



INSTRUCTIONS FOR USE

Monitor Osseointegration



Fig 1



Fig 2



Fig 3

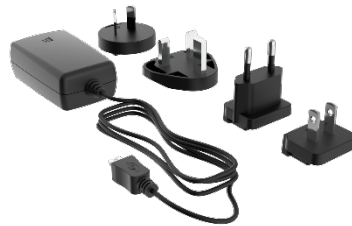


Fig 4

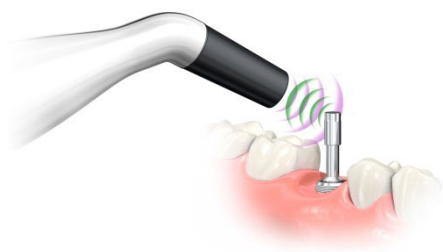


Fig 5



Fig 6

1. Indications for Use





Penguin RFA is indicated for measuring the stability of dental implants in the oral cavity or craniofacial region.

2. Intended users

Professional health care users and professional health care facility environments only. Please read the instruction for use before the first usage.

3. Figures and System components

Fig 1 Penguin RFA Instrument	Included in package
Fig 2 MultiTipeg Driver	Included in package
Fig 3 Example MultiTipeg	Not included, sold separately
Fig 4 Mains adapter and plugs	Included in package
Fig 5 Measurement position	Shows how the instrument tip is held towards the MultiTipeg during a measurement
Fig 6 USB with IFU	Included in package

	Only original parts should be used		Power supply: Use only the supplied mains adapter and plugs		No user modification of this equipment is allowed		Batteries should be collected separately
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4. Specifications

- Power input: 5VDC, 1 VA
- Charger input: 100-240 VAC, 5VA
- Instrument weight: 100g
- Charger safety class: EN 60601-1 Class II
- Instrument safety class: EN 60601-1 ME Class II
- EMC: EN 60601-1-2, class B
- The instrument is intended for continuous use
- The instrument contains NiMH batteries

5. Operating environment




















Ambient temperature: 16° to 40° C (60°-104° F)

Relative humidity: 10% to 80% Rh, non-condensing

6. Transport and storage

Ambient temperature: -20° to 40° C (-4°-104° F). Relative humidity: 10%-85% Rh. Atmospheric pressure: 500 hPa- 1060 hPa (0.5-1.0 atm).

7. Symbols

	Warning		Keep dry
	Follow instructions for use		Temperature limits
	Magnetic field warning		Manufacturer
	Autoclavable up to 134° C		Manufacturing year
	Delivered Non-sterile		CE mark
	Catalogue number		Caution: Federal law restricts this device to sale by or on the order of a physician or dentist.
	Lot/Batch code		Waste from electronic equipment must be handled according to local regulations
	Serial number		Type BF Applied part
	Atmospheric pressure limit		Humidity limit
	Electronic instructions for use		

8. Characteristics

Penguin RFA is an instrument for measuring the stability (ISQ) of dental and craniofacial implants. The instrument measures the resonance frequency of a Multipeg and presents it as an ISQ value. The ISQ value, 1-99, reflects the stability of the implant – the higher the value, the more stable the implant.

The instrument measures the ISQ-value with a precision of +/- 1 ISQ unit. When mounted onto an implant, the Multipeg resonance frequency can vary up to 2 ISQ units depending on the tightening torque.



Warning: Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation.

9. Multipeg

The Multipeg is made from titanium and has an integrated grip for the Multipeg driver on top. Inspect the Multipeg for damage before use. Damaged Multipegs should not be used due to the risk of erroneous measurements.

There are different Multipegs available made to fit different implant systems and types. Please refer to the updated list from the supplier.



Measurements should only be performed using the correct Multipegs. Using the wrong Multipeg could cause erroneous measurements or damages to the Multipeg or implant.



The instrument emits short magnetic pulses with pulse duration of 1 ms and strength of +/- 20 gauss, 10 mm from the instrument tip. Precautions might be necessary when using the instrument close to cardiac pacemakers or other equipment sensitive to magnetic fields.

