Technician's instructions

EXPERTsurg LUX - 1.008.3500

KAVO
Dental Excellence

Distributed by:
KaVo Dental GmbH
Bismarckring 39
88400 Biberach
Germany
Phone +49 (0) 7351 56-0
Fax +49 (0) 7351 56-1488

Manufacturer:
KaVo Dental GmbH
Bismarckring 39
88400 Biberach
Germany
www.kavo.com

Table of contents

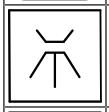
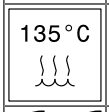
1 User instructions

1.1 User guide

1.1.1 Abbreviations

Abbre-viation	Explanation
IFU	Instructions for use
CI	Care instructions
SIFU	Short instructions for use
AI	Assembly instructions
TI	Technician's instructions
IEC	International Electrotechnical Commission
RI	Repair instructions
RK	Retrofitting kit
AS	Assembly kit
CK	Conversion kit
EP	Enclosed parts
EMC	Electromagnetic compatibility
PI	Processing instructions

1.1.2 Symbols

	Refer to the chapter on Safety/Warning symbol
	Important information for users and service technicians
	Thermodisinfectable
	Sterilisable up to 135 °C
	CE mark (European Community). A product bearing this mark meets the requirements of the pertinent EC directives, i.e. the standards applicable in Europe.

1.1.3 Target group

This document is for service technicians who have been trained by KaVo for the product.

1.2 Service

Please direct all questions regarding the product, service, and maintenance to the following addresses.
Please refer to the serial number of the product in all inquiries!
Service-Hotline:
+49 7351 56-1000
Service.Instrumente@kavokerr.com
For further information, please visit: www.kavo.com

1.2.1 Repair Service

KaVo offers a fixed-price service check for the original factory maintenance. You can use a loaner device for the time of the service check.

For scheduling or if you have any questions, please contact:
KaVo Repair Service
+49 (0) 7351 56-1900
Service.Reparatur@kavokerr.com
KaVo Dental GmbH
Repairs
Bahnhofstr. 18
88447 Warthausen

1.3 Terms and conditions of warranty

KaVo provides the final customer with a warranty with regard to proper function and guarantees zero defects in the material or processing for a period of 12 months from the date of purchase, subject to the following conditions:
Upon justified complaints of flaws or a short delivery, KaVo will make good its warranty by replacing the product free of cost or repairing it according to the customer's wishes. Other claims of any nature whatsoever, in particular with respect to compensation, are excluded. In the event of default and gross negligence or intent, this shall only apply in the absence of mandatory legal regulations to the contrary.
KaVo cannot be held liable for defects and their consequences due to natural wear, improper cleaning or servicing, non-compliance with operating, servicing or connection instructions, calcification or corrosion, contaminated air or water supplies or chemical or electrical factors deemed abnormal or impermissible in accordance with factory specifications.
The warranty does not usually cover bulbs, glassware, rubber parts and the colourfastness of plastics.
Defects or their consequences that can be attributed to interventions on or changes made to the product by the customer or a third party are excluded from the warranty.

1.4 Transportation and storage

1.4.1 Currently valid packaging regulations

Note
Only valid for the Federal Republic of Germany.

Dispose of and recycle the sales packaging appropriately in accordance with current packaging regulations, employing waste management or recycling companies. Comply with the comprehensive return system. KaVo has had its sales packaging licensed for this purpose. Please comply with the regional public waste-disposal system.

1.4.2 Damage in transit

In Germany

If the packaging is visibly damaged on delivery, please proceed as follows:

1. The recipient of the package must record the loss or damage on the delivery receipt. The recipient and the representative of the shipping company must sign this delivery receipt.
2. Leave the product and packaging in the condition in which you received it.
3. Do not use the product.
4. Report the damage to the shipping company.
5. Report the damage to KaVo.
6. Consult with KaVo first, before returning a damaged product.
7. Send the signed delivery receipt to KaVo.

If the product is damaged but there was no discernable damage to the packaging on delivery, proceed as follows:

1. Report the damage to the shipping company immediately and no later than 7 days after delivery.
2. Report the damage to KaVo.
3. Leave the product and packaging in the condition in which you received it.
4. Do not use a damaged product.

Note

Failure on the part of the recipient to comply with any of the above-mentioned obligations will mean that the damage will be considered to have arisen following delivery (in accordance with the General German Freight Forwarders' Terms and Conditions, Art. 28).

Outside Germany

Note

KaVo shall not be held liable for damage arising from transportation.
The shipment must be checked on arrival.

If the packaging is visibly damaged on delivery, please proceed as follows:

1. The recipient of the package must record the loss or damage on the delivery receipt. The recipient and the representative of the shipping company must sign this delivery receipt.
   Without this evidence, the recipient will not be able to assert a claim for damages against the shipping company.
2. Leave the product and packaging in the condition in which you received it.
3. Do not use the product.

If the product is damaged but there was no discernable damage to the packaging on delivery, proceed as follows:

1. Report any damage to the shipping company immediately and no later than 7 days after delivery.
2. Leave the product and packaging in the condition in which you received it.

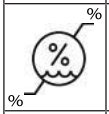
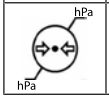
3. Do not use a damaged product.

Note
If the recipient fails to comply with any of the above-mentioned obligations, the damage will be considered to have arisen following delivery (in accordance with CMR law, Chapter 5, Art. 30).

1.4.3 Information on the packaging: Storage and transportation

Note
Please keep the packaging in case you need to return the product for servicing or repair.

The symbols printed on the outside are for transportation and storage, and have the following meaning:

	Transport upright with the arrows pointing upwards!
	Fragile - protect against impact!
	Protect from moisture!
	Permissible stacking load
	Temperature range
	Humidity
	Air pressure

2 Safety

2.1 Description of safety instructions

2.1.1 Warning symbol

	Warning symbol

2.1.2 Structure

⚠ DANGER

The introduction describes the type and source of the hazard.

This section describes potential consequences of non-compliance.

- The optional step includes necessary measures for hazard prevention.

2.1.3 Description of hazard levels

Safety instructions distinguishing between three hazard levels are used in this document to prevent personal and property damage.

⚠ CAUTION

CAUTION

indicates a hazardous situation that can cause damage to property or mild to moderate injuries.

⚠ WARNING

WARNING

indicates a hazardous situation that can lead to serious or fatal injury.

⚠ DANGER

DANGER

indicates a maximal hazard due to a situation that can directly cause death or fatal injury.

2.2 Information about electromagnetic compatibility

Note

Based on IEC 60601-1-2 (DIN EN 60601-1-2) concerning the electromagnetic compatibility of electrical medical devices, we must draw your attention to the following points:

• Medical electrical devices are subject to special precautions concerning the electromagnetic compatibility and must be installed and operated in accordance with the KaVo assembly instructions.

• High-frequency communications devices may interfere with electrical medical devices.

Note

KaVo cannot guarantee the compliance of accessories, cables, and other components not supplied by KaVo with the EMC requirements of IEC 60601-1-2 (DIN EN 60601-1-2).

2.3 Disposal of electronic and electrical devices

Note

According to the general WEEE Directive (Waste Electrical and Electronic Equipment) and EU Directive 2012/19 concerning waste electrical and electronic equipment, we wish to point out that this product is subject to the aforementioned Directive and must be subjected to special disposal within Europe.

For more information, please visit www.kavo.com or contact your specialised dental dealers.

For final disposal:

In Germany

To return an electrical device, you need to proceed as follows:

1. On the homepage www.enretec.de of enretec GmbH, you can download a form for a disposal order under the menu item, eom. Download the disposal order or complete it as an online order.
2. Enter the corresponding information to complete the order, and submit it as an online order or by fax +49 (0)3304 3919 590 to enretec GmbH.
   The following contact options are also available for questions and for initiating a disposal order:
   Phone: +49 (0) 3304 3919-500
   Email: eom@enretec.de and
   Postal address: enretec GmbH, Geschäftsbereich eomRECYCLING®
   Kanalstraße 17
   D-16727 Velten
3. A unit that is not permanently installed will be picked up at the office.
   A permanently installed unit will be picked up at the curb at your address on the agreed date.
   The owner or user of the device will have to bear the cost of disassembly, transportation and packaging.

International

For country-specific information on disposal, contact your specialised dealers.

2.4 Safety instructions

⚠ WARNING

Application of un-authorised accessories or un-authorised modifications of the product.

Accessories that have not been approved and/or inadmissible modifications of the product could lead to hazards and/or personal injury or property damage.

- Only use accessories that have been approved for combination with the product by the manufacturer or are equipped with standardised interfaces (e. g. MULTIflex couplings, INTRAmatic).
- Do not make any modifications to the device unless these have been approved by the manufacturer of the product.

⚠ CAUTION

Electrical sparks in the product.

Explosion and/or fire.

- Do not use product in areas subject to an explosion hazard.
- Do not operate the product in an oxygen-enriched atmosphere.

⚠ CAUTION

Damaged mains cable / missing protective conductor.

Electrical shock.

- Check the mains cable before use. The socket outlet must have a protective contact and meet the respective national guidelines.

