Instructions for use
COMFORTtronic 4894

Always be on the safe side.

KaVo. Dental Excellence.

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340 East Route 22
Lake Zurich, Illinois 60047, USA
Toll free: 800 323 8029
Direct Customer Service 1-888-ASK-KAVO
888-275-5286
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CE 0124

Contents

1 User instructions

1.1 User guide

Requirement
Read these instructions prior to first use to prevent misuse and damage.

1.1.1 Abbreviations

Short form	Explanation
GA	Instructions for use
PA	Care instructions
MA	Assembly instructions
TA	Technician's instructions
STK	Safety check
IEC	International Electrotechnical Commission
RA	Repair instructions
EMC	Electromagnetic compatibility

1.1.2 Symbols

	See the section Safety/Warning Symbols
	Important information for users and technicians
	CE mark (Communauté Européenne). A product with this mark meets the requirements of the applicable EU directive.
▶	Action required

1.1.3 Target group

This document is for dentists and office personnel.

1.2 Service

Note
Send in the product every two years for a service check.

In this service check, the safety checks are performed according to VDE 0751-1as well as calibration.

Direct questions regarding the product, service and maintenance to the following address.
Please indicate the product serial number in all requests.

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340 East Route 22
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1.3 Warranty terms and conditions

Within the framework of applicable KaVo delivery and payment conditions, KaVo guarantees proper function, freedom from flaws in material and manufacturing for a period of 3 years from the date of purchase demonstrated by the purchaser.
In case of justified complaints, KaVo will honor its warranty with a free replacement or repair.
The warranty does not cover defects and their consequences that arose or may have arisen due to natural wear, improper handling, cleaning or maintenance, non-compliance with operating, maintenance or connection instructions, corrosion, contaminated media supply or chemical or electrical influences deemed abnormal or impermissible in accordance with factory specifications.
The warranty does not cover lamps, light conductors made of glass and glass fibres, glassware, rubber parts and the colourfastness of plastic parts.
The warranty expires when defects or their consequences can arise from manipulations or changes to the product. Warranty claims can only be asserted when they are immediately reported to KaVo in writing.
This notification must be accompanied by a copy of the invoice or delivery note on which the manufacturing number is clearly visible.

1.4 Transportation and storage

1.4.1 Damage in transit

Outside of Germany

Note
KaVo cannot be held liable for damage in transit.
Check your package as soon as you receive it!

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

If the product is damaged but there was no discernable damage to the packaging upon delivery, proceed as follows:
1. Report the damage to the shipping company immediately and no later than 7 days after delivery.
2. Leave the product and packaging in the condition in which you received it.
3. Do not use a damaged product.

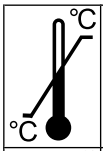
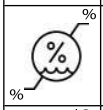
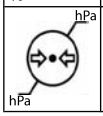
Note
Failure on the part of the recipient to comply with one of the above obligations will mean that the damage will be considered to have arisen following delivery (in accordance with CMR law, Chapter 5, Art. 30).

1.4.2 Information on the packaging: Storage and transport

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

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

	Transport upright with the arrows pointing upwards
	Fragile - protect against knocks
	Keep dry
	Permissible stacking load

	Temperature range
	Humidity
	Air pressure

2 Safety

2.1 Description of safety instructions

2.1.1 Warning symbol

	Warning symbol

2.1.2 Description of danger levels

Safety instructions with three hazard levels are used in this document for avoiding personal and property damage.


CAUTION

CAUTION
indicates a hazardous situation that can lead to property damage or minor to moderate injury.


WARNING

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


DANGER

DANGER
indicates a maximum hazardous situation that can directly cause serious injury or death.

2.1.3 Structure


DANGER

The introduction describes the type and source of the danger.
This section describes the possible consequences of misuse.
- The optional step contains necessary measures for avoiding hazards.

2.2 Purpose – Proper use

2.2.1 General information

The COMFORTtronic 4894 is intended to convert pneumatic output from a dental treatment center to electrical energy for operation of electrically-driven dental handpieces. They are designed for use by a trained professional in the field of general dentistry. The COMFORTtronic 4894 is intended for use in dentistry (medical device). It is a dental treatment unit for operating an electrical COMFORTdrive 200XDA. It may only be used within rooms and not in areas subject to an explosion hazard.

The overarching guidelines and/or national laws, national regulations and the rules of technology applicable to medical devices for start-up and use of the KaVo product for the intended purpose are to be applied and complied with.

Definition (purpose)	Explanation
Primary function	Dental preparation
Use	For working on human teeth and crowns
Specification of the primary function	Network-dependent add-on device for the dentist unit
Duration of use	Approximately 30 to 40 minutes with individual interruptions

This KaVo product is intended only for use in the field of dentistry. The product may not be used for a purpose for which it was not intended.
"Proper use" includes following all the instructions for use and ensuring that all inspections and service tasks are performed.

The user must ensure that that the unit works properly and is in a satisfactory condition before each use.

Users have a duty to:
- Only use equipment that is operating correctly
- to protect himself/herself, the patient and third parties from danger.

Authorized to repair and service the KaVo product:
- Technicians trained by KaVo, KaVo authorized dealer, and technicians from KaVo.

During use, national legal regulations must be observed, in particular:
- the applicable health and safety regulations.
- the applicable accident prevention regulations.

To guarantee constant readiness for use and maintenance of value of the KaVo product, the recommended servicing must be done.

Note
The product must be cleaned and serviced according to instructions if it is not to be used for a long period.

KaVo cannot accept responsibility for damage caused by:

- External factors beyond its control, poor media quality or defective installation
- The use of incorrect information
- Repair work carried out incorrectly

Note
Any waste which is generated must be recycled or disposed of in a manner which is safe both for people and for the environment. This must be done in strict compliance with all applicable national regulations.
Please direct all questions regarding the proper disposal of KaVo products to the nearest KaVo branch.

