

超音波カッター / Ultrasonic Cutter

Sonic Cutter ZERO

取扱説明書 / OPERATION MANUAL

日本語: P1 - P20 / English: P21 - P41 / French: P43 - P45



Thank you for your purchase of Sonic Cutter ZERO Ultrasonic Cutter. This product is a device that can be used for cutting and deburring of plastic materials, rubber, urethane, etc. as well as for cutting sheets, cloths, etc. Please read this manual carefully before use. We hope you will enjoy using this product for many years to come. Please keep this manual in a place where the user can read or refer to it at all times.

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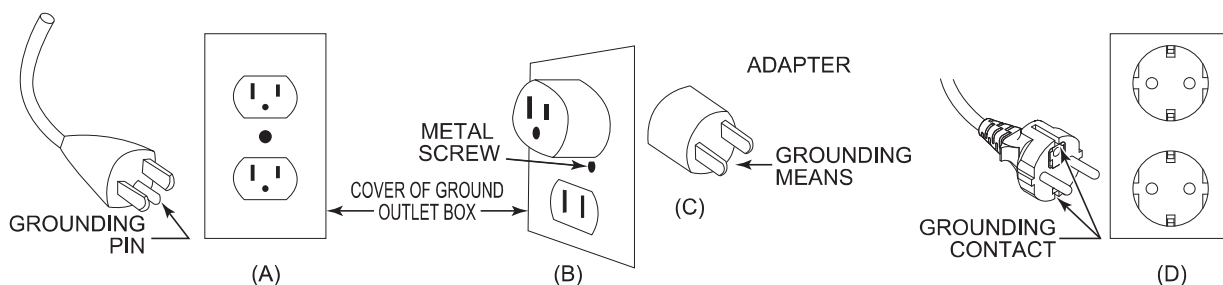
1 Safety Precautions

- Please read the operation manual thoroughly, make sure you understand all warnings and cautions prior to operating the system and only use the system in the manner intended.
- These warnings and cautions are intended to avoid potential hazards that could result in personal injury or damage to the device. These are classified as follows in accordance with the seriousness of the risk.

Class	Degree of Risk
⚠ WARNING	A hazard that could result in bodily injury or damage to the device if the safety instructions are not properly followed.
⚠ CAUTION	A hazard that could result in light or moderate bodily injury or damage to the device if the safety instructions are not followed.
NOTICE	Keep this manual in a safe place for future reference.

■ GROUNDING INSTRUCTIONS

- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This tool is equipped with a power cord having an equipment grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.
- Do not modify the plug provided-if it will not fit the outlet, have the proper outlet installed by a qualified electrician.
- Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment grounding conductor. If repair or replacement of the power cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.
- Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded.
- Use only 3-wire extension cords that have 3-prong grounding plugs and 3-pole receptacles that accept the tool's plug.
- (120V) This tool is intended for use on a circuit that has an outlet that looks like the one illustrated in Sketch A in Figure (below). The tool has a grounding plug that looks like the plug illustrated in Sketch A in Figure (below). A temporary adapter, which looks like the adapter illustrated in Sketches B and C, may be used to connect this plug to a 2-pole receptacle as shown in Sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician. The green-colored rigid ear, lug, and the like, extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.
- (240V) This tool is intended for use on a circuit that has an outlet that looks like the one illustrated in sketch D in figure.
- NOTE: Adapter in (Figure B) is not for use in Canada.



- Use proper extension cord. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. Table (below) indicates the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gauge. The smaller the gauge number, the heavier the cord.

Safety Precautions

English

Ampere Rating		Volts	Total length of cord			
		120V 240V	7.5m (25ft.) 15m (50ft.)	15m (50ft.) 30m (100ft.)	30m (100ft.) 60m (200ft.)	45m (150ft.) 90m (300ft.)
More Than	Not More Than					
0	6		18	16	16	14
6	10		18	16	14	12
10	12		16	16	14	12
12	16		14	12	Not Recommended	

Use the table above for your correct voltage.

⚠ WARNING

- For safety reasons, always wear protective gloves and goggles when using this product.
- Do not drop or impact the product. Strong impacts may result in deformation or damage.
- Do not modify or disassemble this product in any way that is not described in the instruction manual. This can have a significant impact on performance and safety. If the controller is disassembled, you may receive an electric shock due to the high voltage section inside. In the event of malfunction or repair, please contact the place of purchase for repair.
- Be sure to ground the grounding wire of the power cord before use. Failure to do so may result in a malfunction, fire or electric shock.
- Do not use this product in an unventilated room where there is a risk of explosion or near flammable materials. If the tool is in contact with flammable materials for a long periods of time in an oscillating state, it may ignite.
- Use the controller at room temperature in the range of 10 - 40°C (75 - 104°F), with no condensation. Condensation may cause a short circuit or an electric shock.
- Avoid installing the controller in the vicinity of high temperature, high humidity, condensation, corrosive or explosive gases, flammable gases, salt damage, and direct sunlight. Failure to do so may result in a malfunction, fire or electric shock.
- The bottom of the controller also serves as a heat sink. Install it so that the space between it and the work desk is not blocked. A temperature increase can occur inside the controller, causing failure.
- If there is any dust or damage to the threaded part of the blade holder, handpiece, or blade mountings, normal oscillation will not be possible. It can also cause the handpiece to heat up. In addition, the handpiece may generate heat, so be sure to remove any dust before use.
- Make sure the blade is securely installed. If it is not secured firmly, it will cause a loss of power and heat in the handpiece.
- Do not touch the blade or horn during ultrasonic vibration or immediately after the output stops. The blade and horn parts may become hot and may cause injury or burns.
- If oil or other contaminants get into the handpiece, it may cause a malfunction. Do not lubricate the handpiece.
- Damaged main power cord must be replaced with new cord as they may cause fires or electric shock due to a short circuit. Please contact us or your local distributor for details.
- When shipped, the handpiece comes with a blade attached. Remove the cap to avoid touching the blade and causing injury.
- If the blade is over-tightened or cracked, turning the ON / OFF key to "ON" may cause the blade to break off and fall out of the holder.

