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OPERATING INSTRUCTIONS

5853305 | SonoCraft® ST-360 Ultrasonic Control Unit

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SONOFILE®

Multipurpose Ultrasonic Polisher Instruction Manual

Oscillator: ST-360 / Transducer: HP-9706

Thank you very much for your purchase of this product.

This document describes the operation instructions and safety precautions and requirements for the use of this machine.

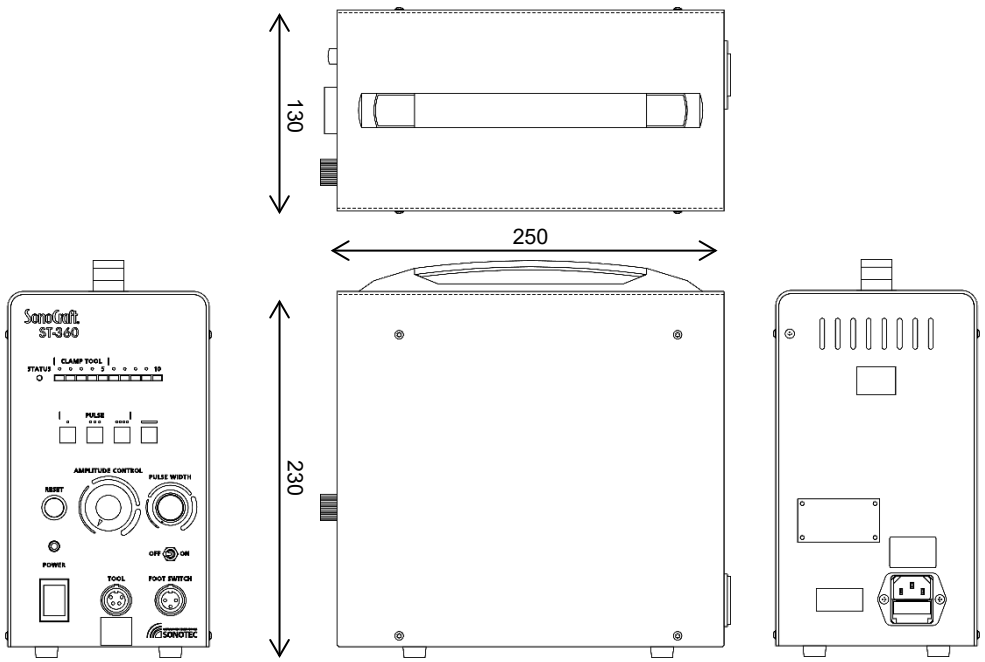
In order to use this machine so as to achieve optimal performance under the best circumstances, please read this manual carefully and store it in a safe place.

Please be aware that some illustrations may vary slightly from the actual product. XXX

1. Specifications

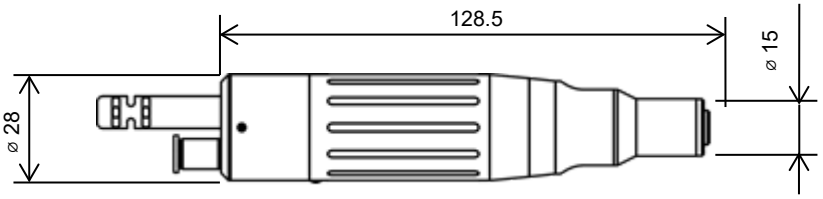
1. Oscillator

Model	ST-360	
Power Supply Voltage	Single Phase AC 100-120 V 50/60 Hz	Single Phase AC 200-240 V 50/60 Hz
Fuses	Model No.: 7550 / Rating: 1.6 A - 250 V / Size: 5 x 20 / 2 fuses used	
Power Consumption	150 VA	
Output Wattage	45 W	
Frequency Adjustment	20-24 kHz Automatic Feedback	
Output Power Adjustment	Variable Control	
Fail-safe Functions	Heat Generation and Overloading Detection	
Operating Temperature Range	0-40°C	
Operating Humidity Range	30-80% RH (no condensation)	
External Dimensions	H 230 mm x W 130 mm x D 250 mm	
Mass	3.0kg	



2. Transducer

Model	HP-9706
Cord	⌀ 4.5 mm x L 1.7 m (curled portion approx. ⌀16 x L 50 mm)
External Dimensions	⌀ 28 mm × L 128.5 mm
Mass	300g
Remarks	Air cooled



2. Table of contents

3. Warnings and Precautions

These are the minimum requirements that you must comply with in order to safely operate this machine.

Failure to comply with these safety precautions may cause accidents which result in serious injuries or death, and may also result in various other injuries or damage to this product or other property.

Any malfunctions resulting from failure to comply with the following warnings and cautions cannot be considered under the terms of our standard repair warranty.

Please always refer to this Manual in order to ensure the safe operation of this machine.

	This mark shows that there is a particular need for caution when handling this machine.
	This mark shows that there are particular actions that are prohibited when operating or maintaining this machine.
	This mark shows that there are particularly important instructions that the user must be sure to understand and remember when handling this unit.

1. Warnings

	This machine must be grounded. Check the power outlet specification and make sure that the power plug is grounded.

	Do not touch the connector electrode section. At the oscillator-transducer connector electrode section and the oscillator power connector electrode section, high voltage accumulates and you can get an electric shock.

	Do not touch the oscillating parts. Touching oscillating parts such as a tool or horn while oscillating can cause friction burns. Exercise caution as these parts can remain very hot after using.

	Wear safety glasses and dust-proofing masks. Abrasive grains, abrasion dust, and pieces of broken tool may scatter.

	Wear ear protectors, such as ear plugs and ear muffs. Some tools and processing conditions can cause abnormal sounds and excess sound pressures that damage your hearing.

	Avoid continuous operating over long periods. Continuous operation over long periods conveys vibrations to the hand that can cause numbness and other hand disturbances. Moderate temperature burns can also be caused by the heat generated by the transducer.

	Do not touch with wet hands.

	Do not disassemble or modify parts unless indicated in the Manual.

2. Precautions

	Do not place or operate the machine in the following places. Outdoors and places under direct sunlight Places where water may splash and the machine could get wet Places with high levels of corrosive gases, humidity and dust Near firearms and other heat sources Places in which strong magnetic fields are generated by high voltage cables, motors, and transformers

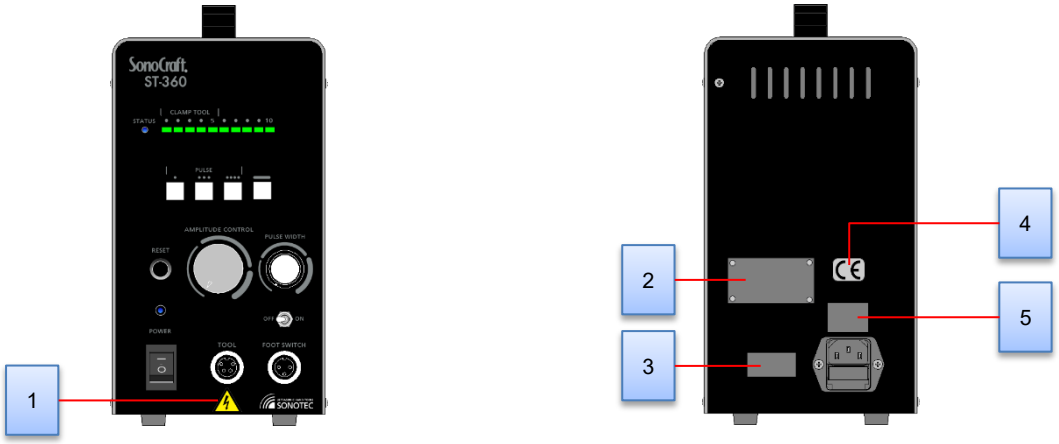
	Avoid dropping the device from heights, shaking the device or causing impact to the device.

