Description of the individual components

Picture	Component	Description
1	Control-Unit	Control unit with touch screen, incl. 4 connecting sockets (1a, 1b, 1c, 1d) and tripod nut on the backside
2	Power Supply	AC/DC converter with Euro-prime plug Input: 100 – 240 V Output: 12 V 1,25 A
3	Foot Switch	Start/stop with connection to the power supply
4	Apex-cable set	4a – Measuring cable with plug 4b – Cable with file clamp 4c – Lip clip
5	Contra-angle	For the Apex-measuring / fully isolated/ transmission 1:1, with ISO-E fitting
6	Motor	Apex-measuring contact, LED performance display and ISO-E connection
7	D-Pack Heating Tip	Different sizes are available
8	D-Pack	DownPack handpiece with LED display
9	BackFill Needle	Different sizes available
10	Heat insulator	Offers protection from thermal damaging
11	BackFill Gun	For the thermo-plastic filling of the root canal 11a – Release device 11b – Piston 11c – Lever 11d – Knurled knob
12	Multi-tool	For forming as well as screwing on and off the BackFill Needles
13	Guttapercha	Pellets made of Guttapercha for the BackFill Gun
14	Cleaning Kit	Brushes for the cleaning of the BackFill Gun
	Base with equipment Holder	Tray for the entire equipment (see illustration on the cover sheet)
	Protective Foil	Foil for protection of the display (optional, no illustration) Can be ordered from the manufacturer

Congratulations!

We are glad you have decided to purchase the **EndoPilot**. You have made a good choice.
For more than 40 years, the family-owned company Schlumbohm® has been successful on the dental industry market. These long-standing experiences as well as excellent contacts to specialists nationally and internationally permit the company Schlumbohm® to design outstanding devices, enabling the patient as well as the dentist to achieve an optimal treatment result.
Each development has, in addition to the self-evident optimal treatment result strived for, the focus on an easy and convenient handling.
With the **EndoPilot**® you acquired a product which was developed and tested with utmost care. With regard to function and usability, it meets even the highest demands.

Manufacturer:

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The manufacturer reserves the right to change indications and data of this operating manual also without prior notice. Upon request, the operating manual is available in several languages.
This operating manual was prepared with utmost care, unfortunately, however, mistakes can never be fully excluded. We are therefore thankful for each hint. Please contact us directly in such an event. Also, should you have any further questions, please do not hesitate to contact us.

Table of contents

Page

1. Remarks

1.1. Symbols

Description of the symbols used in this operating manual.

Symbol	Description
CE 0482	The product complies with the requirements of the EU Directive 93/42
	Warning: Consult the operating manual! If the instructions are not followed properly, operation may result in damages of the device or in the injury of the user or the patient.
	Special protection against electric shock (Usage part)
	This medical product may not be disposed off in the normal garbage. The national disposal regulations for electrical and electronic equipment have to be adhered to.
	Single use only
GP	contains Guttapercha
Ag	contains silver
	use before
EC REP	EU authorized representative
	Mechanic processing in the thermo disinfector
	Steam sterilisation
LOT	Production lot number
	Manufacturer

1.2. Proper Usage

The EndoPilot is an „all-in-one“ device concept for the mechanical root canal treatment.
In addition, the device can also be used in the prophylactic treatment for the chemical treatment of caries as well as for polishing and cleaning. It is exclusively determined for the usage in dentistry and may not be combined with other devices.
The EndoPilot was especially designed for the endodontic. The EndoSystem is intended for the following usage only:

1.2.1. Apexlocator

By the Apexlocator, the file position in the root canal is determined. This length determination can either be done manually by using the file clamp (without motor) or parallel to the preparation of the root canal (integrated length determination with motor).

1.2.2. Motor

Mechanic root canal preparation in connection with rotating nickel-titanium files (NiTi), optionally with integrated length determination.

1.2.3. DownPack-Handpiece with Heating Tip

Vertical thermoplastic condensation of Guttapercha in the root canal as well as cutting off of Guttapercha sticks.

1.2.4. BackFill Gun

Final thermoplastic filling of root canals with Guttapercha.

1.3. General Precautions

Please read the operation manual precisely and completely! This is the only way to assure a maximum of security. Most of the problems in operating and maintenance result from the insufficient attention being paid to basic safety precautions and the fact that the possibility of accidents is not foreseen.
The user and his team have to be familiar with the device prior to the first usage.
Should you have any questions or problems, please contact your supplier immediately.

Do not use the device if you or your patient are having a pacemaker!

1.3.1. Contra-Indications

Using Guttapercha on patients with a known allergy to latex, silver or copper may result in allergic reactions. These reactions may cause irritations of eyes, lips and the face. They may also cause breathing problems. Patients should be instructed to immediately indicate any complaints occurring.

1.3.2. General Conditions of Operating

Operating

- The EndoPilot may only be used by approbated specialists.
- Prior to usage, check the device for damages.
- Use the device only for its intended purposes.
- Do not combine it with other devices, like, for example, Endo-devices from other manufacturers.
- Do not alter the device in any way. Schlumbohm® declines any and all responsibility in case of alteration or modification of the device.

Conditions of the Location

- The device may not get in contact with liquids or be installed in damp places.
- Do not expose the device to direct or indirect heat sources.
- The use of the device in a place with free oxygen, explosive or flammable gases and fluids is not admitted.
- In order not to influence to correct length determination, the EndoPilot should not be installed near devices emitting electro-magnetic radiation.

Device Parts and Accessories

- The power supply has a safety-relevant function. Use only the original permitted medical-power-supply supplied with the device**!**
- Follow the manufacturer's instructions for use and disposal of the endodontic files .
- The accuracy of the length determination, the torque and the speed is only ensured when using the EndoPilot 1:1 contra-angle.
- In case of abnormal or unusual canal morphology (blocked or fractured canal), an exact length determination may not always be possible.
- The tolerance of torque and speed is 10%.
- The DownPack-handpiece and the BackFill Gun become hot; there is a risk of burns, of damaging the surroundings and of fire.
- In order to avoid the induction of separate source voltage, the handpieces shall not be put down on electrically conducting surfaces.
- Guttapercha is a natural rubber which may cause allergic reactions (latex-cross-allergy).

General

- Store this operating manual at the device.
- Keep the documents for this device for the entire product shelf-life.
- The user is obliged to report all incidents according to MDD 93/42/EWG as well as any indications of risks to the manufacturer.

2. First Steps

2.1. Installation

At first, please compare the components delivered with the attached shipping documents and the corresponding serial- resp. LOT-numbers. Please check if the display-glass is damaged (1).

Please note that all components are delivered unsterile (s. chapter 15.).

Following conditions should be considered when installing the device:

- The space for the device must be horizontal.
- The device may not be installed in damp places.
- Do not expose the device to direct or indirect heating. Direct sunlight has to be avoided.
- The temperature in the environment should not be below 15°C and not above 40°C.
- The device shall not be installed near free oxygen, flammable gas-mixtures or liquids.
- In order not to influence the correct length determination, the EndoPilot should not be installed near devices emitting electro-magnetic radiation.

