

# VARIOstar

brushless  
Handpiece **K50**  
**T50**





# Important instructions and warnings

1. For your safety, please read all operating instructions before putting the device into operation.
2. Observe the occupational health and safety regulations of the employer's liability insurance.
3. Before starting, ensure the supply voltage corresponds to the data on the type plate.
4. Remove the chuck-/service-tools before switching the device on.
5. Provide good lighting, safety glass shields, eye protection and an extraction system at the workplace.
6. The handpiece is intended exclusively for dry grinding.
7. Before using the handpiece, make sure the tool is seated firmly and cannot be pulled out.
8. Use only functional, certified tools (drill bits, milling bits, cutting disks, polishing tools, grinding tools, etc.) and observe the tool manufacturer's instructions for use (e.g. maximum permissible speed of rotation).
9. Make sure that the handpiece does not start unintentionally or run unsupervised.
10. Operate the handpiece only with a tool or pin locked in the chuck.
11. Do not turn the chuck while the handpiece is rotating.
12. Clean the chuck regularly according to the instructions (never use compressed air for cleaning / see section 2.1).
13. Repair and maintenance work on the electrical part of the equipment may only be performed by an approved or certified repair technician.
14. Electrical devices may not be used in a damp or wet environment.
15. For 115V, use the grounded power cable SVT3x18AWG with IEC socket and grounded plug.
16. Any interruption in the protective ground conductor inside and outside the device or loosening of the protective ground connection can lead to the device posing a threat to the operator. Intentional interruption is not permitted.
17. In case of defects or damage where safe operation is no longer ensured, the device must be secured against unintentional use.
18. This device is not suitable for use in potentially explosive environments or on patients.

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# 0. ■ Introduction

Thank you!

We are delighted that you have chosen the Zubler VARIOstar D50 and we hope that you will enjoy working with it. The constant further development of our technology is based on cooperation with experienced dental technicians. Our primary goal is to construct dental equipment of maximum quality, flexibility and sustainability. Performance and profitability are the basic prerequisites for this.

In order to ensure trouble-free usage, please read the operation manual carefully.

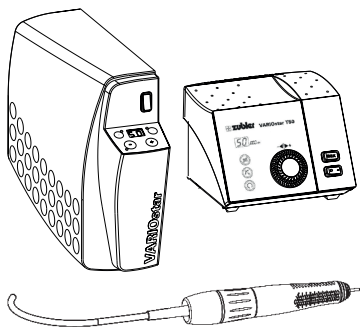


Fig. 1

## 0.1 Declaration of conformity

We, Zubler Gerätebau GmbH  
Buchbrunnenweg 26  
89081 Ulm Jungingen

hereby declare that the products

**VARIOstar K50**

**VARIOstar T50**

conform to the regulations of the following EU directives:

2006/42/EC Machinery Directive

2014/35/EU Low Voltage Directive

2014/30/EU EMC Directive

This declaration loses its validity if the products are modified without our agreement.

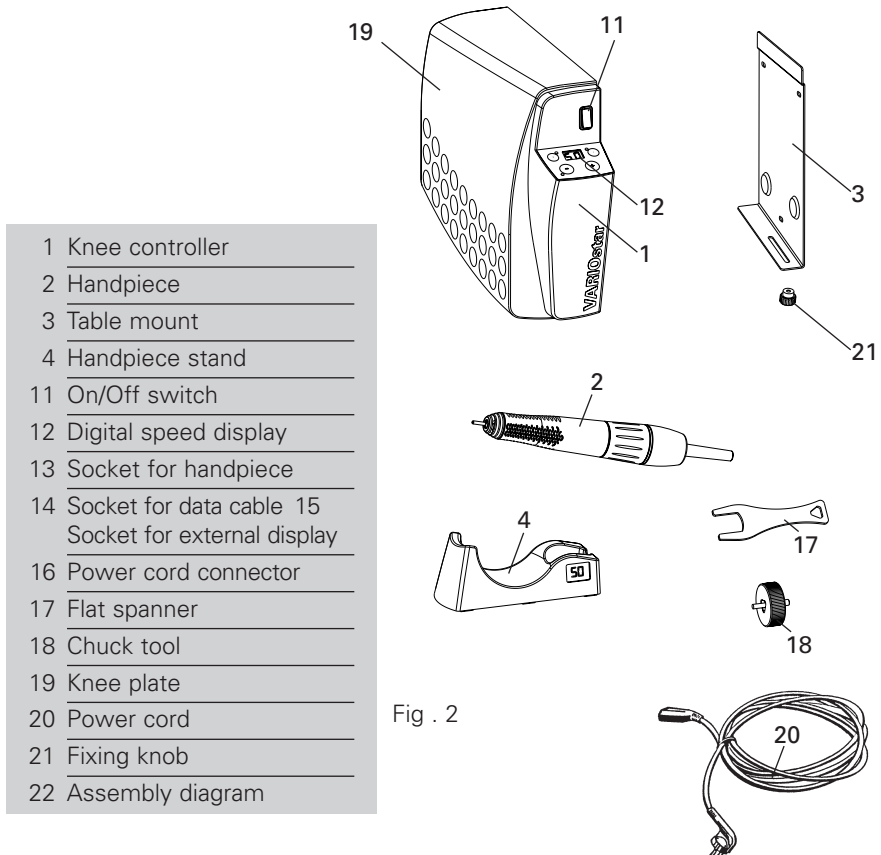
A handwritten signature in black ink, appearing to read 'Kurt Zubler'.