	Do not forcibly pull or excessively bend the cables. Do not damage the cables with tools.

	Tools must be securely attached. Ultrasonic vibrations are vibrations generated by using the resonance of the tool. Steady vibrations are achieved when the tool attached to the oscillator, adapter, holder and tool are connected without looseness or gaps and as close as possible to the transducer and unit. Keep every connection surface clean and use the specific wrench to tighten. Failure to securely attach tools will result in malfunction or breakdown.

	Use moderate levels of vibration output and processing pressure. Tools used with the holder, such as ceramic abrasive stone, can break under high vibrations or generate heat. Use the clamp mode for these tools. Diamond files are hard and brittle. Keep in mind that they tend to break easily. Use moderate processing pressures and avoid causing impact.

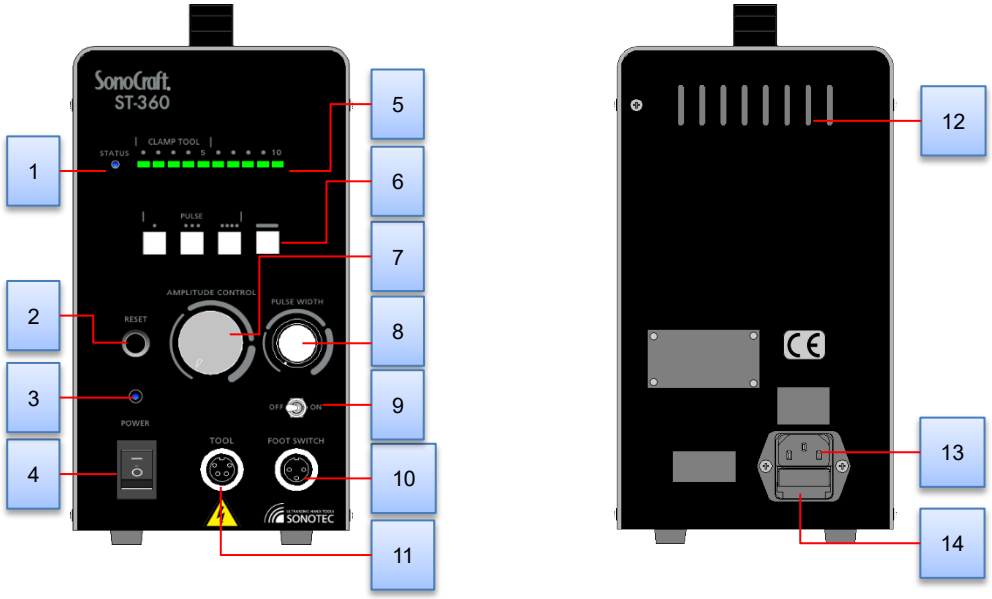
4. Label Positions and Descriptions



1	Electric Shock Warning	You can get an electric shock if you touch the receptacle. Be careful.
2	Rating Plate	Indicates frequency, output wattage, power supply voltage, power consumption, and serial number.
3	Fuse Rating	Indicates fuse rating.
4	CE Marking	This machine is in compliance with the following directives of EU standardization organizations. EMC directives EN 61000-6-4:2007+A1:2001 EN 61000-6-2:2005 Low Voltage Directive EN 61010-1:2010
5	Power Supply Voltage Rating	Indicates power supply voltage rating.

5. Names and Functions of the Oscillator Components

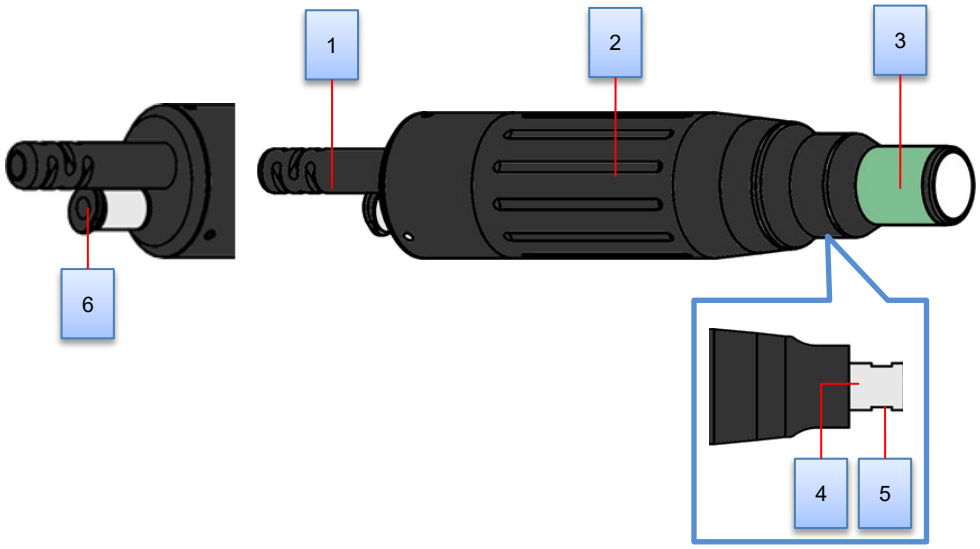
1. Oscillator



1	Oscillation ON Lamp	The lamp is illuminated in blue during oscillation and illuminated in red when an error occurs.
2	Reset button (RESET)	Cancels error mode when an error occurs.
3	Power source lamp (POWER)	Illuminated when the power switch is turned on.
4	Power switch (POWER)	Turns the power on/off.
5	Output lamp	The number of lights illuminated change with output volume.
6	Oscillation interval button	Allows you to select an oscillation interval. The button the selected interval is illuminated.
7	Output volume (OUTPUT)	Allows you to adjust output volume.
8	Oscillation time volume	Allows you to adjust oscillation time.
9	Oscillation switch	The oscillation can be turned on/off.
10	Foot switch connection receptacle (FOOT SW)	Allows you to connect the foot switch plug.
11	Transducer connection receptacle (TOOL)	Allows you to connect the transducer plug.
12	Air outlet	Heat is released from the oscillator.
13	Power source receptacle	Allows you to connect the power source plug.
14	Fuse box	Houses two fuses.