⚠ CAUTION

Inadvertent penetration of liquids.

Electrical shock.

- Do not place the product in a tub-like container.
- Check the coolant containers and lines for absence of leakage. If any liquid is detected on the device, do not touch the device and disconnect the device from the mains supply without delay. Make sure that the surface of the device is completely dry before plugging the main plug back in the socket.

⚠ CAUTION

Rotating parts while the pump is operating

Injuries

- Do not stick anything in the pump. Turn off the device when the pump is open.

⚠ CAUTION

Risks from electromagnetic fields.

Electromagnetic fields might interfere with the functions of implanted systems (such as pacemakers).

- Ask patients if they have a cardiac pacemaker or other system implanted before you start the treatment!

⚠ CAUTION

Impact of power failure.

Failure of the voltage supply or other errors can cause the surgical motor to come to a standstill.

- Make sure that the power supply is working.

⚠ CAUTION

Damage by liquids.

Faults on electrical components.

- Protect openings of the product from any ingress of liquids.

⚠ CAUTION

Electrostatic discharge.

Destroys electronic components.

- Any work on the open device must involve ESD-compliant procedures.
- Always hold electronic boards on their edge only.

⚠ CAUTION

Electrostatic discharge.

Destroys electronic components.

- Discharge your hand before you touch electronic components.

3 Product description

3.1 Purpose – Intended use

Note
The EXPERTsurg LUX is approved for use in surgical theatres.

This KaVo product is intended only for use in the field of dentistry, for surgery to expose and dissect oral tissue structures or endodontic treatments (e.g. periodontal gap, gingiva, bone, jaw, extractions, implantations) and must be used by expert medical staff only. Any other type of use is not permitted.
"Proper use" includes compliance with all information in the Instructions for Use and ensuring that all inspections and service tasks are performed.

The overarching guidelines and/or national laws, national regulations and the rules of technology applicable to medical devices for startup and use of the KaVo product for the intended indications for use must be applied and followed.

The functional safety and proper condition of the device must be checked before each use of the device.

The applicable national legal regulations must be observed during the use of the device, in particular the following:

- Applicable regulations governing the connection and startup of medical devices.
- Current occupational safety regulations.
- Current accident prevention regulations.

It is a responsibility of the user:

- to only use equipment that is operating correctly,
- to protect him or herself, the patient and third parties from hazards, and
- to prevent contamination from the product

To guarantee the consistent readiness for use and to preserve the value of the KaVo product, the recommended maintenance services must be carried out in 2 year intervals.

The following persons are authorised to conduct repairs and servicing and the safety check on the KaVo product:

- Technicians of KaVo branch offices after appropriate product training.
- Specifically KaVo-trained technicians of KaVo franchised dealers.

Note
The permitted work is described in the Technician's Instructions available to the trained service staff.

Operators, equipment managers and users in Germany are obliged to operate their equipment in compliance with the medical device law.
The maintenance services encompass all the test tasks required in accordance with § 6 of the operator ordinance ("MPBetreiberV").

After servicing, interventions, and repairs of the device, the device must be tested according to IEC 62353 (according to the state of the art) before re-use.

Note
The product must be cleaned and serviced according to instructions if it is not to be used for an extended period of time.

Note
Any waste which is generated must be recycled or disposed of in strict compliance with all applicable national regulations in a manner which is safe both for people and the environment.
If you have any questions regarding proper disposal of the KaVo product, please contact the KaVo branch.

Note
A recycling pass can be downloaded from www.kavo.com.

3.2 Technical Specifications of the EXPERTsurg LUX

Width	265 mm
Depth	255 mm
Height	100 mm
Weight	approx. 1.9 kg
Weight of foot control	approx. 1.1 kg
Weight of motor	approx. 125 g
Input voltage	100 - 240 V ~
Input frequency	50/60 Hz
Rated power	max. 150 W
Speed	300 – 40,000 rpm
Max. torque on the motor	5.5 Ncm
Pump delivery rate	30 - 110 ml/min
Foot control: Class of protection	IPX8
Foot control: cable length	2.5 m
Length of motor cable	6.5 ft (2 m)
Operating mode Continuous operation with intermittent load	30 sec. of operation/ 9 min. pause

Note
The maximal motor load is 30 seconds operating time / 9 minutes pause (full load at maximal speed).

Transportation and storage conditions

Ambient temperature	-20 °C - +50 °C
Relative humidity	5% - 95%
Air pressure	700 hPa - 1,060 hPa

Operating environment

⚠ WARNING

Inappropriate operating conditions.

Impairment of the electrical safety of the device.

- It is essential to comply with the operating conditions specified in the "Technical Specifications" chapter.

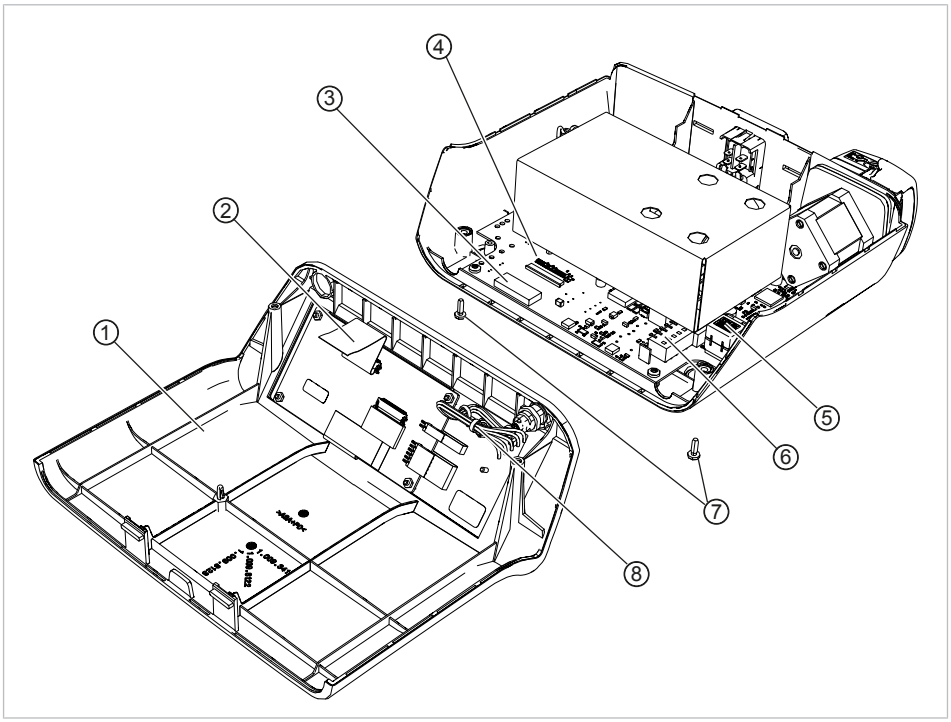
Ambient temperature	+10 °C - +35 °C
Relative humidity	15% - 80%
Air pressure	700 hPa - 1,060 hPa
Max. elevation for operation	up to 3,000 m

4 Assembling and disassembling the cladding

4.1 Removing the bottle holder

- Press down the click-stop knob on the bottom side of the unit and pull off the bottle holder ① towards the back.

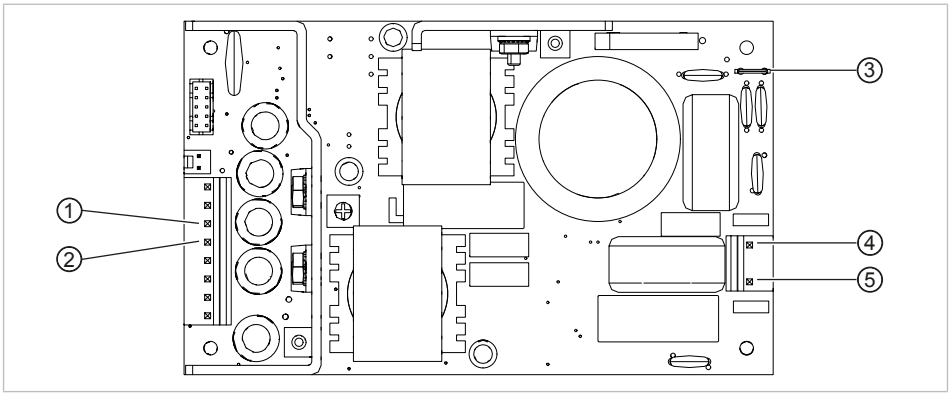
4.2 Open the device



- Undo the EJOT screws ⑦ with screwdriver Torx TX 20 and carefully open the upper part of the housing ①. Check if there are any cable connections still plugged in.
- Unplug the connection lines of the motor bush from the terminal strip ⑥ on the main board.
- Open the split toroidal core ⑤ with a suitable tool (e.g. tweezers) and take out the connection lines.
- Open the locking ④ of the flat ribbon cable of the display on the main board.
- Carefully unthread the flat ribbon cable ② from the split toroidal core ③.

