Kerr™
ENDODONTICS

INSTRUCTIONS FOR USE

Elements™ Connect

CORDLESS ENDODONTIC MOTOR

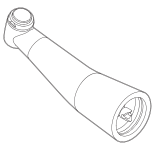
Elements Connect
CORDLESS ENDODONTIC MOTOR

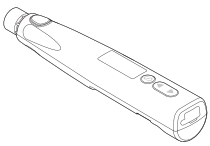
ELEMENTS CONNECT CORDLESS ENDODONTIC MOTOR FEATURES

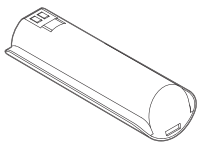
- Motor can be linked to the Apex Connect while the motor is being used.
- It has 10 pre-programed memories and 4 open memories that can be customized.
- The device has 5 programmable operating parameters: torque, speed, motor rotation, auto reverse and rotation angles.
- This motor can be operated clockwise, counterclockwise, with Adaptive Motion, and with Reciprocation.

CONTENTS OVERVIEW

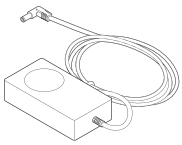
1 All Components

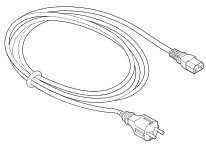

Contra angle


Motor Handpiece

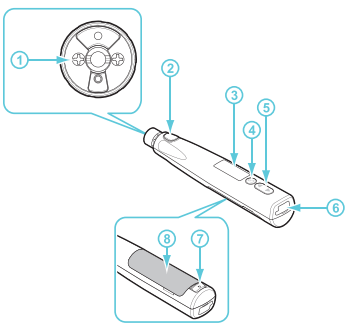

Battery (2)


Charging base


AC/DC Adapter

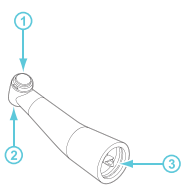

Power Cord

MOTOR HANDPIECE



No.	Name		Function
1	Contra angle connector		Attaches the contra angle to the motor handpiece.
2	Main button		Turns on the motor handpiece. To turn off the power, press any two buttons simultaneously for 2 seconds.
3	Display		The main screen, operation screen, and settings screen appear depending on the device's operation. • On the main screen, the memory number and motor operation information can be reviewed and changed. • The motor operation status is shown while using the device. • On the settings screen, the system settings for the motor handpiece can be changed.
4	S	Mode button	On the main screen and the settings screen, this button can be used to save the settings and highlight the next menu item.
5	△/▽	Select button	On the main screen and the settings screen, use this button to change menu options and settings.
6	Connector terminal		Connects the Elements Connect motor handpiece and the Apex Connect only. It cannot be used for charging.
7	Battery Release button		Removes the battery from the motor handpiece.
8	Battery		Supplies the power to the motor handpiece with a removable battery.

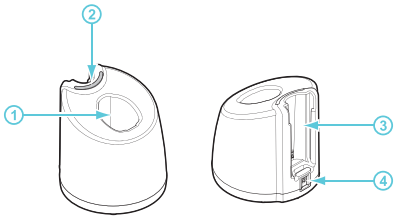
CONTRA ANGLE



No.	Name	Function
1	Push button	Secures or detaches the Ni-Ti files from the contra angle.
2	File mounting part	Mounts the Ni-Ti file on the contra angle.
3	Motor handpiece connector	Mounts the contra angle to the motor handpiece.

PRECAUTION

When selecting the proper file length for the procedure, note that the total working length of the file is reduced by 2mm due to the deep set insert in the contra angle head and might difficult the repositioning of the silicone stopper. A longer file might have to be selected.



CHARGING BASE

No.	Name	Function
1	Device stand	Stores the motor handpiece.
2	Charging indicator	Displays the charging status of the battery. (Charging: Orange, Charged: Blue)
3	Battery charging unit	Charges the battery.
4	Power connector terminal	Connects the power cord and AC/DC adapter to supply power to the charger.

LCD SCREEN

The main screen is the screen that appears on the display when the motor handpiece is turned on. The memory number and motor operation information can be viewed and set.

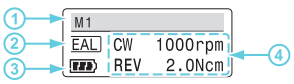


Figure 1 - Main screen

No.	Description
1	Memory number.
2	**[EAL]** appears when the Apex Connect and motor handpiece are connected properly.
3	This is the battery icon. The remaining battery is displayed.
4	The motor operation information is shown here. Motor rotation, speed, torque limit, rotation angle and autoreverse options are displayed.

Motor Settings		
Motor Rotation Settings	CW	Motor rotates clockwise
	CCW	Motor rotates counterclockwise
	Adaptive	• Adaptive Motion relies on a patented feedback algorithm that changes the motion of the file based on the applied load (stress). When the file is doing minimal work—when there is no stress on the file—the motion is purely rotary (clockwise rotation only). • When the file begins to cut more dentin, the motion begins to "adapt" from pure rotary to reciprocation (clockwise and counterclockwise rotation). This action disengages the file from grabbing too much of the canal wall. • The Elements Motor adapts the motion based on the amount of pressure on the file. It may or may not reciprocate and does not pull into the canal. Reciprocating angles vary: no load 600° forward and 0° backwards, loaded 370° forward and up to 50° backwards, based on file load.
	RCP	The motor alternates between clockwise and counterclockwise rotation (Reciprocation).

Motor Settings		
Auto-reverse Settings	R&S	When the set torque limit is reached, the motor rotates in the opposite direction of the current setting until the load decreases and stops.
	REV	When the torque limit value is reached, the motor rotates in the opposite direction of the current setting until the load decreases. It then rotates again in the currently set direction.
Motor Speed	RPM	100-1000
Motor Torque	Torque	1 to 4.0 Ncm/100 to 400 gcm
Rotation Angle (in the RCP mode)	Degrees	20° to 360°
System Settings	Dominant hand	The device window can be changed from right hand to left hand use. (Default: Right)
	Volume	VOL.0 to VOL.3. (Default: VOL.2)
	Autopower off	Standby time can be set between 1 and 10 minutes, in 1 minute increments. (Default: 5 min)
Apex Locator	EAL	Visual indicator that the motor is correctly linked to the Apex Connect.
	Auto Start & Stop	Operates the motor: ON: The motor operates when the file is inserted into the root canal, and the motor stops when the file is pulled out from the root canal. OFF: The motor does not run even if the file is inserted into the root canal.
	Apical Action	When the Apex Locator measurement approaches the APEX reference value during root canal expansion, the speed of motor and torque of motor decrease so that the root canal does not expand deeper than the set value. Speed Slowdown: When the Apex Locator measurement approaches the APEX reference value, the motor's rotational speed decreases. Torque Slowdown: When the Apex Locator measurement approaches the APEX reference value, the motor's torque limit decreases. OFF: The motor operates the same regardless of whether or not the Apex Locator measurement approaches the APEX reference value.

