

Revised date: Sept, 2023

Version/Times: B/4

MEDICAL ELECTRIC SAW DRILL

Operating Manual **N Series**

Please read this manual carefully before
use and keep it properly

FOREWORD

Dear user

Thank you for using this product! This manual contains important contents that must be understood for safe and proper use of the product.

The instruction manual is a part of the product. Therefore, this manual should be placed in a proper position for easy reference at any time for the whole lifetime. The product must be operated by trained personnel with relevant knowledge and experience. All personnel must read this instruction carefully before using this product.

This product is safe and reliable to use, except for the risks arising from special factors like operated by non-professionals or used for other purposes, etc. Therefore, please follow strictly the following rules to avoid accidental use. The product must be operated by professionals.

Instructions are subject to change without prior notice. Please put the manual in a proper position for reference.

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Product introduction

I. Product information

Product Name: ELECTRIC SAW DRILL, ELECTRIC SAW, ELECTRIC DRILL

II. Main performance parameters

Sequence	Product description	Performance parameters
1	ELECTRIC SAW DRILL	Main performance parameters: Non-loading rotation speed or frequency of electric saw and drill: i. Drill rotating speed 120rpm ii. Saw frequency: ≥ 6000 times/min iii. Output power: $\geq 50W$
2	ELECTRIC SAW	iv. Temperature rise: the temperature rise of the shell is no more than 50°C after 5min of non-loading operation; v. Non-loading noise: drill saw non-loading noise $\leq 75dB(A)$;
3	ELECTRIC DRILL	vi. Electric saw & drill saw blades shall be heat treated and its hardness shall be no less than 30 HRC.

III.The structural composition

This product is mainly composed of handpiece, drill components, saw components, accessories, battery and charger.

i.ELECTRIC SAW DRILL



iii.ELECTRIC DRILL



ii.ELECTRIC SAW



IV.The scope of application

Applied in bone drilling and cutting in orthopedic surgeries for medical organization.

V. Contraindications, precautions, warnings and explanatory notes

i. Contraindications

NO

ii. Precautions

(i) Check whether the radial run-out of the bit is intact before use. The bit with large radial run-out cannot be used. Check the sharpness of the drill bit. The drill body should be fixed during drilling without loosening according to conventional surgical methods.

(ii) The drill bit must be firmly fixed well with drill chuck key to avoid accidents. Products and accessories should be placed in a dry place to prevent corrosion after use.

(iii) The battery shall not be disinfected by high temperature, high pressure or stay in the machine for a long time, take out battery after the operation. If power is cut off during the operation (the handpiece does not work), the backup battery should be replaced immediately.

(iv) If there is abnormal sound when using, stop using it immediately. Please contact with the manufacturer or distributor immediately and return the machine to the manufacturer for repairing.

(v) Charge the battery immediately after use. If the battery is not used, charge it every three months to prevent battery loss.

iii. Warning and suggestive notes

According to the Annex IX of MDD93/42/EEC, rules 9, the product is subject to :Class II a. The medical electric drill saw is classified according to the protection of electronic equipment from shock and vibration. The motor belongs to B-type equipment of internal power supply, and the charger belongs to class II B-type ordinary equipment; The equipment shall not be used with a mixture of flammable anesthetic gas or carbon oxide; Sterilization must be carried out before use.

Supplementary external mark:  Working schedule: Short time operation
Each startup time shall not exceed 5min.

Marking pattern description:  Class II equipment  B-type equipment

Rotation mark: **F**: Forward **R**: Reverse **S**: Stop  Operation

Battery cover marking:  Unlock  Lock

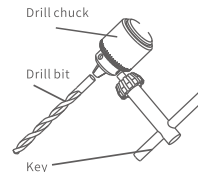
Recycling marks for electronic products at the end of their life: 

VI. Installation and dis-assembly

This product is professional medical device, the installation and dis-assembly must be performed by medical personnel with appropriate technology or with appropriate professional training.