5 Functional relationships

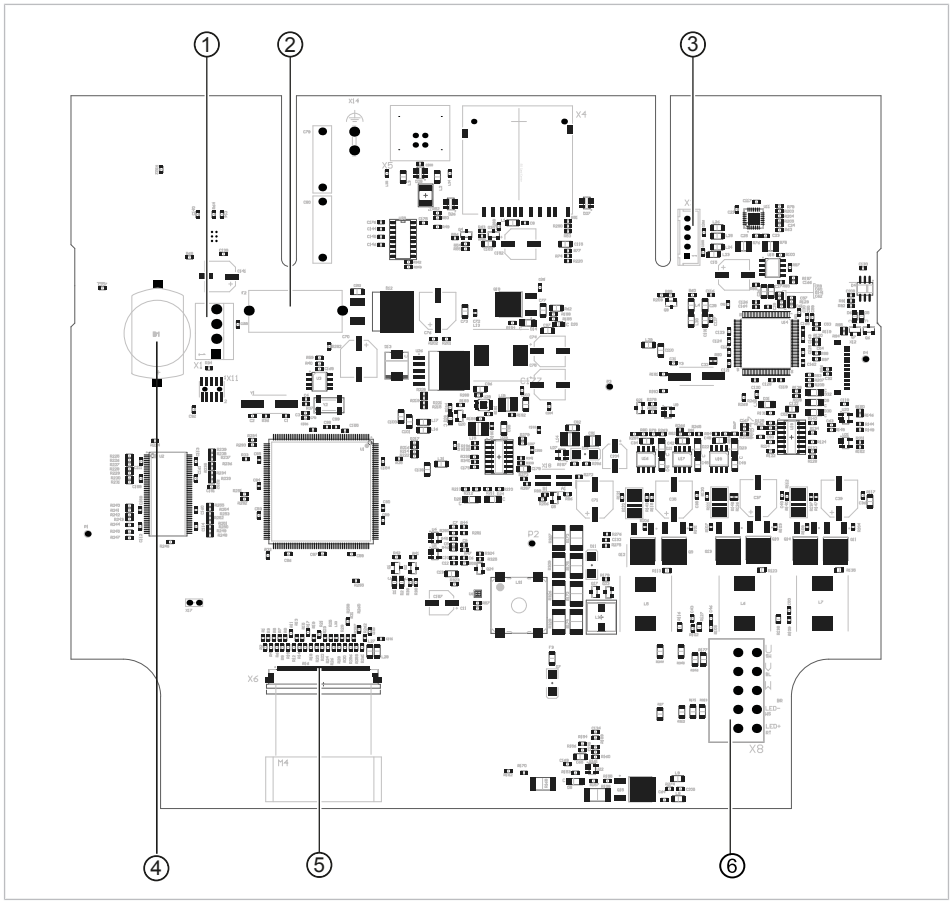
5.1 Description of switching power supply



Switching power supply

① Output +36 V
② Output mass
③ Output earthing (green-yellow)
④ Output phase (L)
⑤ Output neutral conductor (N)

5.2 Description of control board



Control board

① X1: Connector for supply voltage of switching power supply 36 V

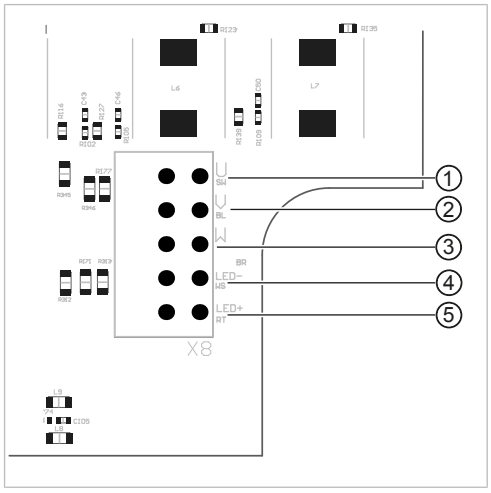
② F2: Miniature fuse T6.3L250V, 5x20 mm bearing UR, CSA, cURus or comparable test mark

③ X3: Connector for stepping motor of the pump

④ CR2032 round cell battery

⑤ X6: Connector for flat ribbon cable for display and keyboard

⑥ X8: Terminal strip for motor cable



Motor terminal strip in detail

① Black: Motor phase U
② Blue: Motor phase V
③ Brown: Motor phase W
④ White: LED supply cable minus (-)
⑤ Red: LED supply cable plus (+)

5.3 Firmware update

Note
The updating procedure must not be interrupted. Do not disconnect the unit from the mains supply!
Preset user data remain unchanged after the updating procedure.

Please proceed as follows to update the software:

- ▸ Download the current firmware file from www.kavo.de/produkte.
- ▸ Copy the firmware file to an SD card (storage capacity 1 - 32 GB, FAT format).
- ▸ Turn the device off.
- ▸ Insert the SD card with the new firmware file into the unit. Make sure that only a single firmware file with the .bin file extension (the downloaded current file) is stored on the SD card.
- ▸ Turn the device on.

⇨ The update process starts automatically.

Note
The unit must not be turned off during the update process.

After the update process, the unit starts using the updated software.

- ▸ Remove SD card.

Note
All program and device settings remain unchanged.

Note
If the error message, "SD card defective", is displayed during the update process, the SD card needs to be formatted in the FAT16 or FAT32 format or a new digital memory card needs to be used. Then, the update process needs to be repeated using the formatted SD card or a new digital memory card.

6 Measurements and settings

6.1 Calibration

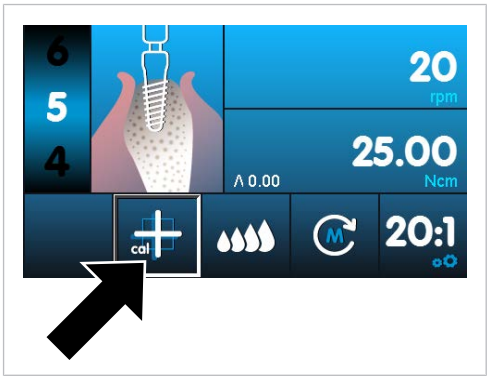
The one-touch calibration automatically compensates for torque deviations of the motor that may be caused, e.g., by aging processes. When the handpiece is attached, the unit detects if the handpiece runs sluggish or is defective. The one-touch calibration thus provides for a more accurate torque on the contra-angle handpiece.

The calibration improves the safety of the patient. The torque that is effectively active on the rotating handpiece is thus measured and defective handpieces can be detected.

Note

The handpiece must be attached for calibration.
One-touch calibration should be carried out only with KaVo surgical handpieces with a transmission ratio of 16:1, 20:1 or 27:1.
The one-touch calibration cannot be carried out with third-party handpieces or handpieces with different transmission ratios.
The calibration must be repeated whenever the handpiece is changed.

- Press the arrow keys until the one-touch calibration is highlighted.



- Press the plus or minus keys to start the one-touch calibration.

⇨ The display shows "Press foot control".

⚠ CAUTION

The motor starts at full speed.
Risk of injury.
- Hold the motor firmly or put it in a safe holder during the calibration.

- Press the foot control and hold it down until the display shows that the calibration has been successful by displaying the message, "Measurement done".
- If you release the foot control before the display shows that the calibration was successful, press the foot control again until the display shows that the calibration was successful.
- Press the back key to terminate the calibration and to return to the selection of device settings.

If an unsuitable or defective handpiece was used in the calibration, the calibration is discontinued and the error message, "Measurement failed - Non-permissible current", is shown.

- Press the back key to terminate the failed calibration.

6.2 Service menu

6.2.1 Starting and closing the service menu

- Press the back key for a long time, until the device settings are shown.
- To start the service menu, toggle five times between 2 languages in the "Language" selection field.

⇨ The service menu is shown on the display.

- Press the back key for long in order to close the service menu.

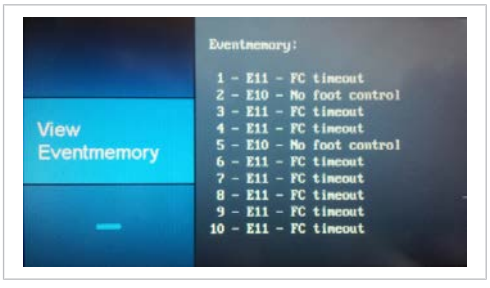
6.2.2 Navigating in the service menu

- Press the plus and minus keys to navigate through the settings in the service menu.

- Press the right arrow key to select the corresponding setting.

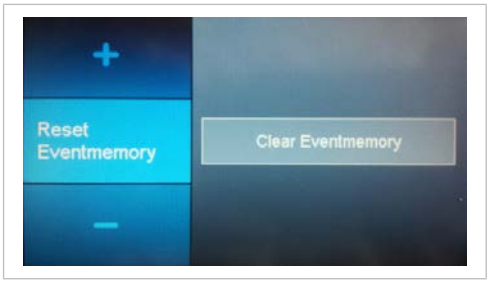
- Press the plus key to activate the selected setting.

