CE 0123

Intended use

The electric motor is intended for the electric drive of dental straight and contra-angled handpieces used in the preparation of cavity and / or crowns.

Important Details

The MK-dent Electric Motor (EM1190K)
- is only intended for dental treatment of patients.
- is according to relevant national regulations as a medical device.

These provisions indicate, that
- applicable accident prevention regulations and health and safety regulations must be observed.
- only a competent user is allowed to use the product according to this instruction.
- only faultless work equipment is to be used.
- any contamination from the product must be avoided.
- patients, users and third parties are to be protected from danger.

Risks from electromagnetic Fields

When treating patients with cardiac pacemakers or comparable implanted systems it must be expected that electromagnetic fields will influence the functioning of the implanted systems. Before beginning of the treatment, the user must be question the patient accordingly.

Technical Facts

MK-dent Electric Motor EM1190K

Motor Voltage:	min. 1,6 - 2,5 V DC, max. 26 V DC	**Air Cooling:**	2,4 - 4,6 bar (34.8 - 66.7 psi)
RPM:	min. 450min^{-1}, max. 40.000 min^{-1}	**Cooling Capacity:**	31 ± 5 NL/min.
Torque:	max. 2,8 Ncm	**Air Out Motor Coupling:**	7,6 ± 1,5 NL/min.
Operating Mode:	Intermittend Duty 2 min on, 5 min off	**Air Pressure of Spray Cooling:**	1,0 - 2,4 bar (14.5 - 34.8 psi)
Operating Voltage of LED:	3,0 - 3,5 V DC (recommended: 3,2 V DC)	**Spray Pressure:**	0,9 - 2,0 bar (13.0 - 29.0 psi)

Meaning of Symbols

REF	SN		CE 0123
Item No.	Serial No.	Caution!	CE-Sign

Guidance and manufacturer´s declaration - electromagnetic emission

The electric micromotors are intended for use in the electromagnetic environment specified below. The customer or the user of the electric micromotors should assure, that it is used in such an environment.

Emission Test	**Compliance**	**Elecromagnetic Environment - Guidance**
RF emissions CISPR 11	Group 1	The dental electrical micromotors use 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 dental electrical micromotors are suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic.
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 electric micromotors are intended for use in the electromagnetic environment specified below. The customer or the user of the electric micromotors should assure, that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Electromagnetic Environment - Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	± 6kV Contact ± 8kV Air	Floors should be wood, concrete or ceramic tile. If floor is covered with synthetic material, the relative humidity should be at least 30%.
Radiated RF immunity test IEC 61000-4-3	Level 3V/m 80%AM 80MHz - 2,5GHz	
Electrical fast transient/burst IEC 61000-4-4	± 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 in differential mode ± 2 kV in common mode	Mains power quality should be that of a typical commercial or hospital environment.
Conducted RF immunity test IEC 61000-4-6	Level 3V 80%AM 150kHz - 80MHz	
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 cycles	Mains power quality should be that of a typical commercial or hospital environment. If the user of the electric micro motor requires continued operationduring power mains interruptions, it is recommended, that the electrical micromotors be powered from an uninterruptible power supply or battery.
	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 sec.	
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3A/m	The power frequency magnetic field should be measured in the intended installation location to assure that is sufficiently low.

U_T is the A/C mains power voltage prior the application of the test level.

Storage & Transportation

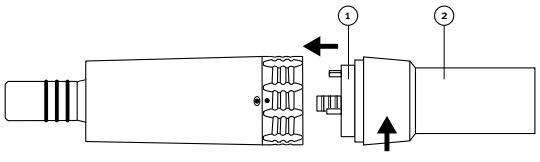
At temperature below 20° C (68° F), malfunctions may occur when starting the product.
Bring strongly cooled instruments to a temperature of 20° C (68° F) up to 25° C (77° F) before using.
Protect from moisture!

Temperature max./min. :	- 30° C (-58° F) up to 40° C (176° F)	**Air Pressure:**	710hPa (10.2 psi) up to 1065 hPa (15.5 psi)
Air Moisture:	non-condensing		

Starting Up

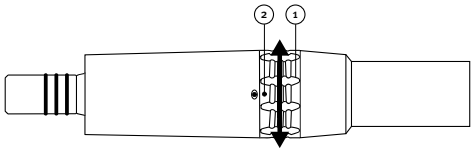
Disinfect the Electric Motor before first use and after each use. Use dry, not contaminated, cleaned compressed air only.
Contaminated or humid air will cause premature wear!

