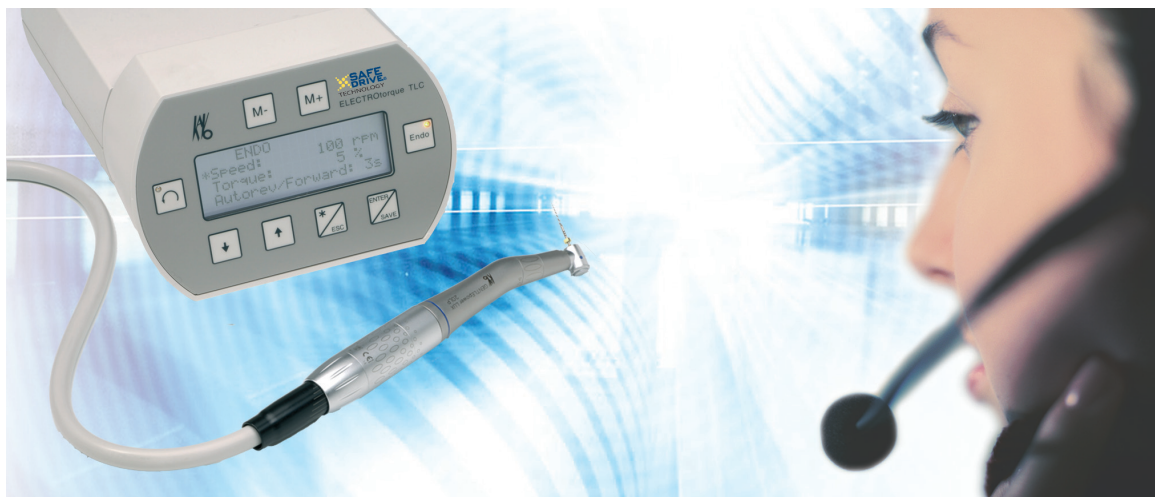


Instructions for use

ELECTROtorque TLC 4893



Always be on the safe side.



KaVo. Dental Excellence.

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11729 Fruehauf Drive
Charlotte, NC 28273 USA
Toll Free: 800 323 8029
Direct Customer Service 1-888-ASK-KAVO
888-275-5286
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D-88400 Biberach
www.kavo.com



Table of contents

	Table of contents	1
1	User notes	4
1.1	User guidelines	4
1.1.1	Abbreviations	4
1.1.2	Symbols	4
1.1.3	Target group	4
1.2	Service	4
1.3	Warranty terms and conditions	5
1.4	Transportation and storage	5
1.4.1	Damage in transit	5
1.4.2	Information on the packaging: Storage and transport	6
2	Safety	7
2.1	Explanation of safety symbols	7
2.1.1	Warning symbol	7
2.1.2	Description of danger levels	7
2.1.3	Structure	7
2.2	Purpose - proper use	7
2.2.1	General	7
2.3	Safety instructions	9
2.3.1	General	9
2.3.2	Product-specific	12
3	Product description	14
3.1	Scope of delivery	14
3.2	ELECTROtorque TLC 4893	15
3.3	Overview of control panel	16
3.4	Technical data on the ELECTROtorque 4893	16
3.5	ELECTROtorque TLC 4893 rating plate	19
3.6	Transformer 4881	20
3.7	Technical data on the transformer 4881	20
3.8	Rating plate for transformer 4881	22
3.9	Media supply data TLC 4893	22
4	Commissioning	24
4.1	Location	24
4.2	Connection	24
4.2.1	Electrical operating conditions	24
4.2.2	Voltage adjustment for transformer	25
4.2.3	Connect the transformer	25
4.2.4	Connect ELECTROtorque	26
4.2.5	Connect motor	26
4.2.6	Measure cooling air quantity at motor coupling	26
5	Operation	28
5.1	Operation in general	28
5.1.1	Insert the ELECTROtorque	28
5.1.2	Start the motor	29
5.2	Using the USER MENU	29
5.2.1	Open the USER MENU	30
5.2.2	Calibrate the foot control	30

5.2.3	Check the device connection pressure	32
5.2.4	Select the transfer ratio	32
5.2.5	Set the Chip Air for ENDO mode	33
5.2.6	Activate/deactivate the ENDO warning signal	33
5.2.7	Reset the user values to the factory setting	34
5.2.8	Set the contrast of the display (LCD)	35
5.2.9	Setting the backlighting of the display (LCD)	35
5.2.10	Setting the lamp voltage	36
5.2.11	Setting the lamp afterglow time	36
5.2.12	Select the torque display	37
5.2.13	Deactivate ENDO warning	37
5.2.14	Setting the language	38
5.2.15	Setting and using the SAFEdrive safety function against overheating	39
5.2.16	Turn the ACTUAL SPEED display on and off	40
5.3	OPERATIVE mode	41
5.3.1	Set OPERATIVE mode	41
5.3.2	Setting the speed	42
5.3.3	Setting the user speed	42
5.3.4	Setting the rotational direction	43
5.3.5	Turn SAFEdrive on/off	43
5.4	ENDO mode	44
5.4.1	Setting ENDO mode	44
5.4.2	Set parameters	45
5.4.3	Select torque mode	47
6	The setup methods follow DIN EN ISO 17664.	49
6.1	Cleaning	49
6.1.1	Preparation at the site of use	49
6.1.2	Manual cleaning of the exterior	49
6.1.3	Manual cleaning of the inside	49
6.1.4	Mechanical cleaning of the exterior and interior	50
6.2	Disinfection	50
6.2.1	Manual disinfection of the the exterior	50
6.2.2	Manual disinfection of the interior	51
6.2.3	Mechanical disinfection of the exterior and interior	51
6.3	Sterilisation	51
6.4	Storage	51
7	Maintenance	52
7.1	Changing the bulb	52
7.1.1	Changing the high-pressure bulb (INTRAmatic LUX Motor KL 702)	52
7.1.2	Changing the KaVo MULTI LED bulb (INTRAmatic LUX Motor KL 702)	53
7.2	Repair aging paint	54
8	Troubleshooting	55
9	Accessories and spare parts	56
9.1	Accessories	56
9.2	Spare parts	57

Table of contents

10	Information on electromagnetic compatibility	58
10.1	Guidelines and manufacturer's declaration - electromagnetic transmission	58
10.2	Guidelines and manufacturer's declaration - electromagnetic resistance to jamming	58
10.3	Guidelines and manufacturer's declaration - electromagnetic resistance to jamming	59
10.4	Recommended safe distance between portable and mobile HF telecommunications equipment and the ELECTROtorque TLC 4893	60

1 User notes

1.1 User guidelines

Requirement

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

Requirement

If other languages are required, they can be requested from the responsible KaVo branch. Prior approval from KaVo must be obtained before copying and passing on the instructions for use.

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 IEC 62353 - VDE 0751-1as well as a measuring check.



Direct questions regarding the product, service and maintenance to the following address.

Please indicate the product serial number in all requests.

KaVo Dental Corporation
11729 Fruehauf Drive
Charlotte, NC 28273 USA
Toll Free: 800 323 8029
Direct Customer Service 1-888-ASK-KAVO 888-275-5286
www.kavousa.com

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 12 months 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 usually cover lamps, light conductors made of glass and glass fibers, glassware, rubber parts and the colorfastness 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. In addition to the guaranty, the statutory warranty claims of the purchaser also apply with a warranty period of 12 months.

1.4 Transportation and storage

1.4.1 Damage in transit

Outside of Germany



Note

KaVo cannot be held liable for damage in transit.
Immediately inspect the delivery after receipt!

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 Explanation of safety symbols

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

The ELECTROtorque is intended for use in dentistry (medical device). It is a dental treatment unit for operating an electrical dental low-voltage motor. It may only be used within rooms and not in areas subject to an explosion hazard. The device may only be used by trained medical professionals.

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 treatment for preparations and endodontics
Use	For dental treatment of humans Tooth crown and root
Specification of the primary function	Network-dependent add-on devise 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 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, the patient and third parties from danger.
- use the equipment for the proper purpose.
- to avoid contamination from the product.
- do not use damaged functional parts.

Authorized to repair and service the KaVo product:

- Technicians from KaVo branches with appropriate product training.
- technicians from KaVo franchised dealers specifically trained by KaVo.



Note

Only use original KaVo parts for operation and repair.
After servicing, manipulation or repair of the device, the device must be tested according to IEC 62353 - VDE 0751-1 before it is used again.

During use, national legal regulations must be observed, in particular:

- the applicable health and safety regulations.
- the applicable accident prevention regulations.



⚠ CAUTION

Improper service and care.

Wear, malfunctions and reduced product service life.

- ▶ Regularly perform proper service and care.



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.

Questions on proper disposal of the KaVo product can be answered by the KaVo branch.

Information on electromagnetic compatibility

The interference radiation and immunity test levels required in IEC 60601 are maintained.



Note

Based on EN 60601-1-2 concerning the electromagnetic compatibility of electro-medical 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.

	⚠ 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

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.

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.
	⚠ WARNING Use of incorrect handpiece/contra-angle handpiece or deactivated SAFEdrive Danger of burning from lack of protection against overheating ▶ Only use original series 25LP/25LPA/25LPR/25LCA KaVo handpieces/contra-angle handpieces. ▶ Treatments may only be performed in the oral cavity when the SAFEdrive is activated.
	⚠ CAUTION Damage due to liquids. Malfunctions in electric components. ▶ Protect product openings from penetration of liquids. ▶ Have a service technician remove liquids from the inside of the device.
	⚠ CAUTION Premature wear and malfunctions from improper servicing and care. Reduced production time. ▶ Regularly perform proper service and care.
	⚠ 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 during operation .

