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PIEZON® 707 BIK
PIEZON® 707 BIK LED

INSTALLATION MANUAL FOR A-DEC 500 AND 300 DELIVERY SYSTEMS WITH DELUXE TOUCHPAD



℞ ONLY Caution! Federal (USA) law restricts this device to sale by or on the order of a dentist.

Hu-Friedy EMS ELECTRO MEDICAL SYSTEMS

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About this manual

This manual will assist you in installing the PIEZON® 707 BIK and PIEZON® 707 BIK LED built-in scaler. Please read this manual carefully before installing the device and follow the instructions. Always keep this document close at hand.

The difference between PIEZON® 707 BIK and PIEZON® 707 BIK LED is that the handpiece of the PIEZON® 707 BIK LED has integrate light (LED) while the handpiece of the PIEZON® 707 BIK has no integrated light. For simplification purposes and unless specified differently, this manual will use the name PIEZON® 707 BIK to cover both versions. The short BIK stands for Built-In Kit.

To prevent injury to people and damage to property, please follow the corresponding directives. They are marked as follows:

Danger
Risk of patient or user injury

Caution
Risk of damage to the device or environmental harm

Please note
Useful additional information and hints

Prohibited

Authorized

Please observe the safety notes to prevent injury to persons or material damages.

We would be happy to assist you for any question you may have. Do not hesitate to contact your local Hu-Friedy & EMS dealer for further information.

Hu-Friedy & EMS reserve the right to carry out changes to technology, accessories and the installation manual, as well as the content of the original packaging in the course of technical development without prior notice.

Important information

PIEZON® 707 BIK is based on an ultrasonic module (EJ-120) that drives the dental handpiece which applies a linear oscillation to the instrument.

The EJ-120 ultrasonic module has an automatic power regulation feature (dynamic response) that increases the ultrasonic output power to the set-point only when a mechanical resistance is applied at the end of the instrument, corresponding to the presence of calculus. As long as there is no resistance force or in other words no calculus at the end of the instrument, the generated ultrasonic power remains low.

The EJ-120 ultrasonic module is compliant with the standards for electromagnetic conformity IEC 60601-1-2:2007 and electrical security IEC 60601-1 including the deviations for United States and Canada (CB-Certificates IEC 60601-1:2005, ANSI/AAMI ES 60601-1:2005, CAN/CSA C22.2 NO.60601-1: 2008).

Use of an EN 60601-1 conform power supply as well as the use of Hu-Friedy & EMS approved handpieces and cords are required to retain the conformity with this standard.

Safety notes

The PIEZON® 707 BIK has been tested on an A-dec 500 unit and complies with the General Requirements for Basic Safety and Essential Performance (IEC 60601-1 3rd ed.) as well as Electromagnetic Compatibility (IEC 60601-1-2) for Medical Electrical Equipment.

The PIEZON® 707 BIK must be installed in the dental unit by qualified staff who have been authorized by the unit manufacturer.
Hu-Friedy & EMS accept no liability for direct or consequential injury or damage resulting from improper installation or use arising in particular through non-observance of Hu-Friedy & EMS instructions or improper preparation and maintenance.

The system assembler must provide an instruction for use that is specific to the treatment unit allowing to properly and safely control the product, especially regarding the power and the water level regulation. The usability of the selected function and set values must be guaranteed by the system assembler.

The power supply of the dental unit must comply with the following requirements:
- Double insulation for the highest expected supply voltage must be provided between primary and secondary power circuits
- The compliance with leakage currents of the applied part must be guaranteed by the system assembler
- Double insulation for the highest expected secondary voltage must be provided between the secondary voltage and ground (PE)
- The system has to ensure a galvanic separation between all secondary voltages including light supplies
- The secondary circuits must be protected against shorts and overloading

Risk of explosion: Do not use this product in the presence of anesthetics or inflammable gas.

This product must always be connected to the water supply of the treatment unit. The control of the water circuit is under responsibility of the system assembler.

The system assembler is responsible to provide the Operation instructions for Piezon Systems (FB-536/HS) included with this product to the user.

