike: USB
- CARDIOSOFT / CS: USB

cable 2017911-131

---

### USB interface / driver installation

To use the communication via USB, a driver to generate a virtual COM port has to be installed in the PC.

The driver for the used operating system is available on the CD delivered with the eBike III system.

If the driver CD is not available, it can be downloaded from GE InfoCenter or you can contact GE technical support.

## Driver installation (virtual COMx)

Administrator rights are required to install the driver.

1. Start PC and Monitor.

2. Shut down all running programs (all programs running in the background as well).

3. Insert the USB driver and manual CD (PN 2017911-xxx) into the CD-ROM drive.

4. Depending on the Windows® operating system used, start the appropriate driver from the CD:

   Windows 2000®:
   **CP210x_VCP_Win2K_XP_S2K3.exe**

   Windows XP®, Windows Vista®, Windows 7, Windows 8®:
   **CP210x_VCP_XP_S2K3_Vista_7.exe**

5. Follow the instructions given on the screen. Confirm the installation if a warning for a non indentified program is displayed.

6. Click „Finish" to start the first part of the USB driver installation.

7. Connect the eBike with the USB cable to the PC and place the eBike power switch in the ON position: eBike is automatically recognized by WINDOWS and the driver is loaded („Silicon Labs CP 210x").

8. Follow the instructions given on the screen.

9. Remove the CD from the drive unit.

## Check USB interface

1. The eBike has to be connected to the PC via USB cable and power switch in the ON position.

2. Start the WINDOWS „Device manager".

3. Double click "COM & LPT" to display all connections.

4. For CardioSoft/CS V6.71 and below:
   If an USB Serial Port ("Silicon Labs CP 210x USB to UART Bridge") is assigned from COM1 up to COM4, no change is necessary. If an USB Serial Port higher than COM4 is assigned, one of the COM ports 1 to 4 has to be deactivated to use this port number with eBike.

5. For CardioSoft/CS V6.73 and above:
   If an USB Serial Port ("Silicon Labs CP 210x USB to UART Bridge") is assigned from COM1 up to COM32 no change is necessary. If an USB Serial Port higher than COM32 is assigned, one of the COM ports 1 to 32 has to be assigned to use this port number with eBike.

6. Write down the assigned COM port; this port number has to be used in the CardioSoft/CS settings.

7. Close all open windows.

### Change COM port assignment

1. Right click "Silicon Labs CP 210x USB to UART Bridge (COMx)"

2. Select "Settings"

3. Select tab "Port Settings".

4. Click "Advanced".

5. For CardioSoft/CS V6.71 and below:
   Click the "COM Port Number" and select an unused COM port between COM1 and COM4.

6. For CardioSoft/CS V6.73 and above:
   Click onto "COM Port Number" and select an unused COM port between COM1 and COM32.

7. Confirm by clicking OK.

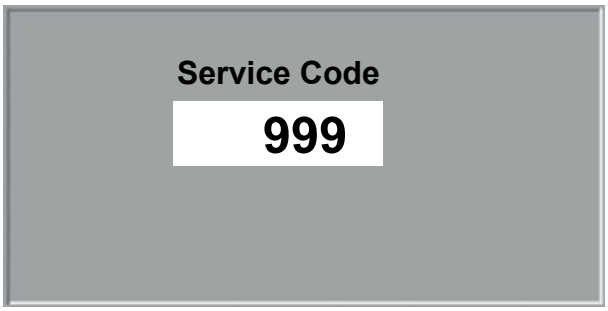
8. Close all open windows.

---

### eBike III software setting

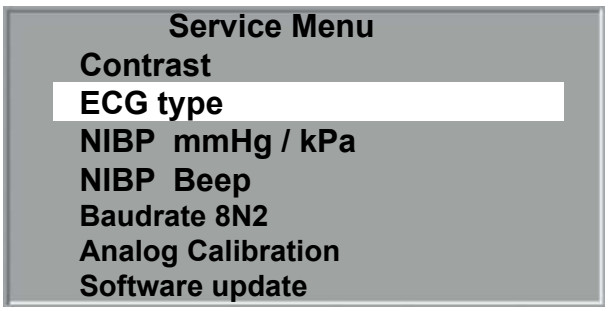
To activate the service menu, the ergometer has to be powered off and on again.


As soon as the self test displays on the ergometer LCD, press the two arrow keys simultaneously:

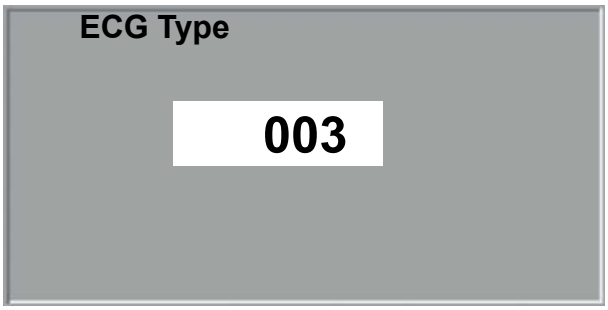



To prevent settings from being changed in error, the service menu is "protected" with a password.
Select "999" with the arrow keys and confirm by pressing NIBP.

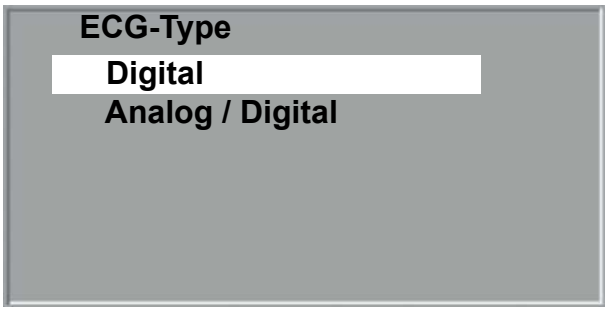
Select "ECG type" by using the arrow keys and confirm by pressing NIBP




To prevent settings from being changed in error, the ECG type menu is protected with a password.
Using the arrow keys, enter "003" and confirm the entry by pressing NIBP.




Select the ECG type "Digital" and confirm the selection by pressing NIBP.




Power off the ergometer to leave the service menu.

## CARDIOSOFT / CS SOFTWARE SETTINGS

Please refer to the manual of the CARDIOSOFT / CS system.