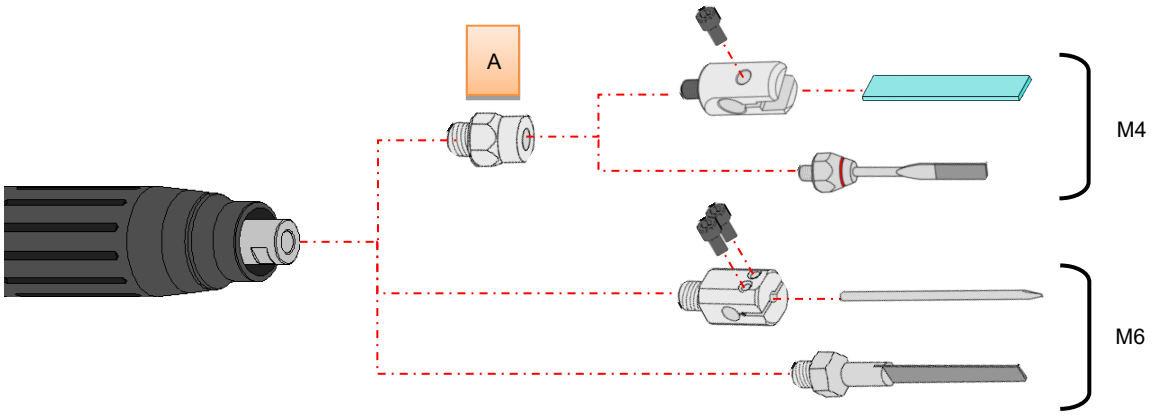
2. Transducer

(1) Body



1	Cord	It can be connected to the oscillator.
2	Housing	It can be used as a handpiece.
3	Sleeve	It can be used as a handpiece. It can be screwed on or off. Remove it when exchanging the tool or when using a tool that is not compatible with the sleeve.
4	Cone	A part of the transducer unit to which a tool can be attached. The sleeve must be removed. Do not touch while vibrating. Friction can cause burns.
5	Wrench catcher	Used to catch the wrench when exchanging tools. The sleeve must be removed.
6	Air inlet	When air is run through the inlet, it flows out near the cone. Use it with an air flow rate of 50 L / m or less.

(2) Female thread diameter of cone



The tool can be freely changed according to the purpose.

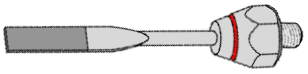
can also insert M4 tools and holders by using the conversion adapter (A).

6. Tools

1. Integrated tools

Since it is an integrated tool that attaches the tool directly to the cone, it can be used at maximum output.

(1) Diamond File



It is a tool that combines diamond grinding powder with a metal shank.

We emphasize polishing power.

(2) Diamond abrasive stones (metal bond)

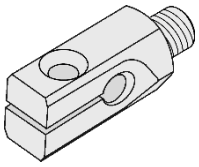
This is a sintered stone made of metal powder and diamond particles.

It can be used not only on the surface but also inside of the surface, so it has a long life.

2. Clamp tools

Only use half the power of the clamping tool used for the holder.

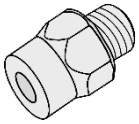
(1) Holder



You can install tools that cannot be installed alone.

The shape of the holder depends on the tool to be installed.

(2) Adapters



Converts tool mounting diameter from M6 to M4.

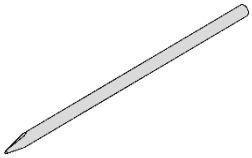
It is not possible to convert from M4 to M6.

(3) Ceramic abrasive stones

Composite material of ceramic (alumina) filaments and thermosetting resin.

Since it does not clog and is hard to break, it is possible to finish fine surfaces and fine parts.

(4) Chisels

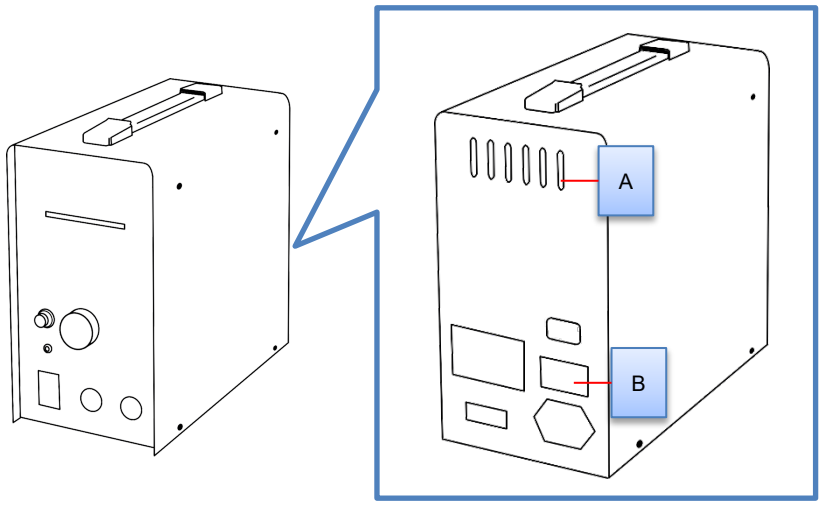


It is a tool specialized for carving and jewelery work of carbide materials.

Work like hitting a hammer continuously with ultrasonic vibration is possible.

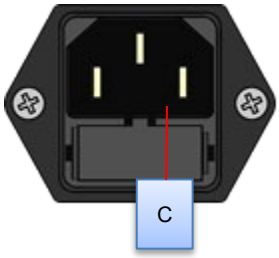
7. Set-up and Connection

1. Set-up of the oscillator



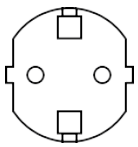
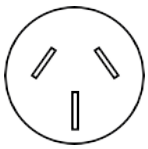
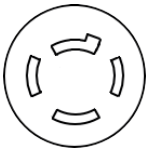
- The front surface must be visible and accessible.
- There must be no object within 100 mm of the back surface to allow air flow.
- Do not cover the air outlet (A).
- Do not place the oscillator on its side. Always place it on a flat surface, avoiding sloped surfaces.
- Operate within the temperature range of 0-40°C and humidity range of 30-80%.
- Do not let condensation form.

2. Power Supply and grounding



Check the power source voltage rating (B) found at the back of the oscillator first. Connect the supplied power cord to the power receptacle (C).

This machine must be grounded (earthed) to prevent accidents.

Model 7102	Model 7103	Model 7104
		

Power cords with various types of plugs as shown above are available.

After confirming the model number you wish to purchase, please contact the distributor or SONOTEC.

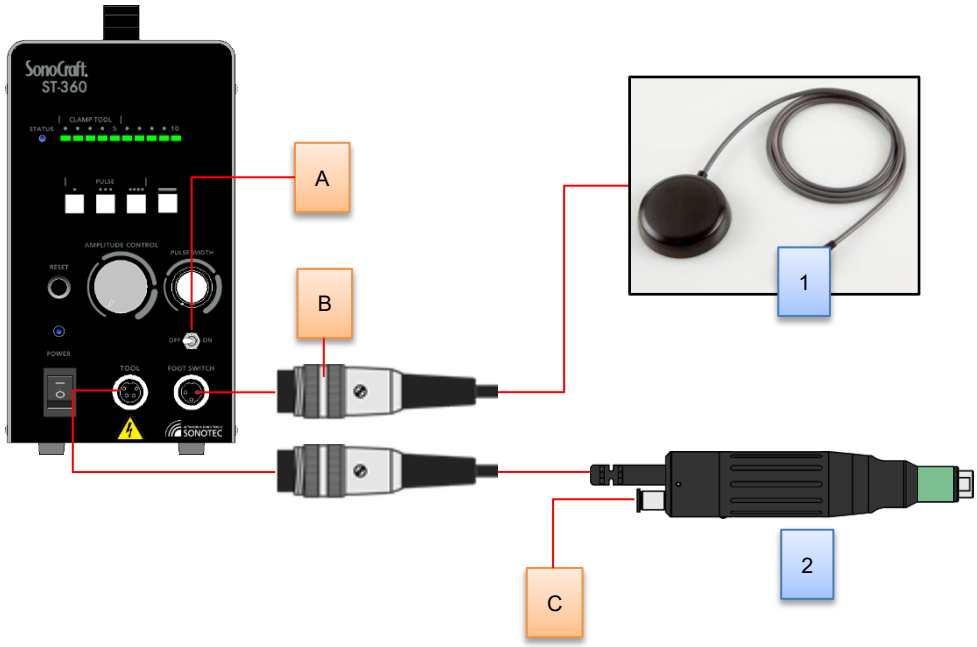
3. Connections

Connect the foot switch (1) and transducer (2) to their respective receptacles.

