Instructions for use

KaVo uniQa

KAVO
Dental Excellence

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CE 0124

Table of contents

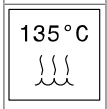
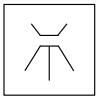
1 User instructions

Dear user,
Congratulations on purchasing this KaVo quality product. By following the notes below you will be able to work smoothly, economically and safely.

Target group

The instructions for use are intended for medical professionals, in particular dentists and dental practice personnel.

General marks and symbols

	See Chapter on User Instructions/Hazard Levels
	Important information for users and service technicians
▶	Action request
CE	CE mark (European Community). A product bearing this mark meets the requirements of the applicable EC directives.
	**Sterilisation parameters** ▪ Sterilizer with Dynamic-Air-Removal (pre-vacuum) method: – 3 minutes at 135 °C (275 °F) – Drying time: 16 min. ▪ Sterilizer with gravity displacement method: – 10 minutes at 135 °C (275 °F) – Drying time: 30 min.
	Thermodisinfectable

Information on the packaging

	Material number
	Serial number
	Manufacturer
	Note: Please note accompanying documents
	Follow the electronic instructions for use
	HIBC Code

EAC	EAC conformity mark (Eurasian Conformity)
	Transportation and storage conditions (temperature range)
	Transportation and storage conditions (air pressure)
	Transportation and storage conditions (Humidity)
	Protect from moisture (Keep dry)
	Protect from impact
	Transport upright
...kg max	Permissible stacking load
MD	Medical device, labelling of medical devices
CE 0124	CE mark for medical devices
UDI	UDI symbol

Hazard levels

The warning and safety notes in this document must be observed to prevent personal injury and material damage. The warning notes are designated as shown below:

⚠ HAZARD

In cases which – if not prevented – directly lead to death or severe injury.

⚠ WARNING

In cases which – if not prevented – can lead to death or severe injury.

⚠ CAUTION

In cases which – if not prevented – can lead to minor or moderate injury.

CAUTION

In cases which – if not prevented – can lead to material damage.

KaVo Technical Service
If you have any questions or complaints, please contact the KaVo Technical Service:
+49 (0) 7351 56-1000
service.einrichtungen@kavo.com or service.treatmentunits@kavo.com

Please refer to the serial number of the product in all inquiries! For further information, please visit: http://www.kavo.com

1.1 Terms and conditions of warranty

KaVo provides the final customer with a warranty that the product cited in the transfer form will function properly 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.

Claims from this warranty can only be asserted when the transfer form (copy) belonging to the product has been sent to KaVo, and the original can be presented by the operator or user.

2 Safety

The instructions for use are a component of the product and must be read carefully prior to use and must be accessible at all times.
The device may only be used in accordance with the intended use, any other type of use is not permitted.

NOTE
All serious events occurring in relation to the product must be reported to the manufacturer and the competent authority of the member state, in which the user and/or patient resides.

2.1 Explosion hazard

Electrical sparks in the product can lead to explosion or fire.

- Do not set up or operate the product in areas where there is an explosion hazard.

The use of medical gases can lead to explosion or fire.

- Do not used medical gases in the vicinity of the product.

2.2 Infection hazard

Patients, users or third parties could be infected by contaminated medical devices.

- Take suitable personal protective measures.
- Follow the instructions for use of the components.
- Before initial startup and after each use, reprocess the product and accessories appropriately.
- Reprocess the product and accessories appropriately before disposal.

Given the arrangement of the instruments, injury or infections may occur when reaching for the tray holder or control panel.

- Be aware of the arrangement of the instruments when you reach for the tray holder or operating device.

Suspended instruments (S-table) can cause injury.

- When you move the dentist element, make sure that nobody gets injured.

It is feasible to use, on standardised interfaces, products from other manufacturers, which are not equipped with a protective device preventing back-suction of treatment water via the instruments into the dental treatment centre. Infection may be caused by back-suction at the instruments.

- If products from other manufacturers are used at the standardised interfaces, you must make sure that the products are equipped with an appropriate protective device.
- Do not use products with no protective device.

If a water consumer is connected to the third-party connector assembly kit (optional), stagnant water may cause reverse contamination with germs.

- Before starting, rinse all water drain lines while no handpiece is attached (if applicable).
- Before initial start-up and after downtimes (weekends, holidays, vacations, etc.), rinse or purge the air and water lines with air.
- Mind the H_2O_2 resistance of the water consumer since the water is doped with OXYGENAL 6 (concentration up to 0.02 %).

Germ formation can lead to infection.

- Carry out an intensive germ reduction.
- Actuate the tumbler filler several times.

2.3 Electrical shock

Improper connection of a non-medical system to the USB interfaces of the device can lead to electrical shock and injury to patient, user and third parties.

- Connect any IT device to the medical system in accordance with IEC 60601-1.
- Use USB devices with no additional power supply (USB-powered) only.
- Applied parts connected to the USB interface of the dentist element must comply with the requisite insulation.
- USB-powered devices failing to meet the requisite insulation for applied parts must be placed appropriately such that direct contact of the USB device and the patient is excluded.
- It is not permissible to touch USB-powered devices failing to meet the requisite insulation for applied parts and the patient at the same time.

2.4 Technical condition

A damaged device or components could injure patients, users and third parties.

- Only operate devices or components if they show no signs of damage on the outside.
- Check to make sure that the device is working properly and is in satisfactory condition before each use.
- Have parts with sites of breakage or surface changes checked by the service personnel.
- If the following defects occur, stop working and have the service personnel carry out repair work:
  - Malfunctions
  - Damage
  - Irregular running noise
  - Excessive vibration
  - Overheating
  - Dental bur is not seated firmly in the handpiece

The electrical safety of the device may be affected by improper operating conditions.

- Comply with the operating conditions specified in the "Technical Specifications" chapter.

Instrument hoses may burst due to stickers.

- Do not affix stickers or adhesive tape to instrument hoses.

2.5 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 and counsel them about the risks before you start the treatment.

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

- Do not use cell phones in medical offices, hospitals or laboratories.
- Remove electronic devices such as e.g. computer storage media, hearing aids etc. during operation.
- Comply with the tables of electromagnetic compatibility during installation and commissioning.
- If the device needs to be used in the immediate vicinity of other equipment, monitor the device or system for malfunctions.

2.6 Use

Sitting down on a dental chair that is in horizontal orientation may lead to injury.

- Do not sit down or support yourself on the head or foot end or edges of the upholstery of the patient chair when it is in a horizontal position.
- Do not support yourself or sit on the armrest.

Exposing the arm system to an overload may cause damage and ensuing injury.

- Never strain the swivel arm, spring arm, assistant element and dentist element by using it as a support.

Lack of instructions to the cleaning staff and improper preparation of the treatment centre can lead to the cleaning staff sustaining injuries.

- Only trained professionals and instructed cleaning personnel may be present in the treatment rooms.
- Position the chair for cleaning and turn the device off.

Injury and material damage may result from the improper use of the charger for the wireless foot control.

- Do not use the treatment centre during the charging process.
- Do not use the enclosed wireless foot control's charger to charge non-rechargeable batteries.
- Charge the wireless foot control with the enclosed charger only.

Long stay in the patient chair can lead to decubitus (pressure sores).

- Take precautions against the formation of decubitus in long treatments.

Overload or dynamic loads can lead to injury and material damage.

- Do not subject the patient chair to a load exceeding its limit (185 kg).
- Do not subject the patient chair to dynamic loads.

Hair of the patient or practice personnel may get caught when the headrest of the dental chair is moved.

- Mind the hair of the patient or practice personnel when moving the dental chair or the headrest.

Manual motions of components can lead to injury and material damage.

- Monitor the patient and treatment personnel when you move components.

While entering or exiting, the patient make get entangled in instrument hoses of the dentist element.

- Position the dentist element outside the entry and exit area.

Automatic motions of the patient chair can lead to injury and material damage.

- Monitor the patient and treatment personnel when changing the chair position.

Components of the product may be in the walking path and may lead to injury.

- In use, mind the walking path.
- Keep entry and exit positions unobstructed.

2.7 Accessories and combination with other equipment

Use of non-authorised accessories or non-authorised modifications of the device could lead to injury.

- Only use accessories that have been approved for combination with the product by the manufacturer.
- Do not make any modifications to the device unless these have been approved by the manufacturer of the product.

The use of non-approved accessories as well as non-approved modifications made to the medical device cause the conformity of the medical device according to MDR 2017/745 to be voided. Anybody using non-approved accessories or making non-approved modifications is deemed, according to MDR 2017/745, to be the sole liable manufacturer of the medical device and to assume full responsibility. The new manufacturer is obliged to provide a new declaration of conformity for the new medical device.

2.8 Qualification of personnel

Application of the product by users without the appropriate medical training could injure the patients, the users or third parties.

- Make sure that the user has read and comprehends the instructions for use.
- Make sure that the user has read and comprehends the national and regional regulations.
- The device may be used only if the user has completed the appropriate medical training.

The operator is responsible for making sure that the product is not used by unauthorised persons.

2.9 Service and repair

Repairs, servicing and safety checks may only be performed by trained service personnel. The following persons are authorised to do this:

- Service technicians of KaVo branches after the appropriate product training
- Service technicians of KaVo authorised dealers after the appropriate product training

Observe all the following items during servicing work:

- Have the service and testing tasks carried out according to the Medical Device Operator Ordinance.
- After servicing, interventions on and repairs of the device and before re-use, have the service personnel perform safety checks on the device.

Improper maintenance and care may lead to premature wear and malfunction.

- Service regularly with suitable agents.

Residual liquids of any type can cause stains on or damage to cushions and parts of the housing.

- Remove any residual liquids without delay.

The operator may only carry out repair work if the device is switched off and no patient is being treated.

2.10 Internet security (Cybersecurity)

Unauthorised access by malware can lead to data loss are unauthorised disclosure of sensitive data.

- Always use a current virus scanner with firewall.

Hard disk defects can lead to data loss.

- Generate backup copies regularly.
- Keep backup copies in a safe location.

The user is responsible for backing up data.

For security reasons, the database and all document files should be backed up regularly. A data backup schedule should be prepared.

KaVo recommends daily backup.

Backup copies must be stored in a safe place protected from access of third parties. The detailed procedure should be defined in a data protection concept.

2.11 Intended use

Indications for use:

- The medical device is designed for dental treatment of children and adults.
- The KaVo equipment system is a dental treatment centre in accordance with ISO 7494 equipped with a patient chair.
- KaVo three function and multifunctional handpieces are dental handpieces in accordance with EN 1639. They support the dental application in the mouth of the patient by supplying air, water or spray. In addition, the multifunctional handpiece supplies light and heated media.
- These KaVo products are designed for use in dentistry only and must be used by trained medical personnel only. The installation is done exclusively in a fixed place in premises used for medical purposes.
- KaVo service table 1568 is an accessory of KaVo treatment centres that do not feature a dentist element mounted to the unit. The KaVo Service table 1568 serves as a support surface for the dentist during the treatment. KaVo service table 1568 can be used as a support for trays.

Connection of devices

KaVo-approved accessories for patient communication. Use these accessories exclusively.

Accessories	Use	Name (material number)
Monitors	Monitor 22"	KaVo Screen HD (1.011.0302)
	Monitor 19"	KaVo Screen One (1.011.0300)
Cameras	Intraoral camera	ERGOcam One 130 (1.011.2130) ERGOcam One 160 (1.011.2129)
	Caries diagnostic device	DIAGNOcam 2170 U (1.011.0400) DIAGNOcam Vision Full HD (1.013.1500)
Cables between unit, accessories and PC	USB extension cord	USB extension cord 5m with 1:1 hub (1.004.6953) USB extension cord 2x5m with 1:1 hub (1.011.3745)
	HDMI cables	HDMI cable 10 m (1.014.7351) HDMI cable 3 m (1.014.7352)
Patient communication systems	Patient communication	KaVo CONNECTbase (3.006.6892) KaVo CONEXIO (1.010.2000; 1.010.1500)

NOTE
The USB interfaces of the system may only be connected to IT devices approved by KaVo.

NOTE
Connecting IT equipment to the medical electrical system make sure to comply with EN 60601-1.

NOTE
Charge the wireless foot control with the charger supplied by KaVo only.

NOTE
The wireless foot control charger may only be used indoors and must be protected from moisture.

Proper use:

The general guidelines and/or national laws, national regulations and technical rules for medical devices relating to the commissioning and use of the KaVo product in accordance with the prescribed indications for use must be applied and followed.

KaVo accepts liability for the safety, reliability, and performance of components supplied by KaVo, provided:

- installation, instructions, expansions, adjustments, changes or repairs were carried out by technicians trained by KaVo or third parties authorised by KaVo, or by the personnel of authorised distributors.
- the unit was operated in accordance with the instructions for use, servicing and assembly.
- the IT components supplied by the operator meet the technical requirements in the present instruction for use for hardware and software, and are installed and set up according to the descriptions of these components.
- in the case of repairs, the requirements of IEC 62353 "Recurrent tests and tests before start-up of electrical items of medical electrical equipment and systems - general regulations" are met in full.

According to these regulations, the user is required:

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

According to these regulations, this product may only be used for the described application by a properly trained user. You need to comply with the following:

- the applicable health and safety regulations
- the applicable accident prevention regulations
- these Instructions for use

Regular servicing and safety checks are essential for the permanent assurance of the operating and functional safety of the KaVo product and for the prevention of damage and hazards. Testing and maintenance intervals: Maintenance must be performed once a year, the safety checks at intervals of 2 years. Shorter intervals for the safety checks may be specified by the tester if necessary.

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").

NOTE
The MULTIflex couplings, the current K/KL motors, and the ultrasonic scaler hoses of KaVo are equipped as standard with a protective device to prevent treatment water from being drawn back into the treatment centre via the handpieces. If products from other manufacturers are used at the standardised interfaces, it must be ensured that they are equipped with an appropriate protective device! They must not be used unless this is the case!

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 medical electrical devices.
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).

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.

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. Alternatively, the following contact options are available to you to initiate a disposable order or if you have any questions:
   Phone: +49 (0) 3304 3919-500
   Email: eom@enretec.de
   and Postal address: enretec GmbH, eomRECYCLING® business unit
   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.

Final disposal, international

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

Currently applicable packaging law

NOTE
Only valid for the Federal Republic of Germany.

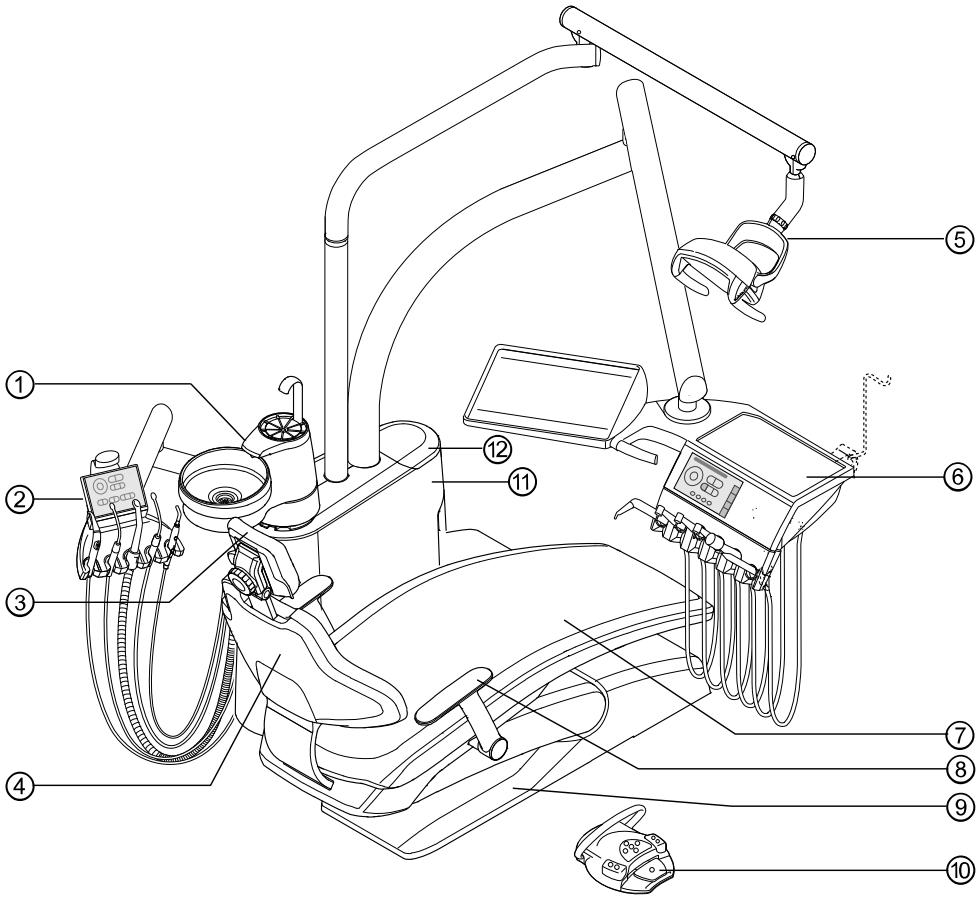
Dispose of and recycle the packaging appropriately in accordance with current packaging law, employing waste management or recycling companies. Comply with the comprehensive return system. KaVo has had its packaging licensed for this purpose. Please comply with the regional public waste-disposal system.

3 Description of the product

NOTE
The configuration can be changed as needed and does not have to be as shown in the figure.

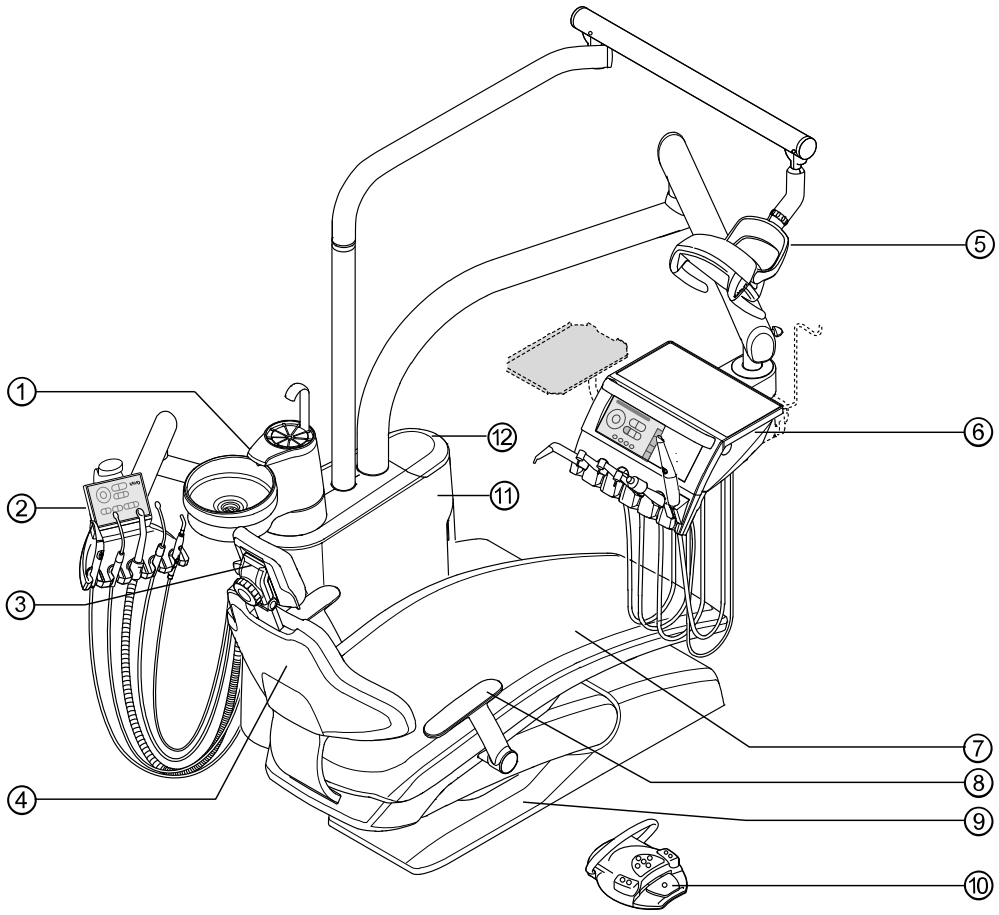
3.1 Treatment centre

3.1.1 KaVo uniQa T



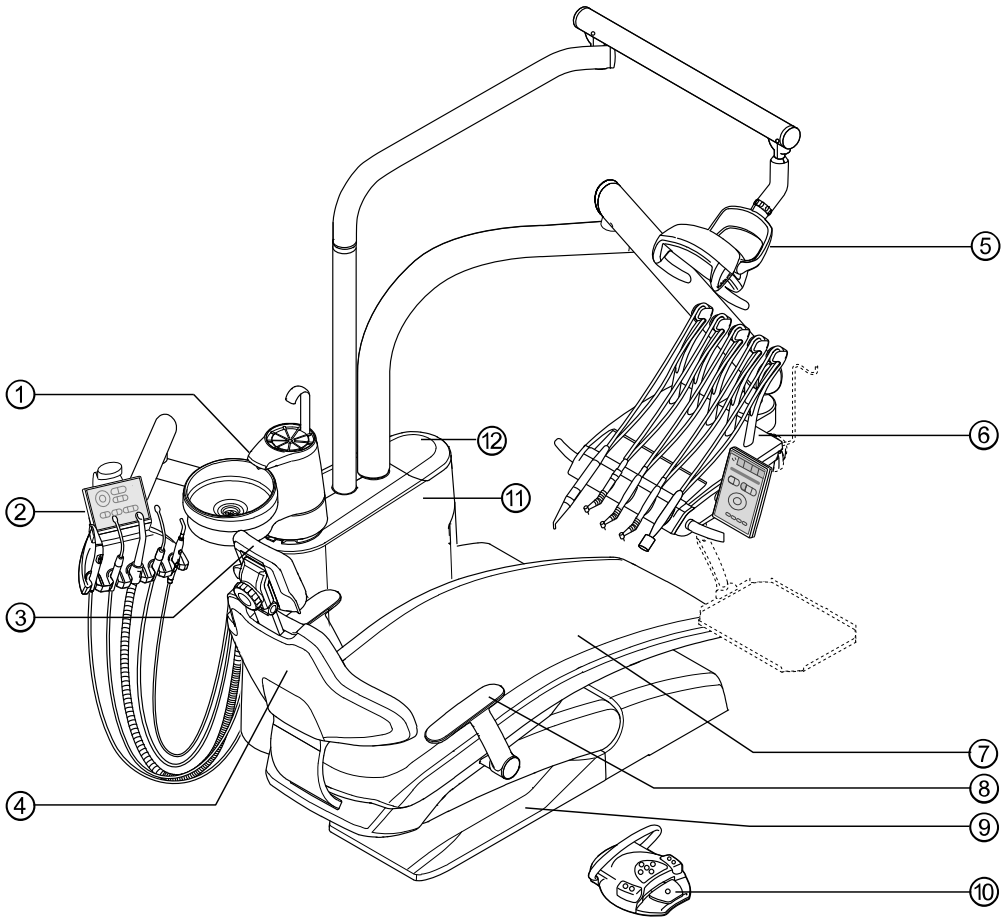
① Patient element
② Assistant element
③ Headrest
④ Backrest
⑤ Operating light
⑥ Dentist element
⑦ Bench
⑧ Armrest
⑨ Base plate
⑩ Foot control
⑪ Unit body
⑫ Hygiene centre

3.1.2 KaVo uniQa TM



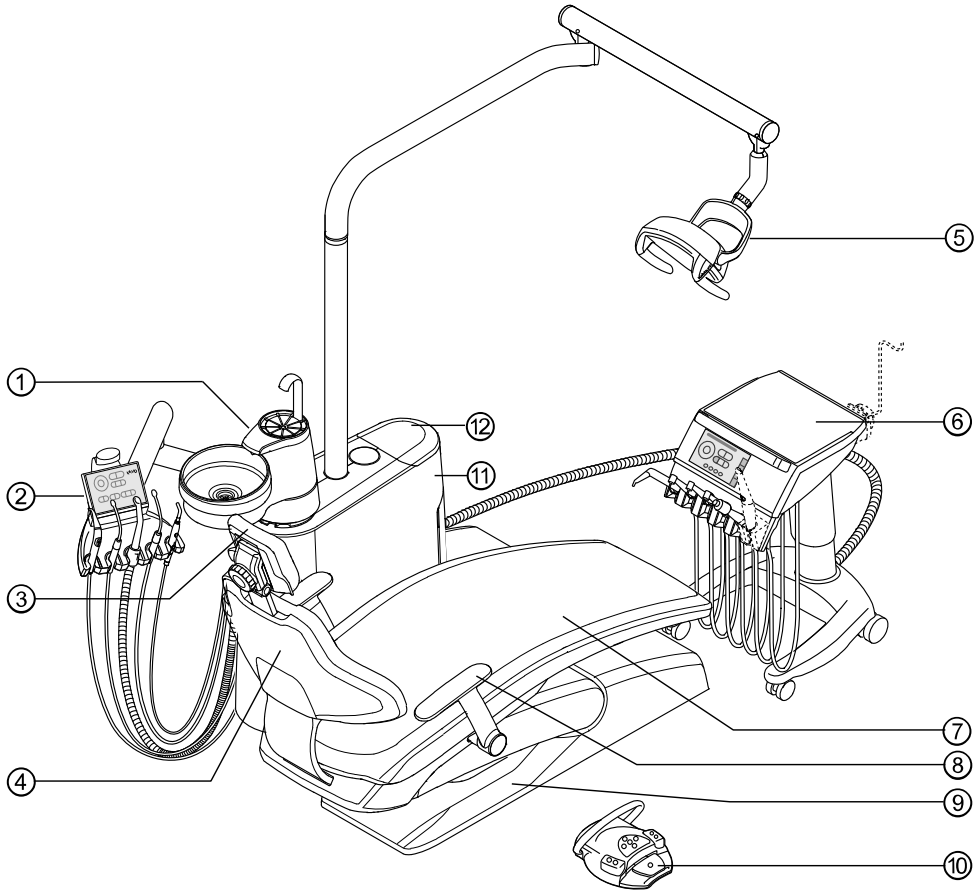
① Patient element
② Assistant element
③ Headrest
④ Backrest
⑤ Operating light
⑥ Dentist element
⑦ Bench
⑧ Armrest
⑨ Base plate
⑩ Foot control
⑪ Unit body
⑫ Hygiene centre

3.1.3 KaVo uniQa S



① Patient element
② Assistant element
③ Headrest
④ Backrest
⑤ Operating light
⑥ Dentist element
⑦ Bench
⑧ Armrest
⑨ Base plate
⑩ Foot control
⑪ Unit body
⑫ Hygiene centre

3.1.4 KaVo uniQa Cart

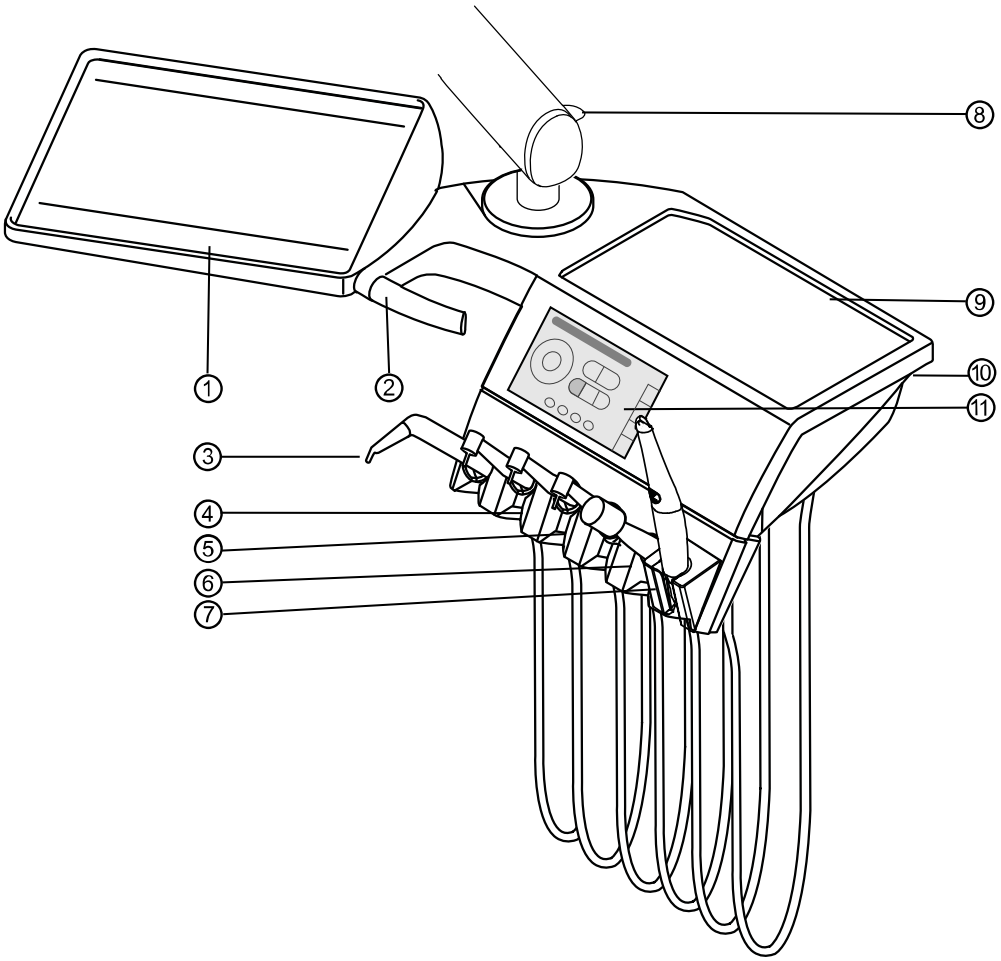


① Patient element
② Assistant element
③ Headrest
④ Backrest
⑤ Operating light
⑥ Dentist element
⑦ Bench
⑧ Armrest
⑨ Base plate
⑩ Foot control
⑪ Unit body
⑫ Hygiene centre

3.2 Versions of the dentist element

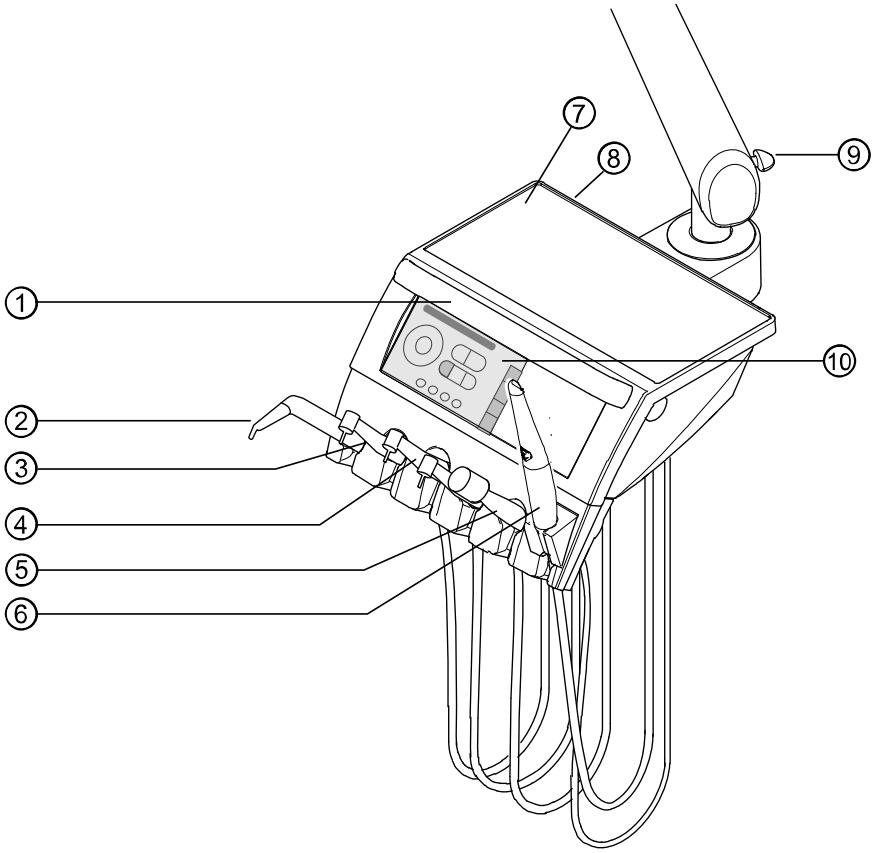
NOTE
The holder assignment and arrangement of the instruments can be changed as needed and does not have to be as shown in the figure.

3.2.1 T-Table



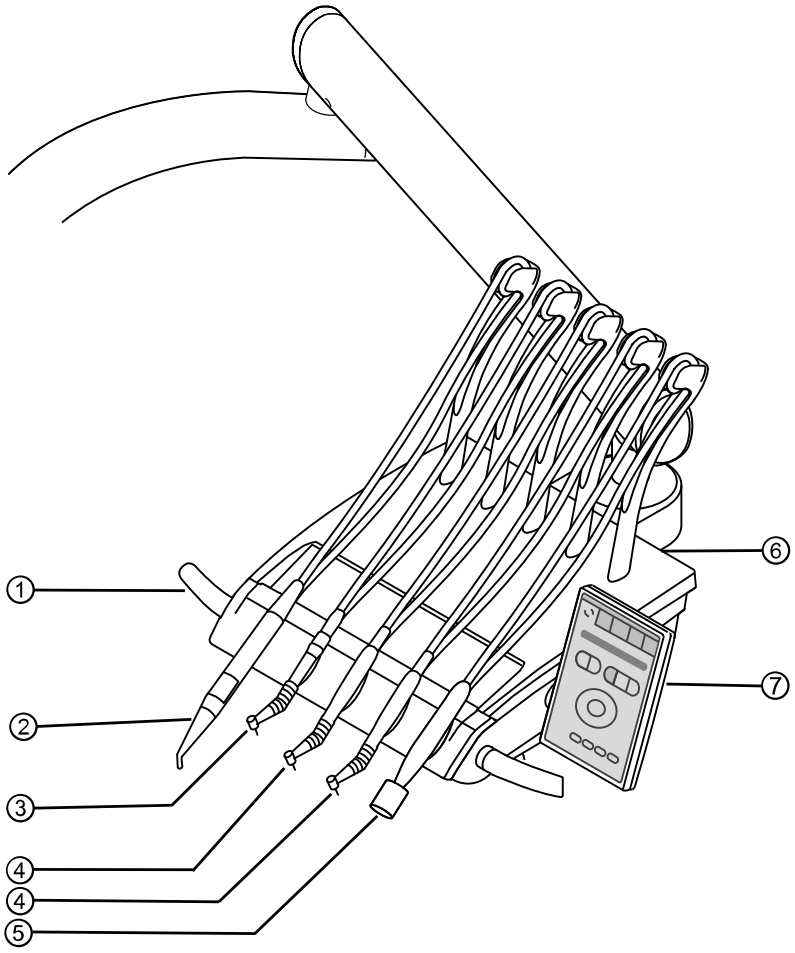
①	Tray holder	⑦	ERGOcam One
②	Handle	⑧	Locking brake
③	Three function handpiece or multi-functional handpiece	⑨	Tray support
④	Air instrument (MULTIflex coupling)	⑩	USB interface
⑤	INTRA LUX KL 703 Motor	⑪	Touchscreen for display and operation
⑥	ultrasonic scaler PiezoLED		

3.2.2 TM table



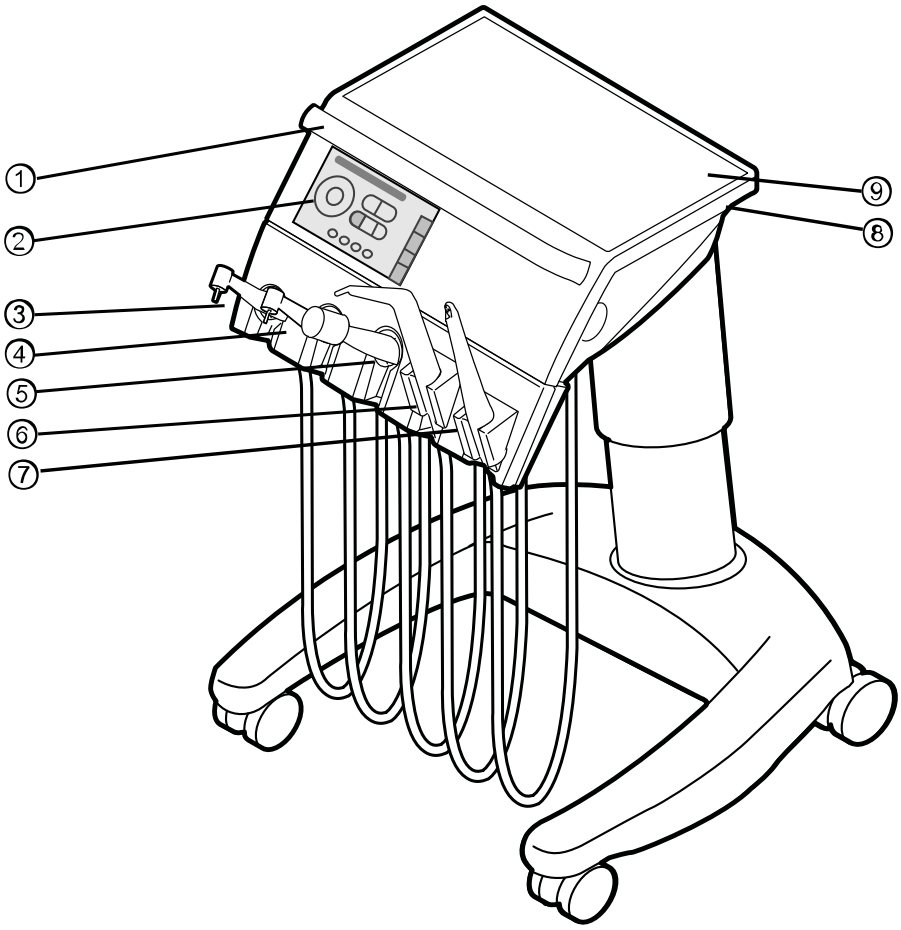
①	Handle	⑥	ERGOcam One
②	Three function handpiece or multi-functional handpiece	⑦	Tray support
③	Air instrument (MULTIflex coupling)	⑧	USB interface
④	INTRA LUX KL 703 Motor	⑨	Locking brake
⑤	ultrasonic scaler PiezoLED	⑩	Touchscreen for display and operation

3.2.3 S-Table



① Handle
② Three function handpiece or multi-functional handpiece
③ Air instrument (MULTIflex coupling)
④ INTRA LUX KL 703 Motor
⑤ ultrasonic scaler PiezoLED
⑥ USB interface
⑦ Touchscreen for display and operation

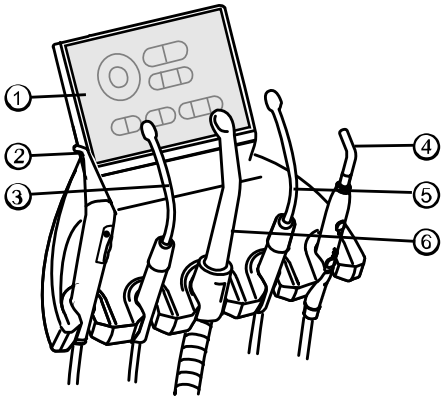
3.2.4 Cart



①	Handle	⑥	Three function handpiece or multi-functional handpiece
②	Touchscreen for display and operation	⑦	ERGOcam One
③	INTRA LUX KL 703 Motor	⑧	USB interface
④	Air instrument (MULTIflex coupling)	⑨	Tray support
⑤	ultrasonic scaler PiezoLED		

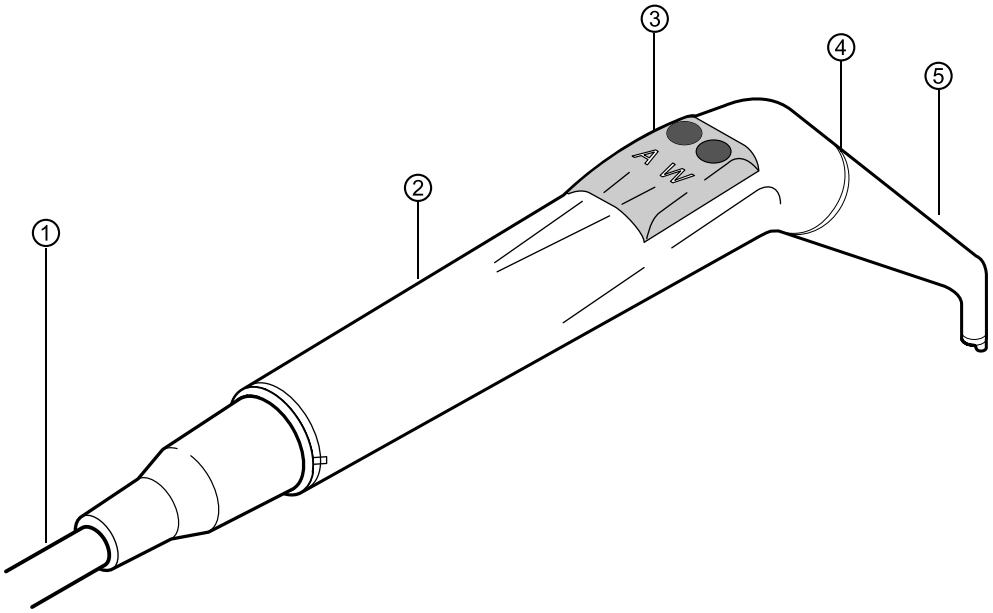
3.3 Assistant element

NOTE
The holder assignment and arrangement of the instruments can be changed as needed and does not have to be as shown in the figure.