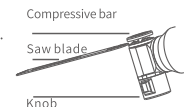
i. Installation and dis-assembly of drill bits

- (i). Loosen the chuck by turning counterclockwise with the drill chuck key;
- (ii). Insert the prepared bit into the three-jaw hole
- (iii). Turn the drill chuck key clockwise and tighten it vigorously.
- (vi). Conversely, the drill bit can be removed



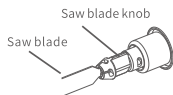
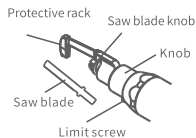
ii. Installation and removal of oscillating saw blade

- (i). Turn the knob counterclockwise to lift the pressure bar;
- (ii). Insert the blade into the interface along the guide direction. Align the seven holes of the blade with the seven lugs of the product. Press down gently to make the lugs pass through the saw blades holes.
- (iii). Turn the knob clockwise and pull down the pressure bar Locking saw blade;
- (vi). Conversely, the saw blade can be removed.



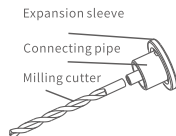
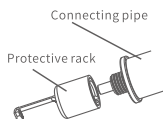
iii. Installation and removal of sternal saw/reciprocating saw blade

- (i). Hold the knob with one hand, apply force to the limit screw, and rotate the knob;
- (ii). Pull the protective rack with the other hand, and the protective rack can be removed;
- (iii). Rotate the saw blade knob;
- (iv). Aim the saw blade at the installation slot, loosen the saw blade knob, and then saw blades is installed well.
- (v). Repeat the operation with serial number 1, insert the protection frame into the slot;
- (vi). Release the knob, the protection frame is fixed, and the installation is completed;
- (vii). Conversely, the saw blade can be removed.



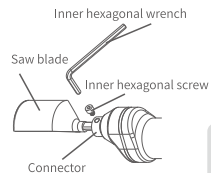
iv. Installation and removal of cranial milling cutter

- (i). Rotate the protective frame clockwise to lower the protective frame;
- (ii). Pull back the expansion sleeve;
- (iii). Insert the milling cutter into the jack and loosen the expansion sleeve to make the milling cutter stuck in the card slot;
- (iv). Tighten the protection rack counterclockwise and the installation is completed;
- (v). Conversely, the cranial milling cutter can be removed.



v. Installation and removal of TPLO saw blade

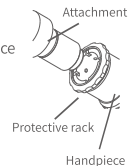
- (i). Loosen the inner hexagon screw with the hexagon wrench;
- (ii). Insert the triangular flat position of the saw blade into the triangular hole of the interface of the handpiece;
- (iii). Tighten the hexagon screw with the hexagon wrench and complete the installation;
- (iv). Detachable on the contrary.



vi. Installation and removal of drill saw adapters.

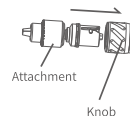
- (i). Press down the expansion sleeve on the handpiece;
- (ii). Align the assembly installation position with the handpiece interface, and pay attention to the phase position;
- (iii). After insertion, loosen the expansion sleeve, jam the drill or saw adapter and complete installation;
- (iv). Converse to detach components.

Type A






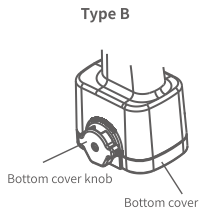
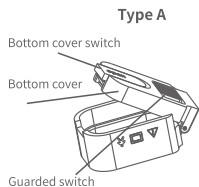
- (i). Align the assembly installation position with the handpiece, and pay attention to the phase position;
- (ii). Turn the knob on the handpiece;
- (iii). Release the knob after insertion, jam the drill or saw adapter and complete installation;
- (iv). Converse to detach components.



Type B



vii. Opening and closing of the bottom cover

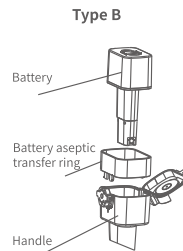
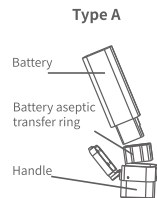
- (i). Push the guided switch to  when opening the bottom cover;
- (ii). Push and press the bottom cover switch to  open the bottom cover;
- (iii). Push the safety switch to  when closing the bottom cover;
- (iv). Press the bottom cover to the handle cover and hear the "click" sound;



- (i). When opening the bottom cover, select the knob to the position  to open the bottom cover;
- (ii). When closing the bottom cover, close the bottom cover and turn the knob to the position .

viii. Battery installation

- (i). The battery should not be in direct contact with the handpiece to prevent pollution;
- (ii). To install the battery, first install the battery aseptic transfer ring on the handle, install the battery into the battery bin through the battery aseptic transfer ring, press into position, close the bottom cover, and move the dial block to lock the bottom cover.