2.2. Tripod with Tray for handpieces

The tripod offers a secure stand for the device and the operating tools. Thanks to the recessed grip in the upper part, the tripod can be transported single-handedly. The surfaces are easy to clean and skid-proof feet ensure optimal stability. For the mounting of the tripod as well as the arrangements of the handpieces, please read the mounting instructions (delivered separately) for the tripod! The EndoPilot is connected to the tripod by the tripod-screw.

2.3. Connection

All connections are to be plugged in and may **not** be screwed!
The „Push and Pull"-connections for the handpieces and the foot switch (3) are colour-coded:

Illustration 1	Connection	Use
1a	red	BackFill Gun (11) / also to be used for Updates
1b	black	Foot Switch (3)
1c	blue	1. Motor (6) or 2. DownPack Handpiece (8)
1d	green	Apex-cable (4a), connection to the patient (Lip Clip) (4c)

Connect the power supply directly with the foot switch.

2.4. Touch-Display

Before the first use, pull off the matte protection foil. All functions of the EndoPilot are activated by the comfortable Touch-Display. The Touch-Display allows an intuitive and self-explanatory handling. The display is operated directly with a soft finger touch. It is of course also possible wearing gloves. Alternatively, a small stick with a rounded plastic tip may also be used. For protection from scratches and dirt, we recommend our crystal-clear display protection foil. It can be orders as an accessory.

By no means may the display be operated with any metal objects (danger of breakage of glass)!

With the  -key, you always return to the previous menu.

2.5. Foot Switch

Functions of the foot switch:

- Start/stop of the motor
- Saving of the measured root length (s. chapter 3.)
- Start/stop of the D-Pack heating-process (s. chapter 5.1.)
- Activate the EndoPilot from the sleep-mode

2.6. Switch on, Standby, Switch off

Connect the foot switch (3) with the power supply (2). Put the power supply into the socket (green LED in the power supply has to light up). Now, the plug of the foot switch has to be plugged into the black connection (1b) of the EndoPilot. If the device is not being used for some time, it automatically switches to the sleep-mode. The display light is turned off. The device is turned on again by a short step on the foot switch or touch of the touch-display. The menu displayed as last will be displayed again.

In order to avoid waste of electricity in the standby-mode, the EndoPilot should be disconnected if it will not be used for a longer period.

2.7. Preparation of the Root Canal – Motor and Contra-Angle

The EndoPilot contra-angle (5) is mounted on the motor (6). Use only contra-angles with 1:1 gear. The integrated Apex length measurement (s. chapter 4.6.1.) via the contra-angle (during the preparation) does only work in connection with the original-EndoPilot contra-angle.

If the contra-angle was changed or sterilized, it is necessary to run the calibration-process under the menu item Option. Contra-angles may only be changed upon standstill of the motor (s. chapter 4.6.).

Operating Remarks:

Before starting the device, please check if the motor is tightly snapped into the contra-angle.
Do not use any pressure on the push-button of the contra-angle while operating it as this may cause frictions or mismeasurements!

Depending on the shape of the root canal, the Endo-files are bent and stressed during usage. The device reduces the risk of file-breakage; however, this danger cannot be eliminated completely. Please ensure that you know the allowed torques of the instruments. Select the correct file. Never use and deformed or damaged files!

To avoid file-breakage, please pay attention to the following points:

- Never use pressure to insert the file or to move it forward.
- Nickel-titanium files also break due to material fatigue. Only prepare as many canals as allowed by the manufacturer of the files.
- In order to use NiTi-instruments effectively, experience and practice are indispensible.
- Practice on extracted teeth or Endo-plastic blocks.

LED Motor:	GREEN:	The torque is below 80% of admissible load
	RED:	The torque is above 80% of admissible load

2.8. Filling Technique - DownPack (D-Pack)

The DownPack handpiece (8) shares the blue connection with the motor (6). Only plug the DownPack handpiece into the connection when the device is switched on, otherwise it will not recognize the handpiece.
Do not put the DownPack handpiece down on electrically conducting surfaces, this could lead to induction of separate source voltage.
Do not connect the DownPack handpiece at the same time with the Apex-cable. Put down the handpieces only on the EndoPilot tripod or a temperature-resistant tray. Please keep in mind that the tip becomes very hot.

Operating the heating tip:
Open the tongs by two turns of the nut and insert the heating tip (7) (always insert the piston to mechanical stop). The tip is fixed by screwing the nut tight.
Before using it, make sure that the heating tip is firmly fixed. A twisting tip can cause injuries.
If necessary, the multi-tool (12) may be used to loosen the nut.
Please pay attention to limited life expectancy of the heating tip which differs depending upon the frequency of use, stress and deforming.
Check the heating tip before each use on its function and on its good mechanic condition. Use of excessive force may lead to breaking and to injuries caused by slipping.

Never use heating tips from other manufacturers!

Due to the continued induction of heat into the point of treatment, a warming up of the tooth and the surrounding tissue may occur.
Provide for sufficient waiting times and act carefully. An exaggerated heating may change of the characteristics of the filling material.

LED DownPack:
Red blinking: DownPack is operating, heating procedure is running (Usage s. chapter 5.).

2.9. Filling Technique - BackFill (B-Fill)

Connect the BackFill Gun (11) with the delivered cable to the red connection (1a) at the device.
Insert a new needle (9). Tighten it with the multi-tool (12).
Form the needle between the forming rolls of the multi-tool. Always be careful that the needle is not being bent or torn out of the screwing base. Avoid bending back and forth.
Please always use a Heat insulator (10), which should only be put on shortly before usage in order to avoid burns.
Press the release (11a) and pull the piston (11b) a bit backwards.
Then always insert only 1 pellet Guttapercha (13) at a time in the upper opening of the Gun. If the Gun is already heated, do so quickly in order to avoid the inner parts to agglutinate.
By using the lever (11c), you push the Guttapercha into the heating chamber with the help of the piston (11b) and later on through the needle.
As long as the set temperature has not been reached and the Guttapercha is still rigid, do not press too hard as that may damage the Gun.
If the heating times are longer, the outer parts of the Gun will also be warmed up. Check the temperature of the protection cap (10).
Do not touch the patient's lips or mucous membrane with the needle.
During the filling process, the needle should be able to rise with the filling material.

Do not put the BackFill Gun on electrically conducting surfaces, this could lead to induction of separate source voltage.
Do not connect the BackFill Gun at the same time with the Apex-cable.
Put down the BackFill Gun only on the EndoPilot tripod or on a temperature-resistant tray.

Use of excessive force may break the needle and cause injuries. Please take care that the Gun is cleaned and prepared before each use. Use a new needle each time as well as a new Guttapercha-pellet for each treatment. After the usage and as long as the handpiece is still hot, press all remains of Guttapercha out of the Gun. Only use the original Guttapercha-pellets.

For remarks on dismantling, please see preparation instructions (chapter 15.)!