10. Technical function

For bringing the Multipeg into vibration, short magnetic pulses are sent from the instrument tip. The magnetic pulses interact with the magnet inside the Multipeg and cause the Multipeg to vibrate. A pickup in the instrument picks up the alternating magnetic field from the vibrating magnet, calculates the frequency and from that, the ISQ value.

11. Implant stability

An implant can have different stabilities in different directions. Make sure to measure from different directions around the top of the Multipeg.

12. ISQ-value

The stability of the implant is presented as an “ISQ value”. The higher the value, the more stable the implant. The ISQ is described in numerous clinical studies. A list of studies can be ordered from the supplier.

13. Batteries & charging

The instrument contains 2 NiMH battery cells that must be charged before use. A full charge takes approximately 3 hours at 20°C or 68°F. Warmer room temperature will increase the charging time. From fully charged, the instrument can measure continuously for 60 minutes before it needs to be recharged. The yellow LED is lit when the battery needs recharging. When the battery reaches a critical level, the instrument shuts off automatically. When the batteries are charging, the blue LED is lit. When the charging is ready, the light goes off. The charger should not be plugged in while measuring due to the risk of power line interference making it difficult to measure.

14. Usage

14.1 Instrument on/off

To turn the instrument on, press the operating key. A short beep should be heard and then all display segments are lit up for a short while. Check that all display segments are lit.

The software version is then shown briefly before the instrument starts to measure. If any error code (EX, where “X” is the error number) is shown during start up, please refer to the section “Troubleshooting”.

To turn off, press and hold the operating key until the instrument turns off. The instrument will power down automatically after 30 seconds of inactivity.

14.2 Measurement Penguin RFA

A Multipeg (fig 3) is mounted onto the implant by using the Multipeg driver (fig 2). Use hand-tightening with 6-8 Ncm of tightening torque. Turn on the instrument and hold the tip close to the top of the Multipeg (fig 5). When a signal is received, a beep is heard and then the ISQ-value is shown on the display for a short while before the instrument starts to measure again.

If electromagnetic noise is present, the instrument cannot measure. The electromagnetic noise warning is audible as well as visible on the display. Try to remove the source of the noise. The source could be any electric equipment close to the instrument.

15. Cleaning and maintenance



Before use, the parts should be cleaned and disinfected.

15.1 Recommended disinfectants

The following disinfectants are recommended for the instrument, the MultiTeg and the MultiTeg Driver:

- Schülke & Mayr: MikroZid AF Liquid
- Dürr: FD 322
- Metrex: CaviCide

Follow the instructions for use for the disinfectant that is used.



Do not autoclave the instrument

15.2 Autoclave sterilization (MultiTeg & MultiTeg Driver)

Sterilization should be made in a pre-vacuum steam sterilizer (autoclave) according to ISO 17665-1.

Clean the products and put them in an autoclave

The following sterilization process shall be used:

- At least 3 Minutes at 134 (-1/+4)°C or 273(-1.6/+7.4)°F

Follow the instruction for the autoclave that is used.



Do not clean the MultiTeg by ultrasound. Could cause damage.



The instrument must be used with a cover in all uses. (Only US)
The instrument must be cleaned with a disinfectant between patients.

15.3 Cleaning

• Instrument

The instrument is cleaned with a wet cloth. Any of the above disinfectants can be used. For use in environments requiring sterility, the instrument should be covered with a sterile cover.

• MultiTeg Driver and MultiTegs

The MultiTeg Driver and the MultiTeg should be cleaned with water with or without detergent, using a light brush. Any of the above disinfectant fluids can be used. For use in environments requiring sterility, the MultiTeg Driver and MultiTeg should be autoclaved before use according to the above instructions.

16. Lifetime

The lifetime of the instrument is determined by the number of charging cycles. The internal batteries can be fully charged more than 500 times before they need to be replaced. The instrument should not be left uncharged for more than 1 year.