# eBike III to MAC 2000


eBike III

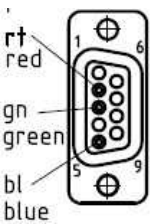
MAC 2000

## Connections

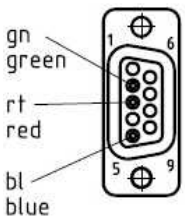
- cable: **2006795-001**
- eBike: **PORT 1 (RS-232)**
- MAC 2000: **RS-232 B**

cable 2006795-001

## Cable PIN settings




eBike (DSUB-9 male)



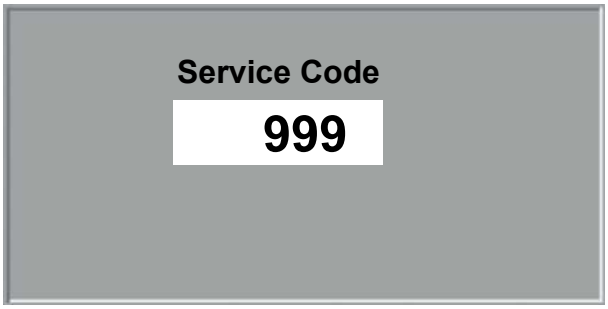

MAC 2000 (DSUB-9 male)

## eBike III software setting

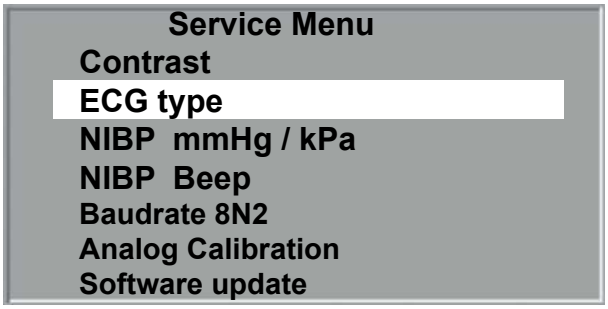
To activate the service menu, the ergometer has to be powered off and on again.

As soon as the self test displays on the ergometer LCD, press the two arrow keys simultaneously:

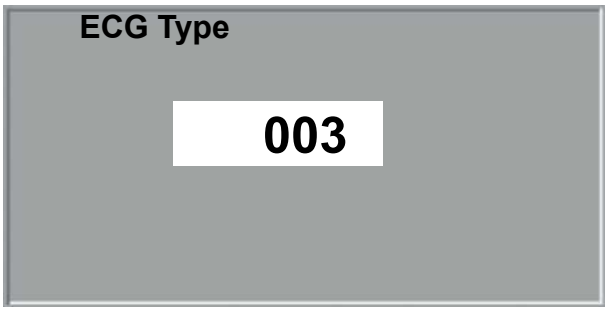

To prevent settings from being changed in error, the service menu is "protected" with a password.
Select "999" with the arrow keys and confirm by pressing NIBP.



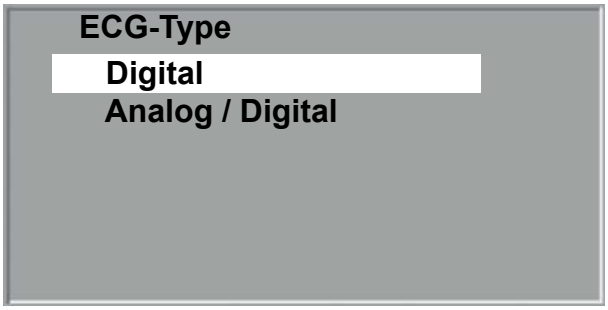

Select "ECG type" by using the arrow keys and confirm by pressing NIBP




To prevent settings from being changed in error, the ECG type menu is protected with a password.
Using the arrow keys, enter "003" and confirm the entry by pressing NIBP.




Select the ECG type "Digital" and confirm the selection by pressing NIBP.

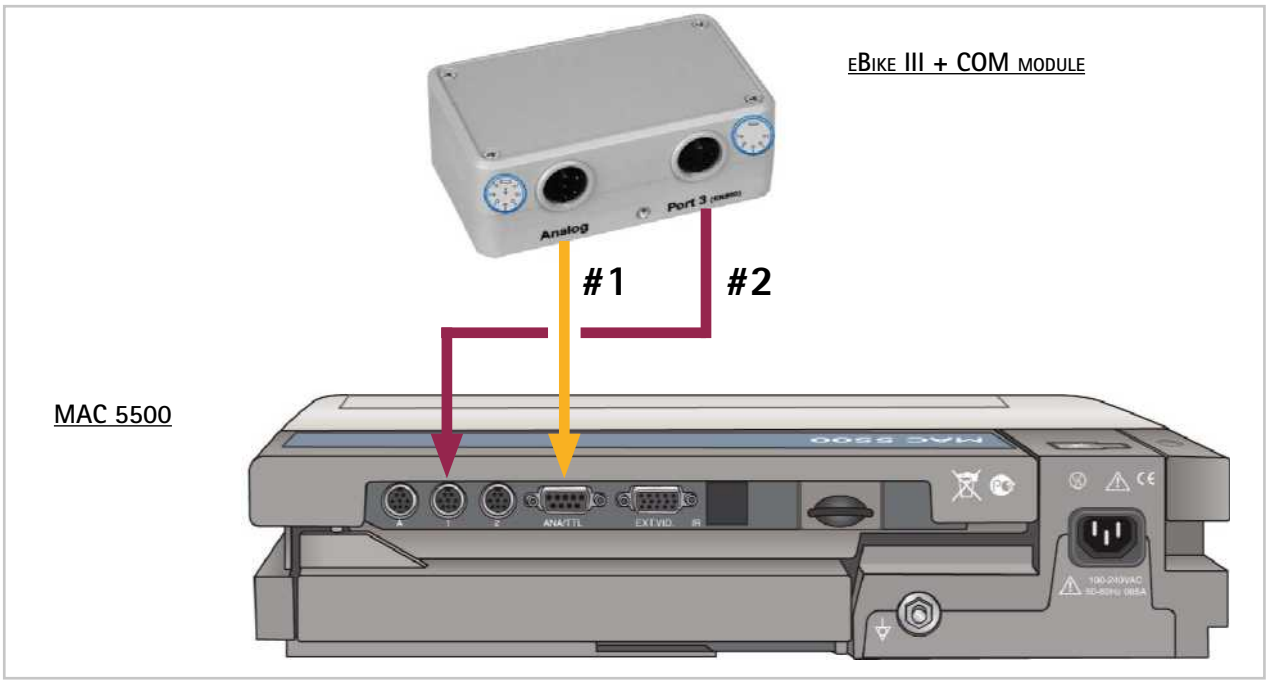



Power off the ergometer to leave the service menu.

## MAC 2000 software settings

Please refer to the manual of the CASE system.

# eBike III to MAC 5500 (MAC 5000 ST)

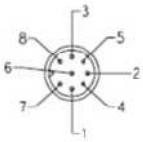



## Connections (2 cables)

- cable #1: 2008110-001
- eBike: ANALOG at COM module
- MAC 5500: ANA / TTL

cable #2: 2008114-001
**eBike:** PORT 3 (RS-232) at COM module
MAC 5500: Jack #2 (P5)

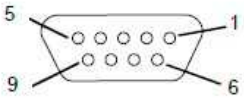
## Cable PIN settings



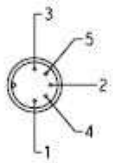

eBike + COM module

cable #1 2008110-001 (analog)

Pin 1 ⟷ Pin 2
Case ⟷ Pin 5



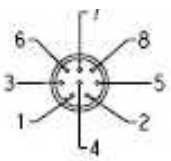

MAC 5500




eBike + COM module

cable #2 2008114-001 (RS-232)

Pin 1 ⟷ Pin 8
Pin 2 ⟷ Pin 4
Pin 5 ⟷ Pin 6




MAC 5500

## Installation of ther COM – Interface extension

The MAC 5000 ST / MAC 5500 use analogue signals to set the load of the eBike, while the bloodpressure measurement is controlled with digital signals..