	⚠ CAUTION Damaged power cable/missing protective conductor. Electrical shock. ▶ Check the power cable before use. The socket outlet must have a protective contact and meet the respective national guidelines. ▶ Always completely inset the power cable into the device's socket to connect to the mains.
	⚠ CAUTION Stickers can damage the instrument hoses. Instrument hoses can rupture. ▶ Do not affix stickers or adhesive tape.
	⚠ CAUTION Unintended penetration of liquids. Electrical shock. ▶ Do not immerse the product in a tub-like container. ▶ Check and make sure that the coolant containers and lines do not leak before each use. If liquid is found on the device, do not touch it and disconnect the power cable from the mains. Completely dry the surface of the unit before re-inserting the power cable.
	⚠ CAUTION Risks from electromagnetic fields. The functions of implanted systems (such as pacemakers) can be influenced by electromagnetic fields. ▶ Ask patients before treatment. ▶ Evaluate the risks and benefits. ▶ Do not bring motors close to the systems. ▶ Take suitable emergency precautions and immediately react to any changes in health. ▶ Symptoms such as elevated heart rate, irregular pulse and dizziness are signs of problems with a pacemaker.

2.3.2 Product-specific

The following guidelines must be observed to ensure safe use of the electrically driven handpieces:

- Check the speed setting each time you turn on the unit!
- Observe the tool manufacturer's specified values for permissible maximum speed and maximum tool pressure.
- Make sure that the tool is firmly seated.
- Before each treatment, insert a dental dam for safety reasons.
- The service instructions of handpieces must be precisely followed when using KAVOspray or QUATTROcare care systems.
- Before each use, the handpiece must be checked for external damage.
- Do a test run with the handpiece. Dabei auf untypischer Erwärmung, auffällige Laufgeräusche und Vibrationen achten.
- Immediately stop using handpieces that act unusual.
- Never press the pushbutton during operation. This also 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.

	⚠ CAUTION Improper use of handpieces. Improper use can cause personal injury. ▶ Follow the instructions for use for each additional device.
	⚠ CAUTION use of impermissible filing systems Do not use impermissible filing systems and which can damage the product or cause personal injury. ▶ Only use permitted NiTi filing system with a calmness in the >2% that are suitable for rotary preparation. ▶ Only use files with shafts in conformance with DIN EN ISO 1797-1, DIN EN ISO 1797-2, DIN EN ISO 3630-1 and DIN EN ISO 3630-2 having a shaft diameter of 2.334 to 2.35 mm. ▶ Follow manufacturer's instructions (mode of operation, speed, torque levels, torsion resistance, etc.), and use the files properly.
	⚠ CAUTION Use of damaged files Damaged files can damage the product or cause personal injury. ▶ 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 replaced if necessary.

Operating mode



Note
30 seconds operating time and 9 minutes interval is the feasible limit load of the motor (full load at maximum speed).

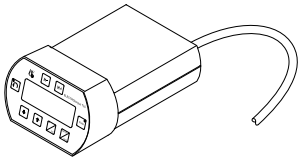
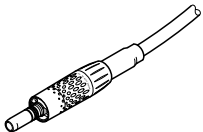
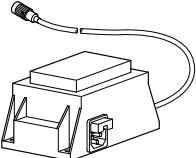
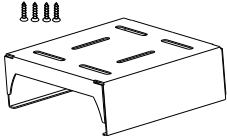
In practice, it is realistic for impulse loading to last a number of seconds and intervals to last anywhere between a number of seconds to a number of minutes, with the maximum motor current not usually being reached. This represents the typical procedure for dentists.

	CAUTION
	Excessive torque. Injury or damage to instruments. ► Only use root canal instruments in ENDO mode.

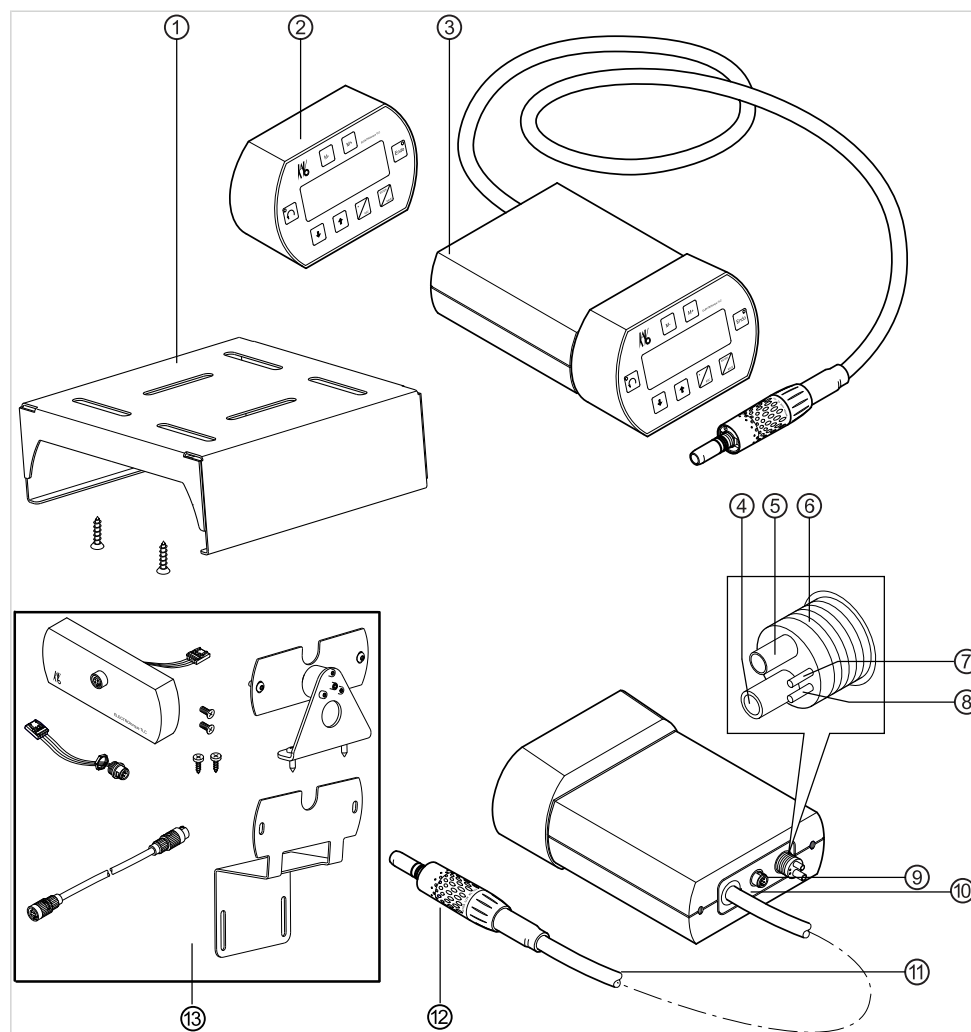
3 Product description

The ELECTROtorque TLC 4893 is a dental treatment unit for operating the dental electric small motor, INTRA LUX Motor KL 702.

3.1 Scope of delivery

Presentation	Material summary	Material number
	ELECTROtorque TLC Basic unit	Mat. no. 1.003.3490
	INTRAmatic LUX Motor KL702	Mat. no. 1.003.5622
	Transformer ELECTROtorque	Mat. no. 1.003.8542
	Line (US)	Mat. no. 0.692.6891
	ELECTROtorque mount- ing plate TLC	Mat. no. 1.002.0622
	Instructions for use	Mat. no. 1.003.5925
	Quick reference guide	Mat. no. 1.003.8440
	Service manual	Mat. no. 1.003.8441

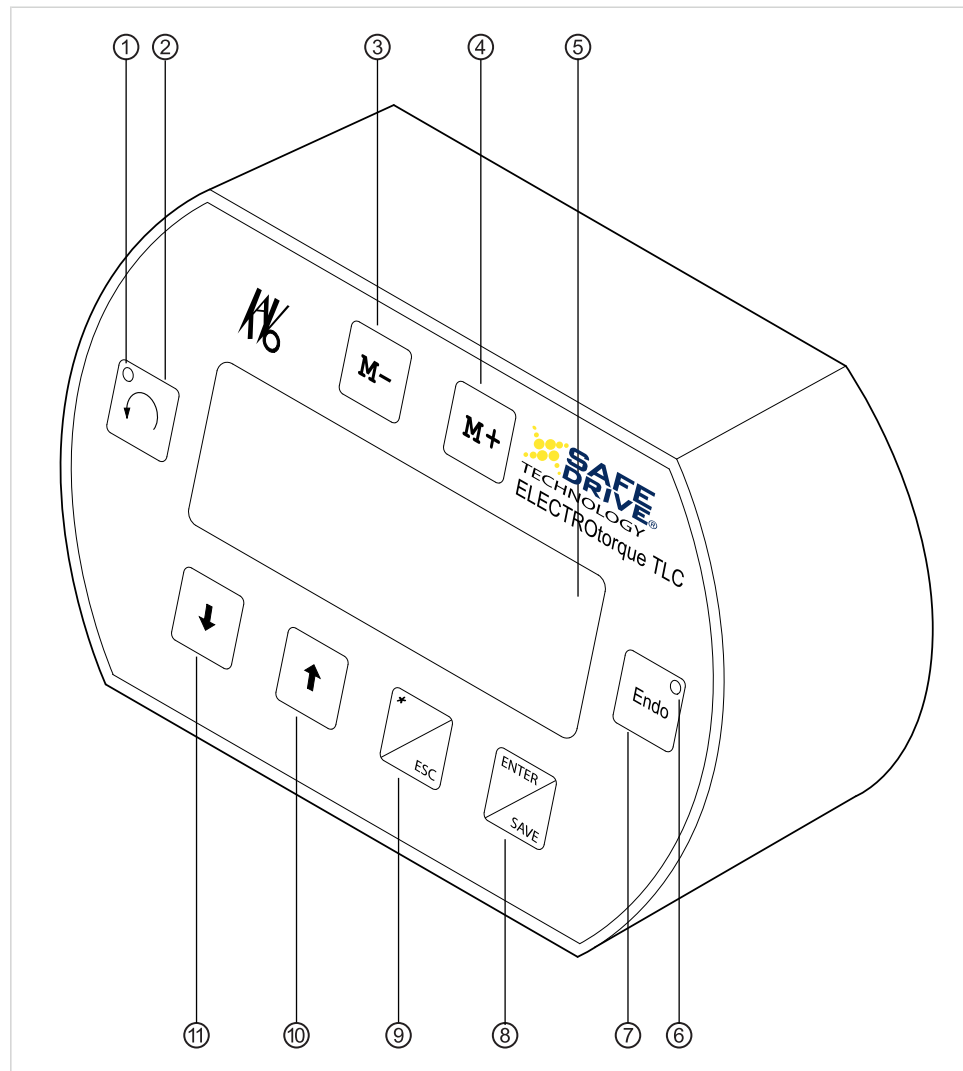
3.2 ELECTROtorque TLC 4893



ELECTROtorque TLC 4893

- | | |
|---------------------------------|------------------------------|
| ① Mounting plate with screw set | ⑧ Spray air |
| ② Controls | ⑨ Transformer connection |
| ③ Basic unit | ⑩ Solenoid valve ventilation |
| ④ Do not use with TLC 4893 | ⑪ Motor hose |
| ⑤ Drive air, cooling air | ⑫ INTRA LUX Motor KL702 |
| ⑥ 4-hole connection | ⑬ Connection kit (optional) |
| ⑦ Spray water | |