The MultiTeg Driver is guaranteed for at least 100 autoclave cycles, and a MultiTeg is guaranteed for at least 20 autoclave cycles, before they are degraded in any way.

17. Troubleshooting

17.1 Possible errors

• Difficult to achieve a measurement:

In some cases it is more difficult for the instrument to bring the MultiTeg into vibration. If so, try to hold the instrument tip closer to the tip of the MultiTeg. Check also that no soft tissue is touching the MultiTeg which might stop its vibration.

• Noise warning (audible and visible on the display):

An electric device close to the instrument is causing the warning. Try to remove the source.

• The instrument suddenly turns off:

The instrument turns off automatically after 30 seconds of inactivity. It also turns off if the battery level is too low, and due to any of the error codes described below.

• Not all segments are lit up when instrument is started:

The instrument is damaged and has to be sent for repair or exchange.

17.2 Error codes

If malfunctioning, these error codes are shown on the display before it turns off:

E1: Hardware error. Malfunctioning electronics

E2: Noise error. Shown if constant electromagnetic noise is present

E3: Pulse power error. Malfunctioning magnetic pulse generation



Use of accessories other than those specified or provided by the manufacturer of this equipment could result in increased emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

18. Accessories & Spare Parts

Model	Multipeg Driver	Sterile Cover	Mains adapter Model No. UE05WCP-052080SPC	EU plug	UK plug	AU plug	US plug
REF	55003	55105	55093	55094	55095	55096	55097

Multipeg: Please refer to the updated list from the supplier.

19. Repair

In case of a malfunctioning instrument, contact the manufacturer or distributor. Penguin RFA is covered by a two-year warranty.

20. EMC Information

The instrument fulfils the requirements according to EN 60601-1-2 regarding emission and immunity. If sensitive electronic equipment is affected by the instrument, try to increase the distance to such equipment. The charger should not be connected during measurements.

Guidance and manufacturer's declaration - Electromagnetic Emissions.		
Penguin RFA is intended for use in the electromagnetic environment specified below.		
Emissions tests	Compliance	Electromagnetic environment - guidance
RF emissions C1SPR11	Group 1	Penguin RFA uses RF energy only for its internal function.
RF emissions C1SPR11	Class B	Penguin RFA Rechargeable battery operated device
Harmonic emissions IEC61000-3-2	Not applicable	
Voltage fluctuations/flicker emissions IEC61000-3-3	Not applicable	

Guidance and manufacturer's declaration - Electromagnetic Immunity Test Levels		
Penguin RFA is intended for use in the electromagnetic environment specified below.		
Immunity test	EMC standard or test method	Professional healthcare facility environment
Electrostatic discharge (ESD)	IEC61000-4-2	± 8kV contact ± 2 kV ± 4 kV ± 8 kV ± 15 kV air
Radiated RF EM fields	IEC61000-4-3	3 V/m 80 MHz - 2.7 GHz 80 % AM at 1 kHz
Proximity fields from RF wireless communications equipment	IEC61000-4-3	30 cm minimum separation distance from radio transmitter
Rated power frequency magnetic fields	IEC61000-4-8	30 A/m 50 Hz or 60 Hz
Electrical fast transient/burst	IEC 61000-4-4	± 2kV 100 kHz repetition frequency
Surges Line-to-line, Surges Line-to-ground	IEC 61000-4-5	± 0.5, ± 1 kV, ± 2 kV
Conducted disturbances induced by RF fields	IEC61000-4-6	3V 0,15 MHz – 80 MHz 6 V in ISM bands between 0,15 MHz and 80 MHz 80 % AM at 1 kHz
Voltage dips, Voltage interruptions and Electrical transient condition along supply lines	IEC 61000-4-11	5% UT, 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0 % UT; 1 cycle And 70 % UT; 25/30 cycles (50/60Hz) Single phase: at 0° 0 % UT; 250/300 cycle (50/60 Hz)