It is possible to use only the oscillation switch (A) without using the foot switch (1).

The plugs are screwed in. Turn the screw fastener (A) to securely connect the plugs.

Run cooling air (B) through the air inlet at the back of the oscillator.



4. Cooling Air

Be sure check the following if you are using cooling air to air cool the oscillator.

There are two common types of air compressors: wet type oil-lubricated compressors and dry type oil-less compressors.

Wet type (oil-lubricated)	Drives using oil with large output. Usually not used for work involving blowing air directly.
	Mainly used for air-driven machining tools, motors, and production line driving force.
Dry type (oil-less)	Outputs clean dry air without using oil. Can be used for work involving blowing air directly.
	Mainly used for air cooling, cleaning, and painting.
	Without the oil mist, there are also food, medical and other health related uses.

(1) Oil mist contamination

Oil mist is mixed in by wet type compressors, or they are designed to incorporate oil mist.

The majority of the machines that use this type of air are driven by air pressure and designed to operate even if contaminated with oil.

Dry type compressors do not have any oil in the compressor unit so as to prevent oil mist from mixing.

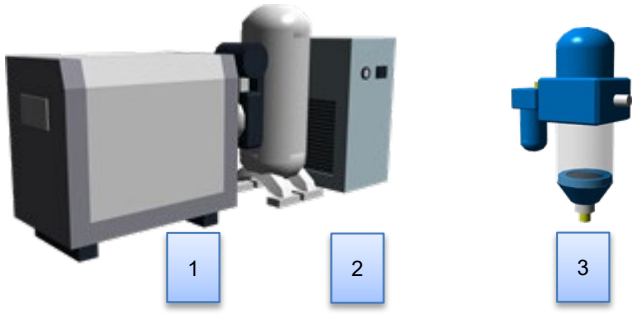
(2) Water droplets and draining

Air compressors suction air and compresses it.

When air is compressed, the temperature rises, always creating water droplets from condensation. This is the same for the wet type or dry type.

After each use, the air compressor must be drained and water that accumulates inside the compressor must be dried off.

(3) Required system

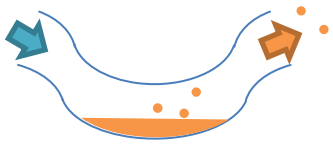


1	Compressor	The equipment that suctions, compresses, purifies, compresses, and stores air. These functions may be run by independent units and can vary from one equipment to another. Check the specifications of your equipment.
2	Dryer	As compressed air is wet due to condensation, this equipment dries the condensation.
3	Air filter	This equipment removes impurities.

The above description is only a typical example. Always consult system/equipment technicians and check the specifications.

(4) Piping

Despite having a system as described in the previous section, contamination by water droplets, oil mist, and other impurities may still occur due to system malfunction or poor maintenance. Once contaminated, impurities may collect at the bend of a pipe.



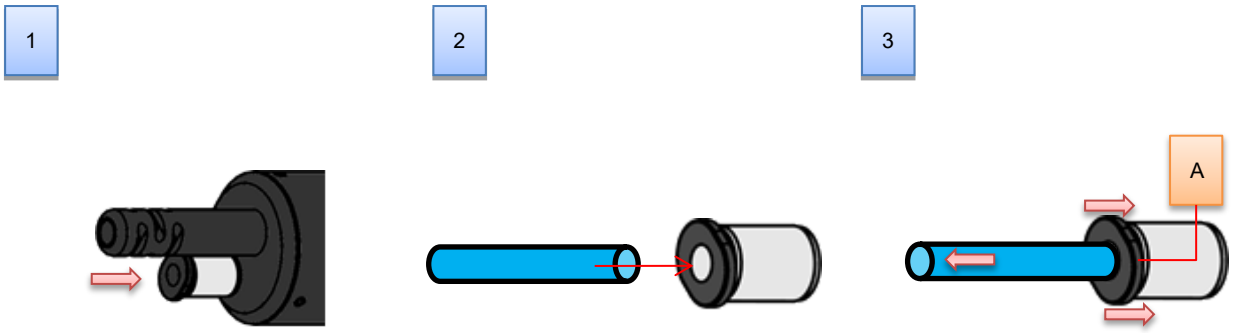
It is difficult to remove contaminants once they collect in piping. In the worst case, the piping needs to be replaced.

If piping cannot be replaced, a certain amount of contaminants can be expelled, and an air filter can be added near the end of the piping.

(5) Cooling air supply

To cool the Transducer, adjust the air flow rate according to your work.

The air inflow rate should be 50L/min or less. The Transducer may be damaged.



1	There is an air inlet at the rear of the Transducer.
2	Insert an air tube as far as it goes into the air inlet at the back of the oscillator. Once inserted, the tube is fixed.
3	To remove the air tube, pull the tube as you hold down the A part.

8. Affixing/Removing and Cleaning Tools

1. What you will need

1 2 3 4 5 6

1	Model 7302: Wrench (10 mm) x 2	Supplied as part of standard accessories.
2	Model 7003: Hex wrench (M3)	Supplied as part of standard accessories.
3	Model 7122: Torx wrench (T8)	Supplied as part of standard accessories.
4	Cleaning agents	Parts cleaner, organic solvent, or similar which removes oil and are safe to use on machinery
5	Cleaning wipes	Low lint paper cleaning wipes work best.
6	Thin plate	Used to clean holder slits (gaps). Metal sheets work best.

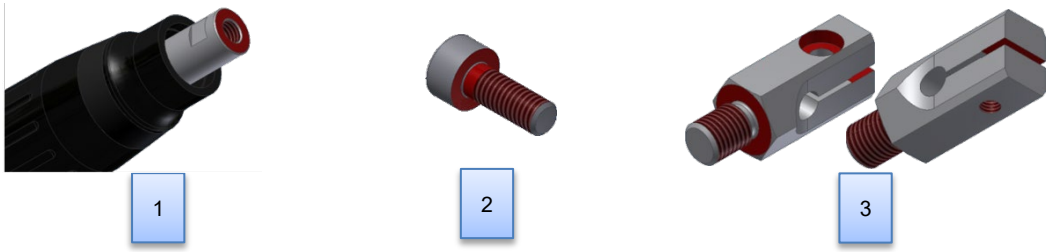
2. Cleaning

(1) Areas that require cleaning

Clean areas of each part marked in red.

The areas marked in red are the surfaces that come in contact when two parts are attached. Dirt, oil and other contaminants on the surface prevent proper attachment.

Improperly attached parts cause abnormal heat generation and vibration, which may lead to malfunction.