Default Settings					
Memory Code	**Name**	**RPM**	**Torque**	**Motor Rotation**	**Auto-reverse**
TRVO	Kerr Traverse Opener	500	350 gcm (3.50Ncm)	CW	REV
TRVG	Kerr Traverse Glide Path	500	150gcm (1.50 Ncm)	CW	REV
ZF 04 Small	ZenFlex 0.04 20-25	500	100gcm (1.0 Ncm)	CW	REV
ZF 06 Small	ZenFlex 0.06 20-25	500	300gcm (3.0 Ncm)	CW	REV
ZF 04 Large	ZenFlex 0.04 30-45	500	200gcm (2.0 Ncm)	CW	REV
ZF 06 Large	ZenFlex 0.06 30-45	500	350 gcm (3.5Ncm)	CW	REV
K3	K3 / K3XF	350	300gcm (3.0Ncm)	CW	REV
ADP	Adaptive	N/A	N/A	ADP	REV
TF	TF files	500	400gcm (4.0 Ncm)	CW	REV
RCP	Left Handed Reciprocation	N/A	N/A	CCW 150 CW 30	REV

Default Settings					
Memory Code	**Name**	**RPM**	**Torque**	**Motor Rotation**	**Auto-reverse**
M1 – M4	Open				

Programmable Settings					
Memory Code	**Name**	**RPM**	**RCP**	**Auto Reverse Settings**	**Torque**
TRVO	Kerr Traverse Opener	100 to 600 in CW	N/A	REV	On or Off
TRVG	Kerr Traverse Glide Path	100 to 1000 in CW	N/A	REV	On or Off
ZF 04 Small	ZenFlex 0.04 20-25	100 to 1000 in CW	N/A	REV	On or Off
ZF 06 Small	ZenFlex 0.06 20-25	100 to 800 in CW	N/A	REV	On or Off
ZF 04 Large	ZenFlex 0.04 30-45	100 to 1000 in CW	N/A	REV	On or Off
ZF 06 Large	ZenFlex 0.06 30-45	100 to 600 in CW	N/A	REV	On or Off
K3	K3 Files	100 to 800 in CW	N/A	REV	On or Off
ADP	Adaptive	N/A	N/A	REV	N/A
TF	TF files	100 to 600 in CW	N/A	REV	On or Off
RCP	Left Handed Reciprocation	N/A	20 to 360° in CW or CCW	REV	N/A
M1 – M4	Open	100 to 1000 in CW and CCW. Adaptive available	20 to 360° in CW or CCW	R&S, REV available	1.0 to 4.0 Ncm/ 100 to 400 gcm

INDICATIONS FOR USE

The Elements Connect motorized handpiece can be used to enlarge and prepare root canals, remove gutta-percha points. When connected to Apex locator (Apex Connect), the Elements Connect can be used to measure the length of root canals.

CONTRAINDICATIONS

- Do not use this device on patients with pacemakers or nerve regulators. Also, do not use this device on patients who are sensitive to metals such as stainless steel, nickel and titanium
- Do not use this device in the presence of oxygen oxides, nitrogen oxides, or flammable anesthetic mixtures containing air. There is a risk of explosion.

SAFETY PRECAUTIONS

To ensure the safety of users and patients and to use the device properly, be sure to read the contents of this instructions for use before using the device. The manufacturer is not responsible for any injuries or damages caused by not following the precautions.

The most important thing when using medical devices is the safety of all users, including patients and medical staff members. Please read the following safety information thoroughly to identify and prevent potential hazards.

WARNING
May cause serious damage or, severe injury if safety instructions are not followed.

PRECAUTION
May cause physical injury or property damage. It also indicates unsafe procedures or cases where the device may be damaged.

WARNINGS

- For use by qualified and trained dental personnel only.
- U.S. federal law restricts the sale of this device by or on the order of a healthcare professional.
- Do not use this device on patients with pacemakers or nerve regulators.
- Do not use this device with electric surgical devices.
- Use of other accessories that are not authorized for use in connection with this device may cause malfunction and compromise patient safety.
- Do not use this device in the presence of oxygen oxides, nitrogen oxides, or flammable anesthetic mixtures containing air. There is a risk of explosion.
- Do not use the device in a place that it is exposed to direct sunlight, heat sources, or near a fire. The battery may explode or cause a fire.
- Never use a damaged cable. There is a risk of fire or electric shock.
- Be sure to connect the power plug to a power supply with a protective ground. There is a risk of fire or electric shock.
- Do not touch electrical parts with wet hands. There is a risk of electric shock and injury.
- To prevent accidental aspiration, the use of a rubber dam is strongly recommended.
- Use the battery, AC/DC adapter, and power cord included in the package. Only use Kerr Endodontics batteries designated for this system. Use of other batteries may damage the device(s) or cause a malfunction.
- Ensure conductors such as metal are not in contact with the metal part of the device. There is a risk of device malfunction, fire, or electric shock.
- Do not disassemble the device. There is a risk of electrical shock and burns if the inside of the device is touched.
- Do not repair, modify, or disassemble the device, unless by an authorized service engineer or a specialist who has received repair training. Product failure or damage caused by unauthorized actions is not subject to free service and warranty service.
- Do not spray the motor handpiece or the base with disinfectants. Use a cloth or a wipe moistened in isopropyl alcohol.
- When transporting the device, use the original packaging provided by manufacturer to prevent accidental activation of the unit or any damage to the device itself.
- Air or land transportation of the device is allowed in the original packaging container.
- For shipping batteries within the United States or Internationally, consult the Department of Transportation's Pipeline and Hazardous Materials Safety Administration or the International Air Transport Association guidelines.
- Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.
- Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.
- Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part

of the Elements Connect, including cables specified by the Kerr Corporation.