3. - 5. Functions Main Menu I

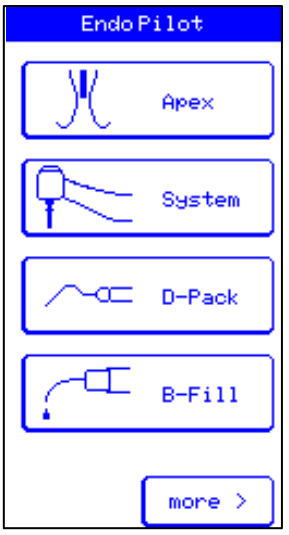
3. *Manual root length measurement*

4. *Motor system for NiTi files*

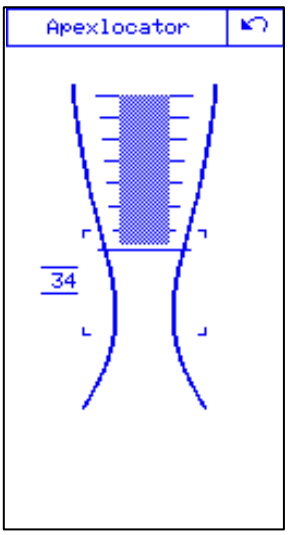
5. *DownPack -handpiece*

6. *BackFill-Gun*

Next menu



3. Manual Root Length Measurement

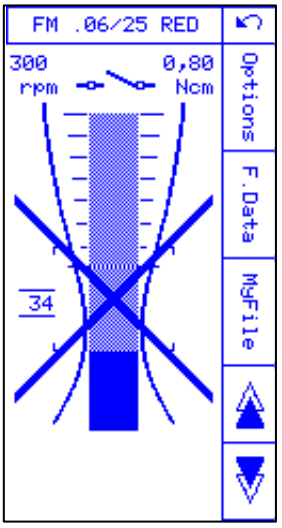


In this menu, you can probe the canal manually, that means by a file lead by hand.
For this purpose, the lip clip (4c) as well as the file clamp (4b) are used.

The horizontal line determines the position in the root canal where the "Auto-stop"-function is reached when using the mechanic preparation. The setting can be stored either directly at the display by moving the line (short tip of the finger) or also comfortably by pushing the foot switch.
With this function, it is, for example, possible to transfer an X-ray verified position of a pilot instrument onto the screen.

The setting of the line is stored until the device is switched off.
If the device is switched on again, the line is re-set to a standard value.

Parallel to the graphic display, a value (here 34) is also shown, this is the length of the line in the display, however NO indication of millimetres. This number is only for a better orientation.



ATTENTION: If the file gets in touch with the lip clip, this will cause a short-circuit.
With this short-circuit, you may test the function of the display and the Apexlocator.

3.1. Advice for an accurate Measurement

Put on the lip clip (4c) in the cheek pouch of the patient (the side which is opposite to the operating area).
Before you start the length measurement, the root canal should be rinsed with NaCl and then be dried (for example with a cotton-pellet), in order to avoid leakage current and, as a consequence, incorrect measurements.
It is recommended to wear protective gloves during the measurement in order to isolate the measuring current.
For the manual measurement, the file has to be connected with the file clamp below the shaft and shall be inserted slowly into the root canal.

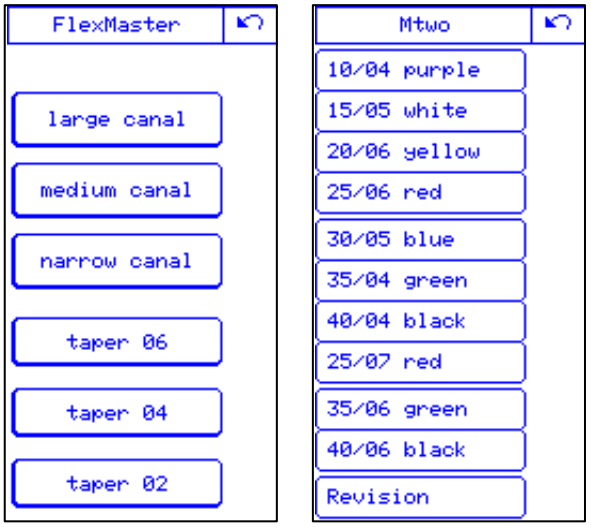
Please keep in mind that, principally, mismeasurements may occur during the electronic canal measurement caused by variable disturbances (conductive fillings, cracks in the tooth, etc.)

The results should always be compared with an x-ray photo.

4. Motor system

4.1 File system →

4.2 Sequence / File →



When selecting the motor system (s. chapters 3.-5.), you will get to the last file system you have been working with.
The general layout is the same for each system, but it differs in the characteristics and sequences of the individual file systems, resp. the manufacturer.
With FlexMaster (s. illustration), for example, you first select the sequence and in the next step the file.

The file system Mtwo does not offer this selection of sequences. The file system is offered directly (s.chapter 4.2.).

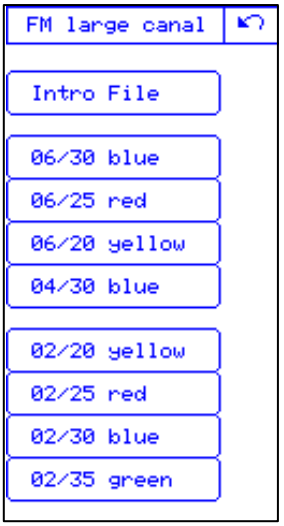
4.1. Selection of file system and MyFile

By a short touch of the currently selected file system (in our illustration at the top FlexMaster resp. Mtwo), you will reach the overview of integrated file systems (see picture on the right).
With the ↶ key, you will return to the system selected the last time.
The file system which was selected the last time is automatically pre-selected at the next usage.

A special feature is offered by the MyFile –function which you may activate directly from each file system.

With this function, you can define your individual sequences, independent of the manufacturer (Hybrid-technique).
The programming of the MyFile –system is done under F. Data of the selected file (see 4.5.).

4.2. Selection of a Sequence / File



After selecting a file system you can either directly choose a file or a file sequence. This depends upon the file system of the manufacturer.

