

VARIOstar

brushless
Handpiece **K50**
D50



 **zubler**[®]
dental & technik
www.zubler.de

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.
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

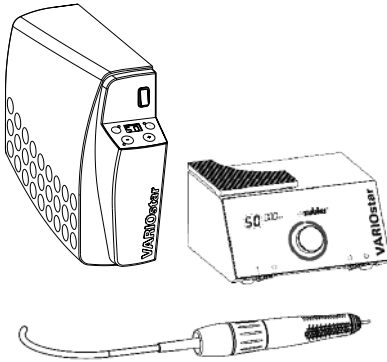


Fig. 1

0.1 Declaration of conformity

Ladies and Gentlemen,

We are delighted that you have chosen the Zubler brushless Micromotor VARIOstar K50/D50 and we hope that you will find it pleasant to work with. The constant further development of our technology is based on co-operation with experienced dental technicians. Our primary aim 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 working, you must read the operation manual carefully.

We, Zubler Gerätebau GmbH
Buchbrunnenweg 26
89081 Ulm Jungingen

hereby declare that the products

VARIOstar K50

VARIOstar D50

conform to the regulations of the following EU directives:

2006/42/EG Maschinenrichtlinie,

2006/95/EG Niederspannungsrichtlinie,

2004/108/EG EMV-Richtlinie,

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

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

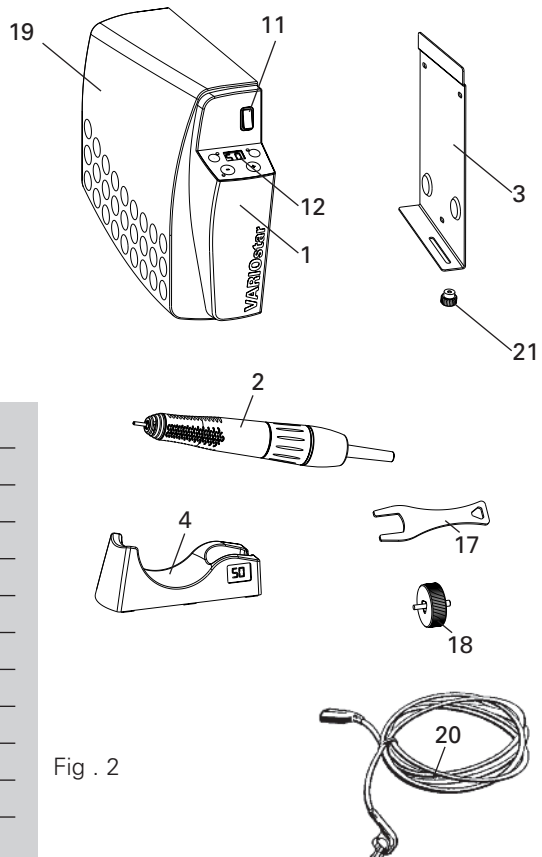
Kurt Zubler
Chief Executive Officer

0.2 General notes



Functional principle: Thanks to its special brushless design, the VARIOstar K50/D50 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



- 1 Knee controller
- 2 Handpiece
- 3 Table mount
- 4 Handpiece stand
- 11 On/Off switch
- 12 Digital speed display
- 17 Flat spanner
- 18 Chuck holder
- 19 Knee plate
- 20 Power cord
- 21 Fixing knob
- 22 Assembly diagram

Fig . 2

0.4 Commissioning the VARIOstar K50 knee controller

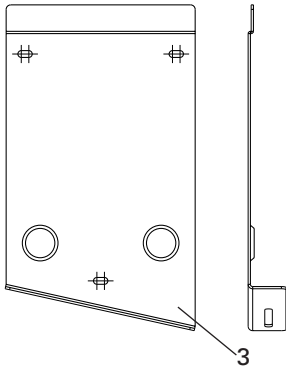


Fig. 3

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 motor handpiece

Close the VARIOstar motor 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**.