- The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

PRECAUTIONS

- Do not use this device for any purpose other than its intended use. The manufacturer is not responsible for any injuries or damage caused by this.
- This device is not waterproof. Do not submerge the device in water or let the device come into direct contact with water. There is a risk of electric shock or device malfunction.
- Do not connect unsupported types of devices. The device may break down or malfunction.
- When using or moving the device, do not throw or drop it. The device may break down or malfunction.
- When using, be fully aware of the protective measures for the patient and be prepared for possible risks.
- Check the patient's condition and device operation during use.
- If the device is dropped during use, ensure that there is no danger to the patient or user.
- When not using the device for a long period of time, store it in a clean and dry place, where the temperature and humidity do not change easily.
- If there are sign of smoke or burning, turn off the power immediately, and take appropriate measures.
- If the device breaks down or has a problem, stop using it immediately, and contact customer services.
- Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State.
- When selecting the proper file length for the procedure, note that the total working length of the file is reduced by 2mm due to the deep set insert in the contra angle head and might difficult the repositioning of the silicone stopper. A longer file might have to be selected.

ADVERSE REACTIONS

None known.

SYMBOL DESCRIPTION

Full explanation of symbols used on Kerr packaging is located at: **http://www.kerrdental.com/symbols-glossary**

SN	Serial number
EC REP	Authorized representative in the European Community
	Original Equipment Manufacturer: Meta Systems Co., Ltd. Private Label Manufacturer: Kerr Corporation
CE 1639	CE - Mark and identification number of notified body. Product conforms to the essential requirements of the Medical Device Directive 93/42/EEC
	Type BF Applied Part
	Humidity limitation
	Fragile, handle with care
	This way up
132°C 270°F	Sterilizable up to the stated temperature
	Warning
	WEEE Marking
REF	Catalogue number
MD	Medical Device
Rx only* *for US law only	CAUTION: Federal law restricts this device to sale by or on the order of a dentist
	Date of manufacture
C SP US 273015	CSA Mark with "C/US" Indicator for Certified Products
	Temperature limit
	Atmospheric pressure limitation
	Keep dry
	Refer to instruction manual
	Caution

STEP-BY-STEP INSTRUCTIONS

PRECAUTION

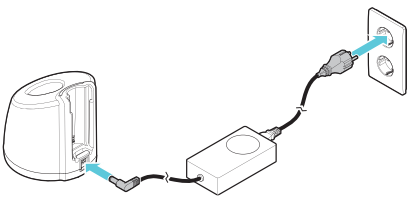
The components and devices have not been disinfected or sterilized prior to shipping. Please perform the necessary cleaning and disinfection steps prior to patient treatment.

GETTING STARTED

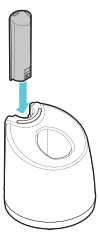
Remove the device, contra angle, charging base, AC/DC adapter, and power cord from their packaging.

1 Charging the Battery

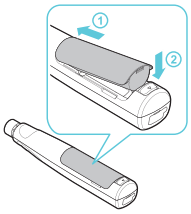
- When using the device for the first time or after long-term storage, charge the battery sufficiently before use.
- After connecting the power cord and AC/DC adapter, plug the AC/DC adapter into the charging terminal on the back side of the device and plug the power cord into the power supply.



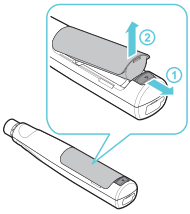
- Insert the battery into the battery charging unit with the charging terminal facing down. The charging indicator illuminates orange indicating that the battery is being charged.
- While charging, the charging indicator lights up in orange.
- When charging is complete, the charging indicator lights up blue.



- Insert the protrusion of the battery into the groove on the back of the motor handpiece, and then push it until it clicks.



- To remove the battery, press the **[Battery Release]** button at the bottom of the back of the motor handpiece.



WARNINGS

- Only use the battery, charger, AC/DC adapter, and power cord included in the package.
- Be sure to plug the power cord into an outlet with a protective grounding.

PRECAUTIONS

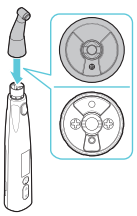
- If only one slot of the battery icon remains on or the icon flashes, replace it with a charged battery and charge the used battery.

INITIAL SET-UP

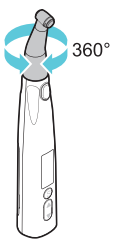
1 Assembling the Device

- With the motor handpiece powered off, attach, and remove the contra angle, Ni-Ti file, from the motor handpiece.

1. Insert the pin of the contra angle connector into the groove of the motor handpiece connector and then push it until it clicks.



2. The contra angle rotates 360° and can be adjusted to work in the desired position.



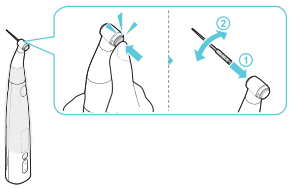
PRECAUTIONS

- It is recommended to use a plastic barrier with your handpiece to ensure longevity of the device and prevent cross-contamination between patients.
- If there is any residual oil on the surface of contra angle, wipe it with the tissue and then alcohol gauze.

PRECAUTIONS

- Do not install any contra angle other than the contra angle included in the package to the motor handpiece.
- When using the device for the first time or after long-term storage, refer to "**Cleaning, Disinfection, Lubrication, Packaging and Sterilization Instructions**" to sterilize the device.
- The contra angle is not sold sterile and must be sterilized prior to first use.

3. While holding down the **[Push]** button of the contra angle, insert the Ni-Ti file into the contra angle latch. Then turn it slightly to the left or right, and slide it into the latch groove.



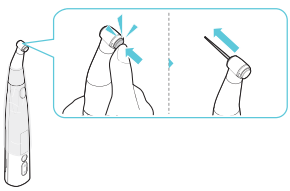
4. Pull the inserted Ni-Ti file gently to make sure it is properly secured.

PRECAUTIONS

- If the Ni-Ti file is not properly secured to the contra angle, the file may come off during use and may cause injury to the patient.
- Do not use deformed or damaged Ni-Ti files.

2 Disassembling the Device

1. While holding down the **[Push]** button of the contra angle, pull out the Ni-Ti file.

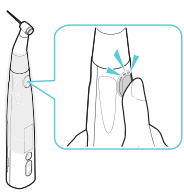


PRECAUTION

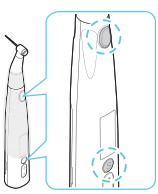
After using the device, refer to "**Cleaning, Disinfection, Lubrication, Packaging and Sterilization Instructions**" to sterilize the contra-angle and to disinfect the motor.