Information on electromagnetic compatibility

Note
Based on EN 60601-1-2 concerning the electromagnetic compatibility of electromedical devices, we need to point out that:
• Medical electrical devices are subject to special measures regarding electromagnetic compatibility and must be operated in accordance with KaVo assembly instructions.
• Portable and mobile high-frequency communications devices can influence medical electronics.
• More information about the technical description of EMC can be obtained upon request.

CAUTION

Damage from unsuitable accessories
The use of other accessories, transformers and lines than those indicated (with the exception of transformers and lines that KaVo sells as replacement parts for internal components) can increase transmission or reduce the electromagnetic immunity of the product.
▸ Only use accessories recommended by KaVo.

Note
KaVo cannot guarantee that accessories, lines and transformers not delivered by KaVo will correspond with EMC requirements of EN 60601-1-2.

2.3 Safety instructions

2.3.1 General information

This KaVo product is not permitted for use in areas where there is a risk of explosion.


CAUTION

Improper product maintenance or repair.
Damage to product
- Repair and servicing work on the electronic part of the unit may be done only by skilled staff or by technicians trained by KaVo.
- Only use original KaVo spare parts.


WARNING

Injury or damage from damaged functional parts.
When functional parts are damaged, it can cause additional damage or personal injury.
- When operating parts are damaged: Stop working, eliminate the damage, or notify a service technician.
- Check the electrode lines and accessories for damage to the insulation.


CAUTION

Damage due to liquids
Faults in electric components.
- Protect product openings from penetration of liquids.
- Remove liquids from the inside of the device.


CAUTION

Premature wear and tear, and malfunctions caused by improper care and maintenance.
Foreshortened product life.
- Perform proper care and maintenance operations on a regular basis.


CAUTION

Malfunctions due to electromagnetic fields.
The product meets the applicable requirements regarding electromagnetic fields. Given the complex interactions between equipment and cell phones, the product may be influenced by a cell phone that is in use.
- Do not use cell phones in medical offices, hospitals, or laboratories.
- Put electronic devices such as e.g. computer storage media, hearing aids etc. down duringoperation .


CAUTION

Damaged network cable/missing protective conductor.
Electrical shock.
- Check the network cable before use. The socket outlet must have a protective contact and meet the respective national guidelines.


CAUTION

Damage to the instrument hoses from stickers.
Instrument hoses can explode.
- Do not affix stickers or adhesive tape.


CAUTION

Unintended penetration of liquids.
Electrical shock.
- Do not immerse the product in a tub-like container.


CAUTION

Risks from electromagnetic fields.
The functions of implanted systems (such as pacemakers) can be influenced by electromagnetic fields.
- The electromagnetic field generated by this electric motor falls below the threshold limit for interference according to CISPR 11. However, patient history and patient health must be examined by the clinician in order to ascertain the safety of the device on any particular patient. See 9.1.

KaVo recommends that only **original KaVo parts®** be used for operating and repairs since their safety, operation and specific suitability have been tested in extensive tests.

2.3.2 Product-specific


CAUTION

Improper use of handpieces.
Improper use can cause personal injury.
- Follow the instructions for use for each additional device.


CAUTION

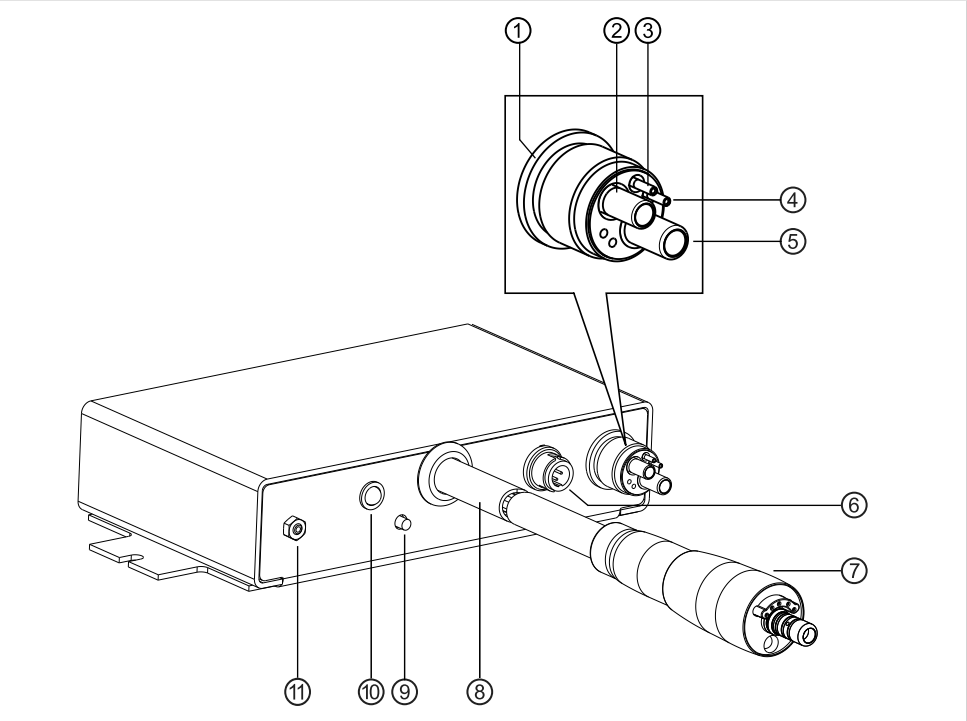
Instructions for the safe use of handpieces with electronic micromotors.
Electronic micromotors generate much more energy than conventional pneumatic turbines and motors. Given the higher torque and speed, handpieces that are poorly serviced, damaged or used improperly can overheat which can seriously burn the patient.
- Observe the following points.