The eBike III is by default only equipped with a digital interface.

To connect an eBike III with a MAC 5000 ST / 5500 a special adapter (COM module PN 2018111-340) has to be installed to add an analogue interface to the eBike III.

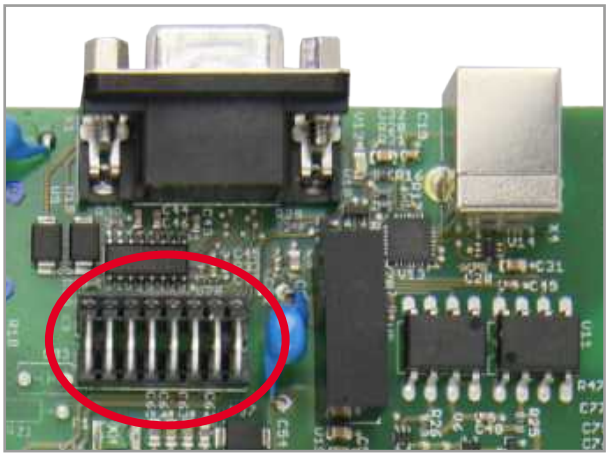
COM module with cable, jumper and velcro tape

A jumper adapter has to be placed onto the LIU board to connect all required signals to the DSUB connector:

1. Open the electronic carrier housing located in the bottom plate of the eBike III of the BKE on the bottom side of the ergometer.

Open the electronic carrier housing (bottom side)

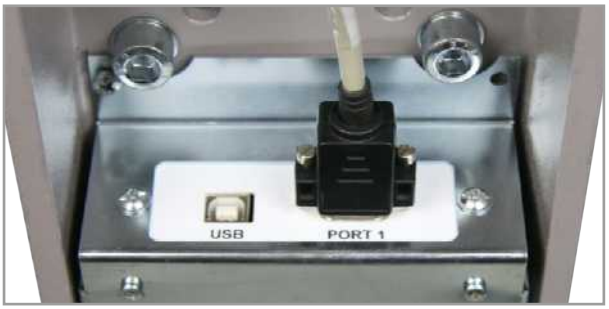
2. Insert the jumper adapter into the corresponding socket, to close all necessary connections.



LIU-PCB WITH JUMPER ADAPTER INSTALLED

3. Close the electronic housing and fix it to the ergometer chassis again.

4. The COM module is connected with a short cable plugged onto the 9 pole DSUB connector (PORT 1).




COM MODULE CONNECTOR ON PORT 1 INTERFACE

5. Use the plastic velcro tape to fix the COM module to the housing of the eBike

COM MODULE MOUNTED ON EBIKE III

Insert the appropriate digital and analog connecting cables.

The analog adapter has to be activated in the eBike III software as follows:

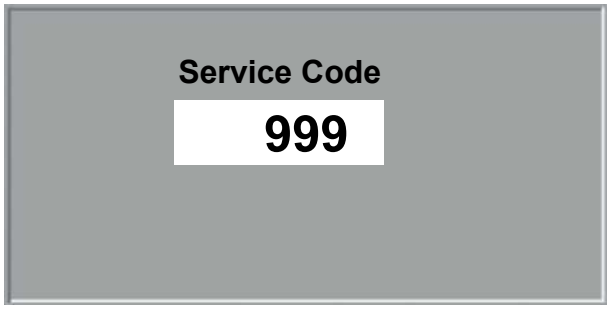

COM MODULE CONNECTORS

## eBike III software setting

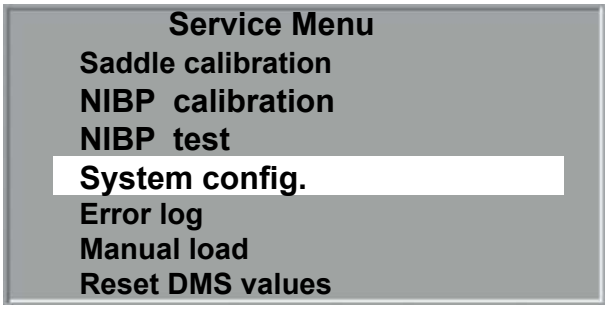
To activate the service menu, the ergometer has to be powered off and on again.

As soon as the self test displays on the ergometer LCD, press the two arrow keys simultaneously:

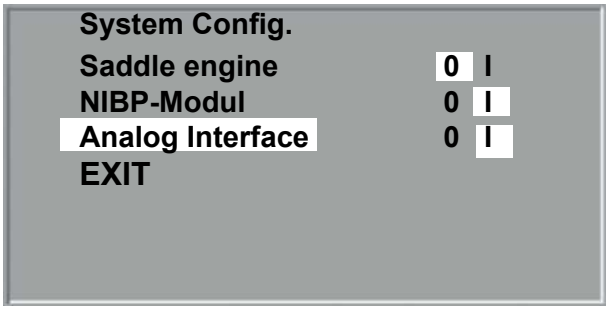

To prevent settings from being changed in error, the service menu is "protected" with a password.
Select "999" with the arrow keys and confirm by pressing NIBP.




Select "System config." by using the arrow keys and confirm by pressing NIBP




Select "Analog Interface" by using the arrow keys and change the setting to "I" by pressing NIBP.




Then select "EXIT" and return to the service menu.by pressing NIBP.

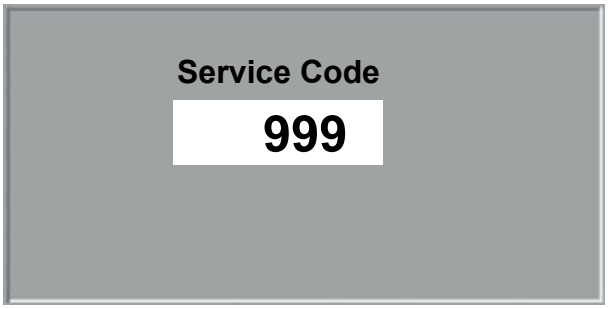
Then power OFF/ON the eBike.

