KaVo LS 3
Instructions for Use

Important Notice
This documentation contains the relevant functions of use. These Instructions for Use include all necessary safety information which the user has to observe for the secure operation of the device.

Description of the device

The KaVo LS 3 is a fast 3D desktop scanner for creating the design of patient specific dental restorations like single and multi-implant replicas, articulated models or models with single and multiple tooth preparations.

Disclaimer of liability

KaVo Dental GmbH strongly discourages any use other than intended. KaVo Dental GmbH shall not accept liability for damages which occur because the user has not used the scanner as intended and/or not observed the safety notes in the Instructions for Use.

Indications for Use

The KaVo LS 3 scanner is intended to be used for optical, three-dimensional measurement of human jaw models. The scanner can be used in orthodontics and prosthetics for all types of reconstructions as well as for archiving. Jaw models in occlusal relation can be scanned in terms of skull position, the same as dental registers (bite registers) and dental models (wax-up) as well as reference bodies (scanbodies) screw-retained in the model.

Contraindications

The KaVo LS 3 is not designed for scanning other models or objects, models made of transparent material or living organisms. The KaVo LS 3 is not suited for operation in an environment which is strongly contaminated with emissions (e.g. dust or varnishes).

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Medical Device

The KaVo LS 3 is no medical device according to German law MPG § 3, Medical Device Directive 93/42/EEC. In US optical impression systems for CAD/CAM are medical devices according to the FDA product classification, class II (product code NOF). By delivery the scanner complies with EU standards and directives:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- Directive 2011/65/EU on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment
- DIN EN ISO 12100:2010
- DIN EN 61326-1:2013
- DIN EN 61010-1:2010.

General safety instructions

Warning

Risk of injury due to electrical shock
Risk of fire due to short circuit
A technical fault of the cables or of an individual component could cause an electric shock or short circuit. This can result in a fire.

- Ensure that electrical equipment does not come into contact with water/moisture. However, should this happen, immediately disconnect the power plug. Dry the parts affected with a soft microfiber cloth.
- Under no circumstances work with faulty equipment or cables.
- Only operate electrical equipment at the recommended operating temperatures.
- Use the supplied cables or original spare parts exclusively.
- If electrical equipment is not used for a longer period, e.g. overnight, switch these off and disconnect the plug of the power socket.

Warning

Health hazards due to magnetic fields
The scanner and the accessories contain magnetic components. Magnetic fields can be hazardous to health.

- Persons with implants, in particular cardiac pacemakers, may only operate the scanner and the accessories with the express permission of a physician.

Warning

Health hazards due to stripe light and/or RGB flash light
The scanner operates with stripe light and RGB flash light. Permanent visual contact with stripe light and/or RGB flash light can trigger epileptic seizures, migraine or similar.

- Persons with the appropriate health disposition should cover the scanner during operation.

Caution

Fall hazard due to packaging materials
The scanner is packaged extensively as protection against damage during transport. Packaging can present an obstacle during setting up and lead to a fall.

- Do not leave packaging materials lying on the floor.
- Remove obstacles before a transport.

Caution

Risk of injury by the mechanics of the scanner
The mechanics of the scanner can crush your hands.

- Only reach into the scanner when all the axes are at a standstill. Should the axes not stop at the end of a scanning run, switch off the scanner and disconnect the power plug.

Caution

Risk of injury due to incorrect carrying
Due to the dimensions and weight, we recommend strong people to unpack and set up the scanner. Smaller persons in particular, can injure themselves by lifting or carrying the scanner on one's own.

- Lift the scanner from the packaging from behind.
- Carry the scanner with two persons.
- For transport, hold the scanner at the bottom corners.

Caution

Injuries due to clothes, jewelry or hair getting caught

Loose clothing, jewelry or long hair can get caught in the mechanics of the scanner. Objects or hair can be entangled through movement in the scanner. This can lead to injuries.

- Do not wear loose clothing such as scarves or ties, or jewelry such as long necklaces at the scanner workstation.
- Tie your long hair in a bun for example.
- However, should an item of clothing, hair, etc. get caught in the moving parts, switch off the scanner immediately. Disconnect the power plug before extracting clothing, jewelry or long hair.

Note

Inaccurate measurements due to neglected calibration or calibration with damaged calibration model

The measuring precision of the scanner is only assured if the scanner is calibrated. For this process you require a calibration model and the corresponding predefined values.

The calibration model can be damaged mechanically. This can only be tolerated in the border areas.

- Perform calibration after commissioning and then during operation every time the software asks you to do so.
- Only start calibration if the values entered in the software correspond with the values of the calibration model.
- Check whether the calibration is damaged at any central position.
- Only use the calibration model in perfect condition.