① Control element
② Three function handpiece or multifunctional handpiece
③ Saliva ejector
④ Satelec Mini LED
⑤ 2nd Saliva ejector (optional accessory)
⑥ Spray mist suction

3.4 Three function and multifunctional handpiece (3F and MF handpiece)



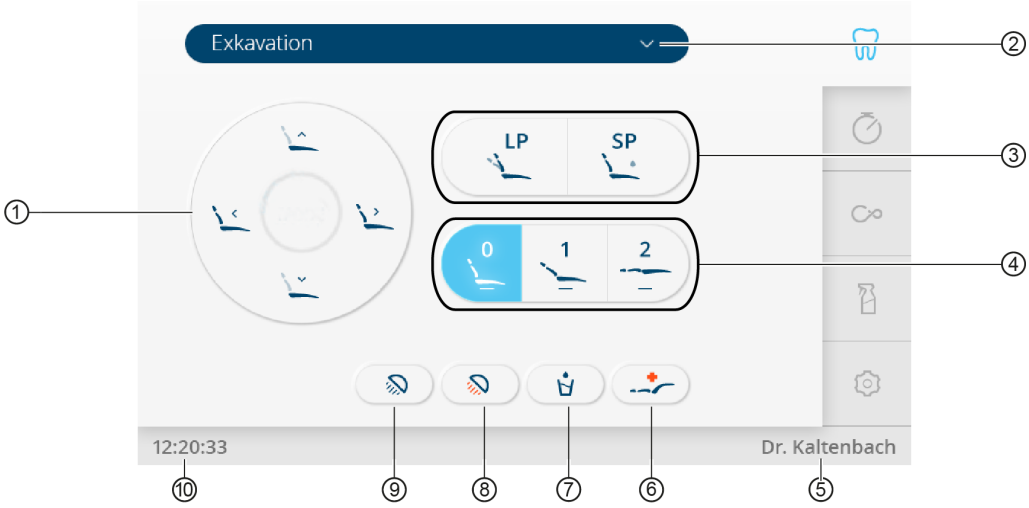
① Handpiece hose
② Gripping sleeve
③ Media buttons (air/water)
④ Labelled blue: Three function handpiece (3F handpiece)
Labelled gold: Multifunctional handpiece (MF handpiece)
⑤ Cannula

3.5 Controls

3.5.1 Dentist element T-Table/TM-Table/Cart

Touchscreen

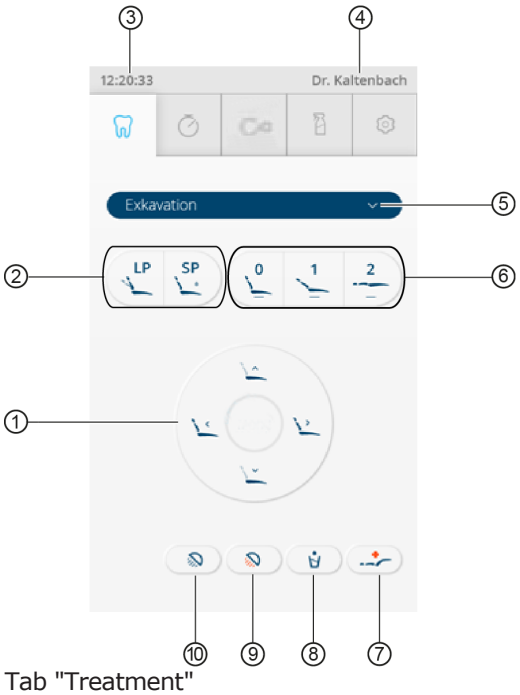
① Tab "Treatment"
② Tab "Timer"
③ Tab "Patient communication" (optional)
④ Tab "Cleaning"
⑤ Tab "Settings"



Tab "Treatment"

① Direct keys "Chair functions"
② Selection of treatment mode
③ "Most recent position" and "Rinse position" keys
④ "Automatic positions" keys
⑤ Display "User"
⑥ "Collapsed position" key
⑦ "Tumbler filler" key
⑧ "Operating light dimming" key
⑨ "Operating light on/off" key
⑩ Display "Time of day"

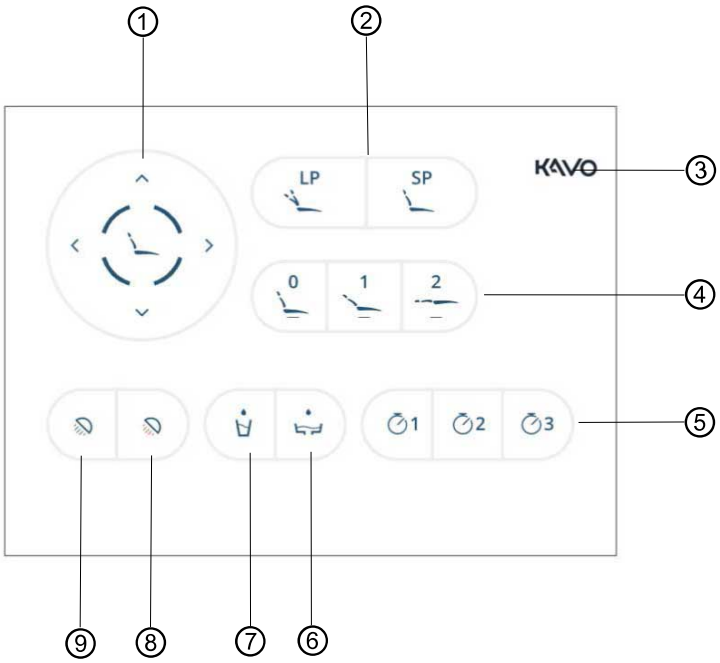
3.5.2 Dentist element S-table



Tab "Treatment"

①	Direct keys "Chair functions"	⑥	"Automatic positions" keys
②	"Most recent position" and "Rinse position" keys	⑦	"Collapsed position" key
③	Display "Time of day"	⑧	"Tumbler filler" key
④	Display "User"	⑨	"Operating light dimming" key
⑤	Selection of treatment mode	⑩	"Operating light on/off" key

3.5.3 Assistant element



① Direct keys "Chair functions"
② "Most recent position" and "Rinse position" keys
③ "Lock screen" key
④ "Automatic positions" keys
⑤ "Timer" keys
⑥ "Bowl rinsing" key
⑦ "Tumbler filler" key
⑧ "Operating light dimming" key
⑨ "Operating light on/off" key

3.5.4 Groups of keys

Direct keys for chair functions

Key	Name
SP	"SP" button (rinse position)
LP	"LP" button (last position)
0	"AP 0" button (automatic position 0)
1	"AP 1" button (automatic position 1)
2	"AP 2" button (automatic position 2)
	"Collapsed position" key
	"Chair up" key
	"Backrest up" key
	"Chair down" key

Key	Name
	"Backrest down" key

Direct keys for operating lights (selectable in "Settings" tab on the dentist element)

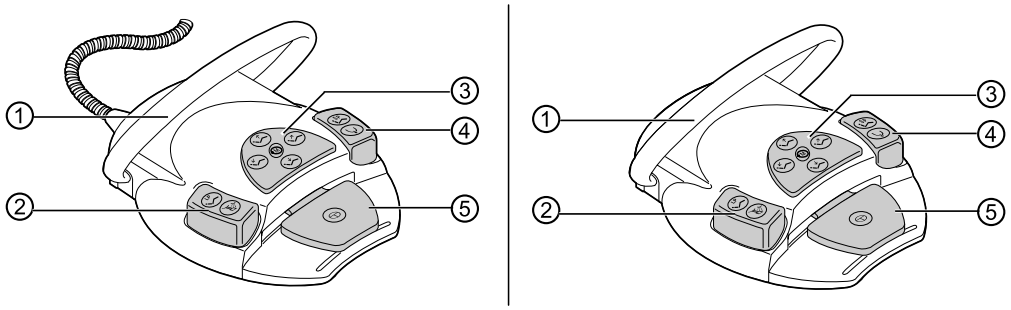
Key	Description	Control element
	"Operating light on/off" key	Dentist element and assistant element
	"Operating light dimming" key	Dentist element and assistant element
	"Laser mode" key	Dentist element only (only in combination with the KaVoLUX 540 LED)

Direct keys (selectable in "Settings" tab on the dentist element)

Key	Description	Control element
	"Tumbler filler" key	Dentist element and assistant element
	"Bowl rinsing" key	Dentist element and assistant element
	"Bell" key	Dentist element

Active keys show blue background.

3.6 Foot control



Cable-connected foot control and wireless foot control

Item Name	Function with handpiece mounted	Function with handpiece taken out
① Stirrup switch		Switches the footswitches to the "Chair motion" function.
② "LP/preselected spray" footswitch	Drives dental chair to previous position.	Sets the spray preselection.
③ "Chair position/motor rotational direction" cross switch	Changes the position of the dental chair.	Selects the direction of motor rotation (for KL 701 / KL 703 LED motor).
④ "SP/blown air" foot switch	Drives dental chair to rinsing position.	Activates blown air (Chipblower) on the instrument (does not apply to PiezoLED).

Item Name	Function with hand-piece mounted	Function with hand-piece taken out
⑤ Foot pedal "Select treatment mode"	Selection of treatment mode	Starts the motor/hand-pieces and controls the speed/intensity of the handpieces.

NOTE
Only one version of the foot control is shown in these instructions for use since the operation of both models is identical and they differ in how they are connected only.

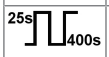
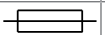
3.7 Signs on the product

3.7.1 Warning plates and safety signs

	Follow instructions for use
	Do not step on the product!
	Do not sit on the product!

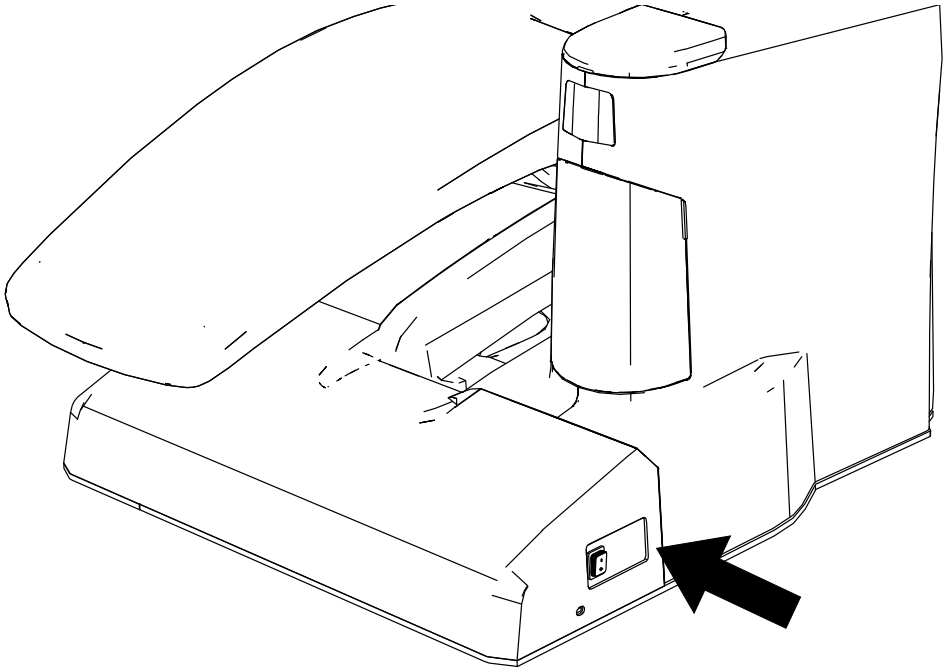
3.7.2 Rating and name plates

NOTE
Unit base, dentist element and chair always share the same serial number.

SN	Serial number
REF	Material number
	Please note the instructions for use
	Operating mode: Patient chair on-time: 25 seconds Patient chair pause: 400 seconds (The permissible operating times correspond to common dental procedure.)
	Fuse rating: The "?????" depend on the mains voltage and are either T10 H or T6.3H. 100, 110, 120, 130 V~ = T10H 220, 230, 240 V~ = T6.3H
	Non-ionising radiation (radio system included)
	Follow the electronic instructions for use

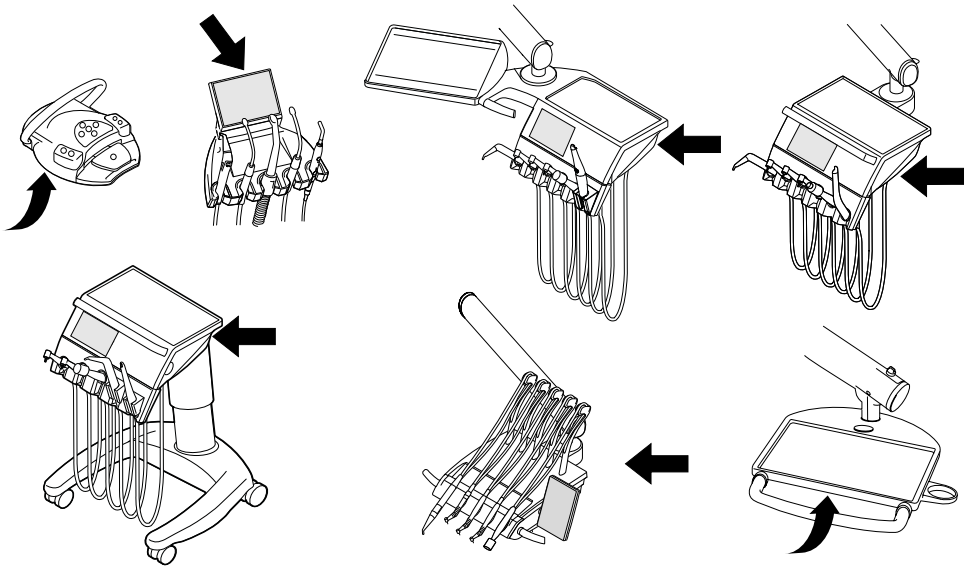
	Manufacturing date
	CE mark for medical devices
	Comply with all safety-related information in the accompanying documents, such as warning notes and precautionary measures.
	Labelling in accordance with Directive 2012/19/EU on waste electrical and electronic equipment
	Type B applied part
	DV GW labelling (Deutscher Verein des Gas- und Wasserfaches e.V.)
	VDE mark
	HIBC Code
	EAC conformity mark (Eurasian Conformity)
Type	Device type
_V _Hz _VA	Supply voltage, frequency, power
	Medical device, labelling of medical devices
	UDI symbol

Rating plate on the base of the unit

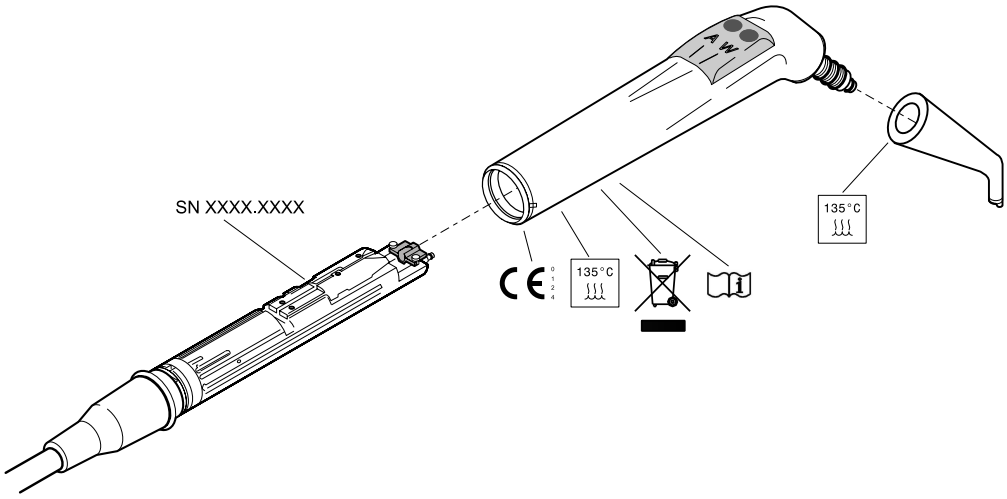


Mounting site for the rating pate on the device base

Control element rating plate



Mounting site of rating plate and applied part mark on wireless foot control, dentist and assistant element and service table 1568.



Labelling and marking of the three-function handpiece and multifunctional handpiece

3.8 Technical Specifications

Electrical system

Maximum power consumption (at 100 V to 240 V)	70 to 700 VA
Heat emission	360 to 3240 kJ/h
Heat emission average	900 kJ/h
USB unit connection	(Dentist element) USB 1.0/1.1, 2.0, max. 500 mA

Wireless foot control

RF Technology	Bluetooth low energy
RF Power	0dBm (1mW)
Range	Indoors < 5 m
Supply	Rechargeable battery
Type	Lithium ion polymer
Number of cells	1
Charging time	2 h
Rated capacity	1400 mAh, 1450 mAh
Type of charger	FW7574S 1.005.4229 (Euro), 1.007.3208 (UK), 1.007.3207 (USA/ Japan)
Input voltage	100 - 240 V AC / 50 - 60 Hz / 0,15 A
Output voltage	4.2 V DC / 1 A

Operating time (as per charge cycle)	At least 1 month – The indicated operating time assumes normal handling of the treatment unit and wireless foot control. This may vary according to the treatment approach.

Three function handpiece and multifunctional handpiece

Water pressure	1.5 ± 0.3 bar; Flow pressure; 4 x manometer
Maximum static pressure water	2.5 ± 0.3 bar
Water flow	80 ± 10 ml/min
Atmospheric pressure	3.3 ± 0.1 bar; Flow pressure; 4 x manometer
Maximum static pressure air	4 + +0.5 bar
Air flow	at least 16 Nl/min
Operating time	1 minute (multifunctional handpiece only)
Pause time	3 minutes (multifunctional and peace only)

Electrical system of the multifunctional handpiece

Safety extra-low voltage according to DIN EN 60601-1	24 V AC ± 10% (non-grounded voltage)
Frequency	50/60 Hz
Type of use	B
Heat output for water	approx. 90 W
Heat output for air	approx. 20 W
Lamp voltage	max. 3.4 V ± 10 mV
LED power	max. 0.41 W

Water supply

NOTE
If the water is very hard (above 12 °dH), a water softening device based on an ion-exchange procedure must be fitted.
Insufficient water hardness (below 8.4 °dH) can promote the growth of algae.

NOTE
In conjunction with the "DVGW water block with integrated water germ reduction" a water germ reduction unit is installed in dental units from KaVo. The germ reduction liquid OXYGENAL 6 is continually added to the water at a concentration which is harmless for humans, but hygienically effective to maintain the quality of the treatment water. The handling is described in the care instructions of the treatment centres. Supplementary measures such as the rinsing of water conducting lines and intensive germ reduction must be carried out according to the instructions of the manufacturer.

NOTE
The "Water block, compact" assembly kit does not include a separation between the treatment water and water supplied by the local mains. The operator must observe and comply with relevant national directives concerning the prevention of backflow. Upon failure to comply with these rules, the manufacturer accepts no liability for the quality of the treatment water and the microbial re-contamination of the public drinking water network.

⚠ WARNING

There is a risk of infection if you fail to comply with national regulations.

Contamination of the treatment water and/or drinking water supply with germs.

- Note and comply with national regulations concerning the quality of water for human use (drinking water) - if applicable.
- Note and comply with national regulations concerning the prevention of backflow (flow from the treatment centre back to the public water supply) - if applicable.

⚠ WARNING

Risk of infection if the "Water block, compact" is used without additional safeguards.

Contamination of the treatment water and/or drinking water supply with germs.

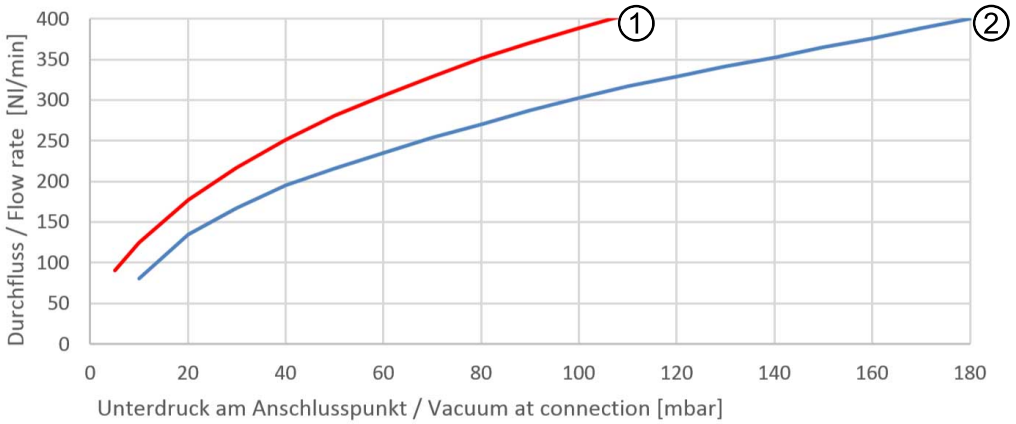
- With regard to the "Water block, compact" assembly kit, please note that no germ reduction facility is installed in the unit, and take appropriate safeguards. KaVo recommends to use the "Water block DVGW with integrated water germ reduction facility" in combination with KaVo OXYGENAL 6 (Mat. no. 0.489.3451).
- ▸ If the Water bottle kit is used with the enclosed dosing attachment (Mat. no. 1.002.0287), add the proper amount of KaVo OXYGENAL 6 (Mat. no. 0.489.3451) with each filling. For the correct amount, please refer to the instructions of the dosing attachment for water reprocessing.

According to DIN EN 1717, each unit that is not listed by DVGW must be provided with an upstream type AA, AB or AD safety device.
When establishing a water connection, make sure that there are no sections of brackish water with standing water (also in the house plumbing).
For further information, please refer to www.dvgw.de

Free drainage according to DIN EN 1717 - DVGW certified	Register No.: AS-0630BT0111
Water quality according to ISO 7494-2	Tap water, cold water connection
Water hardness	1.5 to 2.14 mmol/l ≙ 8.4 to 12 °dH
pH	7.2 to 7.8
Water filter, supplied by customer	80 µm
Water connection	Customer-provided shut-off valve with brass cone compression screw connection 3/8" to Ø 10 mm
Above-floor water connection	min. 50 mm, max. 100 mm with valve opened
Water inlet pressure	2.0 to 6.0 bar (0.2 to 0.6 MPa)

Water inflow	> 4 l/min
Diameter of the drain connection	40 mm
Above-floor drain connection	20 mm
Outflow quantity	max. 4 l/min
Slope of water drain pipe	downstream from device: at least 10 mm per metre

Suction



Pressure drop at the connecting point

① Semi-dry and wet suction
② Dry suction

NOTE
If the negative static pressure is > 180 mbar, the unit must be equipped with the negative pressure regulating valve assembly kit.

Cannula connecting pieces	according to DIN EN ISO 7494 - 2
Diameter of cannula of saliva ejector and surgical suction	7 mm
Diameter of cannula of spray mist suction	15 mm
Suction air quantity at spray mist cannula	minimum 250Nl/min (suction system with high flow rate), recommended 300Nl/min
Diameter of the suction connection	40 mm
Suction connection above floor	20 mm

DEKASEPTOL Gel supply

- Pressure P 2 - 5 bar by means of ball valve, to be provided by customer (John Guest PPMSV040808W)
- Supply rate V 0.005 - 0.15 l/min
- Supply line polyethylene (LLDPE), John Guest, dimensions dependent on object (building, number of units)
- Supply hoses must be routed to be frost-protected, not above 25 ˚C and not exposed to direct sunlight.

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.

Floor quality	The quality of the flooring must meet the load bearing ability for buildings DIN 1055 page 3 and have a pressure resistance in accordance with DIN 18560 T 1.
Ambient temperature	+10 to +40 °C / +50 to +104°F
Optimum ambient temperature	+15 to +35 °C / +59 to +95°F
Relative Humidity	30% to 75% non-condensing
Atmospheric pressure	700 hPa to 1060 hPa (10 psi to 15 psi)
Max. altitude for operation	up to 3000 m

Maximum loads

Maximum patient weight load	185 kg
Tray holder of the dentist element - loadable up to	2 kg
Assistant element standard tray - loadable up to	1 kg
Dentist element - loadable up to	2 kg
Service table 1568 without locking system	2 kg
Service table 1568 with locking system	5 kg

Air supply

⚠ WARNING

Non-compliance with national guidelines concerning the quality of the dental air.

Infection hazard.

- Note and comply with the national guidelines concerning the quality of the dental air - if any.
- Blow through the air line prior to commissioning.

Air inlet pressure	5.2 to 7 bar (0.52 to 0.7 MPa)
Minimum air flow rate	min. 80 Nl/min

Pressure dew point	< -30 ºC (compressor with dry air system)
Oil content	< 0.1 mg/m^3 (oil-free compressor)
Contamination	< 100 particles/m^3 at particle sizes of 1 to 5 µm
Air connection	Customer-provided shut-off valve with brass cone compression screw connection 3/8" to Ø 10 mm
Air connection above floor level	min. 50 mm, max. 100 mm with valve opened

Transportation and storage conditions

Ambient temperature	-20 to +55 °C / -4 to +131°F
Relative Humidity	5% to 95% non-condensing
Atmospheric pressure	700 hPa to 1060 hPa (10 psi to 15 psi)

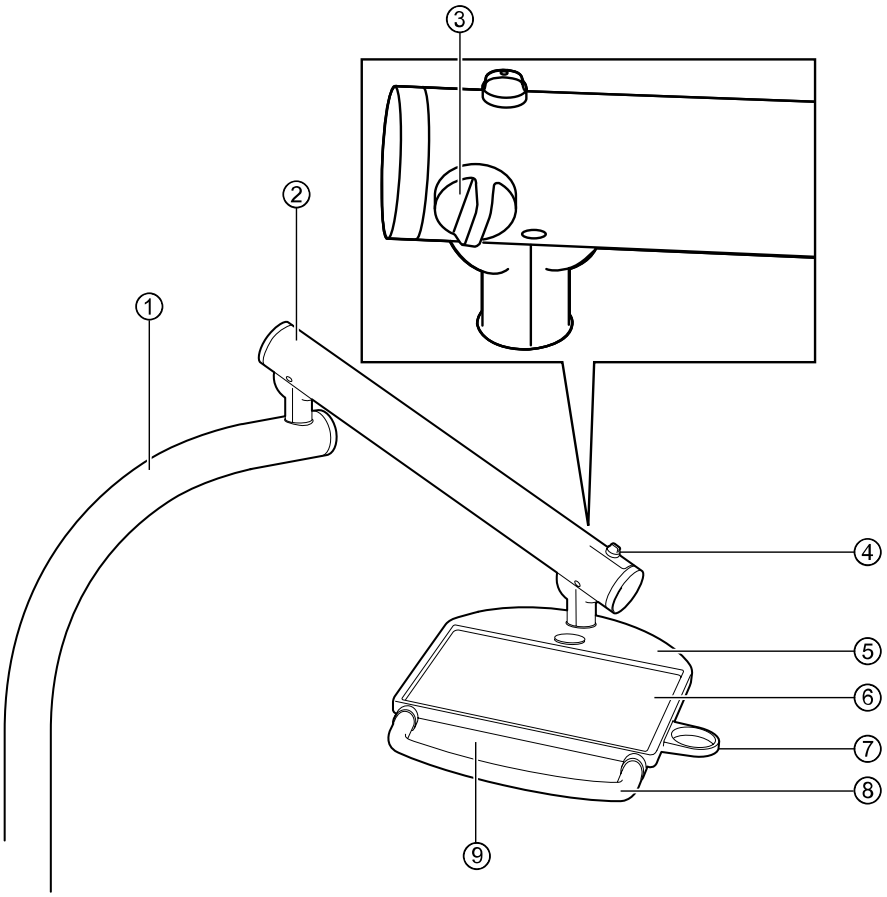
Weight

Table TM	gross 36 kg/net 18 kg
Table T	gross 33 kg/net 20 kg
Table S	gross 33 kg/net 18 kg
Cart	gross 33 kg/net 18 kg
Chair	gross 105 kg/net 87 kg
Equipment	gross 69 kg/net 54 kg
Treatment centre TM	gross 210 kg/net 159 kg
Treatment unit T	gross 207 kg/net 159 kg
Treatment centre S	gross 207 kg/net 159 kg
Treatment unit cart	gross 207 kg/net 159 kg
Service table 1568 with locking system	gross 25 kg/net 19 kg

Operating light KaVoLUX 540 LED

Also refer to:
Instructions for use KaVoLUX 540 LED

3.9 KaVo Service table 1568 (optional accessory)



① Swivel arm
② Spring arm
③ Rotary knob (brake)
④ Rotary knob (lockable)
⑤ Service table
⑥ Non-slip mat
⑦ Cup holder
⑧ Handle
⑨ Rating plate

4 Operation

Please note also the corresponding instruction and ergonomics videos on the KaVo website. Please use the QR codes or follow the corresponding link:

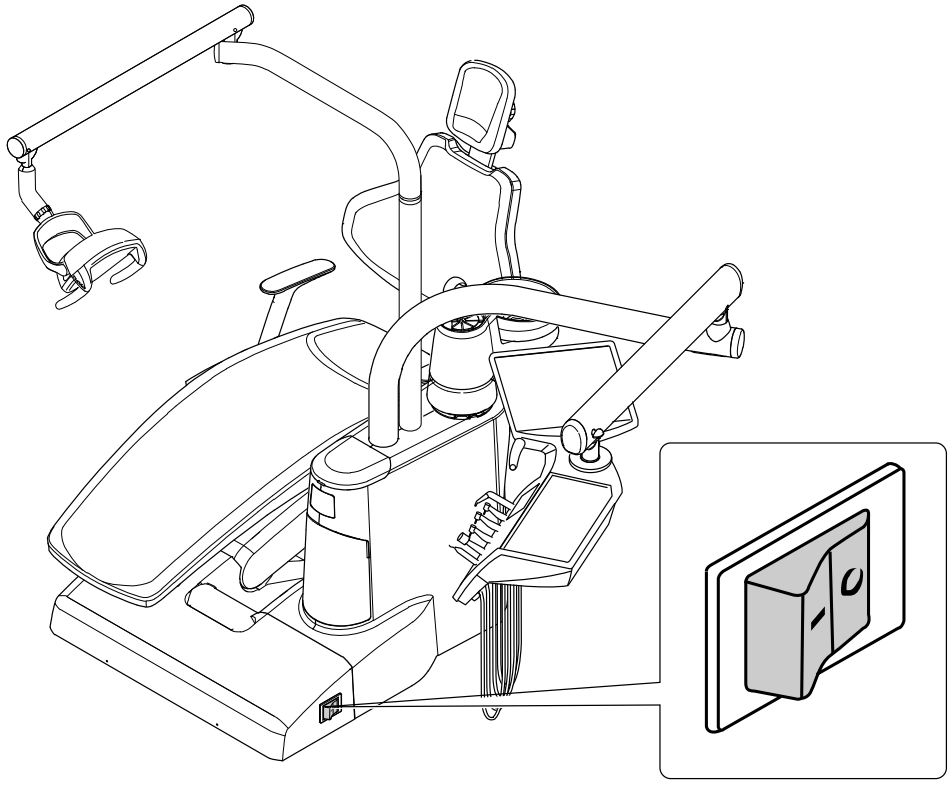
Instruction video: https://www.kavo.com/de/einweisung

Ergonomics video: https://www.kavo.com/de-de/rueckenfreundliches-arbeiten

4.1 Turn the device on

NOTE
Switch the machine off before leaving the practice.

- Switch on the device using the main switch.



⇨ The KaVo logo is illuminated on the display of the dentist element.
⇨ A melody plays as soon as the unit is powered up completely.

4.2 Moving the dentist element

⚠ CAUTION

Risk of injury when the dentist element or assistant element is moved.

The patient or office staff may be injured or bruised.

- Monitor the patient and office staff when moving the dentist or assistant element.

NOTE

Do not pull the dentist element by the instrument hose.

4.2.1 Moving the T/TM/S table

⚠ CAUTION

Excessive load on the support system

The patient or treatment personnel may be injured.

The support system may be damaged.

- Do not exceed the permissible maximum weight (generated e.g. by instruments and accessories).
- Do not use the swivel arm for a support!

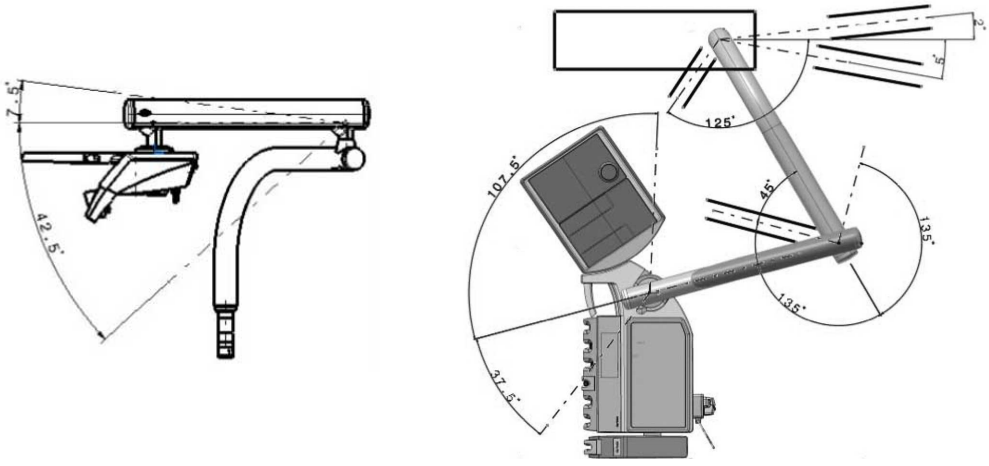
CAUTION

Damage from overloading the dentist element.

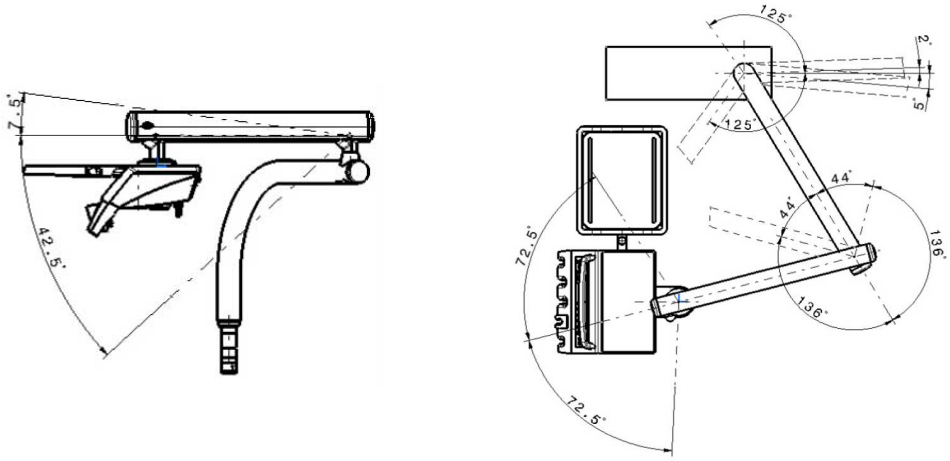
Damage from overloading the dentist element. Exceeding the maximum weight of more than 2 kg by adding handpieces, accessories, etc., can cause damage.

- Do not overload the dentist element!

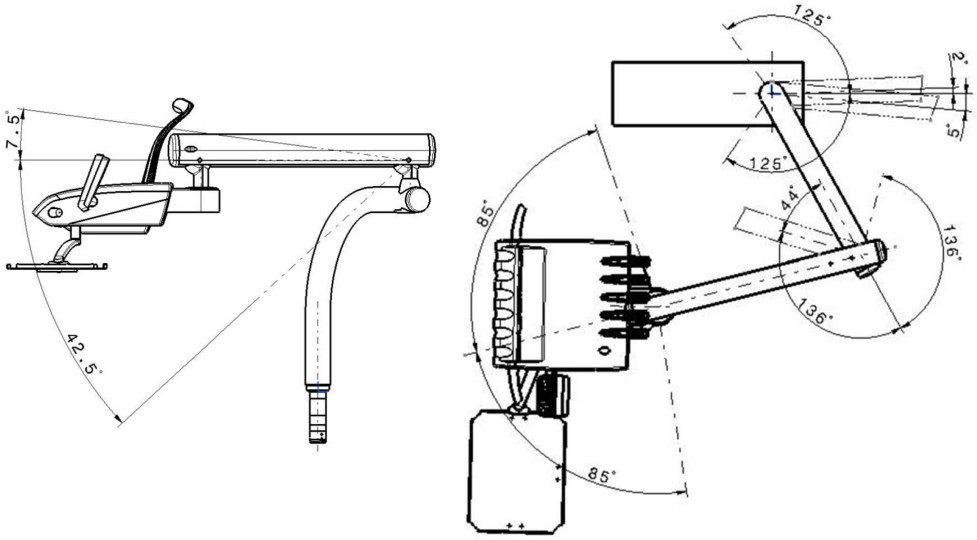
The swinging range of the dentist element is limited by stops.



T-Table



TM table



S-Table

4.2.2 Move the cart

⚠ CAUTION

Moving and overloading the cart.

Danger of tipping and damaging the cart.

- Only use the cart on a continuously smooth floor.
- Do not travel over the supply hose for the cart.
- Make sure that there are no obstructions on the floor.
- Do not sit on the dentist element or step on the castor.

⚠ CAUTION

Manual height adjustment.

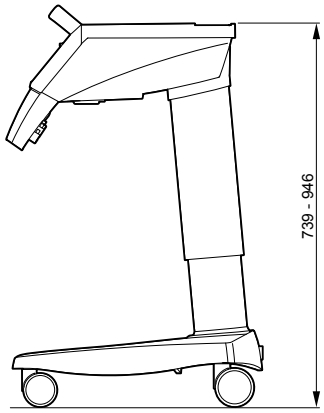
Risk of injury from manual height adjustment.

- Hold on to the unit and lower it slowly when adjusting it downwards.

NOTE
The range in which the cart can be moved is restricted by the length of the lines and hoses that connect the cart to the base of the device. Only move the cart within this range.

- To change the position of the cart, hold the cart by the bow-type handle and move it to the desired position.

The top part of the dentist element can be positioned in 9 levels.



Cart

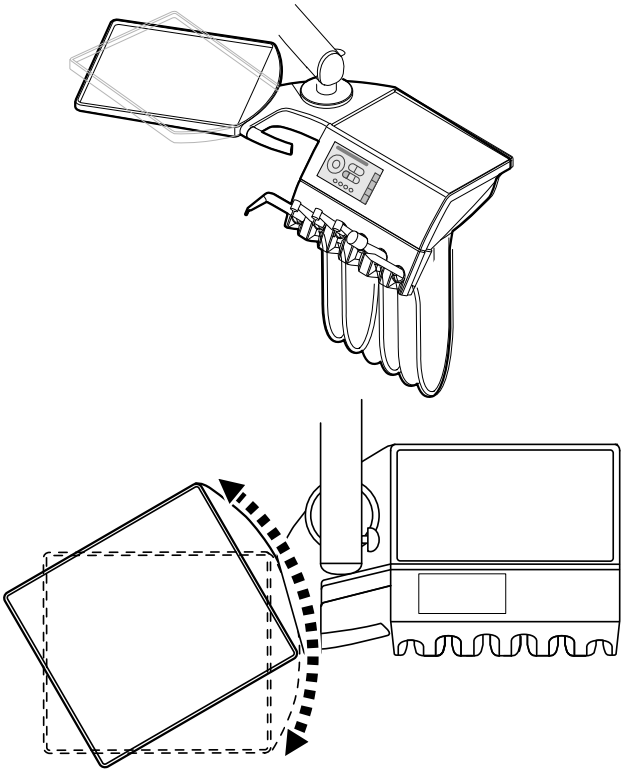
NOTE
Do not lift the dentist element by the handle.

- Lift the top part of the dentist element until it locks into place.
- To release the lock, move the top part all the way up and then move it down.

4.3 Moving the tray

The tray can be swivelled.

- Push the tray into the desired position.



4.4 Moving the assistant element

CAUTION

Damage from overloading the assistant element
Exceeding the maximum weight of more than 1 kg by adding handpieces, accessories, etc., can cause damage.

- Do not overload the assistant element!

⚠ CAUTION

Manual height adjustment.

Risk of injury from manual height adjustment.

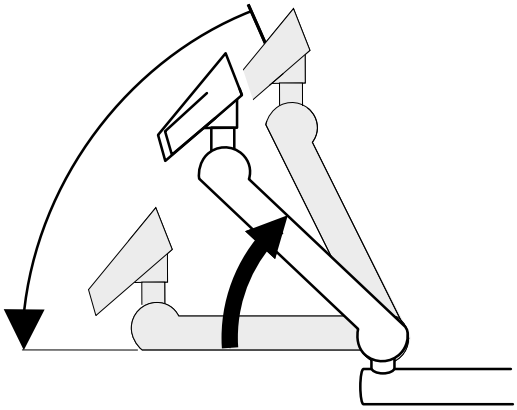
- Hold on to the unit and lower it slowly when adjusting it downwards.

NOTE
Touching the touch panel can trigger functions inadvertently. Hold and position the assistant element on the instrument tray.

The assistant element can be moved vertically into four levels.

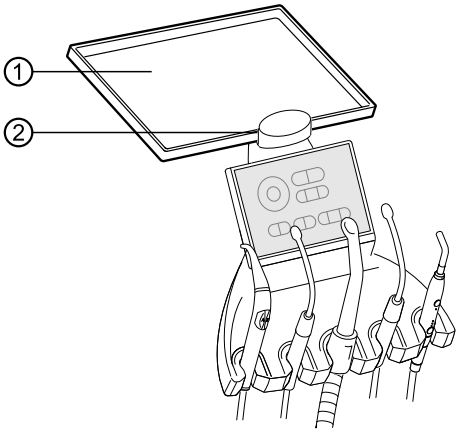
- Pull the assistant element slightly upwards until it locks into place.

- To release the lock, the assistant element must be lifted all the way up.



4.4.1 Attaching the tray holder (optional assembly kit)

- Mount the tray holder on the assistant element.



① Tray support
② Tray holder

The support ② for the tray holder ① is an optional accessory.

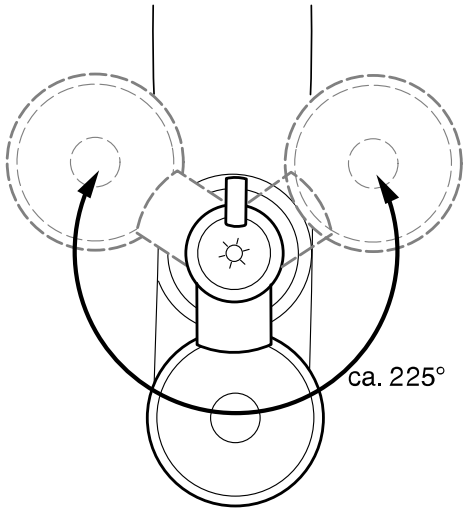
4.5 Moving the patient element (optional)

NOTE
No liquids may be emptied into the spittoon bowl while the device is turned off. Mechanical and electronic damage could occur as a result of liquid leaking into the interior.

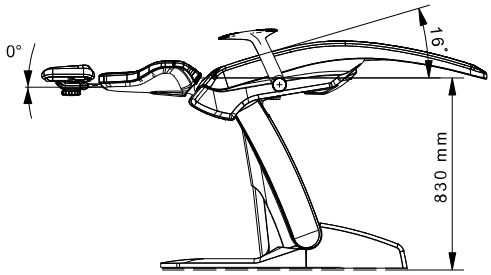
NOTE
If the patient unit is swivelled over the patient chair, the safety shutdown is activated and the patient chair can no longer be moved.

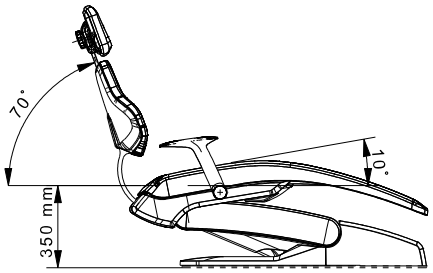
Once the patient part is swivelled back, the safety shutdown is deactivated again. An acoustical signal is issued and the patient chair can be moved again.

The patient part can be swivelled manually. The swivelling range is 225°.



4.6 Adjusting the dental chair





Patient chair

⚠ CAUTION

Danger of injury from automatic chair adjustment

The automatic adjustment of the chair position can lead to injury.

- Only use the automatic functions under the supervision of the user!

⚠ CAUTION

The patient chair is overloaded

Damage to the support system or patient chair.

The patient or treatment personnel may be injured.

- Do not exceed a maximum permissible weight of 185 kg.
- Do not sit on the head or foot end of the patient chair when it is horizontally aligned.
- Monitor the patient when changing the chair position.

⚠ CAUTION

Direct contact between the skin of the patient and the cushion/armrests during patient positioning

Allergic reactions and skin irritation.

To improve hygiene and increase the service life, KaVo recommends to use appropriate covers (e.g. head protection bags) to protect the cushions that are regularly in contact with the skin of the patient. Sweat or hair and skin care products can be a serious strain on the cushions. The cover can prevent allergic reactions or skin irritations in patients with sensitive skin. Cover the armrests

with protective film/protective covers before use. Select the protective films/ protective covers in compliance with national regulations for medical products. Please comply with the instructions of the manufacturer of the cover.

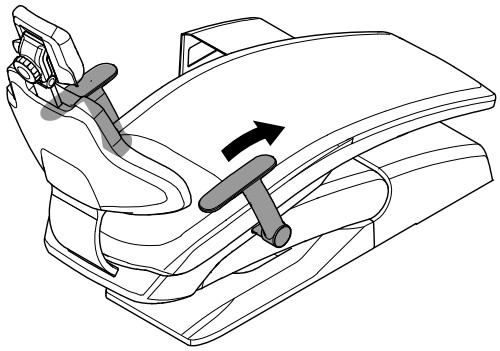
CAUTION

Loads on the cover hood.
Damage to the cover hood in front of the chair when exposed to loads.
- Do not step on the cover hood!

4.6.1 Armrest

The right or left armrest can be swivelled forward for the patient to get in and out.

- Swivel armrest forward.
- Then swivel the armrest back into place.



NOTE
The armrest can be fixed permanently on the side of the unit body.

4.6.2 Automatic positioning of patient chair

⚠ CAUTION

Motorised motion of the patient chair

The patient or treatment personnel can be clamped or crushed.

- Monitor the patient and treatment personnel when changing the patient's position.

Selecting the automatic chair position

Automatic positions can be saved, and the saved positions can be recalled by the push of a button.

The chair and backrest motions proceed simultaneously in the automatic programme.

The chair can be automatically positioned using the following buttons:

Key	Feature
SP	Move to the rinse position.
LP	Move to most recent position before actuation of the SP.
0	Move to automatic position 0.
1	Move to automatic position 1.

Key	Feature
2	Move to automatic position 2.
+	Move to the collapsed position.

- Briefly press the respective button.
  - ⇨ Chair automatically moves to the saved position.

⇨ The key is activated as soon as the saved position is reached.

Recommended assignment of keys:

- "SP" button: rinse position
- "AP 0" button: entry and exit position
- "AP 1" button: treatment position, e.g. for lower jaw treatment
- "AP 2" button: treatment position, e.g. for upper jaw treatment
- "Collapsed position" button: collapsed position

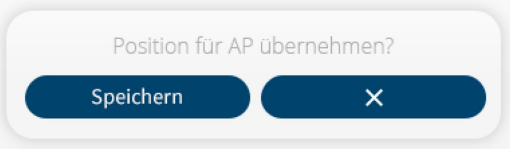
"Last position" button

Upon actuation of the "LP" button, the chair travels to the position in which it was before the "SP" button was pressed.

