Instructions for use
INTRAsurg 300 / INTRAsurg 300 plus



Always be on the safe side.

KaVo. Dental Excellence.

Sales:
KaVo Dental GmbH
Bismarckring 39
D-88400 Biberach
Tel. +49 7351 56-0
Fax +49 7351 56-1488

Manufacturer:
Kaltenbach & Voigt GmbH
Bismarckring 39
D-88400 Biberach
www.kavo.com

CE 0124

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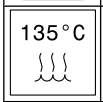
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1 User Notes

1.1 User guidelines

1.1.1 Symbols

	See safety/hazard warning symbol chapter
	Important information for users and Service Technicians
	Can be thermally disinfected
	Sterilisable up to 135°C
	CE (Communauté Européenne) mark. Products bearing this mark conform to the requirements of the pertinent EC directives (applicable European standards).
	ESD warning plate

1.2 Intended users

This document is for dentists and office personnel.

1.3 Service



Service hotline:
++ 49 (0) 7351 56-2500
Service.Einrichtungen@kavo.com
Please indicate the product serial number in all requests.
Additional information can be obtained at: www.kavo.com

1.4 Warranty terms and conditions

For the product cited in the transfer protocol, KaVo warrantees the end customer that the product will function properly, have no material or manufacturing flaws for 12 months from the date of purchase under the following conditions:
In the case of valid complaints due to defects or a short delivery, KaVo will make good its warranty by replacing the product free of cost or repairing it according to your wishes. All other claims of any kind are excluded, especially claims for damages. In case of delayed performance, gross negligence or criminal intent, this shall apply only if there are no compelling legal regulations to the contrary.
KaVo is not liable for defects and their consequences that arise from natural wear, improper cleaning or servicing, the non-observance of instructions for use, servicing or connection, scale formation or corrosion, impurities in the air and water supply, or chemical or electrical influences that are unusual or impermissible according to the manufacturer's specifications.
The warranty does not generally extend to lamps, glassware, rubber parts and the colour fastness of plastic parts.
No liability is assumed when defects or their consequences can arise from manipulations or changes to the product by the customer or a third party.
Claims from this warranty can only be asserted when the transfer protocol (copy) belonging to the product has been sent to KaVo, and the original can be presented by the operator or user.

1.5 Transportation and storage

1.5.1 Currently valid packaging ordinance

Note
Only applicable for the Federal Republic of Germany.

KaVo transport packaging must be disposed of and recycled by local disposal service providers and recycling companies in accordance with Dual System requirements.
For more information about disposal and recycling, and an up-to-date list of local disposal service providers and recycling companies, please visit the following Internet sites:
http://www.umweltdatenbank.de
http://www.quality.de
KaVo will bring KaVo transport packaging returned by the customer at the customer's own cost to the appropriate recycling companies without reimbursement..

1.5.2 Transportation damage

In Germany

If external damage to the packaging is visible upon delivery, follow the procedure below:
1. The recipient must record the loss or damage in the notice of delivery. The recipient and employee of the transportation firm must sign the notice of delivery.
2. Leave the product and packaging unchanged.
3. Do not use the product.
4. Report damage to the shipping company.
5. Report damage to KaVo.
6. A damaged product cannot be returned before talking with KaVo.
7. Send the signed notice of delivery to KaVo.

If the product is damaged and there is no discernable damage to the packaging upon delivery, proceed as follows:
1. Report damage immediately or at least 7 days after the delivery to the delivery company. .
2. Report damage to KaVo.
3. Leave the product and packaging unchanged.
4. Do not use a damaged product.

Note
If the recipient does not follow one of the above instructions, the damage will be held to have occurred after the delivery (according to ADSp. Art. 28)..

Outside of Germany

Note
KaVo is not liable for damage arising from transportation.
Immediately inspect the delivery after receipt!

If external damage to the packaging is visible upon delivery, follow the procedure below:

1. The recipient must record the loss or damage in the notice of delivery. The recipient and employee of the transportation firm must sign the notice of delivery. The recipient can only assert damages against the transportation company based on these records.
2. Leave the product and packaging unchanged.
3. Do not use the product.

If the product is damaged and there is no discernable damage to the packaging upon delivery, proceed as follows:

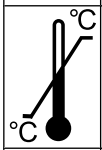
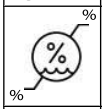
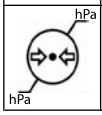
1. Report the damage immediately or at least 7 days after the delivery to the delivery company .
2. Leave the product and packaging unchanged.
3. Do not use a damaged product.

Note
If the recipient does not follow one of the above instructions, the damage will be held to have occurred after the delivery (according to . CMR law , section 5, Art. 30).

1.5.3 Information on the packaging: Storage and transport

Note
Keep the packaging for returning the product for service or repairs .

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
	Maximum permitted 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 Structure


DANGER

The introduction describes the type and source of the hazard.
This section describes the potential consequences of non-observance.
- The optional step contains necessary measures for avoiding hazards.

2.1.3 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.

2.2 Purpose – Proper use

Note
Only the INTRAsurg 300plus with the IPX8 foot switch is permitted for use in operating rooms.

The ambient temperature must lie between +10℃ and +35℃.
The relative humidity must be between 30% and 75%.

This KaVo product is intended only for use in the field of dentistry, for surgery to expose and dissect oral tissue structures (such as the periodontal gap, gingiva, bone, the jaw, extractions and implantations). 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.

Apply and meet the overarching guidelines and/or national laws, national regulations and the rules of technology for medical devices applicable for startup and use of the KaVo product for the intended purpose.

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

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

The user must observe the following:
- - only use properly operating equipment.
- protect himself or herself and third parties from danger.
- avoid contamination from the product.

To guarantee constant readiness for use and maintenance of value of the KaVo product, the recommended annual servicing must be done.
Yearly safety inspections are required.

KaVo recommends an annual service check. In this service check, the safety checks are performed according to VDE 0751-1as well as calibration.
The safety check involves the following tests: Visually inspect the medical device and accessories; check the ratings of fuses that are accessible from outside; protective conductor check and leakage current measurements as per VDE 0751; medical device function test with reference to accompanying documentation.

Authorised to repair and service the KaVo product:
- Technicians from the KaVo branches who are trained to deal with the product.
- the technicians of the KaVo franchised dealers specifically trained by KaVo.

In Germany, the operator, person responsible for the device and user must operate their devices in accordance with the provisions of the Medical Device Law.
These service tasks include all testing tasks that are stipulated in the Operator Ordinance (MPBetreiber V) § 6.

After the unit has undergone maintenance, interventions or repair, it must be tested in accordance with DIN VDE 0751-1 (for compliance with current technical standards).

Check the parameters of the device settings after servicing. Enter the service parameters in the table on the last page.



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



Note
The waste that arises must be recycled or disposed of in a manner safe for humans and the environment. Observe the applicable national regulations.
Please direct all questions regarding the proper disposal of KaVo products to the nearest KaVo branch.



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

2.2.1 Information on electromagnetic compatibility

Conformance level: The immunity test levels required in IEC 60601 are met.



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.



CAUTION

Interactions between devices
Effect on proper use
- ▸ Do not use the device directly next to or stacked with other devices
- ▸ If it is necessary to use it next to or stacked with other devices, check for proper use in this set up.



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.



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

2.2.2 Risks from electromagnetic fields (implanted life-sustaining system)



DANGER

Risks from electromagnetic fields.
The functions of implanted systems (such as pacemakers) can be influenced by electromagnetic fields.

- Patients and users must inquire about implanted systems before using the motors and check the use.
- Evaluate the risks and benefits.
- Do not bring the motors close to the systems.
- Take suitable emergency precautions and immediately react to any changes in health.
- Symptoms such as elevated heart beat, irregular pulse and dizziness are signs of problems with a pacemaker.

2.2.3 Disposal of electronics



Note
According to the EC Directive 2002/96 concerning electrical and electronic used devices, this product is subject to the cited directive and must be disposed accordingly within Europe.
Before disassembling and disposing of the product, it must be completely processed (disinfected, sterilised) according to the section "Preparation methods".
Additional information can be obtained from KaVo (www.kavo.com) or your dental supplier.

2.3 Safety instructions


CAUTION

Sparks of electricity within the product.
Explosion.
- Do not use this product in areas where there is a risk of explosion.


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 from liquids.
Malfunctions of electrical components.
- Cover openings in the product to prevent the penetration of liquids.
- Remove liquids from the interior of the device.


CAUTION

Unintentional fluid penetration.
Electric shock.
- Do not place the product in a deep container.


CAUTION

Stickers can damage the instrument hoses.
Instrument hoses can rupture.
- Do not affix stickers or adhesive tape.


CAUTION

Rotating parts when pump is on
Injury
- Do not put your hand into the pump. Switch off the unit when the pump is open.


CAUTION

Risks from electromagnetic fields.
The functions of implanted systems (such as pacemakers) can be influenced by electromagnetic fields.
- Ask patients before treatment.

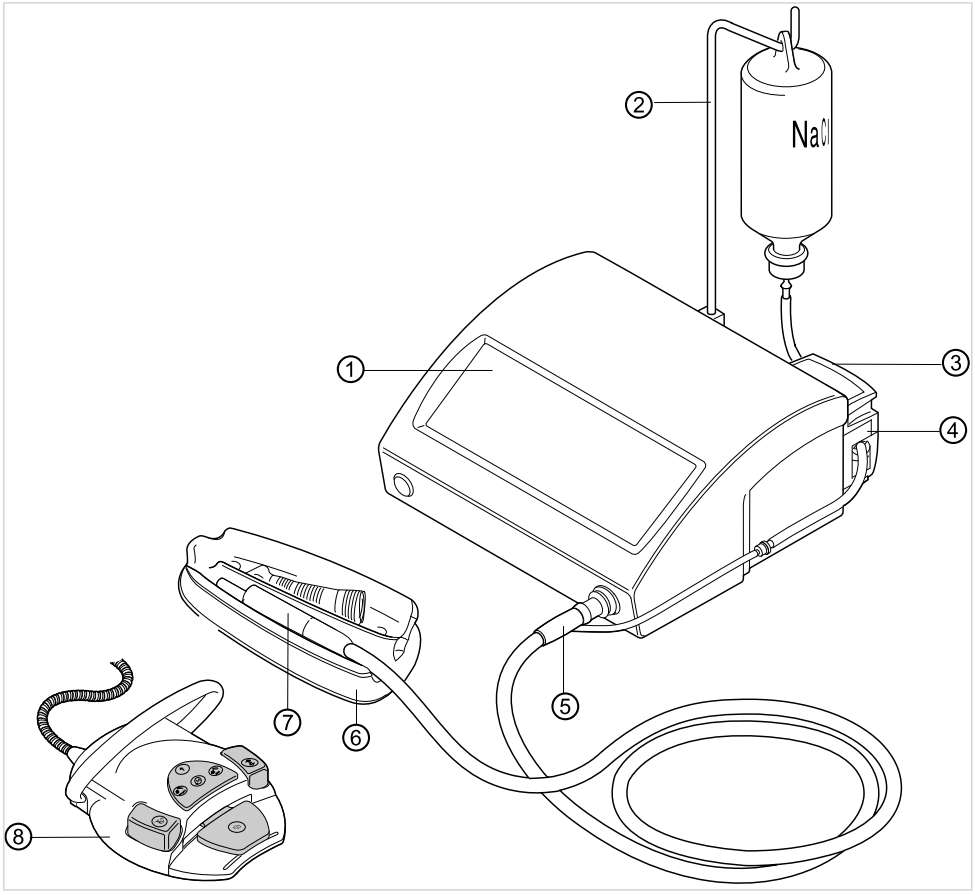

CAUTION

Electrostatic charge.
Destruction of electronic components.
- Before contacting the hose coupling, touch the bottle holder with your hand to release static electricity.

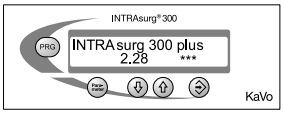
KaVo recommends that only **Original KaVo parts®** be used for the operation or repairs of this product on account of the rigorous safety, functional and dedicated suitability testing which these parts undergo.

3 Product description

3.1 INTRAsurg 300/300 plus



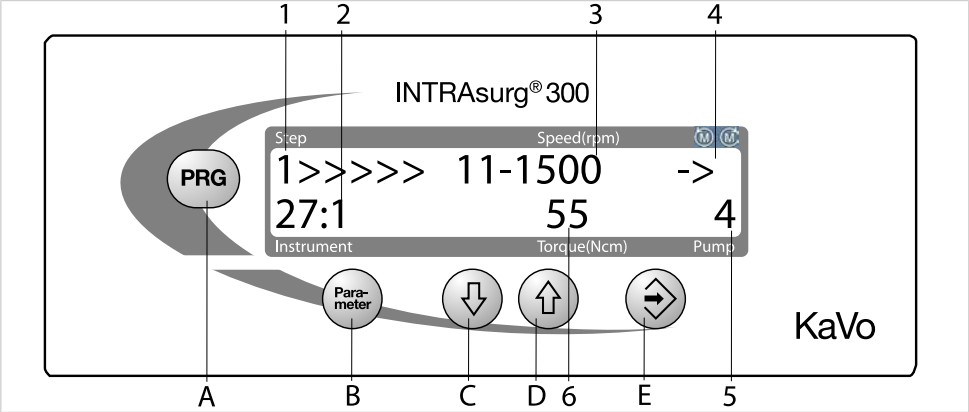
① Controls
② Bottle holder
③ Unlocking the pump mechanics
④ Hose pump
⑤ Surgical hose coupling
⑥ Motor holder
⑦ Surgery motor
⑧ Multifunctional foot control



The KaVo **INTRAsurg 300 plus** has an additional lighting function and recognition function for the **INTRA CL** light, hand and contra-angle handpiece.