**Note**

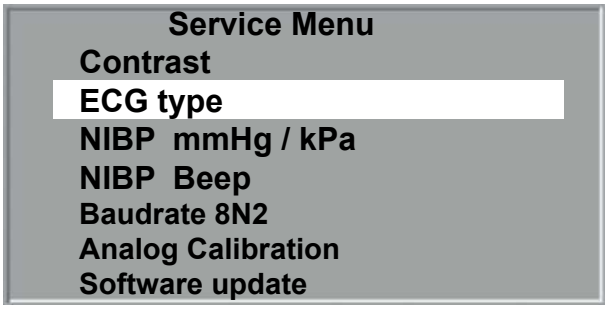
- *The "ECG type" can not be changed until the new system configuration has been activated by powering the eBike III OFF and ON again.*

As soon as the self test displays on the ergometer LCD, press the two arrow keys simultaneously to activate the service menu again

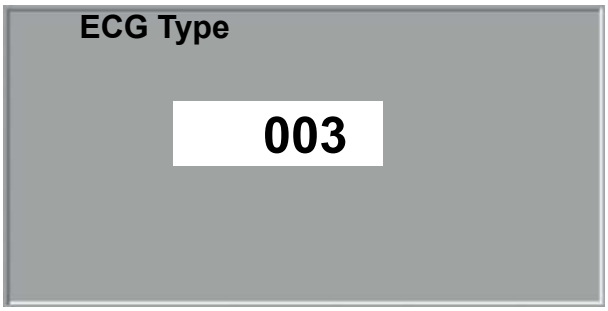

Select service code "999" with the arrow keys and confirm by pressing NIBP.



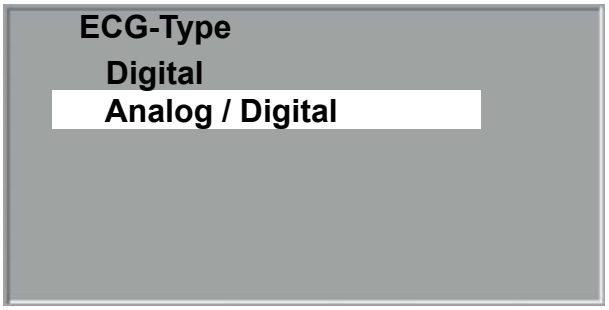

Select "ECG type" by using the arrow keys and confirm by pressing NIBP




To prevent settings from being changed in error, the ECG type menu is protected with a password.
Using the arrow keys, enter "003" and confirm the entry by pressing NIBP.




Select the ECG type "Analog/Digital" and confirm the selection by pressing NIBP.




Power off the ergometer to leave the service menu.

## MAC 5500 / 5000 ST SOFTWARE SETTINGS

Please refer to the manual of the MAC 5500 / 5000 ST system.

# ADDENDUM

## ERRORCODES SOFTWARE EBIKE III

Every electronic module of the eBike III ergometers has its own error codes.
If an error occurs, a hexadecimal code is displayed on the ergometer display and internally stored with date/time of first occurence and numbers of recurrences.
The displayed hexadecimal code is a combination of single error bits, each representing a special fault condition.

example: Displayed Error — Source: DTU
Err.Code: 0018 (hexadecimal)

Bit conversion:

| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** | 0 | 0 | 0 | (0018 hex) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bit 15* | *Bit 14* | *Bit 13* | *Bit 12* | *Bit 11* | *Bit 10* | *Bit 9* | *Bit 8* | *Bit 7* | *Bit 6* | *Bit 5* | *Bit 4* | *Bit 3* | *Bit 2* | *Bit 1* | *Bit 0* | |

Error bits set:
Bit 3 LCD communication error
Bit 4 +24V out of range

**Note**

- *A service software to download Error codes and device settings from the eBike III is available (downloadable) from Infocenter / section software download / eBike III service tool.*

### ERROR CODE BITS DTU (CONTROL TERMINAL PCB)

| Bit | Error | Reaction | Display / Info | Troubleshooting |
|---|---|---|---|---|
| 0 | Illegal program jump | Safety shut down | | - restart eBike (OFF / ON)<br>- if error persists:<br>replace control terminal |
| 1 | Wrong SW configuration | | Warning | - perform software update |
| 2 | not used | | | |
| 3 | LCD communication error | Safety shut down | | - check LCD connection<br>- if error persists:<br>replace control terminal |
| 4 | +24V out of range | | Internal error | - check power supply<br>- check connections:<br>power supply to switch to LIU<br>cable DTU <-> LIU |
| 5 | not used | | | |
| 6 | not used | | | |
| 7 | Safety state mode | Safety shut down | | - restart eBike (OFF / ON)<br>- if error persists:<br>replace control terminal |
| 8 | not used | | | |

## Error code bits LIU (Load regulation and interface PCB)

| Bit | Error | Reaction | Display / Info | Troubleshooting |
|---|---|---|---|---|
| 0 | To high rotation | | Warning | none<br>- advise user to cycle less than 130 rpm |
| 1 | Load out of limit | | Warning | - advise user to cycle between<br>30 and 130 rpm<br>- perform static calibration |
| 2 | DMS Offs. invalid | Safety shut down | | - perform static calibration OFFSET<br>- if error persists:<br>reset DMS default values<br>- if error persists:<br>replace strain gauge module |
| 3 | DMS Gain invalid | Safety shut down | | - perform dynamic calibration<br>- if error persists:<br>replace strain gauge module |
| 4 | +24V out of range | | Internal error | - check power supply<br>- check connections:<br>power supply to switch to LIU<br>cable DTU <-> LIU |
| 5 | +5V out of range | Safety shut down | | - restart eBike (OFF / ON)<br>- if error persists: replace LIU |
| 6 | Brake not released. | Safety shut down | | - check connections:<br>LIU <-> brake<br>LIU <-> strain gauge module<br>- perform static calibration<br>- if error persists:<br>reset DMS default values |
| 7 | Safety state mode | Safety shut down | | - restart eBike (OFF / ON)<br>- if error persists:<br>replace LIU |
| 8 | Setup not ready | | Internal error | - restart eBike (OFF / ON)<br>- if error persists:<br>check cable DTU <-> LIU<br>- check connection between<br>all PCB (e.g. LIU, SMU, BPU)<br>- replace LIU |
| 9 | CAN zykl. Timeout | Safety shut down | | - restart eBike (OFF / ON)<br>- if error persists:<br>check cable DTU <-> LIU<br>- check connection between<br>all PCB (e.g. LIU, SMU, BPU)<br>- replace LRE |

## Error code bits SMU (Saddle-Motor PCB)

| Bit | Error | Reaction | Display / Info | Troubleshooting |
|---|---|---|---|---|
| 0 | Error seat sensor | Module is switched off | Internal error | - check cable sensor <-> SMU<br>- check cable motor <-> SMU<br>- if error persists:<br>check adjustment of saddle tube<br>replace seat motor |
| 1 | Seat no movement | Module is switched off | Internal error | - check cable sensor <-> SMU<br>- check cable motor <-> SMU<br>- if error persists:<br>replace seat motor |
| 2 | Wrong cabling | Module is switched off | Internal error | - check cable sensor <-> SMU<br>- check cable motor <-> SMU<br>- replace cables |
| 3 | not used | | | |
| 4 | +24V out of range | | Warning | - check power supply<br>- check connections:<br>power supply to LIU<br>- replace SMU |
| 5 | not used | | | |
| 6 | not used | | | |
| 7 | Safety state mode | Module is switched off | Internal error | - restart eBike (OFF / ON)<br>- if error persists:<br>replace SMU |
| 8 | not used | | | |
| 9 | CAN zykl. Timeout | Module is switched off | Internal error | - restart eBike (OFF / ON)<br>- if error persists:<br>check cable DTU <-> LIU<br>check connection LIU<-> SMU<br>- replace SMU |