3 Turning the Device On/Off

1. Press the **[Main]** button on the motor handpiece. The power turns on, and the main screen appears on the display.



2. To turn off, press any two buttons simultaneously for 2 seconds.



CAUTION

- After using the device, refer to "**Cleaning, Disinfection, Lubrication, Packaging and Sterilization**" instructions to sterilize the contra angle and to disinfect the motor.

PREPARING THE DEVICE FOR USE

1 Preparation and User Environment

The environmental information appropriate for using this device is as follows.

- Appropriate temperature: 10–35°C (50–95°F) / Appropriate humidity: 30–75% / Atmosphere pressure: 700–1060 hPa
- Do not use the device in a place that it is exposed to direct sunlight, heat sources, or near a fire.

2 Assembly

- Charge the battery sufficiently when using the device for the first time or after long-term storage.
- Be sure to charge the battery using the cable and AC/DC adapter included in the package.
- Sterilize the contra angle when using the device for the first time, after long term storage and after every patient.
- Do not attach and use any device other than the contra angle included in the package.
- Do not use deformed or damaged Ni-Ti files.
- Ensure that the Ni-Ti file is properly secured to the contra angle latch before use.

NOTE:

- Refer to "**Getting Started**" for more information on how to change, install, or remove the battery.
- Refer to "**Initial Set-up**" for more information on how to attach and remove the contra angle and Ni-Ti files.
- Refer to "**Cleaning, Disinfection, Lubrication, Packaging and Sterilization Instructions**" for more information on how to clean and sterilize the contra angle.

USING THE DEVICE

- Refer to "**Initial Set-up**" to connect the contra angle and NiTi file to the device.

1 Basic Functions

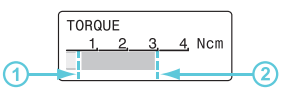
1. Press the [Main] button on the motor handpiece. The power turns on, and the main screen appears on the display.
2. Tables indicating all the pre-set memories and functions is available in "**Contents Overview**".
3. Press the [△/▽] button to check the motor operation information by memory. Then press the [S] button when the desired memory number is displayed between M1 and M4. The memory number is selected, and the next menu is highlighted.

4. Select the motor operation method, and set the motor speed, motor torque limit, rotation angle, and auto reverse options.

- Press the [S] button: Save the settings and highlight the next menu.
- [△/▽] button: Change menu options and settings.

NOTE:
The setting menu appears differently depending on the motor operation method.

5. Press the [Main] button to start the treatment. The motor runs, and the operation shows up on the display. The main button light flashes.



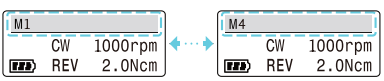
- On the operation screen, review the torque value (①) of the motor in operation and the torque limit value (②) set in the memory.
- To stop the motor operation, press the [Main] button. Here, the memory number and motor operation settings can be adjusted on the main screen.
- If [CW], [CCW], [Adaptive] or [RCP] are selected as the motor operation method, the files can be rotated in the opposite direction by following these instructions:
  - Press and hold the [Main] button on the main screen to rotate the motor in the opposite direction of the current setting.
  - The motor rotates in the opposite direction only while the button is pressed and stops when released.
  - Here, the operation screen does not appear on the display, and the main screen remains on.

6. To turn off, press any two buttons simultaneously for 2 seconds. The power and display are turned off.
7. Refer to "**Disassembling the Device**" for more information on how to attach and detach the Ni-Ti file and contra angle from the motor handpiece.
8. Refer to "**MAINTENANCE**" for more information on how to clean and sterilize the contra angle.

2 Creating Memory

The motor's operation method, menu options, and settings to memory can be pre-assigned. By doing this, the treatment can start right away by selecting the appropriate memory number for each situation.

1. Press the [S] button on the main screen to highlight the memory area.
2. Press the [△/▽] button, and when the desired memory number is displayed, press the [S] button to select. The memory number is selected, and the next menu is highlighted.



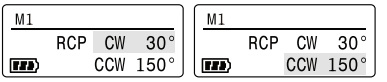
3. Press the [△/▽] button, and when the desired motor operation method is displayed, press the [S] button to select. The settings are saved, and the next menu is highlighted.

- [CW]: The motor rotates clockwise.
- [CCW]: The motor rotates counterclockwise.
- [RCP]: The motor alternates between clockwise and counterclockwise rotation.
- [Adaptive]: Adaptive Motion relies on a patented feedback algorithm that changes the motion of the file based on the applied load (stress). When the file is doing minimal work—when there is no stress on the file—the motion is purely rotary (clockwise rotation only).
  - When the file begins to cut more dentin, the motion begins to "adapt" from pure rotary to reciprocation (clockwise and counterclockwise rotation). This action disengages the file from grabbing too much of the canal wall.
  - The new Elements Motor adapts the motion based on the amount of pressure on the file. It may or may not reciprocate and does not pull into the canal. Reciprocating angles vary: no load 600° forward and 0° backwards, loaded 370° forward and up to 50° backwards, based on file load.

4. Press the [△/▽] button to set the motor speed, torque limit, rotation angle, and autoreverse options, then press the [S] button. The settings are saved, and the next menu is highlighted.
   - When selecting [CW], [CCW] the torque limit value can be set according to the motor speed range.

Speed	Torque limit value
100–600 rpm	1.0–4.0 Ncm
650–800 rpm	1.0–3.0 Ncm
850–1,000 rpm	1.0–2.0 Ncm

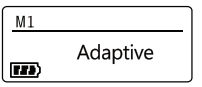
- When selecting [RCP] the rotation angle can be set for each rotation direction.



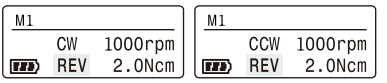
PRECAUTIONS

- When using the rotary file, set the angle of CW bigger than CCW.
- When using the reciprocating file, set the angle of CCW bigger than CW.

- When [Adaptive] is selected, Adaptive motion can be set.
  - The [Adaptive] mode reduces the torsional stress of the file to reduce the possibility of file separation and at the same time increasing the efficiency, which is suitable for narrow root canals.



- When selecting [CW], or [CCW] the autoreverse option can be set.



  - [R&S]: When the set torque limit is reached, the motor rotates in the opposite direction of the current setting until the load decreases, and then it stops.
  - [REV]: When the set torque limit value is reached, the motor rotates in the opposite direction of the current setting until the load decreases. It then rotates again in the currently set direction.