Safety Precautions

⚠ CAUTION

- The operating environment for this product is 10 - 40°C (75 - 104°F),, humidity is 30 - 75% RH,, and air pressure is 700 - 1,060 hPa. Also, use the controller in a non-condensing environment. If used beyond this range, it may cause malfunctions or damage.
- Store the product in a place where the temperature is between 10 - 50°C, degrees Celsius, the humidity is between 30 - 75% RH, the air pressure is between 500 and 1,060 hPa, and there is no dust, sulfur or salt air.
- When installing the controller, provide a space of 10 cm behind the controller to allow for smooth insertion and removal of the power cord in the event of an emergency.
- Before starting to use the product, please inspect it in advance and make sure that there is nothing wrong. If you notice any abnormality, contact your dealer for repair.
- If the blade or handpiece becomes hot or if a strange noise occurs suddenly during use, stop using it immediately and check the entire system. If the blade is damaged, do not continue to use it. Replace the blade with a new one.
- Before turning on the Main power switch or the controller's ON / OFF key (foot switch), make sure that nothing is in contact with the tip of the handpiece or the blade. Oscillation can be difficult to start if there is contact. Re-cutting in the middle of a cut may not be possible if material is stuck to the blade.
- If you hear an abnormal noise coming from the tip of the handpiece, the blade may be broken in the groove at the tip of the horn, or it may not be installed properly.
- Do not turn the ON / OFF key (foot switch) to "ON" with the cap on the handpiece tip.
- If the blade breaks right off at the base after replacing it, the replacement blade may not be correctly installed. Check the replacement blade for burrs, and replace it with a new blade. Do not use blades with holes in them.

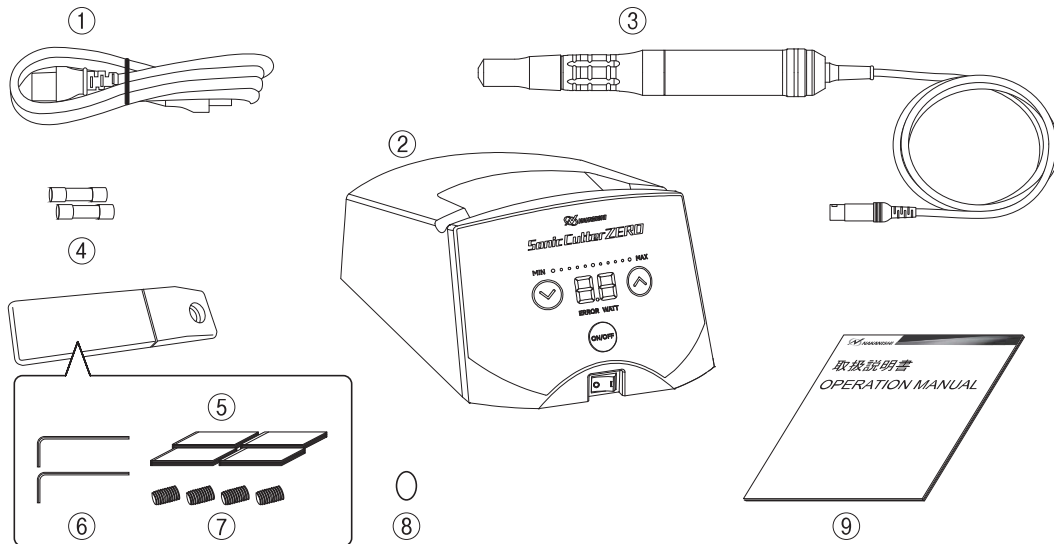
NOTICE

- This product uses an ultrasonic oscillator. The proximity of computers and LAN cables may affect them. Also, if there is a radio receiver nearby, there may be noise.
- When in use, if the operation sounds peculiar to ultrasonic vibration is generated. We recommend that you wear earplugs.
- Set the power switch to OFF after use. Also, unplug the power cord when not in use for long periods of time.
- The user is responsible for operation and maintenance.

2 Product Information

2-1 Bundled items

After opening the package, please check that the contents of "Table - 1 List of Contents " are in order. In the unlikely event that any of the contents of the package are inadequate, please contact " 8 – 2 Contact for inquiries " or the dealer from whom you purchased the product.



English

Table - 1 List of Contents

No.	Name	Code No.	Quantity	Note
①	Main power cord	-	1	2m
②	Controller	7785 (120V)	1	-
		7786 (230V)		
③	Handpiece	7787	1	Cord 3m
④	Fuse	-	2	T1.6AH 250V T:Time lag type H:High interrupting capacity
⑤	Spare blades	-	40	BDC-200P 30° Made by NT Incorporated
⑥	Hexagon wrench	-	2	2mm
⑦	Spare set screws	-	4	M4 x P0.7 x L4
⑧	O-ring	-	1	-
⑨	Operation manual	-	1	-

The above items are included in the "standard set". When purchasing a controller, only items 1, 2, 4 and 9 are included in the package.