6.2.3 View Eventmemory



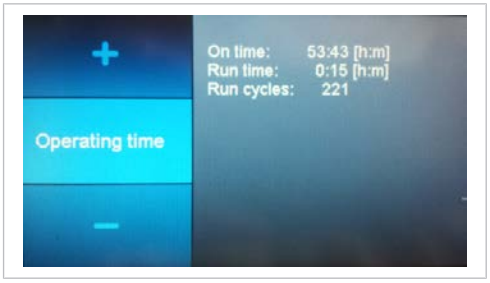
The "View Eventmemory" service menu displays the 10 most recently saved error messages. The error with the lowest number is the most recent error.

6.2.4 Reset Eventmemory



Error messages in the error memory can be deleted In the "Reset Eventmemory" service menu.

6.2.5 Operating time



The total number of operating hours is displayed in the "operating time" service menu.

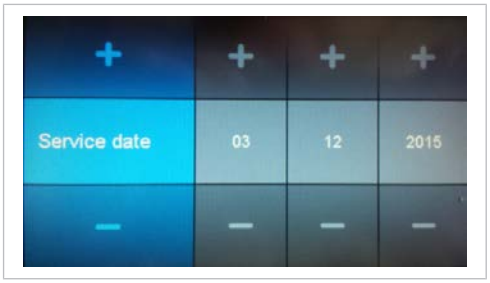
Note
After first commissioning and 30 minutes of operation, the service date is automatically set to "current date + 2 years".

See also:
7 Service Check, Page 27

6.2.6 Version

The "Version" service menu displays information about the unit such as the software and hardware version and the boot loader used.

6.2.7 Service Date



The "Service Date" service menu displays the due date of the next service check. Once a service check is completed, the date for the next service check can be set. KaVo recommends performing the service check every two years together with the safety check.

See also:
7 Service Check, Page 27

6.2.8 Voltages

The "Voltages" service menu displays the phase voltages of the motor. The phase voltages must be distributed evenly. No clearly higher or lower voltage must be applied to any of the phases.
The measured value of the supply voltage of the electronics (+5 V) is: 5 V DC
UB: Power supply voltage downstream of input protective diode, nominal value approx. 36 V
U_Drive: Bridge driver voltage, nominal value in excess of 11 V, typically 11 to 12 V

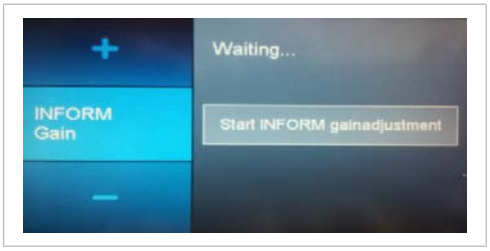
6.2.9 Restore factory settings

Note
Selecting the "Restore factory settings" service menu resets all saved user data to the factory settings (default values). There is no way to restore the user data!

6.2.10 Tubedetect

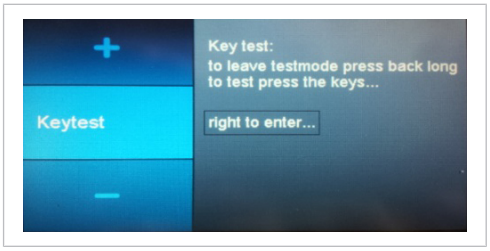
The "Tubedetect" service menu can be used to test the detection sensors for the coolant hose or the coolant hoses. The sensors are situated on the board. Upon connecting a hose, the hose needs to be displayed as "detected".

6.2.11 INFORM Gain



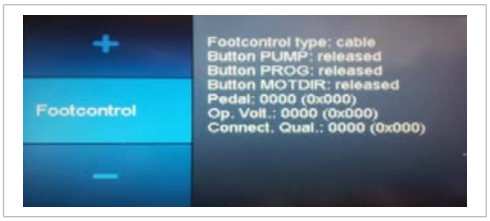
The "INFORM Gain" service menu can be used to start the calibration of the motor electronics. The motor runs briefly and stutters while this is done.

6.2.12 Keytest



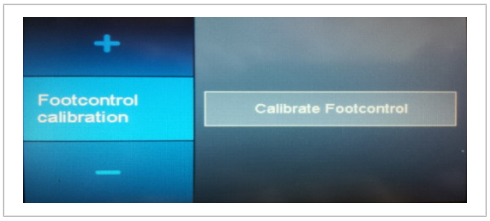
The "Keytest" service menu can be used to test the function of the individual keys of the keypad. Actuation of a key must be indicated by a corresponding response on the display.

6.2.13 Footcontrol



The "Footcontrol" service menu can be used to test the keys/potentiometer in the foot control. Actuation of a foot control key must be indicated by a corresponding response on the display. The potentiometer value shown must be between 0 (not actuated) and 1000 (full deflection).

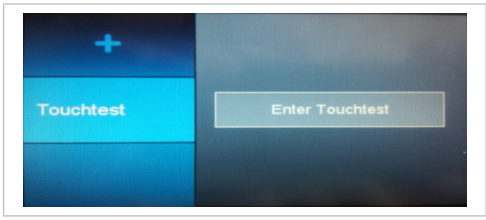
6.2.14 Foot control calibration



After replacing the control button of the foot control, the electronics can be re-calibrated in the "Foot control calibration" service menu.

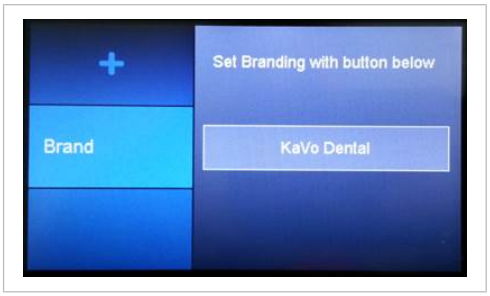
- For calibration of the foot control, follow the instructions shown on the screen.

6.2.15 Touchtest



Not applicable.

6.2.16 Select device version (from software version 1.30)



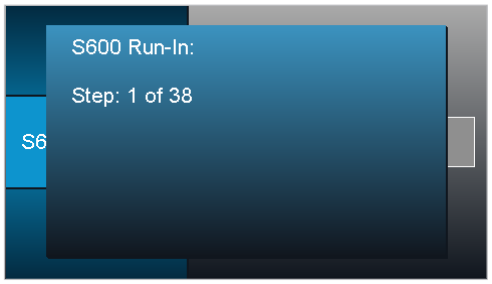
The various OEM device versions can be selected in the "Brand" service menu.

- Select the device version matching the rating plate.

6.2.17 S600 Run-in (from software version 1.40)

After replacement of the ball bearings of the S600 LED handpiece, the "S600 run-in function" is available in the "S600 run-in" service menu to attain uniform distribution of the grease, reduction of the idle power/temperature and a smooth running performance.

- To start the "S600 run-in function", follow the instructions shown on the screen.



⇨ The "S600 run-in function" comprises 38 steps and takes 91 minutes to complete.

7 Service-Check

The EXPERTsurg LUX unit notifies the user that the 2-year service check is due by the following means:

Symbol	Description
 green	Service check is soon due. ▸ Arrange a precautionary appointment at a KaVo subsidiary or with a KaVo-authorised dealer.
 yellow	Service check is due. ▸ Arrange an appointment at a KaVo subsidiary or with a KaVo-authorised dealer.
 red	Service check is over-due. ▸ Arrange an appointment immediately at a KaVo subsidiary or with a KaVo-authorised dealer.

KaVo recommends service checks for the EXPERTsurg LUX at 2 year intervals covering the following scope:

- Check of the surgical motor and handpieces in accordance with the corresponding repair instructions
- Check of the torque measurement/torque display
- Functional test of the motor hose (testing for continuity)
- Functional test of the motor control/speed
- Software update
- Power check on the hose pump/s
- Performing the safety check
- Checking the error messages in error memory
- Setting the next service date

See also:
9 Safety check - Test instructions, Page 35

See also:
6.2.7 Service Date, Page 23

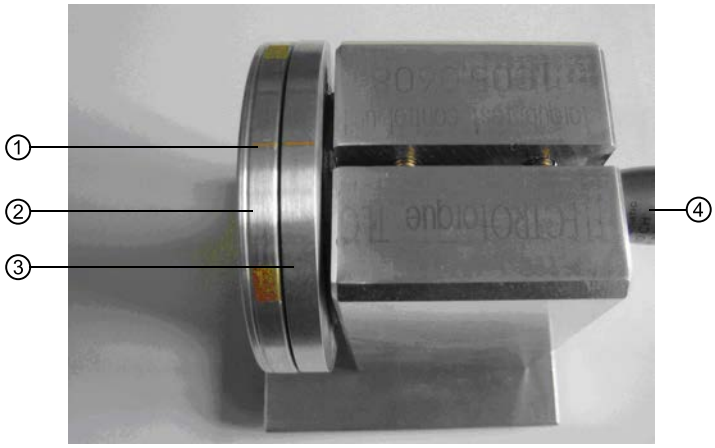
See also:
6.2.3 View Eventmemory, Page 21

7.1 Checking the torque display

- Select program step "Free use", set 300 rpm and 0.85 Ncm torque.

The "torque test control unit" (**Mat. no. 1.005.0608**) is used to check for torque.

7.1.1 Set the "Torque test control unit" to 0



① Zero line
② Rotor wheel
③ Adjusting wheel
④ Instrument 10 CH

- Place the "Torque test control unit“ on a flat surface.