Kurt Zubler  
Chief Executive Officer

## 0.2 General notes

Functional principle: Thanks to its special brushless design, the VARIOstar K50/T50 handpiece enables smooth, fatigue-free and thus economical working in continuous operation. The device is constantly monitored for overload through microprocessor control. An additional thermal fuse provides the handpiece with increased safety.

## 0.3 Scope of delivery: VARIOstar K50 knee controller



## 0.4 Installing the VARIOstar K50 knee controller

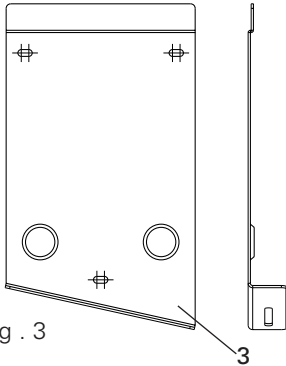


Fig . 3

Fasten the table mount **3** at your workplace with the help of the assembly diagram **22**. You can find the assembly diagram between the knee controller **1** and the table mount **3**.

Hook the knee controller **1** into the table mount **3** and push the knee controller **1** into the table mount **3** to the stop; secure the knee controller with the fixing knob **21**.

### Connecting the handpiece

Connect the VARIOstar handpiece **2** to the socket **13** (align to the notch) and secure the plug by twisting the ring.

Place the motor handpiece **2** in the handpiece stand **4**.

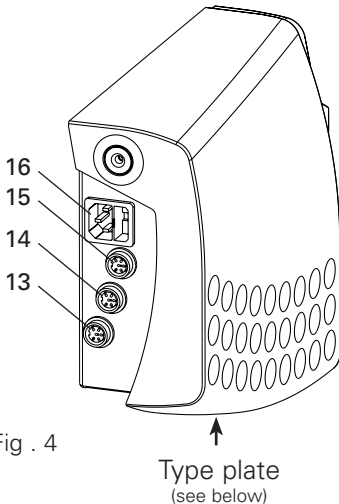


Fig . 4

### Connecting the SL-AP data cable (Zubler suction only!)

Connect socket 14 with the data socket of your Zubler suction unit (align to notch and secure by turning). The data connection enables a disturbance free working.

If using the data cable SL-AP the power cord **20** must not be plugged into the power socket of the suction unit.

### Connecting the power cable

- Compare the voltage specification on the type plate with the mains voltage.
- If they match, plug the power cable into socket **16**.
- Then plug the power plug into the main power socket.