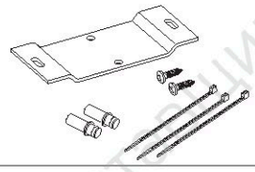
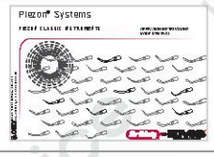
The use of components other than those listed under Product Components may negatively affect EMC performance.

This product must exclusively be repaired by an approved Hu-Friedy & EMS repair center.

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Product component

The A-dec specific PIEZON® 707 BIK and PIEZON® 707 LED references are composed of the following component

Reference	Description	Picture
EJ-120A/B	Ultrasonic module	
EK-408	Wire harness including adapter with resistance	
EL-463	Set of screws and washers	
EL-459	Mounting accessories : 1 x mounting bracket (AL-055) 3 x cable ties 2 x self taping screws 2 x A-dec control block plugs	
EM-149A/A EM-149/B/A	Handpiece cord (length = 1.60m) Handpiece cord (length = 2.06m)	
FS-343HF	Perio Basic System inside SteriBox • Instrument A with CombiTorque • Instrument P with CombiTorque • Instrument PS with CombiTorque	
EN-060HF	Original PIEZON® LED Handpiece (for PIEZON® 707 BIK LED only)	
EN-061HF	Original PIEZON® Handpiece (for PIEZON® 707 BIK only)	
FB-536/HS	Operation instruction for PIEZON® Instruments & Systems for the user	
FB-606/HF	Installation manual for PIEZON® 707 BIK built-in kit for the integrator	

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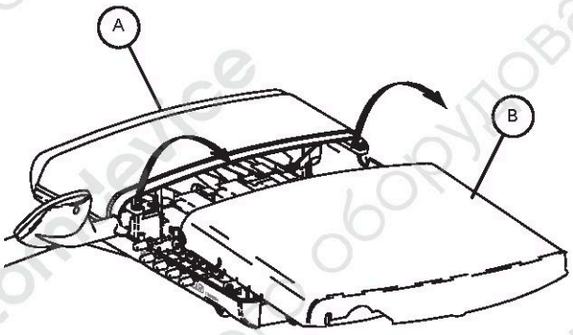
Installation instruction

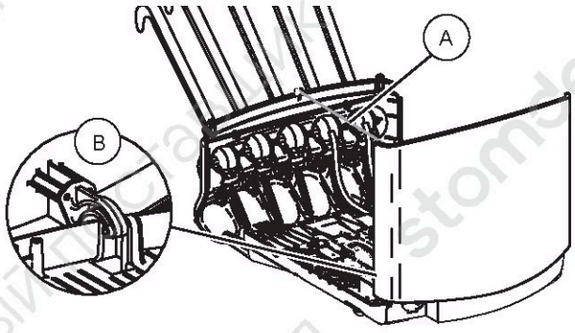
Control head cover removall

Remove the control head cover to install the PIEZON 707 BIK

Tools needed

Wire cutter
Needle nose pliers
Philips screwdriver
Routing cable
Wire stripper
Hex key set (US size)





Traditional control head:

- Lift up the rear of the large cover «B» until it pops free.
- Lift up the front of the large cover and swing it open.

Removal of the small cover “A” is not necessary.

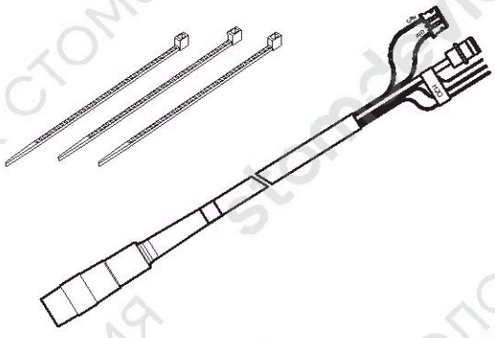
Continental control head

- Remove the screws from the front cover and swing it open.
- The large control head cover can be completely removed by pinching the hinge brackets «B».