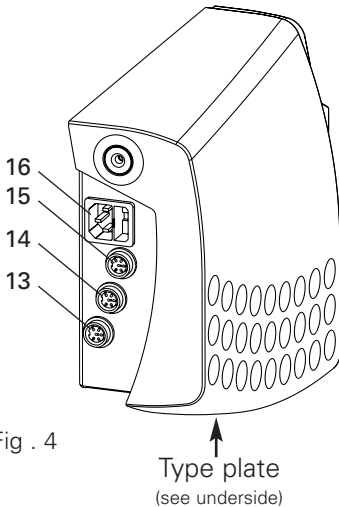


Fig. 4

Connecting the mains cable

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

- 13 Socket for handpiece
- 14 Socket for data cable / automatic switching
- 15 Socket for external display
- 16 Power cord connecting

ZUBLER Gerätebau GmbH

Buchbrunnenweg 26
D-89081 Ulm
Tel. +49(0)731 1452-0 / www.zubler.de



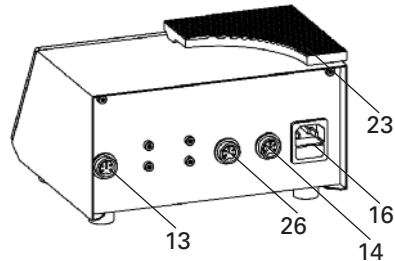
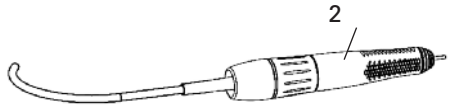
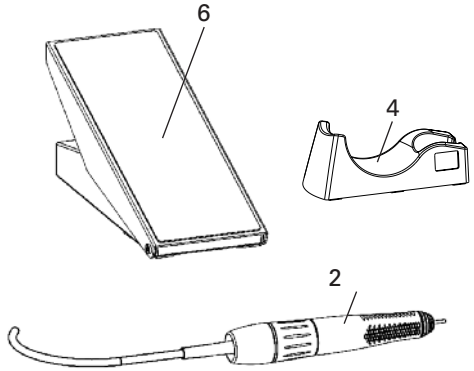
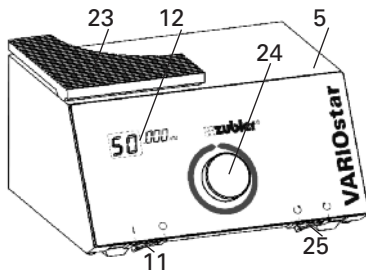
VARIOstar K50

Speed 50.000/min
Voltage xxxV AC
Max. power 270W
Fuse: yyy
K50 / 00-11111-22



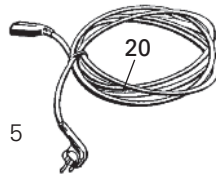
Made in
Germany

0.5 Scope of delivery: Tabletop controller VARIOstar D50



- 2 Handpiece
- 4 Handpiece Stand
- 5 Tabletop Controller D50
- 6 VARIO Foot Pedal
- 11 On/Off Switch
- 12 Digital Speed Display
- 13 Socket for Handpiece
- 14 Socket for Data Cable/
Automatic Switching
- 16 Power Cord Connection
- 20 Power Cord
- 23 Tool Tray
- 24 Speed Knob
- 25 Direction Switch
- 26 Socket for Vario Foot Pedal

Fig . 5



0.6 Commissioning

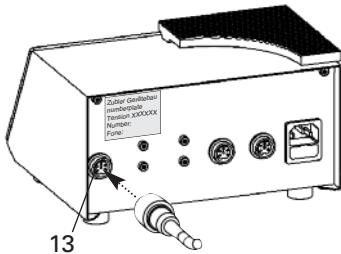


Fig . 6

Connection of the handpiece

Connect the VARIOstar handpiece Motor Cable **16** to socket **13** (align to notch and secure by turning).

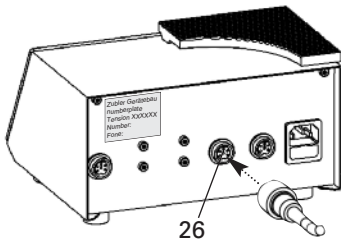


Fig . 7

Connection of the VARIO foot pedal

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

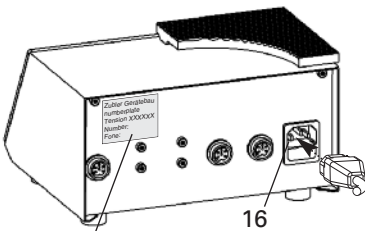


Fig . 8

Connecting the mains 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.

- 13 Socket for Handpiece
- 16 Power Cord Connector
- 26 Socket for VARIO Foot Pedal

ZUBLER Gerätebau GmbH

Buchbrunnenweg 26
D-89081 Ulm
Tel. +49(0)731 1452-0 / www.zubler.de



VARIOstar D50

Speed 50.000/min
Voltage xxxV AC
Max. power 270W
Fuse: yyy
D50 / 00-11111-22



Made in
Germany

1. Operation

1.1 Handling the VARIOstar K50 knee controller

Switch the controller on by the mains switch **11**.