<b>ZUBLER Gerätebau GmbH</b>		
Buchbrunnweg 26 D-89081 Ulm Tel. +49(0)731 1452-0 / www.zubler.de		
<b>VARIOstar K50</b>		
Drehzahl	50.000/min	
Spannung AC	230V	
Leistung max.	270W	
F: T2A		
K50 /	00-11111-22	

## 0.5 Scope of delivery: Tabletop controller VARIOstar T50

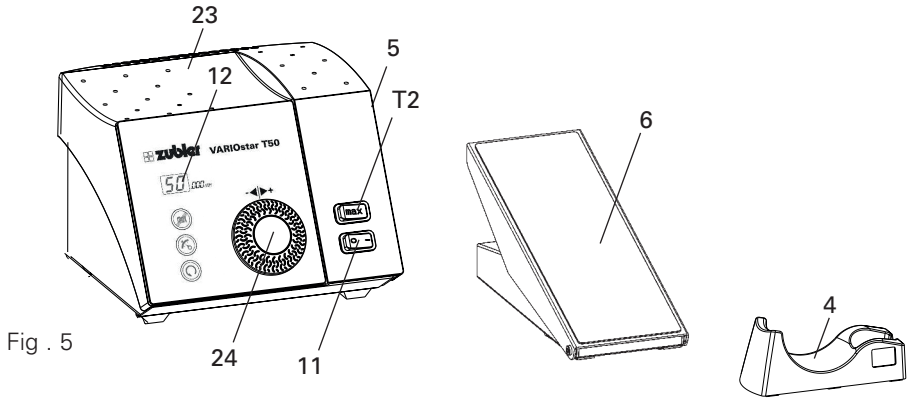
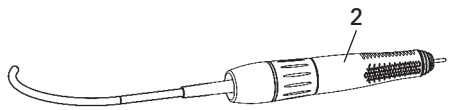
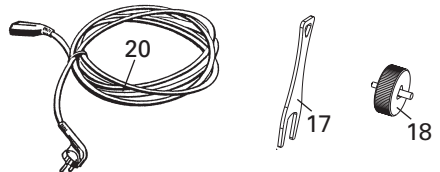


Fig. 5



- 2 Handpiece
- 4 Handpiece stand
- 5 Tabletop controller T50
- 6 VARIO foot pedal
- 11 On/Off switch
- 12 Digital speed display
- 13 Socket for handpiece
- 14 Socket for data cable
- 16 Power cord connector
- 26 Socket for VARIO foot pedal
- 20 Power cord
- 23 Tool tray
- 24 Speed knob





## Installing the VARIOstar T50 desktop controller

### Connecting the handpiece

Connect the VARIOstar handpiece **2** to socket **13** (align to notch and secure by turning).

### Connecting the knee-/foot-pedal

Connect the VARIOstar Foot Pedal **6** to socket **26** (align to notch and secure by turning).

### Connecting the SL-AP data cable (Zubler suction only!)

Connect socket 14 control unit with the data socket of your Zubler suction unit (align to notch and secure by turning). The data connection enables a disturbance free working.

If using the data cable SL-AP the power cord **20** must not be plugged into the power socket of the suction unit.

### Connecting the power cable

After comparing the Power Supply data with the Voltage requirement data on the type plate, plug the Power Cord **20** into Power Cord Connection **16**, then into the Power Supply or Wall Outlet.

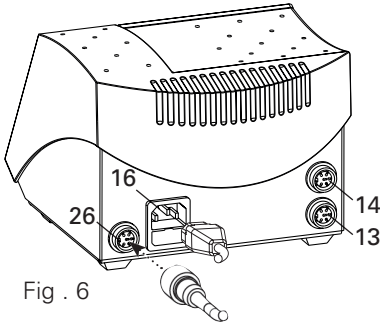


Fig . 6

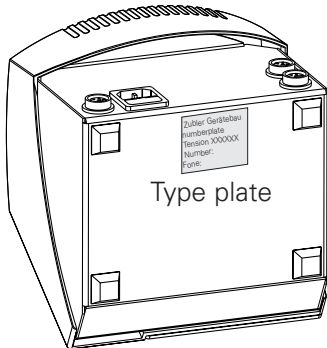


Fig . 7

## ZUBLER Gerätebau GmbH

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### VARIOstar T50

Drehzahl 50.000/min  
Spannung AC 230V  
Leistung max. 270W  
F: T2A  
K50 / 00-11111-22



Made in  
Geramay

# 1. ■ Operation

## 1.1 Operating the VARIOstar K50 knee controller

Turn the controller ON (I) using the mains switch **11**.

The speed display **12** indicates the pre-selected speed. You can change the speed with pushbutton **T4** (+) or **T3** (-).