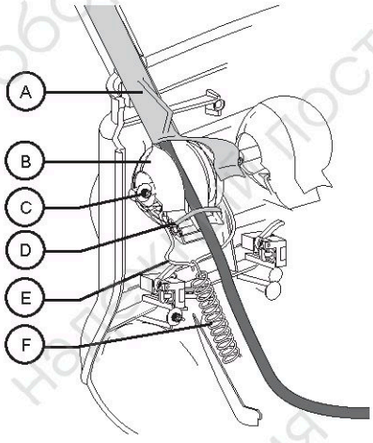
On continental control heads, be sure the lanyard “A” is connected to the front cover to prevent excessive strain on the cover hinges.

For the mounting of the module, a set of screws is supplied with the product.

Handpiece cord installation



Installing handpiece cord in the Continental or in the Traditional control head is similar once it is routed inside the control head.



A - whip
B - whip pivot
C - screws
D - cable tie
E - bail
F - spring

Continental control head

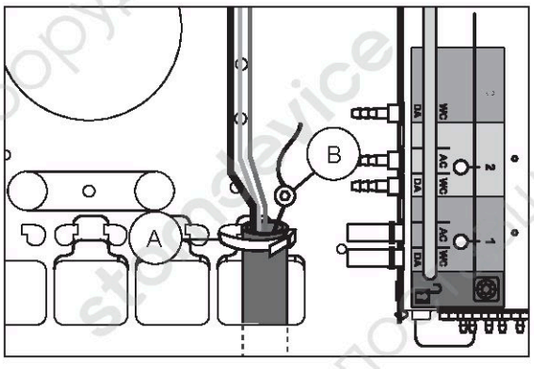
Routing the handpiece cord in the whip assembly:

- Insert the handpiece cord into the whip and route it towards the control head, through the pivot.
- Cable tie the tubing at the base of the whip pivot.

Watch for kinks in the tubing.



Tubing guide and knock out position(s) underneath the traditional control head.



Secure the handpiece cord to the structural platform with a cable tie.

A – cable tie

B – strain relief string

Traditional control head

- Remove the tubing guide from the underside of the control head.
- Knock out the appropriate position
- Insert the handpiece cord
- Install the tubing guide.

Completing this installation:

- Insert the handpiece cord in the tubing retainers.
- Tie the handpiece cord to the platform.
- Control water tubing must remain free.
- Secure the handpiece cord strain relief string to the control head with the screw.

Install handpiece cord with smooth loops to prevent kinking.

Make sure these is enough length to connect the tubing to the control block.

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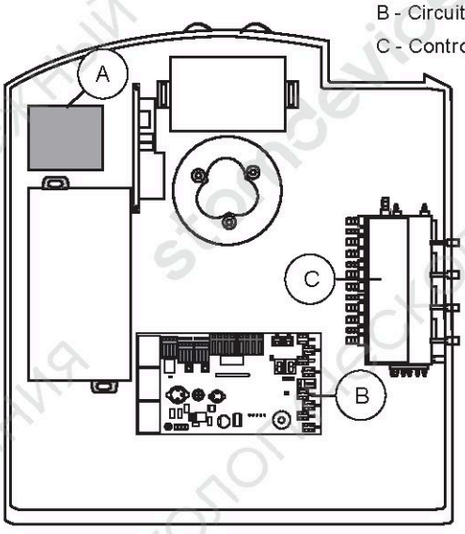
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Ultrasonic module installation

- Screw the module onto the mounting bracket with the screws supplied with the package
- Place the assembly onto the aluminium frame at the space indicated below and screw it using the self-taping screws

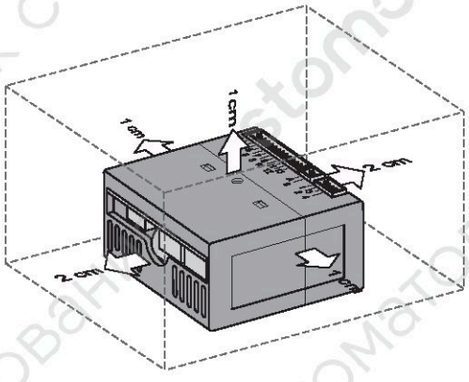
A-dec 500:

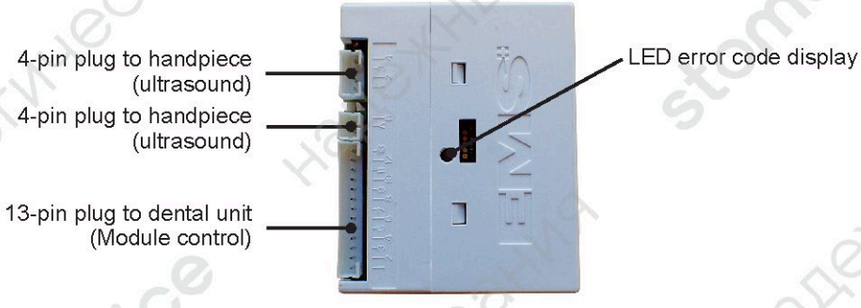
A - Ultrasonic module
B - Circuit board
C - Control block





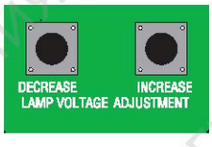
⚠ The ultrasonic module must be installed in a dry zone as its housing does not provide protection against water or liquids. The ultrasonic module has to be installed inside the unit considering a minimum free space as indicated below, this to allow the necessary air circulation for cooling.

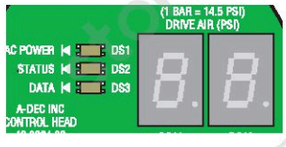




Electrical installation

- On the delivery system circuit board, set the output voltage to 5V using the LAMP VOLTAGE ADJUSTMENT block on the Delivery System Circuit Board for A-dec 500 or on the Quad Voltage Intraoral Light Source (QVIOLS) for A-dec 300.





⚠ It is important to set the LED voltage before connecting the white and violet wires.

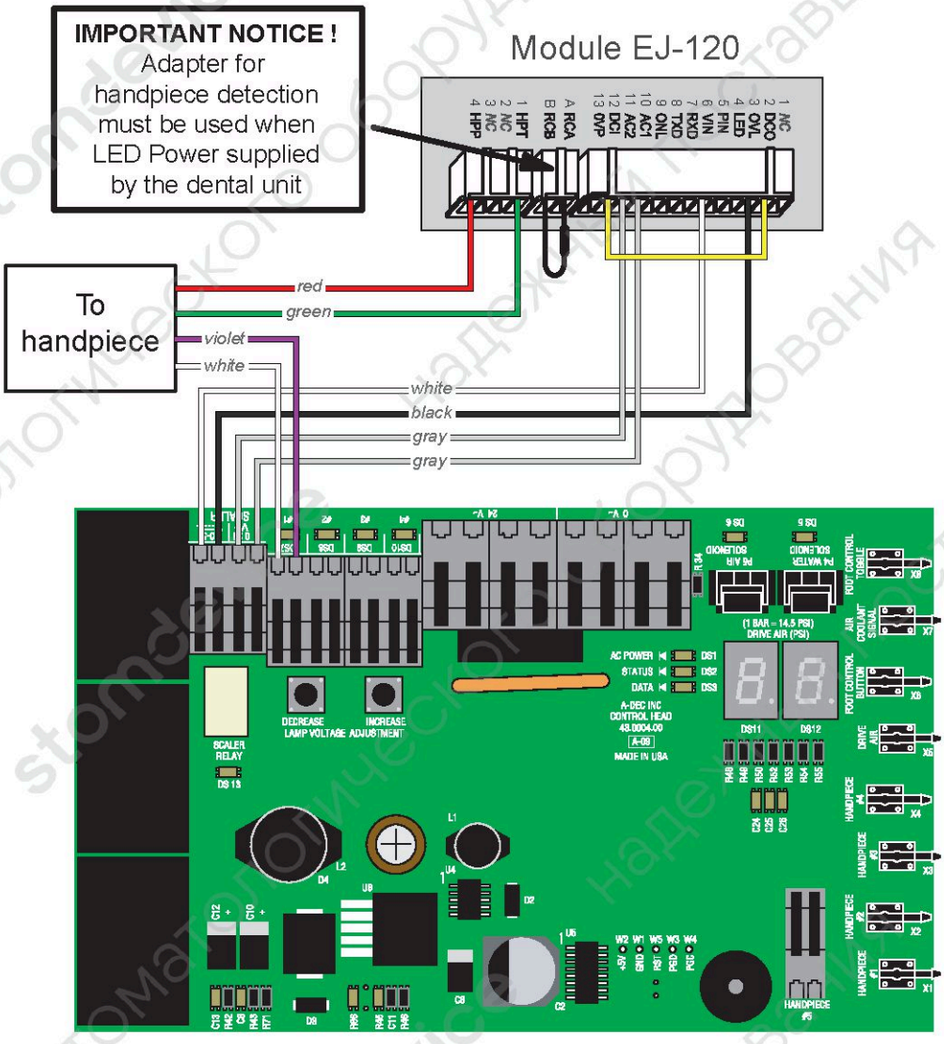
As shown on the following connection diagram :