NOTE
The memory is erased when you turn off the device. After turning on the device again (for example in the morning or after lunch), the chair does not execute a specific motion when you press the "LP" button.

Saving automatic chair positions via the dentist element

- Move the chair to the desired position.
- To save the chair position as desired, press the "AP 0", "AP 1", "AP 2" or "SP" key until the following window is displayed.



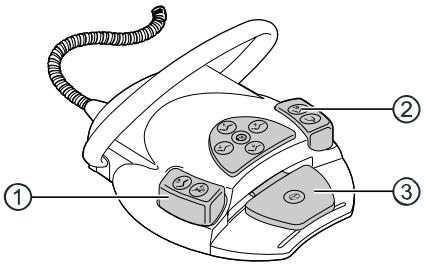
- Tap "Save" to store the chair position or "x" to quit without saving.

Saving automatic chair positions via the assistant element

- Move the chair to the desired position.
- To save the chair position, press the "AP 0", "AP 1", "AP 2", "SP" or "Collapsed position" button until you hear a beep.

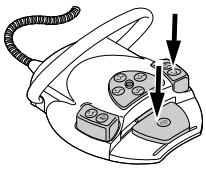
⇨ The chair position is saved.

Saving an automatic position with the foot control

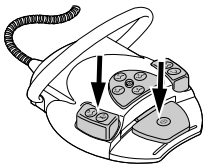


① Spray preselection/AP footswitch
② Blown air/AP footswitch
③ Foot pedal

Chair positions can be saved on two foot switches; the standard setting is as follows:
Foot switch "Spray preselection": Automatic position "LP" (last position)
Foot switch "Blown air": Automatic position "SP" (rinse position)



- Hold down the foot pedal and foot switch "SP", and simultaneously press any button for an automatic position ("AP 0", "AP 1", "AP 2" or "SP") on the dentist or assistant element until a confirmation window is displayed. Confirm to save. Keep the foot control buttons pressed throughout the process.
  ⇨ The automatic position is saved to the foot switch.



- or
- Hold down the foot pedal and foot switch "SP", and simultaneously press any button for an automatic position ("AP 0", "AP 1", "AP 2" or "SP") on the dentist or assistant element until a confirmation window is displayed. Confirm to save. Keep the foot control buttons pressed throughout the process.

⇨ The automatic position is saved to the foot switch.

4.6.3 Positioning the dental chair manually

Setting the chair height and backrest position using the dentist or assistant elements

Use the following buttons to adjust the chair height and position of the backrest:

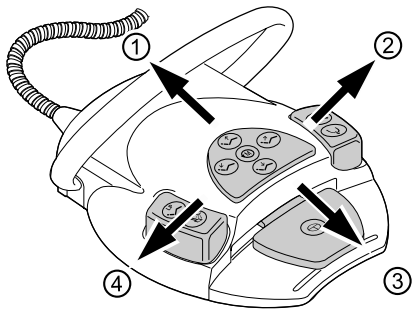
Dentist element key	Assistant element key	Feature
		The chair moves up.
		The chair moves down.
		The backrest moves upward.
		The backrest moves downward.

- Press the corresponding button.

⇨ The chair or backrest moves in the desired direction.

Setting the chair height and backrest position with the foot control

The cross switch of the foot control assumes the function of the button wheel on the dentist element during manual positioning of the patient chair.

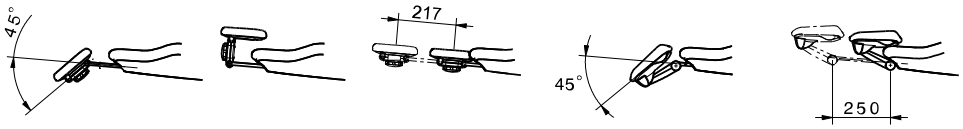


Prerequisites

✓ All instruments are in their holders. If an instrument is taken out, briefly activate the stirrup switch.

- Chair up: slide cross switch on foot control towards 1.
- Chair down: slide cross switch on foot control towards 3.
- Backrest up: slide cross switch on foot control towards 2.
- Backrest down: slide cross switch on foot control towards 4.

4.7 Adjusting the headrest



Headrests

⚠ CAUTION

Adjusting the headrest.

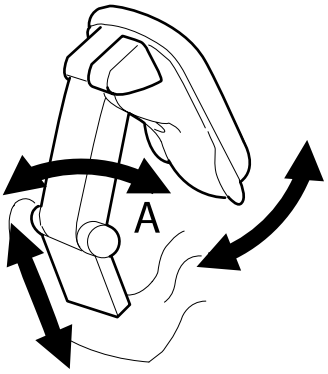
Injury to the neck muscles.

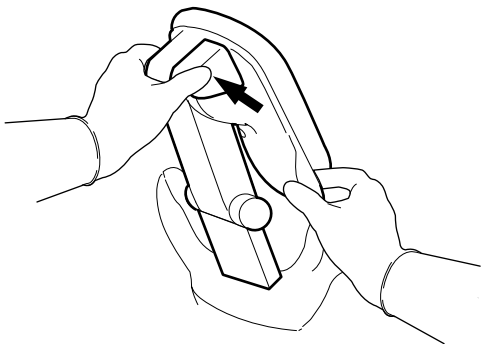
- Make sure that the patient is aware of the headrest being adjusted.
- Patients need to raise their head slightly during adjustment.
- Use both hands to adjust the headrest.

The bar length and angle of the headrest can be adjusted.

4.7.1 Adjusting the double-jointed headrest pushbutton

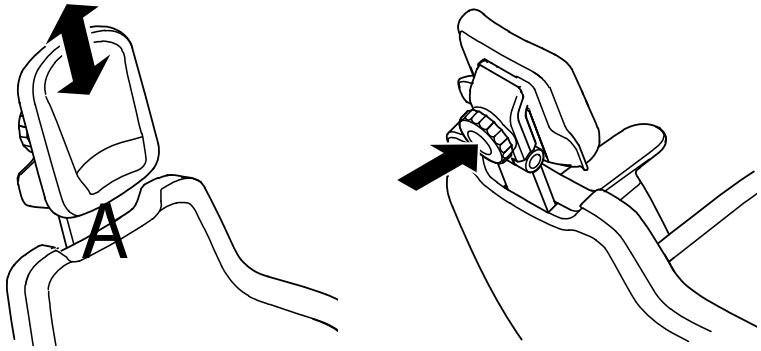
- Push in or pull out the headrest to fit the size of the patient.
- Press the lock button and swing the headrest into the desired position. When swinging the headrest back into position, make sure that there is no object between area A and head cushion.





4.7.2 Adjusting the double-jointed headrest knob

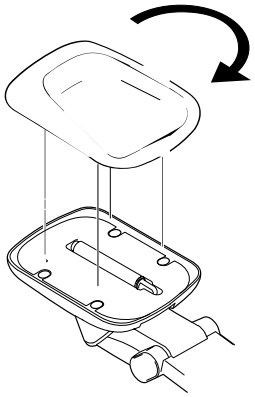
- Push in or pull out the headrest to fit the size of the patient.
- To swivel the headrest, rotate the knob anticlockwise to the stop. After adjustment, rotate the knob clockwise to fix it again. When swinging the headrest back into position, make sure that there is no object between area A and head cushion.



4.7.3 Rotating the head cushion

The headrest cushion is a rotating cushion. It can be turned to offer better neck support, for example when treating children.

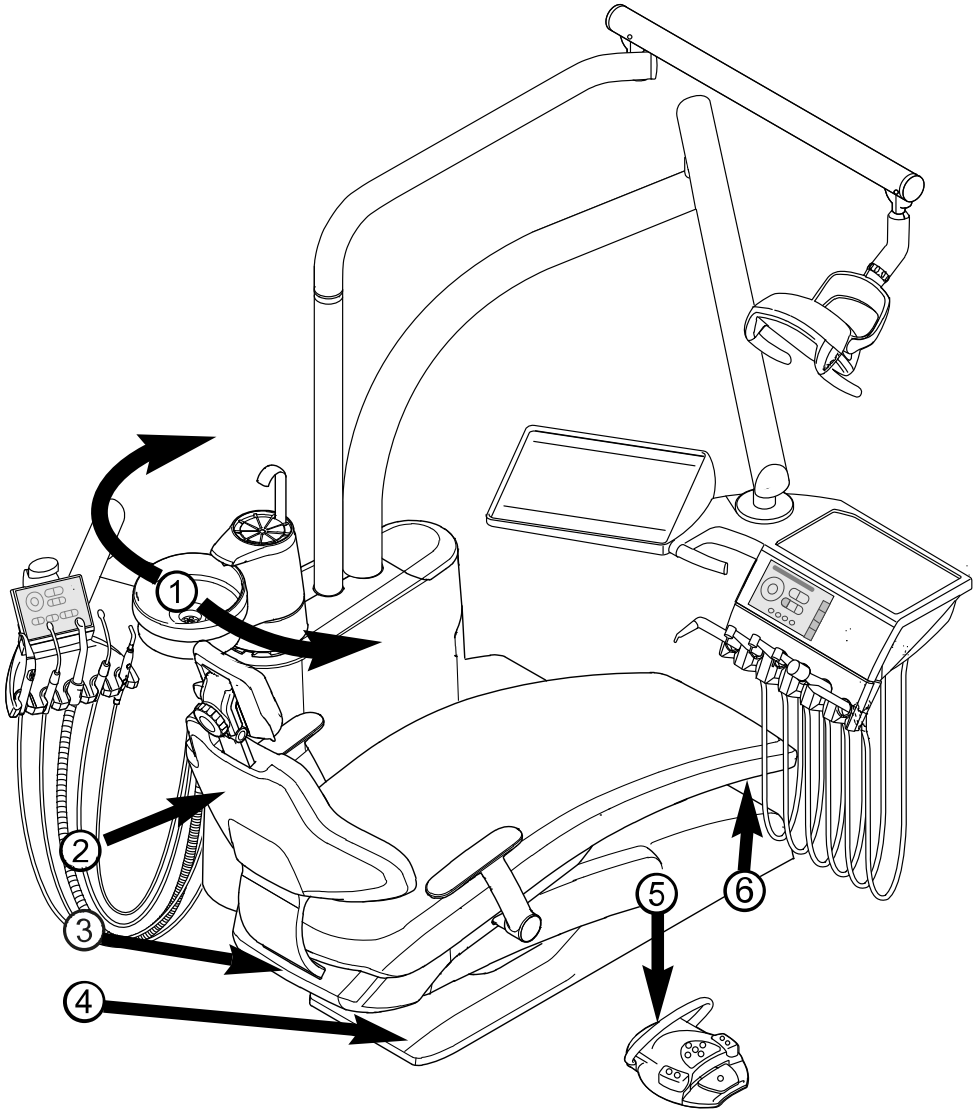
- Treatment of adults: thick cushion side down (neck support).
- Treatment of children: thin cushion side down.
- Evenly pull the cushion up and rotate it 180°.



- Then snap the head cushion back on.

4.8 Safety shutdown

The safety shutdowns are provided to protect the patient and office staff from injury and the treatment centre from damage.
The safety shutdowns can be found at the following places on the treatment centre:



Safety shutdowns

①	Patient element (optional) pivoted over dental chair (2 switches, right/left)	④	Kickplate/VACUstopp (2 switches)
②	Backrest	⑤	Stirrup on foot control
③	Support cover (2 switches)	⑥	Bench

If a person or object triggers a safety shutdown, the chair immediately stops moving.
An activated safety shutdown message is displayed on the dentist element if an active safety shutdown is triggered.
In addition, the activated safety shutdown is displayed by the corresponding button flashing on the assistant element:

Display LED on the assistant element	Safety shutdown actuated
SP	① Patient element
1	② Backrest

Display LED on the assistant element	Safety shutdown actuated
0 	③ Support cover
SP 	④ VACUstopp kickplate
LP 	⑤ Stirrup on foot control
0 	⑥ Bench

NOTE
The chair's position cannot be changed with the key wheels when a safety shutdown is activated.

- To deactivate an active safety shutdown, remove the trigger from the range of movement of the chair.

⚠ CAUTION

Changing the chair's position when the safety shutdown is on.

Personal injury.

Damage to the device.

- Changing the chair position while a safety shutdown is active, do not move the chair against the active safety circuit.

⚠ CAUTION

Pinching from the patient chair.

Injuries

- The safety shutoff of the patient chair is activated by lifting the respective component. Depending on the patient's body weight and the leverage, more force can be exerted on the object to be triggered than is necessary to trigger the switching function.
- The treatment personnel must move outside of the chair's swivelling range whenever the patient chair moves.

⚠ CAUTION

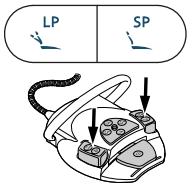
Danger of crushing when retracting the patient chair with activated safety shutdown.

The patient can be clamped in.

- Only retract the patient chair with no patient on it.

To allow the chair to move freely, it can also be moved when the safety circuit is on. Use this function for repair purposes only.

- Press and hold down the "SP" and "LP" keys simultaneously on the assistant element and the foot control.



- Move the chair using the buttons of the wheel buttons of the chair.

⇨ A beep is issued each second while the chairs moving.

CAUTION

Once the safety shutdown is disabled, motors move without monitoring.

Destruction of the motor.

- Monitor the motor's path of travel.
- Do not move the motor to the block.
- For all chair motions, remove all obstructions from the swivel range of the chair.

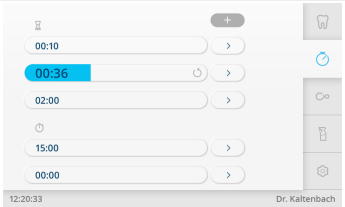
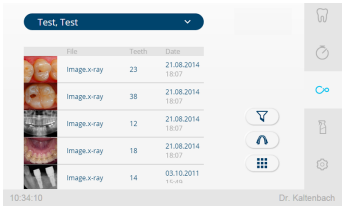
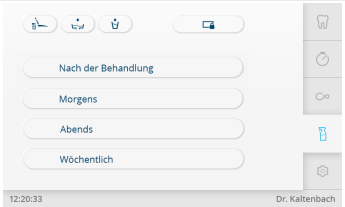
4.9 Using functions through the touchscreen

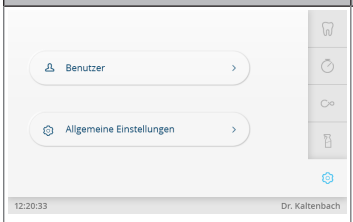
The use of the touchscreen is simple and always follows the same pattern.

The touchscreen is subdivided into five menus (tabs):

- Treatment menu
- Timer menu
- Patient communication menu
- Cleaning menu
- Settings menu

- Tap a tab to display the corresponding menu.

Tab	Menu	Description
	Treatment (with instrument taken out)	▪ Selection of treatment mode ▪ Speed / power ▪ Direction of motor rotation, if applicable ▪ Cooling status
	Timer	▪ Open the timer ▪ Setting the timer
	Patient communication (optional)	Independently or in combination with patient management software
	Cleaning	▪ After treatment ▪ Morning ▪ Evening ▪ Weekly

Tab	Menu	Description
	Settings	▪ Users ▪ Global settings

Navigation

Icon	Feature	Description
Press respective button		to open functions or make settings.
	Selection list	Click the "List" key to select an option from a list.
	"Back" key	Tap the "Back" key to navigate one step back or to exit from the menu.
	"Edit" key	Tap the "Edit" key to edit data.
	"Plus" key	Tap the "Plus" key to generate a new data set.
	Slider	Use the slider to increase or decrease a value.
	"Increase value" key	Press the "Increase value" key to increase a value.
	"Decrease value" button	Press the "Decrease value" key to decrease a value.
	"Save" icon	Tap the "Save" key to save changes.
	"Save" key	Tap the "Save" key to save changes.
	"Cancel" key	Tap the "Cancel" key to quit without saving.

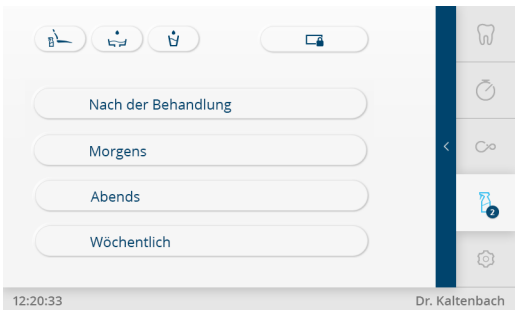
4.9.1 Selecting the dentist

- Tap the name of the user in the status bar until the list of created users is displayed.
- Tap a user to select a different user.

⇨ The status bar displays the active user.

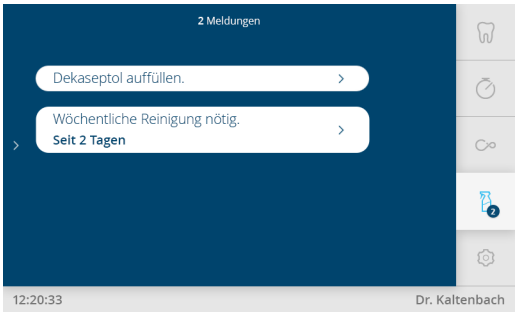
4.9.2 Status message

The respective tab shows a message if there is a status message available.



Status message in the Cleaning menu

- Tap the arrow to display status messages.



Status messages

- Tap the status message and follow the request.

⇨ As soon as the error is remedied, this is recognised and the status message disappears from the display.

4.9.3 Treatment menu

NOTE
The device saves the activation of the switch of the treatment mode for the current user.

⚠ CAUTION

Insufficient cooling of the applied part.

Heat damage to tooth or handpiece.

- Never work under dry conditions, except in case of treatment mode designed for these conditions.

The various types of treatment and the handpiece-specific values can be displayed and set in the "Treatment" menu.
The displayed content depends on which instrument was withdrawn.
The handpiece-specific values can be saved by dentist (up to 6 users) in the following types of treatment. The types of treatment can be renamed (see "User" settings):

- Excavation
- Preparation
- Prophylaxis
- Manual
- Endodontics (optional)
- Surgery (optional)

In "Manual" as the treatment mode, the centring of the foot control pedal is disabled, and no preferential speed can be programmed.

- Tap the type of treatment to unfold a list.
- Select the desired treatment mode from the list in order to display the values.
- Tap the "Edit" key to edit the parameter values. Editable parameters are marked by a dashed line.

Using handpieces

NOTE
Consult the separate installation, use, and servicing instructions for information regarding the installation, use and servicing of the individual handpieces (e.g., turbine, camera Satelec Mini LED, PiezoLED, etc.).

Support logic

All handpieces on the dentist's side are secured against simultaneous use by holder logic. If an handpiece has been removed when the unit is switched on, the relevant holder will not be activated until the relevant handpiece has been replaced once.

Only the withdrawn handpiece is active, i.e., any handpiece that is withdrawn afterward is not started. Exception: MF handpiece (parallel operation is possible here).

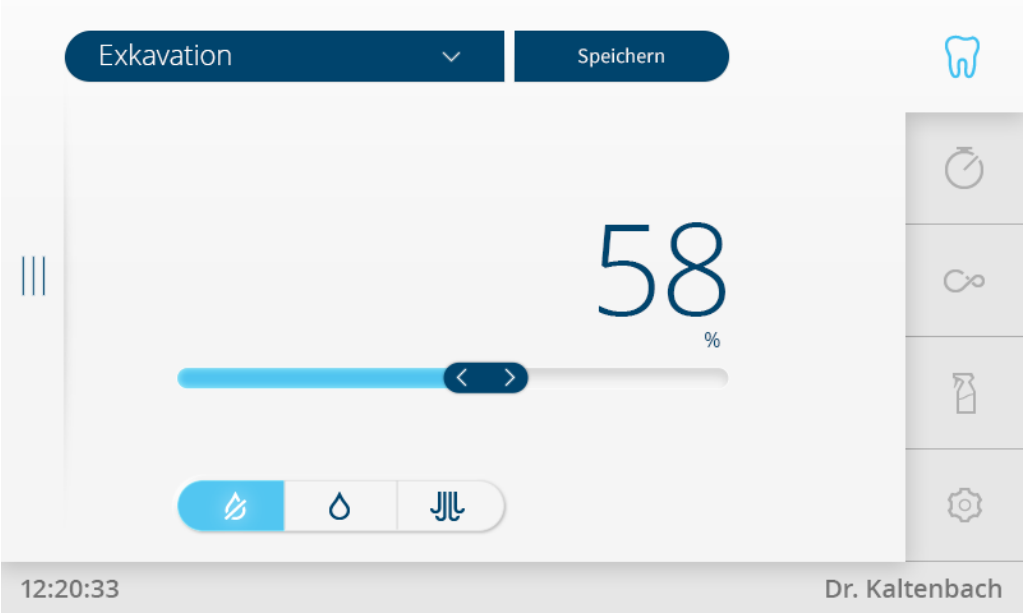
Settings for air-driven handpieces

NOTE
Follow the instructions for use, service instructions and installation instructions in the instrument packaging.

The following settings can be changed in the Treatment menu on the touchscreen:

- Treatment mode
- Speed / power
- Cooling status

▸ Take air-driven handpiece off the holder.
⇨ This causes the settings options for the air-driven handpiece to be displayed.



Setting power / speed

▸ The set power or speed is displayed in blue.
▸ Use the slider to set the value as desired. The value can be displayed in % or 1/min. Tap the unit (% or 1/min) to toggle the display (toggle function = switching function).
⇨ The new value is shown on the display and is effective immediately

Setting the cooling status

Key	Function
	No cooling

Key	Function
	Spray air cooling status
	Spray water cooling
NaCl	NaCl cooling status (optional accessory) "Cooling status spray water" (short press) "Cooling status NaCl" (long press)

Speichern

- After you set a single value or all values, tap the "Save" key to save the values.

Settings for the INTRA LUX Motor KL 703 LED

The following settings can be changed in the Treatment menu on the touchscreen:

- Treatment mode
- Direction of motor rotation
- Speed
- Cooling status

The settings of speed and cooling status are made in the same manner as with the air-driven handpiece.

- Take motor off the holder.

⇨ The display switches to the motor settings menu.

Setting the direction of motor rotation

NOTE
The direction of motor rotation can only be changed when the motor is at rest.

Key	Function
	Tap the "Clockwise motor rotation" key to set the motor to clockwise rotation.
	Tap the "Counterclockwise motor rotation" key to set the motor to counterclockwise rotation.

Setting the cooling status

Key	Function
	No cooling
	Spray air cooling status
	Spray water cooling
NaCl	NaCl cooling status (optional accessory) "Cooling status spray water" (short press) "Cooling status NaCl" (long press)

Speichern

- After you set a single value or all values, tap the "Save" key to save the values.

Settings for PiezoLED

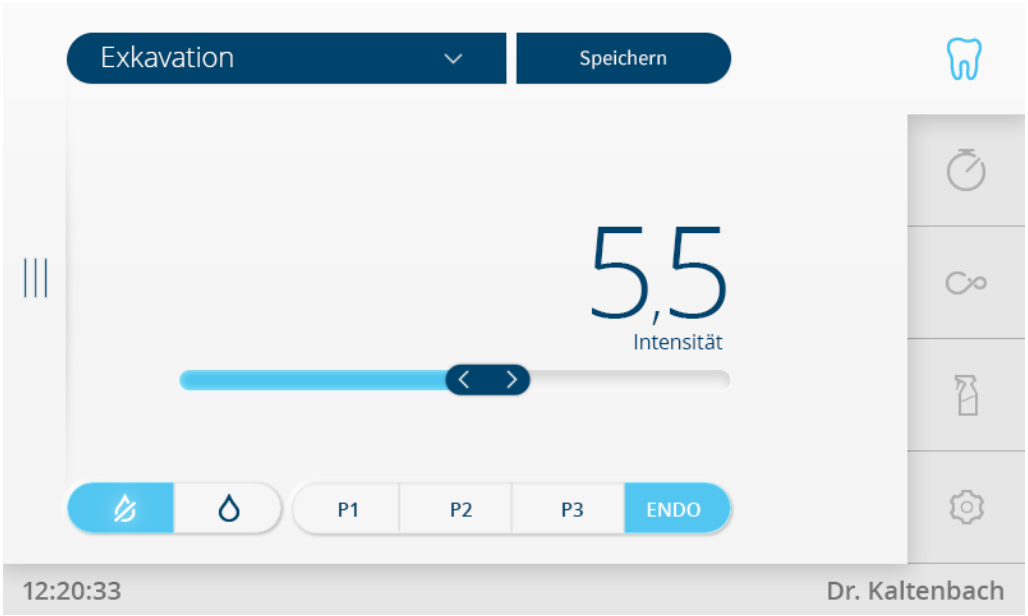
NOTE
Please comply with the enclosed "PiezoLED" Instructions for Use.

The following settings can be changed in the Treatment menu on the touchscreen:

- Treatment mode
- Output intensity
- Operating mode (P1 / P2 / P3 / E)
- Cooling status (no cooling / spray water cooling)

- Take PiezoLED off the holder.

⇨ The display switches to the setting menu PiezoLED.



Setting the intensity

- Use the slider to set the intensity.

⇨ The intensity is displayed.

Define operating mode

NOTE
The selection of the mode depends on the treatment method and the tip used. For information about the selection of an operating mode, please refer to the "Operating modes P1 / P2 / P3 and ENDO" section of the "PiezoLED" instructions for use.

- Tap the corresponding key to select the operating mode as desired. Modes P1 / P2 / P3 / ENDO are available for selection.

Setting the cooling status

- Tap the corresponding key to set the cooling as desired.

Key	Function
	Tap the "No cooling" key to switch the cooling off.
	Tap the "Spray water cooling status" key to set the cooling.

- After you set a single value or all values, tap the "Save" key to save the values.

Dosing the amount of spray water

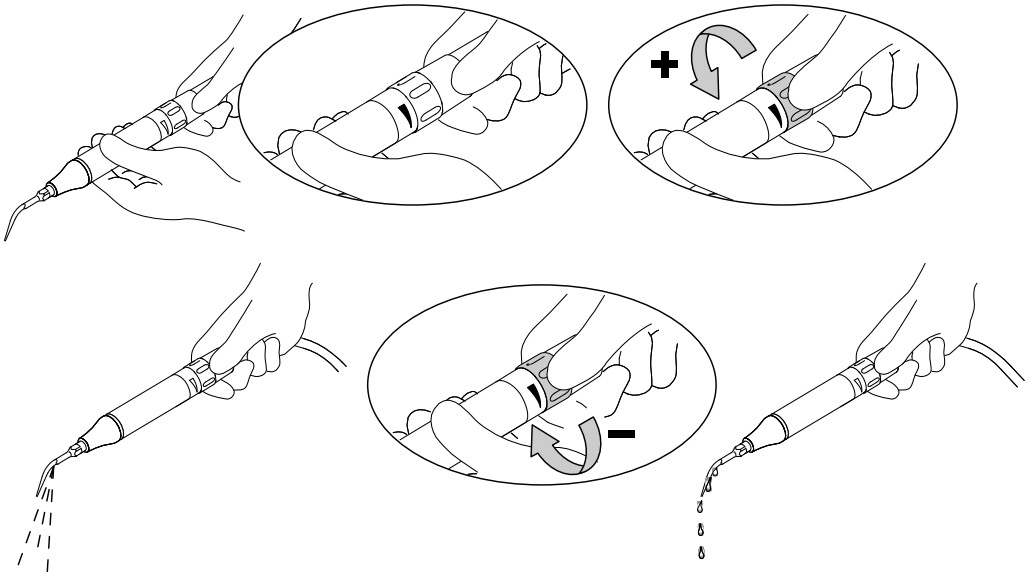
⚠ CAUTION

Insufficient cooling of the working tip.

Heat damage to tooth or handpiece.

- Never work under dry conditions, except in case of tips designed for these conditions.
- Set the minimum flow rate to 6 ml/min. For this purpose, adjust the flow rate such the water is just between dripping and flowing during irrigation.

- For the amount of spray water for each tip, please refer to the PiezoLED Instructions for Use.
  Also refer to:
  Instructions for use PiezoLED
- Adjust the amount of spray water using the regulating ring.

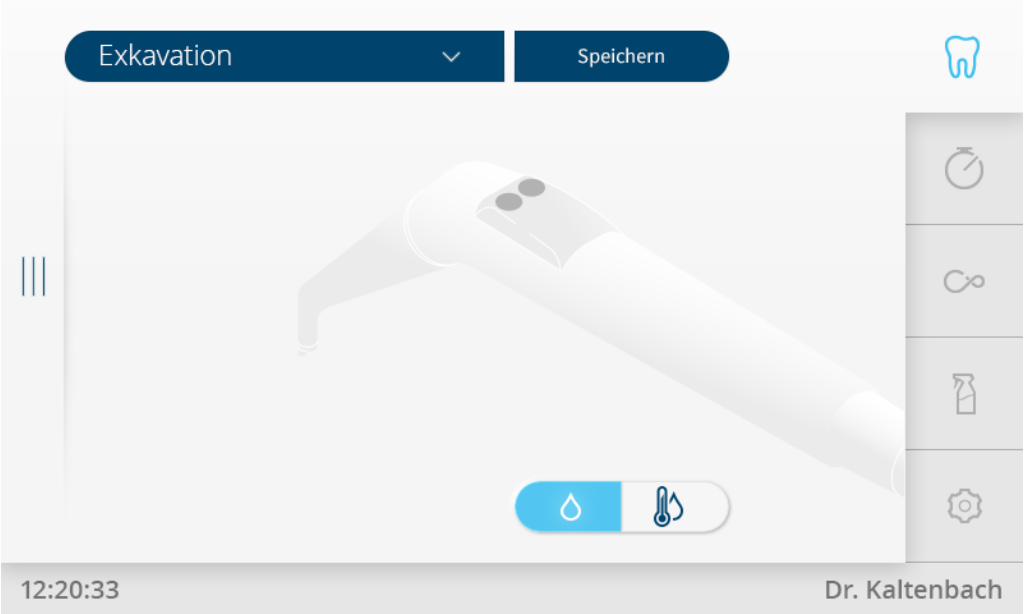


Settings for the multifunctional handpiece

The following settings can be changed in the Treatment menu on the touchscreen:

- Air/water heating

▸ Take the multifunctional handpiece off the holder.
⇨ This causes the settings menu of the multifunctional handpiece to be displayed.



Adjusting the air/water heating

▸ Tap the corresponding key to set "Heating air/water" as desired.

Key	Function
	Tap the "Heating for air/water" key to set the heating.
	Tap the "Heating for air/water Off" key to switch the heating off.

Speichern

▸ After you set a single value or all values, tap the "Save" key to save the values.

Operating the illumination

The following keys are available for use of the light functions:

Key	Function
	"Operating light on/off" key press briefly: The operating light is turned on and off ▪ Operating light On: Key is active ▪ Operating light Off: Key is inactive
	"Operating light dimming" key press briefly: COMPOsave mode (dimmed normal light) of the operating light switches on/off. ▪ COMPOsave mode On: Key is active ▪ COMPOsave mode Off: Key is inactive
	Briefly press the "Laser mode" button (on the dentist element for KaVoLUX 540 LED only): Laser mode of the operating light is switched on/off

Key	Function
	▪ Laser mode on: Key is active ▪ Laser mode off: Key is inactive

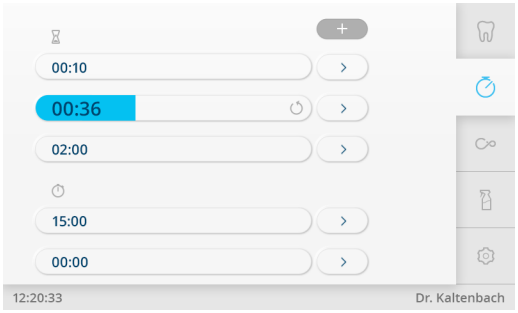
NOTE
For more information on the individual modes, please refer to the Operating light chapter.

4.9.4 Timer menu

Retrieving the timer

Up to five timers can be set in the "Timer" menu.

- Tap the "Timer" tab to display the "Timer" menu.



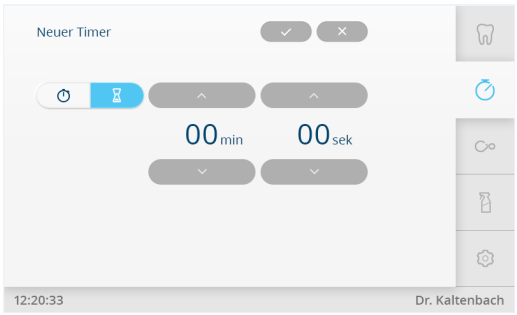
- Tap the "Timer" tab to retrieve the timer.
  ⇨ As soon as the timer is finished, an acoustic signal is issued.
- Tap the timer again to stop the timer.

NOTE
The activated timer times are also displayed on the touchscreen. If several timer times are running simultaneously, this is displayed in the sequence of when they elapse. A beep is issued whenever an activated timer time elapses.

Setting the timer

Up to 59:59 minutes of timer time can be set using the timer.

- Tap the "Plus" key to generate a new timer.

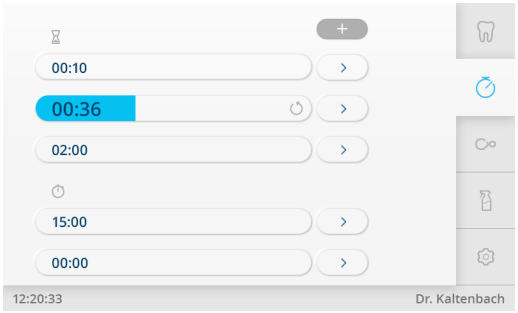


Two timer functions can be selected:

- Hourglass (the set timer time counts down)
- Stopwatch (counts the time)

- Tap the arrow keys to set the timer time.
- Tap the "Save" key to save the value.
- Tap the "Cancel" key to quit without saving.

⇨ This causes the "Timer" menu to be displayed.



▸ Tap the key next to Timer to edit a previously generated timer.

4.9.5 Patient communication menu

KaVo CONNECTbase

Consult instructions for use KaVo CONNECTbase.

CONEXIO

NOTE
For all CONEXIO functions, the dental unit must be connected to an installation of the KaVo "CONEXIO" software.

NOTE
For details of the configuration of CONEXIO and the interface to your patient management system (PMS) for automatic transfer of patients and images, please refer to the CONEXIO installation instructions.

CONEXIO permits full access to all clinically relevant data of a patient from a treatment centre.

The following functions can be called up in the "CONEXIO" menu:

- Selection of images from all sources (cameras, microscopes and X-ray images) from the digital patient file.
- Comparison of images from different sources in one view to support the treatment and for patient communication
- Addition of images with regard to the tooth designation.
- Setting the clinical monitoring status for better overview.

Opening and ending the "CONEXIO" menu

NOTE
To start the CONEXIO menu, no active instrument may be removed.

▸ The CONEXIO menu opens automatically as soon as a camera is taken out.
▸ Open the menu with the "CONEXIO" button to display available images. To be able do so, you must have transferred the patient in your patient management software (PMS) to CONEXIO. If the software has no transfer interface, you can instead create and open the patient manually in CONEXIO on the PC. If no patient is selected, images are displayed under "unassigned data".
▸ Closing CONEXIO: replace the active camera or close the CONEXIO manually (through selection of different tab).

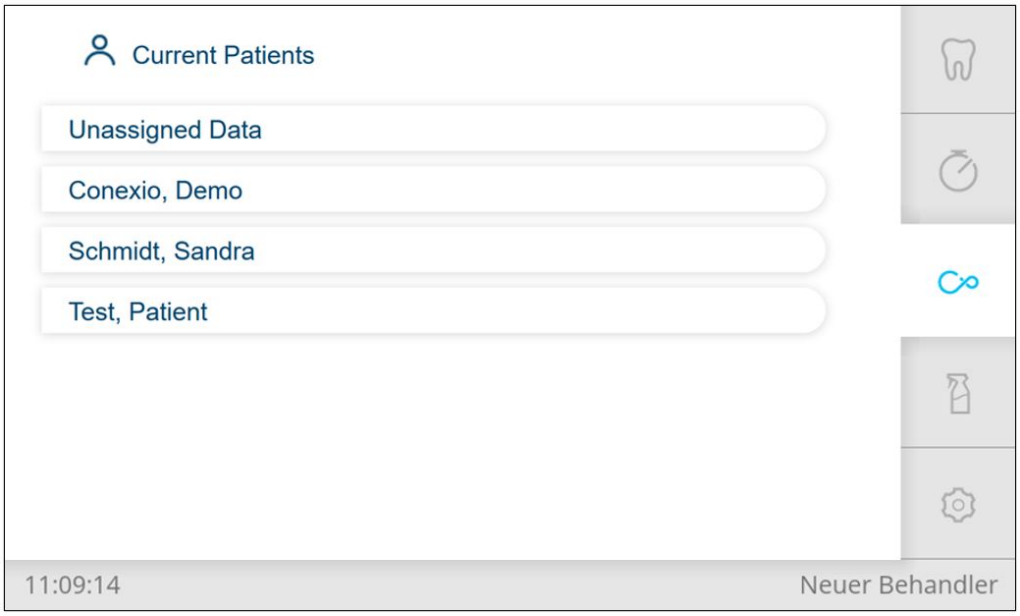
Using the CONEXIO menu

CONEXIO consists of 3 different levels:

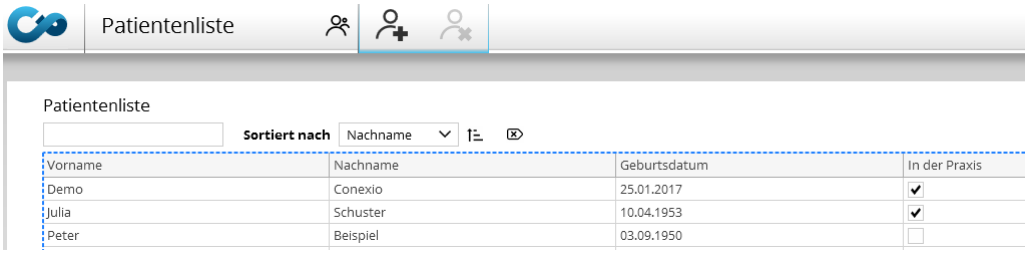
- Level 1 - Patient list: display of all available patients
- Level 2 - Patient file: display of the available images of the patient
- Level 3 - Image display: display of the selected images

CONEXIO patient list | Selection of the patient

NOTE
This function is not needed if the patient is transferred automatically from the patient management system.



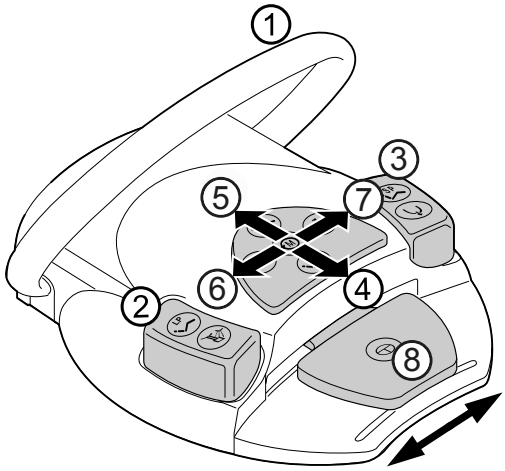
- Open patient files that were marked in CONEXIO (checkmark set at "In the practice"). This pre-selection minimises the access times.



Display on PC

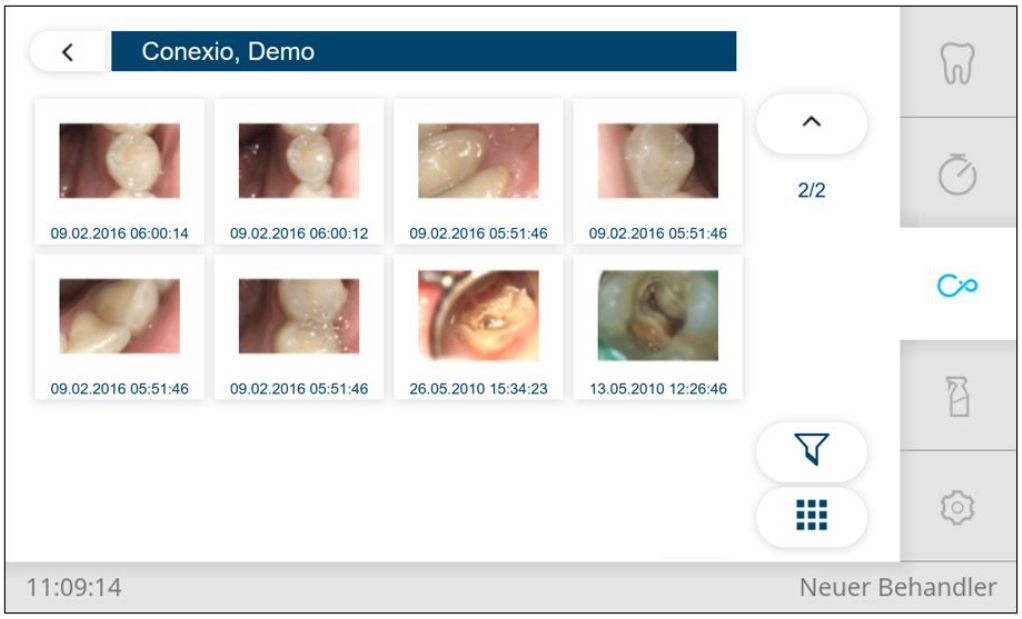
Functions on foot control (optional)

NOTE
To be able to navigate in the "CONEXIO" menu with the foot control, the "CONEXIO" menu must be open or an imaging device activated. When you switch to the "CONEXIO" menu from another menu, the images of the selected patient are displayed until another patient is selected.