Note
For more information about surgery and implantology, visit www.kavo.com.

3.2 Controls



A Program button
B Parameter button
C Minus button
D Plus button
E Enter button

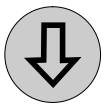
① Step (1... 6)
② Transfer ratio of the handpiece and contra-angle handpiece
③ Speed (rpm)
④ Direction of rotation (< - / - >)
⑤ Coolant pump setting (1... 6)
⑥ Maximum torque (Ncm)



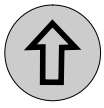
Open the program. Use the PRG button to open the steps; repress the button to switch to free use.



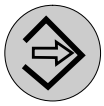
Open setting mode. And Use the parameter button to select changeable parameters. Press the parameter button until the asterisk (*) flashes at the desired position.
Changeable parameters:
- max. torque
- max. speed
- coolant pump setting
- Transfer ratio of the handpiece and contra-angle handpiece
- Direction of motor rotation



Reduce * value.



Increase * value.



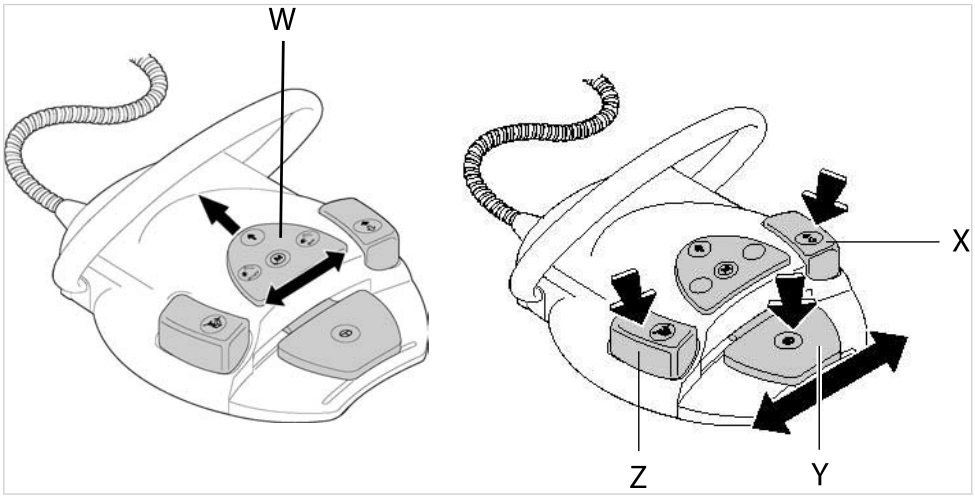
Enter button:
Save set of values/leave setting mode

INTRAsurg 300 Plus: Request maximum torque.



Note
The motor can only be started after you leave the setting mode by pressing the ENTER button. This saves all the changes. Only after this is done is the motor released to start.

3.3 Multifunctional foot control



(W) Shift pedal
(X) Right button
(Y) Hinged pedal
(Z) Left button

Shift pedal W:
Move forward for the default counter-clockwise rotation of the surgical motor
Only with the INTRAsurg 300 Plus: The light can be switched on/off by moving to the left, and the spot light can be turned on by moving to the right.

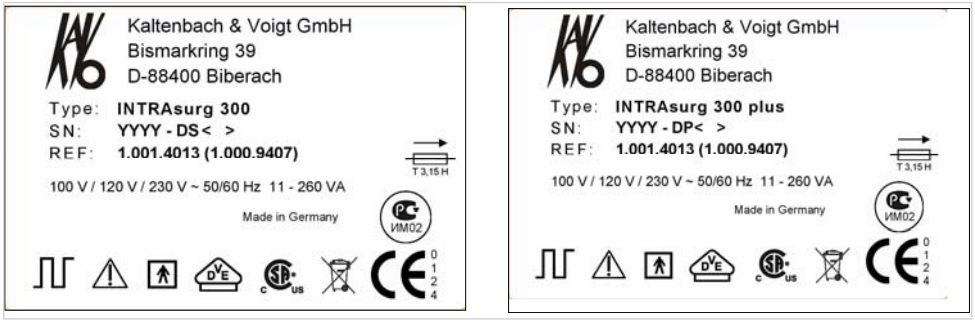
Right button X:
Procedural step button for selections in the program and for advancing the individual steps. Press briefly = proceed forward; press for a long time = proceed backwards. An acoustic signal confirms each entry.

Hinged pedal Y:
Footswitch to start the motor and control its speed, and to start withdrawing the coolant without the motor running and then and then regulate the amount conveyed. The process is started by pressing the pedal down. The intensity is decreased by pressing the pedal to the left, and increased by pressing it to the right.

Note
Always check the input values before each use.

Left button Z:
Coolant button to turn the coolant on/off and select rinsing without the motor.

3.4 Rating plate for 300/300 plus



	Installation side and securing the mains input
	CE mark
	VDE mark
	CSA mark
	Classification, type BF
	Note: Read and note the content of accompanying documents.
	Follow instructions for use
	Mode: Continuous operation duty type.
V	Supply voltage
SN:	Serial number
REF:	Material number
Type:	Device type
	For disposal information, see use in accordance with intended purpose
	GOST R certification

3.5 Technical data for the 300/300 plus

Width	291 mm
Depth	306 mm
Height	126 mm
Weight of the device	6.85 kg
Weight of foot control	2.35 kg
Weight of motor	approx. 170 g
Input voltage	100 V~/120 V~/230 V~
Input frequency	50/60 Hz
Power consumption	Max. 260 VA
True power	Approximately 7 Watt
Speed	300 – 40000 rpm
Pump delivery rate	25 – 150 ml/min
delivery pressure	1.5 – 2.2 bar
Multifunctional foot control	Protection class IPX1
Only KaVo INTRAsurg 300 Plus: Multifunctional foot control, identification: blue FBE stirrup, rating plate. Permissible in surgery rooms.	Protection class IPX8
Standard-length hose for the multifunctional foot control	1.90 m
Special-length hose for the multifunctional foot control Only available with the INTRAsurg 300plus.	3.5 m
Standard motor hose length **Mat. no. 1.001.2651**	2.00 m
Special length motor hose **Mat. no. 1.004.6825**	3.0 m
Mode continuous operation duty type	30 sec. operation/ 9 min.sec pause
The torque precision of the KaVo angle piece 27:1 (TRA C09 + C3) ranges from 20 to 30 Ncm at 20 to 50 rpm. Greater deviations are possible with other angle pieces.	± 3 Ncm
Transportation and storage conditions	
Ambient temperature	-20°C to +70°C
Relative humidity	5% to 95%
Air pressure	700 hPa to 1060 hPa

4 First use

4.1 Unpacking

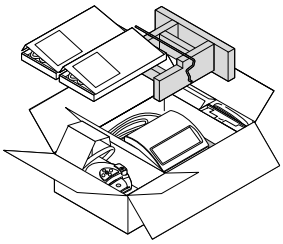
Note
Do not bend the motor tubing; this will cause damage.

Note
Save the box with all the packaging materials so that the device can be safely shipped (for example for a yearly service check). Always send both hose boxes so that the device can be safely packaged to prevent damage.

Unpacking the parts in the correct sequence helps to prevent damage:

- Open box.
- Remove the hose box. Remove the multifunctional foot control and additional equipment.

Note
When removing, note that the multifunctional foot control is tightly connected to the device.



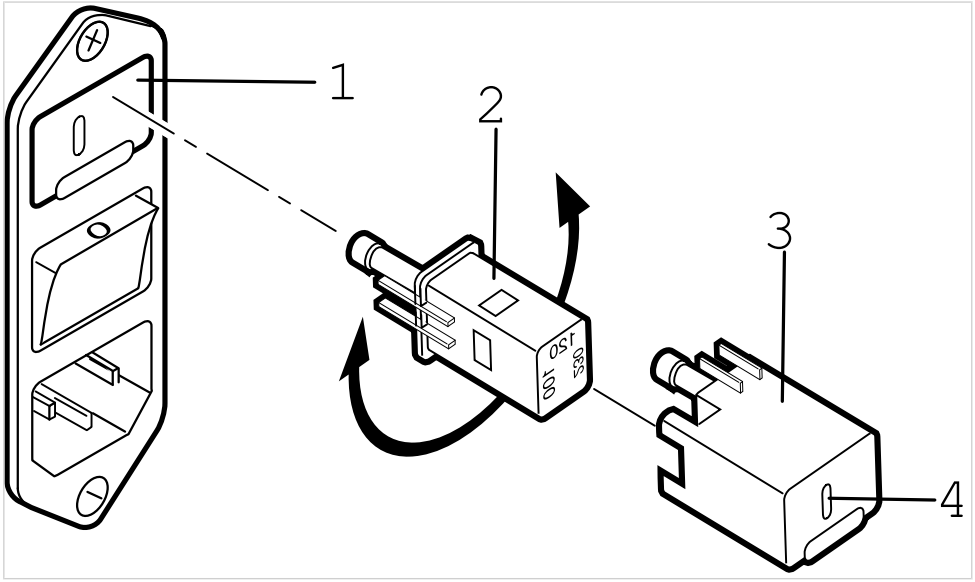
- Pull out the INTRAsurg 300/300 plus vertically upward and place on a flat surface.

4.2 Adjust the mains input voltage

CAUTION

Live parts
Electrical shock.
- Disconnect the power cable from the power supply!

A country-specific mains input voltage (a rating play) is set at the plant. Check the setting and change it if necessary to the existing mains input voltage.
The voltage selector ① can be set to 100V, 120V or 230V. The existing setting can be read at the cutout ④.
Remove the housing ③.
Remove fuse holder ② from the housing ③ and turn it on its axis until the required voltage is displayed in the window ④.
Push the fuse holder ② back into its housing ③. Insert the housing ③ back into the unit. The housing is specially coded to prevent it from being inserted incorrectly.



4.3 Electrical connection

CAUTION

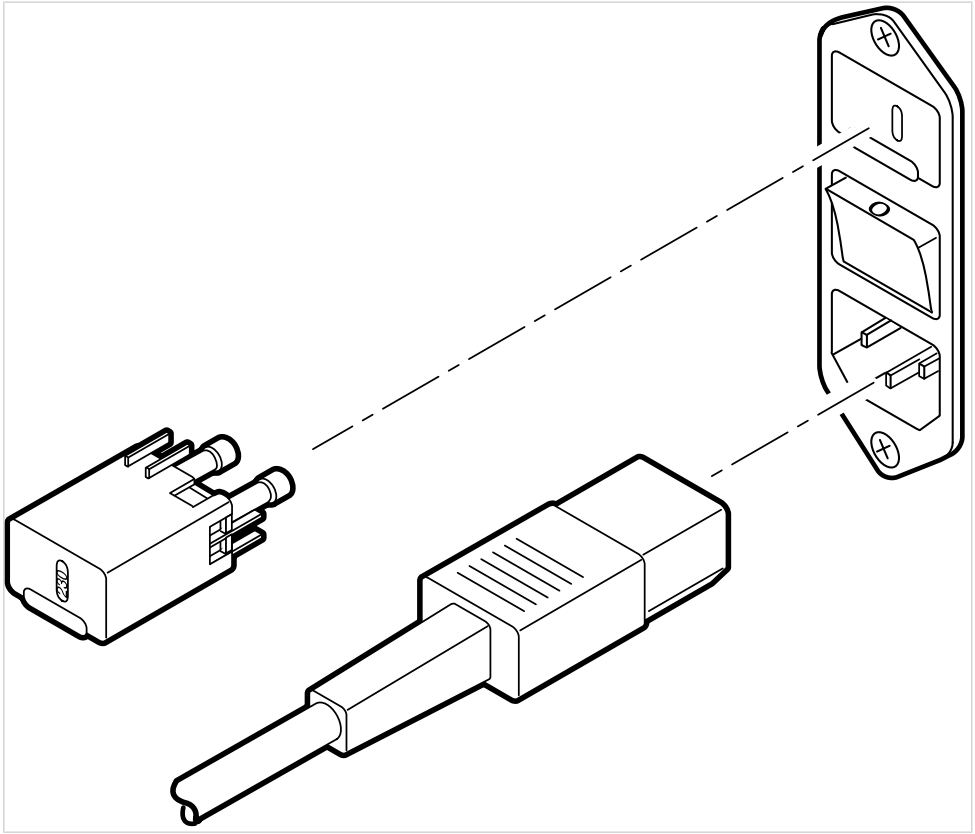
Damaged network cable/missing protective conductor.
Electrical shock.
- Check the network cable before use. The socket outlet must have a protective contact and meet the respective national guidelines.