The speed display **12** indicates the pre-selected speed. You can change the speed with the plus pushbutton **T4** or the minus pushbutton **T3**.

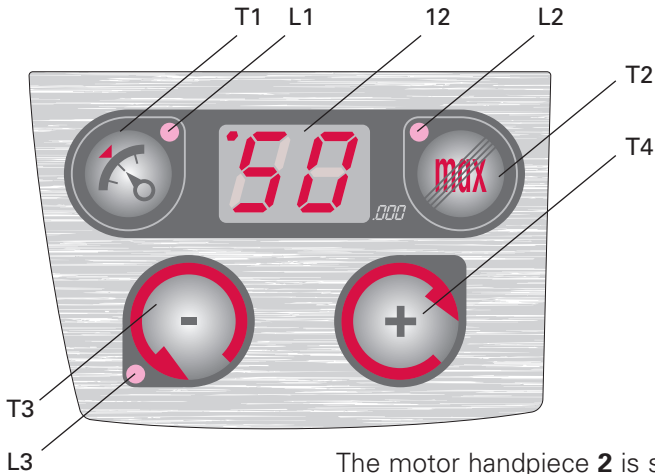


Fig. 9

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

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 / anticlockwise rotation
T4	+ pushbutton / clockwise rotation

Automatic speed control function

The automatic speed control function is activated by pressing pushbutton **T1**. LED **L1** lights up. The motor handpiece **2** starts when the knee plate **19** is pressed and remains at the desired speed.

After 3 seconds without a change, the speed of the motor handpiece **2** remains at the desired speed even without pressing the knee plate **19**. The motor handpiece stops when the knee plate **19** is pressed again, or when the pushbutton **T1** is pressed.

The automatic speed control function is switched off by pressing the pushbutton **T1** again.

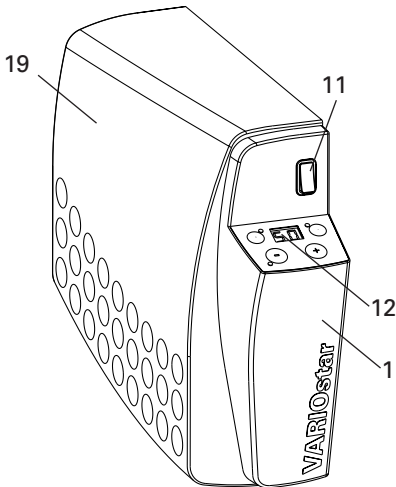


Fig. 10

Safety switch

The safety switch **T2** is a protective function for programming a maximum speed (e.g. 10,000 rpm for abrasive wheels at the AV station).

Press the pushbutton **T2** until LED **L2** flashes. You can change the maximum possible speed of the freely selectable speed range with the plus pushbutton **T4** or the minus pushbutton **T3**. (maximum 40,000 rpm).

The adjusted value is fixed as the safety value by pressing the pushbutton **T2** again. LED **L2** no longer flashes.

This value is pre-adjusted in the factory to 40,000 rpm.

Changing the direction of rotation

Switching over to anticlockwise rotation:

Switch the knee controller off the mains switch **11**.

While holding the minus/anticlockwise rotation pushbutton **T3** depressed, switch the knee controller on by the mains switch **11**.

LED **L3** lights up. The K50 knee controller is now set to anticlockwise rotation.

Switching over to clockwise rotation:

Switch the knee controller off by the mains switch **11**.

While holding the plus/clockwise rotation pushbutton **T4** depressed, switch the knee controller on by the mains switch **11**.

The K50 knee controller is now set to clockwise rotation again. LED **L3** is no longer lit.

All individually adjusted functions remain programmed even when the device is switched off.

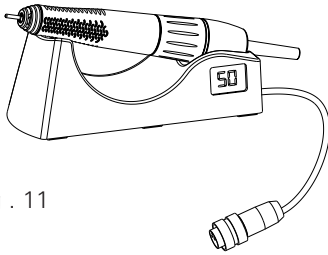


Fig . 11

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**.

1.2 Handling the controller VARIOstar D50

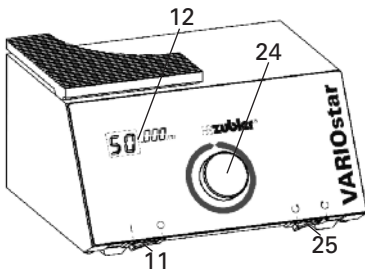


Fig . 12

Turn the controller on using the On/Off switch **11**.