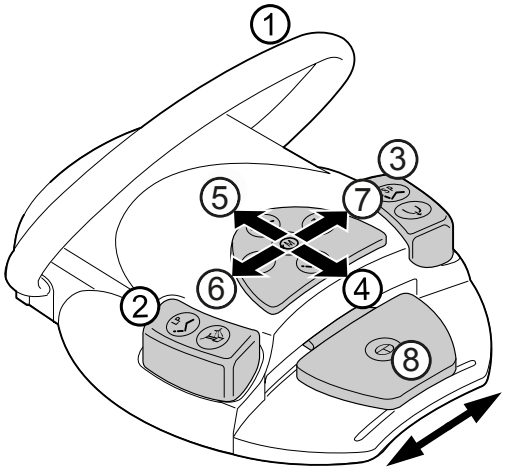
Item Name	Pressing button	Function
① Stirrup switch	long	Deselect selected patients.
② "LP/preselected spray" footswitch	briefly	Move cursor to previous patient
③ "SP/blown air" foot switch	briefly	Move cursor to next patient
④ - ⑦ "Chair position/ motor rotational direction" cross switch		No function
⑧ "Level preselection/ handpieces" foot-pedal	briefly	Select/deselect patient
	long	Select a patient and open the patient file

CONEXIO patient file | Selection & filtering of the digital data



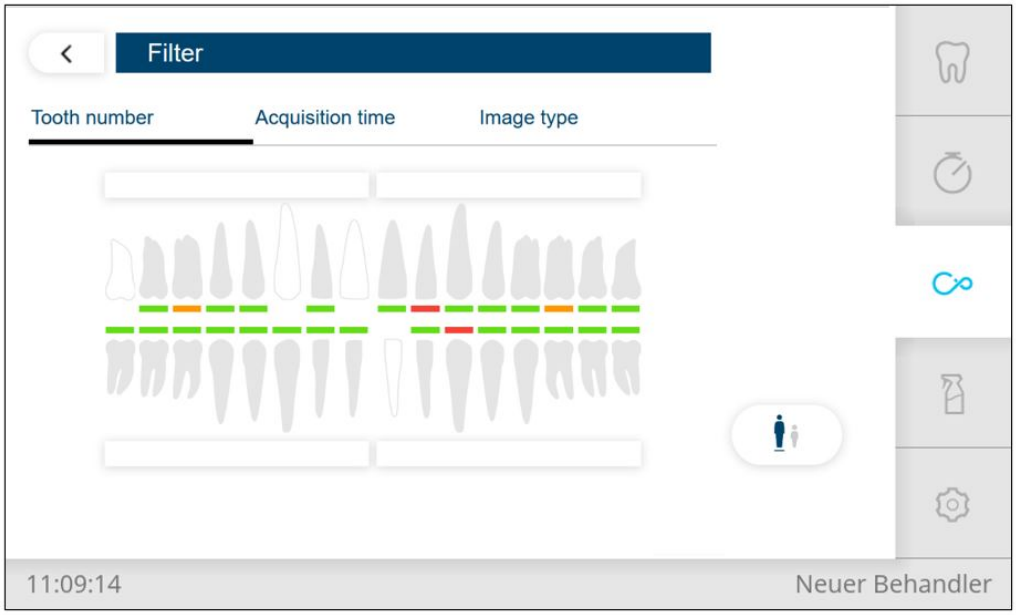
Symbol	Pressing button	Function
	briefly	Return to patient file
	briefly	Displays the selected patient
	briefly	To image display
	briefly	To filter selection
	Display	Note: Filter is active
	briefly	Toggle between list view and tile view

Functions on foot control (optional)



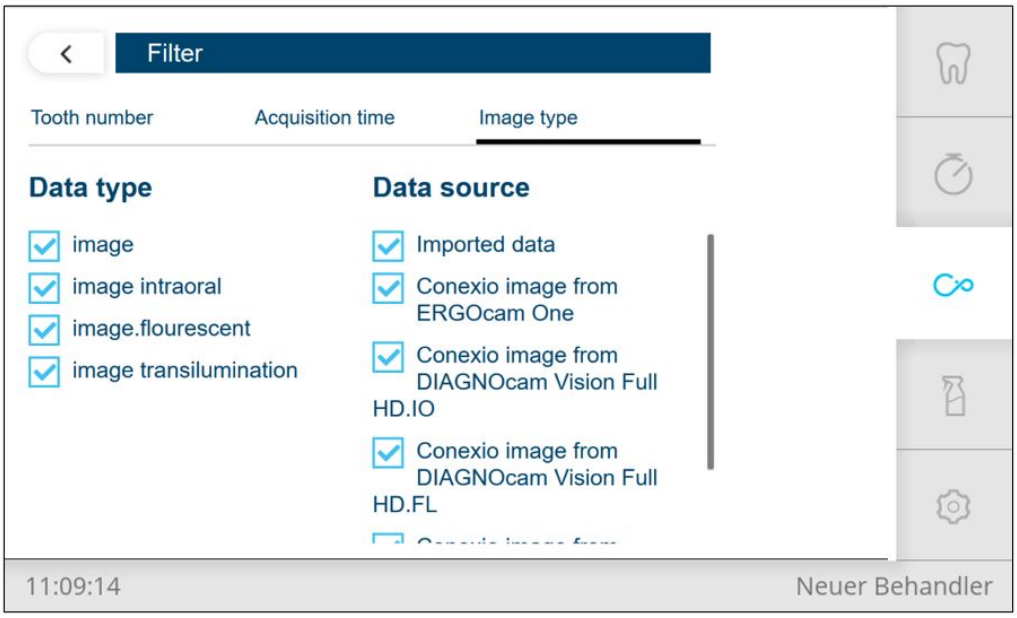
Item Name	Pressing button	Function
① Stirrup switch	briefly	Deselect all selected images
	long	Return to patient file
② "LP/preselected spray" footswitch	briefly	Move cursor to previous image
③ "SP/blown air" foot switch	briefly	Move cursor to the next image
	long	Open "Filter" menu
④ - ⑦ "Chair position/ motor rotational direction" cross switch		No function
⑧ "Level preselection/ handpieces" foot-pedal	briefly	Select/deselect image
	long	Select an image and open the image display

CONEXIO Filter selection



Tooth filter

Time filter



Source filter

Symbol	Pressing button	Function
	briefly	Back to patient file
	briefly	Reset filter
Tooth number	briefly	Filter option: By tooth
Acquisition time	briefly	Filter option: By time
Image type	briefly	Filter option: By type and source

Tooth filter

Symbol	Pressing button	Function
	briefly	Group selectors (entire quadrant)
	briefly	Tooth selected
	briefly	Tooth (no images available)
	briefly	Tooth (images available)

Symbol	Pressing button	Function
	briefly	Tooth (missing - Setting via "Clinical monitoring status")

Time filter

Symbol	Pressing button	Function
	briefly	Show all images
	briefly	Show images from last session
	briefly	Show images from last year
	briefly	Display images from one date (check or uncheck to select or de-select)

Source filter

Symbol	Pressing button	Function
	briefly	Display images of one specific type (check or uncheck to select or de-select)
	briefly	Display images of one specific source (check or uncheck to select or de-select)

CONEXIO Image display (Single/Compare/Split)

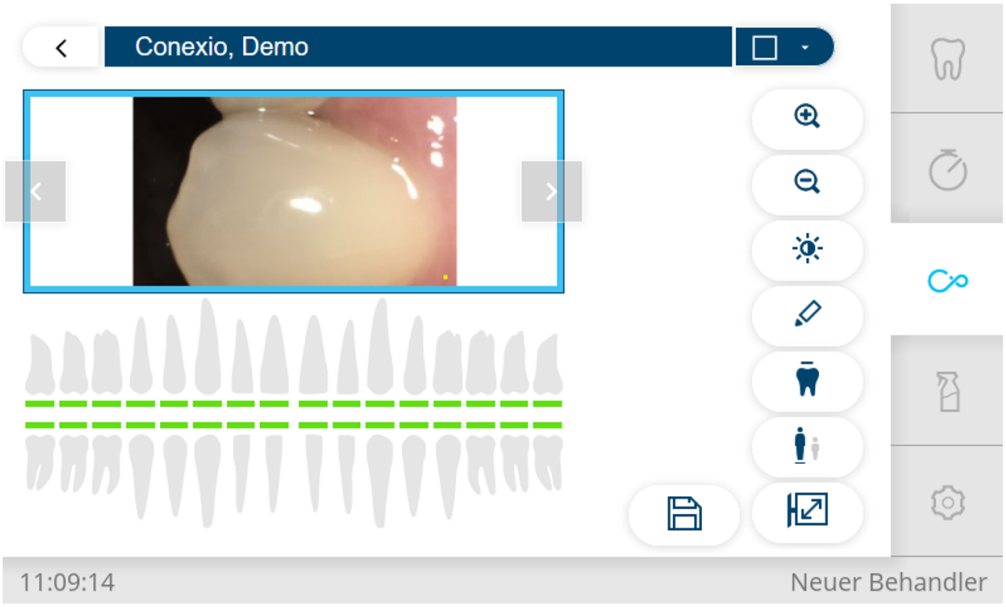
There are three different display options for the display of images:

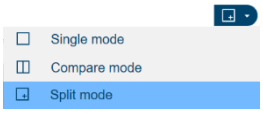
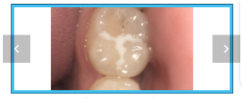
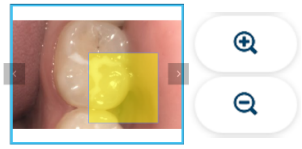
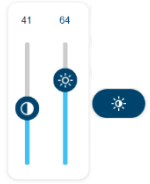
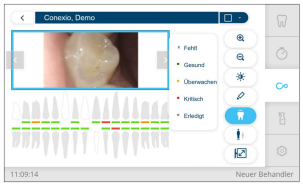
- Single - Single image display
- Compare - Two images side-by-side
- Split - Up to 6 images side-by-side

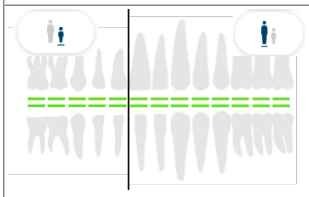
  The mode to be opened for each option can be configured in the CONEXIO settings.

Single image display

Only one image at a time is displayed in this mode. Once an image is saved, the live image of the camera is shown again. If the camera is being replaced, the latest saved image is displayed. This mode is used mainly for recording the findings.

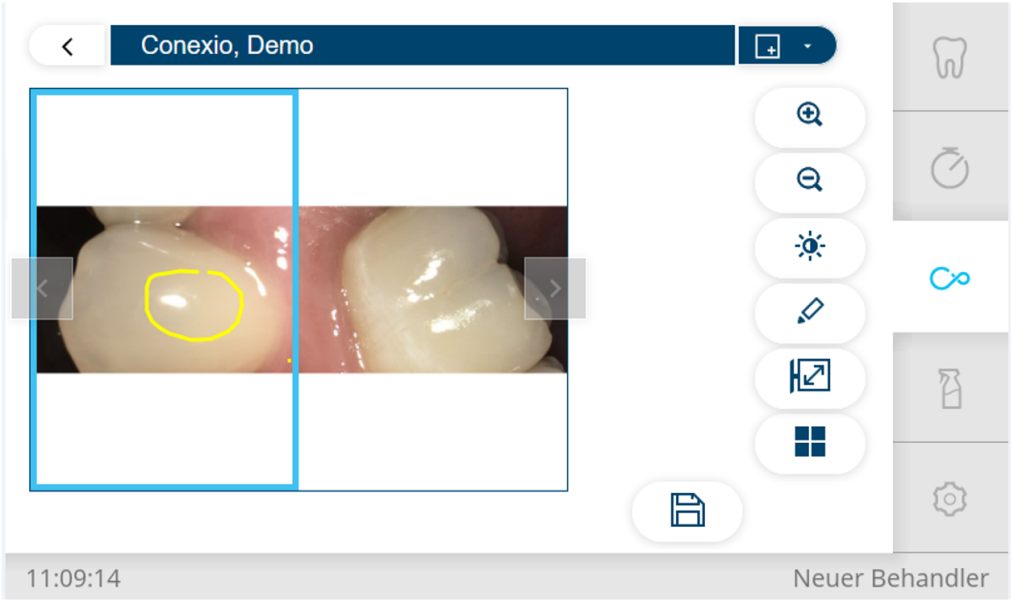


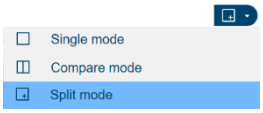
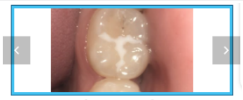
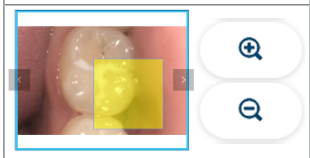
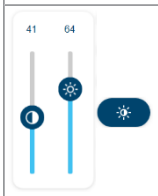
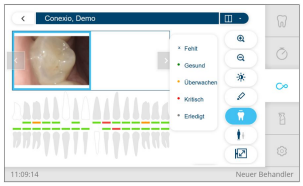
Symbol	Pressing button	Function
	briefly	Back to patient file
	Dropdown	Selection of display mode Single | Compare | Split
	briefly	Image preview for stock images, Changing the image with arrow keys
	briefly	Saving changes in image (e.g. free-hand marking)
	briefly	Enlarging and reducing image detail, image navigation by moving the yellow frame
	briefly	Setting contrast and brightness with slider. To close the menu, tap the "Contrast Brightness" button again
	briefly	Freehand drawing for marking clinically relevant information on the image. Deselecting the function by pressing the key again
	Display	Display of tooth selection and clinical monitoring status ▪ Fehlt: Missing Tooth is shown in white ▪ Gesund: Healthy Tooth is shown in green ▪ Überwachen: Monitor Tooth is shown in orange

Symbol	Pressing button	Function
		▪ Kritisch: Critical Tooth is shown in red ▪ Erledigt: Done
	briefly	Tooth selection/deselection by clicking
	briefly	Display of clinical monitoring status ▪ Fehlt: Missing ▪ Gesund: Healthy ▪ Überwachen: Monitor ▪ Kritisch: Critical ▪ Erledigt: Done
	briefly	Switch between adult/paediatric notation
	briefly	Open/close Full Screen

Compare Image display

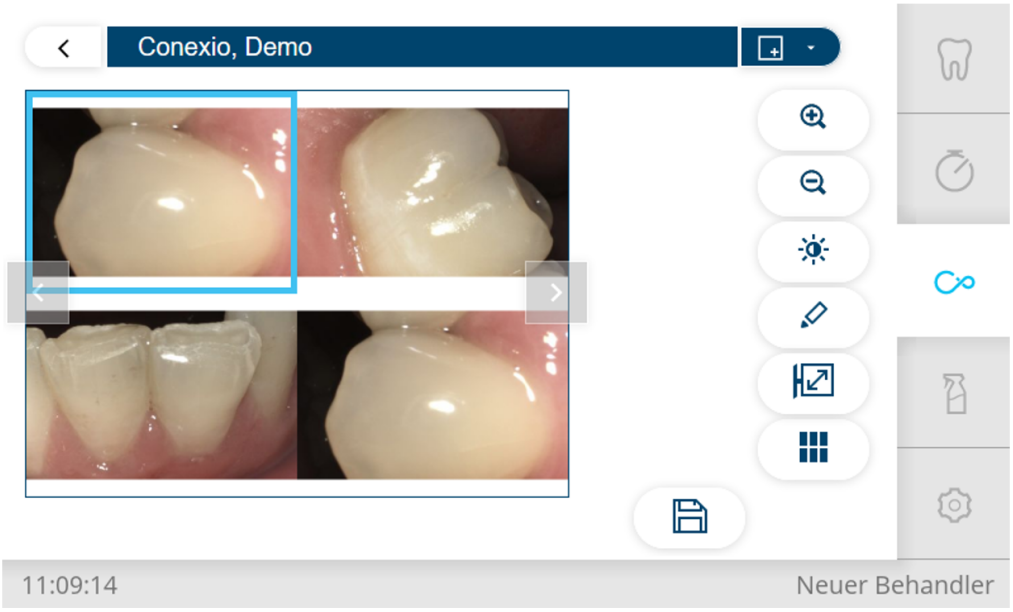
In this mode, two images from identical or different sources (cameras, microscopes, X-ray) can be compared to each other. If a tooth is selected, the available images that can be selected are limited to the selected tooth (Auto filter). The image on the left shows the live image of the camera. The latest image of the selection is always shown on the right. If a different image is to be displayed, the user can select the image with the selection buttons (LP/SP or arrow keys). If the camera is being replaced, the latest saved image appears in the left frame. This mode is mainly used for follow-up and patient communication



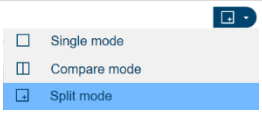
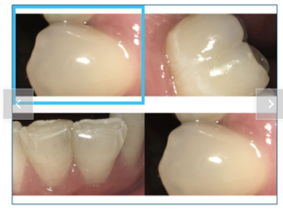
Symbol	Pressing button	Function
	briefly	Back to patient file
	Dropdown	Selection of display mode Single | Compare | Split
	briefly	The live camera image is always shown in the left frame. If there is no live image (camera in holder), both frames can be used for stock images. The selection of the arrow keys relates to the active frame (blue). Change by selecting the other frame Autofilter: the possible selection of images is limited to the filter value of the selected tooth
	briefly	Saving changes in image (e.g. freehand marking)
	briefly	Enlarging and reducing image detail, image navigation by moving the yellow frame
	briefly	Setting contrast and brightness with slider. To close the menu, tap the "Contrast Brightness" button again
	briefly	Freehand drawing for marking clinically relevant information on the image. Deselecting the function by pressing the key again
	briefly	Display of clinical monitoring status ▪ Fehlt: Missing ▪ Gesund: Healthy ▪ Überwachen: Monitor ▪ Kritisch: Critical ▪ Erledigt: Done
	Display	Display of tooth selection and clinical monitoring status ▪ Fehlt: Missing Tooth is shown in white ▪ Gesund: Healthy Tooth is shown in green ▪ Überwachen: Monitor Tooth is shown in orange ▪ Kritisch: Critical Tooth is shown in red ▪ Erledigt: Done
	briefly	Tooth selection/deselection by clicking

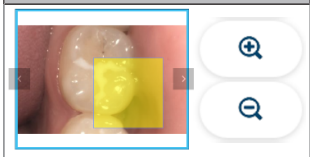
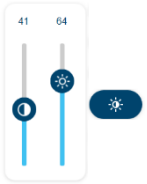
Symbol	Pressing button	Function
	briefly	Open/close Full Screen
	briefly	Toggle between list view and tile view

Split image display

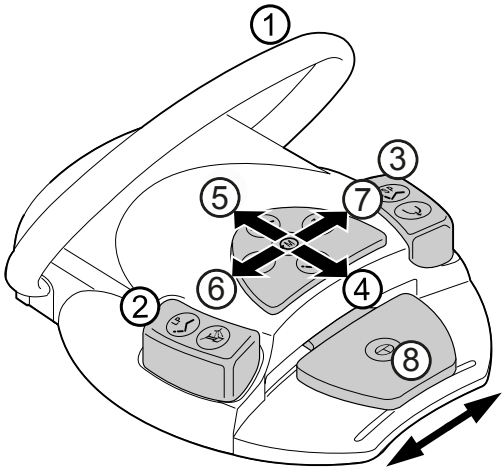


In this mode, up to 6 images from different sources (cameras, microscopes, X-ray) can be displayed. During image recording the live image is displayed in the next unoccupied frame until the maximum number of 6 images is reached. The display in the active frame can be selected individually by the user. If the camera is being replaced, the frame showing the live image disappears. This mode is well-suited mainly for patient communication.

Symbol	Pressing button	Function
	briefly	Back to patient file
	Dropdown	Selection of display mode Single | Compare | Split
 Up to a maximum of 6 images	briefly	The live camera image is always shown in the last frame. If there is no live image (camera in holder), all frames can be used for stock images. The selection of the arrow keys relates to the active frame (blue). Change by selecting the other frame. Change by selecting the other frame.
	briefly	Saving changes in image (e.g. free-hand marking)

Symbol	Pressing button	Function
	briefly	Enlarging and reducing image detail, image navigation by moving the yellow frame
	briefly	Setting contrast and brightness with slider. To close the menu, tap the "Contrast Brightness" button again
	briefly	Freehand drawing for marking clinically relevant information on the image. Deselecting the function by pressing the key again
	briefly	Open/close Full Screen
	briefly	Toggle between list view and tile view

Foot control functions for Single / Compare / Split image display (optional)



Camera inactive

Item Name	Pressing button	Function
① Stirrup switch	briefly	Remove image in active field (does not delete)
	long	Return to patient file and deselect the selection made
② "LP/preselected spray" footswitch	briefly	Display previous image
③ "SP/blown air" foot switch	briefly	Show next image
	long	Open tooth chart

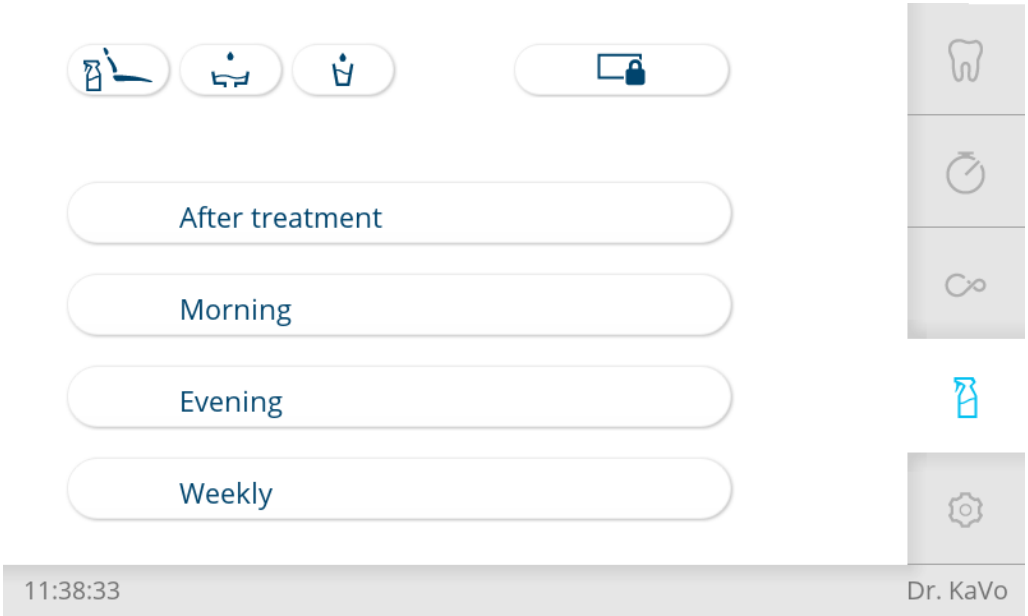
Item Name	Pressing button	Function
④ - ⑦ "Chair position/ motor rotational direction" cross switch	briefly	Open/close Full Screen
⑧ "Level preselection/ handpieces" foot-pedal	briefly	Selection key

Camera is active

Item Name	Pressing button	Function
① Stirrup switch	long	Return to patient file and deselect the selection made
② "LP/preselected spray" footswitch	briefly	Select previous tooth
③ "SP/blown air" foot switch	briefly	Select next tooth
	long	Open tooth chart
④ - ⑦ "Chair position/ motor rotational direction" cross switch	briefly	Open/close Full Screen
⑧ "Level preselection/ handpieces" foot-pedal	briefly	Freeze image
	long	Save image

4.9.6 Hygiene functions

- Tap the "Cleaning" tab to open the "Cleaning" menu.



The following buttons are available for the use of the hygiene functions:

Key	Function
	Chair position for cleaning: chair drives to the cleaning position.
	Bowl flushing The bowl is being rinsed. The flushing time can be changed.

Key	Function
	Once the rinsing position (SP) is reached, the bowl rinsing is activated, i.e. the bowl is being wetted. Leaving the rinsing position (SP), the bowl is rinsed again. Selectable for "Home screen" in "Settings" tab. The function can be disabled by a service technician.
	Tumbler filler The tumbler is being filled. The filling time can be changed.
	Lock screen Locks the screen to allow it to be disinfected by wiping it down. Selectable for "Home screen" in "Settings" tab.

- To activate a function, briefly press the key.
- For bowl rinsing and tumbler filling only: Press key again in order to discontinue the function.
- To open the settings menu, long-press the button.

A selection from four different cleaning programmes can be made in the "Cleaning" menu:

- After treatment
- Morning
- Evening
- Weekly

Also refer to:
Care instructions KaVo uniQa

Changing the settings of the hygiene functions

The following settings can be changed:

- Tumbler filling time
- Bowl rinsing time

Set the tumbler filling time

- Actuate the "Tumbler filler" key for long until the following view is shown.

- Confirm tumbler filling time by saving once the desired filling level is reached.
- Tap "x" to quit without saving.

Setting the rinsing time

- Actuate the "Bowl rinsing time" key until the desired rinsing time is achieved and the following view is shown.

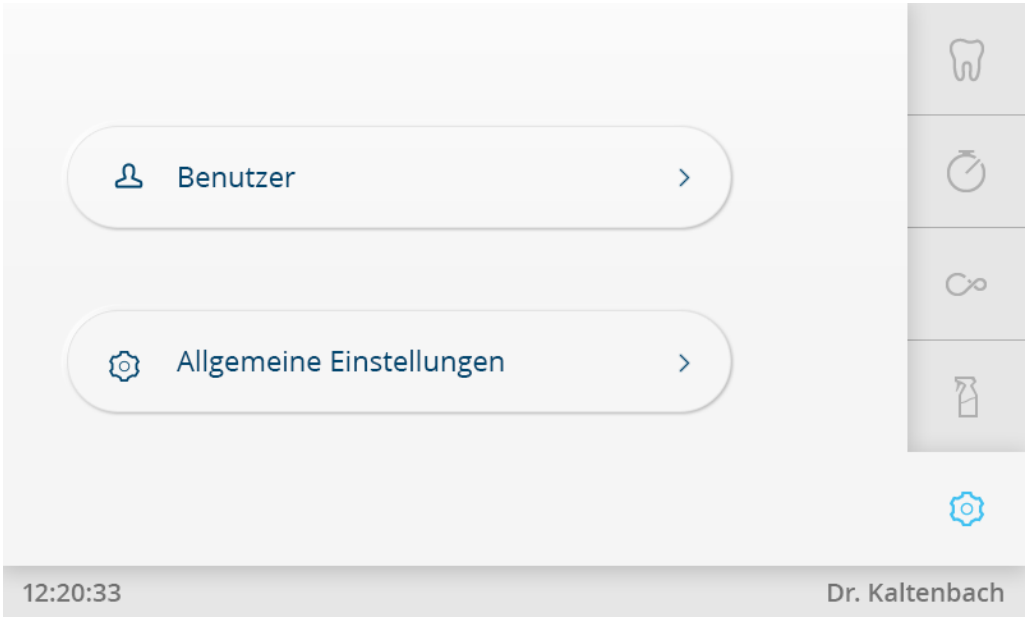
- Confirm the bowl rinsing time by saving once the desired rinsing time is reached.
- Tap "x" to quit without saving.

NOTE
A technician can block the setting of the time.

4.9.7 Settings menu

Changes to the following areas can be made in the "Settings" menu:

- Users
- Global settings



- Tap the "User" key to display or edit the user settings.
- Tap the "Global settings" key to display or edit the user settings.

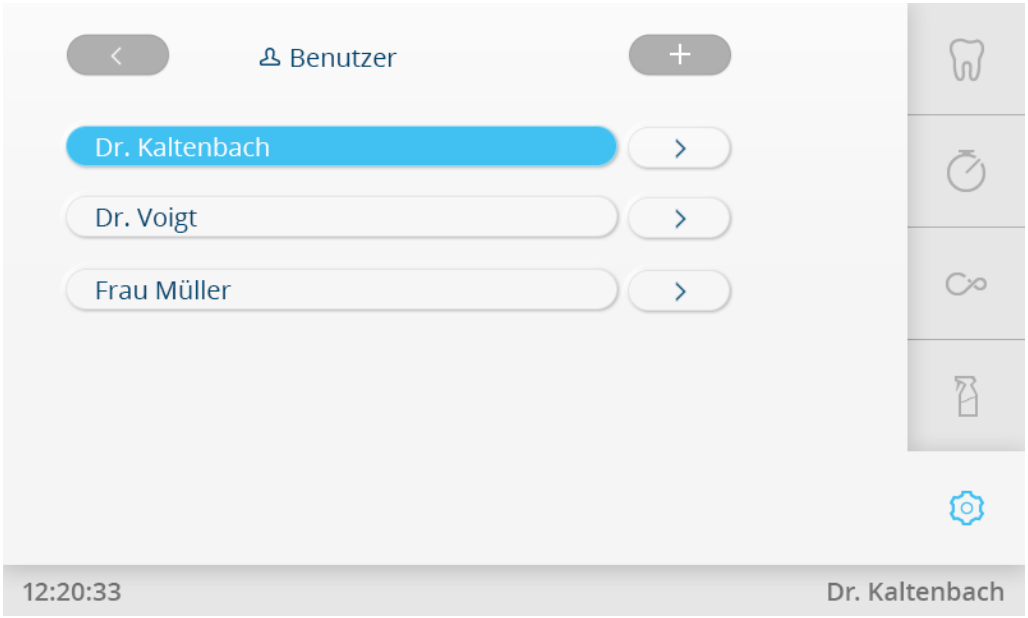
User settings

The following items can be selected in the "User" menu:

- Users
- Types of treatment
- Language
- Light
- Home screen

Users

- Tap the "+" key to enter a new user.



- Tap the user name to edit settings.
- Tap the arrow key to the right of the user to make individual settings.
- Tap the "DELETE USER" key to delete a user.

User settings

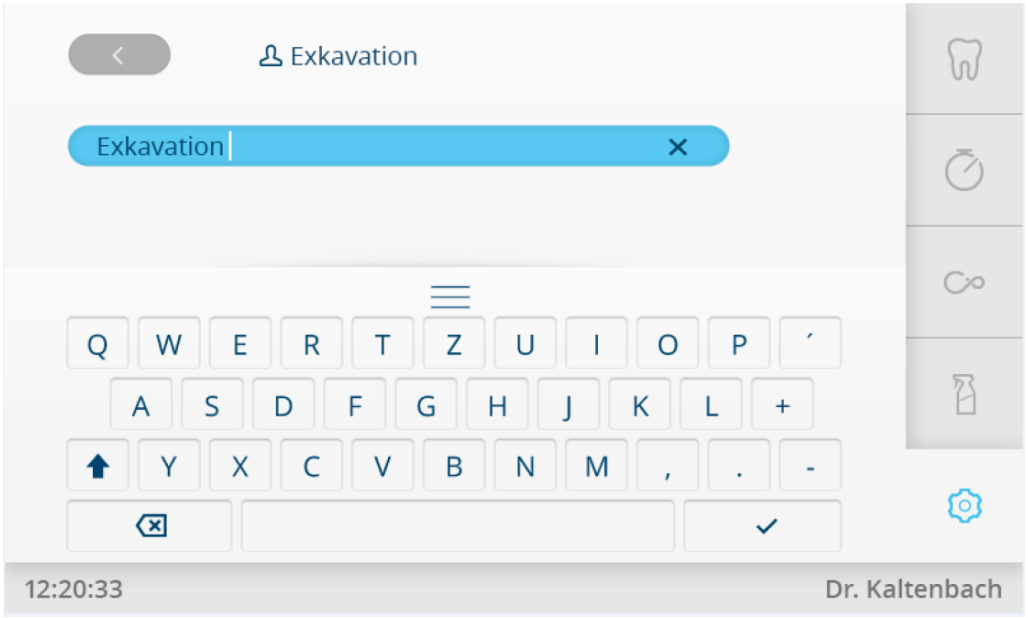
- Tap the "Back" key to switch to user overview.

Treatment mode

- Tap the "Treatment mode" key to edit the types of treatment.

Types of treatment

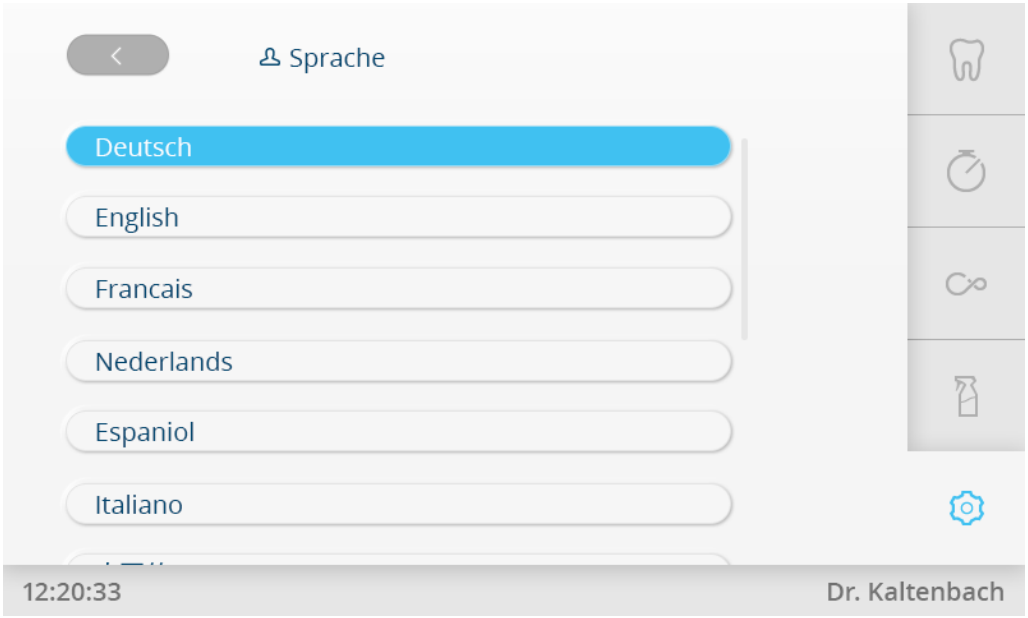
- Tap the key of the type of treatment to be changed, e.g. "Excavation", and rename the type of treatment.



Renaming treatment mode

Language

- Tap the "Language" key and select a language.



Select a language

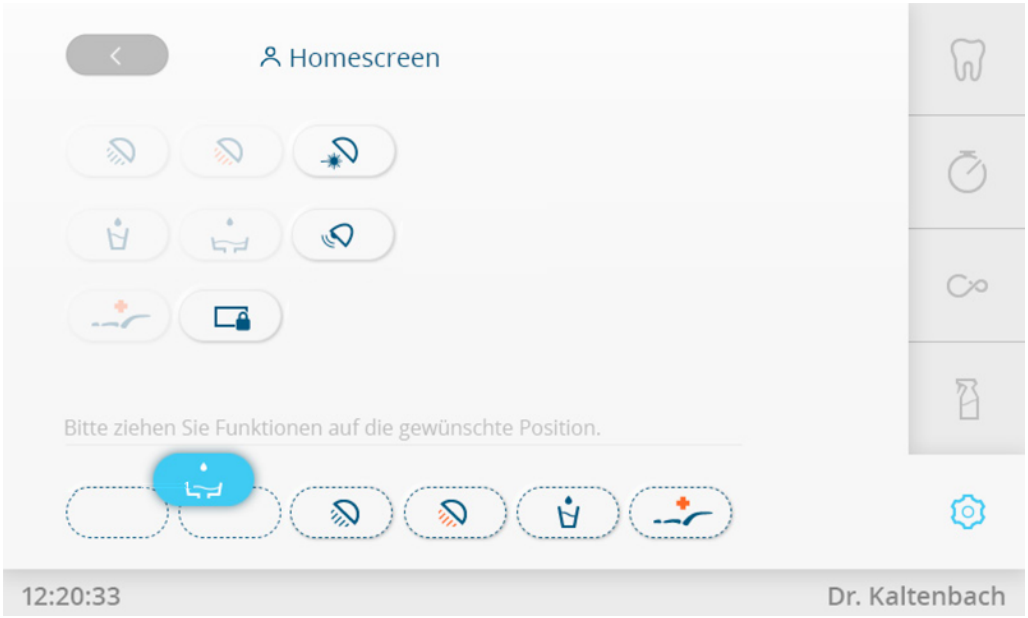
Light

- Tap the "Light" key to edit the lamp settings.

Set light

Home screen

- Tap the "Home screen" key to configure the home screen with up to six direct keys.
- Draw the respective key to where you want it.

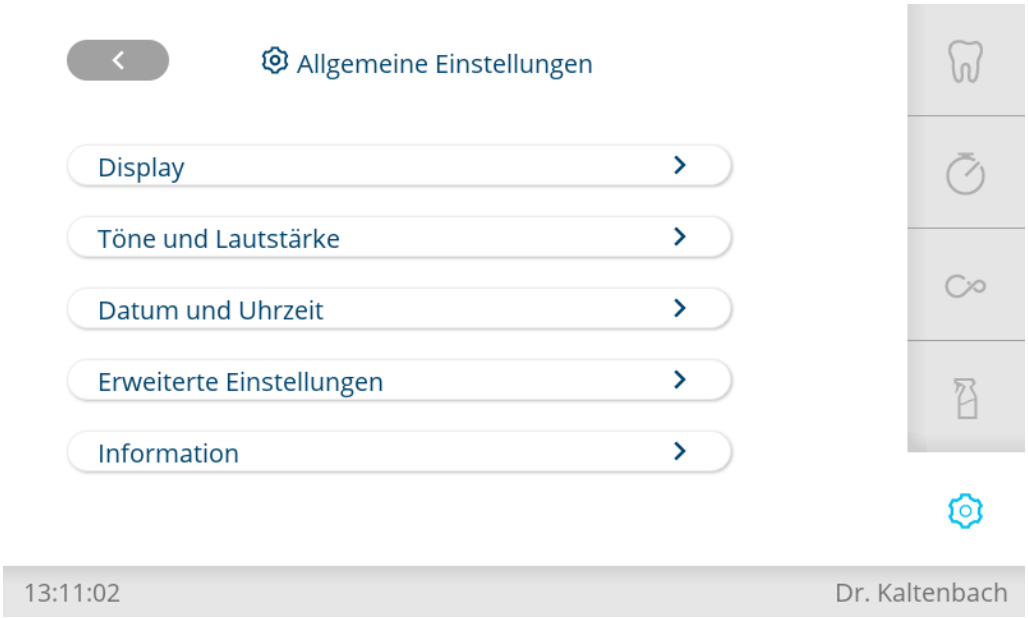


Select direct keys

Global settings

The following items can be selected in the "Global settings" menu:

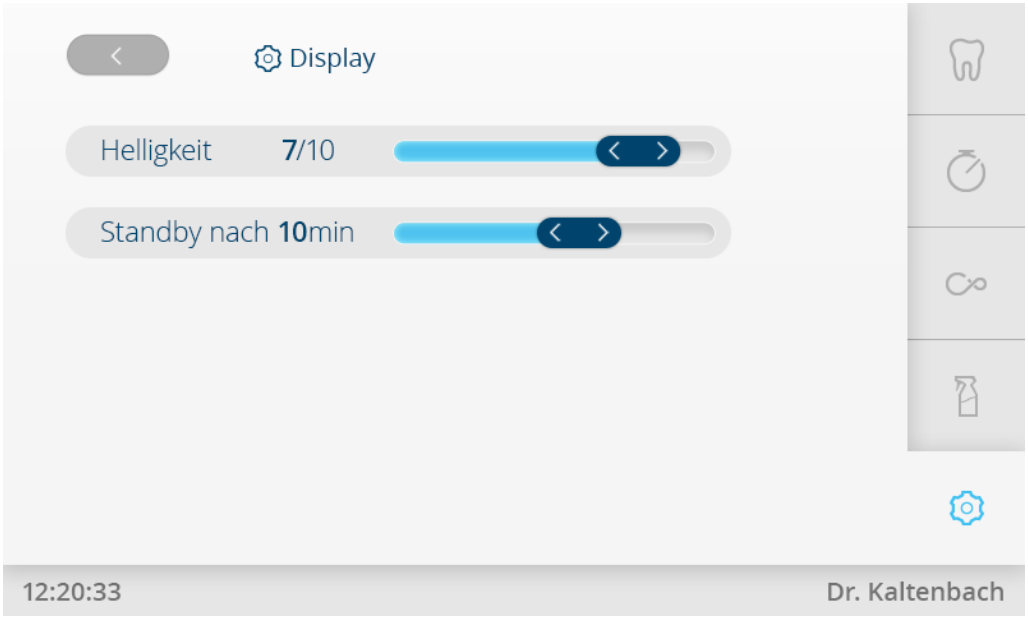
- Display
- Sounds and volume
- Date and time
- Advanced settings
- Info



Global settings

Display

- Tap the "Display" key to set the brightness and the time until activation of standby mode.



Global settings / Display

Sounds and volume

- Tap the "Sounds and volume" key to set the key sounds and the volume.

General settings / Sounds and volume

Date and time

- Tap the "Date and time" key to set the date and time of day.

or

- Tap the time in the status bar until the window for setting the time is displayed.

General settings / Date and time

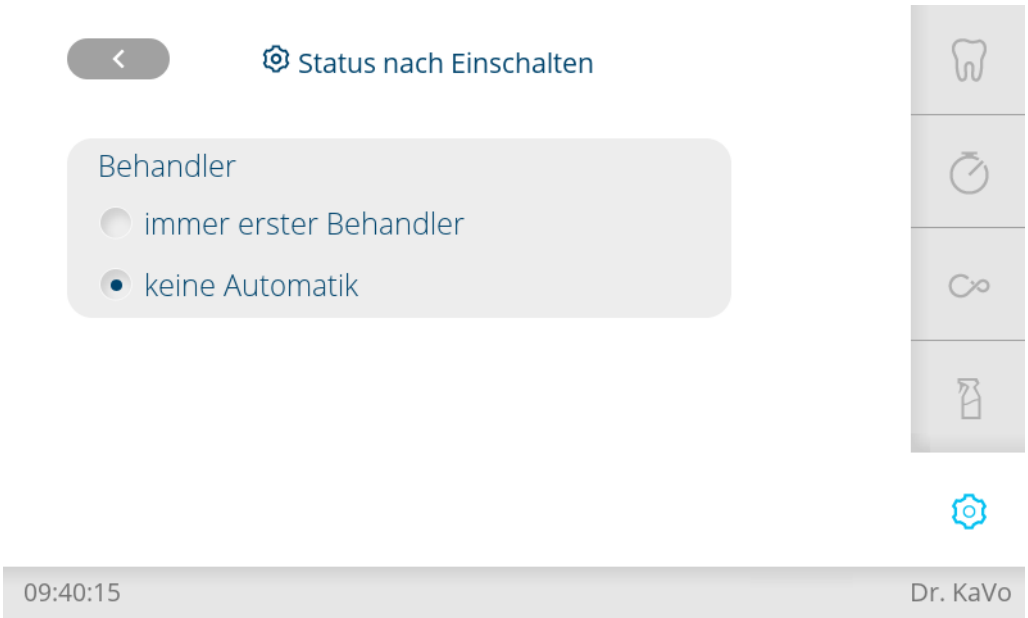
Advanced settings

The following items can be set in the "Advanced settings" menu:

- Status after the unit is switched on
- Instruments
- Tumbler and bowl
- Boiler temperature
- Foot control
- Operating light
- Weekly cleaning
- Suction system

Status after the unit is switched on

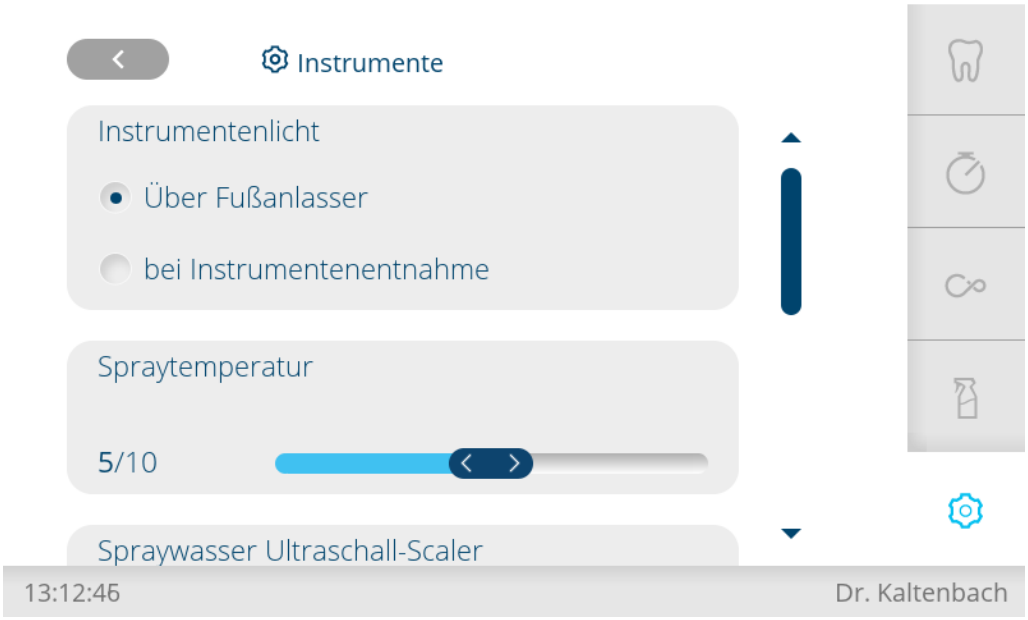
- Tap the "Status after power up" key to define the "Dentist" and the "Treatment mode" to be selected after the unit has been switched on.