Both wires (L and N) are individually protected (T3, 15 H) with a permitted mains frequency of 50 or 60 Hz.

Requirement
Make sure that the supply voltage is correct.

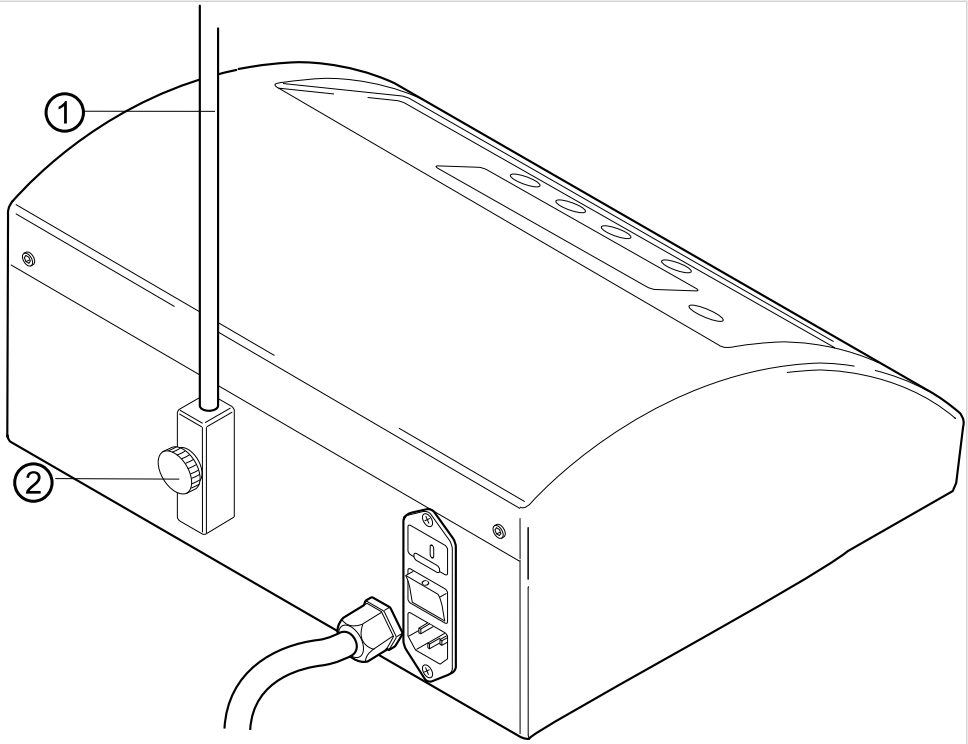
- First plug the inlet connector for non-heating apparatuses into the device, and then plug the other end of the line into a socket.

See also: 4.2 Adjust the mains input voltage, Page 23



4.4 Mount the bottle holder and use the correct coolant container

- Insert the bottle holder ① **Mat. no. 0.761.1872** and secure with the screw ② **Mat. no. 1.005.8527**.



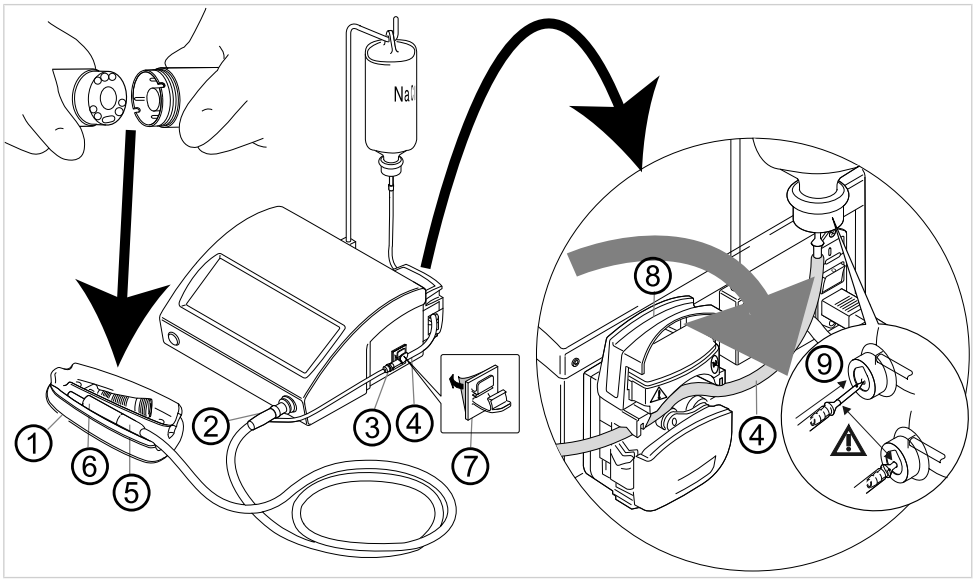
CAUTION

Tipping danger from excessively heavy coolant reservoir
Malfunctions
- Do not use coolant reservoirs that can hold more than 1 litre!
- Ensure that the device is standing securely.

Insert a ventilation needle into glass bottles. The flow will otherwise be reduced if coolant is withdrawn for a long period.

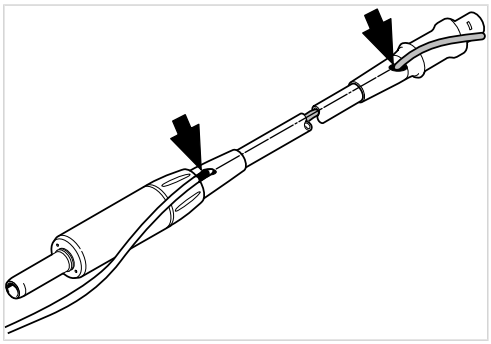
4.5 Connect the surgery motor and coolant reservoir

Note
The delivered parts are not sterile. Sterilise them before the first patient treatment. All parts conducting liquids must be sterilised.



- Plug in the surgery motor ⑥ at these surgery hose coupling and tighten with a union nut ⑤.
  Follow the separate instructions for use for the motor.
- Place the surgery motor on the motor holder ①.

Note
The kink-protection part on the coolant hose inlet may not be twisted. Twisting the kink protection can cause defects in the house and lead to a restriction of coolant flow and causes the coolant to drip afterwards.

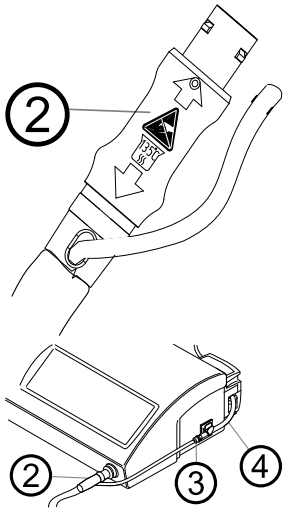




ESD symbol

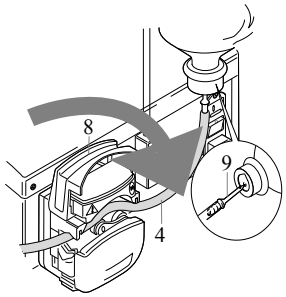
CAUTION

Electrostatic charge.
Destruction of electronic components.
- Before contacting the hose coupling, touch the bottle holder with your hand to release static electricity.



- Insert the hose coupling ② into the device connection until it audibly locks into place and the marking ring on the plug is covered.
- Shove the coolant hose ④ onto the plug-in nipple ③ by twisting slightly.
- Open the pump mechanics by lifting the lock ⑧.

Note
Insert the pump hose into the pump so that it is not clamped or pinched by the lock. Run all hoses relaxed without tension. Shove the hoses firmly on the plug-in nipple to ensure a tight connection.



- Close the lock ⑧ in the direction of the arrow.
- Insert the insertion needle ⑨ into the coolant reservoir, and hang the coolant reservoir on the bottle holder. Check the seal and seat of the insertion tip. Prevent fluid from exiting the device.

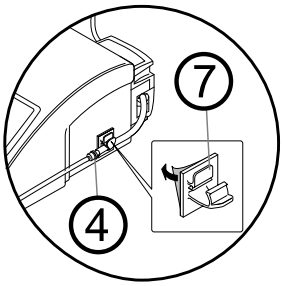
CAUTION

Tipping danger from excessively heavy coolant reservoir
Malfunctions
- Do not use coolant reservoirs that can hold more than 1 litre!
- Ensure that the device is standing securely.

Insert a sterile ventilation needle into glass bottles. The flow will otherwise be reduced if coolant is withdrawn for a long period. Check the level of the coolant

reservoir several times after waiting a while. The system must be leak-free. No liquid may escape from the coolant hose or the side of the connections.

Note
The saline solution corrodes all the metal parts. Immediately remove residue.

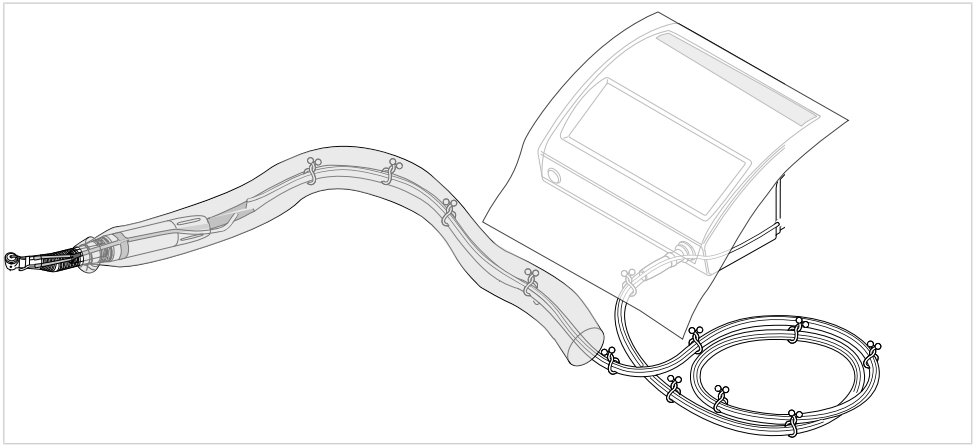


- Fasten the self-adhesive cable clip ⑦ **Mat. no. 1.001.3348** to the INTRAsurg 300/300 plus (for the location, see the illustration).

- Insert the coolant hose ④ into the cable clip and close.

Note
Always monitor the level of the coolant reservoir. The device itself does not monitor the level. Use transparent coolant reservoirs.

If the product is used on potentially infectious patients, use disposable products for supplying coolant and thorough infection protection. KaVo recommends using a sterile disposable protective hose over the motor and hose (approx. 1.2 m) and a transparent disposable protective film over the device. The control buttons and display must always be identifiable for operation.



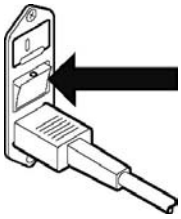
5 Operation

5.1 Operation in general

5.1.1 Switch on

CAUTION

Damage to product as a result of incorrect voltage setting.
Electric parts are destroyed.
- Adjust the mains input on the product to match your local voltage setting.



- Switch unit on.
  An acoustic signal confirms that the device is turned on.
  The device runs a self test.
  The firmware version and note "Please check parameters" is briefly shown on the display.

- Observe on-screen information.

If the device is not monitored, we recommend turning it off for safety reasons and to save energy.

Note
The most recently saved values are displayed.

5.2 Surgery motors

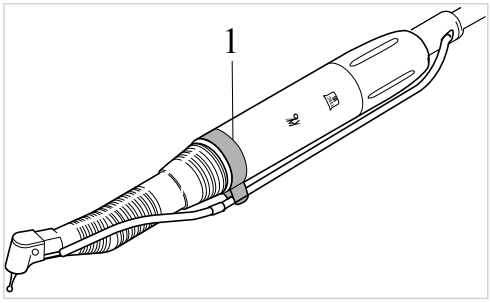
CAUTION

Parameters configured incorrectly
Damage as a result of incorrect input values
- Check all input values before use.

Note
Following instructions for use, service instructions and installation instructions in the motor, handpiece and contra-angle handpiece packaging.

5.2.1 INTRA S 550 surgical motor

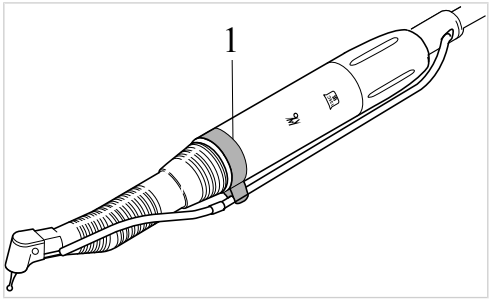
- Fit the straight or contra-angle handpiece on the motor coupling.
- Before every treatment, make sure that it is in position.
- Connect irrigant tubing.