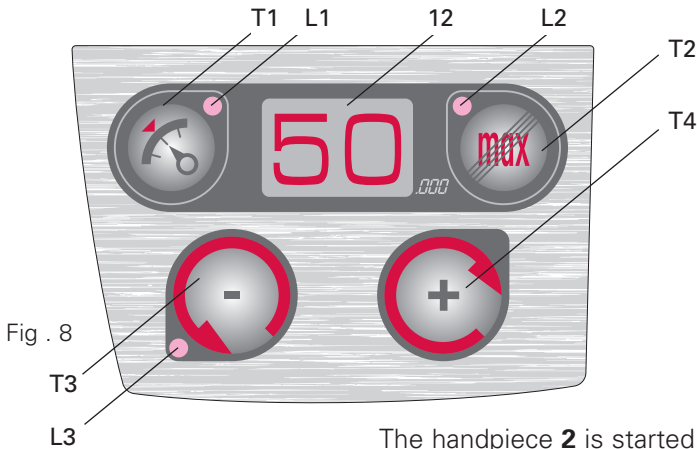


Fig. 8

The handpiece **2** is started by pressing the knee plate **19**. Due to the wide range of movement you can control the speed with ease.

12	Digital speed display
L1	LED Automatic Speed Control
L2	LED safety switch
L3	LED anticlockwise rotation
T1	Automatic speed control
T2	Safety switch
T3	- pushbutton / counterclockwise rotation
T4	+ pushbutton / clockwise rotation

### Cruise control

The cruise control is enabled by pressing pushbutton **T1**, LED **L1** lights up.

Pressing and holding the knee plate **19** for 3 sec. on the desired speed will activate the cruise control and the handpiece is running even without pressing the knee plate **19**.

To stop the handpiece, press the knee plate **19** again or press pushbutton **T1** to disable the cruise control, LED **L1** is no longer lit.

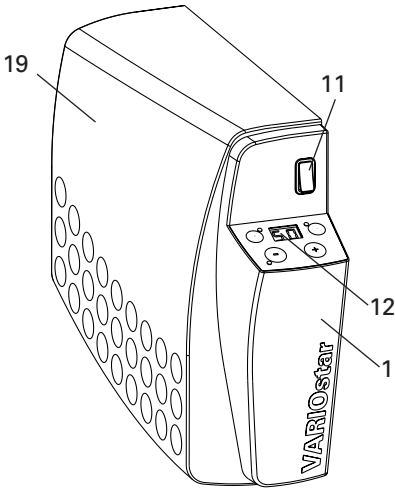


Fig. 9

### Speed limit

The VARIOstar K50 is equipped with an adjustable speed limiter to limit the maximum speed (e.g. 10k rpm for cutting disc).

Press pushbutton **T2** to deactivate the speed limiter, LED **L2** lights up.

Press pushbutton **T2** again to activate the speed limiter, LED **L2** is no longer lit.

The speed limiter is factory set to 40k rpm.

### Changing the speed limit

Press and hold pushbutton **T2** until LED **L2** starts flashing. Adjust the maximum speed with pushbutton **T4** (+) or **T3** (-). (max. 40k rpm).

To save the setting press pushbutton **T2** again, LED **L2** no longer flashes.

### Changing the direction of rotation

#### Changing to CCW:

Switch ON (I) the control unit with the mains switch **11**, while pressing and holding pushbutton **T3**, LED **L3** lights up.

#### Changing to CW:

Switch ON (I) the control unit with the mains switch **11**, while pressing and holding pushbutton **T4**, LED **L3** is no longer lit.

The rotational direction is factory set to CW.



Caution: Observe the tool manufacturers specified speeds.

## 1.2 Operating the VARIOstar T50 tabletop controller

Turn the controller ON (I) using the mains switch **11**.

The speed display **12** indicates the pre-selected speed. Use the speed knob **24**, to set the desired maximum speed.

### Manual Start/Stop (without Foot-/Knee-pedal only!)

Press the speed knob **24** to start/stop the handpiece manually.



Fig . 10

### Cruise control (with Foot-/Knee-pedal only!)

The cruise control is enabled by pressing the speed knob **24**, LED **L1** lights up.

Pressing and holding the Foot-/Knee-pedal **6** for 3 sec. on the desired speed will activate the cruise control and the handpiece is kept running.