3.3 Overview of control panel



- | | |
|--|--------------------|
| ① LED for CCW rotation | ⑦ "Endo mode" key |
| ② CCW rotation key | ⑧ "ENTER/SAVE" key |
| ③ M key (Memory down) | ⑨ "*/ESC" key |
| ④ M+ key (Memory down) | ⑩ "UP" key |
| ⑤ LCD display | ⑪ "DOWN" key |
| ⑥ LED-Anzeige der Behandlungsart
Endo | |

3.4 Technical data on the ELECTROtorque 4893

Packaging dimensions

Length	540 mm/21.26"
Width	240 mm/9.45"
Height	120 mm/4.72"

Dimensions and weight of basic device

Width	130 mm/5.12 "
Height	80 mm/3.15 "
Depth	210 mm/8.27 "
Weight	910 g /32.1 ounces

Ambient 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 above sea level
Air pressure	700 to 1060 hPa

Environmental conditions Transport

Permissible environmental temperature range	-20 °C to 70°C / -4°F to +158°F
Permissible to maximum moisture	95%, non-condensing

Requirements, classification

Protection class	II
Overvoltage category	II
Contamination level	2
Device classification	Type B (in accordance with EN 60 601)
Protection category	IP40

Intermittent operation operating mode

Operating time	0.5 minutes
----------------	-------------

Interval	9 minutes
----------	-----------

Speed

Speed range	100 to 40,000 rpm
Maximum clockwise speed	40,000 rpm
Maximum counterclockwise speed	40,000 rpm

Motor torque

Torque	Max. 2.7 Ncm
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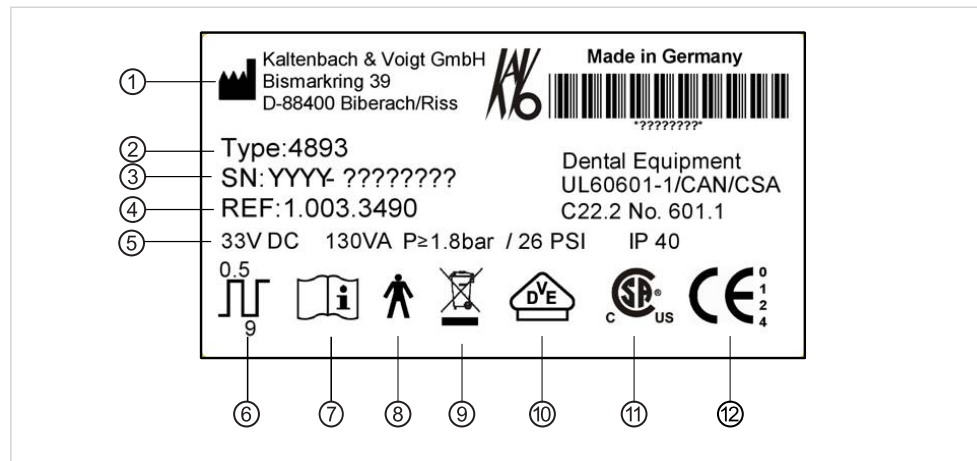
Rated voltage

Motor voltage	22 V AC
Lux bulb voltage (high-pressure bulb or KaVo MULTIflex LED bulb).	3.2 V
Setting range	3.0 - 3.6 V

Current values

Motor current	Max. 4.1 A per phase
Constant current	7 seconds constant current max., 2 A for 1 minute max.
LUX lamp current	Max. 0.7 A

3.5 ELECTROtorque TLC 4893 rating plate



① Manufacturer

② Device type

③ Year of manufacture/serial number

④ Reference numbers

⑤ Device supply voltage, compressed air and protection rating

⑥ Mode: exposure mode
(Operating time = 0.5 min.; pause time = 9 min.)

⑦ Note: observe accompanying documents and safety instructions.

⑧ Application part type B

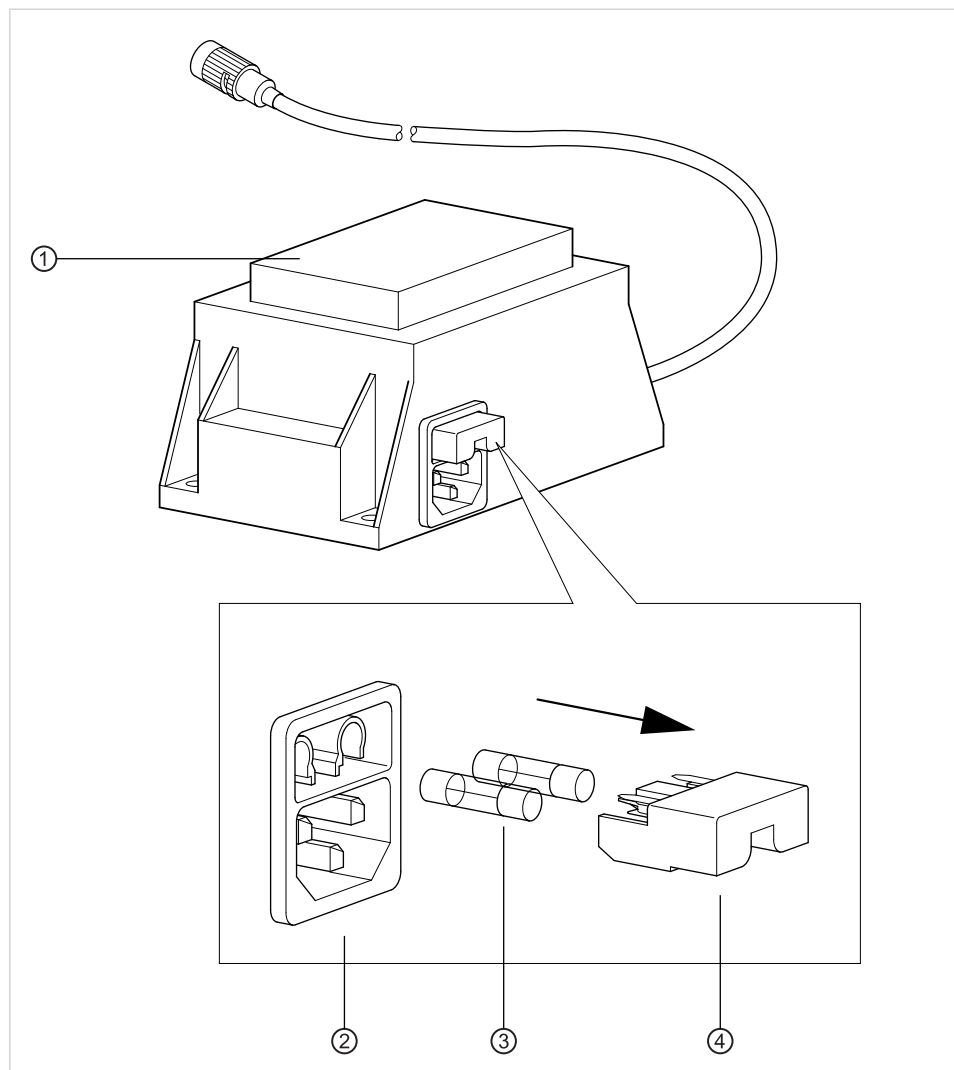
⑨ Disposal instructions for Europe

⑩ VDE mark

⑪ CSA mark

⑫ CE mark according to 93/42/EEC medical device

3.6 Transformer 4881



Transformer 4881 (Mat. no. 1.003.8542)

- ① Rating plate
- ② Power input module
- ③ Fuse
- ④ Fuse holder

3.7 Technical data on the transformer 4881



Note

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

Dimensions and weight

Width	87 mm/3.42"
Height	71 mm/2.80"

Depth	147 mm/5.89"
Weight	1,4 kg /49.4 ounces

Connected ratings

Nominal voltage	33 V DC
Performance	150 VA

Requirements

Protection class	I
Protection category	IP 40

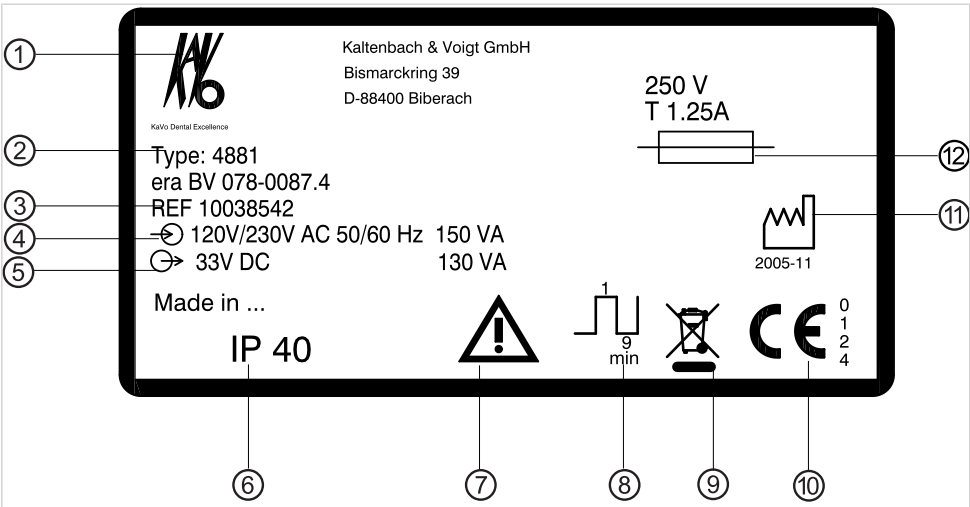
Environmental conditions while operating