The rotor wheel ② is clamped directly into instrument 10 CH and must be able to swing freely.
The adjusting wheel ③ can be rotated only by applying a bit of force.

Requirement
During the zero adjustment, the motor may not be coupled to the test device.

- For a zero setting, align the zero line of the adjusting wheel ③ with the zero line of the rotor wheel ②.

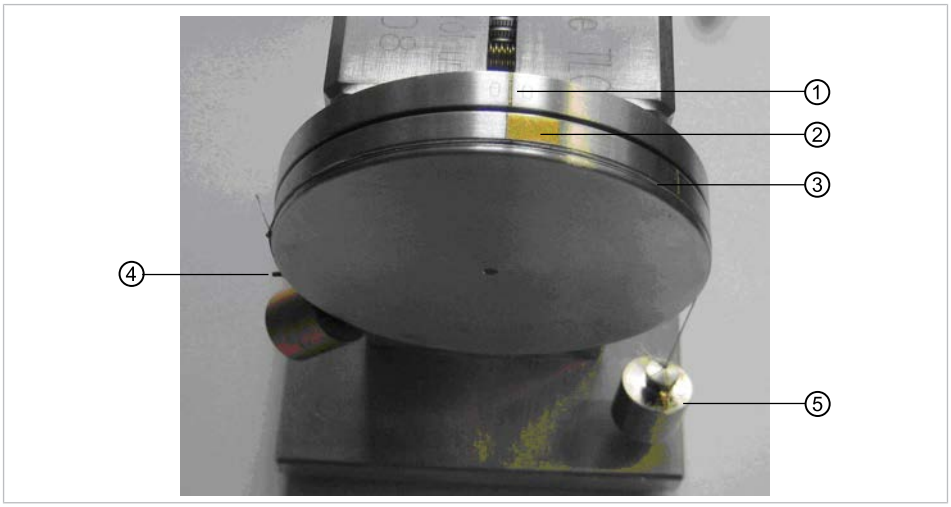
7.1.2 Checking the torque limits

The torque must be tested before startup or after transport or at least once yearly.

Use the following weights for the check:

- Upper limit: 24.6 grams
- Lower limit: 19.5 grams

Note
The user is responsible for the correct weights. KaVo recommends checking the weights annually.



① Zero line of the adjusting wheel
② Coloured area of the rotor wheel
③ Rotor wheel groove
④ Pen
⑤ Weight

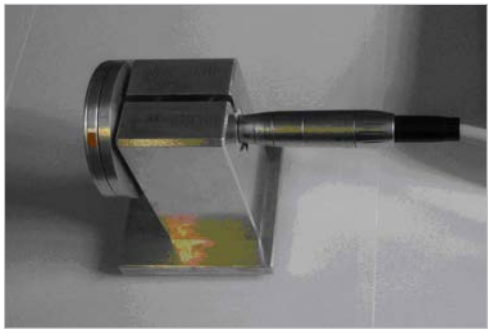
- ▸ Remove the motor from the test device.
- ▸ Retain the thread with the pin.
- ▸ Insert the thread in the groove of the rotor wheel.
- ▸ Spend the weight freely at the end of the thread and let it dangle.

⇨ The coloured area of the rotor wheel must align with the zero line of the adjusting wheel.

⇨ If the thresholds are not reached, the test device must be sent to KaVo Service for repair.

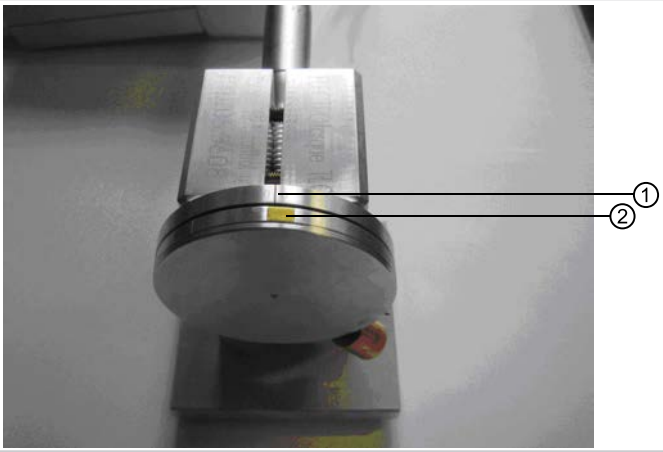
7.1.3 Checking the torque

- ▸ Connect the motor to the "torque test control unit".



- ▸ Press the foot switch to start the motor.

⇨ The coloured area of the rotor wheel must become aligned with the zero line of the adjusting wheel.

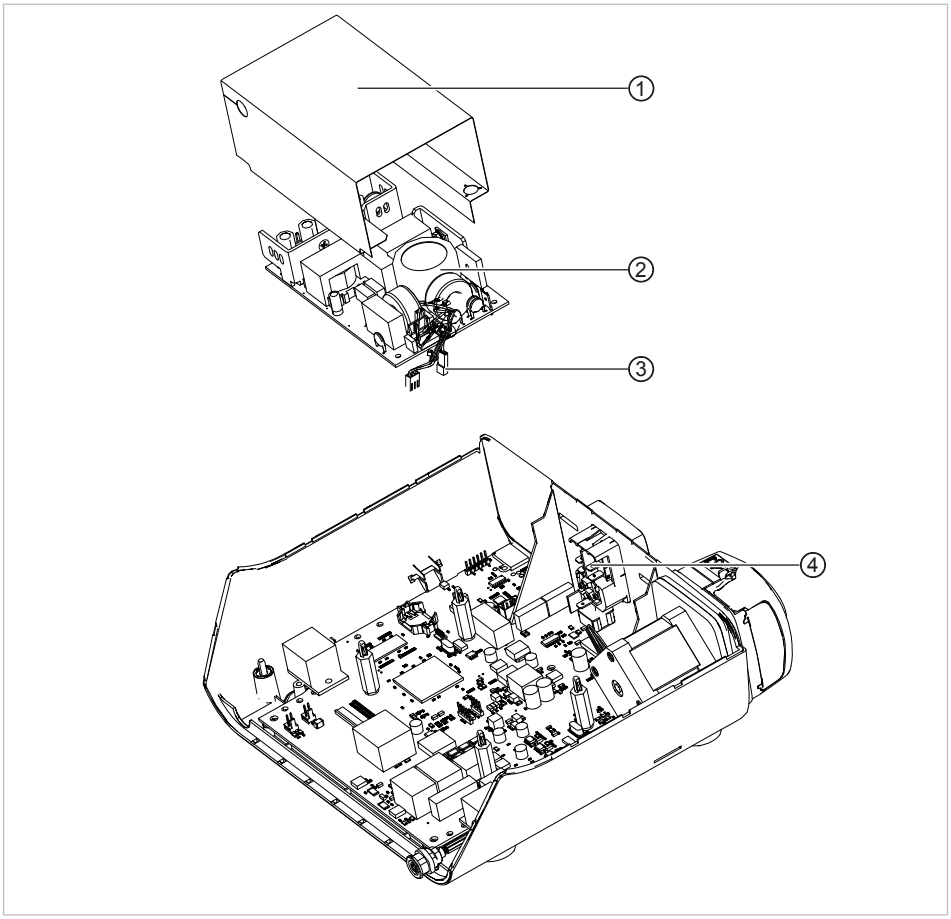


① Zero line of the adjusting wheel ② Coloured area of the rotor wheel

- ▸ Rotate to motor a full turn.
- ⇨ The coloured area of the rotor wheel must remain aligned with the zero line of the adjusting wheel during the entire rotation.