The following guidelines must be followed to safely use the electrical handpieces:
- Precisely follow the servicing instructions for handpieces using the KAVOspray or QUATTROcare care system.
- Before each use, the handpiece must be checked for external damage.
- In a test run of the handpiece, watch for atypical heating, unusual noise and vibration.
- If the handpiece seems irregular, stop using it immediately.
- Never press the pushbutton during operation. This includes lifting the cheek or tongue.

To ensure proper function, the medical device must be set up according to the methods described in the KaVo instructions for use, and the care products and methods described therein must be used. KaVo recommends specifying a service interval at the dental office for a licensed shop to clean, service and check the functioning of the medical device. This service interval should take into account the frequency of use.
Service may only be provided by repair shops that have undergone training by KaVo and that use original KaVo replacement parts.

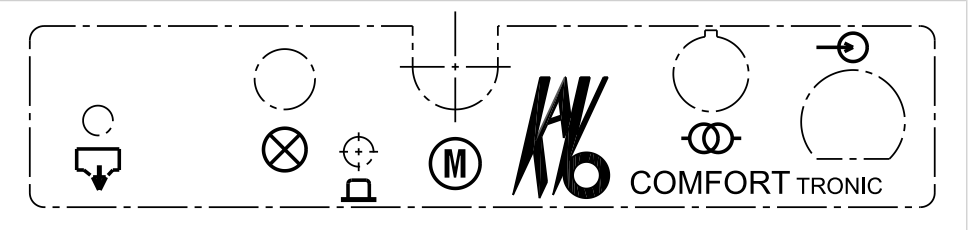
3 Product description

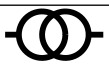
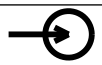
3.1 COMFORTtronic 4894



① 4-hole connection
② Drive air, cooling air
③ Spray water
④ Spray air
⑤ Return air
⑥ Connection for power supply type 4882
⑦ COMFORTbase coupling
⑧ Motor hose
⑨ Reset button
⑩ LED display
⑪ Solenoid valve ventilation

3.2 Symbols on the front



Symbol	Designation
	Solenoid valve ventilation
	LED display
	Reset button
	Motor hose
	Connection for power supply type 4882
	4-hole connection

3.3 Media supply data

System pressure at the treatment unit	4,0 to 6,0 bar/58 to 87 psi
Spray air	1,0 to 2,5 bar/14,5 to 36,2 psi
Spray water	0,8 to 2,0 bar/11,6 to 29 psi
Cooling air exit at the motor coupling	7 to 10 NL/min.
Air requirements	Dry, oil free, dirt free, uncontaminated in accordance with EN ISO 7494-2.
Customer air filtration	50 µm
Water quality	Tap water
pH	7.2 to 7.8
Customer water filtering	80 µm

Recommended settings

System pressure at the treatment unit	5,0 bar/72,5 psi
Spray air	1.0 bar/14.5 psi
Spray water	0.8 bar/11.6 psi

3.4 Technical data for the COMFORTtronic 4894

Speed and motor torque

Speed range	30,000 to 200,000 rpm
Torque	max. 0.4 Ncm

Dimensions and weight

Width	77 mm/3,03 "
Height	30 mm/1,18 "
Depth	132 mm/5.20"
Weight (without power supply)	470 g /16.6 ounces

Nominal voltage

Motor voltage	20 V AC
LUX lamp voltage	3.2 V

Current values

Motor current	max. 4 A per phase
Continuous current	max. 60 seconds at 4 A
LUX lamp current	max. 0.7 A

Requirements, classification

Class of protection	II
Overvoltage category	II
Degree of soiling	2
Device classification	Type B (according to EN 60 601)
Protection class	IP40

Intermittent duty

Operating time	0.5 minutes
Pause time	9 minutes

Environmental conditions

Permissible ambient temperature range	+5°C to +40°C/41°F to 104°F
Permissible to maximum relative humidity	80 %
Permissible to a maximum	2,000 m / 6562 ft above sea level

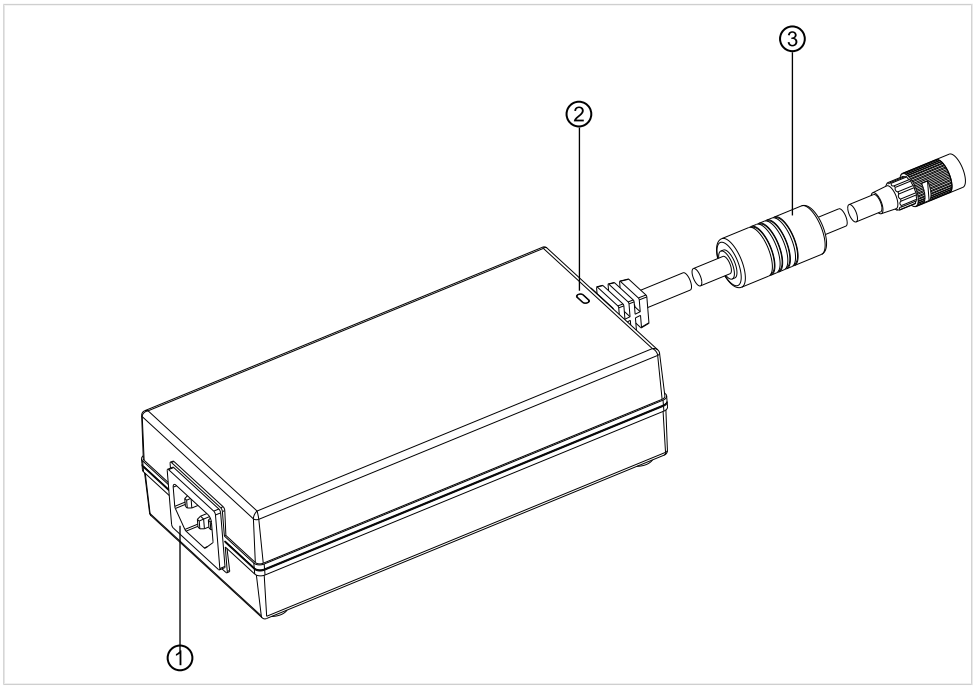
Transportation and storage conditions

Ambient temperature	-20℃ to +70℃ / -4 °F to 158 °F
Relative humidity	5% to 95%
Air pressure	700 hPa to 1060 hPa