To stop the handpiece press the Foot-/Knee-pedal **6** again shortly or press the speed knob **24** to disable the cruise control, LED **L1** is no longer lit.

- |    |                                 |
|----|---------------------------------|
| 11 | On/Off switch                   |
| 12 | Digital speed display           |
| 24 | Speed knob/<br>Direction switch |
| T2 | "maximum" Button                |
| L1 | LED                             |
| L2 | LED "max"                       |
| L3 | LED left                        |

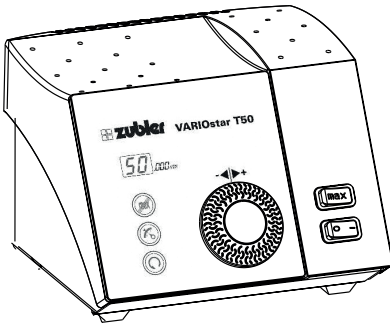


Fig . 11

### Speed limit

The VARIOstar T50 is equipped with an adjustable speed limiter to limit the maximum speed (e.g. 10k rpm for cutting disc).

Press pushbutton **T2** to deactivate the speed limiter, LED **L2** lights up.

Press pushbutton **T2** again to activate the speed limiter, LED **L2** is no longer lit.

The speed limiter is factory set to 40k rpm.

### Changing the speed limit

Press and hold pushbutton **T2** until LED **L2** starts flashing. Adjust the maximum speed with speed knob **24**. (max. 40k rpm).

Press pushbutton **T2** to save the setting, LED **L2** stops flashing.

### Changing the direction of rotation

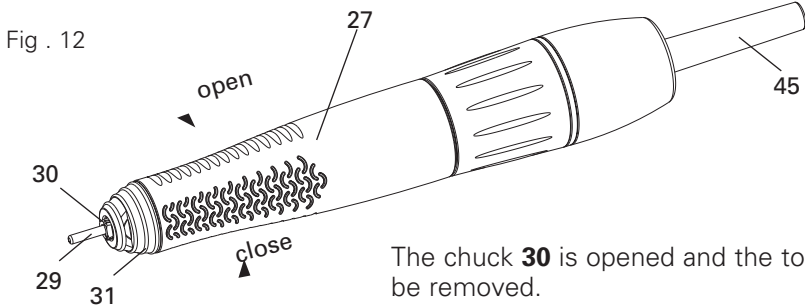
The rotational direction can be toggled by switching ON (I) the control unit with the mains switch **11**, while pressing and holding the speed knob **24**. Once the direction is set to CCW, LED **L3** lights up.

The rotational direction is factory set to CW.

### 1.3 Operating the handpiece

#### Tool change:

The chuck on the handpiece is opened or closed by turning the grip **27**.



- |    |             |
|----|-------------|
| 27 | Grip        |
| 28 | Cap         |
| 29 | Pin         |
| 30 | Chuck       |
| 31 | Tip         |
| 45 | Motor cable |

The chuck **30** is opened and the tool can be removed.

After inserting the tools the chuck **30** is closed again by turning the grip **27** in the opposite direction.

An optional 3.00 mm chuck can be used (see 2.1)



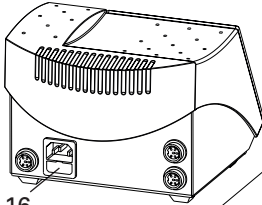
Only change the tool with the motor turned off!

Check before using the handpiece that the tool is seated firmly and cannot be pulled out.

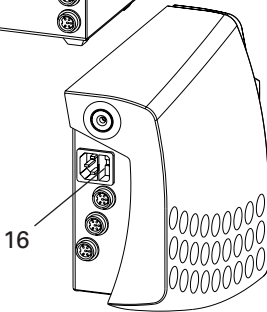
In order to avoid deformation of the chuck, a tool or the pin provided must always be inserted in the chuck.

# 2. ■ Maintenance

## 2.1 Changing the main fuse



16  
Fig. 13



16  
Fig. 14

The fuse is located in the fuse drawer in the power input connector **16**. Open the drawer and replace the fuse. The fuse value is marked on the type plate.

Reasons for a blown fuse: short-circuit in the device or overvoltage.