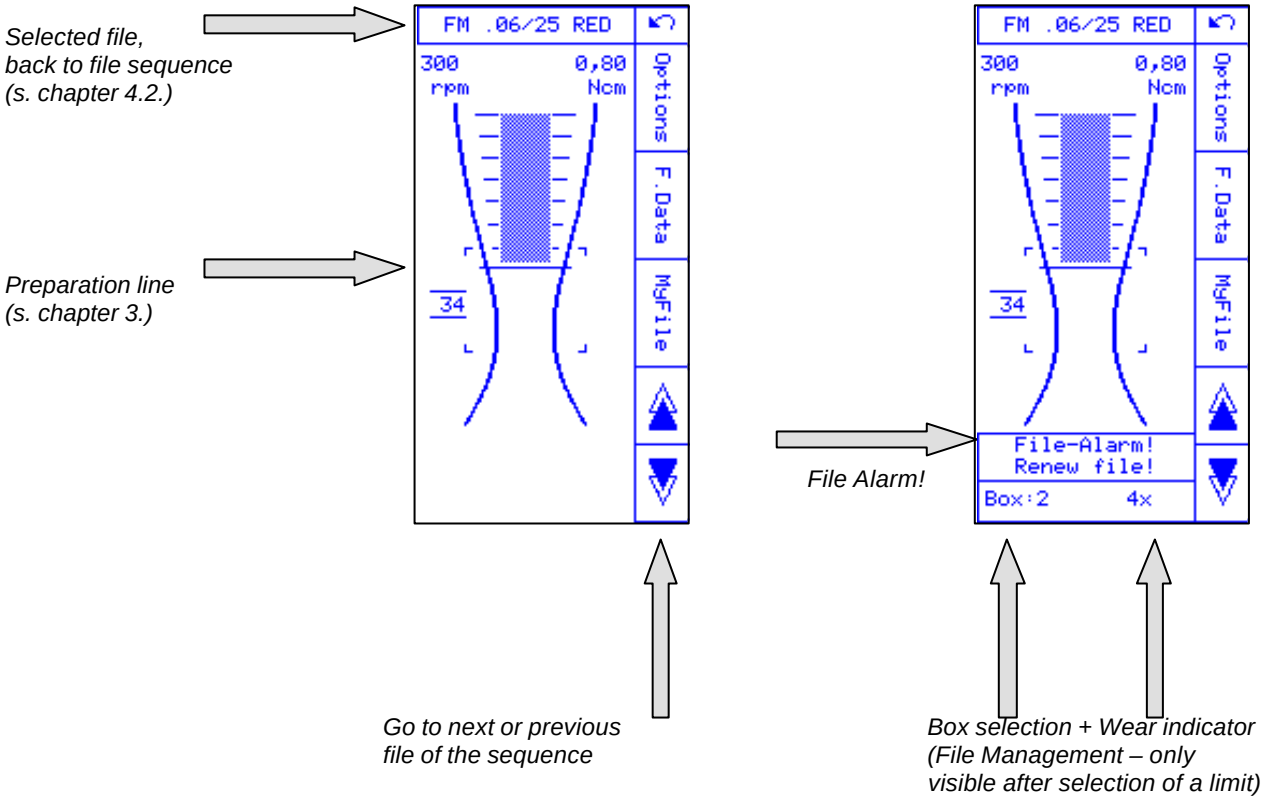
Please note:
Each file exists only once in the database. Therefore, a change of the file parameters (chapter 4.5. (F. Data)) also has to be done once only.
The changes are automatically available in each sequence in which the file is integrated (also in the MyFile sequence).

4.3. File Menu

In the file menu, the EndoMotor is started with the foot switch. The selected file is shown in the upper line. Below it, the speed and torque value of the file are indicated.

The Apex screen is always displayed which enables a manual probing with the help of the file clamp. Please note that the file clamp has to be put down on an isolated surface as otherwise it may cause mistakes in the root canal measurements with the contra-angle.

The settings which are valid for the entire preparation can be selected in the menu Option (s. chapter 4.6. Options). With the F. Data-key, you reach the sub-menu file parameters. It offers the possibility to change the individual parameters for the selected file (Chapter 4.5. file parameters).



4.4. File Management / Selection of Box

The patented file management supervises the wear, resp. the stress of each file. All important parameters like speed, torque and run-time are added up and displayed as parameter (s. chapter 4.5. right picture). It is also possible to pre-select the bending of the canal as a factor under Option (s. chapter 4.6.).

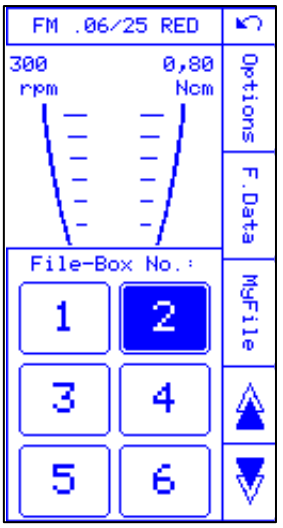
For each file, an individual limit for the file alarm can be defined under F. Data (s. chapter 4.5.).

The wear-indicator will only be displayed in the file menu if a limit has been defined (s. chapter 4.3.).

If you tip on the wear-indicator Box:.. , a window opens for the file box selection (see illustration on the right).

In total, up to 6 file boxes with any number of files, but different in size, can be managed. After selecting a box (1-6), all wear-values of the files from this box used during will be booked on the account of this box.

If the counter exceeds the defined limit, the note: **"File Alarm –Please replace the file!"** is displayed. If a used file is replaced, the counter has to be re-set to zero with the new-key under F. Data (s. chapter 4.5.).



4.5. File Parameters (F. Data)

Indicator File

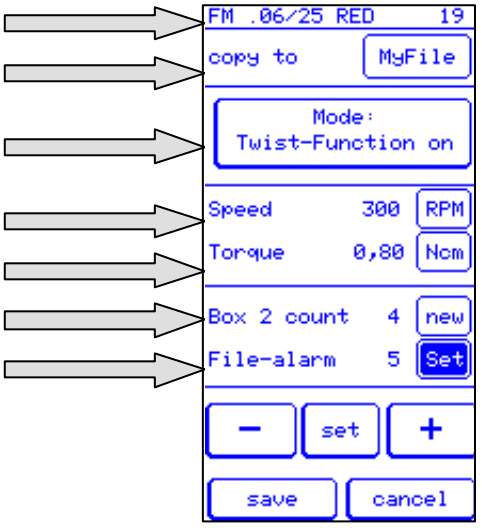
Selection Saving in MyFile

Twist-Function

Speed-value of the file
Torque –value of the file

Wear-values of the file in the selected box

Defined limit of the file alarm



The speed- and torque-values may be changed after selecting UPM or Ncm by the + and - -keys which are then displayed. The individual key UPM Reset or Ncm Reset between the + and - -key resets the values to the factory settings (according to the recommendation of the file manufacturer).

In the menu function Reset (s. chapter. 8), the values of all files can be reset to the factory settings at once.

Please note:

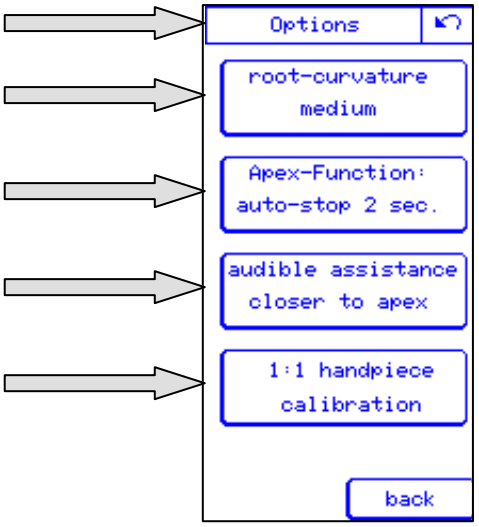
Keep in mind that the file manufacturers provide themselves the right to change and adjust the instrument parameters. The data stored in this device were determined with utmost care according to manufacturer's recommendations. Future changes may be individually adjusted by the user or by running an update.

4.5.1. MyFile

MyFile serves in designing your own sequences. Files from the extensive file library can be chosen and stored. In order to store the selected file in the MyFile-sequence, choose the position via the MyFile-key where the file shall be stored.