## Error code bits BPU (Blood pressure module)

| Bit | Error | Reaction | Display / Info | Troubleshooting |
|---|---|---|---|---|
| 0 | not used | | | |
| 1 | cuff loose | | Warning | - check correct placement of cuff at patient (tight)<br>- check cuff |
| 2 | Micro position | | Warning | - check correct placement of microphone (see User Manual)<br>- check microphone in cuff<br>- replace cuff |
| 3 | Leakage | | Warning | - check cuff<br>- check hoses, hose connections<br>- check compensation container<br>- replace pneumatic unit |
| 4 | Errror Calibration | Module is switched off | Internal error | - perform NIBP test<br>- perform NIBP calibration<br>- replace BPU PCB |
| 5 | Error offset | Module is switched off | Internal error | - perform NIBP test<br>- perform NIBP calibration<br>- replace BPU PCB |
| 6 | not used | | | |
| 7 | not used | | | |
| 8 | Safety state mode | Module is switched off | Internal error | - restart eBike (OFF / ON)<br>- if error persists:<br>replace BPU |
| 9 | Setup not ready | Module is switched off | Internal error | - restart eBike (OFF / ON)<br>- if error persists:<br>check connection LIU <-> BPU<br>- replace BPU |
| 10 | CAN zykl. Timeout | Module is switched off | Internal error | - restart eBike (OFF / ON)<br>- if error persists:<br>check cable DTU <-> LIU<br>check connection LIU <-> BPU<br>- replace BPU |

## Error code bits COM (External Analog interface module)

| Bit | Error | Reaction | Display / Info | Troubleshooting |
|---|---|---|---|---|
| 0 | not used | | | |
| 1 | not used | | | |
| 2 | not used | | | |
| 3 | not used | | | |
| 4 | +24V out of range | | Warning | - check mounting of COM (DSUB connector)<br>- check jumper on LIU<br>- check power supply<br>- check connections: power supply to LIU<br>- replace COM |
| 5 | not used | | | |
| 6 | not used | | | |
| 7 | Safety state mode | Module is switched off | Internal error | - restart eBike (OFF / ON)<br>- check mounting of COM (DSUB connector)<br>- check jumper on LIU<br>- if error persists: replace COM |
| 8 | Setup not ready | Module is switched off | Internal error | - check mounting of COM (DSUB connector)<br>- check jumper on LIU<br>- restart eBike (OFF / ON)<br>- if error persists: replace COM |
| 9 | CAN zykl. Timeout | Module is switched off | Internal error | - check mounting of COM (DSUB connector)<br>- check jumper on LIU<br>- restart eBike (OFF / ON)<br>- if error persists: replace COM |

## 2018111-300 SPARE EBIKE III BASIC COVER TOP WITH BELLOW

Service Kit: cover top eBike III basic, kit

*1x cover top with bellow*
*2x washer M4*
*2x screw M4x10.*
*1x screw M4x12*
*2x plastic caps type 4*

## 2018111-303 SPARE EBIKE III BASIC INLAY FOR COVER

*1x inlay eBike basic, left*
*1x inlay eBike basic, right*

## 2018111-304 SPARE EBIKE III BASIC COVER SET R/L

Service Kit: cover set eBike III basic, kit

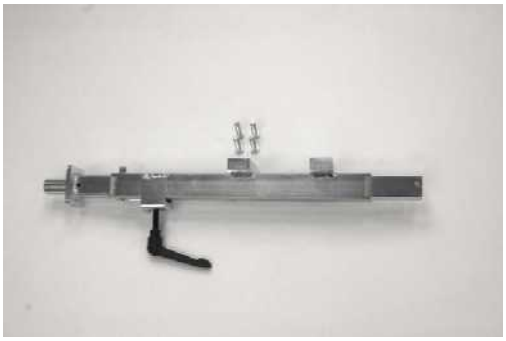
*1x side panel eBike III basic, left, with silk-screened GE logo*
*1x side panel eBike III basic, right, with silk-screened GE logo*
*10x screw M4x10*
*4x screw M4x16*
*1x screw M4x12*
*2x washer*
*6x plastic cap type 4*
*2x plastic cap type 1*

## 2018111-148 SPARE EBIKE II III BASIC CLMPG LEVER AND PLATE

Service Kit: Plate with threaded bushing and clamping lever, incl. grease

*1x threaded plate 34x35x8 mm*
*1x clamping sheet 30x26x5 mm*
*1x clamping lever M10x 40*
*1x screw M6x20*
*1x screw M5x16*
*1x high-performance lubricant, white, approx. 5 g*

## 2018111-310 SPARE EBIKE III BASIC SADDLE TUBE COMPLETE



Service Kit: saddle guide eBike III basic with saddle tube

*1x saddle guide*
*1x saddle tube (assembled)*
*1x clamping lever, cpl.*
*4x screw M10x40, galvanized*

## 2018111-144 SPARE EBIKE II III BASIC SADDLE TUBE

Service Kit: Assembled saddle tube w/o. motor for eBike II/III basic

*1x saddle tube w/o motor for eBike II / III basic*
*1x plate with threaded bushing, 34x35x 8 mm*
*1x clamping sheet galvanized*
*1 x screw M6x20*
*1x setscrew M5x16*
*1x clamping lever M10x 40 for clamping of saddle/handlebar*
*1 x compensating sheet 0,5 mm*
*1x high-performance lubricant, white, approx. 5 g*

## 2018111-022 SPARE EBIKE SADDLE STANDARD

Bicycle saddle, standard

## 2018111-021 SPARE EBIKE LEG LEVELLERS

Service Kit: Levelling device, kit

*2x levelling device M10x30*

## 2018111-311 SPARE EBIKE III WHEEL SET

Service Kit: Plastic wheels, kit

*2x plastic wheel preassembled*
*8x screw M6x12*

## 2018111-020 SPARE EBIKE STRAIN RELIEF SET

Service Kit: Strain relief, kit

*3x cable strain relief, size 1, black, 4.5 - 5.7 mm*
*1x cable strain relief, size 3, black, 6.5 - 7.7 mm*
*4x screw M5x18 Li Kr*

## 2018111-302 SPARE EBIKE III PEDAL SET R/L LARGE

Pedal set

*1x pedal, large, left and right*

## 2018111-301 SPARE EBIKE III CRANK/PEDAL SET R/L

Pedal set, left and right, cranks and large pedals

*1x crank, left, square, 170 mm*
*1x crank, right, square, 170 mm*
*1x pedals, large, left and right*
*2x combi-slotted screw M8x1x18*
*2x lock washer*
*2x cap for crank thread*

## 2018111-029 SPARE EBIKE SCREW SET FOR CRANKS

Service Kit: screw set for pedal kit

*2x combi-slotted screw M8x1x18*
*2x lock washer*
*2x cap for crank thread*

## 2018111-324 SPARE EBIKE III HANDLE BAR

*1x handlebar eBike III*

## 2018111-322 SPARE EBIKE III CLAMP LEVER FOR HANDLEBAR

Service Kit: Clamp lever for handlebar

*1x clamp lever*
*1x screw M5x20*
*1x washer plastic (special)*
*1x washer metal (special)*