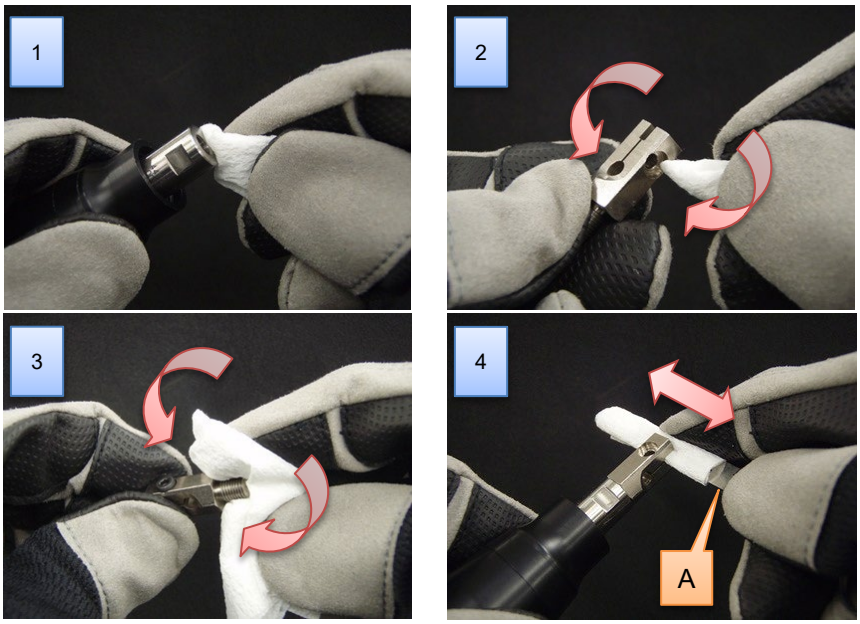


1 2 3

1	Cone
2	Fastening screw
3	Holder

(2) How to clean

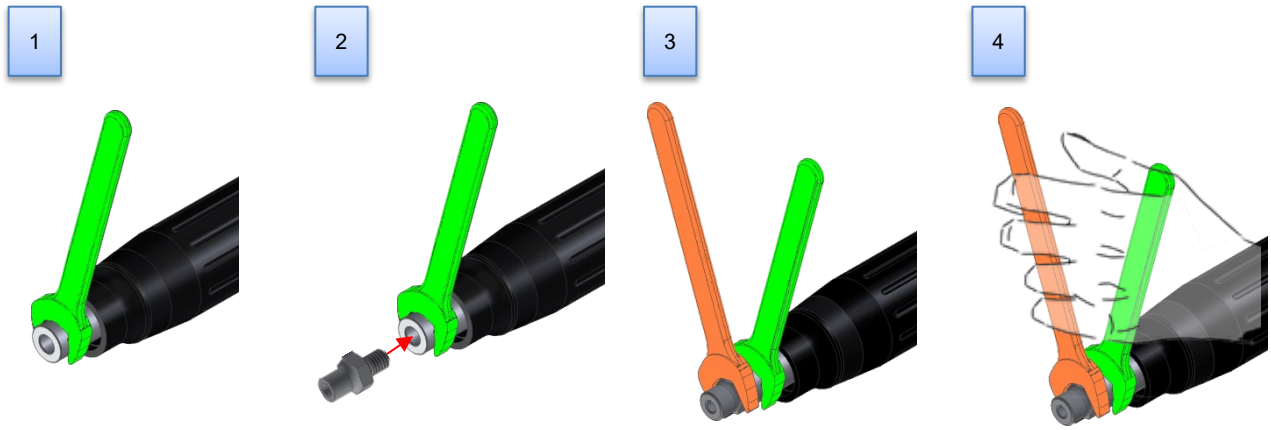
Spray a cleaning agent (such as parts cleaner) directly to the areas to be cleaned or dampen a cleaning wipe with the cleaning agent and perform the cleaning.



1	Surfaces	Wipe the surfaces and remove any dirt.
2	Female screws (seat)	Twist a small piece of a cleaning wipe and push it in to wipe off any dirt.
3	Male screws	Wipe between the screw threads with a cleaning wipe pinched under your fingernails.
4	Slits	Wrap a cleaning wipe around a thin plate and wipe off the space. Using a thin plate alone to carefully scrape off any dirt without scratching the holder is also effective.

3. How to affix and remove all-in-one tools or the holder

Below are the steps to affix a part. To remove a part, perform the steps in the reverse order.



1	Place a wrench (green/10 mm) on the “wrench catcher” of the cone.
2	Attach a part you wish to affix (e.g., all-in-one tool, holder) and tighten.
3	Place a wrench (orange/10 mm) on the part.
4	Use the two wrenches to tighten. If you can hold them in one hand, hold them as shown in the diagram to tighten.

Screw Gauge	Tightening Torque	Remark
M6	10N･m	HP-9706 Cone

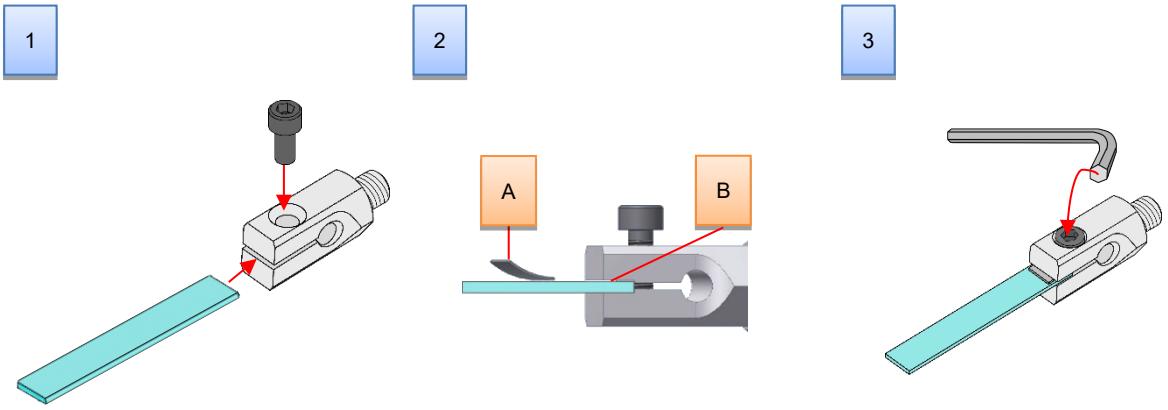
Always use the correct tightening torque to avoid under- or over-tightening.

Improperly attached parts cause abnormal heat generation and vibration, which may lead to malfunction.

4. How to affix and remove tools

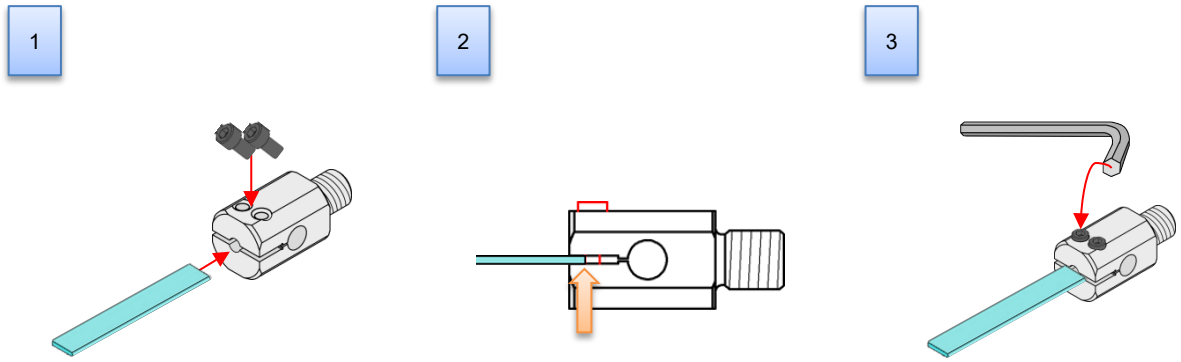
Below are the steps to affix a part. To remove a part, perform the steps in the reverse order.