5.2.2 INTRA LUX SL 550 surgical motor

Note
The INTRAsurg 300 plus has a recognition function for INTRA CL light, hand and contra-angle handpieces. Handpiece and contra-angle handpiece-specific parameters are automatically transferred.
Check all input values before use.

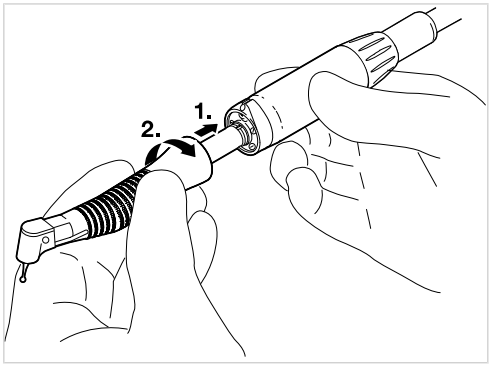
Mount the handpiece or angle piece



CAUTION

Heat emitted from high pressure lamp.
Burns as a result of touching the high pressure lamp.
- Only operate the motor with the retainer ring ①.

- Place the **INTRA CL** light, hand and contra-angle handpiece on the surgery motor and turn it until the catch audibly locks in place.



CAUTION

Damage from changing the handpiece and angle piece during operation.
Wear to the catch on the handpiece and angle piece and the motor
Unbalanced motor axis.
- Change the handpiece and angle piece only when the motor not running.

CAUTION

Damage from operating with open chucks
The handpiece or angle piece locks and rotates on its own axis.
- Only operate the handpiece or angle piece when the chuck is locked.

5.2.3 Detach the straight or contra-angle handpiece

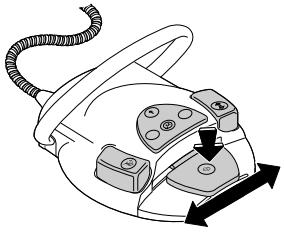
CAUTION

Damage from changing the handpiece and angle piece during operation.
Wear to the catch on the handpiece and angle piece and the motor
Unbalanced motor axis.
- Change the handpiece and angle piece only when the motor not running.

- Detach the irrigant tubing from the straight or contra-angle handpiece.
- Rotating slightly, detach the straight or contra-angle handpiece.

See also: 5.1.1 Switch on, Page 29

5.2.4 Start motor



- Start the motor. Press the slide pedal and change the speed by moving it the side. Left stop: minimum speed; right stop: maximum preselected speed. When the slide pedal is no longer actuated, the selected speed is set on the multifunctional foot control. Repress the slide pedal to retrieve the last selected speed.

See also:

5.3.3 Preset the speed range, Page 35
5.4.4 Set parameters, Page 41

Note

When the hinged pedal is pressed in an unchanged position (to the side), the last selected position with an assigned motor speed is retrieved. The motor immediately runs at the assigned speed. After the program step changes, check the speed setting, and move the hinged pedal to the required position before pressing.

CAUTION

Excessive speed.

Injuries.

- In applications where the speed is critical, move the hinged pedal to the left position (minimum speed) before the motor starts and move up to the desired speed.
- Set the speed to a safe maximum for the application.

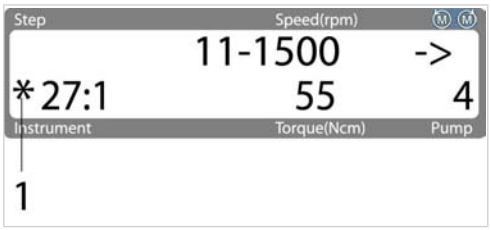
5.3 Free use

5.3.1 Parameters menu

The following values can be changed in the parameter menu:
- Transfer ratio of the handpiece and contra-angle handpiece
- max. speed
- Direction of motor rotation
- Coolant pump setting
- max. torque

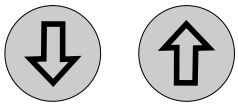


- Press the parameter button.
  A star ① flashes next to the alterable parameter.

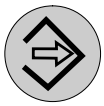




- Select the desired parameter by pressing the parameter button several times.
  An asterisk * flashes next to the alterable parameter.



- Use the plus or minus button to set the parameter to the required value.



- Press Enter.

The configured values are stored.



Note
Always save the selected setting with enter button when leaving the menu. Otherwise, the motor will not start (safety circuit).

Examples of saving values of handpieces and contra-angle handpieces

Note
Default values for the respective transfer ratios can be selected with the Plus or Minus buttons.

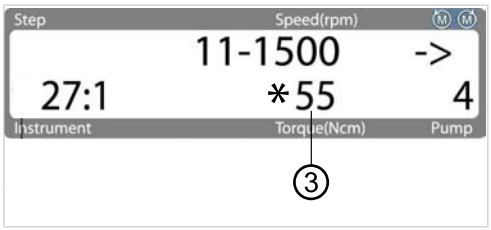
Indication	Transfer ratio	Combined unit Reducing shank	Head	Speed range rpm	Maximum torque Ncm
Grinding, cutting	1:2	3555 1:2	--	600-80.000	2,7
Grinding, Drilling, cutting	1:1	3,610 N 1:1	--	300-40.000	5,5
Grinding, Drilling, Thread, Implant	12:1	3624 N 4:1	C 3 3:1	25-3.300	40
Grinding, Drilling, Thread, Implant	16:1	3624 N 4:1	67 RIC 4:1	18-2.500	45
Grinding, Drilling, Thread, Implant	27:1	C 09 9:1	C 3 3:1	11-1.500	55
Grinding, Drilling, Thread, Implant	36:1	C 09 9:1	67 RIC 4:1	9-1.100	55

Note
The listed indications are only examples. To prevent unnecessary risk, observe the guideline speeds given by the manufacturer of the rotating instruments. KaVo recommends setting a speed range of 11-25/min or 11-35/min for screwing tasks.

5.3.2 Set the torque limitation



- Press the parameter button until the asterisk flashes at the torque display ③.



Note
The torque values ③ are only for KaVo handpieces and angle pieces that operate properly.

The maximum value can be changed in the parameter menu by using the Plus and Minus buttons.

Note
Once 90% of these set torque has been reached, a signal sounds. When the set torque is exceeded during treatment, the motor stops. The foot pedal has to be pressed again to start the motor.

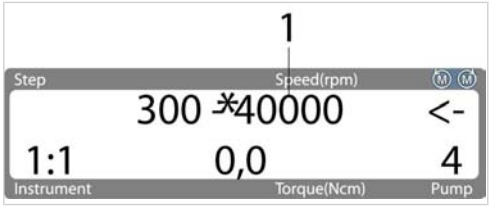
Checking the handpieces and contra-angle handpieces:
Check the set transfer ratio, and let the motor and handpiece or contra-angle handpiece run for 20 seconds at maximum speed. The torque ③ is an indicator for the condition of the instrument.
Display of 0 = status is good
Display < 0.5 = improve maintenance
Display > 0.5 perform service

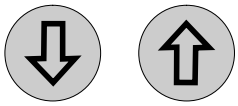
5.3.3 Preset the speed range

Note
Only the maximum value ① can be preset. Use the multifunctional foot control to select the speed within the predetermined range by simultaneously pressing the slide pedal and moving it to the side.

Para-
meter

- Press the parameter button until the asterisk flashes at the maximum speed ①.





The maximum value can be changed in the parameter menu by using the Plus and Minus buttons.



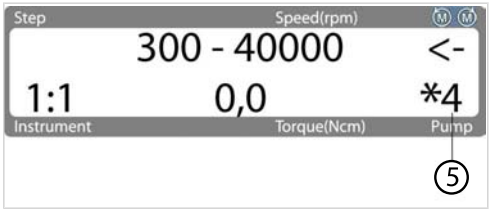
CAUTION

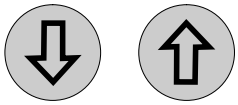
Excessive speed.
Injuries.
- In applications where the speed is critical, move the hinged pedal to the left position (minimum speed) before the motor starts and move up to the desired speed.
- Set the speed to a safe maximum for the application.

5.3.4 Set the coolant flow

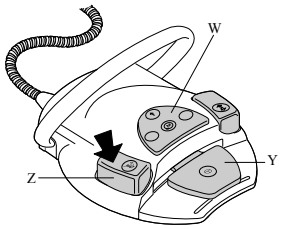


- Press the parameter button until the asterisk flashes at the coolant flow ⑤.





The flow ⑤ can be changed in the parameter menu by using the Plus and Minus buttons.
1: Pump at the minimum flow for approximately 25 mL/min
6: Pump at the maximum flow for approximately 150 mL/min
The flow is determined by the size of the outlet. When the outlet is small, back-pressure arises in the hose that can cause the hose connections to separate. Dripping coolant indicates that this may occur.



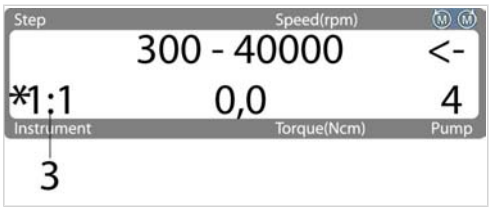


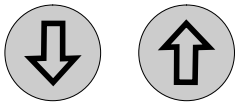
Note
The pump can only be turned on and off with the left button on the multi-functional for control. Display when the pump is turned off ⑤: 0

To save the pump at OFF (0), press the button on the multifunctional foot control and save it with the enter button. The previously set flow is retained. If you can turn it on again by pressing the left button on the multi-functional foot control and save it with the enter button.

5.3.5 Selecting the handpiece and contra-angle handpiece

- Press the parameter button until the asterisk flashes at the transfer ratio ③.





Use the Plus and Minus buttons to scroll through the specified table of transfer ratios ③ of the instruments in the parameter menu. Always check the selection in the display.

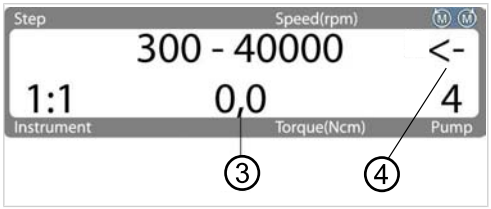


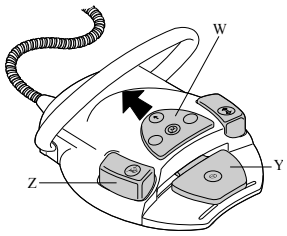
Note
The maximum permissible speed and torque of the selected handpieces and contra-angle handpieces are displayed.

5.3.6 Switching the direction of motor rotation



Note
The direction of motor rotation can only be switched with the multi-functional for control. Counterclockwise rotation <- ④ remains active until the next switch. If counterclockwise rotation is not saved by pressing the ENTER button, the motor rotates clockwise -> when the device is turned on. Wait for the acoustic anti-clockwise signal.



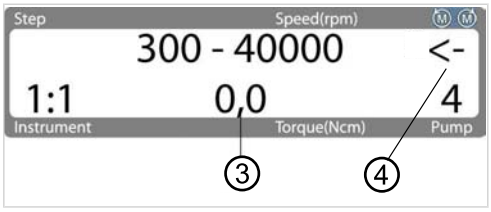


- Move the shift pedal in the direction of the arrow.

With counterclockwise rotation <- the rotational direction display ④ flashes, and two acoustic signals sound. When the motor is started, three acoustic signals sound. In

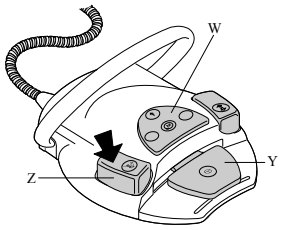
the PRG menu, counterclockwise rotation can be saved by pressing the enter button.

Note
No display of the torque value ③ in counterclockwise rotation.

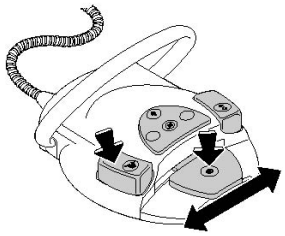


5.3.7 Rinsing function

This function can be selected from each step, but it cannot be saved.



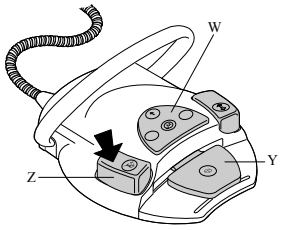
- Press the left button for 3 seconds to select the rinsing function.



- Start the drawing of the coolant by pressing the slide pedal.
  The flow can be changed in six steps by moving the slide pedal to the side.



- The rinsing function is shown in the display.



- Press the left button briefly to stop the rinsing function.
  The device returns to the previously selected function.

5.3.8 Surgical motor in free use

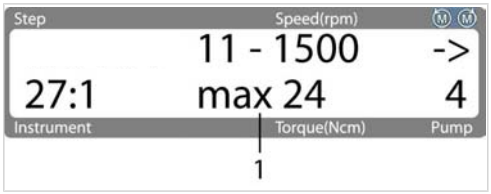
Note
This function is only supported by the **INTRAsurg 300 plus** in conjunction with the **INTRA CL** light, hand and angle pieces.