## 2018111-319 SPARE EBIKE III COVER SET

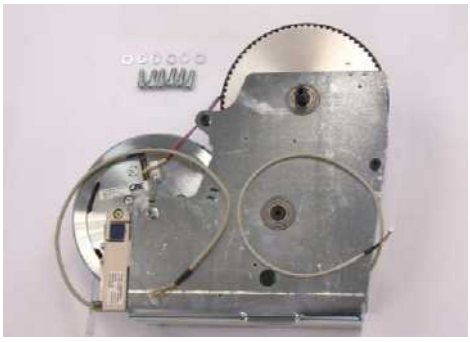
Service Kit: Cover for handlebar pole

*2x cover R/L, short*
*2x screw M4x16, allen key*
*2x plastic cap type 0*

## 2018111-325 SPARE EBIKE III HANDLEBAR POLE COMPLETE

*1x handlebar pole, cpl., preassembled with*
*1x terminal mounting adapter*
*1x NIBP tube*
*1x microphone cable*
*1x patch cable*
*1x lever for handlebar*
*4x screws M10x25 allen key*

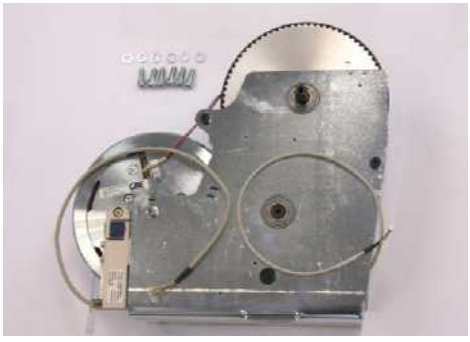
## 2018111-306 SPARE EBIKE III DRIVE UNIT NEW WITH STRAIN GAUGE



Service Kit: drive unit, new, for eBike III

*1x drive unit eBike III, assembled*
*6x screw M8x20*
*6x star washer 8.4x15x0.8*

## 2018111-307 SPARE EBIKE III DRIVE UNIT EXCHANGE WITH STRAIN GAUGE



Service Kit: drive unit, replacement, for eBike III

*1x drive unit eBike III, replacement, assembled*
*6x screw M8x20*
*6x star washer 8.4x15x0.8*

## 2018111-308 SPARE EBIKE III STRAIN GAUGE

Service Kit: Strain gauge module eBike III

*1x strain gauge module for drive unit eBike III with cable*
*2x screw M5x40, allen key*

## 2018111-309 SPARE EBIKE III RPM SENSOR

Service Kit: rpm sensor

*1x RPM sensor preassembled*
*2x screw M4x8*
*1x special Allen key*

## 2018111-152 SPARE EBIKE II III POWER SUPPLY

Service Kit: power supply module for eBike II and eBike III Basic, kit

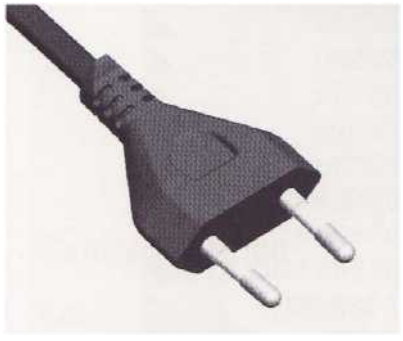
*1x power supply 24V, 2.5A, 60VA, 50/60 Hz, preassembled*

## 2018111-305 SPARE EBIKE III BASIC POWER SWITCH

Service Kit: power switch with panel and cable for eBike III Basic, kit

*1x power switch with cover, pre-assembled, for eBike III basic*
*1x cable connecting the power supply to the PCB LIU*

## 2017911-140 POWER CORD C EURO EBIKE II III



power cord EURO for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-141 POWER CORD G2 UK EBIKE II III

power cord UK for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-142 POWER CORD A US EBIKE II III

power cord US for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-144 POWER CORD M2 SOUTH AFRICA EBIKE II III

power cord SOUTH AFRICA for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-145 POWER CORD I2 AUSTRALIA EBIKE II III

power cord AUSTRALIA for:

eBike II basic/comfort

eBike III basic/comfort

## 2018111-312 SPARE EBIKE III PWA LIU

PCB LIU kit for eBike III

*1x LIU PCB, pre-assembled with back panel*
*3x mounting bolts*

## 2018111-313 SPARE EBIKE III PWA BPU

PCB BPU for eBike III

*1x PCB BPU*

## 2018111-314 SPARE EBIKE III PWA SMU

PCB SMU for eBike III

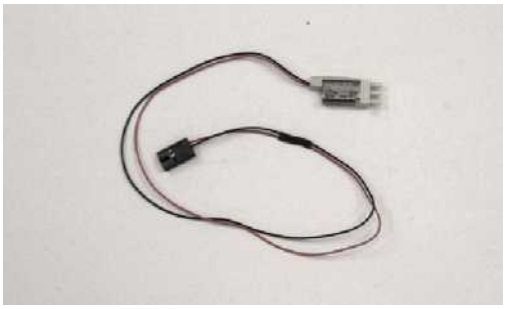
*1x PCB SMU*

## 2018111-315 SPARE EBIKE III NIBP PUMP WITH CABLE

Service Kit: blood-pressure pump unit for eBike III

*1x blood-pressure pump incl. cable*
*1x input filter unit*
*1x check valve*

## 2018111-316 SPARE EBIKE III MEASURE VALVE



Measuring valve for eBike III

*1x measuring valve incl. Cable*

## 2018111-317 SPARE EBIKE III PUMP TUBING COMPLETE

Service Kit: NIBP tube kit

*1x tube set*
*1x check valve*
*1x sound absorber*
*1x input filter*

## 2018111-318 SPARE EBIKE III AIR COMPENSATION CONTAINER

*1x NIBP air compensation container*

## 2018111-320 SPARE EBIKE III CONTROL TERMINAL COMPLETE WITH NIBP

*1x control terminal eBike III, new, with NIBP, GE*
*2x screw M4x10, combi-slotted*

## 2018111-321 SPARE EBIKE III CONTROL TERMINAL COMPLETE WITHOUT NIBP

*1x control terminal eBike III, new, w/o NIBP, GE*
*2x screw M4x10, combi-slotted*

## 2018111-323 SPARE EBIKE III CUFF CONNECTOR SET

Service kit: cuff connector set eBike III

*1x microfone cable with ferrite and connector*
*1x tube with rectus connector*
*1x microfone connector with nut*
*2x shrinking tubes*

## 2018111-334 SPARE EBIKE III SCREW SET

Service Kit: screw set, kit

*- all screws for eBike III basic / comfort*

## 2018111-335 SPARE EBIKE III PLASTIC CAP SET

Service Kit: plastic caps, kit

*- all plastic caps and metal brackets for eBike III basic / comfort*

## 2018111-326 SPARE EBIKE III COMFORT COVER TOP

cover, top for eBike III comfort

*1x cover top for eBike III comfort*
*1x M5x100 allen key*
*1x washer*
*1x M4x25 allen key*
*1x special nut*
*2x plastic cap type 3*