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 above sea level
Air pressure	700 hPa to 1060 hPa

Environmental conditions transportation and storage

Permissible environmental temperature range	-20 °C to 70°C / -4°F to +158°F
Permissible to maximum moisture	95%, non-condensing

3.8 Rating plate for transformer 4881



Transformer 4881 rating plate

- ① Manufacturer
- ② Transformer type
- ③ Order number (reference number)
- ④ Supply voltage 120V/230V AC per-
formance 150 VA
- ⑤ Output voltage 33 V DC performance
130 VA
- ⑥ Protection class IP 40
- ⑦ Note: observe accompanying docu-
ments and safety instructions
- ⑧ Mode: Exposure mode
The operating time is 1 minute, and
the pause time is 9 minutes
- ⑨ Disposal instructions for Europe
- ⑩ CE mark according to 93/42/EEC
medical device
- ⑪ Year of manufacture
- ⑫ Fuse 1,25 A

3.9 Media supply data TLC 4893

System pressure	1.8 to 5 bar/26 to 72.5 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	6 to 10 NI/min.
Air requirements according to DIN EN 7494-2	Dry, oil-free, dirt-free, non-contaminated
Air filter	50 µm
Water quality according to DIN EN 7494-2	Tap water
pH	7.2 - 7.8

Customer water filtering	80 µm
--------------------------	-------

Recommended settings

System pressure	3.0 bar/43.5 psi
-----------------	------------------

- Spray air ¹⁾	1.0 bar/14.5 psi
---------------------------	------------------

Spray water ¹⁾	0.8 bar/11.6 psi
---------------------------	------------------

¹⁾ Measure the pressure at the motor coupling with a pressure gauge
Mat. no. 1.003.1050.

4 Commissioning



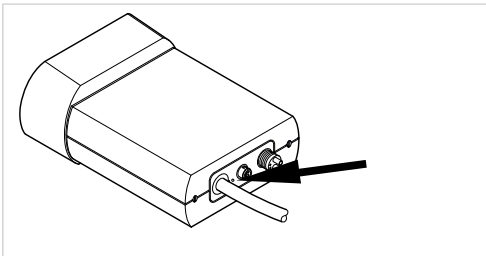
Note
Only operate the ELECTROtorque TLC 4893 with the **INTRAmatic LUX KL 702** motor **Mat. no. 1.003.5622** and 4881 transformer.

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 Electrical operating 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! ► The water pH must be between 7.2 and 7.8.



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:

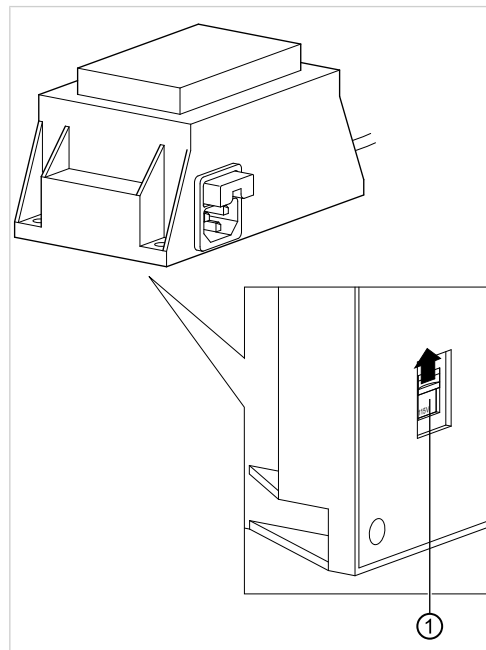
- Use a compressor with a dry air system.
- Connect the air filter in series.
- Blow out the lines before connecting.

Measure cooling air quantity at motor coupling

See also: 4.2.6 Measure cooling air quantity at motor coupling, Page 26

4.2.2 Voltage adjustment for transformer

- Adjust to the selector switch ① so that the required voltage of 115 V or 230 V can be read.



4.2.3 Connect the transformer



Note

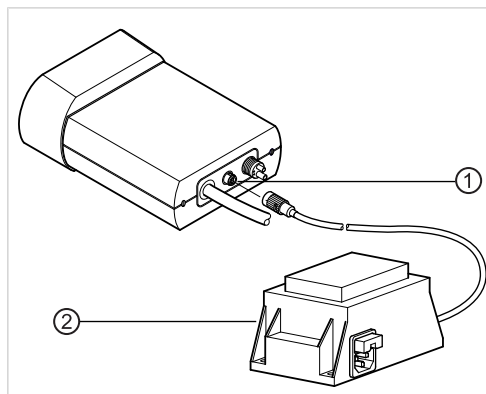
The transformer connection must correspond to the country-specific regulations and requirements for medical devices.



Note

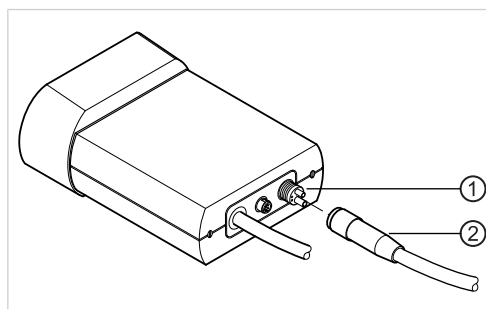
The transformer 4881 is delivered preset to operate at 115 V mains voltage.

- Connect transformer ② to socket ①.



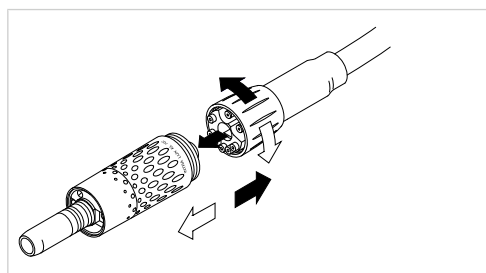
4.2.4 Connect ELECTROtorque

- Connect the four hole, five hole or six hole hose ② to the four hole connection ① of the ELECTROtorque.



4.2.5 Connect motor

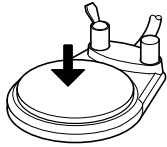
- Connect motor to cladding tubing.



- Place the motor in the provided holder.

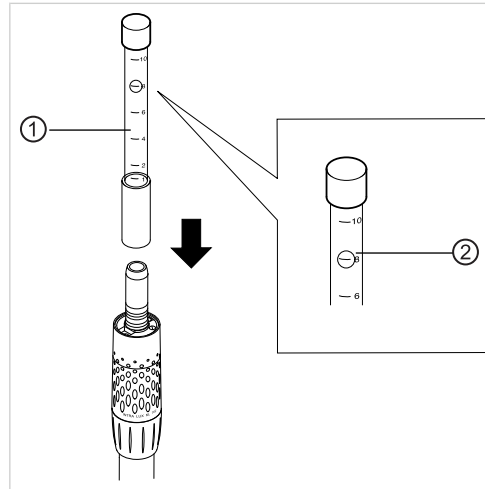
4.2.6 Measure cooling air quantity at motor coupling

- Place the airflow measuring tube ① (Mat. no. 0.411.4441) on the motor.



- Press the foot control to start the motor.

When the motor is operating, the value must lie between 6 to 10 NI/min. (top edge of ball ②).



5 Operation

5.1 Operation in general

	⚠ CAUTION Incorrectly set parameters. Damage from incorrect input values. ▶ Check all input values before use. In OPERATIVE mode, the motor speed is shown in the display; in ENDO mode, the drill speed is shown in the display.
	⚠ CAUTION Incorrect transfer ratio. Damage from incorrect transfer ratio during ENDO operation. ▶ Only use permissible instruments with a transfer ratio of 1:1 or 3:1. ▶ Only use KaVo 1:1 reducing shank 20LH or 20LP with 1:1 INTRA LUX head 68 LU (Mat. no. 1.003.7191) or 3:1 INTRA LUX head 66 LU (Mat. no. 1.004.4587).
	⚠ CAUTION Damage resulting from use of a non-authorized transformer. Product damage. ▶ Only operate product with the 4881 type transformer.
	⚠ CAUTION Germ formation Infections ▶ Before 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 ELECTROtorque must be sterilized by the treatment unit in OPERATIVE mode.

5.1.1 Insert the ELECTROtorque

- ▶ Turn on the product. Connect the unit to the circuit.

The software versions of the front panel and controls are shown for a few seconds on the display, for example:

KaVo Dental GmbH
ELECTROtorque TLC
Panel: V1.00 27.09.05
V1.00 14.10.05

Then the set speed is shown in OPERATIVE mode.



Note

Once the foot control has been calibrated, the product is ready for use.

- ▶ Calibrate the foot control.

See also: 5.2.2 Calibrate the foot control, Page 30

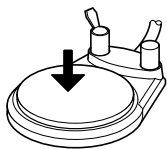
5.1.2 Start the motor



Note

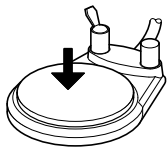
The pressure to start the motor is 1 bar/14.5 psi.

The minimum operating pressure at 40,000 rpm is 1.8 bar/26 psi.



- ▶ Press the foot control until the motor starting pressure (1 bar, 14.5 PSI) is exceeded.

Motor started.



- ▶ Completely depress the foot control.

The set maximum speed (max. 40,000 rpm) is reached.