NOTE:

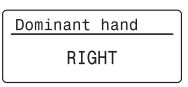
- The setting menu appears different depending on the motor operation method.
- When in [Adaptive] mode, the auto-reverse option is automatically set to [REV].

5. Repeat steps 2 to 4 to program additional motor operations to the memory.
6. Press any two buttons simultaneously for 2 seconds to turn off the power. The memory is saved.

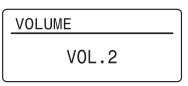
SYSTEM SETTINGS

Follow the steps below to change the system settings for the motor handpiece.

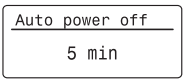
1. With the device powered off, press the [Main] button and the [S] button at the same time. The power turns on, and the settings screen appears on the display.
2. Press the [S] button until the desired menu appears, then press the [△/▽] button to select a value.
   - [Dominant hand]: Set the screen direction RIGHT and LEFT to suit the main hand of the operator. (Default: RIGHT)



   - [VOLUME]: Set the alarm volume between VOL.0 and VOL.3. (Default: VOL.2)



   - [Auto power off]: Set a standby time of the device being turned off after a certain period of inactivity. The standby time can be set between 1 and 10 minutes, in 1-minute increments. (Default: 5 minutes)



3. Press the [Main] button. The settings are saved, and return to the main screen.

ADVANCED SETTINGS

Linking the Elements Connect Cordless Endodontic Motor to the Apex Connect

This device can be used in conjunction with the Apex Connect. By connecting the two devices, the working length of the canal while instrumenting the canal can be measured.

PRECAUTIONS

- This device is designed to be compatible with the Apex Connect. Do not connect any other device other than Apex Connect.
- Use the USB connection terminal on this device only to connect Apex Connect. Do not connect the charging USB cable.

1 Apex Connect Components

The components of Apex Connect required to link are as follows.

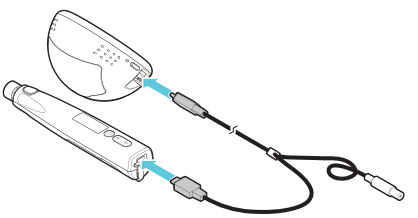
Apex Connect Unit | Probe Cord | Lip Hook

NOTE:

- For more information on the components of the Kerr Apex Locator and how to use them, refer to the "**Apex Connect Instructions for use**."

2 Assembly and Connection

1. Plug the USB connector on one end of the probe cord into the USB connection terminal on the motor handpiece and the other end into the USB connector on the main unit.

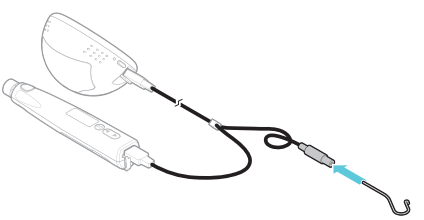


PRECAUTIONS

The USB connector (Type C) on the probe cord has its intended use. Examine the role of each connector and connect to the appropriate device.

- Single USB connector: Apex Connect Unit connection
- USB connector supplied with lip hook connector: Motor handpiece and file holder connection

2. Insert the lip hook into the lip hook connector of the probe cord.



PRECAUTION

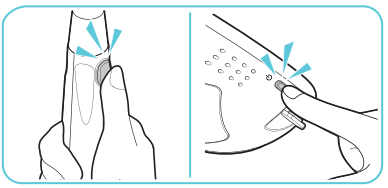
Be sure to clean and sterilize the lip hook before each use.

3. Refer to "**Initial Set-up**" to attach the contra angle and Ni-Ti file to the motor handpiece.

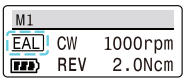
PRECAUTION

When selecting the proper file length for the procedure, note that the total working length of the file is reduced by 2mm due to the deep set insert in the contra angle head and might difficult the repositioning of the silicone stopper. A longer file might have to be selected.

4. Press the [Main] button on the motor handpiece and the [⏻] button on the main display unit. The power and the display of both turn on.



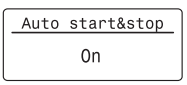
5. Check that [EAL] appears on the main screen of the motor handpiece. Motor handpiece and main unit are connected correctly. If the [EAL] **does not appear on the screen, check the Troubleshooting Guide**.



3 Setting the Linkage

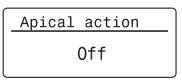
Set the motor operation options when using the device in conjunction with the Apex Connect.

1. On the main screen of the motor handpiece, press the [S] button for 2 seconds. The linkage settings appear.
2. Press the [S] button until the desired menu appears, then press the [△/▽] button to select a value.
3. [Auto start & stop]: Set whether to operate the motor depending on the location of the file.



- [On]: The motor operates when the file is inserted into the root canal, and the motor stops when the file is pulled out from the root canal.
- [Off]: The motor does not run even if the file is inserted into the root canal. Regardless of where the file is, the [Main] button to operate the motor can be pressed.

4. [Apical action]: When the Apex Locator measurement approaches the APEX reference value during root canal instrumentation, the speed of motor and the torque of the motor decrease so that the root canal does not instrument deeper than the set value.

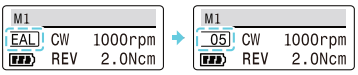


- [Speed slowdown]: When the Apex Locator measurement approaches the APEX reference value, the motor's rotational speed decreases.
- [Torque slowdown]: When the Apex Locator measurement approaches the APEX reference value, the motor's torque limit decreases.
- [Off]: The motor operates the same regardless of whether or not the Apex Locator measurement approaches the APEX reference value.

5. Press the [Main] button. The settings are saved, and the device returns to the main screen.

4 Using Linkage

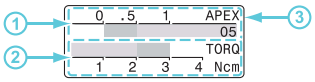
1. Refer to "**USING THE DEVICE > Basic functions**" in the Elements Connect Endodontic Motor Instructions for use to set the memory number and the motor operation method.
2. Place the lip hook on the lip opposite the tooth to be worked on.
3. Slowly insert the Ni-Ti file into the root canal. The root canal length is measured, and the Apex Locator measurement is displayed in the [EAL] area of the main screen.



NOTE:

To measure root canal length only, [Auto start&stop] must be set to [Off]. For more information on how to set the motor operation, refer to "**Setting the Linkage**" in this manual.

4. Press the [Main] button on the motor handpiece, and the motor will start with the operation displayed on the motor screen.