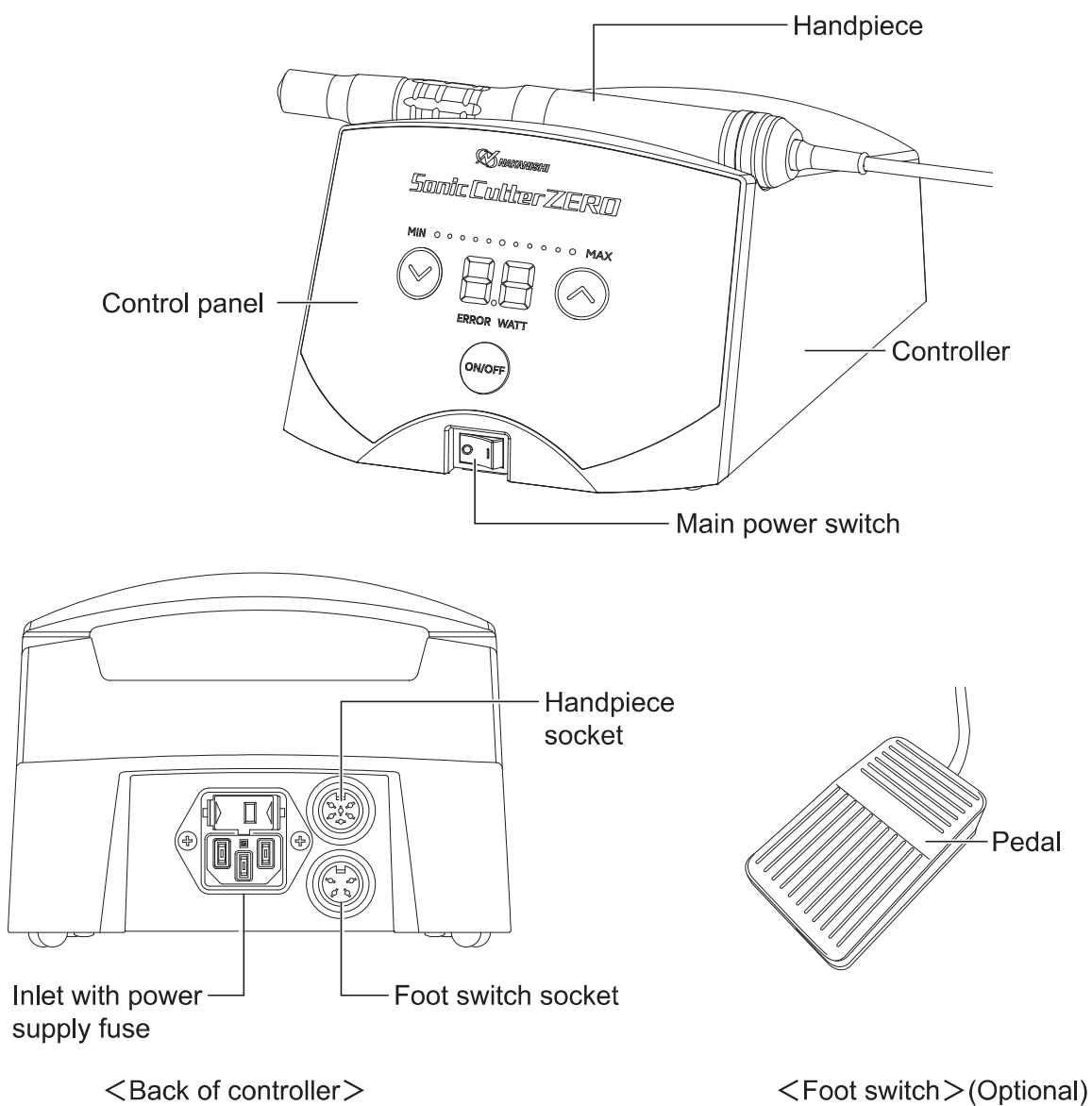
Table - 2 List of Option

Name	Code No.	Description
Foot switch	8103	FC-24

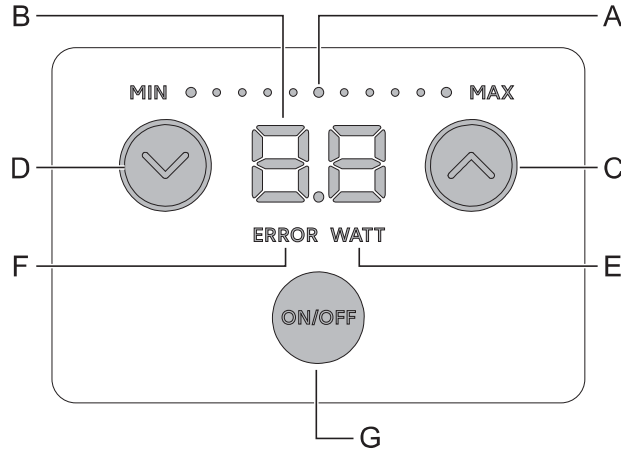
Product Information

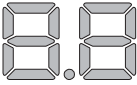
2-2 Names of parts

Overall Structure



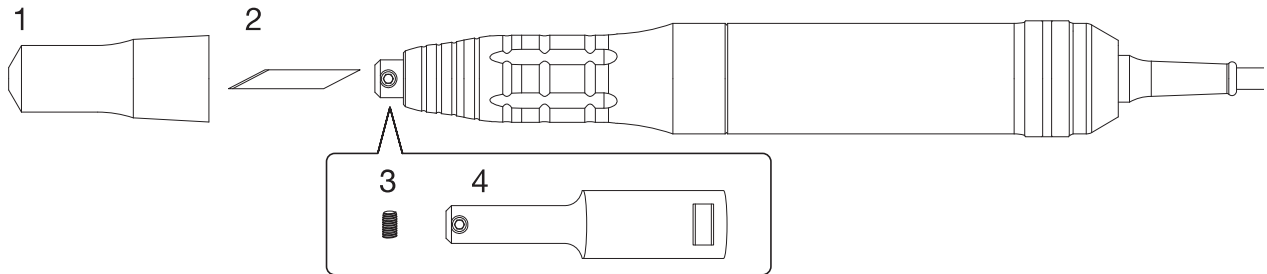
Control panel



No.	indication	name	function
A	MIN MAX	Power level indicator	Displays the power level. About the display. 1 [MIN] (lit) → 1.5 (blinking) → 2 (lit) → 2.5 (blinking)... 10 (lit) → 10.5 (blinking) → 11 [MAX] (lit).Indicates the increase or decrease of the output level by repeatedly lighting and blinking in 21 step variable .
B		Indicator	Displays the watt, amplitude, and ERROR values. Indication display of amplitude. Maximum amplitude is displayed in 50 divisions. Please use this as a guide for cutting.
C		UP key	Increase the power level. Pressing and holding the UP key raises the output level continuously.
D		DOWN key	Reduce the power level. Pressing and holding down the DOWN key allows you to continuously lower the Power level.
E	WATT	WATT	This is displayed when W units are set. (See "6 – 4 Setting the watt display and amplitude display")
F	ERROR	ERROR	This is displayed in case of an error.
G		ON / OFF Key	Start and stop the handpiece.

Product Information

Handpiece

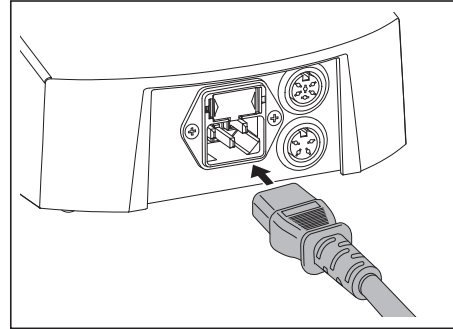
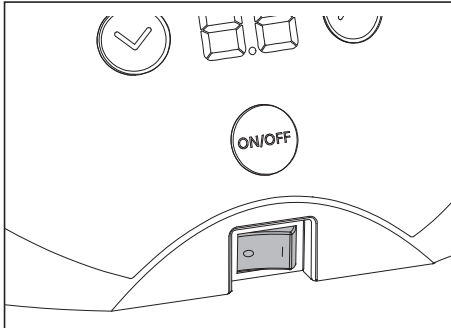