## 2018111-327 SPARE EBIKE III COMFORT HOUSING BRACKET

housing bracket R/L for eBike basic III comfort

*1x housing bracket left*
*1x housing bracket right*
*1x metal bracket small*
*1x metal bracket large*
*2x screw M4X16 allen key*
*2x screw M4X10 allen key*
*2x plastic cap type 4*
*2x plastic cap type 2*

## 2018111-328 SPARE EBIKE III COMFORT SIDE PANEL L/R

housing side panel R/L for eBike basic III comfort

*1x side panel left*
*1x side panel right*
*4x screw M4x16 allen key*

## 2018111-337 SPARE EBIKE III COMFORT SADDLE MOTOR

Service Kit: saddle motor eBike III comfort

*1x saddle motor eBike III, pre-assembled*
*1x screw M10x25 special*
*1x washer M10*
*1x washer M8*
*1x nut M8, self-locking*

## 2018111-332 SPARE EBIKE III COMFORT SADDLE GUIDANCE TUBE

Service Kit: saddle guide for eBike III comfort with saddle tube

*1x saddle guide*
*1x saddle tube (mounted and adjusted)*
*4x screw M8x30, allen key*

## 2018111-022 SPARE EBIKE SADDLE STANDARD

Bicycle saddle, standard

## 2018111-311 SPARE EBIKE III WHEEL SET

Service Kit: Plastic wheels, kit

*2x plastic wheel preassembled*
*8x screw M6x12*

## 2018111-021 SPARE EBIKE LEG LEVELLERS

Service Kit: Levelling device, kit

*2x levelling device M10x30*

## 2018111-020 SPARE EBIKE STRAIN RELIEF SET

Service Kit: Strain relief, kit

*3x cable strain relief, size 1, black, 4.5 - 5.7 mm*
*1x cable strain relief, size 3, black, 6.5 - 7.7 mm*
*4x screw M5x18 Li Kr*

## 2018111-302 SPARE EBIKE III PEDAL SET R/L LARGE

Pedal set

*1x pedal, large, left and right*

## 2018111-301 SPARE EBIKE III CRANK/PEDAL SET R/L

Pedal set, left and right, cranks and large pedals

*1x crank, left, square, 170 mm*
*1x crank, right, square, 170 mm*
*1x pedals, large, left and right*
*2x combi-slotted screw M8x1x18*
*2x lock washer*
*2x cap for crank thread*

## 2018111-029 SPARE EBIKE SCREW SET FOR CRANKS

Service Kit: screw set for pedal kit

*2x combi-slotted screw M8x1x18*
*2x lock washer*
*2x cap for crank thread*

## 2018111-324 SPARE EBIKE III HANDLE BAR

*1x handlebar eBike III*

## 2018111-322 SPARE EBIKE III CLAMP LEVER FOR HANDLEBAR

Service Kit: Clamp lever for handlebar

*1x clamp lever*
*1x screw M5x20*
*1x washer plastic (special)*
*1x washer metal (special)*

## 2018111-319 SPARE EBIKE III COVER SET

Service Kit: Cover for handlebar pole

*2x cover R/L, short*
*2x screw M4x16, allen key*
*2x plastic cap type 0*

## 2018111-325 SPARE EBIKE III HANDLEBAR POLE COMPLETE

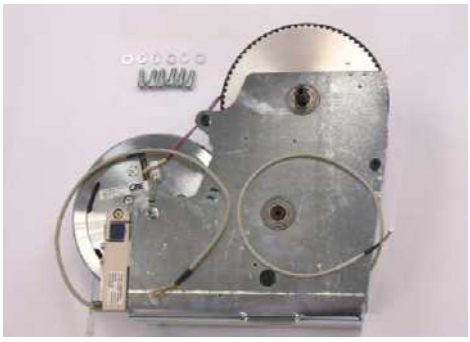
*1x handlebar pole, cpl., preassembled with*
*1x terminal mounting adapter*
*1x NIBP tube*
*1x microphone cable*
*1x patch cable*
*1x lever for handlebar*
*4x screws M10x25 allen key*

## 2018111-306 SPARE EBIKE III DRIVE UNIT NEW WITH STRAIN GAUGE

Service Kit: drive unit, new, for eBike III

*1x drive unit eBike III, assembled*
*6x screw M8x20*
*6x star washer 8.4x15x0.8*

## 2018111-307 SPARE EBIKE III DRIVE UNIT EXCHANGE WITH STRAIN GAUGE



Service Kit: drive unit, replacement, for eBike III

*1x drive unit eBike III, replacement, assembled*
*6x screw M8x20*
*6x star washer 8.4x15x0.8*

## 2018111-308 SPARE EBIKE III STRAIN GAUGE

Service Kit: Strain gauge module eBike III

*1x strain gauge module for drive unit eBike III with cable*
*2x screw M5x40, allen key*

## 2018111-309 SPARE EBIKE III RPM SENSOR

Service Kit: rpm sensor

*1x RPM sensor preassembled*
*2x screw M4x8*
*1x special Allen key*

## 2018111-152 SPARE EBIKE II III POWER SUPPLY

Service Kit: power supply module for eBike II and eBike III Basic, kit

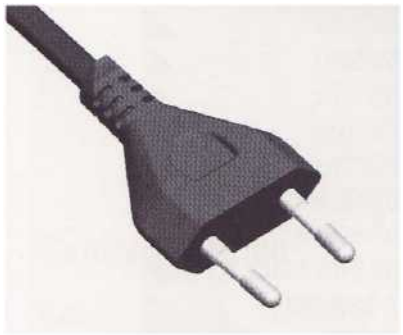
*1x power supply 24V, 2.5A, 60VA, 50/60 Hz, preassembled*

## 2018111-339 SPARE EBIKE III COMFORT POWER SWITCH

Service Kit: power switch with panel and cable for eBike III comfort, kit

*1x power switch with cover, pre-assembled, for eBike III comfort*
*1x cable connecting the power supply to the PCB LIU*