Return the device to your distributor for evaluation if the cause is unclear.

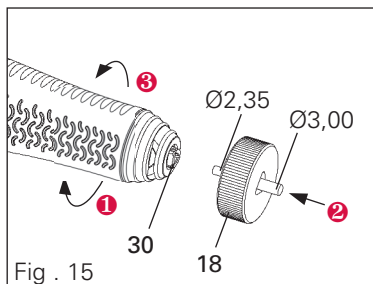
## 2.2 Malfunctions

If the handpiece is overloaded or blocked, the device switches off for safety reasons. Switch the device off and on again. The device is ready for use again immediately.

Zubler accepts no warranty claims if the Micromotor VARIOstar K50/T50 is not operated in accordance with the operation manual.

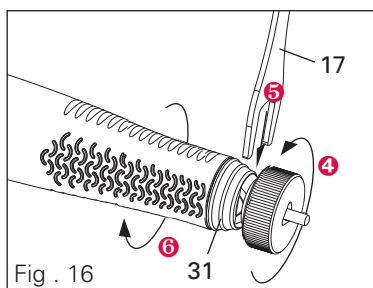
Repair and maintenance work on the electrical part of the device may only be carried out by technical personnel or by persons trained in the factory who have been instructed about the safety regulations. For maintenance work, disconnect the power cord or isolate the device from the power supply so there is no electrical current.

## 2.3 Cleaning or replacement of the chuck

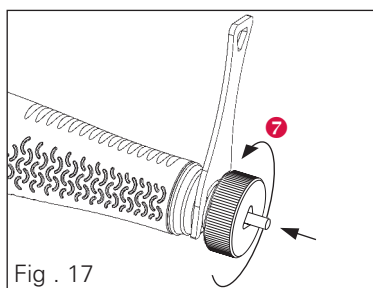


### 2.3.1 Removing the chuck

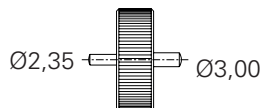
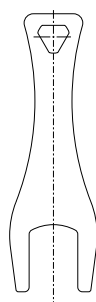
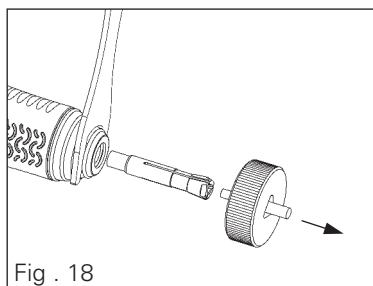
- 1 Open the chuck **30** and remove the tool.
- 2 Push the chuck tool **18** onto the chuck **30**.
- 3 Fix the chuck **30**.



- 4 Turn the chuck **30** with the help of the chuck tool **18** until the flanks of the spindle are visible at the tip 01 and the flat spanner **17** can be inserted.
- 5 Insert the flat spanner **17** and hold it tight.
- 6 Open the chuck **30**.



- 7 Turn the chuck tool **18** counter-clockwise to loosen and unscrew the chuck **30**.



Screw in the chuck **30** in the clockwise direction up to the end stop and lightly tighten it.



### 2.3.2 Cleaning the chuck

Remove accumulated dirt if possible using a suitable twist drill (max. 2 mm). Then clean in an ultrasonic bath, repeating if necessary. Dry the chuck well with compressed air!

Also clean the cone before inserting. To do this, dip one end of a Q-Tip in cleaning agent (Vaseline). Ensure that the handpiece opening is held vertically downwards in order to prevent liquid getting into the ball bearing. Clean the cone with rotary movements. Subsequently, dry the cone using the dry end of the Q-Tip.

Do not blow out with air! Lightly grease the chuck all round on the cone and on the thread side and insert in the shaft.

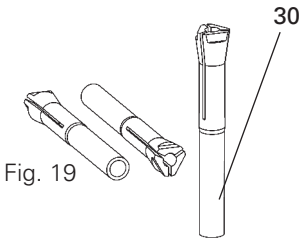


Fig. 19

Do not clean handpieces with compressed air!

The digital display in the handpiece stand, which is available as an accessory, can be connected to the knee controller via socket **15**.

The VARIOstar K50 knee controller also includes a data interface/switching signals for controlling an extraction system. To use this function, connect your extraction system to the K50 knee controller via socket **14**.