4.6. Options

The settings which will be valid for the entire treatment can be selected in the menu Options.



The setting of the bending of the root canal serves for the calculation of the wear.

The following can be selected as root-curvature:
slight (Factor 1x)
medium (Factor 2x) – pre-set
strong (Factor 3x).

As Apex-functions, you can select (s. also chapter 4.6.1.):
auto-stop (arbitrary, stopping time: 0,5, 1, or 2 seconds)
no auto-stop
off

As audible assistance, you can select:
off
approaching Apex– the close the file gets to the Apex, the shorter the time between the tones.
Motor load - the stronger the torque-load (file is approaching the maximum torque limit), the shorter the times between the tones.

The function 1:1 calibrate contra-angle so should be used after each change and each sterilization of the contra-angle. This can compensate smaller torque-losses at the contra-angle and helps to ensure a stable usage of small torque-limits.
If the calibration is not possible, the contra-angle is dirty or damaged. In this case, please contact the manufacturer.

4.6.1. Apexlocator – Root Canal Measurement during Preparation

Check the apex-cable and the correct connection by a short contact of the lip clip to the connected file. The error message Short Circuit has to be displayed (see page 10 at the bottom).

A comfortable function of the EndoPilot is the measurement during the mechanic preparation.
In general, all remarks in chapter 3 apply here as well.
Difference: The task of the file clamp is here taken over by the contra-angle.
The measurement signal is transferred to the file by the isolated contra-angle.
The lip clip is further on necessary in order to close the electric circuit.
The results should always be compared with an x-ray for confirmation.

Overall, there are 3 operating modes available:

1. Apex-function auto-stop **0,5 sec./ 1 sec./ 2 sec.**

The position resp. the movement of the file in the root canal is displayed on the symbolised Apex during preparation and the manual probing.
While the motor is started by the foot switch, the parameters cannot be entered or changed.

1. If the horizontal line (which might have been adjusted by manual measurement) is reached, the motor stops for the selected time (0,5; 1 or 2 seconds).
2. An acoustic signal and flashing red LED`s at the motor signalize that, with immediate effect, the maximum torque limit of the file will be reduced.

The symbol ("torque reduced")  appears in the upper right corner of the display. The patented torque-reduction close to the apex reduces the cutting force of the file in the apical area and provides for a constant disposal of the dental chippings out of the canal.

2. Apex-function no auto-stop

The position resp. the movement of the file in the root canal is displayed on the symbolized apex during the preparation and manual probing.
While the motor is started by the foot switch, the parameters cannot be entered or changed.

If the horizontal line (which may have been adjusted by manual measurement) is reached, an acoustic signal will sound. The motor does not stop and the torque will also not be reduced.

3. Apex-function off

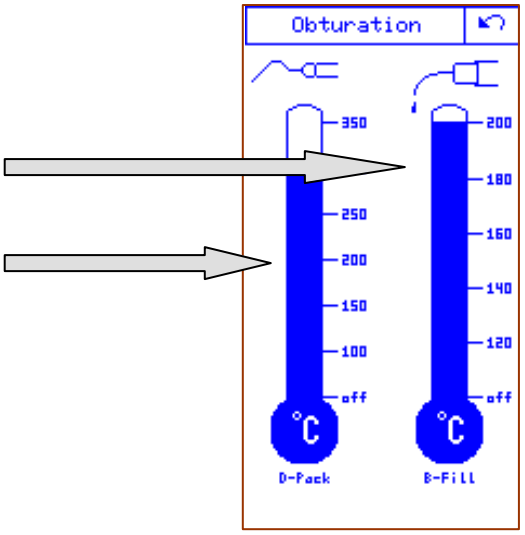
If the Apex-function is turned off, the file menu is still displayed. However, a measurement resp. display of it does not take place.

Please note:
An electronical length determination is only possible with conductive tool shafts. The "Alpha" file system from the company Fa. Gebr. Brasseler uses isolated plastic shafts. A length determination during preparation is consequently not possible.

5. Obturation

5.2. Setting BackFill Temperature

5.1. Setting D-Pack Temperature



The selected temperatures are only examples.

5.1. DownPack

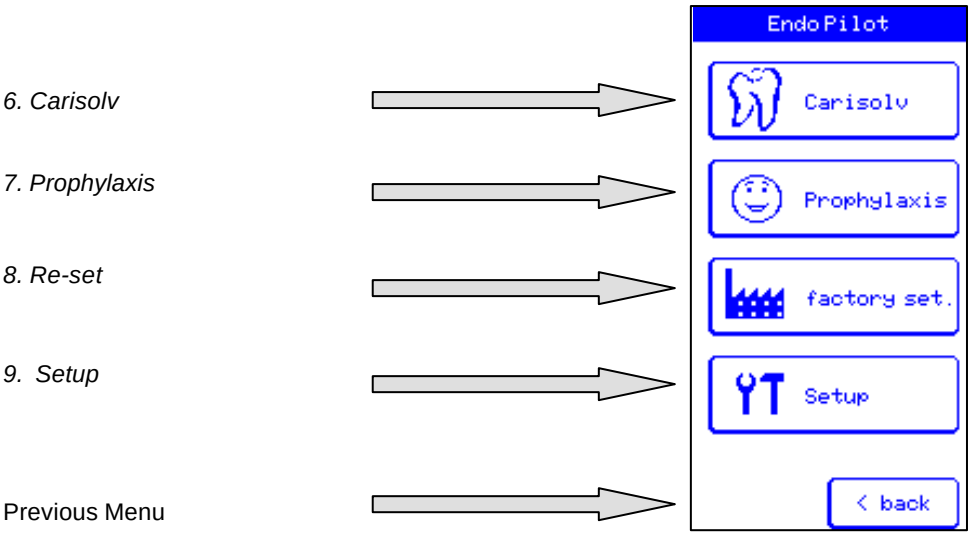
In this menu, you can select the temperature of the heating tip. The bar-graph will be set to the requested temperature (Touch-Display).
The heating process is started by the foot switch. If the requested temperature is reached, an acoustic signal will sound. Either by releasing the foot switch or at the latest after 50 seconds, the heating process will be stopped.
During the heating process, the connected BackFill Gun is shut-off for a short time.
Please see also chapter 2.8

5.2. BackFill

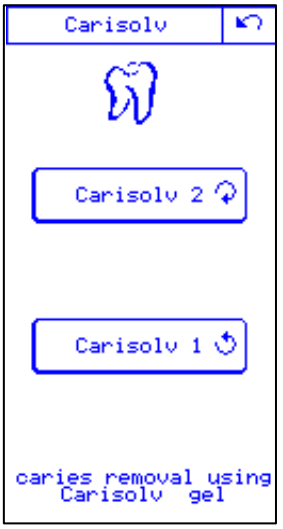
When the BackFill Gun is connected, you can select the temperature of the Gun's heating cylinder in this menu.
The bar-graph will be set to the requested temperature.
The heating process is started as soon as a temperature was selected (the flashing of the display shows that the temperature has not been reached yet).
If the temperature has been reached, an acoustic signal will sound. After about 2 minutes, the heating process will automatically stop (acoustic signal).
By pushing the OFF-key at the lower bottom of the bar-graph, the heating process can be stopped manually. Please see also chapter 2.9

The patient may not be connected to the Apex-cable during the obscuration (D-Pack and Backfill)!