- Plug in the wire harness connector to the ultrasonic module
- Plug in the LED adapter to the ultrasonic module
- Plug in the handpiece connector (red and green wires for ultrasound power) to the ultrasonic module

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Connection diagram A-dec 500

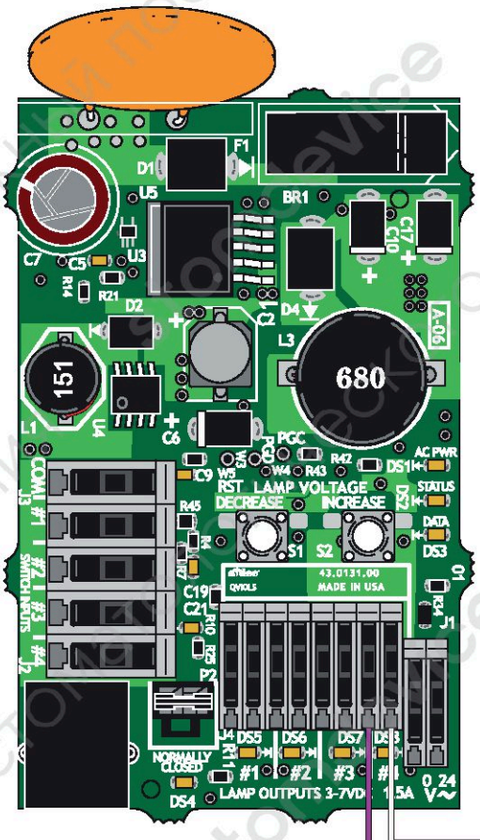


- Connect the wires of the harness to the Deluxe Touchpad circuit board :
  - gray to 24 VAC
  - gray to 0 VAC
  - black to 0 VDC
  - white to 5 VDC

- Connect the LED wires of the handpiece cord to the LAMP OUTPUT block position #1:
  - white to 0V
  - violet to 5V

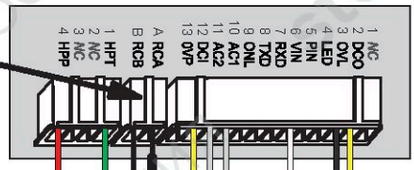
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Connection diagram A-dec 300



IMPORTANT NOTICE !
Adapter for handpiece detection must be used when LED Power supplied by the dental unit

Module EJ-120

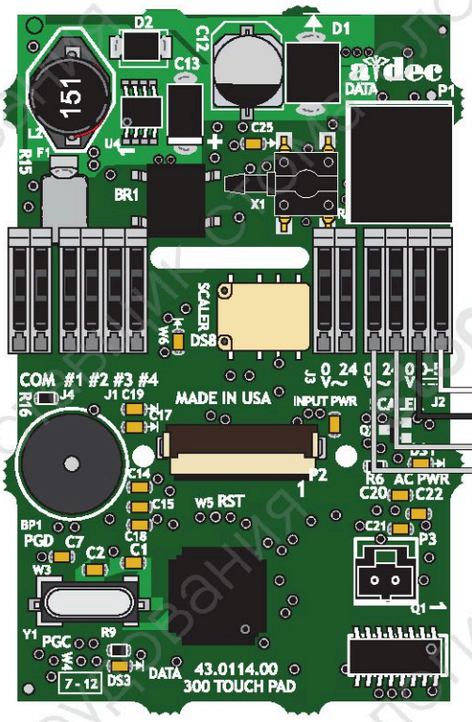


To handpiece

red
green
violet
white

Connect the LED wires of the handpiece cord to the LAMP OUTPUT block of the QVILS:
- white to 0V
- violet to 5V