- The following information is displayed in the motor operation screen:

No.	Description

1	• These values represent the APEX reference value and the measurements taken by the Apex Locator at the file's current location. The measured value is also displayed numerically on the right side of the screen.
	• When the measured value reaches the APEX reference value, the motor operates as follows.
	  • [R&S]: The motor stops after rotating in the opposite direction of the current setting.
	  • [REV]: The motor rotates in the direction opposite to the current setting. It then rotates in the set direction again.

2	It is the torque value of the motor in operation and the torque limit value set in the memory.
3	[APEX] blinks when the measurement reaches or passes the APEX reference value.

- The following information can be confirmed with the Apex Connect Unit:
  - If the instrument reading approaches the value of the APEX reference value, an alarm will beep rapidly.
  - If the reading reaches or passes the value of the APEX reference value, the alarm will beep continuously, and the screen will blink.
- The measured value range can be reviewed with the lamps of the [Main] button on the motor handpiece.
  - If the reading reaches or passes the value of the APEX reference value, the [Main] button of the motor handpiece will blink.

Lamp Color	Lamp Status	Measured Value Range (mm)
Blue	On	30 – 11
Yellow	On	10 – 01
Red	On	00 – -5

- To stop the motor operation, press the [Main] button. Here, the memory number and motor operation can be changed as settings on the main screen.
- If [CW], [CCW], [RCP] or [Adaptive] are selected as the motor operation method, press and hold the [Main] button on the main screen to rotate the motor in the opposite direction of the current setting.
  - The motor rotates in the opposite direction only while the button is pressed and stops when released.
  - Here, the operation screen does not appear on the display, and the main screen remains on.

5. To end use, press any two buttons on the motor handpiece at the same time for 2 seconds, then press and hold the [⏻] button on the Apex Connect Unit. The power and the display of both are turned off.
6. To remove pull the lip hook connector from the probe cord.

7. Pull out the USB connectors at both ends of the probe cord from the motor handpiece and Apex Connect unit
8. Refer to "**Disassembling the Device**" in the Elements Connect Endodontic Motor Instructions for use to detach the Ni-Ti file and contra angle from the motor handpiece.
9. Refer to "**Cleaning, Disinfection, Lubrication, Packaging and Sterilization Instructions**" from the Elements Connect Endodontic Motor instructions for use to manage the device and accessories.

PRECAUTION

Be sure to clean and sterilize the lip hook and contra angle.

MAINTENANCE

After using the device, be sure to keep it clean for the next use. Also, if the device is stored for a long period of time, clean it before use.

CLEANING, DISINFECTION, LUBRICATION, PACKAGING AND STERILIZATION INSTRUCTIONS

NOTE:

The instructions provided in the section "**Cleaning, Disinfection, Lubrication, Packaging and Sterilization Instructions**" have been validated by the manufacturer of the medical device as being capable of preparing a medical device for use.

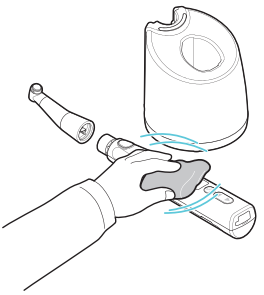
Health Care facilities are responsible for calibration of sterilization equipment and training of staff on infection control and sterilization according to the manufacturers' instructions

PRECAUTION

- The use of automated cleaning devices is not recommended for the cleaning of the above components.
- Do not sterilize the contra angle and lip hook in a chemical sterilization unit as it might corrode its components.

1 Cleaning and Disinfection: Motor Handpiece and Charging Base

- Clean all the surfaces with CaviWipes™ or a cloth lightly moistened with other intermediate level disinfectant per manufacturer instructions.
- Use a cotton swab and a small, soft brush moistened with CaviCide™ or other intermediate level disinfectant to remove any soil that may have accumulated in crevices (e.g. between Button and the body of the device, between the LCD display and the body of the device). Wipe the device with additional CaviWipes™ or cloths lightly moistened with intermediate level disinfectant until no visible soil is detected on the cloth. Visually inspect the device/charging base to assure cleanliness. If any contamination is visible, repeat the cleaning steps. Use one more CaviWipes™ or a cloth moistened with disinfectant to ensure that no residual contaminants are left on the device.
- Use a clean cloth lightly moistened with distilled water and wipe all device surfaces. Device is ready for reuse when all surfaces are visibly dry.



PRECAUTIONS

- Do not use organic solvents such as thinner, benzene, or methanol to clean the device.
- Do not put the device in alcohol or water and be careful not to let foreign substances such as water or dust get inside the device.
- Do not spray the motor handpiece or the base with disinfectants. Use a cloth or a wipe moistened in isopropyl alcohol.

2 Cleaning, Lubrication and Sterilization of the Contra Angle

The contra angle must be lubricated and sterilized after cleaning.

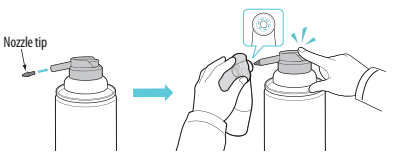
Frequent use and reprocessing may cause wear to the contra angle chuck. If symptoms such as wear or discoloration appears, the contra angle should be replaced.

Cleaning:

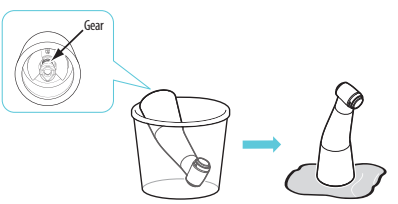
1. Thoroughly clean the contra angle immediately after each patient use, following the cleaning steps to prevent drying of soil and contaminants.
2. The contra angle should be inspected prior to cleaning for the appearance of defects such as deformations or corrosion, which are indicators that the instruments are not in conditions to be re-used and must be discarded.
3. Immerse the contaminated contra angle in tap water for 5 minutes.
4. Using isopropyl alcohol containing tissue (ex. Cavi Wipes), wipe all surfaces twice for 1 minute.
5. Rinse with tap water for 30 seconds.
6. Wipe off the water with a soft cotton cloth.
7. Dry at room temperature for at least 30 minutes.
8. If the device is determined not to be visually clean at the end of the cleaning step, the user should either repeat the relevant previous cleaning steps.

Lubrication and Packaging :

Lubricate the contra angle at least once a day after using the device or before sterilization.