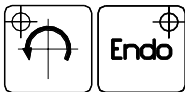
5.2 Using the USER MENU

The following menu items can be opened from the USER MENU:

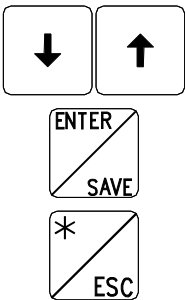
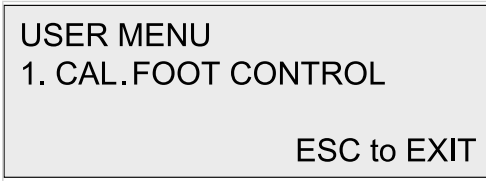
1. CAL FOOT CONTROL
2. UNIT AIR PRESSURE
3. ENDO Ratio
4. ENDO Chip Air
5. WARNING SIGNALS
6. FACTORY SETTINGS
7. LCD CONTRAST
8. LCD BRIGHTNESS
9. FIBER OPTIC VOLT
10. FIBER OPTIC DELAY
11. TORQUE UNIT
12. ENDO WARNING
13. LANGUAGE
14. SAFEdrive
15. ACTUAL SPEED

Keys	Function
Press keys simultaneously.  	Switch to USER MENU
 	Select the menu item/change parameters
	Select/change parameters
	Leave the USER MENU

5.2.1 Open the USER MENU



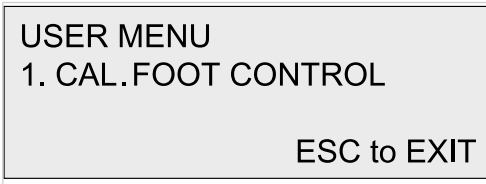
- ▶ Hold down the "CCW" button and press the "Endo" button for 3 seconds until the USER MENU appears in the display.



- ▶ Press THE "UP" or "DOWN" key to open a menu item.
- ▶ Press the "ENTER/SAVE" button to select the menu item.
- ▶ Press the "*/ESC" button leave the USER MENU.

5.2.2 Calibrate the foot control

- ▶ Select menu item 1. CAL FOOT CONTROL in the USER MENU.

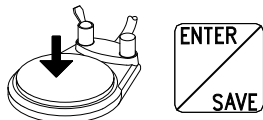




- Press the "ENTER/SAVE" key.

Calibration starts.

CAL. FOOT CONTROL
PRESS PEDAL TO 100%
Continuously.
Press SAVE KEY



- Press down the foot control all the way (maximum pressure), and press ENTER SAVE to save.

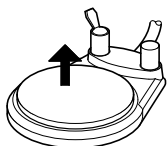
The instructions appear in the display.

CAL. FOOT CONTROL

WAIT....

CAL. FOOT CONTROL

SAVING DATA



- Release the foot control.

Calibration is complete and the values are saved.



Note

The default for the maximum pressure is 3 bar (44 psi).

Impermissible calibration pressure

If the maximum pressure is higher than 5.5 bar (80 psi), the following display appears. Calibration is permissible, however.

CAL. FOOT CONTROL

PRESSURE TO HIGH

If the minimum pressure is less than 1.8 bar (26 psi), the following displays appear and the values are not saved.

CAL. FOOT CONTROL
PRESSURE TO LOW



- ▶ Press the "ENTER/SAVE" key and repeat calibration.

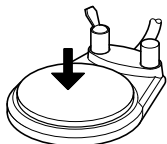
5.2.3 Check the device connection pressure

- ▶ Select menu item 2. UNIT AIR PRESSURE in the USER MENU.

USER MENU
2. UNIT AIR PRESSURE
3.0 bar
ESC to EXIT

The current device operating pressure is shown in bar in submenu 2. UNIT AIR PRESSURE.

The value depends on the utilized foot control and the system pressure.



- ▶ Press the foot pedal.

The current device pressure is shown.

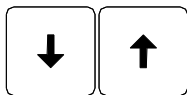
5.2.4 Select the transfer ratio

There are two transfer ratios available: 1:1 or 3:1.

USER MENU
3.ENDO
Ratio: 3:1
ESC to EXIT



- ▶ Select menu item 3. ENDO Ratio in the USER MENU.
- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" key to select the transfer ratio.



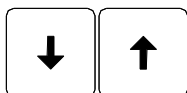
- ▶ Press the "ENTER/SAVE" button to confirm the selection.

5.2.5 Set the Chip Air for ENDO mode

- ▶ Select menu item 4. ENDO Chip Air in the USER MENU.



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" button to set the Chip Air (ON / OFF).



- ▶ Press the "ENTER/SAVE" button to confirm the selection.

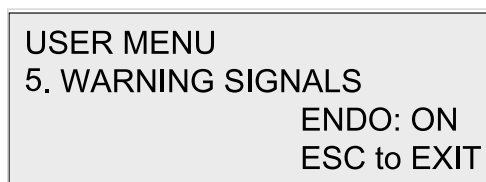
5.2.6 Activate/deactivate the ENDO warning signal



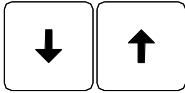
Note

The ENDO warning signal sounds when you reach 90% of the set torque.

- ▶ Select menu item 5. WARNING SIGNALS in the USER MENU.



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" key to activate or deactivate the ENDO warning signal (ON / OFF).

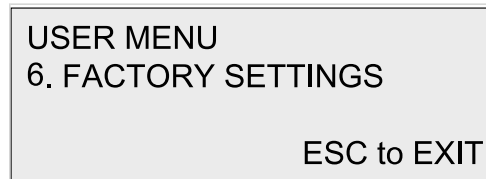


- ▶ Press the "ENTER/SAVE" key to confirm the selection.

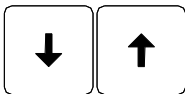
5.2.7 Reset the user values to the factory setting

The user can reset the changed values to the default.

- ▶ Select menu item 6. FACTORY SIGNALS in the USER MENU.



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" key to select "YES".



- ▶ Press the "ENTER/SAVE" key to confirm the selection.

The following user values are reset to default:

User values	Default
Starting pressure	1 bar/14.5 psi
Calibration pressure	3 bar/43.5 psi
Lamp voltage	3.2 V
Lamp afterglow time	3 seconds
Speed setting OPERATIVE M1	40,000 rpm
Speed setting OPERATIVE M2	30,000 rpm
Speed setting OPERATIVE M3	20,000 rpm
Speed setting OPERATIVE M4	15,000 rpm
Speed setting OPERATIVE M5	10,000 rpm
Speed setting OPERATIVE M6	5,000 rpm
LCD contrast	80 %
LCD backlighting	80 %
ENDO mode	Autoreverse
ENDO acoustic signals	ON
ENDO auto forward time	3 seconds
ENDO speed settings M1 – M6	300 rpm

User values	Default
ENDO torque settings M1 – M6	5 %
ENDO spray water valve	OFF
ENDO torque display	Ncm
Transfer ratio	3:1
ENDO warning	ON
Language	English
SAFEdrive	Normal
ACTUAL SPEED	OFF

5.2.8 Set the contrast of the display (LCD)

- ▶ Select menu item 7. LCD CONTRAST in the USER MENU.

USER MENU

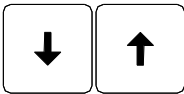
7. LCD CONTRAST

Value: 80

ESC to EXIT



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" button to select the desired value.



- ▶ Press the "ENTER/SAVE" key to confirm the selection.

5.2.9 Setting the backlighting of the display (LCD)

- ▶ Select menu item 8. LCD BRIGHTNESS in the USER MENU.

USER MENU

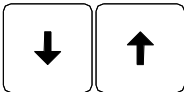
8. LCD BRIGHTNESS

Value: 80

ESC to EXIT



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" button to select the desired value.



- ▶ Press the "ENTER/SAVE" key to confirm the selection.

5.2.10 Setting the lamp voltage

The bulb voltage can be changed within the range of 3.0 V to 3.6 V when the motor is turned off. While the voltage is being set, the bulb shines.



Note

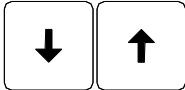
KaVo recommends setting the bulb voltage to 3.2 V.

- ▶ Select menu item 9. FIBER OPTIC VOLT in the USER MENU.

```
USER MENU
9. FIBER OPTIC VOLT
      Voltage: 3.2 V
      ESC to EXIT
```



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" button to select the desired value.



- ▶ Press the "ENTER/SAVE" key to confirm the selection.

5.2.11 Setting the lamp afterglow time

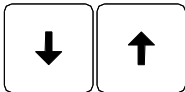
- ▶ Menu item 10. Select FIBER OPTIC DELAY in the USER MENU.

```
USER MENU
10. FIBER OPTIC DELAY
      Time: 3s
      ESC to EXIT
```



- ▶ Press the "ENTER/SAVE" button to select the menu item.

The lamp afterglow can be set in second increments from 0 to 10 seconds. The default is 3 seconds.



- ▶ Press the "UP" or "DOWN" key to change the value in one-second increments.



- ▶ Press the "ENTER/SAVE" key to confirm the selection.

5.2.12 Select the torque display

The torque can then be displayed in Ncm or % in Endo mode.

- 1:1 transmission: 100% = 3 Ncm
- 3:1 transmission: 100% = 8 Ncm

	⚠ CAUTION
	File breakage due to incorrectly entered value. Destroyed files can cause personal injury. ▶ Check all the input values before use.

- ▶ Menu item 11. TORQUE in the USER MENU.

USER MENU

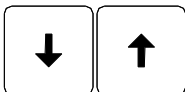
11. TORQUE UNIT

Unit: Ncm

ESC to EXIT



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" key to select the unit (Ncm/%).



- ▶ Press the "ENTER/SAVE" key to confirm the selection.

5.2.13 Deactivate ENDO warning

When you switch to ENDO mode, the ENDO warning appears on the display.

See also: 5.4.1 Setting ENDO mode , Page 44

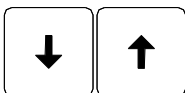
The ENDO warning can be deactivated.

- ▶ Select menu item 12. ENDO WARNING in the USER MENU.

USER MENU
12. ENDO WARNING
WARNING: ON
ESC to EXIT



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" key to deactivate the ENDO warning.



- ▶ Press the "ENTER/SAVE" button to confirm the selection.