6. - 10. Functions Main Menu II



6. Carisolv®



Carisolv is a caries-dissolving gel for the soft treatment of caries
In the Carisolv® Menu, you can select from two different programmes in connection with the corresponding tools.

The instruments for the Carisolv-application have a special design. They are shaped in a way that you can work with the motor running clockwise and counter-clockwise. In the clockwise mode (red LED) the cutting angles of the instruments are more active than in the counter-clockwise mode (green LED). The characteristics of the instruments and the torque-limit controlled by the processor in the control unit help to effectively soften and remove carious substances by mild, rubbing movements. Please take care that no treatment liquid will get into the gear mechanism of the contra-angle.

Motor LED´s:

Green: counter-clockwise
Red: clockwise

For further information, please contact:

MediTeam AB
Medicinaregatan 8 B, 5th Floor
SE-413 46 Gothenburg
Sweden
www.mediteam.com

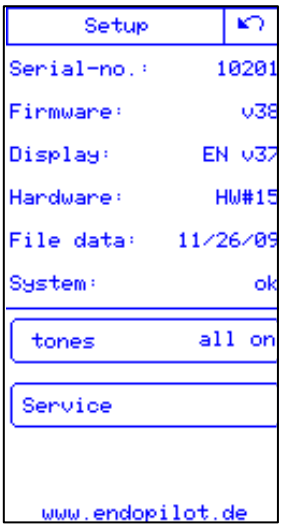
7. Prophylaxis

Quite a variety of different instrument sets are on the market. Select the correct speed-/torque-setting according to the operating manual of the individual manufacturer. The programme data indicate the speed per minute (rpm) and the power rating. Use a 1:1 Prophylaxis contra-angle. The provided EndoPilot contra-angle is not suitable for this.
Please pay attention that no polishing paste gets into the gear mechanism of the contra-angle.
The EndoPilot continuously measure the torque and automatically stops if the torque limit is reached. If the torque is reduced, the motor will automatically start again.

8. Factory Setting

By re-setting, **all file parameters and MyFile-settings** will be set back to the factory settings. .

9. Setup / Updates / Tones



In the Setup Menu, the general device information is displayed.
They may be of help especially for service and updates.

With the Menu Tones you may select individually the acoustic signals of the device.

10.-15. Addendums

10. Maintenance

You will also find information on maintenance in the instructions in chapter 15.
Check cables and connections at least every 5 months.

Attention!

? Do not lubricate the motor for any reason!

? Please make sure that no lubricant or cleaning liquid gets into the motor of the contra-angle! Let excess oil drip out of the contra-angle before using it again after maintenance. To do so, put the contra-angle in an upright position. The contra-angle should only be lubricated before sterilisation.

The EndoPilot does not contain any parts which can be repaired on-site.
If the device opened or modified, the warranty is immediately expired (see chapter warranty).
A repair may only be executed by the manufacturer!

11. Problem Solutions

If the EndoPilot does not seem to work properly, it does not necessarily have to be a device error. First, please check device with the help of the following table, in order to exclude any handling errors or disturbances (like, for example, anatomic peculiarities).

Problem	Possible Reason	Solution
Device in general		
Device shows no function and display does not work.	No power	Is the power supply connected correctly (LED must be shining)? Plug in the D-Pack hand-piece only after turning the device on.
Use of Touch-Display not possible, device does not react.	Touch of display damaged	Result of using excessive force. Contact the manufacturer.
No acoustic signals	Tones are turned off	Turn the tones on again.
Foot switch without function	Foot switch damaged	Check the cables and the plug for damages.
EndoMotor		
Instrument does not turn.	Calibration not been done	Execute calibration with contra-angle.
	Motor damaged	Check the cables and the plug for damages. Check if the motor is running with contra-angle.
	Contra-angle damaged	Check if the axle can be turned freely.
Apexlocator		
No measurement possible	Contact problems	Are lip clip and cable connected correctly? Are lip clip and file clamp absolutely clean? Make sure that a short circuit is shown on the display when file contact and lip clip are touching each other.
	Lip clip at the wrong connection	The lip clip must be connected to the connector of the Apex-cable!
	Wrong contra-angle	Please check if the EndoPilot contra-angle has been connected. Did it snap in correctly? Bring lip clip and NiTi-file in touch with each other. Does the display show a short circuit?
	Root canal calcified or obliterated	Check x-ray photo, eventually catheterisation with suitable file until working length.
	Root canal very dry	Rinse with NaCl. Dry access cavity with cotton pellet.
	Blocking by old filling / medicated substances	X-ray for comparison! Complete removal of old Guttapercha remnants or of medicated substances.
DownPack		
Instrument does not heat	Instrument damaged	Insert new heating tip.
	Instrument is turning	Use the tool to tighten the nut.
BackFill		
No Guttapercha at the needle	Hand-piece too cold	Was the heating time long enough? Is the heating chamber warm?
	Pellet is used up	Is the piston completely in front position? Insert a new pellet.
	Instrument turns	Turn the knob clockwise until the stop (see 2.9)
Piston is blocked (cannot be pulled back during cleaning)	Guttapercha remnants	The remnants stick to the piston, the gun has to be emptied completely while it is still warm.

If the problem cannot be solved, please contact your supplier or Schlumbohm GmbH & Co. KG directly.

12. Error Messages

For some user errors or disturbances, the device will display error messages.
The following errors are, for example, detected automatically:

- Motor not connected,
- Back-Fill not connected or external voltage on the Apex-cable or contra-angle.
- Short circuit (File clamp resp. NiTi-file touches the lip clip)
- Calibration not possible (Friction in the contra-angle too strong, service is necessary)

If the coded error messages are displayed, for example E2, please contact the manufacturer.

13. Warranty / Liability

The company Schlumbohm® warrants this product against defects in material and workmanship for the period of one year from the date of the original invoice. The product warranty by Schlumbohm® includes the repair or the replacement of the entire device or of individual parts. The decision if a repair or replacement will done, rests solely with the manufacturer.

In the case of an alleged defect during warranty, the customer has to inform the Schlumbohm® Customer Service immediately. The Customer Service will give further instructions, usually directing to turn in the entire device for service. The costs of the return consignment are at the expense of the sender.

User errors void the warranty. Schlumbohm® does not warrant for wear and dirt in the hand-pieces and contra-angles. Schlumbohm® does not warrant for breakage of the display-glass.

Schlumbohm® does not assume any risk or liabilities arising from the clinical use of its products, whether or not such use involves coincidental utilization of other medical devices (e.g. pacemaker).