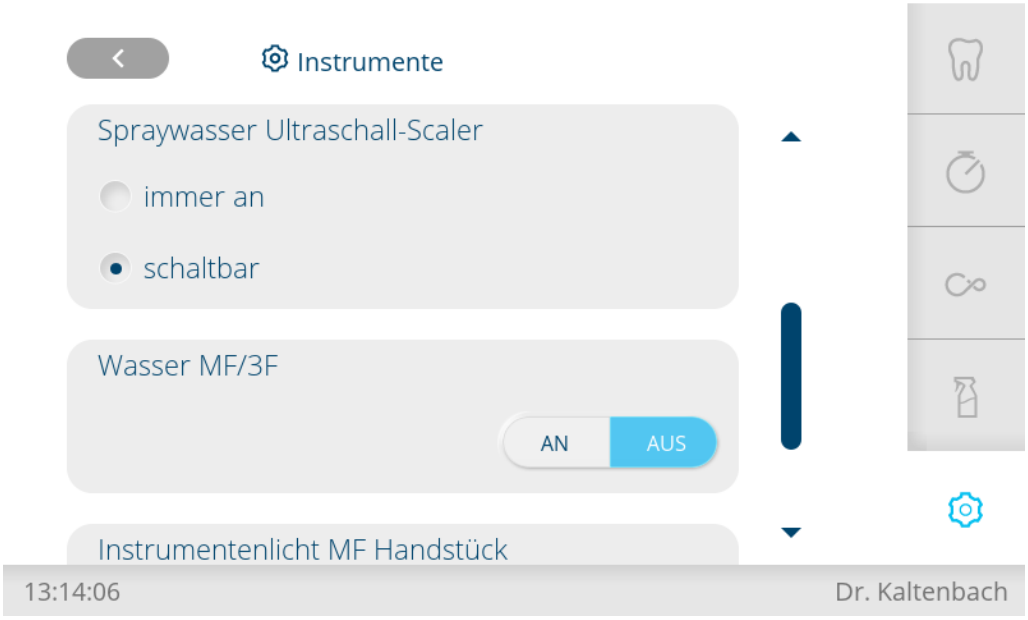
Advanced settings / status after the unit is powered up

Instruments

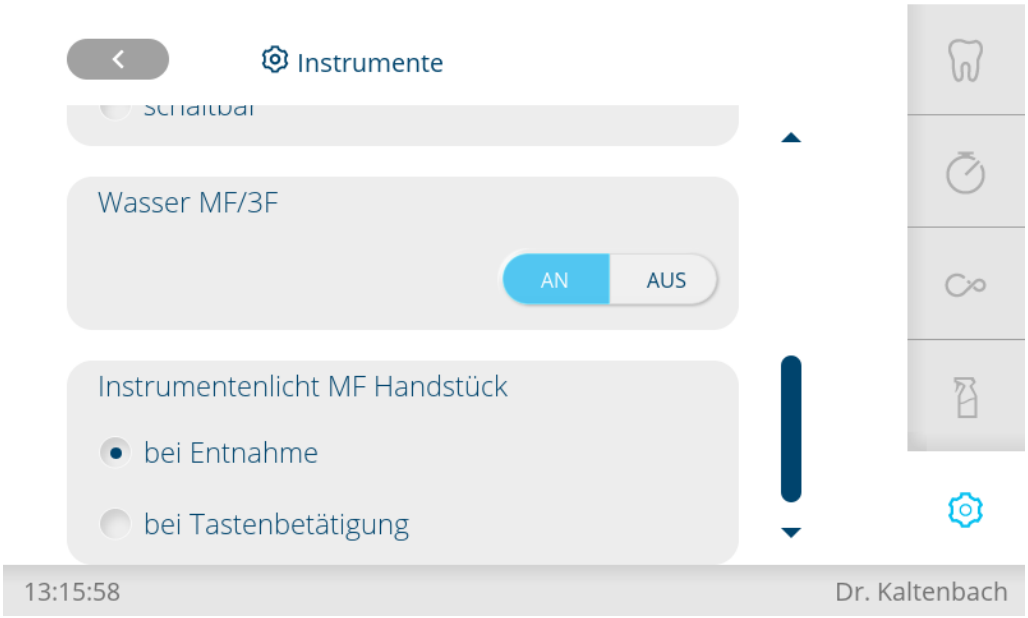
- Tap the "Instruments" key to make the following settings:
  - Instrument light and spray temperature
  - Spray water for ultrasonic scaler
  - Water for three function / multifunctional handpiece
  - Instrument light of the multifunctional handpiece Advanced settings / Instruments Advanced settings / Instruments Advanced settings / Instruments



Advanced settings / Handpieces



Advanced settings / Handpieces



Advanced settings / Handpieces

Tumbler & bowl

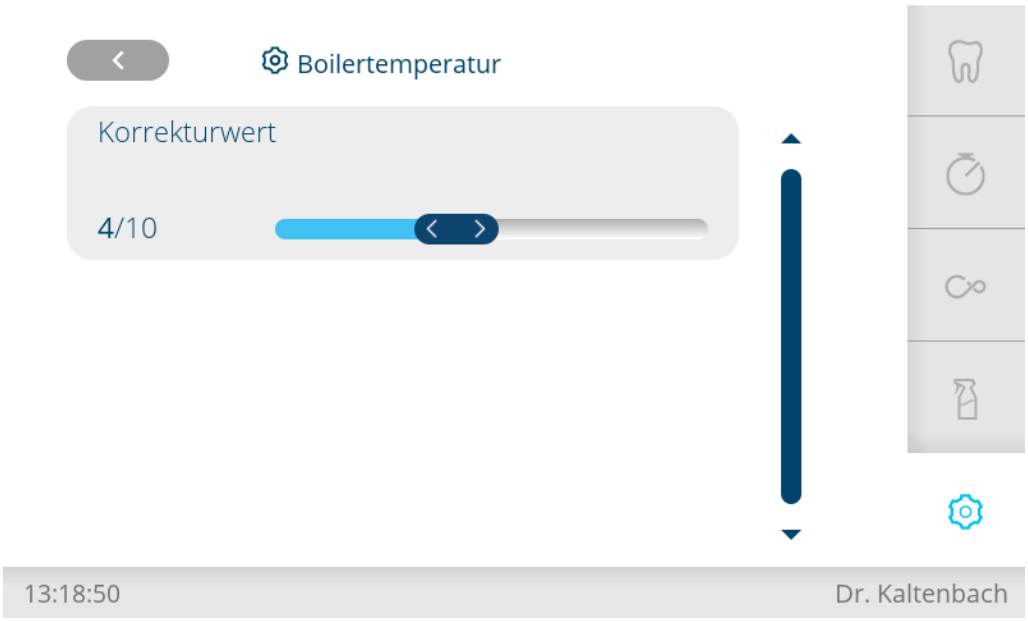
- Tap the "Tumbler & bowl" key to make the following settings:
  - Automatic bowl rinsing
  - Tumbler filling and tumbler sensor

Advanced settings / Tumbler and bowl

Advanced settings / Tumbler and bowl

Boiler temperature

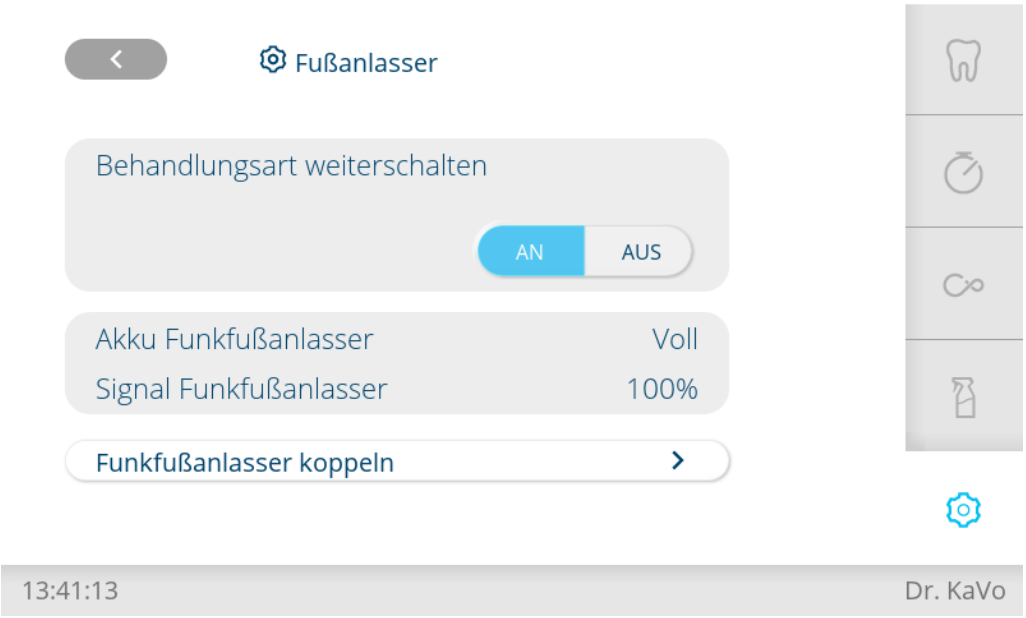
- Tap the "Boiler temperature" key to set the boiler temperature.



Advanced settings / Boiler temperature

Foot control

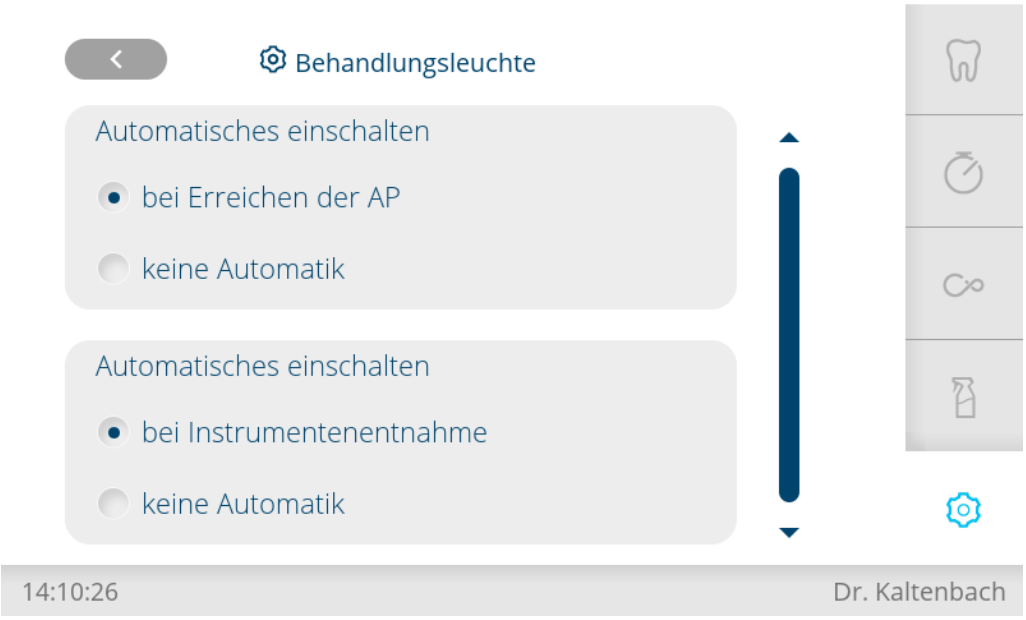
- Tap the "Foot control" key to set the foot control mode.



Advanced settings / Foot control

Operating light

- Tap the "Operating light" key to set the automatic activation of the operating light.

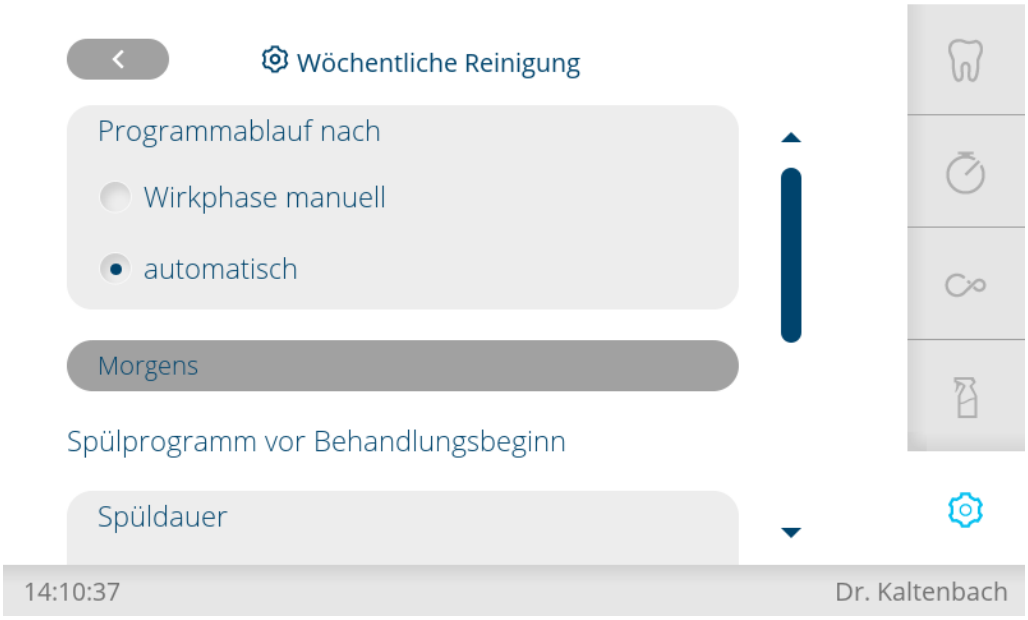


Advanced settings / Operating light

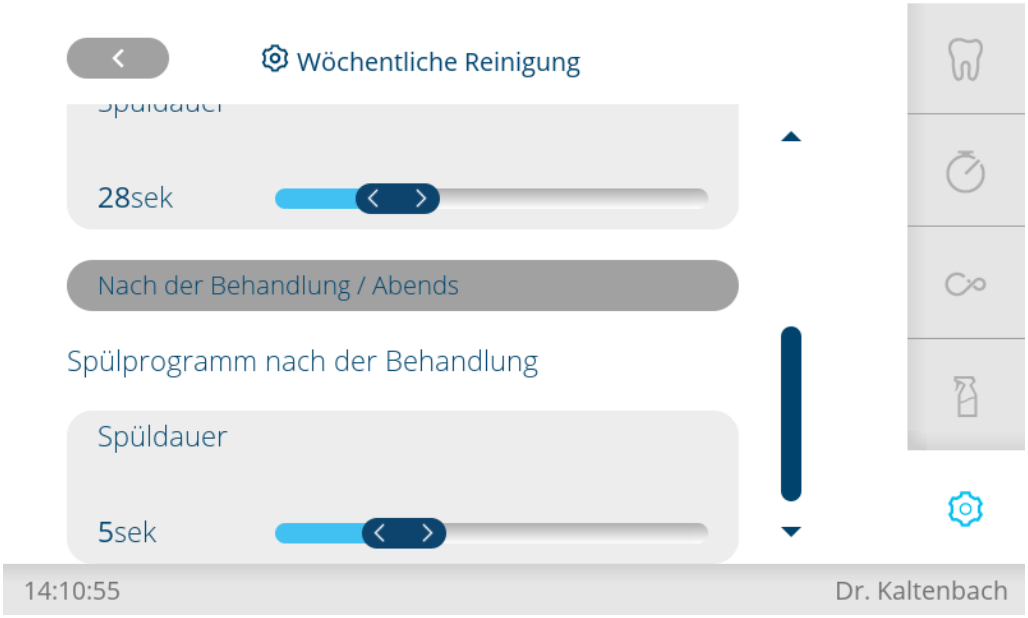
Weekly cleaning

- Tap the "Weekly cleaning" key to make the following settings:
  - Weekly cleaning
  - Instrument rinse time in "Morning" cleaning programme
  - Instrument rinse time in "After treatment/Evening" cleaning programmes

The KaVo-recommended values are set as defaults.



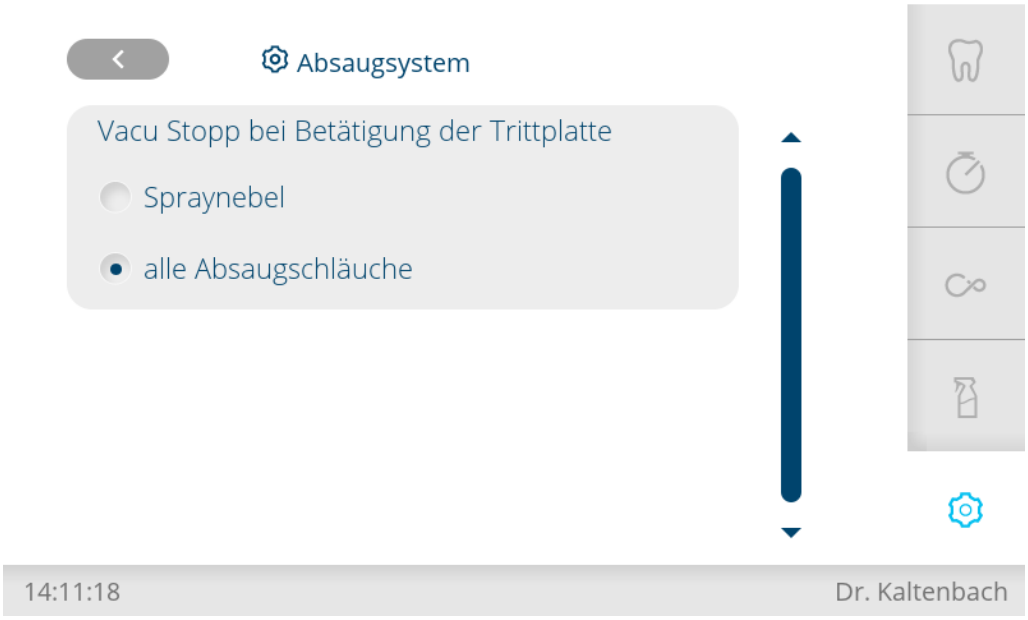
Advanced settings / Weekly cleaning



Advanced settings / Weekly cleaning

Suction system

- Tap the "Suction system" key to set VACUstopp.

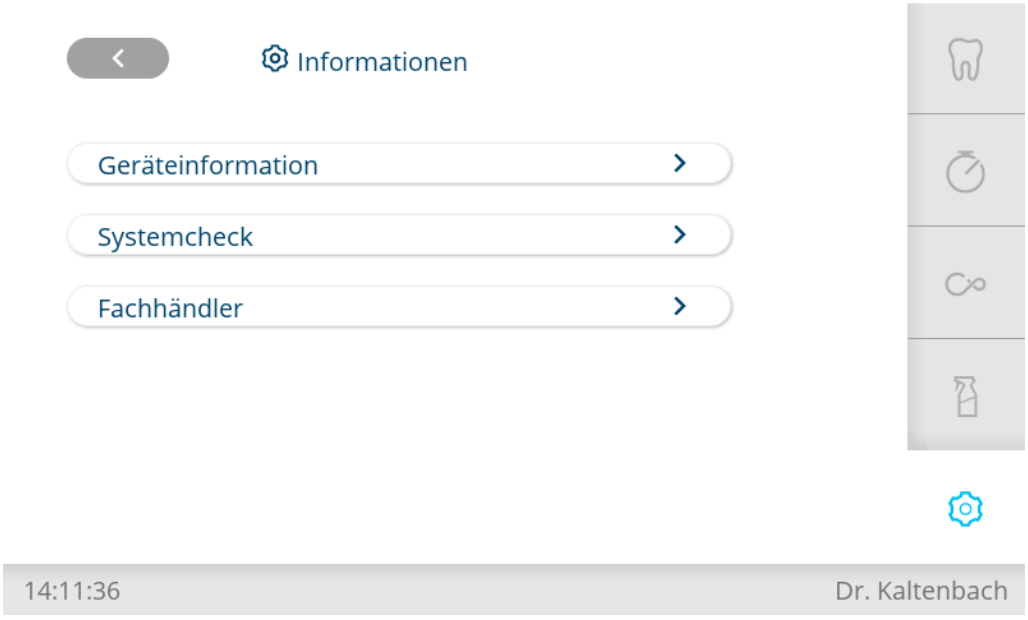


Advanced settings / Suction system

Information

The following items can be selected in the "Information" menu:

- Device information
- System check
- Specialised dealers



Global settings / Information

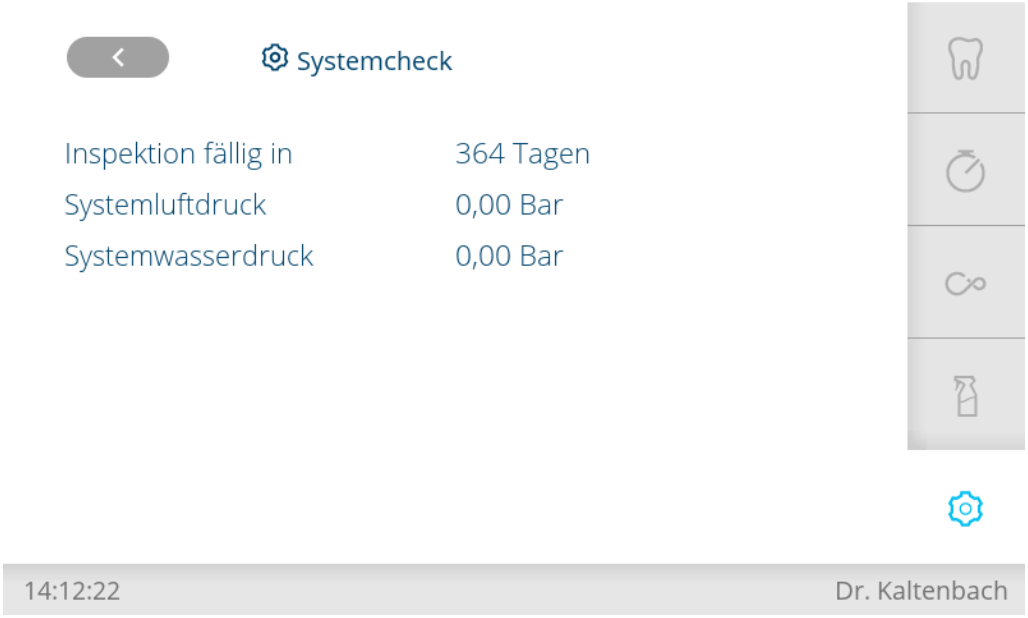
Device information

- Tap the "Device information" key to display information about the device.

Global settings / Device information

System check

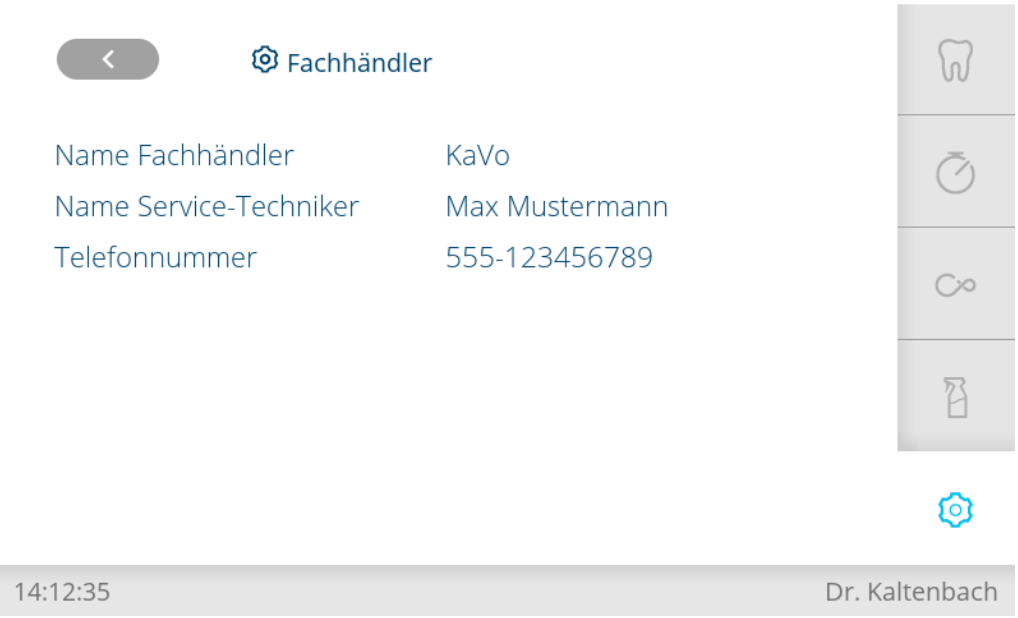
- Tap the "System check" key to open the system check.



Global settings / System check

Specialised dealers

- Tap the "Specialised dealer" key to display specialised dealers.



Global settings / Specialised dealer

4.10 Using functions through the control panel of the assistant element

4.10.1 Using the chair functions

⚠ CAUTION

Motorised motion of the patient chair

The patient or treatment personnel can be clamped or crushed.

- Monitor the patient and treatment personnel when changing the patient's position.

The chair can be automatically positioned using the following buttons:

Key	Function
	Move to most recent position before actuation of the SP.
	Move to the rinse position.
	Move to automatic position 0.
	Move to automatic position 1.
	Move to automatic position 2.

- Briefly press the respective button.
  - ⇨ Chair automatically moves to the saved position.
  - ⇨ The key is activated as soon as the saved position is reached.

Setting the chair height and backrest position using the dentist or assistant elements

Use the following buttons to adjust the chair height and position of the back-rest:

Dentist element key	Assistant element key	Feature
		The chair moves up.
		The chair moves down.
		The backrest moves upward.
		The backrest moves downward.

- Press the corresponding button.

⇨ The chair or backrest moves in the desired direction.

4.10.2 Using the hygiene functions

Key	Feature
	Tumbler filler The tumbler is being filled. The filling time can be changed.
	Bowl flushing The bowl is being rinsed. The flushing time can be changed. Once the rinsing position (SP) is reached, the bowl rinsing is activated, i.e. the bowl is being wetted. Leaving the rinsing position (SP), the bowl is rinsed again. Selectable for "Home screen" in "Settings" tab. The function can be disabled by a service technician.

- To activate a function, briefly press the key.
- For bowl rinsing and tumbler filling only: Press key again in order to discontinue the function.
- To open the settings menu, long-press the button.

4.10.3 Using the light functions

The following keys are available for use of the light functions:

Key	Function
	"Operating light on/off" key press briefly: The operating light is turned on and off ▪ Operating light On: Key is active ▪ Operating light Off: Key is inactive
	press long until the Settings menu is displayed on the dentist element: The brightness of the operating light can be set to either of five levels.
	"Operating light dimming" key press briefly: COMPOsave mode (dimmed normal light) of the operating light switches on/off. ▪ COMPOsave mode On: Key is active ▪ COMPOsave mode Off: Key is inactive
	Press down both keys simultaneously Switch laser mode on/off (KaVoLUX 540 LED only).

- To open the settings menu, long-press a button.

4.10.4 Using the timer

Three timers can be selected. The timers can be set on the dentist's control element.

Select the timer time

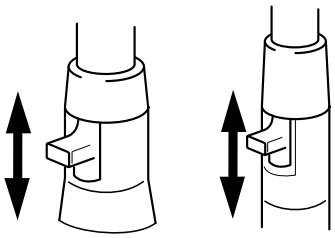
- To start a timer time, e.g. Timer 1, press the "Timer 1" key.
  ⇨ Time on the timer starts to run. A beep is issued after the timer time is elapsed.
- Press the selection button again to stop the timer time.

4.10.5 Using suction hoses

- Remove the spray mist suction device or saliva ejector from the holder.

⇨ The spray mist suction device or saliva ejector automatically turns on, and shuts off when it is replaced in the holder.

The suction flow of the saliva ejector or spray mist suction device can be reduced or blocked with the slide valves integrated in the handpieces.



- Move the slide valve completely upward.

⇨ The slide valve is open: maximum suction.

- Move the slide valve down all the way.

⇨ The slide valve is closed: no suction.

NOTE
Connectors for the spray mist suction and the saliva ejector without slider as well as reducing pieces for the spray mist suction are available as accessories.

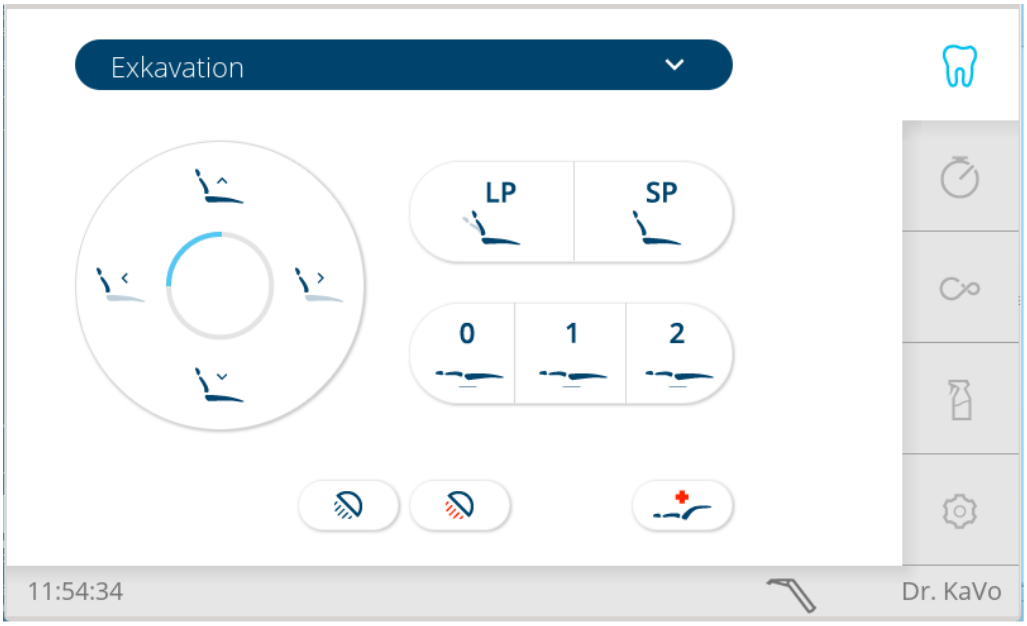
- Cannula holder, short, for spray mist ejector (mat. no. 0.764.5783)
- Cannula holder, long, for spray mist ejector (mat. no. 0.764.5853)
- Cannula holder, short, for saliva ejector (mat. no. 0.764.5863)
- Cannula adapter, reducing handpiece to 7 mm (mat. no. 0.764.5873)
- Cannula adapter, reducing handpiece to 11 mm (mat. no. 0.764.5883)

4.10.6 Setting the multifunctional handpiece

The following settings can be made:

- Air/water heating

- Take the multifunctional handpiece off the holder.
  ⇨ Syringe symbol is shown on the touch display of the dentist element.



- Open the settings menu by pressing the symbol.
  - ⇨ This causes the settings menu of the multifunctional handpiece to be displayed.
- Select Heating On/Off to select "Heating Air/Water".
- Press the "Save" key to save the values.

4.10.7 VACUstopp

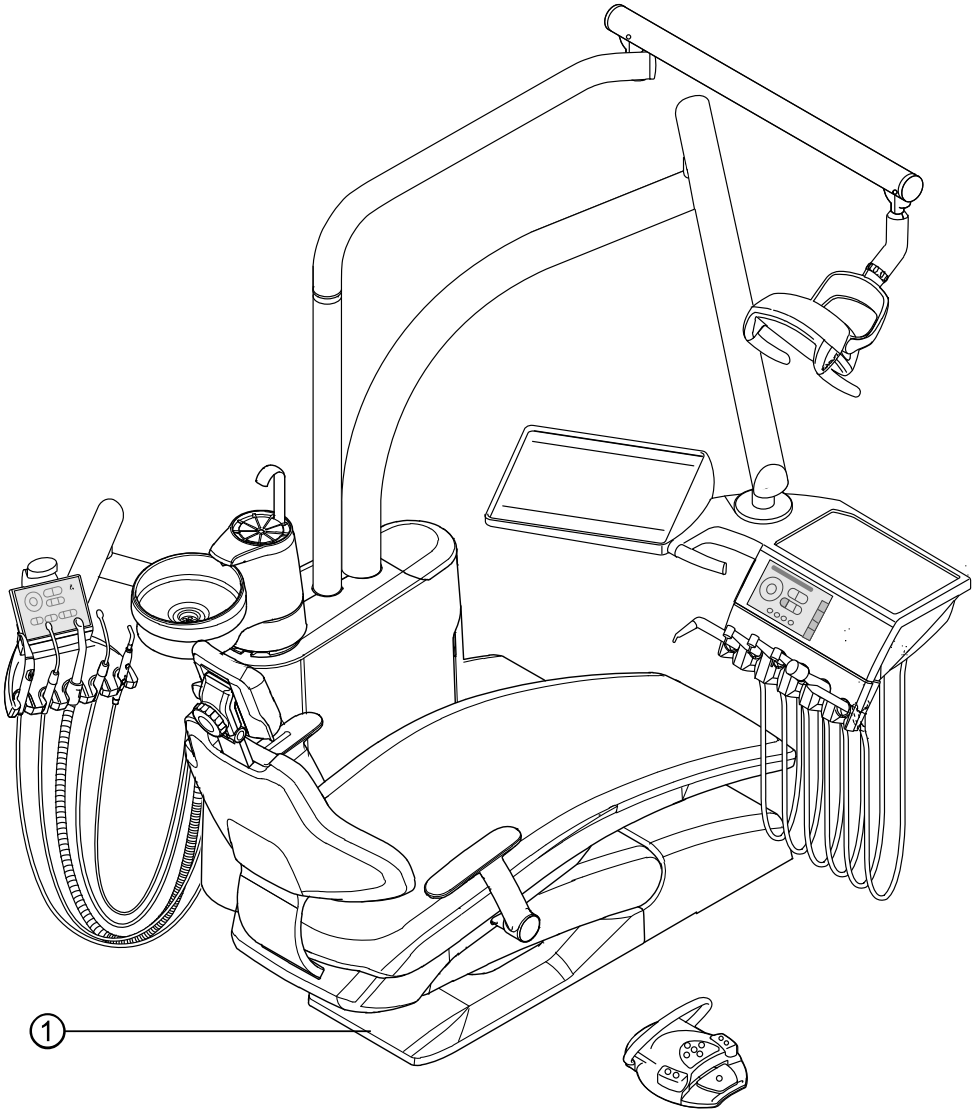
⚠ CAUTION

Danger of backflow.

Swallowing or choking hazard.

- Actuate the VACUstopp when the suction cannula is outside the patient's mouth!

When the chair kickplate is actuated, the suction of the removed hose is stopped.



① Chair kickplate

In the delivery state, only the spray mist suction stops in the VACUstopp function.

4.11 Using the three function and multifunctional handpiece

⚠ CAUTION

Risk of injury from touching the cheek with the handpiece.

Irritation of the mucosa.

- Rotate the cannula of the handpiece into an operating position where there is no contact to the mucosa.

⚠ CAUTION

Cannula that is worn or not locked into place.

Injury from swallowing the cannula.

- Before each treatment, ensure that the cannula is locked into place and firmly seated.
- Use original KaVo cannulas only.
- Only use reliable cannulas showing no damage.

⚠ CAUTION

Insufficient clearance between cannula and surface of gums or gingiva.

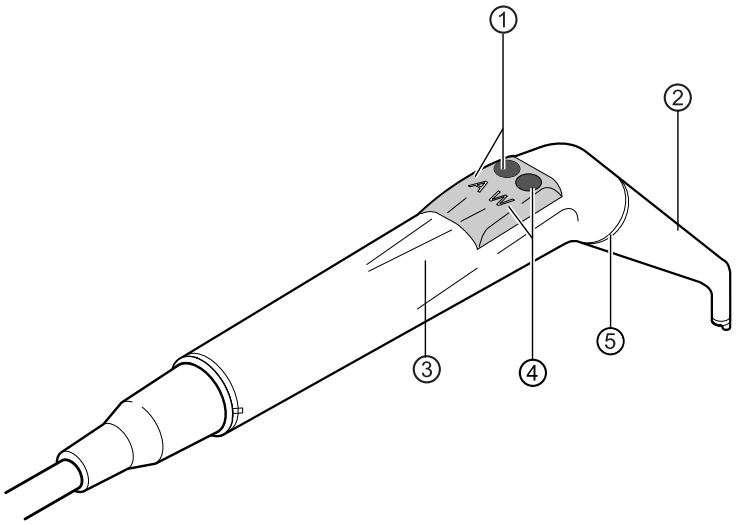
Risk of injury.

- Adhere to a minimum clearance of 10 mm between cannula and surface of gums or gingiva.

CAUTION

Damage due to missing media on the multifunctional handpiece.
Air and water heating systems are destroyed.

- Check if the air and water are connected!
- Check the air and water supply!
- If possible, switch the heating off at the unit after initial start-up or after servicing! Press the buttons carefully several times until the media are available. Then activate heating and check its operation.



① Air button (A)
② Cannula
③ Gripping sleeve
④ Water button (W)
⑤ Ring, gold (multifunctional handpiece)
Ring, blue (three function handpiece)

NOTE

Cannulas can be rotated by 360°.

The "on" time for the multifunctional handpiece with heating is 5 minutes with a resting time of 3 minutes.

NOTE
If only the cold light is preselected (heater: off), the multifunctional handpiece shines when it is removed from the holder.

- Remove the handpiece from the holder.
- Set the water/air heating (multifunctional handpiece only).
- Check the passage for the media in the cannula ② each time before using it on a patient.
- Press the air button ① and continuously increase or decrease the exiting air flow by applying more or less pressure on the air button ①.

or

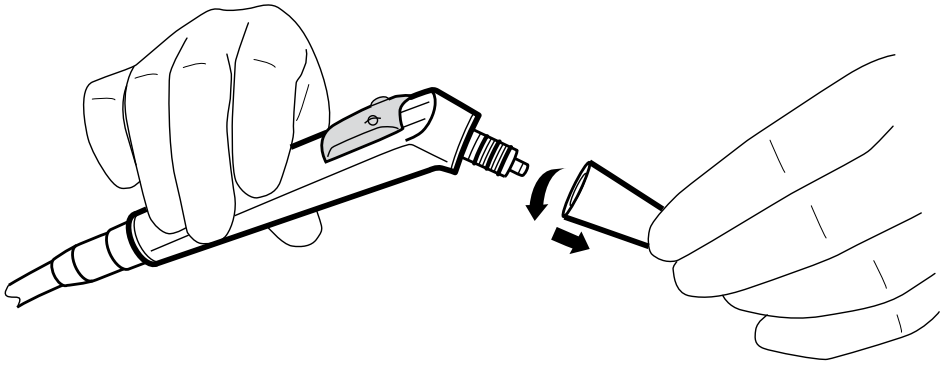
- Press the water button ④ and continuously increase or decrease the exiting water jet by applying more or less pressure on the water button ④.

or

- Simultaneously press the air button ① and water button ④ and continuously increase or decrease the exiting spray by applying more or less pressure on the two buttons.

Remove the cannula

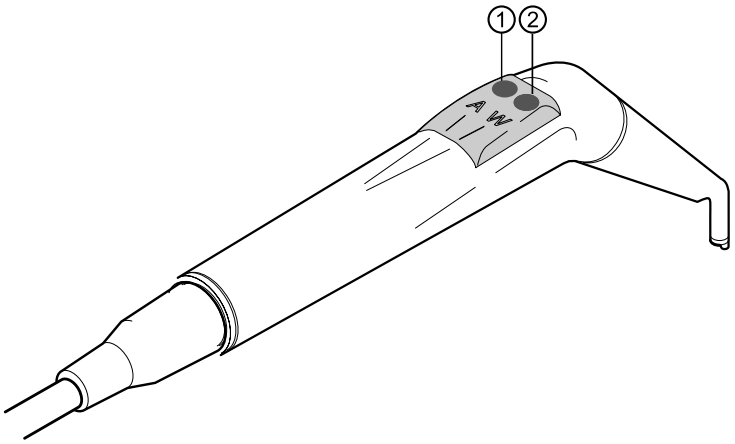
- Hold the 3-way or multifunctional handpiece at the gripping sleeve and take off the cannula with a slight twisting motion.



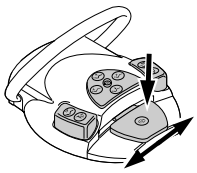
Using the cold light (multifunctional handpiece only)

Prerequisites
✓ The light and heating are preselected.

- Setting the cold light intensity.
- Press the air button ① and/or the water button ②.



or



- Press the "Handpieces" foot pedal.

⇨ The light turns on.

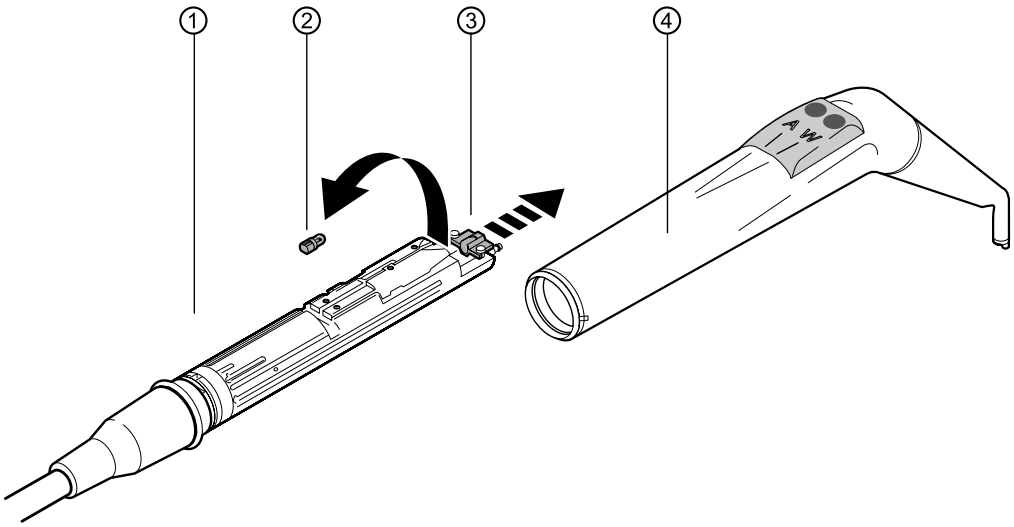
4.11.1 Replacing the lamp (multifunctional handpiece only)

⚠ CAUTION

Danger of injury if the valve body is hot (heating elements, high-pressure lamp).

Risk of burn injury.

- Switch off the unit at the main switch.
- Allow the handpiece to cool down after long use.



- Jointly pull the gripping sleeve ④ and the cannula off the valve body ①.

NOTE

The LED lamp is a semiconductor element and must be operated with direct voltage only. The lamp must be inserted with the poles in the correct orientation for the lamp to work properly.

- Push the holder ③ forward and pull the defective LED lamp ② out of the mount.
- Insert a new LED lamp (mat. no. 1.007.5372).

The following may happen after you turn on the LED lamp:

- Case 1: LED lamp is on.
- Case 2: LED lamp is faint. - Increase the cold light intensity on the unit until the desired light intensity is reached.
- Case 3: The LED lamp is red or off. - Take the KaVo MULTI LED lamp out of its mount as described above and re-insert it after rotating it by 180° about its axis.

4.12 Using PiezoLED

⚠ CAUTION

Handpiece inserts can be damaged from long-term use, or when dropped or bent.

They are not guaranteed to function properly.

Injury from insert breakage.

- Check the handpiece inserts before each use.

⚠ CAUTION

Sharp-edged tips.

Risk of injury.

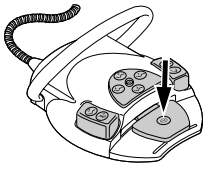
- When not in use, always keep the supplied torque wrench attached to the tip!

NOTE
Please comply with the enclosed "PiezoLED" Instructions for Use.

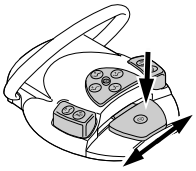
Operation by means of the touchscreen

Also refer to:
Settings for the PiezoLED

Operation with the foot control



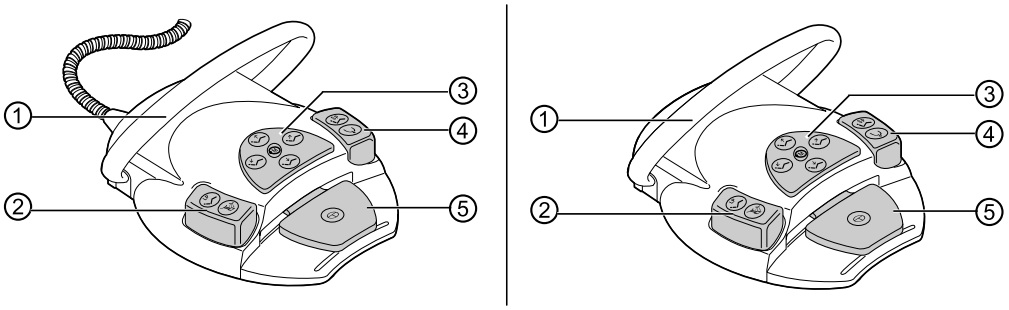
- Press the "Instruments" foot pedal.
  ⇨ The PiezoLED works at the set intensity at levels 1 through 3.



- To adjust the intensity, move the "Instruments" foot pedal to the side.

4.13 Operating the foot switch

General functions



Cable-connected foot control and wireless foot control

Item Name	Function with handpiece mounted	Function with handpiece taken out
① Stirrup switch		Switches the footswitches to the "Chair motion" function.
② "LP/preselected spray" footswitch	Drives dental chair to previous position.	Sets the spray preselection.
③ "Chair position/motor rotational direction" cross switch	Changes the position of the dental chair.	Selects the direction of motor rotation (for KL 701 / KL 703 LED motor).
④ "SP/blown air" foot switch	Drives dental chair to rinsing position.	Activates blown air (Chipblower) on the instrument (does not apply to PiezoLED).
⑤ Foot pedal "Select treatment mode"	Selection of treatment mode	Starts the motor/handpieces and controls the speed/intensity of the handpieces.

4.13.1 Positioning the patient chair with the foot control

NOTE
The automatic chair positioning must be monitored by the treatment personnel.

Selecting the automatic chair position

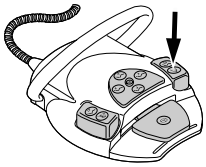
Prerequisite
All instruments are in their holders. If an instrument is taken out, briefly activate the stirrup switch.

NOTE
The foot-operated buttons "SP" and "LP" can also be assigned any "AP" buttons.

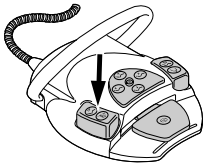
Delivery status:

Spray key: Automatic position LP

Blown air key: Automatic position SP

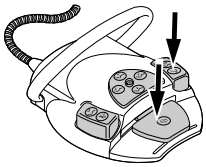


- Press the "SP" foot switch.
  ⇨ The chair moves into the saved position.