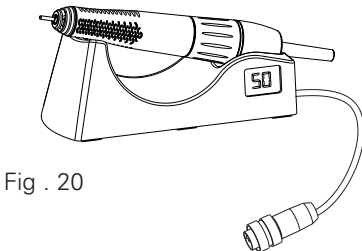


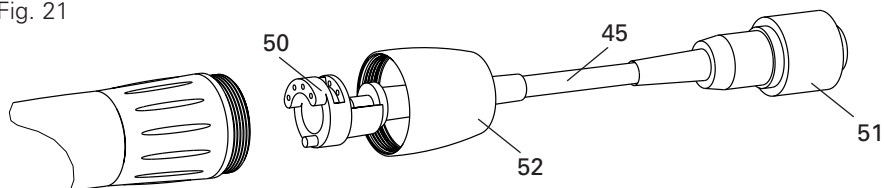
Fig. 20

## 2.4 Replacing the Motor Cable

Unscrew the cap **52** from the motor and release the cable by pulling off the handpiece connector **50**.

Plug in a new motor cable **45** and secure it with the cap **52**. Use only an original motor cable with a new cap **52**.

Fig. 21



45	Motor Cable
50	Handpiece Connector
51	Motor Cable Connector
52	Cap

## 2.5 Spindle change is simple

The instructions for changing the spindle (OrderN° 896-1003) are attached to the replacement spindle.

## 2.6 Troubleshooting

Malfunction	Cause	Remedial action
Handpiece does not start.	<p>Check whether the controller is switched on and the motor speed display is lit.</p> <p>Check whether the chuck of the handpiece is closed (check that the tool is firmly seated)</p> <p>Check whether the handpiece is plugged into the controller.</p> <p>Check whether the foot pedal is plugged into the controller.</p>	<p>Unplug the mains cable 20 and plug it in again; switch on the mains switch 110, see 1.2.</p> <p>Open and close the chuck mechanism.</p> <p>Plug in and secure the handpiece cable (see 0.4 &amp; 0.6). Plug in and secure the foot pedal (see 0.6)</p>
The speed display on the controller does not show any display	<p>Check whether the controller is switched on (On/Off switch 11)</p> <p>Check whether the controller is connected to the mains supply.</p> <p>Check whether the fuse in the controller (mains cable connector) has blown.</p>	<p>Unplug the power cable and plug it in again. Switch on the On/Off switch 11.</p> <p>Replace the fuse (see 2.4)</p>
The speed of the handpiece does not increase	<p>The maximum speed of the handpiece must be set with the speed knob (T50).</p> <p>The maximum speed of the handpiece must be set with the safety switch T2 (K50)</p>	<p>Adjust the setting with the speed knob 24.</p> <p>Adjust the safety switch T2 (see 1.1)</p>
<p>Otherwise contact your distributor.</p>		

# 3. Data

## 3.1 Technical Data:

<b>Dimensions:</b>	<b>VARIOstar K50</b>	<b>VARIOstar T50</b>
Control unit		
Width	95mm	180mm
Height	250mm	140mm
Depth	310mm	200mm
Weight	5,6kg	7,1kg
Rated voltage	AC 230V/115V	AC 230V/115V
Rated frequency	50/60 Hz	50/60 Hz
Power consumption (max.)	270W	270W
<b>VARIOstar Handpiece</b>	VARIOstar	
Speed range	1.000- 50.000/min	
Max. Torque	max. 7,8Ncm	
Protection class	I	
Length	162mm	
Diameter	30mm	
Weight	235g	

## 3.2 Scope of delivery **VARIOstar K50**:

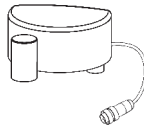
<b>Knee control unit VARIOstar K50</b> 230V	804-3012
<b>Knee control unit VARIOstar K50</b> 115V	804-3011
Table mount	896-1022
Fixing knob	896-1023
Assembly diagram	896-1024
Power cord	896-1020
Operation Manual	

### 3.3 Scope of delivery **VARIOstar T50**:

<b>Tabletop control unit VARIOstar T50</b> 230V	804-3052
<b>Tabletop control unit VARIOstar T50</b> 115V	804-3051
<b>VARIO</b> Foot Pedal, standard	804-1016
<b>VARIO</b> Rotary Foot Lever	804-1015
<b>VARIO</b> Knee Pedal (can be mounted left or right)	804-1017
Power cord	896-1020
Operation Manual	