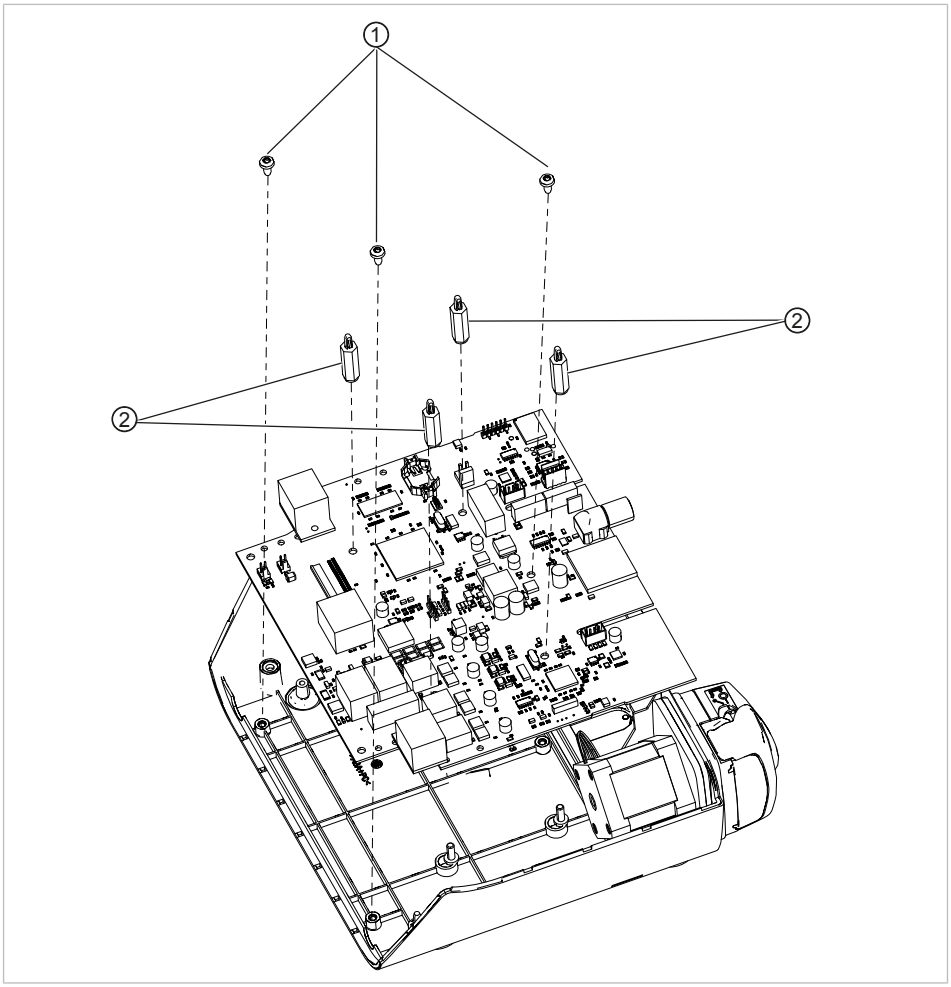
8 Repair and replacement of components

8.1 Replace the power supply



- Disconnect the cable connection ③ of unit connection socket ④ and board.
- Disconnect the clip holder from the switching power supply ② and take off the switching power supply ② in upward direction.
- Take off the insulating cover ①.

8.2 Replace the control board



- Undo the EJOT screws ① with screwdriver Torx TX 20.
- Disconnect the plug connection between stepping motor and control board.
- Take out the control board.
- Dismantle the spacer ②.

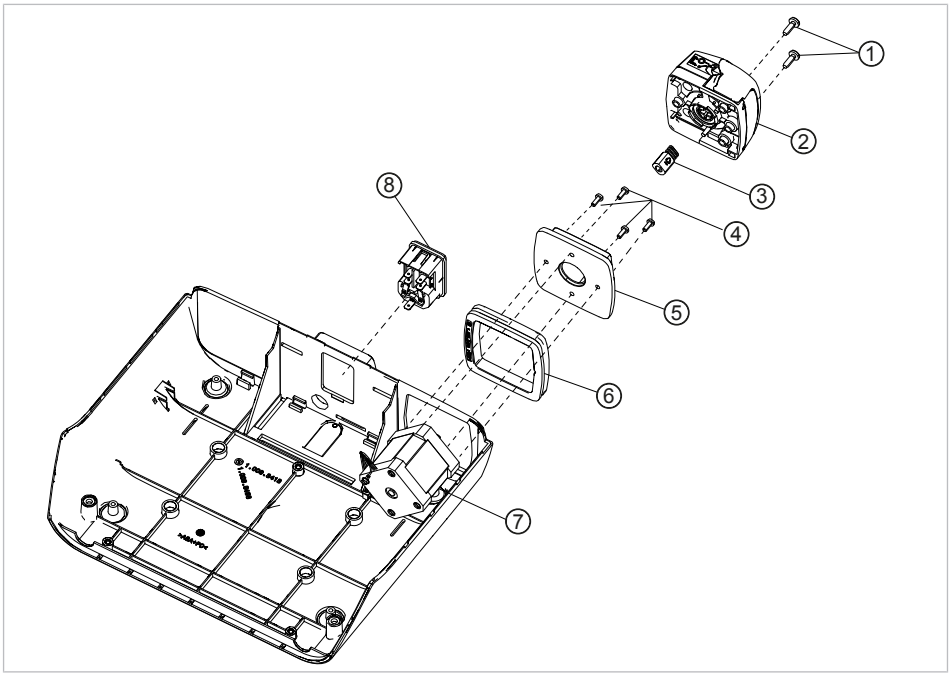
Note

After any replacement of the control board on an OEM device, the device version matching the rating plate must be selected in the service menu. "KaVo" is selected as the default of the replacement board.

See also:

6.2.16 Select device version (from software version 1.30), Page 25

8.3 Replace the pump



- Remove the EJOT screws ① with screwdriver Torx TX 20.
- Take off the pump ② and take the driver pin ③ off the pump axis.
- Remove the EJOT screws ④ with screwdriver Torx TX 10 and take the pump holder ⑤ off the stepping motor ⑦.
- Remove the vibration damper ⑥ from the lower part of the housing.
- Remove the unit connection socket ⑧ from the lower part of the housing.

8.4 Replacing the bottom part of the housing

A blank rating plate is included with the spare lower part of the housing.
To replace the lower part of the housing, it is mandatory to do the following:

- Copy original data of the unit, such as, e.g., serial number, type, to the blank rating plate.
  Make sure that a suitable and sustainable procedure is used for data transfer.
- Attach the rating plate to the spare housing.

8.5 Replacing the top part of the housing

- Replace the top part of the housing and mount it again.

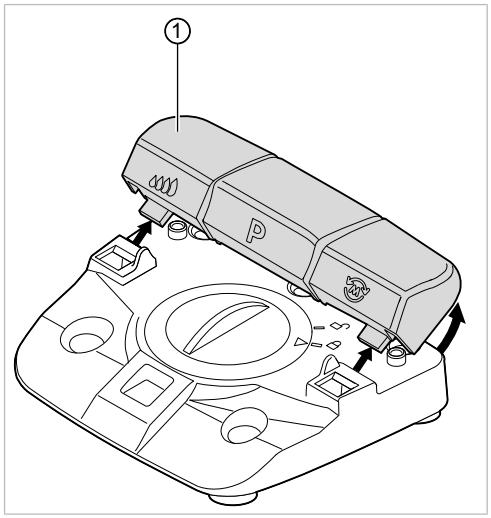
See also:

4.2 Open the device, Page 16

- Open the top part of the housing.

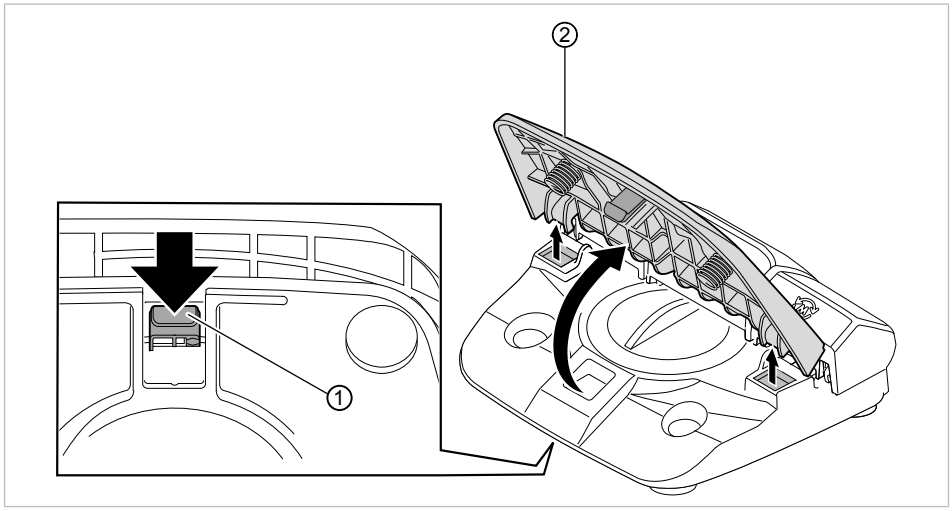
8.6 Remove foot control keypad

- Pull the button bar ① including the pump button, program button, and motor direction button slightly upwards and take it off the foot control.



8.7 Dismantle foot control key

- On the underside of the foot control, press down the snap-in lug ① of the speed button ② and take the speed button ② off the foot control.



Note
After replacing the control button, the foot control needs to be re-calibrated.

See also:
6.2.14 Foot control calibration, Page 25

Note
The two pressure springs (**Mat. no. 1.010.3761**) need to be glued into the starter button with epoxy adhesive DP110 / 3M.

9 Safety check - Test instructions

9.1 Introduction

9.1.1 General instructions

Note
The safety check may only be carried out by one or more electricians (as defined in IEC 61140) who have been appropriately trained for the device to be inspected.

Note
The contents and specified tests described in this document are based on the international standard, IEC 62353. This standard applies to the testing and inspections of medical electrical devices or medical electrical systems complying with IEC 60601-1 (DIN EN 60601-1).

Note
In order to evaluate the safety of medical devices, systems or components of medical devices or systems, the safety check must be carried out at the following times:
- Prior to startup
- during servicing
- during inspections and maintenance
- following repairs
- on the occasion of recurrent tests

Note
With regard to devices that have not been manufactured in accordance with IEC 60601-1 (DIN EN 60601-1), these requirements can be applied taking the mandatory safety standards for the production of these devices into consideration.