- ▶ Press the "*/ESC" key.

Return to OPERATIVE mode.

5.2.14 Setting the language

The following menu languages are available:

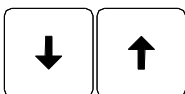
- English
- Italian
- Spanish
- French
- German

- ▶ Menu item 13. Select LANGUAGE in the USER MENU.

USER MENU
13. LANGUAGE
ENGLISH
ESC to EXIT



- ▶ Press the "ENTER/SAVE" button to select the menu item.



- ▶ Press the "UP" or "DOWN" key to select the desired language.

The selected language flashes.



- ▶ Press the "ENTER/SAVE" key to confirm the selected language.

5.2.15 Setting and using the SAFEdrive safety function against over-heating

	⚠ WARNING
	Use of incorrect handpiece/contra-angle handpiece or deactivated SAFEdrive Danger of burning from lack of protection against overheating ▶ Only use original series 25LP/25LPA/25LPR/25LCA KaVo handpieces/contra-angle handpieces. ▶ Treatments may only be performed in the oral cavity when the SAFEdrive is activated.

SAFEdrive reduces the risk of overheating instrument heads that are defective or have been poorly maintained and thereby minimizes the risk of burns in the oral cavity. A potential defect can be detected by continuously monitoring the idling properties of the instrument during operation. When the safety function is triggered, SAFEdrive first reduces the motor speed and completely stops the motor if the problem persists.



Note
SAFEdrive only works with KaVo series 25LP/25LPA/25LPR/25LCA handpieces and contra-angle handpieces. When instruments by other manufacturers are used, SAFEdrive may be mistakenly triggered.

In the user menu, SAFEdrive can be activated on two levels of sensitivity, and it can also be completely deactivated. The two sensitivity levels are NORMAL and SENSITIVE. SENSITIVE reacts more sensitively than NORMAL.

Adjust SAFEdrive

- ▶ Menu item 14. Select SAFEdrive from the USER MENU.

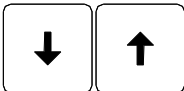
USER MENU

14. SAFEdrive

NORMAL

ESC to EXIT

- ▶ Press the "ENTER/SAVE" button to select the menu item.
- ▶ Press the "UP" or "DOWN" key to select the sensitivity level, or deactivate SAFEdrive.
- ▶ Press the "ENTER/SAVE" button to confirm the selection.



Using SAFEdrive

When SAFEdrive is activated and the instrument head becomes too hot, the message "OVERHEAT WARNING" appears on the ELECTROtorque TLC display. In addition, a periodic warning tone sounds. If the problem continues for more than 5 seconds, the message OVERHEAT ERROR appears, the motor is automatically stopped, and the motor is prevented from restarting.

- ▶ When the message "OVERHEAT WARNING" appears and a periodic warning tone sounds, let the instrument rest for least 2 seconds.
- ▶ When the message disappears, continue working as usual.
- ▶ When the message "OVERHEAT ERROR" appears and the motor automatically stops, remove the instrument from the patient's oral cavity and proceed as follows:
- ▶ Carefully check the instrument head for the following:
 - Temperature
 - Damage
 - The ability of the drill bit to rotate
- ▶ If there is no damage or overheating, confirm the "OVERHEAT ERROR" message by pressing the "ENTER" key.

The motor can be started.

- ▶ If there is damage or overheating, turn off the instrument or have it repaired.

Briefly turn off SAFEdrive

In OPERATIVE mode, the SAFEdrive can be briefly turned off.

	 WARNING Deactivated SAFEdrive Danger of burning from lack of protection against overheating ▶ Treatments may only be performed in the oral cavity when the SAFEdrive is activated.
---	---

- ▶ To briefly turn off SAFEdrive in OPERATIVE mode, press ESC.

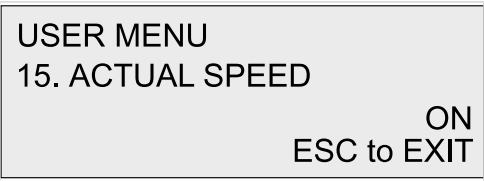
SAFEdrive is deactivated. SAFEdrive automatically turns on five minutes after the last time the motor stops.

- ▶ To turn on SAFEdrive when it was turned off in OPERATIVE mode, pressed ESC again.

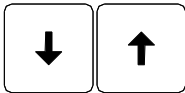
5.2.16 Turn the ACTUAL SPEED display on and off

When is the ACTUAL SPEED" display is active, the current motor speed is shown while the motor is operating. This display can be turned on or off.

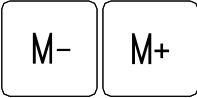
- ▶ Menu item 15. Select ACTUAL SPEED from the USER MENU.



- ▶ Press the "ENTER/SAVE" button to select the menu item.
- ▶ Press the "UP" or "DOWN" key to activate (ON) or deactivate (OFF) the speed display.
- ▶ Press the "ENTER/SAVE" button to confirm the selection.



5.3 OPERATIVE mode

Keys	Function
	Increase speed
	Reduce speed
	CCW rotation
	Select or change speed settings 1 - 6 (M1 - M6).
	Switch to endodontics mode. The LED shines when the device is in ENDO mode.
	Turn SAFEdrive on/off

5.3.1 Set OPERATIVE mode

The device is in OPERATIVE mode when the LED in the "Endo" does not shine.



- ▶ When the LED in the "Endo" key shines, press the "Endo" key.

When the LED in the "Endo" key goes dark, the device is in OPERATIVE mode.

5.3.2 Setting the speed



Note
The speed can be adjusted while the motor is running.

The speed range is 100 rpm to 40,000 rpm.

The speed can be adjusted in increments of 100 from 100 rpm to 1,000 rpm, and in increments of 1,000 from 1,000 rpm to 40,000 rpm.



Note
Hold down the "UP" and "DOWN" keys for the function to repeat automatically.



- ▶ Press the "UP" key to increase the speed.



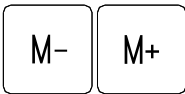
- ▶ Press the "DOWN" key to reduce the speed.

5.3.3 Setting the user speed

Six user speeds (M1 - M6) can be preset with the M- and M+ keys.

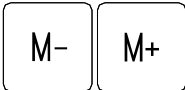
Default setting:

Memory	rpm
M1	40.000
M2	30.000
M3	20.000
M4	15.000
M5	10.000
M6	5.000



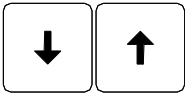
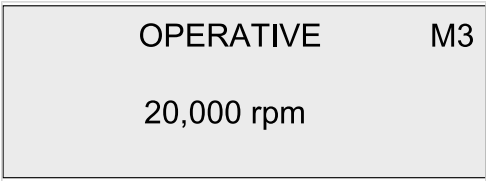
- ▶ Briefly press the M- or M+ key to retrieve user speed M1 - M6.

Change and save user speed



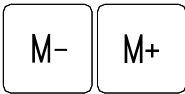
- ▶ Briefly press the M- or M+ key to select M1 - M6.

The set speed is displayed.



- ▶ Press the "UP" or "DOWN" button to select the desired speed.

See also: 5.3.2 Setting the speed, Page 42



- ▶ Press the M- or M+ key for more than 2 seconds until you hear a signal.

The set speed is saved in memories M1 - M6 when you press the M- or M+ key.

5.3.4 Setting the rotational direction



Note
Counterclockwise rotation cannot be saved.



- ▶ Press the CCW rotation key.

The LED shines in the "CCW" key in counterclockwise rotation.

5.3.5 Turn SAFEdrive on/off

See also: 5.2.15 Setting and using the SAFEdrive safety function against overheating, Page 39



⚠ WARNING

Deactivated SAFEdrive
Danger of burning from lack of protection against overheating

- ▶ Treatments may only be performed in the oral cavity when the SAFEdrive is activated.

- ▶ To briefly turn off SAFEdrive in OPERATIVE mode, press ESC.

SAFEdrive is deactivated. SAFEdrive automatically turns on five minutes after the last time the motor stops.

- ▶ To turn on SAFEdrive when it was turned off in OPERATIVE mode, pressed ESC again.

5.4 ENDO mode

Buttons	Function
↓ ↑	Changing parameter values and modes
M- M+	Select or save parameters (M1 – M6)
* / ESC	Select parameter/mode
Endo	Switch to OPERATIVE mode



Note
When switching from OPERATIVE mode to ENDO mode, a small amount of spray water drains.

- ▶ Drain the residual water before ENDO treatment by briefly switching on the device when it is outside of the oral cavity.

5.4.1 Setting ENDO mode



Note
Check the transmission factor on the display before use.



Note
A precise torque display is only ensured with the KaVo 1:1 reducing shank 20LH or 20LP and the INTRA LUX head 68 LU (**Mat. no. 1.003.7191**) or 3:1 INTRA LUX head 66 LU (**Mat. no. 1.004.4587**).

The device is in ENDO mode when the LED in the "Endo" shines and the display shows ENDO.



- ▶ Press the "Endo" key.

The LED in the "Endo" key shines. The device is in ENDO mode.

ENDO Caution
See Manual for
correct settings of
Ratio, Torque & Speed

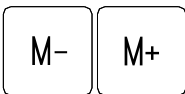
The message appears for 3 seconds in the display.

ENDO	3:1
Speed :	300 rpm
Torque:	5 %
* Autoreverse	

5.4.2 Set parameters

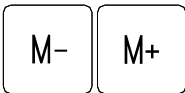
In ENDO mode, six different parameter settings (M1 - M6) can be selected.

Retrieving parameters



- ▶ Briefly press the M- or M+ key to retrieve the parameters of parameter memories M1 - M6.

Change and save parameters



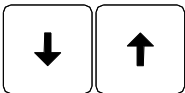
- ▶ Briefly press the M- or M+ key to select the desired parameter memories (M1 - M6).

The asterisk shines next to the parameter to be changed.
See also: 5.2.12 Select the torque display, Page 37

ENDO	M1	3:1
* Speed :	550 rpm	
Torque:	45%	
Autoreverse		



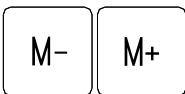
- ▶ Press the "*" / "ESC" button to select the desired parameter.