No.	name	Note
1	Blade Protector Cap	This cap to protect the blade from direct contact with the hand. If the inner O-ring is damaged or lost, please use the spare O-ring included in the package.
2	Blade	Please purchase replacement blades at a tool store or stationery store. BDC-200P angle 30° Made by NT Incorporated.
3	Set screw	Screws for attaching the blade. M4 x P0.7 x L4
4	Horn	This is the part where the ultrasonic vibration is output from the handpiece.

3 Preparation before use

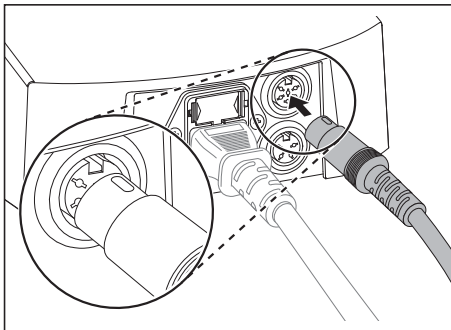
3-1 Connecting the main power cord

- 1 Make sure the main power switch is in the OFF position.
- 2 Insert the main power cord into the Inlet with power supply fuse. Then plug it into a commercial power outlet.



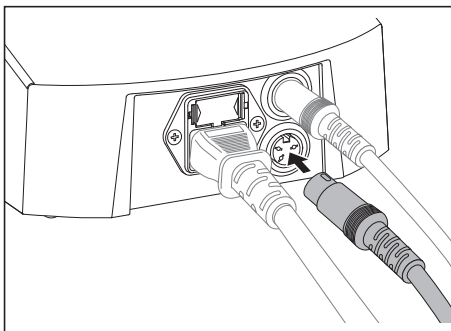
3-2 Connecting the handpiece

Align the plug of the handpiece with the handpiece socket on the back of the controller and insert it.



3-3 Connecting the foot switch(optional)

When using a foot switch, align the foot switch plug with the foot switch socket and insert.

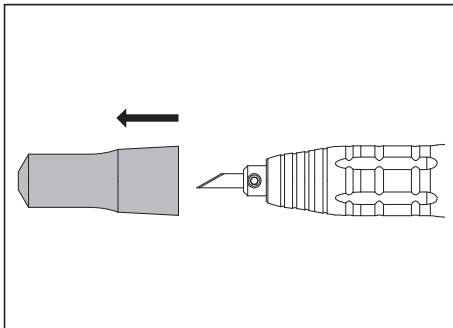


Preparation before use

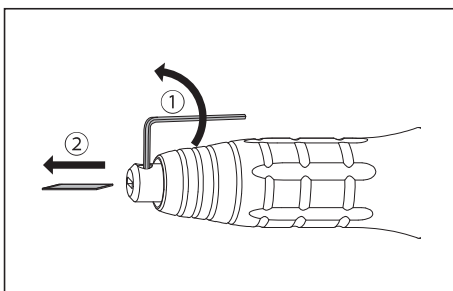
3-4 Replacing the blade

■ The blade is attached to the handpiece. Make sure the blade is securely attached before use.

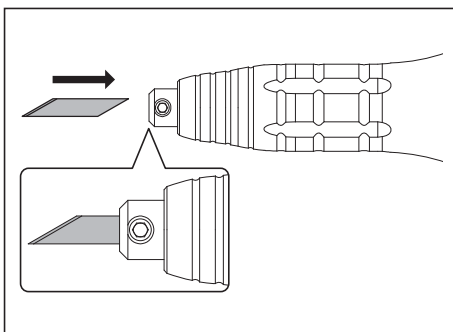
- 1 Remove the cap by pulling it straight off.