14. Technical Data

Type	**EndoPilot**
Electric supply	Input: 90-264V/AC - Output: 12V/1,25A /DC Power supply according to IEC601 (Power supply for medical devices)
Electric safety class	II
Output	max. 3V/5A bzw.12V/1,25A (DC)
Operation	The device is designed for short-term use.
Speed	200-1000 rpm +/- 10%
Torque	0,2 -5 Ncm +/- 10%
Device class	EN 60601-1, Type BF
IP Class	Safety class/permeation protection for device and foot switch IP52
MPG / EU Class	IIa
Environment conditions	10° C - 40°C / RH: 20-80%, not condensing
Weight	440 gr

Subject to technical changes!

15. Cleaning, Disinfection, processing of devices

Processing the product after each use resp. after each patient. Also the brand-new product has to be prepared before its first use. Please find the instructions in the attached processing instructions:

Part I: Control-Unit with tray, contra-angle and motor

Part II: Apex-cable, DownPack-handpiece and BackFill Gun

15.1. procedural instruction part I : Control-Unit, Contra-angle and Motor

Note: (This instruction is valid for new products also)
Motor, control-box, foot switch and cables are to be wipe-disinfected, the parts can be cleaned and disinfected applying quick-acting-disinfection-spray FD 333 www.duerdental.com with a disposable tissue, exposure time 5 min (wipe out the edges carefully) completely be wet surfaces.
Observe instructions of the spray manufacturer.
The contra angle is to be steam sterilized in addition, machine processing is possible.

CAUTION:	During the cleaning of contra angles it is necessary to pay attention on the process. Automatic-cleaning is only possible for the contra angle. Expose contra angle to 138°C maximum. Motor and contra angle may not be submerged in fluids! Motor must not be steam sterilized. The processing has to be done by skilled personnel only.
Restrictions of treatment:	Frequent treatment has no or little impact on this instrument. The end of the lifetime is usually determined by wear and damages caused by usage.

INSTRUCTIONS:	
Destination of usage:	Remove surface contamination using a disposable (paper) tissue.
Storage and transport:	Contra angle and motor are to be processed immediately after usage. Do not allow adhesions to dry, do not use protein-fixing cleaning and disinfection agents. Avoid waiting time.
Preparation before cleaning:	For cleansing disconnect contra angle from motor, take out the instrument.
Cleaning: automatic	**A.** Only the contra angle can be processed automatically -Material: Quick-acting-disinfection-spray FD 333 (www.duerdental.com), disposable tissues, thermo disinfector, for example: Miele Professional G7881 (device for mechanical cleansing and disinfection, equipped for cleaning contra angles type critical B with higher processing requirements) -Process: For pre-disinfection: spray a disposable tissue with FD 333 and thoroughly wipe contra angle, remove adhesions, rinse the contra angle with de-mineralized water and wipe it with a disposable tissue. Place the contra angle in the thermo-disinfector, follow the manufacturers-instructions of the device and the cleansing and rinsing agents. The process has to be validated and supervised.
Cleaning: manual	**B.** Material: Quick-acting-disinfection-spray FD 333 www.duerdental.com) disposable tissues, spray-adapter for ISO-contra-angles and oil spray F1 (product of W&H www.wh.com) -Process: spray a disposable tissue with FD 333 and, thoroughly wipe motor as well as contra angle (separately), remove adhesions, be wet surfaces completely, exposure time 5 min (observe instructions of the spray manufacturer) (do not apply the spray to the motor directly as the inner parts of the motor may come in contact with any fluid). Rinse the contra angle with de-mineralized water, in addition, and brush it off (soft plastic brush). Attach the contra angle to the adapter of the oil spray-can and spray continuously for about 1 sec. Remove surplus oil and contaminations with a dry tissue.
Disinfection:	Material: Quick-acting-disinfection-spray FD 333 (www.duerdental.com), disposable tissues, Process: spray a disposable tissue with FD 333 and, again, thoroughly wipe motor as well as contra angle (separately), be wet surfaces completely, exposure time 5 min (observe instructions of the spray manufacturer). Rinse the contra angle with de-mineralized water, in addition, and brush it off (soft plastic brush).
Drying:	Dry motor and contra angle with a disposable tissue, blow the contra angle dry, in addition, with sterile compressed air.

Continued on next page

Part I – Continued …

Maintenance:	**C.** Material: disposable tissues, Quick-acting-disinfection-spray FD 333 (www.duerdental.com), spray-adapter for ISO-contra-angles and oil spray F1 (product of W&H www.wh.com) -Process: spray the oil continuously through the contra angle for about 1 sec, remove surplus oil with a disposable tissue. Turn the contra angle downwards (the head), attach the motor (no oil may flow into the motor). Keep the motor running for about 30 sec to remove surplus oil. Start with minimum rotational peed and increase to maximum speed. If contaminants leak out, repeat the whole cleansing, disinfection, drying, and maintenance process Alternatively we recommend oil-service with W&H Assistina (please see the manufacturer's instruction) Finally wipe motor and contra angle (separately) thoroughly.
Inspection and checking of the function:	All parts: Inspect the parts for signs of damage and wear. Do not use damaged components.
Packing:	Contra angle: separately in standardized sterile-bag for steam sterilization Size of packing has to be sufficient. Motor: The disinfected motor can be stored in a plastic bag (unsealed / no autoclaving) Attention! The motor must not be autoclaved
Sterilisation:	Steam sterilization (fractioned vacuum) autoclave device class B: 5 min at 134°C, 2 bar. Treatment duration should be sufficient for the potential germs, if necessary, choose the prion-program (for example: Melag Vakuklave 43 B)
Storage:	No special requirements.
Additional information:	When sterilising several instruments in one cycle, maximum load capacity of the autoclave must not be exceeded.
Contact to manufacturer:	For questions please contact your dealer or the manufacturer www.schlumbohm.de
The instruction stated above has been validated as SUITABLE by the medical device manufacturer for the preparation of a medical product prior to its re-usage. The person who does the treatment is responsible that the treatment that actually took place leads to the desired results. To ensure this it is normally necessary to validate and supervise the process. Each deviation from the instructions provided should be evaluated carefully with regard to effects and negative consequences.	

15.2. procedural instruction part II: Apexcable, D-Pack-handpiece and BackFill-gun

Note: (This instruction is valid for new products also)

1. Apex-cable, file-cable with clip and lip-clip,
2. DownPack handpiece with cable and
3. BackFill gun with cable

are to be wipe-disinfected (see **A.**), they can be cleaned and disinfected with a disposable tissue applying quick-acting-disinfection-spray FD 333 www.duerdental.com), exposure time 5 min (wipe out the edges carefully) completely be wet surfaces (do not apply the disinfectant directly onto the handpieces, but spray it on a tissue) observe instructions of the s pray manufacturer. The following components are intended for manual cleaning and steam sterilization (**B.**):

1. file-cable with file-clip and the lip-clip (not the main Apex-cable with plug)
2. nut (the screw-cap of the handpiece), O-ring (blue) and pen-tip (heating instruments)
3. heat insulator and needle (the disposable needles are to be prozessed before usage)