3.5 Rating plate for the COMFORTtronic 4894

Type	COMFORTtronic 4894
SN	Year/serial number
REF	Material number
IP 40	Type of protection
0.5 9	Intermittent duty The operating time is 0.5 minutes, and the pause time is 9 minutes. This notional numbers are for normative purposes only. Both numbers are much lower in practice.
	Follow instructions for use
	Application part type B
	Disposal instructions (Purpose – Proper use)
	VDE mark
C US	CSA mark with the indicators "C" and "US" means that the product is certified for both the U.S. and Canadian markets.
CE 0124	CE mark according to 93/42/EEC medical device

3.6 Power supply type 4882



① Connection to the power supply
② Standby LED
③ Connection line

3.7 Technical data for the power supply type 4882

Note
The type 4882 power supply connection must correspond to the country-specific regulations and requirements for medical devices.

Dimensions and weight

Width	160 mm/6.3 "
Height	44 mm/1.7 "
Depth	76 mm/3 "
Weight	0.78 kg /27.51 ounces

Connected loads

Supply voltage	100 to 240 V AC, 47 to 63 Hz
Output voltage	36 V DC
Performance	120 W
Current	3.34 A

Requirements

Class of protection	I
Type of protection	IP 40

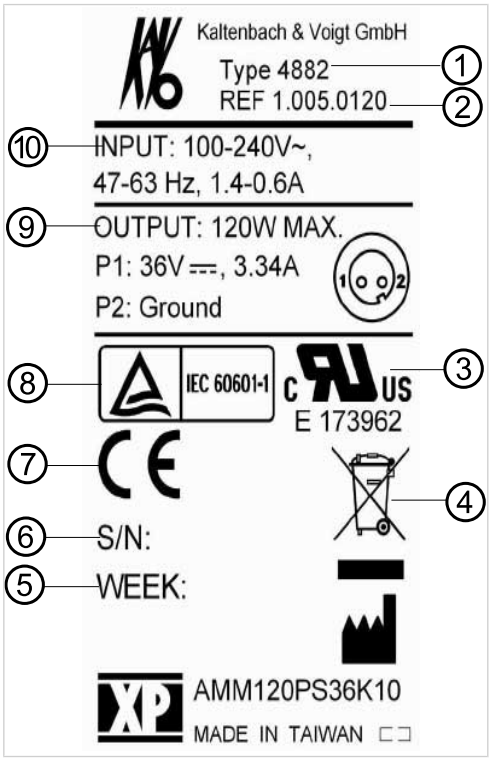
Environmental conditions

Permissible environmental temperature range	5 °C to +40°C / 41°F to 104°F
Permissible to maximum relative humidity	80 %
Permissible to a maximum	2.000 m / 6562 ft above sea level

Transportation and storage conditions

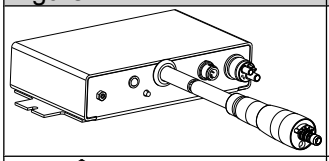
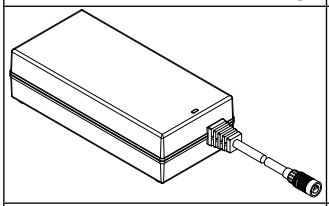
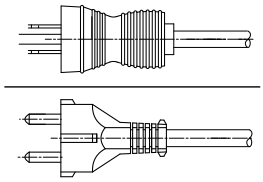
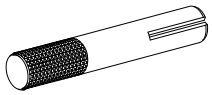
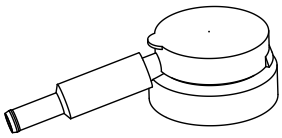
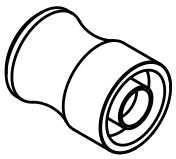
Ambient temperature	-20°C to +70°C / -4 °F to 158 °F
Relative humidity	5% to 95%
Air pressure	700 hPa to 1060 hPa

3.8 Rating plate for the type 4882 power supply



① Type 4882
② Material number
③ Recognized Component Mark for Canada and the United States.
④ Disposal instructions (Purpose – proper use)
⑤ Date of manufacture
⑥ Serial number
⑦ CE mark
⑧ TÜV Rheinland mark
⑨ Output voltage
⑩ Supply voltage

3.9 Scope of delivery

Figure	Material summary	Material number
	Basic unit COMFORTtronic 4894	1.005.0169
	Power supply type 4882	1.005.0120
	Power cable (NEMA 5-15, Hospital Grade) or Power cable (CEE 7/7, Schuko)	1.002.6861 (NEMA 5-15, Hospital Grade) or 0.223.4142 (CEE 7/7, Schuko)
	Bulb changer	1.005.1773
	Spray head for the COMFORTdrive for manual care of the COMFORTdrive instruments with KaVo spray. See also: GA COMFORTdrive.	1.005.3154
	COMFORTtronic disinfection cap	1.006.5370
	Self drill screw 3,5 x 13	0.260.0758
	Instructions for use	1.006.0552 (DE) or 1.006.0553 (EN) or 1.005.0023 (FR)

Note
COMFORTdrive 200XDA handpiece and related instructions for use are included within packaging for the COMFORTdrive system but separate from these instructions.