Note

Measuring error due to unsuitable climatic conditions

The scanner is intended exclusively for use in dry, closed rooms. The scanner will only achieve accurate measuring results under suitable climatic conditions. Excessive heat causes measuring errors as well as overheating of the scanner. Overheating can cause permanent damage to the scanner.

- Only operate the scanner at temperatures between 18°C - 30°C.
- Only operate the scanner at low humidity.
- Avoid direct sunlight at the workstation.
- Reduce cold, heat and high humidity, for example, by using air-conditioning or sun protection.

Handling procedure

Scope of delivery (content)

Item					
	1 scanner	1 standard object holder	1 flexible object holder	1 multiDie adapter	1 calibration model
Ordering no.	0.870.0000	0.870.0400	0.870.0403	0.870.0402	0.870.0401

Item					
	6 Power Cables, plug types: E+F, N, B, G, I, L	1 USB-Cable	1 Ethernet to USB Adapter	1 Ethernet-Cable	2 adhesive putty pads for fixing
Ordering no.	0.870.0406	0.870.0405	0.870.0411	0.870.0404	—

Storing and operating

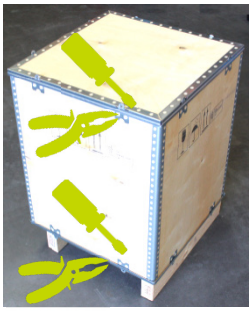
Unpacking

A

577 W, 760 H, 570 D mm

> 37 kg

18°C - 30°C



1. Bend the tabs in vertical position.
2. Lift off both covers.

3. Pull up the frame.
4. Fold the frame.

5. Put the box aside.
6. Remove the protection material.
7. Position yourself behind the device.

B

20 kg

1 Person

8. Reach underneath from both sides if possible. If not, grab the upper edges.
9. Lift and carry to workstation.
10. Remove the accessories from the bottom.

Install and switch on

Requirements:

Power

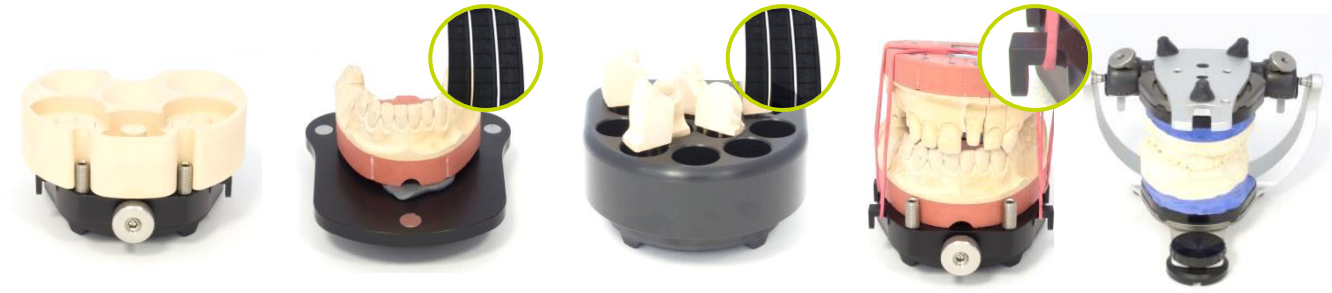
100 - 240 V AC
50/60 Hz, max.
60 W

USB

2.0 / 3.0

- Choose a fitting power cable from the scope of delivery.

Fixing models



1

- Use for single jaw models or calibration model
- Fix by turning screw

2

- Use for single jaw models or calibration model
- Fix with putty

3

- Use for multiDie scan of single tooth models
- Fix with putty

4

- Use for non-articulated occlusional models
- Fix with rubber band

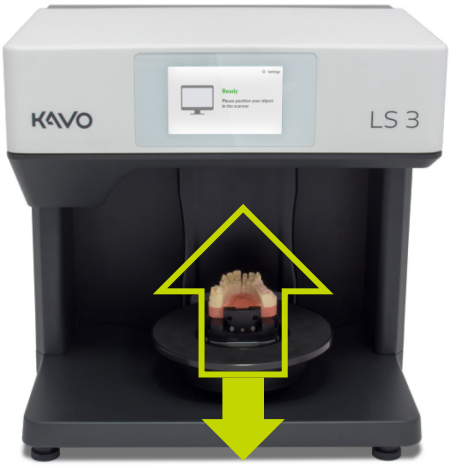
5

- Articulate as usual
- Remove support pin

Creating scan

- Insert fixed models only.
- Place object holder straight on magnetic base plate.
- Use your respective software for scanning the model.

Demount scan model



- Move slightly up and out.

- Wait until software prompts.
- Grasp on both sides.
- Move out straight. Don’t move up!