1. Please attach the nozzle tip into the spray. (Note : The nozzle tip is not provided in the package.)
2. Cover the head of the contra angle with gauze or cloth. Hold the contra angle tightly enough not to slip from the hands by the spray pressure.
3. Clean the inside of the chuck by spraying the lubricant toward the file insertion area of the contra angle for about 2-3 seconds while slightly pressing the push button. Repeat 2-3 times until no foreign materials come out.



4. Apply 1-2 drops of oil into the gear area of contra angle and put the contra angle in a paper cup with its head facing down for 10 minutes. Then, place the contra angle on the gauze with its head facing up to allow any excessive lubricants to drain. (Recommended time : 2 hours)
5. Wipe the oil on the surface of contra angle with the tissue and then alcohol gauze.

6. Place the lubricated contra angle in a sterilization pouch which is FDA-cleared and/or ISO 11607/DIN 58953-7 compliant.

Sterilization:

1. Place the contra angle packed in a pouch into an autoclave (pre-vacuum type) and heat it under the following conditions.
2. Recommended sterilization parameters:

Cycle	Pre-Vacuum
Temperature (℃)	132℃ (270℉)
Exposure time (min)	4 minutes
Drying time (min)	30 minutes

3 Cleaning, Disinfection and Sterilization: Lip Hook

After using the device, be sure to keep it thoroughly clean for the next use. And clean everything thoroughly before autoclaving. In order to prevent the dirt on the surface of the device from drying out before cleaning, please wash it as soon as possible after use.

In addition, the reprocessing procedure should minimize delays between steps.

1. Put the lip hook in the tap water for 5 minutes.
2. Thoroughly clean the surfaces of the lip hook with a tissue containing isopropyl alcohol (e.g., CaviWipes).
   - Wipe the surface of the lip hook at least twice in one minute.
   - Clean the surface of the lip hook thoroughly to avoid leaving any residue of contamination.
3. Rinse the lip hook in tap water for 30 seconds.
4. Dry the lip hook with a soft cloth, and dry at room temperature for at least 30 minutes.

NOTE:

- Health Care facilities are responsible for making sure that the sterilization equipment is calibrated according to the manufacturer's manuals and specifications. In addition, health care facilities are responsible for training their staff on infection control, proper sterilization and disinfection procedures.
- Make sure that the sterilization pouches are suitable for steam sterilization and comply with the national guidelines, standards, and requirements.
  - ISO 11607
  - For USA: Use FDA-cleared accessories

1. Place the cleaned lip hook into an autoclave pouch.
2. Recommended sterilization parameters:

Cycle	Gravity Displacement	Pre-Vacuum
Temperature (℃)	121℃ (250℉)	132℃ (270℉)
Exposure time (min)	30 minutes	4 minutes
Drying time (min)	30 minutes	30 minutes

3. Take out the lip hook from the autoclave and dry it while keeping it packed in the pouch for at least 30 minutes at room temperature.

PRECAUTIONS

- Maximum number of re-sterilization of lip hook is 250 times.
- Immediately after sterilization, the lip hook can be very hot. Cool it sufficiently before use as there is a risk of injury such as burns.
- Do not leave the lip hook inside the autoclave after sterilization.
- Never sterilize components other than the lip hook.

4 Cleaning and Disinfection : Probe Cord

1. Wet a small soft brush in ethanol for disinfection (ethanol 70-80 vol%) to remove all contaminants from the crevices and all surfaces. (repeat 20 times)
2. Wipe all surface thoroughly using a cloth (or gauze) lightly dampened in ethanol for disinfection. (repeat 20 times)
3. Wipe all surfaces with a cloth moistened with distilled water, then dry with a clean, dry cloth.
4. After visual inspection to ensure cleanliness, repeat the cleaning steps if contamination is visible.

STORAGE AND DISPOSAL

1 Storage:

After sterilization, place the pouches containing the contra angle in a dry and dark place such as a closed cupboard or a drawer.

- Follow the instructions provided by the pouch manufacturer regarding storage conditions and maximum allowed time in storage.

2 Disposal

- For proper disposal always follow local and regional laws (i.e. The Waste Electrical and Electronic Equipment - WEEE).

TROUBLESHOOTING GUIDE AND TECHNICAL SUPPORT

If a problem occurs with the device, refer to the guide below. If this guide does not resolve the problem, contact Customer Care at 1-800-537-7123 (Available from 6:00am to 4:00pm PST). Outside of these hours, email us at KerrCustCare@kavokerr.com. Alternatively, contact the dealer or Kerr Endodontics sales representative.

1 Motor Handpiece

Problem	Cause	Solution
The power does not turn on.	The battery is dead.	Charge the battery or replace it with a new one.
	The battery is not installed properly.	Check the battery connection, and install the battery properly again.
	Motor handpiece malfunction.	Please contact where the device was purchased or with the customer service.
Pressing the main button does not work.	The contra angle is not properly attached.	Refer to "**Initial Set-up**" to properly attach the contra angle to the hand-piece.
	The head of the contra angle is blocked.	Refer to "**Cleaning, Lubrication and Sterilization of the Contra Angle**" to clean and lubricate or replace with a new one.
The motor handpiece turns off during use.	The battery is dead.	Charge the battery or replace it with a new one.
No beep sounds.	The alert sound volume is set to 'VOL.0'.	Refer to "**System Settings**" and ad-just the alarm volume.
ERROR CODE #1	There is something wrong with the motor speed sensor.	Turn off and turn on the device again. If the problem persists, please con-tact customer service.
Linkage to Apex Connect [EAL] does not appear on the main screen of the motor handpiece	Make sure the connectors to the Elements Connect Motor and the Apex Connect are correctly set. There is something wrong between the Elements Connect Motor and the Apex Connect connections.	Please contact customer service.

2 Charger Base

Problem	Cause	Solution
When the battery is installed, the charging lamp indicator does not light up.	The AC/DC adapter or power cord is not properly connected	Refer to "**INITIAL USE** to properly connect the AC/DC Adapter or power cord.
	The battery is not installed properly.	Check the battery connection and install the battery properly again.
	The battery is faulty	Replace it with a new battery.
The charging lamp indicator flashes.	The battery is not installed properly.	Check the battery connection and install the battery properly again.
	The battery is faulty	Replace it with a new battery.
	The charger is faulty	Please contact customer service.