Connection to the Treatment Unit



Use MK-dent Premium Service Oil to lubricate the o-rings on the tubing.
Plug the connection 1 into the motor bearing assembly. Pay attention to the right position of contacts. Fasten the tubing 2 by turning in dirction of arrow.

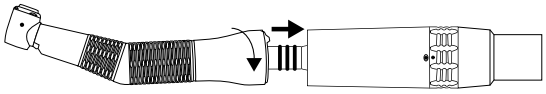
Spray Regulation



Turn the regulating sleeve 1 right or left to regulate the spray water.
In the center position (button is in line with the dot on the adjustment ring), you have reached the highest spray water pressure.

Connecting with Instruments

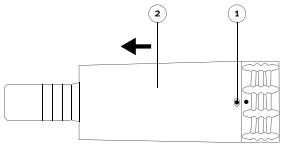
Instruments may not be connected or disconnected during running rotation. This may cause damages on motor and instrument. Only use operationally safe instruments. Do never run the motor without air-cooling! This may cause overheating!



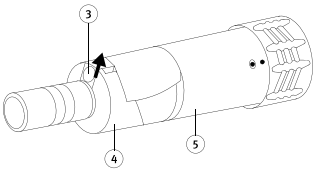
Attach the instrument to the motor, until it clicks in place. Turn in direction of arrow until fixing projection clicks in place.
To remove, pull instrument in axial direction from the motor.

The disconnection of instruments from the motor during operation may cause danger to patient and operator! Before each start of operation, make sure that instrument and motor are connected properly.

Replacement of the LED

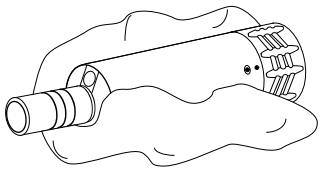


Push button 1 and pull off sleeve 2 from socket and take it out.

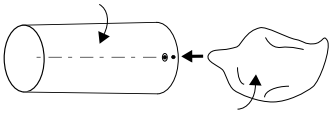


Press the porter 4 to the body 5 and push the LED 3 with screw driver in direction of arrow out of the socket. Take it out.
Place the new LED in the socket. Pay attention to the right position of contacts. Push the LED into the socket and reattach sleeve. Turn LED 180º, in case it doesn´t light.

Cleaning and Care



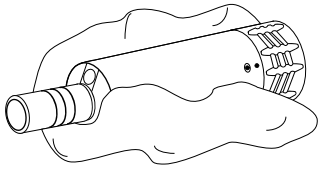
Clean the motor externally with a moistened cloth, then clean with a solution containing 60 - 70% alcohol. Swipe off with a cotton cloth.



Pull off the sleeve and clean with water first, then with a solution containing 60 - 70% alcohol. Swipe off with a cotton cloth.

Ultrasonic cleaning may cause malfunctions! The motor may only be cleaned manually! After each treatment spray air and water for at least 20 seconds.

Disinfection



Spray disinfecting solution on a cloth and swipe off the motor. See manufacturers´ manual for contact time.
Only use DGHM/VAH listed chemical disinfectants for spray and wipe disinfection.

The motor may not be disinfected in disinfection baths! This may cause malfunctions. Only desinfect manually!

Sterilization

The Electric motor EM1190K can not be sterilized in an autoclave device.

Storage

Cleaned instruments should be stored protected from dust in a dry, dark and cool room. Store low-germ.

Warranty

MK-dent provides the end user a warranty for proper function, immaculate material and workmanship for the period of 12 months after purchasing. Relevant for this is the invoice date.

In case of justified complaints MK-dent carries out a free repair or a possible free replacement. This will be decided by MK-dent.
Other claims of any kind, in particular damage compensation are excluded. In the event of default, gross negligence or intent, this shall only apply unless there are compelling legal regulations.

MK-dent is not liable for defects and their consequences that have arisen whose arising may be due to natural wear, improper handling, improper cleaning, or maintenance, non-compliance with operating or manual instructions,
calcination or corrosion, contaminated air and water supply or chemical or electrical influences that are unusual or not permitted according to MK-dent's instruction for use or to other manufacturer's instructions.

The warranty does usually not cover lamps, light conductors made of glass fibers, glassware, rubber parts and the color fastness of plastic parts. All liability is excluded if defects or their consequences arise because of interventions or modifications on the product by the end user or by a third party not authorized by MK-dent.

Warranty claims will only be accepted if the product is submitted with a proof of purchase in the form of an invoice or a copy of the delivery note. Dealer, purchase date, model and serial number must be clearly visible.

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