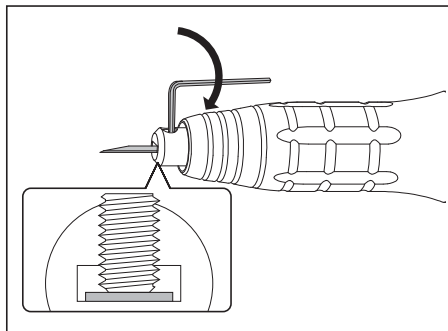
- 2 Loosen the set screw at the end of the handpiece with the supplied hexagon wrench, and remove the old blade.



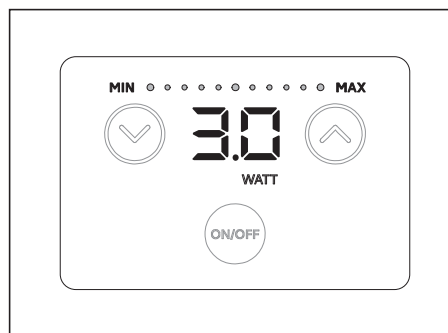
- 3 Insert the blade all the way into the Horn. The correct orientation is having the set screw clamping onto the Angled Flange Marks on the blade.



- 4 Tighten the set screws with a hexagon wrench. When installing a new blade, tighten it in the center so that both ends of the blade do not touch the horn. The standard tightening torque is 1.5 N•m.



- 5 If less than 3.0W when the maximum output power is displayed, the blade has been installed correctly. (See "6 - 4 Setting the Watt display and amplitude display.") 3.0W or less is only a guide. It may increase or decrease depending on the surrounding temperature and environment.



⚠ WARNING

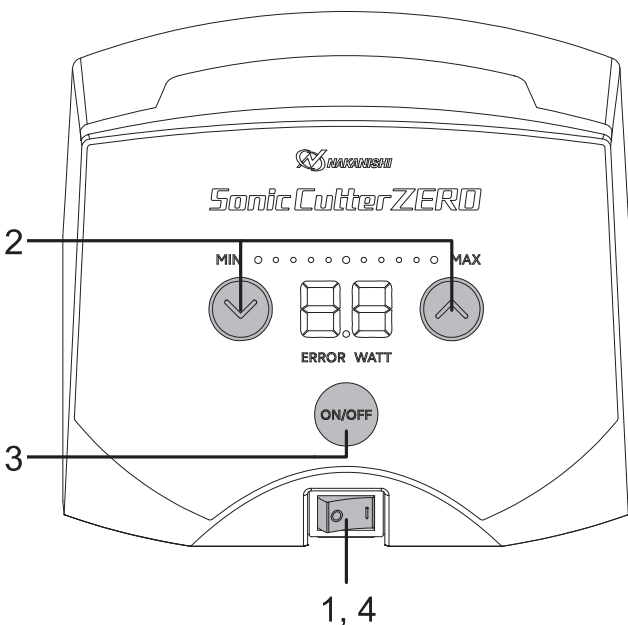
- Replace the blade to avoid injury from touching it .

NOTICE

- Use the blade in a vertical position for easier and more efficient cutting.

4 How to use

Basic Operation



1 Power ON
The LED on the control panel lights up.

2 Power level adjustment
Press and hold down the key to activate the key repeat function.



UP key



DOWN key

3 Startup / Stop
You can start and stop the program in one of the following two ways

(1) Manual ON / OFF	(2) When using the foot switch(Optional)
 Press the ON / OFF key to activate and Stop.	 Activated the handpiece by pressing the pedal. Release the pedal to stop. (See "6 – 5 Setting the foot switch")
If it is started by the ON / OFF key, it can only be stopped by the ON / OFF key.	If activated by a foot switch, it can only be stopped by a foot switch.

The ON / OFF key and the LED on the handpiece light up when starting up.
As long as the LED is on, it is vibrating.



4 Power off

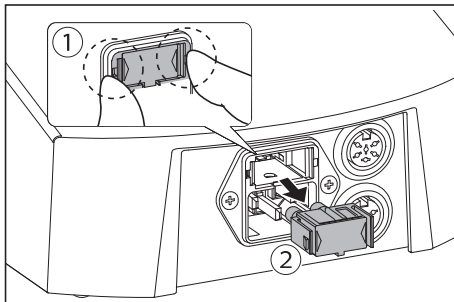
⚠ CAUTION

- Setting the WATT display (see "6–4 Setting the watt display and amplitude display."), use 8W or less for continuous use.
- Using the handpiece at high power can cause the blade to become very hot, which can cause handpiece failure and injury.
- Do not plug or unplug the handpiece and foot switch while the foot switch is depressed. Failure to do so may result in failure or malfunction.

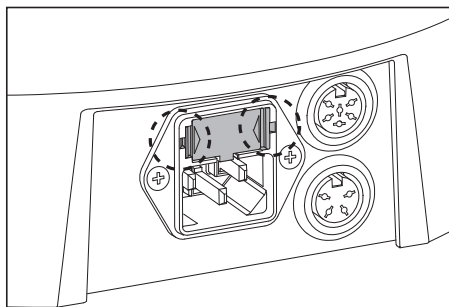
5 Maintenance

5-1 Fuse replacement

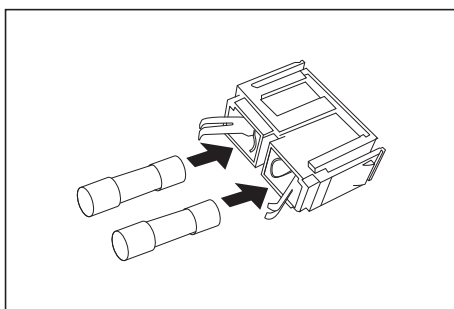
- 1 The fuse box is set in a Inlet with power supply fuse. Push the claws on both sides of the cap inward and pull it out.



- 3 Push the claws of the cap firmly into the inlet box.