4 First use

CAUTION

Damage from use of impermissible accessories
Damage to the product.
- Only use the COMFORTtronic 4894 together with the COMFORTdrive 200XDA (**Mat. no. 1.003.5550**) and the power supply 4882 (**Mat. no. 1.005.0120**)!

4.1 Location

- Place the product in an easily accessible place visible for diagnostic purposes on or under the dental unit.

Note
When the solenoid valve ventilation is defective, a slight amount of spray water can drain from the vent.
The solenoid valve ventilation should be checked regularly for leaking spray water.

4.2 Connection

4.2.1 Connection conditions

CAUTION

Damage due to improper pressure.
Defective motor or instrument.
- ▸ Set the pressures according to the technical data.

CAUTION

Damage due to bad media.
Defective motor or instrument.
- ▸ The compressed air must be dry and free of dirt and oil according to EN ISO 7494-2!

Note
If necessary, insert a filter, water trap or air dryer.

Air and water requirements according to DIN EN 7494-2

The compressed air must be free of oil, uncontaminated, and free of dirt. If needed:
- Use a compressor with a dry air system.
- Connect the air filter in series.
- Blow out the lines before connecting.

See also: 3.3 Media supply data, Page 15

Measure the cooling air flow at the coupling

See also: 4.2.6 Measure the cooling air flow at the coupling, Page 26

- ▸ Adjust the drive air, spray air and spray water pressures to the manufacturer's specifications of the turbine tubing and the COMFORTtronic

4.2.2 Connect the power supply

CAUTION

damage from impermissible power supply.
Damage to the product.
- Only use the product with the type 4882 power supply (**Mat. no. 1.005.0120**)!

Note
The power supply connection must correspond to the country-specific regulations and requirements for medical devices.

Note
The power supply automatically adjusts to the available mains voltage.

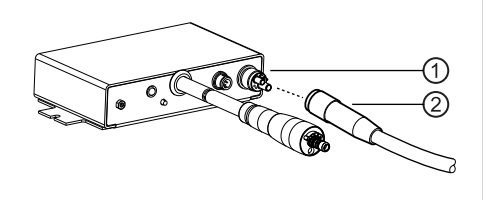
See also: 3.4 Technical data for the COMFORTtronic 4894, Page 16

- Plug the type 4882 power supply into the socket of the COMFORTtronic 4894.

Note
Grounding reliability can only be achieved when the equipment is connected to an equivalent receptacle marked "Hospital Only" or "Hospital Grade."

4.2.3 Connect the COMFORTtronic 4894

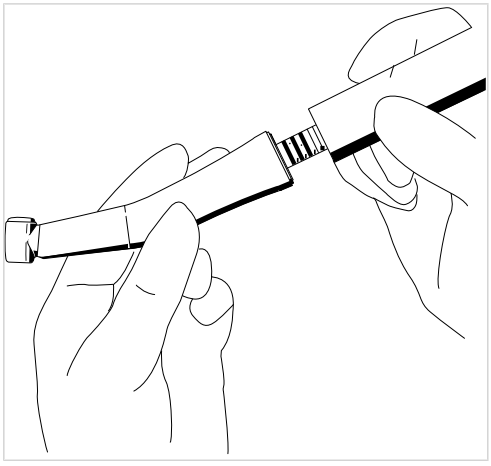
- Connect the turbine hose of the treatment unit ② to the four-hole connection ① of the COMFORTtronic 4894.



4.2.4 Connect the COMFORTdrive to the coupling

- Slightly wet the O-rings on the coupling with KAVOspray.

- Connect the COMFORTdrive with the coupling until it locks into place, and twist it until the catch audibly locks in place.



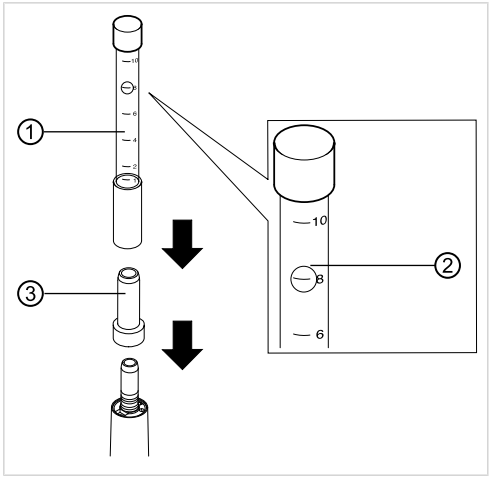
4.2.5 Connection to treatment unit

The COMFORTtronic 4894 is designed to be compact and therefore allow you flexibility in terms of where it is positioned. If you choose it can be mounted via the screw ports on each side. The enclosed screws are recommended for mounting the COMFORTtronic 4894 to a sheet metal surface.

4.2.6 Measure the cooling air flow at the coupling

When the motor is operating, the value must lie between 7 to 10 NL/min. (top edge of ball) ②.

- Place the air flow measuring tube (**Mat. no. 0.411.4441**) ① with the adapter (**Mat. no. 1.005.1702**) ③ on the coupling.
- Measure the amount of cooling air.
- In case of deviations, adapt the system pressure.



4.3 Adjust the foot switch

The COMFORTtronic 4894 automatically adjusts to the system pressure of the treatment unit.


CAUTION

The motor rotates at maximum speed
Risk of injury
- Take special care when first starting up the motor.

During initial start-up and when first using the device, fully press down the footswitch pedal once when the COMFORTtronic 4894 is turned on. The motor is started and rotates at maximum speed.

- Then only press the foot control pedal until the motor starts. Hold it for about 1 second in this position.