804-1016



804-1015

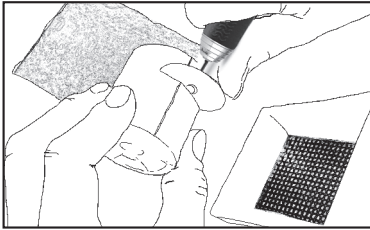


804-1017

### 3.4 Product overview **VARIOstar** and spare parts:

Handpiece <b>VARIOstar</b> with Chuck Ø2,35mm only	804-3002
Handpiece <b>VARIOstar</b> with Chuck Ø3,00mm only	804-3005
Handpiece Stand standard	896-1019
Handpiece Stand with digital speed display K50	896-1021
Tip	896-1001
O-ring for tip	896-1002
Spindle, completely assembled	896-1003
Chuck, 2.35 mm	896-1004
Protection pin, 2.35 mm	896-1005
Chuck, 3.00 mm	896-1006
Protection, pin 3.00 mm	896-1007
Ring, red	896-1015
Motor cable	896-1016
Flat spanner, tool 1	896-1017
Chuck holder, tool 2	896-1018

## 4. ■ Safety notes



Even if you barely remove any material and cannot see dust particles, milling and grinding generates fine dust that is suspended in the air throughout the entire room. The distance between your face and the grinding position is so small that you inhale high concentrations of this dust, even if you consider the grinding amount to be insignificant. The fine components of the dust in particular penetrate deeply into the lungs with ease. Alveolar dust particles with a size of less than 5 µm can settle in the lungs and lead to permanent asthmatic suffering and serious lung diseases.

Remember, it's your job. You are exposed to this contamination every day!

### **Dust in dental technology – a great danger!**

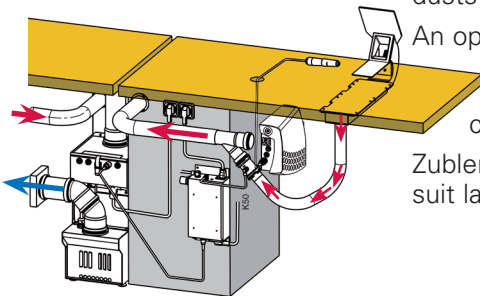
Dental technicians are especially endangered. According to statistics held by the employer's liability insurance association, occupationally-related skin and lung diseases are considerably higher here than the average in the industries united in the employer's liability insurance association for fine mechanics and electrical engineering.

Fine dust in the air is particularly dangerous. Damaging effects on the skin and the respiratory organs have also been found with dental gypsum, embedding compounds and unclassified mixed dusts that are assigned to the general dust limit values.

The Ordinance on Hazardous Substances principally prescribes the extraction of dusts as a legal requirement.

An optimization of the intake systems and the use of modern dust collectors can decrease the dust concentration many times over.

Zubler offers a dust collection solution to suit laboratories of all sizes.



## 5. ■ Warranty terms

In accordance with its General Terms and Conditions of Business, Zubler Gerätebau GmbH (Zubler) guarantees the perfect function of the equipment and its freedom from material and manufacturing defects for a period of 12 months from the date of purchase certified by the seller.

We give a lifetime guarantee on armature and winding.

In case of valid complaints, from the armature and winding Zubler provides replacement parts or repairs free of charge.

The warranty does not cover defects and their consequences if they are caused or could have been caused by: natural wear and tear; inappropriate treatment, cleaning or maintenance; disregard of the maintenance, operating or connection instructions; corrosion; contamination; chemical or electrical effects that are unusual or impermissible.

The warranty claim will not be accepted if defects or their consequences are due to interference with or modifications to the product. Warranty claims can only be asserted if they are notified without delay to Zubler in writing. A copy of the invoice or delivery note is to be attached to the notification.

In addition to the guarantee, the purchaser's legal warranty claims apply, wherein the warranty period is 12 months.

### Service



M-VARIOstar 36/2018en  
technische Änderungen vorbehalten!



[www.zubler.de](http://www.zubler.de)

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