- 2 Two fuses are used. When replacing them, replace both with the specified fuses.



⚠ WARNING

- When replacing the fuses, turn off the controller's power switch and then unplug the power cord from the power your input power supply.
- Use fuses specified by us. Designated fuses T1.6AH 250V

5-2 Care

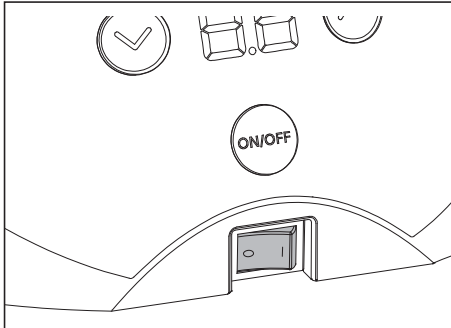
When the controller and handpiece are dirty, wipe them up well with a dry cloth.

6 Setup

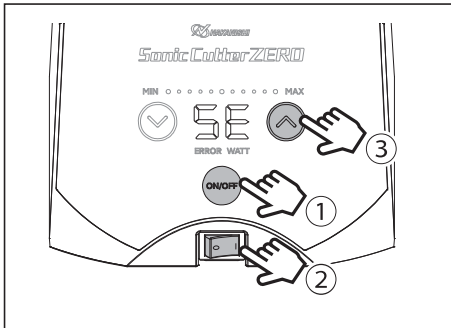
Various settings can be made for your use from below.

6-1 User setting operations

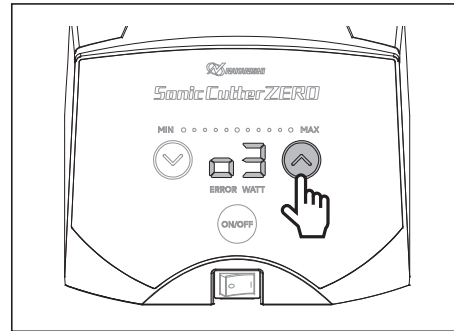
- 1 Set the Main power switch to OFF.



- 2 While holding down the ON / OFF key (1), turn on the Main power switch (2). Press the UP key (3) during the 2 seconds when "SE" is displayed. With a "beep" sound, "03"*1 will appear on the display.



- 3 Press the UP key to select the item you want to set. The display unit will display the following order*2: "03" → "b2" → "P2" → "F0" → "H1" → "03" → ... Press the DOWN key to change the setting value. When the settings are complete, turn the power off and then on again to complete the settings.



*1 "03" is displayed only when it is first set up. After the second time, "00", "01", "02", "03", "05", "08", or "0A", which are stored by the "memory function", will be displayed.

*2 Display order "03" → "b2" → "P2" → "F0" → "H1" → "03" → ... is displayed only at the initial setting. From the second time onwards, the settings are retained by the "memory function".

00	6-2 Setting the forced stop time when not in use	F0	6-5 Setting the foot switch
b0	6-3 Setting of notification volume	H0	6-6 Setting the handpiece heat protection function
P0	6-4 Setting the watt display and amplitude display		

NOTICE

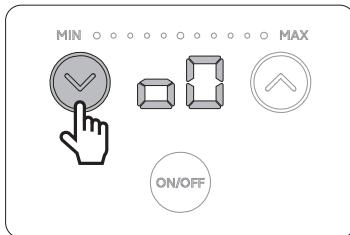
- Memory function
When the power is turned off and then on again, the settings before the power was turned off are retained.
- Pressing the foot switch does not activate the controller during the 6-1 User setting operations.

Setup

6-2 Setting the forced stop time when not in use

This function forces the handpiece to stop if the handpiece has been left unused with the ON / OFF key turned on.

Press the DOWN key to change the setting value.



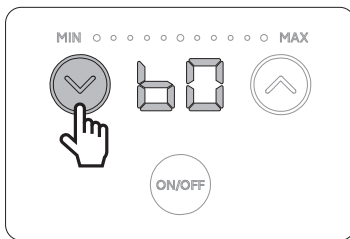
The Indicator shows the following order

"00" → "01" → "02" → "03" → "05" → "0A" → "00" → ...

00	No setup time	03	3 minutes. (factory setting)
01	one minute	05	5 minutes.
02	2 minutes.	0A	10 minutes.

6-3 Setting the notification volume

Press the DOWN key to change the setting value.



The Indicator shows the following order

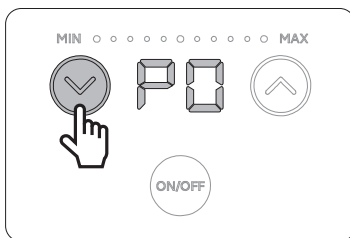
"b0" → "b1" → "b2" → "b0" → ...

b0	No sound.
b1	Notification tone.
b2	Loud notification (default setting)

6-4 Setting the Watt display and amplitude display

The LED display can be switched between "Amplitude" and "Watt".

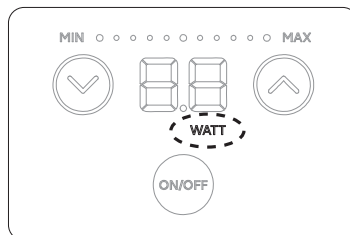
Press the DOWN key to change the setting value.



The Indicator shows the following order

"P0" → "P1" → "P2" → "P0" → ...

P0	Amplitude display
P1	Displayed in 1W increments
P2	Displayed in 0.1W increments (default setting)

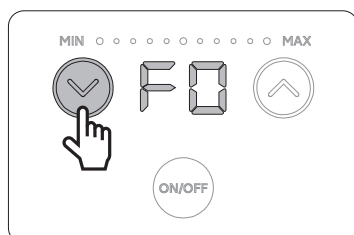


The "watt" will be displayed when the "P1" and "P2" are set to display in W units.