Technical specifications

Measurement	
Measurement field	80 mm width 60 mm height 85 mm depth
Camera pixel	2.8 MP
Accuracy (ISO 12836)	Up to 4 µm

Measurement time*	
Complete jaw	33 seconds
Single tooth	36 seconds
3-unit bridge	36 seconds

Device			
Dimensions	431 mm width 432 mm height 398 mm depth	Power supply voltage, consumption and fuse	100 – 240 VAC, 50/60 Hz 60 W max., 2 x T 1.6 A L 250 V
Weight	20 Kilogram	Sensor technology	White stripe light triangulation
Axes system	1 rotating axis 1 swiveling axis 1 z-axis, incl. status LED	Color scanning	RGB lighting
Baseplate	KaVo Protar®	Interface	USB & Ethernet

Software

Compatibility	DTX Studio™ design

System requirements minimum:

Windows 7 64-BIT, Quad-core CPU 2.8 GHz, 8 GB RAM.
USB 2.0 Port, Graphics card with 2 GB Video RAM

Recommended:

Windows 10 64-BIT, Quad-core CPU 3.2 GHz, 16 GB RAM,
USB 3.0 Port, Graphics card with 2 GB Video RAM,
5 GB free hard disk space needed, more disk space based on number of cases. Dataset in one case is about 50 MB.

Notes

Please refer to software and device installation manuals for detailed requirements

Ordering

Material. Nr. 0.870.0000

* Scan time only with scan color deactivated, excluding post processing time

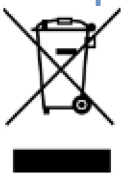
Storage handling

431 W, 432 H, 398 D mm

–5°C - 50°C Storage
18°C - 30°C Operation

The device must be stored and transported in dry conditions in the original packaging at storage temperature and not exposed to direct sunlight. Incorrect storage and transportation may influence device characteristics leading to failure.

Disposal



Disposal of the device shall follow local regulations and environmental requirements, taking different contamination levels into account. The devices marked with this symbol are subject to European Directive 2002/96/EC for WEEE (Waste Electrical and Electronic Equipment). WEEE registration number of smart optics: DE47893210. Electrical equipment does not belong in domestic waste.

USA and Canada

Canada license exemption: Please note that not all products may have been licensed in accordance with Canadian law.

For prescription use only. Caution: Federal (United States) law restricts this device to sale by or on the order of a clinician, medical professional or physician.

Explanation of symbols

Warning: Crushing of hands
To warn of a closing motion of mechanical part of equipment.

Do not touch
To prohibit touching objects/parts of an object.

Warning: Electricity
To warn of electricity.

Protective earth; protective ground
To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.

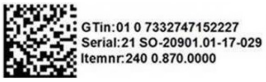
USB
USB connection.

SN : **Serial number**
To identify the manufacturer's serial number, for example on a medical device or its packaging. The serial number shall be placed adjacent to the symbol.

Barcode
Coded consecutive serial number by the hardware manufacturer.

REF : **Catalogue number**
Product reference and item number for ordering by the distributor.

Fuse
To identify fuse boxes or their location.



QR code
Code with severel informations.

GTin is a standardized global item number which identifies the item distinctively. SN and REF are included as well.

CE mark

RoHS **RoHS EU directive**
Restriction of the use of certain hazardous substances in electrical and electronic equipment.

EN 55011 Class A **EM labelling**
Electromagnetic compatibility.

Rx only **For prescription use only**
To show that the use of the device is restricted to healthcare practitioners.

Manufacturer
To identify the manufacturer of a product.

WEEE sign (Waste Electrical and Electronic Equipment)
To symbolize the compliance with the European Directive for the disposal of electrical equipment.

Operator's manual; operating instructions
To identify the location where the operator's manual is stored or to identify information that relates to the operating instructions. To indicate that the operating instructions should be considered when operating the device or control close to where the symbol is placed..

Caution
To indicate that caution is necessary when operating the device or control close to where the symbol is placed, or to indicate that the current situation needs operator awareness or operator action in order to avoid undesirable consequences.

Temperature limit
To indicate the maximum and minimum temperature limits at which the item shall be stored, transported or used.

This way up
To indicate correct upright position of the transport package.

Do not stack
To indicate that the items shall not be vertically stacked, either because of the nature of the transport packaging or because of the nature of the items themselves

Fragile; handle with care
To indicate that the contents of the transport package are fragile and the package shall be handled with care.

Keep away from rain
To indicate that the transport package shall be kept away from rain and in dry conditions.

KAVO
Dental Excellence

Hardware manufacturer
smart optics Sensortechnik GmbH
Lise-Meitner Allee 10 | D-44801 Bochum | Germany | info@smartoptics.de
www.smartoptics.de