- ▶ Press the "UP" or "DOWN" key to change the selected parameter.



Note
Hold down the "UP" and "DOWN" keys for the function to repeat automatically.



- ▶ Press the M- or M+ key for more than 2 seconds until you hear a signal.

The selected parameter memory was changed.

Setting the speed

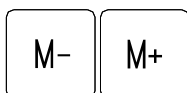
The speed can be adjusted in steps of 10 from 100 rpm to 500 rpm, in steps of 50 from 500 rpm to 1000 rpm, and in steps of 100 from 1000 rpm to 6000 rpm.



- ▶ Press the "UP" key to increase the speed.



- ▶ Press the "DOWN" key to reduce the speed.



- ▶ Press the M- or M+ key for more than 2 seconds until you hear a signal.

The selected parameter memory was changed.

Setting the torque

The torque is limited to the set value.



Note

The ENDO warning signal sounds when you reach 90% of the set torque.

See also: 5.4.3 Select torque mode, Page 47

1:1 transmission ratio

The torque can be set in 0.05 Ncm steps ranging from 0.15 Ncm to 3.0 Ncm, or in 5% steps ranging from 5% to 100%.

.

3:1 transmission ratio

The torque can be set in 0.1 Ncm steps ranging from 0.4 Ncm to 8 Ncm, or in 5% steps ranging from 5% to 100%.

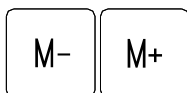
See also: 5.2.12 Select the torque display, Page 37



- ▶ Press the "UP" key to increase the torque.



- ▶ Press the "DOWN" key to reduce the torque.



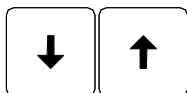
- ▶ Press the M- or M+ key for more than 2 seconds until you hear a signal.

The selected parameter memory was changed.

5.4.3 Select torque mode

There are three different torque modes in Endo mode:

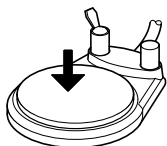
- Autoreverse
- Torque Control only
- Autorev / Forward



- ▶ In Endo mode, select the desired torque mode by pressing the "UP" or "DOWN" key.
- ▶ Press the M- or M+ key for more than 2 seconds until you hear a signal.

The selected parameter memory was changed.

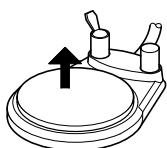
Autoreverse



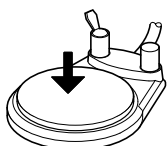
- ▶ Press the foot pedal.

The motor starts.

When the set torque is reached, a signal sounds, and the light flashes. The motor rotates at a constant speed to the left.



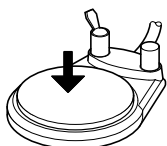
- ▶ To stop this, release the foot pedal.



- ▶ Press the foot pedal.

The motor rotates to the right.

Torque Control only



- ▶ Press the foot pedal.

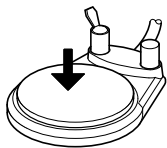
The motor starts.

The torque is limited to the set threshold.
 The speed reduces until it stops depending on the load.
 The direction of rotation is always to the right.
 When the set torque threshold is reached, a signal sounds, and the light flashes



- ▶ Press the "CCW" key to switch the direction of rotation to the left.

Autorev / Forward



- ▶ Press the foot pedal.

The motor starts.

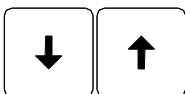
When the set torque is reached, a signal sounds, and the light flashes. The motor rotates at a constant speed to the left.

In Autorev/Forward mode, you can set a period of time (1 to 10 seconds) after which the motor automatically runs clockwise so that you do not have to stop it by using the foot pedal.

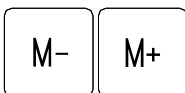


- ▶ Press the "ENTER/SAVE" in the torque mode Autorev/Forward to select the time.

The seconds value flashes.



- ▶ Press the "UP" or "DOWN" key to change the time.



- ▶ Press the M- or M+ key for more than 2 seconds until you hear a signal.

The selected parameter memory was changed.

6 The setup methods follow DIN EN ISO 17664.

	⚠ 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 **INTRA LUX Motor KL702** as well as the instructions for use of the handpiece and contra-angle handpiece.

6.1 Cleaning



Note

Do not use solvents or aggressive chemicals.

6.1.1 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.

6.1.2 Manual cleaning of the exterior



Note

Do not use scouring cleansers.

- ▶ 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 ELECTROtorque housing and outer surface of the motor hose using a damp cloth.

6.1.3 Manual cleaning of the inside

There is no special method for cleaning the inside of the unit.

6.1.4 Mechanical cleaning of the exterior and interior

Not applicable.

6.2 Disinfection

	⚠ CAUTION
	Germ formation Infections ▶ Before 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 ELECTROtorque must be sterilized by the treatment unit in OPERATIVE mode.



Note

The unit may only be manually disinfected.

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.

6.2.1 Manual disinfection of the the exterior

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

- Microcide AF by Schülke&Mayr (liquid or cloths)
- FD 322 by Dürr
- CaviCide by Metrex

Follow the manufacturer's instructions for use.

Required tools:

Cloths for wiping down 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.

6.2.2 Manual disinfection of the interior

There is no special method for disinfecting the inside of the unit. To protect from infection, rinse the water and air channel for at least 20 seconds before treating a patient.

The unit must to be sterilized using the treatment unit.

KaVo recommends the products KaVo Oxygenal 6 by KaVo Dental GmbH for sterilization. www.kavo.com and BluTab by ConFirm Monitoring Systems Inc. www.blutab.com. Use according to manufacturer's instructions.

6.2.3 Mechanical disinfection of the exterior and interior

The exterior and interior of this product are not designed for automated disinfection.

6.3 Sterilisation

Only the INTRAmatic LUX Motor KL can be sterilized.

See also: GA INTRAmatic LUX Motor KL 702, "Sterilization"

6.4 Storage

Prepared products must be stored germ-free and protected from dust in a dry, dark and cool room.



Note

Observe the expiration date of the sterilized item.

7 Maintenance

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.

Authorized to repair and service the KaVo products:

- Technicians at KaVo branches throughout the world.
- the technicians of the KaVo franchised dealers specifically trained by KaVo.
- Independent technicians specially trained by KaVo.

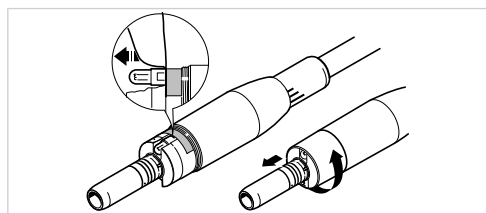
7.1 Changing the bulb

7.1.1 Changing the high-pressure bulb (INTRAmatic LUX Motor KL 702)

The user may change the bulb.

	 DANGER Electricity Electrical shock ▶ Before opening the unit covers, pull the plug from the mains or disconnect the unit from the voltage source.
	 CAUTION Hot bulb Burning hazard ▶ Before changing the bulb, wait until it has cooled.

- ▶ Unscrew the sleeve.



- ▶ Push the bulb out of the recess with your fingernail and remove it.
- ▶ Inset a new bulb into the recess so that the contact surface corresponds to that of the recess.
- ▶ Push the lamp into the holder.
- ▶ Place the sleeve on the motor and screw it tight.

7.1.2 Changing the KaVo MULTI LED bulb (INTRAmatic LUX Motor KL 702)



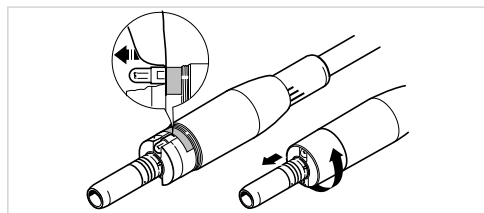
Note

Only equipment with the SAFEdrive functionality are suitable for the KaVo MULTI LED bulb.

The user may change the bulb.

	⚠ DANGER Electricity Electrical shock ▶ Before opening the unit covers, pull the plug from the mains or disconnect the unit from the voltage source.
	⚠ CAUTION Hot bulb Burning hazard ▶ Before changing the bulb, wait until it has cooled.

- ▶ Unscrew the sleeve.



Note

The KaVo MULTI LED bulb is a semiconductor element and may only be operated with direct current. To ensure proper function, the LED needs to be inserted with the correct polarity.

- ▶ Push the bulb out of the recess with your fingernail and remove it.
- ▶ Inset a new KaVo MULTI LED bulb into the recess so that the contact surface corresponds to that of the recess.
- ▶ Place the sleeve on the motor and screw it tight.

After the KaVo MULTI LED bulb is turned on, the following can occur:

- 1: The KaVo MULTI LED lamp shines
- 2: The KaVo MULTI LED lamp is dim.
 - Increase the bulb voltage to reach the desired illumination (see section 5.2.10).
- 3: The KaVo MULTI LED lamp does not shine or shines red
 - As described above, remove the KaVo MULTI LED bulb, twist it 180° and insert it back into the socket.

7.2 Repair aging paint

Aging paint can be identified by the reduced gloss, brightness and clarity of the color.



Note

Only use conventional paint care products and cleansers to restore the paint.

- ▶ Clean the painted surface.

See also: 6.1.2 Manual cleaning of the exterior, Page 49

- ▶ To preserve the paint, apply the paint care product with a lint-free cloth in a circular motion.
- ▶ Repolish with a pad or cloth until the surface shines.

8 Troubleshooting



Note

With this product, error messages or instructions are shown on the display. Fault numbers 1 to 30 are possible. The motor is shut off when faults occur.