The recognition function of the **INTRA CL** light, handpiece and contra-angle handpieces enable parameters for the free use of handpiece and contra-angle handpieces to be recognised and adopted.

5.3.9 Request maximum torque

Note
This function is only supported by the **INTRAsurg 300 plus**.

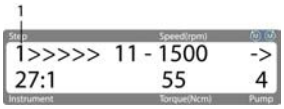
- Hold down the enter button after the motor stops.
  The maximum torque ① of the last motor operation is displayed in Ncm.



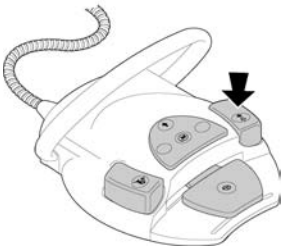
Note
Once the motor has been restarted and there is a loading of at least 5 Ncm, the torque values are overwritten.

5.4 Program

5.4.1 Start the program



The product has a basic program with six programmable steps. The current step is shown in the display ①.



- Press the right button briefly.

or

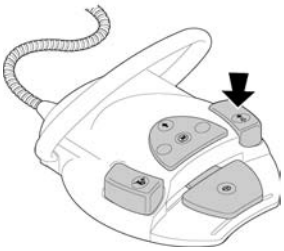


- Press the program button once.
  An acoustic signal confirms the program selection.



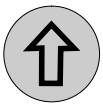
- To switch to free use from the program, press the program button again briefly.

5.4.2 Switch forward step



- Press the right button briefly.

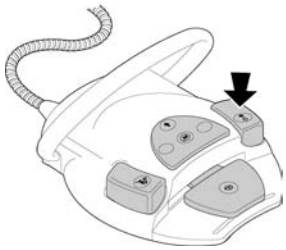
or



- Press the plus button.

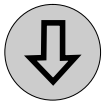
An acoustic signal confirms the entry.

5.4.3 Go backward a step



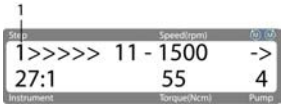
- Press the right button for a while.

or



- Press the minus button.
  An acoustic signal confirms the entry.

5.4.4 Set parameters



- Select the step ① to be changed.



- Switch to the parameter menu by pressing the parameter button.

See also: 5.3 Free use, Page 33

The values shown for a step are default values that you can use to start work immediately. They can all be changed in the parameter menu and can hence be adapted to the your individual approach.
Changed values can be saved in the parameter menu and are then available for the next use.

The following values can be changed in the parameter menu:
- Transfer ratio of the handpiece and contra-angle handpiece
- max. speed
- Direction of motor rotation
- Coolant pump setting
- max. torque

See also: 5.3 Free use, Page 33



CAUTION

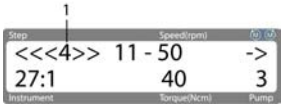
Incorrect use.
danger of injury.
- Always check the values before use.

5.4.5 Limit the number of steps

Six steps are saved upon first start up and after setting up the delivery status.

Example: Limiting the steps

The number of steps should be limited to four.



- Select step 4 ①.



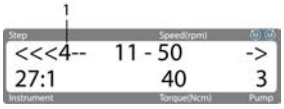
- Press the program button for at least three seconds.

An acoustic signal confirms the entry.



Note
Now only the first four steps can be selected.
When you continue to step 4, the message END appears.
If you continue, you go to free use.

Remove restriction



- Select the last step ① (4 in this example).



- Press the program button for at least three seconds.

An acoustic signal confirms the entry.

5.4.6 Setting up delivery status



Note
All of the entries and changes are deleted with this function.



- Hold down program button and switch on unit.
  After initialisation, the unit's default settings are all restored.

Delivery status: Program

Step	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Direction of motor rotation
1	27:1	11-1500	55	4	->
2	27:1	11-50	40	4	->
3	27:1	11-50	40	4	->
4	27:1	11-50	40	4	->
5	27:1	11-50	55	0	-<
6	27:1	11-50	10	0	->

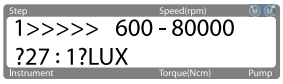
Delivery status: Free use

Step	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Direction of motor rotation
	27:1	11-1500	55	4	->

5.4.7 Surgical motor in the program

Note
This function is only supported by the **INTRAsurg 300 plus** in conjunction with the **INTRA CL** light, hand and angle pieces.

Requirement
The mounted **INTRA CL** light, hand and contra-angle handpiece must be selected on the display.



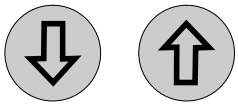
If the mounted handpiece or contra-angle handpiece is not selected, the device asks for the corresponding input.
if the motor is turned on without the corresponding entry, three acoustic signals sound, and the read-in instrument flashes on the device display with question marks, for example: ?27:1? .

Note
The motor will not start (safety circuit).
To start the motor, either the selected handpiece or contra-angle handpiece must be mounted, or the mounted handpiece or contra-angle handpiece must be saved using the ENTER button.

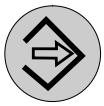
Save the light, hand and contra-angle handpieces (without the mounted and peace and contra-angle handpiece)



- Press the parameter button until the asterisk flashes at the transfer ratio.



- Set the correct parameters with the Plus or Minus button.

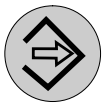


- Save the set values with the enter button.
  The data are now saved in this step.

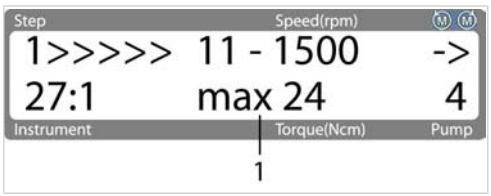
5.4.8 Request maximum torque



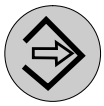
Note
This function is only supported by the **INTRAsurg 300 plus**.



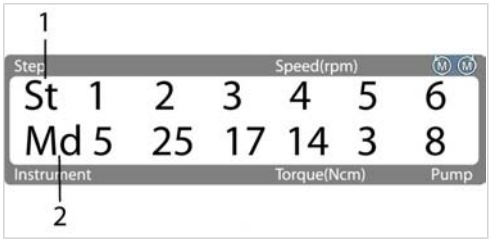
- Hold down the enter button after the motor stops.
  The maximum torque ① of the last motor operation is displayed in Ncm.

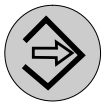


The maximum torque is saved when you advance a step.
When the motor is started in the next step, the highest torque is always saved.



- Press the enter button after closing the program.
  In each step ①, the max. torque ② is shown in the display.





- To leave the display, press the enter button.
  All saved torques are deleted.



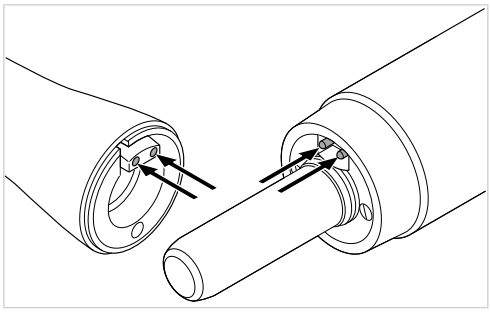
Note
If you leave the program buy pressing the plus button or the right button on the multifunctional foot control, all torques are deleted. If you accidently go too far and skip the torque display, the values can be reactivated and displayed by pressing the right button on the multifunctional foot control.

5.5 Functions exclusively with the 300 plus program version

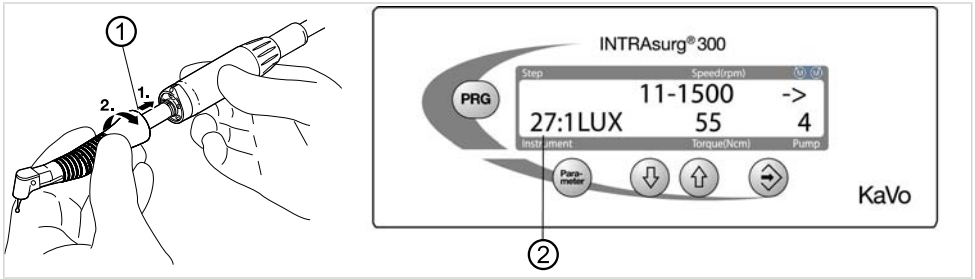
Additional functions of the INTRAsurg 300 plus with an INTRA LUX SL550 motor:
- Light function.
- IPX8 multifunction foot control (blue stirrup, rating plate).
- Recognition of the INTRA CL light, hand and angle piece. The transfer ratio and associated values are shown on the display.
- The user can perform additional calibration with the INTRAsurg Calibration 1.002.3569. (27:1 angle piece is required)
- Display of the maximum torques. The maximum torque is saved in each step. The max. torque can be read on the display during surgery or after the program ends (only with clockwise rotation).
- Read-out table for the torque values at the end of applications.

5.5.1 Recognition function

Note
To prevent misinformation, the contact's provided for recognition always need to be regularly cleaned on the motor and instrument pusher. The contacts always must be shiny. Wipe off the contacts with a cloth soaked in disinfectant and rub dry.



- Place the INTRA CL light, hand and angle handpiece on the INTRA LUX SL 550 motor and turn it until the catch ① audibly locks in place.

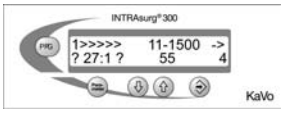


The hand and angle piece is recognised, and the corresponding saved parameters are shown on the device display ②.

CAUTION

Incorrect input values.
Danger of injury.
- The input values must be checked before each use.

These parameters are immediately activated in free use.



The recognised handpiece or angle piece must be selected in the program. If it is not selected, the device asks for the corresponding input. Three acoustic warning signals sound, and the read-in instrument flashes on the device display with a question mark, for example: ?27:1?

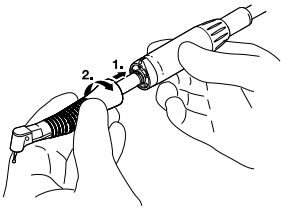
Note
For safety reasons, the motor does not start (safety circuit) since the input value on the display always has priority.

- Check the parameters. Values displayed by the device can be saved by pressing the ENTER button.

The data of the mounted INTRA CL light, hand and angle piece are only saved in this step. The motor starts with these released parameters.

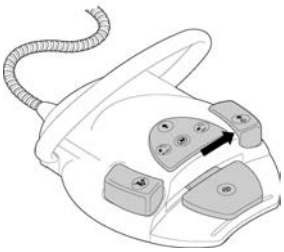
Note
This must be done for the saved parameters to be reliably maintained and continuously followed.

5.5.2 Light functions



Place the INTRA CL light, hand and contra-angle handpiece on the INTRA LUX SL 550 motor and turn it until the catch audibly locks in place. The INTRA CL light, hand and contra-angle handpiece is recognised and the corresponding parameters appear on the display (this function is only possible with the INTRA CL light, hand and contra-angle handpiece).

Light on/off without motor and pump running (spot)



- Move the shift pedal to the right.
  The light only shines when actuated (spotlight function).

Light selection with running motor



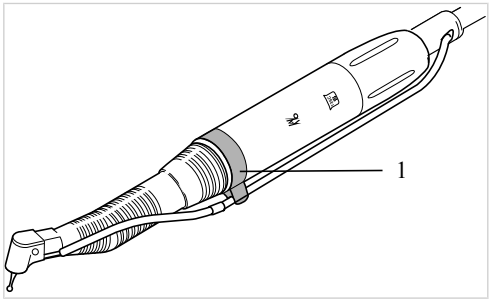
- Move the 4-way cross switch to the left and release.
  The light is turned on or off. When the light is turned on, the following appears in the display: LUX. (This function is only possible with INTRA CL light, hand and contra-angle pieces)

Note
If there is no light function, check if the light is turned on and if the INTRA CL light, hand and contra-angle handpiece is properly mounted.

Delay before light goes out

Once the motor has stopped running, there is a three second delay before the light goes out.

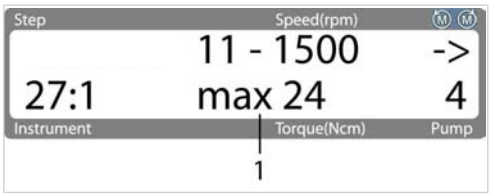
Note
The motor can only operate with retention ring ①**Mat. no. 1.001.5029**.



Note
Only the light function is activated and a 1:1 hand and angle piece is displayed with hand and angle pieces with a metal snap-in button. The torque is not displayed.

5.5.3 Request maximum torque (free use)

- Hold down the enter button after the motor stops.
  The maximum torque ① of the last motor operation is displayed in Ncm.



Note
Once the motor has been restarted and there is a loading of at least 5 Ncm, the torque values are overwritten.