SPECIFICATIONS

1 General Specifications

Item	Description
Protection from electric shock	Internal powered ME equipment Type BF Applied Part
Degree of Protection (IEC 60529)	IPX0
Applied part	Contra angle
Battery	Lithium-ion battery

2 Device Specifications

Item		Description
Motor handpiece	Speed range	100–1,000 rpm
	Torque range	1.0–4.0 Ncm
	Rated input	3.7 V DC / 800 mAh (Lithium-ion battery)
	Dimensions	202 X 28 X 28 mm (including battery and contra angle)
	Weight	130 g (including battery and contra angle)
	Operation mode	Continuous operation
AC/DC Adapter	Input voltage	100–240 V, 50–60 Hz
	Output voltage	9.0 V DC
	Output current	2.0 A

Recommended root canal instrument according to ISO 1797-1 : Nickel-titanium files, suitable for 360° rotation, shaft diameter 2.35mm (type 1)

3 Environmental Specifications

Item		Description
Operation	Temperature	10–35°C (50–95°F)
	Humidity	30–75%
	Atmosphere pressure	700–1060 hPa
Storage and transportation	Temperature	-20–60°C (-4–140°F)
	Humidity	5–90%
	Atmosphere pressure	700–1060 hPa

WARRANTY

Kerr Endodontics warrants the system (excluding batteries) to be free from defects in materials or workmanship for period of 2 years from the original date of purchase. The batteries are warrantied for a period of 6 months from the original date of purchase. If the system shows any defect within the warranty period that are not excluded from this warranty, Kerr Endodontics shall, at its sole discretion, either replace or repair the device using suitable new or reconditioned parts.

In the case other parts are used which constitutes an improvement, Kerr Endodontics may, at its discretion, charge the customer for the additional cost of these parts. If the warranty claim provides to be justified, the product will be returned to the user freight prepaid. Warranty claims other than those indicated herein, are expressly excluded.

EXCLUSIONS

Damage and defects caused by the following conditions are not covered by the warranty:

- Improper handling/disassembly/modifying, neglect, or failure to operate the unit in compliance with the instructions given in this manual.
- Force majeure or any other condition that is beyond the control of Kerr Corporation.
- Damage caused by customer misuse or uses other than those specified.

DISCLAIMER

For safety reasons, this product should be used with accessories manufactured and sold by Kerr Corporation. Any use of non-authorized accessories or not following any of the instructions for use is done so at the operator's risk and voids the warranty. Kerr Corporation does not assume any responsibility for incorrect diagnosis due to operator error or equipment malfunction.

Product Name	Elements Connect	**Model**	
Warranty	Device: 2 years / Accessories: 6 months		
Manufacturer	**Distributed By:** Kerr Corporation 1889 W. Mission Blvd. Pomona, CA 91766 USA 1-800-KERR-123 | kerrdental.com **Manufactured By:** Meta Systems Co., Ltd. #1214-18, Sicox tower 12F, 484 Dunchon-daero, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13229, Korea		
Sales Pace Info.	Business name: Phone: Address:		

PART NUMBERS

Part Number	Components
815-1800	Elements Connect Cordless Motor Kit - US
815-1801	Elements Connect Cordless Motor Kit - EU
815-1804	Elements/Apex Connect Power Cord - US
815-1805	Elements/Apex Connect Power Cord - EU
815-1806	Elements Connect AC/DC Adapter
815-1808	Elements Connect Contra Angle
815-1809	Elements Connect Charging Base
815-1810	Elements Connect Battery Pack

ELECTROMAGNETIC COMPATIBILITY

This device has been tested for compliance with electromagnetic tests according to EN60601-1-2 and is designed to protect against harmful interference when installing and using the device following the instructions. This device can generate, use, and discharge radio wave energy. This device may cause harmful interference with other nearby equipment. In this case, the user should use one or more of the recommendations described below to resolve the interference.

- Increase the distance between the device and the device causing the interference.
- Reinstall the device and restart.

- Contact the dealer, Kerr Endodontics sales representative or Customer Care.

Phenomenon	Basic EMC standard or test method	Test level/requirement
Mains terminal disturbance voltage	CISPR 11 EN 55011	Group1, Class A
Radiated disturbance	CISPR 11 EN 55011	Group1, Class A
Harmonic Current Emission	IEC 61000-3-2 EN 61000-3-2	Class A
Voltage change, Voltage fluctuations and Flicker Emission	IEC 61000-3-3 EN 61000-3-3	Pst: 1, Plt: 0.65, Tmax:0.5, dmax: 4%, dc: 3.3%
Electrostatic Discharge Immunity	IEC 61000-4-2 EN 61000-4-2	± 8 kV/Contact ±2, ±4, ±8, ±15 kV/Air
Radiated RF Electromagnetic Field Immunity	IEC 61000-4-3 EN 61000-4-3	3 V/m 80 MHz - 2.7 GHz 80% AM at 1 kHz
Immunity to Proximity Fields from RF wireless Communications Equipment	IEC 61000-4-3 EN 61000-4-3	Table 9 in IEC 60601-1-2: 2014
Electrical Fast Transient/Burst Immunity	IEC 61000-4-4 EN 61000-4-4	±2 kV, 100 kHz repetition frequency
Surge Immunity	IEC 61000-4-5 EN 61000-4-5	Line to Line ±0.5 kV, ±1 kV Line to Ground ±0.5 kV, ±1 kV, ±2 Kv
Immunity to Conducted Disturbances Induced by RF fields	IEC 61000-4-6 EN 61000-4-6	3 V 0.15 MHz - 80 MHz 6 V in ISM bands Between 0.15 MHz and 80 MHz 80% AM at 1 kHz
Power Frequency Magnetic Field Immunity	IEC 61000-4-8 EN 61000-4-8	30 A/m 50 Hz and 60 Hz
Voltage dips	IEC 61000-4-11 EN 61000-4-11	0 % UT: 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°
		0 % UT; 1 cycle and 70 % UT; 25/30 cycles Single phase: at 0º
Voltage interruptions	IEC 61000-4-11 EN 61000-4-11	0 % UT; 250/300 cycle

BUYER INFORMATION

Business Name_____

Address _____

_____

Phone _____

Date of Manufacture _____

Serial Number _____

Date of Purchase_____

Purchase Price/Quantity _____

Distributed By Kerr Corporation
1889 W. Mission Blvd.
Pomona, CA 91766 USA
1-800-KERR-123 | kerrdental.com

Manufactured By
Meta Systems Co., Ltd.
#1214-18, Sicox tower 12F, 484
Dunchon-daero, Jungwon-gu
Seongnam-si, Gyeonggi-do
13229, Korea

MADE IN KOREA

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