(1) Series "MX" Holder :Affixing/removing a ceramic abrasive stone (plate)



1	Insert a ceramic abrasive stone (flat) and fastening screws into the holder.
2	When the tool such as a grinding stone to be clamped is thin and a gap exists in the slit, insert a metal sheet(A) to eliminate the gap(B) before tightening the fixing screw together with the tool.
3	Tighten the fastening screws using the hex wrench. Tighten the screws firmly without stripping the screw head.

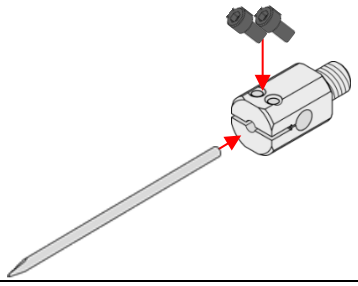
(2) Series "HR" Holder :Affixing/removing a ceramic abrasive stone (plate)



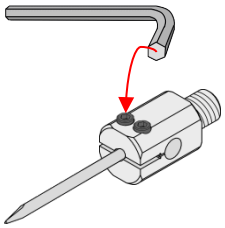
1	Insert a ceramic abrasive stone (flat) and fastening screws into the chisel holder.
2	Flat tools should go just far enough to touch the fastening screws.
3	Tighten the fastening screws using the hex wrench. Tighten the screws firmly without stripping the screw head.

(1) Affixing/removing a chisel or ceramic abrasive stone (cylinder)

1



2

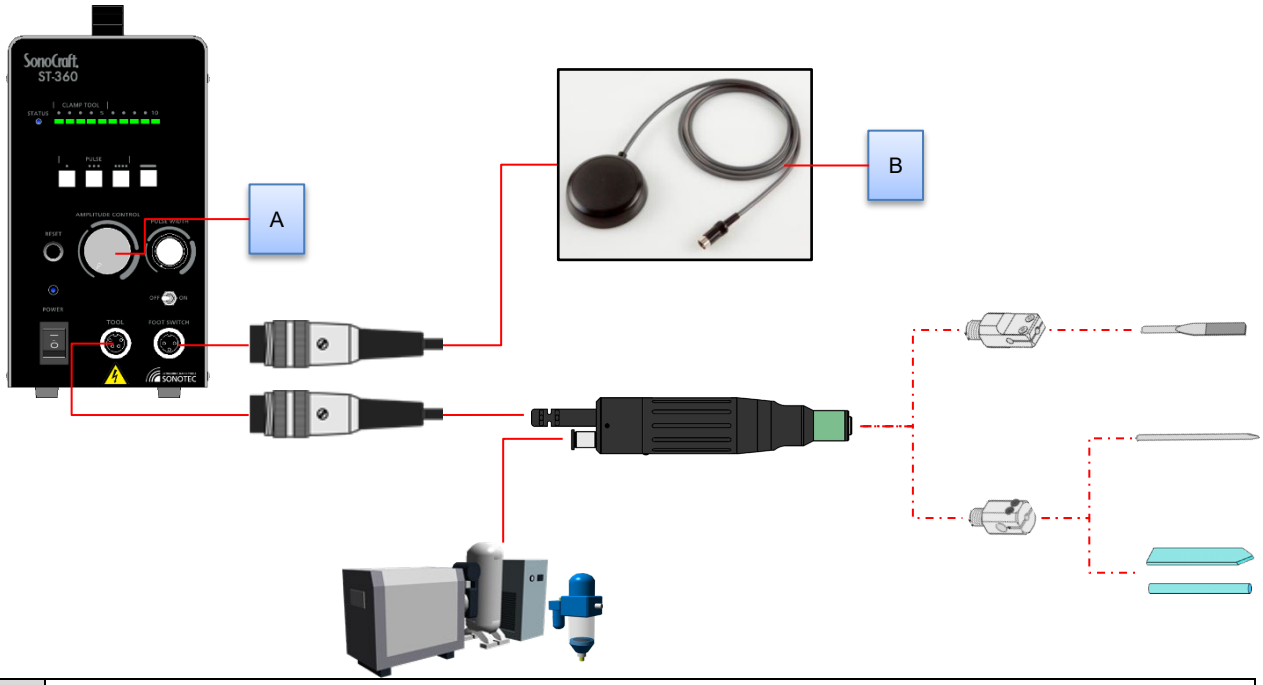


1	Insert a chisel or ceramic abrasive stone (cylindrical) and fastening screws into the chisel holder.
2	Tighten the fastening screws using the hex wrench. Tighten the screws firmly without stripping the screw head.

9. Operation Instructions

1. Basic operation instructions

Ensure that the system is set up as shown below before turning the power on.



1	You can adjust output by turning OUTPUT volume dial (A).
2	Step on the foot switch (B) to start operation. (Oscillation continues while the foot is on the switch.)

Precautions when using the holder

If you are using a diamond filing tip or ceramic abrasive stone with the holder, reduce the output volume in half.

Tools heat up from excessive vibration because of the way they are clamped. There is a risk of scorching and damage.

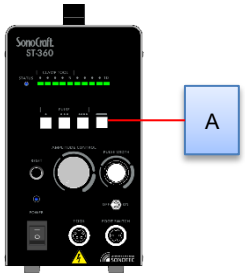
Output volume can be increased only when heat is being suppressed by the use of cooling air.

You can use the maximum output with chisels.

2. Oscillation modes

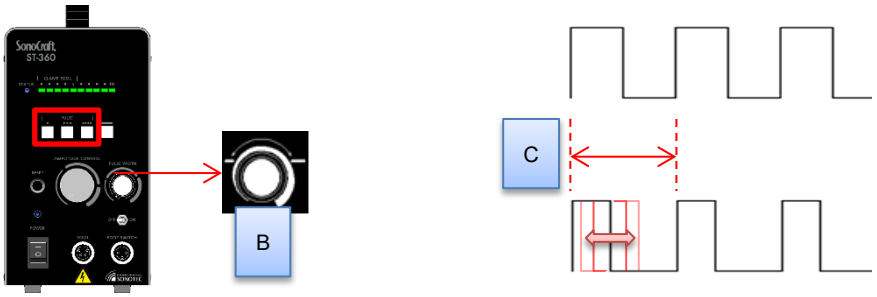
(1) Select oscillation interval

You can select one of four patterns of oscillation intervals with the interval button (A).