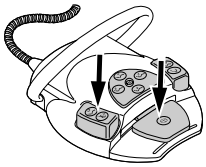


- Press the "LP" foot-operated button.
  ⇨ The chair moves into the saved position.

Reassign "SP" or "LP" foot switches



- Hold down the foot control and foot switch "SP", and simultaneously press any button for an automatic position (SP, LP, AP 0 to AP 3 or collapsed position) on the dentist or assistant element until you hear a beep.
  ⇨ The automatic position is saved to the foot switch.
  or

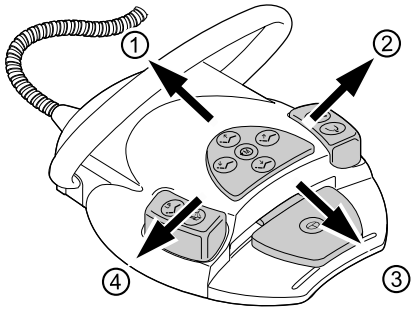


- Hold down the foot control and foot-operated button "LP", and simultaneously press any button for an automatic position (SP, LP, AP 0 to AP 3 or collapsed position) on the dentist or assistant element until you hear a tone.

⇨ The automatic position is saved to the foot switch.

Positioning the patient chair manually with the foot control

The cross switch of the foot control assumes the function of the button wheel (function level 1) on the dentist element during manually positioning of the patient chair.



Prerequisites

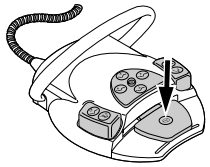
✓ All instruments are in their holders. If an instrument is taken out, briefly activate the stirrup switch.

- Chair up: slide cross switch on foot control towards ①.
- Chair down: slide cross switch on foot control towards ③.
- Backrest up: slide cross switch on foot control towards ②.
- Backrest down: slide cross switch on foot control towards ④.

4.13.2 Pre-selecting the treatment mode

Prerequisites

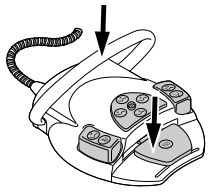
✓ "Next treatment mode" is activated in Advanced settings / Foot control.



- With the handpieces in the holders, press the foot pedal.

⇨ The treatment mode advances upon each actuation of the foot pedal.

4.13.3 Preselecting dentist



- Hold down the foot pedal and press the stirrup switch (with handpieces stored).

⇨ Up to six users can be programmed. This can be set in "User" in the "Settings" tab.

4.13.4 Starting and adjusting instruments

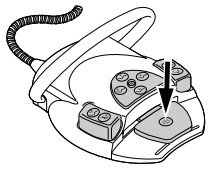
⚠ CAUTION

Centring in the middle is effected for the wireless foot control by a positioning motor.

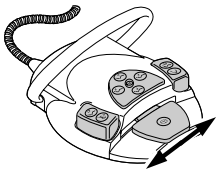
If the positioning motor breaks down, switching from or into the middle position using the wireless foot control is no longer feasible. The treatment mode can still be selected, but the foot pedal does not leave the middle position and cannot switch into the middle position. The speed currently set on the wireless foot control is always shown on the display of the treatment centre.

- "Manual" must not be selected as the treatment mode.
- Charge battery.
- If centring in the middle does not work despite the batteries being charged, the positioning motor is defective. Have the positioning motor checked!

- Remove the handpiece (such as turbine, motor, PiezoLED etc) from the holder.
  ⇨ The handpiece is active.



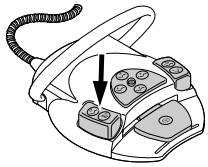
- Press the foot pedal.
  ⇨ The removed handpiece runs at the set speed or intensity.



- Changing speed or intensity with the foot pedal.
  ⇨ The left stop corresponds to the minimum speed/intensity.
  ⇨ The right stop corresponds to the maximum speed/intensity.

4.13.5 Setting the cooling status

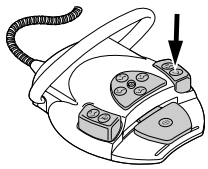
- Remove the handpiece (e.g turbine handpiece, motor) from the holder.
  ⇨ The handpiece is active.



- Press "Preselected spray" footswitch.
  - ⇨ The cooling level is switched each time the foot switch is pressed: no cooling - air - spray.
  - ⇨ The cooling level is displayed on the dentist and assistant element.

4.13.6 Activating blown air

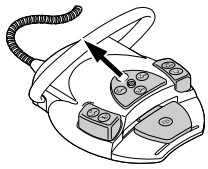
- Remove the handpiece (e.g turbine handpiece, motor) from the holder.
  - ⇨ The handpiece is active.



- Press the "Blown air" foot-operated button.
  - ⇨ As long as the foot switch is pressed, blown air exits from the removed handpiece (does not apply to PiezoLED).

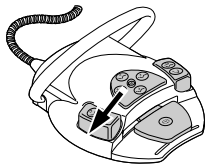
4.13.7 Preselecting counterclockwise motor rotation

- Take motor off the holder.
  - ⇨ The handpiece is active.



- Slide the cross switch upward.
  - ⇨ The direction of motor rotation is toggled each time the cross switch is pushed: counterclockwise rotation - clockwise rotation.
  - ⇨ The direction of motor rotation is displayed by the active symbol on the dentist element.

4.13.8 Setting the instrument light

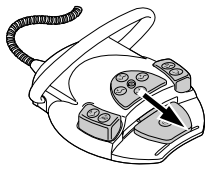


- Slide the cross switch to the right. (spotlight function)
  - ⇨ Cold light on (even when "Cold light: off" is preselected). Once the cross switch is no longer actuated, the light goes off again.
- Slide the cross switch to the left.
  - ⇨ Change the cold light status: "On/Off"

4.13.9 Using physiological saline (optional accessory)

Prerequisites

✓ Treatment centre is turned on. The handpiece is connected to the pump via the pressure line.



- Remove an instrument.
- Push down the cross switch of the foot control for 4 seconds until you hear a beep.
- After activation, select the "NaCl" cooling on the dentist control panel.

4.13.10 Special functions of the wireless foot control

⚠ CAUTION

Electrical power

Personal injury or damage to the wireless foot control.

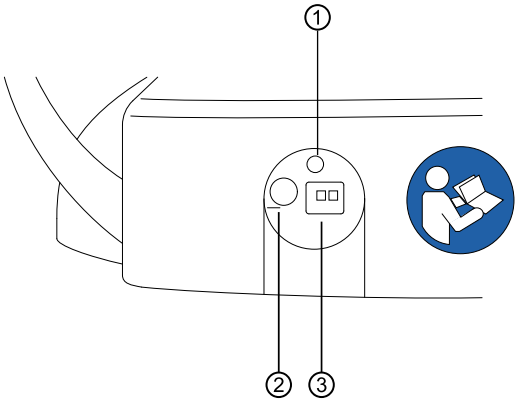
- The user must never touch the charger connector and the patient at the same time!
- Do not touch the contacts of the charger connector!

CAUTION

Damage or malfunction due to improper servicing.
Reduced product life.

- Comply with the information provided in the care instructions to ensure correct servicing!

The wireless foot control transmits the user activities to the treatment centre by Bluetooth.



Item No.	Name	Function
①	LED display	Status display / charge status display
②	On/Off switch	On/off switch to prevent deep discharge during long periods of non-use. The wireless foot control can remain switched on at all times as a matter of principle. The device must be switched off for transport. The battery can also be charged when it is switched off.
③	Charge socket	Charge socket for the provided charger (**Mat. no. 1.005.4229**).

The charging status of the rechargeable battery of the wireless foot control is displayed by the LED display and signaled by a beep.

Residual capacity	Foot control status	Status display / charge status display	Beep
< 100 %	Idle state Foot control is on	Flashes green (approx. 2 second intervals)	-
	Active actuation	Flashes green (approx. 200 millisecond intervals)	
< 30 %	Idle state Foot control is on	Flashes yellow (approx. 2 second intervals)	A single brief beep when a button is pressed.

Residual capacity	Foot control status	Status display / charge status display	Beep
	Active actuation	Flashes yellow (approx. 200 millisecond intervals)	
< 10 %	Idle state Foot control is on	Flashes yellow (approx. 2 second intervals)	Two brief beeps when a button is pressed.
	Active actuation	Flashes yellow (approx. 200 millisecond intervals)	
	Moreover, a message is displayed on the touch display of the dentist element.		

⚠ CAUTION

Critical charge status of the battery.

Risk of injury

- Always charge batteries in due time! If the battery reaches a critical charge status, a beep is issued every time a function key is pressed.
- To make sure that the battery of the wireless foot control is recharged in due time you need to note the optical and acoustical signals of the wireless for control when you commission the treatment centre!

Establishing a connection between the wireless foot control and the treatment centre

⚠ CAUTION

Loss of functionality due to interruption of wireless connection

Bluetooth allows for safe operation of two or more wireless foot controls simultaneously. However, I cannot be excluded that other coexistent wireless devices working in the same frequency band might interfere with the wireless connection of the foot control.

⚠ CAUTION

Improper use of the wireless foot control

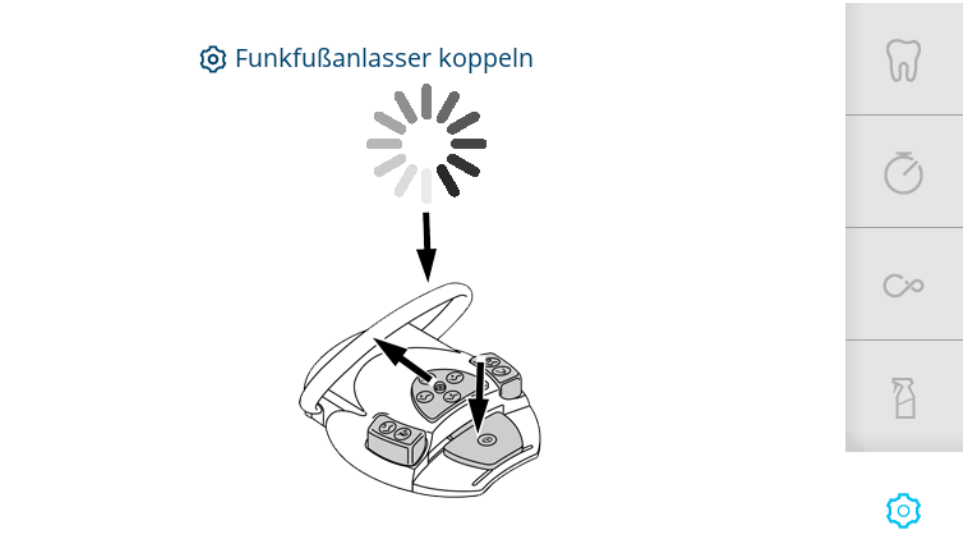
Damage or malfunction

- In case of improper use (such as cleaning), turn off the wireless foot control or the treatment centre.

Via the settings menu of the dentist element

- Tap the "Foot control" button in Advanced settings on the dentist element in order to set the foot control mode.

- To couple the foot control and the treatment centre, actuate the "Couple wireless foot control" button.
  - ⇨ The following window appears:



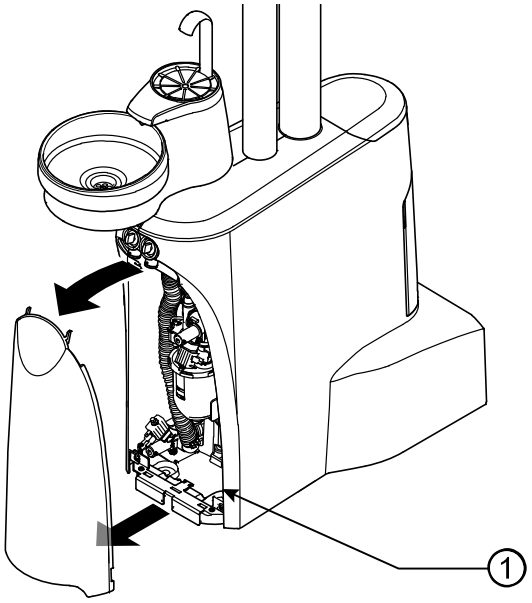
- For coupling, press and hold down the stirrup switch button, the cross switch up button and the foot pedal until you hear a beep.
- Then the buttons can be released.
  - ⇨ The previous menu is shown again. If coupling was successful, battery level and signal strength are displayed.

⇨ If the coupling was not successful, the original display is shown and the coupling needs to be repeated.

Via the receiver of the treatment centre

NOTE
If connection via the settings menu of the dentist element does not work, establish the connection using the receiver in the treatment centre.

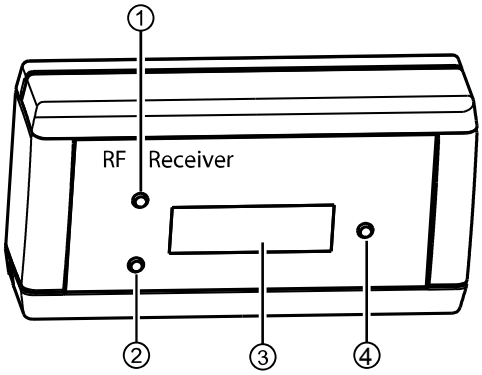
The RF receiver ① is located behind the service door



NOTE

Only one wireless foot control per treatment centre can be registered to a RF receiver at any given time. If another wireless foot control was previously registered, the last wireless foot control to be registered will be deleted with every new start of the synchronisation process.

Every wireless foot control and every RF receiver has a unique address, which are communicated during the synchronisation procedure. This ensures unambiguous assignment. The different wireless foot controls operate on different channels in order to prevent interference during the application of several wireless foot controls.



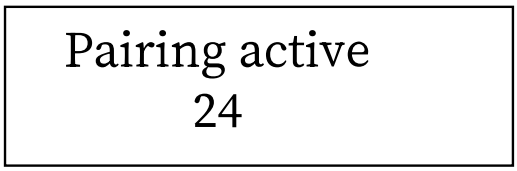
① "Up" key
② "Down" key
③ Display
④ "OK" key

The wireless foot control and the treatment centre need to be synchronised in order to establish a connection between the devices. The synchronisation must be done once by a service technician.

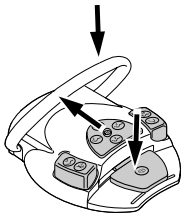
If the display of the receiver shows "DISCONNECTED", a synchronisation of receiver and wireless foot control needs to be run.

NOTE
If the wireless foot control is switched off, the display of the receiver also shows "Disconnected".

- Use the "Up" or "Down" keys to select the "Pairing" menu item, and activate it with the "OK" key.
  - ⇨ Synchronisation starts. The remaining countdown time in seconds is displayed.



  - ⇨ A combination of keys on the wireless foot control must be used during the 30 second countdown.



- Press the foot pedal, then move the cross switch toward "Chair up", and then actuate and hold the stirrup switch until you hear a beep. The status LED begins to flash green.
  - ⇨ If the synchronisation is successful, the display of the receiver shows "CONNECTED". In addition, the wireless foot control indicates successful synchronisation by issuing two beeps.

- If the keys are not pressed within the 30 second countdown period, synchronisation is terminated after expiry of the 30 second period.
  - ⇨ The display indicates if synchronisation was successful. The receiver stays in the "Pairing" service menu. The synchronisation can be started again using the "Confirm" button.
- If synchronisation was unsuccessful, repeat the process making sure to comply with the countdown time.
- After successful synchronisation, the receiver automatically switches to operating mode.

⇨ The set values will be accepted and saved automatically.

4.13.11 Charging the wireless foot control

⚠ CAUTION

Risk of injury and material damage from incorrect use of the charger for the wireless foot control.

Personal injury or damage to the wireless foot control or charger.

- Do not use the treatment centre during the charging process!
- Do not use the enclosed wireless foot control's charger to charge non-rechargeable batteries.
- Charge the wireless foot control with the enclosed charger only.

The wireless foot control has a built-in rechargeable battery.

NOTE

Charge the wireless foot control with the charger supplied by KaVo only.

The wireless foot control charger may only be used indoors and must be protected from moisture.

- Connect the charger to the wireless foot control.

The display of the charger may show the following:

Display	Meaning
flashes green	Device ready for use
	Charging the battery
No lights	Battery is deeply discharged or short-circuited
	Battery voltage exceeds tolerance range
	Incorrect polarity

The transition phase from Charging to Full is indicated by brief flicker of the display.

4.14 Using the operating light

⚠ CAUTION

Wrong handling.

Reversible blinding (temporary sight impairment).

- Do not direct the light field at patients, users or/and third parties while you switch on the light.
- Do not direct the light field at the patient's eyes when you move the light head.
- Keep a clearance of approx. 700 mm between the light and the mouth of the patient.

⚠ CAUTION

Stroboscopic effect of the rotating instrument.

A stroboscopic effect could arise in instruments rotating at a certain speed during application of the operating light. This is an optical illusion that makes the handpiece appear to be standing still or rotating extremely slowly.

Risk of injury.

- If the stroboscopic effect is evident, change the speed slightly and continue working as usual.

⚠ CAUTION

Premature hardening of composite fillings.

A light intensity that is too high can have a negative impact on the durability of the treatment.

- Select the appropriate dimming level according to the processing time.

The following buttons on the dentist element can be used to operate the operating light:

Key	Function
	"Operating light on/off" key press briefly: The operating light is turned on and off ▪ Operating light On: Key is active ▪ Operating light Off: Key is inactive
	"Operating light dimming" key press briefly: COMPOsave mode (dimmed normal light) of the operating light switches on/off. ▪ COMPOsave mode On: Key is active ▪ COMPOsave mode Off: Key is inactive
	Briefly press the "Laser mode" button (on the dentist element for KaVoLUX 540 LED only): Laser mode of the operating light is switched on/off ▪ Laser mode on: Key is active ▪ Laser mode off: Key is inactive

4.14.1 Setting the operating light

- Tap the "Operating light" key for long.

⇨ This causes the settings options of the operating light to be displayed.

Menu Settings - Operating light

Set brightness and colour temperature

- Use the "Brightness" slider to set the brightness to one of 5 levels.
- Set the colour temperature using the "Colour temp". slider.

Set the brightness and type of dimming

- Tap the "Dim mode" key to toggle between COMPOsave and Dim mode.
  - ⇨ The active mode is indicated by the blue background.
  - ⇨ Tapping the "Dim operating light" key causes the active mode to be executed.
  - ⇨ The COMPOsave mode can be recognised by the yellow light.

NOTE
The "Set dimming mode for LED lamp" option is only indicated if an LED lamp is installed on the treatment centre and has been activated by the technician in service mode.
Tapping the "Dim operating light" key switches on the COMPOsave mode. The light can be dimmed in COMPOsave mode.

COMPOsave is a dimmer mode. In COMPOsave mode the hardening of the composite is greatly reduced by filtering the blue parts of the light spectrum.

Setting the brightness of the dimmer (COMPOsave mode)

NOTE
The time it takes for composites to harden depends on the brightness and/or the effective radiation intensity of the light: The processing time is reduced by increasing brightness / effective radiation intensity. The processing time for composites is prolonged by reducing brightness / effective radiation intensity.
The "Dim operating light" key can be added as a direct selection key to the "Home screen" in the Settings menu.

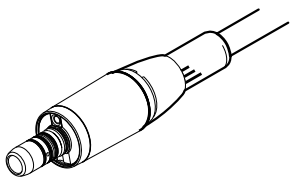
- Use the slider to set the brightness mode to one of 5 levels.
- Tap the "Back" key twice to get to "Global settings".

NOTE
Falsified colour reproduction: the laser mode only possesses a restricted spectral range. Therefore, a colour comparison should not be done in laser mode.

Also refer to:
Instructions for use of the operating light

4.15 Using the KL 703 LED in ENDO mode (optional accessory)

NOTE
The endo drive can only be operated with the INTRA LUX KL 703 LED.



INTRA LUX KL 703 LED

⚠ CAUTION

Use of impermissible file systems.

Impermissible file systems may damage the product or cause personal injury.

- Only use approved NiTi file systems with a conicity >2% that are suitable for rotary reprocessing.
- Only use files with shafts in conformance with DIN EN ISO 1797, DIN EN ISO 3630-1 and DIN EN ISO 3630-2 having a shaft diameter of 2.334 to 2.350 mm.
- Follow manufacturer's instructions (mode of operation, speed, torque levels, torsion resistance, etc.), and use the files according to their intended use.

⚠ CAUTION

Use of damaged files.

Injury to the patient or damage to the medical device.

- Before preparing each root canal, insert a dental dam for safety reasons.
- Before each use, the files must be checked for possible signs of material fatigue, deformation or excessive stress and must be replaced if any such signs are evident.

⚠ CAUTION

Excessive torque.

Patient injury or damage to instruments.

- Use root canal instruments in ENDO mode only.

NOTE

The control of the device is matched to the efficiency of the KaVo handpieces. Speed and torque can be assured only with the following KaVo handpieces.

- Only use KaVo-approved handpieces with a transmission ratio of 1:1, 3:1 or 8:1.
- Use only the KaVo 1:1 shanks listed below in conjunction with the KaVo 1:1 or 3:1 heads listed below or the KaVo 8:1 or 1:1 contra-angle handpieces:

KaVo contra-angle handpieces 8:1	KaVo contra-angle handpieces 1:1	KaVo 1:1 shanks	KaVo 1:1 heads	KaVo 3:1 heads
SMARTmatic ENDO S81 (Mat. no. 1.011.6780)	SMARTmatic S20 (Mat. no. 1.011.6750)	INTRAmatic LUX shank 20 LH *	INTRA LUX head 68 LU *	INTRA LUX head 66 LU *
	SMARTmatic S20 S (Mat. no. 1.011.6752)	GENTLEpower LUX shank 20 LP *	INTRA head L68 B (Mat. no. 1.008.1834)	INTRA head L66 B (Mat. no. 1.008.1831)
		MASTERmatic LUX shank M20 L (Mat. no. 1.009.3620)		

Product is no longer part of the current sales portfolio

NOTE
The INTRAINTRA LUX KL 703 LED motor has a torque range from 0.15 to 3 Ncm. If the torque is in excess of 2.0 Ncm, KaVo recommends using a reducing contra-angle handpiece 3:1 or 8:1 in order to reduce the load on and heating of the motor. The reducing contra-angle handpiece should be selected appropriately such that the torques specified by the file manufacturer are within the recommended torque range (middle column):

Reduction ratio of contra-angle handpieces	Torque of the file	Minimum/maximum attainable torques
1:1 (M20 L with L68 B) 1:1 (S20) 1:1 (S20 S)	0.15 – 2.0 Ncm	0.15/3.0 Ncm
3:1 (M20 L with L66 B)	0.5 – 6.0 Ncm	0.45/6.0 Ncm
8:1 (ENDO S81)	1.5 – 6.0 Ncm	1.2/6.0 Ncm

Technical specifications for the KL 703 LED in ENDO mode

NOTE
The technical specifications apply to the KL 703 LED in ENDO mode.

Motor torque rating	max. 3 Ncm
Motor speed rating	200 to 3,200 min^{-1}

Operating mode

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

In practice, pulse loads lasting seconds or pause times lasting seconds or minutes are realistic, usually without reaching the maximal possible motor current. This corresponds to the common working procedure of a dental professional.

4.15.1 Setting the storage position of the endo-motor

- Tap the "Settings" tab.
- Tap the "User" key and call up the settings of the respective dentist. Select the "Endodontics" treatment mode.
  ⇨ This causes the settings of the "Endodontics" treatment mode to be displayed.
- Tap the "Set storage position" key.
  ⇨ This opens a dialog field.
- Take the respective motor for the Endodontics treatment mode from the holder, and confirm.
- Switch the operating light on or off.
- Tap the "Back" key to return to the "Treatment" menu.

4.15.2 Calling up ENDO mode

- Take the INTRA LUX Motor KL 703 endomotor off the holder.

- Unfold the "Type of treatment" selection list and select "Endodontics".

⇨ The display switches to "Endodontics" as the treatment mode.

NOTE
Before using the endomotor, always check the speed and transfer ratio!

The device exits from the "Endodontics" treatment mode as soon as the INTRA LUX KL 703 LED endomotor is returned to the holder. The "Endodontics" treatment mode is activated automatically upon the endomotor being taken out provided "Endodontics", as the treatment mode, was previously ended by replacing the endomotor in the holder.

NOTE
The automatic start does not take place if the "Endodontics" treatment mode has never been activated since the last time the unit was turned on.

"Endodontics" treatment mode

⚠ CAUTION

Incorrectly set parameters.

Injury or property damage from incorrect input values.

- Check all input values before use (e.g. transmission ratio, transmission factor, torque, etc.).

4.15.3 Setting the parameters

A total of eight parameter memory locations (profile 1 to profile 8) are available.

The following parameters can be changed:

- Speed
- Torque
- Cooling status
- Direction of motor rotation
- File selection from the file database
- Transmission ratio
- Torque mode
- Step of the respective file set

4.15.4 File database

Endodontics mode (optional accessories) has a file database integrated in it. It is necessary to check if the file data are up-to-date by comparing them to the respective manufacturer information. Speed and torque of the files in the file database correspond to the maximum permissible values of the respective manufacturer.

NOTE
The values deposited in the file database by the manufacturer are examples only. They must be matched by the user to the actually used file data according to the manufacturer specifications.

⚠ CAUTION

Incorrectly set values

In the worst case, non-compliance with these instructions can lead to file breakage and ensuing tooth loss.

- The values deposited in the database and used by the user are the sole responsibility of the operator. Before each use, the user must make sure that the values retrieved from the database are correct for the file in current use. The safety mechanisms for ENDO mode (checking of of speed, torque, etc.) used by the treatment centre can work effectively only if the entered nominal values and the permissible thresholds are used correctly.

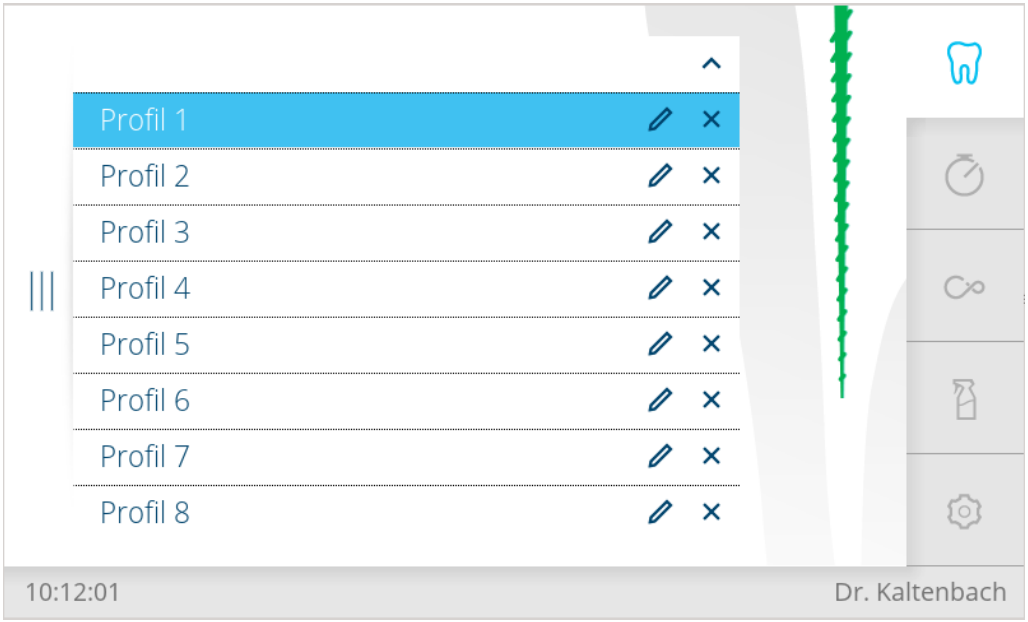
The file database includes data on the following file systems and manufacturers:

Manufacturer	File system	Manufacturer	File system
COLTENE	HyFlex™ EDM HyFlex™ CM	Dentsply	ProFile® ProTaper® Universal ProTaper Next ProFile® GT PathFile™ GT Series X® ProFile® Vortex® Protaper Gold Vortex Blue TRUShape
FKG	BioRace		
KOMET	F360		
MICRO-MEGA	Hero 642® Revo-S™		
Kerr Endodontics (SybronEndo)	K3™ Lightspeed TF™ Twisted Files		
VDW	Mtwo®		

4.15.5 Editing/defining/modifying file profiles

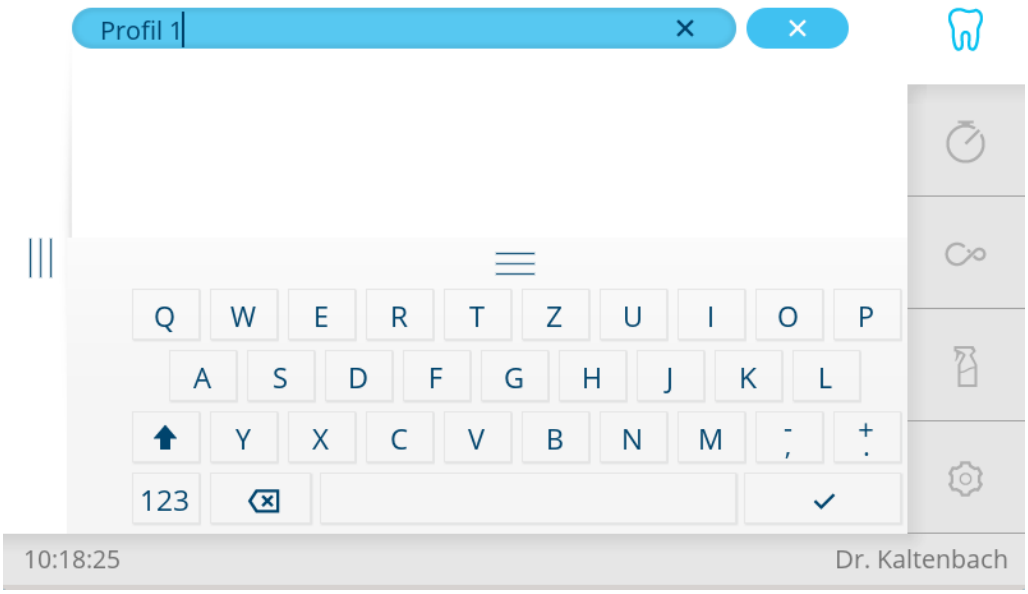
The user can compile individual workflows by defining file profiles in the file editor. Up to 8 different file sequences with 10 files each can be defined. It is also possible to combine files from different file systems in a file sequence.

- Open the file editor, then tap file profile "Profile 1" to display the file profile selection list.

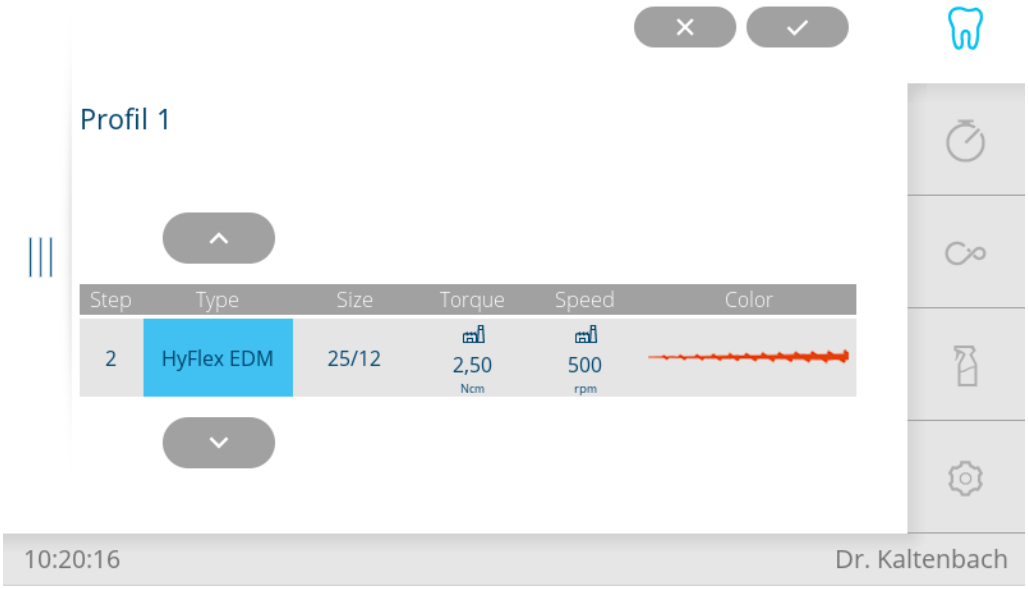


- Tap the "Pen" control element to edit the sequence.
  ⇨ The display shows file sequence "Profile 1" in editing mode.

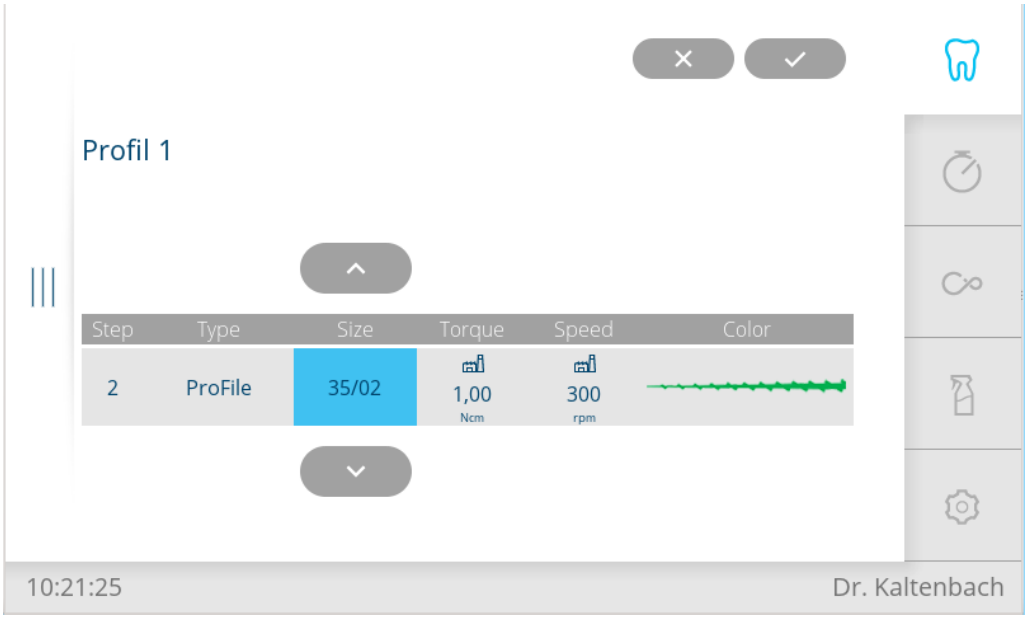
- Tap the "Pen" control element again to edit the profile name.
  ⇨ The display shows a keyboard.



- Edit "Profile 1" with the keyboard and tap the "Save" key to save the value.
- Tap the second column called "Type" and use the arrow keys to select the file system (here: HyFlex EDM).



- Tap the third column called "Size" and use the arrow keys to select the file geometry.



⇨ Once the file system and file geometry have been selected, the columns "Torque", "Speed" and "Colour bar" (colour of the file) are assigned automatically except for the user-defined files.

⇨ The data concerning the file systems and file geometries are stored in a file database, except for the user-defined files.

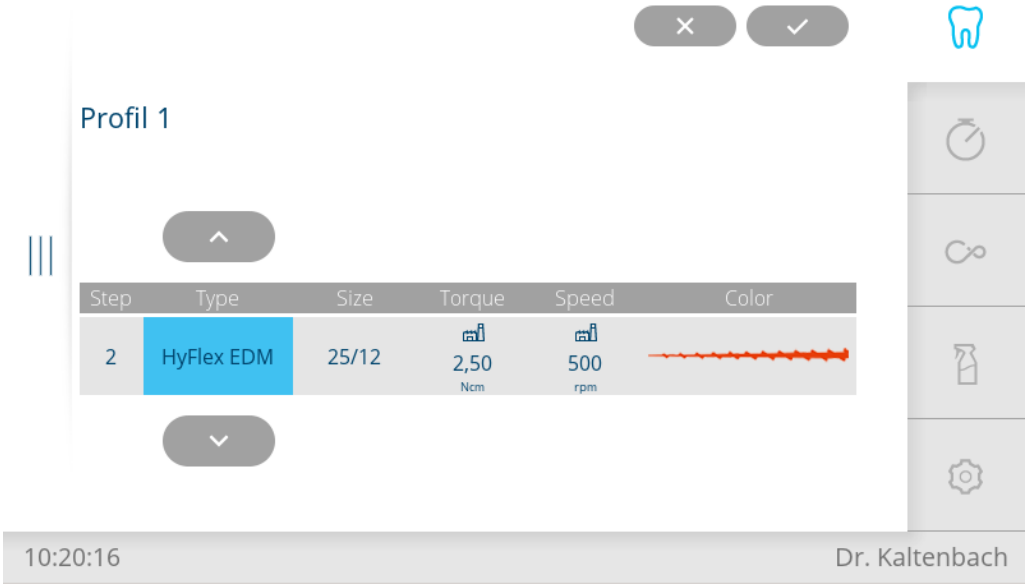
Speed and torque of the files from the file database can be changed. The data recommended by the manufacturer of the file are indicated by a factory symbol.

Defining/changing user-defined files

By selecting and adapting the data of user-defined files, the user can insert a file system that is not stored in the database into a sequence.
In order to define a user-defined file, the "FILE" entry in the second column "File system" of the file editor must be selected.

- Open the file editor, then tap file profile "Profile 1" to display the file profile selection list.
- Tap the "Pen" control element to edit the sequence.
  ⇨ The display shows file sequence "Profile 1" in editing mode.

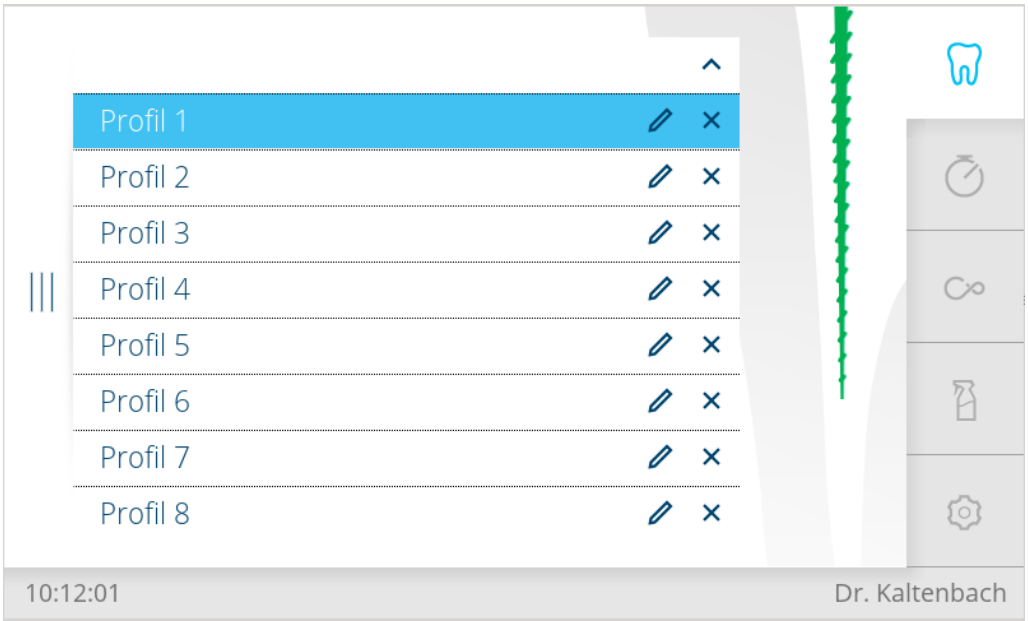
- In order to define user-defined files, tap on the column named "Type" and use the arrow keys to jump to "FILE" and make the selection



- All other data must be set manually by the user according to the information provided by the file manufacturer. For this purpose, tap on the corresponding column and use the arrow keys to select the desired data value (torque, speed, file colour).
- Tap the "Save" key to terminate the editing of file sequences.
  ⇨ The set data are saved.
- Tap the "Cancel" key to quit without saving.

Selecting endodontics file profiles

- Open the file editor, then tap file profile "Profil 1" to display the file profile selection list.



- Each file profile has up to 10 files assigned to it. Usually, these 10 files are used in sequence as determined by the indication.

Changing parameters short-term

- Unfold the "Profile" list and select a profile as desired.
- Use the "slider" to set speed and torque.
- Select the transmission factor, torque mode and step of the respective file set using the corresponding list.

Setting the speed

The speed can be varied in the range of 200 min^{-1} to 3,200 min^{-1}.

- Tap the current speed (value in rpm).
  - ⇨ The font colour switches to blue.

- Use slider to set the speed.

⇨ The speed is shown on the display and is effective immediately.

If the set speed differs from the recommended value of a file, a greyed-out factory symbol is shown.

Use the "Save" key for saving in the profiles. You can save after setting each parameter individually or after setting all parameters.

Setting the torque

The torque is limited to the set value.
Transmission factor 1:1 / 3:1 / 8:1
The torque can be set in 0.1 Ncm steps in the range from 0.2 Ncm to 6.0 Ncm.

NOTE
The ENDO warning signals are emitted once a certain percentage of the set torque value is reached.
75% slow signal beep
90% faster signal beep
100% permanent beep

- Tap Current torque (value in Ncm).
  - ⇨ Font colour switches to blue.

- Use slider to set the torque.

⇨ The torque is shown on the display and is effective immediately.

If the set torque differs from the recommended value of a file, a greyed-out factory symbol is shown.

Use the "Save" key for saving in profiles 1 to 8. You can save after setting each parameter individually or after setting all parameters.

Set torque mode

Three different torque modes are available:

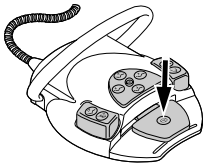
- Auto-reverse
- Torque Control only
- Autorev / Forward

▸ Unfold the "Torque mode" list and select the torque mode as desired.

⇨ Torque mode is shown on the display and is effective immediately.

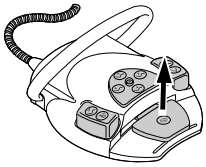
Use the "Save" key for saving in profiles 1 to 8. You can save after setting each parameter individually or after setting all parameters.

Set Autoreverse torque mode

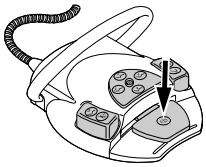


▸ Press the foot pedal.

⇨ The motor starts by rotating clockwise (unless selected otherwise). When the set torque is reached, the motor switches to counterclockwise rotation.



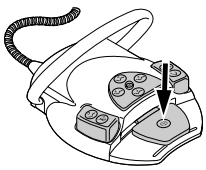
▸ To stop this, release the foot pedal.



▸ Press the foot pedal.

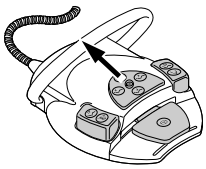
⇨ The motor rotates clockwise again.

Torque mode Torque Control only



▸ Press the foot pedal.

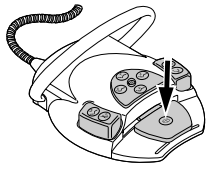
⇨ The motor starts by rotating clockwise (unless selected otherwise). The torque is limited to the set threshold. The speed reduces until it stops depending on the load. The direction of rotation is always clockwise.



▸ Push cross switch on the foot control upward in order to switch to counterclockwise rotation.
or

▸ Tap the "CCW direction of motor rotation" key.

Torque mode Autorev / Forward



- Press the foot pedal.
  - ⇨ The motor starts by rotating clockwise (unless selected otherwise). When the set torque is reached, the motor switches to counterclockwise rotation. After the pre-set time of 4 seconds, the motor automatically reverts to clockwise rotation.