6-5 Setting the foot switch

The setting can be changed from pressing the foot switch to start (ON) or release to stop (OFF), to pressing the foot switch to start (ON) or pressing it again to stop (OFF).

Press the DOWN key to change the setting value.



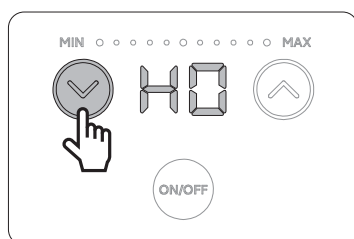
The Indicator shows the following order
"FO" → "F I" → "FO" → ...

FO	Motion operation (depressing the foot switch turns ON and releasing the foot switch turns OFF) (factory default setting)
F I	Alternate operation (press the foot switch to start up, press it again to stop off)

6-6 Setting the handpiece heat protection function

The heat protection function can be set to work if an abnormal heat is detected on the tip of the tool.

Press the DOWN key to change the setting value.



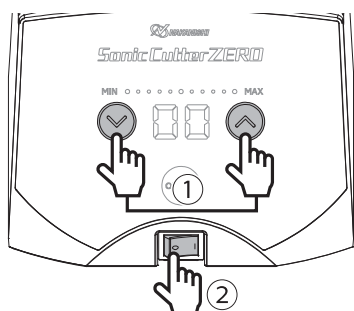
The Indicator shows the following order
"HO" → "H I" → "HO" → ...

HO	unprotected
H I	Protected (default setting)

6-7 Initializing Settings

You can restore the factory default settings.

While pressing the UP key and the DOWN key (1) at the same time, turn ON the power switch (2). Release the UP key and DOWN key after "beep" and a beep sounds to initialize the user settings. When the power switch is turned OFF and then ON again, the output display is set to MIN and the unit starts up in normal mode.



Factory Default Settings

Forced stop time when not in use	03	3 minutes.
Notification volume	b2	Notification Sound Loud
Amplitude display and watt display	P2	Displayed in 0.1W increments
Foot switch	FO	Motion operation (depressing the foot switch turns ON and releasing it turns OFF)
handpiece heat protection function	H I	Protection Values

7 Trouble-shooting

7-1 Error code

If a problem occurs with the product, an error code will be displayed on the display unit on the operation panel.

- 1 Stop the operation at once.
- 2 Press the ON / OFF key, or step on the footswitch again or turn it back on and see if the error is resolved.
- 3 If the error appears again, please refer to the following table for solutions.

Error code	Error Description	How to remedy the Error
00	System error	Please return complete unit for service.
03	Handpiece overload error (Excessive load or force on the blade.)	Reduce the cutting pressure or working force applied to the blade.
04	Amplifier error (Board heat generation error)	Allow the unit to cool and turn it back on. Do not put excess load on the blade. Also, make sure that the blade is not loose. If it is loose, tighten it securely.
05	Excessive input voltage	Please return complete unit for service.
06	Under Input Voltage	Please return complete unit for service.
07	Amplitude feedback residual voltage error	Please return complete unit for service.
08	Handpiece fever abnormality	Check for loose blade. Tighten blade firmly.
09	Start frequency confirmation error	Please return complete unit for service.
10	Resonance frequency search timeout (This is an error if the resonant frequency of the integral tool, tip holder, or tip that is installed is not found.)	Check for loose blade. Tighten blade firmly.
11	Frequency pull-back anomaly (This is an error when the resonance frequency changes significantly during operation.)	Check for loose blade. Tighten blade firmly.
12	Memory failure	Please return complete unit for service.
13	Forced deactivation when not in use	The factory default setting is "3 minutes". (See "6-2 Setting the Forced Stop Time When Not in Use".)
14	Excessive amplitude of the oscillator feedback signal	Please return complete unit for service.

7-2 Failure causes and countermeasures

A malfunction? If you think that this is the case, please check the following again before you call for repairs.

Symptoms	Visual Checklist	Cause	Countermeasure
No vibration.	The control panel is not illuminated.	Main power cord is not plugged in.	Plug the main power cord into an outlet.
		The main power switch is in the OFF position.	Turn the main power switch to the ON position.
		Main power cord breakage.	Replace the main power cord.
		Faulty main power switch.	Please return complete unit for service.
		Fuses are blown.	Replace the fuses. If it gets disconnected again for unknown reasons, please send it to us.
	The LED on the ON / OFF key does not light up.	The ON / OFF key is in the OFF position.	Turn the ON / OFF key to ON.
		The handpiece plug is not fully connected to the Handpiece socket.	Make sure the handpiece plug is securely connected to the handpiece socket.
		Disconnection of the cable.	Please return complete unit for service.
	The LED on the ON / OFF key is on.	Defects in the ultrasonic transducer or controller.	
		Loose blade.	Retighten the blade.
The vibration stopped while I was working.	The ERROR LED is lit.	An abnormal load has triggered the protective function.	Reduce the cutting pressure or working force applied to the blade.
		The output level of the UP key is high.	Use the DOWN key to lower it slightly.
		Abnormal heat generation triggered the handpiece heat protection function.	Turn the main power switch off and let it cool for a while.
		Loose blade.	Retighten the blade.
		Blade edge damaged, dull or bending.	Replace the blade.