Quad Voltage Intraoral Light Source (QVILS)



white
black
gray
gray

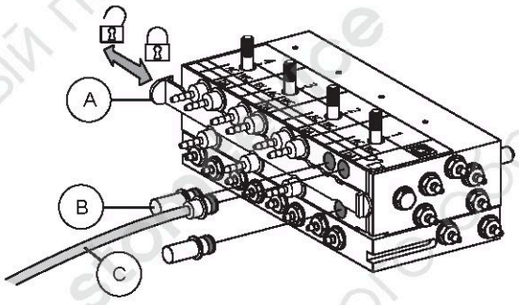
Root the wires of the harness through the touchpad's arm and connect them on the Deluxe Touchpad's circuit board:
- gray to 24 VAC
- gray to 0 VAC
- black to 0 VDC
- white to 5 VDC

Deluxe-Touchpad Circuit Board

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Connection of water tubes

- Connect the water tube of the handpiece to the control block
- Plug two unused connections: air coolant “AC”, drive air “DA”.
- Insert the water tube of the handpiece cord marked H2O into the water coolant connection “WC”
- Lock the slide-lock



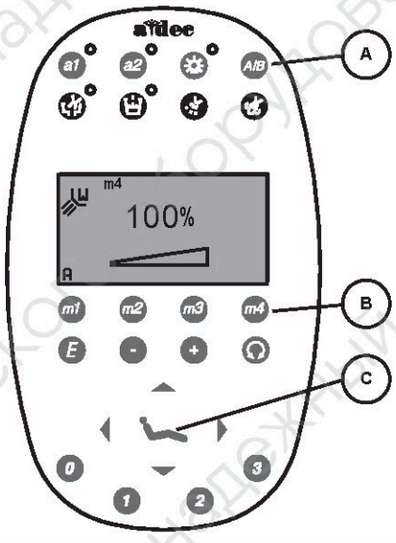
Tubing connection on control blocks :
A - slide lock
B - control block plug
C - Handpiece cord water tube (H2O)

Setting up the ultrasonic scaler

Configuring the scaler position on the delivery system

Touchpad keys:

A – A/B key
B – Power quick setting keys
C – Program key



With the Deluxe touchpad, the EMS Piezon scaler can be mounted on any available position. Use the touchpad to confirm the scaler’s position.

Steps

- Press and hold “Program” key and “A/B” key together for 5 seconds to access the set up menu.
- Follow on-screen instructions and select the actual position of the EMS Piezon scaler.
- When prompted, lift the EMS Piezon handpiece from the holder.
- Select “Ultrasonic” in the Handpiece setup.
- Return the handpiece to its holder.
- Press “Program” key to exit set up mode.

Programming the power level indication for EMS scalers

- Press and hold “Program” key and “A/B” key together for 5 seconds to access the setup menu
- Chose: Handpieces ⟶ Ultrasonic Setup ⟶ Acteon colors OFF
- Press “Program” key to exit the setup mode

Power quick setting keys

The memory keys for scalers are factory preset as follows.

- m1 25 %
- m2 50 %
- m3 75 %
- m4 100 %

Alternatively they can be programmed to fit individual working preferences.



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Trouble shooting

Symptom	Solution
No or intermittent ultra-sound power	• Check the connections between module and unit, between module and handpiece cord and between handpiece cord and handpiece • Check for error message on EJ-120 module LED error code display (see below) • Check that the ultrasonic module is powered correctly when foot switch activated, respectively when the handpiece is taken out of the tray • Check that the connector between handpiece and handpiece cord is dry • Check the settings and the working mode • Replace the handpiece cord and/or the handpiece to verify if these components are not damaged • Contact an approved Hu-Friedy & EMS repair center

LED error code on ultra-sonic module	Error description	Solution
1 pulse (1 sec break)	No handpiece or broken US wires inside handpiece cord	• Replace the handpiece and/or the handpiece cord
2 pulses (1 sec break)	Handpiece resistance error or broken LED wires inside handpiece cord	• Check if handpiece LED connector is connected to the EJ-120 module • Check if adapter is connected to the EJ-120 module (only if LED power supply coming from dental unit) • Replace the handpiece and/or the handpiece cord
3 pulses (1 sec break)	No resonance frequency found, broken or missing instrument or defect handpiece	• Replace the handpiece and/or instrument • Replace module

Symbols

EMS ELECTRO MEDICAL SYSTEMS	Manufacturer's logo
Hu-Friedy	Distributor's logo
SN	Serial number
REF	Catalogue number
	Manufacturer
	Applied part, type BF
	Read the operating instructions
	Caution!