5 Operation

CAUTION

Germ formation
Infections
- After treating a patient, let the spray air and spray water exit for at least 20 seconds.
- Before start-up and after the device has not been used for a while (weekends, holidays, vacations, etc.), rinse or purge the air and water lines.
- The disinfection of the COMFORTtronic must be effected via the treatment unit. See also: 6.2.3 Disinfection.

5.1 Turned on COMFORTtronic 4894

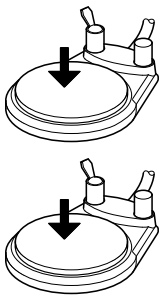
- Connect the type 4882 power supply with COMFORTtronic 4894.
  The readiness of the COMFORTtronic 4894 is notified by a single acoustic signal, and the LED display continuously flashes green.

Note
The foot switch pressure automatically adjusts the first time the foot switch is actuated.

- Adjust the foot switch pressure.

See also: 4.3 Adjust the foot switch, Page 27

5.2 Start the motor



- Press the footswitch pedal until the motor starts.

- Completely depress the foot switch pedal.
  The set maximum speed (max. 200,000 rpm) is reached.

The speed can be varied between 30,000 and 200,000 rpm with the drive air pressure.

6 Maintenance

6.1 Servicing

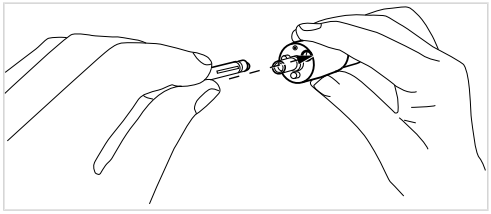
6.1.1 Change the high-pressure bulb of the COMFORTbase

CAUTION

Danger of injury due to hot high-pressure bulb
Burning hazard
- Switch main device switch off.
- Let the COMFORTbase cool down after long use.

Requirement
The COMFORTdrive is pulled off of the COMFORTbase coupling.

- Insert the included lamp changer (**Mat. no. 1.005.1773**) into the lamp socket, and pull the old lamp out axially.



- Insert the new lamp (**Mat. no. 1.002.2928**) into the lamp changer, and introduce it into the coupling. Carefully shove the lamp into the socket by twisting slightly.
- Remove the lamp changer by quickly twisting it and simultaneously pulling it out in an axial direction.

6.1.2 Replace O-rings

CAUTION

Missing or damaged O-rings
If the O-rings are missing and damaged, malfunctions and premature failure can occur.
- Check if all O-rings are on the coupling and undamaged.

Note
The O-ring on the COMFORTbase may only be lubricated with cotton ball wet with KAVOspray.

Number of available O-rings: 3

- Press the O-ring between your fingers to form a loop.
- Shove the old O-ring to the front, and remove it.
- Insert new O-rings (**Mat. no. 1.005.0327**) into the grooves.

6.2 For the preparation methods, refer to DIN EN ISO 17664

KaVo recommends that only **original KaVo parts®** be used for operating and repairs since their safety, operation and specific suitability have been tested in extensive tests.


CAUTION

Damage due to penetrated liquids
Malfunctions from penetrated liquids.
- Do not let any liquids enter the device.


CAUTION

Product damage due to improper disinfection.
Malfunctions.
- Use disinfectant in accordance with manufacturer's instructions.
- Only disinfect by wiping.
- Do not immerse product in liquids.

Note
For cleaning and care, refer to the instructions for use of the **COMFORTdrive XDA** .

6.2.1 Preparation at the site of use

- Unplug the unit from the main power supply.
- Decontaminate as close as possible to use.
- Remove extensive soiling immediately after it occurs.

6.2.2 Cleaning

Manually cleaning the outside

- Unplug the device.
- Use a soft cloth dampened with tap water or a mild cleaning solution (weak soapy water).
- Wipe off the entire outside of the COMFORTtronic housing and outer surface of the motor hose using a damp cloth.

Manually cleaning the interior

There is no special method for cleaning the inside of the COMFORTtronic 4894.

Mechanically cleaning the exterior and interior

Not applicable.

6.2.3 Disinfection

Damage to the paint surfaces as well as plastics can arise from the wide variety of medicines and chemicals used in the dentist's practice.

Tests have shown that no one hundred percent surface protection can be found for all materials that are available in the marketplace.
As damage to the surface is very much dependent on the exposure time, it is vital that the affected areas are wiped down immediately with a moist cloth.
Any residue arising from disinfectants can be cleaned to a certain degree on painted and plastic surfaces with neutral, nonabrasive rinses and cleansers.
New painted surfaces that do not cause water to bead can be cleaned with water and nonabrasive, mild cleansers.

Manually disinfecting the exterior

KaVo recommends the following products based on material compatibility. The microbiological efficacy must be ensured by the disinfectant manufacturer.

- CaviCide by Metrex / Kerr TotalCare

Required burs:
Cloths for wiping off the medical device.

- ▸ Spray the disinfectant on a cloth then wipe the medical device and let it work according to the disinfectant manufacturer.

Note
Observe the instruction for use for the disinfectant.

Manual disinfection of the interior

The disinfection of the COMFORTtronic must be effected via the treatment unit.

- ▸ Connect the COMFORTtronic to the treatment unit.
- ▸ Disconnect the COMFORTdrive from the COMFORTbase coupling.
- ▸ Plug the disinfection cap **Mat. no. 1.006.5370** on the COMFORTbase coupling.
- ▸ Follow the waterline treatment protocol of the treatment unit.
  Ignore the error signal "COMFORTdrive not connected".

For disinfection KaVo recommends the product „PureTube“ made by Sterisil. The product should be used according to the manufacturer´s instructions (www.sterisil.com) and the instructions of your treatment unit.

Mechanically disinfecting the exterior and interior

Not applicable.