Pattern		When the foot switch is depressed
▬▬▬	Continuous	The basic pattern of continuous oscillation. Oscillation time cannot be adjusted.
▬ ▬ ▬ ▬	Intermittent (fast)	Oscillation ON/OFF is intermittently repeated. There is a 0.14-second interval between two oscillations (approximately 7 oscillations per second).
▬ ▬ ▬	Intermittent (slow)	Oscillation ON/OFF is intermittently repeated. There is a 0.4-second interval between two oscillations (approximately 2.5 oscillations per second).
▬	Single oscillation	A single oscillation is generated.

(2) Adjusting oscillation time

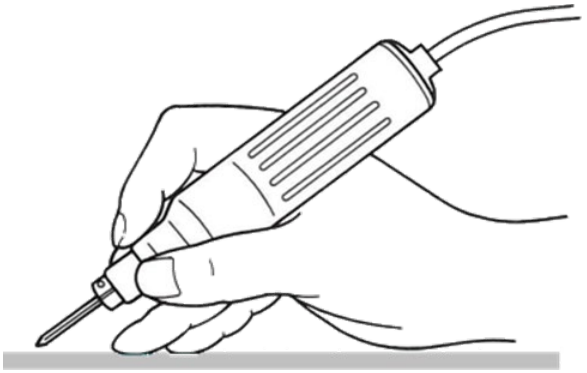
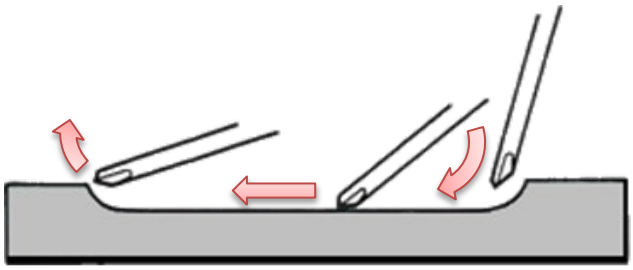
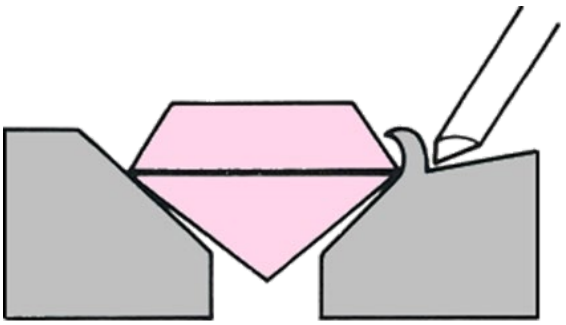
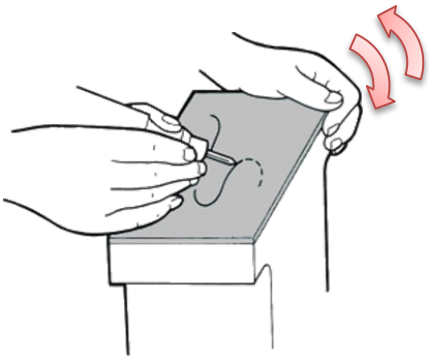


You can change the oscillation time for intermittent (fast), intermittent (slow), and single oscillation patterns by adjusting the volume dial (B).

In the intermittent patterns, the OFF time is shortened and ON time is extended. The oscillation interval (C) stays the same.

In the single oscillation pattern, the ON time is extended. There is no OFF time.

3. Engraving and ornamentation works

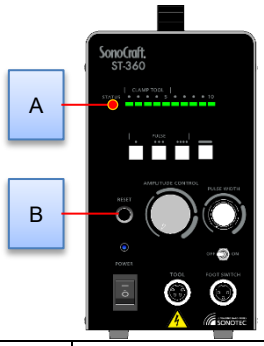
How to hold the transducer Hold the transducer the same way you hold a pencil, securing it with your thumb, index finger and middle finger and adding the other fingers. Placing your ring and little fingers on the workpiece helps to stabilize your hand as you engrave continuously.	
Tool angle Keep the tool at a small angle. When engraving continuously, keep the tool at a slightly larger angle. Once you decide on a depth, keep carving at the same angle. Move the chisel by guiding the tool slowly and without too much force.	
Stone mounting / prong making Start operation with the chisel ready in place on the workpiece. Do a test run on a copper plate or similar to check the prong size, depth, tool angle, etc. before you start working on the actual workpiece.	
Curved line engraving Attach a chisel for curved lines. Keep the transducer steady and move the workpiece or vise for easy carving and excellent results.	

10. Error

When the oscillator detects a problem preventing normal operation, it stops in error mode to prevent malfunction.

This happens when an excessive load is applied during processing or when operation is started with an improperly attached tool.

Error mode is canceled by pressing the RESET button.



A	Oscillation ON Lamp	Illuminated in red when an error occurs and blue when operating normally.
B	Oscillation switch	Please turn it off once. (Cannot oscillate after reset)
C	Reset button (RESET)	Cancels error mode when an error occurs.

11. Troubleshooting

In case of a failure, please take the steps described for the following problems. If the problem cannot be resolved, please contact SONOTEC or the distributor.

1. Check first

This machine uses resonance ultrasonic vibrations to apply surface processing.

For the device to produce ultrasonic vibrations while keeping balanced resonance, all parts must be correctly attached and there must be no foreign materials inside.

Cause	What to do
Unclean parts or tools	See Affixing/Removing and Cleaning Tools (p.16) Clean parts and tools and keep them free of foreign materials. Properly attach parts and tools and tighten using the appropriate tightening torque.
Parts not cleaned	
Foreign material (dust) trapped in parts and tools	
Parts and tools not properly attached	
Insufficient tightening torque	

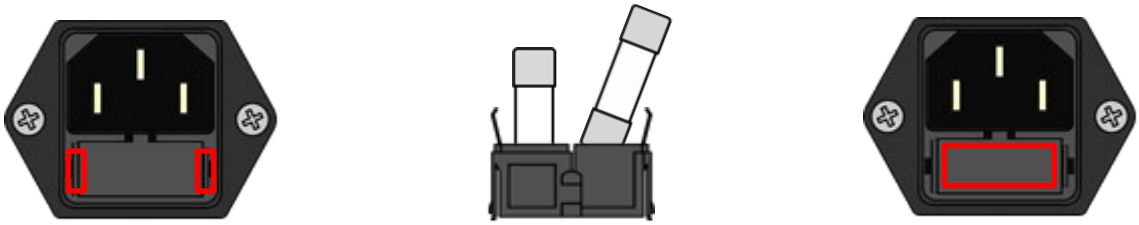
2. What to do in these situations

Situation	Cause	What to do
The power does not turn on.	Connection failure.	See Power Supply and grounding (p.12)
	Power cord disconnection.	
	High power supply voltage.	Malfunction will result. In this case, contact SONOTEC.
	Blown fuse.	See Replacing Fuses (p.27) However, if the problem persists after replacing the fuses, please contact SONOTEC.
The oscillation ON lamp does not come on.	Not oscillating.	Test with Oscillation switch and foot switches, respectively. Connect the foot switch and check for cord disconnection or switch malfunction.
	The foot switch is not connected or malfunctioning.	
The oscillation ON lamp is illuminated in red. (Error)	The oscillator is arrested in error mode due to high processing load.	See Error (p.24) Cancel the error. Reduce the processing pressure (how much force you apply) or lower the power output and resume work.
The power output lamp does not come on.	Not oscillating.	The power output lamp is not illuminated when not oscillating.