5.5.4 Request maximum torque (program)

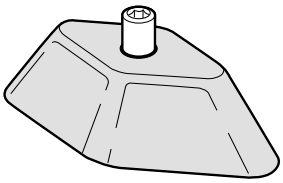
See also: 5.4.8 Request maximum torque, Page 44

5.5.5 Recommended programming when setting a number of implants one after the other

Mode of operation:
Perform all tasks for drilling an implant in Free use mode. Screw in the respective implant in PRG steps (max. 6). At the end of the task, the torque screw-in value can be requested and manually documented for evaluating primary stability (in the form of the following table, for example).

Step	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l
1	27:1	11 – 50	40	0	->
2	27:1	11 – 50	40	0	->
3	27:1	11 – 50	40	0	->
4	27:1	11 – 50	40	0	->
5	27:1	11 – 50	40	0	->
6	27:1	11 – 50	40	0	->

5.5.6 INTRAsurg calibration

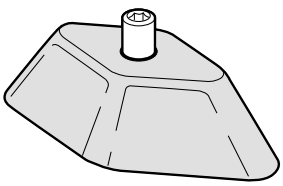


The influence of the efficiency of the instruments is taken into account when testing the torque display.
Store the INTRAsurg calibration device at 15°C to 30°C to provide precise calibration. The calibration value refers to the temperature of the INTRAsurg calibration of 23°C. If this temperature is not maintained, the value needs to be corrected according to table. For example: Calibration at 20°C (read 15.2) results in a corrected input value (+0.3) of 15.5.

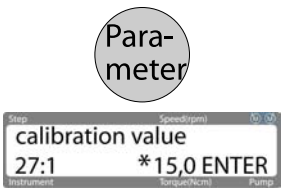
Temperature	15°C	16°C	17°C	18°C	19°C	20°C	21°C	22°C	23°C	24°C	25°C	26°C	27°C	28°C	29°C	30°C
correction	+0.8	+0.7	+0.6	+0.5	+0.4	+0.3	+0.2	+0.1	0	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.7

A sterile instrument can also be used for calibration. To prevent contamination, use a sterile catch pin.

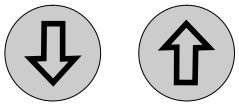
Note
The INTRAsurg Calibration system can be disinfected.



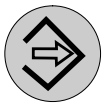
- Pre-position cleaned and set up angle piece 27:1 and INTRAsurg Calibration **Mat. no. 1.002.3569**.



- Press the parameter button for 3 seconds.
  The following message appears on the display:

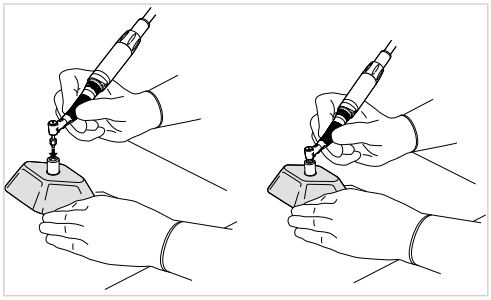


- Read the calibration affixed to the bottom of the INTRAsurg Calibration (such as 15.2), correct the value according to the temperature, and enter with the Plus and Minus keys.



- Confirm with the enter button.

- Insert the catch pin into the INTRAsurg Calibration.
- Place the INTRAsurg Calibration on a fixed base and hold.
- Start the motor. The motor always rotates to the right.





Note
Do not apply any pressure.
The motor may not experience any additional load.

The process can be monitored on the display.



After calibration, the following appears on the display:



If calibration is unsuccessful, the following appears on the display:



Note
The output values are retained in case of interruption or error.

The calibration automatically ends. The INTRAsurg 300 plus is ready with the new setting.

6 Preparation methods DIN EN ISO 17664

Note
Before preparations, follow the instructions for use of the surgery motor and handpieces and angle pieces the instruments.
The instructions for cleaning and sterilisation have been validated by the manufacturer. Any deviation from the provided instructions by the person preparing the device should be checked to see if it is effective, and potential negative consequences should be evaluated.
Sufficient safety that prevents microorganisms that have entered the instruments from becoming a possible cause of infection is only provided by carefully processing the outside and inner surfaces directly after use. The handpieces and angle pieces must be packaged and sterilised and sterile when used.
If potentially infectious liquids and particles can contact the products, it is recommendable to cover and protect these areas with sterile disposable products.
Frequent preparation with proper use does not significantly affect the unit and motor. The product life normally ends due to wear and damage from use. Observe all manufacturer instructions.
Treat KaVo gently when cleaning them. Remove deposits such as saline coolant residue, blood and saliva with a disposable cloth immediately after use. Only use fully functional products for treating patients.
Observe all current national hygiene regulations. See also: www.rki.de (infection protection)

Note
A German language CD on hygienic measures in medical practices is obtainable from: MEDIEN & Forum, Am Brunnen 8, 29229 CELLE – Tel. D 05141/370188/89. e-mail: hammer@medien-information-bildung.de. Additional information can be obtained at: www.rki.de

Site of use

Remove moisture-sensitive parts close to the disinfection site. The treatment surfaces of the area should be hygienically smooth surfaces. Protect difficult to clean surfaces and objects from contamination by covering them.

Preparation for decontamination

- Wear suitable protective clothing.
- Wear eye protection. No eating, drinking or smoking.
- Disinfect hands properly.
- Turn off the device and unplug it.
- Prepare and follow a hygiene plan.
- Only use disinfectants suitable for this group of devices.
- Prepare the parts suitable for sterilisation: Care, rinsing and packaging.
- Use qualified trained personnel for preparing dental equipment and instruments. Train the personnel according to these instructions for use Plan and provide a schedule.

6.1 Cleaning

Always clean directly after using the medical device to prevent contaminants from hardening. Saline solution contains sodium chloride which corrodes metal. Quickly remove all residue to prevent surface damage.

6.1.1 Machine cleaning

Not applicable for INTRAsurg device parts.


CAUTION

Damage due to liquids
Faults in electric components.
- Do not machine-clean the INTRAsurg device.

6.1.2 Manual cleaning

- Wipe off the supply unit (all visible surfaces), motor hose, motor holder, bottle container, foot control surfaces and the connecting lines with a damp disposable cloth. Do not wipe the cloth on edges and press so that liquid will not penetrate. Remove all residue and dry the device.

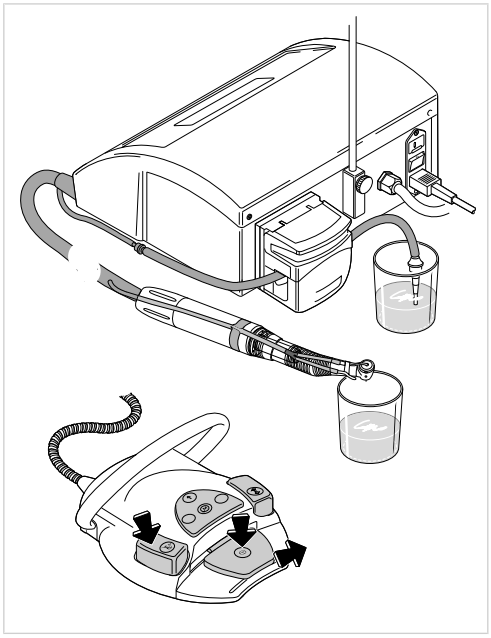


Note
After uses that run the risk of infection, rinse the coolant lines of the handpieces and contra-angle handpieces with a disinfectant (approx. 20 ml) with a disposable syringe. Avoid damage. Rinse the coolant lines with demineralised water, then drain and dry them.

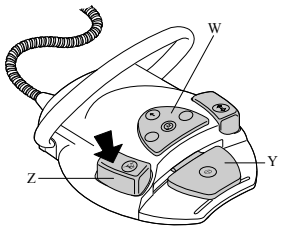
6.1.3 Rinse the hoses

Preparation for product decontamination:
Directly after each use, rinse all the hoses to prevent malfunctions from the crystallisation of the saline solution. All of the hoses must be completely emptied. Then sterilise them and observe the hygienic requirements for storage and maintaining sterility.

- Remove the pump hose needle from the coolant reservoir. Immerse the pump hose needle in a clean container with demineralised water (50-60 ml). Place the spray hose from the instrument in an empty container or sink.



Note
Rinse until all the hoses are drained. Do not immerse the water outlet into the liquid. Observe the necessary measures for infection protection.

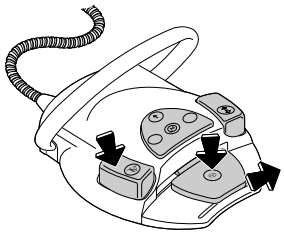


- Press left button 3 sec. The rinsing function is selected.

See also: 5.3.7 Rinsing function, Page 38

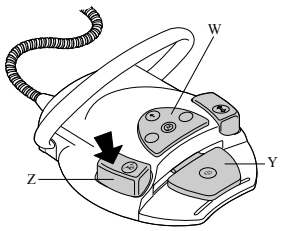


- The rinsing function is shown in the display.



- Hold down slide pedal and slide it completely to the right.
  The hose pump runs at the max. rate.

- Ensure that the water jet is in the right direction and that it is the right amount.



- Press the left button briefly.
  You exit the rinsing menu.

6.2 Disinfection

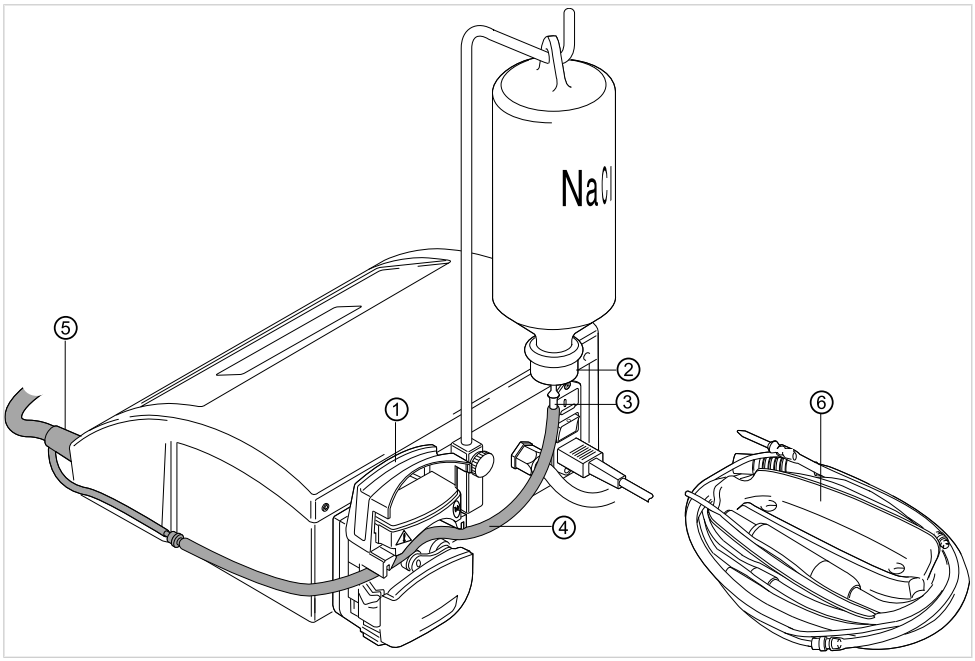
Note
The motor and motor hose cannot be thermodisinfected. After treating each patient, disinfect the surfaces close to the patient that are contaminated by contact or aerosols. Wipe disinfection should be used in all cases.

6.2.1 Automated disinfection

Not applicable for INTRAsurg device parts.

6.2.2 Manual disinfection

- Pull the insertion needle ③ out of the coolant reservoir ②.
- Open the lock ① and remove the hose ④.



- Remove all hoses marked gray including tips and surgical motor on the unit.
- Wipe-disinfect surfaces with a soft, disposable cloth and permissible disinfectants. Make sure that the device is completely wet. Let the disinfectant act for the prescribed time. Dry the surface.

Permissible disinfectants (the uses correspond to the existing manufacturer's instructions and national guidelines. observe the safety data sheets.) KaVo recommends the following products based on material compatibility. The microbiological efficacy must be ensured by the disinfectant manufacturer.

- Incidin Liquid (Ecolab)
- FD 322 Dürr
- Schülke & Mayr Microcide
- Isopropanol 70%

6.2.3 Drying

- After disinfection and sterilisation: Let the surfaces and plug-in parts for the hoses and cables (contacts) completely dry in the room before they are used again.

6.2.4 Service, inspection and testing after preparation

- Testing for cleanliness and lack of wear, care, maintenance: Check if the hose connections are easily insertable and have a firm grip. Check the device setting functions and motor operation. Check the hose pump for sufficient coolant flow. Check if the hose connections are firm. Check the control commands on the foot control. Check the recognition function of the INTRAsurg 300plus. Observe proper hygiene when checking. In case of fractures and clearly recognisable changes to the surface, have service check the parts.

6.3 Sterilisation in a steriliser in compliance with DIN EN 13060

CAUTION

Product damage due to improper sterilisation.
Damage to the sterile product.
- No hot air sterilisation, no chemical cold sterilisation, do not sterilise with ethylene oxide!