Trouble-shooting

Symptoms	Visual Checklist	Cause	Countermeasure
The vibration is weak.	The LED on the ON / OFF key is on.	No standard blade are used.	Replace it with a standard blade.
		Loose blade.	Retighten the blade.
		The Power level indicator is in the minimum position.	Adjust the UP and DOWN keys to the output appropriate for your work.
		There is dust on the blade mounting area.	Remove dust and debris from the blade mounting area.
Strange noises or sudden heat buildup in the handpiece.	The LED on the ON / OFF key or the LED for ERROR is on.	Loose blade.	Retighten the blade.
		Blade edge damaged, dull or bending.	Replace the blade.
		Non Standard blade is being used.	Replace it with a the correct blade.
		There is debris or dust on the blade mounting area.	Remove any dust from the mounting area.
No vibration when using the foot switch.	The LED on the ON / OFF key does not light up.	The foot switch is not plugged in properly.	Make sure the foot switch is plugged in correctly.
		The handpiece plug is not fully connected to the Handpiece socket.	Connect the plug of the handpiece to the handpiece connection socket securely.
		Faulty foot switch.	Please return complete unit for service.
		Disconnection of the cable.	
		Defects in the ultrasonic transducer or controller.	
	The LED on the ON / OFF key or the LED for ERROR is on.	Defects in the ultrasonic transducer or controller.	

8 After-sales service

8-1 Warranty

We provide a limited warranty for our products. We will repair or replace the products if the cause of failure is due to the following manufactures defects. Please contact us or your local distributor for details.

- (1) Defect in manufacturing.
- (2) Any shortage of components in the package.
- (3) Where damaged components are found when initially opening the package.
(This shall not apply if the damage was caused by the negligence of a customer.)

8-2 Contact for inquiries

To ensure that you can purchase and use our products with confidence, we are happy to answer any questions you may have about our products.

Please contact our "Contact Us" for information on how to use the product you purchased, maintenance after purchase, malfunctions, etc.

Contact Us

● For U.S. Market

Company Name	: NSK America Corp. Industrial Div.
Business Hours	: 8:00 to 17:00 (CST) (closed Saturday, Sunday and Public Holidays)
U.S. Toll Free No.	: +1 800 585 4675
Telephone No.	: +1 847 843 7664
Fax No.	: +1 847 843 7622
Website	: www.nskamericacorp.com

● For Other Markets

Company Name	: NAKANISHI INC. 
Business Hours	: 8:00 to 17:00 (JST) (closed Saturday, Sunday and Public Holidays)
Telephone No.	: +81 289 64 3520
e-mail	: webmaster-ie@nsk-nakanishi.co.jp

8-3 Product disposal

When disposal of products is necessary, follow the instructions from your local government agency for proper disposal of industrial components.

9 Specifications

9-1 Specifications

Controller

Model	Sonic Cutter ZERO Controller (NE337)
Oscillation frequency	38kHz - 40kHz
frequency control	Auto-tracking system
Outputs	30W (maximum)
Output adjustment	21 steps variable
Rated input	100V AC - 240V, 50/60 Hz, 24 W
Applicable Fuses	T1.6AH 250V
Overvoltage category	Category II
Pollution degree	Class 2
Max. mains voltage fluctuation	+/-10%
External dimensions	W 161 x D 256 x H 84 mm
Weight	1.4 kg / 3 lbs.

Handpiece

Model	US-40C
Cord length	3 m
Vibration value	2.5m / s ² or less
Weight	120g / 4.2 ounces (excluding cord)
Noise Level at 1m distance	Less than 70dB (A)

Use, transportation and storage environment

	Temperature	Humidity	Air pressure
operating environment	10 - 40°C	30 - 75%	700 - 1,060 hPa
Transport and storage environment	-10 - 50°C	10 - 85%	500 - 1,060 hPa
Max. operation altitude	Less than 2,000m		
This product is for indoor use only.			

9-2 Conformity standards

The products complies with the following overseas safety standards.

North American Safety Standards (UL, CSA)		United Kingdom Conformity Assessed	
	UL 61010-1		
	CSA 61010-1		
European Directive		The Electrical Equipment (Safety) Regulations	
	Low Voltage Directive(2014/35/EU)		EN 61010-1
	EMC Directive(2014/30/EU)		EMS : EN 61000-6-2
RoHS Directive(2011/65/EU)	EMI : EN 61000-6-4	Electromagnetic Compatibility Regulations	EMI : EN 61000-6-4
		The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations	

9-3 Protection Circuitry

■ Protection Features

- 30W or more is detected, the unit will stop operating for safety. (see "7 – 1 Error code"03")
- If the handpiece is pulled out of the connector during operation, it will stop.
- To prevent the handpiece from forgetting to turn it off, the handpiece will stop automatically if it is still unused when it is on. (see "7 – 1 Error code"13") (Time to stop can be changed by user settings. It can also be disabled. see "6 – 2 Setting the forced stop time when not in use")

▲ CAUTION

- If the main power switch is turned on while stepping on the foot switch, it will be disabled for safety reasons. Release the foot switch because the indicator on the operation panel blinks and a notification sounds. The drive prohibit state is lifted and the unit can be used normally.
- If a handpiece temperature rise is detected from the output power, or if the blade is found to be generating excessive heat, the handpiece heat protection function is activated, the display on the control panel flashes and an audible alarm will sound.
After that, it automatically suppresses the output and keeps the temperature from rising, allowing for continuous use. When the temperature drops, the indicator on the control panel stop blinking and the notification sound is automatically cancelled.
(You can also disable it through user settings. 6-6 Setting the handpiece heat protection function")

■ How to clear the error condition with the protection function

If the protection function is activated and the error is stopped, remove the cause of the activation of the protection circuitry and then clear the error state by performing the following operations
Press the ON / OFF key or step on the foot switch again. The ERROR LED goes off and the error state can be cleared.

9-4 Symbol



Note, see Operating Instructions



Conforms to European Directives



United Kingdom Conformity Assessed



Conforms to North American Safety Standards (UL, CSA)



Disposal of products and accessories in accordance with the EU Directive on Waste Electrical and Electronic Equipment (WEEE) (2012/19/EU)



serial number



Caution, high temperature surface

取扱説明書のダウンロード ▶
Download operation manual



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