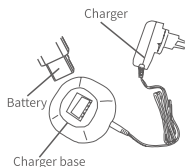
- (i). The battery should not be in direct contact with the handpiece to prevent pollution;
- (ii). To install the battery, first install the battery aseptic transfer ring on the handle, install the battery into the battery bin through the battery aseptic transfer ring, press into position, close the bottom cover, and move the dial block to lock the bottom cover.

VII. Operating instructions

This product must be disinfected before use and tested before use after disinfection. The method is: insert the corresponding battery for the handpiece, press the trigger gently, the motor shall rotate, switch forward and reverse, the motor work, or else, the handpiece has a problem, then please stop using immediately, contact the manufacturer or distributor to send product back to the manufacturer for maintenance.

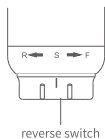
i. Battery charging

- (i). Plug the charger into the power supply, and the blue green light flashes alternately to indicate that the self-test is qualified and the charger enters the standby state;
- (ii). Insert the battery into the charger base. The blue light is always on to indicate charging, the green light indicates full, and the blue light flashes to indicate an error.



ii. Forward and reverse operation

- (i). When you need forward rotation, please adjust the knob mark to the corresponding F mark.
- (ii). When you need reverse rotation, please adjust the knob mark to the corresponding R mark.
- (iii). Turn the mark to position S to show stop.



iii. Trigger operation

The adjustment of the speed is linear and depends on the extent of pressing the trigger. When turning on the trigger for the first time, you should lightly touch the trigger until it starts, and then press it slowly until it reaches the maximum speed. Quick release of trigger triggers the emergency stop function. This



VIII. Maintenance

This product is maintenance-free. It contains no parts that require maintenance by the user or manufacturer. However, the manufacturer recommends that the function and safety of the product be checked regularly by a professional or hospital technician. It must be checked once before each operation, and be recorded, analyzed and evaluated in time to ensure that the product is in good condition and guarantee the use quality.

IX. Cleaning and sterilization

A. Cleaning: the protection of cleaning after use is same as sterilization, and the handpiece can be wiped clean with gauze soaked in water or alcohol and then store.

B. Disinfection: Product can be used only when passing inspection after disinfection and sterilization according to the hospital standards.

Note: Do not soak any part of the medical electric saw drill in liquid.

Recommended sterilization methods for the handpiece

The handle and accessories are certified to withstand the following steam sterilization procedures.

Steam sterilization cycle parameters

Steam cycle type	Temperature	Steam hold time	Minimum drying time
Forevacuum	132°C/270°F	4mins	8mins
Forevacuum	132°C/270°F	8mins	8mins

Commitment

i: This instrument has no parts that can be disassembled and repaired by non-professionals. If it fails, please contact the company's after-sales service department.

ii: If you need technical information about this medical electric drill, please write to us..

Service Guide

X.Transport and storage conditions

Transport and storage conditions	Ambient temperature range	-10°C~+40°C
	Relatively moderate range	≤90%
	Atmospheric pressure range	500hPa~1060hPa
Equipment operating conditions	Ambient temperature range	5°C~40°C
	Relatively moderate range	≤70%
	Atmospheric pressure range	860hPa~1060hPa
	Charger power	100~240V±10%；50/60Hz±1Hz
	Main power supply (DC)	7.2V/14.4V±10%

Production date: Refer to product certificate
Service life: Five years

XI.Accessories list

Prepare standard configuration and accessories according to product model number and product customer need, such as saw blade, drill bits, battery aseptic transfer ring, drill chuck keys, etc.