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

Select the desired rotation direction of the handpiece motor using direction switch **25** (forward/backwards)

Depress the VARIO Foot Pedal **6** to start handpiece 102 rotation. Release the Foot Pedal **6** to stop handpiece **2** rotation.

While in usage, the speed can be varied within the preselected speed range by varying the pressure on the foot pedal **6**.

- 11 On/Off switch
- 12 Digital speed display
- 24 Speed knob
- 25 Direction switch



Caution: Observe the tool manufacturers specified speeds.

1.2 Handling the handpiece

Tool change:

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

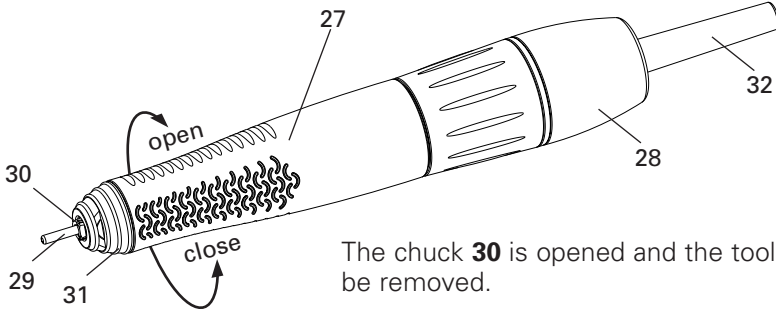


Fig . 13

- | | |
|----|-------------|
| 27 | Grip |
| 28 | Cap |
| 29 | Pin |
| 30 | Chuck |
| 31 | Tip |
| 32 | Motor cable |

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

After inserting the tool 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!

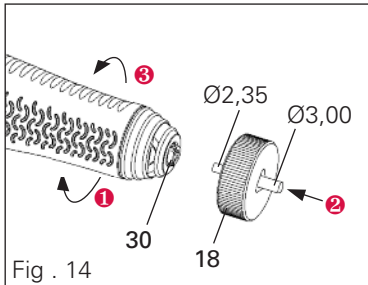
Check before using the handpiece that the tool is seated firmly and cannot be pulled out.

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

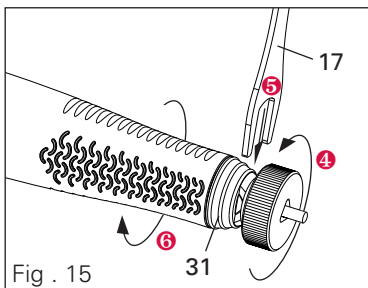
2. Maintenance

2.1 Cleaning or replacement of the chuck

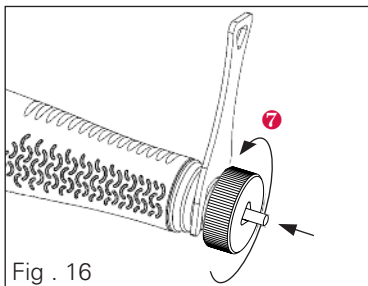
2.1.1 Removing the chuck



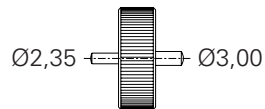
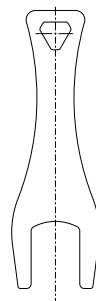
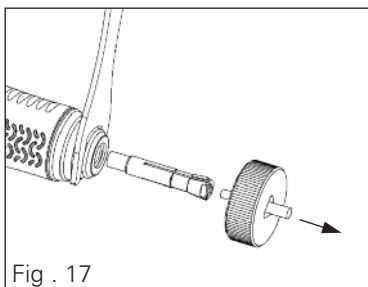
- 1 Open the chuck 04 and remove the tool.
- 2 Push the chuck holder 18 onto the chuck 04.
- 3 Fix the chuck 04.



- 4 Turn the chuck 04 with the help of the chuck holder 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 04.



- 7 Turn the chuck holder 18 counter-clockwise to loosen and unscrew the chuck 04.



Screw in the chuck **04** in the clockwise direction up to the end stop and lightly tighten it.

2.1.2 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 (petroleum ether). 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.

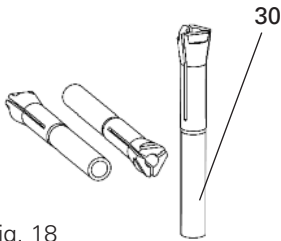


Fig. 18

Do not clean handpieces
with compressed air!