CAUTION

Product damage due to improper sterilisation.
Damage to the sterile product.
- An initial vacuum can shorten the product life.

CAUTION

Moisture
Nonsterility
- Ensure dryness. Autoclaves with a subsequent vacuum ensure dryness. In addition, drying can be accelerated with a 10 minute drying phase with the autoclave door open.

CAUTION

Product damage
Contact corrosion
- Remove the sterilised item from the autoclave immediately after sterilising and drying.

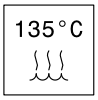
CAUTION

Crystallising saline solution
Malfunctions
- Rinse all hoses and drain them completely before they are sterilised.

Note
The user is responsible for observing the regulations and conditions for sterility. After each patient, dispose of the coolant reservoir, rinse the hoses, and completely drain and sterilise them.

Note
When treating patients who may have an acute, critical infectious disease, be sure to observe the hygienic measures cited in applicable publications and reports. If possible, use suitable disposable products to avoid the transmission of critical pathogens. These protect the user, the patient and all participants in the surgery. A microbiologically appropriate coolant liquid must be used. Only use prescribed isotonic saline solution E NaCl 0.9 (identified as an infusion solution; follow the instructions on the package insert) for cooling and spraying wounds. All materials that are contaminated from the dental and medical fields must suitably processed and sufficiently identified after cleaning and sterilisation (RKI recommendation, www.rki.de).

See also: 6.1.3 Rinse the hoses, Page 53

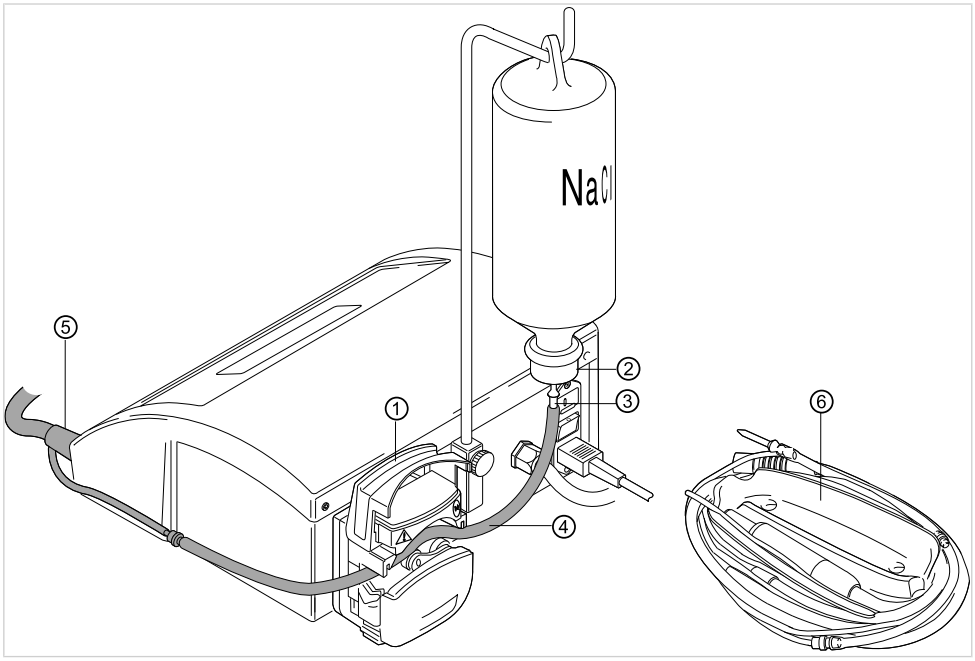


The KaVo medical devices released for sterilisation have a maximum temperature resistance of 138 °C.

6.3.1 Packaging

The sterilisation bag must be large enough for the items to be sterilised so that the bag is not stretched. The quality and use of the packaging of the items to be sterilised must satisfy the applicable standards and be appropriate for sterilising.

- Wind all hoses previously cleaned and disinfected that are marked grey including tips and the surgical motor on the motor holder ⑥.
  Seal the motor holder, handpieces and contra-angle handpieces in sterile bags or place them on a surgical tray.



6.3.2 Sterilisation

- Sterilise in saturated steam at 135±1°C, gravity, for at least 4 minutes.

Note
Let the sterilised materials cool and try to the ambient temperature before using them again.

6.3.3 Storage

Observe all necessary measures for hygiene when storing sterile goods. Store protected from dust, release with identification on the packaging. Monitor storage length.

7 Troubleshooting

Note
If your problem cannot be rectified after reading the following troubleshooting documentation, please contact a KaVo-trained Service Technician.

If there is a fault, a fault number will be displayed on screen: "warning xx" or "remark xx"
Faults are numbered from 1 to 67.

Note
Choose ENTER to confirm all other error messages. Contact the KaVo Service team if this fails to clear the error message or the error messages keep reappearing.

Note
Confirm all other error messages with the ENTER button. If the error message does not disappear or the error is reported again, please notify customer service. Please always write down what you want or the service you want performed when you send in the device. The settings must be rechecked after the device is returned.

Malfunction	Cause	Remedy
Everything has stopped working.	Fuse has blown.	▸ Check fuse; replace if necessary.
	The unit is switched off.	▸ Switch on the unit using the on/off switch at the rear.
	Both ends of the power line are not plugged in.	▸ Connect a power line.
	The wrong handpiece or angle piece is mounted or set on the device.	▸ Adjust the right handpiece or angle piece on the device.
	Not known.	▸ Switch the machine off and then on.
No coolant in the instrument.	Coolant flow not preselected.	▸ Set the coolant flow. **See also:** 5.3.4 Set the coolant flow, Page 36
	The pump hose is sticky or crusty.	▸ Exchange the pump hose. **See also:** 7.1 Exchange the pump hose, Page 62
The coolant in the instrument is insufficient.	The spray nozzles are crusty or soiled.	▸ Clean the spray nozzle with the nozzle needle.
	The pump hose is sticky or crusty.	▸ Exchange the pump hose. **See also:** 7.1 Exchange the pump hose, Page 62
	Glass bottle with saline solution is not ventilated.	▸ Ventilate the glass bottle.
Coolant is dripping	Clogged coolant line or restricted flow	▸ Check if the coolant hose and connecting nipple are blocked.
	The coolant pump is set too high.	▸ Adjust the coolant flow. **See also:** 5.3.4 Set the coolant flow, Page 36 7.1 Exchange the pump hose, Page 62

Malfunction	Cause	Remedy
	The pump hose is too long.	▸ To avoid dripping, keep the pump hose length after the pump as short as possible.
Leaky hose pump housing.	The pump hose is worn.	▸ Exchange the pump hose. **See also:** 7.1 Exchange the pump hose, Page 62
Leaky surgical hose.	Worn or defective coolant hose.	▸ Exchange coolant hose. **See also:** 7.2 Exchange coolant hose, Page 65
		▸ Shorten the hose by approx. 6 mm.
The motor shuts off during treatment without an error message.	The wrong handpiece or angle piece is mounted or set on the device.	▸ Adjust the right handpiece or angle piece on the device.
The motor makes a grinding noise.	The motor is not correctly plugged on or screwed on.	▸ Firmly insert the motor hose into the housing.
		▸ Firmly screw on the motor hose to the motor.
		▸ Switch the machine off and then on.
		▸ Check if all the connections and couplings are firmly seated.
The motor runs out of true.	The motor is not correctly plugged on or screwed on.	▸ Firmly insert the motor hose into the housing.
		▸ Firmly screw on the motor hose to the motor.
		▸ Switch the machine off and then on.
		▸ Check if all the connections and couplings are firmly seated.
No light on the handpiece and angle piece.	The light is not turned on.	▸ Turn on the light.
	The hand and angle piece is improperly attached.	▸ Mount the handpiece and angle piece until the catch audibly locks.
	The lamp is faulty.	▸ Replace the lamp **Mat. no. 1.002.2928**. **See also:** Instructions for use for the motor.
	The catch is dirty.	▸ Clean the catch (gold contacts). **See also:** Instructions for use for the motor and instrument.
	No suitable light, hand and angle piece	▸ Use a suitable light, hand and angle piece.
Display: >>remark 65 -motor is overloaded	Motor overload warning	▸ Stop treatment as soon as possible and let the motor cool off for a few minutes.
Display: >>warning 50 -motor is overloaded	Motor is overloaded, the maximum permissible motor output was exceeded.	▸ The motor is blocked for 10 minutes; let it cool.
Display: >>remark 66 -motor not plugged	The motor hose is not correctly inserted.	▸ Properly insert the motor hose.
	The motor is not correctly connected to the motor hose.	▸ Properly plug in the motor.

Malfunction	Cause	Remedy
Display: >>remark 67 -motor not plugged.	When the motor starts, the disconnection of the motor from the hose is detected.	▸ Plug the hose onto the motor and screw it tight. This display disappears after eight seconds. The motor can be restarted after this time.
Display: >>warning 36 -missing foot control	Defective footswitch or defective connection to the footswitch, possibly by unintentional penetration of moisture.	▸ Dry the footswitch. Turn the machine off and on
Display: error 3	Internal system error	▸ Exchange the pump hose. Contact service.
Display: error 4	Internal system error	▸ Exchange the pump hose. Contact service.
Display: error 29	The motor hose is damaged.	▸ Check the motor hose and exchange it if necessary
Display: warning 49	The power consumption of the surgical motor was too high.	▸ Press the ENTER button and continue. Exchange the motor hose. Exchange surgical motor.

7.1 Exchange the pump hose

Note
When delivered, substitute parts are not sterile. Before initial treatment, they must be rinsed and sterilised.

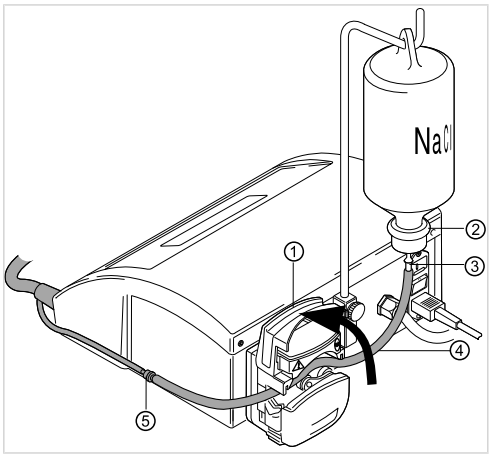
See also: 6.3 Sterilisation in a steriliser in compliance with DIN EN 13060, Page 58

Lengths of pump hose can be obtained under **Mat. no. 0.065.5789**. Approx. 500 mm is needed.

Note
If the pump hose becomes brown after extended use, it must be exchanged.

- ▸ Make sure that all lines containing saline solution are completely empty.

- To drain the lines, remove the insertion needle ③ from the saline solution reservoir ② and activate the pump by using the multifunctional foot control until the hoses are free of saline solution. Remove the container and store it so that it does not drain.

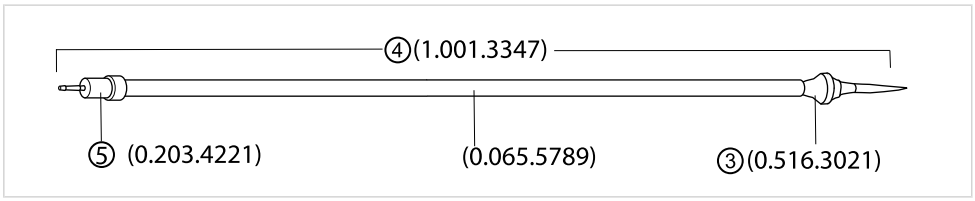


- Turn off the INTRAsurg 300/300 plus.

CAUTION

Running, open hose pump.
Injury hazard
- Turn off the device before opening the hose pump.

- Open the pump mechanics by lifting the lock ①.
- Remove the pump hose ④ with the insertion needle ③ and plug-in nipple ⑤.
- Remove the insertion needle ③ and plug-in nipple ⑤ axially from the pump hose while twisting slightly and replace with a new pump hose **Mat. no. 1.001.3347**.



- Insert the new pump hose into the hose pump.

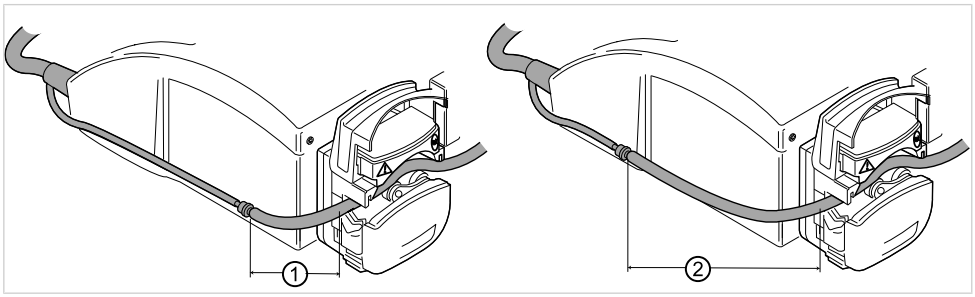
Note
Insert the pump hose into the pump so that it is not clamped or pinched by the lock. Run all hoses relaxed without tension. Shove the hoses firmly on the plug-in nipple to ensure a tight connection.