6.2.4 Drying

- ▸ Let the COMFORTtronic 4894 including the motor hose completely dry at room temperature until there is no residual moisture.

6.2.5 Visual inspection and function check

- Check the surface for damage.
- Check the hose material for damaged sites.
- Plug in the device.
  The LED flashes green: functioning properly
  The LED flashes red: Error

See also: 7 Troubleshooting , Page 34

6.2.6 Packaging

Not applicable.

6.2.7 Sterilisation

Not applicable.

6.2.8 Storage

- Place the COMFORTtronic 4894 in an area protected from contamination.
- Place the motor hose in an area protected from contamination when it is not used. Cover if necessary.

6.2.9 Handpiece maintenance

The COMFORTdrive 200XDA handpiece should be maintained according to the user instructions for that product. Note that in addition to manually cleaning the exterior KaVo Spray or QUATTROcare should be used after each patient treatment.

CAUTION

Danger of Injury
Burning hazard
- Be aware that the FDA, in their December 12, 2007 Public Health Notification stated that serious patient injuries, including third degree burns, have been associated with the use of poorly maintained electric dental handpieces.

7 Troubleshooting

An error is signaled by four sequential tones. This repeats each time the motor starts until the error is eliminated. If there is no error, the LED flashes green.

The error number corresponds to the number of red flashes of the LED. Each flash cycle is followed by a longer pause before the flash cycle repeats.
The following errors can be eliminated by the user:

Malfunction	Cause	Remedy
Number of flashes: 1 Motor overloaded	The continuous load is too high	▸ Let the motor rest and restart.
Number of flashes: 2 Motor blocked	The drill is blocked, or the COMFORTdrive is defective.	▸ Relieve the drill and restart the motor. ▸ If there are still errors, test the COMFORTdrive.
Number of flashes: 3 COMFORTdrive not connected	No COMFORTdrive connected.	▸ Connect the COMFORTdrive with the supply hose until it locks into place and twist it until the catch audibly locks in place. Ignore the error signal during disinfection procedure.
Number of flashes: 4 Motor phase missing	The COMFORTtronic 4894, hose or COMFORTdrive 200XDA is defective.	▸ Repeat with a different COMFORTdrive 200XDA. If an error was not reported, test the defective COMFORTdrive 200XDA. ▸ If the error was reported again, check the COMFORTtronic 4894.
Number of flashes: 5 Unknown COMFORTdrive	A different COMFORTdrive is mounted than the COMFORTdrive 200 XDA, or the COMFORTtronic 4894 is defective.	▸ Connect the COMFORTdrive 200XDA. ▸ If the error is reported again, check the COMFORTtronic 4894.
Number of flashes: 6 Start lock is activated	The footswitch pedal was pressed when the device was turned on.	▸ Release the footswitch pedal and restart the motor. ▸ If the error is reported again, check the COMFORTtronic 4894.
Number of flashes: 7 System pressure is above the maximum	The system pressure is too high.	▸ Adjust the system pressure according to the technical data.
	The pressure sensor is defective.	▸ Have the COMFORTtronic repaired.
The medical device is too hot while idling.	The amount of coolant air is not correct	▸ Check the amount of cooling air
	An O-ring is missing on the supply hose.	▸ Replace O-rings.
The maximum speed is not reached.	The saved maximum system pressure is higher than the actual system pressure.	▸ Hold down the reset button at least fives seconds until you hear a signal, then push down the footswitch pedal once all the way.

Errors that are not described here can be eliminated by turning the COMFORTtronic 4894 on and off.

- If the error should arise again, notify KaVo service and report the number of flashes.

8 Replacement parts and accessories

Designation	Material number
Airflow measuring tube	0.411.4441
Adapter for the airflow measuring tube	1.005.1702
Bulb changer	1.005.1773
High-pressure bulb	1.002.2928
O-ring	1.005.0327
Power supply type 4882	1.005.0120
COMFORTdrive service coupling	1.005.1707
COMFORTdrive spray head	1.005.3154
Power cable (NEMA 5-15, Hospital Grade)	1.002.6861
Power line (CEE 7/7, Schuko)	0.223.4142
COMFORTtronic disinfection cap	1.006.5370
Self drill screw 3,5x13	0.260.0758

9 Information on electromagnetic compatibility

9.1 Guidelines and manufacturer's declaration - electromagnetic transmission

The COMFORTtronic 4894 is for use in an environment like the one cited below. The COMFORTtronic 4894 customer or user should ensure that use takes place in such an environment.

Measurements of noise transmissions	Conformance	Electromagnetic environment - hints
HF transmission according to CISPR 11	Group 1	The COMFORTtronic 4894 uses HF energy only for its internal operation. Its HF transmission is therefore very low, and it is improbable that neighbouring electronic devices will be disturbed.
HF transmission according to CISPR 11	Class B	The COMFORTtronic 4894 is for use in all facilities including residential ones, and facilities that are directly connected to a public power supply that also supplies residential buildings.
Harmonics in accordance with IEC 61000-3-2	Class A	The COMFORTtronic 4894 is for use in all facilities including residential ones, and facilities that are directly connected to a public power supply that also supplies residential buildings.
Transmissions of voltage fluctuations or flicker according to IEC 61000-3-3	fulfilled	The COMFORTtronic 4894 is for use in all facilities including residential ones, and facilities that are directly connected to a public power supply that also supplies residential buildings.

The COMFORTtronic 4894 may not be stacked on other devices or located next to other devices, and when it is necessary to operate it next to or stacked on other devices, the COMFORTtronic 4894 should be monitored to ensure proper use in this arrangement.

The immunity test levels required in IEC 60601 are met.