## 2017911-140 POWER CORD C EURO EBIKE II III



power cord EURO for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-141 POWER CORD G2 UK EBIKE II III

power cord UK for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-142 POWER CORD A US EBIKE II III

power cord US for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-144 POWER CORD M2 SOUTH AFRICA EBIKE II III

power cord SOUTH AFRICA for:

eBike II basic/comfort

eBike III basic/comfort

## 2017911-145 POWER CORD I2 AUSTRALIA EBIKE II III

power cord AUSTRALIA for:

eBike II basic/comfort

eBike III basic/comfort

## 2018111-312 SPARE EBIKE III PWA LIU

PCB LIU kit for eBike III

*1x LIU PCB, pre-assembled with back panel*
*3x mounting bolts*

## 2018111-313 SPARE EBIKE III PWA BPU

PCB BPU for eBike III

*1x PCB BPU*

## 2018111-314 SPARE EBIKE III PWA SMU

PCB SMU for eBike III

*1x PCB SMU*

## 2018111-315 SPARE EBIKE III NIBP PUMP WITH CABLE

Service Kit: blood-pressure pump unit for eBike III

*1x blood-pressure pump incl. cable*
*1x input filter unit*
*1x check valve*

## 2018111-316 SPARE EBIKE III MEASURE VALVE

Measuring valve for eBike III

*1x measuring valve incl. Cable*

## 2018111-317 SPARE EBIKE III PUMP TUBING COMPLETE

Service Kit: NIBP tube kit

*1x tube set*
*1x check valve*
*1x sound absorber*
*1x input filter*

## 2018111-318 SPARE EBIKE III AIR COMPENSATION CONTAINER

*1x NIBP air compensation container*

## 2018111-320 SPARE EBIKE III CONTROL TERMINAL COMPLETE WITH NIBP

*1x control terminal eBike III, new, with NIBP, GE*
*2x screw M4x10, combi-slotted*

## 2018111-321 SPARE EBIKE III CONTROL TERMINAL COMPLETE WITHOUT NIBP

*1x control terminal eBike III, new, w/o NIBP, GE*
*2x screw M4x10, combi-slotted*

## 2018111-323 SPARE EBIKE III CUFF CONNECTOR SET

Service kit: cuff connector set eBike III

*1x microfone cable with ferrite and connector*
*1x tube with rectus connector*
*1x microfone connector with nut*
*2x shrinking tubes*

## 2018111-334 SPARE EBIKE III SCREW SET

Service Kit: screw set, kit

*- all screws for eBike III basic / comfort*

## 2018111-335 SPARE EBIKE III PLASTIC CAP SET

Service Kit: plastic caps, kit

*- all plastic caps and metal brackets for eBike III basic / comfort*

## 2017911-131 USB CABLE 5 M EBIKE II III TO CARDIOSOFT PC

22336203 CABLE RS232 INTERFACE EBIKE I II III TO CASE/PC

2006795-001 CABLE RS232 INTERFACE EBIKE I II III TO MAC1200/1600/2000

2008114-001 CABLE RS232 INTERFACE EBIKE I II III TO MAC5500ST

2008110-001 CABLE ANALOG INTERFACE EBIKE I II III TO MAC5500ST

## 2018111-340 COM MODULE EBIKE III

Interface box to MAC 5500 (analogue)

*1x COM module*
*1x connecting cable COM module to eBike III*
*1x jumper adapter*
*2x plastic velcro tape*

## 2005737-001 SERVICE TOOL EBIKE PEDAL PULLER

Pedal puller for all eBikes

## Technical Specifications eBike III basic / comfort

| | |
|---|---|
| **Model** | modular ergometer system eBike III basic / comfort |
| **Operating Mode** | continuous operation |
| **Power** | 100 - 240 V / 50 - 60 Hz (100 VA max.)<br><br>**specification power cord US:**<br>SJT 2xAWG16 125 V / 10 A<br>„hospital" or „ hospital grade" |
| **Braking Principle** | computer-controlled eddy current brake<br>with torque measurement;<br>speed independent to DIN VDE 0750-0238 |
| **Load Range** | 6 - 999 watts, speed independent<br>(see diagrams) |
| **Speed Range** | 30 to 130 RPM |
| **Deviation of Measured Load** | - according to DIN VDE 0750-0238:<br>25 ... 60 watt: ± 3 watt<br>60 ... 400 watt: ± 5 %<br><br>- according to manufacturer:<br>6 ... 60 watt: ± 3 watt<br>60 ... 999 watt: ± 5 % |
| **Load Increments** | remote controlled |
| **Permitted Patient Weight** | <u>eBike III basic:</u><br>160 kg (352 lbs) max.<br><br><u>eBike III comfort:</u><br>200 kg (440 lbs) max. |
| **Saddle Height Adjustment** | continuous, for patients between<br>120 cm and 210 cm (47 - 83 in) patient height<br><br><u>eBike III basic:</u><br>manual adjustment of saddle height<br><br><u>eBike III comfort:</u><br>electrical adjustment of saddle height with digital readout |
| **Handlebar Adjustment** | for patient heights between 120 cm and 210 cm<br>(47 - 83 in)<br>continuous handlebar adjustment over 360° |
| **Crank Length** | 170 mm / 6.7 in (cranks with adjustable length are optional accessories) |

| | |
|---|---|
| **Displays** | LCD:<br>128 x 64 pixels, 68 x 34 mm (3 x 1 in)<br>additional LED display for speed (RPM) |
| **Interfaces** | PORT 1 (DSUB-9-pole):<br>digital remote control RS232 by PC or ECG recorder,<br>USB:<br>digital remote control by PC (driver required)<br>ANALOG (optional):<br>analog remote control by ECG recorder |
| **Dimensions, Weight** | length: 1030 mm (40,6 in)<br>width: 490 mm (19,3 in)<br>(handlebar: approx. 575 mm / 23 in)<br>height: 1140 mm to 1400 mm (45-55 in)<br>weight: eBike III basic: approx. 66 kg (145 lbs)<br>eBike III comfort: approx. 70 kg (154 lbs) |
| **Safety Standards** | DIN EN 60601-1, DIN EN 60601-1-2,<br>DIN VDE 0750-238 |
| **Protection Class / Degree of Protection** | II / B (to DIN EN 60601-1) |
| **MDD Classification** | class IIa to 93/42 EEC |
| **RF Emission** | class B to DIN EN 55011 / 5.0<br>DIN EN 60601-1-2 |
| **Environment** | **operation:**<br>temperature: +10 to +40 °C (50 to 104 °F)<br>rel. humidity: 30 to 75%, no condensation<br>atmospheric pressure: 700 to 1060 hPa<br><br>**transport and storage:**<br>temperature: -20 to +70 °C (-4 to +158 °F)<br>rel. humidity: 10 to 90%, no condensation<br>atmospheric pressure: 500 to 1060 hPa |

## Technical Specifications eBike III Blood pressure module

| | |
|---|---|
| **Measuring Method:** | auscultatory method, oscillometric; for resting BP, the results from both measurements are compared for plausibility |
| **Measuring Range** | systolic pressure: 40 to 280 mmHg<br>diastolic pressure: 40 to 280 mmHg<br>pulse rate: 35 to 230 P/min |
| **Measurement Error** | pressure readout error: +/- 3 mmHg<br>readout resolution: +/- 1 mmHg |
| **Inflation Pressure** | 300 mmHg max.; during inflation the inflation pressure automatically adapts to patient's BP |
| **Inflation Rate** | between approx. 6 seconds (to 140 mmHg) and approx. 18 seconds (to 300 mmHg) |
| **Max. Cuff Pressure** | 300 mmHg |
| **Cuff Deflation Method** | pulse-dependent deflation rate<br>approx. 3 mmHg/beat or approx. 3 mmHg/s |
| **Calibration** | calibration with external pressure meter |
| **Artifact Rejection** | automatic artifact rejection and comparison of the resting BP readings from both methods for plausibility |

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