CAUTION:	During the cleaning of electronical handpieces it is necessary to pay attention on the process. Expose the autoclaveable components to 138°C maximum. Handpieces (gun) and cables may not be submerged in fluids! The processing has to be done be skilled personnel only. Automatic-cleaning is not possible.
Restrictions of treatment:	Frequent treatment has no or little impact on this instrument. The end of the lifetime is usually determined by wear and damages caused by usage. Needles are to be used only once!
INSTRUCTIONS:	
Destination of usage:	Remove surface contaminations with a disposable (paper) tissue. Note regarding the B-Fill (Backfill) gun: Empty the Guttapercha filling completely by actuating the gun (in operating condition). Now press the silver coloured locking knob and pull the piston (using the black button) out of the gun.
Storage and transport:	Handpieces (gun) and cables are to be processed immediately after usage. Do not allow adhesions to dry, do not use protein fixing cleaning or disinfection agents. Avoid waiting time. (BackFill gun has to be cooled down)
Preparation before cleaning:	1. Disconnect lip contact from the apex-cable 2. Detach pen tip, nut (screw cap) and O-ring 3. Remove the heat insulator and unscrew the needle from the cooled gun *(dispose the needle appropriately). Press the locking knob of the Backfill gun and turn the knob (knurled) of the guide-cylinder for approximately 180° to the left. Now release the lock ing knob and pull the knurled knob slowly out of the housing (about 2 cm).Turn the knurl knob for another 90° to the left (nose points upwards). Press the locking knob and pull the guide-cylinder entirely out of the gun. (The piston with the black knob, as well as the guide-cylinder are intended to be wipe-disinfected together with the BackFill gun)* (see picture in the operating manual)
Cleaning: automatic:	Caution: The product is not designed for automatic-cleaning
Cleaning: manual:	**A.** (all parts which may not be steam-sterilized and the file cord) -Material: Quick-acting-disinfection-spray FD 333 www.duerdental.com), disposable tissues -Process: Spray a disposable tissue with FD 333 and thoroughly wipe the cables as well as handpieces (or gun), guide cylinder and piston (see above); remove adhesions, be wet surfaces completely, exposure time 5 min (observe instructions of the spray manufacturer) (Neither the inner parts of the handpiece (or gun), nor the plug may come in contact with any fluids, therefore do not spray them directly). After an initially cleaning of the BackFill gun insert the cleaning drill from the muzzle, by screwing it into the heating chamber of the gun. Residues of cooled Guttapercha can be removed. Now dip the cleaning brush of the gun into Isopropanol 70% (the brush should only be damped, but not drop) and brush the gun inwardly. Repeat this procedure until all residues are removed.
Disinfection:	-Material: Quick-acting-disinfection-spray FD 333 www.duerdental.com), disposable tissues -Process: Spray a disposable tissue with FD 333 and thoroughly wipe the cords as well as the handpieces (or gun), guide cylinder and piston again, be wet the entire surface, exposure time 5 min (observe instructions of the spray manufacturer) (exposure time depends on the potential germs). Subsequently rinse the guide-cylinder and piston of the BackFill gun with de-ionized water containing low levels of germs and endotoxines (aqua purificata). Wipe the heating chamber with brush and aqua purificata. It is vital to ensure that the cleaning agents are removed completely (for further instructions see **C.**)

Part 2 – Continued **...**

Cleaning: manual:	**B.** (all parts for steam sterilization, except file cable see above) 1. lip clip 2. nut (screw cap), O-ring (blue) as well as pen tip (heating instruments) 3. heat insulator and needle (the disposable needles are to be processed before usage) (see chapter "**Needle**") -Material: Combined cleaning and disinfection agent ID213 (www.duerdental.com), disposable tissues, ultrasonic bath with instrument-tank, brush for interior drillings 3 mm (no metal bristles) -Process: for initial disinfection submerge all parts intended for processing in a fresh bath with combined cleaning and disinfection agent ID213 (www.duerdental.com). This procedure is necessary for protecting your safety and it stops the drying of adhesions. Please adhere to the concentrations indicated by the manufacturer. Do not submerge the parts overnight, do not keep the parts longer than 4 hours in the pre-cleaning-bath. -For removing contaminations from the components use disposable tissues and cold running water. NOTE: Use an appropriate brush when cleaning drills. Wear protective clothing.
	-Process: submerge the parts in a fresh solution with combined cleaning and disinfection agent ID21 3 (www.duerdental.com) in the ultrasonic bath. The parts have to be entirely covered and may not touch each other. Please adhere to the concentrations indicated by the manufacturer.- To entirely clean the components from contaminations, use a soft brush and clean all inner as well as outer surfaces several times. Examine the parts to ensure appropriate cleansing. The cleaned parts have to remain in the bath for the exposure time indicated by the manufacturer. **Needle** (new) take one needle out of the transport packing, wear clean disposable gloves. Place the needle separately in a clean, disinfected vessel with fresh combined cleaning and disinfection agent ID213 (www.duerdental.com) in the ultrasonic device. Adhere to concentrations and exposure times indicated by the manufacturer. Cleansing and disinfection has to be carried out separately from the other parts to avoid contaminating the needle with suspended solids. -Rinsing: Take out all parts and rinse them thoroughly with de-ionized water containing low levels of germs and endotoxines (aqua purificata). Use the ultrasonic bath, change the water several times, it is vital to ensure that the cleaning and disinfection agents are removed completely (for further instructions see **C.**).
Drying:	**C.** Wipe handpieces (or gun) and cables with a disposable tissue. In addition blow dry the file cable with file clip, lip clip, nut (screw cap), O-ring and pen-tip (heating instrument), as well as needle, heat-cover, guide-cylinder and the piston of the BackFill gun with oil-free, dry and sterile compressed air (use a sterile filter).
Maintenance:	No maintenance necessary Insert the piston with the black knob and the guide-cylinder of the B-Fill gun into the gun. To do so press the locking knob and insert the guide cylinder, the nose pointing upwards, into the gun, as far as possible. Turn now the knurled knob 90° to the right. Push the knurled knob entirely into the housing. Turn now the knurl knob for another 180° to the right.
Inspection and checking of the function:	All parts: Inspect the parts for signs of damage and wear. Do not use damaged components.
Packing:	All parts intended for steam sterilization: separately in standardized sterile-bags for steam sterilization. Packaging has to be sufficient. The disinfected Handpieces (or gun) and Apex cable (main-cable with plug) can be stored in a plastic bag (unsealed / no autoclaving) Attention ! Do not autoclave other parts than the intended.
Sterilisation:	Steam sterilization (fractioned vacuum) autoclave device class B: 5 min at 134°C, 2 bar. Treatment duration should be sufficient for the potential germs, if necessary, choose the prion-program (for example: Melag Vakuklave 43 B)
Storage:	No special requirements.
Additional information:	When sterilising several instruments in one cycle, maximum load capacity of the autoclave must not be exceeded.
Contact to manufacturer:	For questions please contact your dealer or the manufacturer www.schlumbohm.de
The instruction stated above has been validated as SUITABLE by the medical device manufacturer for the preparation of a medical product prior to its re-usage. The person who does the treatment is responsible that the treatment that actually took place leads to the desired results. To ensure this it is normally necessary to validate and supervise the process. Each deviation from the instructions provided should be evaluated carefully with regard to effects and negative consequences.	