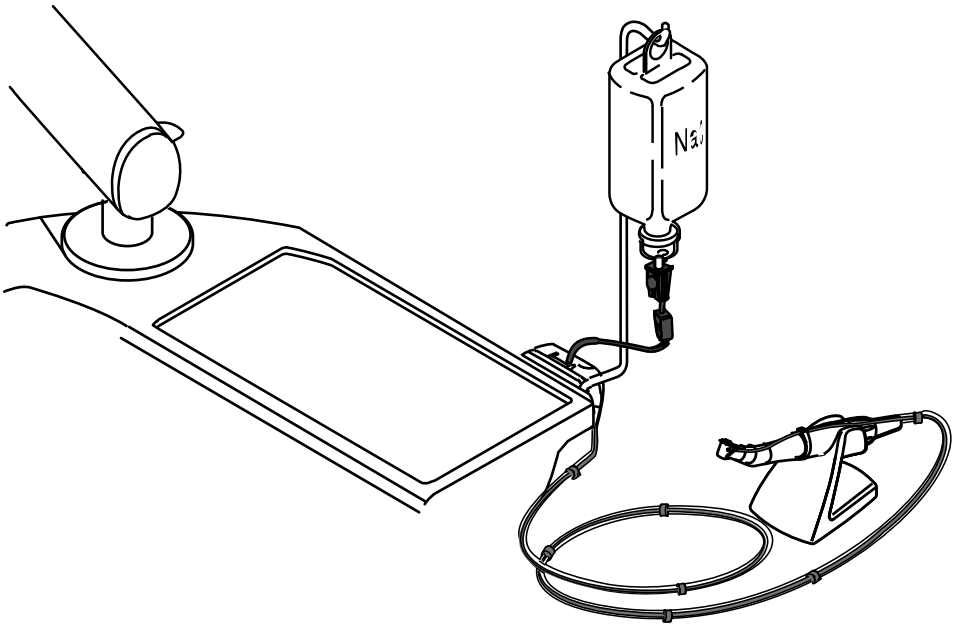
NOTE
The motor's rotational direction can be reversed with the cross switch on the footswitch in all torque modes.

4.15.6 Exiting from the treatment mode "Endodontics"

- Tap the "Cancel" key to exit from "Endodontics" as the type of treatment.
  or
- Place the INTRA LUX KL 703 LED back in the holder.

NOTE
If the unit was switched to "Endodontics" treatment mode, ENDO mode is only interrupted when the ENDO motor is replaced in the holder, and it is continued when the ENDO motor is taken out.

4.16 Using the SL600 surgical motor (optional accessory)



Technical Specifications

Motor voltage rating	22 V AC
Motor speed rating	40,000 rpm
Motor torque rating	max. 5.5 Ncm

Operating mode

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

4.16.1 Connecting and operating the pump for physiological saline

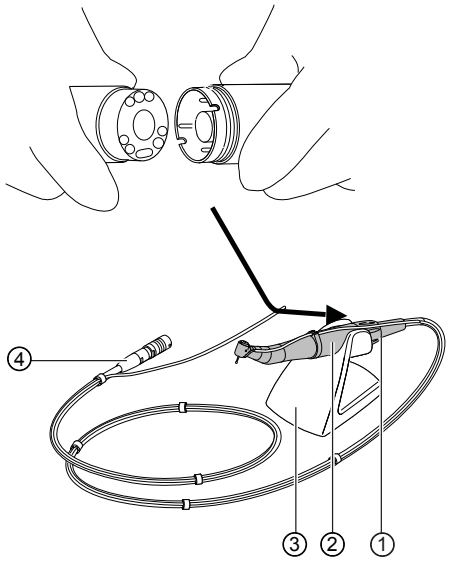
The surgical motor set includes the "Pump for physiological saline solution" assembly kit.

Also refer to:
Assembly instructions NaCl Pump assembly kit

4.16.2 Connecting the SL 600 surgery motor

NOTE
Surgery mode can only be accessed when the surgical motor is connected to the surgical connection of the dentist element.

The delivered parts are not sterile (except for the coolant hose). Before the first treatment of a patient, the surgical motor, motor cable, and the handpiece tray need to be reprocessed.



① Motor coupling
② Surgical motor
③ Instrument tray
④ Plug of motor cable

- Plug the surgical motor ② into the motor coupling ① and secure it with a union nut. Please note the separate instructions for use of the motor.
- Place the surgical motor on the handpiece tray ③.
- Insert the plug of the motor cable ④ into the connector on the device, align the marker points, and insert the plug until it snaps into place.

4.16.3 Calling-up surgery mode

Prerequisites
✓ The surgical motor is connected.
No handpiece has been taken off the holders.

- Unfold the "Treatment mode" selection list and select "Surgery".

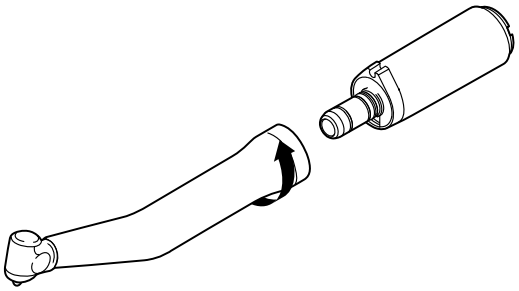
4.16.4 Mounting or pulling off the handpiece or contra-angle handpiece

NOTE
Follow the instructions for use, service instructions and installation instructions in the instrument packaging.

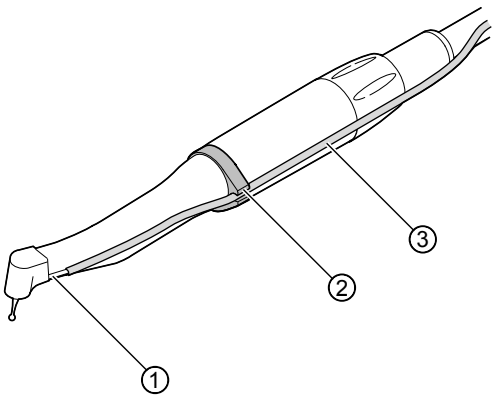
CAUTION

Removing and attaching the straight or contra-angle handpiece while the drive motor is rotating.
Damage to the catch pin.
- Never attach or remove the straight or contra-angle handpiece while the drive motor is rotating.

All straight and contra-angle handpieces with INTRAmatic connection according to DIN EN ISO 3964 can be attached.



- Place the instrument on the motor, lightly press it against the motor while turning it in the direction of the arrow until the guide stud can be heard to lock into place.
- Pull on it to make sure that the instrument is securely attached to the motor.



- Route the coolant hose ③ from the unit along the motor cable (clips) and connect it to the straight or contra-angle handpiece ①. Place the coolant hose ③ into the holding ring ② for this purpose.

Remove the straight or contra-angle handpiece

- Pull the coolant hose off the straight or contra-angle handpiece.
- Pull the instrument off the motor in axial direction.

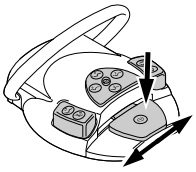
4.16.5 Starting-up the motor

⚠ CAUTION

Incorrect input values.

Risk of injury.

- The input values must be checked before each use.



- Press the foot pedal and change the speed by moving it to the side.
  Left limit stop: minimum speed
  Right limit stop: maximum speed

4.16.6 Using the surgical motor with programme steps

⚠ CAUTION

Wrong speed or excessive torque.

Patient injury or damage to instruments.

- The control panel shows the speed and torque of the instrument head rather than the motor's.
- The user should always check if the displayed transmission ratio is correct before turning on the device.

NOTE

The torque values may deviate by max. ± 10 % in the KaVo contra-angle handpieces SURGmatic S201. Larger deviations are possible with other contra-angle handpieces.

- Unfold the "Treatment mode" selection list and select "Surgery".

⇨ Calls up programme step 1.

Type of treatment Surgery - Programme steps

① Current programme step

② Activity assigned to the programme step

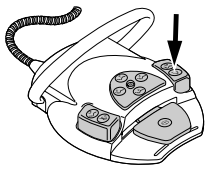
The current programme step ① and the corresponding activity are shown as symbol ②. Each programme step can be assigned to any activity by selecting the corresponding symbol.
Visualising the activity is an easy means for checking if the activity set on the

device is the same as the current treatment step. Operating errors can thus be largely prevented.
Default values have been set at the factory for the parameters, speeds, torques, transmission ratios and coolant flow rate for every activity according to application. The parameters can be changed only within a reasonable range for the specific activity. In the activity, "Free", all available values can be set.

A treatment sequence can consist of up 10 programme steps and/or activities. The treatment sequence can be designed individually through any arrangement of the activities. Navigate with the foot control within the sequence such that the device does not have to be touched again during the intervention.

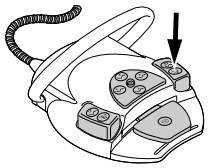
Select working step

- Press the "Next step" key to advance a step.
  or



- Briefly press the "Blown air/SP" foot-operated button.

- Press the "Previous step" key to go back a step.
  or



- Long-press the "Blown air/SP" foot switch.

Setting and saving parameters

- Selecting the working step to be changed.
  The following parameters can be changed:
- Maximum torque
- Programmed speed
- Coolant flow
- Transmission ratio
- Direction of motor rotation
- Activity
- Set the parameters as in the instrument settings.

The values shown for a programme step are default values that you can use to start work immediately. These can all be changed and thus adapted to your individual work technique. Changed values can be saved and are then available for the next use.

Recommended programming when placing multiple implants consecutively

NOTE
Default values for the respective transmission ratios can be selected with the sliders.

Activity	Step	Icon	Speed [rpm]	Torque [Ncm]	Transmis-sion ratio
Marking	1		200 – 2,000 500 (D)	5 – 20 10 (D)	16:1 27:1 20:1 (D)
Pilot drilling	2		200 – 2,000 500 (D)	5 – 20 10 (D)	16:1 27:1 20:1 (D)
Form drilling	3		200 – 2,000 500 (D)	5 – 20 10 (D)	16:1 27:1 20:1 (D)
Tapping	4		15 – 50 20 (D)	5 – 80 25 (D)	16:1 27:1 20:1 (D)

Activity	Step	Icon	Speed [rpm]	Torque [Ncm]	Transmission ratio
Placing implant	5		15 – 50 20 (D)	5 – 80 25 (D)	16:1 27:1 20:1 (D)
Setting a closure cap	6		15 – 50 20 (D)	5 – 15 8 (D)	16:1 27:1 20:1 (D)
Free use	7		300 – 40,000 40,000 (D)	0.15 – 5.5 3 (D)	1:1
			20 – 2,000	5 – 80	16:1
			15 – 2,000	5 – 80	20:1
			15 – 1,200	5 – 80	27:1

Tab. 1: Placing multiple implants consecutively

(D) = factory setting (default setup)

NOTE
The listed indications are for exemplary purposes only. To prevent unnecessary risk, observe the guideline speeds given by the manufacturer of the rotating instruments.

4.16.7 Using the surgical motor with "Free application" activity

In the activity, "Free application", all available values can be set.

NOTE
The user should always check if the displayed transmission ratio is correct before turning on the device.

Setting the parameters

The following parameters can be changed:

- Maximum torque
- Programmed speed
- Coolant flow

- Transmission ratio
- Direction of motor rotation
- Activity

Changing and saving parameters

- Use the "slider" to set speed and torque.
- Tap the "NaCl" key to select the coolant flow rate.
- Select the transmission ratio and torque mode from the respective list.
- Tap the "Direction of motor rotation" key to toggle between clockwise and counterclockwise rotation.

- Tap the "Save" key to save the parameter.

- Tap the "Cancel" key to close the menu without saving.

⇨ The changed parameters are saved to the selected parameter memory location.

Setting the torque

- Tap Current torque (value in Ncm).
  ⇨ Font colour switches to blue.

- Use slider to set the torque.

⇨ The torque is shown on the display and is effective immediately.

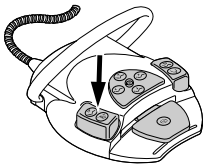
Setting the speed

- Tap the current speed (value in rpm).
  ⇨ Font colour switches to blue.

- Use slider to set the speed.

⇨ The speed is shown on the display and is effective immediately.

Setting the coolant



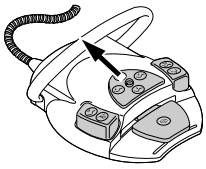
- Tap the "NaCl" key to select the coolant flow rate.
- Press the "Preselect spray" foot button to turn the coolant on or off and to adjust the coolant flow.

Setting the transmission factor

- Unfold the "Transmission ratio" list and select the transmission ratio as desired. The transmission ratio cannot be saved.

Setting the direction of motor rotation

- Tap the "Direction of motor rotation" key to toggle between clockwise and counterclockwise rotation.
  or



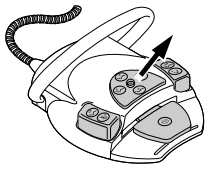
- Slide the cross switch upward.

⇨ The rotational direction of the motor is switched back and forth each time the cross switch is pushed: counterclockwise rotation - clockwise rotation. A signal beep is issued when the setting "Motor left rotation" is selected.

Setting activity

- Tap the activity symbol to change the activity of the respective step (toggle function).

4.16.8 Setting the operating light (LUX)

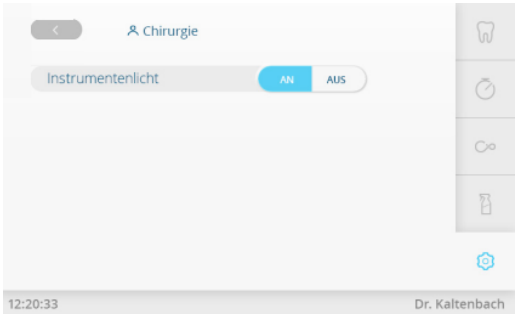


- Push the cross-switch to the right to activate the light (without the motor and pump running).

⇨ The light is on only while the cross button is being actuated (spotlight function).

NOTE
The handpiece light can be turned on as a spotlight even without a handpiece being attached. This function serves for control purposes.

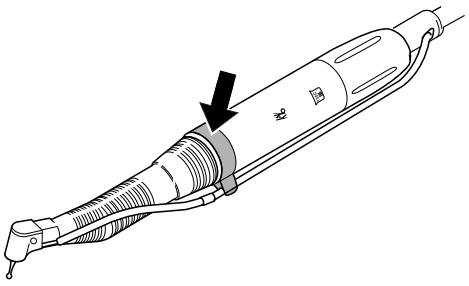
- Tap the "Settings" tab.
- Select "User" and desired dentist.
- Select "Surgery" as the "Treatment mode" from the corresponding list.



Operating light LUX

- Tap the "Operating light" selection key to switch the operating light on or off.

NOTE
The motor can only operate with the retention ring.



4.16.9 Auto-calibration

The auto-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 auto-calibration thus provides for a more accurate torque on the contra-angle handpiece.

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

⚠ 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 a message to indicate "Calibration successful".
- If you release the foot control before the display shows that the calibration was successful, press the foot control again until the display shows a message indicating that the calibration was successful.
- Tap the "Cancel" 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.
- Tap the "Cancel" key to terminate the failed calibration.

4.16.10 Exiting from surgery mode

- Tap the "Cancel" key to exit from "Surgery" as the type of treatment.

4.17 Using the pump for physiological saline (optional accessory)

NOTE
The pump for physiological saline solution can be used to use sterile saline solution instead of treatment water for cooling. The application of the pump is designed for instruments with a suitable interface for the coolant.

⚠ CAUTION

Running, open hose pump.

Risk of injury.

- Turn off the device before opening the hose pump!

⚠ CAUTION

Coolant container made of glass.

Danger of injury due to falling or shattering glass coolant container.

- Do not use glass bottles as coolant containers on the dentist part of the dental unit.

⚠ CAUTION

Danger of tipping due to the coolant containers being too heavy.

Malfunctions.

- Use coolant containers with a maximum volume of 1 litre only.
- Check the stability.

⚠ CAUTION

Use of non-sterile coolant hose with accessory.

Infection hazard.

- The sterile hose kit is only designed for single use, do not re-use.
- Dispose of the sterile hose kit in appropriate manner.
- Use a new, sterile packed coolant hose with accessory for every treatment.

NOTE

The liquid-conveying parts are not sterile! They must be sterilised before the first treatment. All parts conveying liquids must be kept sterile.

NOTE

The coolant must be selected to suit the planned application. The flow rate of the coolant is dependent on the instrument used. The user must set an adequate flow of coolant and check this.

Check the integrity of the hose set before use. If product or packaging are damaged, the product needs to be discarded.

The correct flow direction must be observed when the hose is inserted into the pump. The physiological saline solution may only be used in conjunction with NaCl-resistant instruments.

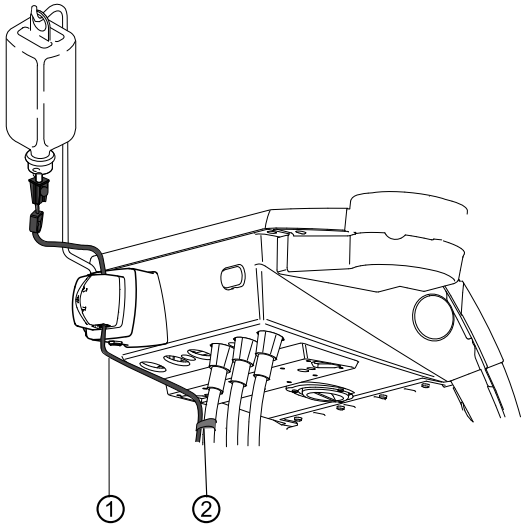
The following symbols are displayed on the sterile hose kit S 600 (10 pcs) (mat. no. 1.009.8757):

	Manufacturing date
	Adhere to the expiry date
	Lot de production
	Sterilisation method
	Do not reuse – single use only

4.17.1 Connecting the coolant

NOTE
The liquid-conveying parts are not sterile! They must be sterilised before the first treatment. All parts conveying liquids must be kept sterile.

Connect the coolant via the standard instrument hose

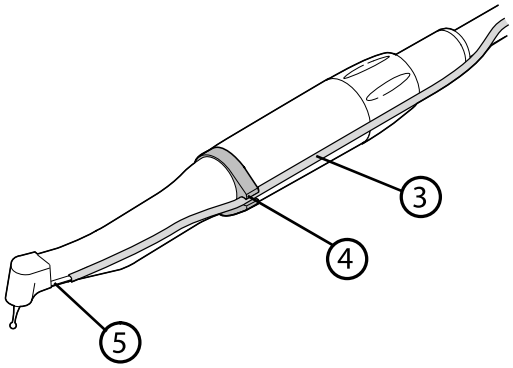


- Attach the pressure line ① to the motor hose with the enclosed hose clips ②.

NOTE
The distance from the motor to the first hose clip must be approx. 80 mm.
The enclosed hose clips fit the motor hose of the surgical motor S600 LED. Use the hose clips mat. no. 0.211.7492 for the motor hose of the INTRA LUX KL 703 LED.

Connect coolant to instrument (general)

- Route the coolant hose ③ from the unit along the motor cable (clips) and connect it to the straight or contra-angle handpiece ⑤. Insert the hose into the retention ring ④.



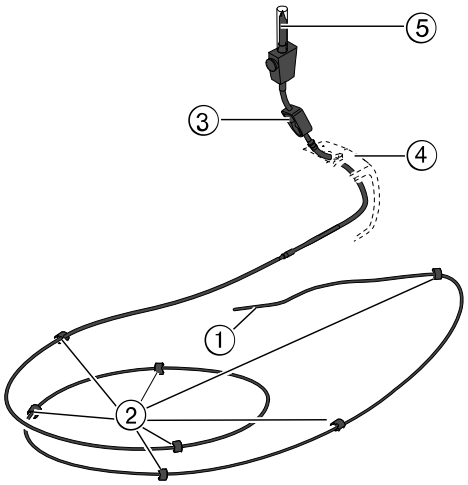
Connecting the coolant container and hose set

NOTE

The coolant must be selected to suit the planned application. The flow rate of the coolant is dependent on the instrument used. The user must set an adequate flow of coolant and check this.

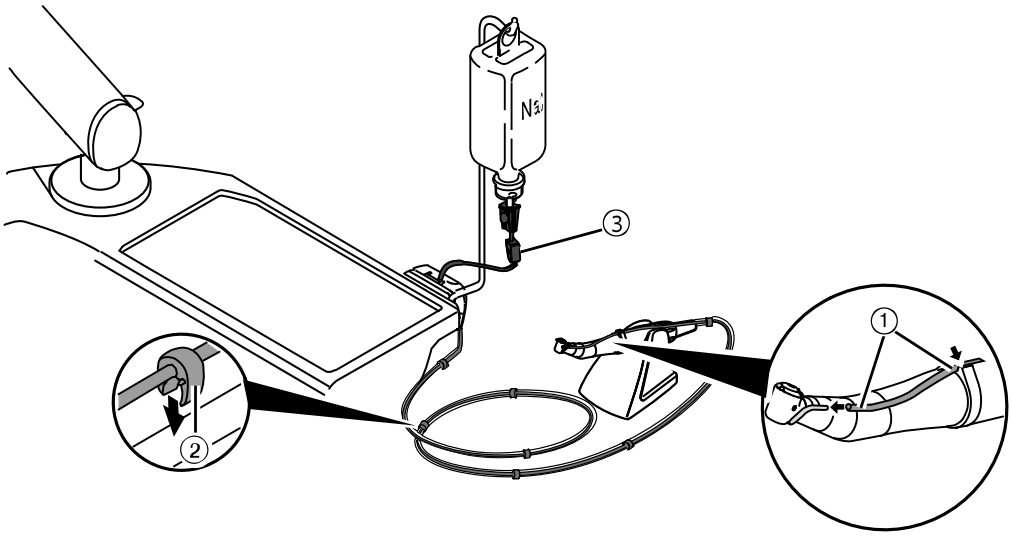
Check the integrity of the hose set before use. If product or packaging are damaged, the product needs to be discarded.

The correct flow direction must be observed when the hose is inserted into the pump. The physiological saline solution may only be used in conjunction with NaCl-resistant instruments.

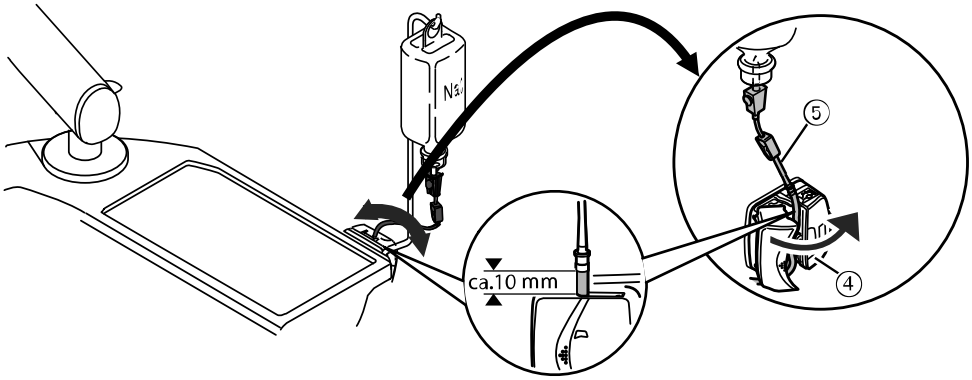


① Coolant hose
② Clip
③ Hose clamp
④ Lock
⑤ Insertion needle

- Close the hose clamp ③ of the hose set.
- Attach the coolant hose ① to the straight or contra-angle handpiece.
- Place the coolant hose ① tightly, without loops or kinks, against the outside of the motor cable and attach it in regular intervals using the enclosed clips ②.

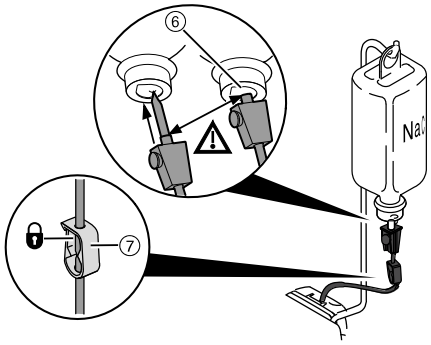


- Open the lock ④ and insert the pump hose ⑤.
- Close the lock ④.



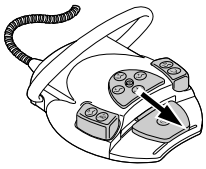
NOTE
Make sure to place the pump hose in the pump appropriately such that the pump hose does not get clamped or pinched by the lock. Route all hoses relaxed and without tension.

- Stick the puncture needle ⑥ into the coolant container and hook-in the coolant container on the bottle holder.
- Check the sealing and firm seating of the puncture needle ⑥. Prevent fluid from leaking above the device.
- If you use a glass bottle, open the ventilation on the puncture needle ⑥.
- If you use a bag, keep the ventilation on the puncture needle ⑥ closed.
- Open the hose clamp ⑦ before startup.



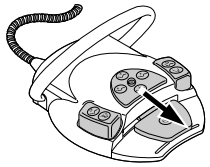
4.17.2 Turning on and adjusting the pump

Prerequisites
✓ Treatment centre is turned on. The handpiece is connected to the pump via the pressure line.



- Remove an instrument.
- Push down the cross switch of the foot control for 4 seconds until you hear a beep.
- After activation, "NaCl" cooling can be selected.

NOTE
Using a new hose, it may take up to approx. 10 seconds for the coolant to exit on the handpiece, depending on the feed rate. The pump does not have any back suction.

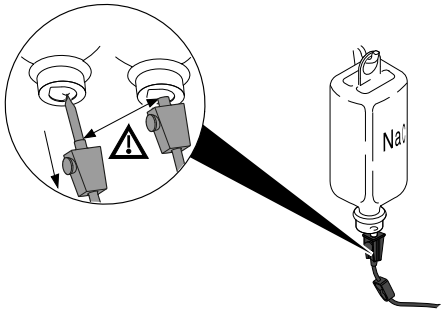


- Move the cross switch down for four seconds until the signal sounds to turn off the saline pump.

4.17.3 Changing the coolant container

The coolant container can be changed as follows:

- Close the hose clamp.



- Pull the hose and puncture needle out of the empty coolant container.
- Replace the empty coolant container by a full coolant container.

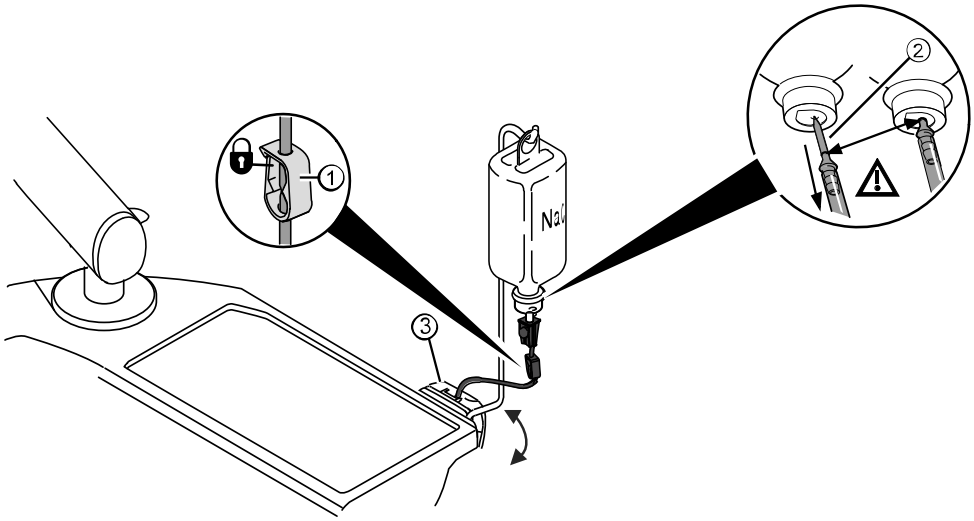
4.17.4 After treatment: disposal

⚠ CAUTION

Use of non-sterile coolant hose with accessory.

Infection hazard.

- The sterile hose kit is only designed for single use, do not re-use.
- Dispose of the sterile hose kit in appropriate manner.
- Use a new, sterile packed coolant hose with accessory for every treatment.



- Close the hose clamp ①.
- Pull the puncture needle ② out of the coolant container.
- Open the lock ③ and remove the hose.
- Remove the hose set from the unit and discard it.

4.18 Using the USB interface

⚠ CAUTION

Electrical power.

Electrical shock.

- Set up the external PC outside of the patient environment keeping a minimum distance of 1.5 m.
- Connect the PC and equipment connected to the PC in accordance with IEC 60601-1 / 60950.

⚠ CAUTION

Electrical power.

Electrical shock from incorrectly connecting a non-medical system to the USB interfaces of the device.

- Connect any IT device to the medical system in accordance with IEC 60601-1.
- Use USB devices with no additional power supply (USB-powered) only.
- Applied parts connected to the USB interface of the dentist element must comply with the requisite insulation.
- USB-powered devices failing to meet the requisite insulation for applied parts must be placed appropriately such that direct contact of the USB device and the patient is excluded.
- It is not permissible to touch USB-powered devices failing to meet the requisite insulation for applied parts and the patient at the same time.

The treatment centre may be fitted with up to three USB ports. Camera interfaces are situated on the underside of the dentist element (TM-table / T-table / Cart) or in the dentist element (S-table). Only the cameras approved/enclosed in the delivery by KaVo may be connected to these interfaces. The USB port in the back is connected directly to the back-of-the-head PC (in the presence of the corresponding wiring). USB devices meeting the specifications listed above can be connected to this interface. To use USB devices that have been connected, it may be necessary to install a suitable driver software on the back-of-the-head PC.

Getting the USB ports ready for use

- To run an USB device, connect the USB port in the terminal box of the treatment centre to an external back-of-the-head PC. Use one or maximally two USB extension cables 5 m (mat. no. 1.004.6953) as needed.
- USB devices connected to the dentist element must meet the USB standards, USB 1.0, 1.1 or 2.0, and consume max. 500 mA of electrical power.

4.19 Using the camera

Also refer to:
Instructions for use ERGOcam One

Also refer to:
Instructions for use DIAGNOcam 2170 U

4.20 Service table 1568 (optional accessory)

CAUTION

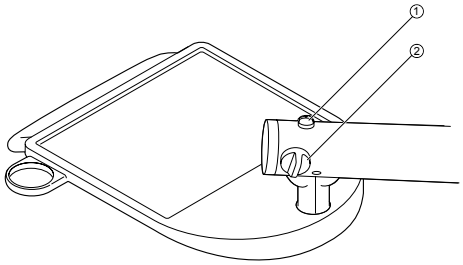
Over-travel beyond swivel range.
Material damage.
- Comply with rotary knob swivel range of 180°.

CAUTION

Exceeding the load limits.
Damage to the service table.
- Comply with maximum load limits.

The service table 1568 can be locked in 4 snap-in positions using the knob ①. This locks only the downward movement to allow for higher loads.

In the absence of the locking mechanism, the maximum load of the service table is 2 kg. The presence of the locking mechanism increases the maximum load to 5 kg.



- Rotate the knob ① in counterclockwise direction to lock the service table in place.
- Rotate the knob ① in clockwise direction to unlock the service table.
- Use knob ② to adjust the brake for vertical motion.

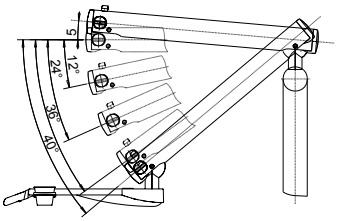
4.20.1 Moving the service table

⚠ CAUTION

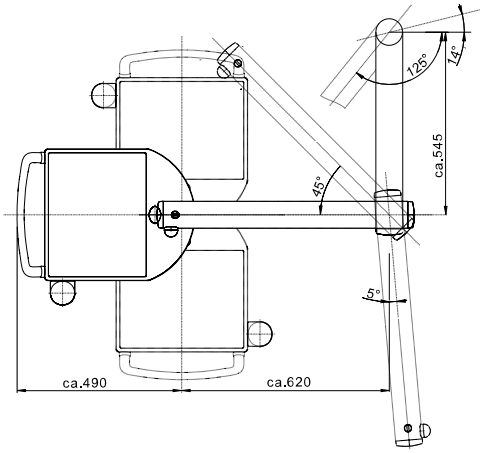
Collision with people or furnishings.

Collisions could be caused by the required degrees of freedom and the large swivel range.

- Always move or swivel the service table with great care.



Swing ranges

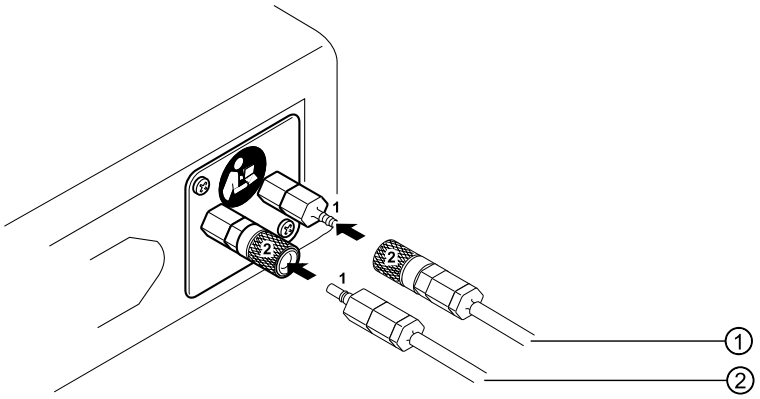


Dimensions and swing ranges (in mm)

4.21 Third-party device connector

The third-party device connector allows dental devices from third-party manufacturers to be used on the KaVo treatment centre.

- Connect the water ① and air ② supply lines to the couplings.



Media connectors

Air inlet pressure	4.75 ± 0.25 bar
Air consumption	max. 50 Nl/min
Water inlet pressure	2.5 ± 0.1 bar
Water inflow	100 ml/min

Electrical connectors

Line power	Max 1 A (see label on additional power socket), fits power cord with IEC device connector E

4.22 Using the water bottle

⚠ CAUTION

Insufficient cooling due to lack of patient water.

A lack of water or the water bottle not being inserted can lead to personal injury.

- Before use, check for the presence of the water bottle and its content.

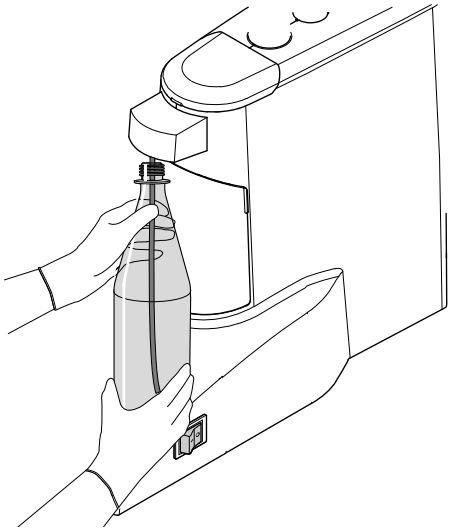
CAUTION

Damage caused by defective water bottle.
Malfunctions or failures from a leaky water bottle.

- Do not wash the water bottle in a dish washer, and do not rinse it with water hotter than 50 °C.
- Do not use the water bottle if it is scratched, deformed or discoloured.
- Note the maximum useful life of the water bottle on the label.

Water bottle complete: (**Mat. no. 0.710.4151**)

- Slowly turn the water bottle counterclockwise to take it off.
  - ⇨ This allows the over-pressure to be released slowly from the water bottle.



NOTE

The water in the water bottle needs to be changed at least once daily. In order to ensure the efficiency of the measures, KaVo urgently recommends reprocessing the water with KaVo OXYGENAL 6. Also refer to: Care instructions of the treatment centre.

5 Reprocessing methods DIN EN ISO 17664

NOTE
The reprocessing methods are specified in the Care instructions.

Please note also the corresponding hygiene video on the KaVo website. Please use the QR code or the following link:
https://www.kavo.com/hygiene-easy-way

6 Additional equipment and assembly kits

General information concerning the connection of additional equipment:
The following products can be combined with the KaVo treatment centre.
Moreover, the KaVo treatment centres, in part, provide standardised interfaces.
These can be used freely (e.g. MULTIflex for air lines or the ISO 3964 standard-compliant INTRA coupling for contra-angle handpieces).
Accessories that are approved for these open interfaces and are sold, according to intended use, with the KaVo connecting parameters, are permissible.

NOTE
Connecting IT equipment to the medical electrical system make sure to comply with EN 60601-1.

NOTE
The USB interfaces of the system may only be connected to IT devices approved by KaVo.

NOTE
Only accessories licensed for use with this unit may be used.

NOTE
Instructions for use, servicing and installation of additional equipment and kits, e.g. lights, etc., are enclosed in the respective packaging.

6.1 Equipment

Name	Description
Monitor support arm	The monitor holder is either affixed to the lamp mount pole or a Centro 1540.
Monitor	KaVo Screen One and KaVo Screen HD
Service table 1568	It can be mounted on a device stand (cart version). Service table accessories: ▪ Instrument tray ▪ Cup holder
CENTRO	Central organisation and support system directly on the treatment centre.
KaVoLUX 540 LED	Operating light
Foot control	Cable-connected or wireless foot control for hands-free and hygienic operation of the treatment centre
Connector for third-party equipment	The third-party device connector allows dental devices from third-party manufacturers to be used on the KaVo treatment centre.
Additional device adapter	Adapter on the light mounting post for connection of third-party devices.

6.2 Assistant element

Name	Description
triple function handpiece	The assistant element can be equipped with a three function handpiece.
Second saliva ejector	The second saliva ejector kit is mounted on the sieve housing that is part of the basic configuration.

Name	Description
Satelec Mini LED	The assistant element can be equipped with Satelec Mini LED.

6.3 Dentist element

Description	Description
Three function and multifunctional handpiece	The dentist element can be equipped with the three function handpiece and the multifunctional handpiece.
Physiological saline solution	For aseptic bur cooling during surgical work, an assembly kit for physiological saline is available.
Surgical motor	For surgical work.
Sterile irrigation set S600	Accessories for the physiological saline solution and surgical motor.
Coupling for dental turbines	MULTIflex LED coupling 465 LED
Motors	INTRA LUX Motor KL 703 LED (brushless motor with light) INTRA LUX S600 LED
Light polymerisation device	The dentist element can be equipped with Satelec Mini LED.
ultrasonic scaler PiezoLED	Handpiece for the removal of dental calculus with the tip sets, Scaler / Paro / Endo / Prep.
Pneumatic brakes	The dentist element is easy to move.
6-outlet handpiece holder	Optional extension of the integrated handpiece holder.
Endodontics function	Drive for endodontic treatment.
ERGOcam One	Intraoral camera for documentation and patient communication
USB devices	Connection of USB devices to the dentist element
DIAGNOcam 2170 U	Camera for X-ray-free caries diagnosis.
DIAGNOcam Vision Full HD	Caries diagnostic device
CONEXIO	Patient communication system allowing access to all clinically relevant date of the patient on the dentist element of the treatment centre.
KaVo CONNECTbase	Patient communication system

6.4 Patient chair

Name	Description
Comfort head cushion	The headrests can be fitted with the comfort head cushion.

NOTE

Any attachment of products without the approval of KaVo or in the absence of a standardised interface is prohibited. If this is done regardless, the CE conformity, and thus the proof of the conformity of the product, may be voided. The manufacturer can then no longer guarantee the operability and safety of the product. The manufactured guarantee of the original medical product is voided.
As a matter of rule, the owner/person making a change shall be liable for the changes made and all ensuing effects on the originally CE-marked medical product and all ramifications the same may have on the user or patients.
KaVo recommends to make no changes without prior consultation.

7 Safety check - Test instructions

7.1 Introduction

7.1.1 General notes

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:
before commissioning
upon maintenance
during inspection and servicing
after repair
on the occasion of repeat 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!

7.1.2 Notes for medical electrical systems

NOTE
An ME System is the combination of individual devices (as defined by the manufacturer) that must meet the following conditions:
at least one of the 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 define the necessary measuring parameters and measuring procedures as required 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 network or which can be connected to or separated from the power supply network without the aid of a tool, must be checked individually. Moreover, the ME system must be checked as one unit to avoid any "aging" of individual devices leading to unacceptable values in sum.

NOTE
An ME system that is connected to the supply network 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 supply network by means of an insulating 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 is 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.

7.1.3 Components of the safety check

Visual inspection (inspection by examination)

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

Measurements

- Measurement of the protective earth resistance in accordance with IEC 62353
- Measurement of the equipment leakage current - Alternative measuring method in accordance with IEC 62353
- Measurement of the applied part 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.

7.1.4 Testing intervals

Testing interval for type IIa devices is every 2 years

7.1.5 Notes on the test method in accordance with IEC 62353

- Protection class 1
- Type BF
- The device is permanently installed / threshold: PE conductor test < 0.3 Ω
- Measurement of the equipment leakage current - alternative measurement / threshold: < 10 mA*
- Measurement of applied part leakage current - alternative measurement / threshold: < 5mA
  *The limit of the equipment leakage current corresponds to the value defined in IEC 60601 (DIN EN 60601), taking comment 2 from table 2 into consideration.

7.1.6 Notes on recurrent testing

NOTE
The value determined in these tests must be documented and evaluated together with the measuring process. The measured values must not exceed the specified values.

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

7.2 Instructions for the safety check

7.2.1 Preparatory measures to be undertaken on the device

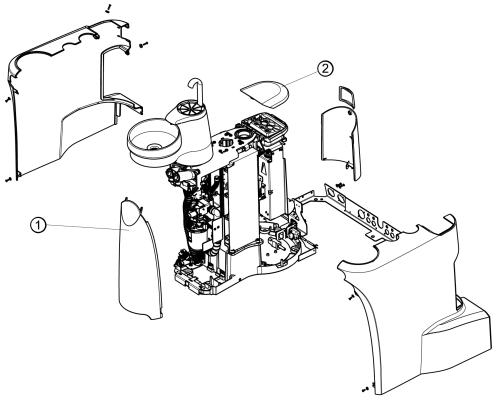
⚠ WARNING

Electrical power.

Death or injury from electric shock.

- Before servicing, pull the mains plug out of the socket or completely disconnect the device from the power to de-energise it!
- After conversion, check the electrical safety in accordance with DIN EN 62353 [IEC 62353].

- Turn off the main switch before any maintenance work.
- Take off the cover ② proceeding in upward direction.
- Release the rear cover ① below and remove it.
- Unscrew the fastening screws (see: arrows) of the cladding and take off the covers.



7.2.2 Visual inspection (inspection by examination)

- Check the following items in advance:
  Has the configuration of the ME device or the ME system been changed since the last inspection?
- Has the change been documented and approved (test documentation of safety check)?
- Are there any indications of insufficient safety?

Check the ratings of fuses that are accessible from outside

NOTE

A check of whether or not the main fuse on the mains socket corresponds to the rated values is no longer included in DIN EN 62353:2015 [IEC 62353:2015].

Visual inspection and appraisal of the medical device and accessories

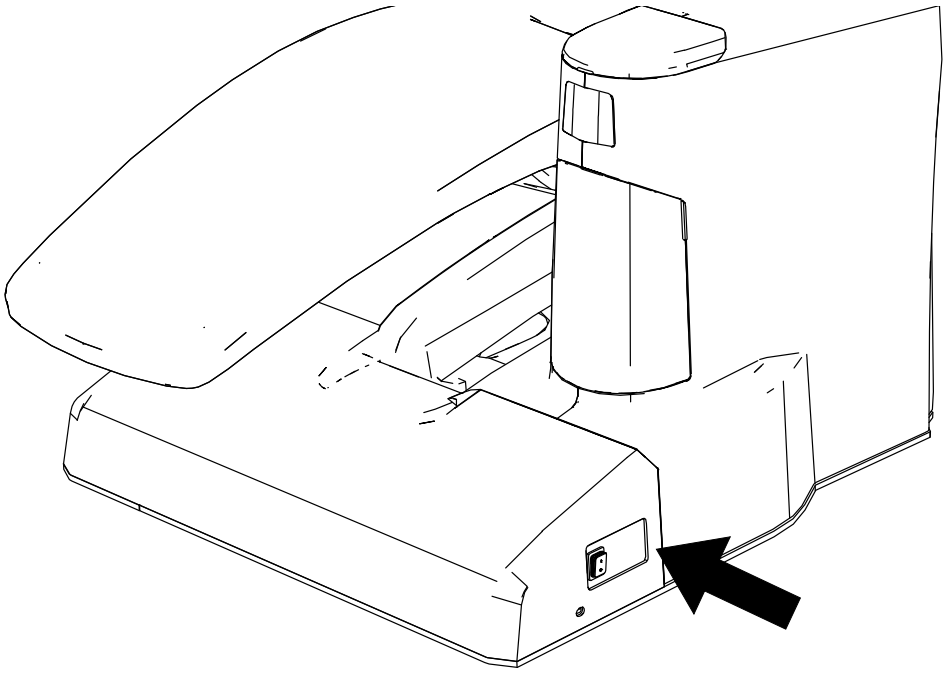
The following list is for exemplary purposes and makes no claim of being complete.