Situation	Cause	What to do
The power output lamp does not come on. (The oscillation ON lamp is illuminated in blue)	The transducer is not connected or malfunctioning.	Connect the transducer and check for cord disconnection or switch malfunction.
The power output lamp is flashing. The power output lamp does not come on properly.	Power output is too low.	Power output is too low to correctly resonate. Increase the power output and resume work at an output level that turns on the power output lamp.
	Frequency mismatch.	Frequency is determined by various factors, such as the length, form, weight, and attachment. Check attachment. Replace the part and tool and check.
Turning the power output volume does not change output.	Power output volume malfunction	Do polishing to check output changes and contact SONOTEC.
	The output power lamp malfunction	
Does not vibrate. Low vibrations.	Tool frequency mismatch	Use another tool to do polishing to check output changes first and contact SONOTEC.
	Tool damage or handpiece malfunction	In this case, contact SONOTEC.
Does not vibrate. Low vibrations. (Vibrates when other tools are used)	The tip of the tool is right at the “vibration node.”	This phenomenon is unique to ultrasonic vibrations in which, depending on its length, a tool has an area that vibrates greatly and another area, “the vibration node,” where there are almost no vibrations. Cut or file down the tool to shorten it or replace it with a longer tool.
Abnormal sound is coming from the transducer.	Tool damage Transducer damage	Check the tool and transducer first and contact SONOTEC.
Transducer is generating heat.	In use for a long period. Power output is high.	See Cooling Air (p.14) Use the cooling air to cool down the transducer.

12. Replacing Fuses

1 2 3



1	Hold the tabs to pull out the fuse box housed in the power receptacle at the back of the oscillator.
2	Replace the two fuses inside the fuse box.
3	Finally, insert the fuse box all the way.

If fuses keep blowing even after replacing them, there may be a mechanical problem with the main unit. In this case, contact the distributor or SONOTEC.

13. Product Warranty

Product Warranty and points to keep in mind when using this product.

1. The warranty period for the oscillator and transducer will be for one year from the date of shipment.
   In the case of any malfunction and/or breakage/damage that occurs under normal conditions (pursuant to our Instruction Manual) within the warranty period, exchange and/or repair will be performed by our company free of charge.

2. Even within the warranty period, the following conditions are NOT covered under the terms of the warranty:
   A) Incorrect use, which includes any use differing from the described intended purposes, or, damages suffered from any other equipment.
   B) Malfunction and/or breakage/damage resulting from any external factors after delivery of product (such as falling/being dropped, impact shock, overload, contact with liquids or foreign substances, etc.).
   C) Malfunction and/or breakage/damage by fire, earthquake, wind and/or water damage, and any other extraordinary natural phenomena, as well as environmental pollution, salt pollution, abnormal voltage, etc.
   D) Malfunction and/or breakage/damage caused by operating the equipment under conditions/using methods which do not accord with this Instruction Manual.
   E) Any repair, disassembly or conversion not undertaken by us (which includes any tampering with the warranty sticker and warranty rivet).
   F) Malfunction and/or breakage/damage deemed to be caused by insufficient packaging for return shipment to us.
   G) Attachment tools (including blades and abrasive stones), holder, fastening screws, fuses and other consumables.
   H) Anything which upon close inspection we evaluate as equivalent to any of the above (A-G).

3. In addition to attachment tools (including blades and abrasive stones), holder, fastening screws, fuses and other consumables, the following limited-life components are also included.
   The length of time for which limited-life components are viable varies depending on factors such as frequency of use and operating environment, but the period may shorten due to tear, deterioration and other factors. In order to maintain this product in a stable condition for longer, we recommend a regular inspection once every 2 years on average.
   [Time-frame for replacement of main limited-life components]

Oscillator	Cooling Fan	11 years	Switches	25,000 times
	Electrolytic capacitor	7 years	Liquid crystal display	6 years

Transducer	Oscillating components such as the cone	6 years	Collar, O-ring flange, and other anti-vibration components	2 years
	Rotary joint	2 years	Transducer connection cord	2 years
	Connecting screws	2 years	Manual transducer switch	100,000-500,000 times

*This is a guideline and not a guarantee that each component will last for the stated period.

4. Exchanges, repairs and inspections can only be made at the SONOTEC factory and the products have to be sent to us regardless of the time in or out of the warranty period. We do not provide any on-site exchange/repair/inspection service.
   Maintenance and machine fault diagnosis of this machine performed on site are subject to fees.

5. Please understand that usually 2 weeks to 1 month of repair/inspection time are required after receipt of your order. However, it is possible that the period required may be longer if the repair in question is especially difficult, and in such cases the time-frame will be a matter for consultation. Please make sure that a spare unit is available for use if you cannot afford to halt work tor the whole repair time.

6. The shipping and its related costs to and from SONOTEC for out-of-warranty repair are to be borne by the customer.

7. In order to improve the competitiveness and productivity of our machines, SONOTEC may implement improvements and changes to our products without being able to immediately notify all of our customers. For the repair of products that have been sold previously, SONOTEC will attempt to ensure that the component parts are repaired, but if there is a case in which this is difficult, there is a possibility that SONOTEC shall suggest alternative parts and other viable solutions.

8. In the case of custom specifications (such as for the oscillator, transducer, attachment tools) for this product, only short-term testing will have been performed in most cases, and therefore unexpected failures may occur with long-term operation. The customer is advised to conduct thorough testing.
   Also, in the case of custom specifications, there may be certain issues that shall not be covered by the warranty.

9. According to factors such as the frequency of use by the customer and the operating environment, wear and breakdown/malfunction may be caused by factors that could not be foreseen based on the technical standards applied to the production of these machines, and therefore certain failures may occur that are not described in the instruction manual, and the maintenance and replacement of such components are a matter for consultation.

10. This product is intended to be used in conjunction with general industrial equipment.
    If you wish to use this product in conjunction with equipment for which the quality and reliability requirements are extraordinarily high, and where injuries or fatalities, as well as environmental damage or serious property damage due to a malfunction or failure may occur (such as with nuclear power control equipment, aerospace equipment, transportation equipment, traffic signal equipment combustion control, life support equipment, medical equipment, various safety devices, etc.), please contact us in advance. Extensive consultation and comprehensive validation of the compatibility for use are necessary, and it shall be made under the responsibility of the customer, including any potential risks.

11. In the event that a customer has received a claim for damages from a third party by reason of claims of patent infringement or violation of intellectual property rights with regard to production facilities and manufacturing methods that make use of this product, SONOTEC shall not stand as a party to any proceedings.

12. Regardless of the warranty period or the cause of the type of legal request made, any loss of opportunities, loss of profits, secondary damage, or damage to products other than of our company, as well as the cost of replacement work, readjustment and trial runs of on-site machinery resulting from any use of present products or inoperability thereof lies outside of the terms of the warranty.

13. In order to prevent circumstances that lead to a serious accident or the catastrophic failure of this product, please configure your set-up with backup and fail-safe functions integrated into the system.

14. PLEASE NOTE

In the case that there are questions regarding the interpretation of the provisions of the Product Warranty, the Japanese language copy takes precedence.
Although this instruction manual has been adapted for use overseas, in order to avoid misinterpretation due to differences in expression, definitions which are translated into a language other than Japanese are not valid.
For the benefit of its customers, SONOTEC will always apply the most up-to-date information about product warranty provisions.