Note
To avoid dripping, keep the pump hose length after the pump as short as possible.

- Carefully turn the lock ① downwards and turn it until it locks into place.

The pump hose length after the pump determines the dynamic pressure in the coolant hose after the motor or pump stops (drop formation).

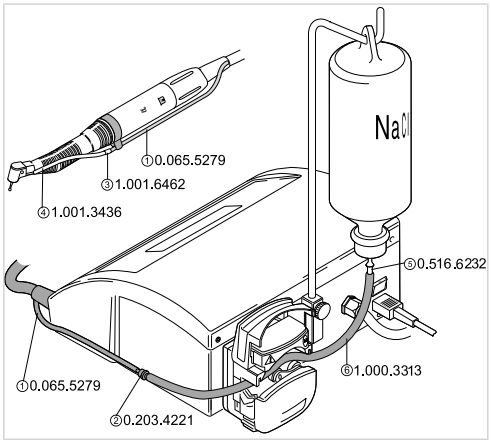
Pump hose ① short: less accumulated volume in the coolant hose (less potential dripping)
Pump hose ② long: large accumulated volume in the coolant hose (increased dripping possible)
Observe hygiene to prevent infection: The liquid in the coolant hose may not draw back to far (avoid contamination).



7.2 Exchange coolant hose

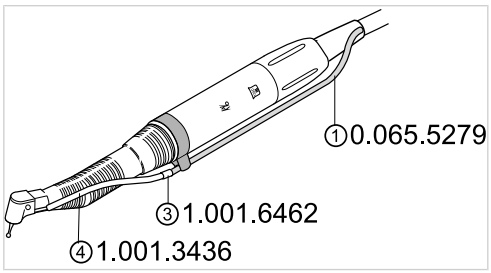
Note
The parts delivered for exchange are not sterile. Rise and sterilise them before the first treatment.

The coolant hose is run to the handpiece/contra-angle handpiece and consists of 2 pieces:
Coolant hose ①(approx. 2.3 m long and obtainable as a section under **Mat. no. 0.065.5279**)
Coolant hose ④(obtainable approx. 150 mm long under **Mat. no. 0.593.0252** and as a section under **Mat. no. 0.065.5188**)



7.2.1 Exchange the coolant hose from the handpiece or angle piece.

- Pull off the coolant hose ④ **Mat. no. 0.593.0252** (150 mm), or **Mat. no. 1.001.3436** (70 mm), or **Mat. no. 0.065.5188** (cut section) off the coupling ③ **Mat. no. 1.001.6462** and the handpiece or angle piece and exchange.

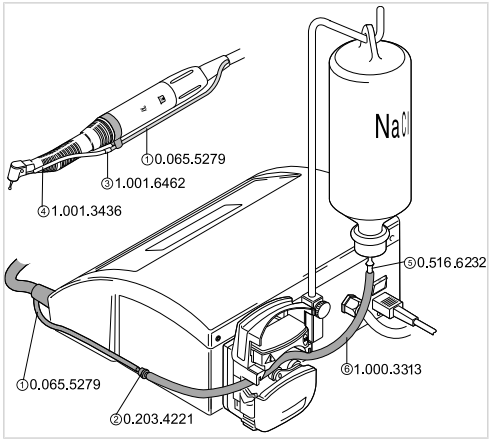


7.2.2 Exchange the coolant hose in the motor hose

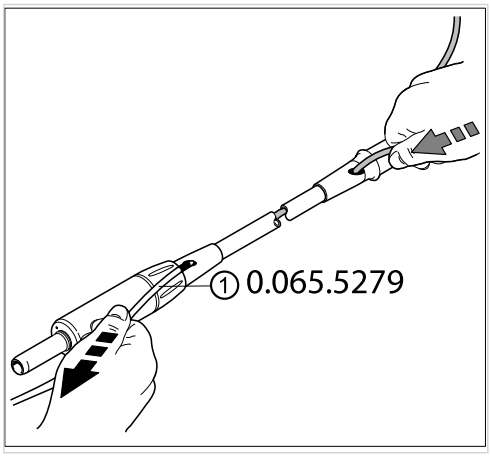
Note
Run the new hose straight in the direction of tension so that it can be pulled in as easily as possible. Talcum powder can be used as a lubricant.

- Remove the coolant hose ① from the plug-in nipple ② and coupling ③.

- Connect the new and existing coolant hose ① to the coupling ③.



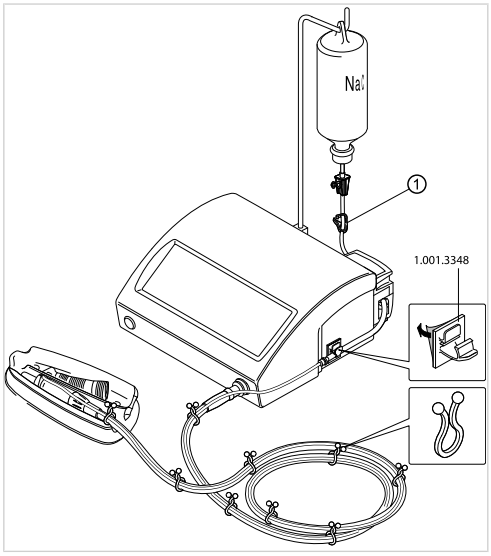
- Carefully remove the old hose from the motor end and simultaneously shove on the new one until the coupling ③ piece is visible.
- Pull the coupling ③ out of the hose opening e.g. using a tweezers so that the coupling piece is not clamped there.



7.2.3 Disposable coolant hose

Sterile-packaged coolant hoses can be ordered under **Mat. no. 1.001.9902** (package contents: 10 units).
This should be used for applications with an increases infection risk or when the motor hose cannot be prepared according to the existing instructions.
The disposable coolant hose consists of an insertion tip, pump hose, clip and hose holder.
The length of the hose can be cut at the exit end with a sterile knife or sterile scissors.
Observe the instructions regarding use on the package.

- Connect the coolant hose directly to the outside of the motor hose without loops or kinks, and affix with the accompanying holders (evenly distributed).



- Before using the pump, completely open the inserted hose clip ①.

The coolant flow is also affected by the outlet in the handpiece or angle piece. A focused water jet should arise.

- Set the pump flow on the device.

Note
To avoid dripping, keep the pump hose length after the pump as short as possible.

7.3 Device settings table

Enter the set parameters in the table before each service check. Always check the parameters using the table after the service check.

Date: _____ **Name:** _____

Step	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l

	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l
Free					

Date: _____ **Name:** _____

Step	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l

	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l
Free					

Date: _____ **Name:** _____

Step	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l

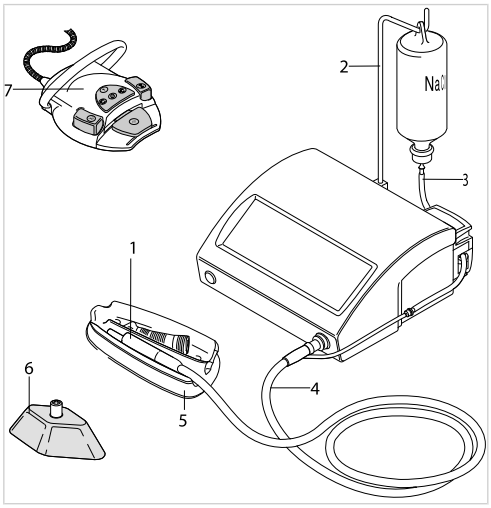
	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l
Free					

Date: _____ **Name:** _____

Step	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l

	Instrument	Speed (rpm)	Torque (Ncm)	Pump	Motor r/l
Free					

8 Accessories



The INTRAsurg 300/300 plus contains the follow permissible accessories:

- INTRA S 550 surgical motor **Mat. no. 1.000.8072** ① (autoclavable collectorless motor with a speed range of 300 to 40000 rpm)
- Alternative: INTRA LUX SL 550 surgical motor **Mat. no. 1.001.3421** ① (autoclavable collectorless motor with a speed range of 300 to 40000 rpm)

- Bottle holder **Mat. no. 0.761.1872** ②
  Do not user containers with a capacity of more than 1 litre (tipping hazard).
- Pump hose **Mat. no. 1.001.3347** ③
- Disposable coolant hose **Mat. no. 1.001.9902**
- Motor hose 2 m (standard) **Mat. no. 1.001.2651** ④
  Motor hose 3 m (only upon request) **Mat. no. 1.004.6825** ④
  The coolant-conducting connecting hose is autoclavable.
- Motor sterile holder **Mat. no. 0.726.2922** ⑤
- IPX 8 foot control with 3.5 m connecting cable (only upon request) **Mat. no. 1.004.8276** ⑦
- Steri-Set INTRAsurg 300 (only upon request) **Mat. no. 1.001.4953** consisting of the following parts: 1 motor hose 2 m **Mat. no. 1.001.2651**; 1 surgical motor INTRA S 550; 1 motor sterile holder **Mat. no. 0.726.2922**; 1 hose 150 mm **Mat. no. 0.593.0252**; 1 pump hose **Mat. no. 1.001.3347**.

For the INTRAsurg 300 Plus:

- INTRAsurg Calibration **Mat. no. 1.002.3569** ⑥ (disinfectable).
- Steri-Set INTRAsurg 300plus (only upon request) **Mat. no. 1.001.4968** consisting of the following parts: 1 motor hose 2 m **Mat. no. 1.001.2651**; 1 surgical motor INTRA LUX SL 550; 1 motor sterile holder **Mat. no. 0.726.2922**; 1 hose 150 mm **Mat. no. 0.593.0252**; 1 pump hose **Mat. no. 1.001.3347**.

KaVo surgical, handpiece and angle piece line corresponding to the order.
For news on surgery and implantology, see www.kavo.com.

9 Details on electromagnetic compatibility

9.1 Guidelines and manufacturer's declaration - electromagnetic transmission

The IS 300 is for use in an environment like the one cited below. The IS 300 customer or user should ensure that use takes place in such an environment.

Measurements of noise transmissions	Conformance	Electromagnetic environment - hints
HF-transmissions according to CISPR 11	Group 1	The IS 300 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-transmissions according to CISPR 11	Class B	The IS 300 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 IS 300 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 IS 300 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.



Note
The device or system may not be used or stacked directly next to other devices. If it has to be used close to or stacked next to other devices, the device or system must be monitored to ensure that it is used properly in the existing arrangement.



Note
The immunity test levels required in IEC 60601 are met.

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

The IS 300 is for use in an environment like the one cited below. The IS 300 customer or user should ensure that use takes place in such an 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 made of 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 Push-pull voltage (symmetrical) ± 2 kV common mode voltage (unsymmetrical)	± 1 kV Push-pull voltage (symmetrical) ± 2 kV common mode voltage (unsymmetrical)	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 for 1/2 period (>95% interruption) 40 % U_T for 5 periods (60% interruption) 70 % U_T for 25 periods (30 % interruption) < 5% U_T for 5 s (>95% interruption)	< 5% U_T for 1/2 period (>95% interruption) 40 % U_T for 5 periods (60% interruption) 70 % U_T for 25 periods (30 % interruption) < 5% U_T for 5 s (>95% interruption)	The quality of the supply voltage should correspond to that of a typical business or hospital environment. When the user of the IS 300 needs continued operation even when the power supply is interrupted, it is recommended to supply the IS 300 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.

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 IS 300 is for use in an environment like the one cited below. The IS 300 customer or user should ensure that use takes place in such an 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 10 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 IS 300 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). The field strength of stationary radio transmitters should be less than the conformance level at all frequencies in an on-site check[a].[b] Disturbances are possible close to devices that have the following symbol.

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 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 IS 300 is used, exceeds the conformity level, the IS 300 should be watched to ensure that it 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 IS 300.
[b]Within the frequency range of 150 kHz to 80 MHz, the field strength should be less than 3V_{eff} V/m.

9.4 Recommended safe distance between portable and mobile HF telecommunications equipment and the INTRAsurg 300

The IS 300 is for use in an environment like the one cited below. The customer or user of the IS 300 can help to avoid electromagnetic faults by keeping to the minimum distance apart between portable and mobile HF-telecommunication devices (transmitters) and the IS 300 - dependent on the output lines for the communication device - as given below.

Rated power of the transmitter in W	150 kHz to 80 MHz $d=1.17\sqrt{P}$	80 MHz to 800 MHz $d=1.17\sqrt{P}$	800 MHz to 2.5 GHz $d=2.33\sqrt{P}$
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: To calculate the recommended safe distance from transmitters with a frequency range of 80 MHz to 2.5 GHz, an additional factor of 10/3 was used to reduce the probability that a mobile unintentionally brought into the patient area would cause malfunction.
NOTE 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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