2.2 Replacing the Motor Cable

Unscrew the cap **28** from the motor and release the cable by pulling off the motor cable plug connector **34**.

Plug in a new motor cable **16** and secure it with the cap **28**. Use only an original motor cable with a new cap **28**.

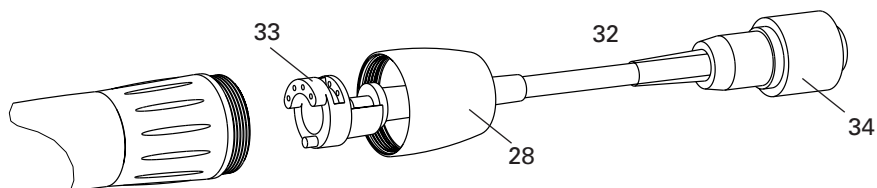


Fig. 19

28	Cap
32	Motor Cable
33	Handpiece Connector
34	Motor Cable Connector

2.3 Spindle change is simple

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

2.4 Changing the fuse in the controller

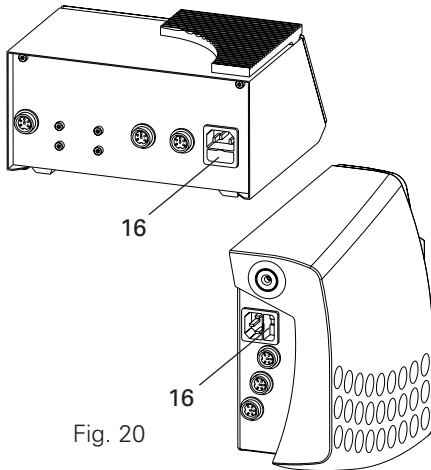


Fig. 20

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.

2.5 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/D50 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.

3. Data

3.1 Technical Data:

Dimensions:	VARIOstar K50	VARIOstar D50
Control unit		
Width	95mm	220mm
Height	250mm	108mm
Depth	310mm	190mm
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
VARIOstar Handpiece	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:

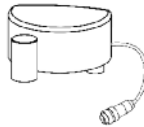
Knee control unit VARIOstar K50 230V	804-3012
Knee control unit VARIOstar K50 115V	804-3011
Table mount	896-1022
Fixing knob	896-1023
Assembly diagram	896-1024
Power cord	896-1020
Operation Manual	

3.3 Scope of delivery VARIOstar D50:

Tabletop control unit VARIOstar D50 230V	804-3022
Tabletop control unit VARIOstar D50 115V	804-3021
VARIO Foot Pedal, standard	804-1016
VARIO Rotary Foot Lever	804-1015
VARIO Knee Pedal (can be mounted left or right)	804-1017
Power cord	896-1020
Operation Manual	



804-1016



804-1015

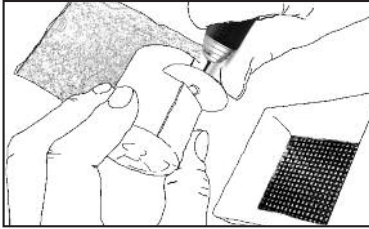


804-1017

3.4 Product overview VARIOstar and spare parts:

Handpiece VARIOstar with Chuck Ø2,35mm only	804-3002
Handpiece VARIOstar 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



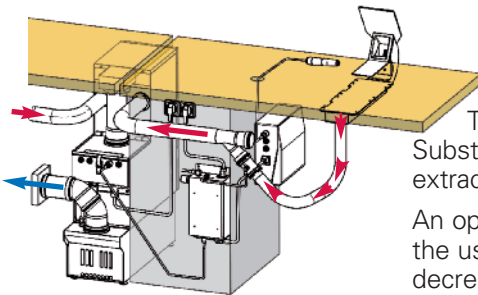
Even if you barely remove any material and cannot see dust particles, milling and grinding generates fine dust that is suspended in the air throughout the entire room. The distance between your face and the grinding position is so small that you inhale high concentrations of this dust, even if you consider 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 $5\ \mu\text{m}$ 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 optimisation 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, 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.

6. Service

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 & 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 (D50).</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>		

Service address

Zubler Gerätebau GmbH
Buchbrunnenweg 26
89081 Ulm-Jungingen
Germany
Telefon: +49(0)731-14520
Fax: +49(0)731-145213
mail: info@zubler.de
www.zubler.de



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Zubler Gerätebau GmbH
Buchbrunnenweg 26
D-89081 Ulm-Jungingen