Note
If several medical electrical devices (ME device) or electrical devices from several manufacturers combined into a system are connected to the KaVo dental unit, the manufacturer data contained in the instructions for use for all products subject to the safety checks must also be noted.

Note
Accessories of ME devices that might impact the safety of the device to be tested or the measured results must be included in the safety checks.

Note
All tests on accessories included in the safety checks must be documented.

Note
Furthermore, the manufacturer data contained in the instructions for use must be adhered to in all products to be tested and inspected.

Note
KaVo offers a medical device book for keeping an inventory and recording essential master data on the medical device. The medical device book is only available in German (**Mat. no. 0.789.0480**).

Note
The following tests and measurements must be documented, for example in the medical device book. We recommend using the templates at the end of the document.

Note
The tests must be performed in the order specified by the manufacturer!

9.1.2 Notes for medical electrical systems

Note
An ME System is the combination of individual devices (as defined by manufacturers) that must meet the following conditions:
- At least one of these devices must be a medical electrical device.
- The devices must be functionally connected or at least they should be connected by the application of a multiple socket outlet.

Note
With ME systems, the person responsible for putting the system together must employ the necessary measuring parameters and measuring procedures defined in IEC 60601-1 (DIN EN 60601-1).

Note
Each individual device in an ME system, which has a separate connection to the power supply mains, or which can be connected to or separated from the power supply mains without the aid of a tool, must be checked individually. Moreover, the ME system must be checked as one unit to avoid the situation, in which the „aging“ of individual devices lead to unacceptable values in sum.

Note
An ME system that is connected to the power supply mains by means of a multiple socket outlet must be treated as one device during checks and testing.

Note
If the ME system or part of the system is connected to the power supply mains by means of an isolating transformer, the transformer must be included in the measurements.

Note
In ME systems, in which more than one ME device are interconnected via data lines or otherwise, e. g. via electrically conductive attachments or coolant tubes, the earth wire resistance of every single device must be checked.

Note
If it should be impossible to check single ME devices that are functionally connected to an ME system individually for technical reasons, the ME system must be checked as a whole.

9.1.3 Components of the safety check

Visual inspection

Optical appraisal of the safe and usable condition of the medical device and its accessories.

Measurements

- Measurement of the equipment leakage current, alternative measuring method in accordance with IEC 62353

Note
A measurement of the insulation resistance in accordance with IEC 62353 need not be carried out. This check is covered by the measurement of the leakage current provided a safety tester specified in IEC 62353 Annex C is used!

Functional test

Medical device function test as well as testing of all safety shutdowns with reference to accompanying documentation/instructions for use.

9.1.4 Testing intervals

- Check every 2 years in accordance with Type II

9.1.5 Notes on the test method in accordance with IEC 62353

- Protection class II
- Type B general
- Mobile device
- Measurement of the leakage current of the device, replacement measurement / limit value: < 0.5 mA

9.1.6 Notes on repeat testing

Note
The value determined in these tests must be documented and evaluated together with the measuring processes. The measured values may not overshoot the specified values.

Note
Comparisons with previous measurements must be carried out if the measured values undershoot the threshold values by more than 10 %. The test intervals should be reduced if a deterioration in values is determined!

9.2 Instructions for the safety check

9.2.1 Visual inspection (inspection by examination)

Check the following items in advance:

- Has the equipment of the ME device or the ME system been changed since the last inspection?
- Has the change been documented and approved (test protocol of safety check)?
- Are there any indications of insufficient safety?

Check the ratings of fuses that are accessible from outside

Note
The unit has no externally accessible fuses. Consequently, this item is not applicable.

Visual inspection and appraisal of the medical device and accessories

The following list is for exemplary purposes and makes no claim of being complete.

The following items must be checked:

- No damage to the cladding or casing (cracks, breakage)
- Condition of handpiece hoses and handpieces
- Condition and secure attachment of connecting plug of the handpiece hose
- Condition and secure attachment of connecting plug of the foot control line
- Condition of the control panel
- Power cable must be intact
- Secure attachment of power cable in the socket of the unit

Check of legibility and completeness of the safety-related labels

- ▸ Check if all safety-related markings (plates and labels) are present and legible.
- ▸ Check if the rating plate and serial number plates are present and legible.

The rating plates of EXPERTsurg LUX and foot control are both affixed on the underside of the housing.

Control of the availability of the necessary documents

- ▸ Check if the required instructions for use and care instructions are available in the surgery.

Note
Any irregularities determined in the visual inspection must be recorded in the test protocol. It is essential to determine whether defects and deficiencies could have an adverse impact on the safe operation of the unit. If the determined irregularities present a safety hazard and cannot be rectified directly, the unit must be closed down until safe operation is restored.

9.2.2 Measurements

⚠ WARNING

Danger to persons due to a lack of care exercised during the safety checks and testing.

- Prior to connecting the treatment centre to the safety tester, disconnect it from the mains supply network.
- Carry out all safety checks and tests in a manner that will ensure that there will be no danger to the testing personnel, patients or other persons.

Note

The safety tester must comply with the requirements defined in DIN EN 62353 [IEC 62353], Annex C.

Note

If no other specifications have been made, all values relating to voltage and current are effective values of alternating voltage, direct voltage or pulsating voltage res. alternating current, direct current or pulsating current.

Note

Cables and wires, e.g. power supply cords, measuring circuits and data lines, must be arranged appropriately such that their influence on measurements is minimised.

Note

Connection cables such as data cables and cables for the functional earth could simulate protective conductor connections. These types of supplementary but unintentional protective earth connections could lead to erroneous measurements.

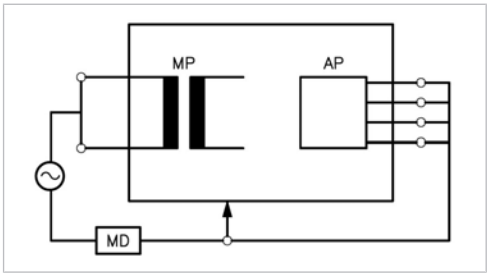
Measure protective conductor resistance

Note

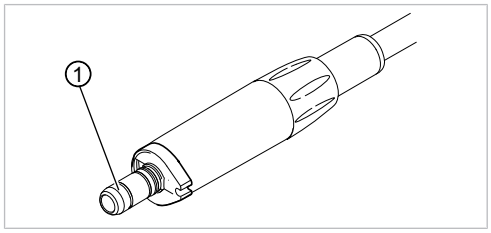
The unit is isolated according to protection class II. The protective connector of the power supply cord is a functional earthing connector for interference-free operation of the unit exclusively. For this reason, there is no need to carry out a measurement of protective conductor resistance.

Measure equivalent unit leakage current

Limit	< 0.5 mA (maximum value!)



Protection class II



Measuring point application part (AP): Motor coupling ①

9.2.3 Functional test

The following conditions must be met in all function tests:

- The basic functions of the unit must be guaranteed.
- The unit must be in a condition ready for use.
- There must be no irregularities, noise or abrasion, etc., present.

The following list is for exemplary purposes and makes no claim of being complete.

- Main switch function
- Functioning of the displays
- Function test of the foot control
- Function test of basic functions
- Function test on straight and contra-angle handpieces

9.2.4 Assessment and documentation

Note

All tests conducted must be documented comprehensively. The documents must contain at least the following particulars:

- Name of the test centre
- Name of the test engineer
- Name of the tested device (e. g. type, serial number)
- Tests and measurements
- Data, type and measuring results of the visual inspections
- Data, type and measuring results of the measurements
- Data, type and measuring results of functional tests
- Measuring/test equipment including SN/test equipment number and calibration period
- Final evaluation
- Name, date and signature of test engineer

There is a copy of a test report template at the end of the chapter on Safety Checks. KaVo recommends the use of this template.

Note

Following testing, repair or adjustment, it must be verified whether the ME equipment or ME system has been restored to the state that is required for the intended usage before it is employed once again.

Note

If the safety of the tested ME equipment or ME system has not been established, e.g. the tests have not been completed with positive results, the equipment or system must be marked accordingly and the potential hazard emanating from the equipment or system must be communicated in writing to the RESPONSIBLE ORGANISATION (to the operator, as a rule). This action is not required if the cause of the malfunction could be determined and rectified. The defect must be recorded in the protocol.

KAVO
Dental Excellence

Test protocol - Safety check [SC]

Operator	Testing organisation
	Name of the test engineer

❒ Test before start-up
❒ Recurrent test
❒ Test after repair

Date of testing:

Manufacturer:	
Device:	
Serial number:	
Ident. no.:	

next recurrent test required in

6	12	18	24	months

Test in accordance with:	**IEC 62353**	
Protection class.:	**I**	**II**
Power connection:		
Application part type:	**B**	**BF**

Measuring equipment used:

Make:	
Type:	
Calibration-date:	

Test:

	passes test	
	yes	no
Visual inspection:	❒	❒

Measurements:	**Measured value**		
Protective conductor resistor		❒	❒
Unit leakage current - replacement measurement		❒	❒
Leakage current of applied part - replacement measurement		❒	❒
Insulation resistance		❒	❒
Functional test (according to manufacturer instructions)		❒	❒

Defect / Comment / Assessment

Overall assessment:

❒ No safety or functional defects detected
❒ No immediate risk, detected defects can be remedied in the short term.
❒ Device must be taken out of commission until defects are remedied!
❒ Device fails to meet requirements - Modification / replacement of of components / Withdrawal from service recommended.