Parts List				
No.	Name	Model No.	Quantity	Note
1	Handpiece	XXXX	1pcs	According to customer needs
2	Battery	XXXX	2pcs	According to the handpiece model
3	Charger	XXXX	1pcs	According to the handpiece model
4	Charger base		1pcs	According to the handpiece model
5	Manual		1pcs	
6	Certificate of conformity		1pcs	
7	Three certificates		1pcs	

XII.Electromagnetic compatibility

Guidance and manufacturer's declaration - electromagnetic emission

Electric Saw Drill, Electric Saw and Electric Drill are intended for the use in the electromagnetic environment specified below. The customer or the user should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions GB4842	Group 1	Electric Saw Drill, Electric Saw and Electric Drill 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 GB4842	Class A	Electric Saw Drill, Electric Saw and Electric Drill 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 purposes.
Harmonic emissions GB17625.1	Not applicable	
Voltage fluctuations flicker emissions GB17625.1	Not applicable	


Guidance and manufacturer's declaration - electromagnetic immunity

Electric Saw Drill, Electric Saw and Electric Drill are intended for use in the electromagnetic environment specified below. The customer or the users should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge GB/T 17626.2	± 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%.
Electrostatic transient / burst GB/T 17626.4	± 2 kV for power supply lines	± 2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge GB/T 17626.5	± 1 kV wire to wire	± 1 kV wire to wire	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 GB/T 17626.11	0% UT; 0.5 cycle g) At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0% UT; 1 cycle and 70% UT; 25/30 cycles Single phase: at 0° 0% UT; 250/300 cycle	0% UT; 0.5 cycle g) At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0% UT; 1 cycle and 70% UT; 25/30 cycles Single phase: at 0° 0% UT; 250/300 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Electric Saw Drill, Electric Saw and Electric Drill require continued operation during power mains interruptions, it is recommended that the Electric Saw Drill, Electric Saw and Electric Drill be powered from an uninterruptible power supply or a battery.
Power frequency (50 Hz) magnetic field	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Guidance and manufacturer's declaration – electromagnetic immunity

Electric Saw Drill, Electric Saw and Electric Drill are intended for use in the electromagnetic environment specified below. The customer or the user should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment –guidance
Conducted RF GB/T 17626.6	3 V(Effective value) 150 kHz to 80 MHz	3 V (Effective value)	Portable and mobile radio frequency communication equipment should not be used in any part of Electric Saw Drill, Electric Saw and Electric Drill, including cables, than the recommended isolation distance. The distance should be calculated by the formula corresponding to the transmitter frequency. Recommended isolation distance $d=1.2$ $d=1.2$ 80MHz~800MHz $d=2.3$ 800MHz~2.5GHz Where: P---According to the maximum output power of the transmitter provided by the transmitter manufacturer, in watts (w); d---Recommended isolation distance, in meters (m)
Radiated RF GB/T 17626.3	3 V(Effective value) 80 MHz to 2.5 GHz	3 V/m	The field strength of the fixed RF transmitter is determined by surveying the electromagnetic field a, and in each frequency range b should be lower than the compliance level. Interference may occur near equipment marked with symbols as beside. 

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.


NOTE 2 These guidelines may not apply in all situations. Electromagnetic 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 Electric Saw Drill, Electric Saw and Electric Drill are used exceeds the applicable RF compliance level above, Electric Saw Drill, Electric Saw and Electric Drill should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Electric Saw Drill, Electric Saw and Electric Drill.

b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.

Recommended isolation distance between portable and mobile video communication equipment and Electric Saw Drill, Electric Saw and Electric Drill

Electric Saw Drill, Electric Saw and Electric Drill are expected to be used in an electromagnetic environment with controlled radio frequency radiation disturbance. According to the maximum rated output power of communication equipment, the purchaser or user can prevent electric magnetic waves by maintaining the minimum distance between portable and mobile radio frequency communication equipment (transmitter) and Electric Saw Drill, Electric Saw and Electric Drill as recommended below interference.

Interference test	IEC60601 test level	Coincidence level	Electromagnetic
Maximum rated output power of the transmitter	Corresponding to the isolation distance of the transmitter at different frequencies/m		
	150kHz~80MHz $d=1.2$	80MHz~800MHz $d=1.2$	800MHz~2.5GHz $d=2.3$
0, 01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3 
100	12	12	23

For the maximum rated output power of the transmitter not listed in the above table, the recommended isolation distance d , in meters (m), can be determined by the formula in the corresponding transmitter frequency column, where P is the emission provided by the transmitter manufacturer. The maximum rated output power of the machine, in watts (w).

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 from structures, objects and people.