System Message: 1
Overload

See user manual

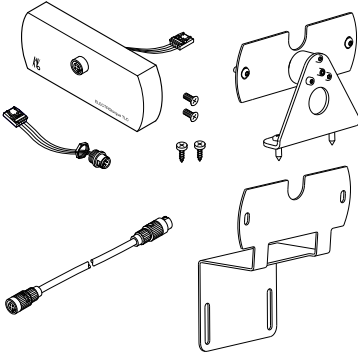
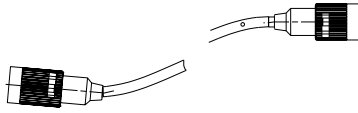
Examples of error displays

- ▶ If the error message does not disappear or the error is reported again, contact Service.
- ▶ Restart the unit with all the other error messages.

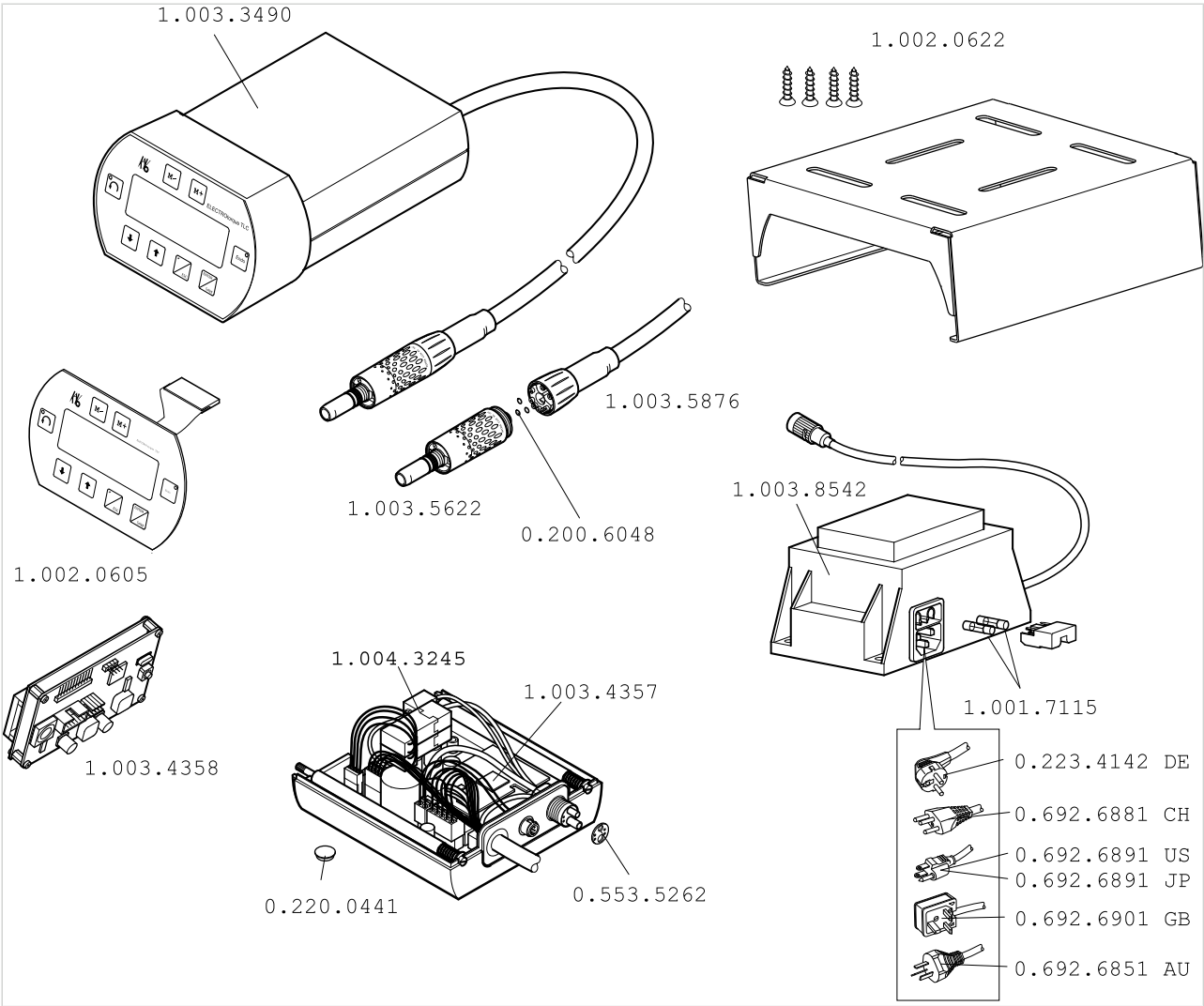
Malfunction	Cause	Remedy
System Message: 1 Overload	Motor overload, motor current above 2,5 A for 7 seconds.	▶ Relieve motor, stop and restart it using the footswitch.
System Message: 2 Motor blocked	Motor blocked	▶ Relieve motor, stop and restart it using the footswitch.
System Message: 3 Motor disconnected	The motor is disconnected or the rotational direction was switched while checking components.	▶ Connect the motor.
System Message: 5 Open Foot Pedal	The foot switch is pressed during Power On.	▶ Release the foot switch.

9 Accessories and spare parts

9.1 Accessories

Presentation	Material summary	Mat. no.
	Connecting kit	10035710
	Connecting kit cable	10038537

9.2 Spare parts



10 Information on electromagnetic compatibility

10.1 Guidelines and manufacturer's declaration - electromagnetic transmission

The ELECTROtorque TLC Type 4893 is for use in an environment like the one cited below. The customer or user of the ELECTROtorque TLC Type 4893 should ensure that it is used in the correct environment.

Measurements of noise transmissions	Conformance	Electromagnetic environment - hints
HF transmission according to CISPR 11	Group 1	The ELECTROtorque TLC type 4893 uses HF energy only for its internal operation. Its HF transmission is therefore very low, and it is improbable that neighboring electronic devices will be disturbed.
HF transmission according to CISPR 11	Class B	The ELECTROtorque TLC type 4893 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 harmonics according to IEC 61000-3-2	Class A	The ELECTROtorque TLC type 4893 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.
Transmission of voltage fluctuations or flicker according to IEC 61000-3-3	In conformance	The ELECTROtorque TLC type 4893 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.

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

The ELECTROtorque TLC Type 4893 is for use in an environment like the one cited below. The customer or user of the ELECTROtorque TLC Type 4893 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 ± 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 and input and output lines	The quality of the supply voltage should correspond to that of a typical business or hospital environment.

Immunity tests	IEC 60601 test level	Conformance level	Electromagnetic environment - guidelines
Surges according to IEC 61000-4-5	± 1 kV Push-pull voltage ± 2 kV common mode voltage	± 1 kV Push-pull voltage ± 2 kV common mode 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	$< 5\% V_T (> 95\% \text{ interruption})$ for $\frac{1}{2}$ period $40\% V (60\% \text{ interruption of the } V_T)$ for 5 periods $70\% V (30\% \text{ interruption of the } V_T)$ for 25 periods $< 5\% V (> 95\% \text{ interruption of the } V_T)$ for 5 s (250 periods)	$< 5\% V_T (> 95\% \text{ interruption})$ for $\frac{1}{2}$ period $40\% V (60\% \text{ interruption of the } V_T)$ for 5 periods $70\% V (30\% \text{ interruption of the } V_T)$ for 25 periods $< 5\% V (> 95\% \text{ interruption of the } V_T)$ for 5 s (250 periods)	The quality of the supply voltage should correspond to that of a typical business or hospital environment. When the user of the ELECTROtorque TLC type 4893 needs continued operation even when there are interruptions to the power supply, it is recommended that the ELECTROtorque TLC type 4893 be supplied from an 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.

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

The ELECTROtorque TLC Type 4893 is for use in an environment like the one cited below. The customer or user of the ELECTROtorque TLC Type 4893 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	$3 V_{\text{eff}}$ 150 kHz to 80 MHz Out-side ISM bands ^a 10 V/m 80 MHz to 2.5 GHz	$3 V_{\text{eff}}$ 10 V/m	Portable and mobile radio devices should not be used closer to the ELECTROtorque TLC type 4893 including the wires, than the recommended safe distance calculated using the equation for the transmission frequency. Recommended safe distance: $d = 1.17 \sqrt{P}$ $d = 0.35 \sqrt{P}$ for 80 MHz to 800 MHz $d = 0.70 \sqrt{P}$ 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 ISM frequency bands (for industrial, scientific and medical applications) between 150 kHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz and 40.66 MHz to 40.70 MHz.

^b The conformance levels in the ISM frequency bands between 150 kHz and 80 MHz and the frequency range of 80 MHz and 2.5 GHz are intended to reduce the probability that mobile and portable communications equipment will produce disturbances when they are unintentionally brought near the patient. For this reason, the additional factor of 10/3 is used when calculating the recommended safe distances within these frequency ranges.

^c The field strength of stationary transmitters such as base stations of mobile telephones and land mobile 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 ELECTROtorque TLC 4893 is used, exceeds the conformity level, the display should be watched to ensure that the ELECTROtorque TLC 4893 is functioning as per the correct usage. Should unusual performance features be observed, additional measures may be required, such as e.g. a different alignment or another location for the ELECTROtorque TLC 4893.

^d Within the frequency range of 150 kHz to 80 MHz, the field strength should be less than $3V_{\text{eff}}$ V/m.

10.4 Recommended safe distance between portable and mobile HF telecommunications equipment and the ELECTROtorque TLC 4893

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 $d=1.17 \sqrt{P}$	80 MHz to 800 MHz $d=0.35 \sqrt{P}$	800 MHz to 2.5 GHz $d=0.70 \sqrt{P}$
0.01	0.12	0.04	0.07
0.1	0.37	0.11	0.22
1	1.17	0.35	0.70
10	3.70	1.11	2.21
100	11.70	3.5	7.0

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.

The ELECTROtorque TLC type 4893 is intended for use in an electromagnetic environment in which HF disturbances are controlled. The customer or the user of the

10 Information on electromagnetic compatibility | 10.4 Recommended safe distance between portable and mobile HF telecommunications equipment and the ELECTROtorque TLC 4893

ELECTROtorque TLC type 4893 can help prevent electromagnetic disturbances by maintaining the minimum distance between portable and mobile HF telecommunications devices (transmitters) and the ELECTROtorque TLC type 4893 depending on the output of the communication device as indicated below.



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