Date / Signature

10 Remedying malfunctions / error messages

Note
Before you carry out the measures described herein, the remedies described in the "Remedy of malfunctions" chapter of the IfU EXPERTsurg LUX must be carried out first.

Malfunction	Cause	Remedy
unit fails to turn on, display is dark.	Blown fuse.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Check the fuse on the main board. **See also:** 5.2 Description of control board, Page 18 ▸ Check power supply and control board. ▸ Replace power supply/control board as needed. **See also:** 8.1 Replace the power supply, Page 31 8.2 Replace the control board, Page 32
	Power supply is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Check output voltage on power supply: 36 V ▸ If needed, replace power supply. **See also:** 8.1 Replace the power supply, Page 31
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
No function on single keys.	Switching foil is defective.	▸ If possible, call up the "Keytest" service menu and check the functions of the key. **See also:** 6.2.12 Keytest, Page 24 ▸ If needed, replace upper part of the housing.

Malfunction	Cause	Remedy
Calibration completed, but error message is shown.	Motor is defective.	▸ Check the motor and repair it, if needed. **See also:** RI INTRA LUX S600 LED
	Contra-angle/straight handpiece is defective.	▸ Check the contra-angle/straight handpiece and repair it, if needed. **See also:** RI for contra-angle/straight handpiece
	INFORM Gain adjustment is defective.	▸ Call up "INFORM Gain" service menu and run it. **See also:** 6.2.11 INFORM Gain, Page 24
	Control board is defective.	▸ Remove power plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
No coolant in the handpiece.	Hose pump is defective.	▸ Check the hose pump and repair it, if needed. **See also:** 8.3 Replace the pump, Page 33
	Stepping motor is defective.	▸ Take the pump off. ▸ Check the function of the stepping motor. ▸ Replace stepping motor, if needed. **See also:** 8.3 Replace the pump, Page 33
No light on handpiece.	Defective LED.	▸ Replace the LED. **See also:** IfU INTRA LUX S600 LED
	Cable breakage in hose.	▸ Check supply voltage at light contacts of the motor: approx. 3.2 to 3.4 V
	Main board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Check supply voltage on main board, at red and white cables on the terminal strip of the unit socket: approx. 3.2 to 3.4 V **See also:** 5.2 Description of control board, Page 18

Malfunction	Cause	Remedy
Event E1: Motor symbol has a yellow background.	Motor is defective.	▸ Check the motor and repair it, if needed. **See also:** RI INTRA LUX S600 LED
	Motor cable / connecting cable of the control board is defect.	▸ Check all contacts on the motor cable for electrical continuity. ▸ Replace cable, if needed.
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E3: Start lock	Foot control sends values > 0 at power up.	▸ Do not actuate the pedal of the foot control during power-up.
	Other possible causes.	▸ **Also refer to:** Event E10, E11, E12 Foot control symbol has a yellow background
Event E4: Settings were deleted due to internal error, recurring	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E5: SD card missing	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
	SD memory card is defective or formatted incorrectly.	▸ Format SD card in FAT16 or FAT32 format or use a new SD card

Malfunction	Cause	Remedy
Event E6: Internal communication error, recurring.	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E7: File not present on SD card	SD memory card is defective or formatted incorrectly.	▸ Format SD card in FAT16 or FAT32 format or use a new SD card.
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E8: Automatic shutoff of motor and Lux light	Continuous motor operation > 30 minutes.	▸ Comply with defined operating mode.
Event E9: Time of day was not set	Time of day is initialised when the unit is turned off.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the button cell battery on the control board. **See also:** 5.2 Description of control board, Page 18
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32

Malfunction	Cause	Remedy
Event E10, E11, E12 Foot control symbol has a yellow background E10: Not connected E11: Data transmission time exceeded E12: Invalid pedal values	Pedal synchronisation error.	▸ Start the service menu. **See also:** 6.2.1 Starting and closing the service menu, Page 21 ▸ Open the "Footcontrol" service menu and check the pedal function. **See also:** 6.2.13 Footcontrol, Page 24 ▸ Check the nominal value of the pedal: 0 to 1000. ▸ Repeat the adjustment, if applicable. **See also:** 6.2.14 Foot control calibration, Page 25
	Foot control is defective/ cable breakage.	▸ Replace foot control.
	Magnet in pedal of foot control missing.	▸ Check if magnet is present in the pedal. ▸ Replace pedal, if needed.
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E17: SD card read error Event E18: SD card write error Event E19: SD card mount error	SD memory card is defective or formatted incorrectly.	▸ Format SD card in FAT16 or FAT32 format or use a new SD card.
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32

Malfunction	Cause	Remedy
Event E20: Internal TASK monitoring, recurring Event E21, E22, E25: Internal memory	SD memory card is defective or formatted incorrectly.	▸ Format SD card in FAT16 or FAT32 format or use a new SD card.
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E23: Motor EMF current too high at One Touch Calibration	Motor is defective.	▸ Check the motor and repair it, if needed. **See also:** RI INTRA LUX S600 LED
	Contra-angle/straight handpiece is defective or use of an inappropriate contra-angle/straight handpiece.	▸ Check the contra-angle/straight handpiece and repair it, if needed. **See also:** RI for contra-angle/straight handpiece
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E24: Motor EMF voltage out of limit	Motor is defective.	▸ Check the motor and repair it, if needed. **See also:** RI INTRA LUX S600 LED
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E26, E27, E28: Service reminder	Reminder of service check interval.	▸ Comply with the specified safety check intervals.

Malfunction	Cause	Remedy
Event E29: SD card write protection	SD memory card is defective.	▸ Using new SD memory card.
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32

Note
All of the following events are transmitted by motor controller MC2.

Malfunction	Cause	Remedy
Event E31, E32, E33: E31: Motor blocked E32: No motor E33: No motor phase	Motor does not rotate or motor is not connected properly or motor is not being recognised.	▸ Check the motor and repair it, if needed. **See also:** RI INTRA LUX S600 LED
	Motor is not connected properly.	▸ Check all contacts on the motor cable for electrical continuity. ▸ Check the motor connection on the control board.
Event E34: Start lock	Starting conditions not evident at power-up of the device.	▸ See event E3.
	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E35: Nominal value - actual value	Deviation between nominal value - actual value	▸ Start the service menu. **See also:** 6.2.1 Starting and closing the service menu, Page 21 ▸ Call up "INFORM Gain" service menu. **See also:** 6.2.11 INFORM Gain, Page 24 ▸ Replace the control board if needed. **See also:** 8.2 Replace the control board, Page 32

Malfunction	Cause	Remedy
Event E36, E37: E36: Motor overtemperature E37: Motor nominal current exceeded	Excessive motor load, motor frictional torque.	▸ Check the motor and repair it, if needed. **See also:** RI INTRA LUX S600 LED
Event E38, E39: E38: Inverse speed E39: INFORM Gain adjustment	Actual speed has sign error and/or INFORM Gain adjustment is invalid.	▸ Start the service menu. **See also:** 6.2.1 Starting and closing the service menu, Page 21 ▸ Call up "INFORM Gain" service menu. **See also:** 6.2.11 INFORM Gain, Page 24 ▸ Replace the control board if needed. **See also:** 8.2 Replace the control board, Page 32
Event E40, E41: E40: Brake switch E41: Brake switch quiescent current	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E42, E43, E44, E45, E46: E42: Supply 5V E43: Supply U_Drive E44 - E46: Supply U_WR	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
	Power supply is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Check output voltage on power supply: 36 V. ▸ If needed, replace power supply. **See also:** 8.1 Replace the power supply, Page 31

Malfunction	Cause	Remedy
Event E47	Residual moisture in the plugs of the motor cable can lead to erroneous re-cognition of an E47 error during the start-up test of the device.	▸ Turn the device off. ▸ Disconnect the motor cable from the device. ▸ Turn the device on. ▸ Connect the motor cable. ▸ If the error persists, replace the control board. **Also refer to:** Event E47: Inverter switch (driver circuitry + power element)
Event E47 E47: Inverter switch (driver circuitry + power element)	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E48, E49: E48: Short-circuit motor phase after GND or U_WR E49: Inverter overcurrent	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E50, E51: E50: Internal memory RAM E51: Internal memory ROM	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E52: Interruption of internal serial communication > 200ms	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32

Malfunction	Cause	Remedy
Event E53: Motor phase currents are asymmetrical	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E55, E56: Motor current measuring facility	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E57: Calibration AD converter	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32
Event E59: Internal watchdog	Control board is defective.	▸ Remove mains plug. ▸ Open the device. **See also:** 4.2 Open the device, Page 16 ▸ Replace the control board. **See also:** 8.2 Replace the control board, Page 32

1.010.7054 · bd · 20210216 - 06 · en

KAVO
Dental Excellence