The following needs to be checked:

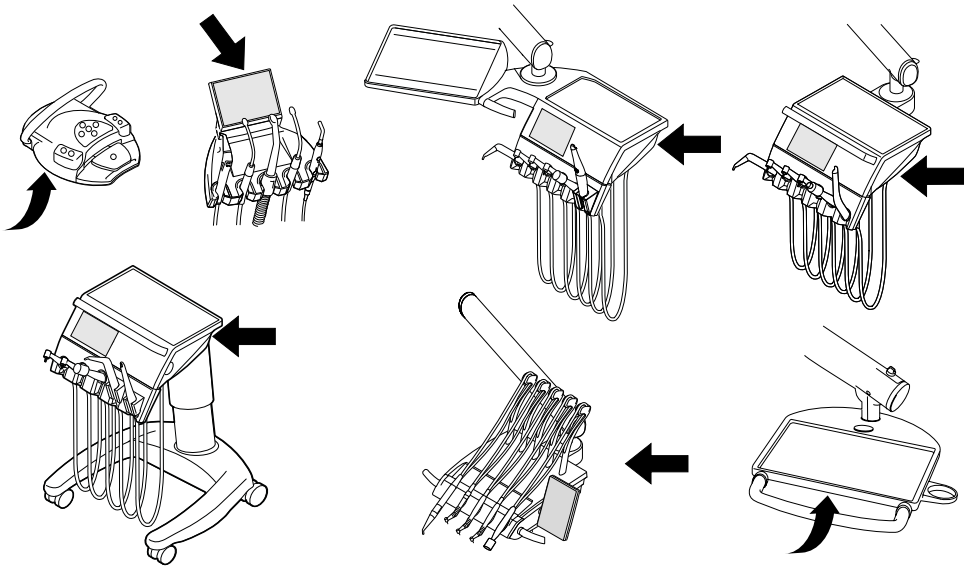
- Stability of the device
- Mechanical integrity of the safety switches.
- Absence of damage to the cladding or casing (cracks, breakage)
- Functioning of the carrier systems on dentist and assistant side, operating light, and display (brakes, height adjustment, etc.)
- Condition of the instrument hoses and suction hoses
- Condition of all installed applied parts
- Condition of the user interfaces
- Condition of the threads for the fitting of tips to the ultrasound scaler handpiece
- Condition of the operating light
- Absence of leaks on the body of the unit
- Condition of the power connection provided by the customer
- Condition of air and water connections
- Absence of damage on the sight window and the casing of the camera ERGOcam
- Expiry date of the water bottle inserted in the BS water bottle assembly kit not exceeded

Check of the legibility and completeness of the safety-related markings

- 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.



Mounting site for the rating pate on the device base



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 a safe operating condition is restored.

7.2.3 Measurements

⚠ WARNING

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

Death or injury from electric shock.

- 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.

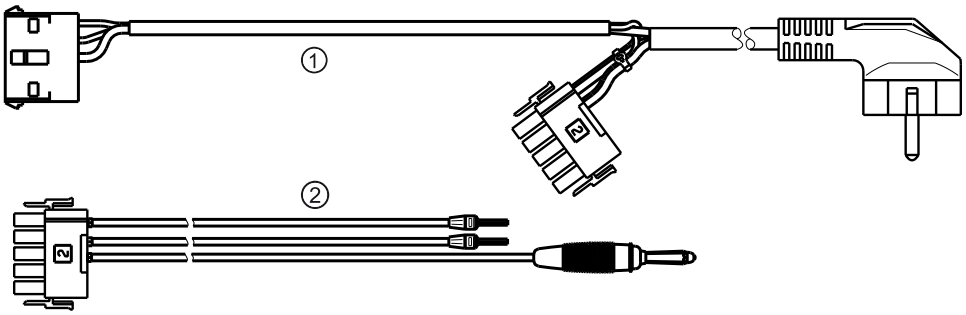
NOTE
The safety tester must comply with the requirements defined in DIN EN 62353 [IEC 62353], Annex C.

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.

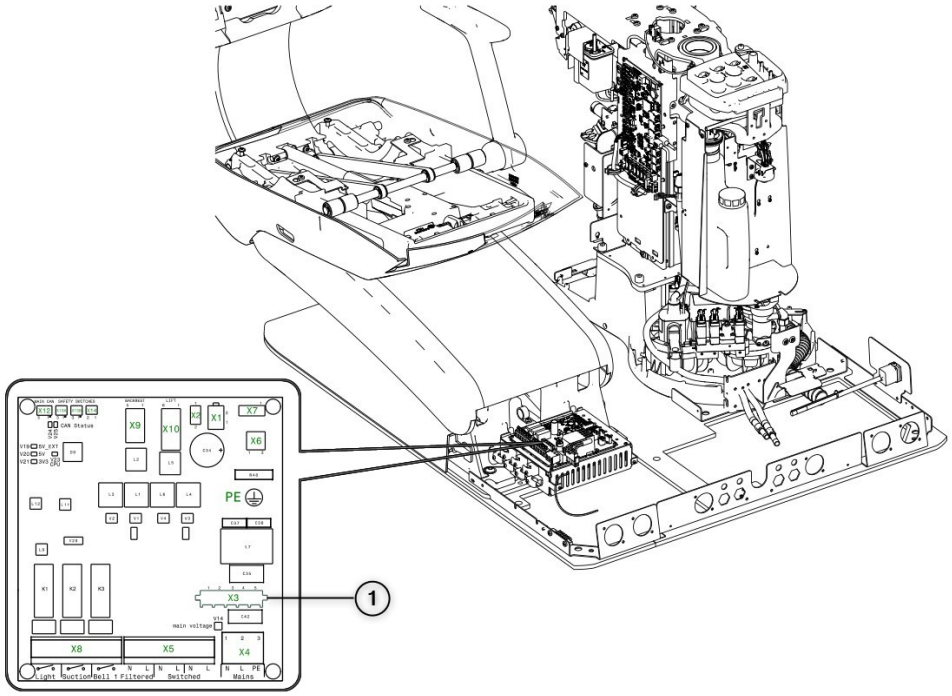
NOTE
Connection cables such as data cables and cables for the functional earth could simulate protective conductor connections. These types of supplementary but unintentional protective earth connections could lead to erroneous measurements.

NOTE
The following measuring aid can be ordered: KaVo measuring cable (mat. no. 0.411.8811)



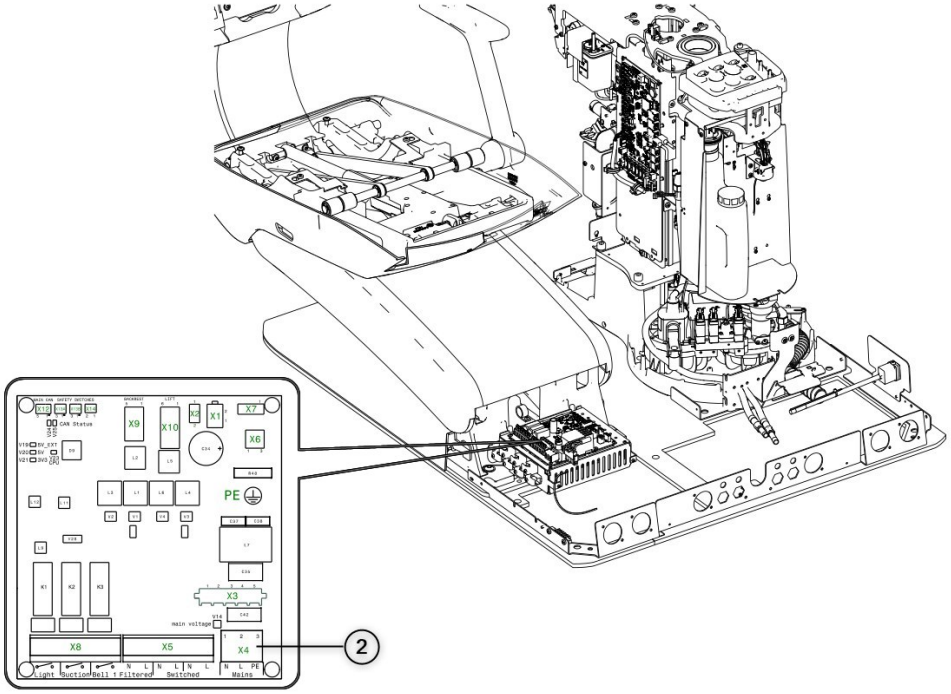
Using the measuring cable ① the unit is disconnected from the mains supply and connection of the treatment centre to the safety tester is enabled. Hence, the customer-provided power supply cord L & N on the power input board need not be disconnected. The adapter cable ② is included in the delivery of the KaVo measuring cable and is required for older treatment centres that are not equipped with an X2 connector.

Connecting the safety tester to KaVo measuring cables to the treatment centre



- Unplug plug X3 ① on PCBA grid/chair and connect it to the matching plug X2 of the KaVo measuring cable (mat.-no. 0.411.8811).
- Plug the second plug X2 of the KaVo measuring cable into the unit PCB grid/chair X3 ①.
- Insert the protective contact plug of the KaVo measuring cable into the safety tester.

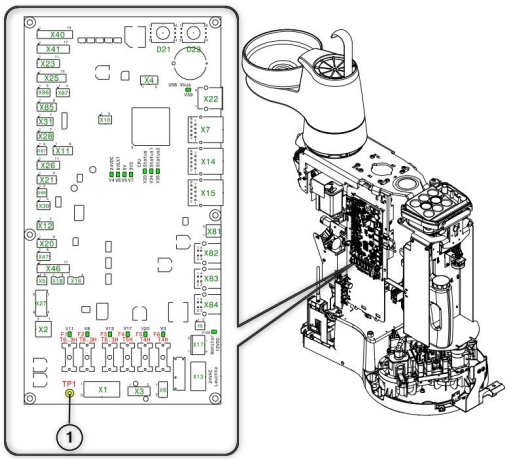
Connecting the safety tester without the KaVo measuring cable to the treatment centre.



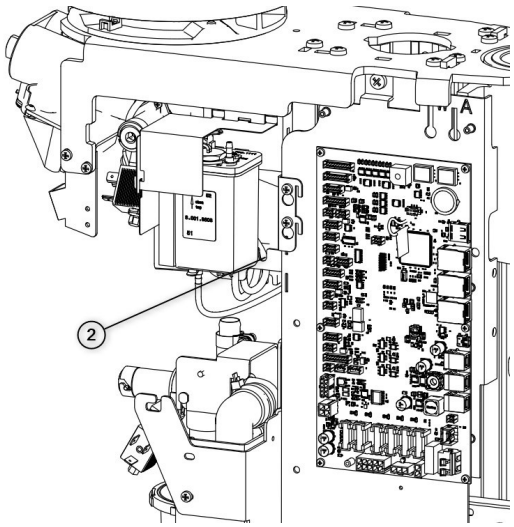
- Switch L + N of the on-site power supply cord to be voltage-free.
- Disconnect L + N on the mains terminals.
- Connect the safety tester directly to terminals mains and protective earth conductor terminal X4 ②.

NOTE
The main switch of the ME device / ME system must be turned on during the measurement.

Connect the applied parts [AP] to the safety tester

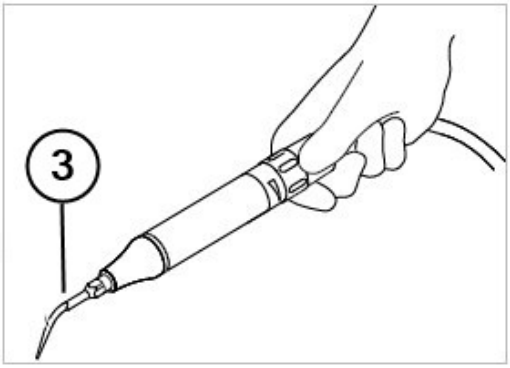


- Connect TP1 of the Unit PCBA ① to the safety tester.
- Connect the safety tester to additional measuring points AP X.



- Connect TP2 measuring socket ② to the safety tester.

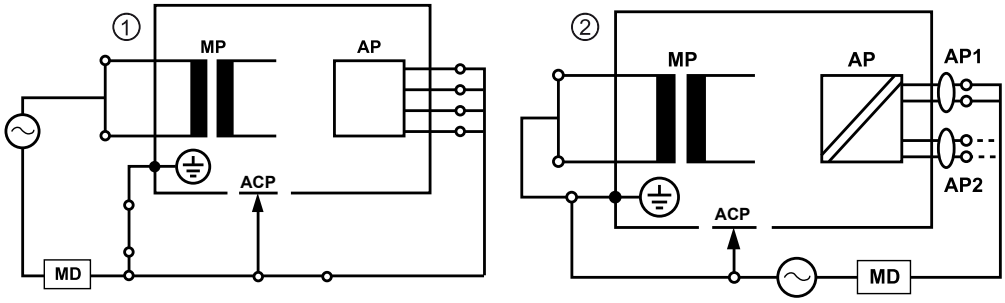
NOTE
If a light polymerisation unit is installed on the assistant element, the light polymerisation unit must be connected to the safety tester as an applied part.



- Connect the ultrasonic scaler tip ③ to the safety tester.

NOTE
Additional measuring points AP X must be taken into consideration in the presence of accessories: e.g. accessories such as PIEZO ultrasonic scaler, etc.
Also refer to:
Annex - Additional measuring points

Connecting accessible conductive parts [ACP] to protective connector



ACP = accessible conductive parts

NOTE
Additional measuring points ACP X must be taken into consideration in the presence of accessories.

ACPs on the treatment centre

No ACPs need to be connected to the protective conductor (PE) during the measurement on the treatment centre, as all relevant parts are connected to the protective conductor (PE) at the factory and are included in the test.

ACPs on treatment lamps

No ACPs need to be connected to the operating lights during the measurement with protective conductor (PE) because all relevant parts have already been connected to the protective conductor (PE) at the factory and are included in the test.

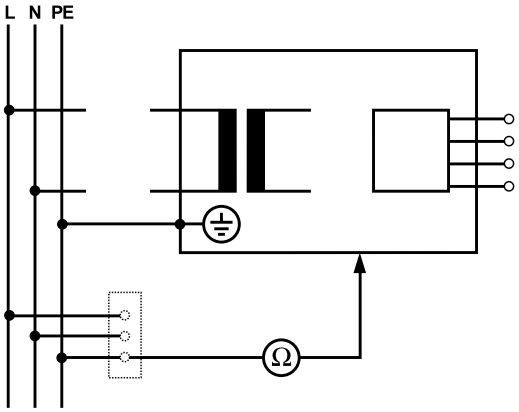
Measuring the protective earth [PE] resistance

Threshold: < 0.3 Ω (maximum value!)

NOTE
The integrity of the power supply cable, in particular the protective earth wire of the power cable must be ensured. As this is a fixed installation, the evaluation can be conducted by means of a visual inspection. If damage is determined, the further procedure to be taken is specified in the general instructions.

NOTE
In this measurement the resistance of the protective earth connection of the supply network can be taken into consideration.

NOTE
If applicable: all removable supply connection lines, which are kept handy for possible use, should be taken into consideration and the respective PE should be measured.



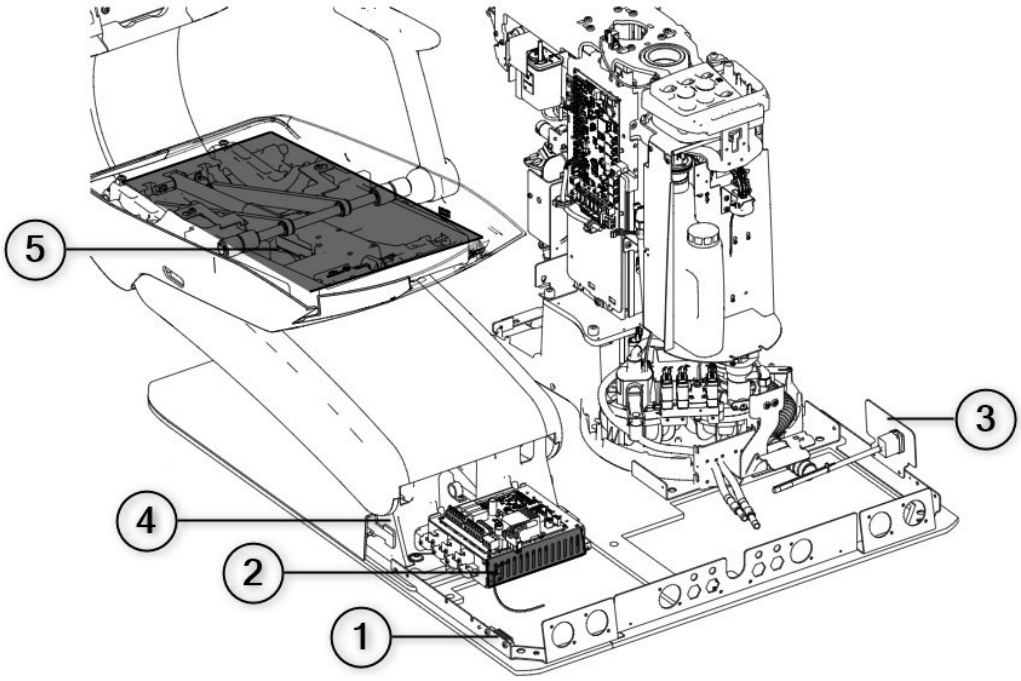
Protective earth measurement

The protective earth resistance must be measured at the following parts of the device:

- Treatment centre
- Operating light
- Optional extras

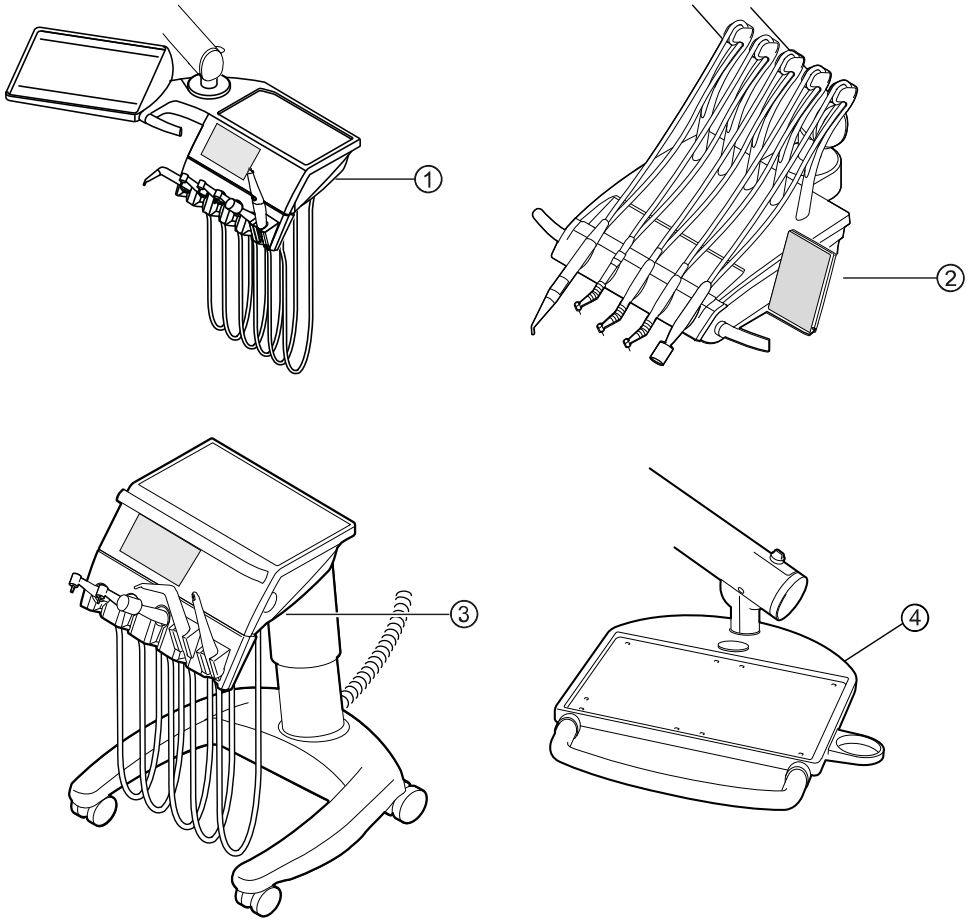
NOTE
Additional measuring points SL X need to be taken into consideration in the presence of accessories: e.g. accessories such as connection to external devices, camera module of the patient communication system, etc.

Scanning the treatment centre with the test tip



Scan the device body and chair at least at the following spots:

① PE terminal
② Housing of switching power supply
③ Main switch metal sheet
④ Base plate of chair base
⑤ Top part of the chair

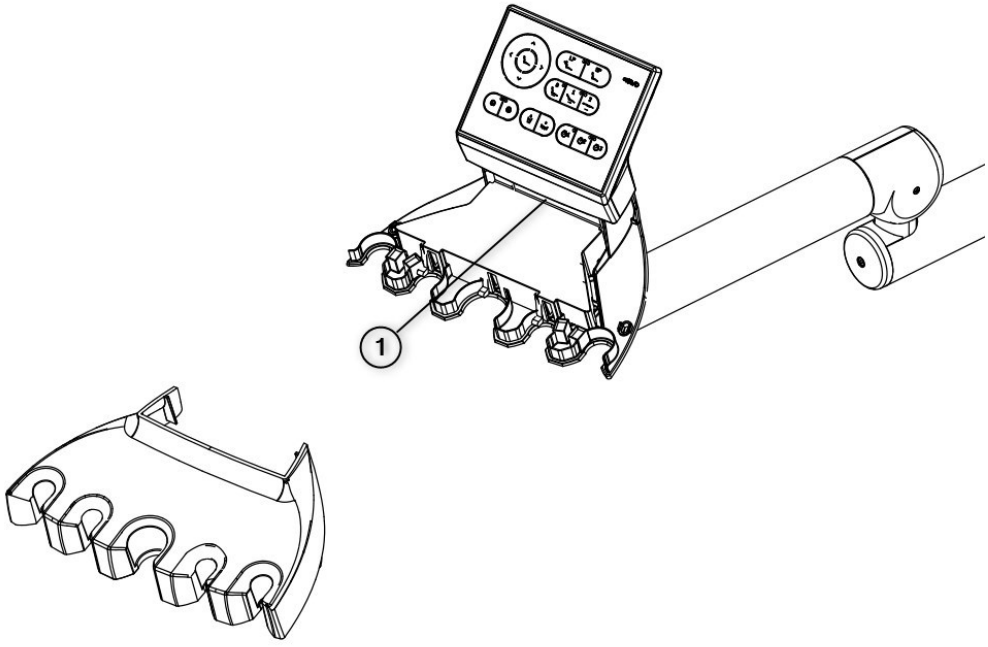


① Dentist element T: Fixing screw on the underside of the dentist element

② Dentist element S: Fixing screw on the underside of the dentist element

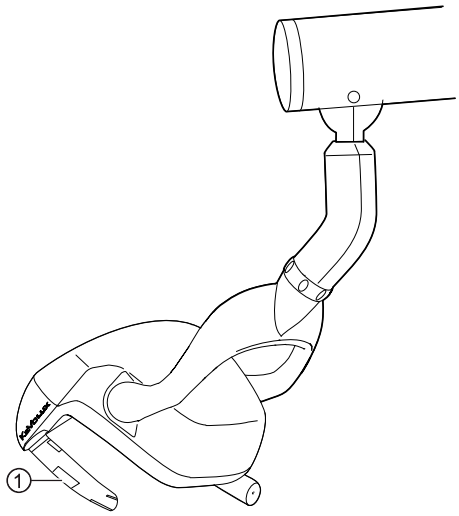
③ Dentist element Cart: table bottom

④ Assistant element: Fastening screw on the bottom of the service table



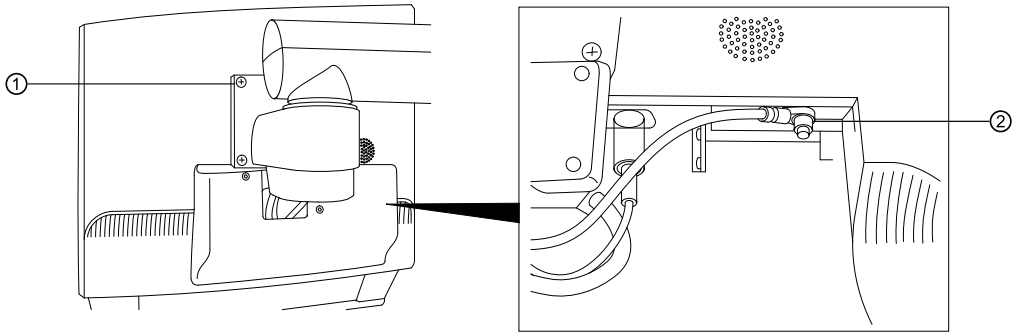
- Remove holder of the assistant element.
- Scan PE connector ① at the screw.

Scanning the operating light with the test tip



① Fastening screw of the handle support when the gripping sleeve has been removed

Scanning the monitor with the test tip

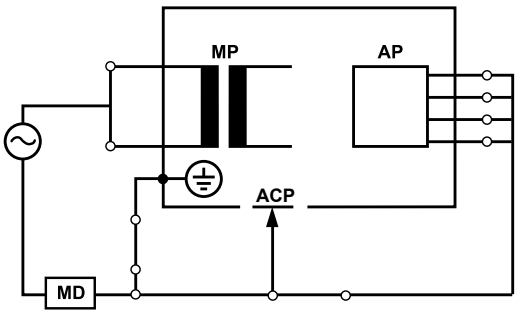


① Either scan measuring point ① with the test tip.

② Or scan measuring point ② after removing the display cover.

Measuring the protective earth resistance of accessories

Equipment leakage current - Alternative measuring method



Protection class 1

Threshold: < 10 mA (maximum value!)

⚠ WARNING

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

Death or injury from electric shock.

- Conduct test for leakage current in devices of Protection Class 1 only after the protective earth test has been passed.

⚠ WARNING

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

Death or injury from electric shock.

- 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

In the testing of ME devices with several applied parts, the parts must be connected in succession. The measured results must be evaluated using the threshold values. Applied parts, which are not included in the measurement, remain open.

NOTE

An additional measurement of the leakage current from type B applied parts need only be carried out if this is specified by the manufacturer (see accompanying documents).

NOTE

A separate measurement is not usually required for type B applied parts. The applied parts are connected to the casing (see diagram) and included in the measurement of the leakage current of the casing, whereby the same permissible values are applicable.

7.2.4 Functional tests

The following conditions must be met in all function tests:

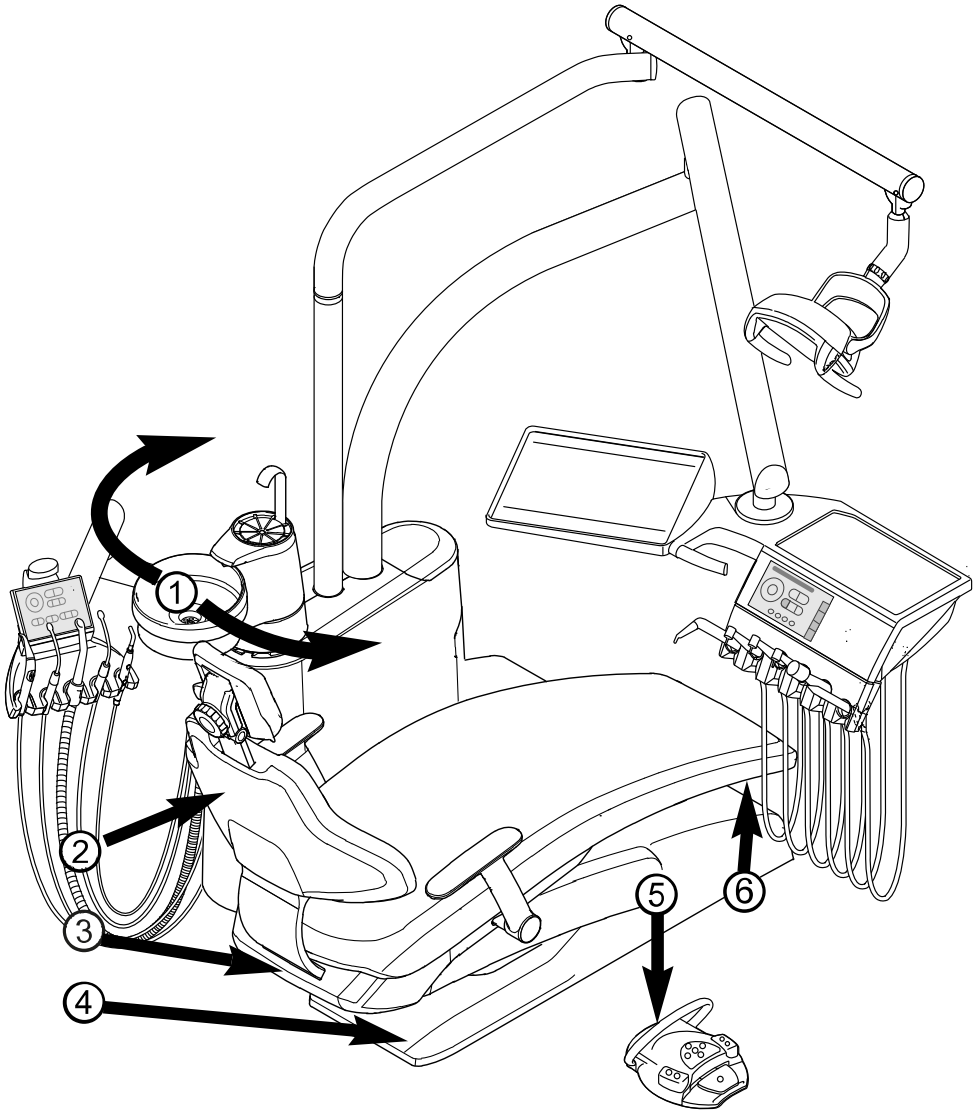
- The basic function of the treatment centre must be guaranteed.
- The treatment centre must be fit for use.
- There must be no irregularities, noise or abrasion, etc., present.

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

- Functional test of the safety circuits (see diagram below)
- Functioning of the master switch of the device
- Functioning of the displays
- Functional test of the holder switch of the dentist and assistant element
- Functional test of the 3F/MF handpiece – seating of the cannula
- Functional test of the operating light
- Functional test of the suction hoses
- Functional test of the foot control
- Function of the chair:
  - Travel on all axes

- Test of the limit switches

▪ Functional test ...



Safety shutdowns

① Patient element (optional) pivoted over dental chair
② Backrest (2 switches)
③ Cladding of top part of the chair (2 switches)
④ Kickplate/VACUstopp (2 switches)
⑤ Stirrup on foot control
⑥ Bench

7.2.5 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 tester
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 results of the measurements
Data, type and results of the functional tests
Measuring/test equipment including SN/test equipment number and calibration period
Final assessment
Date and signature of the tester

There is a copy of a test report template at the end of the chapter on Safety Checks. KaVo recommends to use 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 associated with 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 was determined and rectified. But the defect must be recorded in the protocol.

7.3 Test protocol for the safety check

Test Protocol - Safety Check

(Test of safety and function according to §7 section 3 Medical Device Operation Ordinance)

KAVO Dental Excellence

Operator	**Testing organisation**
	Name of the test engineer

☐ Test before startup
☐ Recurrent test
☐ Test after repair

Date of testing:

Manufacturer:	
Equipment:	
Serial number:	
ID no.:	

next recurrent test required in

6	12	18	24	months

Test according to:	**IEC 62353 : 2014**		
Protection class:	**I**	**II**	
Power connection: *1	**PIE** / **NPS**	**DPS**	
Applied part, type:	**B**	**BF**	

Measuring device used:

Make:	
Type:	
Ser. no.:	
Calibration date	

Test:

	Limit	Measured value	Passes test: yes	Passes test: no
Visual inspection:			☐	☐
Measurements:				
Protective earth resistance	**0,3 Ω**	**Ω**	☐	☐
Insulation resistance	optional: Measurement is not to be performed		☐	☐
Equipment leakage current - Alternative measuring method *2	**10 mA**	**mA**	☐	☐
Applied part leakage current - Alternative measuring method	**5 mA**	**mA**	☐	☐
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 components/de-commissioning recommended.

Date / signature

*1 PIE Permanently installed equipment
NPS Non-DETACHABLE POWER SUPPLY CORD
DPS DETACHABLE POWER SUPPLY CORD

*2 The limit of the equipment leakage current corresponds to the value defined in IEC 60601 (DIN EN 60601), taking comment 2 from table 2 into consideration

Date this test protocol was created: 2021-07-28

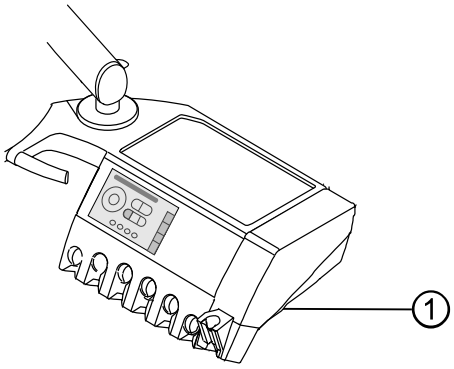
7.4 Annex - Additional measuring points

NOTE

Regarding accessories, which are not listed here, comply with the specifications of the relevant instructions for use.

7.4.1 Additional scan points SL X for

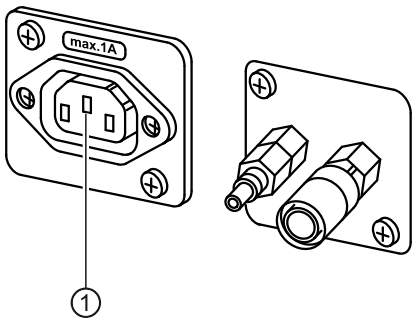
Module ERGOcam One



① Screw in bottom part of housing

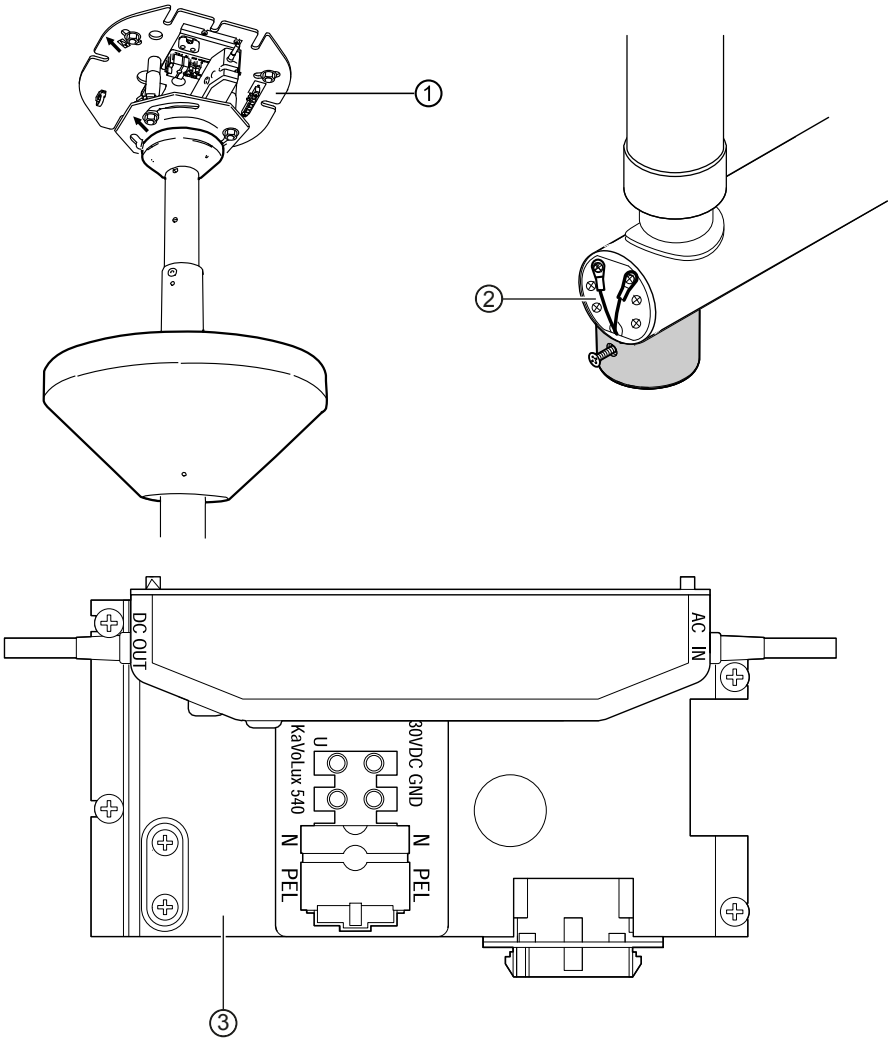
NOTE
The modules are not earthed with a safety conductor. In the case of excessive PE resistance, the electrical connection between the module and the dentist element must be improved. This can be accomplished, for example, by means of a serrated lock washer on the fastening screw.

Connector for third-party equipment



Position the test tip on the middle contact ①.

Ceiling adapter for operating light assembly kit



① Base plate for the ceiling adapter
② Surroundings of the protective conductor connector
③ Surroundings of the protective connector terminal

7.4.2 Additional measuring points AP X for the EGA/EPA measurement

NOTE
Additional measuring points AP X need to be taken into consideration in the presence of accessories: e.g. if third-party devices are connected, camera of the multimedia system, etc.

8 Troubleshooting

NOTE
In case of malfunction, consult the separate instructions for the use and care of the respective instruments (e.g., turbine, motor, camera, etc.).

Malfunction	Cause	Remedy
Nothing works.	Main switch is off.	▸ Turn on the main switch.
	Main service fuse interrupted the electric circuit.	▸ Unplug the unit from the mains. ▸ Check and replace, if required, the main service fuse. The main service fuse is situated next to the master switch. ▸ For this purpose, open the bayonet closure with a screwdriver and replace the fine-wire fuse. (220, 230, 240 V AC: T 6,3 H mat. no. 0.223.2783); (100, 110, 120, 130 V AC: T 10 H mat. no. 1.007.2529). ▸ Then re-close the bayonet closure with the screwdriver.
The patient chair does not move.	The safety shutdown is activated. (LED on the control panel flashes.)	▸ Check the safety shutdown and eliminate the reason for the shutdown.
Display does not work.	Bus / hardware error.	▸ Turn the device off and on. ▸ Consult a service technician if the problem persists.
Control panel does not work.	Bus / hardware error.	▸ Turn the device off and on. ▸ Consult a service technician if the problem persists.
Turbine making loud running noises.	Turbine wheel faulty.	▸ Replace turbine wheels. Follow the operating instructions for the turbine handpiece.
No heating function on the multifunctional handpiece.	Spray heating not preselected.	▸ Pre-select spray heating.
No cold light on the handpieces.	Cold light not preselected.	▸ Preselect cold light.
	The high-pressure lamp or LED lamp on the handpiece is defective.	▸ Replace the high-pressure lamp or LED lamp. Also refer to: Instructions for Use of the handpiece.
No spray in the handpieces.	No spray preselected.	▸ Preselect spray.
	Ring for controlling the spray on the handpieces is closed.	▸ Open the ring for controlling the spray on the handpieces.
Spray at the instruments is insufficient.	The spray nozzles are dirty/clogged.	▸ Clean the spray nozzles according to the accompanying instrument operating instructions.
Leaks in instruments.	O-rings at MULTIflex or motor coupling, gripping sleeve or cannula of the three function handpiece are damaged.	▸ Replace O-rings.

Malfunction	Cause	Remedy
The suction hoses do not have any suction.	Slides on the conical sections are closed.	▸ Open the slide valve.
	Sieves in suction connector are blocked.	▸ Replace sieves.
	VACUstopp foot switch is being pressed.	▸ Release the foot switch.
	Suction machine not running.	▸ Turn on the suction machine. ▸ Check the fuse of the suction machine.
	The amalgam separator does not work properly.	▸ Follow the operating instructions of the amalgam separator.
Water in the return air filter.	O-rings damaged at MULTIflex coupling.	▸ Replace all the O-rings on the MULTIflex coupling.
Several handpieces are simultaneously activated.	Hardware error.	▸ Stop working and call the service technician.
Treatment centre is not connected to the wireless foot control. CIGNA beep on the treatment centre.	Wireless foot control is switched off.	▸ Check the on/off switch on the foot control and switch it on, if applicable.
	Wireless foot control is out of range.	▸ Move the foot control to be within range of the treatment centre.
	Radio interference or low battery	▸ Check the status indicator on the foot control. Yellow: low battery No display: radio interference Charge the battery. ▸ Charge battery.
Wireless foot control no longer switches to centring in the middle.		▸ Charge battery.
An acoustic signal is issued every second.	Leaking water switch recognises leaking water.	▸ Remove water from the unit body. If necessary, have a technician fix the leak.
A signal is issued every ten seconds and a status message is shown.	The oxygenal container is empty.	▸ Refill the Oxygenal container.
Ten beeps are issued.	The Oxygenal container is too full.	▸ Stop filling the Oxygenal container.

9 Information concerning the electromagnetic compatibility according to EN IEC 60601-1-2

9.1 Operating environment and EMC warning notes

This product is neither life-sustaining nor coupled to the patient. It is suitable, in terms of EMC, for operation both in domestic healthcare and in facilities used for medical purposes except in the vicinity of active facilities of HF surgery devices or in rooms/areas, in which EMC interference of high-intensity may occur.

The customer or user has to ensure that the device is set up and used in an environment of the specified type and/or in accordance with the specifications of the manufacturers.

This device uses HF energy for its internal functions exclusively. Therefore, the HF emission of the device is very low and interference with adjacent electronic devices is unlikely.

⚠ WARNING

Use of other devices next to this product

Faulty operation

- The use of other devices in the immediate vicinity of this product or placed on top of this product should be avoided as this may lead to faulty operation of the unit. However, if this kind of use were necessary regardless, this device and the other devices should be monitored closely in order to make sure that they work properly.

⚠ WARNING

Non-approved accessories

Electromagnetic interferences

- The use of accessories, transducers and cables other than those specified or provided by the manufacturer of this device can lead to increased electromagnetic emissions or reduced electromagnetic immunity of the device and faulty operation thereof.

⚠ WARNING

Portable HF communication devices

Reduced performance features

- Portable HF communication devices (including their accessories, such as, e.g., antenna cables and external antennas) should be used no closer than 30 cm (or 12 inch) from the parts and cables of the product designated by the manufacturer. Non-compliance can lead to a reduction of the performance features of the device.

9.2 Results of the electromagnetic tests

Requirement	Class / test level
Electromagnetic emissions	
DIN EN 55011 VDE 0875-11 / 04.2011	
Conducted emitted interference [150 kHz – 30 MHz]	Class B

Requirement	Class / test level
Radiated emitted interference [30 MHz – 1000 MHz]	Class B
DIN EN 61000-3-2 VDE 0838-2 / 03.2010	
Harmonics	Class A
DIN EN 61000-3-3 VDE 0838-3 / 03.2014	
Voltage fluctuations/flicker	Automatic mode

Requirement	Class / test level
Immunity to electromagnetic interference	
DIN EN 61000-4-2 VDE 0847-4-2 / 12.2009	
Discharge of static electricity (ESD)	-
Atmospheric discharge	± 2/4/8/15 kV
Contact discharge	± 8 kV
DIN EN 61000-4-3 VDE 0847-4-3 / 04.2011	
HF emissions of digital mobile phones and other HF-emitting devices [80 MHz - 2700 MHz]	10 V/m
High-frequency electromagnetic fields in the immediate vicinity of wireless communication devices	
385 MHz	27 V/m
450 MHz	28 V/m
710 / 745 / 780 MHz	9 V/m
810 / 870 / 930 MHz	28 V/m
1720 / 1845 / 1970 MHz	28 V/m
2450 MHz	28 V/m
5240 / 5500 / 5785 MHz	9 V/m
DIN EN 61000-4-4 VDE 0847-4-4 / 04.2013	
Fast transient electrical bursts	-
Electrical cables	±2 kV
Input and output cables	±1 kV
DIN EN 61000-4-5 VDE 0847-4-5 / 06.2007	
Surges	-
Electrical cables	±0.5/1 kV L - N ±0.5/1/2 kV L - PE ±0.5/1/2 kV N - PE
DIN EN 61000-4-6 VDE 0847-4-6 / 08.2014	
Conducted disturbances, induced by high-frequency fields	-
Electrical cables	3 V 6 V in ISM bands 6 V in amateur radio bands
Input and output cables	3 V

Requirement	Class / test level
	6 V in ISM bands 6 V in amateur radio bands
DIN EN 61000-4-8 VDE 0847-4-8 / 11.2010	
Magnetic fields with power engineering frequencies	30 A/m
DIN EN 61000-4-11 VDE 0847-4-11 / 02.2005	
Voltage interruptions, short-term interruptions and fluctuations of the supply voltage	-
Electrical cables	0 % / 0.5 cycle at 45° steps from 0°- 315° 0 %/ 1 cycle 70 %/ 25 cycles 0 %/250 cycles

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