	Output
	Input
	Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)
CE 0124	CE marking: Refers to directive 93/42 EEC, including EN 60601-1 and EN 60601-1-2

Technical specifications

Manufacturer	EMS Electro Medical Systems SA – 1260 Nyon – Switzerland
Distributor	Hu-Friedy Mfg. Co., LLC 3232 N. Rockwell St. - Chicago, IL 60618-5935, USA
Model	PIEZON® 707 BIK / PIEZON® 707 BIK LED
Classification	EN 60601-1: Applied part Type BF MDD 93/42: Class IIa Humidity protection class: IP X0
Mode	Continuous operation
Power supply	24 VAC ± 10% or 24-32 VDC ± 10%
Max. power consumption	18 VA
Max. power output	8 W
Frequency range	24 – 32 kHz
Module weight	80 g
Module dimensions in mm	34 x 60 x 50 (without connectors)
Operating conditions	+10°C +40°C 30% – 75% relative humidity Altitude max. 3000 m
Storage and transport conditions	-10°C +40°C 10% to 95% relative humidity 500 hPa – 1060 hPa
Cold water supply	1.0 – 2.0 bar (100 – 200 kPa / 15 – 29 PSI) Adjustable flow rate 0-50 ml/min ±10

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Electromagnetic compatibility according to IEC 60601-1-2:2007

The PIEZON® 707 BIK was tested in combination with an A-dec 500 delivery system and complies with IEC 60601-1-2:2007. To ensure a proper operation the following guidance should be considered.

Guidance and manufacturer's declaration – electromagnetic emissions		
The PIEZON® 707 BIK is intended for use in the electromagnetic environment specified below. The customer or the user of the PIEZON® 707 BIK should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The PIEZON® 707 BIK uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The PIEZON® 707 BIK is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity			
The PIEZON® 707 BIK is intended for use in the electromagnetic environment specified below. The customer or the user of the PIEZON® 707 BIK should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 s	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % UT (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the PIEZON® 707 BIK requires continued operation during power mains interruptions, it is recommended that the PIEZON® 707 BIK be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m (60 Hz)	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a. c. mains voltage prior to application of the test level.			

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Guidance and manufacturer's declaration – electromagnetic immunity			
The PIEZON® 707 BIK is intended for use in the electromagnetic environment specified below. The customer or the user of the PIEZON® 707 BIK should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 V rms 150 kHz to 80 MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the PIEZON® 707 BIK, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.17 \sqrt{P}$ $d = 0.35 \sqrt{P}$ 80 MHz to 800 MHz $d = 0.7 \sqrt{P}$ 800 MHz to 2.5 GHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	10 V/m	where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with the following symbol:
NOTE 1	At 80 MHz and 800 MHz, the higher frequency range applies.		
NOTE 2	These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.		
a	Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the PIEZON® 707 BIK is used exceeds the applicable RF compliance level above, the PIEZON® 707 BIK should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the PIEZON® 707 BIK.		
b	Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.		

Recommended separation distances between portable and mobile RF communications equipment and the PIEZON® 707 BIK			
The PIEZON® 707 BIK is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the PIEZON® 707 BIK can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the PIEZON® 707 BIK as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.17 \sqrt{P}$	80 MHz to 800 MHz $d = 0.35 \sqrt{P}$	800 MHz to 2,5 GHz $d = 0.7 \sqrt{P}$
0.01	0.12	0.04	0.07
0.1	0.37	0.11	0.22
1	1.17	0.35	0.70
10	3.69	1.11	2.22
100	11.67	3.50	7.00
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1	At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.		
NOTE 2	These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.		

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