9.2 Guidelines and manufacturer's declaration - electromagnetic resistance to jamming

The COMFORTtronic 4894 is for use in an environment like the one cited below. The customer or user of the COMFORTtronic 4894 should ensure that it is used in the correct environment.

Immunity tests	IEC 60601 test level	Conformance level	Electromagnetic environment - guidelines
Electrostatic discharge (ESD) according to IEC 61000-4-2	± 6 kV contact discharge (indirect) ± 8 kV atmospheric discharge	± 6 kV contact discharge ± 8 kV atmospheric discharge	Floors should be made of wood or concrete or have ceramic tiles. When the floor is covered with synthetic material, the relative humidity must be at least 30%.
Fast transient electrical disturbances/ Bursts according to IEC 61000-4-4	± 2 kV for power lines ± 1 kV for input and output lines	± 2 kV for power lines ± 1 kV for input and output lines	The quality of the supply voltage should correspond to that of a typical business or hospital environment.
Surges according to IEC 61000-4-5	± 1 kV phase to phase voltage ± 2 kV phase to earth voltage	± 1 kV phase to phase voltage ± 2 kV phase to earth voltage	The quality of the supply voltage should correspond to that of a typical business or hospital environment.
Voltage interruptions, short-term interruptions and fluctuations of the supply voltage according to IEC 61000-4-11	< 5 % U_T(> 95% interruption) for ½ period < 40 % U_T(> 60% interruption) for 5 periods < 70 % U_T(> 30 % interruption) for 25 periods < 5 % U_T(> 95% interruption) for 5 s	< 5 % U_T(> 95% interruption) for ½ period < 40 % U_T(> 60% interruption) for 5 periods < 70 % U_T(> 30 % interruption) for 25 periods < 5 % U_T(> 95% interruption) for 5 s	The quality of the supply voltage should correspond to that of a typical business or hospital environment. If the user of the COMFORTtronic 4894 requires continued Operation even when there are interruptions to the power supply, it is recommended, that the COMFORTtronic 4894 is supplied from uninterrupted power supply or a battery .
Magnetic field with a supply frequency (50/60 Hz) according to IEC 61000-4-8	3 A/m	3 A/m	Magnetic fields at the mains frequency should correspond to typical values in a business and hospital environment.

Note: V_t is the alternating mains voltage before the test level is used.

9.3 Guidelines and manufacturer's declaration - electromagnetic resistance to jamming

The COMFORTtronic 4894 is for use in an environment like the one cited below. The customer or user of the COMFORTtronic 4894 should ensure that it is used in the correct environment.

Immunity tests	IEC 60601 test level	Conformance level	Electromagnetic environment - guidelines
Conducted HF disturbances according to IEC 61000-4-6 ---------- Radiated HF disturbances according to IEC 61000-4-3	3 V_{eff} 150 kHz to 80 MHz Outside ISM bands[a] ---------- 3 V/m 80 MHz to 2.5 GHz	3 V_{eff} ---------- 3 V/m	Portable and mobile radio devices should not be used closer to the COMFORTtronic 4894 including the wires, than the recommenced safe distance calculated using the equation for the transmission frequency. Recommended safe distance: $d = (3.5/3)\sqrt{P} = 1{,}17\sqrt{P}$ $d = (3.5/3)\sqrt{P} = 1{,}17\sqrt{P}$ for 80 MHz to 800 MHz $d = (7{,}0/3)\sqrt{P} = 2{,}33\sqrt{P}$ for 800 MHz to 2.5 GHz with P as the maximum rated power of the transmitter in Watts (W) according to the transmitter manufacturer, and d as the recommended safe distance in meters (m). [b]The field strength of stationary radio transmitters should be less than the conformance level at all frequencies in an on-site check[c]. [d]Disturbances are possible close to devices that have the following symbol.

Comment 1: At 80 MHz and 800 MHz, the higher frequency range applies.
Comment 2: These guidelines may not be applicable in every case. The spread of electromagnetic waves is absorbed and reflected by buildings, objects and people.

a) The field strength of stationary transmitters such as base stations of mobile telephones and land radio devices, amateur radio stations, AM and FM, radio and television broadcasters cannot be theoretically predetermined. To determine the electromagnetic environment of stationary transmitters, a study of the location should be considered. When the measured field strength at the location on which the device or system is used, exceeds the conformity level, the COMFORTtronic 4894 should be watched to ensure that it is functioning as per the correct usage. When unusual performance characteristics are observed, additional measures may be necessary such as changing or relocating the COMFORTtronic 4894.
b) Within the frequency range of 150 kHz to 80 MHz, the field strength should be less than 3V/m.

9.4 Recommended safe distance between portable and mobile HF telecommunications equipment and the COMFORTtronic 4894

The COMFORTtronic 4894 is for use in an environment like the one cited below. The customer or user of the COMFORTtronic 4894 can help to avoid electromagnetic faults by keeping to the minimum distance apart between portable and mobile HF-telecommunication devices (transmitters) and the COMFORTtronic 4894 - dependent on the output lines for the communication device - as given below.

The table shows the necessary safe distance depending on the transmission frequency in m:

Rated power of the transmitter in W	150 kHz to 80 MHz $d=1.12\sqrt{P}$	80 MHz to 800 MHz $d=1.12\sqrt{P}$	800 MHz to 2.5 GHz $d=2.30\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.70	3.70	7.37
100	11.70	11.70	23.30

For transmitters whose maximum rated power is not in the above table, the recommended safe distance d in meters (m) can be calculated using the equation for the respective gap, where P is the maximum rated power of the transmitter in Watts (W) according to the manufacturer's information.

Comment 1: At 80 MHz and 800 MHz, the higher frequency range applies.
Comment 2: These guidelines may not be applicable in every case. The spread of electromagnetic waves is absorbed and reflected by buildings, objects and people.

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